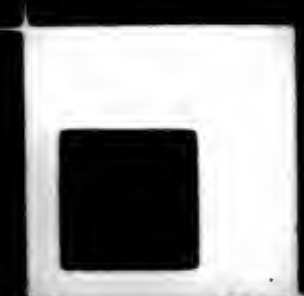


**START**



U. S.  
OFFICIAL GAZETTE  
UNITED STATES  
PATENT OFFICE  
VOL. 956  
MARCH  
1977

MICRO PHOTO DIVISION



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OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE

March 1, 1977

Volume 956

Number 1

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# PATENT AND TRADEMARK OFFICE NOTICES

## Results of Trial Voluntary Protest Programs

This notice updates the results of the First Trial Voluntary Protest Program and summarizes the preliminary results of the Second Trial Voluntary Protest Program.

### First Trial Voluntary Protest Program

The First Trial Voluntary Protest Program was announced in the Commissioner's Notice of May 7, 1974, which appeared in the OFFICIAL GAZETTE on June 4, 1974 at 923 O.G. 2. The preliminary results of the program were summarized in the Commissioner's Notice of September 4, 1975, which appeared in the OFFICIAL GAZETTE on October 7, 1975 at 939 O.G. 1.

In the First Trial Voluntary Protest Program, 667 applications were published for protest. Sixty-seven protests were received in sixty applications. Prosecution was reopened in 37 of the protested applications.

The current status of the 667 published applications is shown in Table I.

TABLE I.—STATUS OF PUBLISHED APPLICATIONS  
[December 31, 1976]

Status	Published applications—			Total
	Not protested	Not reopened	Reopened	
Patent issued.....	586	23	11	620
Allowed, awaiting issue.....	1	0	8	9
Pending.....	0	0	10	10
Abandoned.....	20	0	8	28
Totals.....	607	23	37	667

The issues or grounds for non-patentability raised in the Office actions reopening prosecution in the 37 applications reopened for prosecution are tabulated in Table II. The number shown indicates the number of applications in which the indicated issue was raised. It will be noted that more than one issue was raised in some applications.

TABLE II.—ISSUES RAISED IN REOPENING ACTIONS

Issue raised	Number of applications now—			Total
	Abandoned	Allowed	Pending	
1. Prior art under 35 USC 102.....	3	7	5	15
2. Prior art under 35 USC 103.....	8	16	4	28
3. Prior public use or sale under 35 USC 102(b).....	0	0	1	1
4. Prior invention under 35 USC 102(g).....	0	0	2	2
5. 35 USC 112, first paragraph.....	0	1	1	2
6. 35 USC 112, second paragraph.....	0	4	3	7
7. Misrepresentation or fraud.....	0	0	1	1

The status of claims appearing in the 27 applications in which prosecution was reopened and concluded is shown in Table III.

TABLE III.—STATUS OF CLAIMS

	Number of claims			Total
	In applications—			
	Allowed	Abandoned		
1. Published for protest.....	142	89	231	
2. Rejected in Office action reopening prosecution.....	130	89	219	
3. Ultimately allowed.....	143	0	143	

The applications in which prosecution has not been concluded contained 96 allowed claims of which 62 were rejected in the Office action reopening prosecution.

In 32 of the 37 protested applications in which prosecution was reopened, at least one claim was rejected on prior art under 35 USC 102 or 35 USC 103. The type of prior art utilized in these rejections is shown in Table IV. The number shown indicates the number of applications in which the indicated art was utilized.

TABLE IV.—PRIOR ART RELIED UPON IN REJECTING CLAIMS

Type of art	Number of applications now—			Total
	Allowed	Abandoned	Pending	
U.S. patents—				
Of record.....	10	6	2	18
Newly cited by protester.....	10	4	3	17
Newly cited by examiner.....	3	0	2	5
Foreign patents—				
Of record.....	2	1	0	3
Newly cited by protester.....	8	1	1	10
Newly cited by examiner.....	1	0	0	1
Non-patent literature—				
Of record.....	2	0	0	2
Newly cited by protester.....	7	2	0	9
Newly cited by examiner.....	1	0	0	1

A rejection of at least one claim was made in 33 of the 37 applications in which prosecution was reopened. Of the remaining four, 2 have been placed in interference proceedings, 1 is undergoing public use proceedings and in 1 an allegation of fraud is under investigation. The number of claims rejected, the grounds for the rejections and whether the rejections were based upon information furnished by the protester, the examiner or a combination of information furnished by the protester and the examiner is shown in Table V. The number in parentheses indicates claims rejected in applications which have been issued or allowed.

TABLE V.—GROUNDS FOR REJECTION OF PUBLISHED CLAIMS

Information furnished by	Number of claims rejected			
	On prior art under—		Under 35 USC 112—	
	35 USC 102	35 USC 103	First para.	Second para.
Protester.....	151(57)	150(33)	18(10)	10(2)
Examiner.....	9(1)	9(9)	0	12(8)
Combination.....	0	80(73)	0	0
Totals.....	160(58)	239(115)	18(10)	22(10)

The rejection of claims in those applications now issued or allowed were overcome or the claims cancelled to place the applications in condition for allowance. The number of claims, the ground for rejection and the manner in which the rejection was overcome is shown in Table VI.

TABLE VI.—REJECTIONS OVERCOME

Rejection overcome by	Number of claims rejected			
	On prior art under—		Under 35 USC 112—	
	35 USC 102	35 USC 103	First para.	Second para.
Argument only.....	0	9	10	1
Amendment.....	52	94	0	8
Affidavit or declaration under 37 CFR 1.131.....	4	6	0	0
Affidavit or declaration under 37 CFR 1.132.....	0	6	0	0
Cancelled claims.....	2	0	0	1

### Second Trial Voluntary Protest Program

The Second Trial Voluntary Protest Program was announced in the Commissioner's Notice of September 16, 1975, which appeared in the OFFICIAL GAZETTE on September 16, 1975 at 938 O.G. 945.

Under the Program, a number of applicants were given an opportunity to waive confidentiality of their allowed applications in order to allow publication and public inspection thereof prior to issuance of a patent.

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A request for a waiver of confidentiality was mailed in 4,747 applications together with the Notices of Allowance mailed during a three week period in October, 1975. Waivers of confidentiality were received for 1,303 applications within the three-month period permitted. Filing of the waiver of confidentiality served to vacate the Notice of Allowance. The 1,303 applications were published and at least one claim and a drawing figure, if any, from each was published in the OFFICIAL GAZETTE. Publication of the applications commenced on January 20, 1976 and was completed on April 20, 1976.

The period for submitting protests was three months in length running from the date of publication. During the protest period, 71 protests were filed in 68 applications.

The evidence against allowability of claims submitted in the 68 applications was considered by the appropriate examiners and group directors. The group directors determined that prosecution should be reopened in 43 applications. No prima facie showing of non-patentability was deemed made in the protests to 25 applications, and consequently, the prosecution was not reopened in these applications.

- 5.91 percent of the published applications were continuation-in-part applications.
- 6.8 percent of the published applications were continuations.

The following data show the origin and ownership of the published applications as compared to the patents issued in 1975.

	Percent	Patents issued in 1975
1. Assigned.....	89.2	73
2. No assignment indicated.....	7.4	24
3. Assigned to U.S. Government.....	3.4	3
4. Foreign origin.....	31.9	35

Statistics concerning the ownership, origin and type of application are shown, by examining group, in Table VIII.

TABLE VIII.—PUBLISHED APPLICATION DATA

Examining group:	Application ownership				Type of application			
	Number published	Assigned	Government	Unassigned	Foreign origin	Cont.	Cont.-in-part	Division
110.....	104	93	5	6	35	8	12	10
120.....	216	207	2	7	78	23	38	47
140.....	133	129	1	3	57	14	18	18
160.....	65	60	2	3	22	4	8	9
170.....	75	65	1	9	22	3	11	9
210.....	85	75	3	7	20	6	2	2
220.....	45	32	12	1	12	1	3	1
230.....	97	91	1	5	33	9	3	5
240.....	67	55	2	10	23	3	5	1
250.....	103	91	8	4	31	6	2	3
290.....	33	26	0	7	3	1	4	7
310 (designs).....	78	65	3	10	25	4	1	7
320.....	43	39	0	4	10	3	1	7
330.....	38	30	0	6	13	2	4	3
340.....	83	72	3	8	21	1	5	3
350.....	40	33	1	6	11	0	1	4
Corps.....	1,303	1,163	44	96	416	88	118	129

These statistics are shown, by examining group, in Table VII.

TABLE VII. APPLICATIONS IN PROGRAM

Examining Group:	Number of waivers requested	Number of waivers received	Percent participation	Number protested	Number reopened	Number not reopened
110.....	344	104	30	11	8	3
120.....	476	216	45	11	6	5
140.....	280	133	48	14	7	7
160.....	215	65	30	4	4	0
170.....	239	75	31	9	4	5
210.....	348	85	24	3	2	1
220.....	121	45	37	1	1	0
230.....	314	97	31	0	0	0
240.....	366	67	18	5	4	1
250.....	326	103	32	0	0	0
290.....	308	33	11	0	0	0
310.....	361	78	22	5	3	2
320.....	261	43	16	1	1	0
330.....	249	36	14	1	1	0
340.....	293	83	28	1	1	0
350.....	246	40	16	2	1	1
Totals.....	4,747	1,303	27	68	43	25

The following data were tabulated about the 1,303 published patent applications:

- 5.2 percent of the applications published were protested.
- 305 requests for access to the published applications were made during the protest period.
- Approximately 200 requests for copies of the file wrapper contents of the published applications were made during the protest period.
- 9.9 percent of the published applications were divisional applications.

As indicated above, 71 protests were received in the 68 protested applications. Three applications attracted two protests each. The 43 applications in which prosecution has been reopened constitute 63 percent of the applications in which protests were received.

The issues or grounds for non-patentability raised in the 71 protests filed are tabulated in Table IX. The number shown indicates the number of protests which involved the indicated issue. It will be noted that some protests involved more than one issue.

TABLE IX.—ISSUES INVOLVED IN PROTESTS

Issues involved	Number of protests		
	In applications—		
	Reopened	Not reopened	Total
1. Prior art under 35 USC 102.....	17	5	22
2. Prior art under 35 USC 103.....	39	21	60
3. Prior public use or sale under 35 USC 102(b).....	2	0	2
4. Prior invention under 35 USC 102(g).....	5	2	7
5. 35 USC 112, first paragraph.....	4	1	5
6. 35 USC 112, second paragraph.....	6	1	7

Most of the protests filed included the citation of at least one prior art reference. A few protests were based upon prior art already of record in the applications. Others were based upon newly cited references, and some were based upon a combination of prior art of record with newly cited references. The number of protesters relying upon prior art and the type of references relied upon is shown in Table X.

TABLE X.—PRIOR ART CITED IN PROTESTS

Type of prior art	Number of protests		Total
	In applications—	Not reopened	
None.....	4	4	8
Prior art of record only.....	1	1	2
Prior art newly cited only.....	30	12	42
Combined art of record and newly cited.....	11	8	19
U.S. patents.....	30	14	44
Foreign patents.....	14	3	17
Non-patent literature.....	19	12	31

The number of prior art citations, by type, submitted by the 46 protesters in the 43 applications which were reopened for prosecution is shown in Table XI.

TABLE XI.—PRIOR ART CITATIONS MADE IN APPLICATIONS REOPENED FOR PROSECUTION

Type of prior art	Number of protests	Number of citations	Total
U.S. patents.....	11	1	11
	6	2	12
	6	3	18
	2	4	8
	1	6	6
	1	7	7
	1	8	8
	1	12	12
	1	22	22
	1	26	26
	30	Cited	130
Foreign patents.....	8	1	8
	4	2	8
	2	7	14
	14	Cited	30
Non-patent literature.....	12	1	12
	5	2	10
	1	4	4
	1	5	5
	19	Cited	31

The number of prior art citations, by type, submitted by the 25 protesters in the 25 applications which were not reopened for prosecution is shown in Table XII.

TABLE XII.—PRIOR ART CITATIONS MADE IN APPLICATIONS NOT REOPENED FOR PROSECUTION

Type of prior art	Number of protests	Number of citations	Total
U.S. patents.....	6	1	6
	2	2	4
	1	3	3
	1	4	4
	1	5	5
	1	7	7
	1	10	10
	1	13	13
	14	Cited	52
Foreign patents.....	2	1	2
	1	3	3
	3	Cited	5
Non-patent literature.....	5	1	5
	2	2	4
	2	3	6
	1	4	5
	12	Cited	28

The type of applications in which protests were filed is shown in Table XIII.

TABLE XIII.—TYPE OF APPLICATIONS IN WHICH PROTESTS WERE FILED

Type	Reopened		Not reopened		Total	
	Number protested	Percent	Number protested	Percent	Number protested	Percent
Foreign origin.....	11	26	9	36	20	29
Original.....	27	63	20	80	47	69
Continuation.....	2	5	2	8	4	6
Continuation-in-part.....	8	18	2	8	10	15
Divisional.....	6	14	1	4	7	10

Of the 1,235 published applications which were not protested, 876 had issued as patents on or before December 28, 1976. Nine of the protested applications had issued as patents. One application in which no protest was filed has been reopened for prosecution by the examiner as a result of prior art submitted in a protest to another application.

#### Conclusion

The Trial Voluntary Protest Programs have provided valuable experience relating to the administration of opposition or protest proceedings for allowed applications. The Programs have shown the potential of protest proceedings for bringing to the attention of the Patent and Trademark Office prior art and other information relevant to the patentability of a patent application which otherwise might not be considered.

Based upon available data it is estimated that the publication of allowed applications for protest prior to issuance and the processing of protests received adds at least \$100 to the cost of processing each published application. About two-thirds of this cost is incurred in printing the applications.

In addition, the issuance of the published applications which were not protested was delayed by six to eight months. Protested applications were further delayed for varying periods. It is estimated that if a protest program similar to the trial programs, but applying to all applications, i.e., on a mandatory basis, were in effect, average pendency to issue would be increased by seven to eight months at an overall cost increase to the Office of about \$7 million per year. It could be expected that this would result in the ultimate rejection or abandonment of about 3 percent of the applications which would otherwise have issued.

The voluntary participation of patent applicants by waiving confidentiality to permit publication of their applications prior to issue has been quite low—only 1,970 or 29.2 percent of the 6,745 given the opportunity elected to participate.

The degree of participation by the public has also been quite low—a total of 138 protests were filed in 128 or 6.5 percent of the 1,970 applications published.

Participation by both applicants and the public was less in the second trial than in the first. Of the applicants invited to participate, only 27 percent did so in the second trial while 33 percent elected to participate in the first trial. Protests were filed in 5.2 percent of the applications published in the second trial while 9.0 percent of the applications published in the first trial were protested.

If the trial program were continued on a regular, voluntary basis, the expectation would be that average pendency of all issued patents would increase about two months at a cost to the Office of about \$1.75 million per year and that less than 1 percent of the patents which would otherwise issue would become abandoned.

If the law were such that the same protest procedures were available for three months after instead of before issue, all additional printing costs and delays in issue would be avoided. Assuming the same proportion of successful protests, the procedure would be expected to result in elimination of about 3 percent of the issued patents. Added cost to the Office would be about \$2 million per year. Longer protest periods might be expected to bring forth somewhat more protests.

While these two trials have demonstrated the potential of protest proceedings for having prior art and other information brought to the attention of the Office and thus to avoid the issuance of undeserving patents, it is not planned to repeat the trial program or establish a permanent program for the voluntary publication of allowed applications for protest purposes. It is at least tentatively concluded that use of the same resources in improving the search file and search systems will be more cost-effective in raising the quality of issued patents.

A final evaluation and report on the Trial Voluntary Protest Programs is scheduled for completion in September 1977. We will welcome your comments and opinions on these programs. In the meantime the Office will begin to develop experience under a different procedure for bringing forth prior art applicable to issued patents, that afforded by the reexamination via reissue and the protest procedures contained

in the recently revised rules, 37 CFR 1.11, 1.175, 1.176 and 1.291.

C. MARSHALL DANN,  
Commissioner of Patents and Trademarks.

Dated: Jan. 21, 1977.

#### Board of Appeals Decisions Rendered in the Month of January 1977

Examiner affirmed .....	245
Examiner affirmed in part .....	34
Examiner reversed .....	67
Total .....	346



## PATENT NOTICES

### Certificates of Correction for the Week of Mar. 1, 1977

Re. 28,926	3,966,798	3,985,524	3,993,855
D. 241,267	3,966,896	3,985,532	3,993,856
D. 241,898	3,967,861	3,985,533	3,994,147
D. 242,319	3,968,032	3,985,534	3,994,169
D. 242,537	3,968,098	3,985,777	3,994,224
3,616,716	3,969,352	3,985,858	3,994,337
3,640,074	3,970,077	3,986,001	3,994,806
3,717,648	3,970,832	3,986,072	3,994,870
3,725,311	3,972,591	3,986,247	3,994,957
3,751,919	3,973,014	3,986,517	3,995,493
3,780,618	3,973,790	3,986,594	3,995,669
3,794,872	3,973,956	3,986,638	3,995,900
3,798,290	3,973,983	3,986,850	3,995,956
3,814,764	3,974,041	3,987,436	3,996,162
3,864,246	3,975,375	3,988,314	3,996,329
3,882,304	3,975,499	3,988,380	3,996,485
3,906,114	3,975,585	3,989,010	3,996,875
3,910,074	3,975,909	3,989,505	3,996,940
3,910,979	3,976,148	3,989,895	3,996,992
3,913,464	3,976,599	3,990,013	3,997,078
3,915,423	3,976,661	3,990,193	3,997,088
3,922,298	3,976,816	3,990,271	3,997,134
3,923,861	3,976,997	3,990,509	3,997,135
3,927,817	3,977,106	3,990,560	3,997,244
3,931,360	3,977,886	3,990,605	3,997,680
3,931,678	3,977,958	3,990,653	3,997,683
3,939,720	3,978,486	3,990,790	3,997,765
3,943,348	3,978,640	3,990,869	3,997,775
3,943,853	3,978,944	3,990,926	3,997,804
3,944,785	3,979,338	3,991,026	3,997,813
3,945,390	3,979,758	3,991,113	3,997,827
3,946,040	3,979,878	3,991,162	3,997,861
3,946,057	3,980,479	3,991,407	3,997,871
3,946,060	3,980,492	3,991,477	3,997,876
3,948,085	3,980,538	3,991,479	3,997,977
3,950,449	3,980,547	3,991,528	3,998,007
3,951,229	3,980,666	3,991,592	3,998,082
3,951,586	3,981,415	3,991,598	3,998,098
3,952,808	3,981,464	3,991,767	3,998,262
3,953,269	3,981,532	3,991,806	3,998,270
3,956,135	3,981,892	3,992,181	3,998,546
3,959,438	3,982,012	3,992,303	3,998,698
3,960,923	3,983,000	3,992,999	3,998,747
3,961,082	3,983,113	3,993,000	3,998,756
3,961,467	3,983,163	3,993,015	3,998,953
3,964,983	3,983,250	3,993,191	3,998,974
3,965,064	3,983,355	3,993,477	3,998,980
3,965,560	3,983,921	3,993,712	3,999,213
3,966,144	3,984,458	3,993,750	
3,966,416	3,984,650	3,993,784	
3,966,673	3,985,016	3,993,811	

### Disclaimer and Dedication

3,890,526.—*Kazimir Palac*, Carpentersville, Ill. FACEPLATE MOUNTING STRUCTURE FOR CATHODE RAY TUBE COLOR SELECTION ELECTRODE. Patent dated June 17, 1975. Disclaimer and dedication filed Dec. 30, 1976, by the inventor, the assignee, *Zenith Radio Corporation*, consenting.

Hereby disclaims and dedicates to the Public all claims of said patent.

### Dedications

3,394,352.—*Robert Wernikoff*, Cambridge, *Paul Epstein*, Brookline, and *William F. Schreiber*, Lexington, Mass. METHOD OF AND APPARATUS FOR CODE COMMUNICATION. Patent dated July 23, 1968. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the People of the United States the remaining term of said patent.

3,581,734.—*Michael Emanuel Croslin*, Forest Hills, and *John Ronald Keller*, Babylon, N.Y. SPHYGMOMANOMETER. Patent dated June 1, 1971. Dedication filed Dec. 29, 1976, by the assignee, *Phelps Dodge Industries, Inc.*

Hereby dedicates the entire remaining term of said patent to the Public.

3,586,861.—*Robert E. Wernikoff*, Belmont, Mass. LIGHT PEN COMPRISING SENSORS EACH SENSITIVE TO A DIFFERENT WAVELENGTH AND CORRESPONDING FILTERS ARRANGED TO SELECTIVELY PROVIDE BOTH LARGE AND SMALL EFFECTIVE APERTURES. Patent dated June 22, 1971. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the People of the United States the remaining term of said patent.

3,646,257.—*Paul Epstein*, Brookline, *James Cunningham*, Cambridge, *Robert E. Wernikoff*, Belmont, and *George Rosen*, Brookline, Mass. COMMUNICATION SYSTEM HAVING PLURAL CODING VOCABULARIES. Patent dated Feb. 29, 1972. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the People of the United States the remaining term of said patent.

3,654,846.—*Robert E. Wernikoff*, Belmont, *David M. Perozek*, Watertown, and *Jana M. Roten*, Brookline, Mass. ELECTRO-MECHANICAL SHUTTER ARRAY. Patent dated Apr. 11, 1972. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the People of the United States the remaining term of said patent.

3,686,372.—*John C. Hiatt*, Brandon, Fla., and *John P. Luker*, Houston, Tex. METHOD FOR MAKING CEMENT. Patent dated Aug. 15, 1972. Dedication filed Dec. 20, 1976, by the assignee, *Dillingham Corporation*.

Hereby dedicates to the Public the entire remaining term of said patent.

3,700,797.—*Robert E. Wernikoff*, Belmont, Mass. FACSIMILE NOISE DELETION AND CODING SYSTEM. Patent dated Oct. 24, 1972. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the People of the United States the remaining term of said patent.

3,723,649.—*Alexander D. Pitegoff*, Brookline, *Robert E. Wernikoff*, Cambridge, and *James E. Cunningham*, Brookline, Mass. ADAPTIVE BINARY STATE DECISION SYSTEM. Patent dated Mar. 27, 1973. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the People of the United States the remaining term of said patent.

3,739,085.—*George Rosen* and *Paul Epstein*, Brookline, and *Robert E. Wernikoff*, Cambridge, Mass. CODING TECHNIQUE. Patent dated June 12, 1973. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the People of the United States the remaining term of said patent.

MARCH 1, 1977

U. S. PATENT AND TRADEMARK OFFICE

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3,748,379.—*Paul Epstein*, Brookline, *Robert E. Wernikoff*, Belmont, and *James E. Cunningham* and *George Rosen*, Brookline, Mass. RUN LENGTH CODING TECHNIQUE. Patent dated July 24, 1973. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the Public the entire remaining term of remaining term of said patent.

3,751,582.—*Robert E. Wernikoff* and *Joseph M. Van Horn*, Cambridge, Mass. and *Albert E. Mignone*, deceased, late of Shaker Heights, Ohio, by *Gilda Mignone*, executrix, Barrington, R.I. STORED PROGRAM FACSIMILE CONTROL SYSTEM. Patent dated Aug. 7, 1973. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the People of the United States the remaining term of said patent.

3,763,613.—*Harry H. Wise*, Somerville, N.J. COMPOSITE CONCRETE CONSTRUCTION OF TWO-WAY SLABS AND FLAT SLABS. Patent dated Oct. 9, 1973. Dedication filed Dec. 28, 1976, by the assignee, *Johns-Manville Corporation*.

Hereby dedicates to the Public the entire remaining term of said patent.

3,839,675.—*Robert E. Wernikoff*, Boston, and *George Rosen*, Brookline, Mass. DELTA MODULATION COMMUNICATION SYSTEM. Patent dated Oct. 1, 1974. Dedication filed Dec. 15, 1976, by the assignee, *Xerox Corporation*.

Hereby dedicates to the People of the United States the remaining term of said patent.

3,914,879.—*Edwin J. Taylor III*, North Oakes, and *James E. La Fortune*, Blaine, Minn. FIREARMS TRAINING APPARATUS AND METHOD. Patent dated Oct. 28, 1975. Dedication filed Dec. 15, 1976, by the assignee, *Advanced Training Systems, Inc.*

Hereby dedicates to the Public the entire term of said patent.

3,915,371.—*Kenneth L. Crabtree*, Fairfield, Maine. NESTABLE TRAY WITH CUP SUPPORTING RECESS. Patent dated Oct. 28, 1975. Dedication filed Dec. 15, 1976, by the assignee, *Keyes Fibre Company*.

Hereby dedicates to the Public the entire term of said patent.

3,974,607.—*Henry A. Bolinski*, Hoffman Estates, Ill. FIRE-RATED COMMON AREA SEPARATION WALL STRUCTURE HAVING BREAK-AWAY CLIPS. Patent dated Aug. 17, 1976. Dedication filed Nov. 23, 1976, by the assignee, *United States Gypsum Company*.

Hereby dedicates to the Public the entire remaining term of said patent.

### Disclaimers

3,354,059.—*Herman Koretzky*, Poughkeepsie, N.Y. ELECTRO-DEPOSITION OF NICKEL-IRON MAGNETIC ALLOY FILMS. Patent dated Nov. 21, 1967. Disclaimer filed Dec. 9, 1976, by the assignee, *International Business Machines Corporation*.

Hereby enters this disclaimer to all claims of said patent.

3,609,151.—*Florin Seng*, Cologne, *Kurt Ley*, Odenthal, *Karl Georg Metzger*, Wuppertal-Elberfeld, and *Dieter Fritsche*, Wuppertal-Vohwinkel, Germany. 2-AMINO - 3 - CARBAMIDO-QUINOXALINE-DI - N - OXIDES AND THEIR PRODUCTION. Patent dated Sept. 28, 1971. Disclaimer filed Jan. 7, 1977, by the assignee, *Bayer Aktiengesellschaft*.

Hereby enters this disclaimer to claim 8 of said patent.

3,612,066.—*Samuel O. Jones*, *James Gilbert Ashburn*, *Grant M. Stewart*, and *Glenn Philip Moser*, Winston-Salem, N.C. DENICOTINIZING PROCESS. Patent dated Oct. 12, 1971. Disclaimer filed June 21, 1976, by the assignee, *Reynolds Leasing Corporation*.

Hereby enters this disclaimer to claims 1 through 7, inclusive of said patent.

3,780,311.—*Verne R. Brown*, Ann Arbor, Mich. BREATH ALCOHOL DETECTOR AND AUTOMOTIVE IGNITION INTERLOCK EMPLOYING SAME. Patent dated Dec. 18, 1973. Disclaimer filed July 22, 1976, by the assignee, *Borg-Warner Corporation*.

Hereby enters this disclaimer to claims 1-11, inclusive and 13 and 16 of said patent.

3,785,092. *Alma A. Hutchins*, Pasadena, Calif. ABRADING TOOL HAVING SUCTION SYSTEM FOR COLLECTING ABRADED PARTICLES. Patent dated Jan. 15, 1974. Disclaimer filed Jan. 3, 1977, by the inventor.

Hereby enters this disclaimer to claims 1, 3 and 5 of said patent.

3,790,839.—*Leonard Dietch*, Skokie, Ill. RECTANGULAR GRADE BLACK SURROUND SCREEN. Patent dated Feb. 5, 1974. Disclaimer filed Nov. 26, 1976, by the inventor, the assignee, *Zenith Radio Corporation*, consenting.

Hereby enters this disclaimer to all claims of said patent.

3,876,472.—*Murray Arthur Polinsky*, Somerville, N.J. METHOD OF ACHIEVING SEMICONDUCTOR SUBSTRATES HAVING SIMILAR SURFACE RESISTIVITY. Patent dated Apr. 8, 1975. Disclaimer filed Dec. 16, 1976, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1, 5, 6 and 8 of said patent.

3,909,087.—*James Cairns*, Cherry Hill, N.J. COMPOSITE BEARINGS. Patent dated Sept. 30, 1975. Disclaimer filed Dec. 20, 1976, by the assignee, *Garlock Inc.*

Hereby enters this disclaimer to claims 1-4, 6-8, 12, 14-17, 19-21 and 25 of said patent.

3,930,740.—*Bradshaw Boiman*, Carmel, Calif. TOOLS FOR IMPRINTING NON-REPEATING STONE PATTERNS IN FRESH CONCRETE. Patent dated Jan. 6, 1975. Disclaimer filed Nov. 19, 1976, by the assignee, *Bomanite Corporation*.

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

3,950,417.—*Robert J. Verdicchio*, Succasunna, and *John M. Walts*, Clark, N.J. HIGH-LATHERING NON-IRRITATING DETERGENT COMPOSITIONS. Patent dated Apr. 13, 1976. Disclaimer filed Dec. 27, 1976, by the assignee, *Johnson & Johnson*.

Hereby enters this disclaimer to claims 1-12, inclusive, of said patent.

3,951,471.—*Joseph G. Langenstein*, Edelman, Ill. RECIRCULATING BALL BEARING ASSEMBLY FOR FORK LIFT MAST UNITS. Patent dated Apr. 20, 1976. Disclaimer filed Dec. 22, 1976, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claims 1 through 25 of said patent.

3,991,630.—*Daniel J. Toby*, South San Francisco, Calif. VARIABLE FEED DRIVE MECHANISM. Patent dated Nov. 16, 1976. Disclaimer filed Jan. 6, 1977, by the assignee, *Toby Enterprises*.

Hereby enters this disclaimer to claims 1-4 of said patent.



## Service by Publication

Shiro Tom Ito

In accordance with 37 CFR 1.47(a) (Rules of Practice in Patent Cases), notice is hereby given of the filing on December 8, 1975, of an application for patent entitled "Solenoid Circuit for Pushbutton Release in Telephones," on behalf of Shiro Tom Ito, whose last known address is 167 Mary Avenue, London, Ontario, Canada. The application was made in com-

pliance with 37 CFR 1.47(a) and 35 U.S.C. 116 by Graham Stirling Laing without execution by the said Shiro Tom Ito. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Shiro Tom Ito in connection with the said application must be taken within thirty (30) days of the publication of this notice.

RENE D. TEGTMEYER,  
Assistant Commissioner for Patents.

## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

## CONDITION OF PATENT APPLICATIONS AS OF JANUARY 29, 1977

PATENT EXAMINING GROUPS		Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>		
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.		6-17-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.		6-16-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.		1-2-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director.. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.		4-22-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director.. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.		2-20-76
<b>ELECTRICAL EXAMINING GROUPS</b>		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director.... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.		10-15-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio- Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.		3-1-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director..... Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.		1-2-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director.. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.		8-6-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Net- works; Optics; Radiant Energy; Measuring.		4-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.		7-23-75
<b>MECHANICAL EXAMINING GROUPS</b>		
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.		3-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.		7-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director.. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.		5-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.		2-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.		7-1-76

**Expiration of patents:** The patents within the range of numbers indicated below expire during February 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents.....	Numbers 2,923,008 to 2,926,351, inclusive
Plant Patents.....	Numbers 1,901 to 1,918, inclusive

## DEFENSIVE PUBLICATIONS

PUBLISHED MARCH 1, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T956,001

### ELECTROGRAPHIC APPARATUS AND PROCESS FOR HUMIDITY STABILIZED DEVELOPMENT

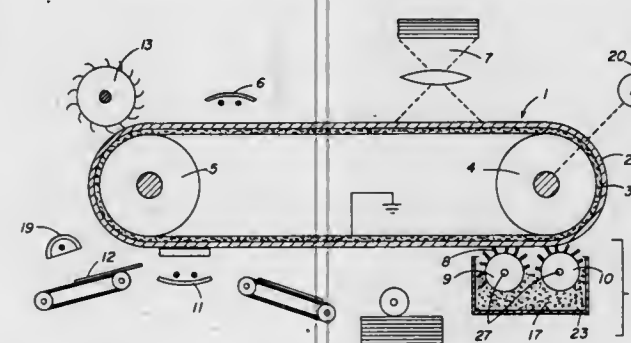
George P. Kasper, and Robert J. O'Brien, both c/o Kodak Park Division, Rochester, N.Y. 14650

Continuation of Ser. No. 571,674, April 25, 1975. This application July 19, 1976, Ser. No. 706,328

Int. Cl.<sup>2</sup> G03G 13/08

U.S. Cl. 96—1 SD

3 Sheets Drawing. 25 Pages Specification



An electrographic apparatus for applying a dry particulate developer mix comprising a triboelectric mixture of toner powder and carrier particles to an electrostatic image and a process for using the same are disclosed. The apparatus includes developing means for applying the developer mix to the electrostatic image and heat generating means associated with the developing means to directly heat the developer mix whereby the developer mix is electrically stabilized against relative humidity effects, particularly high relative humidity conditions.

T956,002

### WATERFLOODING METHOD USING SULFONATES

Roy C. Sias, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 20, 1976, Ser. No. 659,617

Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 252—8.55 D

No Drawing. 12 Pages Specification

A method for recovering hydrocarbons from a petroliferous formation is disclosed. The method comprises injecting into a petroliferous formation an effective amount of an aqueous mixture which contains about 0.5 to about 25 weight percent of an alkali metal hydrocarbon sulfonate mixture and recovering the displaced hydrocarbons from the formation. An important feature of the method is that the alkali metal hydrocarbon sulfonate mixture is prepared by the process of:

- sulfonating an admixture of (i) an aromatic-containing refinery stream and (ii) a synthetic hydrocarbon sulfonatable feedstock,
- recovering from the reaction mass of step (a) the admixture of hydrocarbon sulfonic acids, and
- converting the hydrocarbon sulfonic acids to the alkali metal salts.

A suitable refinery stream is pale oil extract. Suitable synthetic sulfonatable feedstocks include alkaryl hydrocarbons. Inclusion of the synthetic hydrocarbon with the refinery stream results in a product having a lower viscosity than the sulfonate

from the refinery stream per se. This lower viscosity results in an improvement when using the sulfonate to recover hydrocarbon from a petroliferous formation.

T956,003

### INTERCONNECT LOGIC FOR A SERIAL PROCESSOR

Richard B. Simone, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

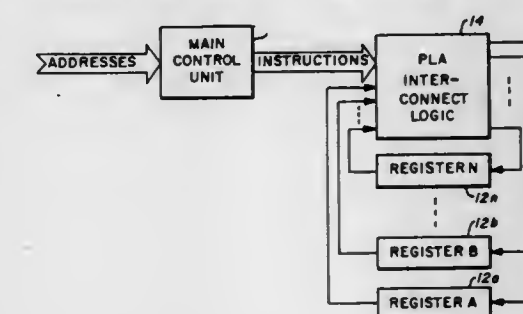
Continuation of Ser. No. 584,637, June 6, 1975, abandoned.

This application June 14, 1976, Ser. No. 695,675

Int. Cl.<sup>2</sup> G06F 9/00

U.S. Cl. 340—172.5

1 Sheet Drawing. 7 Pages Specification



The interconnect logic between a main control unit and the data handling register of a serial processor is formed of a programmable logic array (PLA). The serial processor includes a main control unit, a plurality of registers and PLA interconnect logic. The interconnect logic decodes and implements instructions supplied from the main control unit to control the flow of data into and out of the serial registers. The interconnect logic includes a plurality of input terminals  $I_1-I_m$ ;  $D_1-D_n$  and a plurality of output terminals  $A-N$ . The input lines are connected to a plurality of lines directly and to another plurality of lines indirectly through inverters. A plurality of AND gates 34 are provided with their inputs connected to various ones of the lines. The outputs of the AND gates are connected to various ones of the inputs to the OR gate 36. If the PLA is made in integrated circuit technology, the selected connections are mask options which are represented in the drawing by an X at each of the connections.

The input terminals  $I_1-I_m$  are adapted to receive instructions from the main control unit. The input terminals  $D_1-D_n$  are adapted to receive the outputs of respective ones of the general registers. Accordingly, selected inputs from the instructions supplied by the main control unit are their complements as provided by the inverters and selected inputs from the registers and their complements as provided by the inverters may be connected by mask options to the inputs of any one of the AND gates 34. The output of the AND gates form partial product terms. Selected ones of the partial product terms may therefore be connected by mask options to the inputs of any one of the OR gates 36 to form outputs on the output terminal 20. Thus, the circuit can be used to transfer data between registers and to recirculate data within a register.



**T956,004**  
**ETHYLENE POLYMERS**

Denis George Harold Ballard; Eric Jones, and John Christopher Padget, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 8, 1976, Ser. No. 664,984

Claims priority, application United Kingdom, Mar. 7, 1975, 9563/75

Int. Cl.<sup>2</sup> C08F 10/14

U.S. Cl. 526—350

4 Sheets Drawing. 49 Pages Specification

A copolymer of ethylene with at least one other mono- $\alpha$ -olefine is prepared and is characterized as having a density in the range 918 to 940 Kg/m<sup>3</sup>, an apparent viscosity (A) at 200° C and a shear rate of 100 sec<sup>-1</sup> of  $0.5 \times 10^3$  to  $3.0 \times 10^3$  Nsm<sup>-2</sup> and a viscosity at 200° C and a stress of  $10^3$  N/m<sup>2</sup> of  $2 Ae^{(1.6A \times 10^{-3})}$  to 10,000 A.

The copolymer from which the film is formed is preferably one in which the comonomer contains at least 5 carbon atoms; the comonomer may contain up to 12 carbon atoms. Hexene-1 is the preferred comonomer and can be present in the copolymer in an amount of 6.5 to 16.5%, by weight.

The copolymers are readily processed and can be formed into films which combine good stiffness and good impact properties.

The copolymers are conveniently prepared using supported transition metal benzyl compounds followed by a total work-up of the polymerization mixture. In particular, a process for forming the copolymers includes copolymerizing ethylene and the comonomer in the presence of a transition metal olefine polymerization catalyst and separating a polymeric product having an annealed characteristic set forth above.

## REISSUES

MARCH 1, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 29,144**  
**AUTOMATIC CHORD AND RHYTHM SYSTEM FOR ELECTRONIC ORGAN**

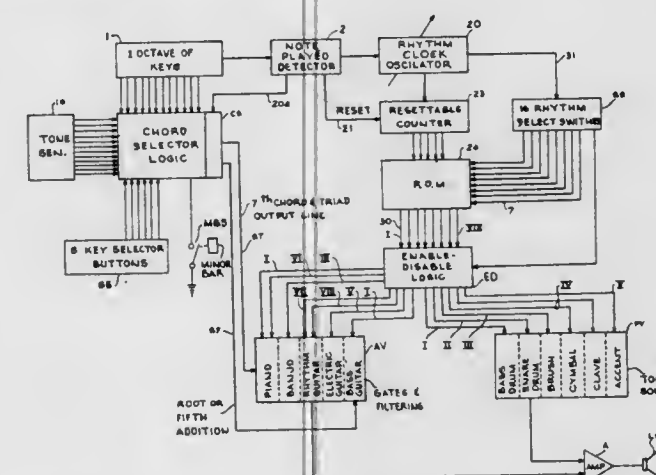
David A. Bunker, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Original No. 3,918,341, dated Nov. 11, 1975, Ser. No. 454,426, Mar. 25, 1974. Application for reissue Feb. 12, 1976, Ser. No. 657,359

Int. Cl.<sup>2</sup> G10H 1/00, 5/00

U.S. Cl. 84—1.01

22 Claims



22. In an electronic organ, an array of playing keys, means responsive to actuation of selected ones of said array of playing keys for sounding chords, means for selecting rhythmic patterns, means for sounding said chords in a selected rhythmic pattern in a first sequence of rhythm accompaniment voices in response to actuation of first predetermined selected ones of said array of

playing keys, and for sounding said chords in said selected rhythmic pattern in a second sequence of rhythm accompaniment voices in response to actuation of second predetermined selected ones of said array of playing keys.

**Re. 29,145**  
**CATALYST FOR SULFURIC ACID CONTACT PROCESS**

Ludwig Dorn, Cologne; Gerhard Heinze, Scholgen; Jürgen Wokulat; Wilhelm Möller, both of Leverkusen, all of Germany; Franz Rübsam, deceased, late of Leverkusen, Germany, by Marianne Rübsam; by Ralph Wilhelm Rübsam, heir, Leverkusen, Germany; by Marion Mathilde Emilie Rübsam, heir, Leverkusen, Germany, and by Bernd Friedrich Konrad Rübsam, heir, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Original No. 3,793,230, dated Feb. 19, 1974, Ser. No. 229,163, Feb. 24, 1972. Continuation of Ser. No. 36,234, May 11, 1970, abandoned. Application for reissue Aug. 14, 1975, Ser. No. 604,867

Claims priority, application Germany, May 23, 1969, 1926564

Int. Cl.<sup>2</sup> B01J 11/34; C01B 17/78

U.S. Cl. 252—452

14 Claims

7. A bead-form catalyst comprising a support and activating agent, the support being at least 97% by weight of amorphous silica, based on the calcined support, the activating agent being from 4 to 8% by weight of V<sub>2</sub>O<sub>5</sub> and 3.1 to 12.4% by weight of K<sub>2</sub>O, based on the impregnated anhydrous catalyst, a portion of pores with diameters of from about 100 to 1500° A. of at least 80% of the total pore volume present [ ], said catalyst having an abrasion resistance of about 0 to 3% by weight.



## PLANT PATENTS

GRANTED MARCH 1, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,019

### ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Jan. 21, 1976, Ser. No. 650,913

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—14

1 Claim

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous, upright habit of growth, stiff, straight, strong stems, particularly suitable for use as a greenhouse grown cut flower, Garnet Brown new foliage, white to near white (very light Chartreuse Green) buds and open blooms, very light musky fragrance.

4,020

### STRAWBERRY PLANT

Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Apr. 7, 1976, Ser. No. 674,455

Int. Cl.<sup>2</sup> A01H 5/03

U.S. Cl. Plt.—49

1 Claim

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.



## PLANT PATENTS

GRANTED MARCH 1, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

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### ROSE PLANT

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Filed Jan. 21, 1976, Ser. No. 650,913

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—14

1 Claim

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous, upright habit of growth, stiff, straight, strong stems, particularly suitable for use as a greenhouse grown cut flower, Garnet Brown new foliage, white to near white (very light Chartreuse Green) buds and open blooms, very light musky fragrance.

14

4,020

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Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Apr. 7, 1976, Ser. No. 674,455

Int. Cl.<sup>2</sup> A01H 5/03

U.S. Cl. Plt.—49

1 Claim

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

## PATENTS

GRANTED MARCH 1, 1977

### ERRATA

For	See
CLASS	PATENT NO.
264-210 F .....	4,009,511
350-035 .....	4,009,526
111-006 .....	4,009,666
424-275 .....	4,009,847
354-029 .....	4,009,866
029-523.2 .....	4,010,043
429-082 .....	4,010,044
053-067 .....	4,010,100
428-035 .....	4,010,139
156-578 .....	4,010,203
428-361 .....	4,010,295
358-127 .....	4,010,317
358-128 .....	4,010,318
358-213 .....	4,010,319
358-289 .....	4,010,320
358-233 .....	4,010,321
358-233 .....	4,010,322
235-054 .....	4,010,353
210-071 .....	4,010,391
361-056 .....	4,010,402
361-018 .....	4,010,403
361-179 .....	4,010,404
361-433 .....	4,010,405
361-433 .....	4,010,406

# PATENTS

GRANTED MARCH 1, 1977

NOTE: A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

## GENERAL AND MECHANICAL

4,009,494

### PROTECTIVE COVERING

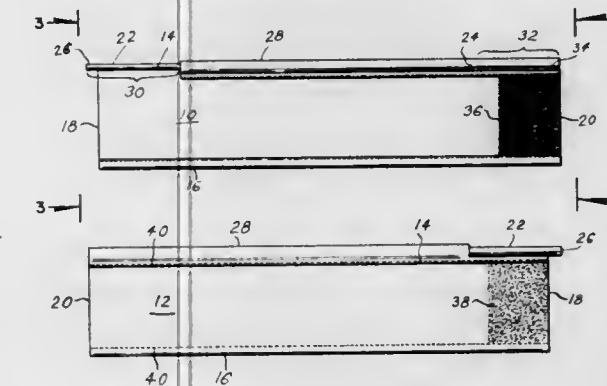
Max J. Nusbaum, 30 Arlo Road, Staten Island, N.Y. 10301

Filed Oct. 28, 1975, Ser. No. 626,312

Int. Cl.<sup>2</sup> A41D 13/00

U.S. Cl. 2-2

9 Claims



1. A protective covering for preventing water from contacting a portion of the body, comprising:
  - a sheet of flexible fluid-imperious material having a front and back surface, and a top, bottom and two side edges, said sheet being sized so that the edges thereof overlap when placed on the body portion,
  - fastening means for holding said edges in overlapping relationship to retain said sheet around the body portion;
  - a flexible rod attached to and extending along the greater part of the top of the sheet from one edge thereof, and
  - an open ended flexible sleeve attached to the top of the sheet and extending from the other edge thereof, said sleeve covering at least a part of said flexible rod, the open end of said sleeve telescopically receiving the uncovered part of the rod when said sheet encircles said body portion, wherein the covered rod forms a seal against the body for preventing water from reaching the body portion, and
  - wherein the part of said sleeve which telescopically receives said rod includes a longitudinal slot therein to accommodate passage of said one edge therethrough.

4,009,495

### VENTILATED BRIEFS

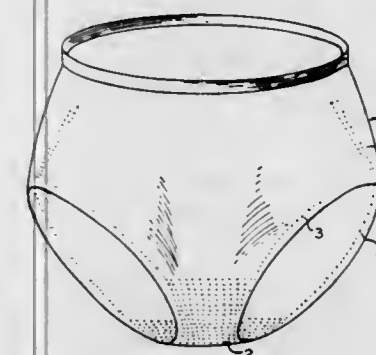
Martin H. Faust, Wyomissing Hills, Pa., assignor to Penn-Dak Knitting Mills, Inc., Sinking Spring, Pa.

Filed Apr. 25, 1975, Ser. No. 571,555

Int. Cl.<sup>2</sup> A41B 9/04

U.S. Cl. 2-406

1 Claim



1. A panty knit of synthetic plastic threads throughout the entire body portion with the exception of a crotch and leg surrounding portions which crotch and leg surrounding portions are integrally knit thereto by cotton thread formed of a

4,009,496

### PROSTHETIC ADAPTER FOR SKI POLES AND THE LIKE

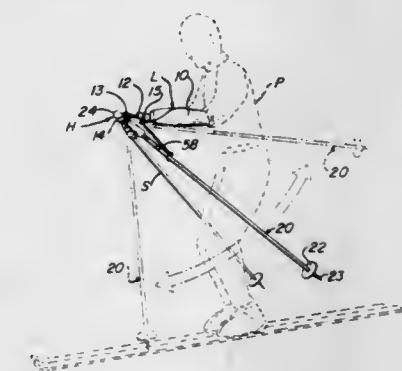
Ralph Samuel Allen, III, 1610 Dahlia St., Denver, Colo. 80220

Filed May 24, 1976, Ser. No. 689,468

Int. Cl.<sup>2</sup> A61F 1/06

U.S. Cl. 3-12.8

11 Claims



1. In a prosthetic device adapted for releasable attachment of an artificial hand to an article having an elongated handle portion wherein the artificial hand includes spaced hook portions, said prosthetic device comprising a pair of generally loop-shaped first and second fasteners disposed on opposite sides of the handle, each fastener being sized to provide an opening therein adapted for insertion of one of the hooks on the artificial hand, each of said fasteners including connector means for connecting said fastener to the handle in spaced offset relation to the connector means for said other fastener.

4,009,497

### WATER SAVING PANEL DEVICE FOR WATER CLOSETS

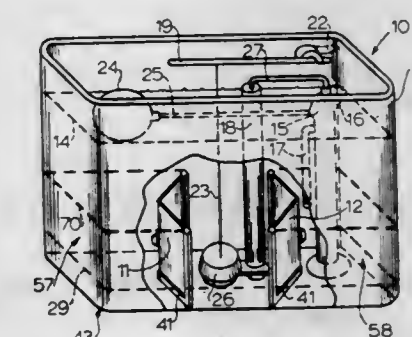
Jacob R. Moon, Hillsborough, N.C., assignor to Moon Walter Saver, Inc., Hillsborough, N.C.

Filed Apr. 19, 1972, Ser. No. 245,531

Int. Cl.<sup>2</sup> E03D 1/20, 1/34, 5/02, 5/10

U.S. Cl. 4-18 R

10 Claims



10. In a water closet having a flush tank formed by bottom and side walls and providing a hydraulic head and storage of predetermined height and capacity, having an outlet valve assembly mounted in the bottom wall of the tank and communicating with a toilet bowl, having manual handle means to open the valve to empty the tank and cooperative water supply.



ply means for refilling the tank upon the outlet valve returning to a closed position, the opening of the outlet valve normally causing initiation of the flushing and bowl evacuation followed by substantial emptying of the tank and subsequent closing of the outlet valve, the improvement comprising, in combination:

At least one rectangular panel member adapted to be vertically positioned and fixably retained in spaced relation to the outlet valve whereby the panel member contacts opposite interior vertical wall surfaces of the said tank and a bottom horizontal edge of said panel member contacts the interior bottom wall surface of the tank to form in effect an open top column of less height than the normal water storage height and extending above and around the outlet valve assembly and closed at the bottom by the bottom wall of the tank and bounded at the side by said interior wall surfaces forming a continuation of the wall area of said panel member.

4,009,498

## BOOKBINDING SYSTEM

Henry N. Staats, Deerfield, and Robert K. Newcomb, Wilmette, both of Ill., assignors to General Binding Corporation, Northbrook, Ill.

Continuation of Ser. No. 265,305, June 22, 1972, abandoned.

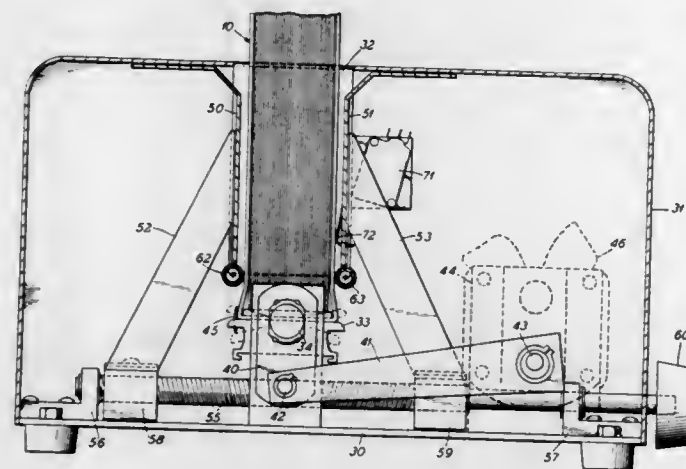
This application May 12, 1975, Ser. No. 576,385

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B42C 19/00

U.S. Cl. 11-1 AD

3 Claims



1. A binding apparatus for binding a book having a plurality of pages for securement to a generally flat backbone pivotally connected to front and back covers, comprising a generally flat plate, means for selectively heating said plate, means contacting the covers of said book along generally horizontal lines of contact above said plate for maintaining the pages of the book generally vertical on the plate and establishing the thickness of the book without tightly clamping the pages thereof together at the backbone, and means for pivotally rocking said plate about an axis generally parallel to the longitudinal axis of the backbone and lying generally within the plane of the plate whereby adjacent portions of the plate are cyclically moved up and down relative to each other.

4,009,499

## APPARATUS FOR TREATING THE SURFACE OF AN ARTICLE

William H. Casler, 35321 Beach Road, Capistrano Beach, Calif. 92624, and Lance Morris, 1426 E. 15th St., Santa Ana, Calif. 92701

Filed Mar. 25, 1976, Ser. No. 670,392

Int. Cl.<sup>2</sup> A46B 13/02

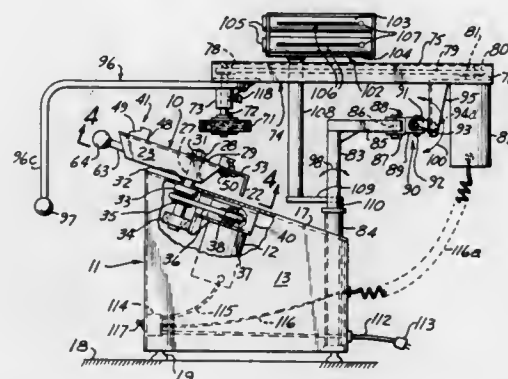
U.S. Cl. 15-21 D

9 Claims

1. Apparatus for treating a surface of an article of which at least a portion of said surface is non-planar, comprising:

- a clamping table;
- means for clamping the article to the table;

- means for rotating the table and clamped article;
- a treating wheel;
- means for rotating the treating wheel;
- support means supporting the treating wheel in proximity to the article; and
- means for permitting universal movement of said support means,



whereby the rotating treating wheel may be manually moved into and out of contact with said rotatable article and may be oriented in various positions and attitudes relative to the article to make contact with different parts of the surface of the article.

4,009,500

## FLOOR SCRUBBING APPARATUS

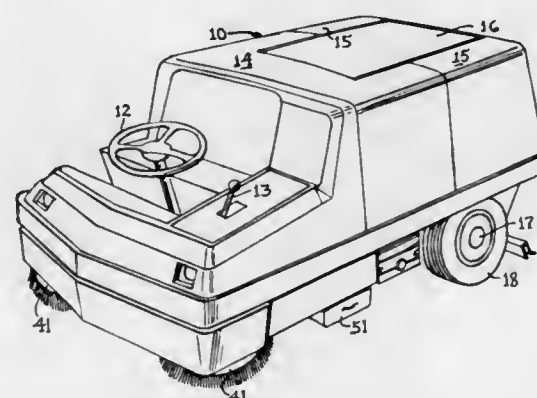
Walter G. Ashton, Winnetka, Ill., assignor to Star Industries, Inc., Highland Park, Ill.

Filed Apr. 26, 1976, Ser. No. 680,364

Int. Cl.<sup>2</sup> A47L 11/29

U.S. Cl. 15-50 R

8 Claims



1. A floor scrubbing apparatus having an operator-driven wheeled vehicle including a single, front, steerable, drive wheel, wherein the improvement comprises

- a frame for the wheeled vehicle,
- a brush unit mounted on said frame so as to dispose a brush to either side of the front steerable drive wheel and a single brush rearwardly thereof,
- said brush unit providing a pair of brush supporting bars connected together at one end to form a horizontally disposed V-shaped arrangement,
- a pair of tow bars each pivotally connected to one of said brush support bars intermediate the ends thereof and to said frame,
- means carried by said frame and connected to said tow bars for pivoting the same relative to their connection to said frame for raising and lowering said brush unit,
- a refuse container carried by said frame adjacent to one of said brushes to collect debris swept by said brush, and
- means for mounting said container on said frame and for connection to said brush unit so that said container may be pivoted into a raised and lowered position together with said brush unit by said first-mentioned means.

4,009,501

## STREET AND PEDESTRIAN ZONE CLEANING MACHINE

Johannes Straub, Fussener Strasse 32, 8950 Kaufbeuren, Germany

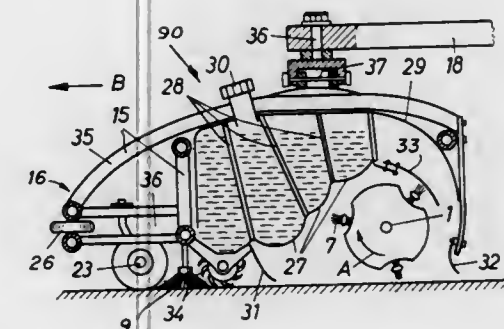
Filed Mar. 3, 1975, Ser. No. 554,441

Claims priority, application Germany, July 26, 1974, 2436114

Int. Cl.<sup>2</sup> E01H 1/04

U.S. Cl. 15-84

10 Claims



1. A street and pedestrian zone cleaning machine comprising: at least one sweeping mechanism arrangement comprising a brush cylinder with plural brushes rotatably mounted on the machine and adapted to sweep the surface to be cleaned, a permeable sack mounted on said machine extending closely adjacent the surface of said brush cylinder, said sack containing liquid maintaining a surface of said sack damp causing the dust swept by said brush cylinder to collect on said surface of said sack; a receptacle arrangement mounted on said machine adjacent one end of said brush cylinder so as to collect the scales of dust which fall from said surface of said sack, said receptacle arrangement including a brushing means and a means for receiving the material brushed by said brushing means; and said brushes of said brush cylinder being twisted in such a direction so as to cause the dust scales which fall from said sack to be swept in the direction of said receptacle arrangement.

4,009,502

## WIPER DEVICE

Sumio Tamaki, Kariya, and Isao Ito, Handa, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

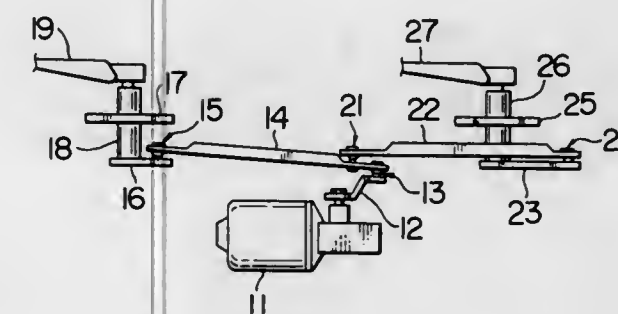
Filed Aug. 19, 1975, Ser. No. 605,883

Claims priority, application Japan, Sept. 9, 1974, 49-108282[U]; Feb. 27, 1975, 50-27363[U]

Int. Cl.<sup>2</sup> B60S 1/08

U.S. Cl. 15-250.27

3 Claims



1. An improvement in a wiper device for wiping the windowpanes of cars, ships, and the like by wiper blades reciprocally movable in a synchronized manner through pivotally mounted wiper arms, comprising driving means including a wiper motor arranged between the wiper arms centrally of their pivot points, a crank arm connected at one of its ends to the driving means and having securely fixed to the opposite end thereof first pin means provided with a ball portion, a single first link means rotatably mounted at one of its ends on the ball portion of the first pin means and operatively connected at its opposite end to one of said wiper arms to impart

a swinging movement to the wiper arm about its pivot point when said wiper motor is actuated, second pin means connected to the first link means intermediate its ends at a location adjacent to the mounting between the first pin means and said first link means, said second pin means also being connected to a second link means, said second pin means having a ball portion to which one of said link means is rotatably fitted, said second link means being connected to the other of said wiper arms to impart a swinging movement to said other wiper arm about its pivot point in synchronism with movement of the first link means, the driving force to said second link means being transmitted through the first link means.

4,009,503

## WIPER BLADE UNIT WITH FASTENING CLIP

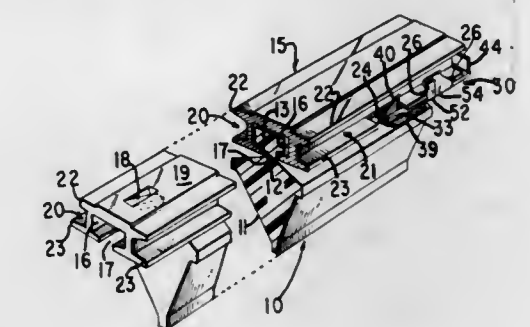
Bernard C. Sharp, White Plains, N.Y., assignor to Parker-Hannifin Corporation, Shelton, Conn.

Filed Mar. 31, 1976, Ser. No. 672,245

Int. Cl.<sup>2</sup> B60S 1/04

U.S. Cl. 15-250.42

13 Claims



10. A resilient clip adapted to be secured to one end of the backing strip of a windshield wiper blade unit for fastening the blade unit detachably to a set of claws of a pressure-applying wiper blade holder, said backing strip having along its opposite sides laterally open channels each defined by upper and lower lateral flanges thereon, for receiving slidably, confining and bearing pressure from said claws, said lower flanges each having an opening formed therethrough near said one end, said clip being a unitary piece of resilient sheet metal formed to comprise a base portion for underlying an end portion of said strip, two resilient legs to extend forwardly from said base portion beneath said lower flanges and each having along a forward portion thereof an upturned ridge portion to protrude through one of said openings into the related strip channel for engagement with one of said claws, and side structures turned upwardly from opposite side edges of said base portion and providing oppositely disposed fingers to be crimped over and upon portions of said lower flanges so as to grip said base portion tightly to said strip.

4,009,504

## SUPPORT OF THE WIPER BLADES IN THE WINDSHIELD WIPER INSTALLATIONS ON MOTOR VEHICLES IN GENERAL

Dario Arman, Via Venaria, 13/15, 10040 Druento, Torino, Italy

Filed Apr. 13, 1976, Ser. No. 676,629

Claims priority, application Italy, Apr. 15, 1975, 67957/75

Int. Cl.<sup>2</sup> B60S 1/04

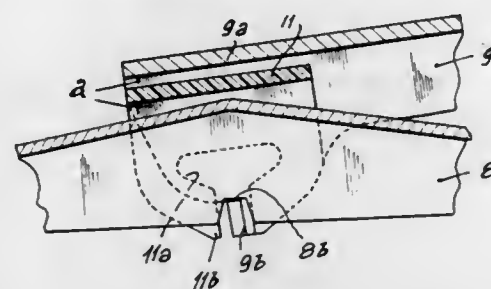
U.S. Cl. 15-250.42

2 Claims

1. A support for a wiper blade in a windshield wiper installation on motor vehicles comprising a support assembly formed by metal members having a traverse cross section substantially shaped like a U, comprising a main rod (9) whose ends (9a) are articulated to the central portions of small secondary bridges (8), wherein each end of said main rod (9) is defined by fork-shaped side walls (9a) and provided with a pair of transverse and opposed teeth (9b) thereon projecting within said fork; each small secondary bridge (8) is centrally provided with a cut (8b) on each side wall portion, each small



secondary bridge carries astride at the central portion thereof a gasket (11) of plastic material which is substantially shaped like a U having side walls extending to substantially the height of the side walls of said small bridge; each side wall of said gasket is provided with an open side seat (11a); each end (9a)



of said main rod is mounted astride said gasket (11) and is engaged with its teeth (9b) within the seats (11a) of said gasket (11) and within the cuts (8b) of the corresponding small bridge (8) in order to form articulated connections between the ends of the main rod (9) and the bridges (8).

#### 4,009,505 CARPET SECURING DEVICE

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

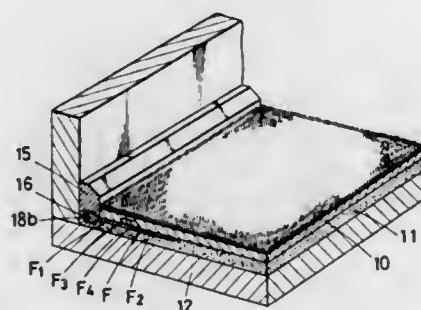
Filed Jan. 22, 1976, Ser. No. 651,546

Claims priority, application Japan, Feb. 1, 1975, 50-15133[U]; Feb. 1, 1975, 50-15134[U]

Int. Cl.<sup>2</sup> A47G 27/04

U.S. Cl. 16-7

4 Claims



1. The combination with an anchoring means of an adapter for carpets and the like, said adapter comprising a longitudinal strip attached to a reverse surface of the carpet and a locking projection formed integral with and along a longitudinal edge of said strip, said anchoring means having an elongate channel and a slit communicating coextensively with said channel, and said locking projection protruding from an edge of the carpet, and retained in locked relation to said channel when said adapter is attached to the carpet, said adapter further comprising a sliding clasp fastener having a pair of opposed interlockable stringers, one of said stringers bearing said locking projection and the other stringer being attached to said reverse surface of the carpet.

#### 4,009,506 BACKPLATE AND BAIL ASSEMBLY

Carl A. Henriksen, Grandville, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.

Filed Sept. 29, 1975, Ser. No. 617,425

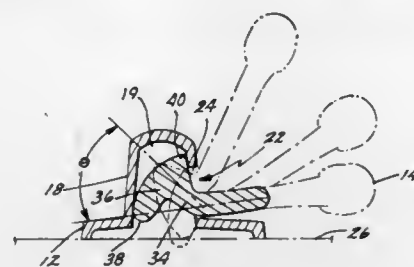
Int. Cl.<sup>2</sup> A47B 95/02

U.S. Cl. 16-126

5 Claims

1. A backplate and bail assembly, comprising:  
a backplate;  
a bail having an end portion, said end portion including a shank portion and a foot portion integral with and depending transversely from said shank portion said end portion including said foot portion extending in a plane perpendicular to said bail;

means a part of said backplate, for pivotally securing said bail at said bail end portion to said backplate without rotation of said backplate and only when said backplate is



secured to a mounting surface, said bail providing a handle portion lying in a single plane and said shank portion being angled upwardly with respect to the plane of said handle portion and said perpendicular plane.

#### 4,009,507 DOOR PIVOTING DEVICE

Alain Lascarrrou, Epinay-sur-Seine, France, assignor to La Telemecanique Electrique, France

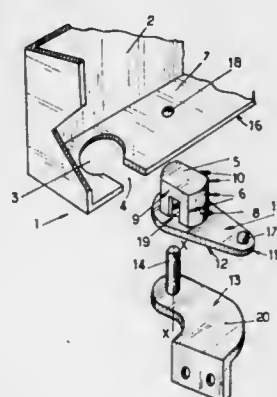
Filed Dec. 3, 1975, Ser. No. 637,258

Claims priority, application France, Dec. 17, 1974, 74.41482

Int. Cl.<sup>2</sup> E05D 7/12

U.S. Cl. 16-171

4 Claims



1. An assembly of two relatively pivotable structures comprising in combination:

i. a first structure including two mounting means secured in spaced relationship and each having a bearing surface, the bearing surfaces being parallel to each other, and opposed;  
ii. two hinge pins each of which is secured on a respective mounting means and projects normally from the bearing surface thereof, said hinge pins being axially aligned and axially spaced from each other, and projecting towards each other;  
iii. a second structure including two walls each having a bearing face, said bearing faces being parallel, each such wall defining a part-circular recess and a parallel-sided channel opening at one end into said recess and opening at its other end at a free edge of said wall;  
iv. a hinge member including a bearing element and a stud, said bearing element having a bore to receive a hinge pin, said bearing element having a first face normal to the axis of said bore to abut on a respective bearing surface, said stud projecting from an opposed second face of said bearing element, said stud having two diametrically opposed first sidewall surface portions which are of greater radial separation about the axis of said bore than the width of said channel, said stud having two diametrically opposed second sidewall surface portions which are of lesser radial separation about the axis of said bore than the width of said channel

v. means of said hinge member and on said second structure for retaining said hinge member releasably in a selected position of rotation of said stud in said part-circular recess,

whereby, with each hinge engaged on a respective hinge pin in a first position of rotation with respect to a respective wall, the walls can each receive the stud passed through the channel into the part-circular recess by reason of the lesser separation of the second sidewall portions, whereafter rotation of the hinge member into a second position of rotation causes the stud to be locked in the part-circular recess by reason of the greater separation of the first side wall portions.

#### 4,009,508 METHOD FOR FORWARDING AND CHARGING A BUNDLE OF FILAMENTS

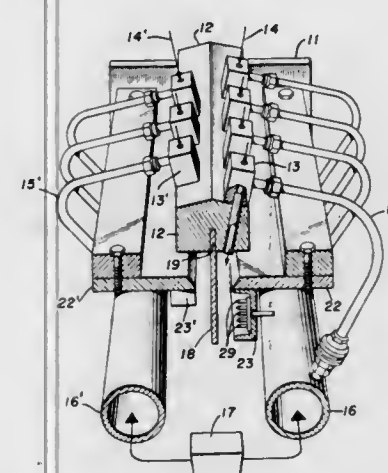
Ernest M. Sternberg, Chapel Hill, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 29, 1975, Ser. No. 573,275

Int. Cl.<sup>2</sup> D04H 3/00

U.S. Cl. 19-155

8 Claims



1. The method of forwarding and charging filaments, comprising

a. forwarding a plurality of filament groups along parallel paths into impingement with a target electrode at spaced locations thereon, said filament groups each being forwarded in bundle configuration,  
b. directing a plurality of electric fields to said locations to charge the filaments, said filaments being forwarded in such a manner that the filament configurations are transformed from a bundle configuration to a fan configuration under the influence of said impingement and said electric fields,  
c. a portion of said filament groups being forwarded into impingement with one side of the target electrode and the remainder of said filament groups being forwarded into impingement with the opposite side of said target electrode in such a manner that the groups of said portion are adjacent to each other, the filament groups of said portion being positioned along the target electrode in staggered relationship to the filament groups of said remainder.

#### 4,009,509 CABLE TIES

Mathew McCormick, East Didsbury, England, assignor to Bowthorpe Hellerman Limited, Crawley, England

Filed Mar. 13, 1975, Ser. No. 558,004

Claims priority, application United Kingdom, Mar. 12, 1974, 11004/74; Nov. 20, 1974, 50373/74

Int. Cl.<sup>2</sup> B65D 63/00

U.S. Cl. 24-16 PB

5 Claims

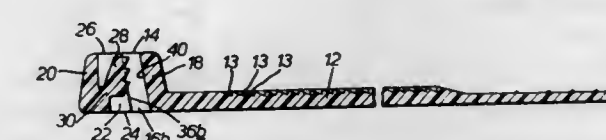
1. A one-piece cable tie formed of synthetic plastic material, comprising  
a. a flexible elongate strap including a strap portion (12),

and an enlarged head portion (14) at one end of said strap portion, said head portion containing an aperture (22) of rectangular cross-sectional configuration extending generally normal to the plane of the strap portion, said aperture having opposed pairs of side and end walls;

b. said head portion containing

1. a pawl (28) disposed within said aperture and formed with a plurality of pawl teeth having crests which face a first one of said end walls and lie in a common plane generally perpendicular to the plane of said strap; and  
2. pivot means (30) pivotally connecting one end of said pawl with the other end wall of said aperture for movement of said pawl teeth in respective arcs across said aperture in the longitudinal direction of said strap portion;

3. said first aperture end wall being inclined to the plane of the crests of the pawl teeth to define an abutment surface (40) which is so inclined that the pawl tooth



furthermost from the pawl pivot means is nearest said inclined abutment surface; and

c. a series of ratchet teeth (13) formed on and extending longitudinally on one surface of said strap portion, said pawl and ratchet teeth being complementary and so oriented that when the free end of the strap portion is introduced into the aperture end adjacent said pawl pivot means, said pawl and ratchet teeth cooperate to prevent removal of the strap portion from the aperture;

d. each of said pawl teeth including a first surface (35b) generally facing the pawl pivot end of said aperture, and a second surface (35a) facing the opposite end of said aperture, the second surfaces (35a) of said pawl teeth lying substantially perpendicular to a radius passing through the pawl pivot axis, thereby to direct toward the pawl pivot axis the force (F) applied to said second pawl tooth surfaces by the corresponding ratchet teeth when the strap is tensioned in the withdrawal direction.

#### 4,009,510

#### DEFLECTION DEVICE FOR SAFETY BELTS

Oskar Lennart Lindblad, Hedsagatan 16, 440 20 Vargarda, Sweden

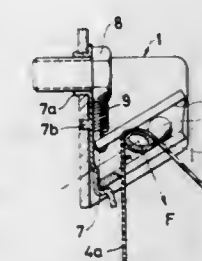
Filed Jan. 8, 1976, Ser. No. 647,518

Claims priority, application Sweden, Jan. 10, 1975, 7500247

Int. Cl.<sup>2</sup> A44B 11/10

U.S. Cl. 24-196

9 Claims



1. A deflection device for a safety belt arrangement including a belt and belt collecting means, comprising: a bracket to be connected to a part of a vehicle, a bar about which a belt is adapted to pass, a stop, said bar being movable in a direction towards and away from said stop, an arm pivotally supporting said stop about an axis transverse to the longitudinal extension of a belt passed around said bar, said bar being movable along said arm in said transverse direction, said bar and stop being



arranged to permit the belt to run free about said bar when the belt is subjected to a force at least equivalent to the collecting force of said collecting means under normal conditions of use, and to lock the belt between said bar and said stop when the belt is subjected to abnormal forces.

4,009,511

# PROCESS FOR DRAWING POLYAMIDE MONOFILAMENTS

Sibley Paul Gauntt, Bon Air, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 480,759, June 19, 1974, abandoned.

This application Dec. 15, 1975, Ser. No. 641,135

Claims priority, application United Kingdom, July 4, 1973, 31809/73

Int. Cl.<sup>2</sup> D01D 5/12

U.S. Cl. 264—210 F

9 Claims

1. In a process including the coupled steps of spinning, quenching and drawing a heavy denier, aliphatic polyamide monofilament in first and second draw stages to a total draw ratio of at least 5.5X, the improvement comprising:

water-quenching the monofilament, advancing the quenched monofilament, in said first draw stage through a pressurized, surface-plasticizing, steam atmosphere wherein it is orientation-stretched at a ratio of at least 3.5X, and then

advancing the monofilament, in said second draw stage through a zone heated with a radiant heater at a temperature of 700° C.—1300° C. wherein it is orientation-stretched at a ratio of at least 1.3X.

4,009,512

# METHOD FOR SIZING WARP YARNS

Hirohito Baba, No. 12-36, 2-chome, Yamate-cho, Suita, Osaka, Japan

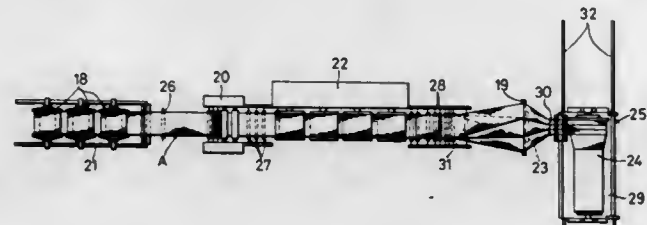
Filed Sept. 10, 1975, Ser. No. 611,873

Claims priority, application Japan, Feb. 27, 1975, 50-24617

Int. Cl.<sup>2</sup> D02H 9/00, 5/02

U.S. Cl. 28—72.6

4 Claims



1. A method for sizing warp yarns for yarn dyed fabric comprising the steps of:

- forming a plurality of warpers beams by the steps of:
  - arranging a plurality of cheeses on a cheese creel which is sufficient for forming only a fraction of a predetermined pattern for one section of the fabric;
  - winding the warp yarns from said cheeses through a first lease reed onto a beam;
  - inserting a first lease cord through the ends of the warp yarns on said beam by use of said first lease reed just before a required length of yarns is wound thereon;
  - cutting the warp yarns between said first lease cord and said first lease reed to form a warpers beam with said first lease cord inserted through the yarn ends thereon;
- mounting on a beam creel a required number of thus formed warpers beams;
- passing the yarns from said warpers beams through a second lease reed into parallel side-by-side relation for the predetermined pattern;
- guiding the warp yarns by means of said second lease reed through a sizing unit, a drying unit and separating rollers and onto a winding drum with the warp yarns from the respective warpers beams in side-by-side relation;

e. mounting said second lease reed on a reed holder provided between said separating rollers and said winding drum;

f. inserting a second lease cord through the ends of the warp yarns by use of said second lease reed before starting winding on said winding drum;

g. running the warp yarns through said sizing unit and said drying unit for sizing and winding said sized and dried warp yarns on said winding drum in the aforementioned side-by-side relation; and

h. rewinding said sized and dried yarns on a beam by means of a rewinder to form a loom beam with said second lease cords at the ends of yarns.

4,009,513

# PRODUCTION OF WARP OF TEXTURED YARNS OF UNIFORM PROPERTIES

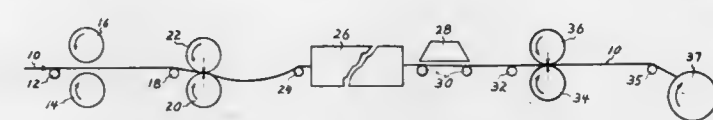
Bjorn A. Andersen, Horseleg Creek Road, Rome, Ga. 30161

Filed Feb. 2, 1976, Ser. No. 654,669

Int. Cl.<sup>2</sup> D02H 1/100; D02J 1/02

U.S. Cl. 28—72.6

7 Claims



1. A process comprising passing a plurality of synthetic yarns having latent texture from a supply into and through the nip of a first pair of rolls in the form of a warp, said yarns having residual shrinkage, driving said first pair of rolls so as to advance said warp, pulling said warp from said first pair of rolls with a second pair of rolls at a speed less than that of said first pair, heating said warp while moving between said first and second pair of rolls at a temperature and for a time sufficient to effect shrinkage of said yarns, the speed of said second pair of rolls being such as to maintain all of the yarns of said warp under almost tension-free condition between said first pair of rolls and the point of heating, and periodically separating said first pair of rolls from one another, whereby slack accumulated in individual yarns between said first and second pairs of rolls will be taken out and said yarns will be restored to equal tensions and a warp of pre-shrunk equally tensioned but almost tension-free synthetic yarns will issue from said second pair of rolls.

4,009,514

# DIE SET

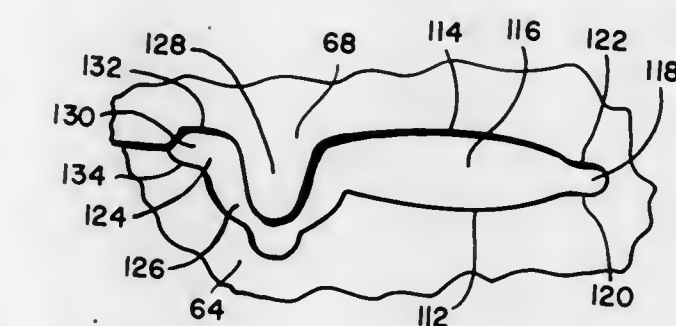
Luis R. Couto, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Division of Ser. No. 566,192, April 9, 1975. This application Sept. 30, 1975, Ser. No. 618,150

Int. Cl.<sup>2</sup> B21F 1/00

U.S. Cl. 29—751

4 Claims



1. A die set comprising: a first die member and a second die member; said first die member having a first crimping nest; first and second expansion zones, one to each side of said first crimping nest for receiving any material flowing out from said

first crimping nest when an electrical terminal is crimped within said first crimping nest; a second crimping nest in said first die member; third and fourth expansion zones, one to each side of said second crimping nest for receiving any material flowing out from said crimping nest when an electrical terminal is crimped within said second crimping nest; said second and said third expansion zones overlapping one another to decrease the overall length of said first die member required to accommodate both said first and said second crimping nests; a third crimping nest in said second die member arranged to be aligned with and cooperate with said first crimping nest; fifth and sixth expansion zones, one to each side of said third crimping nest for receiving any material flowing out from said third crimping nest when an electrical terminal is crimped within said first and third crimping nests; a fourth crimping nest in said second die member arranged to be aligned with and cooperate with said second crimping nest; seventh and eighth expansion zones, one to each side of said fourth crimping nest for receiving any material flowing out from said fourth crimping nest when an electrical terminal is crimped within said second and said fourth crimping nests; said sixth and said seventh expansion zones overlapping one another to decrease the overall length of said second die member required to accommodate both said third and said fourth crimping nests.

4,009,515

# DISC BRAKE PISTON PULLER

Charles Racine, 2713 W. Comet Road, Clinton, Ohio 44216

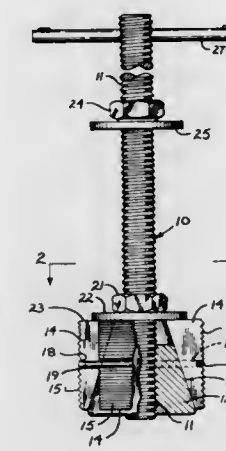
Continuation of Ser. No. 530,881, Dec. 9, 1974, abandoned.

This application Jan. 23, 1976, Ser. No. 651,845

Int. Cl.<sup>2</sup> B23P 19/04

U.S. Cl. 29—265

11 Claims



1. A tool as for forcibly releasing a frozen brake piston, provided with a cylindrical inner wall portion, from a cylindrical cavity of a disc brake caliper or like work part, said tool comprising: an elongated rigid shank having outer and inner end parts; said shank having a camming tool head, screw-threaded on the inner end thereof, for axially centered reception of said camming tool head within the cavity of the piston, and said camming tool head having a radially outwardly presented conical cam surface adapted to define an annular space between said conical surface and said cylindrical inner wall portion of the piston; a plurality of separate tool head segments each having peripherally arcuate outer wall portions adapted for complementary gripping engagement with said cylindrical inner wall portion of the brake piston, and each said tool head segment also having axially tapered, peripherally arcuate inner surface areas for complementary sliding engagement with said outwardly presented conical surface of said camming tool head; said shank having a first stop means axially inwardly adjustable thereon against said camming tool head segments, to slide the segments on said conical cam surface of the camming tool head, axially to adjust said camming tool head segments radially outwardly into direct clamping engagement of said peripherally arcuate outer wall portions of the segments with the cylindrical inner wall portion of

the piston; a second stop means axially adjustably mounted on said shank, axially outwardly of said first stop means, for axial adjustment of said second stop means against a relatively fixed portion on the work part, whereby said rigid shank is thereby urged axially outwardly of said caliper, with said clamped piston thereon, to release and withdraw and piston from the cylindrical inner wall portion of the work part.

4,009,516

# PYROELECTRIC DETECTOR FABRICATION

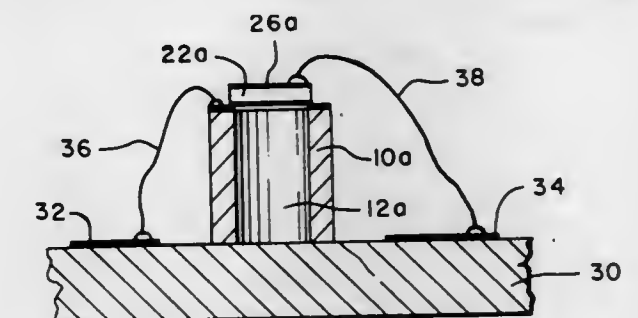
Alice M. Chiang, Framingham; Brian W. Denley, Melrose, and Richard L. Schapker, North Andover, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1976, Ser. No. 671,913

Int. Cl.<sup>2</sup> H01L 37/00

U.S. Cl. 29—592

21 Claims



1. A method of fabricating a pyroelectric detector, the method comprising:

- providing a substrate of a first material, the substrate having first and second surfaces and a cavity therein;
- mounting a pyroelectric body on the first surface of the substrate with a first portion of the body in contact with the substrate and a second portion extending over the cavity;
- filling the cavity with a second material; processing the pyroelectric body, after filling the cavity, to form a pyroelectric detector; and
- removing the second material from the cavity after processing the pyroelectric body.

4,009,517

# BARBERING TOOL

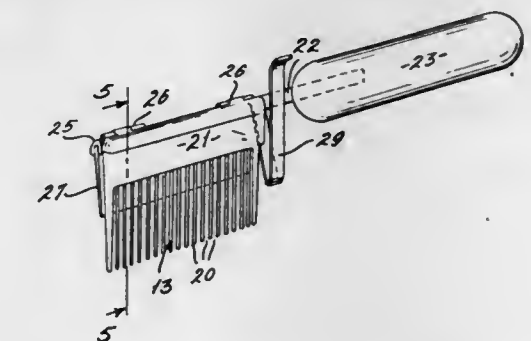
Robert E. Horn, 4866 Viento Drive, St. Louis, Mo. 63129

Division of Ser. No. 351,422, April 16, 1973, Pat. No. 3,919,769. This application Nov. 5, 1975, Ser. No. 629,025

Int. Cl.<sup>2</sup> B26B 21/12

U.S. Cl. 30—30

1 Claim



1. A barbering tool comprising a cutting blade element and a comb element disposed in substantially parallel relation with each other, said comb element having teeth projecting beyond the cutting edge of said blade element, said blade and comb elements being held against movement lengthwise of said blade and lengthwise of said teeth with respect to each other, one of said elements having a shank extending parallel to the cutting edge, an elongated handle rigidly mounting said shank



for simultaneous movement of both said blade and comb elements through a person's hair, and means for selectively varying the spacing of the cutting edge of said blade element from said comb element transversely of the plane of said blade element comprising hinge means along two adjacent edges of said comb and blade elements, and an elongated finger piece fixed to said blade element adjacent to said handle and extending transversely of said hinge means whereby to permit the user of the tool to adjust said blade element during use by finger pressure on a selected end portion of said finger piece without releasing his grip on said handle.

4,009,518

### ELECTRIC DRY SHAVER HAVING FLEXIBLE FOIL TYPE OUTER CUTTER

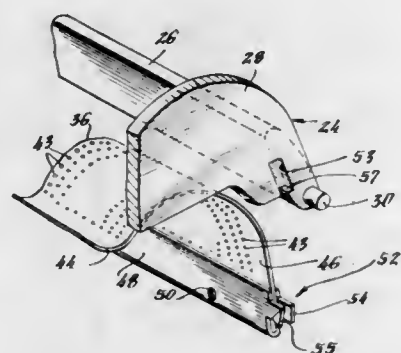
David R. Locke, Bridgeport, and Edward Szymansky, Fairfield, both of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed June 4, 1975, Ser. No. 583,618

Int. Cl.<sup>2</sup> B26B 19/04

U.S. Cl. 30—43.92

5 Claims



1. An outer cutter assembly for an electric dry shaver comprising,

- a frame member having slots therein,
- a flexible foil outer cutter having oppositely disposed marginal portions,
- elongated U-shaped bars clamped to a pair of said marginal portions for stiffening said pair of marginal portions,
- tabs formed on said bars extending from opposed ends thereof, and
- resilient spaced leg members formed on at least one of said bars and biased against wall portions of said frame member slots for interlocking the foil outer cutter to the frame member.

4,009,519

### ADJUSTABLE DISTAL EXTENSION HINGED STRESS BREAKER

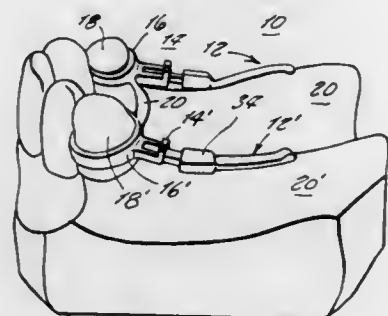
Ralph Hallmark, 2 Brick Yard Drive R.R. 1, Hudson, N.H. 03051

Filed July 23, 1975, Ser. No. 598,416

Int. Cl.<sup>2</sup> A61C 13/22

U.S. Cl. 32—5

7 Claims



1. A distal extension hinged stress breaker for a dental appliance comprising;

- a head portion adapted to be coupled to an attachment which connects onto existing teeth;
- a substantially longitudinal shank portion;
- pivot means pivotally coupling one end of said shank portion to said head portion to permit rotational movement therebetween;
- a rear portion enclosing the opposite end of said shank portion and adapted to be coupled to a base which fits over the mouth ridges and support artificial teeth; and
- retention means extending from said head means and holding said shank means for preventing lateral movement of the shank means with respect to the head means,
- wherein said head portion is a U-shaped member and said retention means are free deformable ends extending from said head portion,
- further comprising stop means positioned on said head portion for restricting said rotational movement to only one direction from an initial rest position,
- and wherein said stop means includes arms coupled to the ends of said extensions and facing towards each other with a space therebetween, said arms positioned to lie above said shank portion.

4,009,520

### GRAIN DRYING SYSTEMS

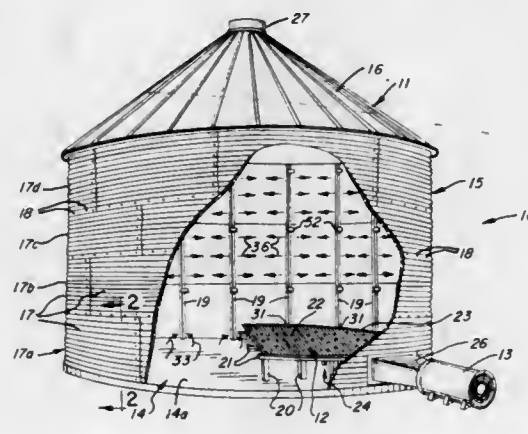
Eugene G. Sukup, Dougherty, Iowa 50433

Filed July 21, 1975, Ser. No. 597,362

Int. Cl.<sup>2</sup> F26B 19/00

U.S. Cl. 34—233

9 Claims



1. In a grain bin having a foundation including a bottom floor, a noninsulated wall supported on said foundation, a perforated subfloor spaced above said bottom floor and forming a chamber between said floors, and means for forcing dry air into said chamber;

means for preventing condensation from forming on the interior surface of said wall and for reinforcing said wall comprising:

- a plurality of upright rigid hollow conduit members positioned about the interior of the bin wall in arcuately spaced relation to one another;
- each of said conduit members resting at its lower end on said foundation;
- means providing fluid communication between the hollow interior of each of said conduit members and said chamber when said conduit members are resting on said foundation;
- each of said conduit members having a closed upper end;
- each of said conduit members having a plurality of spaced air diffusing perforations formed therein, a predetermined number of which direct air flow laterally along said bin wall; and
- said conduit members being secured in reinforcing relation to the interior of said bin walls and with said lower ends resting on said foundation whereby said conduit members provide reinforcement and load bearing support for said wall.

4,009,521

### INTERCONNECTED RESPONSE RECORDING AND DISPLAY CONSOLES

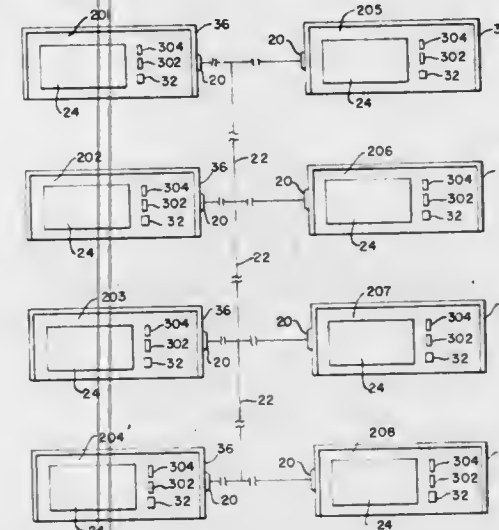
John E. King, Fairport, and Herbert W. Watkins, Pittsford, both of N.Y., assignors to The Singer Company, New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,038

Int. Cl.<sup>2</sup> G09B 5/00

U.S. Cl. 35—8 R

18 Claims



1. An apparatus for the selective transmitting and receiving of responses between a plurality of console operators comprising:

- a plurality of response recording and display consoles; electrical interconnection means operably coupling the console;
- each console including a plurality of electrical switches each having a plurality of stable states including a response recording state and a non-response recording state;
- each console including a plurality of response indicating lamps;
- each lamp on a console operably associated through electrical circuitry with a corresponding one of the switches on the console whereby actuation of a switch to the response recording state causes the corresponding one of the lamps on the console to illuminate;
- each lamp operably associated through the electrical circuitry and the interconnection means with a corresponding one of the lamps on each of the other consoles;
- each console including a console operator actuatable transmit switch interposed in the electrical circuitry adapted to simultaneously reversibly couple all illuminated lamps on a console with the corresponding lamps on each of the other consoles; and
- each console including a console operator actuatable receive switch interposed in the electrical circuitry adapted to simultaneously reversibly de-couple all lamps on a console with the corresponding illuminated lamps on each of the other consoles.

4,009,522

### DEVICE FOR THE TEACHING AND/OR TRAINING IN THE GAME OF BRIDGE

Henri Marie Léon Borianne, 10 avenue de Wagram, 75008 Paris, France

Filed Oct. 28, 1975, Ser. No. 626,047

Claims priority, application France, Oct. 31, 1974, 74.36417

Int. Cl.<sup>2</sup> G09B 19/22

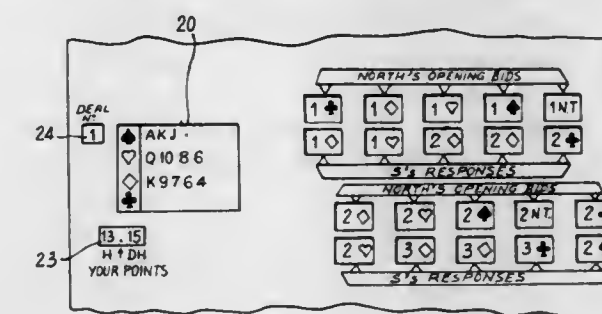
U.S. Cl. 35—8 B

18 Claims

15. A device for teaching or practicing bidding for the card game of bridge, which comprises:

- at least one printed support means, associated with and movable along a fixed path of travel relative to a masking

means, said support means bearing non-overlapping columns of information relative to bidding of a player's hand along the path of travel, said information being printed along lines orthogonal to the path of travel of said support means, said columns of said support means including a first column having lines of printed symbols representing the value of a selected number of cards of the same suit, said first column including at least one series of more than four said lines which are sequentially arranged so that the number of cards represented by any four successive lines of said at least one series equals a full hand of thirteen cards, and said support means also including at least one other column having lines of printed symbols, each line representing a bid by the player for a corresponding group of four lines of said at least one series, in which the suit of each line is determined by the position of said support means relative to said masking means; and



said masking means, which include a large window corresponding to said first column of said support means, which is adapted in size and relative position to permit the appearance therein of exactly for lines of said first column of said support means, so that as said support means is moved to its next position, at least two of the four lines are preserved within said large window, said masking means having

four symbols representing the four card suits printed along a side of said large window so that each suit symbol is adjacent one of the four lines of said first column of said support means within said large window, said masking means also including at least one other window corresponding to said at least one other column of said support means, within which appears said bid by the player for the hand appearing simultaneously within said large window.

4,009,523

### ACOUSTIC SIGNATURE SIMULATION

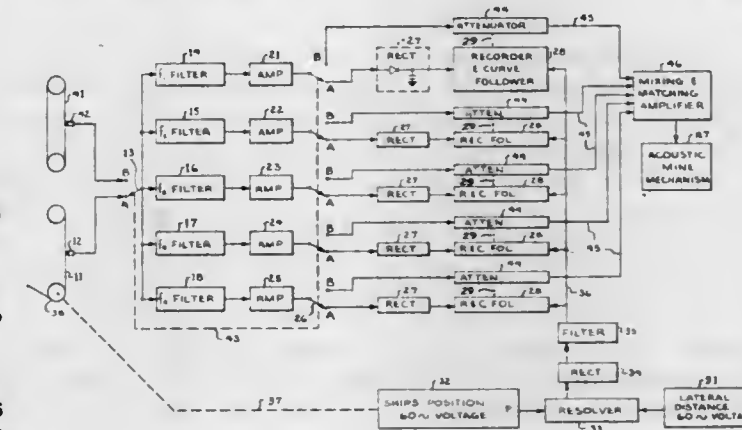
Jack K. Van Hook, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1958, Ser. No. 780,638

Int. Cl.<sup>2</sup> G08B 3/00

U.S. Cl. 35—10.4

3 Claims



1. The method of producing an electric signal corresponding to the underwater acoustic signature which would be



generated by the movement of a certain sound source through a remote underwater environment which comprises preparing a recording at a substantially constant signal level of the acoustic output of said certain sound source in deep water far from shore, preparing a series of curves of the transmission characteristics of said remote environment for sound in selected consecutive frequency bands as a function of distance from said source, reproducing the constant level recording as electrical waves, separating the reproduced electrical waves into said selected consecutive frequency bands, modulating the amplitude of the electrical waves in each frequency band in accordance with the corresponding sound transmission characteristic curve, and combining the modulated electrical waves.

4,009,524

# EDUCATIONAL DEVICE FOR LEARNING FUNDAMENTALS OF ENGINE OPERATION

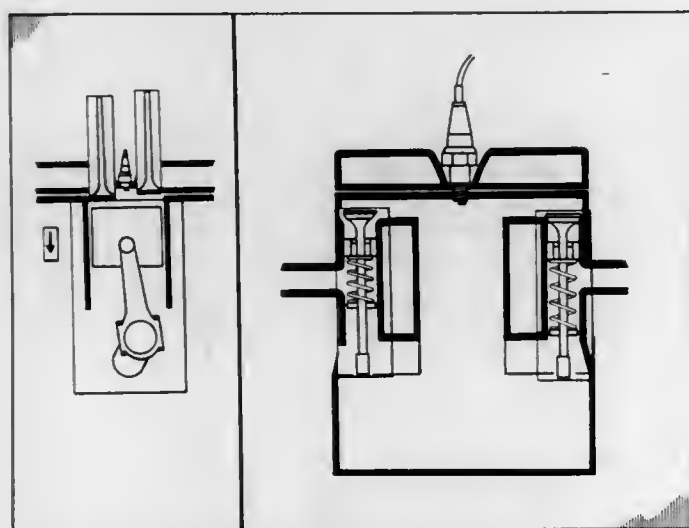
Charles G. Valentine, Stamford, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 19, 1973, Ser. No. 352,774

Int. Cl.<sup>2</sup> G09B 25/02

U.S. Cl. 35—13

6 Claims



1. An educational kit programmed for teaching the internal combustion engine comprising as integrated component parts thereof:

- a. a simulator board having a surface of magnetically attractive material and having graphic indicia on the surface thereof including schematic sectional views of the cylinder portion of the internal combustion engine, the graphic indicia on said simulator board being the non-numerical board indicia as shown in FIG. 1;
- b. a plurality of magnetically attractive manipulative pieces individually bearing on their surfaces specific graphic indicia defining parts for said internal combustion engine including pistons, valves, and shafts and gears, said pieces including a plurality of pieces each bearing piston indicia indicating the different positions of a piston during the compression, ignition, combustion and exhaust cycles of an internal combustion engine, another plurality of said pieces bearing valve indicia for depicting valve positions during said engine cycles, said pieces adapted for positioning on said simulator board such that the indicia on said pieces complements the indicia on said board, and further adapted for sequential manipulation on said simulator board such that the assembly of parts and a plurality of operating conditions of said internal combustion engine may be simulated; said magnetically attractive board or alternatively each of said magnetically attractive pieces being magnetic to provide a mutual attraction between said board and said pieces, the graphic indicia on said manipulative pieces being the non-numerical piece indicia as shown in FIG. 3; and
- c. audio-visual instructional means including synchronized

recordings and visual slides or filmstrips presenting information relevant to the internal combustion engine including information defining the relationship between the indicia on said pieces and the indicia on said simulator board; said audio-visual instructional means further characterized in that it is periodically stoppable to permit the user to perform a manipulative activity requested by the instructional means using said simulator board and said manipulative pieces, and being restartable again by the user upon completion of the activity; whereby the assembly, relationship of parts and operation of an internal combustion engine may be simulated by positioning and manipulating said pieces on said simulator board in response to said instructional means.

4,009,525

# APPARATUS FOR SIMULATION OF INTERPERSONAL RELATIONSHIPS AND ACTIVITY

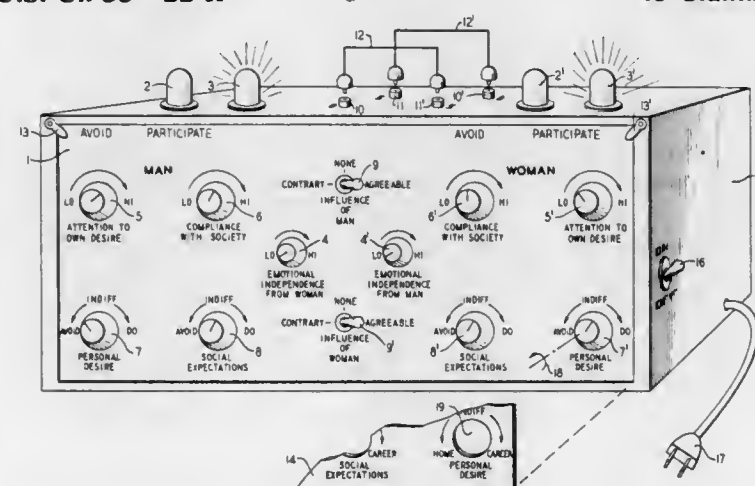
James Fisher Hollander, 40 Middlesex St., Matawan, N.J. 07747

Filed Nov. 4, 1975, Ser. No. 628,830

Int. Cl.<sup>2</sup> G09B 19/00

U.S. Cl. 35—22 R

45 Claims



45. Interpersonal relationship simulator apparatus comprising

- a first decisionmaking simulation apparatus adjustably indicating levels of one or more decisional influences upon a first simulated individual and displaying simulated decisions resulting from an action of forces in said first apparatus corresponding to said first decisional influences, a physical decision output being available from said first apparatus; and
- a second decisionmaking simulation apparatus adjustably indicating levels of one or more decisional influences upon a second simulated individual and displaying second simulated decisions, said physical decision output from said first apparatus causing an influence on said second apparatus in analogy with a decisional influence upon said second simulated individual, said second simulated decisions resulting from an action of forces in said second apparatus corresponding to said second decisional influences, whereby the simulation of interpersonal relationships is facilitated.

4,009,526

# BINOMIAL MICROSCOPE

Kuniomi Abe, Kobe, and Yuji Maekawa, Nishinomiya, both of Japan, assignors to Konan Camera Research Institute, Japan

Filed Sept. 30, 1975, Ser. No. 618,278

Claims priority, application Japan, Apr. 24, 1975, 50-56683

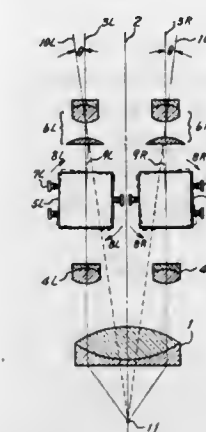
Int. Cl.<sup>2</sup> G02B 21/22

U.S. Cl. 350—35

1 Claim

1. A binomial microscope comprising an auxiliary objective and a pair of optical systems having substantially parallel optical axes and being arranged in the rear of said auxiliary objective, each of said optical systems including an objective, an erect prism and an ocular, and said optical system further

includes means for moving at least a part of said erect prism while the remaining optical components remain fixed,



whereby the observed image can be positioned in the vicinity of the object being observed.

4,009,527

# COORDINATED COLOR CHART SYSTEM, AND METHOD FOR PRODUCING SAME

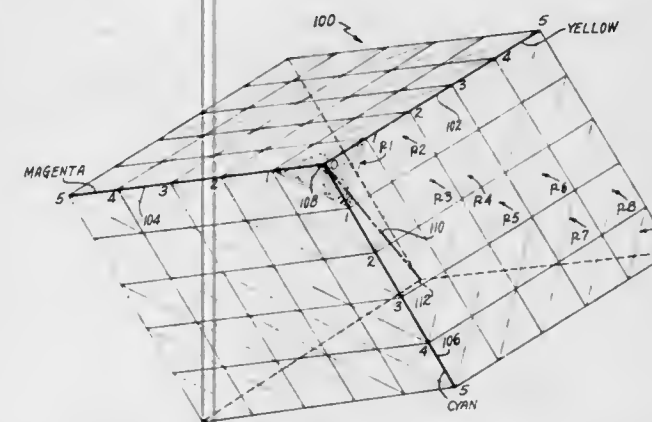
Camilla Ann Scott, Reston, Va., and Elizabeth L. Zimmerman, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,270

Int. Cl.<sup>2</sup> G09B 19/00

U.S. Cl. 35—28.3

3 Claims



1. A color chart displaying a plurality of coordinated distinct colors, each coordinated color on said chart being obtained by utilizing specific amounts of each of only independently variable, constant tint density colorants yellow, magenta, and cyan, and being represented by a specific point in a plane disposed perpendicular to a line drawn between one point and another point diagonally opposite thereto within the space of a color cube on which said colorants are arranged along three mutually perpendicular edges of said cube mutually intersecting at said one point, one of said colorants corresponding to each edge with the amount of each colorant uniformly and progressively increasing along its respective edge from a minimum at said one point to a maximum at corresponding cube corners, and wherein there is associated with each said specific point on said plane a unique combination of amounts of each said colorants which is characterized by a constant tint density.

4,009,528

# SNEAKER WITH INSOLE

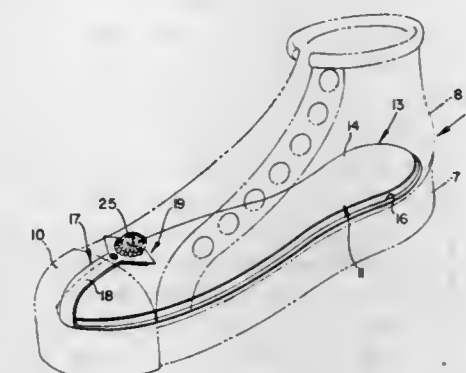
John J. Villari, Jr., 30 W. Central Ave., East Bangor, Pa. 18013, and Charles Paraschos, P.O. Box 458, Portland, Pa. 18351

Filed Mar. 2, 1976, Ser. No. 663,067

Int. Cl.<sup>2</sup> A43B 13/38

U.S. Cl. 36—44

6 Claims



1. A sneaker or canvas shoe containing an insole including a foot sole-shaped pad and a casing enclosing said pad, said pad being formed of a resilient cushioning material capable of receiving and expelling air, two edge sealed sheets of thin elastic material constituting said casing and comprising a sealed air and moisture proof envelope having a main body portion of a shape and size to conformably enclose said pad and an appendage extending from the toe end of the main body portion to receive and entrap air expelled from the pad enclosing main body portion when pressure is applied to the insole for compressing the pad and collapsing the casing portion enclosing the pad.

4,009,529

# GRADING BLADE FOR A TOOTHED SHOVEL

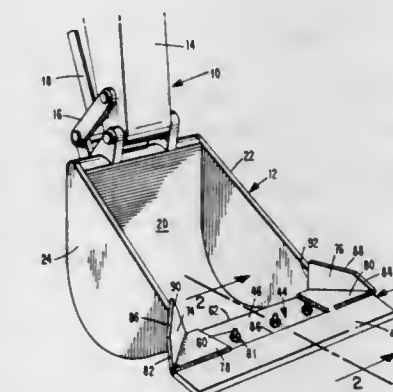
Lawrence M. Johnson, 3594 S. Sand Creek Road, Decatur, Ill. 62521

Filed Sept. 25, 1975, Ser. No. 616,657

Int. Cl.<sup>2</sup> E02F 3/76, 3/81

U.S. Cl. 37—117.5

4 Claims



1. A grading blade attachment for a backhoe shovel or the like having a plurality of outwardly extending spaced teeth, each of said teeth having a raised portion on the upper surface thereof, said blade attachment comprising:

- a substantially planar trapezoidal first blade member having a short parallel edge of width substantially equal to the width of said shovel, a long parallel edge, and a pair of opposed converging side edges,
- a substantially planar rectangular second blade member rigidly affixed to said long parallel edge of said first blade member and extending outwardly thereof, said second blade member terminating in a scraping edge substantially parallel to said parallel edges,
- a pair of upstanding side portions, one of said side portions being attached to said first blade member along each of



said nonparallel edges and extending upwardly substantially perpendicular to said first blade member, means for attachment of said blade attachment to said shovel without modification of said shovel consisting essentially of,

- a clamping member attached to the underside of said second blade member to define therebetween an opening for receiving the end portions of said teeth, said clamping member being so located as to position said attachment such that said short parallel edge and said side portions are in juxtaposition to the respective edges of said shovel when said end portions of said teeth are in said opening,
- a plate member attached to the underside of said first blade member, said plate member having a plurality of notches for receiving the teeth of said shovel, each of said notches being defined at least in part by a shoulder oriented substantially perpendicular to said short parallel edge and engageable with the raised portion of said teeth when said teeth extend into said opening, and
- a plurality of threaded bolts extending through the holes provided in said first blade member and said clamping member and passing through the spaces between said teeth, said bolts being secured by nuts installed thereon to fasten said grading blade attachment to said shovel.

4,009,530

## APRON LIFT LINKAGE

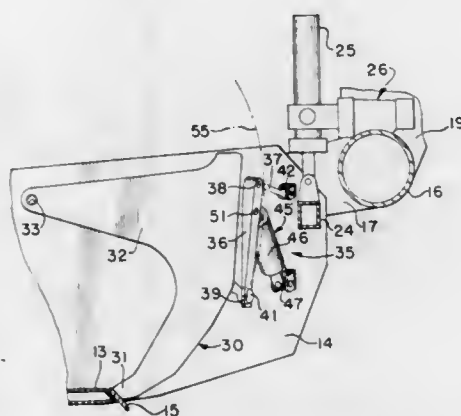
Larry G. Eftefield, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 9, 1976, Ser. No. 675,361

Int. Cl.<sup>2</sup> E02F 3/75

U.S. Cl. 37—126 AD

6 Claims



1. In a tractor-drawn scraper having a bowl rearwardly supported by wheels, said bowl including a floor and sidewalls, and being open at its forward end, a cutting edge disposed along the forward edge of the bowl floor, an apron at the forward open end of said bowl, said apron being pivotally mounted on the bowl sidewalls for pivotal movement about an axis transverse to said bowl and rearwardly of said apron and between a lower closed position and an upper open position wherein the lower edge of said apron is substantially above said cutting edge, a tractor forwardly supported by wheels and having draft arms extending rearwardly thereof to pivotal connections on the bowl sidewalls, hydraulic lift jack means connected between the rear of said tractor and the front of said bowl for raising and lowering the front of said bowl, the improvement comprising:

- first and second links, one end of said first link being articulately connected with one end of said second link;
- means articulately connecting the other end of said first link to the center of said apron;
- means articulately connecting the other end of said second link to one of said sidewalls of said bowl forwardly of said apron;
- a hydraulic jack having a cylinder and an axially movable rod extending from said cylinder;
- means for articulately connecting one end of said hydraulic jack to one of said links near said one end thereof; and

means articulately connecting the other end of said hydraulic jack to said one sidewall of said bowl at a position vertically spaced from the other end of said second link.

4,009,531

## REVERSIBLE DIRECTION BUCKET WHEELS

Michel Metrier, Saint Cloud, France, assignor to Koch Transporttechnik GmbH, Germany

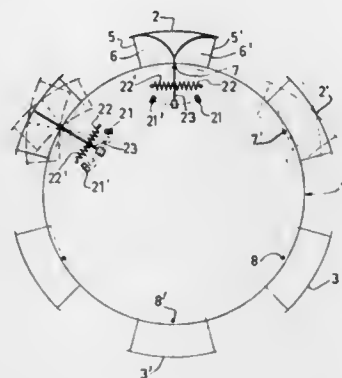
Filed Oct. 14, 1975, Ser. No. 622,414

Claims priority, application Germany, May 22, 1975, 2522562

Int. Cl.<sup>2</sup> E02F 3/24

U.S. Cl. 37—189

4 Claims



1. An apparatus for picking up bulk products, particularly granular or pulverulent products from a heap, of the type constituted by a plurality of buckets mounted on an endless mobile support, such as a bucket wheel, wherein the mobile support comprises a driving device allowing said mobile support to be driven in two opposite directions, each bucket comprising a pivot means having a pivoting axis transverse with respect to the path of the mobile support, and means defining first and second pick up openings, each opening means being capable of being placed in a picking up and active position substantially perpendicular with respect to the path of the mobile support, and facing a direction opposite to the direction faced by the other bucket opening means when in active position, thus permitting the mobile support to be moved alternatively in two opposite directions each of which corresponds to one of the opening means of the buckets being placed in active picking up position, so as to face the heap, each bucket comprising further means to cause said bucket automatically to be pivoted when the direction of the mobile support path is turned by 180°;

said means being constituted by:

- a plurality of pivoting arms, each arm being connected to one pivot means on one bucket;
- a plurality of actuation members, each member being adapted to move one of said arms so as to cause the corresponding bucket to be pivoted;
- a common auxiliary support on which said actuation members are mounted, said auxiliary support being driven by the driving device of the apparatus, and in the same direction with respect to the direction of the mobile support of the buckets, the displacement of said auxiliary support compared with said mobile support of the buckets causing the pivoting arms to be angularly moved and the bucket to be pivoted, so as to place one bucket opening in active position facing the heap towards which the mobile support is moved.

4,009,532

## ADJUSTABLE DISPLAY STANDARD

Wayne A. Thomas, 200 N. Van Ness, Los Angeles, Calif. 90004

Filed Oct. 31, 1975, Ser. No. 627,549

Int. Cl.<sup>2</sup> G09F 3/14

U.S. Cl. 40—11 A

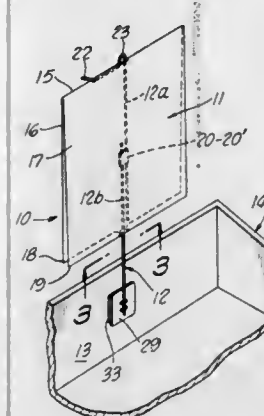
8 Claims

1. A display standard, comprising:

- a. an elevated sheet-like display member folded upon itself

along a fold line to provide a top folded edge and at least one facing panel having a lower edge;

- b. a tab member centrally carried by said lower edge of said panel, said tab being releasably attachable to the rod-like structure to stabilize the sheet-like member as supported by said rod-like structure against tilting movements, said tab having an opening adjacent a projecting end thereof of a size to receive said rod-like structure, and an end slit extending radially outwardly from said opening to enable relative lateral movement of the rod-like structure into a gripped position in said opening;



- c. a first elongated rod-like element having one end formed to releasably engage a top portion of said display member;
- d. a second elongated rod-like element having means at one end for attachment to an associated object; and
- e. a tubular member for adjustably interconnecting and frictionally retaining the respective other ends of said elements in overlapped parallel relation to form an upright support for and extending below the display member, and a support having an axial length adjustment to vary the spacing distance between said attachment means and the elevated position of the display member.

4,009,533

## SAMPLE ENLARGING MATERIAL DISPLAY DEVICE

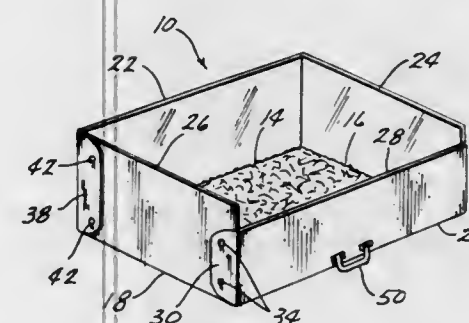
John M. Larkin, 6304 Colby Ave., Des Moines, Iowa 50311

Filed Jan. 19, 1976, Ser. No. 650,144

Int. Cl.<sup>2</sup> G09F 11/00, 13/14, 19/16; B65D 7/28

U.S. Cl. 40—28 B

10 Claims



1. A device for displaying a sheet of material comprising: a floor wall having perimetric edges in a rectangular shape; an upstanding wall extending upwardly from each of said perimetric edges and being hinged thereto for pivotal movement about an axis approximately coincident with said perimetric edge from an upstanding position to a folded position in facing relation to said floor wall; said upstanding walls having adjoining vertical edges when in said upstanding position so as to close said floor wall in a rectangular configuration having an open upper end; securing means connected to at least some of said vertical edges of said upstanding walls, said securing means being adapted to retentively engage the adjoining upstanding wall when said upstanding walls are in their upstanding

position, and being adapted to retentively engage said floor wall when said upstanding walls are in their folded position;

said upstanding walls having mirror surfaces on their inwardly presented sides so that a viewer looking through said open upper end will see the illusion that said upper surface of said floor wall extends infinitely, said mirrored surfaces facing inwardly toward said bottom wall when in said folded position.

4,009,534

## KINETIC SCULPTURE

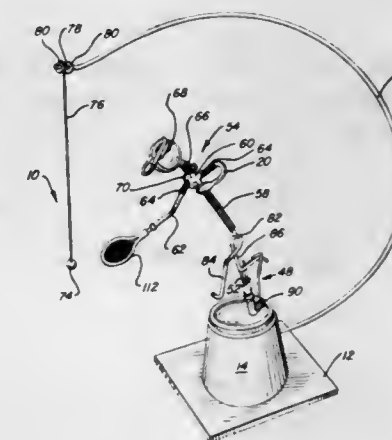
Gordon E. Bradt, Kinetic Center, Busch, Ark. 72620

Filed Dec. 17, 1975, Ser. No. 641,616

Int. Cl.<sup>2</sup> G09F 19/08

U.S. Cl. 40—106.3

16 Claims



1. A kinetic sculpture, comprising: a base adapted for positioning on a support surface, such as a table or the like; a rotatable drive means mounted on said base; an outwarily extending object mounted on said base and operatively connected with said drive means for rotation thereby in a given direction; releasable connection means between said object and said drive means for releasing the driving force therebetween at a predetermined point of rotation of said object; biasing means between said base and said object for returning the object to an initial point of rotation whereby continuous operation of said drive means effects oscillating movement of said object; and said rotatable drive means including a rotatable tubular drive member having a substantially open irregularly shaped periphery defining a portion of the releasable connection means.

4,009,535

## ILLUMINATED HOUSE NUMBER SIGN

William Stock, 172 High Park Ave., Ontario, Canada

Filed Oct. 1, 1975, Ser. No. 618,316

Int. Cl.<sup>2</sup> G09F 13/00

U.S. Cl. 40—130 K

2 Claims

1. A self contained illuminated house number sign which stores solar energy in daylight and utilizes the stored energy for night illumination comprising photovoltaic cell means, battery means, photoconductive cell means for coupling said photovoltaic cell means to said battery means only during







bers supported directly on said footings, the beam members extending parallel to each other and at right angles to the footings, the beam members extending in cantilevered fashion beyond the edges of the footings and defining the longitudinal edges of the housing unit to be supported, longitudinal beams extending in cantilevered fashion at right angles to the first beams to determine the lateral edges of the housing unit, load-supporting uprights provided on the cantilevered beams for supporting the load of said housing unit; the cantilevered beams and uprights being provided with integral communicating ducts which may be used for circulating heating or air-conditioning air throughout the housing unit.

4,009,543

## GEODESIC DOME

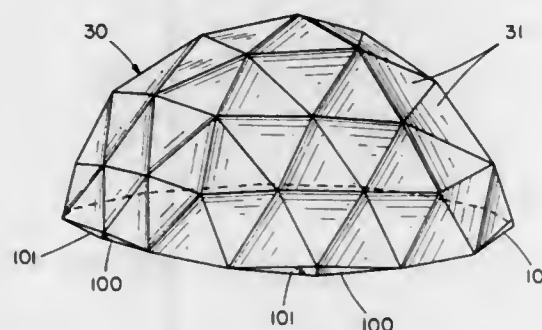
Thomas J. Smrt, 31W 300 W. Bartlett Road, Bartlett, Ill. 60103

Filed May 15, 1975, Ser. No. 577,762

Int. Cl.<sup>2</sup> E04B 1/32

U.S. Cl. 52—81

3 Claims



1. A geodesic dome formed from a plurality of structural triangles, each triangle having three apices, three struts joined together at the apices, and a panel member secured to the struts and covering the area within the struts, each strut having a hollow rectangular cross section and a flange portion positioned on the outside of the triangle, the flange portion of each strut of each triangle being secured to a flange portion of an adjacent strut, a generally V-shaped reinforcing member positioned within each strut, each triangle including three V-shaped connectors and a corner extension at each end of each strut, each corner extension being generally channel-shaped in cross section and having a pair of end portions, one of the end portions being received within one of the hollow struts and having a pair of inclined inner surfaces mating with the V-shaped reinforcing member, each connector having a pair of legs which are received by two adjacent struts of the triangle at one of the apices of the triangle, each leg including a downwardly extending tab, each connector including a transverse wall abutting the tab of the associated connector and restraining outward movement of the connector from the strut.

4,009,544

## DRILLING RIG WITH IMPROVED MAST SUPPORT STRUCTURE

Theodore B. Houck, Tulsa, Okla., assignor to Parker Drilling Company, Inc., Tulsa, Okla.

Filed July 7, 1975, Ser. No. 593,635

Int. Cl.<sup>2</sup> E04H 12/34

U.S. Cl. 52—120

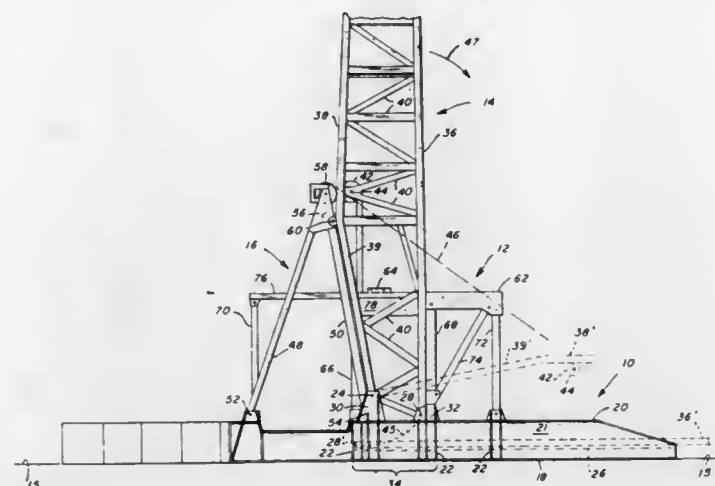
4 Claims

1. In a rotary drilling system having a tilting mast, the improvement comprising:

- a pair of paralleled longitudinal members forming a base supported on the ground, each member being fabricated as a box section in the shape in vertical cross-section of an open top U;
- four pairs of paralleled spaced vertical support plates centered over and affixed to said U members and rising above the tops of said U members;
- a mast having two front and two rear corner columns,

arranged in a rectangular horizontal cross-section, the lower end of each of said columns being pinned to a said pair of support plates and centered over said U-shaped members; and

- means to tilt said mast forward about a horizontal axis through the pins in said rear columns;



whereby as said mast tilts forward the lower portion of the front columns will be received within said U-shaped stiffening members so that when the mast is horizontal the front columns are at a height above the ground less than the height of the top of said longitudinal members.

4,009,545

## APPARATUS FOR PIPE-TO-MANHOLE SEALING

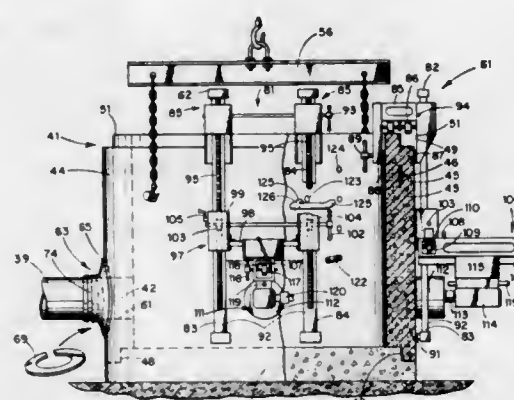
John C. Rossborough, Amherst, N.H., assignor to Merchants National Bank of Manchester, Manchester, N.H.

Continuation of Ser. No. 374,029, June 26, 1973, abandoned, Division of Ser. No. 257,703, May 30, 1972, abandoned. This application Sept. 25, 1975, Ser. No. 616,862

Int. Cl.<sup>2</sup> E21C 11/00

U.S. Cl. 52—173 R

7 Claims



1. In combination with a pre-cast, wire mesh, reinforced concrete manhole, having an upstanding cylindrical side wall, apparatus for core drilling a hole in said side wall of said manhole, comprising:

- frame means detachably supported vertically on a face of said upstanding cylindrical wall of said manhole, by clamp means tightened on the upper rim thereof;
- said frame means comprising a pair of spaced-apart parallel posts, each having a clamp bracket proximate the upper end thereof, each clamp bracket having rollers there-within for riding on the rim of a manhole;
- carriage means movable vertically on said frame means;
- said carriage means comprising a carriage extending between said posts and having an integral sleeve at each opposite side thereof slidable on one of said posts;
- cutter track means movable horizontally on said carriage means,
- and a cutter movable on said cutter track means in a path normal to the side wall of said manhole for cutting a port hole therethrough.

4,009,546

## PRE-ASSEMBLED UNITARY BAY WINDOW CONSTRUCTION

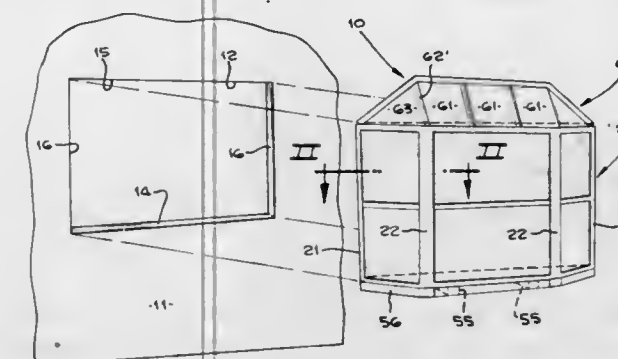
Elwood W. Buck, Jr., Pasadena, Calif., assignor to D G Shelter Products Company, City of Industry, Calif.

Filed Oct. 1, 1975, Ser. No. 618,518

Int. Cl.<sup>2</sup> E06B 1/38

U.S. Cl. 52—201

2 Claims



1. A window-counter construction comprising: a pre-assembled unitary window means having a plurality of window frames positioned in angular relation; each of said window frames including a sill member, a head member, and vertical side members; adjacent side members of adjacent window frames being interconnected by a vertical jamb member; exterior side members of said window frames including a vertically extending flange; and peripheral frame means including top and bottom plate members secured to said frames and said intermediate jamb members, and side frame members secured to said flanges on said exterior side window frame members; the interior edges of said top and bottom plate members and peripheral side frame members lying in a planar zone adapted to correspond to the planar zone of a framed opening in a building wall; roof means covering said top plate member and having edges lying in said planar zone for abutting contact against an exterior surface of a wall; and counter surface means interiorly of said peripheral frame means and extending over said bottom plate member to said window frames for providing a counter surface extension into said window means.

4,009,547

## PRECAST MONUMENT BASE

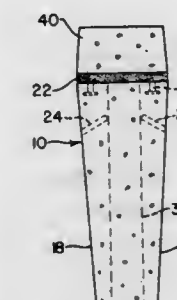
Clarence Francis Hood, Fairview, Pa., assignor to Top Roc Precast Corporation, Erie, Pa.

Filed Dec. 10, 1975, Ser. No. 639,300

Int. Cl.<sup>2</sup> E04C 2/04; E02D 27/00

U.S. Cl. 52—294

5 Claims



1. A precast monument base comprising, a precast concrete base member having considerable depth to extend well below the frost line when inserted into the ground; said base having a substantially large flat top surface, a relatively thick closed-cell resilient foam layer secured to and substantially covering at least the periphery of the top surface of the base member,

a substantially rectangular-shaped base cap resiliently positioned on top of the foam layer in operative alignment with the base member, and adjusting means positioned between the base cap and the base member to adjust the level alignment of and adjustably connect the base cap with respect to the base member while the foam layer effects a resilient mounting relationship therebetween.

4,009,548

## ROOF CONSTRUCTION

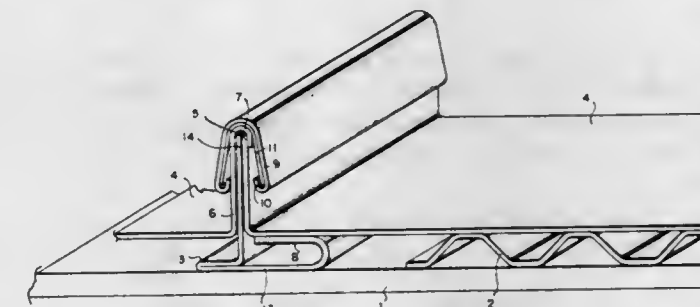
Clarence R. Hicks, Greenville, Tenn., assignor to Ball Corporation, Muncie, Ind.

Filed Sept. 30, 1975, Ser. No. 618,120

Int. Cl.<sup>2</sup> E04C 1/34; F16B 1/00

U.S. Cl. 52—469

2 Claims



1. A metal covering for a roof deck which comprises: a. a spaced parallel array of corrugated pan supports, fastened to the deck; b. standoff support strips placed substantially centered therebetween and fastened to the deck, said standoff strips consisting of a base, a vertical member and a horizontal member spaced above the base; c. roof pans which lay on the corrugated pan supports and the horizontal member of the standoff supports in abutting relationship to the vertical member of the standoff support strip, abutting portions of the said roof pans consisting of an upturned edge on one side and an upturned edge with a downturned flange on the opposite side; the downturned flange being placed over the vertical member of the standoff support and the abutting upturned edge of the adjoining roof pan; d. the seam consisting of three pieces, the upturned edge of a roof pan, the vertical member of the standoff support, and the upturned edge of the adjacent roof pan, being dimple punched on alternating sides along the length of the seam; and e. a two-piece cap forced over the dimple punched seam, said cap comprising an inverted V-shaped portion with inwardly inverted sides and an insert place therewithin, substantially adjoining all of the inner surface of the cap.

4,009,549

## STONE STRUCTURAL SECUREMENT SYSTEM AND METHOD

Alfred A. Hala, Islip, N.Y., assignor to Hohmann & Barnard, Inc., Hauppauge, N.Y.

Filed Nov. 25, 1975, Ser. No. 635,099

Int. Cl.<sup>2</sup> E04B 1/38

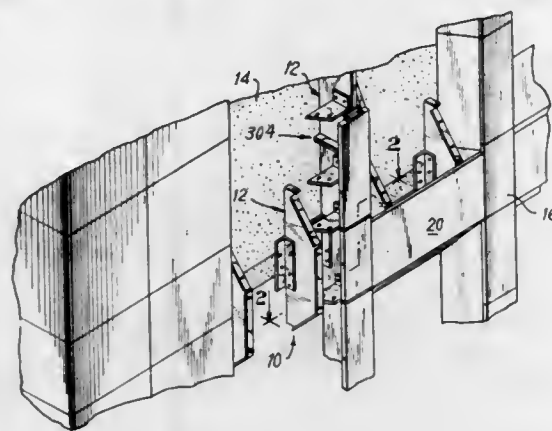
U.S. Cl. 52—506

54 Claims

1. A strut member for use in the interconnection of a structural frame and masonry panels of an edifice and comprising a substantially planar body portion of predetermined geometrical configuration, a plurality of flange members formed integrally with said body portion and disposed at predetermined edges of said body portion and at predetermined angular orientation with respect thereto, at least one of said flange members having apertures formed therein for enabling adjustable positional securement of



said flange member to one of said masonry panels and said structural frame, and  
said body portion having apertures formed therein for enabling adjustable positional securement of said body



portion to the other one of said masonry panels and said structural frame, thereby providing for secured interconnection of said strut member between said masonry panels and said structural frame.

4,009,550

## MODULAR PILING SYSTEM

Frank Edward Young, Abingdon, England, assignor to West's Piling and Construction Company Limited, Great Britain

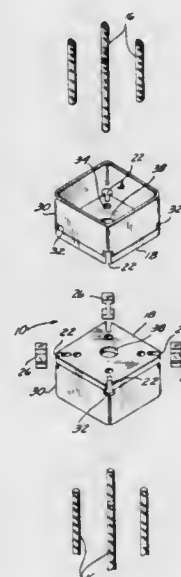
Filed July 17, 1975, Ser. No. 596,911

Claims priority, application Canada, Dec. 2, 1974, 215085

Int. Cl.<sup>2</sup> E04C 3/30; E02D 35/00

U.S. Cl. 52—726

17 Claims



1. A pile connecting device, comprising two plates each plate being adapted to be secured to the end of a pile section, each plate having several corners and having a number of recesses extending inwardly from its periphery, there being a recess formed at a selected number of the corners of each plate, each plate having two parallel planar surfaces, one of which is adapted to bear against one of the planar surfaces of the other plate when the plates are brought into abutment, a recess in one plate registering with a corresponding recess in the other plate, and a longitudinal pin substantially uniformly l-shaped in cross-section throughout its length adapted to be inserted and retained in a pair of registering recesses, each pin having opposed ends and including in cross-section a central stem and a head at each end of the stem, the heads and stem of each pin being substantially flush at each end thereof, substantially the entire underfaces of the heads of the pin

bearing against the outer planar surfaces of the abutting plates, the pins being uniformly distributed around the periphery of the plates in selected pairs of registering recesses, at least one bar anchored to each plate adjacent to and spaced from each recess, each recess being so constructed and arranged that the associated pin is in relative close alignment with such bar to reduce the deformation of the plate between the bar and the adjacent recess wall and consequent joint failure, and means cooperating in securing the pin in each recess to maintain it therein during the pile driving operation.

4,009,551

## METHOD AND APPARATUS FOR REGISTRATION OF WEB MATERIAL IN FORMING FILLING AND SEALING INDUSTRIAL BAGS

Eddie Lee Greenawalt, and Lorezo Dow Geren, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

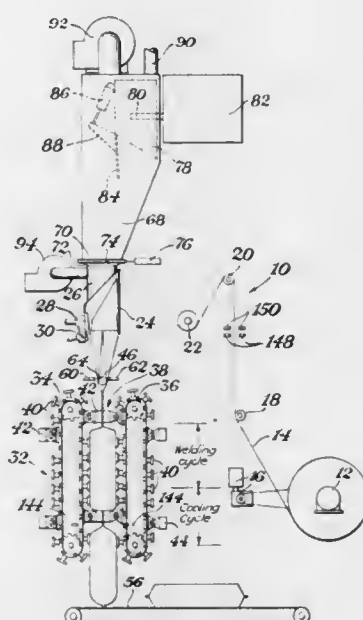
Division of Ser. No. 460,864, April 15, 1974, Pat. No.

3,925,963, which is a continuation-in-part of Ser. No. 347,923, April 4, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,582

Int. Cl.<sup>2</sup> B65B 9/12, 41/18

U.S. Cl. 53—28

3 Claims



1. In the method generally wherein web material is continuously drawn off a supply roll and converted into a continuously moving tube, simultaneously with the periodic entry of the product into the tube, and the collapsing and transverse sealing of the tube at regular intervals to form therefrom filled bags, the steps to register regularly occurring printed matter on the material with respect to the position of the transverse seals comprising: reading a position that is fixed with respect to the position of the transverse seals, generating a signal responsive to reading the fixed position to activate spaced apart sensing means located in the region between the tube former and the supply roll, decreasing the unwinding tension on the web should the sensor closest to the tube former read a registration mark on the web, increasing the unwinding tension on the web should the sensor farthest from the tube former read the registration mark, and maintaining the unwinding tension on the web static during periods in which such mark floats between such sensors and therefore is not read by either.

4,009,552

## DEVICE FOR PACKAGING OF GOODS

Kurt Schlachter, Wallau, Lahn, Germany, assignor to Kramer & Grebe GmbH & Co. KG Maschinen-und Modellfabrik, Wallau, Lahn, Germany

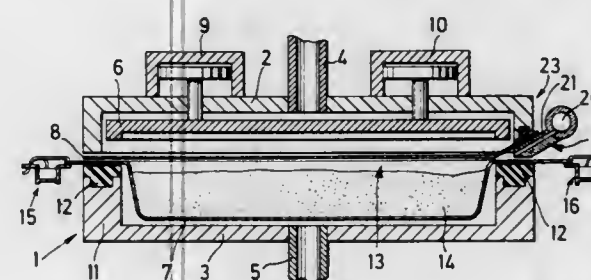
Filed June 23, 1975, Ser. No. 589,701

Claims priority, application Germany, June 25, 1974, 2430497

Int. Cl.<sup>2</sup> B65B 31/02

U.S. Cl. 53—86

9 Claims



1. In a packaging apparatus having first means for providing a first package member defining a material-receiving cavity, second means for providing a second package member, said first and second package members being in overlying relation to each other and third means for effecting a sealing of said first package member to said second package member, the improvement comprising:

evacuation chamber means comprising first and second chamber halves supported for movement away from each other to an opened position and toward and into sealing engagement with each other and a closed position;

nozzle means mounted on at least one side of said evacuation chamber means and to one of said first and second chamber halves;

means defining a spacing between said first and second chamber halves when in said opened position for receiving one of said first and second package members therebetween and into said evacuation chamber means;

passageway means between said nozzle means and said one of said first and second chamber halves for receiving the other of said first and second package members therein and into said evacuation chamber means; and

sealing means in said passageway means for effecting a sealing engagement of said other of said first and second package members to said one of said first and second chamber means and said nozzle means in response to a sealing engagement between said first and second chamber halves with each other in said closed position.

4,009,553

## MACHINE FOR FILLING POCKETS

Jacques Yves Monjo, "Gueyrosse", 33350 Ste-Terre, France

Filed Feb. 7, 1975, Ser. No. 547,976

Claims priority, application France, Feb. 7, 1974, 74.04751

Int. Cl.<sup>2</sup> B65B 5/08, 5/10, 35/30

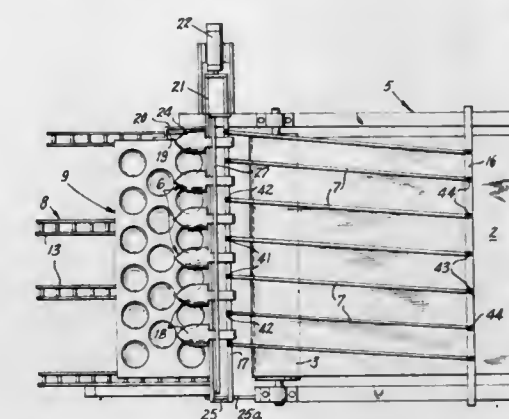
U.S. Cl. 53—160

8 Claims

1. In an automatic machine for filling pocketed trays with articles, said machine comprising an upper conveyor mounted on a framework to travel between an input point and an output point, a row of dispensers extending transversely of said conveyor at said output point, separating guides mounted on said framework longitudinally of and above said conveyor for directing said articles into columns extending longitudinally of said upper conveyor, with each column leading to a different dispenser, a lower conveyor positioned to advance trays toward a filling position just beyond and beneath said output end of said upper conveyor in a direction substantially parallel to the path of travel of said upper conveyor, means for advancing said conveyors in synchronism, said dispensers being adapted to open and close, and to permit an article held thereby to fall onto a tray in said filling position when open,

and means for opening and closing said dispensers, the improvement which comprises:

means for causing relative movement between said row of dispensers and lower conveyor in a direction transverse to said lower conveyor in synchronism with the movement



of said lower conveyor, and means in alignment with said row of dispensers for blocking only an endmost dispenser each time a selected relationship between said row of dispensers and lower conveyor resulting from said relative movement is attained while allowing other dispensers of said row to operate.

4,009,554

## WINDROWER HAVING SHIFTABLE TONGUE PIVOT

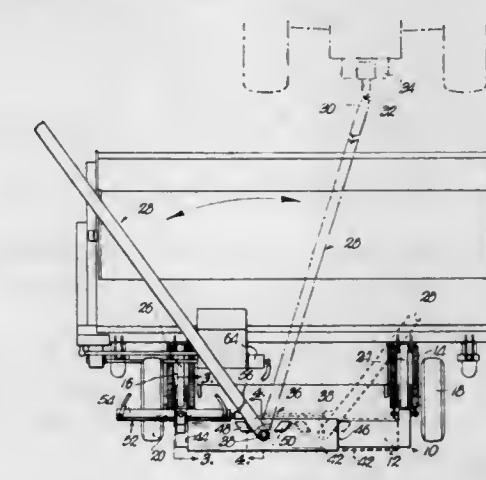
Raymond A. Adee, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Nov. 24, 1975, Ser. No. 634,829

Int. Cl.<sup>2</sup> A01D 73/00

U.S. Cl. 56—1

10 Claims



1. In a towable piece of mechanized equipment:

a mobile frame;

an elongated tongue provided with a hitch adapted to be coupled with a towing vehicle for swinging movement about a first upright axis;

connector means remote from the hitch joining the tongue with the frame for swinging movement relative to the frame about a second upright axis and for reciprocable movement relative to the frame laterally of the normal path of travel of said equipment;

power means for effecting said movements, said tongue having an arch between the connector means and said hitch; and

a harvesting implement carried by the frame beneath said arch for up-and-down movement toward and away from the arch.



4,009,555

**HEIGHT CONTROL FOR COMBINE HEADERS**

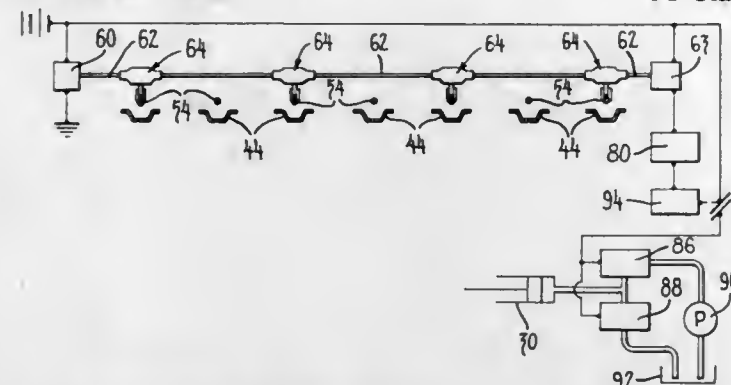
William F. Temple, Northville, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Feb. 26, 1976, Ser. No. 661,671

Int. Cl.<sup>2</sup> A01D 47/00

U.S. Cl. 56—10.2

11 Claims



1. A harvesting machine having a harvesting header operated by power means, control means for regulating said power means for moving said header between predetermined operating position relative to the ground and an elevated position, sensing means for sensing the elevation of said header relative to the ground, a source of light, light sensitive means responsive to the presence and absence of light from said source and being operatively connected to said control means to move said header relative to the ground between its said operating positions, and actuating means operatively connected with said sensing means to interrupt and reestablish communication of light from said source of light to said light sensitive means upon changes of elevation of said header.

4,009,556

**CROP HARVESTER DRIVE AND CONTROL SYSTEM**

Herbert W. Molzahn, Hamilton, Canada, assignor to International Harvester Company, Chicago, Ill.

Filed May 8, 1975, Ser. No. 575,753

Int. Cl.<sup>2</sup> B62D 11/04

U.S. Cl. 56—10.7

1 Claim

1. In a crop harvester including a self-propelled chassis, an engine, two drive wheels, a crop harvesting header coupled to the chassis including crop handling elements, a power drive system for the harvester comprising:

- first and second hydraulic motors for driving said drive wheels;
- a third hydraulic motor for driving said crop handling elements;
- first and second hydraulic pumps of variable displacement hydraulically connected to said first and second motors for supplying pressure fluid thereto;
- a third hydraulic pump of variable displacement hydraulically connected to said third motor for supplying pressure fluid thereto, said first, second, and third pumps having rotary input drives;
- means mounting said first, second, and third pumps on said chassis with the input drives thereof successively interconnected in coaxial alignment so that the pumps may be simultaneously driven through a common input;
- means drivingly connecting said engine to said common input;
- and control means for varying the displacement of said first and second pumps to vary the speed of said first and second motors, whereby the speed of the crop harvester chassis may be controlled;
- said control means including a control rod disposed parallel to the aligned input drives;
- means pivotally interconnecting said control rod to said first and second pumps for simultaneously varying the outputs thereof in response to longitudinal shifting of said rod;
- a rock-shaft journaled on said chassis and disposed transversely relative to said control rod;
- means interconnecting said rock-shaft to said control rod

for shifting said control rod in response to rotation of said rock-shaft;

and a control lever secured to said rock-shaft for shifting said control rod to vary the displacements of said first and second pumps.

4,009,557

**SOYBEAN HARVESTER**

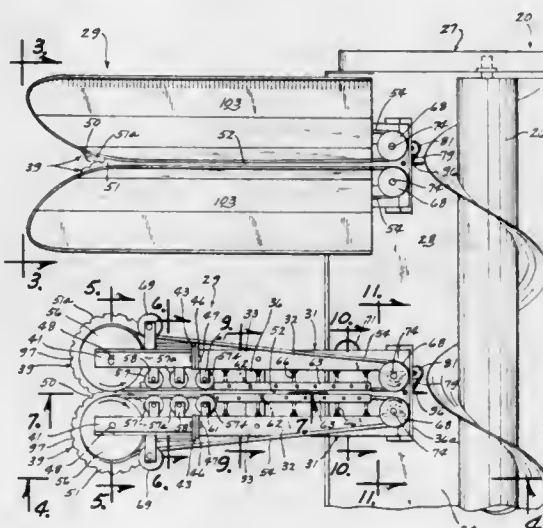
Allen V. Reicks, East Moline, Ill., assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 16, 1975, Ser. No. 578,274

Int. Cl.<sup>2</sup> A01D 45/02

U.S. Cl. 56—98

2 Claims



1. A soybean harvester including:

- a. a portable frame movable over a field of row planted crops including a platform assembly having a rearwardly located crop inlet means and means for delivering severed crop plants to said inlet means,
- b. a plurality of transversely spaced longitudinally extended row units projected forwardly from said platform assembly, each row unit having a fore-and-aft guideway over the full length thereof,
- c. means movably supporting each of said row units on said platform assembly for free lateral movement of the forward end thereof,
- d. a pair of endless flexible gathering means for each row unit having transversely opposite rearwardly moving runs thereof arranged at opposite sides of a guideway for engaging crop plants therebetween,
- e. a pair of rotatable cutting discs corresponding to each row unit rotatably supported adjacent the forward end of a row unit at opposite sides of a guideway for rotation about upright axes,
- f. each cutting disc having an upwardly and outwardly extended peripheral section and each pair of said cutting discs having the adjacent peripheral portions thereof in an overlapped relation within the transverse confines of a corresponding guideway, and
- h. means on each of said discs for centering a row unit relative to each crop plant in a row,
- i. with a standing crop plant in a row severed by a pair of cutting discs being engaged and carried by a pair of said gathering means to said delivery means,
- j. a plurality of horizontal base members corresponding to said row units,
- k. means supporting said base members on said platform assembly for projection forwardly therefrom,
- l. each of said means for movably supporting a row unit including a bearing assembly,
- m. means supporting each bearing assembly adjacent the front end of a base member, and
- n. a shaft projected downwardly from each row unit, intermediate the ends thereof, for rotatable support within a corresponding bearing assembly to provide for a lateral

pivotal movement of a row unit about the axis of said shaft.

4,009,558

**CROP-FEED ARRANGEMENT FOR HAY BALER**

Rudolf Schulze, Neustadt; Horst Schumacher, Langburkersdorf, and Ferdinand Simora, Bonnewitz, all of Germany, assignors to VEB Kombinat Fortschritt, Neustadt in Sachsen, Germany

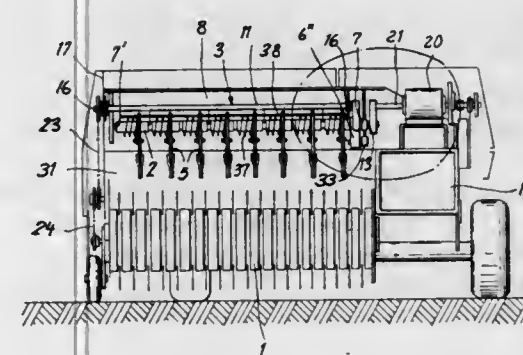
Division of Ser. No. 339,185, Aug. 3, 1973, Pat. No. 3,939,630.

This application July 17, 1974, Ser. No. 489,171

Int. Cl.<sup>2</sup> A01D 39/00

U.S. Cl. 56—341

5 Claims



1. A baling apparatus comprising:

- a housing displaceable along the ground in a travel direction;
- a pickup drum at the front of said housing and rotatable about an axis transverse to said direction;
- a channel member extending transverse to said direction in back of said drum;
- a baling chamber on said housing at one end of said channel member;
- drive means on said housing operatively connected to said drum for rotating said drum and thereby lifting crop off the ground and displacing the crop back toward said channel member;
- an oscillatable member on said housing extending transversely to said direction above and between said drum and said channel member;
- a plurality of pusher elements on said member displaceable from said drum to said channel member;
- eccentric means operable by said drive means and coupling means connecting said eccentric means to said oscillatable member for oscillating said elements at a relatively slow rate to displace said crop from said drum into said channel member and at a relatively rapid rate away from said channel member, said coupling means including a pair of arms pivoted on said housing at one end and each connected at their other end to said oscillatable member, and a crank connected to said oscillatable member, said eccentric means including a crankshaft lying intermediate the ends of said arms and rotatable in such direction that said crank lies between said crankshaft and said oscillatable member during oscillation of said elements toward said channel member and said crankshaft lies between said crank and said oscillatable member during oscillation of said elements back from said channel member;
- means on said housing in said channel member for displacing crop therealong into said chamber;
- means in said chamber for forming bales of said crop; and
- means including at least one spring interposed between said elements and said crankshaft whereby said elements can be restrained from motion without stopping said crankshaft, said drum being provided with a plurality of tines, said elements being engageable between said tines.

4,009,559

**SYNCHRONIZING ROLL FORMING AND WRAPPING OPERATIONS IN A CROP MATERIAL ROLL FORMING MACHINE**

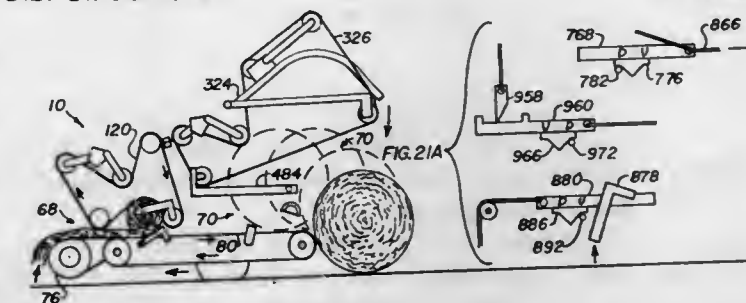
Aquila D. Mast, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Feb. 9, 1976, Ser. No. 656,661

Int. Cl.<sup>2</sup> A01D 39/00

U.S. Cl. 56—343

15 Claims



1. In a method of forming crop material rolls by a mobile machine adapted to move across a field and having front and rear roll forming chambers, the combination of steps comprising:

- moving the machine across the field;
- delivering crop material to said machine;
- forming a roll of crop material in said rear chamber;
- initiating the wrapping of said roll with twine or the like in said rear chamber in response to said roll reaching a predetermined size;
- initiating the formation of another roll of crop material in said front chamber prior to termination of said wrapping of said roll in said rear chamber;
- completing said wrapping of said roll;
- discharging said wrapped roll from said rear chamber in response to termination of said wrapping of said roll; and
- transferring said another roll from said front chamber to said rear chamber after discharging said wrapped roll therefrom.

4,009,560

**WHEELED RAKING DEVICE**

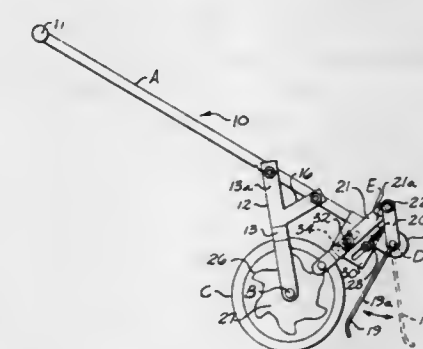
Edward H. Wells, 111 Mooring Buoy Road, Hilton Head Island, S.C. 29928

Filed Feb. 4, 1976, Ser. No. 655,127

Int. Cl.<sup>2</sup> A01D 7/00

U.S. Cl. 56—400.01

14 Claims



1. A wheeled raking device comprising:

- a. an elongated handle member for moving and steering said device;
- b. a first shaft member carried by said handle member;
- c. at least one wheel member carried on said first shaft member supporting said handle member above the ground;
- d. a transverse shaft rotatably carried across a lower end of said handle member;
- e. a raking head having a plurality of raking tines carried by said transverse shaft;
- f. connection means connected between said wheel member and said transverse shaft; and



g. said connection means imparting a rocking motion to said transverse shaft to oscillate said raking head in a raking motion as said wheel member rolls along the ground surface; whereby said raking tines move in a raking motion to gather leaves and the like as said device is rolled along the ground.

4,009,561

## METHOD OF FORMING CABLES

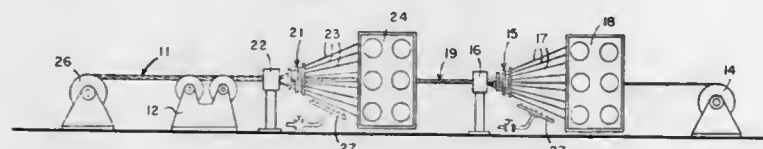
Geoffrey Stanley Young, San Jeronimo, Mexico, assignor to Camesa, S.A., Lerdo, Mexico

Filed Sept. 2, 1975, Ser. No. 609,845

Claims priority, application Mexico, June 2, 1975, 158666 Int. Cl.<sup>2</sup> D07B 3/04

U.S. Cl. 57-6

7 Claims



1. A method of forming a cable including the steps of drawing a cable core through a first working station, drawing a plurality of armor wires from a rotatable bank of wires also to pass through said station, heating said armor wires prior to their arrival at said working station, winding said armor wires around said core at said working station to form a composite cable and causing the cooling wires to shrink fit on to the core.

7. Apparatus for forming a cable including  
a reel for supplying a cable core,  
a first working station comprising a first preforming head and a first closing die,  
a first rotatable bank for supplying a plurality of first armor wires to said first working station for winding around said core,  
means for heating said first armor wires between said first bank and said first working station,  
a second working station comprising a second preforming head and a second closing die,  
a second rotatable bank for supplying a plurality of second armor wires to said second working station for winding around the wound first armor wires,  
means for heating said second armor wires between said second rotatable bank and said second working station,  
means for drawing the core and armor wires through said first and second working stations, and  
take up means for accommodating the wound cable.

4,009,562

## METHOD AND APPARATUS FOR ELIMINATING IMPURITIES FROM AN OPEN-END SPINNING MACHINE

Herbert Stalder, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Feb. 9, 1976, Ser. No. 656,202

Claims priority, application Switzerland, Feb. 14, 1975, 1859/75

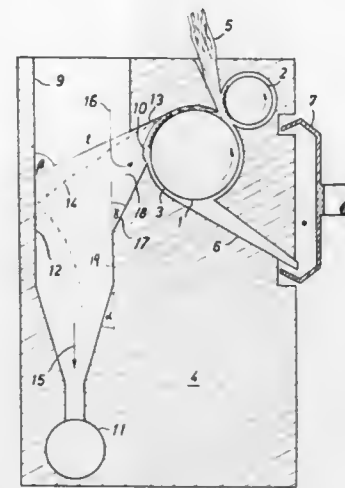
Int. Cl.<sup>2</sup> D01H 11/00, 1/12

U.S. Cl. 57-56

11 Claims

5. In an open-end spinning machine, the combination of a fiber opening means for opening fibers;  
a duct extending in close vicinity to said opening means, said duct having a first wall opposite said opening means; and  
a separating opening located between said opening means

and said duct to permit passage of impurities from said opening means into said duct, said opening having a



second wall the projected plane of which forms an acute angle with said wall of said duct.

4,009,563

## APPARATUS FOR FALSE-TWISTING SYNTHETIC FILAMENT YARNS

Hans Lenz, Dormagen; Edgar Muschelknautz, Leverkusen; Heiko Herold, Dormagen; Kurt Bernklau, Dormagen, and Lutz Georgias, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

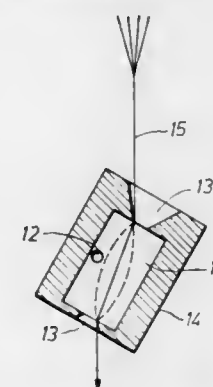
Filed Oct. 30, 1974, Ser. No. 519,302

Claims priority, application Germany, Nov. 10, 1973, 2356220

Int. Cl.<sup>2</sup> D02G 1/16

U.S. Cl. 57-77.3

11 Claims



1. An apparatus for false twisting yarns moving in a take-off direction, comprising a cylindrical twisting chamber, having one or more tangential inlet bores for injection of air, and two axial bores for, respectively entry of yarn into the twisting chamber and leaving of the yarn from the twisting chamber, wherein the axis of the twisting chamber is arranged at an angle of 2° to 40° to the take-off direction of the filament.

4,009,564

## ELECTRONIC WATCH CONSTRUCTION

Rudolf F. Zurcher, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 2, 1975, Ser. No. 609,258

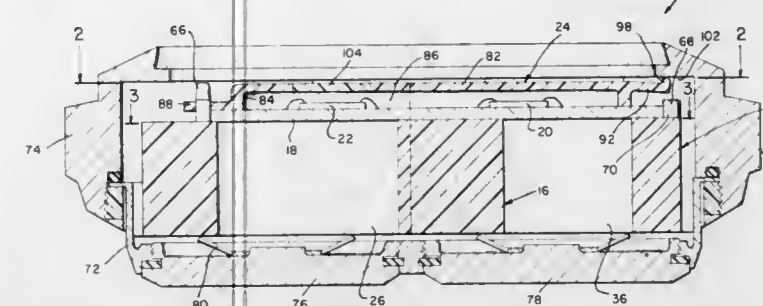
Int. Cl.<sup>2</sup> G04B 37/04; G04C 3/00

U.S. Cl. 58-23 R

2 Claims

1. A spacer block for an electronic watch module, said spacer block being formed of resilient synthetic polymer composition material and having a top surface and a bottom surface and having a battery opening extending into said block from one of said surfaces for receipt of a battery for powering the electronic watch module, said spacer block having a crystal can opening therein from one of said surfaces for positioning in said opening an electronic crystal in a crystal can, said block having resilient ears mounted on one of said surfaces said resilient ears being monolithically formed with the re-

mainder of said spacer block and permanently attached thereto and extending adjacent said crystal can opening so that said resilient ears can be resiliently bent away from said



opening for introduction of a crystal can into said crystal can opening and said resilient ears being resiliently positionable over the crystal can in said crystal can opening to retain said crystal can in said crystal can opening.

4,009,565

## TIME MEASURING DEVICE HAVING A PERIODIC SIGNAL GENERATOR

Henri Edouard Francois Marie Courier de Mere, Paris, France, assignor to BISOCA Societe de Recherches, Clichy, France

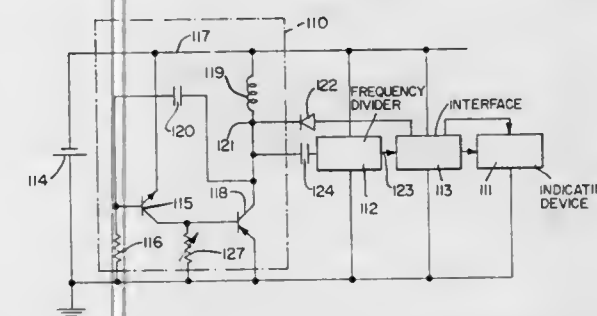
Filed Oct. 10, 1974, Ser. No. 513,927

Claims priority, application France, May 7, 1974, 74.15738; June 19, 1974, 74.21207; July 11, 1974, 74.24214

Int. Cl.<sup>2</sup> G04B 19/34

U.S. Cl. 58-50 R

18 Claims



1. A time measuring device comprising a continuous current source; an indicating device; oscillator means in circuit connection to be energized by said continuous current source and comprising at least one transistor, an inductance having a high overvoltage coefficient, and capacitive means including the inherent capacitance of said inductance connected in a resonant circuit to provide an oscillator assembly having a frequency several orders of magnitude greater than the control frequency of said indicating device, said frequency being determined by the values of said inductance and capacitive means, first means connected to said oscillator assembly for coupling the output to said indicating device, and second means connected directly to a terminal of said inductance and adapted to supply voltage for said indicating device.

4,009,566

## DIGITAL WATCH WITH LIQUID CRYSTAL AND SEQUENTIALLY READ OUT LIGHT EMITTING DIODE DISPLAYS

Ernest C. Ho, Newport Beach, Calif. assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 27, 1975, Ser. No. 581,075

Int. Cl.<sup>2</sup> G04B 19/34

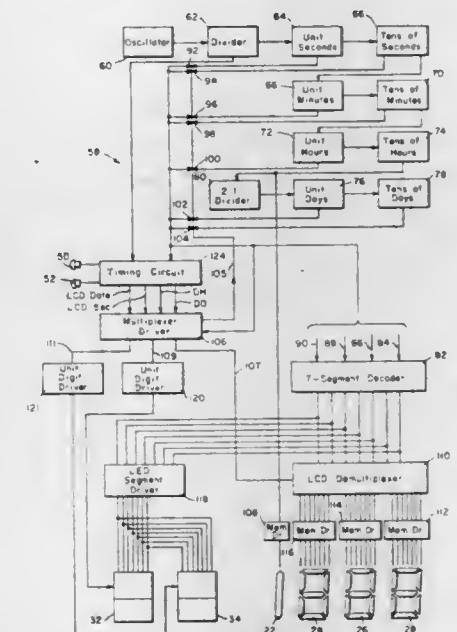
U.S. Cl. 58-50 R

5 Claims

1. A digital watch for displaying selectable horological information comprising:

first display means comprising a plurality of liquid crystal display devices;  
second display means comprising two light emitting diode display devices, which sequentially display a first set of horological information followed by a second set of horological information when activated;

an electronic circuit for providing information to be selectively displayed on said displays, said electronic circuit comprising an oscillator, a frequency divider coupled to the output of said oscillator for producing a timing signal, and counters for receiving said timing signal and maintaining a plurality of sets of horological information; first and second manually operable pushbutton controls connected between said counters and said displays;



means for causing said liquid crystal display to continuously display a first set of horological information when said first and second controls are unactuated and to display a second set of horological information on said liquid crystal display when said first control is actuated; and a timing circuit which causes said light emitting diode display to display said first set of horological information when said second control is activated.

4,009,567

## DELAYED RAMPING IN THE PRIMARY CONTROL SYSTEM OR LOCAL MAINTENANCE CONTROLLER OF A GAS TURBINE IMPLEMENTED ELECTRICAL POWER PLANT

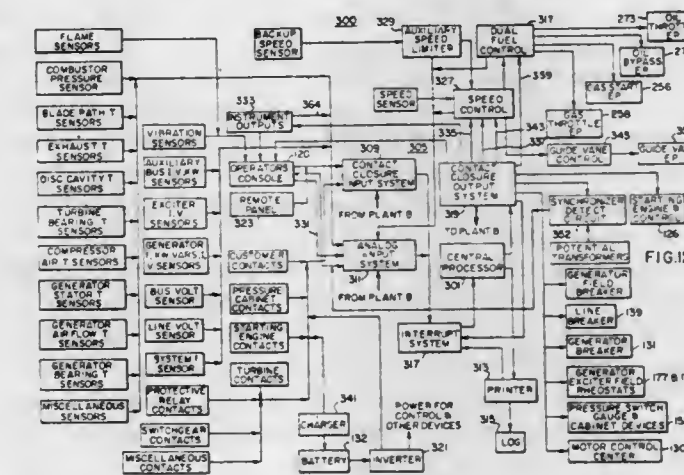
Leonard H. Burrows, Gibsonia, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1975, Ser. No. 551,201

Int. Cl.<sup>2</sup> F02C 9/08

U.S. Cl. 60-39.03

7 Claims



7. A method of positioning fuel valve means and controlling the flow of fuel to the combustor portion of a gas turbine comprising the steps of:

a. receiving information concerning predetermined turbine operating parameters, including a signal indicative of the occurrence of a predetermined event;



- b. generating a speed setpoint signal;
- c. comparing said speed setpoint signal to a signal related to actual turbine speed;
- d. developing an error signal as a result of comparing said speed setpoint signal and said turbine speed signal for use in positioning the fuel valve means;
- e. incrementing said speed setpoint signal at a predetermined rate after said predetermined event has occurred;
- f. delaying said incrementing step by a predetermined time period after said predetermined event has occurred; and
- g. holding the fuel valve means position substantially fixed during the time delay.

4,009,568

**TURBINE SUPPORT STRUCTURE**

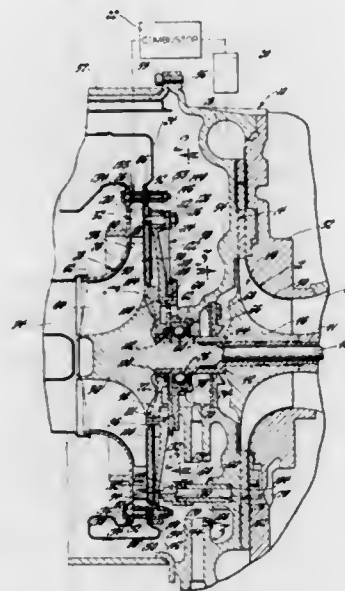
Brian P. King, Greenwood, and Charles H. Smale, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1975, Ser. No. 627,115

Int. Cl.<sup>2</sup> F02C 7/20

U.S. Cl. 60—39.32

3 Claims



1. In a gas turbine engine of the type having a combustor and compressor with means including an inboard scroll operated at a reduced temperature and a radial turbine including a rotor having a shaft connected to the compressor and shroud components for defining a flow path across the rotor operated at a temperature in excess of the compressor temperature, the improvement comprising: means for supporting the shroud components including a radially inwardly located bearing support secured to the compressor scroll, an annular conically dished turbine support plate located radially outwardly of the shaft of the turbine rotor and including a peripheral surface thereon located axially of the shroud components, means for securing the shroud components to the turbine support plate, means for securing said turbine support plate to said bearing support, said turbine support plate being subjected to heat conduction from the turbine flow path to said bearing support during turbine operation to produce an axial and radial thermogradient thereacross capable of producing a relative deflection between the turbine rotor and the shroud components, means forming a plurality of circumferentially spaced support surfaces on the compressor scroll at a point axially spaced from the turbine support plate, a ceramic rod extending axially outwardly of each of said support surfaces having a low coefficient of thermal expansion to maintain a control length from the compressor scroll during temperature excursion of the turbine, means on each of said ceramic rods including an axial end surface located in close spaced relationship to said turbine support plate to permit a first predetermined deflection of the turbine support plate, said end surface engag-

ing the turbine support plate upon a predetermined deflection occurring therein to limit the movement of the turbine support plate to maintain a desired clearance between the rotor and the shroud components with the ceramic rods serving to transfer the additional loading from the turbine support plate directly to the compressor scroll.

4,009,569

**DIFFUSER-BURNER CASING FOR A GAS TURBINE ENGINE**

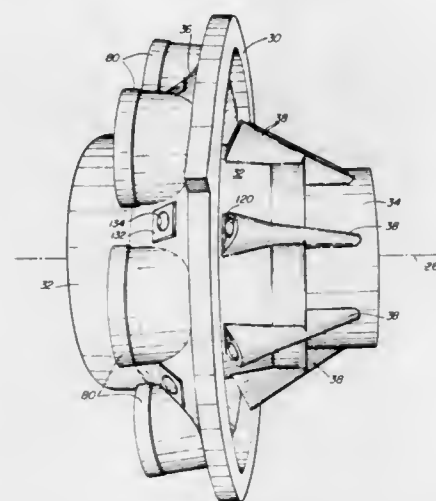
Joseph R. Kozlin, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed July 21, 1975, Ser. No. 597,875

Int. Cl.<sup>2</sup> F02C 7/20, 3/00

U.S. Cl. 60—39.32

11 Claims



1. A diffuser-burner casing for a gas turbine engine in which casing a generally axial flow of air rearwardly from the diffuser of the engine compressor is directed into combustion chamber assemblies distributed in circumaxially spaced relationship about the engine axis upstream in the flow from or forward of the turbine section of the engine comprising:

- an outer structural ring portion;
- an intermediate structural ring portion having an expansible connecting means and a rigid connecting means, said intermediate structural ring portion being spaced radially inward of the outer ring portion and shaped to envelop the compressor case and to expandably engage the compressor case hot portion via said expansible connecting means, and to structurally engage the compressor case cold portion via said rigid connecting means, and to join at least part of the outer wall of the compressor diffuser;
- a frustoconical wall portion interconnecting the outer and intermediate ring portions and defining a forward part of an annular plenum in which the combustion chamber assemblies are disposed;
- an inner structural ring portion spaced radially inward of the intermediate ring portion and forming at least part of the inner wall of the compressor diffuser whereby the annular space between the intermediate and inner ring portions comprises at least part of the diffuser duct;
- a plurality of struts distributed about the engine axis and extending between the intermediate and inner ring portions and through the diffuser duct; and
- a removable plenum cover connecting with the outer structural ring portion and circumscribing the engine to define at its inner surface a radially outer wall of the annular plenum in which the combustion chamber assemblies are disposed.

4,009,570

**TORQUE CONVERTER**

Masahiro Ohkuo, Kadoma, and Heiji Fukutake, Osaka, both of Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

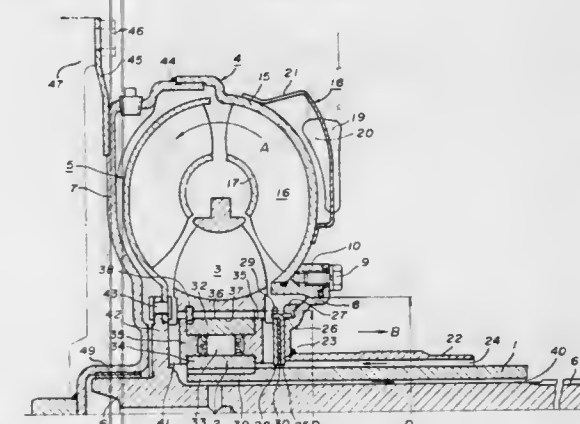
Filed Nov. 13, 1975, Ser. No. 631,663

Claims priority, application Japan, Nov. 28, 1974, 49-137392

Int. Cl.<sup>2</sup> F16D 33/00

U.S. Cl. 60—341

1 Claim



1. A torque converter comprising a driving vaned impeller including a shell to which the vanes are secured, a driven vaned turbine fixed to a driven shaft, a vaned stator disposed intermediate said vaned impeller and vaned turbine, said vaned stator being fitted to a fixed stator shaft by means of a one-way clutch, a reinforcing impeller flange fixed to the inner peripheral part of said impeller shell, said impeller flange having an inner diameter larger than the outer diameter of said one-way clutch, and an impeller hub located at the inner side of said impeller flange, said hub including a guide pipe and being removably secured to said impeller flange by a plurality of bolts, and said one-way clutch being easily installable and removable from the converter by axial movement through said impeller flange following removal of only said hub.

4,009,571

**TORQUE CONVERTER HAVING ADJUSTABLY MOVABLE STATOR VANE SECTIONS AND ACTUATOR MEANS THEREFOR**

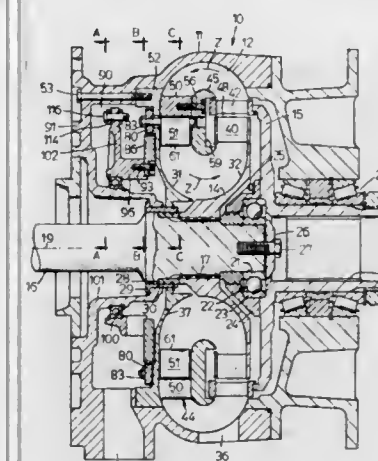
James B. Black, Roscoe, Ill., and Horst G. Steinhagen, Racine, Wis., assignors to Twin Disc, Incorporated, Racine, Wis.

Filed Jan. 30, 1976, Ser. No. 654,047

Int. Cl.<sup>2</sup> F16D 33/04

U.S. Cl. 60—354

17 Claims



1. In a torque converter:

- a housing;
- a plurality of movable stator blade sections within said housing arranged around an axis;
- a ring-like member mounted on said housing concentric

with said axis and connected to effect movement of said blade sections, said ring-like member being oscillatably movable about said axis between blade open and blade closed positions; and actuator means mounted on said housing and connected to said ring-like member to effect movement thereof, said actuator means comprising an actuator having a first piston rod connected to said ring-like member and a power assist assembly having a second piston rod connected to said ring-like member, said actuator being selectively actuatable to effect movement of said ring-like member and said power assist assembly acting in cooperation with said actuator to assist in movement of said member.

4,009,572

**HYDROSTAT SYSTEMS CONTAINING COAXIAL MULTIDIRECTIONAL FLOW CONTROL VALVES**

Roydon B. Cooper, Locust Valley, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

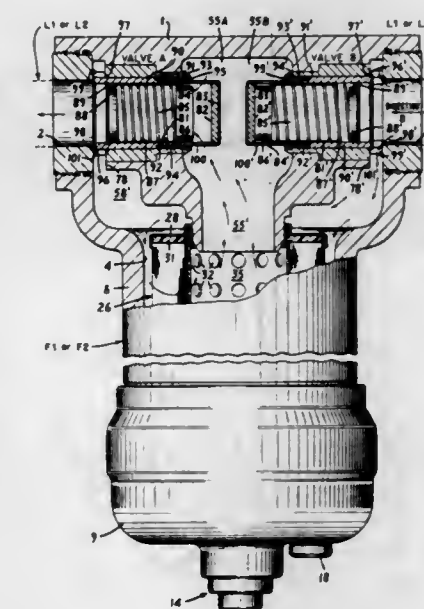
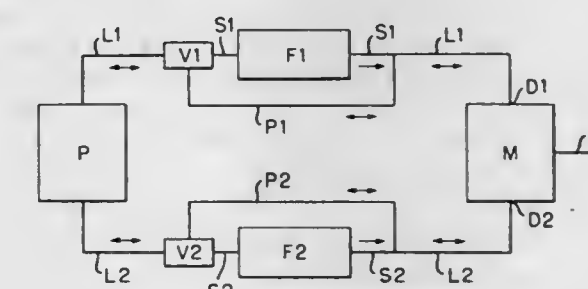
Division of Ser. No. 356,231, May 1, 1973, Pat. No. 3,908,693.

This application Oct. 31, 1974, Ser. No. 519,726

Int. Cl.<sup>2</sup> F15B 15/18; F16K 17/26

U.S. Cl. 60—454

29 Claims



16. A hydrostat system comprising a hydraulic pump; a hydraulic motor; a fluid line operatively connecting the pump with the motor, and arranged to carry fluid flow therebetween in either direction; a unidirectional function interposed in the fluid line between the pump and the motor, for acceptance of fluid in one direction of flow between the pump and the motor; and two coaxial multidirectional flow control valves in fluid flow connection with the fluid line and with the function, and in series flow connection with the function upstream and downstream of the function, and controlling flow through the series line and connected with the function in either direction of the flow in the fluid line, the valves directing fluid flow in the same and normal direction through the function via the line in series with the function, one of the valves sensing and



responding to a differential fluid pressure across the valve arising from one direction of the fluid flow, to direct fluid flow in the normal direction through the function, and the other valve sensing and responding to a differential fluid pressure across the valve arising from the other direction of fluid flow, to direct fluid flow in the normal direction through the function, each valve comprising, in combination, a tubular valve housing; first and second valve seats in the housing; first and second coaxial tubular valve elements nested concentrically and separately reciprocable within the valve housing towards and away from the first and second valve seats, respectively, between closed and open positions, to close and open first and second valve flow passages, respectively, of which one passage is in fluid flow connection with the fluid line; a fluid-pressure receiving surface operatively connected to each valve element, urging the first valve element in a first direction towards or away from its valve seat, and the second valve element in a second direction, towards or away from its valve seat; bias means urging each valve element in the opposite direction, the biasing force of the bias means being adjusted to resist movement of each valve element in said direction away from or towards its valve seat except under differential fluid pressure arising from flow and applied to the fluid-pressure receiving surface from the one or the other flow direction; and each of the valve elements moving in said direction towards or away from its valve seat and opening when flow begins from that direction and closing when flow stops from that direction, the first valve element being responsive to differential fluid-pressure arising from flow in the one direction from one side of the valve, and the second valve element being responsive to differential fluid-pressure arising from flow in the other direction from the other side of the valve, so that the valve is arranged to open or close in response to differential fluid-pressure arising and applied from either direction of flow, and to direct such flow through the passage in fluid flow connection with the function, thereby directing such flow from either direction to proceed through the function in the normal direction.

4,009,573

## ROTARY HOT GAS REGENERATIVE ENGINE

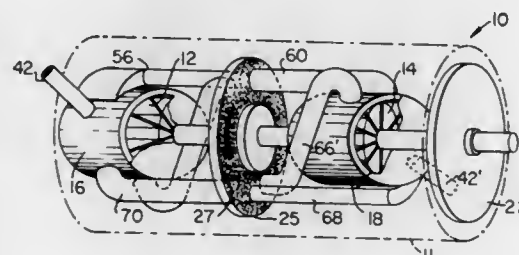
Ronald W. Satz, 4518 Cedar Lake Road, St. Louis Park, Minn. 55416, assignor to Transpower Corporation, St. Louis Park, Minn.

Filed Dec. 2, 1974, Ser. No. 528,703

Int. Cl.<sup>2</sup> F02G 1/04

U.S. Cl. 60—519

15 Claims



## 1. A hot gas engine comprising:

- an even number of elliptical stators;
- a plurality of cylindrical rotors equal in number to the number of said stators, one each of said rotors being disposed within and offset from the center of one each of said stators, one of said rotors and one of said stators constituting a rotor-stator pair, a longitudinal axis of said rotor of said rotor-stator pair being offset from a longitudinal axis of said stator of said rotor-stator pair;
- a plurality of sliding vanes attached to said rotor of each said rotor-stator pair, said plurality of vanes in conjunction with the inner edge of said stator of said rotor-stator pair defining a plurality of chambers wherein compression and expansion of a fluid occur in accordance with a thermodynamic cycle, said chambers in which compression occurs define compression chambers and said chambers in which expansion occurs define expansion chambers, said compression chambers disposed at one side of said stator of each said rotor-stator pair and said expansion chambers disposed at an opposite side of said stator of each said rotor-stator pair; and

d. control means for timing said thermodynamic cycle, said control means including regenerator means operatively connected between said stators of said rotor-stator pairs, said regenerator means extracting heat from said expanded fluid and imparting heat to said compressed fluid.

4,009,574  
COMPRESSION-IGNITION INTERNAL COMBUSTION ENGINES

Jean F. Melchior, Paris, France, assignor to The French State, Paris, France

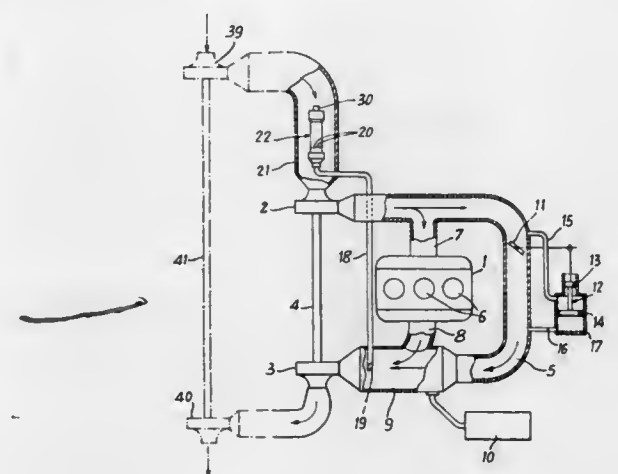
Filed July 25, 1975, Ser. No. 599,140

Claims priority, application France, Aug. 1, 1974, 74.26703

Int. Cl.<sup>2</sup> F02B 33/44

U.S. Cl. 60—606

10 Claims



1. A power plant comprising: a compression ignition internal combustion engine; a turbo-compressor set for supercharging the engine, and comprising a compressor having an intake duct, a turbine driving the compressor and a passage communicating with the compressor outlet and the turbine inlet, the engine comprising a variable-volume working chamber so communicating via an inlet duct with the compressor outlet and via an exhaust duct with the turbine inlet as to be in parallel with at least some of the passage; an auxiliary combustion chamber supplied with fresh air through the passage, with fuel by a fuel supply system, and with combustion gases by the exhaust duct and delivering hot gases to the turbine to help drive the same; and a recycling duct one end of which is located between the downstream zone of the auxiliary combustion chamber and the turbine inlet, and the other end of which is disposed in the compressor intake duct, the recycling duct having actuating means adapted to close such duct once the compressor can, without recycling, produce upstream of the engine thermodynamic conditions for spontaneous ignition.

4,009,575

## MULTI-USE ABSORPTION/REGENERATION POWER CYCLE

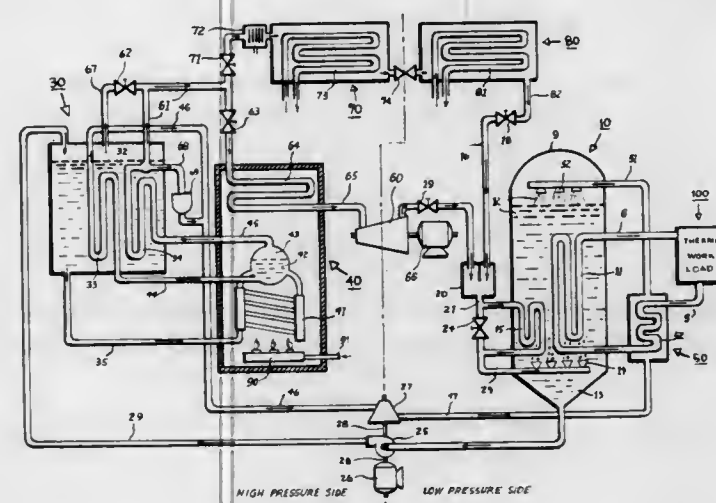
Thomas Hartman, Jr., 290 Lake Sue Drive, Winter Park, Fla. 32789; Ronald D. Evans, and Bruce G. Nimmo, both of Maitland, Fla., assignors to said Thomas L. Hartman, Jr., Winter Park, Fla., by said Ronald D. Evans and said Bruce G. Nimmo

Filed May 12, 1975, Ser. No. 576,449

Int. Cl.<sup>2</sup> F03G 7/00

U.S. Cl. 60—648

16 Claims



1. Chemical absorption/regeneration apparatus for converting thermal energy to forms suitable for performing useful work at a high efficiency comprising:

- absorber means for causing an exothermic chemical reaction;
- first energy extraction means for extracting heat energy from said exothermic reaction;
- first work producing means arranged to utilize such first extracted heat energy;
- regeneration means for producing an endothermic chemical reaction, said reaction reversing said exothermic chemical reaction;
- second energy extraction means for extracting energy introduced by said regeneration means not required for said endothermic reaction; and
- second work producing means arranged to utilize such second extracted energy.

4,009,576

## REGENERATOR FOR ROTARY RANKINE CYCLE ENGINES

William Allen Doerner, and Oral R. Van Buskirk, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 520,344, Nov. 4, 1974, abandoned. This application Dec. 4, 1975, Ser. No. 637,685

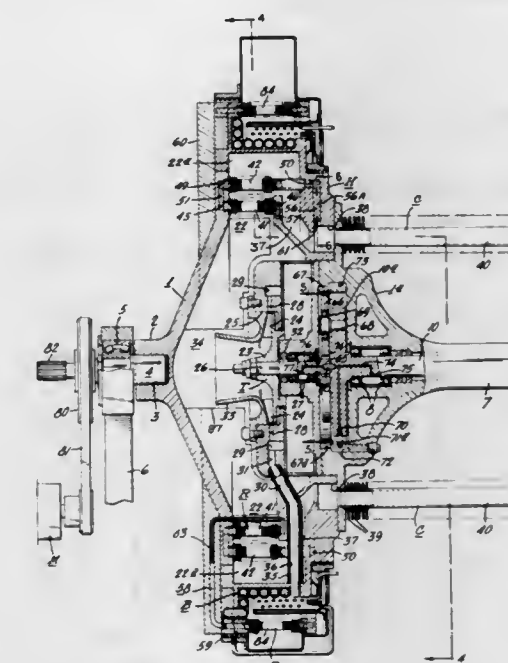
Int. Cl.<sup>2</sup> F01K 11/02, 11/04

U.S. Cl. 60—669

10 Claims

1. A rotary Rankine cycle engine comprising:
- a cylindrical housing rotatable about its axis
  - a coaxial annular boiler associated with said housing and rotatable therewith, said housing and boiler adapted to be rotated at a first predetermined speed to maintain in the boiler an annular body of boiler liquid having a liquid/vapor interface spaced a predetermined distance radially from said axis,
  - means to rotationally drive the housing and boiler at said first predetermined speed,
  - means to heat the liquid in the boiler and generate pressure vapor therein,
  - an expander mounted coaxially within the housing for extracting work from the pressure vapor generated in the boiler and including a coaxial driving member rotatably driven thereby at a second predetermined speed,

an annular regenerator chamber radially inward of the boiler defined by portions of the housing, means for discharging exhaust vapor from the expander and delivering same to the regenerator chamber, an annular regenerator in said chamber rotatable with the housing comprising at least one annular series of a plurality of equally circumferentially spaced axially extending heat exchange tubes each having thereon an array of a plurality of axially spaced annular fins operable by rotation thereof to convey exhaust vapor discharged to said chamber outwardly between said fins,



a plurality of small elements of high thermal conductivity substantially filling each of the heat exchange tubes of said regenerator, a condenser for the exhaust vapor mounted coaxially adjacent the housing and rotatable therewith, means for conducting exhaust vapor after passage through the regenerator to said condenser and for returning liquid condensate therefrom to the regenerator for passage through the tubes thereof in heat exchange relation with exhaust vapor conveyed between the fins thereon, and means for returning the liquid condensate to the boiler after passage through the regenerator tubes.

4,009,577

## COOLING TOWER BLOWDOWN HEAT EXCHANGE SYSTEM

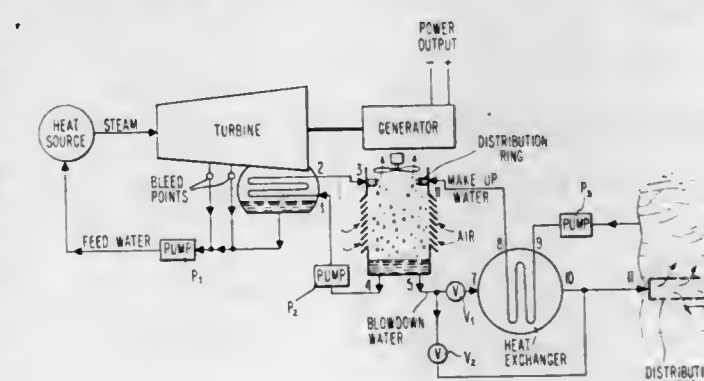
John L. Allen, 2253 West Ave., Ocean City, N.J. 08226

Filed Jan. 21, 1976, Ser. No. 651,125

Int. Cl.<sup>2</sup> F02M 31/00

U.S. Cl. 60—692

10 Claims



1. A method of cooling the exhaust steam from a steam turbine comprising the steps of:

- passing the exhaust steam through a condenser;
- passing a stream of cooling water through the condenser;



- c. cooling the condenser cooling water by passing it through a cooling tower;
- d. extracting blowdown water from the cooling tower to avoid a buildup of salts in the cooling water;
- e. adding makeup water from an external source to the cooling tower to compensate for evaporative and drift losses in the tower and the extraction of blowdown water;
- f. passing the blowdown water and the makeup water through a heat exchanger which cools the blowdown water to within a few degrees of the temperature of the makeup water;
- g. discharging the blowdown water into the external source of makeup water.

4,009,578

# METHOD FOR PREVENTING FLUID MIGRATION IN COAL SEAMS

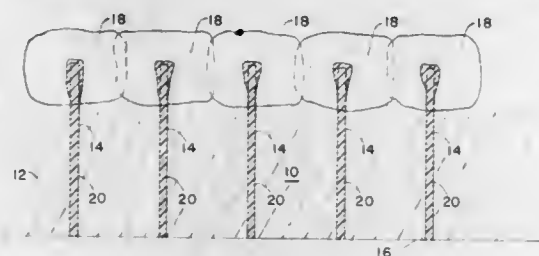
Dai S. Choi, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed July 14, 1975, Ser. No. 595,938

Int. Cl.<sup>2</sup> E02D 3/14

U.S. Cl. 61—36 R

10 Claims



1. A method for preventing fluid migration in a coal seam, said method consisting essentially of forming a substantially fluid impermeable zone across the fluid migration path by
  - a. positioning at least one borehole in said coal seam in a direction generally parallel to the direction of fluid migration;
  - b. injecting a substantially anhydrous material selected from the group consisting of hydrogen chloride and ammonia at a pressure sufficient to force said material into the coal seam surrounding said borehole, but less than the fracturing pressure of said coal seam, in an amount equal to from about 0.01 to about 5.0 weight percent based on the weight of the coal contacted by said material; and
  - c. plugging said borehole to prevent retrograde flow of said materials.

4,009,579

# METHOD FOR CONSTRUCTING A TUNNEL OR UNDERPASS

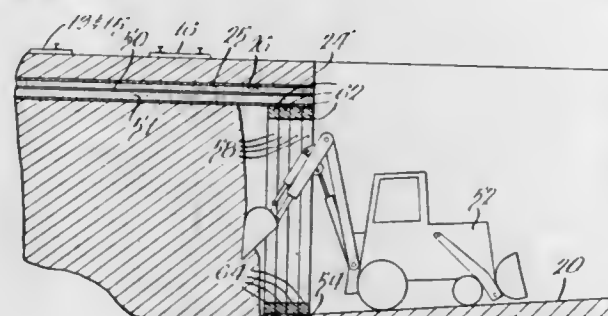
Delbert M. Patzner, 301 N. Main, Rochelle, Ill. 61068

Filed Dec. 8, 1975, Ser. No. 638,694

Int. Cl.<sup>2</sup> E21D 9/04

U.S. Cl. 61—42

15 Claims



1. A method of constructing a tunnel or underpass beneath an existing structure comprising the steps of:
  - inserting a plurality of longitudinal support members side by side through the ground beneath the existing structure so that the support members extend continuously beneath

the structure from side to side thereof and overlie the roof of the tunnel to be formed, after the support members are in place, excavating a longitudinal increment of the ground beneath the support members, installing tunnel forming means beneath the support members in place of each longitudinal increment of excavated ground to support the support members, and repeating the latter two steps until the earth has been excavated from beneath the full length of the support members and the tunnel forming means extends from one side of the structure to the other, whereby the existing structure is continually supported by the support members during the entire period of construction of the tunnel, and the tunnel is constructed without interfering with substantially normal use of the existing structure.

4,009,580

# UNDERWATER STRUCTURE

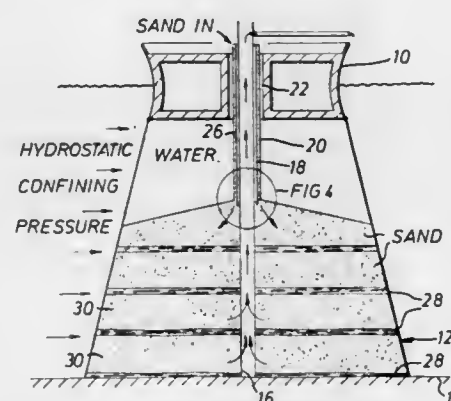
Brian Edward Wesley Dowse, Reading, England, assignor to Golder Hoek and Associates Limited, Maidenhead, England

Filed May 22, 1975, Ser. No. 579,905

Int. Cl.<sup>2</sup> E02D 27/22, 27/52

U.S. Cl. 61—88

6 Claims



1. A method of forming an underwater structure, comprising the steps of attaching an impervious membrane to the periphery of a floatable structural unit to form an assembly defining a closed container; extending the membrane from a folded to an extended condition, when the assembly is positioned at the site where the underwater structure is to be formed to cause a base portion of the membrane to rest on the river or sea bed; filling the membrane with a body of non-settable particulate material; draining the particulate body to enable the external water pressure to exert a confining pressure on the body to render it coherent; and supporting said structural unit on the coherent particulate body.

4,009,581

# GROUT LINE PROTECTED PRESSURE LINES FOR SETTING SLEEVE PACKERS

Frederick G. Britton, Bedford, and Don B. Landers, Arlington, both of Tex., assignors to Oil States Rubber Company, Arlington, Tex.

Filed May 19, 1975, Ser. No. 578,632

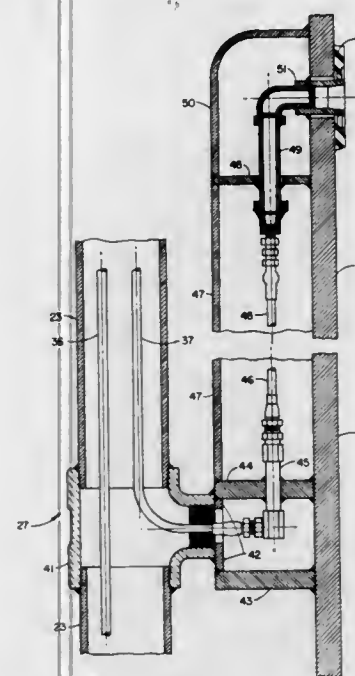
Int. Cl.<sup>2</sup> E02D 5/14

U.S. Cl. 61—99

12 Claims

1. In an offshore marine structure of the type having a platform deck supported by one or more legs extending from the platform deck to the water body bottom, said legs having piling guide sleeves mounted thereon and adapted to receive piling driven therethrough into the bottom for anchoring the structure, said sleeves having inflatable packer assemblies mounted therein and adapted to be inflated to seal the annulus formed between each sleeve and its pile prior to the annulus being filled with grouting material, said platform deck having therein grouting material supply means and packer inflation

pressure supply means, improved apparatus for connecting the grouting material supply means to a sleeve annulus and connecting the packer inflation supply means to the inflatable packer assembly associated with said sleeve including: rigid pipe means extending from the platform deck down to said sleeve; pressure conduit means inside said pipe means; first coupling means exiting said pipe means at said platform deck



- for coupling one end of said conduit means to said packer inflation supply means; second coupling means exiting said pipe means for coupling the other end of said conduit means to said associated packer assembly; first grouting supply coupling means for coupling said pipe means to said grouting material supply means; and grouting feed coupling means for coupling said pipe means to said annulus.

4,009,582

# METHOD FOR FORMING DEEP CAST-IN-PLACE CASELESS CONCRETE PILES

William R. LeCorgne, New Orleans, La., assignor to Interpile USA, Inc., New Orleans, La.

Filed Oct. 29, 1975, Ser. No. 627,012

Int. Cl.<sup>2</sup> E02D 5/34

U.S. Cl. 61—53.64

6 Claims



1. The method of forming a deep cast-in-place monolithic concrete pile having a predetermined diameter along its entire length, and a long design depth of earth penetration, comprising the steps of first driving a closed bottom hollow rigid cylindrical metallic pipe pile section having an axial length to span a substantial fraction of said design depth and an outer diameter substantially corresponding to said predetermined

diameter into the earth at the pile site to a depth approximating the axial length of the pipe pile section and leaving a short exposed top portion of said pipe pile section at the earth surface, coupling to said exposed top portion in axially aligned relation therewith an elongated driving mandrel to dispose the mandrel in vertically aligned driving relation to the pipe pile section, driving the mandrel into the earth to drive said pipe pile section a further distance into the earth approximating the mandrel length to a depth disposing the lower end of the pipe pile section at said design depth while concurrently forming a caseless pile-molding cavity in the earth encircling and axially coextensive with the portion of the mandrel driven into the earth, the mandrel having a cross sectional configuration that affords a large void area defining uninterrupted flow channels along the mandrel portion within said cavity communicating with the hollow interior of the pipe pile section for flow of flowable concrete through said flow channels and into the pipe pile section interior, concurrently gravity feeding flowable concrete downwardly into said flow channels defined within said cavity and into the hollow interior of the pipe pile section communicating therewith during driving of the mandrel to form a column of concrete extending the full height of the pipe pile section and pile-molding cavity, and withdrawing the driving mandrel from the cavity before any concrete therein has set sufficiently such that mandrel withdrawal would damage the concrete, thereby leaving a cast-in-place monolithic concrete pile column extending throughout the cavity and the interior of the pipe member.

4,009,583

# BUOYANCY CONTROL APPARATUS FOR DIVERS

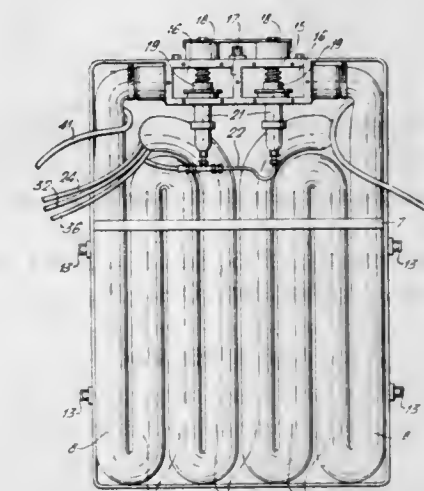
Brian Leonard Buckle, 16, Sunningdale Heights, Colwyn Bay, North Wales, England

Filed Oct. 7, 1975, Ser. No. 620,275

Int. Cl.<sup>2</sup> B63C 11/02

U.S. Cl. 61—70

11 Claims



1. A buoyancy control apparatus for carrying by a diver comprising:
  - frame means supporting coiled or looped tubular fluid-tight reservoir means;
  - carrying means for attachment of the frame means to a diver;
  - water inlet valve means for admitting water to said reservoir from externally of the apparatus to displace gas from the reservoir;
  - gas outlet valve means for releasing said displaced gas from the reservoir to externally of the apparatus;
  - gas inlet valve means for admitting compressed gas to the reservoir to displace water from the reservoir; and
  - water outlet valve means for releasing said displaced water from the reservoir,
 whereby water and gas can be selectively admitted to the reservoir to displace gas and water respectively already in the reservoir thereby to change to buoyancy of the apparatus.



4,009,584

**METHOD OF AND A DEVICE FOR FORMING A FLUIDTIGHT DUCT TRANSITION THROUGH A WALL**  
 Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to C. G. Doris, Paris, France

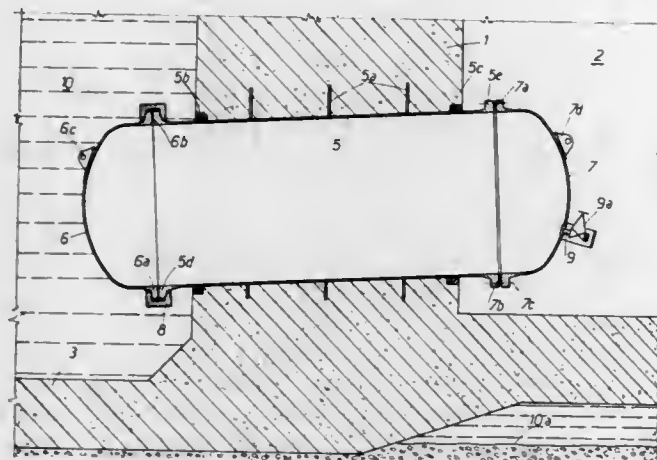
Filed May 1, 1975, Ser. No. 573,759

Claims priority, application France, May 17, 1974, 74.17243

Int. Cl.<sup>2</sup> F16L 1/04; E02D 27/38

U.S. Cl. 61-107

18 Claims



1. A method of executing the transition of a duct across a wall between a first space in which a first pressure prevails and a second space normally subjected to a second pressure differing from the first, comprising the steps of: forming a passage across the wall, temporarily closing the passage by a pressure-differential method which utilizes the difference between the first pressure and the second pressure, subjecting the second space to the first pressure, reopening the passage, passing the duct through the passage, temporarily sealing the passage around the duct, restoring the second pressure in the second space, and finally sealing the passage around the duct.

4,009,585

**METHOD OF PRODUCING VACUUM IN RECIPIENT AND VACUUM PUMP FOR EFFECTING SAME**

Marxen Petrovich Larin, prospekt Nauki, 29, kv. 78, Leningrad, U.S.S.R.

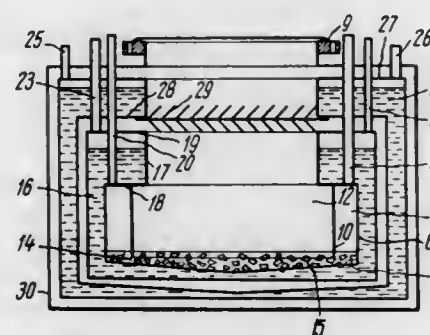
Filed Apr. 29, 1975, Ser. No. 572,915

Claims priority, application U.S.S.R., Apr. 30, 1974, 2019987

Int. Cl.<sup>2</sup> B01D 5/00

U.S. Cl. 62-55.5

9 Claims



1. A method of producing a vacuum in a recipient comprising: filling a vessel with a condensed phase gas mass, dividing the internal vessel volume into two spaces, wherein one space is connected to the recipient and another to a preliminary evacuation system, evacuating gases from the recipient through said gas mass, solidifying said gas mass when supercooled by the removal of surface vapours coincidental with said evacuation, thereby resulting in a pressure drop in the recipient from atmospheric to an initial vacuum pressure, and further cryosorption of the recipient residual atmosphere by a

solid-phase gas, resulting in a high vacuum level in the recipient.

4,009,586

**METHOD AND APPARATUS FOR PREVENTING CONDENSATION FROM FORMING ABOUT THE PERIPHERY OF A FREEZER DOOR**

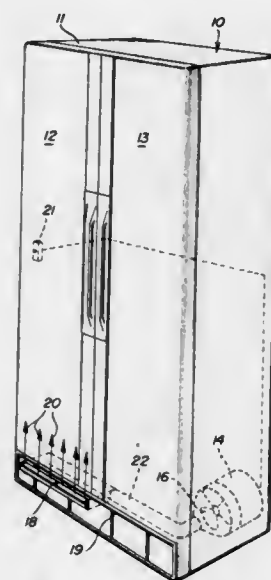
John A. Skvarenina, 2639 W. Augusta, Chicago, Ill. 60622

Filed Feb. 3, 1975, Ser. No. 546,768

Int. Cl.<sup>2</sup> F25D 21/12

U.S. Cl. 62-80

10 Claims



10. A method of preventing condensation from forming about the outer periphery of a freezer door as set forth in claim 9 further including the step of channeling the warm air from said compressor through ducts, and discharging the warm air through outlets at the end of said ducts.

4,009,587

**COMBINED LOOP FREE-PISTON HEAT PUMP**

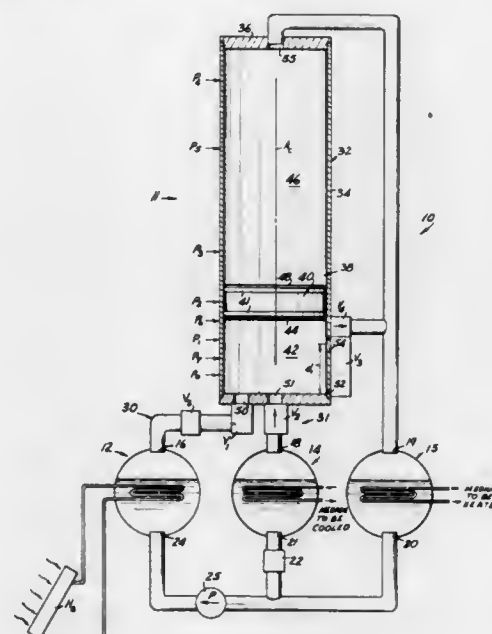
Glen P. Robinson, Jr., Atlanta, and Samuel V. Shelton, Stone Mountain, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 550,413, Feb. 18, 1975. This application Apr. 7, 1975, Ser. No. 565,629

Int. Cl.<sup>2</sup> F25B 1/00, 27/00

U.S. Cl. 62-116

17 Claims



1. A method of operating a dual loop, single working fluid, a heat pump system which has a boiler; an evaporator; a condenser; and an expansion-compression device slidably mounting a free piston in a working chamber for linear move-

ment of the free piston within the working chamber along the axis of the chamber so that the free piston divides the working chamber into a first subchamber of varying size and a second subchamber of varying size as the piston moves linearly within the chamber, where the high pressure outlet of the boiler is connected to the first subchamber, the outlet of the evaporator is connected to the first subchamber, the inlet of the condenser is connected to the first subchamber, the method comprising the steps of:

- pressurizing the second subchamber to urge the piston toward the first subchamber;
- connecting the high pressure outlet of the boiler to the first subchamber to introduce working fluid from the boiler into the first subchamber to drive the piston linearly toward the second subchamber and induce linear kinetic energy in the piston while working fluid from the evaporator is prevented from entering the first subchamber and while the working fluid in the first subchamber is prevented from entering the condenser;
- stopping the introduction of working fluid from the boiler into the first subchamber to allow the high pressure working fluid in the first subchamber to expand while the piston continues to move toward the second subchamber until the working fluid in the first subchamber has expanded to the pressure of the working fluid in the evaporator;
- connecting the outlet of the evaporator to the first subchamber while the piston continues to move toward the second subchamber so that working fluid from the evaporator is drawn into the first subchamber to maintain the pressure in the first subchamber at the pressure of the working fluid in the evaporator as long as the piston moves toward the second subchamber with the pressure in the second subchamber being greater than the pressure of the working fluid in the first subchamber when the piston reaches its limit of movement toward the second subchamber so that the pressure of the working fluid in the second subchamber reverses the movement of the free piston and drives the free piston back toward the first subchamber while inducing linear kinetic energy in the piston;
- preventing the flow of working fluid from the first subchamber into the evaporator, from the boiler into the first subchamber, and from the condenser into the first subchamber as the free piston moves toward the first subchamber so that the pressure of the working fluid in the first subchamber is raised as the free piston moves toward the first subchamber; and,
- connecting the working fluid in the first subchamber to the inlet of the condenser when the working fluid in the first subchamber reaches the pressure of the condenser as the free piston moves toward the first subchamber so that the working fluid in the first subchamber is discharged into the condenser as the free piston continues to move toward the first subchamber.

4,009,588

**ELECTRICAL APPLIANCE FOR MAKING SORBET**  
 Pierre Tanguy, Daix, and André Faivre, Dijon, both of France, assignors to Societe Anonyme Etud, Dijon, France

Filed Jan. 24, 1975, Ser. No. 543,798

Claims priority, application France, Jan. 30, 1974, 74.03045

Int. Cl.<sup>2</sup> A23G 9/00, 9/22

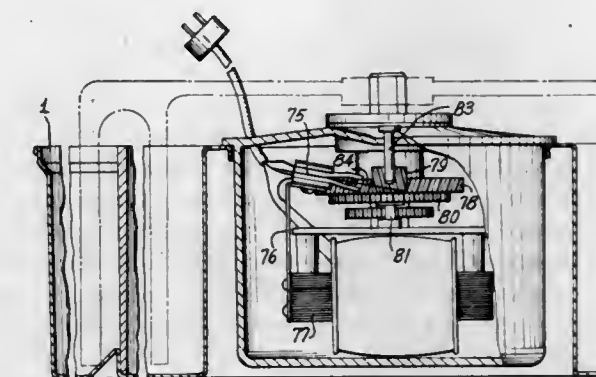
U.S. Cl. 62-126

8 Claims

1. In an appliance for making sorbet or ice cream and including means for preventing mixer blades from becoming locked in the ice by effecting a progressive withdrawal of the blades from a vertical orientation towards a horizontal orientation under the action of an opposing torque applied to the blades by the hardening of the ice during freezing, the improvement comprising an automatic stopping device including:

- a stepped pinion adapted for axial displacement in depen-

dence upon the variation of said torque applied to the blades, and



- a switching means actuated by said stepped pinion to break a motor supply circuit when the blades reach their withdrawn position.

4,009,589

**SINGLE EVAPORATOR, SINGLE FAN COMBINATION REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS AND METHOD OF ADJUSTMENT**

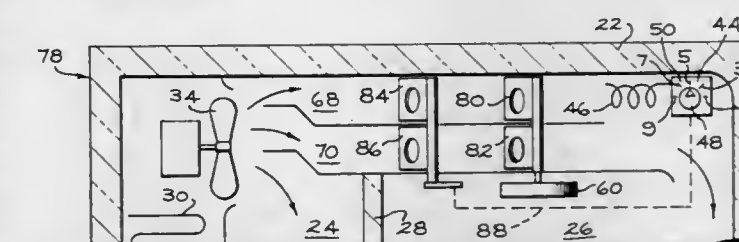
William M. Webb, Louisville, Ky., and Stephen G. Boughton, Antioch, Tenn., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 2, 1976, Ser. No. 646,166

Int. Cl.<sup>2</sup> F25D 17/00

U.S. Cl. 62-180

3 Claims



- A refrigerator comprising:
  - a freezer compartment;
  - a fresh food compartment;
  - an evaporator chamber and an evaporator in said chamber;
  - an air circulation system including a fan and passageways for circulating air from both of said compartments through said evaporator chamber, a passageway for conducting a first stream of air from said evaporator chamber to said freezer compartment, and a first duct for conducting a second stream of air from said evaporator chamber to said fresh food compartment;
  - a thermostatic control for maintaining a desired temperature in said fresh food compartment by causing energization of said evaporator as required, said thermostatic control including an element for sensing temperature in said fresh food compartment;
  - a first user-operable control member for setting a desired temperature to be maintained in said freezer compartment;
  - a second user-operable control member for setting the desired temperature to be maintained in said fresh food compartment, said second user-operable control member being operatively connected to said thermostatic control;
  - a first main damper disposed within said first duct, said main damper being constructed to only partially block airflow when in the fully closed position and operatively connected to said first user-operable control member so as to permit decreased airflow through said first duct when said first user-operable control member is adjusted to call for a lower temperature to be maintained in said freezer compartment and to permit increased airflow through said first duct when said first user-operable con-



trol member is adjusted to call for a higher temperature to be maintained in said freezer compartment; and

- i. a first compensating damper disposed within said first duct, said compensating damper being constructed to only partially block airflow when in the fully closed position and operatively connected to said second user-operable control member for ganged operation with said thermostatic control so as to permit increased airflow through said first duct when said second user-operable control member is adjusted to call for a lower temperature to be maintained in said fresh food compartment and to permit decreased airflow through said first duct when said second user-operable control member is adjusted to call for a higher temperature to be maintained in said fresh food compartment,

the airflow through said first duct into said fresh food compartment thereby being a function of the settings of both of said user-operable control members, said function being selected so that the desired temperature is approximately maintained in said freezer compartment even though the setting of said second user-operable control member is changed.

4,009,590

# **SINGLE EVAPORATOR, SINGLE FAN COMBINATION REFRIGRATOR WITH INDEPENDENT TEMPERATURE CONTROLS**

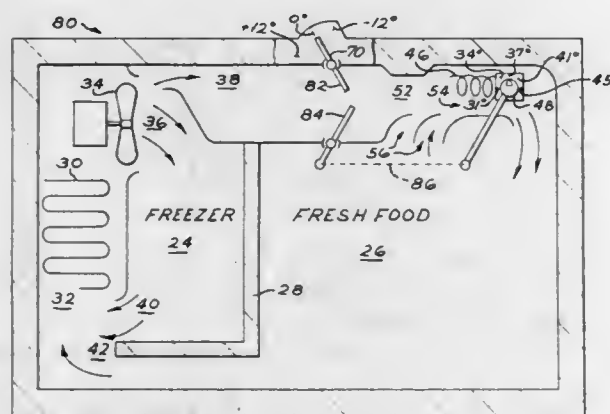
William M. Webb, and William F. Hester, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 2, 1976, Ser. No. 646,167

Int. Cl.<sup>2</sup> F25D 17/00

U.S. Cl. 62—180

14 Claims



## **1. A refrigerator comprising:**

- a. a freezer compartment;
- b. a fresh food compartment;
- c. an evaporator chamber and an evaporator in said chamber;
- d. means for conveying air from both of said compartments through said evaporator chamber;
- e. means for supplying refrigerated air from said evaporator chamber to said compartments;
- f. a thermostatic control for maintaining a desired temperature in one of said compartments by causing energization of said evaporator as required, said thermostatic control including an element for sensing temperature in said one of said compartments;
- g. a first user-operable control member for setting a desired temperature to be maintained in the other of said compartments;
- h. a second user-operable control member for setting the desired temperature to be maintained in said one of said compartments, said second user-operable control member being operatively connected to said thermostatic control; and
- i. apparatus for apportioning the flow of refrigerated evaporator chamber air between said compartments as a function of the settings of both of said user-operable control members, said apparatus having a main input connected

to said first user-operable control member and a compensating input connected to said second user-operable control member, and said function being selected so that the desired temperature is approximately maintained in said other of said compartments, even though the setting of said second user-operable control member is changed.

4,009,591

# **SINGLE EVAPORATOR, SINGLE FAN COMBINATION REFRIGRATOR WITH INDEPENDENT TEMPERATURE CONTROLS**

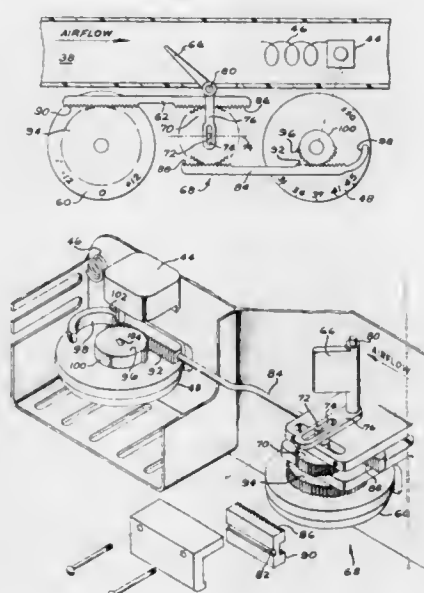
William F. Hester, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 2, 1976, Ser. No. 646,196

Int. Cl.<sup>2</sup> F25D 17/00

U.S. Cl. 62—180

6 Claims



## **1. A refrigerator comprising:**

- a. a freezer compartment;
- b. a fresh food compartment;
- c. an evaporator chamber and an evaporator in said chamber;
- d. an air circulation system including a fan and passageways for circulating air from both of said compartments through said evaporator chamber, a passageway for conducting a first stream of air from said evaporator chamber to said freezer compartment, and a duct for conducting a second stream of air from said evaporator chamber to said fresh food compartment;
- e. a thermostatic control for maintaining a desired temperature in said fresh food compartment by causing energization of said evaporator as required, said thermostatic control including an element for sensing temperature in said fresh food compartment;
- f. a first user-operable control member for setting a desired temperature to be maintained in said freezer compartment;
- g. a second user-operable control member for setting the desired temperature to be maintained in said fresh food compartment, said second user-operable control member being operatively connected to said thermostatic control; and
- h. variable airflow control apparatus for varying airflow through said duct as a function of the settings of both of said user-operable control members, said apparatus including:
  - i. an adjustable air valve for controlling airflow through said duct; and
  - ii. a mechanical summer having a main input connected to said first user-operable control member, a compensating input connected to said second user-operable

control member, and an output operatively connected to said air valve, the connection to said air valve being such that the degree of opening of said air valve is a direct function of the temperature setting of said first user-operable control member and an inverse function of the temperature setting of said second user-operable control member, said function being selected so that the desired temperature is approximately maintained in said freezer compartment even though the setting of said second user-operable control member is changed.

4,009,592

# **MULTIPLE STAGE EXPANSION VALVE FOR AN AUTOMOTIVE AIR CONDITIONING SYSTEM**

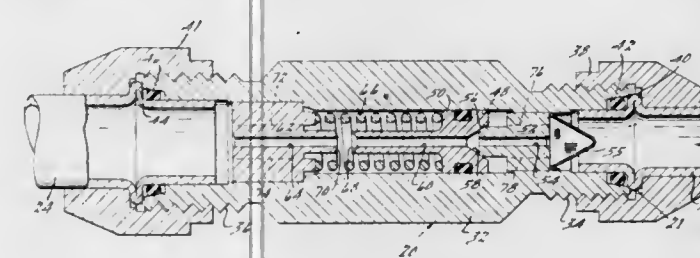
David H. Boerger, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 9, 1976, Ser. No. 656,670

Int. Cl.<sup>2</sup> F25B 41/04

U.S. Cl. 62—222

4 Claims



1. An air conditioning system comprising a compressor, a condenser and an evaporator arranged in a closed series circuit and a refrigerant expansion device situated between the condenser and the inlet side of the evaporator; said expansion device comprising a housing situated in a refrigerant passage between the condenser and the evaporator and adapted to pass refrigerant therethrough, a first orifice member located at the inlet side of said housing, a second orifice member located at the outlet side of said housing, a movable piston situated in said housing intermediate said first and second orifice members, each orifice member having a calibrated refrigerant flow orifice therein, said piston also having a refrigerant flow orifice therein; said piston and said first orifice member having registering portions which, when engaged, establish a continuous flow passage through said piston and said first orifice member whereby the fluid passing through said expansion device follows a flow path through the orifices in said piston and said first orifice member, said first and second orifice members having bypass passages therethrough which bypass their respective orifices, spring means for urging said piston into engagement with said first orifice member; said piston, upon a predetermined pressure drop across said expansion device, shifting against the opposing force of said spring into engagement with said second orifice member whereby the pressure drop across said expansion device is determined by the orifice characteristics of the orifices in said piston and in said second orifice member.

4,009,593

# **REFRIGERATED SALAD AND SALAD DRESSING DISPENSING APPARATUS**

Gary A. Davis, Wichita, Kans., assignor to Stevens-Lee Company, Minneapolis, Minn.

Filed Mar. 10, 1976, Ser. No. 665,543

Int. Cl.<sup>2</sup> A47F 3/04; B67D 5/62

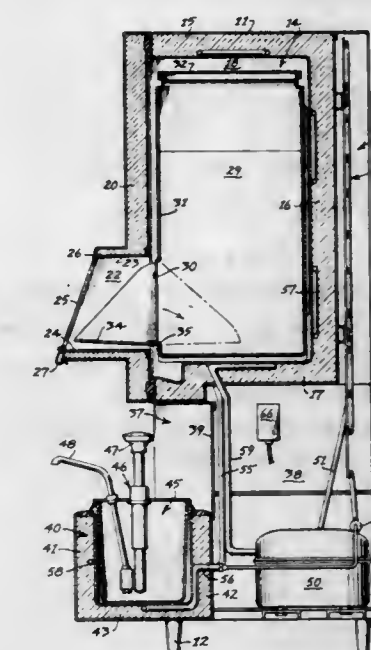
U.S. Cl. 62—250

9 Claims

1. A refrigerated apparatus for dispensing salad and salad dressing comprising:

- a. a cabinet having front, rear, upper and lower portions,
- b. an insulated salad compartment in the upper portion of said cabinet having a front opening,
- c. a front door connected to said salad compartment for opening and closing said front opening,
- d. a salad port in the lower portion of said front door,

- e. a port door connected to said front door for opening and closing and said salad port,
- f. an insulated well extending transversely in the front portion of said cabinet,
- g. at least one salad dressing container in said well,
- h. means for dispensing salad dressing from each of said containers,
- i. a compressor compartment in the lower portion of said cabinet,



- j. a refrigeration system within said cabinet including a compressor, a condenser and first and second evaporators,
- k. said compressor being mounted in said compressor compartment,
- l. said condenser being mounted in the rear portion of said cabinet,
- m. said first evaporator being mounted in cooling relationship with said salad compartment, and
- n. said second evaporator being mounted in cooling relationship with said well.

4,009,594

# **HOT GAS DEFROSTING APPARATUS**

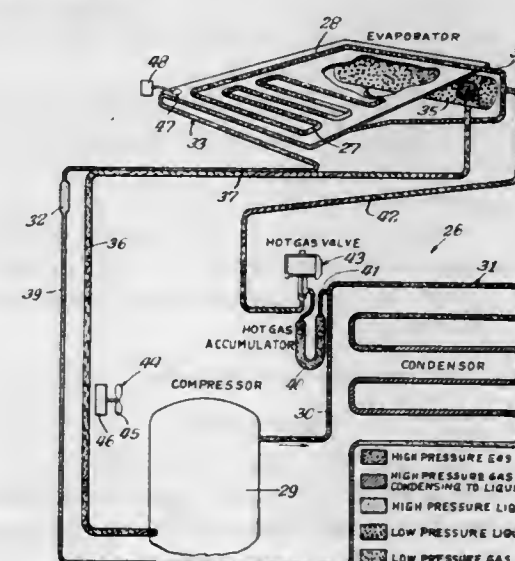
Donald F. Swanson, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 2, 1975, Ser. No. 582,909

Int. Cl.<sup>2</sup> F25D 21/06

U.S. Cl. 62—278

13 Claims



1. In a refrigeration apparatus having an evaporator, a compressor, means for delivering refrigerant fluid from the evaporator to the compressor, a condenser, and flow passage



means for delivering cooled liquefied refrigerant fluid from the condenser to the evaporator including a capillary tube restrictor, the improvement comprising: means defining an accumulator chamber connected in parallel with said condenser between said compressor and evaporator; delivery means for delivering hot compressed refrigerant fluid from the compressor to the condenser and said chamber during a cooling operation of the apparatus; and controlled means for causing the hot compressed refrigerant fluid delivered to said chamber to be stored therein as a liquid during refrigeration operation of said apparatus and the stored refrigerant liquid to be delivered from said accumulator chamber to said evaporator as a result of continued delivery of hot compressed refrigerant fluid from the compressor for heating the evaporator during a heating operation of the apparatus.

4,009,595

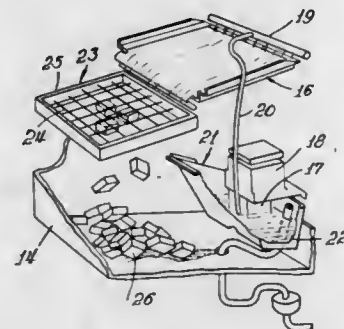
**ICE MAKER COMPONENT MOUNTING MEANS**

Walter C. Barnard, White Bear Lake, Minn., and Kenneth J. Dahlstrom, St. Croix Falls, Wis., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Feb. 6, 1976, Ser. No. 655,705  
Int. Cl.<sup>2</sup> F25C 1/12

U.S. Cl. 62—300

28 Claims



28. In a slab-type ice maker having a liner carried in a cabinet, an improved mounting arrangement for the evaporator means, the cutting grid means and water pan components of said ice maker comprising:

- first and second bosses formed in said liner on opposite sidewalls thereof for directly supporting opposite sides of evaporator means adjacent a first end thereof;
- a third boss formed in said liner on said opposite sidewalls thereof for receiving first fastener means for mounting a second opposite end of said evaporator means to said liner;
- flange means supported on the rear wall of said liner for supporting a first edge of said water pan;
- second fastener means for mounting a second opposite edge of said water pan to bracket means attached to said third boss by said first fastener means for supporting said water pan subjacent said evaporator;
- tab means carried by said evaporator means adapted to be received in notches formed in the frame of said cutting grid means for supporting a first end of said cutting grid means adjacent said evaporator; and
- a fourth boss formed in said liner on said opposite sidewalls thereof for receiving third fastener means for mounting a panel carrying a second opposite end of said cutting grid means to said fourth boss.

4,009,596

**SUCTION ACCUMULATOR**

Robert L. Morse, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich. and Sharon Manufacturing Company, Toledo, Ohio

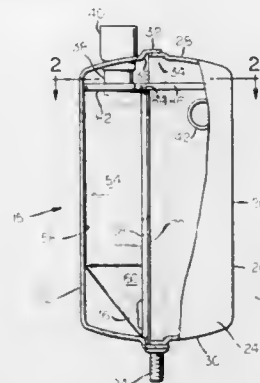
Filed July 21, 1975, Ser. No. 597,583  
Int. Cl.<sup>2</sup> F25B 43/00

U.S. Cl. 62—503

7 Claims

1. In a refrigerant retention device comprising a suction accumulator or the like for a refrigerant compressing-

evaporating system, said accumulator comprising a pressure vessel of the type having a liquid storage reservoir therein, a fluid inlet to said vessel communicating with said reservoir, fluid pick-up means defining a generally upright U-shaped fluid passageway disposed within said reservoir but isolated therefrom by said fluid pick-up means, a liquid metering aperture communicating the bottom bight of said fluid passageway with said reservoir, a fluid outlet from the vessel communicating with an outlet end of said fluid passageway, a baffle disposed in said pressure vessel separating said vessel fluid inlet from an inlet to said fluid passageway, said baffle having aperture means therethrough communicating the portion of said reservoir exposed to said vessel fluid inlet with the portion of said reservoir communicating with said inlet to said fluid passageway, said baffle being disposed in said vessel so as to extend generally horizontally therein and above the elevation of said vessel fluid inlet to thereby separate said reservoir into a lower, liquid-receiving chamber and an upper gas-



accumulating chamber, said upper chamber communicating with said inlet to said fluid passageway, said baffle aperture means providing communication between said chambers such that the bulk of fluid flow through said vessel occurs serially via said vessel fluid inlet, said lower chamber, said baffle aperture means, said upper chamber and thence via said fluid passageway to said vessel fluid outlet, the improvement wherein said pressure vessel is disposed with its major longitudinal axis oriented vertically and said baffle is disposed adjacent the upper end of said vessel, said vessel fluid inlet being oriented to direct a stream of fluid generally horizontally into said lower chamber and tangentially relative to a confronting interior wall of said vessel at an elevation immediately below the inlet of said fluid passageway such that the stream of fluid is caused to flow in a generally circular path in said lower chamber with a swirling action to thereby create in said lower chamber a vortex communicating with said baffle aperture means.

4,009,597

**ELASTIC TAPE WITH RAVEL RESISTANT EDGE AND METHOD OF KNITTING**

Cothran D. Wall, and John L. Overly, both of Browns Summit, N.C., assignors to Southern Webbing Mills, Inc., Greensboro, N.C.

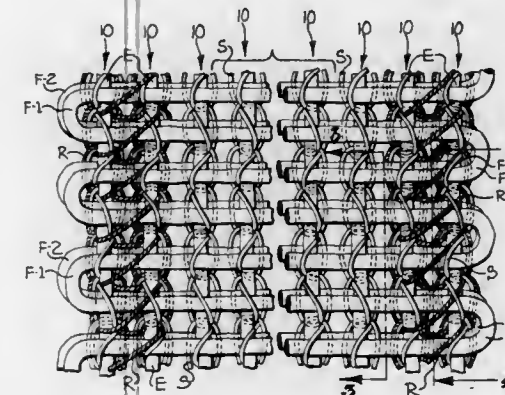
Filed Dec. 24, 1975, Ser. No. 644,126  
Int. Cl.<sup>2</sup> D04B 7/12, 9/12, 11/08, 23/08

U.S. Cl. 66—193

15 Claims

- 1. A warp knit elastic fabric including at least one edge portion resistant to raveling and including
  - a. a plurality of walewise parallel stitch loop chains knit of stretchable yarn and forming successive courses extending from one side of said fabric to the other,
  - b. an elastomeric yarn inlaid in and extending along selected ones of said parallel stitch loop chains,
  - c. filling yarn extending back and forth across said fabric and being held in said stitch loop chains, and
  - d. at least one multiple wale lapping stitch loop chain knit of stretchable yarn and forming stitch loops knit in plated

relationship with the stitch loops of at least a pair of said parallel stitch loop chains extending along one selvage



edge of said fabric for preventing raveling of the corresponding parallel stitch loop chains.

4,009,598

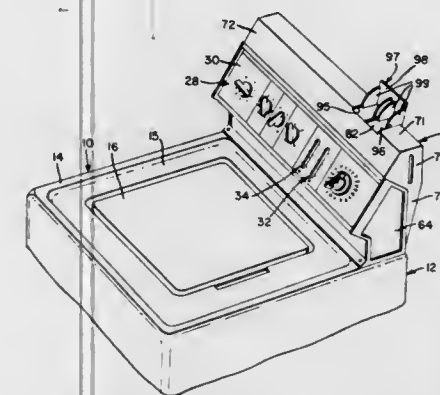
**AUTOMATIC TREATING AGENT DISPENSER FOR WASHING APPLIANCE**

James A. Bernard, Dayton, and Roy R. Smith, Eaton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1975, Ser. No. 635,645  
Int. Cl.<sup>2</sup> D06F 39/02

U.S. Cl. 68—12 R

4 Claims



1. In a laundry machine having an outer rectangular shaped casing, said casing having an upper wall defining upper edges with said casing, a receptacle for receiving laundry and water supply means for providing water to said receptacle, a hollow control housing above said receptacle on said upper wall, including a front wall and a top wall, extending along an upper edge of said outer casing, a dispensing compartment in said control housing, a settable timer control for initiating and controlling a cycle of operations of the machine including sequential periods of wash and rinse, a liquid agent storage reservoir removably mounted on said top wall above said dispensing compartment, said reservoir providing a storage tank holding a treating agent, means for manually releasing the treating agent from said storage tank into said dispensing compartment in said control housing, means for dispensing the treating agent from said dispensing compartment into the laundry receptacle during a period of wash or rinse; liquid conduit means, including manually operable valve control means therefor, communicating between said storage tank and said dispensing compartment; said front wall having an elongated translucent viewing window associated with said dispensing compartment providing a view of the level of liquid agent therein, said manually operable valve control means being operable for controlling the gravity flow of a liquid agent from said storage tank into said dispensing compartment, indicia means for said viewing window allowing the operator to preselect the quantity of liquid agent to be dispensed by comparing the level of said liquid agent in said

viewing window with the desired indicia means while said valve control means is being manually operated and said liquid agent is flowing from said storage tank to said dispensing compartment, and liquid conduit means, including timer operable valve control means therefor, communicating between said dispensing compartment and the laundry receptacle for automatically delivering the preselected quantity of liquid agent to said receptacle.

4,009,599

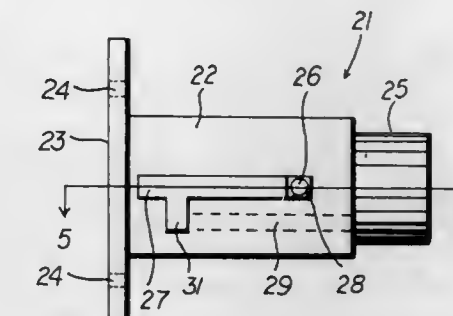
**PLUNGER LOCK**

George P. Patriquin, Gardner, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Filed May 29, 1973, Ser. No. 364,874  
Int. Cl.<sup>2</sup> E05B 65/08

U.S. Cl. 70—90

14 Claims



1. A lock comprising:

- a housing;
- shell means defining a keyway and longitudinally movable in said housing between a locked position and an unlocked position in response to actuation by a proper key in said keyway; and
- restraining means responsive to the key for selectively preventing and allowing the removal of said shell means from said housing means, said restraining means comprising a key responsive latch means movable between a shell latched position wherein removal of said shell from said housing is prevented and a shell removal position allowing removal of said shell from said housing, said latch means being concealed by said housing when moving into said removal position so as to be operable only by the key operably positioned in said keyway, said restraining means further comprising limit means for allowing longitudinal movement of said shell beyond said unlocked position only after rotational movement of said shell within said housing, and rotational restraining means for allowing said rotational movement only after movement of said latch means to said removal position in response to actuation of the key, said limit means comprising a mating slot and stop, and rotational restraining means comprising a restraining groove in said housing that is substantially parallel to said slot and slidably retains said latch means during longitudinal motion of said shell means.

4,009,600

**BIT KEY LOCK**

Maynard A. Boeckman, Kane, Pa., and Richard M. Singer, Lafayette, Calif., assignors to Kane Manufacturing Corporation, Kane, Pa.

Filed Aug. 29, 1975, Ser. No. 608,835  
Int. Cl.<sup>2</sup> E05B 21/00

U.S. Cl. 70—355

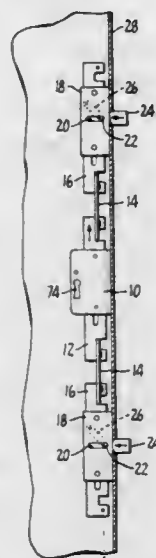
4 Claims

1. In a bit key lock, a mounting plate positioned to serve as one side of a lock housing, a cover positioned to serve as the opposite side of said lock housing, first and second keyholes formed in opposite sides of said housing, mounting posts for securing said mounting plate and cover together in laterally spaced relation, a slide lever mounted between said mounting



plate and cover on said mounting posts for reciprocal movement and having a laterally projecting arm and a key-receiving indentation in one edge portion, a plurality of lock tumblers pivotally mounted on a mounting post adjacent said slide lever and between said mounting plate and cover, said tumblers having T-shaped slots formed therein to accommodate the laterally projecting arm on the slide lever, the improvement comprising:

- a. at least one deadplate positioned off-center relative to the mounting plate and cover and between two of said lock



tumblers, said deadplate having a peripheral portion extending into the lock actuating path of a key, and  
b. a key that may be selectively inserted through either said first or second keyholes and having a blade portion adapted to engage said slide lever and tumblers, a notch being formed in said blade portion to accommodate said deadplate and allow at least partial rotation of said key when inserted through said first keyhole, said blade portion being engageable with said deadplate to prevent actuation of said tumblers and slide lever if said key is inserted through said second keyhole.

4,009,601

#### METHOD OF AND APPARATUS FOR BENDING A DOUBLE PIPE

Sadaichi Shimizu, Hino, Japan, assignor to K.K. Shimizu Seisakusho, Tokyo, Japan

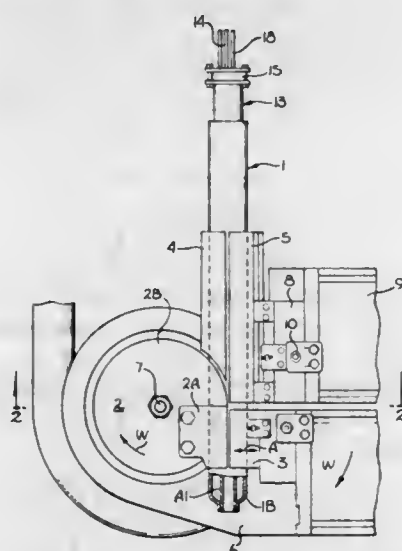
Filed Jan. 21, 1976, Ser. No. 650,899

Claims priority, application Japan, Jan. 24, 1975, 50-10807; Jan. 24, 1975, 50-10808; Jan. 24, 1975, 50-10809

Int. Cl.<sup>2</sup> B21D 9/04

U.S. Cl. 72-369

5 Claims



4. A method for bending a double pipe comprising: coupling the inner and outer of the double pipe together at one end;

inserting the end of the double pipe into a bending mold fixed to a turntable;  
fixing the end of said double pipe opposite the coupled together end to prevent movement in a radial direction;  
inserting an inner metal core and a cylindrical outer metal core into respectively said inner pipe and said outer pipe between said inner and outer pipes, said cores being inserted until the end is adjacent a contact point between said double pipe and said bending mold;  
rotating the turntable thereby bending the double pipe along the contour of the bending mold; and  
applying a force to rear of said inner pipe in an axial direction while said turntable is being rotated.

4,009,602

#### TUBE BENDING TOOL WITH ANGLE SIGHTING MEANS

Wayne A. Linquist, Rockford, Ill., assignor to Greenlee Brothers and Co., Rockford, Ill.

Filed Oct. 14, 1975, Ser. No. 622,331

Int. Cl.<sup>2</sup> B21D 7/024; B21C 51/00

U.S. Cl. 72-459

4 Claims



1. In a tube bending tool, the combination comprising:
  - a. an arcuate shoe against which a tube is bent to form a bend in the tube;
  - b. a handle attached to said arcuate shoe for rocking the tool on a supporting surface;
  - c. a tube engaging hook attached to the front end of said shoe;
  - d. a support structure mounted on said shoe;
  - e. a sighting indicator means cast with said support structure, said sighting indicator means having a non-detachable stationary projection; and,
  - f. a plurality of angle indicators mounted on the front end of said shoe for selective alignment by operator sight with said sighting indicator during a tube bending operation for making accurate bends in a tube.

4,009,603

#### ZERO SPEED CALIBRATION METHOD AND APPARATUS FOR USE WITH AN ELECTRO-MAGNETIC UNDERWATER LOG FOR MARINE VESSELS

Marvin J. Molny, Huntington, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 13, 1976, Ser. No. 657,900

Int. Cl.<sup>2</sup> G01F 1/64, 25/00

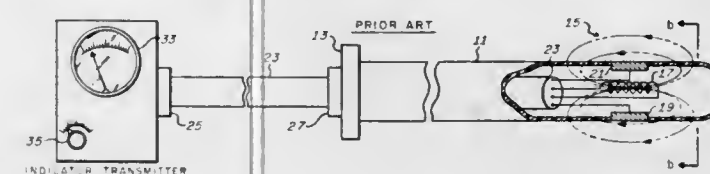
U.S. Cl. 73-3

6 Claims

1. An improved electro-magnetic underwater log for measuring the speed of a marine vessel, said log being of the type that includes a submersible sensor unit having an electrical coil for establishing a magnetic field with a component essentially perpendicular to the direction of the vessel's forward motion and voltage sensing means for detecting the voltage gradients induced in water flowing through said magnetic field by virtue of the fore-aft motion of the vessel, said log further

including means to energize said coil, and adjustable indicating means responsive to said detecting means for displaying the speed of the vessel, said improvement consisting of zero speed calibration apparatus comprising means to disconnect the energizing means from the coil and to substitute a dummy load across the coil, and means to set said indicator means to zero value when said coil is terminated by the dummy load.

6. A method for calibrating an electro-magnetic underwater log used for indicating the speed of a marine vessel, said log being of the type having submersible sensing means and on-board indicator/transmitter means, said submersible sensing



means including coil means for establishing a magnetic field and detecting means for detecting voltage gradients induced in the water flowing through said magnetic field, said indicator/transmitter means including means for energizing said coil and adjustable indicating means responsive to the magnitude of the detected voltage gradients for indicating the speed of the vessel, said method comprising the steps of disconnecting said energizing means from said coil means, terminating said coil means and said energizing means with individual loads, energizing said log and adjusting said indicating means to a zero speed reading.

4,009,604

#### PRESSURE CONVERTER FOR CALIBRATING GAUGES

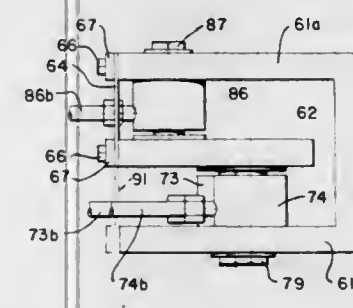
Samuel D. Taber, and James H. Coulter, both of Santa Rosa, Calif., assignors to National Controls, Inc., Santa Rosa, Calif.

Filed Aug. 7, 1975, Ser. No. 602,569

Int. Cl.<sup>2</sup> G01L 27/00; G01G 5/04

U.S. Cl. 73-4 R

3 Claims



1. In a pressure converter for connection between a pressure source and a pressure-operated indicator: a base having first and second spaced apart, generally parallel legs, a beam member disposed between the legs of the base and extending in a direction generally parallel thereto, a flexure connected between the beam member and one of the legs of the base, first and second force-pressure transducers mounted respectively on the first and second legs of the base, each of the transducers comprising a chamber for receiving fluid and movable means for varying the volume of the chamber, means for connecting the chamber of the first transducer to the pressure source, and means for connecting the chamber of the second transducer to the indicator, the movable means of the first and second transducers being connected to the beam member at predetermined distances from the flexure, whereby the pressure applied to the indicator is determined by the source pressure and the ratio of the predetermined distances, the transducers being mounted on the legs of the base in a manner permitting adjustment of the predetermined distances.

#### 4,009,605 METHOD FOR DETERMINING T<sub>250</sub> TEMPERATURE

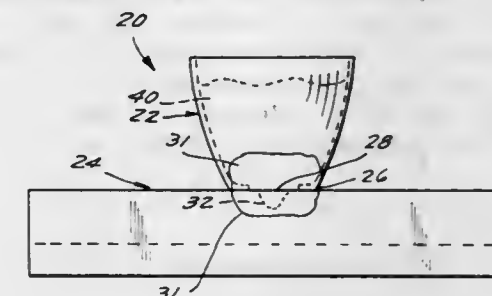
Alfred E. Kober, Hopatcong, N.J., assignor to Apollo Chemical Corporation, Whippany, N.J.

Filed Feb. 24, 1976, Ser. No. 660,828

Int. Cl.<sup>2</sup> G01N 11/04

U.S. Cl. 73-56

11 Claims



1. A method for rapidly determining the temperature at which a given coal ash has a viscosity of 250 poises comprising the steps of

- A. providing apparatus comprising
  - i. an open top container having at the base thereof a generally circular aperture of substantially 0.25 inch diameter, and
  - ii. a support for said container including a compartment at least partially positioned below said container and communicating with the interior of said container through said aperture, at least a vertical section of said compartment directly beneath said aperture being subject to visual inspection;
- B. packing into said container a thick paste sample formed by mixing a thickener solution with a predetermined quantity of coal ash sufficient to fill said vertical section of said compartment; and
- C. heating said sample at a predetermined slow rate at least until said coal ash therein becomes molten and fills at least said vertical section of said compartment, the temperature of said sample at that point being approximately the temperature at which said coal ash has a viscosity of 250 poises.

4,009,606

#### DEVICE FOR THE STUDY OF MATERIALS SUBJECTED TO ALTERNATE TENSILE AND COMPRESSIVE TESTS

Jean-Claude Clebant, Carbon Blanc, and Jean-Claude Fecan, Merignac, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

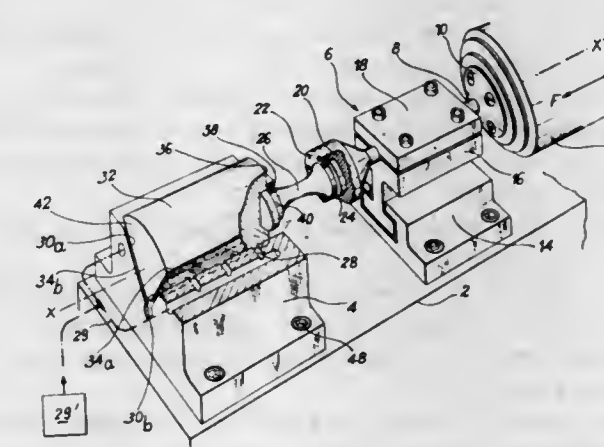
Filed Jan. 21, 1976, Ser. No. 650,918

Claims priority, application France, Jan. 27, 1975, 75.02444

Int. Cl.<sup>2</sup> G01N 3/32

U.S. Cl. 73-91

7 Claims



1. A device for subjecting n (n > 1) test specimens of a material to alternate tensile and compressive stresses, wherein



said device comprises an excitation source having a horizontal axis of displacement, a guide rod in which one end of said rod is rigidly fixed to said exciter and the other end is fitted with  $n$  elements for securing one of the ends of the  $n$  test specimens, said rod being guided so as to be capable of free translational displacement along a horizontal axis and a massive part provided with  $n$  horizontal bearing blocks and with nozzles for the injection of a gas under pressure, said  $n$  bearing blocks being thus intended to constitute gas bearings for  $n$  cylindrical masses which each have a horizontal axis, said masses being provided on that face which is directed towards said rod with an element for securing the other end of one of the  $n$  test specimens.

4,009,607

# FORCE MEASURING SYSTEM INCLUDING COMBINED ELECTROSTATIC SENSING AND TORQUING MEANS

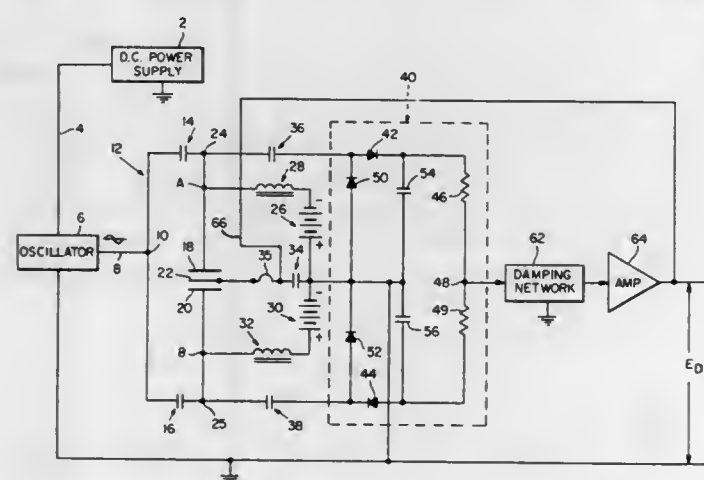
William H. Ficken, Berkeley Heights, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 24, 1975, Ser. No. 644,218

Int. Cl.<sup>2</sup> G01L 1/08, 1/14; G01P 15/08

U.S. Cl. 73-141 R

4 Claims



1. A force measuring system, comprising: a signal source for providing a relatively high frequency alternating signal; a capacitance bridge arrangement connected to the signal source and energized by the high frequency alternating signal therefrom, and including a pair of fixed capacitors and a pair of variable capacitors formed by a displaceable force sensitive element displaceably mounted to a case and disposed between two plates fixed to the case, the force sensitive element normally in a null position relative to the fixed plates for providing a balanced bridge condition; the displaceable force sensitive element being displaced by an applied force toward one of the fixed plates for providing an unbalanced bridge condition; means responsive to the unbalanced bridge condition for providing an error signal; the displaceable force sensitive element connected to the error signal means and energized by the signal therefrom; means for connecting the displaceable force sensitive element to ground; means for providing constant level signals for energizing the two fixed plates; means connected between the means for providing the constant level signals and the two fixed plates for isolating the constant level signals from the high frequency alternating signal; and an electrostatic reaction between the energized displaceable force sensitive element and the energized fixed plates providing a restoring force for restoring the force sensitive element to the null position, the restoring force being a measure of the applied force.

4,009,608

# SHEAR MEASURING FLEXURE ISOLATED LOAD CELLS

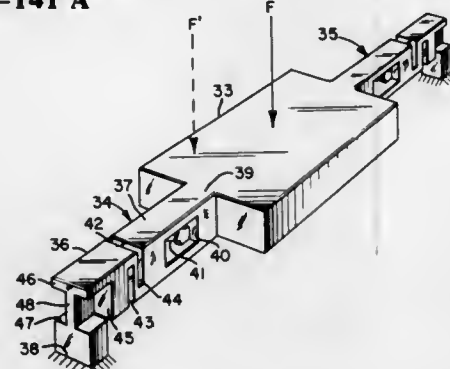
Alfred Newman Ormond, 11969 E. Rivera Road, Santa Fe Springs, Calif. 90670

Division of Ser. No. 542,369, Jan. 20, 1975, Pat. No. 3,985,025. This application Jan. 12, 1976, Ser. No. 648,454

Int. Cl.<sup>2</sup> G01L 1/26

U.S. Cl. 73-141 A

2 Claims



1. In combination, at least two shear measuring load cell bodies, each having first and second end portions, one of said end portions including load responsive strain gage means and the other including integrally formed flexure means, and a platform for carrying a load generally normal to the plane of the platform, said load cell bodies being secured between peripheral points of said platform and a stationary structure such that a straight line passing through said first and second end portions is parallel to the plane of said platform, said flexure means substantially isolating extraneous moments from said load responsive strain gage means so that only a force component normal to the plane of said platform is measured, said one end portion including a cut-out window having an integrally formed diagonal bar lying in a plane normal to the plane of the platform and parallel to said straight line, said strain gage means comprising strain gages fixed to opposite sides of said bar, said flexure means comprising oppositely directed slots in said other end portion of said body defining therebetween a first flexure web lying in a plane perpendicular to said straight line and to the plane of said platform, and a cut-out portion defining opposed flanges having a second flexure web therebetween lying in a plane including said straight line and normal to said first flexure web and the plane of said platform, said second flexure web isolating extraneous torsion forces from said strain gages.

4,009,609

# METHOD AND APPARATUS FOR TESTING A SUBSURFACE FORMATION FOR FLUID RETENTION POTENTIAL

Wayne L. Sayer, 1755 Trinity, No. 12, Walnut Creek, Calif. 94596, and Pat Wright, 1967 Desert Circle, Apt. No. 8, Walnut Creek, Calif. 94598

Filed Aug. 15, 1975, Ser. No. 605,213

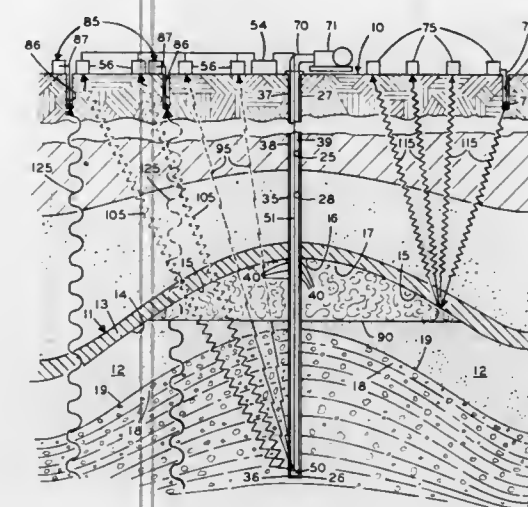
Int. Cl.<sup>2</sup> G01V 9/00

U.S. Cl. 73-155

12 Claims

1. A method for testing a subsurface formation for fluid retention potential, comprising the steps of: forming a borehole leading into communication with the formation; inserting a buoyant fluid into the formation through the borehole laterally thereof; and conducting test energy, affected by contact with said fluid,

through the formation laterally of the borehole to determine the location and concentration of the fluid within



the formation by determination of the test energy affected by contact with said fluid.

4,009,610

# ROLL MOUNT FOR PLUG ROLLING MILL

Manfred Hien, and Paul Schmitt, both of Saarbrücken, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

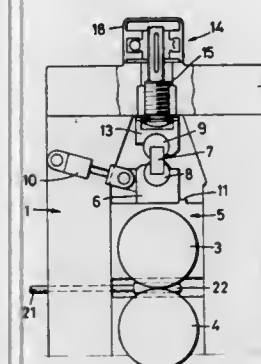
Filed Apr. 30, 1976, Ser. No. 681,825

Claims priority, application Germany, May 22, 1975, 2523023

Int. Cl.<sup>2</sup> B21B 31/32, 17/10, 25/02

U.S. Cl. 72-209

5 Claims



1. In a plug rolling mill having a stand and a pair of grooved rolls the improvement comprising in combination: a carrier for one of the rolls of the pair disposed for up and down movement in the stand; first hydraulic means coupled to the carrier and to the stand for holding said carrier in vertically variable positions in relation to the other one of the rolls of the pair; a carriage laterally movably disposed on the carrier; second hydraulic means coupled to the stand and to the carriage for reciprocating the carriage on the carrier; a pivotal mount for said carriage holding the carriage against the carrier in a first, protracted position of the second drive thereby urging the carrier and the one roll into a particular operating position, the mount permitting said carrier to yield in a direction away from said other roll upon retraction of the carriage by the second drive from the first position; and means for mounting said mount to said stand so that forces acting on the carrier during rolling are being reacted through the carriage and the mount into the stand.

4,009,611

# HAND-HELD MICROPIPETTOR WITH IMPROVED PIPETTE TIP EJECTOR

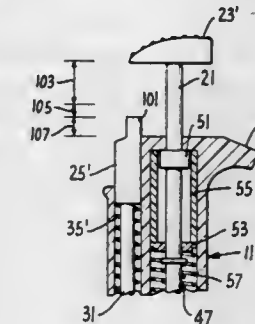
George Warren Koffer, Los Altos, and Doud Roger Branham, Redwood City, both of Calif., assignors to Oxford Laboratories Inc., Foster City, Calif.

Filed May 13, 1976, Ser. No. 686,240

Int. Cl.<sup>2</sup> B01L 3/02

U.S. Cl. 73-425.6

5 Claims



1. In a hand-held micropipettor, comprising: an elongated body having one defined end, a piston chamber within said body oriented along the length of said body, a piston within said piston chamber and adapted to move back and forth in an axial direction of said elongated body, means extending from said piston out of said one defined end of said body to a first knob for providing such reciprocal motion to said piston by depression of said first knob, a resilient element normally urging said first knob outward away from said one defined end of the body, another end of said body being adapted to frictionally engage the interior of a detachable plastic tip, a tip ejecting sleeve surrounding at least a portion of said body adjacent its said tip holding end and operable in an axial direction along the body between a normal position that does not interfere with the attachment of a tip to said another end and a tip ejecting position which forces a tip from said another end of the body, and a resilient means operably connected between said ejecting sleeve and said body for urging said sleeve toward its said first position absent manual operation thereof, the improvement comprising: a second knob body positioned at said one defined body end and adjacent said first knob, and means connecting said second knob and said tip ejecting sleeve for operating said sleeve to its said second position upon an axial movement of said second knob in a direction toward said tip engaging end of the body.

4,009,612

# WHEEL BALANCER

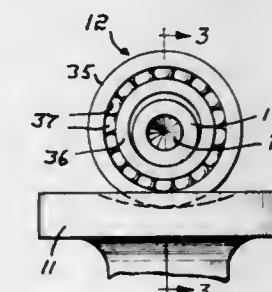
James A. Johnson, 59 Ocean House Road, Cape Elizabeth, Maine 04107

Filed Nov. 24, 1975, Ser. No. 634,931

Int. Cl.<sup>2</sup> G01M 1/12

U.S. Cl. 73-480

5 Claims



1. A device for use in supporting a circular member to



determine whether it is balanced relative to its axis of rotation as defined by an axial shaft member extending from both sides of the circular member, spaced support members, each having an upwardly opening arcuate seat, and bearing units for each end of the axial member and of the type including inner and outer races and a series of rotatable members rotatably confined therebetween, the radius of each seat greater than that of each outer race, the outer race of each unit resting on and centered by the appropriate one of said seats and held against turning by the weight of the circular shaft members and the other race member of each unit free to turn as the axial member turns in response to any unbalancing weight distribution of the circular member, each shaft member end supported by a corresponding one of the inner races, and the diameter of each inner race greater than the diameter of the ends of the member it supports.

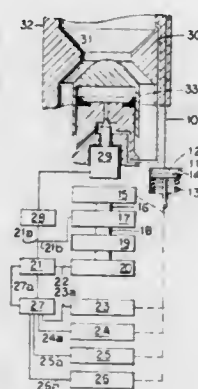
4,009,613

# APPARATUS AND METHOD FOR INDICATING AT THE SURFACE THE MEASUREMENT OF A DOWNHOLE CONDITION

John D. Jeter, 201 W. Clara, Iowa Park, Tex. 76367  
Division of Ser. No. 409,176, Oct. 24, 1973, Pat. No. 3,908,453. This application July 24, 1975, Ser. No. 598,708  
Int. Cl.<sup>2</sup> F21B 47/06

U.S. Cl. 73—155

21 Claims



1. A method of indicating at the earth surface the measurement of a condition in an earth borehole in which a pipe string is situated comprising the steps of; measuring the condition, sending a signal to the surface after a delay that is proportional to the measurement and measuring the delay in terms of the amount of movement of at least one material moving within the pipe string outer surface envelope.

4,009,614

# APPARATUS FOR MONITORING TWO-PHASE FLOW

John D. Sheppard, Oak Ridge, Tenn., and Long S. Tong, Gaithersburg, Md., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 19, 1975, Ser. No. 642,439

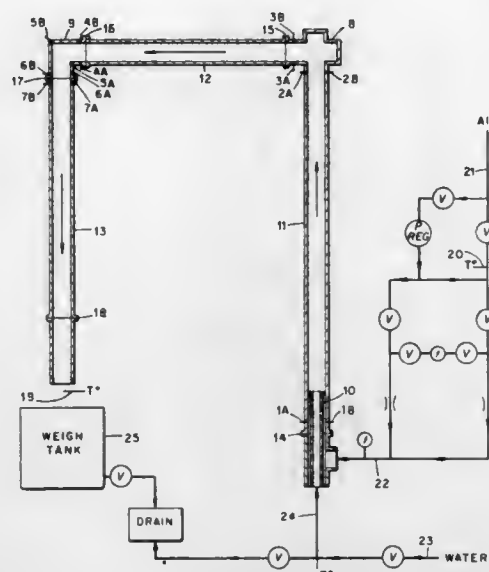
Int. Cl.<sup>2</sup> G01F 1/86

U.S. Cl. 73—195

3 Claims

1. In a system for monitoring transient two-phase flow rates, said system including a flow tube provided with a vertical leg having a vapor-liquid mixture flowing therethrough, said vertical leg including an instrumented piping spool piece for monitoring flow of said air and water mixture through said flow tube, said spool piece including a drag disk flowmeter, a gamma densitometer, and a turbine flowmeter, the improvement comprising a flow disperser mounted in said vertical leg of said flow tube upstream from said spool piece, and said drag

disk flowmeter being positioned upstream from said turbine flowmeter, whereby the mass two-phase flow rate through said



flow tube can be accurately determined from the outputs of the flow meters and the densitometer of said spool piece.

4,009,615

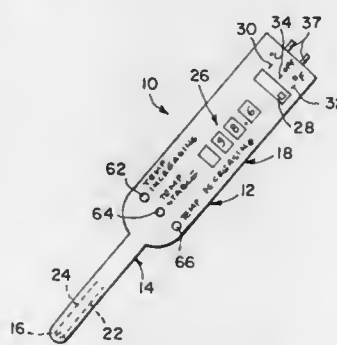
# SELF CONTAINED ELECTRONIC DIGITAL THERMOMETER

George A. Ruhl, 95 Hartley Ave., Mt. Vernon, N.Y. 10550  
Filed Dec. 23, 1975, Ser. No. 643,677

Int. Cl.<sup>2</sup> G01K 3/00

U.S. Cl. 73—362 AR

1 Claim



1. A digital thermometer device comprising: an elongated probe carrying a temperature electrical transducer means at its front end and a first electrical digital display means at its rear end; said transducer means having an analog output; switch means mounted on the rear end of said probe for selecting readout of said first display means in either degrees Fahrenheit or degrees Centigrade; and circuit means housed within said probe for converting the analog output of said transducer means to a digital signal for driving said first display means; said circuit means including amplifier means fed by said analog output; said amplifier means having first and second sets of gain and bias parameters selectable by said switch means; second electrical display means on the rear end of said probe for indicating whether the analog output of said transducer is increasing, decreasing or is substantially stable; a differentiator means fed by said amplifier means and feeding said display means; said comparator means having three output signals for feeding said second display means, a first output indicative of whether the output of said differentiator means is greater than a predetermined positive constant; a second output indicative of whether said differentiator output is less than the negative of said constant; and a third output indicative of whether said differentiator output is between said positive constant and the negative of said constant.

4,009,616

# ACOUSTIC METHOD FOR MEASURING GAS PRESSURE

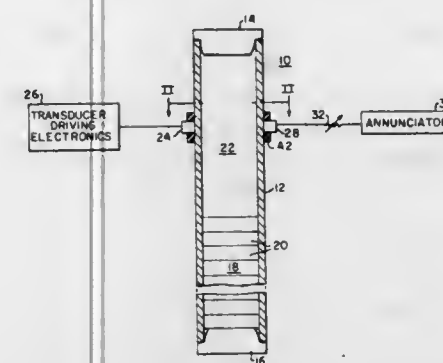
James W. Wonn, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 29, 1975, Ser. No. 545,238

Int. Cl.<sup>2</sup> G01L 9/00; G01N 29/02

U.S. Cl. 73—398 R

8 Claims



1. A method of nondestructively measuring over a wide continuous range of pressures the gas pressure within a pressurized nuclear fuel element having a nuclear fuel region and a gas plenum hermetically sealed within an elongated tubular cladding having portions of the cladding walls constructed of an acoustically conductive medium, without violating the integrity of the cladding comprising the steps of:

generating an acoustic signal exterior of the cladding; transmitting the acoustic signal through an acoustically conductive portion of the cladding wall in the plenum region along a selected path within the gas medium sealed within the plenum in a direction across the longitudinal axis of the fuel element that continues through a second acoustically conductive portion of the cladding wall; receiving the acoustic signal after it has traversed the selected path through the gas, exterior of the second portion of the cladding wall; converting the received acoustic signal into a corresponding electrical output; and calibrating the electrical output against a standard to provide a direct measure of the pressure of the gas within the enclosure over a wide range of pressures.

4,009,617

# ON-LINE LIQUID SAMPLERS

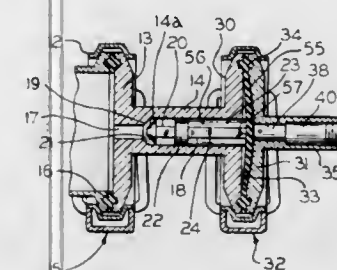
Julius Theodore Johnson, 348 - 20th St. SE., Cedar Rapids, Iowa 52403

Filed Mar. 18, 1976, Ser. No. 667,971

Int. Cl.<sup>2</sup> G01N 1/14

U.S. Cl. 73—422 TC

8 Claims



1. A sampling device for periodically withdrawing small samples of a liquid flowing through a pipe, which device comprises a sample intake member having a sample intake passage, an entrant port at one end of said intake passage, and a diaphragm pumping chamber at the opposite end of said intake passage; said diaphragm pumping chamber having a flexible diaphragm extending thereacross and subdividing said chamber into a pneumatic side and liquid pumping side, the latter being in communication with said intake passage; means for periodically applying pneumatic pressure to the pneumatic

side of said chamber; a check valve axially slidable in said intake passage; a valve seat in said intake passage adjacent said port; a valve head on one end of said check valve seatable in said valve seat upon axial movement of said check valve toward said port; said check valve having its opposite end projecting into said chamber and in contact with said diaphragm whereby said check valve is moved positively by said diaphragm during its pumping stroke to port-closing position when pneumatic pressure is applied to said diaphragm, said valve and said intake passage having spaced portions therebetween for flow of liquid into and through said passage into said chamber; a sample discharge member having a sample discharge passage communicating with said intake passage; valve means in said discharge passage adapted to open upon build-up of liquid pressure in said intake passage and diaphragm chamber during said pumping stroke of said diaphragm; and means on said sample discharge member for collecting the increments of samples of liquid withdrawn from said pipe by said sampling device.

4,009,618

# REACTOR SAMPLER

Robert Michael Chatham, Cleethorpes, England, assignor to Continental Oil Company, Ponca City, Okla.

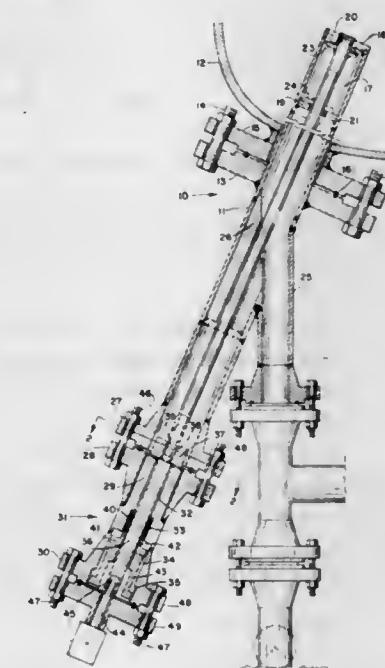
Filed Feb. 12, 1976, Ser. No. 657,671

Claims priority, application United Kingdom, Feb. 17, 1975, 6592/75

Int. Cl.<sup>2</sup> G01N 1/10

U.S. Cl. 73—424

10 Claims



1. A sampling apparatus for removing a sample of particulate solid catalyst from the interior of a reactor comprising: a. an elongated tube member having an end cap with an opening therein; b. an actuating rod extending through said tube member and having a pair of discs attached thereto, each of said pair of discs having a notched opening therethrough, and said pair of discs being spaced longitudinally one from the other; c. a plate member in said elongated tube member longitudinally spaced from said end cap, said plate member being affixed to the interior of said tube member and having a first opening therethrough through which said actuating rod extends, said plate member having a second opening therethrough for delivery of catalyst particles; d. a sample chamber defined by the portion of said elongated tube member between said end cap and said plate member, said sample chamber being selectively open to or isolated from the interior of a reactor in which it is located, and said sample chamber being selectively open to or isolated from a sample delivery means attached to said sampler;



- e. a turning member engageable with said actuating rod for rotation of said actuating rod, said turning member extending through a stuffing box detachably affixed to said elongated tube member, said stuffing box comprising a sleeve having a bore therethrough, said bore including a counterbored section and an expanded bore section terminating in a threaded section;
- f. packing ring means in the counterbored section of said bore and about the turning member extending therethrough;
- g. a packing nut in the expanded bore portion of the stuffing box threadedly engaged with the expanded bore section of said stuffing box; and
- h. a packing gland between said packing nut and said packing ring means.

4,009,619

## ACCELEROMETERS

Mattheus Johannes Snyman, 805 Lukas Meyer St., Tileba, Pretoria, Transvaal, South Africa

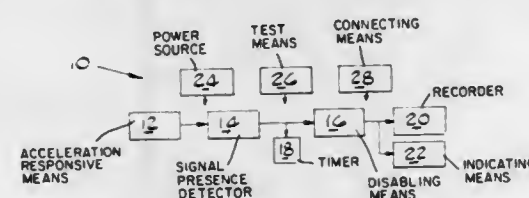
Filed Apr. 18, 1975, Ser. No. 569,406

Claims priority, application South Africa, Apr. 19, 1974, 74/2501

Int. Cl.<sup>2</sup> G01P 15/08

U.S. Cl. 73—517 R

7 Claims



1. Apparatus for detecting and recording abuse of a motor vehicle, including:
- an acceleration responsive means which provides a first output signal responsive to acceleration of the vehicle above a preset level;
  - a signal presence detector means connected to the acceleration responsive means providing a second output signal when the first output signal persists for a first predetermined period of time;
  - a recorder;
  - means responsive to the second output signal for actuating the recorder and then preventing the recorder from recording any further signals during a second period of time substantially greater than the first period of time.

4,009,620

## DRIVE BELT

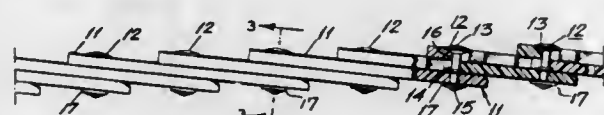
Lawrence M. Thompson, Lancaster, Pa., assignor to The Arbee Corporation, Manheim, Pa.

Filed Sept. 25, 1975, Ser. No. 616,768

Int. Cl.<sup>2</sup> F16G 51/80; B29H 7/22

U.S. Cl. 74—236

5 Claims



1. A drive belt comprising a series of links arranged in superimposed successive overlapping relation, each of said links having apertures at the forward, intermediate and trailing portions of the link, fastening means extending through the apertures in the overlapping portions of the link and having means at the opposite end thereof engaging the innermost and outermost links to secure said plurality of links together, said links comprising a homogeneous material devoid of fibrous reinforcement and consisting of a segmented thermoplastic

copolyester containing long chain ester units derived from dicarboxylic acids and long chain glycols and short chain ester units derived from dicarboxylic acid and low molecular weight diols, and having a durometer higher than 40D(92A) and lower than 72D.

4,009,621

## ASSEMBLY OF CHAIN SPROCKETS AND CRANKS FOR BICYCLE

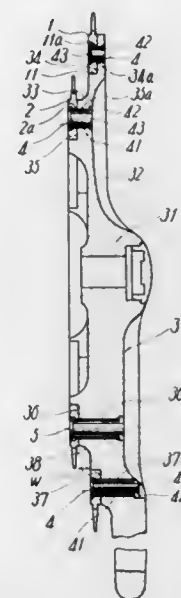
Takashi Segawa, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Mar. 3, 1976, Ser. No. 663,364

Int. Cl.<sup>2</sup> F16H 55/30, 55/12

U.S. Cl. 74—243 DR

7 Claims



1. An assembly of chain sprockets and cranks for a bicycle, comprising:
- a plurality of chain sprockets of different diameters, said chain sprockets being annular ring-like plate members with teeth on the outer periphery thereof and having mounting bores spaced circumferentially about said ring-like plate members;
  - a plurality of mounting arms for fixing said chain sprockets thereto; and fixing means for fixing said chain sprockets to said mounting arms respectively, said mounting arms having bases connected together, each of said mounting arms extending radially outwardly from its base and terminating in a tip, each of said tips having a mounting bore aligned with one of the mounting bores on the appropriate diameter sprocket, whereby said chain sprockets are supported by each of said seats and fixed thereto by said fixing means.

4,009,622

## COLLAPSIBLE MEMBER

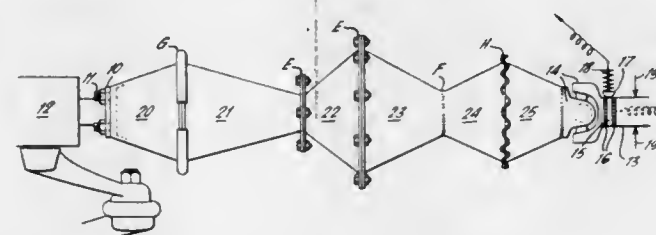
Mitja Victor Hinderks, 15a Adamson Road, London, England (NW3)

Filed Oct. 28, 1975, Ser. No. 626,535

Int. Cl.<sup>2</sup> B62D 1/18; A62C 35/12

U.S. Cl. 74—492

9 Claims



1. A collapsible structural member for absorbing loads,

comprising a plurality of generally truncated conical members substantially coaxially arranged in end-to-end relation, said structural member having a first predetermined length, at least one of said conical members including means facilitating the splitting of a portion of the conical surface of said at least one conical member upon application thereto of a predetermined, substantially axial load to thereby collapse said structural member to a second predetermined length.

4,009,624

## APPARATUS FOR MENDING A PUNCTURE IN A TUBELESS TIRE

Tatuji Nishino, No. 456-4, Oaza-Yakatabara, Fukuoka, Fukuoka, Japan

Continuation-in-part of Ser. No. 428,742, Dec. 27, 1973, abandoned, which is a division of Ser. No. 220,301, Jan. 24, 1972, abandoned. This application Aug. 6, 1975, Ser. No. 602,311

Claims priority, application Japan, Jan. 28, 1971, 46-3354[U]; Feb. 10, 1971, 46-5728; Oct. 26, 1971, 46-99863[U]

Int. Cl.<sup>2</sup> B60C 25/16

U.S. Cl. 81—15.7

5 Claims



1. An apparatus for use in mending a puncture in a tubeless tire, said apparatus comprising:

- a driver tool having a handle and a driver-shaped body, a first end of said body being in the form of an awl-like member having an elliptical cross-sectional configuration of decreasing size toward the tip of said first end, said awl-like member having a circumferentially extending grooved portion spaced from said tip, said grooved portion having an elliptical cross-sectional configuration, a second end of said body being connected to said handle, said handle having a recess with an inner wall coaxially surrounding a portion of said body, said inner wall having female threads therein;
- a sleeve member having therethrough a longitudinal bore of a size to fit over said driver-shaped body of said driver tool, said sleeve member having at one end thereof male threads of a size to engage with said female threads of said driver tool;
- whereby, with said driver tool and said sleeve member coupled such that said male threads of said sleeve member engage said female threads of said driver tool and such that said driver-shaped body of said driver tool extends through said longitudinal bore of said sleeve member, said awl-like member of said driver-shaped body and then said sleeve member may be inserted into a puncture in a tubeless tire, whereafter said driver tool may be manipulated to release the engagement between the female threads thereof and said male threads of said sleeve member, said driver tool may be removed from said sleeve member, said sleeve member remaining in said puncture, and a puncture plug may be inserted into said longitudinal bore of said sleeve member; and
- a plug insertion tool having a handle and a shaft member, said shaft member being connected at a first end thereof to said plug insertion tool handle, said plug insertion tool handle having a recess with an inner wall coaxially surrounding a portion of said shaft member, said inner wall of said plug insertion tool having therein female threads of a size to engage with said male threads of said sleeve member, a second end of said shaft member comprising means for forcing a puncture plug further into said sleeve member, whereby said plug insertion tool may be manipulated such that said plug forcing means forces said plug further into said sleeve member, said shaft member being inserted partially into said longitudinal bore of said sleeve member, whereafter said plug insertion tool may be manipulated to engage said female threads thereof with said male threads of said sleeve member, and said plug insertion tool and said sleeve member may be pulled from said puncture, said plug remaining in said puncture, and said shaft member having a length such that when said plug insertion tool and said sleeve member are removed from said puncture said plug will have an outer end portion projecting from the outer surface of said tire.

4,009,623

## FOOT LEVER CONSTRUCTION HAVING CONTROLLED FLEXIBILITY

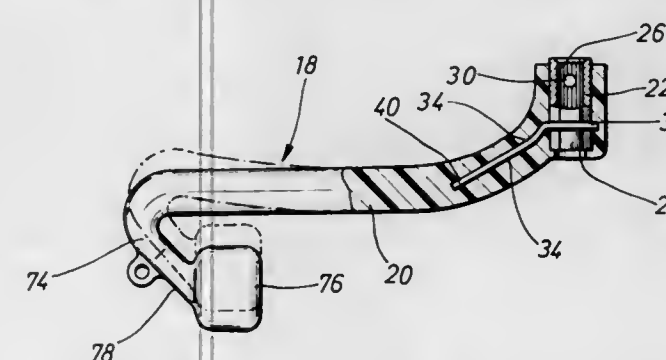
Grover C. Smith, and Thomas M. Smith, both of Houston, Tex., assignors to Interstate Sports, Inc., Houston, Tex.

Filed Dec. 17, 1974, Ser. No. 533,700

Int. Cl.<sup>2</sup> G05G 1/14

U.S. Cl. 74—512

14 Claims



1. A controllably yieldable foot lever for motorcycles and other mechanical devices which will yield in controllable manner in the event of impact with an object to prevent excessive forces from being transmitted to a lever shaft to which the lever may be connected and which is controllably yieldable to prevent the transmission of excessive torque forces to said lever shaft, said foot lever comprising:

- a body of yieldable material formed in the configuration of a foot lever and defining a free extremity and a shaft connection extremity of said lever extending in transverse relation to said shaft connection extremity;
- an insert of substantially rigid material and of non-cylindrical external configuration being intimately retained within said body of yieldable material at said shaft connection extremity, said insert being formed to be received in substantially immovable assembly with said lever shaft; shaft receiving means being formed within said insert; locking means being received by said insert and being adapted to establish locking engagement between said insert and said shaft; and
- an elongated structural element extending from said insert and being molded within said body of yieldable material, said elongated structural element extending within said body at least partially along the length of said body and terminating short of the free extremity of said lever and causing said lever to be more rigid in the vicinity of said shaft connection extremity than at said free extremity thereof.



4,009,625

**SELF-STRIPPING PUNCH WITH EARS**

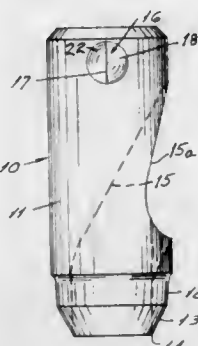
Paul D. Pfaff, Bloomfield Hills, Mich., assignor to Bernal Incorporated, Troy, Mich.

Filed Oct. 24, 1975, Ser. No. 625,636

Int. Cl.<sup>2</sup> B26D 7/26; B26F 1/14

U.S. Cl. 83—97

3 Claims



1. In a side outlet, self-stripping punch for mounting in a die board, the combination comprising:

- a cylindrical, elongated punch base provided with a cutting edge on the top end thereof;
- at least one integral locking ear formed on the periphery of the punch, adjacent the bottom end of the punch, for retaining the punch against rotation in a die board;
- said locking ear being provided with a flat face on one side thereof which is disposed on a plane that passes through the longitudinal axis of the punch; and,
- said locking ear being formed on the other side thereof in the form of an arcuate web.

4,009,626

**VARIABLE ROTARY CUTTER**

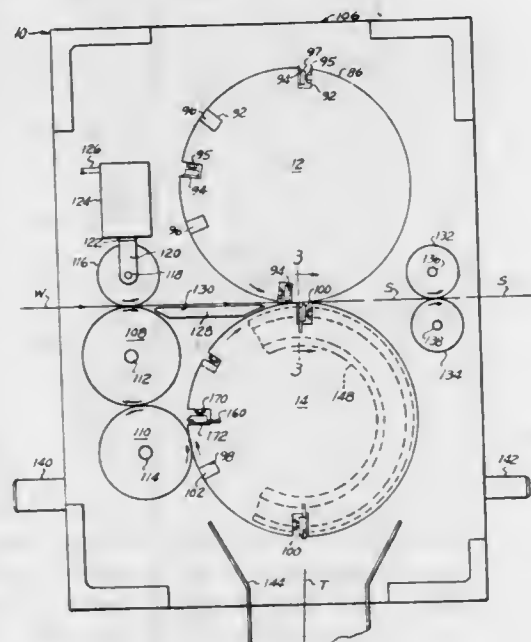
Richard H. Gressman, 37342 Glenbrook Ave., Mt. Clemens, Mich. 48043

Filed July 9, 1975, Ser. No. 594,294

Int. Cl.<sup>2</sup> B26D 1/36, 1/40

U.S. Cl. 83—116

8 Claims



1. A variable rotary cutter for cutting sheets of predetermined lengths from an elongated web of sheet material moving therepast, said cutter comprising a frame,

- a pair of substantially cylindrical cutting rolls rotatably mounted in said frame upon parallel axes of rotation and having peripheries disposed in close proximity to one another and defining a web path therebetween,
- each of said rolls having secured to its periphery a plurality of axially extending straight cutting blades mounted

thereon parallel to the axis of rotation thereof in circumferentially-spaced parallel relationship and having thereon anvil portions extending between said cutting blades with the cutting edges of the cutting blades of each roll substantially engaging the anvil portions of the other roll in compression-cutting relationship therewith,

each of said rolls having a helical gear drivably connected thereto, each helical gear being disposed in meshing engagement with the other helical gear, certain of the cutting blades of each cutting roll coacting with the anvil portions of the opposite cutting roll to compression-cut the opposite ends of workpiece sheets of predetermined circumferential lengths from the web passing therebetween, and means operable during rotation of said cutting rolls for adjustably moving one of said helical gears axially relatively to the other helical gear and thereby adjustably rotating one of said cutting rolls relatively to the other cutting roll and consequently varying the circumferential spacing of the straight cutting blades of said one cutting roll relatively to the straight cutting blades of said other cutting roll whereby during operation to adjustably vary the circumferential lengths of the workpiece sheets cut from the web between said straight cutting blades of said cutting rolls.

4,009,627

**DEVICE FOR DISPENSING PORTIONS OF A CHAIN**

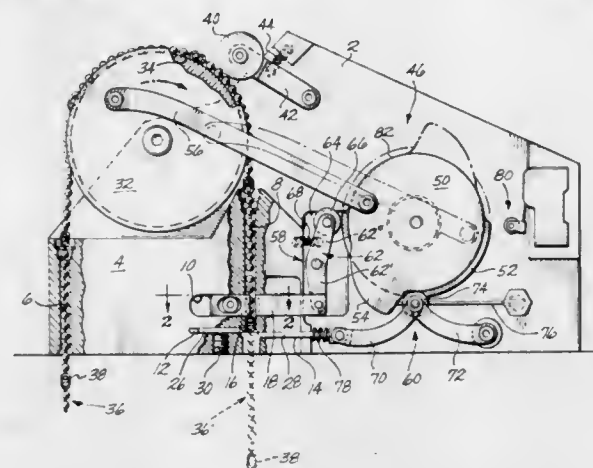
Cliff High, Tacoma, Wash., assignor to Morley Brotman, Tacoma, Wash.

Filed Nov. 3, 1975, Ser. No. 628,399

Int. Cl.<sup>2</sup> B26D 5/40

U.S. Cl. 83—205

14 Claims



1. A device for dispensing portions of a chain having relatively diametrically enlarged segments at substantially regularly spaced intervals along the length thereof, comprising a pair of collar forming jaws and means for supporting the chain so that it is movable relatively lengthwise thereof through the opening in the collar, the jaws being relatively reciprocally mounted to enable the collar to be opened and closed about the chain, and the opening in the collar having a diameter of less than that of the relatively enlarged segments of the chain in the closed condition of the collar; a chain engaging member relatively reciprocally mounted on one side of the collar, and operable to advance the chain lengthwise in the direction of the collar when said member reciprocates in one direction thereof, and alternately, to undergo slippage lengthwise of the chain, in the direction away from the collar, when said member is reciprocated in the other direction; means operable to sever the chain at a point on the opposite side of the collar; and means interconnected with the jaws, the chain engaging member, and the chain severing means, to actuate the same in two stages, in the first stage of which the actuating means is operable to open the collar and reciprocate the chain engaging member in the one direction thereof, to the extent that a portion of the chain including one segment therein, is fed

through the opening in the collar and assumes a position on the other side thereof, and in the second stage of which, the actuating means is operable to close the collar and actuate the chain severing means, while reciprocating the chain engaging member in the other direction thereof, to tension the chain against the collar.

4,009,628

**SYSTEM FOR CUTTING PIECES FROM A TRAVELING STRIP OF SHEET MATERIAL**

Tetsuji Kato, Otake, Japan, assignor to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

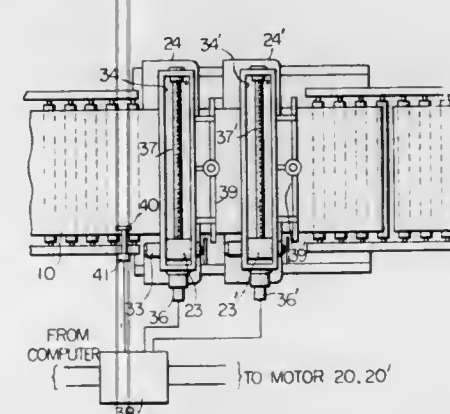
Division of Ser. No. 434,065, Jan. 17, 1974. This application Dec. 16, 1974, Ser. No. 533,182

Claims priority, application Japan, Jan. 18, 1973, 48-8169; Jan. 18, 1973, 48-8170

Int. Cl.<sup>2</sup> B23D 45/20

U.S. Cl. 83—294

7 Claims



1. An apparatus for cutting a traveling strip of plastic into pieces and comprising a stationary bed positioned under the traveling strip and a pair of units mounted on said bed and through which the strip travels in succession; each unit comprising an upstanding frame mounted on said bed and extending transversely across the strip and which is reciprocative on the bed in the strip's longitudinal direction, said frame having powered means for reciprocating it independently and individually with respect to the corresponding frame of the other unit, and said frame mounting a screw-threaded drive shaft extending transversely across the strip and having a guideway parallel to the shaft and a carriage in screw-threaded engagement with the drive shaft and reciprocally guided by the guideway to traverse the strip, said drive shaft having a rotary drive motor which is independently and individually operative with respect to the corresponding drive motor of the other unit, a rotary motor and rotary saw assembly being mounted by said carriage with the saw positioned to make a transverse cut in the strip; each of said units being individually reciprocative and its screw-threaded drive shaft drive motor being individually controllable.

4,009,629

**APPARATUS FOR CUTTING POLYMER FLAKE**

Dorsey O. Thomas, Jr., Chesterfield, and Alvah B. Terry, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed July 28, 1975, Ser. No. 599,809

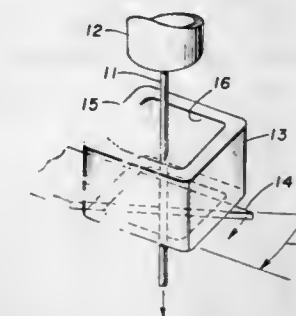
Int. Cl.<sup>2</sup> B26D 5/20

U.S. Cl. 83—355

1 Claim

- a die having a passageway for forming a strand,
- a rectangular shear bushing secured to the die in such a position that the strand passes through said shear bushing, the size of the shear bushing relative to the size of the strand forming passageway being such that the strand is free to vary its position at random as it moves through said shear bushing.
- a rotor, and

d. a cutter mounted on the rotor, said rotor being so positioned that an edge of the cutter cooperates with the edge



of one of the inner surfaces of the shear bushing to sever the strand, said cutter edge being at an angle of 4°-15° to the bushing edge when the strand is severed.

4,009,630

**DEVICE WITH MOVABLE END STOP MEANS FOR PIECES OF LUMBER TO BE CUT INTO SHORTER PIECES**

Rolf Ekholm, Nyland, Sweden, assignor to AB Hammars Mekaniska Verkstad, Nyland, Sweden

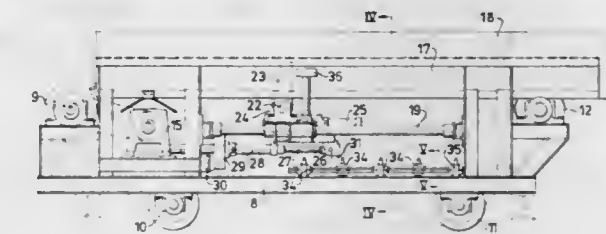
Filed Sept. 19, 1975, Ser. No. 614,844

Claims priority, application Sweden, Oct. 7, 1974, 7412582

Int. Cl.<sup>2</sup> B26D 5/28, 7/16

U.S. Cl. 83—369

4 Claims



1. A device having a conveyor with a carrying plane for longitudinal feeding of pieces of lumber against an end stop device with means for adjusting the distance between said end stop device and saw means for cutting off a piece of lumber into several pieces, said end stop device adjusting means comprising:

- a slide located under the carrying plane of the conveyor;
- a hydraulic device for displacing said slide along a pair of guiding means arranged in the longitudinal direction of the conveyor;
- stop means having at least two spaced arms for cooperation with, in the transport direction, the front end of the piece of lumber;
- said stop means supported by a horizontal shaft mounted on said slide; and
- said horizontal shaft rotatable by hydraulic means for swinging said stop means arms between a first stopping position above said carrying plane and a second position below said carrying plane of the conveyor.

4,009,631

**DEVICE FOR HOLDING PIECES OF LUMBER WHEN THEY ARE CUT**

Rolf Ekholm, Nyland, Sweden, assignor to AB Hammars Mekaniska Verkstad, Nyland, Sweden

Filed Sept. 19, 1975, Ser. No. 614,845

Claims priority, application Sweden, Oct. 7, 1974, 7412581

Int. Cl.<sup>2</sup> B27B 5/10, 5/18; B26D 5/42

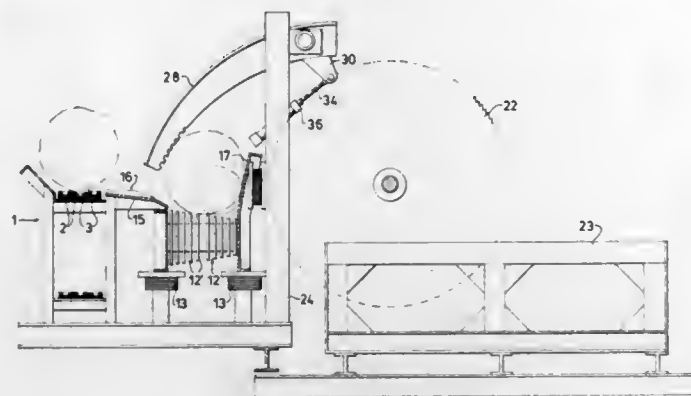
U.S. Cl. 83—375

6 Claims

1. A device for holding pieces of lumber to be cut by movable saw means comprising, a saw blade, a conveyor including transport rollers arranged to support and feed a piece of lumber to a discharge end of the conveyor, said saw means being positioned at said discharge end and movable in a plane trans-



verse to that of the conveyor, at least one clamping arm positioned ahead of said saw means along the feeding direction of the piece of lumber, at least one generally vertical abutment plate positioned for supportive engagement of said lumber disposed on said conveyor, said clamping arm being swingable



in a vertical plane substantially parallel to the plane of movement of the saw means in a direction to and from said abutment plate to clamp and engage the lumber against the abutment plate, said saw blade being movable to a cutting position at a side of the piece of lumber which is opposite to that side engaged by said clamping arm.

4,009,632

**SAWMILL LOG-HANDLING SYSTEM**

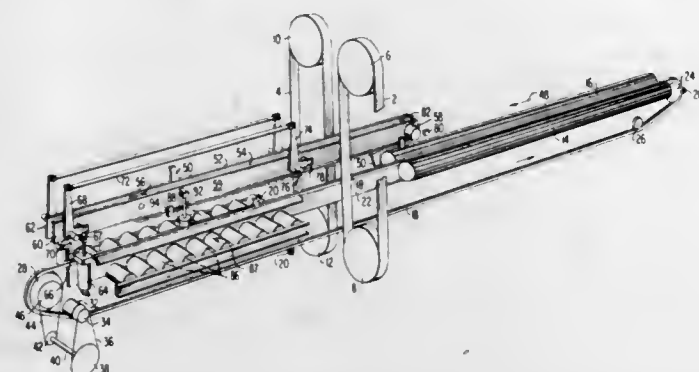
Robert K. Detjen, Eau Claire, Wis., assignor to McDonough Manufacturing Company, Eau Claire, Wis.

Filed Mar. 10, 1975, Ser. No. 556,836

Int. Cl.<sup>2</sup> B27B 15/08, 1/00

U.S. Cl. 83—731

17 Claims



1. A sawmill log handling system for advancing logs longitudinally along a given path from an infeed side of a saw, through the saw and to an outfeed side of the saw, said system comprising,

- rear log-engaging means for engaging a rearward end of a log,
- forward log-engaging means for engaging a forward end of said log,
- a lower carrier means for supporting one of said log-engaging means, said lower carrier means being positioned below the given path of the log,
- an upper carrier means for supporting the other said log-engaging means, said upper carrier means being an endless member movable in a continuous path and positioned above the given path of the log,
- rear drive means for moving a said carrier means to advance the rear log-engaging means along said given path to carry said logs from said infeed side, through the saw and to said outfeed side,
- said forward log engaging means engaging a forward end of said log while said log is being moved by said rear drive means, said forward log-engaging means being movable from the infeed side to the outfeed side as the log is cut by the saw, and,

forward drive motor means for moving said carrier means supporting the forward log-engaging means to drive the forward log engaging means forwardly away from the log after the log has passed through the saw.

4,009,633

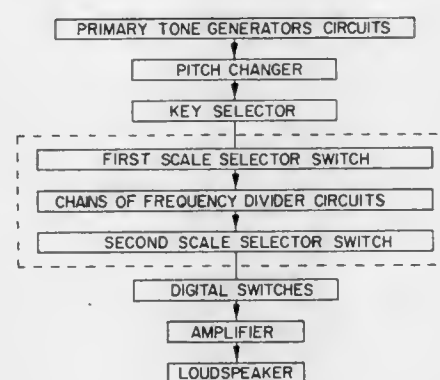
**ELECTRONIC MUSICAL INSTRUMENT**

Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806  
Continuation-in-part of Ser. No. 553,798, Feb. 27, 1975, and a continuation-in-part of Ser. No. 538,012, Jan. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 496,806, Aug. 12, 1974, Pat. No. 3,943,811. This application Oct. 14, 1975, Ser. No. 622,218

Int. Cl.<sup>2</sup> G10H 1/00, 5/02

U.S. Cl. 84—1.01

7 Claims



1. A method for selecting a single hexatonic musical scale from a plurality of hexatonic musical scales to be played on an electronic musical instrument, the improvement comprising: electronically generating at least first and second sets of six primary tone signals, corresponding respectively to the whole tone scale and an irregular hexatonic scale, the members of said first set of primary tone signals being arranged in a first sequence in order of increasing pitch, with constant intertone intervals of two semitones between consecutive members of said sequence, the members of said second set of primary tone signals being arranged in a second sequence in order of increasing pitch with at least one intertone interval of one semitone, at least one intertone interval of two semitones, at least one intertone interval as large as three semitones, and a maximum interval of eleven semitones between the first and last members of the sequence, arranging six chains of frequency divider circuits in a predetermined sequence, each chain of frequency divider circuits having a single audio input lead and a plurality of cascaded frequency divider circuits, each circuit with its individual output lead, successive cascaded circuits producing the input musical tone in descending octave relationship, selectively coupling one of said sequences of six primary tone signals to the six inputs of said predetermined sequence of six chains of cascaded frequency divider circuits, consecutive members of said sequence of primary tone signals being coupled to consecutive members of said predetermined sequence of chains of frequency divider circuits in order of increasing pitch.

4,009,634

**TOGGLE FASTENING DEVICE AND PROCESS FOR ITS MANUFACTURE**

Thomas C. Barmore, 4 N. 127 Verrill, Addison, Ill. 60101

Filed Nov. 14, 1975, Ser. No. 631,953

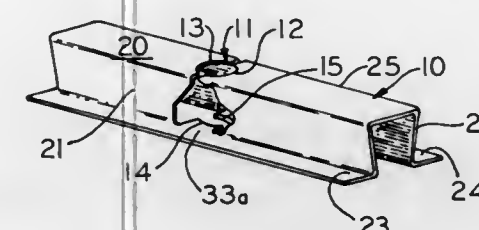
Int. Cl.<sup>2</sup> F16B 21/00

U.S. Cl. 85—3 R

6 Claims

1. A toggle fastening device comprising an elongated plate in which the central area is raised above the original plane of the plate to form a longitudinal rib having a top and spaced sides and providing side panels which extend in the original

plane of the plate, a central opening in the top of said rib, an opening in each of the sides of said rib, each of said side openings being defined by a cut line extending from said top opening and downwardly to a point on a side panel and a cut line extending from said top line to a point on said side panel which point is spaced from said first mentioned point, tabs extending inwardly from said side panels toward the interior of said rib, said tabs being between and spaced from said points,



said side openings being in communication with said top opening on opposite sides thereof whereby said plate is bendable at areas near said points to bring the ends of said plate forward each other to permit the plate to be inserted through a wall opening smaller than the length of the plate, and a screw in threaded engagement with said tabs and also in threaded engagement with the edges of said top opening when the ends of the plate are in a position of alignment.

4,009,635

**HELICOPTER LAUNCH AND RECOVERY DEVICE FOR HORIZONTAL FLOATING ASW MOBILE TARGETS**

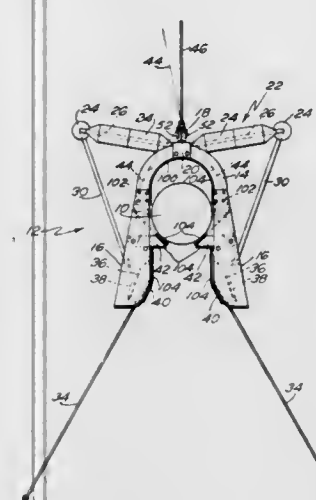
James M. Munro, North Kingstown; David L. Ramstad, Portsmouth, both of R.I., and Paul M. Getty, Sunrise, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1976, Ser. No. 680,621

Int. Cl.<sup>2</sup> F41F 5/02

U.S. Cl. 89—1.5 G

17 Claims



1. A launch system for mobile targets comprising: a U frame structure having a plurality of separated U clamps and a strongback connecting said U clamps; suspension means connected to the front and rear portions of said strongback for suspending said U frame; bomb shackle means connected to said U frame structure having a plurality of bomb shackles with wire cable attached to said bomb shackles, said wire cables adapted for encircling and holding a mobile target, said bomb shackle means adapted for releasing said wire cables; and an electrical cable system having a first plurality of electrical conductors connected to said bomb shackles and a second plurality of electrical conductors adapted to make a breakaway connection with the mobile target.

4,009,636

**HOBGING MACHINE**

Masato Ainoura, 1253 Eguchi, Kita-Shigeyasu-cho, Miyaki, Saga, Japan

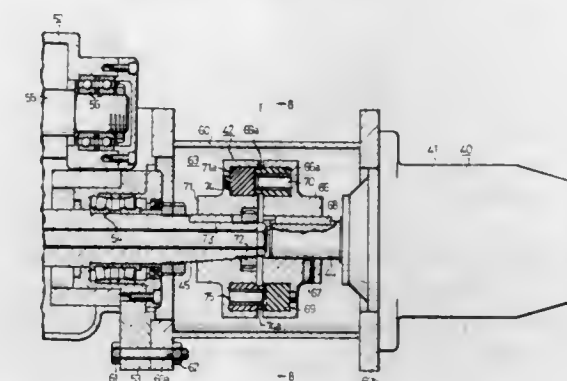
Filed Oct. 8, 1975, Ser. No. 620,784

Claims priority, application Japan, Oct. 19, 1974, 49-120675

Int. Cl.<sup>2</sup> B23F 11/00

U.S. Cl. 90—4

6 Claims



1. In a hobbining machine having:
  - a. a tool support member (22) operably provided on a machine frame and having a tool support shaft (24);
  - b. a workpiece support member (26) operably supported on said machine frame and serving to support a workpiece;
  - c. a tool (43) provided on said tool support shaft and serving to cut the outer periphery of the workpiece;
  - d. a fluid drive pressure motor provided on said tool support member in the neighborhood of said tool and having a motor shaft (44) extending coaxially with said tool support shaft;
  - e. a coupling (42) provided between said motor shaft (44) and tool support shaft (24) for directly driving said tool (43) and having means providing an effect of shock absorption, said means including:
  - f. a drive coupling member (66) secured on the end portion of the motor shaft and having an annular groove (66a);
  - g. a resilient annular buffer member (69) disposed in the annular groove and having a plurality of uniformly spaced drive projections (69a);
  - h. a driven coupling member (71) secured on the end portion of the tool support shaft (45) and having an annular groove (71a); and,
  - i. an annular buffer member (74) disposed in the annular groove (71a) of the driven coupling member and having a plurality of uniformly spaced driven projections (74a) engage with the drive projections.

4,009,637

**MILLING DEVICE**

Hans-Joachim Bittner, Hagen, Germany, assignor to H. Putsch & Comp., Germany

Filed Oct. 7, 1975, Ser. No. 620,291

Claims priority, application Germany, Oct. 16, 1974, 2449316

Int. Cl.<sup>2</sup> B23C 3/00

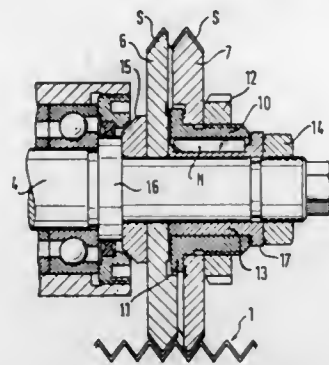
U.S. Cl. 90—11 B

16 Claims

1. Milling device for producing cutting chamfers on knives provided with roof-shaped cutting edges, which milling device comprises a milling arbor; a milling tool clamped to rotate circularly about a central axis of the milling arbor, the milling tool having roof-shaped cutting edges which cut chamfers which are to be produced on the roof-shaped cutting edges of the knives; and at least one further milling tool also having roof-shaped cutting edges, said tool being mounted on the milling arbor with a mounting means for circular rotation about said central axis and for non-rotatable motion relative to the milling arbor but freely movable during cutting along the axis of the milling arbor between limit means on said arbor to self-seek correct axial alignment for an adjacent cutting



edge on the knife; and wherein protrusions and recesses are formed in the mutually facing sides of the two milling tools at least in the region of their cutting edges, and the protrusions



on one milling tool extend into the recesses in the other milling tool to produce alternating overlapping of the cutting edges of the milling tools to simultaneously cut adjacent and closely spaced roof-shaped cutting edges of the knives.

4,009,638

## AMMUNITION CONTAINER

Robert Ramseyer, Versoix, and Hanspeter Novet, Hegnau, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

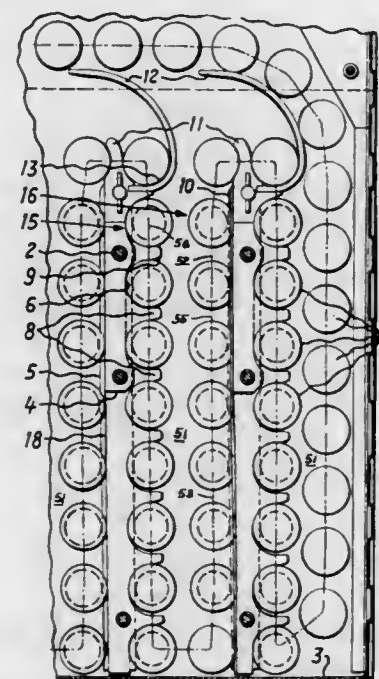
Filed Apr. 4, 1975, Ser. No. 565,010

Claims priority, application Switzerland, Apr. 10, 1974, 5045/74

Int. Cl.<sup>2</sup> F41C 25/00

U.S. Cl. 89—34

5 Claims



1. An ammunition container for the reception of a looped cartridge belt, comprising:

- a. a container structure;
- b. a plurality of supports arranged in said container structure so as to form therein a number of compartments, each compartment containing a loop of the cartridge belt;
- c. each support being equipped with spaced teeth extending the length thereof forming a plurality of aligned recesses for receiving cartridges therein;
- d. each loop of the cartridge belt consisting of two loop portions, one loop portion bearing against one support of the associated compartment and the other loop portion bearing against an oppositely situated support of such compartment, said loop portion containing a number of cartridges which correspond to the number of recesses in said support; and
- e. each recess of the support of each associated compart-

ment having arranged therein a respective cartridge of one loop portion of a loop of the cartridge belt located in such compartment.

4,009,639

## HYDRAULIC SWING MOTOR

Toshihiko Sabashi, Gifu, Japan, assignor to Kayabakogyo-Kabushiki-Kaisha, Tokyo, Japan

Continuation of Ser. No. 473,440, May 28, 1974, abandoned.

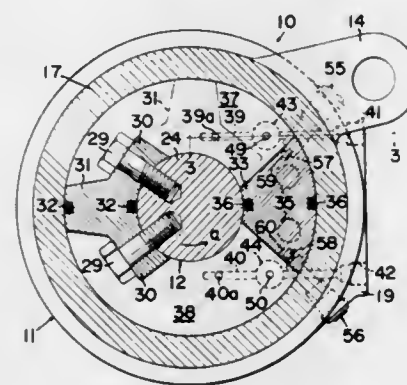
This application Nov. 28, 1975, Ser. No. 636,044

Claims priority, application Japan, Aug. 9, 1973, 48-93172[U]

Int. Cl.<sup>2</sup> F15B 15/22, 13/042

U.S. Cl. 91—25

6 Claims



1. A hydraulic swing motor, comprising
  - a casing having an annular center portion and two side plates closing opposite ends of said annular center portion;
  - a shaft journaled in said side plates and being rotatable in said center portion, said shaft defining with said casing a working chamber;
  - vane means subdividing said working chamber into two compartments and including a fixed first vane and a second vane mounted on said shaft for performing a swing stroke having two end positions;
  - a pair of hydraulic fluid inlet and outlet passages each having a first end portion communicating with the outside of said chamber and a second end portion,
  - each passage having a port connecting the respective end portion with one of said compartments and positioned to be closed by said second vane as the same approaches the respective end positions;
  - a pair of throttling valves each interposed in one of said passages and each communicating with one of said compartments intermediate said first vane and the respective end positions of said second vane for permitting only throttled escape of hydraulic fluid from the respective compartment subsequent to closing of the port in said compartment by said second vane;
  - and a pair of relief valves, both mounted within one of said side plates of said casing and each communicating with one of said compartments for limiting the maximum fluid pressure therein whereby, due to the pressure buildup resulting from the throttled escape of fluid subsequent to the closing of a port, a rapid braking of the swing stroke of said second vane occurs, but without danger of damage to said motor since the pressure build-up is quickly limited by the respective relief valve due to the location thereof within said one side wall close to the source of increased pressure and the point of initiation of said maximum fluid pressure.

4,009,640

## ANTI-LOCK BRAKE SYSTEM

Yasuhiro Takeuchi, and Haruhiko Iizuka, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 446,829, Feb. 28, 1974, Pat. No.

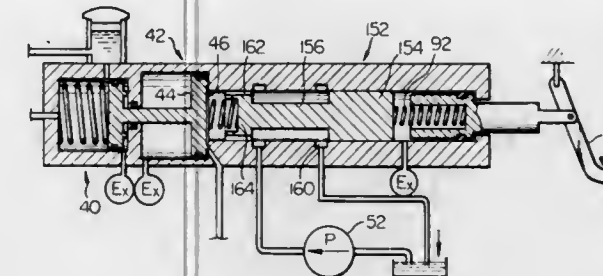
3,910,645. This application June 20, 1975, Ser. No. 588,629

Claims priority, application Japan, Mar. 1, 1973, 48-24693

Int. Cl.<sup>2</sup> F15B 13/042, 13/14

U.S. Cl. 91—47

1 Claim



1. In a motor vehicle having a pump means and a reservoir the combination comprising:

- a housing forming a power chamber and having an inlet port communicating operating fluid from the pump, and an outlet port in communication with the reservoir;
- a piston in said power chamber;
- a spool having a passage therein communicating with the power chamber and having axially spaced lands slidably engaging the housing, the lands and the ports being so constructed and arranged as to provide unrestricted communication between the passage and the outlet port when the spool is in a rest or starting position, whereby the pressure in the power chamber is substantially zero;
- means including a continuous pressure of operating fluid in the power chamber and a biasing spring between the piston and spool for biasing the spool to the rest position thereof;
- operator actuable means adapted to progressively move the spool relative to the housing to restrict fluid communication of the passage with the reservoir thereby increasing the operating fluid pressure to the power chamber;
- spring means disposed between the spool and the operator actuable means for damping force applied to the operator actuable means by the spool.

4,009,641

## COMPACT POWER STEERING GEAR

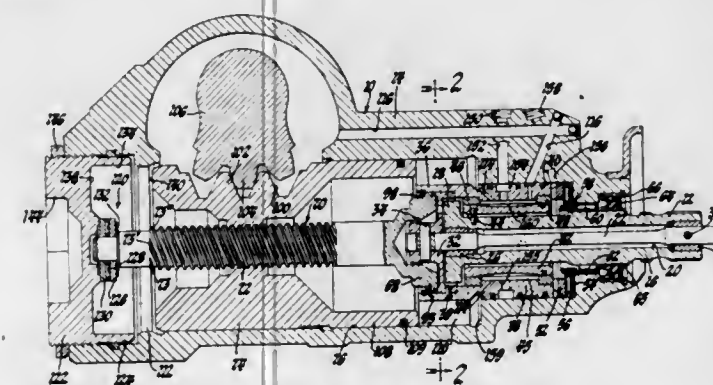
Robert P. Rohde; John H. Christ, and Stanley E. Anderson, Jr., all of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1975, Ser. No. 631,839

Int. Cl.<sup>2</sup> F15B 9/10

U.S. Cl. 91—375 A

5 Claims



1. A power steering gear unit comprising a housing, an input member operatively mounted for turning movement in said housing and extending outside one end thereof, an output member operatively mounted for turning movement in said housing and extending outwardly therefrom, piston means

mounted for longitudinal sliding movement in said housing and cooperating therewith to provide first and second expansible and contractible fluid pressure chambers therein, gear means drivingly connecting said piston means to said output member so that said output member turns in response to sliding movement of said piston means, valve means in said housing operatively connected to said input member and having a connection to a source of pressurized hydraulic fluid for selectively supplying and exhausting pressurized fluid to and from said chambers to hydraulically move said piston means and said connected output member to predetermined positions as controlled by the amount of movement of said input member, axially extending rotatable actuator means extending completely through said piston means and operatively connected thereto for mechanically moving said piston means in said housing, means operatively drivingly connecting said input member to said actuator member so that said actuator member can be turned by said input member, said actuator means having a head portion at one end thereof extending into one end of said valve means, and retainer ring means mounted within said valve means and engaging said head portion to prevent the axial separation of said actuator means and said valve means so that said input can turn said valve means and said actuator member.

4,009,642

## DIFFERENTIAL PRESSURE SENSING VALVE

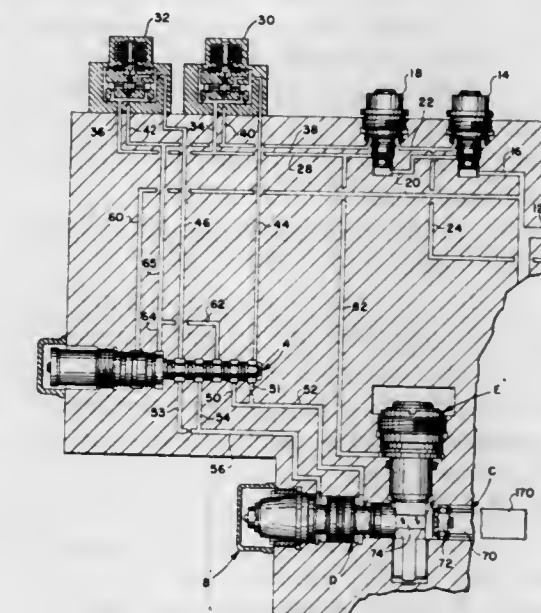
Robert D. Vanderlaan, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Nov. 6, 1974, Ser. No. 521,262

Int. Cl.<sup>2</sup> F15B 20/00

U.S. Cl. 91—464

14 Claims



3. A differential pressure sensing valve having a pair of inlet and outlet ports and an axially shiftable spool including axially-spaced land areas on which a pair of pressure sources connectable with said valve through said pair of inlet ports act in the same predetermined direction with spool shifting force, biasing means for biasing said spool in an opposite direction from said predetermined direction with spool shifting force, means for corresponding increasing the pressure at one of said inlet ports as the pressure at the other of said inlet ports is decreased and vice versa so that the total forces acting on said spool are substantially balanced over the normal operating range of said pressure sources for maintaining said spool in an operating position for normal flow of fluid through said valve between said inlet and outlet ports, and means for unbalancing said total forces acting on said spool for shifting said spool out of said operating position when said pressure sources substantially deviate from their normal operating range for blocking communication between said inlet and outlet ports.



4,009,643

**HYDRAULIC MOTOR FOR ROTATING THE BUCKET OF AN EXCAVATING MACHINE**

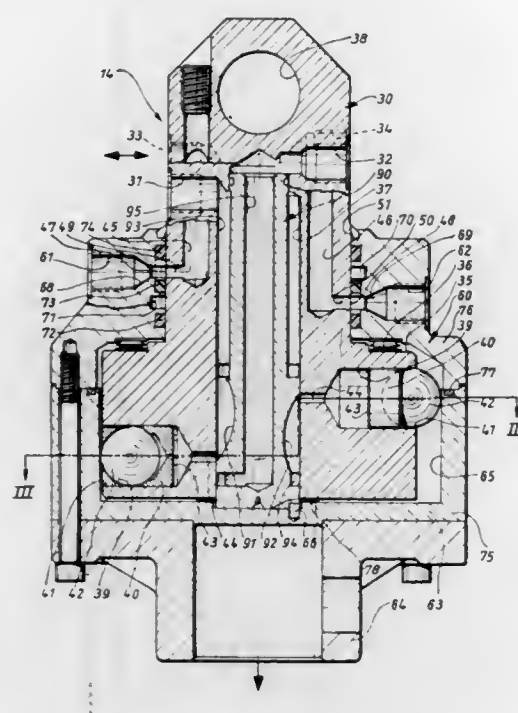
Heinz Thumm, Benzstrasse 9, D-7013 Oeffingen, Germany

Filed Feb. 26, 1975, Ser. No. 553,108

Int. Cl.<sup>2</sup> F01B 13/06; B66C 3/02, 3/16

U.S. Cl. 91-492

10 Claims

**1. A hydraulic motor comprising:**

- a. a first motor member and a second motor member movably engaging each other in an interface of circular cross section about a common axis,
  1. said first member being formed with a plurality of radial cylinder bores and an axial bore remote from said interface, each cylinder bore having an orifice in said axial bore,
  2. each cylinder bore receiving piston means including a cam follower,
  3. the other member having a radially undulating cam face extending about said axis in a closed loop,
  4. each cam follower engaging said cam face when pressure fluid is admitted to the associated cylinder bore while said motor members move relative to each other about said axis;
- b. a distributor member rotatably received in said axial bore and defining two connecting conduits sequentially communicating with said orifices during rotation of said distributor member in said axial bore; and
- c. coupling means coupling said distributor member to said second motor member for joint rotation about said axis while permitting limited radial and axial movement of said distributor member relative to said second motor member,
  1. one of said motor members being formed with two first accessible ports permanently communicating with said two connecting conduits respectively,
  2. each of said motor members being formed with two second accessible ports, two recesses in said interface, and two ducts respectively connecting said second ports to said recesses,
  3. each of said recesses permanently communicating with a corresponding recess in the other motor member in such a manner that said ducts and said recesses constitute two separate passages connecting the second ports of said first motor member to the second ports of said second motor member respectively.

4,009,644

**ROTARY ACTUATOR**

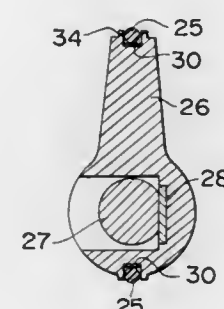
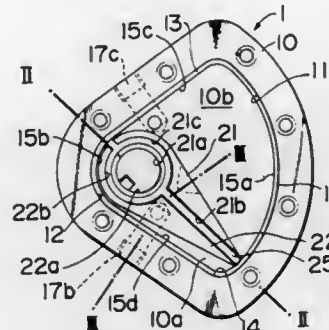
Yasuo Higuchi, and Yosio Mitumura, both of Komaki, Japan, assignors to Chukyo Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 378,497, July 12, 1973, abandoned. This application Apr. 2, 1975, Ser. No. 564,445

Claims priority, application Japan, July 14, 1972, 47-69927 Int. Cl.<sup>2</sup> F01C 9/00

U.S. Cl. 92-125

2 Claims



1. In a rotary actuator having a sectoral sectioned cylinder with two ends and larger and smaller circumferential inner surfaces opposing each other and having the same center of curvature in common and different radii of curvature, a pair of end covers for closing tightly the ends of said cylinder, a shaft concentric with said curvature and supported rotatably by the end covers, and a vane secured to said shaft and pivotally movable within said cylinder, the improvement which comprises the combination of a sectoral cylindrical seal member of a predetermined thickness disposed within said cylinder in contact with the inner surfaces thereof, said seal member having a sectoral section similar to that of said cylinder, said seal member having a normal length greater than that of the cylinder and having squared edge portions, said seal member being compressed uniformly along the normal length in the axial direction by said end covers, the outer peripheral surface of said seal member not being fixed to the inner surfaces of said cylinder, a relatively thin gasket of elastic material and flat surfaces disposed within a groove around the entire periphery of said vane, said gasket having ring-shaped portions and rectilinear portions, an inner surface thereof being bonded to the bottom surface of said groove to provide a smooth, continuous surface for the bottom of said groove, and a packing thicker than said gasket disposed within said groove over said gasket and having ring-shaped portions and rectilinear portions, said packing sealably contacting another surface of said gasket, the inner surfaces of said end covers and the inner surface of said seal member.

4,009,645

**PISTON PUMP**

Gerhart William Freimuth, Flemington, N.J., assignor to Gerhart Engineering and Machine Company, Somerville, N.J.

Filed Nov. 3, 1975, Ser. No. 628,349

Int. Cl.<sup>2</sup> F16J 1/06

U.S. Cl. 92-202

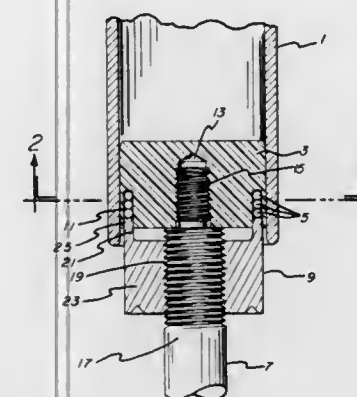
4 Claims

1. A piston pump comprising:  
a cylindrical sleeve member having an interior cylindrical wall;

a plunger head of resilient material having an outside diameter of such dimension to permit said plunger head to be slidable within and guided by the interior wall of said cylindrical sleeve member, an upper transverse face and a lower transverse face, a longitudinal circular aperture radial with and extending axially from said lower transverse face into said plunger head, and a hole centrally located upon and extending axially from said lower transverse face into said plunger head;

a piston rod having an end mounted within said hole of and rigidly connected to said plunger head, and a threaded portion immediately adjacent thereto;

resilient material means contained within said circular aperture; and



a cylindrical pressure cap having an uppermost cylindrical end portion dimensioned to be slidably engaged in said circular aperture of said plunger head, and a lowermost solid bar-like portion with a centrally located threaded axial hole for mounting upon said threaded portion of said piston rod below said plunger head, thereby permitting the pressure cap to be selectively manually turned for positioning said cap without removing the plunger head from said cylindrical sleeve to apply even and continuous pressure upon said resilient material means, expanding said resilient material means to force the adjacent portions of said plunger head to "seal" against the interior wall of said sleeve member, preventing the escape of a product contained within said sleeve member above said plunger head.

4,009,646

**METHOD OF AND APPARATUS FOR RAPIDLY LINING CONTAINERS**

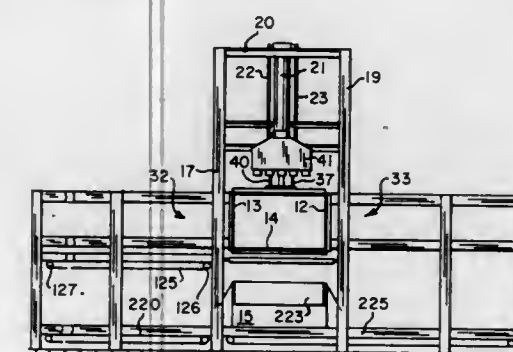
William E. Mott, 215 Wilson Downing Road, Lexington, Ky. 40507

Filed July 2, 1975, Ser. No. 592,612

Int. Cl.<sup>2</sup> B31B 7/02

U.S. Cl. 93-36.01

20 Claims



1. A method of automatically lining an open-top container comprising, moving an empty unlined container to a lining station below a panel-grasping mechanism and thereafter moving the lined container from said station, horizontally moving a flat bottom liner panel to said station, dispensing side and

end lining panels from four separate storage racks extending horizontally from said station, grasping each of two end panels, two side panels and one bottom panel with said panel-grasping mechanism, bringing said panels into contact with each other in the form of an open-top, box-like array above said container, moving said array downwardly into said container, releasing the panel-grasping mechanism from said array, thereafter moving the released mechanism upwardly from the lined container, and automatically conducting the above-recited steps of operation in accordance with a preferred program of interrelated steps.

4,009,647

**CLEAN AIR ZONE FOR SURGICAL PURPOSES**

Frederick Hugh Howorth, Chorley, England, assignor to Howorth Air Engineering Limited, Bolton, England

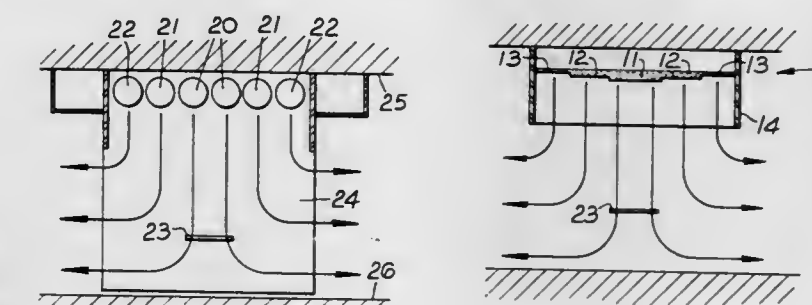
Filed Apr. 16, 1975, Ser. No. 568,614

Claims priority, application United Kingdom, Apr. 26, 1974, 18303/74

Int. Cl.<sup>2</sup> F24F 9/00

U.S. Cl. 98-36

2 Claims



1. Apparatus for providing a clean air zone around a patient undergoing surgery comprising:  
a plurality of air delivery means,  
a plurality of air supply means for supplying sterile air to the air delivery means,  
a first central one of the air delivery means being adapted to supply air at a first velocity,  
and a second outer one of the air supply means being adapted to supply air at a second velocity lower than the first velocity,  
the different air delivery means having different permeabilities for attaining the desired flow velocity differential.

4,009,648

**AIR CONDITIONER AIR FLOW CONTROL MECHANISM**

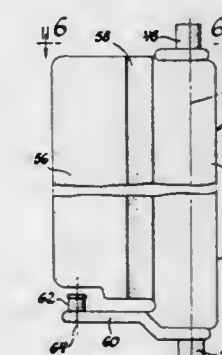
Ralph S. Braden, Bellbrook; Edgar W. Stienecker, and John Weibel, Jr., both of Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 3, 1975, Ser. No. 619,198

Int. Cl.<sup>2</sup> F24F 3/00, 13/08

U.S. Cl. 98-40 V

1 Claim



1. In a room air conditioner front and grill assembly having sweep air deflecting structure including a tie bar adapted to be oscillated in the direction of its length and pivotally oscillatable air deflecting vanes engaged in oscillatable driven rela-



tion with said tie bar to direct air flow from said assembly in a sweeping movement when said tie bar is oscillated and air is flowing through said assembly, the improvement comprising: each of said vanes having a planar main body section provided with pivot supports and defining the leading edge portion of the vane, a drive arm attached to said main body section and to said tie bar for transferral of linear oscillating movement of said tie bar into pivotally oscillating vane movement, and a trailing edge planar air deflecting section attached to said main body section by a flexibly yieldable hinge section having a normal position maintaining said vane sections in a predetermined planar relation and resisting hinge movement from said normal position by air impingement but flexibly yielding under potentially damaging outside force application to said trailing edge planar air deflecting section to protect the vane and tie bar from damage by such outside force application, said trailing edge planar air deflecting sections being connected to said drive arms only through said flexibly yieldable hinge sections and said planar main body sections whereby all transferral of linear oscillating movements of said tie bar to said vane trailing edge planar air deflecting sections occurs through said flexibly yieldable hinge sections.

4,009,649

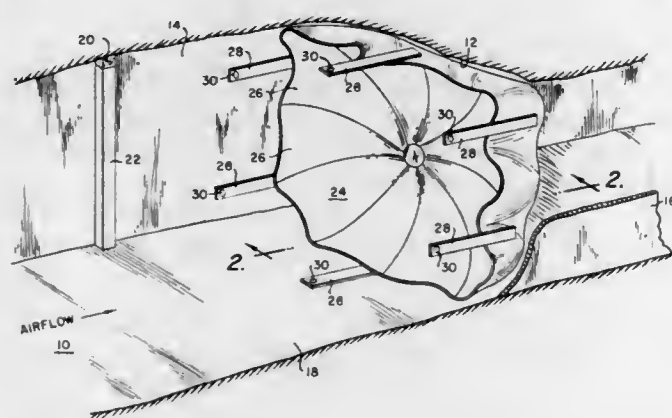
## MINE VENTILATION CONTROL DEVICE

Edward D. Thimons, Tarentum, and Fred N. Kissell, Pittsburgh, both of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 2, 1976, Ser. No. 672,901  
Int. Cl.<sup>2</sup> E21F 17/00, 1/14

U.S. Cl. 98-50

7 Claims



1. In a mine ventilation control system for underground mines having passageways which must be blocked to form suitable air passageways including:

- a stopping for blocking a passageway by forming a seal between the roof, side walls, and floor surfaces thereof, and formed of a gas impervious, fire-resistant, flexible sheeting material adapted to extend in gas-tight relation between the roof, side walls, and floor surfaces of the mine passageway,
- and frangible means for securing said stopping in the passageway, said frangible means capable of breaking away by a force less than the force necessary to damage the flexible sheeting material of said stopping.

4,009,650

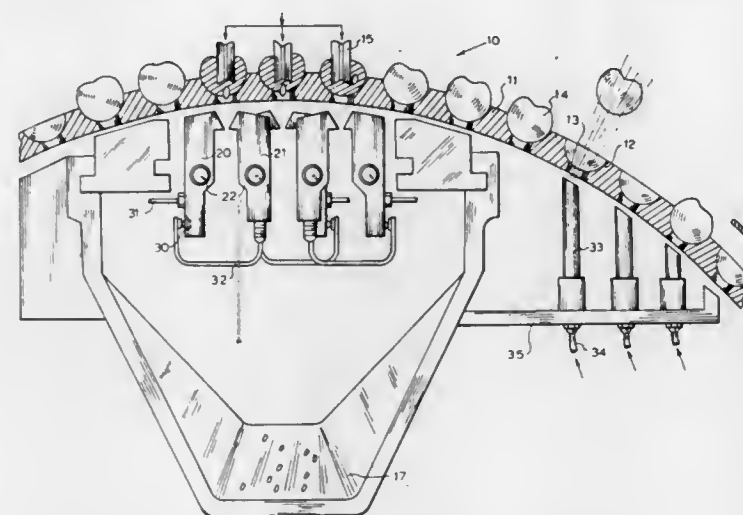
## FRUIT PITTING MACHINE

Daniel J. Lascelles, Deland, and Dexter Spear French, Jr., Longwood, both of Fla., assignors to Dunkley Company, Kalamazoo, Mich.

Filed Sept. 22, 1975, Ser. No. 615,602  
Int. Cl.<sup>2</sup> A23N 3/00

U.S. Cl. 99-490

15 Claims



1. A fruit pitting machine comprising in combination: fruit positioning support means for positioning and supporting fruit for pitting;
- pitting means for removing pits from pit containing fruit supported by said fruit positioning and supporting means, said pitting means having a plurality of pitting needles each having a predetermined shape for driving a pit from the unpitted fruit;
- a plurality of jaws located adjacent said pitting means, at least one said jaw associated with each pitting needle and being shaped to receive said needle and to be moved by a fruit pit being removed from a piece of fruit;
- signal generating means coupled to said jaws and being actuated by movement of said jaws;
- control means coupled to said generating means and actuated by movement of said jaws to generate an output control signal responsive to the absence of a fruit pit moving a jaw; and
- a fruit separating means operatively connected to said control means to separate a piece of fruit upon control of said actuation means, whereby unpitted fruit is detected and separated in said fruit pitting machine.

4,009,651

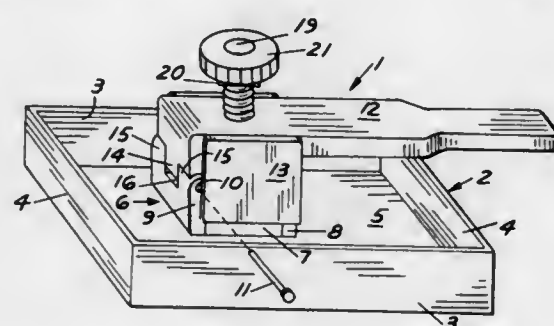
## NUTCRACKER

Fred M. Adams, 143 Carroll St., Shreveport, La. 71105

Filed Nov. 3, 1975, Ser. No. 628,426  
Int. Cl.<sup>2</sup> A23N 5/00

U.S. Cl. 99-579

10 Claims



1. A nutcracker comprising:
  - a. a tray having a pair of opposed upwardly extending sides and ends and an essentially flat bottom;
  - b. a cracking block carried by said tray and having an upward standing generally flat forward base member and an upward standing generally flat rear base member adjacent said cracking block, said forward base member and said

rear base member being in essentially parallel relationship to each other and separated by said cracking block; and

- c. a cracking lever hingedly mounted on said forward base member and having a pair of downwardly extending, spaced apart cracking lever flanges which are shaped and positioned to cooperate with said cracking block to define a closed nutcracking chamber when said cracking lever is closed over said cracking block.

4,009,653

## MACHINE FOR FORMING A ROUND BALE OF FIBROUS AGRICULTURAL MATERIAL

Hans Otto Sacht, Wolfenbittel, Germany, assignor to Gebrüder Welger, Wolfenbittel, Germany

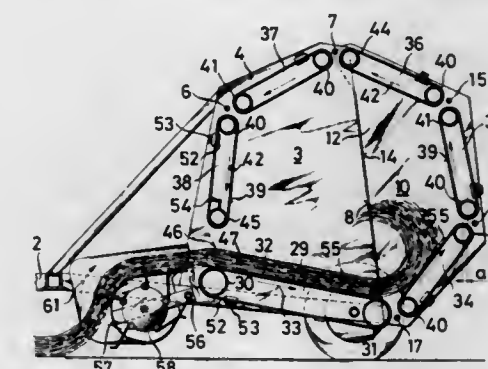
Filed Sept. 10, 1975, Ser. No. 612,104

Claims priority, application Germany, Sept. 13, 1974, 2443838

Int. Cl.<sup>2</sup> B30B 5/06; A01D 39/00

U.S. Cl. 100-88

13 Claims

4,009,652  
APPARATUS FOR TRIMMING FAT FROM A BOSTON STYLE BUTT

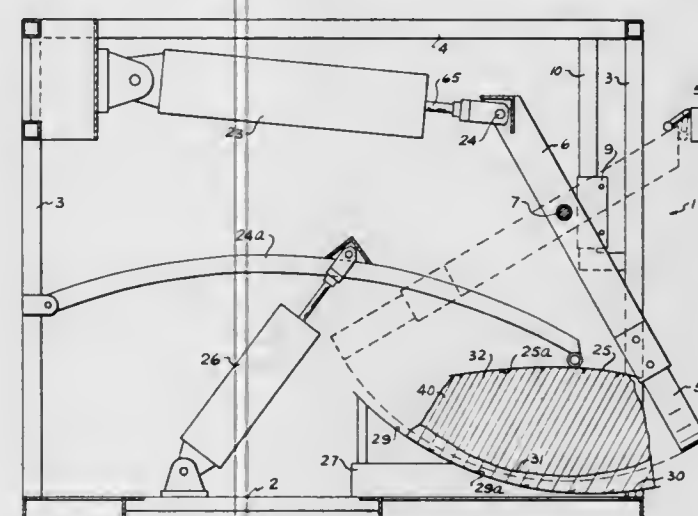
John Anderson, 13030 - 65 St., Edmonton, Alberta, Canada

Filed July 24, 1975, Ser. No. 598,887

Int. Cl.<sup>2</sup> A23N 7/00; A47J 17/00; A22B 5/16

U.S. Cl. 99-590

4 Claims



1. Apparatus for severing a layer of back fat from a Boston style pork shoulder butt having lean and fat portions, comprising:

- a frame;
  - a saddle element associated with the frame for supporting the butt in position to be severed longitudinally along a path substantially parallel to the fat-lean interface, said saddle element having a curved support surface contoured to substantially conform with the outer surface of the back fat layer of the butt;
  - an arcuate knife curved to substantially conform to the curved transverse interface line of the lean meat and back fat layer;
  - means pivotally mounting the knife on the frame so that it can be drawn through the butt;
  - means for rotating the knife about an axis fixed during pivoting movement of the knife and generally parallel to the support surface of the saddle along an arc through the butt; and
  - disengageable means associated with the frame for clamping the butt against the support surface during the severing operation;
- said apparatus being operative to move the knife through the butt to cut a layer of back fat of varying thickness therefrom while leaving a layer of back fat of substantially constant thickness adhering to the lean meat.
- Also enclosed, for purposes of the record, are photostatic copies of two letters which were shown to the Examiner during the interview.

4,009,654

## AUTOMATIC MODIFICATION OF THE PRINT CONTROL IN A PRINTING DEVICE

Samuel C. Harris, Jr., and Terry L. Hewitt, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed Dec. 20, 1974, Ser. No. 534,600

Int. Cl.<sup>2</sup> B41J 5/30

U.S. Cl. 101-93.09

13 Claims

1. A print selection system for a printer wherein said printer has a plurality of printing characters in selectable set lengths and means for effectively moving said printing characters during printing such that they appear as a sequence of individually different printing characters moving from column to column along a print line, said print selection system comprising memory means for storing a plurality of numerical representations wherein said representations represent numerals of







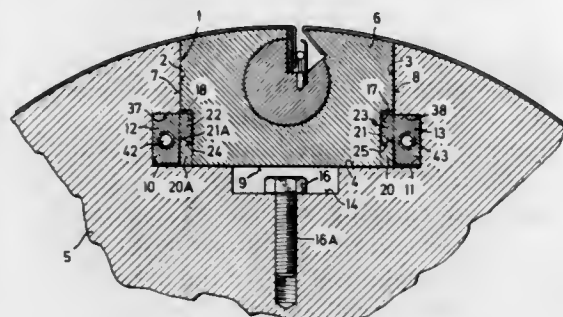
4,009,659

**MECHANISM FOR SECURING PRINTING PLATE CLAMPING DEVICES ON FORME CYLINDERS**  
 Georg Schneider, Wurzburg, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany  
 Filed July 14, 1975, Ser. No. 596,030  
 Claims priority, application Germany, Aug. 8, 1974, 2437758

Int. Cl.<sup>2</sup> B41F 27/06

U.S. Cl. 101—415.1

9 Claims



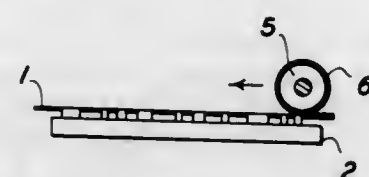
1. A mechanism for securing a mounting block for a printing plate clamping device on a forme cylinder, comprising: a groove formed in said forme cylinder parallel to the axis thereof; a mounting block positionable in said groove, said mounting block having a cross-section similar to the cross-section of said groove, said mounting block further including a longitudinally extending notch and a plurality of spaced vertical notches defining a plurality of spaced locking shoulders; a guiding notch formed in a wall of said groove and extending longitudinally of said groove; a locking bar mounted in and longitudinally slidable within said guiding notch, said locking bar carrying a plurality of spaced locking pieces, said locking pieces extending into said mounting block notches, said locking pieces having inclined pressing surfaces engagable with said mounting block locking shoulders; and locking means for sliding said locking bar longitudinally along said guiding notch to bring said pressing surfaces of said locking pieces into locking engagement with said shoulders to secure said mounting block in said groove.

4,009,660

**INKING IN LITHO PRINTING THROUGH A NON-IMAGED SCREEN**  
 John B. Wells, Savannah, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 456,349, March 29, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,838  
 Int. Cl.<sup>2</sup> B41M 1/08; B41F 31/22  
 U.S. Cl. 101—450

9 Claims



1. A method of selectively reinking a lithographic image on a master having residual ink on its image areas after transfer of an image to a receiving member comprising providing a non-imaged screen being a web with openings or pores extending through to both sides and the web being coated with an ink releasing silicone elastomer, interposing said screen between and in contact with said master and an inking member containing a viscous lithographic ink and passing ink through the pores of said screen from the inking member to the image whereby only the imaged portions of said master receive ink.

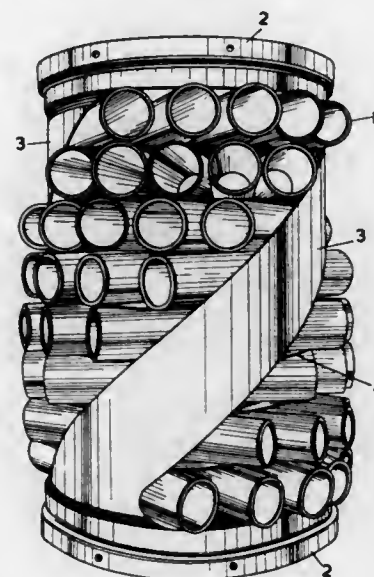
4,009,661

**MISSILE WARHEADS**  
 Imrie Dodd, 110, Brampton Road, Bexley Heath, Kent, England  
 Filed Oct. 24, 1958, Ser. No. 769,510  
 Claims priority, application United Kingdom, Oct. 24, 1957, 33308/57

Int. Cl.<sup>2</sup> F42B 13/50

U.S. Cl. 102—61

4 Claims



3. A missile warhead having a plurality of projector tubes, a pair of projectiles arranged back to back within each projector tube, each projectile having a plurality of spaced integral tongues extending longitudinally rearward thereof in normal unrestricted alignment, the tongues of the back to back projectiles formed to interfit into the spaces between the tongues of the other a propellant charge within the interfitting tongues, means for igniting the propellant charge to discharge the projectiles in opposite directions, said tongues being bendable outwardly under the action of the propellant gases upon leaving the projector tube to form stabilizing fins for the projectiles.

4,009,662

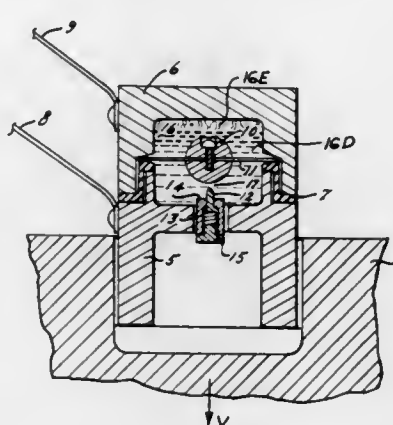
**DISCRIMINATING SENSOR FOR CONTACT FUZING**  
 Carlo Riparbelli, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 29, 1975, Ser. No. 618,306

Int. Cl.<sup>2</sup> F42C 19/06; H01H 35/02

U.S. Cl. 102—70.2 R

5 Claims



1. A contact fuzing sensor for a missile having a solid cone front end operating as a plunger and attached at its rear end to a shell constituting the vehicle's structure comprising a conducting base forming the rear end of said plunger, said conducting base having a top portion, a conducting cover for said base, said cover having a top portion, an insulating sleeve separating said base from said cover, said cover and insulating sleeve, in combination, forming therein a sealed cavity, first

and second external electrical leads for said conducting base and conducting cover, respectively, a first spring having first and second ends and attached electrically at each of said ends to the opposite respective sides of said conducting cover in approximately the center portion of said cavity, a mass attached to and suspended from said first spring at the center portion of said spring, a guide bushing in the center of said top portion of said conducting base extending up into said cavity, a slidable contact probe inserted in said guide bushing extending into said cavity, a second spring keeping said probe in place, a screw to adjust the pressure upon said second spring and also to adjust a gap between said probe and said mass; said first spring, said mass, said guide bushing, said slidable probe, said second spring, and said screw, in combination, forming a mass-spring system for said cavity, and means to controllably damp said mass attached to and suspended from said first spring to prevent said gap from closing under frequently occurring perturbations and vibrations in flight of said missile.

4,009,663

**APPARATUS FOR POSITIONING BALES WITHIN A BALE ASSEMBLY AREA**

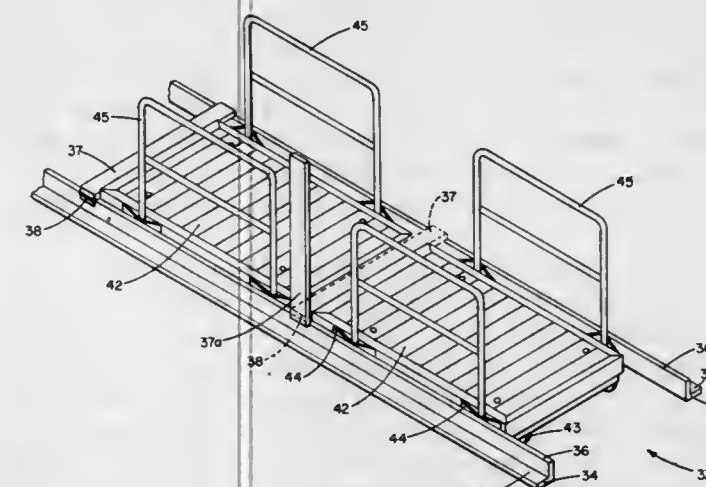
Alex Jacques Keller, 2222 Scottwood Drive, Gastonia, N.C. 28052

Division of Ser. No. 507,792, Sept. 20, 1974, Pat. No. 3,951,282, which is a division of Ser. No. 409,297, Oct. 24, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 644,828

Int. Cl.<sup>2</sup> B61K 7/16

U.S. Cl. 104—1 R

7 Claims



1. Apparatus for precisely positioning cubical bales within a bale assembly area behind a fiber feeding machine having a hopper at one end and a discharge outlet at the other end, said apparatus for positioning bales comprising:

- a. means for moving successive bales into said assembly area,
- b. means for precisely positioning the bales at predetermined points within the assembly area, said positioning means including guide means for confining said bale within a predetermined dimension extending perpendicular to the width of said bale, and including stop means for confining said bale within a predetermined dimension extending parallel to the length of said bale.

4,009,664

**CLOSURE ACTUATING DEVICE FOR RAILWAY HOPPER CAR DOORS**

Joseph G. Fearon, Boise, Idaho, assignor to Morrison-Knudsen Company, Inc., Boise, Idaho

Filed Mar. 12, 1975, Ser. No. 557,591

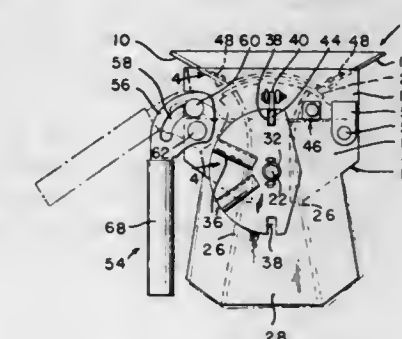
Int. Cl.<sup>2</sup> B61D 7/06, 7/18, 7/26, 49/00

U.S. Cl. 105—239

2 Claims

1. A discharge control door assembly for controlling discharge of particulate material from a hopper car having side walls and a bottom wall, comprising:

opposed sloping extension plates extending from longitudinal discharge openings formed in the bottom wall of the hopper car having terminating edges forming a discharge opening in the bottom wall of the hopper car, parallel support plates extending downwardly from the opposite sides of the discharge opening transverse to the extension plates, each support plate including an upper portion and a lower portion, means at one side of each of the support plates hinging the lower portion of the support plate to the upper portion, a discharge control door assembly including a segment having an upper arcuate surface supported by the lower plate for rotation about a pivotal axis extending parallel to the length of and beneath the discharge opening equi-



4,009,665

**SHELF ASSEMBLY**

Andreas Weisheit, Rosenweg 4, 5974 Herscheid, Germany

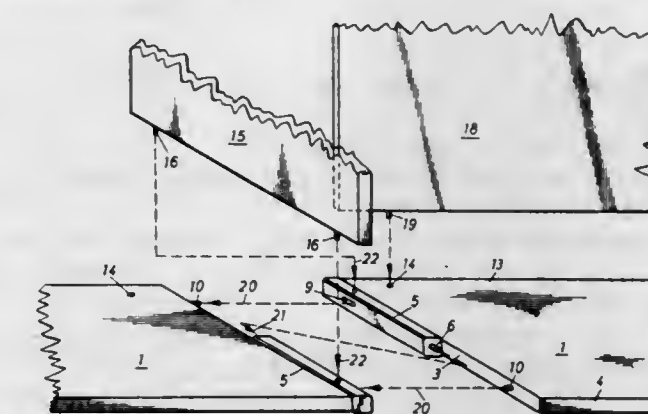
Filed Aug. 21, 1975, Ser. No. 606,579

Claims priority, application Germany, Aug. 24, 1974, 7428708[U]

Int. Cl.<sup>2</sup> A47B 47/04

U.S. Cl. 108—111

10 Claims



1. A shelf assembly comprises a plurality of base panels having abutment sides and side panels having upper and lower edges with first plug-in connecting elements on the upper and lower edges, the base panels having on their respective abutment sides a connecting ledge having a lateral surface on which is



located a first sliding connector element, the connecting ledge extending from one edge of the base panel towards the centerline thereof and terminating short of the opposite edge of the base panel in a front face having a second plug-in connecting element thereon, thereby leaving a portion of the abutment edge clear of said connecting ledge, the base panels further having on their respective abutment sides, in the portion thereof which is clear of the connecting ledge, a complementary second sliding connector element,

each of said first and second connector elements being one of an oblong hole and a peg respectively, and located a corresponding distance from its respective base panel edge so as to permit sliding engagement of said sliding connector elements with each other when adjacent base panels are placed in coplanar alignment so that the front faces of respective connecting ledges face each other and their associated second plug-in connecting elements are brought into engagement, and third plug-in connecting elements on the side faces of the connecting ledges to receive the first plug-in connecting elements on the side panels in engagement therewith, a given side panel thereby being connected to both of adjacent base panels to tie them together.

4,009,666

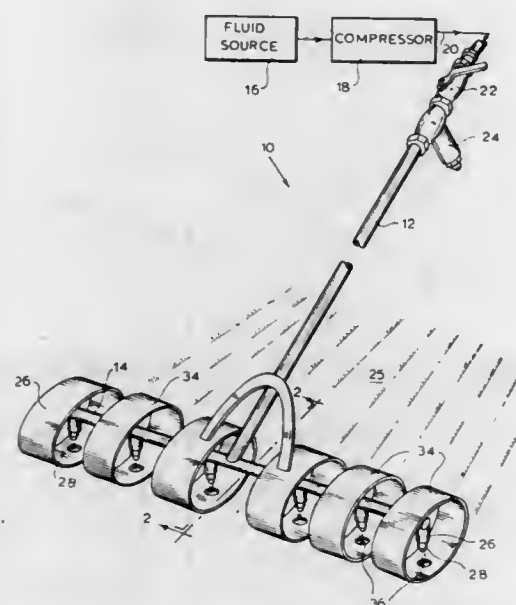
#### APPARATUS FOR DISTRIBUTING FLUIDS BELOW SOIL SURFACES

Jack C. Russell, 2615 Ardsley Drive, Orlando, Fla. 32804, and John F. Russell, Blackhawk Drive, Indian Mound Village, Sanford, Fla. 32771

Filed May 19, 1975, Ser. No. 578,761  
Int. Cl.<sup>2</sup> A01C 23/02; B05B 1/20

U.S. Cl. 111—6

11 Claims



1. Apparatus for injecting a fluid below a soil surface comprising:

- an oblong hollow tube member;
- a hollow support rod extending substantially normal to said tube member;
- a plurality of nozzles carried by said support rod, each said nozzle capable of forming a stream of said fluid passing therethrough;
- said tube member communicating with said rod and said rod communicating with all of said nozzles;
- a plurality of spaced, individual skids of generally elliptical cross-section, each positioned adjacent one of said nozzles for providing a low friction contact with said soil surface and for engaging said soil surface to hold said nozzles out of contact with said soil surface, each skid having an aperture therethrough axial with the corresponding one of said nozzles;
- means for pumping fluid through said nozzle under pressure; and wherein

said pumping means and said nozzles cooperate to inject said fluid substantially below said soil surface.

4,009,667

#### INCINERATOR FOR COMBUSTIBLE REFUSE

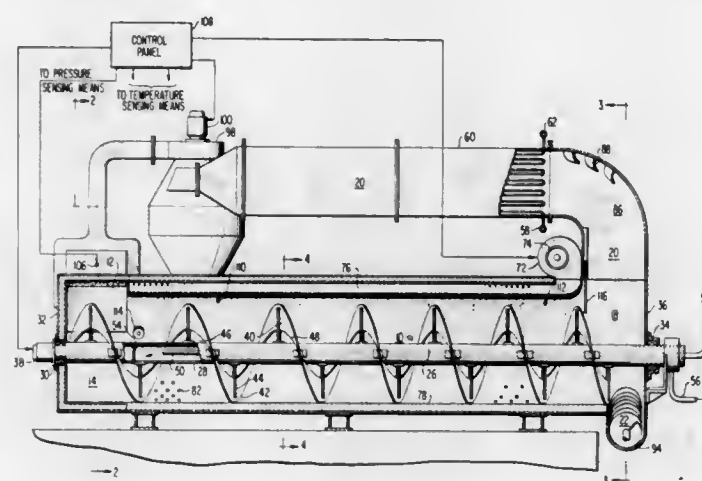
Robert C. Tyer, 7254 Old Plank Road, Jacksonville, Fla. 32205, and Larry C. Bruce, 1800 Kingsley Ave., Orange Park, Fla. 32073

Filed May 5, 1975, Ser. No. 574,706

Int. Cl.<sup>2</sup> F23G 5/12

U.S. Cl. 110—8 A

21 Claims



1. An incinerator for burning combustible refuse which comprises:

- a horizontally disposed stationary cylindrical combustion chamber means having an inlet end for receiving refuse and an outlet end for discharging exhaust gases and residue;
  - ignition means adjacent said inlet end for igniting the refuse;
  - screw conveyor means extending through the length of said chamber means for moving refuse therethrough;
  - air supply means for supplying combustion air under pressure;
  - stationary hot air manifold means, extending substantially the length of said chamber means in heat exchange relationship therewith, said manifold means having distributing means for admitting approximately equal volumes of air along the length of said chamber means; and
  - means for delivering said air under pressure from said air supply means to said manifold means adjacent the outlet end of said chamber means;
- whereby the air is selectively pre-heated as it flows longitudinally through said manifold means counter to the flow of refuse through said chamber means, with the hottest air being admitted at the inlet end of said chamber means to quickly heat incoming refuse, and cooler, denser air containing more oxygen being admitted at the outlet end of said chamber means, to effect total combustion and prevent emission of smoke.

4,009,668

PLANTER APPARATUS AND METHOD FOR PLANTING  
Ronald William Brass, Bettendorf, Iowa, and Harold Valentine Hansen, Cordova, Ill., assignors to Deere & Company, Moline, Ill.

Filed July 7, 1975, Ser. No. 593,798

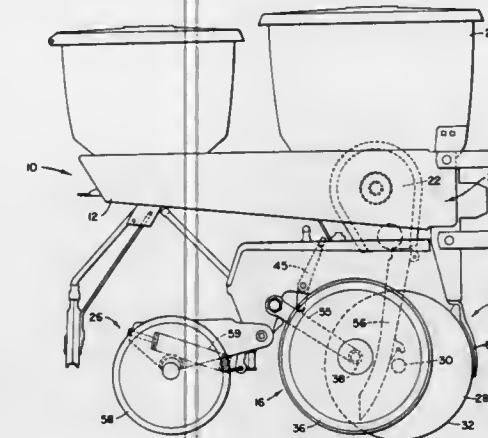
Int. Cl.<sup>2</sup> A01C 5/06

U.S. Cl. 111—85

50 Claims

1. An agricultural implement for planting seeds comprising: a frame having means thereon for securing said frame to a mobile power source; a furrow-forming unit depending from said frame and including a pair of opposed furrow-forming disks having means rotatably supporting said disks on intersecting axes so that the disks diverge upwardly and rearwardly from adjacent edges forward of their axes; gauge wheels carried on and supporting the frame for regulating furrow depth, said gauge wheels being rotatably supported on axes spaced

rearwardly of the disk axes and adapted to contact the ground in the area where the disks leave the ground so as to pack the ground on opposite sides of the furrow walls into strips of ground outwardly of and bordering the furrow; said gauge wheel cooperating with said disks to compact the furrow walls; a seed dispensing means including a seed hopper, a seed se-



lecting mechanism, and a seed delivery tube carried by the frame, the tube having a discharge end near the furrow bottom; and a furrow closing means supported rearwardly of the seed delivery tube, said furrow closing means adapted to contact the ground surface outwardly of the furrow and exert thereon a measured force sufficient to collapse the furrow and provide a substantially uncompacted covering for said seeds.

4,009,669

#### KNIFE BLOCK FOR TUFTING MACHINES

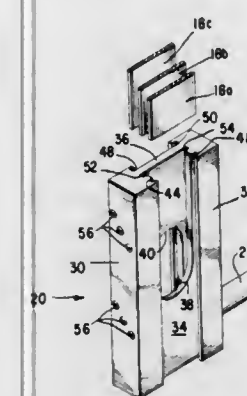
John H. Wear, Calhoun, Ga., assignor to The Singer Company, New York, N.Y.

Filed May 6, 1976, Ser. No. 683,862

Int. Cl.<sup>2</sup> D05C 15/24

U.S. Cl. 112—79 R

10 Claims



1. A knife block for a tufting machine comprising an elongated body member having a pair of longitudinally extending spaced flange portions, said flange portions being connected together by a pair of webs, said webs being laterally offset from and parallel to each other, said webs further being longitudinally offset from each other such that any plane extending substantially normal of the planes of said webs and to said flange portions intersects no more than one of said webs, means for slidably receiving at least one cutting knife between said flange portions laterally outwardly of each web, and means for slidably receiving at least one cutting knife between said flange portions laterally intermediate said webs.

8. The method of manufacturing a knife block having a pair of longitudinally extending spaced flange portions connected together by a pair of laterally spaced apart webs such that at least one pair of knife receiving grooves may be formed in said flange portions laterally intermediate said webs, said method comprising:

- a. removing a portion of each web from a different longitudinal extremity to an inner edge of the web, the inner

edges of said webs being longitudinally spaced one from the other,

- b. cutting at least one pair of longitudinally extending grooves in the flange portions laterally intermediate said webs from one extremity of the block to a location within the longitudinal space between the webs adjacent the inner edge of a first web by cutting from the extremity from which the portion of the first web has been removed, and
- c. continuing to cut said at least one pair of longitudinally extending grooves by cutting from the other extremity of the block to adjacent the inner edge of the second web.

4,009,670

#### ROTARY HOOK SEWING MACHINE

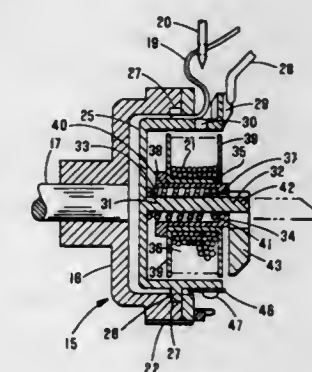
Beatty Thomas Mitchell, 4800 Baja Court NE., Albuquerque, N. Mex. 87111

Filed Nov. 24, 1975, Ser. No. 634,776

Int. Cl.<sup>2</sup> D05B 57/14

U.S. Cl. 112—231

4 Claims



1. A rotary hook, lock stitch, stationary bobbin case, sewing machine with the rotary hook mounted on and rotated by a horizontal shaft; the bobbin case, having a cylindrical sidewall and an inner closed end, rotatably mounted and retained inside the body of the rotary hook; the bobbin case being restrained from rotation with the rotary hook by means of a position finger slot in the sidewall thereof, having a bobbin thread guide shoulder adjacent to the position finger slot and having a center post affixed to the inside of the closed end thereof; a bobbin, having a center bore therein and two end flanges, operably mating with the bobbin case wherein the improvement comprises:

- the bobbin case center post having a free end formed to provide a latch pivot support;
- a bobbin ejector coil spring installed over the center post with one end against the closed end of the bobbin case;
- a bobbin ejector bushing having a cylindrical body sized to rotatably fit the center bore of the bobbin, a smaller center bore sized to rotatably fit the center post of the bobbin case, a flange at one end to fit against one flange of the bobbin, and a larger bore at the flange end to accept the outer end of the ejector coil spring and form a shoulder at the junction with the smaller bore against which the ejector spring is compressed when the bobbin ejector bushing is operably inserted in the bobbin case;
- a latch pivoted at the free end of the bobbin case center post;
- the latch having a cross-section conforming to that of the cylindrical body of the bobbin ejector bushing so that when positioned in axial alignment with the bobbin case center post the bobbin may be inserted and removed over the latch, and larger than the smaller bore of the bobbin ejector bushing so that the latch will retain the bushing on the center post;
- the pivot end of the latch being so shaped and proportioned, and the pivot so located, that when the latch is in axial alignment with the center post, in the unlatched or released position, the ejector spring forces the bobbin ejector bushing with the bobbin seated thereon outwardly



from the bobbin case so that the bobbin may be grasped and removed therefrom and so that, when the latch is placed in a position at right angles to the axis of the center post, in a latched position, the inner face of the latch bears against the outer end of the bobbin ejector bushing, causing the bobbin ejector bushing to remain operably inserted in the bobbin case; means for biasing the latch in position when latched and when unlatched;

the bobbin case having a thread guide slot in the sidewall thereof, providing a passageway for bobbin thread to pass to the outside of the bobbin case;

a curved leaf spring bobbin thread tensioner mounted externally on the sidewall of the bobbin case over the thread guide slot and secured thereto by a thread tension adjusting screw;

the thread tensioner having a locator prong inserted into a tensioner locator hole in the sidewall of the bobbin case and a thread guide finger bearing against the outer edge of the bobbin case sidewall constraining the bobbin thread between the tensioner and the circumferential surface of the sidewall of the bobbin case; and

the bobbin case having a bobbin thread groove guiding the bobbin thread from the tensioner to the bobbin thread guide shoulder adjacent the position finger slot of the bobbin case;

whereby removal of the bobbin requires only positioning of the latch to the unlatched position and manual grasping of the bobbin and does not require the removal of any other part.

4,009,671

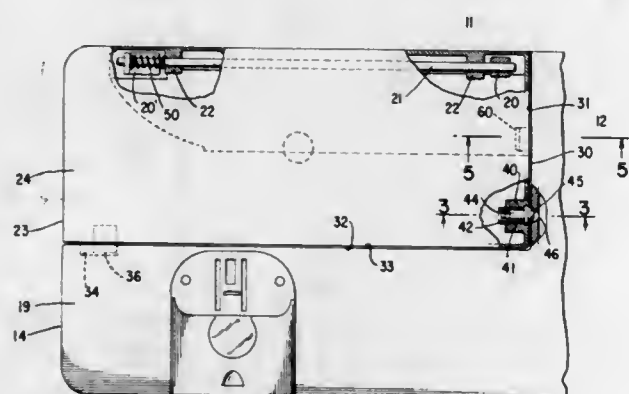
**CONVERTIBLE BED FOR SEWING MACHINES**

Hilmar Wittler, Karlsruhe, and Adolf Martin, Reinstetten-Neu, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,807  
Int. Cl.<sup>2</sup> D05B 73/10

U.S. Cl. 112-258

3 Claims



1. A sewing machine bed construction readily convertible to accommodate flat or tubular shaped work pieces for a sewing machine having a bed portion including a base, a stabilizing strut projecting from said base and defining therewith a plane of support for said sewing machine, and a cylinder bed formed with a work supporting surface, said cylinder bed extending in cantilever fashion from said base in spaced relation with said stabilizing strut, a retractable work supporting panel formed with a work supporting surface having one side adjacent to said sewing machine bed portion base and one side adjacent to said cylinder bed, means shiftably supporting the work supporting panel on said stabilizing strut for movement in a first direction toward and away from said cylinder bed into and out of a position in which the work supporting surface of said panel and said cylinder bed occupy contiguous and coplanar relation, and in a second direction toward and away from said sewing machine bed portion base, characterized in that a single latch detent is provided projecting from that side of said work supporting panel which is adjacent to said sewing machine bed portion base, and said sewing machine bed portion

base is formed with a latch seat located so as both to accommodate said latch detent when the work supporting surface of said panel and said cylinder bed occupy contiguous and coplanar relation thereby holding said work supporting panel in position and to urge said latch detent in said second direction away from said sewing machine bed portion base when said latch detent is forced out of said latch seat thereby shifting said work supporting panel away from sewing machine bed portion base.

4,009,672

**SEWING MACHINE MATERIAL PREASSEMBLY SYSTEM**

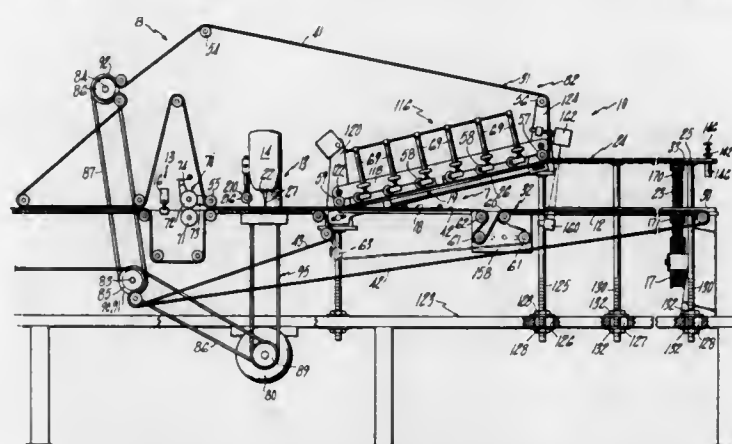
John L. Rockerath, and Harold J. Schreck, both of Utica, N.Y., assignors to Jetsew, Inc., Barneveld, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,968

Int. Cl.<sup>2</sup> D05B 1/00, 21/00, 35/02, 27/00

U.S. Cl. 112-262

32 Claims



1. In a sewing machine system having material conveyance means for conveying material longitudinally forwardly through successive material folding and sewing stations for successively prefolding and sewing the material, and material folding and sewing apparatus at the folding and sewing stations for respectively prefolding the material and sewing the prefolded material as the material is conveyed longitudinally forwardly through the folding and sewing stations by the material conveyance means, the improvement wherein the material conveyance means is operable for simultaneously longitudinally forwardly conveying first and second separate material blanks individually along first and second convergent material paths respectively and into predetermined superimposed relationship at the convergence thereof to form individual preassemblies of individual first and second material blanks, wherein the material folding apparatus comprises first and second material folding means mounted along the first and second material paths respectively for prefolding the first and second material blanks respectively as they are longitudinally forwardly conveyed therealong respectively toward the convergence of the material paths for forming prefolded material preassemblies of the first and second prefolded material blanks, and wherein the material conveyance means is further operable for longitudinally forwardly conveying the prefolded material preassemblies individually from the convergence of the first and second material paths through the sewing station for being sewn by the material sewing apparatus.

4,009,673

**METHOD FOR MAKING A BUTTONHOLE ON A ZIGZAG STITCH SEWING MACHINE**

Marcel Fresard, Petlt-Lancy, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Dec. 30, 1975, Ser. No. 645,358

Claims priority, application Switzerland, July 15, 1975, 9222/75

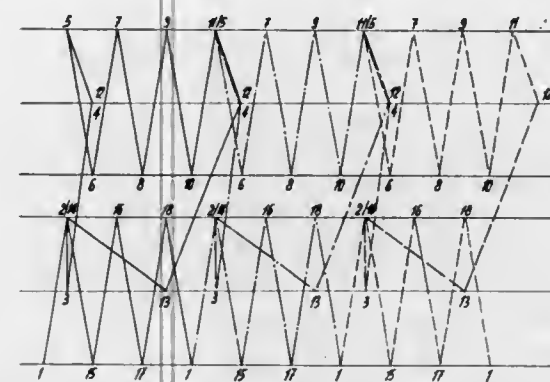
Int. Cl.<sup>2</sup> D05B 3/06

U.S. Cl. 112-264

3 Claims

1. In a method for making a buttonhole in a piece of material using a zigzag stitch sewing machine by forming the lips of

the buttonhole and then cutting the material between the lips, the step of forming the lips by the alternate stitching of opposite fractions of the desired length of the two lips, this stitching



always being carried out in the same directions, the stitching of opposite fractions being repeated in two adjacent zones of lips until two lips of the desired length are obtained.

4,009,674

**METHOD OF STACKING ROLLS**

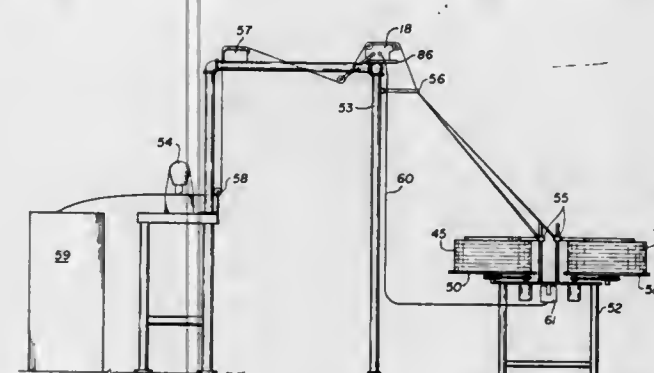
Charles Ray Ladd, Washington, N.C., assignor to Coats & Clark, Inc., Jamesville, N.C.

Filed June 25, 1975, Ser. No. 590,043

Int. Cl.<sup>2</sup> D05B 3/12

U.S. Cl. 112-265

7 Claims



1. In a method for producing zippers of the type including the steps of producing tapes for the zippers on a knitting or weaving machine and feeding a pair of such tapes to a sewing machine for the production of zippers, the improvement comprising producing a pair of packages of tape each comprised of a roll of narrow tape, placing said packages with vertical axes on separate rotatable tables, directing tape from each of said rolls to said sewing machine, separately sensing the tension of each tape extending between a roll and said sewing machine, and positively rotating said tables to maintain the tension in the respective tape substantially constant.

4,009,675

**FLOAT DEVICE WITH AT LEAST ONE FLOAT BODY**  
Nikolaus Waki Zöllner, Kaiserplatz 8, D-8 Munich 40, and Hanfried F. Schwark, Maria-Theresia-Strasse 6, D-8 Munich 80, both of Germany

Filed Nov. 14, 1974, Ser. No. 523,663

Claims priority, application Germany, Nov. 16, 1973, 2357398

Int. Cl.<sup>2</sup> B63B 5/24

U.S. Cl. 114-267

2 Claims

1. A method for the production of a float device having at least two annular bodies coaxially held together by ropes, said bodies being produced simultaneously, said method comprising the steps of:

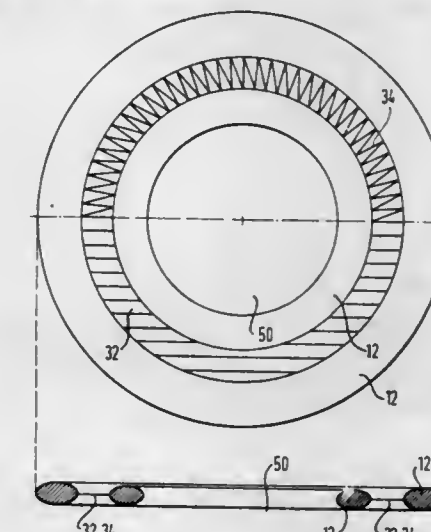
a. forming each annular body by,

1. placing a first foil surface piece on top of a second foil surface piece, said first and second surface pieces being larger than the overall surface of the annular body to be formed; and

2. connecting said first and second surface pieces along a predetermined interior periphery and outer periphery to produce an annular tube having a chamber of predetermined internal dimensions, the portions of the surface pieces disposed beyond the tube so formed defining projection portions which connect the tube to an adjacent tube being simultaneously formed;

b. inflating said chamber;

c. partially filling said chamber along the inner periphery of the tube with an annular layer of a closed pore plastic foam having a high density;



d. then filling the remaining area of the chamber with a closed pore plastic foam having a low density and extended with foreign material having similar mechanical properties;

e. separating the annular bodies initially connected with each other by the projecting portions of the surface pieces; and

f. tying the annular bodies together by means of ropes so that relative peripheral movement between the annular bodies is prevented.

4,009,676

**MOUNTING ARRANGEMENT FOR PROTECTING SHIPBOARD NUCLEAR REACTORS AGAINST COLLISION DAMAGE**

Herbert Kura, Bremen, Germany, assignor to Aktiengesellschaft "Weser", Bremen, Germany

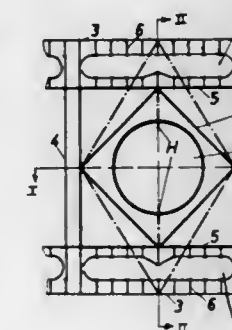
Filed Mar. 14, 1975, Ser. No. 558,718

Claims priority, application Germany, Mar. 27, 1974, 2414714

Int. Cl.<sup>2</sup> B63B 3/56, 25/24

U.S. Cl. 114-78

12 Claims



1. A mounting arrangement for protecting shipboard equipment from collision forces, comprising a ship having bulkheads which bound an interior space in which equipment to be protected is stored; and a discrete polygonally-shaped shield separate from said bulkheads and being mounted to said ship in said space so as to form within said space a call which surrounds the equipment to be protected, said shield comprising a plurality of wall portions each having respective opposite ends fixedly anchored to said ship, said wall portions being



arranged in two opposite pairs each including two wall portions inclined relative to each other so as to include with one another an angle whose bisectrix is normal to a line which extends along the length of said ship.

4,009,677

# **RADIAL THRUST APPARATUS FOR HIGH THRUST TROLLING MOTOR**

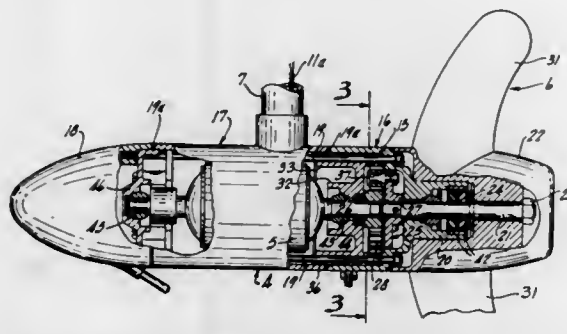
Elmer E. Croisant, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 4, 1975, Ser. No. 610,303

Int. Cl.<sup>2</sup> B63H 5/13

U.S. Cl. 115—18 E

7 Claims



1. In an electric trolling motor apparatus having a lower cylindrical unit including an electric motor having a motor shaft and a drive propeller, an improvement in the coupling of the motor shaft to the propeller, comprising an output gear reduction means for connecting the electric motor shaft to the propeller and having input gear means for providing a rotating input to the gear reduction means and an output drive gear means providing a rotating output of a substantially lesser rate than said rotating input, said motor shaft being connected to said input gear means, said propeller having a propeller shaft secured to said output drive gear means, a gear housing having a bearing recess, a radial bearing means secured within said bearing recess for rotatably supporting said propeller shaft, said radial bearing permitting rotational movement of the bearing and including an outer spherical seat located in said recess and establishing coaxial alignment of the motor and propeller shafts and output drive gear means relative to the input gear means of said gear reduction means.

4,009,678

# **MULTIPLE PUSH-PULL CABLE TRANSMISSION APPARATUS**

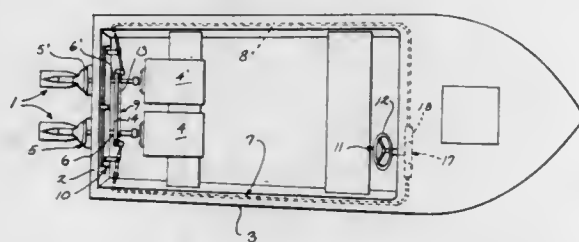
Irving William North, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 23, 1975, Ser. No. 570,716

Int. Cl.<sup>2</sup> B63H 5/12

U.S. Cl. 115—18 R

19 Claims



1. In a powered mechanical motion transmission apparatus having oppositely movable input means for controlling a remote positioning element means through a first and a second push-pull means, each of said push-pull means including an outer guide means and an inner movable core means and having the guide means fixedly mounted at the first end and having means connecting the first end of the core means of the first and second push-pull means to the movable input means for opposite movement of the core means in response to a given movement of the movable input means, means connect-

ing the opposite end of the core means to said remote positioning element means, a power means having a power input means, each of said core means establishing reaction forces on the corresponding guide means as a result of the movement of the core means, the improvement in the coupling of the guide means to the power input means comprising guide tie means interconnecting the power input means of said power means and each of the guide means of the first and second push-pull means, said guide tie means establishing a rigid interconnection therebetween to transmit all reaction forces of both of the said guide means to the power input means and thereby establish rapid response to any of said reaction forces on said guide means of both said first and second push-pull means.

4,009,679

# **DISPLAY FOR A SIMULATED FOOTBALL GAME**

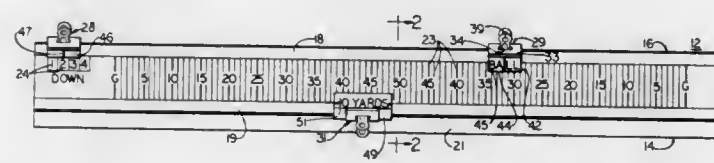
John G. Kircher, 1010 Kinmont Ave., Cincinnati, Ohio 45208

Filed Oct. 9, 1975, Ser. No. 621,161

Int. Cl.<sup>2</sup> A63B 71/06

U.S. Cl. 116—120

3 Claims



1. A display for a simulated football game which comprises a display member including an elongated main panel and a pair of edge panels, the edge panels being mounted on and extending along opposite lengthwise edges of the main panel, the edge panels projecting upwardly and outwardly of the main panel, yard marking indicia arranged along the main panel, a plurality of spring clips mounted on the edge panels and movable therealong, at least one of the spring clips being mounted on each edge panel, a display gripping panel having a main portion mounted in face-to-face relation to the main panel and a gripping edge portion extending outwardly from one edge of the main portion underlying one of the edge panels, and an indicator member mounted on each of the spring clips and alignable with selected yard marking indicia.

4,009,680

# **APPARATUS FOR PRODUCING HIGH WEAR-RESISTANT COMPOSITE SEAL**

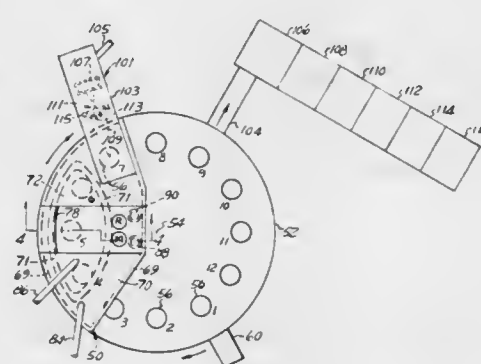
Werner H. Fengler, 23651 Fordson Drive, Dearborn, Mich. 48124

Division of Ser. No. 506,332, Sept. 16, 1974, Pat. No. 3,991,229. This application Aug. 13, 1975, Ser. No. 604,478

Int. Cl.<sup>2</sup> C23C 13/12

U.S. Cl. 118—49.1

4 Claims



1. A continuous-production apparatus for applying a wear-resistant coating to successive groups of machine element workpieces, said apparatus comprising a horizontally disposed rotatable turntable having a planar top surface and a plurality of workpiece holders disposed in an annular path thereon concentric with the axis of

rotation thereof in circumferentially spaced relationship relatively to one another, each of said holders being disposed within a separate recess in said top surfaces, an air-tight housing disposed adjacent a portion of said path on said turntable and defining with the corresponding portion of said table a chamber therein adapted to be evacuated, said housing having a bottom portion which is parallel to said surface and has an opening therein of larger cross-sectional dimensions than any said recess, a pair of spaced, generally annular seal rings disposed about said opening and between said bottom portion and said surface, means to evacuate said chamber and the volume bounded by said pair of seal rings, turntable surface and bottom portion, treating means communicating with said volume, a loading station and an unloading station communicating with said turntable, means within said chamber for holding an evaporable wear-resistant alloy, means in said chamber for evaporating said alloy, automated means for indexing said rotatable turn-table whereby each group of workpieces is successively received within a said recess at the loading station, carried beneath said housing into a first portion of the evacuated volume, out of said volume and within said opening to receive a vapor deposition of said alloy, into a second portion of said evacuated volume whereby to be exposed to said treating means, and finally out of said volume to the unloading station.

4,009,681

# **DEVICE FOR AUTOMATICALLY CLEANING MASKS IN POWDER COATING SYSTEM**

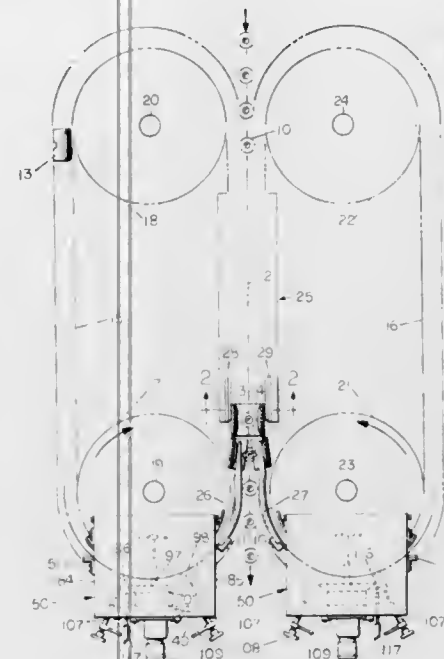
Russell William Heckman, Perrysburg; George Allen Nickey, Toledo, and John Edward Poole, Holland, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 16, 1976, Ser. No. 677,596

Int. Cl.<sup>2</sup> B05C 11/14

U.S. Cl. 118—70

16 Claims U.S. Cl. 118—118



1. In combination: a means for masking a portion of articles which are traveling in a substantially linear path through an article treatment zone comprising a plurality of masks each comprising a pair of complementary shields for masking one portion of the article from exposure to the treatment zone, a carriage for one of the shields of said pair thereof operable in a path on one side of the travel of the articles, and

a carriage for the other of the shields of said pair thereof operable in a path on the opposite side of the travel of the articles, the carriages being operated in unison through their paths of movement for bringing the shields of each pair together and moving them with the traveling articles and surrounding an article in a juxtaposed position prior to entry of the treatment zone and maintaining them in said position through said zone, thereafter separating said shields and carrying them back to the beginning of the treatment zone, and a shield cleaning device individual to each carriage, means supporting said cleaning device along the path of said carriage outside of the treatment zone for movement of the shields through the cleaning device, said cleaning device comprising a frame, a first rotary brush, means connected to the frame rotatably supporting the first rotary brush on one side of the shields for engaging the adjacent surface thereof, a second rotary brush, means connected to the frame rotatably supporting the second rotary brush on the opposite side of the shields for engaging the surface adjacent thereto, a plurality of elongated brushes, means supporting each of the brushes on the frame disposed at opposite sides of the shields for engagement of the brushes along opposite surfaces of each of the shields during movement through the cleaning device, and motor operated drive means connected to operate said first and second rotary brushes.

4,009,682

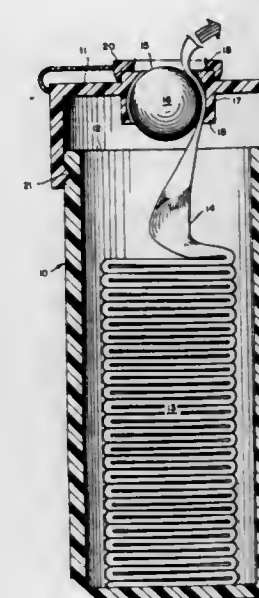
# **WEB DISPENSER**

Savinay Patel, Roselle, and Bernard F. Szuhaj, Lombard, both of Ill., assignors to Central Soya Company, Inc., Fort Wayne, Ind.

Filed Apr. 19, 1976, Ser. No. 678,157

Int. Cl.<sup>2</sup> B05C 11/02

4 Claims



1. A towlette dispenser comprising a container having an open mouth, an elongated web of material in said container, a dispensing closure for said container, said closure including an apertured member closing said open mouth, a ball mounted in said aperture and rotatable therein to pass said web around said ball upon manual pulling of said web, said web being equipped with transversely extending lines of potential severance, said web having a tensile strength so related to the mounting of said ball in said aperture to permit pulling said



web through the clearance between said ball and aperture without severing said web while a line of potential severance is in said clearance, said closure aperture being defined by a wall providing upper and lower spaced apart inwardly extending ball retaining flanges, said upper flange being sized to prevent passage of such ball upon application of said manual pulling, said container including a liquid material therein disposed to coat or impregnate said web, and said ball in conjunction with said aperture defining means metering the liquid being carried by said web passing therebetween.

4,009,683

# APERTURE SEALING DEVICE FOR FILM LEAD FABRICATION

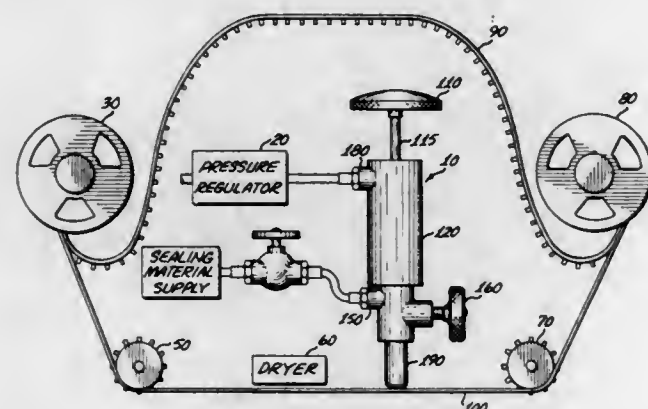
Frederick D. Olney, Jr., and Dennis E. Rich, both of Phoenix, Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Dec. 12, 1975, Ser. No. 640,128

Int. Cl.<sup>2</sup> B05C 1/06

U.S. Cl. 118—266

3 Claims



1. An improved apparatus for sealing apertures in an insulating strip, said apparatus comprising:

- a hollow cylindrical body closed at one end and opened at the other end;
- a plunger mounted so as to move within the hollow cylinder, the diameter of the plunger equal to the inside diameter of the cylinder;
- a rod extending through the closed end of the cylinder and connected to the plunger, the opposite end of the rod being connected to a handle member;
- pressure input means located proximate to the closed end of the cylinder for applying positive pressure to one side of the plunger;
- fluid input means located proximate to the open end of the cylinder for inserting a fluid into the cylinder body; and
- discharge means connected to the open end of the cylinder for directing and controlling fluid flow from the cylinder onto an insulating strip, the discharge means further comprising an outlet orifice terminated with a sintered metal element.

4,009,684

# WATER SOLUBLE POLYMERS USEFUL IN THE PREPARATION OF NOVEL ANIMAL LITTER

Karel Kliment, Princeton; Rudolf N. Vermes, Randolph, and Richard F. Stockel, Somerville, all of N.J., assignors to National Patent Development Corporation, New York, N.Y.

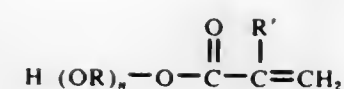
Filed Nov. 26, 1975, Ser. No. 635,522

Int. Cl.<sup>2</sup> A01K 29/00

U.S. Cl. 119—1

20 Claims

1. An animal litter comprising (1) a porous, inert solid substrate treated with (2) a solid water soluble copolymer of (a) 5-35% of a hydroxyester of a 2-alkenoate of the formula



wherein R is alkylene of 2 to 4 carbon atoms, R' is hydrogen or alkyl of 1 to 4 carbon atoms and n is an integer with (b) 95 to 65% of a copolymerizable water soluble monomer or polymer, said copolymer being impregnated with (3) a fragrance or deodorizer.

4,009,685

# METHOD AND APPARATUS FOR HANDLING WASTES FROM SMALL ANIMAL CAGES

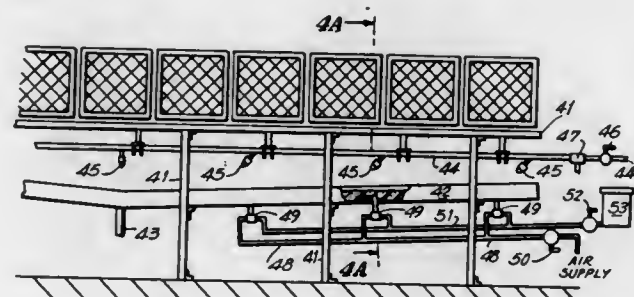
Nickolas J. Sojka, Charlottesville, Va., assignor to The University of Virginia, Charlottesville, Va.

Filed June 16, 1975, Ser. No. 587,306

Int. Cl.<sup>2</sup> A01K 1/01

U.S. Cl. 119—22

6 Claims



1. In an animal cage in which a litter tray is provided to receive animal wastes, a method for treating the wastes, which comprises the steps of

- disposing a semi-solid, long-lasting aqueous foam in the litter tray for a period of time sufficient to receive wastes from an animal in the cage, and
  - removing the aqueous foam from the litter tray by means comprising jets of water when the aqueous foam has become soiled.
6. In combination, a litter tray removably installed in an animal cage, and aqueous waste-receiving foam disposed in the litter tray in a layer between one half inch and two inches deep, the foam comprising air, water, sorbitol, a fatty acid, a polyhydric alcohol, and an amine.

4,009,686

# BIRD PERCH

John E. Gilchrist, 1189 Singletary Ave., San Jose, Calif. 95126

Filed Sept. 2, 1975, Ser. No. 609,840

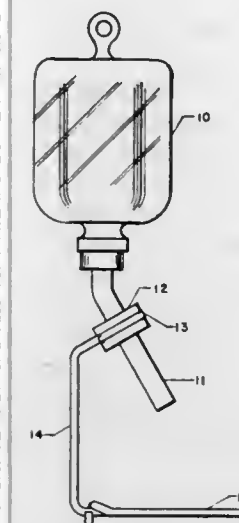
Int. Cl.<sup>2</sup> A01K 31/12

U.S. Cl. 119—26

2 Claims

1. A bird perch in combination with an inverted feeder having a depending feed tube; said bird perch consisting of a resilient collar and a configuration of material defining a perch member and a support member, said support member

having means connecting said resilient collar at one end and said perch at the other end, said resilient collar slidably re-



ceived on said feed tube to permit movement of said perch member with respect to said feeder.

4,009,687

# ROUGHAGE FEEDER UNIT

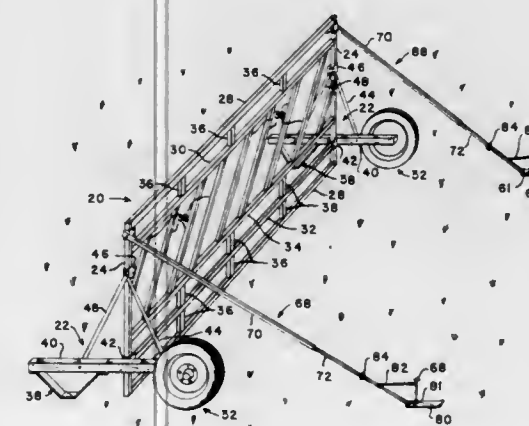
John G. Korthals, R.R. 1, George, Iowa 51237

Filed Sept. 8, 1975, Ser. No. 610,932

Int. Cl.<sup>2</sup> A01K 5/00

U.S. Cl. 119—51 R

14 Claims



9. A roughage feeder unit adapted to be manually transported over the ground and placed adjacent to roughage to allow livestock to move the unit forward to feed on the roughage, comprising:

- an upright gate assembly having a plurality of feeding stations for livestock to feed on roughage located forwardly of said gate;
- a pair of spaced horizontal supports extending forwardly and rearwardly of said gate assembly for supporting said gate assembly in an upright position;
- a ground engaging wheel mounted on each support forwardly of said gate assembly to permit said gate assembly to move forwardly over the ground in response to pressure by livestock against said gate assembly; and
- a ground engaging skid mounted on each support rearwardly of said gate assembly and adapted to slide over the ground in response to pressure by livestock against said gate assembly to allow the livestock to feed on the roughage.

4,009,688

# ROTARY PISTON TYPE ENGINE

Motoyuki Hayashida; Mutsuo Wakamoto; Akinori Tamura, and Masafumi Ikegami, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

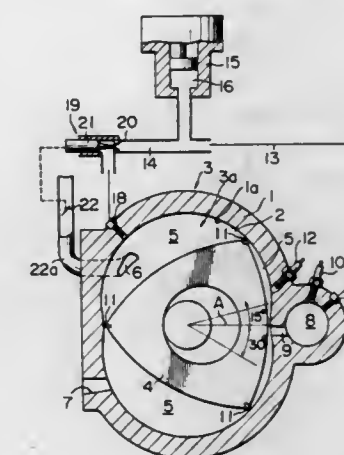
Filed Mar. 3, 1975, Ser. No. 554,929

Claims priority, application Japan, Mar. 4, 1974, 49-25998; May 4, 1974, 49-50057

Int. Cl.<sup>2</sup> F02B 53/10

U.S. Cl. 123—8.09

7 Claims



1. Rotary piston type internal combustion engine comprising a casing having a cavity of multilobed trochoidal configuration defined by an inner peripheral wall and having a major and a minor axis, a substantially polygonal rotor disposed in said cavity of the casing with apex portions in sliding contact with said inner peripheral wall of the casing to define a plurality of working chambers which are variable in volume as the rotor rotates to effect intake, compression, expansion and exhaust strokes of the engine, intake port means provided in the casing for communication with the working chamber in intake stroke, intake passage means communicating with said intake port means, throttle valve means disposed in said intake passage means, exhaust port means provided in the casing for communication with the working chamber in exhaust stroke, main combustion chamber means provided outside the cavity in the casing and having a volume of 35 to 65% of the sum of the volume of the main combustion chamber means and that of the working chamber at top dead center, communication passage means comprising a single duct connecting the main combustion chamber means with the working chamber and opening to the working chamber at a position between 15° before and 30° after the minor axis of the trochoid of the cavity, main fuel supply means including main fuel injection nozzle means for supplying fuel to the main combustion chamber means, auxiliary fuel supply means for supplying fuel to the working chamber on the intake stroke, and control means for allowing the auxiliary fuel supply means to supply fuel to the working chamber during high load operation of the engine only and decreasing the amount of fuel supplied by the main fuel supply means to the main combustion chamber in relation to the increase in the amount of fuel supplied by the auxiliary fuel supply means to the working chamber during high load operation of the engine whereby the air-fuel ratio of mixture formed in the main combustion chamber can always be maintained between 10 to 16.

4,009,689

# ROTARY COMBUSTION ENGINE EXHAUST GAS RECIRCULATION SYSTEM

Leslie K. Walters, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1975, Ser. No. 573,909

Int. Cl.<sup>2</sup> F02B 53/10

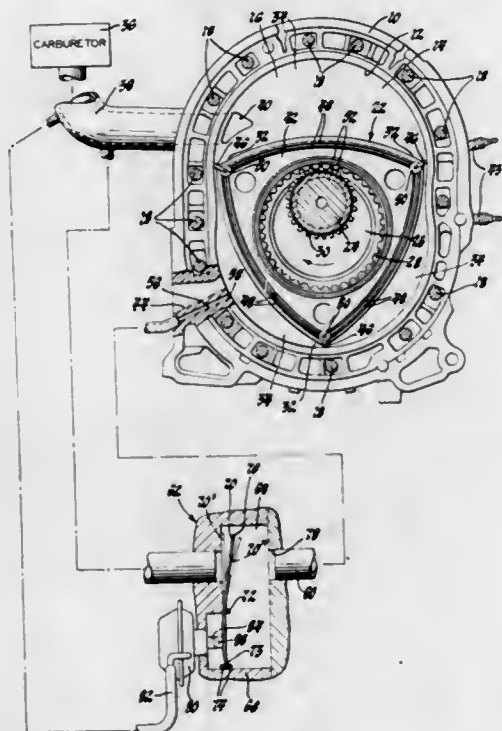
U.S. Cl. 123—8.13

3 Claims

1. A rotary combustion engine comprising housing means having an internal peripheral wall and oppositely facing side walls, a rotor rotatably mounted in said housing means with



sides facing said side walls and apexes that remain adjacent said peripheral wall as said rotor rotates, said rotor and said walls cooperatively providing a plurality of chambers that are spaced about and move with said rotor while varying in volume, said housing means having an intake port openable by said rotor to said chambers for delivering a combustible gaseous mixture to said chambers as they expand in an intake phase, ignition means for igniting the mixture in said chambers following a compression phase whereupon they expand in an expansion phase, said housing means having an exhaust port openable by said rotor to said chambers for exhausting said chambers as they contract in an exhaust phase, and exhaust gas recirculation means including pressure responsive valve



means responsive to both exhaust gas pressure and intake vacuum for sequentially connecting said chambers adjacent their trailing end to said intake port only below a predetermined exhaust gas pressure that occurs when said chambers are nearing the end of their exhaust phase and only then through a variable size opening that increases in size with decreasing intake vacuum whereby the differential between the pressure of the exhaust gases and the intake mixture then causes exhaust gases rich in unburned hydrocarbons in the trailing region of each chamber to flow to said intake port and thereafter be recirculated through the intake, compression and expansion phases and whereby the recirculated exhaust gas flow increases with decreasing intake vacuum.

4,009,690

## ROTARY INTERNAL COMBUSTION ENGINE

George W. Moran, 10532 Berry Knoll, Dallas, Tex. 75230  
Continuation-in-part of Ser. No. 365,413, May 31, 1973, Pat. No. 3,894,519. This application July 14, 1975, Ser. No. 595,578

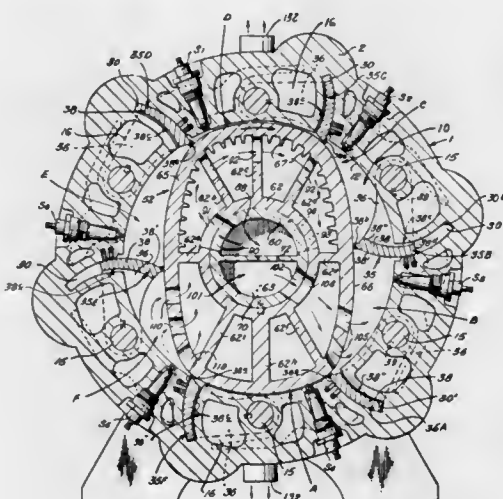
Int. Cl.<sup>2</sup> F02B 53/00

U.S. Cl. 123-8.45

4 Claims

1. An internal combustion engine comprising: an engine block having a circular bore extending therethrough; end plates adjacent opposite ends of said engine block, each of said end plates having openings extending therethrough; a shaft; means rotatably securing said shaft in the bore of the engine block such that said shaft extends through said openings in said end plates; a rotor secured to said shaft, said rotor having a substantially oval shaped cross-section and having first and second arcuate end surfaces, said first arcuate end surface having a radius of curvature substantially equal to the radius of said bore such that said arcuate end surface is substantially parallel to the wall of said bore, said rotor having a second arcuate end surface substantially parallel to the wall of the bore but spaced from the wall of the bore a distance

greater than the distance the first arcuate end surface is spaced from the wall of the bore; sealing vanes, each of said sealing vanes having a concave surface and a convex surface arranged to form an elongated vane having a curved wedge-shaped cross-section means pivotally securing said vanes to said end plates such that said vanes are pivotable about an axis coinciding with the center of curvature of said convex surface on said vane; said concave surface on said sealing vane having a shorter radius of curvature than the convex surface on said sealing vane and a center of curvature located a greater distance from the wall of said bore in the engine block than the center of curvature of the convex surface of the vane; an arm secured to each end of each of said vanes; means pivotally securing each of said arms to said engine block such that each vane is pivotal about a center of curvature of said convex surface of said vanes; curved wedge-shaped vane receiving grooves in the engine block extending longitudinally thereof



and positioned to allow oscillation of said vanes in said grooves said grooves being milled to provide a thin open space between the concave surface of each vane and the inner wall of each groove when the vanes are in the outermost position in the grooves; means to urge said vanes inwardly as the contour of the rotor permits wherein upon rotating the rotor the vanes oscillate in said grooves and due to the curved wedge-shaped cross sections of the vanes and grooves, the said open space between the concave surface on said vanes and the inner wall of the grooves widens appreciably as the vanes move inwardly from their outermost positions thus allowing gases in operational chambers to flow freely between the front and the back of the vanes as they oscillate; means to deliver fuel into space between the wall of the bore and the surface of the rotor intermediate adjacent vanes; means to initiate combustion of fuel in said bore; and means to exhaust products of combustion from said bore.

4,009,691

## PORT CONTROL ARRANGEMENT IN A ROTARY-PISTON INTERNAL-COMBUSTION ENGINE

Huschang Sabet, Eduard-Pfeiffer-Str. 67, Stuttgart, Germany (D-7000)

Filed Dec. 8, 1975, Ser. No. 638,341

Claims priority, application Germany, Jan. 10, 1975, 2500755

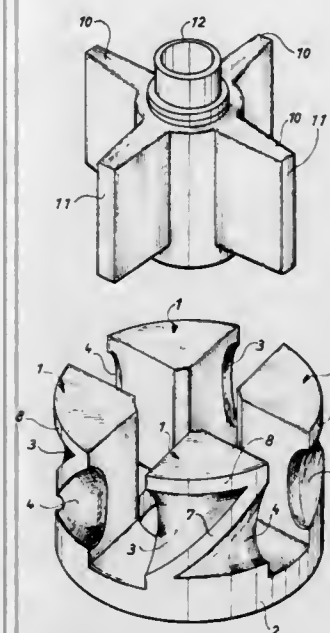
Int. Cl.<sup>2</sup> F02B 55/14; F01C 1/00; F04C 17/00

U.S. Cl. 123-8.47

10 Claims

1. In a rotary-piston, internal-combustion engine having a casing of circular cross section at right angles to an axis of said casing, two sets of pistons mounted in the casing for angular movement relative to each other between two terminal positions and for rotation about said axis, each piston having two radially extending faces, said faces circumferentially defining chambers in said casing between respective pistons of said sets, respective circumferential faces of said pistons sealingly engaging said casing, the circumferential faces of the pistons

in one of said sets having an angular width relative to said axis substantially greater than the angular width of the circumferential faces of the pistons in the other set, each piston in said one set being formed with two recesses in the circumferential face thereof, said recesses being open in respective opposite circumferential directions toward respective chambers and in a radially outward direction toward said casing, said casing being formed with a pair of ports, the improvement which comprises:



- said two recesses defining therebetween an elongated land of the circumferential face of each piston in said one set;
- the circumferential faces of the pistons in said other set being elongated;
- the direction of elongation of each of said lands and the direction of elongation of each of said circumferential faces of the pistons of said other set having each an axial component;
- said directions of elongation being differently inclined relative to said axis.

4,009,692

## TORCH-IGNITION RECIPROCATING INTERNAL COMBUSTION ENGINE

Yasuo Sakai, Yokohama, and Yasuhiko Nakagawa, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

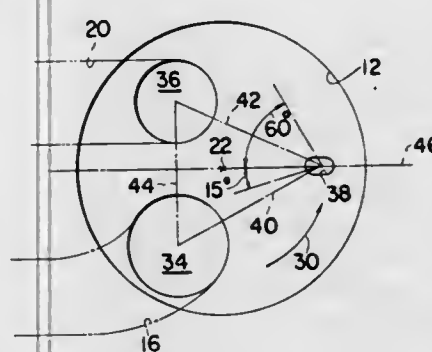
Filed Nov. 15, 1974, Ser. No. 524,319

Claims priority, application Japan, Nov. 20, 1973, 48-130382

Int. Cl.<sup>2</sup> F02B 19/10, 19/16

U.S. Cl. 123-32 SP

1 Claim



1. An internal combustion engine comprising: a cylinder head; a cylinder closed off by the cylinder head; a piston movable within the cylinder between the top dead center and the bottom dead center; a main combustion chamber formed in the cylinder between the piston and the cylinder head; an auxiliary combustion chamber; a torch flame passageway establishing communication between the main and auxiliary

combustion chambers; means for introducing a relatively lean mixture into said main combustion chamber, the relatively lean mixture introducing means being so constructed and arranged as to impart rotation to inflowing relatively lean mixture as it enters the main combustion chamber to cause the rotation flow of lean mixture about the cylinder axis; means for initiating combustion in the auxiliary combustion chamber; the volume of the auxiliary combustion chamber being from 6 percent to 15 percent of the total clearance volume that is the combined volume including a volume of the auxiliary combustion chamber, a volume of the main combustion chamber at the top dead center position of the piston and a volume of the torch flame passageway; a ratio of cross sectional area cut through the torch flame passageway at right angles thereto to the volume of the auxiliary combustion chamber being from 0.07cm<sup>2</sup>/cc to 0.3cm<sup>2</sup>/cc; a length to diameter ratio of the torch flame passageway being from 0.5 to 3.0; and the torch flame passageway being arranged in an axial plane which is parallel to the cylinder axis and includes the inlet end of the torch flame passageway and which is displaced from an axial plane including the cylinder axis and the inlet end of the torch flame passageway by an angle not greater than 60°, as measured from the second mentioned axial plane to the first mentioned axial plane in the direction of the rotating flow of lean mixture passing through the second mentioned plane within an area adjacent to the inlet end of said torch flame passageway and 15°, as measured from the second mentioned axial plane to the first mentioned axial plane in a direction opposite the direction of the rotating flow of lean mixture passing through the second mentioned plane within an area adjacent to the inlet end of the torch flame passageway and as measured with the inlet of the torch flame passageway as the center of measurement.

4,009,693

## AIR PURGING AND COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINES

John M. Bailey, Dunlap; John J. Cychul, Jr., and Michael K. Stratton, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

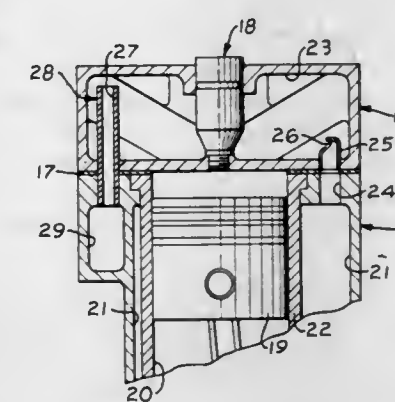
Filed May 19, 1972, Ser. No. 254,851

The portion of the term of this patent subsequent to June 1, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> F02F 1/36

U.S. Cl. 123-41.82 A

11 Claims



1. An engine comprising:

a block having at least one cylinder formed therein and defining a pair of upstanding walls, a head attached to said block to cover said cylinder, said head being substantially rectangular in cross-section with the longer dimension thereof being of the same substantial length as said block and the shorter dimension thereof being aligned and forming an extension of said upstanding walls, first chamber means formed in said block closely adjacent to said cylinder, said first chamber means circumventing said cylinder substantially long the full axial length thereof, and a piston reciprocally mounted in said cylinder and fuel injection means mounted in said head, said head further forming a second chamber means,



said chamber means being substantially unobstructed whereby the fuel injection means is substantially totally exposed to a coolant passing therethrough,  
first passage means communicating said first and second chamber means,  
third chamber means formed in said block vertically below said second chamber means for receiving coolant from said first chamber means by way of said second chamber means, and  
combined air purging and second passage means directly communicating said second chamber means with said third chamber means and having an inlet positioned upwardly in said second chamber means for delaying direct communication of coolant, in an at least generally vertically downwardly direction, from said second chamber means to said third chamber means until said second chamber means has been at least substantially filled with coolant.

4,009,694

# GASOLINE ENGINE TORQUE REGULATOR WITH PARTIAL SPEED CORRECTION

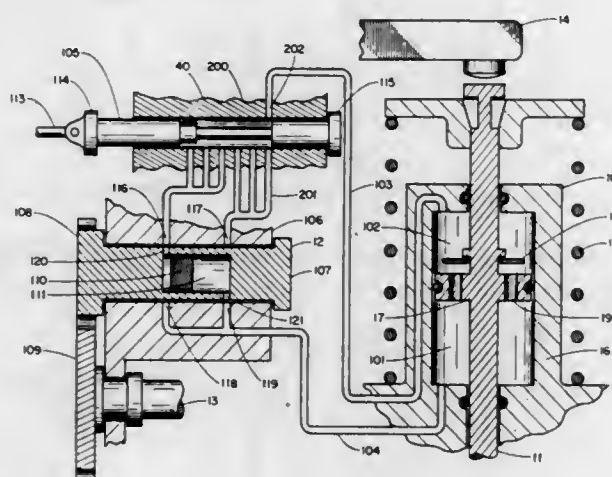
Joseph Carl Firey, P. O. Box 254, Northgate Station, Seattle, Wash. 98125

Filed Apr. 15, 1976, Ser. No. 677,404

Int. Cl.<sup>2</sup> F01L 9/02

U.S. Cl. 123—90.12

4 Claims



3. The combination of a four stroke cycle gasoline engine, complete with engine intake valves, intake valve closing springs, intake valve operating cams and linkage, and additionally fitted with a dashpot connecting between each such engine intake valve and the frame of the engine, wherein the improvement comprises connecting the two chambers of each such dashpot together via a fixed stroke, positive displacement flow regulator;

said fixed stroke, positive displacement, flow regulator comprising a fixed port element, a rotating port element and drive, a free piston element, and a port regulator element with torque control linkage;

said fixed port element being secured to the engine frame and containing a cavity, within which the rotating port element rotates, and having two groups of fixed ports; one group of fixed ports; the pressure fixed ports, being connected individually to the port regulator element whose other connection is via a portion of the control passage to one chamber of the dashpot, these pressure fixed ports connecting into the cavity in two sets of pressure fixed ports, each such set being coplanar in a plane at right angles to the axis of rotation of the rotating port element, the plane containing the one set of pressure fixed ports being displaced axially along said axis of rotation from the plane containing the other set of pressure fixed ports by a distance sufficient for sealing therebetween, the pressure fixed ports of each such set being angularly displaced relative to each other about said axis of rotation, the

number of such pressure fixed ports in each set of the two sets being an integral odd number; the other group of fixed ports, the discharge fixed ports, being connected together and jointly connecting via the other portion of the control passage to the opposite chamber of the dashpot these discharge fixed ports connecting into the cavity in two sets of discharge fixed ports, each such set being coplanar in a plane at right angles to the axis of rotation of the rotating port element, these two planes containing these two sets of discharge fixed ports being coincident with the two planes containing the two sets of pressure fixed ports, the discharge fixed ports of each such set being angularly displaced relative to each other and each such discharge fixed port being displaced 180° from one of the coplanar pressure fixed ports about said axis of rotation, the number of such discharge fixed ports in each set of the two sets being equal to the number of pressure fixed ports with which they are coplanar, the pressure fixed ports of one coplanar set of pressure and discharge fixed ports being angularly displaced from the discharge fixed ports of the other coplanar set of pressure and discharge fixed ports by the displacement angle between the rotating ports as described hereinafter;

said rotating port element being positively rotated, within the cavity in the fixed port element, as by gears or chains, from an engine shaft such as the crankshaft or camshaft, said rotating port element being closely and sealably fitted to the cavity in the fixed port element; said rotating port element being fitted with two passages, each such passage being fitted with two ports at its ends, one such port of one such passage indexing with and being always coplanar with one set of coplanar pressure and discharge fixed ports in the fixed port element the other port of this same passage connecting always to one end of the free piston element as described hereinafter, one such port of the other passage indexing with and being always coplanar with the other set of coplanar pressure and discharge fixed ports in the fixed port element the other port of this latter passage connecting always to the other end of the free piston element, said two rotating ports which index with and are coplanar with the pressure and discharge fixed ports being angularly displaced from one another about the axis of rotation of the rotating port element by the displacement angle which can have any value between zero and 180°; said rotating port element being axially held in alignment within the cavity in the fixed port element so that the rotating ports index with and remain coplanar with the sets of pressure fixed ports and discharge fixed ports;

said free piston element being a free piston and closed ended cylinder with the free piston fitted closely and moveably within the cylinder and being free to move within said cylinder, one end of said cylinder connecting always into one passage in the rotating port element and the other end of said cylinder connecting always into the other passage in the rotating port element; the ends of said cylinder being closed;

said port regulator element comprising a fixed port housing secured to the engine frame and a moveable regulator bar secured to the engine torque control linkage; said fixed port housing containing an open ended cylindrical cavity with cavity ports giving access to and distributed along a portion of the length of said cylindrical cavity, the number of such cavity ports being equal to one more than the number of pressure ports in the fixed port element and each such pressure port being connected individually to one such cavity port, the one extra cavity port not connected to a pressure port being connected via a portion of the control passage to one chamber of the dashpot and being coplanar with that one cavity port which does connect to a pressure port and is never closed by the moveable regulator bar in a plane at right angles to the centerline axis of the cylindrical cavity in the fixed port housing; said moveable regulator bar fitting closely, seal-

ably and axially moveably within the cylindrical cavity in the fixed port housing and having two axial motion stops and a tapered recessed portion of its length between seals, the length of said tapered recessed portion being somewhat longer than the length of that portion of the cylindrical cavity containing the cavity ports, one of the axial motion stops being positioned on the moveable regulator bar so that when the bar is pushed against this stop the tapered recessed portion aligns with that portion of the cylindrical cavity containing the cavity ports and all cavity ports are open, the other axial motion stop being positioned on the moveable regulator bar so that when the bar is pushed against this stop the tapered recessed portion aligns and opens only with that pair of cavity ports which are coplanar and includes the one extra cavity port not connected to a pressure port, said moveable regulator bar being axially moveable to any position between the two positions set by the two axial motion stops via a torque control linkage connected to said moveable regulator bar, such axial motion closing off or opening up cavity ports to the tapered recessed portion of the moveable regulator bar;

the displacement volume of one full stroke of the dashpot,  $VD$ , the displacement volume of one full stroke of the free piston,  $VP$ , the total number of pressure fixed ports in the fixed port element,  $n$ , the revolutions per minute of the rotating port element,  $NR$ , the revolutions per minute of the engine,  $NE$ , are necessarily related to one another and to the minimum intake valve closing angle,  $AM$ , in crankshaft radians, according to the following equations;

$$(VP)(n)(NR)(AM) = (6.283)(VD)(NE)$$

$$(VP)(n)(NR/NE)(AM) = (6.283)(VD)$$

wherein the speed ratio,  $NR/NE$ , is determined by the positive drive mechanism driving the rotating port element from the engine shaft; and related to the maximum intake valve closing angle,  $AX$ , in crankshaft radians, according to the following equations;

$$(VP)(NR/NE)(AX) = 6.283 VD$$

$$(VP)n(NR/NE)(AM) = 6.283 VD$$

$$(AX)(AX) = n(AM)$$

wherein the minimum intake valve closing angle,  $AM$ , is at least as small as the intake valve closing angle in crankshaft radians of the intake cam on the engine camshaft,  $AC$ , and is preferably less than  $AC$  up to as small as one half of  $AC$ ; wherein the maximum intake valve closing angle,  $AX$ , is equal to the minimum intake valve closing angle,  $AM$ , plus 3 radians minus the maximum engine ignition spark advance in crankshaft radians before piston top dead center;

on multicylinder gasoline engines the several moveable regulator bars of the several fixed stroke, positive displacement, flow regulators being connected to the torque control linkage with equal cavity port opening.

4,009,695

# PROGRAMMED VALVE SYSTEM FOR INTERNAL COMBUSTION ENGINE

Louis A. Ule, 27 Mustang Road, Rolling Hills Estates, Calif. 90274

Continuation of Ser. No. 306,399, Nov. 14, 1972, abandoned, which is a continuation of Ser. No. 125,250, March 18, 1971, abandoned. This application Nov. 18, 1974, Ser. No. 524,406

Int. Cl.<sup>2</sup> F01L 9/02

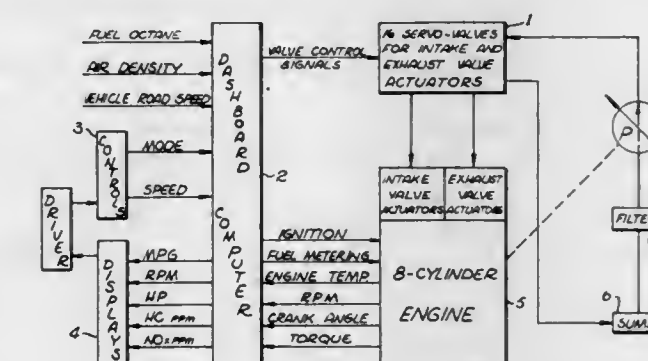
U.S. Cl. 123—90.13

9 Claims

1. An installation for controlling an internal combustion engine comprising:

at least one cylinder and piston combination;

a crank shaft with said piston connected thereto by a connective rod, so that said crank shaft revolves about an axis;  
an inlet valve and an outlet valve for each cylinder;  
a fuel supply means;  
a first means for providing a first signal indicative of the desired output power of said engine;  
second means for detecting the phase angle of said crank shaft and for producing a second signal each time said crank shaft passes a given phase angle;  
third means responsive to said first signal from said first means and also to said second signal from said second



means for providing, at a predetermined time and of a predetermined time duration, a third signal for a respective one of said inlet valves;

fourth means responsive to the second signal from said second means for providing, at a predetermined time, a fourth signal for a respective one of said outlet valves;

fifth means, in combination with a respective inlet valve and responsive to a respective third signal, for opening said respective inlet valve and keeping said inlet valve open for said predetermined time duration;

sixth means in combination with a respective outlet valve and responsive to a respective fourth signal for opening said respective outlet valve.

4,009,696

# HYDRAULIC LASH ADJUSTER WITH INTERNAL OIL PRESSURE CONTROL

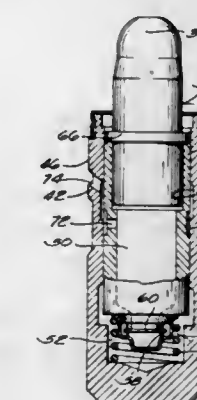
Richard D. Cornell, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.

Filed Nov. 20, 1975, Ser. No. 633,668

Int. Cl.<sup>2</sup> F01L 1/18

U.S. Cl. 123—90.35

13 Claims



1. A hydraulic lash adjuster for use with an internal combustion engine of the type having an overhead cam, a rocker arm having a socket, a lubrication system and a bore formed in the engine cylinder head in communication with the lubrication system, comprising:

a lash adjuster body having a lower portion adapted to be disposed within said cylinder head bore, said body having a stepped cylindrical exterior surface;

a plunger reciprocal within said body and having a central



cavity forming an oil reservoir, said plunger including a passage free fulcrum portion having a head receivable within the rocker arm socket;  
means defining an oil inlet formed in said body and said plunger for placing said cavity in communication with said lubrication system; and  
pressure reduction means formed as a part of the lash adjuster body for reducing the oil pressure within the oil reservoir below that of the lubrication system operating pressure

4,009,697

# AUTOMATIC IGNITION ADVANCE FOR AN INTERNAL COMBUSTION ENGINE

Louis Chateau, Rosny-sur-Bois, France, assignor to Ducellier & Cie, Paris, Cedex, France

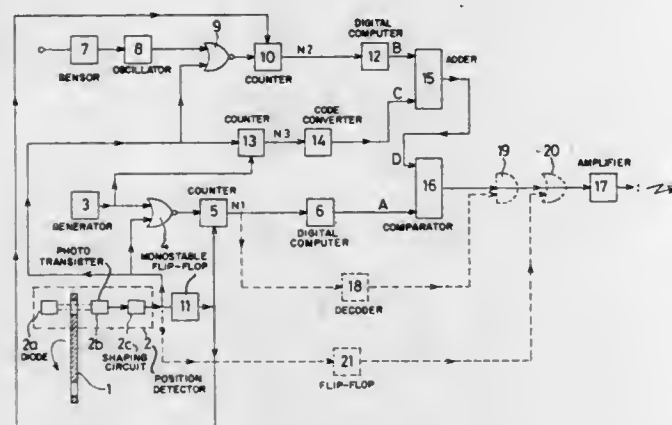
Filed Jan. 21, 1975, Ser. No. 542,851

Claims priority, application France, Jan. 22, 1974, 74.02080

Int. Cl.<sup>2</sup> F02P 5/04

U.S. Cl. 123—117 R

4 Claims



1. A method of controlling ignition timing in an internal combustion engine having a shaft, comprising: generating a first digital signal as a function of the time taken for the shaft to rotate through a constant angle from a first reference position, said first signal varying with the shaft speed in accordance with the required speed/advance characteristic for the engine; generating in said same time a second digital signal corresponding to the value of another operational parameter of the engine; generating a third digital signal increasing continuously with the time elapsed after the shaft passes through a second reference position; adding together the second and third digital signals to derive a fourth digital signal; and generating a spark-triggering pulse when the first and fourth digital signals are equal.

4,009,698

# INTERNAL COMBUSTION ENGINE OF IGNITION TIMING CONTROLLABLE TYPE

Takashi Kato, Eishi Oono, and Toshihiko Nakamura, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 16, 1975, Ser. No. 622,903

Claims priority, application Japan, July 22, 1975, 50-88873

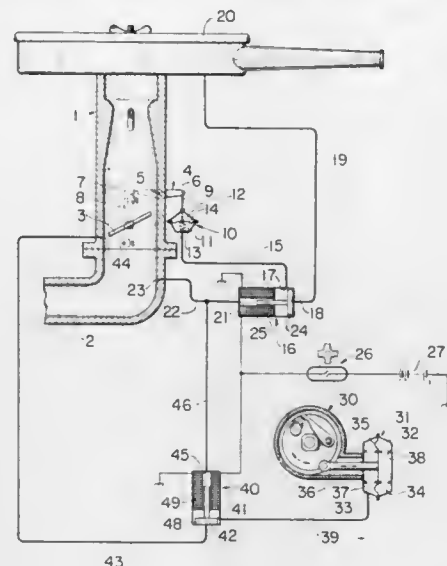
Int. Cl.<sup>2</sup> F02P 5/10

U.S. Cl. 123—117 A

4 Claims

1. An internal combustion engine of ignition timing controllable type for use with an automotive vehicle, comprising: an intake system including a carburetor having a throttle valve; a distributor; an ignition timing regulating device connected to said distributor and having a diaphragm chamber, to which a control vacuum is supplied; a first port from which a carburetor vacuum having relationship to the opening of said throttle valve is taken out; a second port from which an intake vacuum is taken out; and a first direction control valve operable in relationship to one of the speed of rotation of the internal

combustion engine and the running speed of the automotive vehicle, the first- and second-named ports being selectively connected to the diaphragm chamber of said ignition timing regulating device by the first-named direction control valve, so that during a low speed driving condition of the internal combustion engine the intake vacuum taken out from the second-named port may be supplied to said diaphragm cham-



ber to retard the ignition timing, so that during a high speed driving condition of the internal combustion engine a low carburetor vacuum taken out from the first-named port may be supplied to said diaphragm chamber to advance the ignition timing, and so that upon deceleration from a high speed driving condition a high carburetor vacuum taken out from the first-named port may be supplied to said diaphragm chamber to retard the ignition timing.

4,009,699

# DIGITAL IGNITION SPARK TIMING ANGLE CONTROL WITH READ ONLY MEMORY

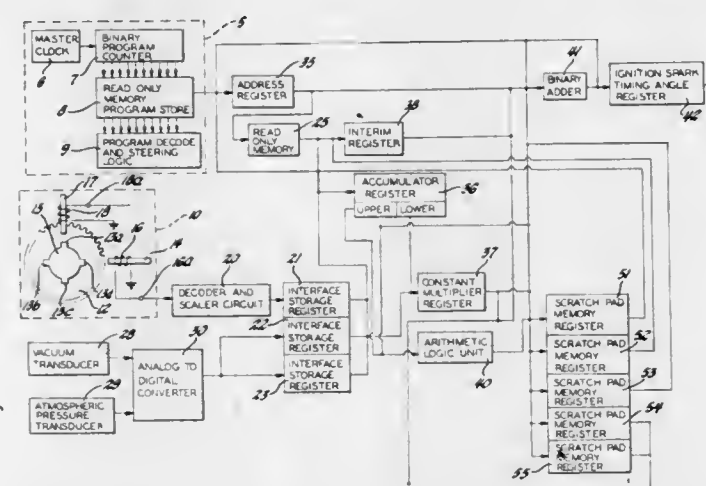
Lewis R. Hetzler, Gerald O. Huntzinger, William P. Winstead, III, and Thomas A. Zickel, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 19, 1976, Ser. No. 650,164

Int. Cl.<sup>2</sup> F02P 1/00

U.S. Cl. 123—117 D

5 Claims



1. An ignition spark timing control system for use with a spark ignition internal combustion engine and a sequence control arrangement comprising: a read only memory pre-programmed to produce an output binary signal representation of predetermined ignition spark timing angle based upon the instantaneous value of both of two selected engine operating parameters at each of a plurality of respective selected points within the range of values in response to respective input address signals whereby over the range of values of the two selected engine operating parameters the read only memory

generates a three-dimensional surface of ignition spark timing angles based upon the two selected engine parameter values; means for producing input address signals for said read only memory in response to binary signal representations of instantaneous values of said selected two engine operating parameters; means for applying said input address signals to said read only memory whereby the binary signal representation of an ignition spark timing angle is produced by said read only memory in response to each of said input address signals; and means effective to vary the binary signal representations of the ignition spark timing angles as retrieved from said read only memory in accordance with engine manifold vacuum in substantial inverse proportion to atmospheric pressure whereby said three-dimensional surface generated by said read only memory is tilted about a selected engine parameter value as an axis in an amount substantially inversely proportional to actual atmospheric pressure.

4,009,700

# CONTROL ARRANGEMENT FOR THE RECONVEYANCE OF EXHAUST GASES

Uwe Engels; Günther Froberg; Peter Klotzbach, all of Neuss; Ernst Kühlen, Willich, and Helmut Rossel, Neuss, all of Germany, assignors to A. Pierburg Autogeratebau KG, Neuss, Germany

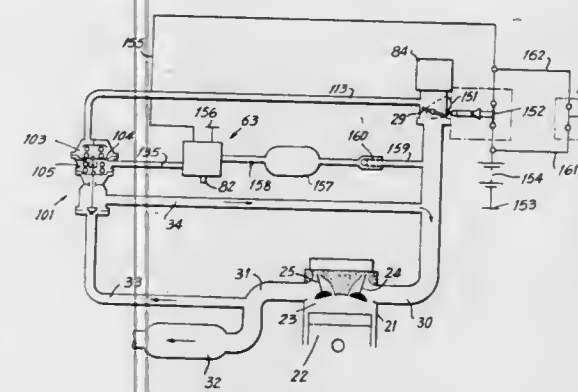
Filed Jan. 22, 1974, Ser. No. 435,587

Claims priority, application Germany, May 10, 1973, 2323515

Int. Cl.<sup>2</sup> F02B 25/06

U.S. Cl. 123—119 A

7 Claims



1. A control arrangement for the reconveyance of exhaust gas into an intake conduit of an internal combustion engine and including a dosing installation for a fuel-air mixture in said intake conduit; comprising an adjusting device for determining the quantity of the reconveyed exhaust gas; a control conduit communicating with said adjusting device adapted to impart operating parameters thereto in response to a gas pressure present in said intake conduit; at least one control membrane in said adjusting device dividing the interior into separate control pressure chamber portions subjected to a differential pressure in response to said operating parameters; a control element fastened to said control membrane and adapted to be actuated thereby; a multiple-position valve being positioned in the flow path of said control conduit, said multiple-position valve being adapted to subject at least one of said control pressure chamber portions to a predetermined gas pressure for imparting control to said adjusting device over the flow of exhaust gas into said intake conduit; a second control membrane in said adjusting device in spaced relationship with and below said first control membrane (4) and defining a control pressure chamber therebetween adapted to be subjected to a control pressure prevailing in the intake; means operatively connecting said first and second membranes; valve means in a reconveying line for influencing the quantity of reconveyed exhaust gas; said adjusting device having a control membrane connected to said valve means; the position of said multiple-position valve being dependent substantially on the position of the dosing installation in said intake; said control pressure chamber being bordered by said first control mem-

brane and facing said second control membrane; said multiple-position valve being connected before the control pressure chambers; said membrane connecting means comprising a free-wheeling coupling member adapted to facilitate relative movement between said first and second membranes.

4,009,701

# INTERNAL COMBUSTION ENGINE HAVING PROVISIONS FOR HEATING THE FUEL-AIR MIXTURE BY MEANS OF THE EXHAUST

Max Ruf, Obereisesheim, and Johannes Steinwart, Obersulm-Willsbach, both of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Germany

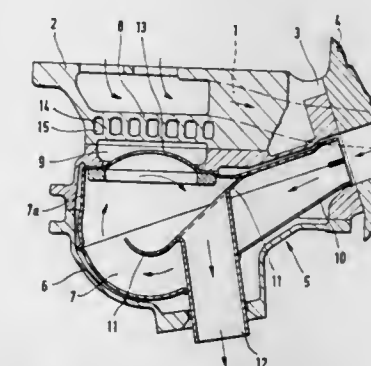
Filed May 20, 1976, Ser. No. 688,344

Claims priority, application Germany, May 22, 1975, 2522671

Int. Cl.<sup>2</sup> F02M 31/00

U.S. Cl. 123—122 AC

6 Claims



1. An internal combustion engine having an intake for the fuel-air mixture and an exhaust line, a device for pre-heating the fuel-air mixture by means of the engine exhaust comprising a portion of the intake and a portion of the exhaust line having a common wall for heat transfer, the heat-transfer wall having a plurality of through coolant passages and means for connecting the passages to a source of coolant when a certain operating temperature is reached.

4,009,702

# PISTON WITH TURBULENCE INDUCING FACE CONFIGURATION

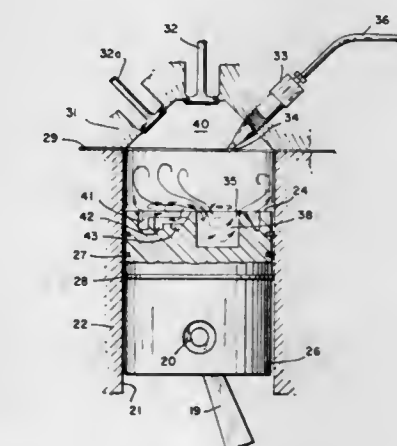
Edward A. Mayer, Newburgh, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 15, 1974, Ser. No. 524,295

Int. Cl.<sup>2</sup> F02F 3/26

U.S. Cl. 123—193 P

3 Claims



1. In an internal combustion engine including at least one cylinder, for an expandable combustion chamber, a piston operably positioned for reciprocating motion in said cylinder and a fuel injector being actuable to introduce a stream of fuel to said expandable combustion chamber, and valve means opening into said combustion chamber for introducing a gas



stream of air therethrough in a manner to cause said air to swirl rapidly about said combustion chamber, means forming a cylindrical walled primary cavity in the face of said piston and defining an open chamber therein, to receive fuel and swirling air, recess means formed into said piston face and positioned to receive a gaseous flow from said primary cavity during the piston power stroke, and defining at least one circular groove about said primary cavity, said at least one circular groove including an outwardly sloping wall connected with said piston face, and a substantially vertically sloping wall forming the periphery of said groove, whereby to facilitate intermixing of air with injected fuel to provide an improved combustion process.

4,009,703

**BOW STRING TRIGGER RELEASE MECHANISM**

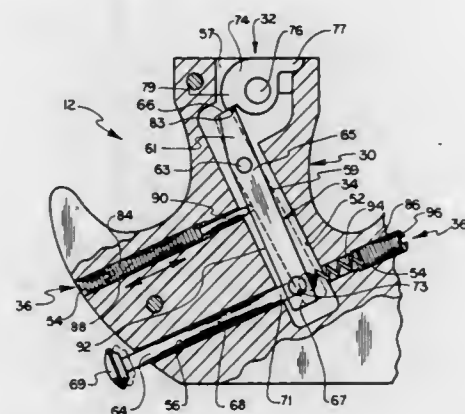
Jerry L. Cunningham, Sr., 5837 Jones St., Wichita, Kans. 67217

Filed Dec. 17, 1974, Ser. No. 533,510

Int. Cl.<sup>2</sup> F41B 5/00

U.S. Cl. 124—35 A

9 Claims



1. A trigger release mechanism adapted to first grasp a bow string of a bow and arrow assembly and secondly release the bow string, comprising:

- a housing assembly having an outer contour to be grasped by one's hand;
- an actuator assembly mounted in said housing assembly;
- said actuator assembly having an actuator member pivotally connected and a plunger pivotally connected to said actuator member and with inward pressure thereon causing pivoting of one end of said actuator member;
- a cam assembly having a release cam member mounted in said housing assembly and releasably engagable with the other end of said actuator member;
- said actuator member having a first pivoted position wherein the actuator member engages and holds said cam member against rotation while holding an entrapped bow string within the housing during a drawing operation of a bow string; and
- said actuator member having a second position wherein said actuator member is out of contact with said release cam member to permit said cam member to pivot and release a bow string.

4,009,704

**COOL-TOUCH COOKING SURFACES**

Louis A. Marzetta, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Division of Ser. No. 544,600, Jan. 27, 1975, abandoned. This application Aug. 17, 1976, Ser. No. 715,026

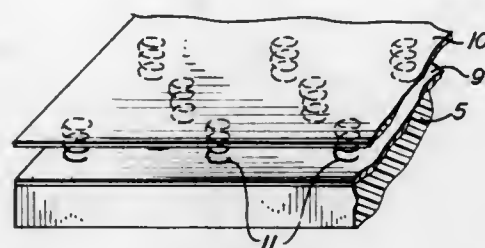
Int. Cl.<sup>2</sup> F24C 15/10

U.S. Cl. 126—221

1 Claim

1. A cool-touch covering for the heated surface of a warming tray, hot plate, or other cooking appliance, comprising: a pair of sheets of thermally stable material which are sepa-

rated by a plurality of spring-like, thermally stable elements, one of said sheets being mounted on said heated surface;



said spring-like elements being compressible under the weight of a cooking utensil and its contents to an extent sufficient to increase the thermal inertia of said sheets and elements by a factor of at least several hundred.

4,009,705

**VENTING SYSTEM FOR A GAS-FIRED HEATING PLANT**

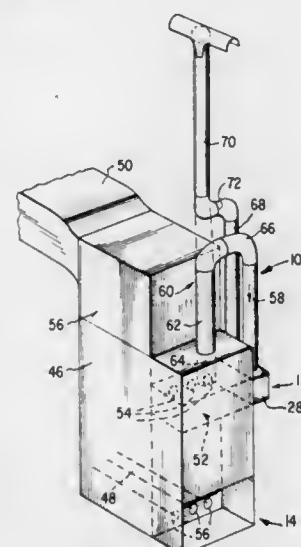
Donald L. Smith, Salem, Ill., assignor to Thrifty-Vent, Inc., Salem, Ill.

Continuation-in-part of Ser. No. 549,059, Feb. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 442,334, Feb. 4, 1974, abandoned. This application May 23, 1975, Ser. No. 580,133

Int. Cl.<sup>2</sup> F23J 11/02

U.S. Cl. 126—307 A

10 Claims



1. In combination with a gas-fired heating plant having a base, an upper portion and having a combustion chamber provided with a flue outlet provided in the upper portion for the outlet passage of combustion gases to be conveyed to a chimney flue for the heating plant: a venting system for the combustion chamber comprising a first piping connected to the flue outlet, a second piping connected to the chimney flue, a diverter box vertically arranged relative to the heating plant exteriorly thereof and having an upper portion and a lower portion, said diverter box being connected to and intercommunicating both of said pipings at its upper portion and having a bottom provided with a substantial opening disposed well above the base of the heating plant at the upper portion of the heating plant with said opening being in constant free communication with the atmospheric air surrounding the heating plant which air enters the diverter box through the opening in the bottom as cold air to establish a cold air pressure head below the first piping and establish a heat lock to prevent the flow of heated air from the combustion chamber outlet of the heating plant and also to prevent down drafts from the chimney flue attempting to pass down through the second piping from reaching the combustion chamber of the heating plant.

4,009,706

**SYNTHETIC ORGANIC FLOCCULANTS TO CLARIFY RAW SUGAR LIQUOR**

Paul Eugene Shaughnessey, Huntingdon Valley, Pa., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 18, 1976, Ser. No. 697,495

Int. Cl.<sup>2</sup> C13D 3/00

U.S. Cl. 127—48

10 Claims

1. A process for refining a raw sugar liquor containing flocculatable impurities and ready for clarification which comprises adding to said sugar liquor an amount effective to flocculate said impurities of the combination of a cationic melamine-formaldehyde acid colloid and an anionic polyacrylamide containing from about 3 to 40 mole percent of its repeating units in the form of sodium acrylate groups and having a molecular weight of at least about 0.5 million and thereafter clarifying said sugar liquor.

4,009,707

**AUTOMATIC ACOUSTIC IMPEDANCE METER**

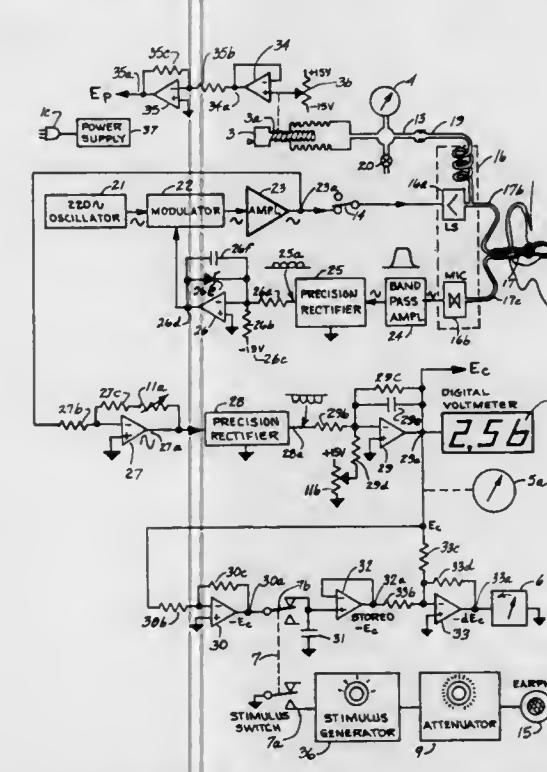
John W. Ward, Charlottesville, Va., assignor to Teledyne Avionics, a division of Teledyne Industries Inc., Charlottesville, Va.

Filed July 29, 1975, Ser. No. 600,067

Int. Cl.<sup>2</sup> A61B 5/12, 10/00

U.S. Cl. 128—2 Z

5 Claims



1. An automatic acoustic impedance meter apparatus for evaluating the middle ear and tympanic membrane system, said apparatus being comprised of:

- sound source means, including oscillator means, modulator means, amplifier means and loud-speaker means, operationally interconnected;
- sound sensor means, including microphone means, narrow-band amplifier means and rectifier means, operationally interconnected;
- ear probe means for insertion in the subject's ear canal, including flexible probe tip pressure sealing means, tubular interconnecting means for acoustically connecting said sound source means and said sound sensor means to said ear probe means and thereby to the subject's ear canal;
- inverse feedback means, including reference means and amplifier means to control said sound source means in response to the ear canal sound level sensed by said sound sensor means, thereby maintaining an unchanging sound level in the subject's ear canal regardless of the compliance thereof;
- measurement means, including compliance analog voltage determining means responsive to the electrical excitation

of said loud-speaker means, thereby obtaining a compliance analog voltage representative of the subject's ear canal compliance and including voltmeter means to measure said compliance analog voltage as a measure of the subject's ear canal compliance.

4,009,708

**PULSE RATE RECORDER**

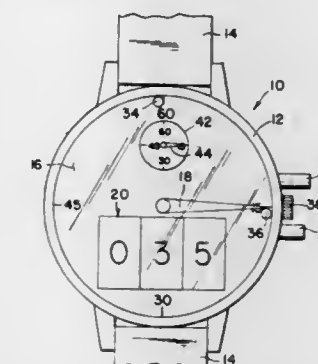
John J. Fay, Jr., 24 Drake Lane, Levittown, N.Y. 11756

Filed May 29, 1975, Ser. No. 581,772

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128—2.05 P

2 Claims



1. A self contained circulatory pulse rate measuring and indicating device comprising: a case; means carried by said case for securing said case to the wrist of a wearer; said case having a front face and a back face; a pulse transducer carried on said back face for contact with said wrist; a digital counter means within said case; a digital display on said front face driven by said counter means; a sweep second hand on said front face; electric motor means within said casing for drivingly rotating said hand at a predetermined rate, first and second stops angularly disposed about said hand for engagement by said hand when said hand is in predetermined orientations; said first stop being fixedly positioned at one angular position; gear train means for angularly moving said second stop to an adjustable angular position; said hand and said stops forming a portion of a switch means for electrically energizing said motor means and for coupling said transducer means for indexing said counter only when said hand is positioned between said stops.

4,009,709

**APPARATUS AND PROCESS FOR DETERMINING SYSTOLIC PRESSURE**

William Trevor Link; Henry Ferdinand Rugge, both of Berkeley, and William David Jansen, Menlo Park, all of Calif., assignors to American Optical Corporation, Southbridge, Mass.

Filed May 15, 1975, Ser. No. 578,047

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128—2.05 A

15 Claims

1. An apparatus for determining systolic pressure, comprising:

- a pressure cuff attachable to a living test subject adjacent a blood vessel;
- means for changing pressure in the cuff and thereby applying pressure to the subject;
- means communicating with said cuff for measuring a quantity proportional to a time-dependent fluctuating component representative of the pulsatile pressure within the blood vessel, said means having a frequency response of at least about five times the pulse rate of the subject whereby said quantity is proportional to the amplitude of said pulsatile pressure;
- means for determining the maximum value attained by said quantity as the applied pressure is changed;
- means for storing a representation of said maximum value;
- means for determining when said quantity is substantially







4,009,716

## NEEDLE-HUB ASSEMBLY FOR SYRINGES

Milton J. Cohen, 9201 Persimmon Tree Road, Potomac, Md. 20854

Filed Feb. 17, 1976, Ser. No. 658,613

Int. Cl.<sup>2</sup> A61M 5/32

U.S. Cl. 128—218 NV

9 Claims



1. In a disposable hypodermic syringe having a barrel open at the forward end, a sealing disc fixed in sealing relation over the open end of the barrel, a cup member fixed onto the open end of the barrel, a hub member confined within the cup for movement in the direction toward and away from the open end of the barrel between extended and retracted positions, a hollow needle extending through the hub with an inner end portion extending inwardly beyond the hub and an outer portion extending forwardly beyond the hub, and a cover for enclosure of the needle portion extending forwardly of the hub, the improvement comprising means wherein the hub is located within the cup member normally intermediate between extended and retracted positions with the inner end of the needle spaced a short distance forwardly of the sealing disc and through the sealing disc when in retracted position, resilient means in position to be tensioned in response to movement of the hub from normal to extended position, and means releasably latching the cover with the hub for displacement of the hub from normal toward extended position responsive to displacement of the cover to expose the needle whereby, when the cover becomes disengaged from the hub, the tensioned resilient means becomes effective to thrust the needle and hub toward retracted position to pierce the sealing disc.

4,009,717

## RETAINING FLUIDS

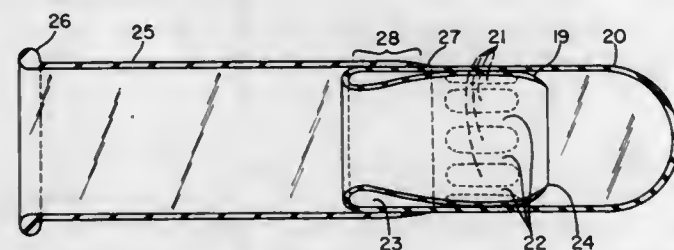
Clayton H. Allen, 651 Concord Ave., Cambridge, Mass. 02138

Filed June 27, 1975, Ser. No. 590,810

Int. Cl.<sup>2</sup> A61F 5/42

U.S. Cl. 128—294

12 Claims



1. Prophylactic apparatus comprising, means defining an outer sheath in the form of a thin rubber

tube closed at one end and open at the other and an inner sheath of thin rubber open at both ends, and means for establishing liquid sealing relationship between said inner and outer sheaths near the open end of said outer sheath to form at least a double wall near said open end with the region between defining a reservoir for retaining fluids originating between the inner opening of said inner sheath and the closed end of said outer sheath while the region on the inside of said inner sheath remains essentially dry, said inner sheath inside said outer sheath being secured to said outer sheath at a plurality of locations to form a double wall with means for receiving and limiting the travel of fluids produced inside said apparatus.

4,009,718

## EARLOBE PIERCING DEVICE

John A. Hastings, 31 Main St., Bass River, Mass. 02664

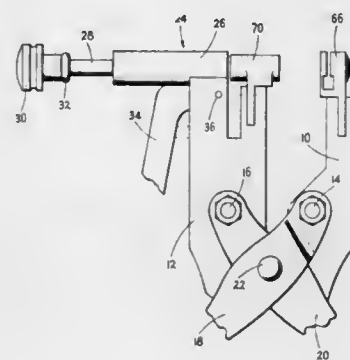
Continuation-in-part of Ser. No. 446,749, Feb. 28, 1974. This

application Mar. 17, 1975, Ser. No. 559,034

Int. Cl.<sup>2</sup> A61B 17/00

U.S. Cl. 128—330

8 Claims



1. A device for piercing an earlobe with a pin having a head at one end and a point at the other end and for securing the pin to the earlobe with a nut engaging the pointed end of the pin comprising:  
a first means for supporting the pin,  
a second means for supporting spaced from the first supporting means,  
means supportively interconnecting the first and second supporting means for permitting relative movement therebetween,  
a first disposable holder including an open barrel for slidably receiving and carrying said pin,  
a second disposable holder for removably receiving and carrying said nut,  
said disposable holders each having base portions shaped to be removably inter-engaged with said first means and second means, respectively,  
said first means including means for removably receiving the first holder,  
and said second means including means for removably receiving the second holder,  
and means supporting said plunger means on said first means independent of said holders for movement of said plunger means into engagement with said pin.

4,009,719

## PROTECTIVE COVER FOR SUTURE BRIDGE

Harold D. Kletschka; Edson H. Rafferty, both of Minneapolis, and Earl W. Clausen, Minnetonka, all of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Filed May 12, 1975, Ser. No. 576,358

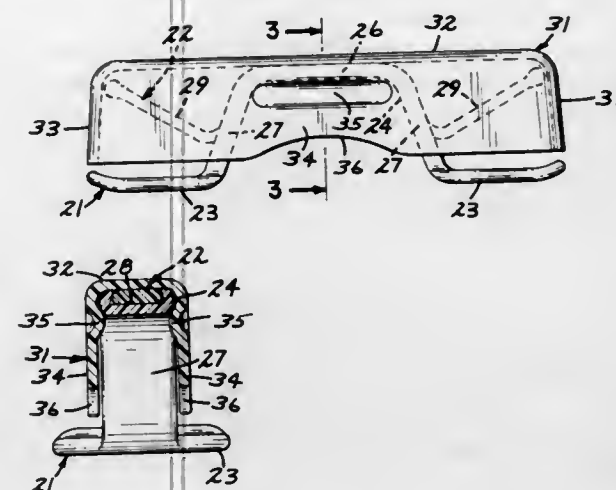
Int. Cl.<sup>2</sup> A61B 17/04

U.S. Cl. 128—335

10 Claims

1. A cover for surgical bridges of the type comprising spaced apart skin-engaging foot portions joined by a bridge portion for supporting incision sutures under tension; said

cover having wall structure adapted to enclose a suture engaging portion of a bridge in outwardly spaced relation to the foot portions of the bridge, said wall structure including a generally flat top wall, opposed generally flat side walls, and at least one



end wall, said cover walls having smooth outer surfaces and rounded corners, said cover including snap fastener elements for releasably holding said cover in enclosing relationship to said suture engaging portion of the bridge.

4,009,720

## WEDGE SEAL FOR A TRACHEOTOMY TUBE

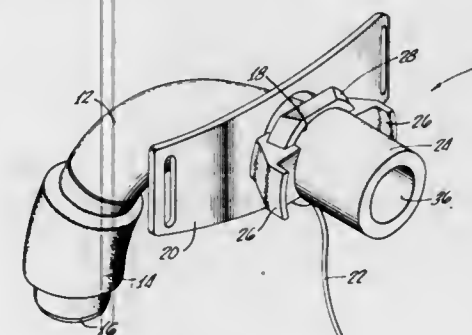
Norman C. Crandall, Diamond Bar, Calif., assignor to Shiley Laboratories, Inc., Santa Ana, Calif.

Filed Aug. 14, 1975, Ser. No. 604,640

Int. Cl.<sup>2</sup> A61M 25/00

U.S. Cl. 128—351

8 Claims



1. A tracheotomy tube comprising:  
an outer cannula;  
a removable inner cannula;  
a coupling to an outside fluid supply;  
a first wedge-like sealing surface of plastic material located adjacent one end of said inner cannula, said sealing surface sloping radially away from the exterior of said inner cannula in a direction along said inner cannula; and  
a second wedge-like sealing surface of plastic material located adjacent said first wedge-like sealing surface and sloping radially away from the exterior surface of said inner cannula in a direction opposite said direction of said wedge-like sealing surface along said inner cannula;  
an internal edge on the end of said outer cannula bearing on said first wedge-like sealing surface and flexing under only slight axial, nonrotational force to seal said inner cannula with said outer cannula; and  
an internal edge on said coupling bearing on said second wedge-like sealing surface and flexing under only slight axial, non-rotational force to seal said coupling with said inner cannula when said inner cannula is positioned completely within said outer cannula.

4,009,721

## ARTIFICIAL PACEMAKER

Mario Alcidi, Florence, Italy, assignor to Pacer S.n.C. of Cerchiai Vanna &amp; C., Italy

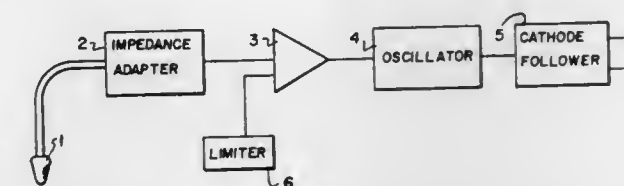
Filed Apr. 23, 1976, Ser. No. 679,742

Claims priority, application Italy, Apr. 24, 1975, 9412/75

Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—419 PG

16 Claims



1. In an artificial pacemaker including oscillator means providing electrical stimuli to the heart at the oscillator frequency, the improvement comprising, in combination, detector means operable to detect instantaneous variations of the pH of the blood as a function of the effort exerted by the wearer of the pacemaker to provide an electrical output which is a function of the instantaneous pH variation; and means connecting said detector means to said oscillator means to control the frequency of said oscillator means as a function of the detected pH of the blood.

4,009,722

## METHOD AND MACHINE FOR MAKING CIGARETTES WITH COMPOSITE FILLERS

Günter Wahle, Reinbeck; Rolf Dahlgren, Tornesch, and Dieter Ludszewit, Hamburg, all of Germany, assignors to Hauni-Werke Korber &amp; Co., KG, Hamburg, Germany

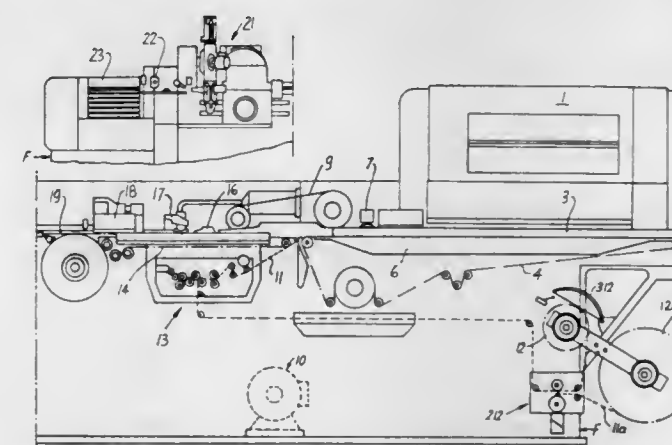
Filed Sept. 11, 1975, Ser. No. 612,584

Claims priority, application Germany, Sept. 26, 1974, 2445856

Int. Cl.<sup>2</sup> A24C 5/18

U.S. Cl. 131—39

18 Claims



1. In a method of making rod-like smokers' products of the type wherein the filler consists of first and second particulate fibrous materials, particularly of making smokers' products wherein the filler consists of two types of tobacco, the steps of feeding said first material into an elongated stream building zone so as to convert said first material into a continuous first stream; feeding into said zone discrete batches of said second material at regular intervals to form a composite stream wherein one of said materials overlies the other of said materials in the region of each of said batches; and removing said first material from each of said regions to thereby convert said composite stream into a filler wherein said batches alternate with filler portions consisting of said first material.



4,009,723

**METHOD FOR CUTTING A TOBACCO PRODUCT ROD AND INCREASING THE END STRENGTH THEREOF**

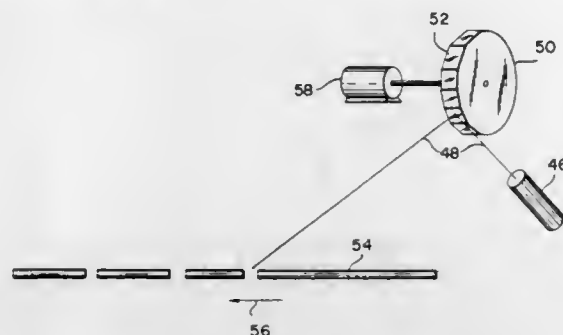
George E. Stungis, and Steven L. Merker, both of Louisville, Ky., assignors to Brown &amp; Williamson Tobacco Corporation, Louisville, Ky.

Filed Jan. 13, 1975, Ser. No. 540,634

Int. Cl.<sup>2</sup> A24C 5/28

U.S. Cl. 131—84 R

10 Claims



1. An improved method of cutting a continuous rod of tobacco product for the manufacture of cigarettes with a laser beam without requiring the presence of an inert gas at the point of cutting into predetermined lengths comprising the steps of

- forming a continuous rod having tobacco product shreds therein;
- continuously moving the rod at a predetermined speed; and
- cutting the rod at predetermined intervals with a laser beam under essentially atmospheric conditions in a direction such that the cut is substantially transverse to the longitudinal axis of the rod, the laser beam having a power of at least 1,000 watts and being in contact with the rod for a time period not greater than 15 milliseconds thereby causing only local thermalization of the product in the region adjacent to the path followed by the laser beam.

4,009,724

**AIR VENT PARTICLE FILTER CAP**

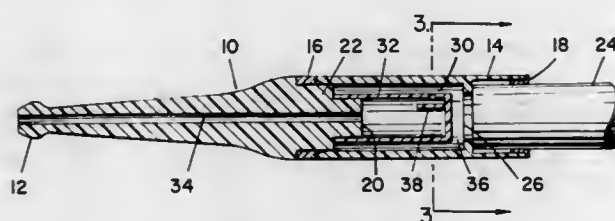
Jack P. Prohoroff, Orange, Calif., assignor to Armando C. Hernandez, Anaheim, Calif.

Filed Aug. 18, 1975, Ser. No. 605,274

Int. Cl.<sup>2</sup> A24F 13/02

U.S. Cl. 131—187

4 Claims



1. For use with a cigarette holder of the kind having a recess at its upstream end of size to receive the end of the cigarette, a bit at its downstream end, a cavity intermediate its ends in communication with said recess, a draw passage for smoke extending through said holder from said cavity to said bit, and conformations at the wall of said cavity for retaining a filter in said cavity such that the exterior of the filter is in communication with said recess and such that the interior of said filter is in communication with said draw passage, a disposable filter comprising:

- a cup having a generally cylindrical side wall and an impermeable end wall;
- said side wall having a perforation formed therethrough;
- a baffle wall extending at its upstream end from said end wall into the interior of said cup and spaced from said side wall and disposed such that an axial line through said

perforation intersects a midregion of said baffle wall, the face of said baffle wall toward said perforation being substantially parallel with the central axis of said cup; the surface of said baffle wall being spaced from the interior surface of the side wall of said cup a distance from 0.025 to 0.075 inches; and said cup having an interior diameter of between 0.20 and 0.27 inches and being approximately 0.5 inches long, said perforation being formed at a point approximately 0.1 inches from the bottom wall of said cup and said baffle wall extending approximately 0.2 inches from said bottom wall of said cup.

4,009,725

**GROOMING DEVICE**

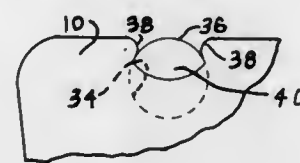
Fred E. Stuart, 1157 Belaire Drive, Daytona Beach, Fla. 32018

Filed July 3, 1975, Ser. No. 592,759

Int. Cl.<sup>2</sup> A45D 24/00

U.S. Cl. 132—11 R

9 Claims



1. In a personal grooming device; a generally flat substantially rectangular member adapted for being carried in the pocket, said member being in the form of a comb element having a back portion extending along one lateral edge of the member and teeth connected to and projecting from the back portion in the plane of said member, a brush element mounted on said back portion and upstanding therefrom substantially at right angles to the plane of said member and near the base ends of said teeth, said back portion of said comb element including recess means for detachably receiving a coin, said recess means including side portions for gripping engagement with spaced points on the periphery of the coin, said recess means exposing a portion of at least one face of the coin for engagement of the coin in the region thereof between said spaced points to assist in removing the coin from the recess.

4,009,726

**DEVICE FOR ELONGATE SOAKING BASINS**

Rolf Ekholm, Nyland, Sweden, assignor to AB Hammars Mekaniska Verkstad, Nyland, Sweden

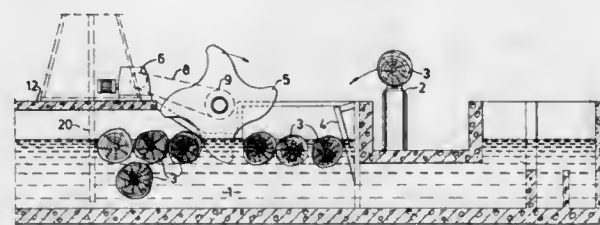
Filed Sept. 19, 1975, Ser. No. 614,884

Claims priority, application Sweden, Oct. 7, 1974, 7412584

Int. Cl.<sup>2</sup> B08B 3/04

U.S. Cl. 134—46

11 Claims



1. A device for an elongate soaking basin for transverse feeding of pieces of lumber, preferably lumber intended for veneer production, in the longitudinal direction of the basin, including a compression wheel arranged at the lumber infeed end of said basin to feed said pieces of lumber forward in the basin to a lumber outfeeding end, comprising:

- a vertical screen vertically movable into and out of said basin by a motor, said screen supported by a frame and having its plane transverse to the longitudinal direction of said basin;
- said frame being longitudinally driveable above said basin

by a driving motor, to move said screen between its initial position at said compression wheel and its end position at said lumber outfeeding end of said basin; said frame including means for providing compression of said pieces of lumber against one of said outfeeding end or said compression wheel; and said frame including means responsive to said compression for starting and stopping said driving motor.

4,009,727

**VALVE LINER FOR A KNIFE GATE VALVE**

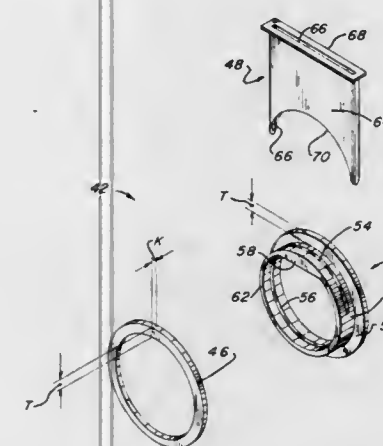
Thomas R. Bailey, Tucson, Ariz., assignor to Thomas R. Bailey, Phoenix, Ariz.

Filed Oct. 20, 1975, Ser. No. 623,800

Int. Cl.<sup>2</sup> F16K 3/02

U.S. Cl. 137—454.2

7 Claims



5. In a flow-through valve assembly having a housing defining an opening through which fluid flow is selectively controlled by a slide gate adapted to be slid transversely of said opening through a slot in said housing, wherein said housing includes connection means for connecting the valve assembly to the end of a fluid flow conduit, the improvement comprising a removable liner including a main body liner member conforming in external size and configuration to the size and configuration of an opening in said housing, said main body liner member being received in said opening to separate the housing from fluid flowing through said valve assembly, said main body liner member extending between said housing and conduit to establish a fluid-tight seal between the housing and conduit, positioning means on said main body liner member for maintaining the position of the main body liner member in the housing, and a slot through the main body liner member aligned with the slot in the housing to allow sliding movement of said gate therethrough, and a slide gate liner member positioned in the slot in said housing, said slide gate liner member having a slot therethrough slideably receiving said slide gate, and an edge conforming in size and configuration to the external size and configuration of the main body liner member at the location where said slot through the main body liner member is located to allow continuous engagement of the liner members at this location, said slot in the liner member being aligned to allow selective sliding movement of the slide gate through said members.

4,009,728

**WATER VALVE ASSEMBLY**

Carl Parise, Reno, Nev., assignor to Parise &amp; Sons, Inc., Reno, Nev.

Filed Mar. 9, 1976, Ser. No. 665,218

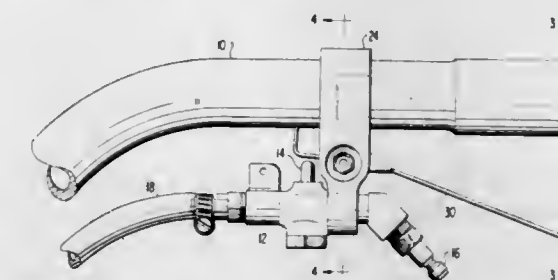
Int. Cl.<sup>2</sup> A47L 9/24

U.S. Cl. 137—594

6 Claims

1. A water valve assembly for mounting on the vacuum return wand of a steam cleaner a water valve of the type having an outwardly biased actuating member which prevents the passage of water in its normal position and permits the passage of water when pressed inwardly, said assembly comprising:

- a first mounting bracket having therein
  - a first concave surface shaped to receive a portion of the periphery of said vacuum steam wand,
  - a second concave surface shaped to receive a portion of the periphery of said water valve, and
  - a hole passing therethrough between said first and second concave surfaces;
- a second mounting bracket having therein
  - a first concave surface shaped to receive a portion of the periphery of said vacuum steam wand,
  - a second concave surface shaped to receive a portion of the periphery of said water valve, and
  - a hole passing therethrough between said first and second concave surfaces;



- a shaft passing through the holes in said first and second mounting brackets;
- a lever arm
  - mounted on said shaft between said first and second mounting brackets;
  - one end of which is positioned to actuate the outwardly biased actuating member of said water valve, and
  - the other end of which is positioned so that it can be comfortably actuated by the fingers of a hand grasping said vacuum return wand during use of said steam cleaner; and
- means for urging said first and second mounting brackets together so as to firmly grasp said vacuum return wand and said water valve therebetween.

4,009,729

**HYDRAULIC COUPLER**

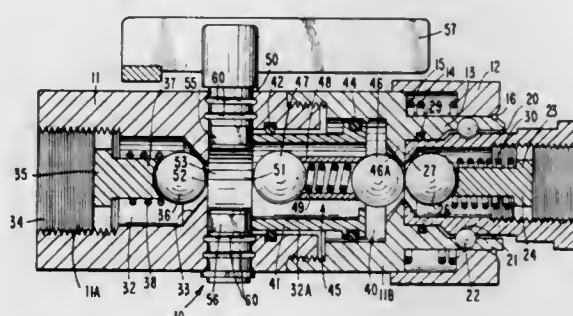
Alban M. Vik, New Brighton, Minn., assignor to Dempco, Inc., Minneapolis, Minn.

Filed Oct. 20, 1975, Ser. No. 623,791

Int. Cl.<sup>2</sup> F16L 29/00, 37/28

U.S. Cl. 137—614.05

11 Claims



1. In a hydraulic coupler attachment device including a coupler body having an interior passageway, a manually controllable inlet check valve, and a manually operable outlet check valve in said interior passageway, said inlet check valve and said outlet check valve defining a chamber on the interior of said coupler body between said valves, the improvement comprising a movable wall defining a portion of said chamber, and means exterior of the chamber operatively associated with said movable wall to move the wall to enlarge said chamber at selected times.



4,009,730

## COMBINATION PRESSURE CONTROL SELECTOR VALVE

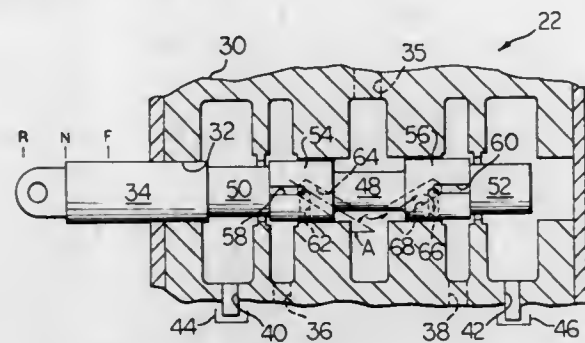
James G. Starling, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 3, 1975, Ser. No. 619,339

Int. Cl.<sup>2</sup> F15B 13/04

U.S. Cl. 137—625.69

7 Claims



1. In a control valve having a bore in a body, an inlet passage communicating with said bore, a pair of outlet passages in said body each spaced axially from said inlet passage and on opposite sides thereof, a spool reciprocably mounted in said bore to close off communication between said inlet and outlet passages, said spool having a central, annular groove arranged to open such communication upon axial movement of said spool, said spool having a pair of laterally disposed annular grooves on said spool opposite sides of said central groove so as to define a pair of lands, and wherein the improvement comprises means for effecting modulated flow through the valve comprising in combination a tapered metering slot means on each of said lands extending axially from a lateral groove to a centrally disposed point on said land, and passage means in each of said lands communicating a centrally disposed point on said land with a respective laterally disposed groove, wherein said passageways comprises a radially directed bore centrally disposed in said land intersecting an angularly directed bore opening into said central groove.

4,009,731

## PIVOTING DISCHARGE FOR SANITARY FLOW FITTINGS

Paul Denz, Lëndringsen, Germany, assignor to Friedrich Grohe Armaturenfabrik, Hemer, Germany

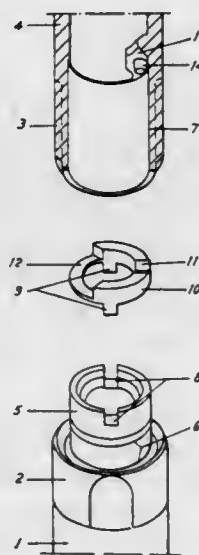
Filed July 14, 1975, Ser. No. 595,870

Claims priority, application Germany, July 15, 1974, 2433915

Int. Cl.<sup>2</sup> F16L 9/22, 25/00

U.S. Cl. 138—37

5 Claims



1. A tubular discharge fitting assembly comprising in combination, a discharge tube member, a discharge fitting member mounted adjacent the output end of said discharge tube member allowing detachment of the fitting member from the tube

member, and a ring insertable removably between said tube member and said fitting member allowing flow from said tube member through the ring and the fitting member; and further including means on one of said members mating with an irregular portion of said ring to prevent relative rotation between the ring and the one member, means on the other member mating with a further irregular portion of the ring for deterring relative rotation between said ring and said other member within a predetermined angular orientation of said other member and said ring, said further irregular portion on said ring allowing relative rotation between said ring and said other member through an arc of predetermined extent, whereby rotation of the fitting member relative to the tube member is controlled by said relative rotation.

4,009,732

## METHODS OF SEALING ANNULAR SPACE BETWEEN INNER AND OUTER GAS MAINS FOR TIE-OVERS

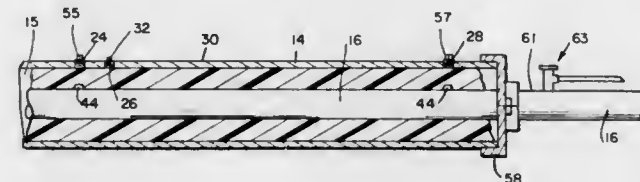
Luther W. Martin, 1221 Julie Drive, Champaign, Ill. 61820, and Richard L. Smith, Box 682, St. Joseph, Ill. 61873

Filed Mar. 1, 1976, Ser. No. 662,949

Int. Cl.<sup>2</sup> F16L 55/12

U.S. Cl. 138—97

10 Claims



1. A method of tying over an individual customer service connection from a live outer gas main to an inner gas main inserted within the live outer gas main comprising the steps of centering the inner main within the outer main, defining an annular region within the annular space between the inner and outer mains, said region being upstream from the customer service connection between the customer service connection and the source of low pressure gas for the outer main, opening a sidewall of the live outer main intermediate the ends of said annular region, introducing into said opening an amount of a high-density liquid foam sufficient to fill said annular region, allowing the foam to harden to prevent gas from flowing downstream below said annular region to the service connection to be tied over, cutting away a section of outer main downstream from the annular region, and placing the new customer service connection through the sidewall of the inner main exposed by cutting away the outer main.

4,009,733

## PRESSURE HOSE

Ernst Schnabel, Offheimer Weg 5, 6250 Limburg, Germany

Filed Aug. 29, 1975, Ser. No. 609,152

Claims priority, application Germany, Feb. 18, 1975, 2506874

Int. Cl.<sup>2</sup> F16L 55/00

U.S. Cl. 138—103

10 Claims

1. A pressure hose, particularly for carrying the cooling water for the rotor of a generator, comprising an elongated hose member of electrically insulating elastomeric material and having longitudinally spaced ends; a pressure-resistant armor of electrically conductive material and surrounding said hose member; two connecting members each at one of said ends of said hose member and each having a nipple extending into said hose member at the respective end and being formed with an external reinforcing bead; mounting sleeves surrounding said armor at said ends of said hose member and each having a longitudinally intermediate portion which surrounds said bead of the respective associated nipple; and means for electrically insulating said armor from at least one of said

connecting members, including a respective end portion of said hose member which extends longitudinally beyond the



respective mounting sleeve and is interposed between said armor and said one connecting member.

4,009,734  
COILED TUBING

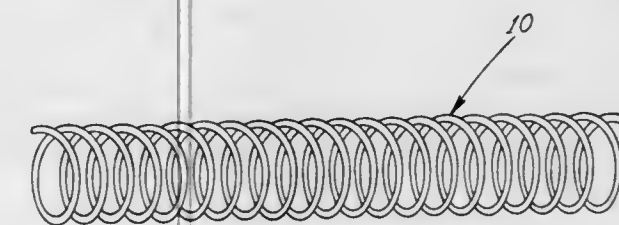
Dennis W. Sullivan, Willoughby Hills, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Feb. 26, 1976, Ser. No. 661,535

Int. Cl.<sup>2</sup> F16L 11/00

U.S. Cl. 138—125

8 Claims



1. A self-retracting flexible coiled tubing structure to transmit fluids under pressure comprising an extruded seamless tube of a mixture of a chemically extended polyester and from about 10% to about 50% of a polybutylene terephthalate polymer.

4,009,735  
THERMAL INSULATION

Gordon P. Pinsky, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 409,109, Oct. 24, 1973, abandoned.

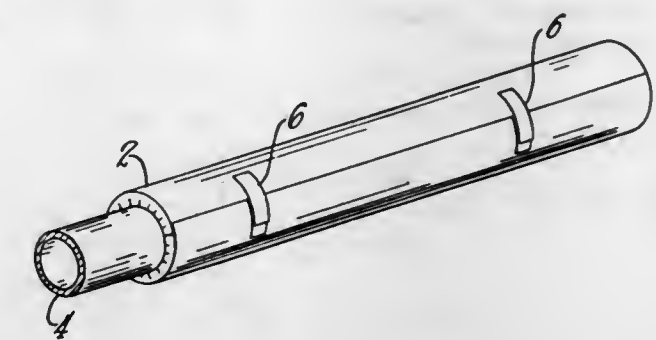
This application Oct. 2, 1974, Ser. No. 511,392

Int. Cl.<sup>2</sup> F16L 9/14

U.S. Cl. 138—147

4 Claims

1. Readily removable and replaceable rewettable thermal insulation for use on vessels and piping within reactor containment areas of nuclear power plants comprising high temperature resistant mineral fiber or glass fiber encapsulated within rewettable, high temperature resistant, asbestos free glass cloth held in place with a plurality of spaced quick release and engage fasteners, wherein the glass cloth can withstand repeated wettings from spray systems within the reactor contain-



the glass cloth has a finish of a leachable, organic silicate carried in a fatty and mineral oil vehicle.

4,009,736  
SANDWICH WALL GLASS FIBER REINFORCED CONSTRUCTION AND METHOD OF MAKING SAME

Agnar Gilbu, Conroe, Tex., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 6, 1974, Ser. No. 530,263

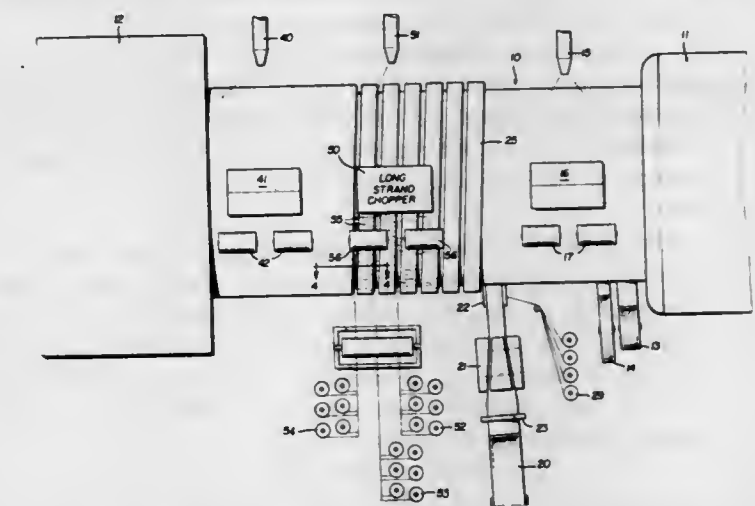
Disclosure was also published under second Trial Voluntary

Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> F16L 9/00

U.S. Cl. 138—177

12 Claims



1. In a composite wall structure for fluid retention, the wall structure having spaced, concentric tubular inner and outer shells each formed of glass fiber reinforced resinous polymeric material, the improvement of an intermediate spacing structure interposed between said shells and comprising:

- generally U-shaped rib forms spaced from each other axially of the shells and each having a bight portion adjacent the outer shell and a pair of spaced, generally parallel leg portions extending from the bight portion toward the inner shell, and
- ribs interspersed with said rib forms and integrally joining said shells to each other, said ribs each comprising a glass fiber mat covering leg portions of adjacent rib forms, filament-wound glass rovings retaining a mat portion bridging adjacent rib forms against the inner shell, and resinous polymeric material impregnating both the mat and said rovings.



4,009,737

**FILLING THREAD STOP MOTION DEVICE FOR A LOOM**  
Willy Rohr, Hinwil, and Viktor Smutny, Wetzikon, both of Switzerland, assignors to Ruti Machinery Works Ltd., Zurich, Switzerland

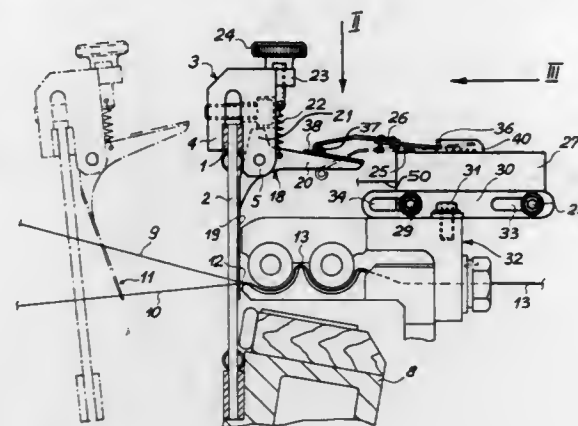
Filed Jan. 28, 1976, Ser. No. 653,040

Claims priority, application Switzerland, Feb. 28, 1975, 2551/75

Int. Cl.<sup>2</sup> D03D 51/34

U.S. Cl. 139—370.2

10 Claims



1. A filling thread stop-motion device for a loom comprising a reed, a weft thread sensor for detecting the presence or absence of the last introduced weft thread and a control means for stopping the loom upon sensing the absence of the last introduced weft thread by said weft thread sensor, characterized by the fact that

- the weft thread sensor is formed from one arm of an angle lever swingably arranged on the reed with the other arm of the angle lever forming a control arm for actuating said control means, said angle lever being subjected to a biasing means, said biasing means swinging the weft thread sensor away from the reed towards the fell of the cloth and locating the control arm in a first position;
- the control means comprises a push button switch and a switch lever operatively associated with it;
- in the presence of the last introduced weft thread the weft thread sensor upon the beating-up motion of the reed is pressed against said weft thread and thereby swung back towards the reed, whereby the control means is brought into a second position before contacting the switch lever; and
- in the absence of the last introduced weft thread the weft thread sensor remains in the position swung away from the reed until the end of the beating-up motion of the reed, whereby the control arm is brought from the first into the second position and thereby actuates the switch lever of the control means when the weft thread sensor strikes against the fell of the cloth.

4,009,738

**APPARATUS FOR CUTTING AN INSULATED WIRE, STRIPPING THE END THEREOF AND TWISTING THE WIRE STRANDS**

Tsutomu Baba, Kawanishi, and Shinpei Inukai, Takarazuka, both of Japan, assignors to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan

Filed Oct. 15, 1975, Ser. No. 622,639

Claims priority, application Japan, Oct. 25, 1974, 49-123762

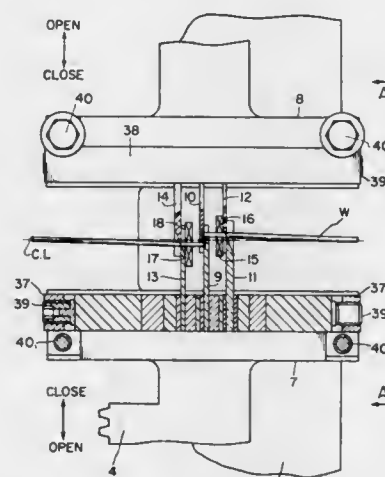
Int. Cl.<sup>2</sup> B21F 7/00; H02G 1/12

U.S. Cl. 140—149

5 Claims

1. An apparatus for cutting an insulated wire, stripping the end thereof and twisting the wire strands, comprising: means for intermittently supplying said insulated wire, wire cutting means adapted to be driven toward said supplied wire to cut the same at a predetermined position during the stoppage of supplying operation of said wire supplying means,

front and rear insulation cutting means adapted to be driven toward said wire to cut substantially only the insulation of said wire at positions spaced apart from said predetermined cutting position of said wire cutting means, said front and rear insulation cutting means being located away from each other with respect to the axis of said supplied wire, whereby the end portions of the wire at the opposite sides of said wire cutting means are placed in spaced relation with each other, when said wire cutting means and said front and rear insulation cutting means have been driven toward said supplied wire, said wire cutting means having recesses formed on the surfaces thereof at the area around the position where the tip ends of said wire at the opposite sides of said wire cutting means abut against said surfaces of said wire cutting means, when said wire cutting means and said front and rear insulation cutting means have been driven toward said supplied wire, front and rear insulation rotating means adapted to be



driven during the stoppage of the supplying operation of said wire supplying means, said front insulation rotating means being located between said front insulation cutting means and said wire cutting means, said rear insulation rotating means being located between said rear insulation cutting means and said wire cutting means for rotating the insulation of said end portions of the cut wire at the opposite sides of said wire cutting means about the axis of said wire,

means for drawing said wires disposed forwardly and rearwardly of said wire cutting means in the directions away from said wire cutting means while said insulation rotating means are rotating the insulation of said end portions of the cut wire at the opposite sides of said cutting means, whereby the insulation of said end portions of the wire at the opposite sides of said wire cutting means is stripped from said wire, while the portion of the wire strands stripped of the insulation is twisted by the rotation of said portions of insulation being stripped, with the tips ends of the wire facing said recesses of said wire cutting means.

4,009,739

**GASOLINE AND VAPOR RETURN HOSE SYSTEM FOR DELIVERY TRUCK**

Danny J. Weatherford, 7250 N. 41st Ave., Phoenix, Ariz. 85021

Filed Sept. 2, 1975, Ser. No. 609,282

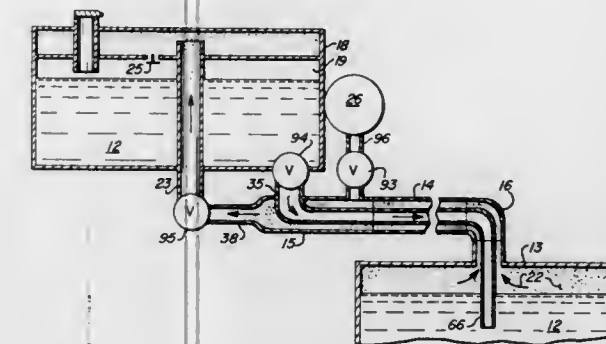
Int. Cl.<sup>2</sup> B65B 39/04

U.S. Cl. 141—59

4 Claims

1. A volatilizable liquid fuel and vapor return hose system for delivery trucks comprising: a flexible hose having coaxially arranged fluid conducting passageways extending along substantially its full length, the inner one of said passageways provided for carrying a volatilizable liquid fuel and the outer one of said passageways carrying vapors of said fuel, a first hose coupler for one end of said hose,

a second hose coupler for the other end of said hose, said first coupler comprising a transition section connectable to a fuel delivery port of the truck for connecting said inner one of said passageways to the truck's liquid fuel compartment and said outer one of said passageways to a vapor return tube of the truck connectable to said liquid fuel compartment of the truck, said second coupler comprising a storage tank entry adaptor having an entry tube for extending a predetermined distance into the storage tank and connectable to said inner one of said passageways and a vapor exhaust opening coaxially arranged adjacent said entry tube and connectable to said outer one of said passageways for exhausting vapors from said storage tank as it fills with liquid,



and a pair of detachable clamping members one mounted at each end of said hose for engaging with said first coupler at one end of the hose for connecting said one of said passageways to the liquid fuel compartment of the truck and the other passageway to the vapor return tube of the truck, and the other end of said hose to said second coupler for connecting said entry tube to said one of said passageways and said vapor exhaust opening to the other of said passageways, and means for connecting a source of air under pressure to said inner one of said passageways for clearing the passageway of fuel before disconnecting said clamping members from said first and second couplers after a fuel delivery procedure.

4,009,740

**ICE CREAM DISPENSING MACHINE**

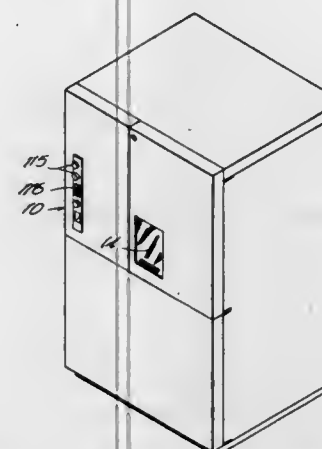
Joseph Frank Michielli, 11324 E. 36th Ave., Spokane, Wash. 99206

Filed Sept. 26, 1975, Ser. No. 617,096

Int. Cl.<sup>2</sup> B65B 43/60

U.S. Cl. 141—172

11 Claims



1. In an automatic ice cream dispensing machine a combination comprising: a supporting framework; ice cream dispensing means on the framework at an ice cream container filling station for successively dispensing ice cream into ice cream containers;

refrigeration means for cooling the ice cream within the dispensing means;

a container magazine on the framework at an empty container dispensing station for receiving an upright nested stack of upwardly open empty ice cream containers and for guiding the stack to move gravitationally downward through a magazine opening;

carriage means on the framework sequentially movable horizontally between the empty container dispensing station and the container filling station and filled ice cream discharge station intermediate the empty container dispensing station and the container filling station;

an escapement means adjacent the magazine opening at the empty containers dispensing station for alternately (a) closing to support the stack and thereby prevent downward movement of the stack through the magazine opening and (b) opening to release the full stack to fall by gravity with the bottom container of the stack falling below the escapement means; and

a container receiving means supported on the carriage and mounted for sequentially (a) moving upward when the carriage is at the empty container station to a first position immediately below the magazine opening to receive the bottom container of the stack when the escapement means is open, (b) supporting the full stack prior to the closing of the escapement means, (c) moving downward after the escapement means is closed to thereby remove the bottom container from the stack, (d) carrying the bottom container on the carriage from the empty container dispensing station to the container filling station, (e) moving this container upward at the container filling station to the ice cream dispensing means, (f) moving the container slowly downward as it is being filled, and (g) carrying the filled container to the container discharge station.

4,009,741

**WOODWORKING MACHINE**

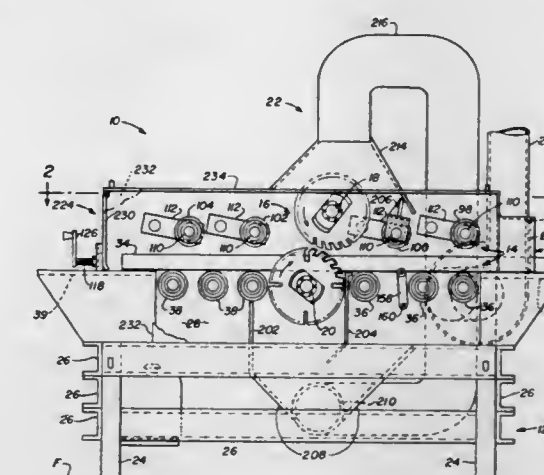
Edwin H. Zimmerman, New Holland, Pa., assignor to E.Z. Mfg. Co., New Holland, Pa.

Filed Mar. 23, 1976, Ser. No. 669,687

Int. Cl.<sup>2</sup> B27C 9/04

U.S. Cl. 144—41

7 Claims



1. A woodworking machine for sawing a stock beam or plank of wood into a plurality of side-by-side board strips and simultaneously shaping the opposite edges of said board strips as they are sawed to form finished strips of desired cross-sectional shapes, said machine comprising in combination:

- a frame having a substantially horizontal linear feed path for stock material,
- a pair of parallel horizontal arbors supported in cantilever manner by said frame transversely to said path and respectively spaced above and below said path and linearly offset from each other relative to said path and the outer ends thereof being threaded and provided with clamping nuts,



- c. a clamping collar fixedly positioned on each arbor precisely within a common vertical plane,  
 d. feeding and tensioning rollers frictionally engaging opposite surfaces of said stock beam or plank to positively feed the same along said path,  
 e. a plurality of pairs of similar rotary saws mounted upon said arbors, respectively in common parallel vertical planes and spaced transversely apart predetermined axial distances corresponding respectively to the thicknesses of board strips to be formed by said machine, the summation of the radii of each pair of said saws being at least equal to the vertical distance between the axes of said arbors and the linear offset of said arbors permitting operations of each pair of saws without interference with each other,  
 f. pairs of cooperating shaping cutters of less radii than said saws respectively mounted upon said arbors between said saws and operable simultaneously with the rotation of said saws to form desired finished edge contours upon both edges of all of said board strips as sawed by said saws and said clamping nuts on said arbors firmly clamping said saws and shaping cutters in accurate operative relationship with each other, and  
 g. power means connected to said arbors and feed means to drive the same in operative directions to feed said stock beam or plank along said path and saw the same into a desired number of board strips while simultaneously shaping and finishing the opposite edges thereof.

4,009,742

## WOOD-WORKING MECHANISM

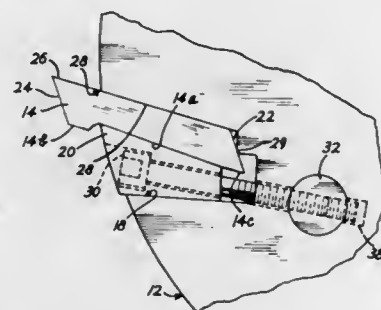
Harold R. Ziegelmeyer, 5010 Griffin Creek Road, Medford, Oreg. 97501

Filed Nov. 28, 1975, Ser. No. 635,906

Int. Cl.<sup>2</sup> B27G 13/04

U.S. Cl. 144—230

7 Claims



1. Wood-working mechanism comprising the combination of  
 a. a blade carrying cutter wheel having a plurality of peripheral blade and wedge carrying slots,  
 b. a series of blades carried in the respective slots of the wheel, and constructed and arranged to protrude fixedly and equally outward beyond the periphery of the wheel, when wedged tightly in their assigned positions in their respective slots, each blade having parallel inner and outer surfaces at its opposite ends which slope equally outward and forward, a flat forward surface, and a rear surface which includes a wedgable portion through which the blade may be urged forward,  
 c. a wedge member associated with each blade in its wheel slot constructed and arranged to force the blade forward to a definite, assigned limit of forward movement relative to the wheel,  
 d. means in each slot for engaging the inner surface of the blade to force it outward as an incident of its being forced forward, and  
 e. means for individually forcing each wedge member inward to an inner limit of movement determined by the thickness of the blade, and positively retaining it there.

4,009,743

## ROOFING TOOL

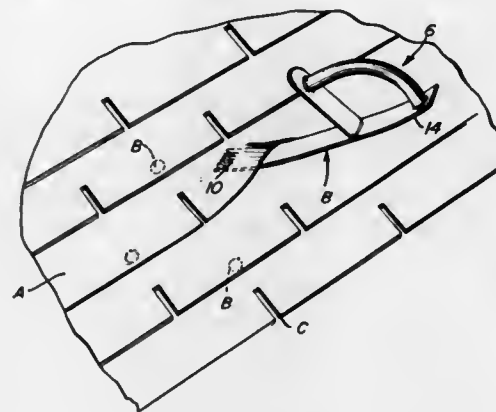
Leonard D. Ackerman, Box 113, Conyngham, Pa. 18219

Filed Feb. 24, 1976, Ser. No. 661,008

Int. Cl.<sup>2</sup> B66F 15/00

U.S. Cl. 145—1 A

10 Claims



1. A compact manually manipulatable tool for removing a particular shingle for repair of a roof comprising; means for permitting the pry-up of the nails holding the shingle to the roof by a one hand operation with a rocker action swing of the user's hand and arm including an elongated bowed rocker bed having a concave surface extending the length thereof and a forward prying end which is adapted to be inserted under the free edge of a shingle to dislodge the nails holding it, said rocker bed having a rearward levered end, and a short handle rigidly attached to and extending upwardly from the concave surface of said levered end, whereby said tool may be worked solely with one hand.

4,009,744

## BICYCLE BAG

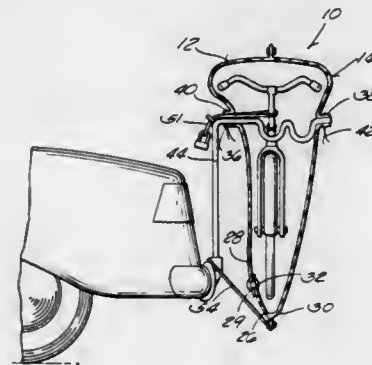
John A. Joslyn, 2441 N. 111th St., Wauwatosa, Wis. 53213

Filed Oct. 1, 1975, Ser. No. 618,591

Int. Cl.<sup>2</sup> B60R 9/10

U.S. Cl. 150—52 R

2 Claims



1. A protective enclosure for a two-wheeled cycle comprising a bag having two opposed flexible side panels, said side panels having first and second longitudinally extending margins, with said first margin forming a bottom for said enclosure and extending upwardly a sufficient distance to overlap said second margin to form a linear closure line between said panels above the bottom of said enclosure, means for detachably connecting said margins to form a weather seal along said closure line and wherein said side panels have two sets of oppositely located openings adapted to receive bicycle supporting members of a bicycle rack on a vehicle, said openings being defined by generally tubular sleeve portions formed in said side panels and extending outwardly therefrom and means to tighten said sleeves to provide a weather seal about said openings.

4,009,745

## WINDOW SHADE SUPPORT ROLLER AND METHOD OF ASSEMBLING

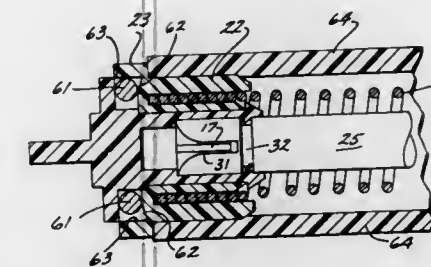
Paul J. Erpenbeck, Muskegon, Mich., assignor to Breneman, Inc., Cincinnati, Ohio

Filed May 2, 1975, Ser. No. 573,985

Int. Cl.<sup>2</sup> E06B 9/208

U.S. Cl. 160—297

13 Claims



1. A window shade support assembly comprising:  
 a. a spear structure having means for engaging an external support bracket and means for forming a portion of a window shade clutch;  
 a spring-retaining structure having means for cooperatively engaging the spear structure, means for forming another portion of a window shade clutch, and means for positively retaining a drive spring; and  
 means acting in cooperation with said clutch portions of the spear structure and the spring retaining structure for providing a window shade roller clutching mechanism; and radially-projecting portions extending laterally from at least one of said spear structure or said spring-retaining structure and interfitting with the other such structure to maintain the two structures assembled together.

4,009,746

## AWNING SYSTEM OR THE LIKE

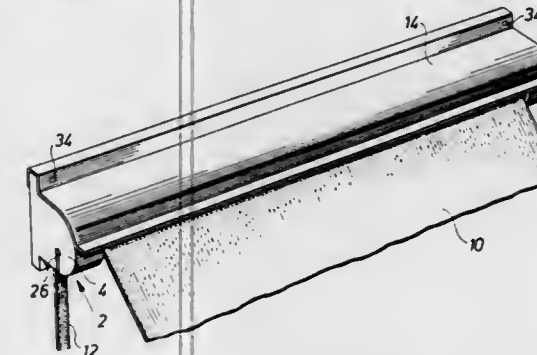
Finn Otterbeck, Gravdalsvejen 12, Oslo 7, Norway

Filed Nov. 24, 1975, Ser. No. 634,656

Int. Cl.<sup>2</sup> E06B 9/24

U.S. Cl. 160—323 R

5 Claims



1. An awning system or the like comprising a screening material piece which is provided at the edge connected with the winding rod with a thickened portion, a winding rod having a longitudinal extending cavity having a narrow portion at the surface of the rod and a wider portion inside the narrow portion, the screening material having its thickened portion received in the wider portion of the cavity and extending away from the cavity through the narrow portion thereof, the cavity being open at at least one end of the rod, and bearing arrangements rotatably supporting the ends of the rod, at least one of the bearing arrangements being formed with a passage having at least the same sectional size as the thickened edge portion of the screening material and being so related to the open end of the cavity that the rod is rotatable to a position in which the thickened edge portion of the screening material piece is in the longitudinal direction of the rod removable from and introducible into the cavity through said passage in order to disconnect the screening material from and connect the material with the rod, respectively.

4,009,747

## METHOD OF AND DEVICE FOR FORMING VACUUM SEALED MOLDS

Takashi Miura; Hideto Terada; Takao Inoue, and Hironobu Kubota, all of Toyokawa, Japan, assignors to Sintokogio, Ltd., Nagoya, Japan

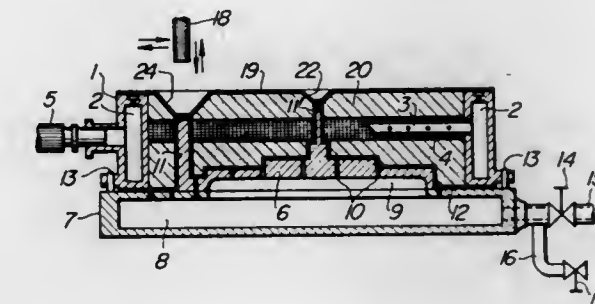
Filed Mar. 12, 1975, Ser. No. 557,452

Claims priority, application Japan, Mar. 16, 1974, 49-30216; Apr. 25, 1974, 49-47029

Int. Cl.<sup>2</sup> B22C 5/12

U.S. Cl. 164—7

11 Claims



1. A method of forming vacuum sealed molds comprising the steps of  
 a. applying a first film over the surface of a pattern plate including a pattern for forming a mold cavity and at least one rod member integral therewith for forming a sprue or a communicating passage;  
 b. assembling said pattern plate with a molding flask provided with means for reducing the pressure therein;  
 c. charging a particulate material into the flask;  
 d. forming a cup-shaped pouring basin in said charged material by removing part of the charged material immediately above the rod member by vacuum suction until the top of said rod member covered with the film is exposed to form said cup-shaped pouring basin in the particulate material;  
 e. applying a shielding film over said flask and the upper surface of the charged material whereby said material covers said cup-shaped pouring basin;  
 f. forcing said first film and the shielding film into intimate contact with the lower and the upper surfaces of the charged material respectively by creating a negative pressure in the flask with said pressure reducing means whereby said shielding film is brought into contact with the first film at the top of said rod member; and  
 g. removing the pattern plate from said first film.  
 10. In a mold forming device comprising:  
 a. a pattern plate including a pattern with at least one rod member for forming a sprue or communicating passage;  
 b. a molding flask mounted on said pattern plate; and  
 c. particulate material charged into an open topped chamber defined by said pattern plate and said molding flask; the improvement comprising:  
 d. sucking means positioned above the upper surface of the charged material for removing the particulate material adjacent the free end of said rod member to form a cup-shaped pouring basin in the charged material above the free end of said rod member.

4,009,748

## METHOD OF STARTING CONTINUOUS CASTING

Heinrich Keddeinis, Lintorf, and Klaus Wünnenberg, Duisburg, both of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

Filed Jan. 30, 1975, Ser. No. 545,416

Claims priority, application Germany, Feb. 14, 1974, 2407435

Int. Cl.<sup>2</sup> B22D 11/08

U.S. Cl. 164—73

7 Claims

1. Method of starting continuous casting using a mold with



a wall and from which an ingot is withdrawn from the bottom as molten metal is poured into the top of the mold, comprising the steps of lining the interior wall surface of the mold with glass;  
 using an adhesive to hold the lining on the inner surface of the mold prior to the beginning of casting;  
 pouring metal into the mold for continuous casting, whereby the glass lining melts to form a lubricating flux layer;  
 and  
 replenishing the flux layer by casting powder.

4,009,749

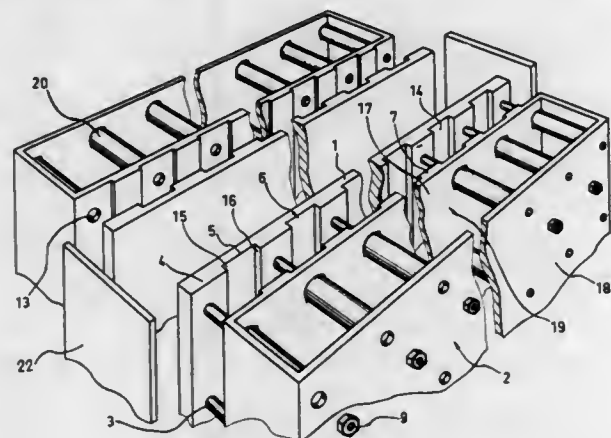
### THIN-WALLED MOLD FOR THE CONTINUOUS CASTING OF MOLTEN METAL

Robert Alberny, Metz, France, assignor to Institut de Recherches de la Siderurgie Francaise (IRSID), Paris, France  
 Filed May 14, 1976, Ser. No. 686,522  
 Claims priority, application France, May 16, 1975, 75.15299

Int. Cl.<sup>2</sup> B22D 11/04

U.S. Cl. 164-147

10 Claims



1. A thin-walled mold for the continuous casting of molten metal, comprising
  1. an inner mold element consisting of copper or a copper alloy, the inner mold element having
    - a. interior faces defining therebetween a passage for the cast metal and
    - b. exterior faces having parallel longitudinally extending ribs defining grooves therebetween;
  2. an outer envelope consisting of steel, the outer envelope being spaced from and surrounding the inner mold element, the outer envelope having
    - a. interior faces having parallel longitudinally extending ribs facing the grooves in the exterior faces of the inner mold element, the facing ribs and grooves defining therebetween longitudinal channels for a cooling liquid for the mold; and
  3. for affixing the envelope to the mold element, the means being anchored to the ribs in the exterior faces of the inner mold element.

4,009,750

### APPARATUS FOR CONTROLLING THE COOLING OF A STRAND EMANATING FROM A CONTINUOUS CASTING MOLD

Kalman Fekete, Stafa, and Werner Bruderer, Wattwil, both of Switzerland, assignors to Concast AG, Zurich, Switzerland  
 Division of Ser. No. 393,556, Aug. 31, 1973, Pat. No. 3,915,216. This application July 24, 1975, Ser. No. 598,641  
 Claims priority, application Switzerland, Sept. 6, 1972, 13120/72

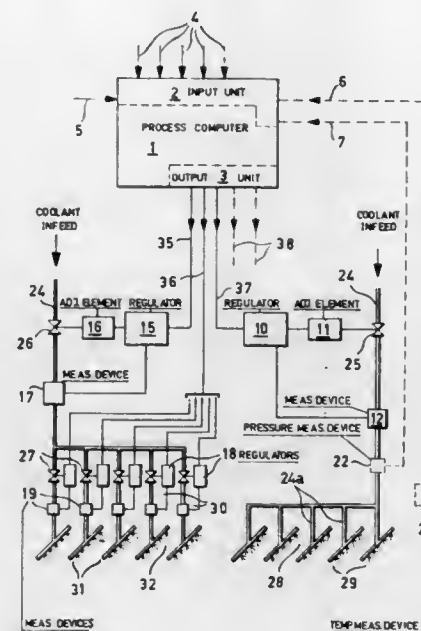
Int. Cl.<sup>2</sup> B22D 11/16

U.S. Cl. 164-154

3 Claims

1. An apparatus for controlling the secondary cooling of a continuously cast strand departing from a continuous casting

mold of a continuous casting installation, comprising computer means, a cooling device arranged downstream of the casting mold and forming a total secondary cooling zone for secondary cooling of the continuously cast strand, said cooling device being divided into at least two sections, each of the sections of the cooling device being further subdivided into sub-groups, cooling agent delivery means for delivering cooling agent to the cooling device, means cooperating with said cooling device sections for applying cooling agent to the strand, means for controlling the quantity of cooling agent



delivered to each of the cooling device sections and each of the sub-groups, said controlling means incorporating individual regulator means connected to each of said cooling device sections and to each of said sub-groups for regulating the quantity of cooling agent supplied to said sections and sub-groups to maintain constant the residence time of the cast strand in the total secondary cooling zone, said respective regulator means further being individually and directly connected to and controlled by said computer means and input means connected to said computer means for introducing cooling control data inputs to said computer means.

4,009,751

### METHOD OF AND APPARATUS FOR HIGH INTENSITY HEAT AND/OR MASS TRANSFER BETWEEN TWO OR MORE PHASES

Andrej Zelnik, Bratislava, Czechoslovakia, assignor to Slovenska vysoká škola technika, Bratislava, Czechoslovakia  
 Filed Nov. 7, 1974, Ser. No. 521,862

Claims priority, application Czechoslovakia, Nov. 9, 1973, 7681/73

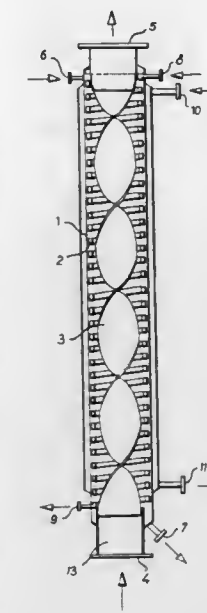
Int. Cl.<sup>2</sup> F28F 1/14

U.S. Cl. 165-1

2 Claims

1. In a method of heat and/or mass transfer between first and second fluid phases wherein the first phase has a specific gravity greater than the second phase and wherein the method comprises the steps of separately flowing the first and second phases along an elongated cylindrical column in heat and/or mass transfer relation, the improvement which comprises the steps of directing the flow of the first phase downwardly through the column along an essentially continuous helical path throughout the entire length of the column adjacent the

inner wall thereof, and directing the flow of the second phase along an essentially continuous helical path through the inter-



ior of the column in direct physical contact with the helical downward flow of the first phase.

4,009,752

### WARP-RESISTANT HEAT SINK

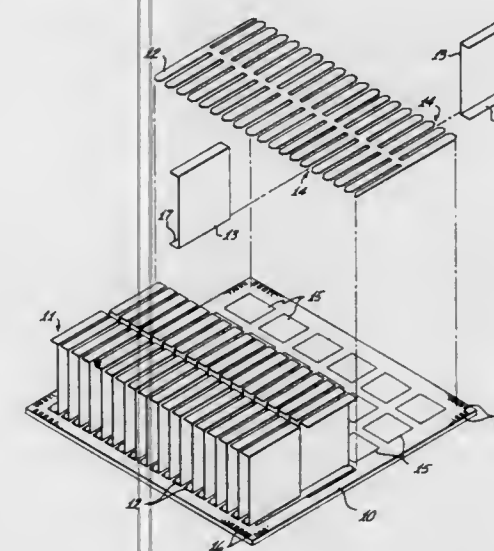
Edward Arthur Wilson, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Feb. 24, 1975, Ser. No. 552,494

Int. Cl.<sup>2</sup> H01L 23/36

U.S. Cl. 165-81

4 Claims



1. A warp-resistant heat sink suitable for soldering to a relatively fragile, ceramic semiconductor substrate, wherein said heat sink comprises
  - a rectangular heat-conducting plate having a plurality of slit-like openings along opposite edges thereof, said openings being normal to the edges, the openings along one edge being offset with respect to those along the opposite edge, said plate having a thermal coefficient of expansion substantially identical to that of said ceramic substrate;
  - a plurality of U-shaped heat-conducting members, each of said members extending through a respective one of said openings in said plate, the members which extend through the openings along one edge of said plate all having an identical orientation and the members which extend through the openings along the opposite edge of said plate all having an identical orientation, the orientation of the members along one side being different from that of the members along the opposite side, one side of each of said members being secured to the same side of

4,009,753

### SUBSEA MASTER VALVE APPARATUS

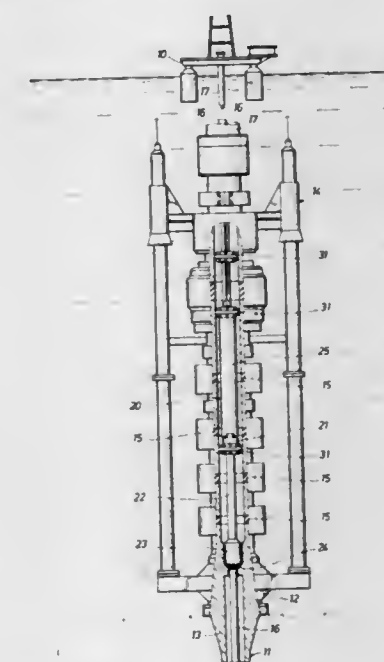
Howard L. McGill, Houston; Ervin Randermann, Jr., Beasley, and Olgerd J. Musik, Houston, all of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 669,128

Int. Cl.<sup>2</sup> E21B 29/00

U.S. Cl. 166-55.1

16 Claims



1. Valve apparatus comprising: a tubular valve body having an axially extending flow passage; a spherical annular seat means surrounding said flow passage; a ball element in said valve body and having a throughbore aligned with said flow passage in the open position and an outer spherical surface engageable with said seat means in the closed position; and means for rotating said ball element between open and closed position; said ball element having cutting means cooperable with said seat means for cutting in two a tubular member extending through said bore, and relief means for preventing a tubular member from being placed in double shear during cutting thereof by said cutting means.



4,009,754

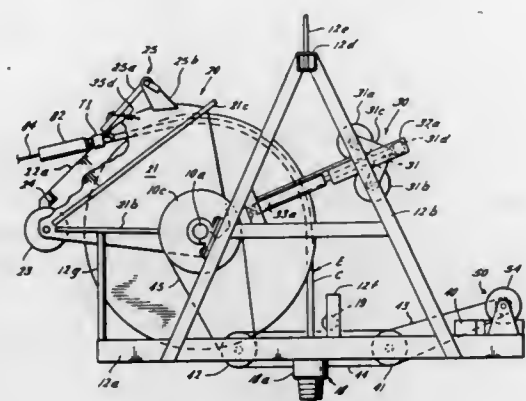
**ELECTRICAL CABLE FEEDING AND REMOVING APPARATUS**

Roy H. Cullen; Joshua M. Jackson, and Jim Witovek, Jr., all of Houston, Tex., assignors to General Electric Company  
Filed Oct. 9, 1975, Ser. No. 621,157

Int. Cl.<sup>2</sup> E21B 19/08; B65H 49/00

U.S. Cl. 166—77

12 Claims



1. An apparatus for feeding and removing one or more sections of an electrical cable having substantially rigid terminal electrical connectors at the ends of each cable conductor section, said apparatus comprising:

a sheave assembly for receiving the electrical cable for feeding and removing the fixed length of electrical cable; and

means for engaging the electrical cable sections for supporting one of the terminal connectors of each cable section for arcuate movement relative to the sheave assembly in response to movement of a connector with the cable being fed or removed to prevent excessive bending of the supported connector and the electrical cable conductor at an interface between the conductor and the supported connector.

4,009,755

**SELECTIVELY CONTROLLING THE FLOW OF FLUIDS THROUGH SUBTERRANEAN FORMATIONS**

Burton B. Sandiford, Placentia, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Mar. 17, 1976, Ser. No. 667,694

Int. Cl.<sup>2</sup> E21B 43/22, 33/138

U.S. Cl. 166—270

34 Claims

1. A method for reducing the permeability of the higher permeability strata or channels of a heterogeneous subterranean formation penetrated by a well comprising:

a. injecting through said well and into said formation about 5 to 200 barrels per vertical foot of strata to be treated of (1) an aqueous solution or dispersion of relatively high molecular weight polymers selected from the group consisting of acrylic acid-acrylamide copolymers, polyacrylamides, partially hydrolyzed polyacrylamides, polyalkyleneoxides, carboxyalkylcelluloses, hydroxyethylcelluloses and heteropolysaccharides obtained by the fermentation of starch-derived sugar, and (2) an aqueous solution of a cross-linking agent selected from the group consisting of mixtures of a compound of a multivalent metal and a reducing agent, a low molecular weight water-soluble aldehyde, and a colloidal hydroxide of a polyvalent cation, said aqueous solution of said cross-linking agent being injected preceding or following said aqueous solution or dispersion of high molecular weight polymer, or said aqueous solution of said cross-linking agent being admixed with said aqueous solution or dispersion of said high molecular weight polymer; and

b. thereafter injecting from about 1 to 10 barrels per vertical foot of strata to be treated of (1) an aqueous solution of an alkali metal silicate and (2) an aqueous solution of a gelling agent selected from the group consisting of acid

and acid-forming compounds, water-soluble ammonium salts, lower aldehydes, aluminum salts and alkali metal aluminates, said aqueous solution of said gelling agent being injected preceding or following said aqueous solution or said gelling agent being admixed with said aqueous solution of said alkali metal silicate.

4,009,756

**METHOD AND APPARATUS FOR FLOODING OF OIL-BEARING FORMATIONS BY DOWNWARD INTER-ZONE PUMPING**

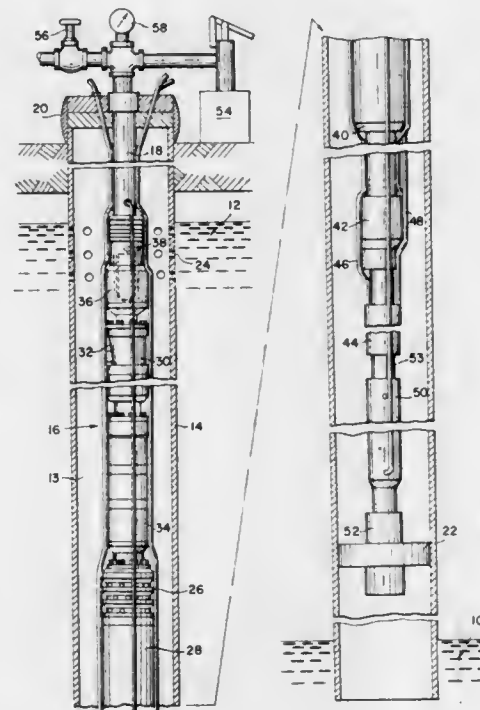
James N. Zehren, Bartlesville, Okla., assignor to TRW, Incorporated, Cleveland, Ohio

Filed Sept. 24, 1975, Ser. No. 616,319

Int. Cl.<sup>2</sup> E21B 43/00, 43/20; F16K 17/06

U.S. Cl. 166—250

21 Claims



14. A flow control valve system comprising a tubular housing having a longitudinal fluid flow passage therein, means including a valve head movable with respect to a seat for dividing said passage into isolated first and second spaces when said head is closed against said seat, means coupling said first space to a source of fluid the pressure of which tends to move said head away from said seat to open said valve when said valve is closed, biasing means normally urging said head against said seat to close said valve, and fluid-pressure-responsive remote control means for selectively applying an adjustable additional force to said valve head to assist said biasing means to close said valve or, upon reduction of said force, to permit said head to move away from said seat in response to the pressure of fluid from said source, whereby said fluid may flow from said first space to said second space.

19. A method of flooding an underground formation with a fluid through a bore hole, which comprises dividing said bore hole into first and second regions, the latter communicating with said formation, providing a submergible pump at said first region which discharges through a valve to said second region, supplying fluid from said first region to said pump, operating said pump, initially blocking the discharge of fluid from said pump to said second region during start-up of said pump by applying a force to said valve to hold it closed, thereafter reducing said force and opening said valve, thereby permitting fluid to flow from said pump to said second region, adjustably controlling said valve independently of the pump to maintain flooding of said formation, terminating the operation of said pump, and thereupon automatically closing said valve, thereby blocking reverse flow from said second region to said pump.

4,009,757

**SAND CONSOLIDATION METHOD**

Roy R. Vann, Box 38, Artesia, N. Mex. 88210

Filed Feb. 3, 1975, Ser. No. 546,802

Int. Cl.<sup>2</sup> E21B 43/116, 43/26

U.S. Cl. 166—276

10 Claims

1. Method of completing an unconsolidated production formation which is located downhole in a borehole comprising the steps of:

1. suspending a perforating gun adjacent to the formation by connecting the gun to a tubing string and running the tubing string downhole;
2. locating a foamable agent in the tubing string downhole adjacent to the gun; said agent initially being in a fluid state and having properties which cause it to undergo chemical reaction over an interval of time to form a self-supporting porous mass;
3. forming a flow path which extends from the interior of the tubing string, through at least part of the gun, and into the borehole annulus located between the borehole wall and the gun;
4. communicating the borehole with the formation by perforating the borehole wall with the gun;
5. forcing said agent to flow from the tubing string and into the formation by increasing the pressure on said agent to a value which exceeds the formation pressure, while the agent is in a fluid state;
6. holding the pressure on said agent at a value which is at least equal to the formation pressure until an interval of time expires during which the agent undergoes chemical reaction and becomes a self-supporting porous mass;
7. reducing the pressure of step (6) so that formation fluid flows through the self-supporting porous mass and into the production tubing.

4,009,758

**BLADE CONTROL APPARATUS OF A MOTOR GRADER INCLUDING WAND VIBRATION DAMPING ELEMENT**

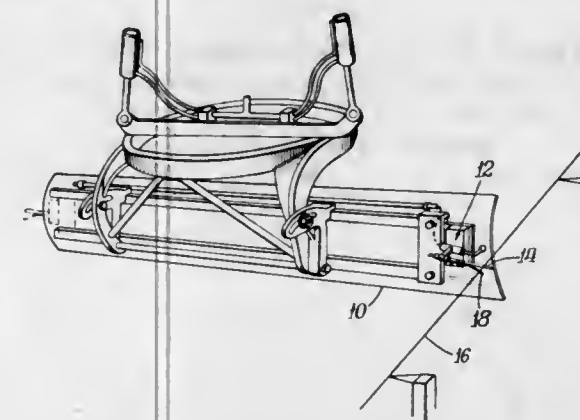
William R. Tillman, Monticello, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 22, 1975, Ser. No. 615,653

Int. Cl.<sup>2</sup> A01B 65/06; E02F 3/76

U.S. Cl. 172—4.5

5 Claims



1. In control apparatus of a blade of a motor grader having a wand extending outwardly from associated controls for contact with a reference line for causing the blade to follow a pathway substantially parallel to the reference line in response to vertical movement of the wand as the wand passes along the reference line, said wand having a first end portion for contacting the reference line connected to the associated controls, the improvement comprising:

biasing means including a flexible means having a substantially smaller cross-section than said wand and flexibly associated therewith for contacting the reference line and urging said reference line toward the first end portion of the wand at a preselected force said biasing means and said wand exerting reaction forces therebetween upon impact forces being subjected upon at least one of said

wand and said biasing means while said reference line is therebetween for damping vibrations of the wand while permitting said reference line to move to positions spaced from the wand during said vibrations with said reference line being sufficiently maintained relative to said flexible means to provide a desirable magnitude of vibration damping upon said wand.

4,009,759

**CULTIVATOR APPARATUS**

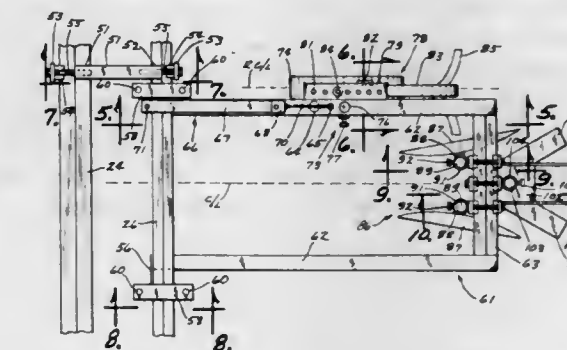
Arnold E. Ernst, Wolverton, Minn. 56594

Filed Mar. 26, 1975, Ser. No. 562,016

Int. Cl.<sup>2</sup> A01B 63/16, 63/26, 37/00, 49/02

U.S. Cl. 172—395

5 Claims



1. A cultivating apparatus for row crops for use with a tractor having a three point hitch arrangement, a draw bar adapted to be connected to the three point hitch arrangement whereby the draw bar is movable by tractor operation of the three point hitch arrangement between a ground working position and a transport position, and a tool bar secured to the draw bar in parallel relation and behind the draw bar relative to the tractor, said apparatus comprising:

cultivating means pivotally connected at one end to the tool bar and extending rearwardly of the tool bar, said cultivating means including a plurality of individual cultivator units each pivotally attached to the tool bar, each of said cultivator units being independently pivotally movable about the tool bar;

each cultivator unit including a frame member, a disk unit and a first sweep means, said frame member having one end pivotally affixed to the tool bar and having a free end, said disk unit being mounted on said free end, said disk unit including a pair of laterally disposed rotatably mounted disks, said disks being adjacent to a row of crops, one each of said disks being disposed on opposite sides of the row of crops when said cultivating means is in the ground working position, said first sweep means being mounted on said free end between said disks and immediately rearward of said disks;

means for supporting said cultivating means upon the ground, said means for supporting including a plurality of gauge wheels, each cultivator unit intermediate its ends having one of said gauge wheels affixed thereto;

means for independently adjusting the vertical and horizontal position of each of said gauge wheels with respect to each respective frame member including a plurality of substantially vertically aligned openings disposed in each respective frame member, an internally threaded horizontally aligned opening disposed in each of said frame members intersecting with each of said vertically aligned openings, a shaft disposed in one of said vertically aligned openings of each of said frame members and selectively receivable in at least one other of the other vertically aligned openings of the frame members for allowing horizontal adjustment, said gauge wheels being rotatably mounted to the bottom of each of said shafts;

threaded set screw means for reception in the horizontally aligned openings for selectively positioning each of the shafts vertically with respect to the frame member and thereby selectively positioning the gauge wheel with respect to said frame; and



wherein said first sweep means and said disk unit are aligned along the longitudinal center line of said cultivator unit, said frame member including side members and a transverse member, said side members being at one end thereof pivotally attached to the tool bar and at the opposite end thereof joined by said transverse member, said disk unit and said first sweep means being mounted on said transverse member, the radial center line of said gauge wheel being parallel to and offset from said longitudinal center line whereby such nonalignment of said gauge wheel with respect to said cultivator unit provides lateral support to said cultivator unit, each of said cultivator units having a second sweep means for cutting attached to said frame member intermediate its ends and directly above said gauge wheel, said second sweep means arcing downwardly therefrom immediately rearward of said gauge wheel, said second sweep means terminating in cutting blades disposed above and adjacent the ground surface in the space between the adjacent rows of crop whereby weeds growing between the rows of crop are cleared away and the soil loosened when said cultivating means is in the lowered position.

4,009,760

## APPARATUS FOR ROOF DRILLING

Lloyd B. Hansen, Bridgeport, and Eugene R. Smarrella, Shinnston, both of W. Va., assignors to Carmel Company, Pittsburgh, Pa.

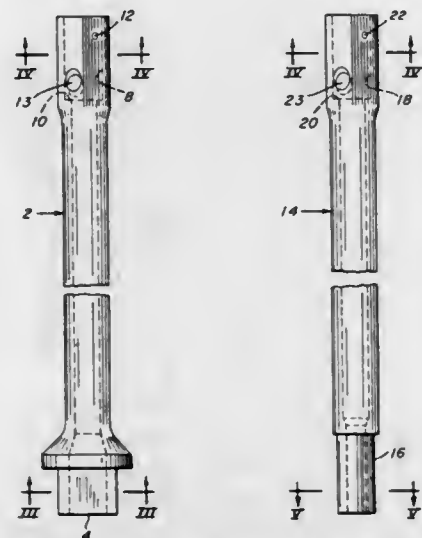
Continuation of Ser. No. 554,878, March 3, 1975, abandoned.

This application May 6, 1976, Ser. No. 683,986

Int. Cl.<sup>2</sup> E21B 17/00, 17/04; E21C 15/00

U.S. Cl. 175-320

3 Claims



1. A roof drilling assembly comprising a starter-driver bar including a first end adapted to be driven by a motor and a second end having a female socket therein, a rod extension having a male end shaped to be received in said female socket and a female socket at its other end of the same cross-sectional size and shape as the first named female socket, and a bit having a male shank of the same cross-sectional shape as said male end, said sockets, male end and shank being non-circular in transverse cross-section, the bottom of each of said female sockets having a shoulder at its inner end, each of said starter-driver bar and rod extension having an axial hole therethrough, and each socket having a transverse hole through its wall spaced from said shoulder, said bit shank being so received in said female socket of said driver bar or rod extension that the axial hole therein communicates with the corresponding transverse hole and the length of said male end received in said socket being such that it covers said transverse hole.

4,009,761

## SKID STEER VEHICLE

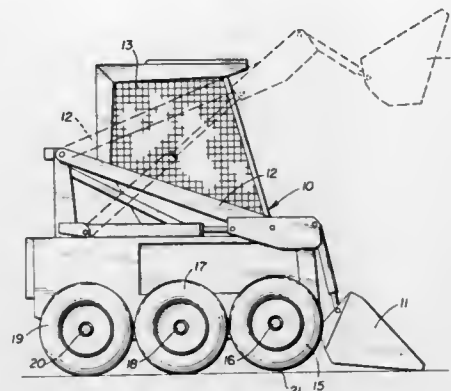
Gustave Meyer, Northglenn, Colo., assignor to Irvin L. Stumpf, Wheat Ridge, Colo., a part interest

Filed May 2, 1975, Ser. No. 573,867

Int. Cl.<sup>2</sup> B62D 11/02

U.S. Cl. 180-6.2

1 Claim



1. A skid steer loader having loader arms pivotally connected near the rear of the vehicle for operating a mechanism at the front of the vehicle, comprising

a. a vehicle body, and

b. three transversely extending axles being a front, a center, and a rear axle supporting said vehicle body and having a plurality of wheels arranged in pairs thereon, each wheel being near but not contacting an adjacent wheel, the front and rear axles being in a single horizontal plane that would levelly support the vehicle body, and the center axle being in a lower horizontal plane than the plane of the front and rear axles, variations in the vehicle load forwardly and rearwardly of the center axle automatically producing rocking movement of the vehicle and four wheel traction utilizing either the combination of wheels on the center and front axles or the combination of wheels on the center and rear axles bearing on a supporting surface.

4,009,762

## CONVERTIBLE LADDER-CARRIER VEHICLE ASSEMBLY

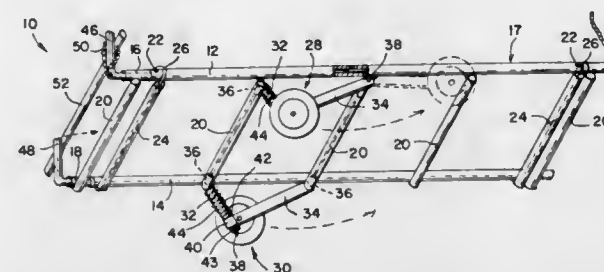
Bjorn Bjerkgaard, Surrey, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 28, 1976, Ser. No. 681,236

Int. Cl.<sup>2</sup> E06C 1/397, 5/00

U.S. Cl. 182-20

8 Claims



1. A convertible ladder-carrier vehicle assembly comprising in combination:

a first pair of elongated parallel hollow metal tubing members having at least one set of opposed aligned apertures therein;

at least four transverse elongated metal elements connected in spaced parallel relation across said first pair of elongated members to thereby maintain said first pair of members in fixed spatial relation;

a second pair of elongated elements positioned slidably within said first pair of elongated members and having at least one set of opposed aligned apertures therein;

at least one transversely extending resilient attaching mem-

ber having a hook element at each end thereof dimensioned to fit within said sets of apertures to thereby secure said second pair of elongated elements in fixed position relative to said first pair of elongated members; and a pair of wheel assemblies detachably journaled in the opposed ends of intermediate ones of said transverse elongated elements.

4,009,763

## POLE LADDER

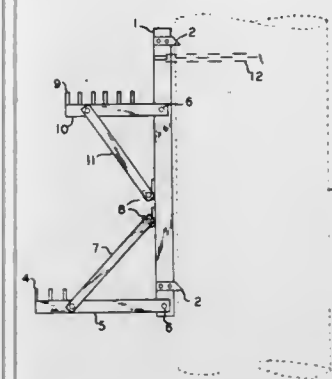
Alex E. Hunter, 924 Chartiers Ave., Pittsburgh, Pa. 15220

Filed Dec. 3, 1975, Ser. No. 637,374

Int. Cl.<sup>2</sup> A47C 9/10

U.S. Cl. 182-187

2 Claims



1. A ladder assembly for suspension from a pole or similar structure, comprising a channel having side flanges, a pair of cleats, each connected to one of said side flanges for piercing said pole, a ladder pivoted to one of said side flanges in a collapsible manner on said side flanges, said ladder comprising a pair of collapsible steps of different width, the lower one being greater, each comprising a platform supported by a pair of braces interconnected by a rod at their extremities, a pair of hooks secured to spaced points along said channel for receiving said rods when the ladder is in operating position, and a chain tightening means swivelly mounted on one of said flanges and automatically adjustable in direction to the circumference of the pole for tightly embracing the pole and piercing it with said cleats.

4,009,764

## LUBRICATING APPARATUS FOR CONVEYOR CHAINS

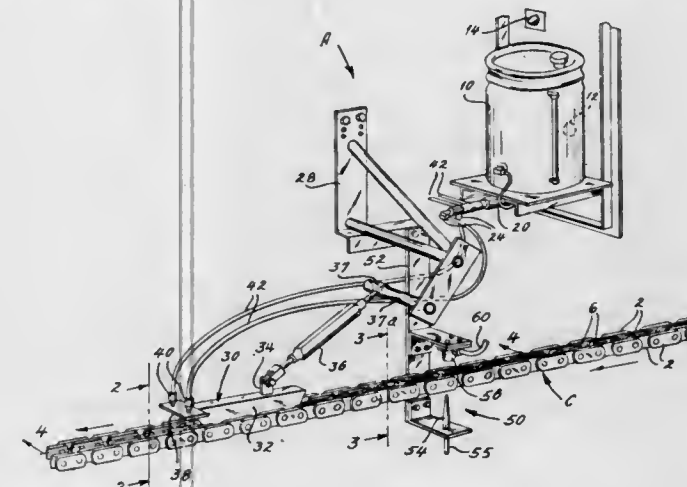
Henry F. Hafner, 9030 Saranac, Richmond Heights, Mo. 63117

Division of Ser. No. 472,299, May 22, 1974, Pat. No. 3,903,994. This application Aug. 7, 1975, Ser. No. 602,774

Int. Cl.<sup>2</sup> F16N 13/22

U.S. Cl. 184-15 A

10 Claims



1. In a chain system including a moving chain having links arranged in two distinct spaced apart rows which are parallel and extend longitudinally of the chain, and cross pieces extending transversely of the chain and connecting successive

links in the rows, all of the cross pieces being parallel and each of the rows being continuous so that no gaps exist between adjacent links of the rows, the chain having a tendency to move laterally as it moves in the normal longitudinal direction of chain advancement; an improved chain lubricating apparatus comprising: an anchor past which the chain moves; a chain follower bearing against the cross pieces on the chain and confined in the lateral direction by the links so that when the chain moves laterally the follower moves laterally with it; restraining means connecting the follower with the anchor for restraining the follower and thereby preventing it from moving in the direction of chain advancement, the restraining means permitting the follower to move laterally with respect to the anchor so that the follower will follow lateral movement of the chain; at least one lubricant nozzle carried by the follower and directed toward the chain; a source of lubricant; and delivery means between the source of lubricant and the nozzle for forcing lubricant out of said at least one lubricant nozzle and onto the chain, whereby the lubricant will be deposited at the correct lateral location on the chain notwithstanding lateral movement of the chain.

4,009,765

## ADJUSTABLE LIFT CHAIN ANCHOR FOR FORK LIFT MAST UNITS

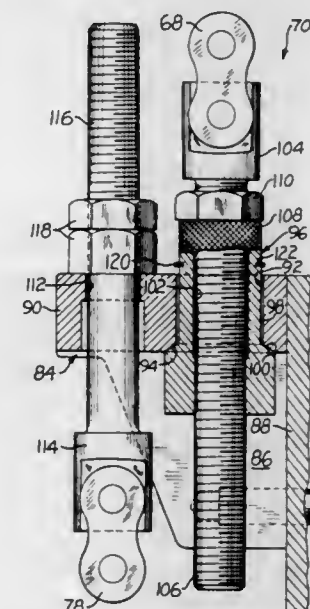
Edward V. Leskovec, Eastlake, and James A. Kulhanek, Perry, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed May 7, 1975, Ser. No. 575,303

Int. Cl.<sup>2</sup> B66B 9/20; F16G 11/12

U.S. Cl. 187-9 E

7 Claims



4. An adjustable anchor as an article of manufacture subsequently employable to provide an adjustable coupling with an adjacent end of a lift chain means in a fork lift mast unit, comprising

an adjustable anchor housing including means for attachment to a base structure and forming a bore with a spherical taper defined about one end thereof,

an adjusting sleeve extending through the bore and having an outer diameter substantially smaller than the bore to permit angular movement of the sleeve relatively to its axis within the bore, the sleeve forming a spherically shaped, annular shoulder arranged in facing relation with the spherical taper of the housing, the sleeve extending through the bore and defining an inner threaded bore for engagement with a suitable connector secured to the adjacent end of the lift chain means and having a threaded shank,

removable means arranged upon the sleeve for engagement with the housing opposite the spherical taper in order to retain the sleeve within the bore prior to its engagement with the threaded shank of the connector, and



adjustable means for engagement with the adjacent end of the additional lift chain means arranged opposite the bore in the anchor housing from the attachment means, a peripheral surface portion of the sleeve being configured to facilitate its rotation within the bore of the anchor housing.

4,009,766

## ELEVATOR CONTROL SYSTEM

Tsuyoshi Satoh, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

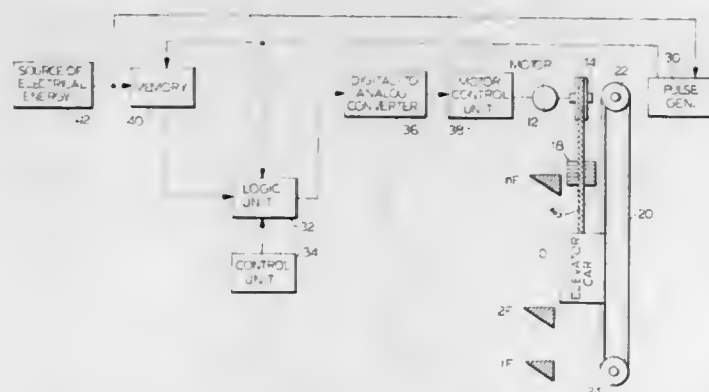
Filed Feb. 7, 1975, Ser. No. 548,079

Claims priority, application Japan, Feb. 21, 1974, 49-21093

Int. Cl.<sup>2</sup> B66B 3/02

U.S. Cl. 187—29 R

3 Claims



1. An elevator control system comprising, in combination, an elevator car, a traction sheave operatively coupled to said elevator car, an electric driving motor coupled to said traction sheave for vertically moving said elevator car, a governor sheave operatively coupled to said elevator car and having a shaft, pulse generator means disposed on the shaft of said governor sheave for generating a digital positional signal in the form of pulses in response to the actual amount of movement of the elevator car, a control unit for estimating the amount of movement of the elevator car necessary in response to a selected one of a call from within said elevator car and a call from a floor, a logic unit connected to both said pulse generator means and said control unit for effecting the arithmetical and comparative operation of said digital positional signal and said needed amount of movement of the elevator car to produce a digital signal, digital-to-analog converter means connected to said logic unit to convert said digital speed signal to an analog speed signal, motor control unit means connected to said digital-to-analog converter means and to said driving motor for controlling said driving motor in accordance with said analog speed signal, memory means connected to said pulse generator means to store said digital positional signal therein and also connected to said logic unit, and a source of electrical energy for supplying electrical energy to both said memory means and said pulse generator means during a failure of the normal power supply to said elevator control system, whereby when the normal power supply fails, said source of electrical energy supplies power to said pulse generator means and said memory means and said pulse generator means continues to generate digital position signals until the elevator car slows to a stop due to inertia thereof, and said memory means stores said digital position signals, and thereby when the normal power supply is restored the control system has available from said memory means the exact position of the stopped elevator car.

#### 4,009,767 MAGNETICALLY ACTUATED LOCKING SYSTEM FOR ELEVATOR DOORS

Hans-Göran Stadigh, Undersaker, Sweden, assignor to Linden-Alimak AB, Skellefteå, Sweden

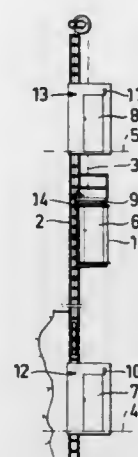
Continuation of Ser. No. 449,154, March 7, 1974, abandoned.

This application Sept. 12, 1975, Ser. No. 612,874.

Int. Cl.<sup>2</sup> B66B 1/00, 13/18

U.S. Cl. 187—31

7 Claims



1. In an elevator having a cage adapted to be moved by electrically operable drive means between a plurality of holding floors, each of said holding floors having a door associated with said cage, a device for mechanically locking said doors and for selectively unlocking the door associated with said cage at a holding floor where said cage is to be stopped, said mechanical locking device at each of said floors comprising a movable locking bolt which includes magnetic material, said bolt being positioned adjacent the door on said floor, spring means engaging said bolt for urging said bolt toward a locking position relative to said door and for normally holding said bolt in its said locking position, a coil surrounding said bolt and operable when energized to move said bolt to a nonlocking position against the force of said spring means, said bolt being retained in its nonlocking position against the force of said spring means by engagement of the free end of said bolt with an edge of said door when said door is at least partially open, circuit means at each of said holding floors for selectively energizing said coil at said floor, said circuit means including a locking activator located at a fixed position at an associated one of said plurality of holding floors for controlling the energization of the coil of the locking device at said floor, the locking activator at each of said floors comprising an energization source connected to said coil via a magnetic field responsive switch which is normally open and which is operable to close when subjected to an external magnetic field thereby to operatively connect said energization source to said coil, a lock actuator carried by said elevator cage, said lock actuator comprising normally inoperative magnet means carried by said elevator cage and a control switch on said elevator cage arranged to be selectively closed to cause said magnet means to emit a sufficiently strong magnetic field, at a distance transverse to the path of travel of said elevator cage and in a plane passing through the magnetic field responsive switch when said cage is at a holding floor where said cage is to be stopped, to close the magnetic field responsive switch in the locking activator at said floor thereby to energize the coil in the locking device at said floor to move the locking bolt at said floor to its nonlocking position, each of said locking devices also including an auxiliary electrical locking device comprising further electrical switch means disposed adjacent to its said locking bolt, said further switch means including a switching element connected to and movable with said locking bolt whereby the operating state of said further switch means is responsive to the position of its associated movable locking bolt, said locking bolt being operative to move said switching element to a position wherein said further switch means is open when said locking bolt is in its nonlocking position and to

move said switching element to a different position thereby to close said further switch means when said locking bolt is in its locking position, an electrical circuit including each of said further switch means at said plurality of holding floors for controlling the energization of said electrically operative elevator drive means to prevent energization of said drive means when at least one of said bolts is in its nonlocking position and the associated further switch means is accordingly open, and means for selectively opening said cage-carried control switch to terminate the emission of said magnetic field, when it is desired to move said cage away from said holding floor, thereby to de-energize the coil of the locking device at said floor to permit said spring means to return said bolt to its locking position and simultaneously to close said further switch means when the associated door is fully closed.

4,009,769

#### AUTOMATICALLY ADJUSTING BRAKING DEVICE

Masatugu Nagatomo, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

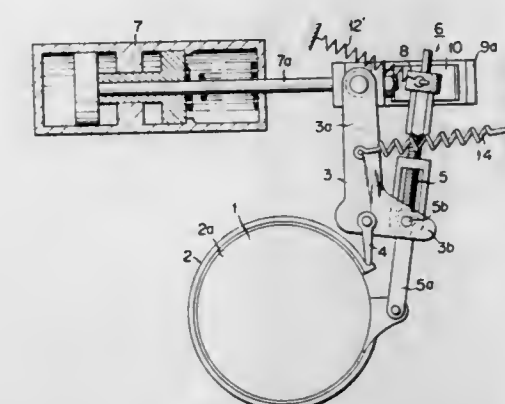
Continuation-in-part of Ser. No. 485,201, July 2, 1974, Pat. No. 3,918,556. This application Sept. 23, 1975, Ser. No. 615,927

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> F16D 49/20

U.S. Cl. 188—77 R

7 Claims



1. An automatically adjusting braking device for a band brake, which comprises a brake drum secured to a vehicle body with a brake band in engaging contact therearound with one end secured to an anchor means and the other end secured to an adjusting component wherein the anchor means is connected between the end of an actuating means and said adjusting component through a feed mechanism for driving said adjusting component and wherein a return spring is connected between said anchor means and the vehicle body.

4,009,768

## CALIPER BRAKE FOR A BICYCLE

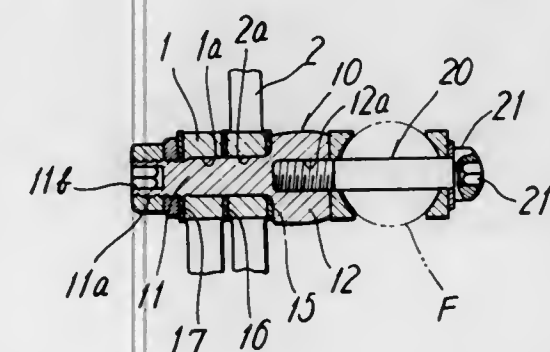
Yuji Fujii, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Feb. 19, 1976, Ser. No. 659,568

Int. Cl.<sup>2</sup> B62L 1/12

U.S. Cl. 188—24

4 Claims



1. A side-pull type caliper brake for a bicycle having a frame and a wheel including a rim, comprising:

- a pair of brake shoes on opposite sides of the rim, respectively;
- a pair of brake arms carrying said brake shoes, respectively, one of said brake arms being C-like shaped and the other of said brake arms being Y-like shaped;
- a single support, rotatably supporting said brake arms, including a pivot having a first portion including an outer periphery supporting thereon said brake arms and a second enlarged diameter portion extending integrally from one end of said first portion, said first portion at the other end thereof having first screw threads at said outer periphery and a first rotary control means for adjusting the space between the rim and each of said brake shoes, said enlarged diameter portion having a first bore extending axially of said pivot and including second inner screw threads; and
- mounting means, independently connected to said single support, including a rod-like member having at one end third screw threads in mesh with said second inner screw threads, and secondary rotary control means, at the other end of said rod-like member, for attaching said single support to the frame.

4,009,770

#### HOIST BRAKE CONSTRUCTION FEATURING CAM DEVICES

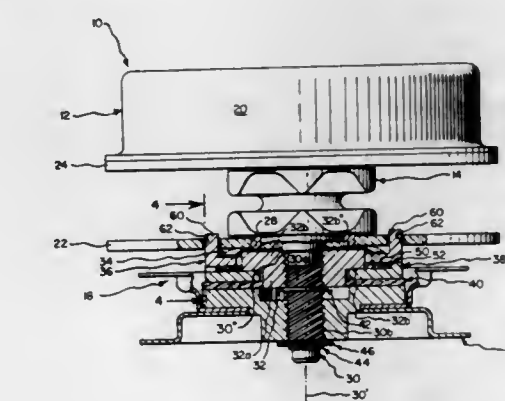
Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,276

Int. Cl.<sup>2</sup> F16D 63/00

U.S. Cl. 188—82.74

13 Claims



1. In a hoist utilizing a Weston brake having a ratchet assembly including a ratchet pawl and ratchet wheel, said ratchet assembly being employed during load lifting rotation of a hand wheel for the purpose of coupling a load wheel drive shaft for rotation with said hand wheel and during load lowering rotations of said hand wheel for the purpose of creating frictional braking effects tending to retard load lowering rotations of said drive shaft, the improvement comprising in combination:

cam means for maintaining said ratchet pawl and ratchet wheel in operative engagement during load lowering rotations of said hand wheel relative to said ratchet wheel.



4,009,771

## SLIP FRICTION CLUTCH

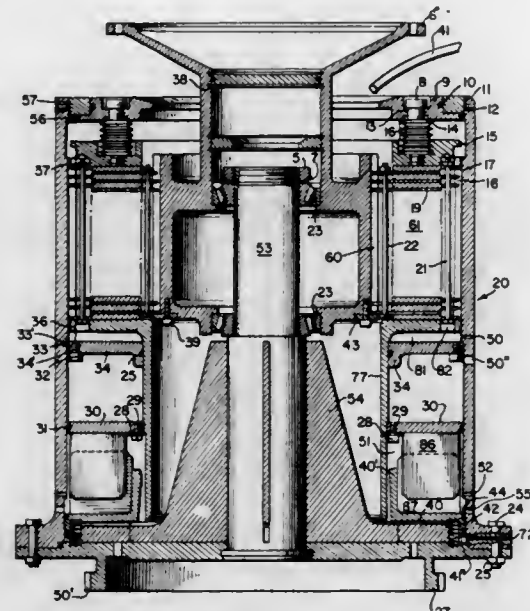
John Crankshaw, Erie, Pa., assignor to Dynetics Inc.

Filed Mar. 17, 1975, Ser. No. 558,893

Int. Cl.<sup>2</sup> F16D 23/10

U.S. Cl. 192-105 A

26 Claims



1. A clutch comprising, a shaft having a sleeve connected thereto, a hub rotatably supported on said shaft, clutch means comprising first clutch means and second clutch means to be moved into frictional engagement with each other, said first clutch means being attached to said sleeve and said second clutch means being attached to said hub, enclosing means enclosing said clutch means providing a clutch cavity receiving said clutch means, a clutch actuating piston slidably supported on means on said clutch and engaging with said first clutch means and pressure plate means supported on said clutch, a spring plate engaging said second clutch means and spring means between said pressure plate and said spring plate means, fin means on said sleeve for imparting a centrifugal force to oil, and means for introducing oil to said clutch cavity for providing a viscous drag between said first clutch means and said second clutch means whereby a rotational force is transmitted between said shaft and said hub and means connecting said clutch cavity in fluid flow relation with said piston whereby oil from said clutch cavity flows to said fins and centrifugal force is imparted to said oil by said fins moving said oil into engagement with said actuating piston whereby said actuating piston forces said first clutch means and said second clutch means axially toward each other and toward said pressure plate means.

4,009,772

## MOSAIC PRINTING HEAD

Wolfgang Glaser; Peter Krischke, both of Karlsruhe; Walter Steinbach, Donaueschingen, and Hans Joachim Steinmetz, Grunwettersbach, all of Germany, assignors to Steinmetz Krischke Systemtechnik GmbH, Germany

Filed Aug. 19, 1974, Ser. No. 498,527

Claims priority, application Germany, Aug. 22, 1973, 2342420

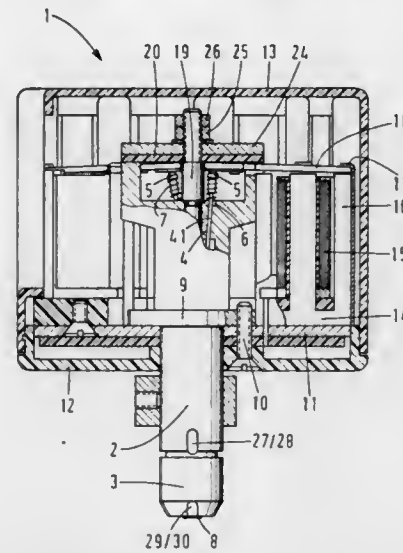
Int. Cl.<sup>2</sup> B41J 3/04

U.S. Cl. 197-1 R

8 Claims

1. A mosaic printing head comprising a plurality of printing needles each having a tip and a base and disposed in a tubular supporting column, and operating means provided around said column and selectively actuatable to act on the needle bases to project the needle tips from said column, wherein said

supporting column comprises a transverse wall of bearing metal near one end thereof, said wall being provided with a plurality of first guide holes receiving said needles adjacent their bases, said first guide holes having their axes arranged in a circle concentrically about the longitudinal axis of said column and extending at a slight inclination to said column axis, wherein the other end of said column is provided with an orifice member having means for guiding said needles adja-



cent their tips so as to extend parallel to one another in a row, and wherein said column contains a guide member intermediate its said ends, said intermediate guide member being of bearing metal and containing a plurality of second guide holes arranged in an ellipse about said column axis for receiving said needles, said intermediate guide member and orifice member being held in opposite ends of a sleeve insertable in said column.

4,009,773

## PAPER ROLL HANDLING APPARATUS

Lawrence A. Brenner, Brookfield, Wis., and Charles H. Scholl, Vermilion, Ohio, assignors to Beloit Corporation, Beloit, Wis.

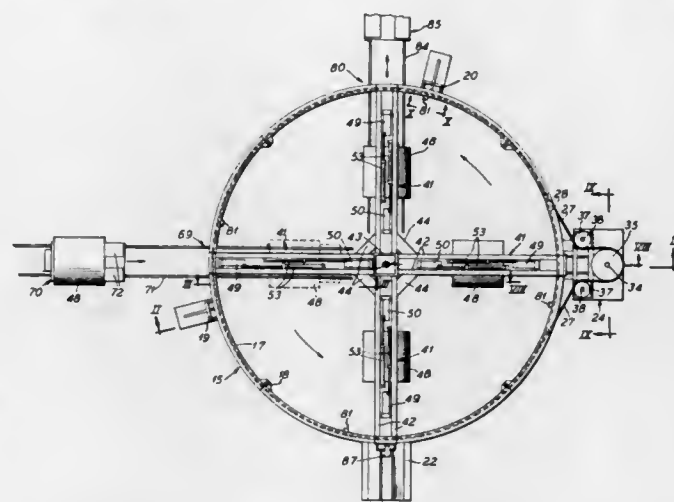
Filed Mar. 20, 1974, Ser. No. 452,944

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B65G 29/00

U.S. Cl. 198-344

24 Claims



1. Apparatus for handling paper rolls provided with center cores, comprising: an elevated rotary carriage; means supporting said carriage for rotation about a vertical axis; a plurality of roll-suspending devices carried by said carriage in angularly spaced relation to one another about said axis; each of said devices having means for supporting engagement within opposite ends of the center cores of the paper rolls;

means for operating said devices for selectively engaging with the roll center cores and suspending the rolls to be carried by said carriage and for releasing the rolls; means for driving said carriage rotatably to advance the roll-suspending devices successively into a plurality of station positions which are angularly spaced from one another in the direction of rotation of the carriage; and said carriage comprising a downwardly facing ring, and said supporting means comprising a plurality of stands circumferentially spaced about the ring and having upwardly facing roller means supporting the ring.

4,009,774

## CONVEYOR

David E. Lutz, 330 Washington Lane, Carlisle, Pa. 17013

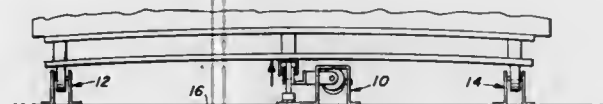
Continuation of Ser. No. 304,432, Nov. 7, 1972, abandoned.

This application Oct. 29, 1974, Ser. No. 519,179

Int. Cl.<sup>2</sup> B65G 25/04

U.S. Cl. 198-773

4 Claims



1. A conveyor for shifting a load comprising a base, load support means mounted on said base, said load support means including longitudinally extending static support means for supporting and restraining said load, said static support comprising a longitudinally extending beam mounted on said base, longitudinally extending roller support means laterally spaced from said static support means and generally parallel thereto, said roller support means comprising a pair of longitudinally extending roller conveyors, one on each side of said beam, the upper surface of said roller means and said static support means lying in substantially the same horizontal plane and normally supporting said load, a walking beam conveyor between said static support means and said roller means and closely adjacent said static support means, said walking beam conveyor being movable vertically from a position wherein its upper surface is below the upper surface of said static support means to a position wherein its upper surface is slightly above said upper surface of said static support means, said load being relatively rigid and having a limited degree of flexibility to permit said load to be deflected relative to a horizontal plane, means for actuating said walking beam conveyor to partially lift said load whereby the load is lifted from said static support means but not from said roller support means, and longitudinal drive means for shifting said walking beam conveyor longitudinally of said base whereby said load is moved over said roller means.

4,009,775

## APPARATUS FOR INVERTING ROWS OF FRENCH TOAST

Robert Wolfelsperger, Fairfield, and Richard J. Bozzo, Wyckoff, both of N.J., assignors to Sandco Ltd., Ottawa, Canada Division of Ser. No. 499,703, March 11, 1974. This application Apr. 16, 1976, Ser. No. 677,569

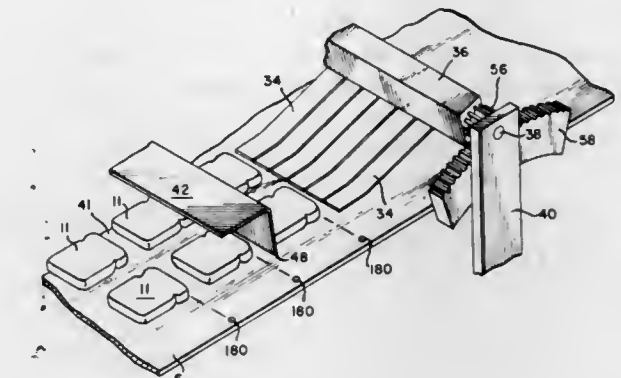
Int. Cl.<sup>2</sup> B65G 47/24

U.S. Cl. 198-403

9 Claims

1. An apparatus for inverting products on a conveyor, the combination of, an inverting means positioned transversely of the conveyor and adapted to swing about a horizontal axis, a pair of spur gears positioned respectively at the opposite ends of said inverting means in axial alignment therewith and fixed thereto, a first arm assembly comprising a first shaft structure and a first pair of vertical arms mounted respectively upon the ends thereof, a second shaft structure and a second pair of vertical arms mounted respectively upon the ends thereof, said shaft structures having concentric axes positioned substantially below said inverting means and parallel thereto, one

of each of said pairs of arms being positioned adjacent one side edge of the conveyor and the other of each of said pairs of arms being positioned adjacent the other side edge of the conveyor, said first pair of arms respectively supporting said spur gears, a pair of gear segments meshing respectively with said pair of spur gears and mounted respectively upon said



second pair of arms, cam-operating means comprising a pair of cam followers mounted respectively upon one of each of said pairs of arms and cam means presenting a pair of cam surfaces on which said cam followers rest, and means to impart synchronized swinging movements to said pairs of arms by imparting movement from a single power source to said cam means.

4,009,776

## CAN UNLOADER

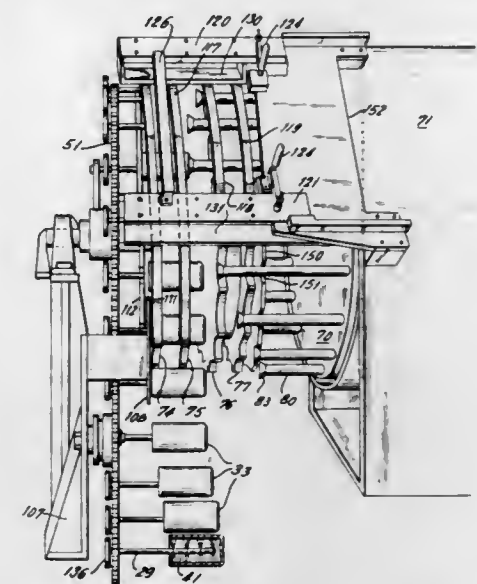
John P. Skrypek, Mahwah; Arnold Peters, West Paterson, and Robert Williams, Randolph, all of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,359

Int. Cl.<sup>2</sup> B65G 47/00

U.S. Cl. 198-478

10 Claims



1. Apparatus for unloading empty containers from an in-feed conveyor and delivering same to a takeoff conveyor, said apparatus including a continuously rotating assembly having in-feed and out-feed regions at opposite sides thereof, said assembly including a rear section having a first plurality of pockets along the periphery thereof and a front section having a second plurality of pockets along the periphery thereof with the pockets of the first and second pluralities of pockets being in front to rear alignment, an in-feed conveyor chain moving along a path including a portion where motion of said chain blends with motion of said assembly between said input and output regions, said first plurality of pockets being positioned to receive containers delivered by said chain, said assembly also including a plurality of rods aligned with said pockets and extending generally parallel to the rotational axis of said assembly, control means for axially moving said rods rearward



to engage containers on said conveyor chain and then moving such containers forward from said pockets of the rear section to said pockets of the front section to strip these containers from said chain, takeoff conveyor means operatively positioned at said output region to receive containers from said front section, said chain mounting a plurality of pin carriers extending generally perpendicular to the general plane of movement for said chain, said carriers at their forward ends having holding means which extends into containers to frictionally engage their inner surfaces, cam means at said input region operatively constructed to engage containers and move them slightly forward on said holding means to a first axial position before engagement thereof with the rear section, said assembly including a rear stop to the rear of the rear section and slightly rearward of containers at said first axial position, said rear stop positioned to arrest rearward movement of containers as the rods move toward their most rearward positions.

4,009,777

## CONTACT LENS HOLDER

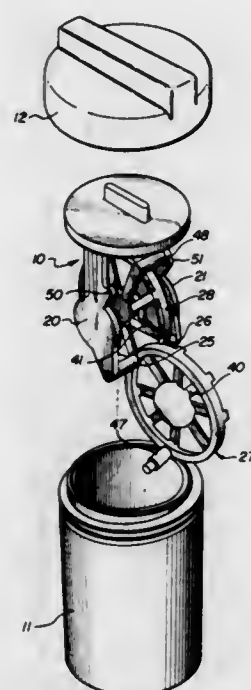
Michael D. Thomas, Elmhurst, Ill., assignor to Ryder International Corporation, Schaumburg, Ill.

Filed Dec. 29, 1975, Ser. No. 645,280

Int. Cl.<sup>2</sup> A45C 11/00; B65D 85/54; B08B 3/04

U.S. Cl. 206—5.1

11 Claims



1. A holder for contact lenses to be immersed in a sterilizing or cleansing medium, said holder comprising: a capsule; lid means for said capsule; and lens retainer structure, said retainer structure including, a pair of spaced generally parallel elongate mast elements extending in an axial direction and defining an intermediate space therebetween which is free from any obstruction, a pair of open-top basket members pivotally mounted relative to said mast elements and movable both into and out of said intermediate space defined by said mast elements, said basket members being disposed in back-to-back, oppositely facing relation such that the top of each basket member opens toward the adjacent mast element, said basket members being pivotal to or from a first position wherein they are disposed in said intermediate space, with the open top portion thereof aligned with a surface portion of the adjacent mast element, such that said mast element will operate to retain a lens in position within said basket member, and each said basket member being movable to or from a second position, out of alignment with the respective mast member to provide for the initial positioning or removal of a lens element, and each said basket member including a rim, centrally disposed web means defining the bottom portion of said basket member and providing support for the lens to be disposed therein, said web means providing a substantial open area in

said bottom portion for the entry of cleansing or sterilizing medium, such that when said basket members are in said first position, said lenses will be maintained within the basket members, with the opposite surfaces of said lenses being exposed to the fluid medium.

4,009,778

## DUAL COMPARTMENT PACKAGE AND METHOD FOR MAKING SAME

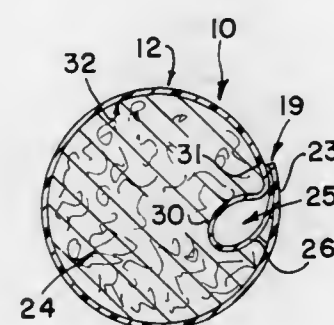
Duane Aaron Howell, Davenport, Iowa, assignor to The Kartridg Pak Co., Davenport, Iowa

Filed Nov. 4, 1975, Ser. No. 628,477

Int. Cl.<sup>2</sup> B65D 25/08, 77/06

U.S. Cl. 206—219

15 Claims



1. A dual compartmented package comprising a first compartment made of pliable-film material; a second compartment made of a portion of said pliable-film material, disposed within said first compartment, and attached thereto along a common sealing engagement therebetween which is substantially parallel to the longitudinal axis of said first compartment from one end thereof to the other;

fluent materials of different composition within said package in said first and second compartments therein, the common sealing engagement between said first and second compartments joining three plies of said pliable film material folded upon one another with two plies being portions adjacent the opposed parallel side edges of said material joined with said edges in aligned adjacent registration, and an additional portion of said film material adjacent one of said side edges forming said second compartment with its opposing boundary including the third and innermost ply of said common sealing engagement; said compartments being cooperatively gathered and closed at each end.

4,009,779

## KIT FOR USE IN PLAYING VOLLEYBALL OR THE LIKE

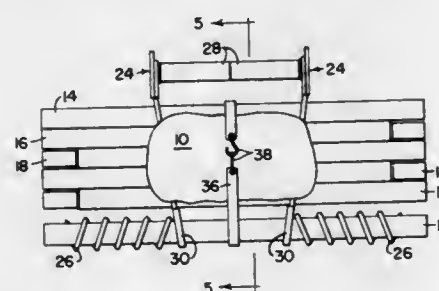
Norman V. Frye, R.R. 4, Davenport, Iowa 52804

Filed May 24, 1976, Ser. No. 689,056

Int. Cl.<sup>2</sup> B65D 85/20

U.S. Cl. 206—315 R

10 Claims



1. A kit for playing volleyball or the like, comprising a pair of generally Z-shaped ground anchors, each having a generally hollow cylindrical ground-penetrating part, a post-supporting part and a pair of parallel legs extending between the parts, said parts lying generally on parallel axes and extending re-

spectively in opposite directions from the legs, the legs being spaced apart on the order of the inside diameter of the ground-penetrating part, said anchors being arranged in the kit with their post-supporting parts coaxial and facing toward each other and the ground-penetrating parts coaxial and, facing away from each other, a plurality of net post sections, including a first section passed through the coaxial ground-penetrating parts and additional sections parallel to the first section and passed through the spaced-apart legs, and means holding the anchors and posts together.

4,009,780

## VOLLEYBALL OR LIKE KIT

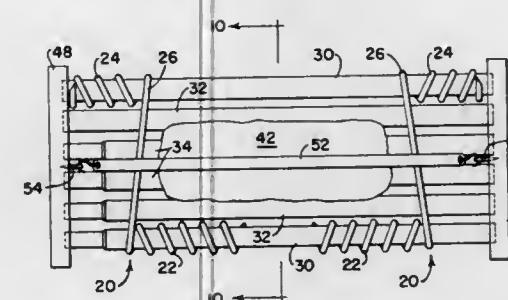
Norman V. Frye, R.R. 4, Davenport, Iowa 52804

Filed May 24, 1976, Ser. No. 689,058

Int. Cl.<sup>2</sup> B65D 85/20

U.S. Cl. 206—315 R

12 Claims



1. A kit for use in playing volleyball or the like, comprising a pair of generally Z-shaped ground anchors, each having a ground-penetrating helix, a post-supporting helix, and a leg extending between and interconnecting the helices, the helices being formed on parallel axes and extending respectively in opposite directions from the leg, the leg joining each helix at its respective first turn and said helices being tangential to the leg at the same side thereof, said anchors being arranged in the kit with the one helix of one anchor in axial alignment with one helix of the other anchor and the other two helices being in coaxial alignment with each other, and with the legs spaced apart axis-wise as respects the helices; a plurality of net post sections of substantially equal length including a first section passed through one pair of coaxial helices and a second section passed through the other pair of co-axial helices; a pair of end members respectively engaging opposite ends of the post sections; and means releasably securing the end members together with the post sections confined between them.

4,009,781

## SLIDE TRAY AND TAPE CASSETTE CONTAINER

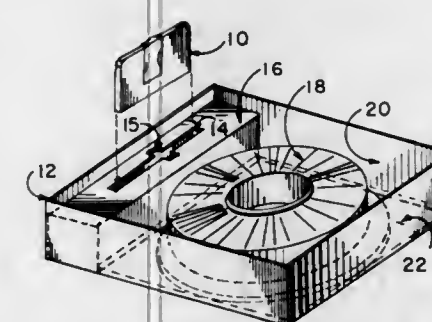
Paul G. Agnew, Braintree, and Stephen P. Becker, Framingham, both of Mass., assignors to Learcom, Inc., Boston, Mass.

Filed Jan. 12, 1976, Ser. No. 648,478

Int. Cl.<sup>2</sup> B65D 85/672

U.S. Cl. 206—387

11 Claims



1. A container for the shipment, storage and organization of a slide tray and associated tape cassette comprising: a first casing member forming a walled enclosure having a bottom and sides;

a first compartment within said first casing member for receipt of said slide tray;

a rectangular cassette storage member mounted securely to abut an inner adjacent side and bottom of said first casing member, said horizontal storage member having an upper surface being recessed in relation to the height of said abutting casing side and having at least one aperture compartment therethrough for receipt of said tape cassette; and

a second casing member to cover said first casing member and to be removable therefrom to completely expose said first compartment and said cassette storage member.

4,009,782

## METHOD AND APPARATUS FOR SORTING AND COUNTING FISH EGGS

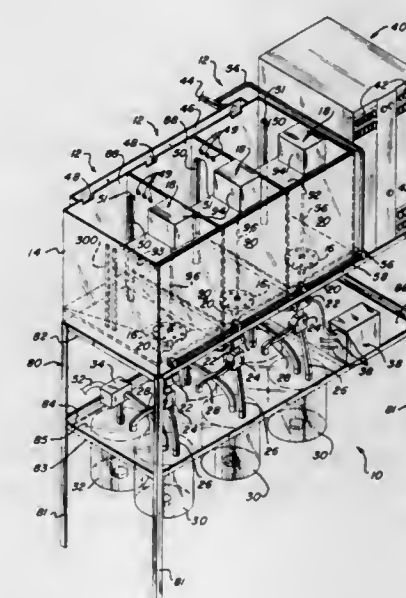
Derald Edward Grimshaw, Denver, Colo., assignor to Roe, Inc., Palmyra, Wis.

Filed Sept. 26, 1975, Ser. No. 616,872

Int. Cl.<sup>2</sup> B07C 5/342

U.S. Cl. 209—73

48 Claims



1. An apparatus for sorting dead fish eggs from a container storing a batch of both live and dead fish eggs, said apparatus comprising:

means connected to said container for individually separating and injecting fish eggs at a predetermined frequency from said batch into a moving fluid, and means responsive to a dead fish egg in said moving fluid for diverting the flow of the portion of said moving fluid containing said dead fish egg out of a main flow of said fluid.

4,009,783

## FRICTION SEPARATOR

Joseph K. Park, Corvallis, Oreg., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Oct. 2, 1975, Ser. No. 618,921

Int. Cl.<sup>2</sup> B07C 5/06

U.S. Cl. 209—108

1 Claim

1. A device for separating rough particles from smooth particles, comprising in combination

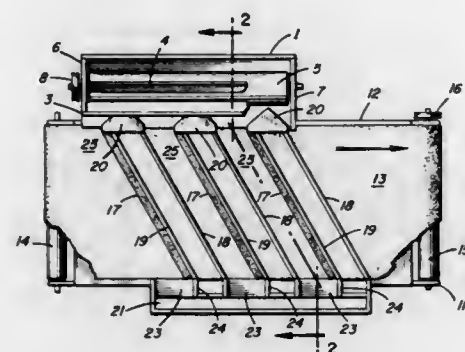
a. a flat belt for conveying the particles to be separated, the surface of said belt being constructed of a friction-creating material which will grip the rough particles having a high coefficient of friction but not the smooth particles having a low coefficient of friction,

b. means for traversing said belt,

c. means for feeding the particles to be separated onto said belt,



d. a plurality of separators, each comprising a bar of yieldable material, mounted over said belt, parallel to and just touching the surface thereof, and extending at an angle of about 45° to the length of the belt, said separators cooperating with said belt to permit the rough particles gripped by said belt to be carried under said separators and to move the smooth particles not gripped by said belt to the side of said belt,



e. means for receiving smooth particles which have been moved to the side of the belt,  
f. collector means after each separator cooperating with said belt to remove the rough particles which have been conveyed under said separator, and  
g. means for receiving the rough particles which have been removed from said belt.

4,009,784

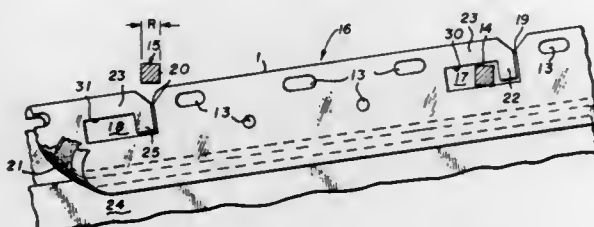
## DOCUMENT HANGING APPARATUS

Abram G. Elias, 1527 Greg St., Sparks, Nev. 89431, and Peter G. Elias, 6 Wedgewood Drive, Winnipeg, Manitoba, Canada (R3T2J8)

Continuation-in-part of Ser. No. 514,890, Oct. 15, 1974, Pat. No. 3,923,353. This application Oct. 8, 1975, Ser. No. 620,569  
Int. Cl.<sup>2</sup> A47B 63/00; B42F 15/00

U.S. Cl. 211—46

15 Claims



1. Document hanging apparatus, comprising:  
an elongated strip of flexible material having a foldline extending along its length and at least two pairs of apertures provided therein, the apertures of each pair being symmetrically disposed about said foldline, said strip also having a slit proximate each of said pairs of apertures and extending from a side portion of one of the apertures of the pair to the corresponding side portion of the other aperture of the pair, said strip being folded along said foldline to form a document receiving slot; and  
means for fastening a document to said strip.

4,009,785

## FIXTURE AND SYSTEM FOR HANDLING PLATE LIKE OBJECTS

Terence John Trayes, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 2, 1974, Ser. No. 511,324

Int. Cl.<sup>2</sup> B65G 53/50

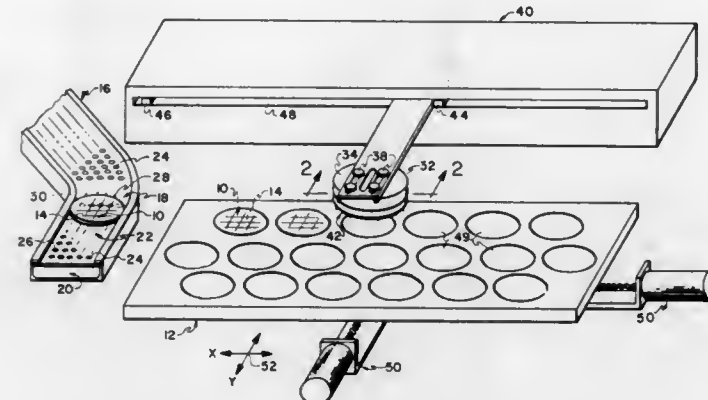
U.S. Cl. 214—1 BT

15 Claims

6. An apparatus for handling plate like objects, which comprises:

1. a gas actuated device having a surface for releasably picking up the plate like objects,

2. means for moving said pickup device from a first to a second position, and  
3. a plurality of retractable members extending from the pickup surface of the device and surrounding an area of the pickup surface of the device, the area being dimensioned to receive one of the plate like objects, said re-



tractable members serving to confine a plate like object picked up with said apparatus to the area so enclosed, said retractable members retracting in response to force applied to them orthogonally to said pickup surface, thereby preventing damage to a plate-like object or a support for a plate-like object applying such a force to said retractable members.

4,009,786

## METHOD OF AND APPARATUS FOR HANDLING FABRIC WORKPIECES

Kenneth Joseph Littlewood, 14 Duscson Drive, Templestone 3106, Australia

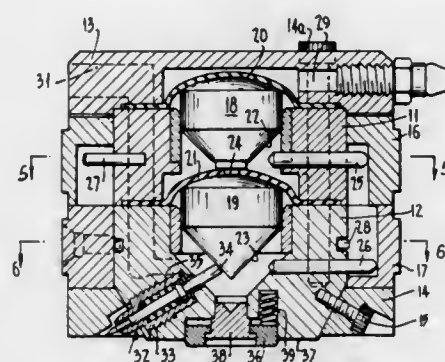
Filed Nov. 12, 1975, Ser. No. 630,964

Claims priority, application Australia, Dec. 2, 1974, 9880/74

Int. Cl.<sup>2</sup> B65H 3/22

U.S. Cl. 214—8.5 C

11 Claims



1. A pick-up device for assembling a preselected number of sheets from several stacks thereof comprising a body member having a sheet engaging surface, a plurality of pointed members slidably mounted in said body member and adapted to extend outwardly at an acute angle to and beyond said engaging surface for sequential engagement with at least one sheet in each stack so as to provide a predetermined assembly of sheets from said stacks for transfer to a processing station, and actuating means in said body member adjustably movable with respect to said pointed members for limiting the extension of said pointed members so as to control the number of sheets engaged in each stack.

4,009,787

## PALLET FORMER

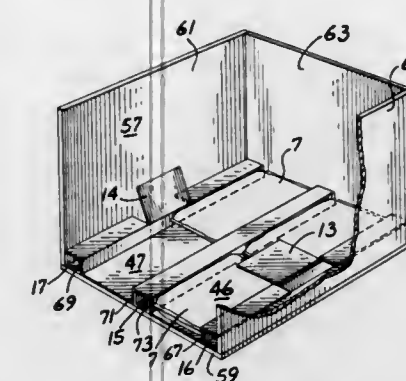
Ira W. Beal, Hudson, Ill., assignor to Funk Seeds International, Inc., Bloomington, Ill.

Division of Ser. No. 395,588, Sept. 10, 1973, Pat. No. 3,946,883. This application Sept. 25, 1975, Ser. No. 616,779

Int. Cl.<sup>2</sup> B65G 1/14

U.S. Cl. 214—10.5 R

1 Claim



1. A structure for forming a flexible sheet into a pallet comprising a box for receiving the flexible sheet and forming it into a pallet therein, said box having an open side, a bottom and three upstanding sides, bars attached to the top surface of the bottom of said box, each such bar having at least one planar side for folding the flexible sheet thereover to form a pallet having upstanding sides defining channels for receiving prongs of a forklift truck to lift the pallet, said bars including a pair of centrally disposed spaced apart bars, their planar sides being the outer sides of the pair, extending into the box parallel to opposing upstanding sides thereof from said open side and another bar positioned on either side of and parallel to said centrally disposed bars, each of the other bars having its planar side facing the centrally disposed bars and being positioned near an upstanding side of said box, the location of all bars being such to accommodate prongs of a forklift truck between said centrally disposed bars and between each of said other bars and its related box side for lifting the pallet at the channels formed over the bars.

4,009,788

## APPARATUS FOR TRANSFERRING FUEL BETWEEN SPACES WHICH ARE AT DIFFERENTIAL PRESSURES

Reinhard Waldhofer, Essen, Germany, assignor to Shell Internationale Research Maatschappij B.V., Den Haag, Netherlands

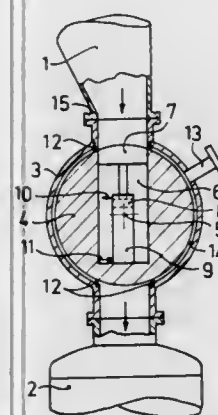
Filed May 28, 1975, Ser. No. 581,574

Claims priority, application Germany, May 30, 1974, 2426035

Int. Cl.<sup>2</sup> B65G 47/82

U.S. Cl. 214—17 B

6 Claims



1. In an apparatus for transferring fuel between spaces which are at differential pressures, a combination comprising first wall means bounding a first space which is at a first pressure; second wall means bounding a second space which is at a

higher second pressure; transfer means for transferring finely divided solid material from one of said spaces into the other space, comprising a casing bounding a spherical chamber having two openings which communicate with the respective spaces, a spherical body provided with a blind bore having an open end, said body being turnable in said chamber between two end positions in each of which said open end registers with a respective opening, and a piston reciprocable in said bore for drawing a quantity of said solid material into said blind bore when the open end thereof registers with one of said openings and for expelling said quantity when said open end registers with the other of said openings, said body and said casing having respective juxtaposed surfaces which together bound a clearance, and means for admitting into said clearance an inert gas at a pressure higher than said second pressure.

4,009,789

## MACHINE FOR FEEDING STACKED ARTICLES

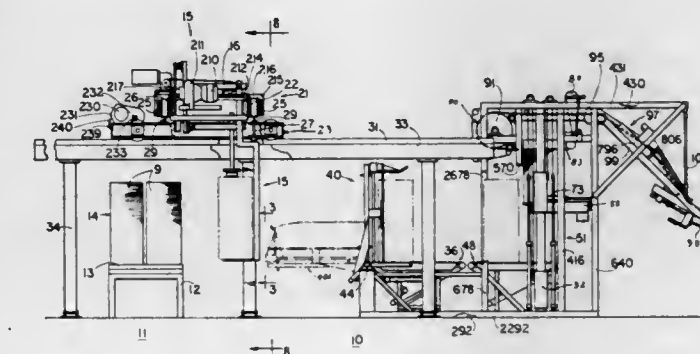
Kenneth R. Runyan, Dayton; Quentin E. Honnert, Cincinnati, and Ronald H. Porter, Milford, all of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Division of Ser. No. 437,167, Jan. 28, 1974, Pat. No. 3,907,273. This application June 27, 1975, Ser. No. 590,966

Int. Cl.<sup>2</sup> B65H 31/40

U.S. Cl. 214—6 S

5 Claims



1. In combination with a conveyor having spaced conveyor belts, a machine for straightening and positioning a stack of articles on the conveyor which comprises a tip-over device swingably mounted at a tip-over station on the conveyor, the tip-over device including fingers which extend between the belts when the tip-over device is in upright position, stack supporting means extending substantially perpendicular to the fingers, and a stack catching member mounted at the outer end of the stack supporting means extending transversely of the stack supporting means on the same side thereof as the fingers, the stack catching member engaging the face of the stack remote from the fingers when the tip-over device is in tipped over position, the stack catching member being spaced from the fingers a distance greater than the height of the stack, means for advancing the conveyor to bring the stack to the tip-over station, means for swinging the tip-over device so that the fingers pick up the stack from the belts and swing the stack against the stack supporting means as the tip-over device is tipped to a position in which the stack supporting means is substantially horizontal so that the stack falls against the stack catching member and the articles in the stack are free to move crosswise of each other, the stack supporting means supporting the stack free of the conveyor, clamps supported on the tipover device on opposite sides of the stack supporting means and engageable with the sides of the articles of the stack, means for drawing the clamps toward the stack supporting means to engage the articles in the stack to align the articles with each other and to center the stack, means for returning the tip-over device to upright position to return the stack to the belt conveyors when the stack has been straightened and positioned and means for advancing the conveyor in an opposite direction to remove the stack from the tip-over station.



4,009,790

## SIDE-DUMPING SLAG POT CARRIER

Gibson E. Brock, R.D. 5, Persimmon Road, Sewickley, Pa. 15143

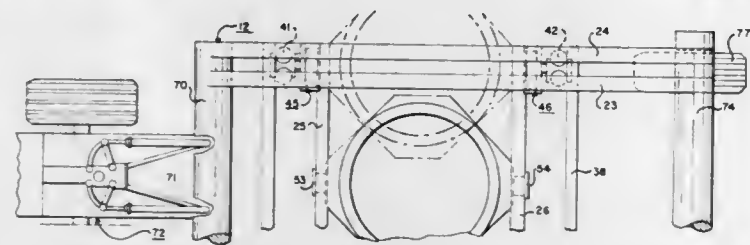
Continuation-in-part of Ser. No. 564,553, April 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 465,864, May 1, 1974, Pat. No. 3,897,881. This application Jan. 22, 1976, Ser. No. 651,537

The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> B65G 65/04

U.S. Cl. 214—317

8 Claims



1. A rubber-tired vehicle for plant roadway and off highway carriage of heavy loads comprising a tractor unit and a trailer unit comprising an elongated load-carrying bridge supported at its front and rear ends by the tractor and a pair of wheels respectively, means for picking up and dumping a slag pot or the like provided with trunnions comprising a pair of hook means suspended from the bridge and spaced from each other longitudinally thereof, coupling means affixed to the bridge in a vertically and horizontally fixed position relative thereto and adapted to make connection with the slag pot trunnions while it is suspended above ground in the hook means, means for raising and lowering the hook means relative to the coupling means, and means for rotating the coupling means so as to tip the slag pot about its trunnions in the hook means, whereby the trunnions are elevated into position in which said coupling means are coupled to said trunnions prior to the dumping of said slag pot, the pair of wheels supporting the rear end of the trailer being idler wheels individually mounted to straddle a load.

4,009,791

## TRUCK DUMP-BODY OPERATING MECHANISM

Christian Derain, Saint Aubin-le Vieil Evreux, France, assignor to Societe Nouvelle des Benes Saphem, La Neuve-Lyre, France

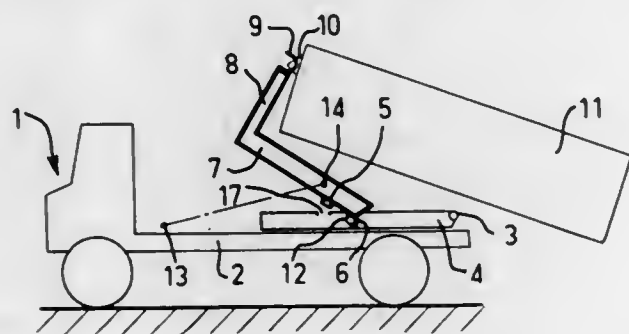
Filed Sept. 23, 1975, Ser. No. 615,890

Claims priority, application France, Oct. 2, 1974, 74.33245

Int. Cl.<sup>2</sup> B60P 1/64

U.S. Cl. 214—501

4 Claims



1. In a vehicle comprising a dump-body with a fastening member carried on the front upper part of said dump-body and the stubs fixed to the underneath of said dump-body, a chassis with a fixed reaction point on the front of said chassis, a truck dump-body actuating mechanism mounted on said chassis and comprising in combination:

an L-shaped pivot member including a vertical branch with an outer upper end and a horizontal branch with an outer rear end, horizontally translatable between a forward position and a rearward position relative to said chassis,

an automatic hook borne on the upper end of said vertical branch and cooperating with said fastening member, tilting means articulated about a tilting axis transverse to said chassis, fixed at the outer end of said horizontal branch, a slipper carried by said horizontal branch, the distance between said slipper and said tilting axis being fixed, a thrust point on the horizontal branch,

two parallel side members comprising tilting means articulated about a tilting axis transverse to said chassis, fixed at the rear end of said two parallel side members at the rear end of said chassis to connect the said two parallel side members with said chassis, a space between said two parallel side members to constitute slipping means where said slipper is engaged for sliding translation, an opening at the upper part of said parallel side members and having a size at least equal to that of said slipper, stop means for limiting the sliding travel of said horizontal branch of said L-shaped pivot member toward the rearward position fixed at the said side members and in front of a correspondent part of said horizontal branch, the distance between said stop means and the opening being such that said slipper is in registry with said opening when said horizontal branch bears against said stop means to reach a pivoted position, projecting catch means upon the upper part of said side members to be in engaging relationship with said stubs fixed to the underneath of said dump-body to impart lateral stability to the latter in its loaded position,

and a single jack for controlling horizontal sliding and pivotal motion, connected between said fixed reaction point on the front of said chassis and said thrust point on said horizontal branch.

4,009,792

## CARGO CONVEYING APPARATUS ON MOTOR TRUCK

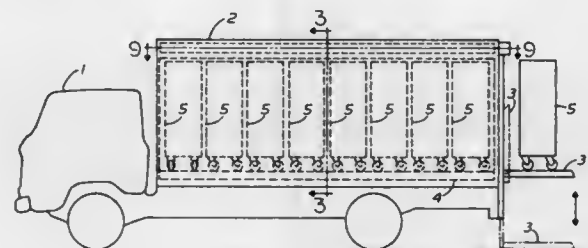
Namito Sano, and Yu Tsuchiya, both of Kariya, Japan, assignors to The Coca-Cola Co., Atlanta, Ga.

Filed Nov. 13, 1975, Ser. No. 631,585

Int. Cl.<sup>2</sup> B60P 3/00

U.S. Cl. 214—83.3

1 Claim



1. A cargo conveying apparatus on a motor truck comprising a motor truck having a cargo carrier truck bed, a series of conveying mechanisms being provided on the truck bed for transporting a movable cargo fore and aft to the longitudinal axis of the motor truck by virtue of a longitudinal conveying means which includes a pair of longitudinal rails installed on the truck bed, a pair of longitudinal feed pawls which are reciprocally installed within the longitudinal rails to convey cargoes only in one direction, and connecting means for reciprocating, in opposite directions, the longitudinal feed pawls, a lateral conveying mechanism which consists of lateral rails installed in the lateral direction at the front end of the truck bed and lateral feed pawls which are reciprocally installed within the lateral rails to convey cargoes only in one direction, said lateral feed pawls being provided with twice as long a stroke as the longitudinal feed pawls and wherein driving means are provided for driving said longitudinal and lateral conveying mechanisms simultaneously by virtue of the interlock device and further wherein the driving means comprises a fluid pressure cylinder unit which serves as a power source for driving said longitudinal and lateral conveying mechanisms simultaneously by virtue of the interlock device, and further

wherein the fluid pressure cylinder unit is installed longitudinally along the longitudinal rails on the unloading side of the motor truck and wherein a T-lever interlock device is rotatably supported at the center of the truck bed on a shaft located on the floor, with either of its legs being fitted between a couple of rollers installed on the longitudinal feed pawls, and further wherein the forward end of a piston of the fluid pressure cylinder unit is connected to said legs, with the other leg of the T-lever carrying a projected pin, which is fitted in the oblong hole made in one end of the T-level rotatably supported by said shaft on the truck bed floor, all of which conveying mechanisms cooperate together to move cargo in a rotational manner about the truck bed by virtue of said interlock device which interconnects the said longitudinal conveying mechanism with said lateral conveying mechanism, and wherein pallet means are provided for transporting said movable cargo fore and aft to the longitudinal axis of the motor truck, said pallet means comprising a rectangular box member having frames on the four sides, castors at four corners on the bottom of the box member, rollers at the top four corners of the box member, all of said castors being pivotally supported on shafts and installed at right angles with the box member, and further wherein L-shaped stoppers are provided at both ends of the pallet means, and wherein said guide rails are laid and positioned on the truck bed respectively with the same spacing as the distance between the castors of said pallet means, and further wherein the intersecting points of said guide rails are formed into a nearly triangular space to allow easy turning of the castors when the direction of travel of the pallet means is changed, whereby a more efficient loading and unloading operation is provided in conjunction with all of the area of the truck bed without producing a dead space on the truck bed.

4,009,793

## TAMPER-PROOF CLOSURE SEAL

David Ellsworth Minesinger, Fort Thomas, and Thomas Foster Leslie, Covington, both of Ky., assignors to The Procter &amp; Gamble Company, Cincinnati, Ohio

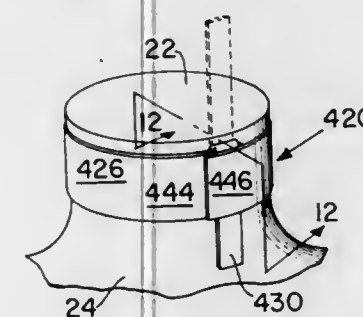
Continuation of Ser. No. 488,103, July 12, 1974, abandoned.

This application Apr. 15, 1976, Ser. No. 677,340

Int. Cl.<sup>2</sup> B65D 41/54

U.S. Cl. 215—246

1 Claim



1. Seal apparatus extending around the rim of a container closure overlapping an adjacent portion of the container to provide tamper-proof means for securing such closure immovably relative such container comprising, in combination, a length of heat shrinkable adhesive tape having a leading end portion and a trailing end portion, said length of heat shrinkable adhesive tape being wrapped around and adhered to both the container and the closure extending across the interface therebetween with said trailing end portion overlapping said leading end portion and a non-heat shrinkable tear strip adhered to the adhesive tape beneath both said leading and trailing end portions thereof masking said adhesive thereat, said tear strip extending generally transversely across said leading end portion of said heat shrinkable adhesive tape beneath the adhesive face thereof, over a side edge of said leading edge portion and back across the non-adhesive face of leading edge portion beneath the adhesive face of said over-lapping trailing end portion and generally laterally outwardly thereof defining a pull tab, said heat shrinkable adhesive tape having been heated and shrunk at least at said overlapping trailing end portion so that said pull tab is curled generally obliquely toward said side edge and outwardly of said closure and container.

4,009,794

## LEVER-ACTUATED CLOSURE DEVICE

Walter Zapp, Oberegg, Switzerland, assignor to I D F Company Ltd., Basel, Switzerland

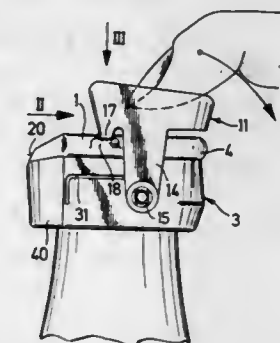
Filed Apr. 26, 1976, Ser. No. 680,059

Claims priority, application Switzerland, May 2, 1975, 5785/75; May 2, 1975, 5787/75

Int. Cl.<sup>2</sup> B65D 81/24

U.S. Cl. 215—210

22 Claims



1. A lever-actuated closure, for bottles or the like containers, comprising a collar or base part adapted for being fixed to the rim of an orifice of the container which is to be closed, a closing member one side of which is hingedly connected to said collar, an actuating member having a manually operated gripper part and being hingedly mounted on said collar below the outlet orifice, and a connecting member hingedly attached to the actuating member and to the closing member at the outside thereof, which closure can be transferred, by means of the actuating member, from an open position, in which the closing member frees the outlet orifice, through elastic deformation of at least one of the said parts of the closure, via a dead-center position, in which the hinge axis of the actuating member and the two hinge axes of the connecting member are in a common plane, into a closed position, in which the closing member seals the outlet orifice, or vice versa from this closed position into the open position, the gripper part of the actuating member being, in the closed position, above the elastically deformed closing member and being movable sideways and downwards, relative to the closing member for opening the closure.

4,009,795

## COMBINED REFLECTOR PAN AND TRIM RING

Bohdan Hurko, and Raymond L. Dills, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 8, 1975, Ser. No. 638,896

Int. Cl.<sup>2</sup> B65D 25/14

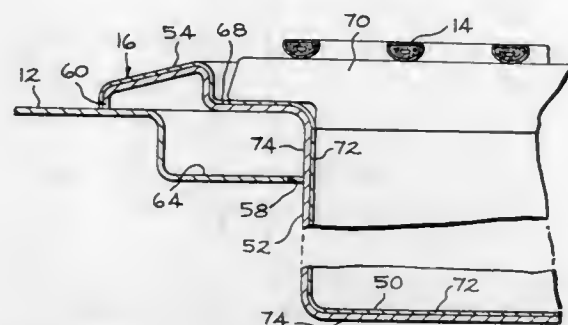
U.S. Cl. 220—64

2 Claims

1. A combined reflector pan and trim ring for use in supporting an electric surface heating unit, said pan comprising a bowl-shaped container formed of composite sheet material having an upper layer of aluminum and a lower layer of steel selected from the group of materials comprising stainless steel and aluminized steel, said container having an outwardly



extending flange adjacent its top edge to serve as a decorative trim ring for encircling the surface heating unit, said upper damaged as said insert is secured to said electrical apparatus by acting as a stop preventing further movement of said insert



aluminum layer being of high reflectivity and high resistance to discoloration at high temperatures above about 750° F.

4,009,796

## STORAGE LOCKER

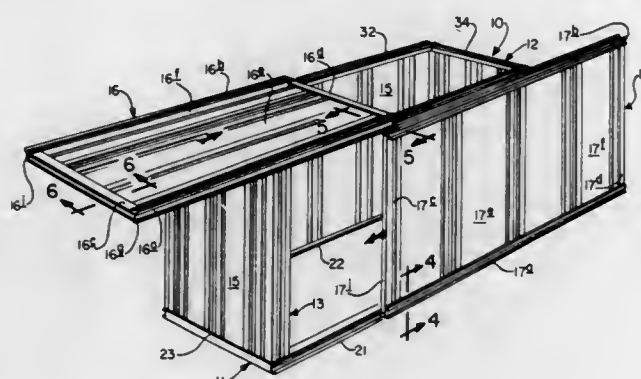
Dietrich F. Schmidt, Carlisle, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.

Filed Aug. 20, 1975, Ser. No. 606,184

Int. Cl.<sup>2</sup> B65D 7/42, 43/20

U.S. Cl. 220—84

22 Claims



1. A storage locker comprising a base frame, a top frame, a plurality of panels joining said base frame to said top frame to form a rectangular box-like construction having an access opening within said top frame and a second access opening between said base frame and said top frame, a slidably movable horizontally and slidably removable horizontally lid horizontally mounted on said top frame, and a slidably movable horizontally and slidably removable horizontally door vertically mounted on said top frame and said bottom frame.

4,009,797

## WALL PLATE FOR ELECTRICAL SWITCHES, ELECTRICAL OUTLETS AND THE LIKE

Martin Lee, Yonkers, N.Y., assignor to American Tack & Hardware Co., Inc., Monsey, N.Y.

Filed July 22, 1976, Ser. No. 707,602

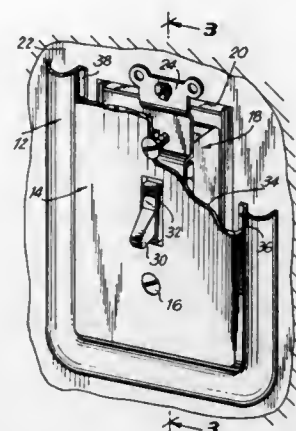
Int. Cl.<sup>2</sup> H02G 3/14

U.S. Cl. 220—242

10 Claims

1. A wall plate adapted to be secured to an electrical apparatus disposed in a mounting surface and comprising a frame, an insert received by said frame, said insert defining a front wall having a front face and a back face at least one fastening-receiving aperture defined in said insert and at least one apparatus-receiving aperture defined in said insert, means cooperating with said fastening-receiving aperture for securing said insert to said electrical apparatus with said insert adapted to maintain said frame against the mounting surface when said insert is secured to said electrical apparatus, and means projecting from said back face of said insert and toward said electrical apparatus for preventing said insert from being

toward said electrical apparatus under the influence of said securing means.



4,009,798

## VESSEL CONNECTOR

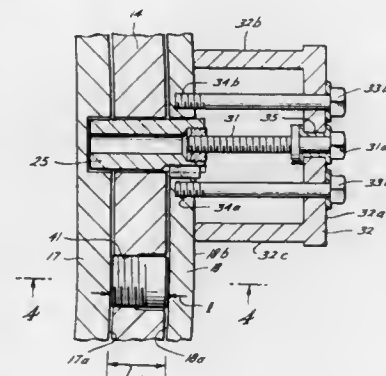
Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay

Filed May 7, 1975, Ser. No. 575,578

Int. Cl.<sup>2</sup> B65D 45/16

U.S. Cl. 220—325

15 Claims



1. A vessel structure including a first vessel section having an annular end portion formed of spaced, double concentric connector rings separated by an annular recess and a second vessel section including an end portion having a single connector ring for insertion into said recess between said double connector rings, said single and double connector rings being releasably joined by a plurality of improved pin-type connectors circumferentially spaced about said connector rings, each of said improved pin-type connectors including the following elements:

- said spaced, double connector rings having aligned openings therein;
- said single connector ring having an opening therein which is substantially alignable with said spaced double ring openings;
- a tapered pin inserted into said double and single ring alignable openings;
- said single connector ring opening including means for allowing said tapered pin to pivot into full bearing engagement with said double ring openings with said single ring opening being in full bearing engagement with said pin under loaded conditions; and
- said opening for said single connector ring including a tapered portion and an untapered portion, said tapered portion bearing directly against said tapered pin with said vessel under load conditions such that said tapered pin is pivoted into full bearing engagement with said double ring openings.

4,009,799

## MONITOR FOR SEED PLANTING APPARATUS

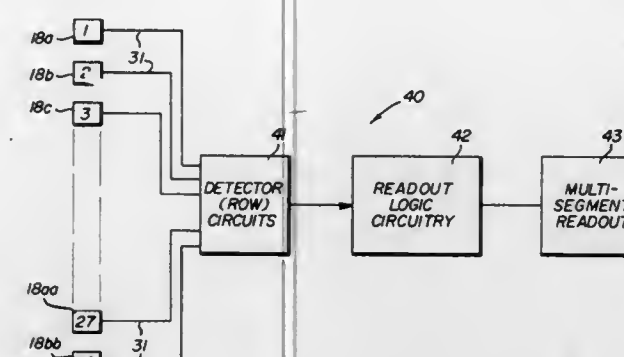
George H. Fathauer, Mesa, Ariz., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Nov. 10, 1975, Ser. No. 630,253

Int. Cl.<sup>2</sup> A01C 7/18

U.S. Cl. 221—3

18 Claims



1. An apparatus for detecting and monitoring seeds passing through a plurality of seed dispensers of a multi-row planter in which said planter is pulled by a tractor means and is powered by a rotary shaft coupled between said planter and said tractor means, comprising: a plurality of seed detecting circuit means respectively associated with said seed dispensers, readout display means, logic circuit means coupled between said seed detecting circuit means and said readout display means and responsive to output signals from said seed detecting circuit means for energizing said readout display means to identify which of said dispensers is operating improperly; shaft rotation sensing means coupled to said shaft for developing a shaft signal corresponding to the rotational speed of said shaft; and indicating means coupled to said shaft rotation sensing means and responsive to said shaft signal for visually indicating that the shaft is rotating.

4,009,800.

## FLUID DISPENSER

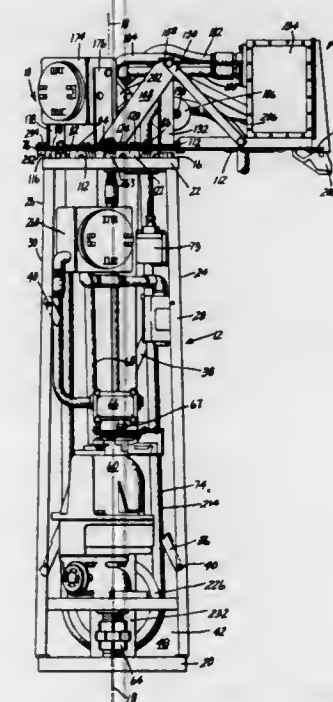
John S. Loy, Melvin C. Hankel, and Elmer A. Robbins, all of Fort Wayne, Ind., assignors to Tokheim Corporation, Fort Wayne, Ind.

Filed Sept. 19, 1974, Ser. No. 507,268

Int. Cl.<sup>2</sup> B67D 5/22

U.S. Cl. 222—28

4 Claims



1. In a fluid dispenser which includes means for pumping, means for metering, and means for controlling the dispensing

of a selected quantity of fluid, the combination comprising a base structure having upper and lower ends and enclosing said pumping and metering means, an arm assembly and bearing means pivotally mounting said arm assembly to said upper end for rotating movement through a predetermined arc about a vertical axis, a fluid dispensing hose connected at one end thereof to said pumping and metering means, said hose being coupled to and extending outwardly from the distal end portion of said arm assembly, electrically operable display means for visually displaying the quantity, price per unit volume, and total price of fluid dispensed, said display means being fixedly mounted in said arm assembly, a plurality of flexible electrical conductors extending between said base structure and said arm assembly and operatively coupling said display means to said metering means, junction boxes fixedly mounted in said base structure and said arm assembly, respectively, a conduit connected between said junction boxes and having a slip bearing therein, portions of said conductors extending between said junction boxes through said conduit, rotational movement of said arm assembly being accommodated by twisting of said conductors within said conduit.

4,009,801

## WASHING AGENT DISPENSER FOR DISHWASHER

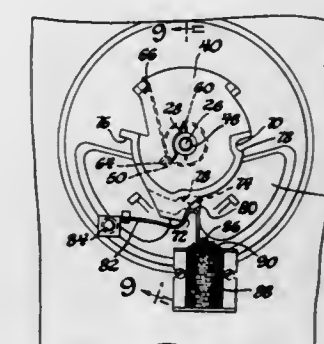
Richard B. Williams, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 14, 1975, Ser. No. 549,907

Int. Cl.<sup>2</sup> B67D 5/08

U.S. Cl. 222—70

3 Claims



1. A multiple charge dispenser comprising a container having a plurality of compartments and a lid adapted to cover all of said compartments and selectively automatically or manually successively uncover each of said compartments, said lid having successive dispensing and pause stops affixed thereto and biased for movement therewith in one direction as said lid successively uncovers each of said compartments, a successive pair of said dispensing stops having a pause stop therebetween and laterally spaced therefrom during the movement of said stops in said one direction, each of said pair of dispensing stops having a ramplike camming surface, and a detent automatically movable and manually yieldable for releasing said lid for biased movement in said one direction, said detent repeatedly automatically movable in a shuttle step between a first detent position in alignment with the biased movement of said dispensing stops and a second detent position in alignment with the biased movement of said pause stop, the length of said shuttle step being equal to the lateral spacing between the dispensing stops and said pause stop, said detent as it moves repeatedly to said first detent position engaging successive dispensing stops to establish a plurality of lid orientations with respect to the compartments, and said detent as it moves to said second detent position engaging said pause stop between the establishment of successive lid orientations to precondition one of said pair of dispensing stops and said lid for establishing one lid orientation to uncover one of said compartments when said detent next moves to said first detent position, said detent as it subsequently again moves to said second detent position releasing said one of said pair of dispensing stops and said lid for biased movement of said lid and



said stops to the next following lid orientation to uncover the next succeeding one of said compartments, said detent in said first detent position being engaged in a sufficiently friction creating manner by said camming surface in response to the biased movement of said dispensing stops to prevent the movement of said lid in said one direction when said detent is in said first detent position and not being automatically moved for releasing said lid, said detent including spring means yieldable to the movement of said camming surface in said one direction in response to a sufficient manual force on said lid to overcome the friction created between said detent and said camming surface for successively manually uncovering each of said compartments, thereby to facilitate either automatic or manual movement of said lid in said one direction.

4,009,802

## PAINT CAN ATTACHMENT

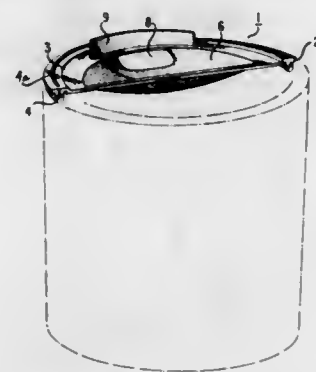
Leon Haydychok, 15 Sandy Lane, Trenton, N.J. 08610

Filed Sept. 2, 1975, Ser. No. 609,425

Int. Cl.<sup>2</sup> B67D 1/16

U.S. Cl. 222-108

6 Claims



1. A semicircular attachment for the open mouth of a paint can which comprises in combination:
  - a peripheral flange constructed and arranged to fit over and engage the edge of the can,
  - the internal straight edge of said attachment connected between inner edges of said flange and forming a narrow scraping ledge,
  - a paint well laterally enclosed between said peripheral flange and said narrow scraping ledge, and substantially depressed below the horizontal plane of said ledge,
  - said well having an opening in the lateral wall on the side opposite said ledge at a level substantially above the bottom of said well, and
  - a curved lip disposed between the upper edge of said opening and the inner edge of said flange.

4,009,803

## WEB FORMER

Kenneth G. Lytton; George J. Miller, and James E. Donnelly, all of Gastonia, N.C., assignors to Fiber Controls Corporation, Gastonia, N.C.

Filed Apr. 1, 1974, Ser. No. 456,981

Int. Cl.<sup>2</sup> B65G 65/70

U.S. Cl. 222-200

5 Claims

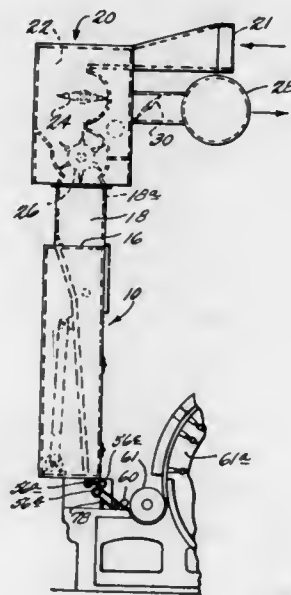
1. A web former for feeding fibers to a card or other subsequent textile equipment comprising:
  - means forming a downwardly tapered chute having a plurality of vertically extending sides forming at their upper ends an inlet opening for receiving open fibers and forming at their lower end a discharge opening of thickness smaller than said inlet opening so as to form in said chute a wedged shaped column of fibers having a given width and a downwardly tapering thickness,
  - means adjacent said inlet opening for introducing open fibers from a source downwardly through said tapered chute,
  - a height extending fiber chamber disposed between said

introducing means and said inlet opening, said height extending chamber having a plurality of sides and having a plurality of apertures through at least one side of said chamber sides to permit removal of air while preventing the escape of fibers,

said chute forming means including a movable shaker plate as one of said vertically extending chute sides, rotatable shaft means disposed adjacent to said movable shaker plate,

offset cam means for shaking said fiber column down throughout its height by oscillating said movable shaker plate to vary said discharge opening generally in a horizontal direction between predetermined maximum and minimum thickness dimensions, said offset cam means comprising an eccentric sleeve secured to said rotatable shaft means and concentrically rotatably journaled within a bearing assembly comprising ball bearings sealed between an inner and outer race, said sleeve being secured to said inner race so that said sleeve may be rotated with respect to said outer race,

means for adjusting said rotatable shaft means in a substantially horizontal direction relative to said shaker plate, said adjusting means enabling the bias of said movable plate against said bearing assembly to be selectively controlled and comprising at least one micrometer disposed adjacent said rotatable shaft means for selectively dis-



placing said rotatable shaft means in a plurality of positions,

means for biasing said movable shaker plate against said bearing assembly so that when said eccentric sleeve is rotated by said rotatable shaft means, sliding contact between said bearing assembly and said movable shaker plate is substantially eliminated during oscillation of said shaker plate,

at least one of said vertically extending sides containing a plurality of apertures sized to prevent escape of fibers from said chute column while allowing the removal of air from the fiber column while said plate shakes the fibers under the urging of said offset cam means down said chute and compresses them into a compact web of uniform density and thickness available at said discharge opening and

means adjacent to said discharge opening for withdrawing a uniform web from said chute and delivering the web to subsequent textile equipment including a plurality of delivery rolls each having a longitudinally fluted outer surface and each extending substantially across the length of a formed web, each of said delivery rolls also having substantially the same circular cross section and disposed adjacent to said discharge opening while being adapted to be rotatably driven so that a web may be transported between driven delivery rolls to subsequent textile equipment.

4,009,804

## ANTI-DROOL EXTRUSION DEVICE

Charles R. Costa, Plainville, and Robert L. Smigel, Middletown, both of Conn., assignors to Loctite Corporation, Newington, Conn.

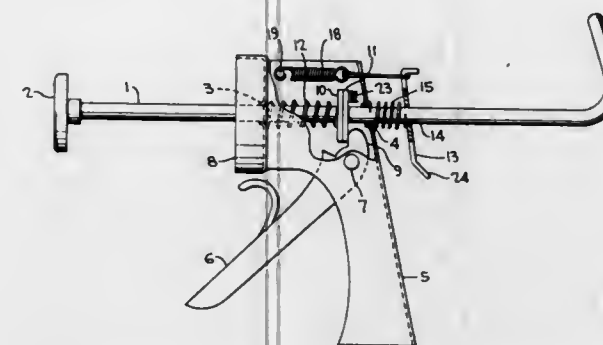
Continuation of Ser. No. 484,532, July 17, 1974, abandoned.

This application Mar. 18, 1976, Ser. No. 662,385

Int. Cl.<sup>2</sup> G01F 11/02

U.S. Cl. 222-391

4 Claims



1. An extrusion device comprising: (a) a rigid frame having two opposing ends and adapted to contain an extrudable material; (b) a nozzle mounted at one end of the frame through which the material is expressed; (c) a handle mounted at the other end of the frame; (d) a plunger and push rod mounted on the handle and advanceable coaxially with the frame and adapted to compress the material thereby causing the material to be expressed; (e) a plunger-advancing means adapted to receive actuating force and transmit this force to the push rod causing the push rod and plunger to advance; and (f) a pressure-relieving means to permit the push rod to automatically move backward, when the actuating force is stopped, a distance sufficient to relieve expansion force which has been developed in the material, said pressure-relieving means comprising a generally vertical dog slidably and pivotally mounted on the push rod, the dog having a pivot point which is longitudinally movable by the opposing action of a tension spring and a compression spring, balanced against each other so as to cause the dog to alternately tilt and then resume a more nearly vertical attitude, said tension spring being connected between the handle and the dog above said pivot point, and said compression spring being mounted coaxially on the push rod and bearing against the handle and the dog.

4,009,805

## POUR SPOUT

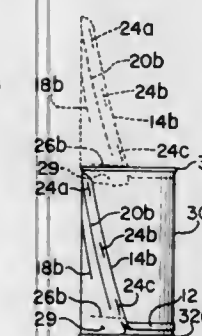
Mindaugas Julius Klygis, Barrington, and William Norfred Weaver, Glen Ellyn, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 29, 1976, Ser. No. 671,512

Int. Cl.<sup>2</sup> B67D 5/06

U.S. Cl. 222-530

16 Claims



1. A spout formed from a sheet of flexible material and adapted for attachment to a complementary container; and comprising a body of generally trapezoidal shape with opposite marginal edges tapering between the smaller and wider end portions to define a pouring spout with the wider end

portion including a transverse strip portion and an adjacent transverse remnant body portion adapted for permissive relative partial separation to provide a band combination for encircling an associated container body for permissive sliding therealong from retracted position with the band combination and spout portion within the ends of a container body to extended position with the spout portion projecting beyond an adjacent end of a container for permissive drawing together of the marginal edges, and interengageable attachment means adjacent opposite marginal edges for holding the said edges in inwardly drawn position reducing the size of the pouring spout at least toward the pouring exit end portion.

4,009,806

## DISPENSING HEAD FOR FLUID DISPENSING SYSTEMS HAVING ELEMENTS MADE FROM PLASTIC MATERIAL

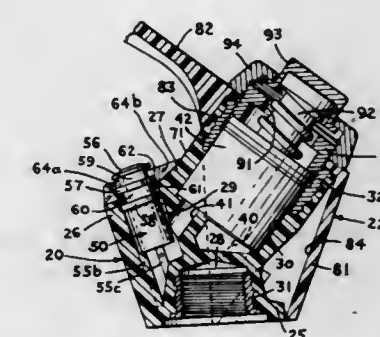
Richard C. Dreibelbis, Fair Lawn, and Warren E. Turner, Succasunna, both of N.J., assignors to Emerson Electric Co. (H &amp; H Thermostats Div.), Cedar Grove, N.J.

Continuation-in-part of Ser. No. 536,177, Dec. 24, 1974, abandoned. This application June 18, 1975, Ser. No. 588,049

Int. Cl.<sup>2</sup> B65D 47/00

U.S. Cl. 222-545

7 Claims



1. A dispensing head for a fluid dispensing system comprising:
  - a. a base member made from an inert plastic material having an inlet chamber in the lower section, an outlet chamber in the upper section, a control valve cavity spaced from said inlet chamber and said outlet chamber, and passage means for fluid in the base member connecting said inlet chamber to said control valve cavity, and said control valve cavity to said outlet chamber,
  - b. means for connecting said base member to said fluid dispensing system and to a source of fluid to be dispensed,
  - c. locking guide means formed adjacent to the lower section of said base member,
  - d. guard means made of an inert plastic material having a connecting section and a shield section continuous therewith
  - e. said guard means having locking guide grooves disposed on said connecting section to engage the locking guide means on the base member.
  - f. stop means on the base member to maintain the guard member in predetermined assembled position,
  - g. and means for holding said base member and said guard member in assembled position.

4,009,807

## GARMENT HANGER

Herb Coon, New York, N.Y., assignor to Red Wing Products Inc., New Hyde Park, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,703

Int. Cl.<sup>2</sup> A47J 51/14

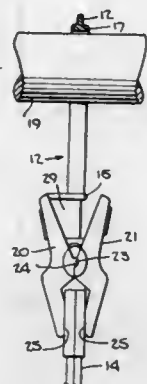
U.S. Cl. 223-96

11 Claims

1. A hanger comprising
  - an elongated cross-bar having an offset portion at each end;
  - a hook disposed at an intermediate part of said cross-bar; and
  - a pair of clips mounted on said cross-bar, each said clip



being disposed at a respective end of said cross-bar and including a first jaw integrally formed on a respective offset portion of said cross-bar, a second jaw mounted on said first jaw in abutting pivotal relation to said first jaw, each jaw of each clip including a gripping means at one



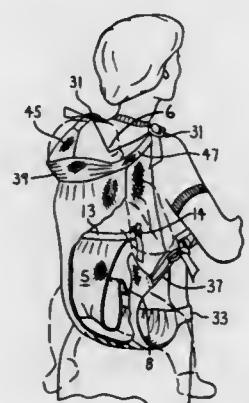
end facing an opposed gripping means of the other jaw of each clip, said oppositely disposed gripping means being located symmetrically of the plane of said cross-bar and a spring biasing said jaw together, said spring being disposed to straddle said jaws.

#### 4,009,808 BABY PACK

Andrea H. Sharp, 2276 Kincaid St., Eugene, Oreg. 97405  
Filed July 7, 1975, Ser. No. 593,766  
Int. Cl.<sup>2</sup> A47D 13/02

U.S. Cl. 224-6

7 Claims



1. In combination, a shoulder supported child carrier, including an outer jacket having a front member and a back member;

a shoulder harness including first shoulder strap means having strap retaining means thereon, said strap means connected to the front member of the carrier;  
plural loop means on the back member;  
second shoulder strap means on the front member adapted to pass through the loop means and engage the strap retaining means;

wherein the improvement comprises:

a removable inner seat attached to the jacket comprising a wide upper portion having a strap attached thereto, a narrow center portion and a lower portion tapering from the narrow center to a wide bottom, the wide upper portion adapted to provide support to the back of a child carried within the seat and the narrow center and wide bottom defining means for adjusting the seat width to provide support for the lower back and buttocks of children of differing sizes, said adjusting means also comprising a plurality of seams securing the bottom of the seat to the outer jacket, said seams being selectively removable when the seat is adapted to hold a larger child.

#### 4,009,809 BACK-PACK FRAME

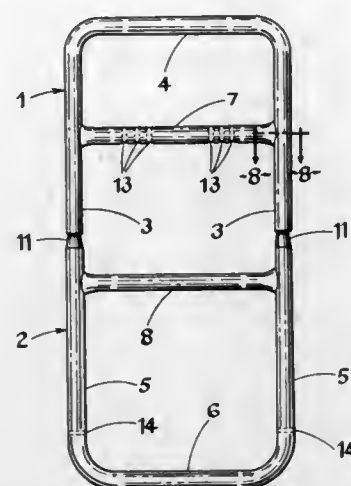
Lowell H. Morris, Dixon, Calif., assignor to Morris Manufacturing Company, Dixon, Calif.

Filed May 5, 1975, Ser. No. 574,358

Int. Cl.<sup>2</sup> A45F 3/10

U.S. Cl. 224-25 A

1 Claim



1. In a back-pack frame comprising a pair of initially separate, one-piece, substantially U-shaped members formed of tubing, said members being disposed in end-to-end facing relation, the outer end portions of the tubular legs of one member being of reduced outside diameter and telescopically engaged in the outer end portions of the tubular legs of the other member, elements connecting said telescoped leg portions, and cross bars spanning in engaged relation between and supported by the legs of said members, the cross bars having tongues projecting from their ends, the legs having corresponding slots into which the tongues extend, the cross bars end-abutting the legs when the tongues extend into said corresponding slots, and the cross bars being of a length between the tongues to space the related legs in parallel; the characteristic improvement comprised of the legs of the individual members initially converging slightly toward the outer ends thereof, said initially converging legs of the members first being spread apart beyond parallel to permit primary insertion of the tongues of the cross bars into the corresponding slots in the legs, and then said legs are permitted to spring back, as limited by the cross bars, to said parallel position whence the tongues fully seat in the slots, the outer end portions of the legs of said members then being telescopically engaged and connected by said elements.

#### 4,009,810 WATER BOTTLE CAGE

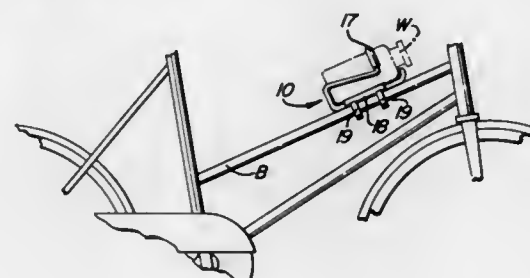
William Blair Shook, Rochester, N.Y., assignor to Thurston, Inc., Columbus, Ohio

Filed Dec. 12, 1975, Ser. No. 640,018

Int. Cl.<sup>2</sup> B62J 11/00

U.S. Cl. 224-39

2 Claims



1. A cage for a water bottle or the like comprising a single piece of resilient wire bent to form a bottle-receiving and retaining socket consisting of the following: an upstanding rear retaining portion of inverted U-form which has an upper

catch portion of eye-form angled forwardly of a pair of legs which converge toward each other in a common plane to lower portions almost in contacting relationship which have forwardly-extending and slightly downwardly-inclined arms which diverge laterally; an inverted U-form forward retaining portion extending upwardly from said inclined arms in forwardly-spaced relationship to the rear retaining portion and inclined rearwardly toward said portion being of lower height than the rear retaining portion and provided with a pair of upstanding rearwardly-inclined legs having the respective ends of the wire bent inwardly into a common horizontal plane at a lower level than said catch portion to substantially meet at a joint, said inwardly bent wire ends bowing forwardly in a forwardly-converging arc; a non-abrasive non-metallic tube section positioned on the arms to connect the wire ends and to bridge the joint therebetween as well as to provide a bumper for engaging the front side of the bottle as it is inserted into the socket; a non-abrasive non-metallic sleeve mounted on said lower converging portions of the rear retainer portion which prevents spreading thereof and also provides a bumper for engaging the rear side of the bottle as it is inserted into the socket.

#### 4,009,811 VENTS-MAKING DISPENSER CARTON

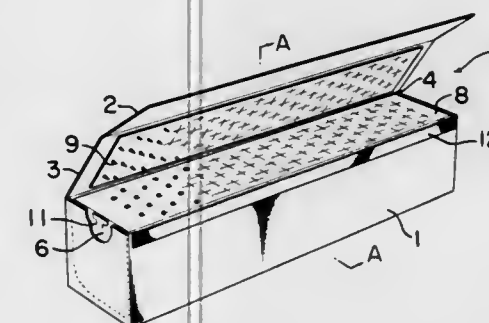
Hiromitsu Takai, Building, 4-12 3-chome, Rm. 202 Daiichi Takai, Shimbashi Minato, Tokyo 105, Japan

Filed Mar. 10, 1975, Ser. No. 556,936

Int. Cl.<sup>2</sup> B26F 1/00, 3/02

U.S. Cl. 225-7

8 Claims



1. In a disposable dispenser carton for the simultaneous dispensing of flexible wrapping sheet materials and the foraminous perforation of selected portions thereof, the improvement comprising:

A. a blank of rigid foldable material, said blank having at least five parallel segments, which when folded laterally inwardly at right angles relative to each other form a carton of rectangular cross-section, one of said segments being in overlapping relation relative to a second said segment, the said one segment bearing plural projections in a preselected pattern and the said second segment of similar pattern defining means which are responsive to perforate action of the said projections of the said first segment therein for intermittent engagement by the projections in the alternate dispensing and perforation of the sheet material;  
B. and means securing the respective folded segments into rigid position.

#### 4,009,812 FIBRILLATOR

Herbert W. Keuchel, Tallmadge, and George A. Farris, North Canton, both of Ohio, assignors to PNC Corporation, Wyc-off, N.J.

Filed Oct. 3, 1975, Ser. No. 619,313

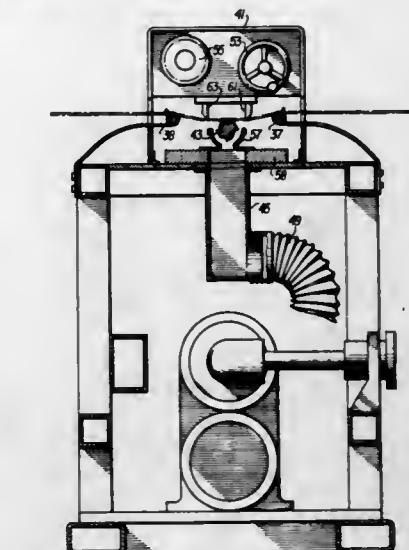
Int. Cl.<sup>2</sup> B26F 3/02

U.S. Cl. 225-97

8 Claims

1. A mechanical fibrillator for use in a slit film tape extrusion system comprising means for guiding said tape through said fibrillator;

a rotating cutter rod mounted in said fibrillator; a plurality of cutting edges extending along the length of said rod; means for forcing said tape into contact with said rotating cutting edges;



means adjacent said cutter rod for collecting dust created during fibrillation; said rod having its axis extending across the direction of movement of said tape; and a motor for rotating said rod in the direction of movement of said tape.

#### 4,009,813 APPARATUS FOR CRACKING PLASTIC SHEET

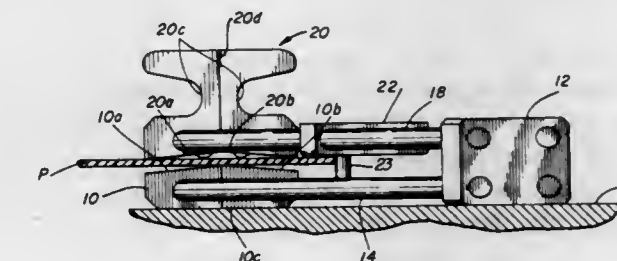
Thomas A. Insolio; Daniel W. Patterson, both of Bristol, and Vincent T. Kozyski, New Britain, all of Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.

Filed Oct. 24, 1975, Ser. No. 625,372

Int. Cl.<sup>2</sup> B26F 3/00; C03B 33/02

U.S. Cl. 225-103

7 Claims



1. Apparatus for manually cracking plastic sheet material along a line of score, and comprising:

a. an anvil having a convex upper face of V-shaped configuration, and having a lower face adapted to rest on a worktable or the like;  
b. a breaker head having a concave lower face of V-shaped configuration complementing said V-shaped anvil face;  
c. means supporting the anvil and head so that they are normally spaced from one another by an amount at least sufficient to accommodate the plastic sheet to be broken therebetween;  
d. said supporting means including a block with a lower face also adapted to rest on the worktable, and upper and lower arms connecting said block to said head and anvil respectively, said arms being parallel to one another, and said upper arm being resilient to permit movement of said head toward said anvil in response to a downward force applied to said head.



4,009,814

## WEB ACCUMULATOR

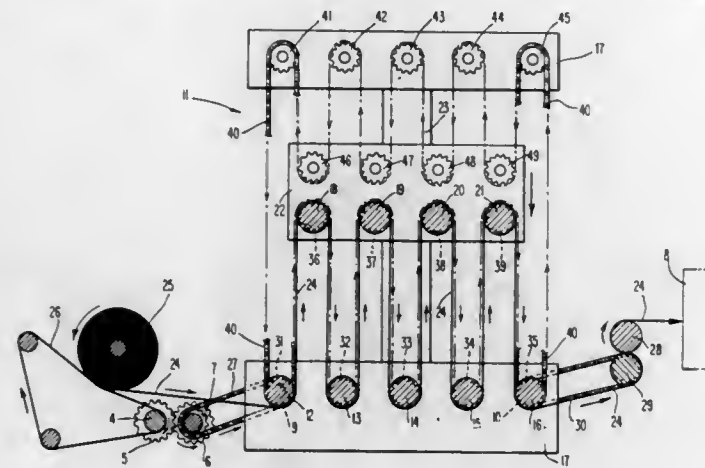
Balbir Singh, Media, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Sept. 8, 1975, Ser. No. 611,064

Int. Cl.<sup>2</sup> B65H 17/42

U.S. Cl. 226-113

8 Claims



1. A web accumulator for accumulating and discharging a reserve portion of a continuous web passing through the accumulator in order to compensate for the difference between an inlet speed and an outlet speed of the web, the accumulator comprising:

first and second sets of rotatably mounted web rolls, each of which is partially wrapped by the web when the web is looped alternately from a roll of the first set to a roll of the second set in consecutive order, the second set of rolls being mounted for movement with respect to the first set of rolls;

means responsive to the inlet and outlet speed of the web for moving the second set of web rolls towards the first set of web rolls to discharge the reserve portion of the web when the outlet speed exceeds the inlet speed and for moving the second set of web rolls away from the first set of web rolls to accumulate the reserve portion of the web; and

web roll drive means separate from the web for rotating each roll at the speed of the web portion in contact with it when discharging and accumulating the reserve portion of the web.

4,009,815

## APPARATUS FOR MAINTAINING VERTICALLY MOVING STRIP AT ESTABLISHED TENSION

Ivan Leo Ericson, Towanda, and James Elroy Morean, Coudersport, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 2, 1976, Ser. No. 672,850

Int. Cl.<sup>2</sup> B65H 17/42

U.S. Cl. 226-113

7 Claims

1. An apparatus for maintaining a vertically oriented moving strip of relatively thin and flexible metallic material at an established tension to prevent deformation thereof, said apparatus comprising:

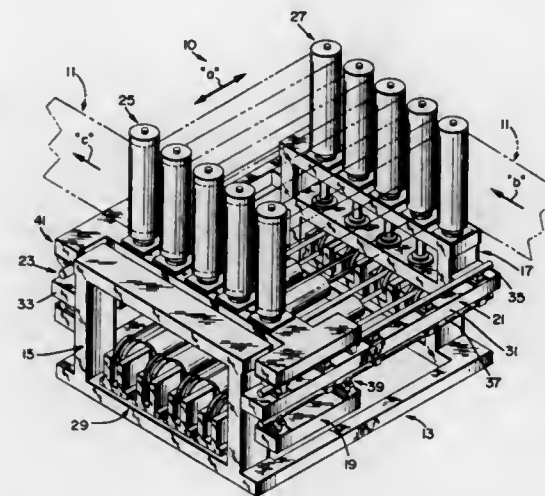
a frame having first and second oppositely positioned upright members and first and second spacedly positioned brace members, each of said brace members interconnecting said first and second upright members;

a movable carriage adapted for moving between said upright members in a reciprocative manner along a substantially horizontally aligned path;

first and second substantially horizontally aligned guide means spacedly positioned on said frame in a substantially parallel relationship for guiding said movable carriage during said reciprocative movement, each of said guide means comprising a pair of shaft members, said pair of shaft members of said first guide means secured to opposing sides of said first brace member of said frame,

said pair of shaft members of said second guide means secured to opposing sides of said second brace member of said frame;

first and second opposing series of vertically-oriented rollers for positively engaging said moving metallic strip to effect circuitous movement of said metallic strip therebetween, said first series of rollers positioned on said mov-



able carriage and extending thereabove, said second series of rollers positioned on said second upright member of said frame; and

motion means located below said first and second series of rollers for imparting motion to said movable carriage to accomplish said reciprocative movement and maintain said metallic strip at said established tension.

4,009,816

## METHOD AND APPARATUS FOR INCREASING EFFICIENCY OF A FOAM FLUXER USED IN WAVE SOLDERING OF PRINTED WIRING BOARDS

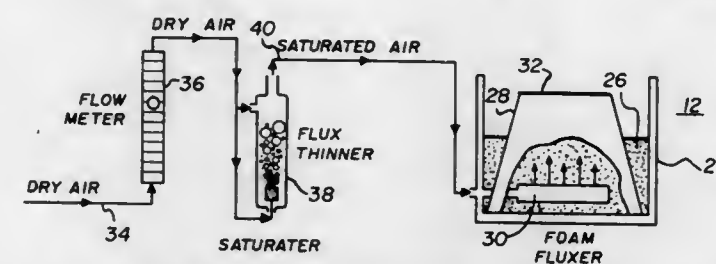
Robert B. Feuchtbaum, Rockaway, and Fredrick C. Disque, Westfield, both of N.J., assignors to Alpha Metals, Inc., Jersey City, N.J.

Filed Sept. 2, 1975, Ser. No. 609,227

Int. Cl.<sup>2</sup> B23K 1/08; H05K 3/00

U.S. Cl. 228-207

7 Claims



1. A method of foam fluxing a wiring board which is to be wave soldered comprising the steps of supplying a foam fluxer, filling said foam fluxer with a quantity of flux solvent solution, providing a source of gas, saturating said gas with a flux thinner compatible with said solvent in said flux solvent solution, feeding said saturated gas to said foam fluxer at a rate sufficient to effect a desired degree of foaming therein and to produce a foam flux, and thereafter applying said foam flux to said wiring board whereby the temperature and specific gravity of said foam flux will remain substantially constant during subsequent wave soldering operations.

4,009,817

## TRAY FOR SHIPMENT OF FROZEN ITEMS

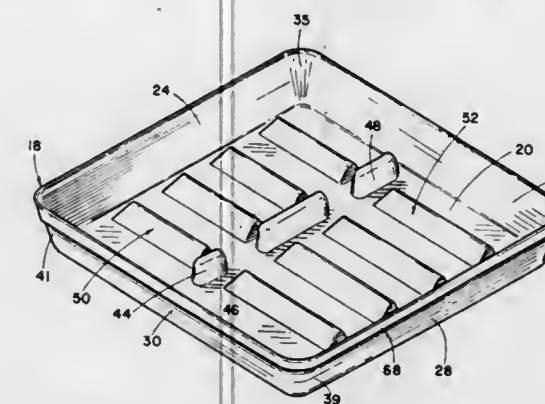
Paul W. Marshall, Tulsa, Okla.; Harold C. Singleton, Dallas, Tex.; Clyde L. Copp, Tulsa, Okla.; Floyd L. Lankford, Tulsa, Okla., and Patsy L. George, Tulsa, Okla., assignors to Bama Pie, Inc., Tulsa, Okla.

Filed June 25, 1976, Ser. No. 700,067

Int. Cl.<sup>2</sup> B65D 1/24

U.S. Cl. 229-2.5 R

6 Claims



1. A tray for shipment of frozen items, comprising a bottom, a pair of opposite longitudinal sides and a pair of opposite lateral sides, each longitudinal side being connected to the lateral sides at right angles thereto, each side extending upwardly and outwardly from said bottom, a plurality of projections located along a longitudinal center line between the longitudinal sides and extending upwardly from said bottom for forming a divided partition, a first row of protuberances located between said partition and one of said longitudinal sides, a second row of protuberances located between said partition and another of said longitudinal sides opposite to the one side thereof, each protuberance extending upwardly from said bottom and laterally away from adjacent said plurality of projections to adjacent one of the two longitudinal sides, each protuberance having a long slope extending upwardly from said bottom towards one lateral side and terminating in an upper edge, each protuberance having a short slope extending almost vertically from the upper edge to said bottom whereby said tray provides a separate space for a frozen item adjoining each long slope and between said one lateral side and each adjacent short slope.

4,009,818

## COMBINATION CRACKER TRAY AND WASTE CONTAINER

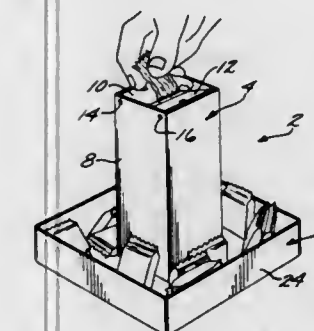
Jack Rogers, 6557 Costello Ave., Van Nuys, Calif. 91401

Filed Dec. 19, 1975, Ser. No. 642,673

Int. Cl.<sup>2</sup> B65D 13/04

U.S. Cl. 229-23 R

8 Claims



1. A combination food display storage holder and packaging waste container to hold various items, such as wrapped crackers in the storage holder and waste cracker wrappers in the waste container comprising:

a base holder member having a support surface and peripheral walls for holding food items such as crackers in a display array;

a container member having container walls extending from the support surface above the holder peripheral walls; the container member adapted to receive and store waste wrappers, the holder member support surface cooperatively coacting with the container walls to provide the bottom structure of the container, and

means on the base holder member for removably attaching the container member to the base holder, to permit the container walls to be operatively positioned adjacent the holder member support surface, the container member occupying only a portion of the base holder support surface to permit the remaining portion to form a display storage area on the base holder member between the container member walls and the holder peripheral walls for items, such as wrapped crackers.

4,009,819

## DISPOSABLE TABLE PAPER BASKET

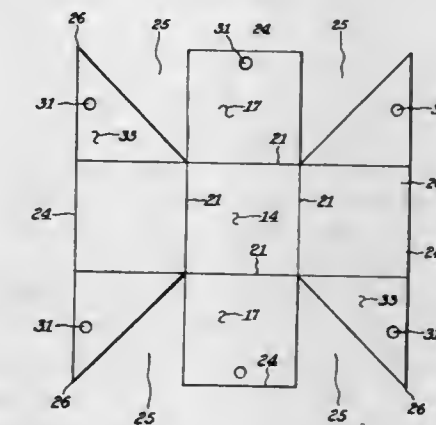
Hallie E. Miller, and Nancy W. Kittrell, both of Ormond Beach, Fla., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 9, 1975, Ser. No. 585,045

Int. Cl.<sup>2</sup> B65D 5/42, 5/22

U.S. Cl. 229-32

2 Claims



1. A paper basket sheet for use in forming a basket for the retention and removal of dining debris which basket is shaped of folded sections of a cut-out paper sheet formed with pre-formed creased lines and with fastening holes, said paper sheets being stackable together in the unfolded form prior to use, in which, each sheet is formed of a square outline bounded by a first pair of spaced, straight parallel first edges that are each perpendicular to a second pair of spaced, straight parallel second edges, with each sheet formed with a first pair of parallel spaced first fold lines, each of said fold lines being equally spaced from a second first edge and an adjacent first fold line, and

a second pair of parallel spaced second fold lines, each of said second fold lines being equally spaced from a said second edge and an adjacent second crease line, with

a triangular cut-out section in each corner of the sheet, each said cut-out section bounded by a line extending from said first edge, a second fold line adjacent the said corner, and a diagonal line extending from the said corner to the intersection of said second fold line with a first fold line adjacent to said corner,

said first and second fold lines being pre-formed with crease lines along the length of such fold lines that are bounded on each side of the line by the shaped sheet,

together with six holes oriented on the sheet in two sets of three holes each, and located so that each set of three holes align with each other on one of two opposed sides of a basket formed by folding the sheet along the pre-creased fold lines to form an open basket of a cubical shape, the bottom of which is in the form of a square bordered by said first and second fold lines.



4,009,820

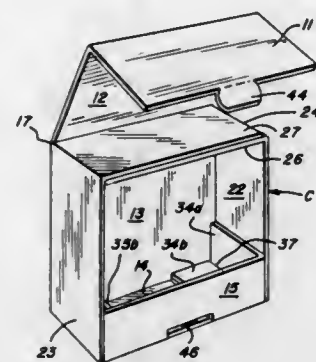
**SHIPPING CONTAINER AND BLANK THEREFOR**  
Robert H. Fitzgerald, Lancaster, Pa., assignor to Packaging Corporation of America, Evanston, Ill.

Filed Nov. 26, 1975, Ser. No. 635,760

Int. Cl.<sup>2</sup> B65D 5/22

U.S. Cl. 229—33

3 Claims



1. A shipping container for a product being formed from a single blank of foldable sheet material comprising a first panel forming a first surface portion of a product accommodating compartment when the container is closed, a pair of flap members being folded towards one another and forming a second surface portion of the compartment, when the container is closed, and being in unfolded relation, when the container is opened for loading or unloading the product accommodating compartment, a second panel overlaying said flap members only when the latter are folded towards one another and when the container is closed, a third panel connected to said second panel and folded relative thereto and forming a third surface of the compartment, a pair of fourth panels connected to said third panel and folded relative thereto and forming fourth surface portions of the compartment, said flap members being foldably connected to corresponding fourth panels and extending angularly therefrom, a fifth panel forming a fifth surface portion of the compartment, and a reinforced edge and corner construction for the compartment; said construction including a reinforcing panel foldably connected to and extending angularly from the fifth panel, end flaps foldably connected to and extending angularly from opposite ends of said reinforcing panel, each end flap having a first section foldably connected to an end of said reinforcing panel and engaging the compartment-forming surface portion of one fourth panel, and an angularly extending second section foldably connected to said first section, and tuck flaps foldably connected to corresponding ends of the fourth panels and extending angularly therefrom, said tuck flaps being sandwiched between the fifth panel and the second sections of said end flaps, when the container is either opened or closed.

4,009,821

**HOT-FOOD TRANSPORTING BOX**

Thomas P. Hambleton, Kansas City, Mo., assignor to International Paper Company, New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,314

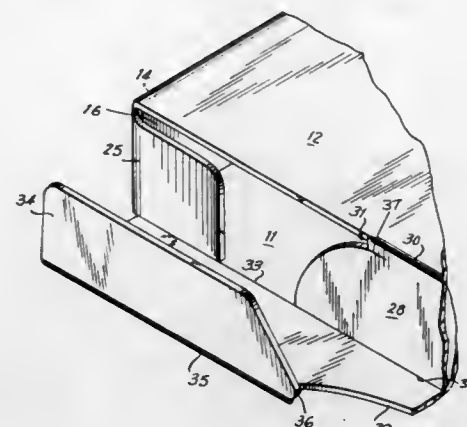
Int. Cl.<sup>2</sup> B65D 5/22

U.S. Cl. 229—36

4 Claims

1. A hot-food transporting box made of a semi-rigid material comprising  
a top panel, a back panel attached to the top panel, a bottom panel attached to the back panel, and side panels attached to the top and bottom panels;  
a multi-lamina front panel, the front panel comprising an inside front lamina attached by a fold line segment to a front edge of the top panel and an outside front lamina attached by a fold line segment to the front edge of the bottom panel,  
the side panels attached to the top panel having inwardly folded flaps vertically oriented between the top and bottom panels,

the outside front lamina comprising tabs, portions of the inside front lamina, of the front edge of the top panel, and of the flaps defining an opening adjacent each side panel of the box, the tabs being folded inwardly into the openings, whereby



the outside front lamina is in releasable engagement with the inside front lamina, and  
the inside front lamina contacts the bottom panel, whereby this contact retards sagging of the top panel due to any heat and moisture generated from hot food contained in the box.

4,009,822

**WEIR IN A PATH OF CONVEYANCE**

Hans Zürrer, Esslingen, Switzerland, and Martin Baram, Brøndby Strand, Denmark, assignors to Escher Wyss Limited, Zurich, Switzerland

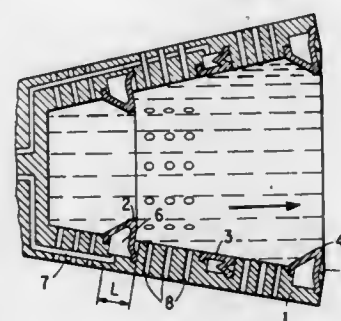
Filed Aug. 26, 1975, Ser. No. 607,884

Claims priority, application Switzerland, Sept. 2, 1974, 011888/74

Int. Cl.<sup>2</sup> B04B 11/04

U.S. Cl. 233—3

4 Claims



1. The combination of an upwardly open path of conveyance which declines in the direction of conveyance and along which material is being transported, and a weir apparatus for selectively blocking such transport, the weir apparatus comprising a pressure medium chamber located at the bottom of said path and extending across the direction of transport; and a membrane which overlies the chamber and seals it from said material, the membrane having a position of repose, in which it lies along the bottom of said path and permits material movement along the path, and an arched position to which it is moved by pressure in the chamber and in which it impedes transport of material along the path, the membrane having two successive parts in the direction of transport which are so arranged that, in said position of repose, the upstream part overlies the downstream part and effectively isolates it from the material being transported, and, in said arched position, the upstream part faces in a direction opposite to the direction of transport, whereby material overlying the membrane when the latter is arched is urged in the upstream, rather than the downstream direction.

4,009,823

**BOWL OF SOLIDS-CONCENTRATION CENTRIFUGE**  
Andrei Stepanovich Nozdrovsky, Krasnaya ulitsa, 50, kv. 29, Leningrad, U.S.S.R.

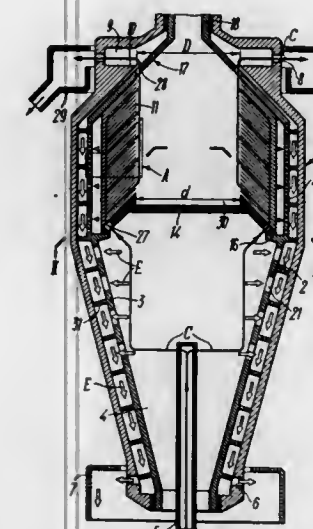
Filed Nov. 12, 1975, Ser. No. 631,031

Claims priority, application U.S.S.R., June 25, 1974, 2032423

Int. Cl.<sup>2</sup> B04B 3/04

U.S. Cl. 233—7

4 Claims



1. A bowl of a solids-concentration centrifuge comprising a hollow case having opposed ends and being formed at the region of one of said ends with outflow openings for clarified liquid and at the region of the other of said ends with discharge openings for the discharge of a cake, said case having a central axis, and a scroll situated coaxially within said case and including a quill and a screw extending outwardly from said quill to the region of an inner surface of said case, said quill having at the region of said discharge openings of said case an inlet for receiving a slurry which is centrifuged, and said quill having an interior hollow bore, a stack of separating discs situated in said hollow quill bore of said scroll at the region of said outflow openings of said case, said stack of separating discs each having the configuration of a truncated cone and each having inner and outer peripheral edges, spacers situated between said separating discs to maintain them spaced from each other so that said discs define between themselves clearances in which slurry is centrifuged, said discs being formed at the region of their outer peripheral edges with holes extending inwardly from the outer edges of said discs for placing all of the clearances between the discs in communication with each other so as to enable the slurry which is centrifuged to pass from said bore of said quill of said scroll into said clearances, said quill having an inner surface directed toward said stack of discs and provided with radial projections extending from said inner surface of said quill into engagement with said outer peripheral edges of said discs for positioning the latter coaxially within said quill of said scroll, and said quill of said scroll being formed with quill holes passing through said quill for placing a space defined between said quill and case in communication with the interior bore of said quill so as to allow the cake to discharge through said quill holes into said space between said quill and case, said quill holes being situated at the region of the interior bore of said quill which is occupied by said stack of separating discs and said quill holes also being situated between said radial projections of said quill.

4,009,824

**SWINGING BUCKET CENTRIFUGE ROTOR**

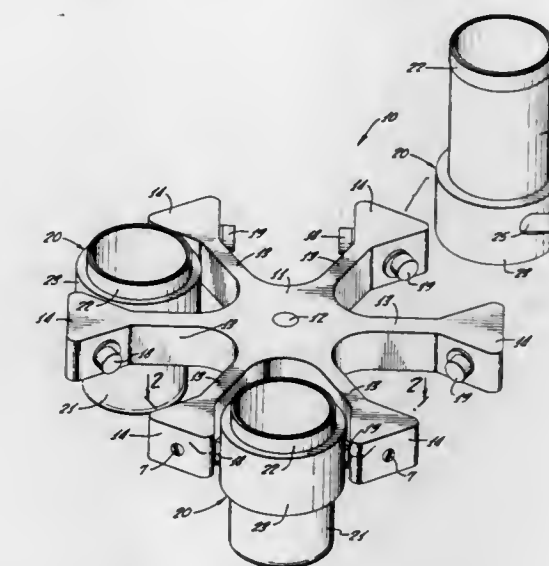
Herschel E. Wright, Santa Clara, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 31, 1975, Ser. No. 645,813

Int. Cl.<sup>2</sup> B04B 9/12

U.S. Cl. 233—26

14 Claims



1. A centrifuge rotor comprising:  
a core for mounting the rotor on a drive shaft for rotating the rotor about its axis of rotation;  
a plurality of spaced arms extending radially outward from said axis of rotation, each of said arms having only a single hole formed in the outer end thereof, perpendicular to the longitudinal axis thereof; and  
a trunnion pin disposed in each of said holes, each trunnion pin including a central portion and acutely oriented opposite extremities, said opposite extremities of each trunnion pin extending outwardly from said arms towards and coaxial with the outwardly extending extremities of the pins of adjacent arms to form trunnions for supporting bucket assemblies.

4,009,825

**CONTROL FOR FORCED AIR HEATING OR COOLING SYSTEM**

George M. Coon, Hillside House Saybrook Road, Essex, Conn. 06426

Filed Feb. 11, 1976, Ser. No. 657,110

Int. Cl.<sup>2</sup> F24F 3/02

U.S. Cl. 236—1 E

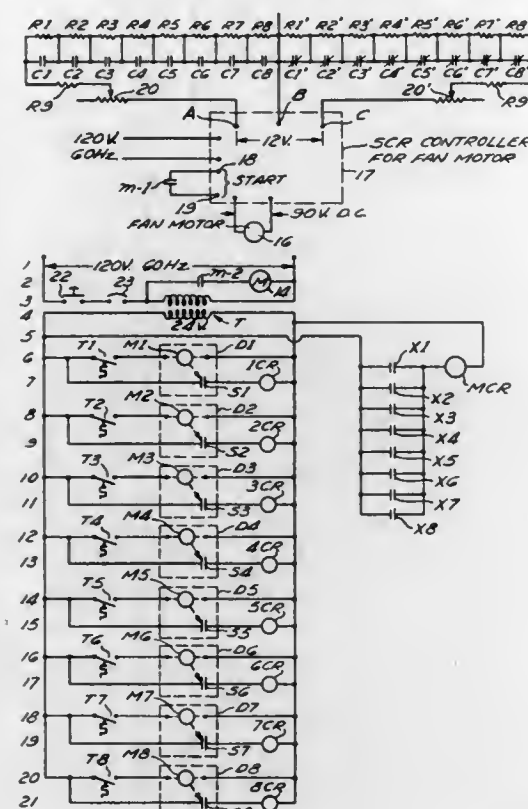
14 Claims

1. In a forced-air heating or cooling system having a plurality of thermostats for different areas, a plurality of dampers which are automatically controlled individually by said thermostats to regulate the delivery of heated or cooled air to the corresponding areas, heat exchange means for heating or cooling the air to be supplied to said dampers, a variable speed motor-driven fan for passing heated or cooled air from said heat exchange means to said dampers, an electrical controller for the fan motor having a potentiometer with a plurality of resistors therein for controlling the speed of the fan motor in accordance with the potentiometer output voltage, and a plurality of control relays each operatively associated individually with a respective thermostat for operation in response to the operation of the corresponding thermostat, the improvement wherein:

said control relays have respective sets of contacts which are connected respectively across different resistors in



said potentiometer to change the potentiometer output voltage each time one of said control relays is operated,



whereby to change the fan motor speed each time one of said thermostats is operated.

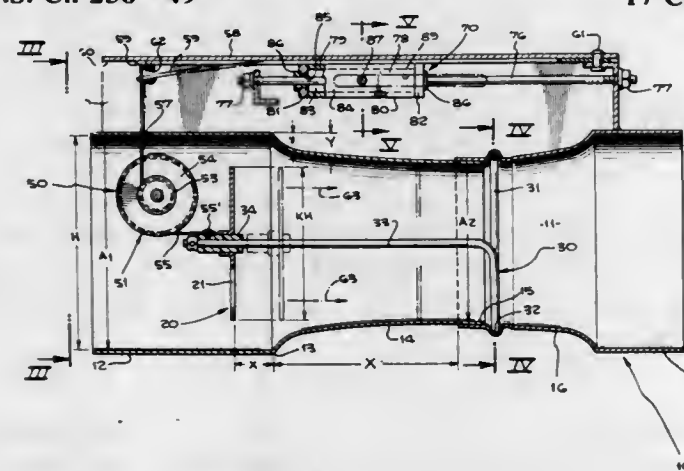
4,009,826

**VARIABLE VALUE CONSTANT VOLUME FLOW DEVICE**  
Jordan E. Walker, 752 S. University Drive, Riverside, Calif. 92507

Filed Oct. 14, 1975, Ser. No. 621,733  
Int. Cl.<sup>2</sup> F16K 31/12

U.S. Cl. 236-49

17 Claims



1. In a constant volume fluid flow device having a body defining a flow passage with an inlet portion and an outlet portion; said body adapted to conduct a flow of fluid through said passage wherein such flow has a varying pressure at said inlet portion, a restricting member movably mounted in said passage and constant volume producing means operatively engaging said restricting member for producing a constant volume flow rate through said passage in response to varying inlet pressures, the improvement comprising:

variable value means operatively engaging said restricting member for varying the setting for said constant volume flow rate from a given value of constant volume flow rate through said body to a selectively greater or lesser second value of constant volume flow rate differing from said given value by an increase of about 500% or a decrease of

about 20% of control volume at any given inlet static pressure, said constant volume producing means further including biasing means engaging said restricting member for normally biasing the restricting member axially toward said inlet portion with said fluid flow forcing said restricting member axially toward said outlet portion against the action of said biasing means, said biasing means including an elongated leaf spring having one end secured to said body and the opposite end fixedly secured to a first elongated member operatively connected to a first rotatable member mounted in said inlet portion, a second rotatable member fixed to said first rotatable member for rotation therewith, and a second elongated member fixedly secured to said restricting member.

4,009,827

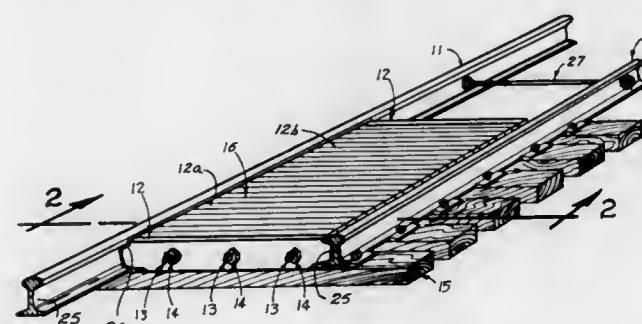
**FLEXIBLE, RESILIENT, AND WEAR RESISTANT RAILROAD CROSSING STRUCTURE**  
Leonard I. Tafel, 6345 N. Tripp, Chicago, Ill. 60646

Filed June 12, 1975, Ser. No. 586,239

Int. Cl.<sup>2</sup> E01C 9/04

U.S. Cl. 238-8

15 Claims



1. A flexible and resilient crossing structure for extending a roadway across a railroad track, said structure comprising a continuous surface formed by the edges of a laminae of elongated, flexible and resilient strips secured together in a face-to-face, vertical relationship with rigid plates terminating opposite ends of said laminae, said laminae having a length equal to the width of a desired roadway, and a width equal to the space between the vertical webs of a pair of railroad rails, each strip in said laminae having longitudinal notches along at least some corners thereof so that said laminae fits snugly between and is supported by said rails and the laminae surface is substantially flush with the tops of said rails, said laminae being free of attachment to the underlying railroad bed.

4,009,828

**ORGANIC NUCLEATING AGENT FOR BOTH WARM AND COLD CLOUDS**

Aaron N. Fletcher, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 581,063, May 27, 1975, abandoned.  
This application Nov. 19, 1975, Ser. No. 633,191

Int. Cl.<sup>2</sup> A01G 15/00

U.S. Cl. 239-2 R

2 Claims

1. In a method for dispersing a fog, wherein particles of a nucleating material are distributed in said fog to cause the fog to form droplets which fall in the form of precipitation, the improvement residing in preparing and distributing as said nucleating material particles of 1,1,1-tris (hydroxymethyl) ethane, said particles being distributed in the form of droplets having diameters from about 5 to about 40 microns if the temperature is greater than minus five degrees centigrade and said particles being distributed in the form of smoke particles if the temperature of the fog is less than minus five degrees centigrade.

4,009,829

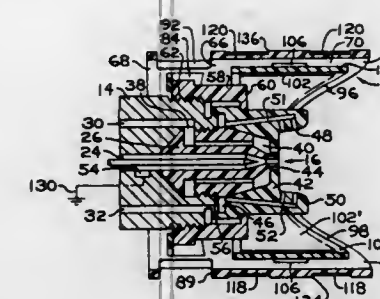
**ELECTROSTATIC SPRAY COATING APPARATUS**  
James E. Sickles, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 11, 1975, Ser. No. 548,958

Int. Cl.<sup>2</sup> B05B 5/02

U.S. Cl. 239-15

35 Claims



1. An electrostatic spray coating apparatus comprising: an electrically nonconductive spray nozzle having liquid discharge ports; induction charging means including electrode means located exteriorly of said discharge ports and defining a charging zone through which passes liquid discharged from said nozzle; means applying a relatively high electrical potential to said electrode means; shielding means for said induction charging means; and means applying a reference potential to said shielding means.

4,009,830

**HYDRANT CONSTRUCTION FOR A SOIL IRRIGATION SYSTEM**

Ivan Stefanov Varlev, Sofia, Bulgaria, assignor to Centralna Laboratoria Za Agrophysicheski Izsledvania, Sofia, Bulgaria

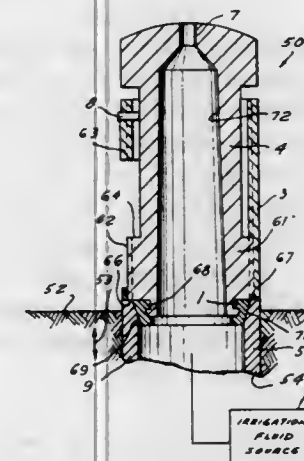
Filed Apr. 21, 1976, Ser. No. 678,763

Claims priority, application Bulgaria, Apr. 24, 1975, 29806

Int. Cl.<sup>2</sup> B05B 15/10, 15/04, 1/30

U.S. Cl. 239-204

8 Claims



1. For use in a soil irrigation system, a soil-mounted hydrant having a vertically disposed cylindrical housing, the lower end of the housing being communicable with a source of irrigating fluid, an upper portion of the cylinder housing having aperture means disposed in the side wall thereof for externally distributing fluid introduced into the housing from the source, the housing being movable between a lower position in which the aperture means are below ground level and an upper position in which the aperture means are above ground level, and a cap positionable within the upper portion of the housing and cooperable therewith for closing the aperture means, the improvement wherein the hydrant further comprises means supporting the cap for adjustably positioning the cap in the upper portion of the housing at a desired location between the

upper limit in which the aperture means are completely open and a lower limit in which the aperture means are completely closed; in which the hydrant further comprises limit means positioned in the upper portion of the cylinder above the aperture means for inhibiting upward movement of the cap when the cap is at the upper limit; and in which the cap is further provided with a central bore extending completely therethrough for selectively conveying a portion of the irrigation fluid upwardly through the cap.

4,009,831

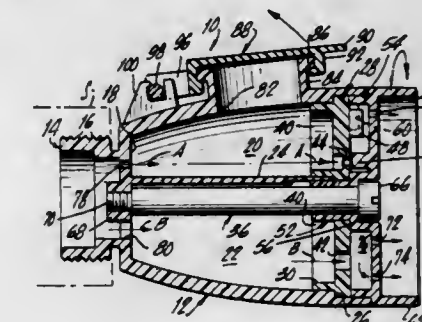
**COMBINED SHOWER HEAD AND DISPENSER**  
Avi Arad, 165 E. 66th St., New York, N.Y. 10022, and William Stephens, 2 Cinder Lane, Hicksville, N.Y. 11801

Filed Sept. 10, 1975, Ser. No. 611,910

Int. Cl.<sup>2</sup> B05B 7/24

U.S. Cl. 239-315

2 Claims



1. An apparatus for producing a plurality of streams of fluid from a supply of fluid and for selectively introducing a substantially equal amount of additive into each of said streams of fluid, said apparatus comprising a main body member having an upstream end and a downstream end, a fluid inlet member and means mounting said fluid inlet member on said main body member at said upstream end thereof, said fluid inlet member including means being constructed and arranged for attachment of said apparatus to a source of supply of fluid, a fluid chamber located within said main body member and having an upstream end and a downstream end, an additive chamber located within said main body member and having an upstream end and a downstream end, an axially extending dividing wall within said main body member at least partially defining said additive chamber and said fluid chamber, said upstream end of said fluid chamber and said upstream end of said additive chamber each being in communication with the interior of said fluid inlet member, an access member being mounted relative to said main body member and including means being constructed and arranged to permit communication with the interior of said additive chamber from the exterior of said main body member for use in introducing an additive through said access member into said additive chamber, a foraminous member mounted relative to said main body member proximate the downstream end thereof for use in producing said plurality of streams of fluid, said fluid chamber and said additive chamber each including at least one opening in the downstream end thereof, said apparatus including a mixing chamber proximate the downstream end of said main body member, said mixing chamber being in communication with said additive chamber and said fluid chamber through, respectively, said additive chamber and fluid chamber downstream end openings, said mixing chamber also being in communication with said foraminous member, said apparatus including means being constructed and arranged to define a fluid path from said fluid inlet member through said fluid chamber and into said mixing chamber, said apparatus further including means being constructed and arranged to define an additive path from said fluid inlet member through said additive chamber and into said mixing chamber, said apparatus including means being constructed and arranged to thoroughly mix said fluid and said additive in said mixing chamber and said apparatus further including additive control means



located in said additive path for selectively interrupting the flow of additive from said additive chamber along said additive path thereby selectively permitting passage of substantially only said fluid through said foraminous member and selectively permitting passage of a thoroughly dispersed mixture of said additive and said fluid through said foraminous member, a cap member mounted within said main body member so as to be relatively stationary with respect thereto and including means being constructed and arranged for at least partially closing the downstream end of both said fluid chamber and said additive chamber, said cap member including at least one fluid chamber exit port having an upstream end and a downstream end, said fluid chamber exit port being constructed and arranged to communicate at its upstream end with the downstream end of said fluid chamber and at its downstream end with said mixing chamber, said cap member further including at least one additive chamber exit port having an upstream end and a downstream end, said additive chamber exit port being constructed and arranged to communicate at its upstream end with the downstream end of said additive chamber and at its downstream end with said mixing chamber.

4,009,832

#### IRRIGATION MEANS FOR THE UNIFORM DISTRIBUTION OF LIQUID

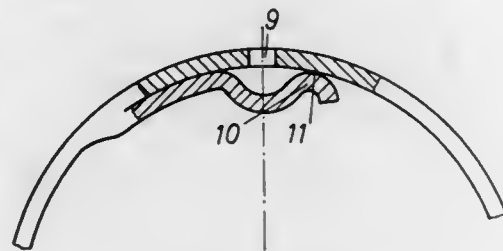
Uwe Tiedt, Karlstrasse 14, 7550 Rastatt, Germany  
Filed July 30, 1975, Ser. No. 600,722

Claims priority, application Germany, Aug. 6, 1974, 2437730

Int. Cl.<sup>2</sup> B05B 15/00

U.S. Cl. 239—542

11 Claims



1. Irrigation means for the uniform distribution of a controlled quantity of liquid comprising a tube for receiving the liquid under pressure, said tube having a plurality of outlet apertures spaced lengthwise thereof, a flexible baffle strip arranged within said tube to underlie said apertures, said baffle strip extending lengthwise of said tube and being attached thereto at only one longitudinal side thereby forming an elongate flap, said flap having a first longitudinally extending portion containing said one attached longitudinal side and which extends up to and beneath said apertures and a second longitudinally extending portion containing a free opposite longitudinal side and which projects beyond said outlet apertures, said flap being spaced so as to conform generally to the cross-sectional contour of said tube so that said projecting second flap portion makes contact with said tube to define therewith a throttle gap through which the liquid flows to reach said outlet apertures, said throttle gap producing a flow resistance which is governed by the pressure of the liquid received in said tube.

4,009,833

#### SCRAP BATTERY PLATE RECLAIMING PROCESS

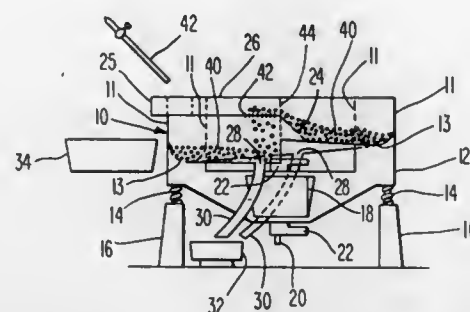
Terry D. Litt, Bay Village, Ohio; Richard C. Shelton, Whittier, Calif., and Earl J. Colwell, Willowick Lake, Ohio, assignors to ESB Incorporated, Philadelphia, Pa.

Filed Aug. 14, 1975, Ser. No. 604,730

Int. Cl.<sup>2</sup> B02C 17/08

U.S. Cl. 241—14

7 Claims



4. A scrap battery reclaiming process for separating scrap battery plates into metallic and non-metallic materials and for reducing the non-metallic material to particles of approximately 500 microns largest diameter or smaller which comprises:

- placing scrap battery plates comprising metallic and non-metallic materials into a trough, the trough being resiliently mounted, having a gradual upward slope from a feed end to a discharge end and being provided with non-metallic material discharge means in the bottom thereof;
- vibrating the trough whereby the scrap battery plates ascend the slope of the trough to the discharge end of the trough and all non-metallic material in the scrap battery plates is shaken free from the metallic materials of the scrap battery plates, is reduced to particles of approximately 500 micron largest diameter or smaller and is discharged through the non-metallic material discharge means in the bottom of the trough; and
- collecting the metallic materials of the scrap battery plates at the discharge end of the trough.

4,009,834

#### METHOD OF OPERATING BREAKER/CRUSHER

William F. Hahn, Devon; Carl R. Graf, Whitehall, both of Pa., and George H. Hart, New Castle, Maine, assignors to Pennsylvania Crusher Corporation, Broomall, Pa.

Continuation of Ser. No. 417,335, Nov. 19, 1973, Pat. No. 3,931,937, which is a continuation-in-part of Ser. No. 267,936, June 30, 1972, abandoned. This application Oct. 28, 1975, Ser. No. 626,600

The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> B02C 13/06

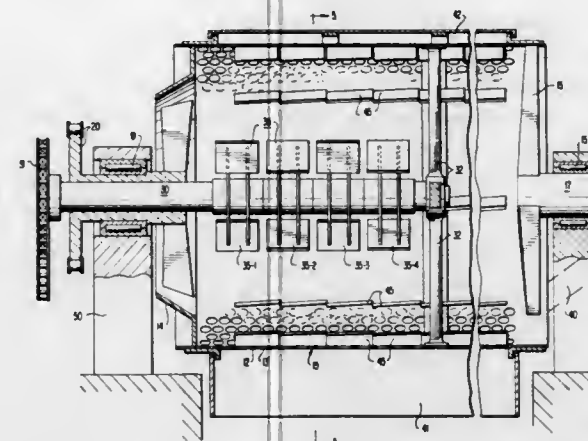
U.S. Cl. 241—27

8 Claims

1. In a method for reducing coal and other materials, in apparatus including a hollow rotatable drum having an opening therein to receive feed material and wall means including screening openings to discharge material of desired size, lifter shelves positioned on the inner surface of said wall means for lifting and dropping material within the drum as the drum is rotated, and rotor means including a rotor shaft and shaft-mounted material impacting means positioned within at least a portion of the length of the drum for impacting material dropped from said shelves, the improvement which comprises:

- driving said drum at a speed in the range of about 70% to about 95% of critical speed;
- maintaining said lifter shelves on the drum at predetermined angle of inclination, ranging from 0° up to 70° in a direction opposite to the direction of drum rotation, which angle will cause said material to drop from said shelves into contact with said impacting means at or near

the crest of the orbit of the impacting means when said drum is rotated at said speed, and which will direct the material from above one side of the rotor shaft to the other side of the rotor shaft in the direction of the down-running side of said rotor shaft; and



c. driving said drum and rotor in the same direction of rotation, whereby material struck by said rotor is flung against the downrunning wall of said drum.

4,009,835

#### PROCEDURE AND APPARATUS FOR PREPARATION OF HOT GROUNDWOOD

Ahti Syrjanen, Valkeakoski, Finland, assignor to Yhtyneet Paperitehtaat Oy Jylhavaara, Valkeakoski, Finland

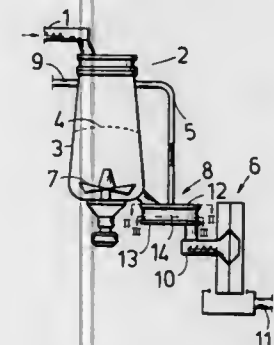
Filed July 29, 1975, Ser. No. 600,093

Claims priority, application Finland, Apr. 4, 1975, 751016

Int. Cl.<sup>2</sup> B02C 7/02

U.S. Cl. 241—28

1 Claim



1. In a continuous process for preparing hot groundwood from wood chips wherein the chips are preheated at a temperature in a steam chamber in excess of 100° C; transporting the preheated chips through steam-preheated compartments of a sealing feeder, having a rotor, to a hot grinder by means of a feeding conveyor; the improvement which is comprised in that the steam is conducted back from the grinder through the feeding conveyor to the sealing feeder in a flow direction opposite to that of the chip flow direction, wherein each compartment is filled with steam as it is emptied of chips, draining the steam from the sealing feeder through a steam draining aperture in the direction of rotation of the rotor, located before the feeding aperture, and through a pipe into the steam chamber, in order to uniformly meter the chip feed and the steam flow.

4,009,836

#### MATERIAL REDUCING MACHINE

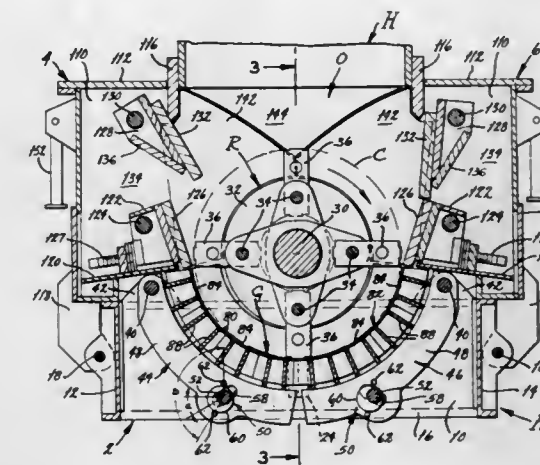
Sven B. Strom, St. Louis, and Donald F. Graveman, St. Charles, both of Mo., assignors to American Pulverizer Company, St. Louis, Mo.

Filed June 30, 1975, Ser. No. 591,462

Int. Cl.<sup>2</sup> B02C 13/284

U.S. Cl. 241—73

7 Claims



1. A reducing machine comprising: a housing having a feed opening; a rotor in the housing and having reducing elements thereon which contact material introduced through the feed opening, the elements describing a circle as the rotor revolves; first and second arcuate grate sections generally beneath the circle, the second grate section being aligned with and forming a continuation of the first grate section in the direction of rotation for the rotor, each grate section having teeth which project toward the other grate section with the teeth of the two grate sections being offset and intermeshed so as to eliminate a continuous gap between the grate sections; first and second cages supporting the first and second grate sections, respectively, each of the cages extending upwardly beneath its respective grate section and at its upper end being pivoted relative to the housing about an axis parallel to the axis of rotation for the rotor to enable the grate sections on the cages to be moved toward and away from the circle described by the reducing elements while the teeth of the two grate sections remain intermeshed; and adjusting means for moving the grate sections toward and away from the circle described by the reducing elements, the adjusting means comprising a shaft extended through the housing adjacent to each cage and being rotatable about an axis fixed in position with respect to the housing, cams carried by the shafts and engaged with the cages, and means for rotating the shafts in unison to cause the grate sections to elevate or depress, depending on the direction of rotation for the shafts.

4,009,837

#### WOOD CHIPPING APPARATUS

Auxilius P. Schnyder, 146 Cherry Lane, Teaneck, N.J. 07666

Continuation-in-part of Ser. No. 535,727, Dec. 23, 1974, abandoned, which is a continuation of Ser. No. 404,134, Oct. 9, 1973, abandoned. This application Nov. 20, 1975, Ser. No. 633,857

Int. Cl.<sup>2</sup> B02C 18/18, 18/22

U.S. Cl. 241—93

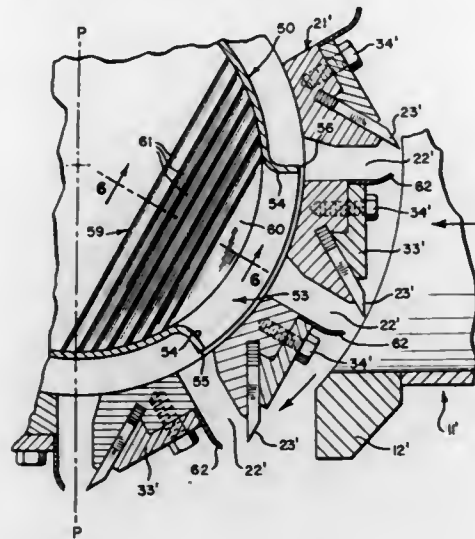
13 Claims

1. A high speed wood chipping apparatus comprising:

- a first drum having:
  - a closed end,
  - an open end, and
  - a plurality of circumferentially spaced wood chip receiving apertures in the peripheral surface of the drum for passing wood chips into the drum interior;
- a plurality of circumferentially spaced wood chipping knives mounted on the drum adjacent to said apertures;
- means for rotating the drum;
- a second drum having:



1. an open end, and
2. shaped complementary to the shape of the first drum for positioning therein with its open end facing out the open end of the first drum;
- e. means for supporting said second drum positioned within said first drum;



- f. a wood chip receiving aperture in the peripheral surface of the second drum for passing wood chips received from all of the apertures of the first drum into the interior of the second drum; and
- g. log feeding means for feeding logs in a cutting relation to the wood chipping knives on the first drum where they move past the wood chip receiving aperture of the second drum.

4,009,838

**PORTABLE SOLID WASTE SHREDDER**

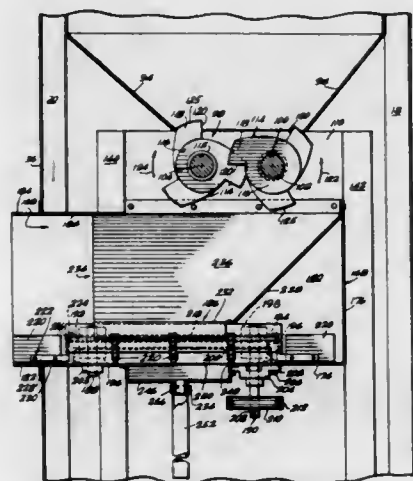
Philip Tashman, 11020 SW. 75th Court, Miami, Fla. 33156

Filed Aug. 28, 1975, Ser. No. 608,468

Int. Cl.<sup>2</sup> B02C 13/02, 13/286

U.S. Cl. 241-99

17 Claims



1. A portable waste shredder device comprising, in combination, an upstanding main shredder housing structure including a main framework defining a top charge opening means, and a discharge opening, a shredder jaw assembly comprising two sets of rotary jaws fixed, respectively, to a pair of parallel shafts, an electric motor, drive means from said electric motor to said pair of shafts for simultaneously rotating said parallel shafts in mutually opposite directions, a first chute means above said shredder jaw assembly to direct waste materials disposed in said top charge opening means into said shredder jaw assembly, a discharge opening, and means to deliver material shredded by said shredding jaw assembly through said

discharge opening, said means to deliver said shredded material comprising a second chute means beneath said shredder jaw assembly, a conveyor means having a discharge run, an interior receptacle beneath said second chute means, the discharge run of said conveyor means being mounted in said interior receptacle, said conveyor means being positioned to discharge the shreds outwardly through said discharge opening, a liquid catch basin fixed relative to a bottom wall of said interior receptacle to receive all waste liquids from the shredder waste materials, a liquid receptacle means and drain means from said liquid catch basin to direct liquids into said liquid receptacle means.

4,009,839

**WINDING APPARATUS**

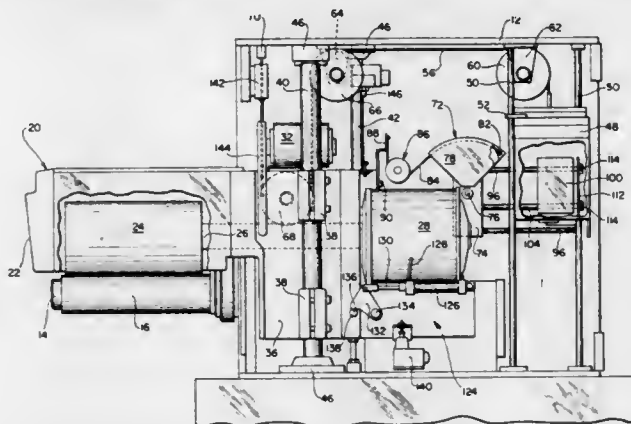
William Malcolm Bense, Barrington, R.I., assignor to Leeson Corporation, Warwick, R.I.

Filed Oct. 6, 1975, Ser. No. 620,173

Int. Cl.<sup>2</sup> B65H 54/42

U.S. Cl. 242-18 DD

13 Claims



1. Apparatus for winding an advanced strand into a package comprising, fixed position take-up means, strand traversing means for guiding said strand to said take-up means, surface drive means for driving said take-up means to wind up the strand into a package thereon, a carriage supported for free vertical movement from an initial lower position at initiation of package winding to an upper terminal position at the completion of winding said package, both said traversing means and said drive means being positioned above said take-up means on said carriage so that said traversing means and said driving means freely move upwardly as the package increases in size, and suspended counterweight means for counterbalancing said carriage and said traversing and drive means mounted thereon while affording a constant substantially uniform force urging said package into engagement with said drive means, and differential pressure means for applying a gradually reducing secondary force upon said package as said package increases in size.

4,009,840

**BLAST NOZZLE FOR ROTATING TEXTILE COILS**

Herbert Müller, Monchen-Gladbach, Germany, assignor to W. Schlafhorst &amp; Co., Monchen-Gladbach, Germany

Filed May 13, 1975, Ser. No. 577,115

Claims priority, application Germany, May 15, 1974, 2423493

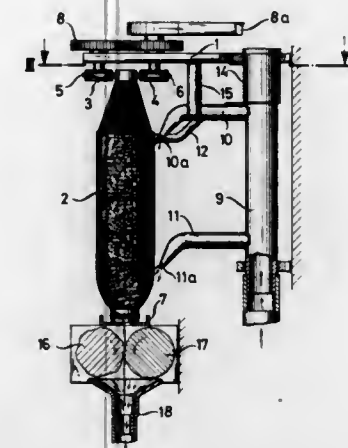
Int. Cl.<sup>2</sup> B65H 54/22

U.S. Cl. 242-35.6 E

5 Claims

1. Blast nozzle assembly for pneumatically loosening thread ends of rotating textile coils comprising a blast nozzle, means for transporting a textile coil past said blast nozzle in a given travel direction, means for pivotally mounting said nozzle, and

means for controlling pivoting movement of said nozzle in accordance with the travel of the textile coil within a limited



angular range in and opposite to the given travel direction of the textile coil.

4,009,841

**MANUAL FLYING PASTER**

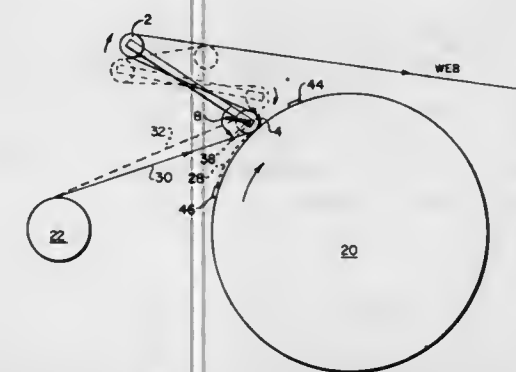
Harshad D. Matalia, Easton, Pa., assignor to American Newspaper Publishers Association, Inc., Easton, Pa.

Filed Oct. 6, 1975, Ser. No. 620,663

Int. Cl.<sup>2</sup> B65H 19/10, 19/20

U.S. Cl. 242-58.3

2 Claims



1. In small printing presses of the type having full paper rolls and press rollers on the same level and including a rollstand for supporting a pair of paper rolls in respective forward and rearward horizontal positions, said rollstand further comprising a frame carrying a horizontally disposed press roller above and between the forward horizontal paper roll position and the rear horizontal paper roll position, the improvement of a manual flying paster which further comprises:

- A. a cradle horizontally pivotable about an axis on said rollstand frame, said axis being below said press roller and both above and between full paper rolls at said forward and rear paper roll positions wherein;
- B. said cradle further includes a forward and a rear paster roller said forward and rear paster rollers being mounted parallel to said axis and thereby respectively pivotable into contact with a full paper roll in said respective forward and rear paper roll positions; and,
- C. a trailing web cut-off means comprising a taut wire and means on said cradle for mounting said taut wire for manual pivotal movement about said forward paster roller, said taut wire extending in skewed relation to the plane of said forward and rear paster rollers, said manual flying paster being adapted to initially receive a web from a full paper roll at said rear paper roll position, wherein said web travels forwardly to beneath, and then upwardly around, said forward paster roller, then rearwardly to beneath, and then upwardly around, said rear paster roller, then forwardly and over said existing press roller to subsequent press operations, whereby said trailing web cut-off means around said forward paster roller is opera-

ble to cut off a trailing web from an expiring paper roll at either of said forward or rear paper roll positions.

4,009,842

**SELF-ADJUSTING REEL**

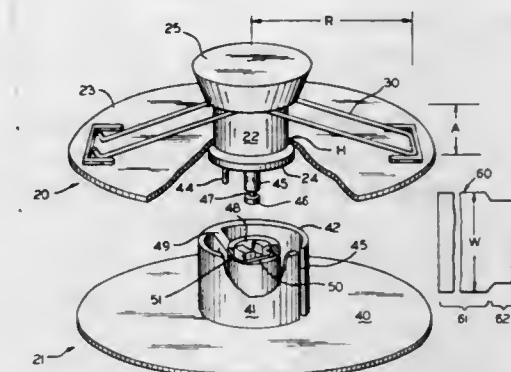
Thomas J. Persha, Juneau, and David Jagielski, West Bend, both of Wis., assignors to Bell &amp; Howell Company, Chicago, Ill.

Filed Jan. 30, 1976, Ser. No. 653,820

Int. Cl.<sup>2</sup> B65H 75/18

U.S. Cl. 242-71.9

8 Claims



1. An automatically self-adjusting reel having two parts, one of said two parts comprising a first central hub section having a reel flange floatingly supported thereon, to move over the length of and between limit stops formed on opposite ends of the first central hub section, at least a parallel wire spring extending from the top of the first hub section outwardly toward the floating flange for biasing it at four points to urge it to move toward a flange formed on the other of said two parts, said spring extending outwardly from said hub for a distance substantially greater than the diameter of said hub to uniformly apply balanced forces against said flange.

4,009,843

**SPRING REWOUND TAGLINE DEVICE WITH SPRING OVERLOAD PREVENTING MEANS**

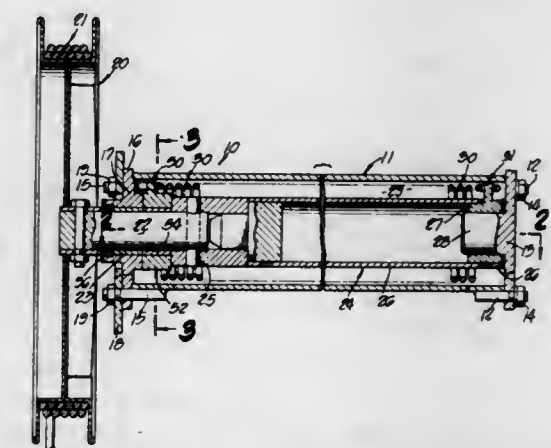
Secundino G. Gomez, Los Angeles, Calif., assignor to McCaffrey-Ruddock Tagline Corporation, Los Angeles, Calif.

Filed Sept. 11, 1975, Ser. No. 612,330

Int. Cl.<sup>2</sup> B65H 75/48

U.S. Cl. 242-107

7 Claims



1. In a spring-loaded tagline rewind device for mounting on a boom, wherein a rotatable cable reel has a shaft extending axially from the cable reel and a coiled spring arranged surrounding the shaft and having one of its ends connected to the shaft by an anchor means, and with its other end connected with a fixed structure by an anchor means, the improvement being to prevent excessive loading from damaging the spring, the improvement comprising:

one of said anchor means being releasable in response to the load stresses on the spring reaching an increased predetermined magnitude, said anchor means comprising:



- means confining the associated spring end to movement in a circular path;
- fixedly mounted stop means in said circular path normally opposing the movement of said spring end in said circular path;
- said stop means including means responsive to a predetermined load stress on the spring and against said stop means for inactivating said stop means with respect to its opposition to the movement of said spring end in said circular path.

4,009,844

# SPRING REWOUND TAGLINE DEVICE HAVING A MECHANISM FOR CONTROLLING THE UNWINDING OF THE SPRING

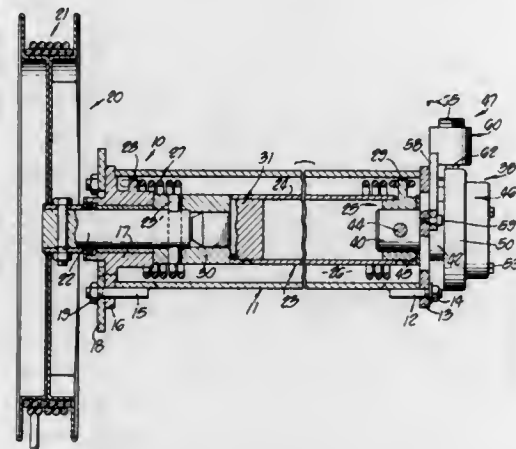
Secundino G. Gomez, Los Angeles, Calif., assignor to McCaffrey-Ruddock Tagline Corporation, Los Angeles, Calif.

Filed Sept. 11, 1975, Ser. No. 612,331

Int. Cl.<sup>2</sup> B65H 75/48

U.S. Cl. 242—107.3

7 Claims



- In a spring rewind tagline device in which a rotatably mounted tagline reel is activated in a rewind direction by a tensioned torsion coiled spring:

mechanism for controlling the rewinding actuation of the reel by the unwinding action of the torsion spring, when the outer load connection end of the tagline is detached, said mechanism, comprising:

- a braking member connected for rotation with the reel; and
- a braking device assembly supported on the tagline device including:
  - a casing;
  - braking shoe means guidingly supported by said casing for axial movement to a position in engagement with said braking member;
  - spring means continuously urging said shoe means towards said position of engagement; and
  - manually operable means carried by said casing for selectively varying the effective force of said spring and the concomitant braking effect by said shoe means.

4,009,845

# UNREEL REINFORCER FOR DISPENSING WIRE

Kenneth E. Santucci, 526 North Edgewood, LaGrange, Ill. 60185, and Donald G. Santucci, 1685 Shelly Lane, Wheaton, Ill. 60187

Filed Sept. 24, 1975, Ser. No. 616,293

Int. Cl.<sup>2</sup> B65H 49/00

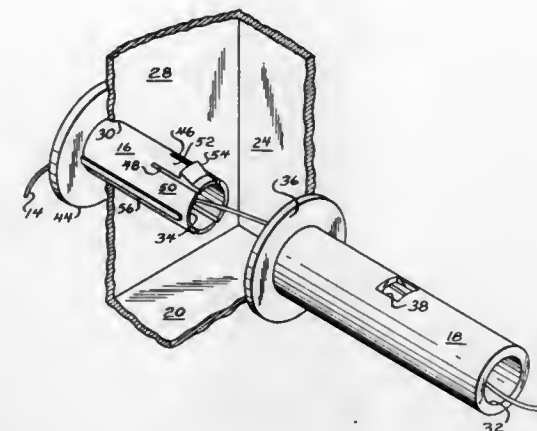
U.S. Cl. 242—129.7

14 Claims

- A support for use in winding and dispensing a winding of flexible material comprising:

- a first tubular member;
- a second tubular member telescoped over the first tubular member;
- means for interlocking said tubular members; and

said interlocking means comprising a pair of first slots formed in a diametrically opposed relationship on said second tubular member and a pair of tangs formed in a



diametrically opposed relationship on said first tubular member, said tangs being separably engageable with the first slots for interlocking connection.

4,009,846

# TAPE RECORDER DRIVE SYSTEM

Orlando Coruzzi, Viale Monte Nero, 57, Milan, Italy

Filed June 27, 1975, Ser. No. 591,232

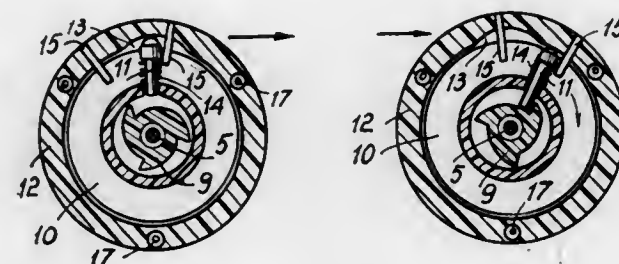
Claims priority, application Italy, Jan. 7, 1974, 24678/74,

Mar. 26, 1975 21706/75

Int. Cl.<sup>2</sup> G03B 1/04

U.S. Cl. 242—201

7 Claims



- In a drive, particularly for use with magnetic tapes in small size recorders, with a recorder frame, a capstan member which drives the magnetic tape in the recording and playing modes of the recorder, pulleys, a reversible electric motor and drive belts continuously connecting said reversible motor to said pulleys and to said capstan member: a pair of shafts supported by said recorder frame, two spindles wherearound the magnetic tape coils and decoils, said shafts being pivotally connected with said spindles to allow selectively free idle rotation of said shafts with respect to said spindles, said pulleys fixedly connected to said shafts; means engaging for rotation each of said shafts with a respective one of said spindles when said respective spindle rotates in the same direction as the tape being wound around said respective spindle, and a friction clutch device arranged between said respective spindle wherearound the tape is wound in the recording and playing modes and said means for engaging said respective spindle to its respective shaft, said clutch device having locking members adapted to prevent the free idle rotatory relationship between said respective spindle and its respective shaft when said respective spindle is rotated faster for a quick winding of the tape.

4,009,847

# 1-TERTIARY-ALKYL-3-(SUBSTITUTED THIENYL)UREAS AND

# 1-TERTIARY-ALKYL-3-(SUBSTITUTED THIETYL)UREAS AS ANTIHYPERTENSIVE AGENTS

Paul Edward Aldrich, Wilmington, Del.; Gilbert Harvey Berzin, West Chester, Pa., and Bruce Ivor Dittmar, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

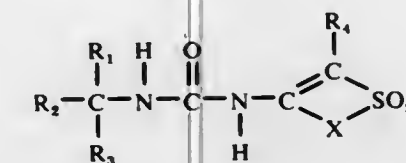
Continuation-in-part of Ser. No. 461,699, April 17, 1974, abandoned. This application Mar. 11, 1975, Ser. No. 555,307

Int. Cl.<sup>2</sup> A01N 9/00

U.S. Cl. 424—275

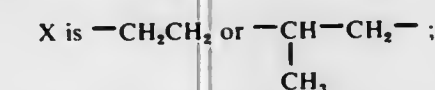
15 Claims

1. A compound of the formula:



where

$R_1$ ,  $R_2$  and  $R_3$  are  $C_1$ - $C_3$  alkyl, or  $C_2$ - $C_3$  alkenyl, with the provisos that the total number of carbon atoms of  $R_1$  plus  $R_2$  plus  $R_3$  does not exceed 5



$R_4$  is H or  $CH_3$  with the proviso that when  $R_4$  is  $CH_3$ , X is  $-CH_2CH_2-$ ; and its sodium, potassium, or calcium salts.

4,009,848

# GYRO SEEKER

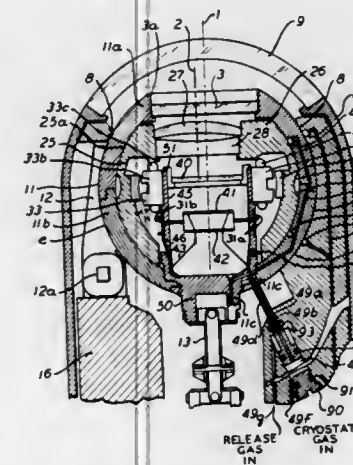
William Charles Albert, Boonton, and Bart Joseph Zoltan, Old Tappan, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 15, 1975, Ser. No. 622,561

Int. Cl.<sup>2</sup> F41G 7/00

U.S. Cl. 244—3.16

9 Claims



- A two degree of freedom wide angle gyro seeker for use with a cannon launched missile which missile includes a nose section adjacent to a fixed base portion comprising:

- a housing having a transparent dome shaped window at its forward end for admitting radiation and adapted to be positioned over the nose section of a missile;
- a platform disposed for angular movement, mounted in said housing;
- an optical assembly having a longitudinal optical axis;
- a gyro carrying said optical assembly mounted interiorly of said platform and positioned behind said window, the rotor of said gyro establishing a spin axis about said optical assembly;

- a detector mounted rearwardly of said optical assembly, said detector being positioned in coaxial alignment with the spin axis of said gyro;
- means for maintaining said optical assembly with its longitudinal optical axis perpendicular to the plane of said detector while moving said platform through its angular limits; and
- means for displacing said optical assembly's optical axis a predetermined distance from but parallel with said gyro spin axis so that as the rotor rotates, an image of a target is formed on the detector plane that describes a path the locus of which is a circle and the radius of which circle is dimensionally equal to the displacement of the optical axis from the gyro spin axis and the distance of the center of said circle from the intersection of said gyro spin axis with said detector is a measure of the angular displacement of the target from the gyro axis.

4,009,849

# FLUID-STREAM DRIVEN AIRCRAFT

Karl Eickmann, 2420 Isshiki, Hayama Machi, Kanagawa, Japan

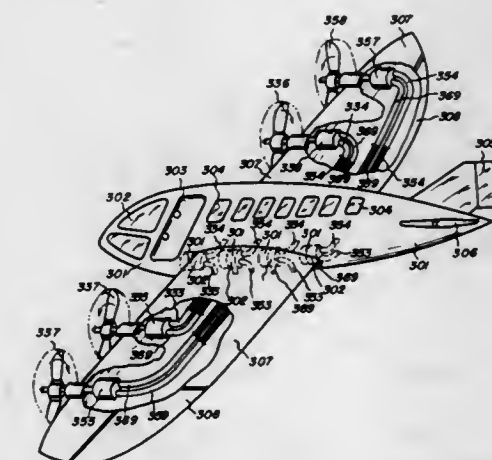
Continuation-in-part of Ser. No. 104,676, March 8, 1971, Pat. No. 3,823,898. This application July 10, 1974, Ser. No.

487,272

Int. Cl.<sup>2</sup> B64D 31/00

U.S. Cl. 244—53 R

1 Claim



- A fluid-stream driven aircraft, comprising, in combination, a body having an axis of substantial symmetry; pairs of hydraulic fluid-operated motors on said body; pairs of stream-creating means driven by said motors, respectively, and arranged symmetrically on opposite sides of said axis; a plurality of hydraulic fluid-flow producing means each having at least a pair of separate fluid-handling chambers each connected to one of a pair of separate outlets, and including means for fluid-tight separation of the chambers and outlets so that fluid from each chamber passes through one of said outlets only; a pair of displacement means associated with said fluid-handling chambers, respectively; equally acting actuator means cooperating equally with said displacement means for maintaining equal movements of said displacement means so that fluid flows in said outlets at proportionate and equal flow rates; pairs of delivery passage means connecting each of said outlets with a different one of said motors, respectively, whereby said stream-creating means on opposite sides of said axis are driven at equal velocities for producing equal thrusts on both sides of said axis to stabilize the movement and attitude of said aircraft, each of said fluid-flow producing means supplying a plurality of separated flows of fluid of proportionate rate of flow into a plurality of separated fluid lines; some of said plurality of fluid-flow producing means being communicated together to form a combined multifold circuit system of a plurality of separated flows of fluid of proportionate rate of flow, and others of said plurality of fluid-flow producing means also being communicated together to form another



combined multiflow circuit system of a plurality of separated flows of fluid of equal rate of flow, so that said combined multiflow circuit systems may either be combined or independently operated and controlled; at least a pair of separated fluid lines of at least two of a plurality of fluid-flow producing means in each of said combined multiflow circuit systems being combined together to form respective pairs of separated common fluid lines; pairs of separated positive displacement fluid motors communicated to respective pairs of said separated common fluid lines, at least one fluid motor of each of said pairs of separated positive displacement fluid motors communicating with one of the fluid lines of the pairs of fluid lines; said combined multiflow circuit systems by connection of rotor members to the said fluid motors actuating at least two pairs of jointly or independently operable and controllable streams of fluid, wherein the streams of each pair of streams of fluid are of proportionate rate of flow; and means for preventing return flow from said separated common fluid lines to and through one or more of said fluid-flow producing means.

4,009,850

## AIRSHIP TANKERS

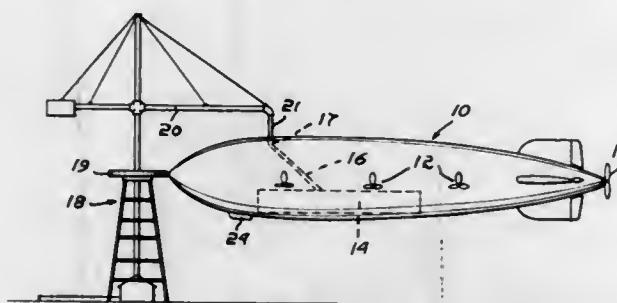
John J. Hickey, 93 Revere St., Boston, Mass. 02114

Filed Apr. 21, 1975, Ser. No. 570,176

Int. Cl.<sup>2</sup> B64F 3/00

U.S. Cl. 244—115

11 Claims



1. An airship comprising a framework, a gas tight envelope covering said framework, and a midship chamber supported by the framework, said chamber including a port opening through the bottom of the airship, at least one tank within said chamber and supported by the framework, an inlet conduit in communication with the tank, at least one flexible outlet conduit of substantial length having a normal stored position within said chamber in the form of a loop, valve controlled means connecting one end of said outlet conduit to said tank, the other end of said outlet conduit being positioned to pass through said port in response to gravity, and reversible power operated means connected to said outlet conduit and operable to pay out said outlet conduit through said port and to withdraw said outlet conduit therethrough and restore the stored position thereof, said power operated means including a winch provided with a cable, a pulley about which the outlet conduit is trained and a yoke connecting the pulley to the cable.

11. An airship comprising a framework, a gas tight envelope covering said framework, an upper deck, and a midship chamber including a port opening through the bottom of the airship, at least one tank within said chamber and supported by the framework, an inlet conduit in communication with the tank with its inlet end exposed in said upper deck relatively near the nose of the airship, at least one flexible outlet conduit of substantial length having a normal stored position within said chamber with one end connected to said tank, valve means in control of said outlet conduit, means operable to pay out the other end of the conduit through the port and to withdraw it therethrough, and a mooring mast including a turntable to which the nose of the airship is secured and a rotatable counterweighted boom above the turntable and of a length to extend lengthwise of the airship into a position substantially over said inlet end of the inlet conduit, and a liquid

delivery conduit including a portion extending through said boom and rotatable therewith, said portion including a flexible exposed portion disposable in said inlet end.

4,009,851

## SPACECRAFT STRUCTURE

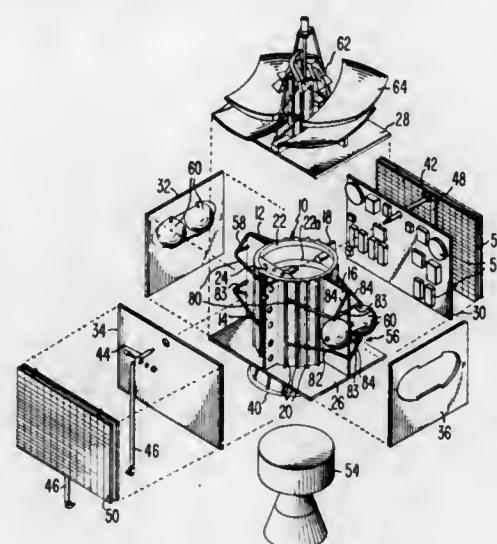
Walter Lester Cable, Freehold, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,810

Int. Cl.<sup>2</sup> B64G 1/10

U.S. Cl. 244—158

6 Claims



1. A spacecraft structure comprising: an inner hollow cylindrical member, a plurality of bulkheads secured to and depending outwardly from said member, and an outer enclosure member secured to the extended ends of said bulkheads and the ends of said inner cylindrical member to form a compartmentalized enclosed structure, means within said cylindrical member including spacecraft engine mounting means connected to said cylindrical member for securing a spacecraft engine within said cylindrical member, said outer enclosure member including means for securing spacecraft equipment thereto and serving to provide structural rigidity to said structure while supporting said equipment.

4,009,852

## CORNER POST HARNESS ASSEMBLY APPARATUS

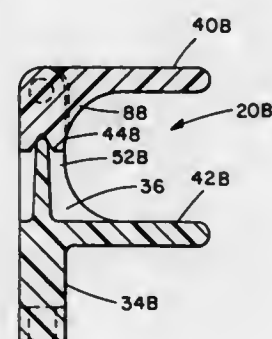
John Jean Bulanda, New Lenox, Ill., and David Robert Schoenfeld, Sandy, Utah, assignors to Panduit Corporation, Tinley Park, Ill.

Filed Sept. 15, 1975, Ser. No. 613,383

Int. Cl.<sup>2</sup> F16L 3/22

U.S. Cl. 248—68 R

5 Claims



4. Harness assembly apparatus for maintaining close grouping of a plurality of flexible elongate objects such as wires as the objects make a turn and are formed into a bundle, said apparatus comprising:

retaining means of one-piece molded plastic construction for releasably holding the objects as they make a turn; and

support means of one-piece molded plastic construction adapted to be mounted on a panelboard or the like and supporting the retaining means, said retaining means comprising a first arm releasably pivotally held by said support means and movable relative thereto between a retaining position wherein said arm extends at least partially outside the turn of said bundle and a release position wherein the arm is disposed substantially inside the turn, said support means comprising a mounting base for securement to said panelboard and a pair of spaced flexible generally parallel legs extending from said base for holding said retaining means, said support means comprising a second fixed arm disposed between said first arm and said mounting base and extending generally parallel to said first arm when said first arm is in its retaining position, one of said retaining means and said support means comprising a web portion extending between said arms for engaging the bundle and defining the turn therein, and further comprising a slot, the other of said retaining means and support means comprising a cantilever beam spring extending between said legs and into said slot biasing said first arm to its retaining position whereby after the objects are formed into said bundle, the bundle can readily be removed from said apparatus after moving said arm towards its release position and, after removal of the bundle, said first arm returns toward its retaining position regardless of the mounting position of said apparatus.

4,009,853

## SINGLE SHOVEL HOLDER

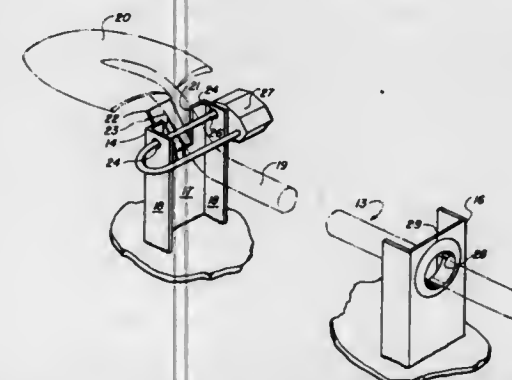
William H. Lile, 771-6 N. Fair Oaks, Sunnyvale, Calif. 94086

Filed Mar. 1, 1976, Ser. No. 662,436

Int. Cl.<sup>2</sup> A47B 96/06; A47F 7/00

U.S. Cl. 248—201

6 Claims



1. A holder for securely mounting a single hand shovel on a piece of equipment comprising:

- A. a pair of channel brackets for said shovel;
- B. a first one of said channel brackets including:
  1. a piece of channel metal having a thin-walled webbing connecting a pair of spaced flanges extending generally orthogonal to said webbing,
  2. an open-ended slot extending into said webbing adapted to receive the handle of a shovel adjacent its scoop end, the width of said slot being less than the width of the scoop of a hand shovel intended to be held thereby,
  3. means enabling the open end of said slot to be blocked to prevent a shovel from being extracted from said bracket through said open end of said slot, and
  4. a block projecting from said webbing into a position at which it will engage the scoop of a shovel in the slot of said webbing to prevent said shovel from being extracted from said slot by passing the handle of said shovel longitudinally through said slot, said block including a tongue projecting angularly upward from adjacent the bottom of said slot in a direction generally parallel to the direction of the shank of the scoop of an upside-down shovel in engagement with said slot;
- C. the second one of said brackets including:

1. a piece of channel metal having a thin-walled webbing connecting a pair of spaced flanges extending generally orthogonal to said webbing, and
2. an opening extending through said webbing adapted to receive the handle of said shovel adjacent the free end of said handle; and
- D. said channel brackets being adapted for permanent securement to said piece of equipment at locations spaced from one another with said webbing slot and said webbing opening axially aligned with one another for simultaneous engagement of a single shovel by both of said channel brackets.

4,009,854

## POLICE OFFICER'S CLUB HOLDER FOR VEHICLE DOOR

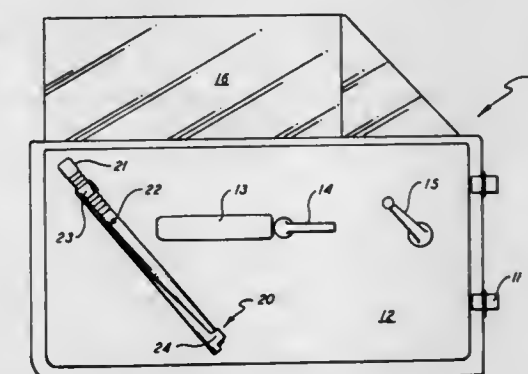
Charles G. Moyer, 532 Volney St., Phoenix, N.Y. 13135

Filed Dec. 5, 1975, Ser. No. 637,936

Int. Cl.<sup>2</sup> A47F 5/00

U.S. Cl. 248—300

1 Claim



1. A police officer's club holder for attachment to a vehicle door, comprising: a comparatively narrow strip of manually unbendable metal having holes therethrough for fasteners therethrough for securing the strip to a door, the upper end of the strip being comparatively wider and bent into a substantially U-shaped clip portion for clamping engagement with a club therein, the lower end of the strip being comparatively wider and bent into a substantially circular socket portion for containing one end of a club therein, the socket portion having an integral narrow tongue joined thereto, the tongue being bent into a stop for a club in the socket portion extending diametrically across the bottom end of the socket portion, the substantially U-shaped upper portion being spaced from the substantially circular socket lower portion a distance which is the major portion of the officer's club length, whereby the holder is adapted to be secured to the inner panel of a vehicle door inclined at a small angle from the vertical with the upper end of a club therein projecting from the holder toward the opening side of the door at the top of the panel for being grasped for immediate removal from the holder upon the opening of the door.

4,009,855  
TRESTLE

Joachim Hoffmann, and Karl Klinkhammer, both of Bielefeld, Germany, assignors to Gebr. Dickertmann Hebezeugfabrik A.G., Bielefeld, Germany

Filed Oct. 6, 1975, Ser. No. 619,853

Claims priority, application Germany, Oct. 12, 1974, 2448751

Int. Cl.<sup>2</sup> E04G 25/00

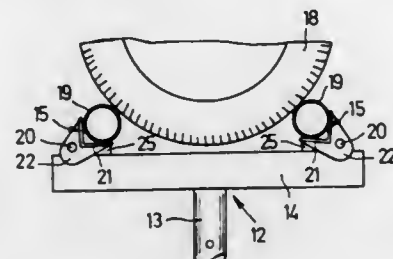
U.S. Cl. 248—352

7 Claims

1. A supporting trestle for heavy loads, especially road and rail vehicles comprising an upright supporting column having a base portion at the lower end thereof; a support member mounted so as to vertically adjustable is said supporting column;



said support member including an adjustable column therein and locking means to fix said adjustable column with respect to said supporting column;  
a longitudinally extending cross beam secured to an upper end of said adjustable column;  
a pair of spaced shafts fixed to said cross beam and extending transversely thereto;



a pair of claws each respectively mounted to pivot on one of said shafts, said claws each including a channeled surface which face each other;  
a pair of hollow members of a length sufficient to extend along the length of and be received therein in contact with said channeled surfaces, and said hollow members serving as load supporting members by receiving thereon at least one wheel of the vehicle.

4,009,856

## MECHANISM FOR TILTING CHAIRS

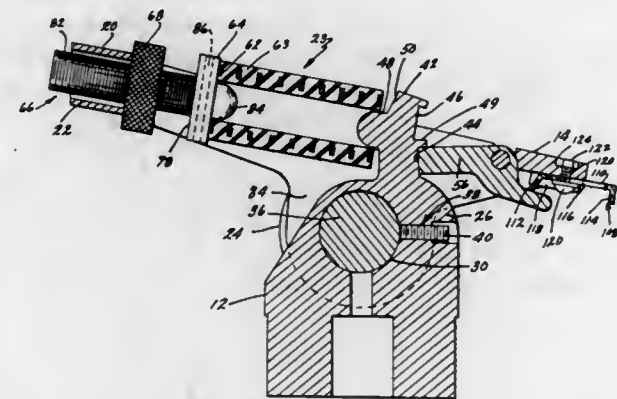
Richard H. Wolters, Grand Rapids, Mich., and William E. Stumpf, Winona, Minn., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Jan. 13, 1976, Ser. No. 648,812

Int. Cl.<sup>2</sup> A45D 19/04; A47J 47/16

U.S. Cl. 248—382

12 Claims



1. A tilting chair support mechanism having a support spindle and a seat mounting plate pivotally mounted to the top of said spindle; a spring resiliently urging said plate into a forwardly tilted position; means for limiting the forward tilting movement of said plate, the improvement in said means comprising: a stop on one of said plate and said spindle and a stop engaging latch on the other thereof; said stop having first and second latch engaging walls at different radial spacings from the axis of pivotal attachment of said plate and spindle whereby the forward pivotal movement of said plate is limited at a different position when said latch engages one of said walls than when it engages the other thereof; means mounting said latch for transfer from engagement with one of said walls to engagement with the other thereof.

4,009,857

## PIE CRUST FORMING AND TRIMMING MOLD

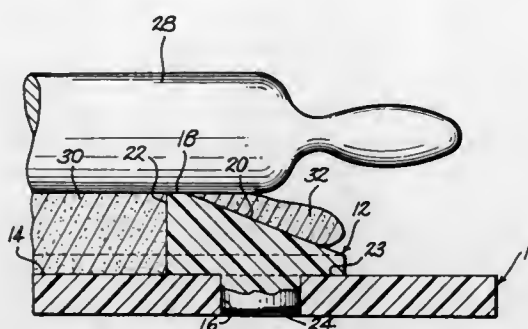
Richard L. Delmas, 7950 Park Blvd., No. 42, Pinellas Park, Fla. 33565

Filed May 27, 1975, Ser. No. 580,939

Int. Cl.<sup>2</sup> B29C 1/00; A21C 11/00

U.S. Cl. 249—102

3 Claims



1. A pie crust dough forming and trimming assembly comprising:

- a planar base element forming a planar a dough roll out surface thereon; the base element including an array of apertures extending completely therethrough;
- at least one dough mold annular ring element having an annular, flat bottom surface arranged to lie contiguously on said roll out surface and within the outer periphery of said planar base element; the ring element including an internal vertical mold wall corresponding in diameter to the desired diameter of a pie crust dough disc, the height of said wall corresponding to the desired pie crust disc thickness; the bottom surface of the ring element including an array of protuberances extending downwardly therefrom, the protuberances being arranged to fit snugly within said apertures in said base element when the ring element lies contiguously on said roll out surface, said protuberances being spaced from said internal vertical mold wall and lying within the outer periphery of said ring element;
- said annular ring element further including a narrow, planar upper ledge surface for supporting a dough roll out implement, and a surface downwardly and radially outwardly sloping from the ledge surface, the ledge surface being adjacent the inner wall of the ring and being narrower than the bottom surface of the ring.

4,009,858

## LOAF MOLD MAGAZINE ASSEMBLY

Alvin Borsuk; Hans H. Heydn, and Charles H. Johnson, all of Madison, Wis., assignors to Oscar Mayer & Co. Inc., Madison, Wis.

Filed Mar. 11, 1975, Ser. No. 557,302

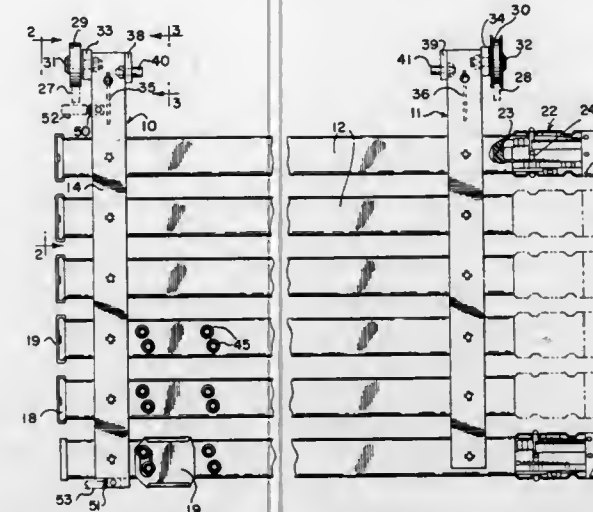
Int. Cl.<sup>2</sup> A22C 7/00

U.S. Cl. 249—120

1 Claim

1. A magazine assembly for processing a stuffable food material to produce a loaf food product comprising: a pair of horizontally spaced vertically extending forks, a plurality of vertically spaced horizontally extending tubular molds secured adjacent their opposite ends to the forks, said molds having a uniform cross section, means closing the opposite ends of the molds to hold the food material during processing, rollers mounted at the upper ends of the forks for coacting with support rails on which the magazine is adapted to be moved along a path extending at right angles to the molds, pin means on said forks adapted to be engaged for moving and

positioning the magazine assembly along the rails, and bars on the outside of one fork for coaction with stops to prevent



movement of the magazine in response to application of forces to the molds in the direction of the stops.

4,009,859

## PAN FOR BAKING HAMBURGER ROLLS

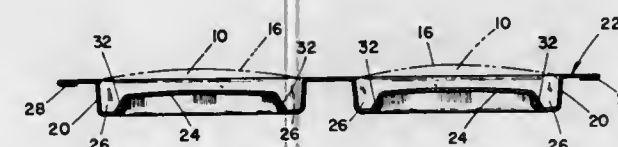
Albert C. Bangert, 1927 Queenswood Drive, York, Pa. 17403

Filed Jan. 8, 1976, Ser. No. 647,631

Int. Cl.<sup>2</sup> B28B 7/26

U.S. Cl. 249—122

3 Claims



1. A bakepan for baking substantially square hamburger rolls having one face provided with a substantially square indentation to provide a rim around the perimeter of said one face of said roll, said pan comprising a metal sheet having a plurality of substantially square recesses of uniform depth extending into said sheet from one surface thereof, the bottom of each recess having a substantially square reentrant projection of less area than said recesses extending upward into said recesses to a height less than the depth of said recesses to form a relatively narrow gutter extending around said projections to form rims of substantially uniform height and width around the perimeters of rolls formed in said recesses, and the corners of said projections being provided with a substantially V-shaped radial projection extending partially toward the corresponding corners of said recesses to form notches in the corners of said rims of rolls baked in said recesses and thereby minimize the thickness of said rims of said rolls at the corners thereof to facilitate the formation of rims on said rolls having outermost surfaces thereon disposed within a common plane for close mating with the rim of a similar roll.

4,009,860

## SHUTOFF VALVE FOR HIGH-PRESSURE SPRAY GUNS

Horst Lingnau, Rheinhausen, Germany, assignor to Woma-Apparatebau Wolfgang Maasberg & Co. GmbH, Rheinhausen, Germany

Filed May 19, 1975, Ser. No. 579,086

Claims priority, application Germany, May 18, 1974, 2424321

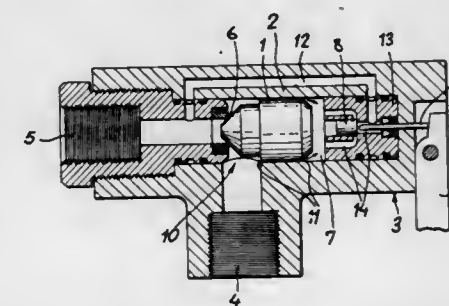
Int. Cl.<sup>2</sup> F16K 31/383

U.S. Cl. 251—44

8 Claims

1. A valve assembly for a high-pressure medium, especially for a high-pressure spraygun comprising:  
a valve housing formed with an outlet for said medium, an inlet for said medium spaced from said outlet, and a

cylinder bore between said inlet and said outlet, said cylinder bore having a rear wall remote from said outlet; a valve seat formed in said cylinder bore at said outlet; a differential piston slidably received in said cylinder bore and having a front end engageable with said seat to block flow of said medium from said inlet to said outlet, said differential piston having a rear end defining a pressure chamber in said cylinder bore, rearwardly of said seat, said piston further defining with the wall of said cylinder bore a throttle path between said inlet and said chamber; a bypass passage formed in said housing and communicating between said outlet ahead of said seat and said chamber; a control piston shiftable in said housing between a blocking position interrupting communication between said chamber and said passage and an open position communicating said passage with said chamber; and an operating mechanism on said housing for displacing said control piston between said blocking position thereby



enabling said medium to shift said differential piston away from said seat, and for releasing said control piston to permit pressure in said chamber to displace said control piston into said blocking position whereby fluid pressure is increased in said chamber through said passage and said medium thereby displaces said differential piston into contact with said seat, said operating mechanism comprising:

- a valve body sealingly received in said cylinder bore behind the rear end of said differential piston and ahead of said rear wall and formed with at least one channel communicating between said chamber and said passage, said control piston being wholly received in and shiftable in said body to selectively block and unblock said channel;
- a pin sealingly received in said body and shiftable therein to displace said control piston, and
- a lever on said housing engageable with said pin for shifting same.

4,009,861

## STEP OPENING GAS VALVE

Paul A. Hirst, Riverside, Calif., assignor to Essex International, Inc., Fort Wayne, Ind.

Filed Feb. 4, 1976, Ser. No. 655,050

Int. Cl.<sup>2</sup> F16K 17/10 31/145

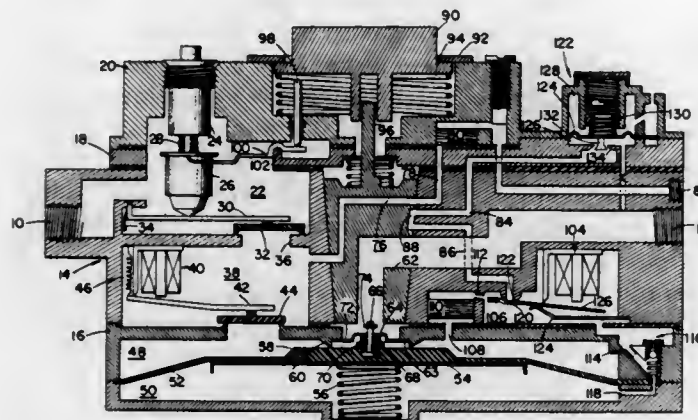
U.S. Cl. 251—61.1

3 Claims

1. In a step opening, combination type gas valve including a casing having an inlet and an outlet, a main valve seat located in said casing in the flow path between said inlet and said outlet, main diaphragm valve means located in said casing to control flow between said inlet and said outlet, said main diaphragm valve means comprising a diaphragm member separating a portion of said casing into a first chamber and a control chamber and valve means on said diaphragm adapted for cooperation with said main valve seat, spring means for normally urging said main diaphragm valve means toward said main valve seat, means for causing said main diaphragm valve means to move toward and away from said main valve seat, the improvement which comprises in combination therewith: an auxiliary valve seat located in said casing, said auxiliary valve seat being recessed from, and concentrically located with said main valve seat;



restricting valve means for restricting the flow of gas therethrough when closed and for allowing an unrestricted flow of gas therethrough when open, said restricting valve means being adapted for cooperation with said auxiliary valve seat and further being mounted upon and operated by said main diaphragm valve means;

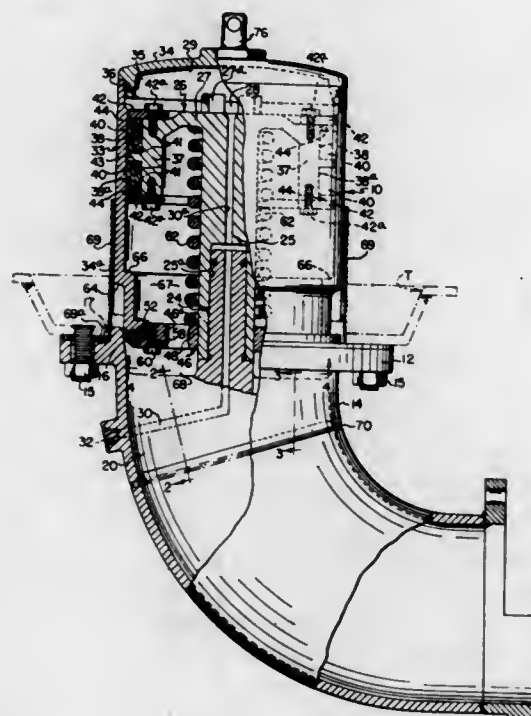


spring means for biasing said restricting valve means toward said auxiliary valve seat; and  
a lost motion connection between said main diaphragm valve means and said restricting valve means.

**4,009,862**  
**HYDRAULICALLY BALANCED REMOTE CONTROLLED EMERGENCY VALVE FOR STORAGE TANK**  
Joseph H. DeFrees, 414 Liberty St., Warren, Pa. 16365  
Filed Aug. 22, 1975, Ser. No. 606,925  
Int. Cl.<sup>2</sup> F16K 31/122

U.S. Cl. 251-63

13 Claims



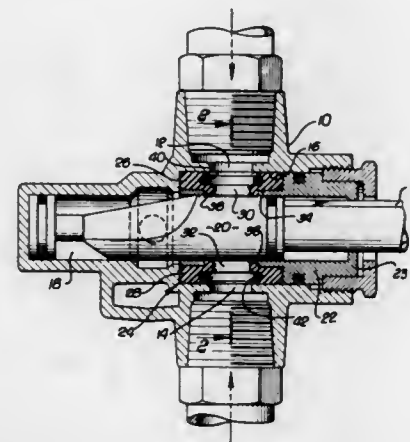
1. A remote controlled valve means for a liquid containing tank having a bottom wall, said bottom wall having an opening therein, said valve means comprising a valve seat adapted for coaction with the opening and defining a valve port, a hollow cylindrical type valve housing reciprocally disposed on said seat to control the flow of liquid through said port from and to the tank, a piston head disposed in said valve housing forming an actuating chamber above the piston head, means connecting the piston head to said seat whereby said housing is adapted to vertically reciprocate on the piston head relative to said seat, means for biasing said housing to a lowered position relative to the piston head whereby said housing is maintained in a normally closed position on the valve seat, means for selectively introducing pressurized fluid into and out of said

chamber to reciprocate the housing to and from the valve seat for selectively controlling the flow of liquid through said port, means for generally hydraulically balancing said housing whereby said biasing means is effective to move said housing to closed position during bottom loading of the tank upon predetermined exhaustion of pressurized fluid from said actuating chamber, and wherein said means connecting the piston head to the valve seat and associated discharge port comprises a piston stem, means on the stem for threading the stem to a vertical stud connected to said valve seat, means sealing the threaded connection between said stem and said stud, and passages projecting through said stud and said stem to said chamber, said passages comprising said means for introducing pressurized actuating fluid into and from the chamber.

**4,009,863**  
**COMPOSITE LIP SEAL FOR LAVATORY OR SINK VALVE**  
Julius L. Tolnai, Los Angeles, Calif., assignor to Price Pfister Brass Mfg. Co., Pacoima, Calif.  
Filed Oct. 17, 1975, Ser. No. 623,436  
Int. Cl.<sup>2</sup> F16K 25/00

U.S. Cl. 251-172

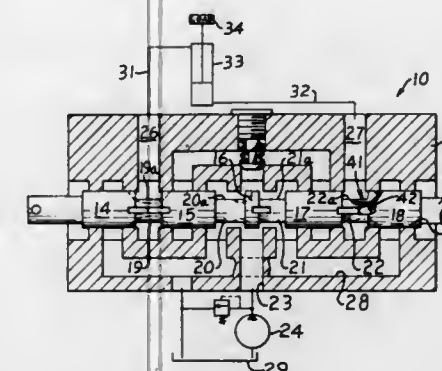
2 Claims



1. In a valve structure:
  - a. a valve body member;
  - b. a valve control member;
  - c. said valve body member having an inlet port opening at a surface opposed to said valve control member;
  - d. means guiding said valve control member for movement transverse to said inlet port for controlling the flow of fluid, said valve control member having a closed position in which a surface of said valve control member is opposed to and spaced from said valve body member surface;
  - e. a flexible seal member interposed between said valve control member and said valve body member, said seal member having a passage to conduct fluid from said inlet port to the valve control member, said passage having a multi-sided configuration with corners between the sides;
  - f. said passage having an intermediate enlargement forming a continuous inner lip and a continuous outer lip respectively cooperable with the valve body member surface and said valve control member surface the distal edges of which lips define said multi-sided configuration; said lips being subjected to fluid pressure conducted to said enlargement via said inlet port to urge said lips into sealing engagement with said surfaces; and
  - g. compressible and resilient endless ring means fitted in the bottom of said enlargement and about said corners, said ring means having a nominal thickness slightly greater than the nominal spacing between said lips thus providing a mechanical assist to the sealing engagement of said lips to said surfaces and to prevent distortions of said lip from precluding an operative seal, said ring means having a substantially D-shaped cross-sectional configuration with the flat located on the inside of the ring, said D-shaped configuration minimizing lateral bulge at said corners.

**4,009,864**  
**THROTTLING SLOT CONFIGURATION FOR A VALVE SPOOL**  
Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.  
Filed Feb. 4, 1975, Ser. No. 546,950  
Int. Cl.<sup>2</sup> F16K 47/04, 5/10, 11/07  
U.S. Cl. 251-282

8 Claims

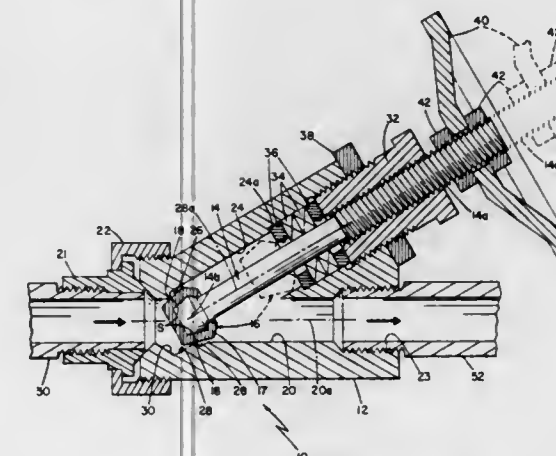


1. In a control valve having a spool reciprocable along its axis within a bore formed in the valve with the spool having a reduced diameter portion and an axially adjacent land formed thereon for controlling fluid flow from a high pressure source to an area of low pressure upon movement of the spool in one direction in which the land leads the reduced diameter portion, wherein the improvement comprises:

means forming a throttling slot in the spool interconnecting the reduced diameter portion and a peripheral surface of the land, said throttling slot including means forming a pocket recessed into the land and means forming a groove having sides which extend from the pocket longitudinally along the spool substantially parallel to the axis of the spool and an end connected to the sides and intersecting said reduced diameter portion, said pocket having a sidewall disposed remote from the groove and inclined relative to the axis of the spool in a direction radially outwardly and axially opposite to the one direction.

**4,009,865**  
**REGULATING FLOW**  
Irwin H. Davlin, 714 S. Court St., Opelousas, La. 70570  
Filed Sept. 15, 1975, Ser. No. 613,280  
Int. Cl.<sup>2</sup> F16K 1/10  
U.S. Cl. 251-318

1 Claim



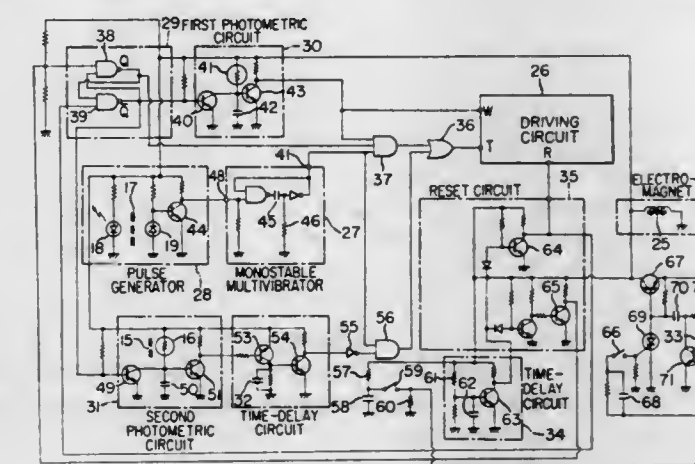
1. A valve comprising:
  - a body having a straight-through flow passage, said passage having a longitudinal axis therethrough and a cross-sectional area perpendicular to said axis,
  - a valve head moveable at a first acute angle with the downstream end of said passage into and out of said passage, and
  - a valve seat extending about said passage for cooperation

with said valve head to adjust said valve over a range from the wide-open to the closed condition, said valve seat approaching said axis of said passage no more closely than does the wall of the narrowest portion of said passage upstream or downstream of said seat, said seat being formed by an annular first recess in the wall of said passage, the plane of said recess being at a second acute angle to said axis of said passage, said first recess being formed by a first bore extending at said first acute angle into said passage, said bore permitting said valve head to pass therethrough, said wall of said passage having a second recess therein formed upstream of said first recess, said second recess permitting said valve head to extend through and beyond said seat, said second recess being formed by a second bore, coaxial with said first bore, narrower than said first bore, and deeper than said first bore, whereby in said wide-open condition, said valve head is removed from said passage, said axis of said passage remains a straight line, and said cross-sectional area of said passage at the position of said seat is no less than it is at the narrowest portion of said passage upstream or downstream of said seat.

**4,009,866**  
**EXPOSURE CONTROL DEVICE**  
Hiroshi Iwata, Osaka, and Katsuji Ishikawa, Higashi-Osaka, both of Japan, assignors to West Electric Company, Ltd., Japan  
Filed Oct. 14, 1975, Ser. No. 621,845  
Claims priority, application Japan, Oct. 18, 1974, 49-120900  
Int. Cl.<sup>2</sup> G03B 7/14

U.S. Cl. 354-29

4 Claims



1. In exposure control device of the type comprising exposure means comprising
  - a plurality of shutter blades which also function as the aperture setting blades,
  - a step-motor drivingly coupled to said shutter blades for displacing stepwise said shutter blades, and
  - a driving circuit adapted to control the at least one rotation of said step-motor in response to the driving pulse and pulse signal generating means adapted to generate the driving pulse or pulses in response to the brightness of a subject detected and to apply said driving pulse or pulses to said driving circuit, thereby causing said shutter blades to open and close, an improvement comprising
    - a. step-motor locking means adapted to lock said step-motor in inoperative position when said shutter blades remain closed, and but to release said step-motor when the exposure operation is started,
    - b. means adapted to control said step-motor locking means.



4,009,867

## SPRING COMPRESSOR

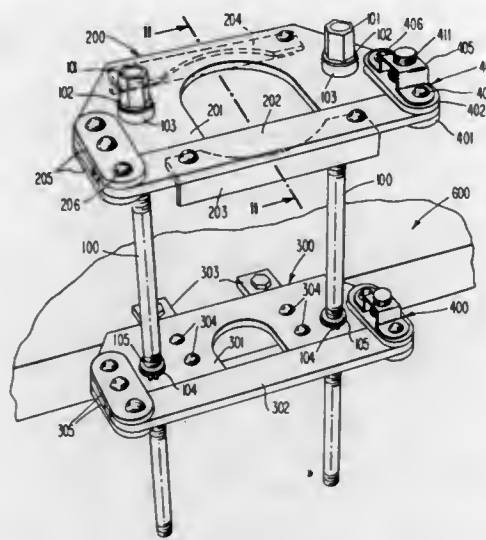
Walter L. Diffenderfer, Lancaster, Pa., assignor to K-D Manufacturing Company, Lancaster, Pa.

Filed Apr. 26, 1976, Ser. No. 680,157

Int. Cl.<sup>2</sup> B23P 19/04

U.S. Cl. 254—10.5

5 Claims



1. A spring compressing unit for use with a MacPherson strut assembly comprising:

- Two parallel end plates adapted to securely engage the housing containing the ends of the spiral spring of the MacPherson strut assembly, wherein apertures in said end plates allow the tubular shock assembly of said MacPherson strut assembly to extend through and beyond said end plates;
- Support means joining the two end plates adapted to vary the perpendicular distance between the two end plates to compress the spring as desired;
- Latch means to secure the MacPherson strut assembly in place pivotally mounted on each end plate comprising a latch having a pivotal end and a free end and a pivotal mounting securing the latch to the end plate in such a manner that one side of the aperture in the end plate is formed by the inner edge of the latch when the latch is in the closed position;
- A quick release catch on the free end of the latch assembly adapted to securely hold the free end of the latch assembly to the end plate when the latch assembly is in the closed position.

4,009,868

## FRONT-DISCHARGE TRANSIT CONCRETE MIXER

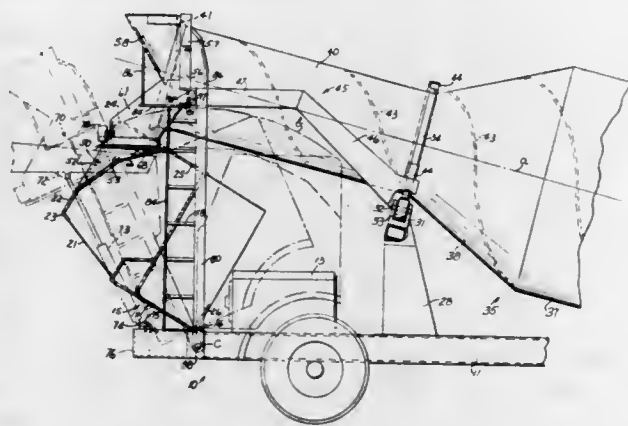
James P. Blind, St. Louis County, Mo., assignor to Panaview Co., Valley Park, Mo.

Filed Mar. 5, 1976, Ser. No. 664,295

Int. Cl.<sup>2</sup> B28C 7/16, 5/18

U.S. Cl. 259—172

14 Claims



1. A front discharging transit concrete mixer comprising a tiltable cab-around-engine truck chassis of the type having

means to permit forward tilt of the cab through an angle of substantially 45° or more about a lower forward transverse tilt axis and having within the cab an engine enclosure and a driver's position at one side thereof,

a rotatable mixer barrel mounted on said chassis and having an axis of rotation directed forward and slantingly upward and having a barrel extension therealong projecting forward beyond the cab, said barrel and barrel extension having internal vanes so convoluted as to deliver concrete mix therefrom when rotated in one sense and to retain and continuously agitate it therein when rotated in the opposite sense,

fixed discharge apparatus at the forward end of said barrel extension supported forwardly of the cab and above the level thereof, and having support structure including columns laterally outward of the cab adjacent to its forward end,

said fixed discharge apparatus including a discharge funnel in position to receive concrete delivered by said barrel extension and a horizontal ring bearing positioned about the lower end of said discharge funnel, and

a removable discharge chute the upper end of which is supported rotatably by and beneath said ring bearing in position to receive concrete from said discharge funnel, the cab roof and rear wall having a channel portion under the barrel extension and over the engine enclosure, whereby to accommodate said barrel extension,

said channel portion increasing in depth toward the rear sufficiently to pass said barrel extension when the cab is tilted forward,

whereby, on removal of said removable discharge chute from its support by said ring bearing, the cab may be tilted fully forward beneath the fixed discharge apparatus and between the columns for access to the engine.

4,009,869

## APPARATUS FOR TREATMENT OF ROLLED WIRE

Karl Rebuschat, Duisburg, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

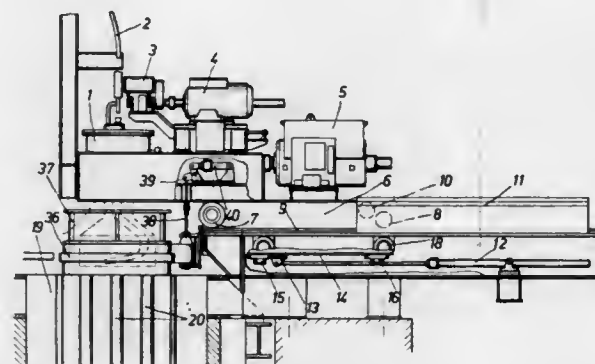
Filed Aug. 6, 1975, Ser. No. 602,200

Claims priority, application Germany, Aug. 10, 1974, 2438565

Int. Cl.<sup>2</sup> C21D 1/62

U.S. Cl. 266—112

7 Claims



2. Apparatus for the liquid treatment of hot rolled wire issuing from rolling apparatus, and having a wire coiling reel in vertical axial orientation, power means for driving said reel and a liquid treating container disposed beneath said reel in vertical axial orientation; characterized by

- said container being closed at the bottom with an open top for receiving wire coiled by said reel;
- a liquid treating medium in said container, said container receiving and treating said wire simultaneously as it is coiled by said reel;
- first means for supporting said reel over said container;
- first means including reversible power means for moving said support means toward and away from said container for moving said reel in a first position over said container and then away from said container to a second position;

- a first pair of rails for supporting said first support means for movement of said reel from said first position to said second position and vice versa;
- said reel being cantilevered from said first support means; and
- said first pair of rails ending at a point spaced from said container.

4,009,870

## METALLURGICAL SHAFT FURNACE

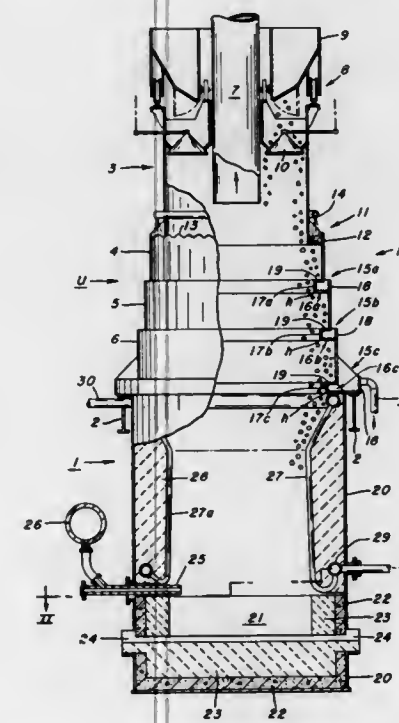
Richard F. Obenchain, 3340 Comanche Road, Pittsburgh, Pa. 15241

Filed June 22, 1976, Ser. No. 698,355

Int. Cl.<sup>2</sup> C21B 7/10, 7/02

U.S. Cl. 266—192

16 Claims



1. In a metallurgical shaft furnace adapted to the production of molten metal from a charge, the furnace comprising an upper preheating portion and a lower melting portion terminating at its bottom in a hearth and having tuyeres therein, the improvement wherein

- the upper portion is comprised of concentric sections, each said section increasing in diameter with respect to an adjacent section from the upper charging section thereof to the lower melting portion, the charging section having an exhaust means and charging means, and a water channel at the lower portion thereof and means for feeding water to said channel, with other of adjacent said sections having a water trough therearound on the outer surface, said trough extending inwardly to form a cooling ring, each said cooling ring increasing in diameter from the section below the charging section to said lower melting portion, said cooling rings providing support for a portion of the charge to the furnace so as to divert hot gases to the center of the furnace for preheating of the charge therein.

4,009,871

## METALLURGICAL FURNACE

Richard F. Obenchain, 3340 Comanche Road, Pittsburgh, Pa. 15241

Filed June 22, 1976, Ser. No. 698,356

Int. Cl.<sup>2</sup> C21B 7/10, 7/02

U.S. Cl. 266—193

6 Claims

1. In a metallurgical furnace for use with sized material wherein the metal oxide component of the material has an average size between 1/4 to 2 inches in diameter, having a preheating portion of a specified diameter wherein the sized material remains as integral solids, the improvement comprising:

a plurality of inwardly directed projections about the interior wall of said preheating portion; the projections having a length equal to between 5 percent



to 15 percent of the diameter of the preheating portion, with adjacent projections being spaced from each other a distance equal to between two to ten times the length of the projections.

4,009,872

## ENERGY-CONSERVING, FAST-COOLING HEAT TREATING FURNACE

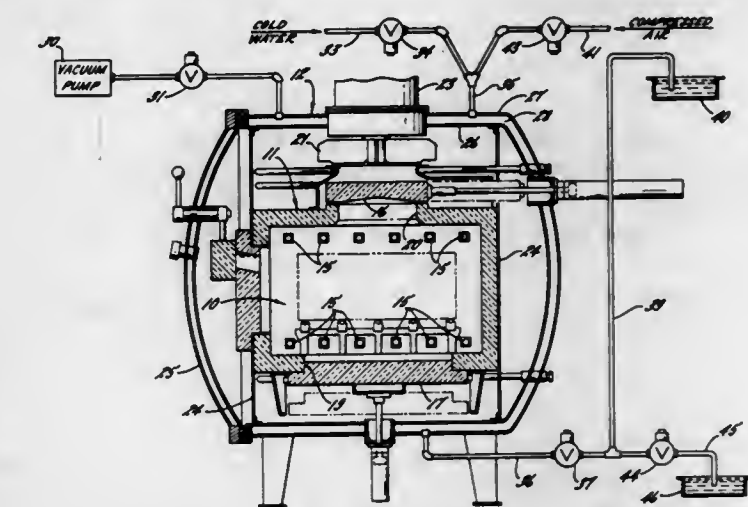
John F. McCoy, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed June 25, 1976, Ser. No. 699,951

Int. Cl.<sup>2</sup> C21D 1/00

U.S. Cl. 266—250

4 Claims



1. A heat treating furnace comprising a vessel defining a chamber for holding workpieces, selectively operable heating elements located within said chamber for heating said workpieces, selectively operable means for circulating a quenching gas within said chamber to cool said workpieces, at least part of said vessel being formed by inner and outer spaced apart walls defining a hollow jacket around at least part of said chamber, means for creating a vacuum within said jacket while said workpieces are being heated thereby to reduce heat transmission from said inner wall to said outer wall and to keep the latter wall comparatively cool, and means for circulating liquid through said jacket while said workpieces are being cooled by said quenching gas whereby said liquid cools said inner wall and said quenching gas to promote fast cooling of said workpieces.

4,009,873

## AIR-RIDE SUSPENSION ASSEMBLY

Philip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Inc., Fresno, Calif.

Filed Oct. 20, 1975, Ser. No. 623,646

Int. Cl.<sup>2</sup> B60G 11/46

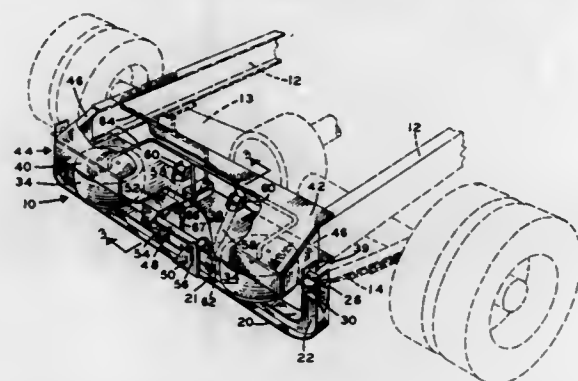
U.S. Cl. 267—15 A

9 Claims

1. An air-ride suspension assembly particularly adapted to be installed as an integrated unit on the frame of a wheeled vehicle comprising:



- A. a cradle adapted to be extended transversely beneath the frame of a selected vehicle and supported at each of the opposite ends thereof by said vehicle;
- B. a pair of laterally spaced air bags mounted on said cradle in substantially coplanar relation therewith;
- C. a pillow plate arranged in substantial coplanar relation with said cradle and seated on said pair of air bags adapted to receive adjacent end portions of a pair of longitudinal frame members for said vehicle; and



- D. centering means for supporting said frame in a centered relationship with said cradle comprising a pair of laterally spaced brackets, one bracket of said pair being rigidly affixed to said cradle and projected upwardly therefrom and the other bracket of said pair being rigidly affixed to said pillow plate and projected downwardly therefrom, and a radius rod extended between the brackets of said pair of brackets and pivotally connected thereto.

4,009,874

## PROPELLER MAKING APPARATUS

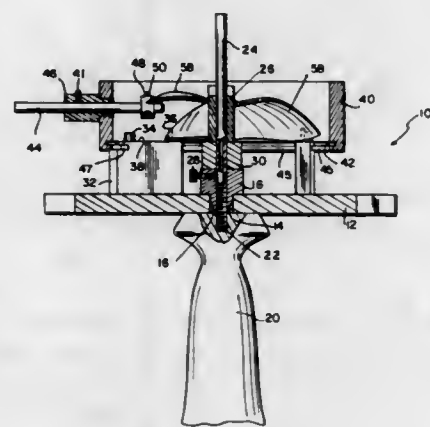
Emerson Dee Hughey, 840 E. 64th St., Indianapolis, Ind. 46240

Filed Apr. 26, 1976, Ser. No. 679,984

Int. Cl.<sup>2</sup> B25B 9/00

U.S. Cl. 269—3

11 Claims



1. Apparatus for making a propeller from a propeller hub and a plurality of propeller blade blanks, comprising a base; a shaft extending upwardly from said base for receiving the propeller hub; a plurality of blocks corresponding in number to the number of blade blanks and mounted on said base in a radial arrangement about said shaft; a pin extending upwardly from each of said blocks, said pins being disposed at equal radial distances from said shaft; positioning means mounted on said blocks; a collar positioned on said blocks by said positioning means and rotatable with respect thereto; a plurality of radially arranged inwardly extending arms mounted on said collar and corresponding in number to the number of blade blanks; and holding means mounted on each of said arms whereby each blade blank is supportable by contact with the hub, one of said pins, and said holding means on one of said arms, with the pitch angle of each blade blank with respect to the hub depending upon the position of rotation of said collar with respect to said blocks.

4,009,875

## FLETCHING JIG

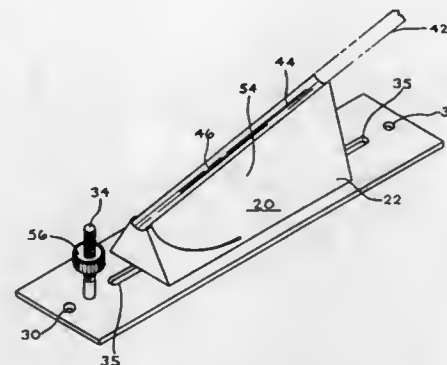
Roger S. Erlandson, Rte. 2, Box 2185, Elk Grove, Calif. 95624

Filed Aug. 13, 1976, Ser. No. 714,029

Int. Cl.<sup>2</sup> B25B 1/20

U.S. Cl. 269—38

10 Claims



1. An improved arrow fletching jig for use with a multi-vane fletch having a bridge between adjacent vanes, said jig comprising, in combination:

- an upstanding jig block having sidewalls and an upper surface, the latter being adapted to support an arrow shaft and the bridge of a multi-vane fletch against said shaft for proper bonding and fletching;
- an upstanding nock post spaced from said block, said post including means for releasably receiving the nock of an arrow when the shaft of said arrow is on said block;
- means for releasably securing an arrow shaft to said block and for facilitating the joining of said fletch bridge to said shaft; and
- a base support to which said block is secured and defining a plurality of vertical apertures adapted to receive the lower end of said post, said apertures being spaced along the longitudinal axis of said block but external of said block, whereby the spacing between said block and post can be varied.

4,009,876

## SHEET FEEDING MECHANISM

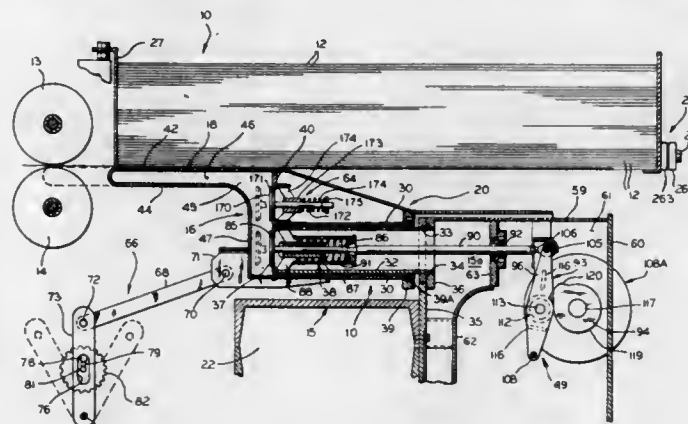
RaImond J. Smiltneek, Butler, Wis., assignor to Uniplex, Inc., Milwaukee, Wis.

Filed Mar. 24, 1975, Ser. No. 561,411

Int. Cl.<sup>2</sup> B65H 3/12

U.S. Cl. 271—99

16 Claims



1. Apparatus for feeding blanks into process machinery and including translatable means including enclosure defining means and perforated blank engaging means mounted on an upper portion of said enclosure defining means for engaging said blanks and operative when said enclosure defining means is subjected to a vacuum to grip a blank, operating means for reciprocating said translatable means from an initial position and in a first direction toward said process machinery and for return movement to said initial position,

elongated tubular means extending generally in the direction of movement of said translatable means, said tubular means being connected to a vacuum source and having an opening adjacent one end, said translatable means including sleeve means affixed to said enclosure defining means and telescopically movable with respect to said tubular means for placing said enclosure defining means in communication with said tubular means through said opening, said enclosure defining means being disposed adjacent said tubular means opening and is in communication therewith when said translatable means is in its initial position, and evacuating valve means for sealing the opening in said tubular means and valve operating means for opening and closing said valve means in timed relation to the cycle of said translatable means.

15. Apparatus for feeding blanks from a stack into process machinery having feed rolls and including a suction means, means for supporting said blanks above said suction means, said suction means being operative when subjected to a vacuum to grip the lowermost blank in said stack and for releasing the same in a timed relation, translating means for reciprocating said suction means toward and away from said feed rolls, first and second frame means extending generally parallel to the direction of movement of said suction means and one being disposed on each of the opposite sides thereof, said support means including a first elongate member extending between said first and second frame means and in a direction generally normal thereto, means mounting the opposite ends of said first elongate member on said frame portions and operable for selectively moving said first elongate member in said direction, said support means including a second elongate member mounted on said first elongate member for pivotal movement about an axis generally parallel to said direction, and locking means operative to lock said second elongate member in its pivotal angular position, and blank engaging means mounted on said second elongate member and being pivotal therewith.

4,009,877

## DOCUMENT TRANSPORT DEVICE

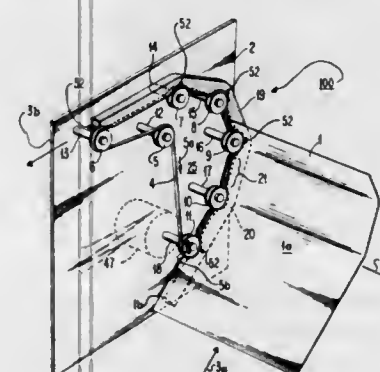
John Wesley Ward, Jr., Pflugerville, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1975, Ser. No. 627,984

Int. Cl.<sup>2</sup> B65H 29/16

U.S. Cl. 271—272

3 Claims



1. Document transport apparatus, comprising:
- a drive train assembly comprising a plurality of idle pulleys, a belt of relatively high coefficient of friction material disposed around said pulleys, and means for continuously advancing said belt along a transport path from a single document entry location to a document exit location defined by said pulleys, and
  - a rigidly mounted strip of material having a low coefficient of friction, said strip having a principal surface following the contour of, and cooperating with, said belt to

define a guideway for documents advanced along said transport path, said principal surface having first surface portions recessed from said pulleys and said second surface portions intermediate said pulleys immediately adjacent said belt defining document pinch points, whereby documents aligned within said guideway are transportably engaged by said belt at said pinch points and are substantially released from said engagement at the location of said first recessed surface portions.

4,009,878

## SHEET CARRYING APPARATUS

Paul Scheck, Prille, Switzerland, assignor to J. Bobst &amp; Fils, S.A., Switzerland

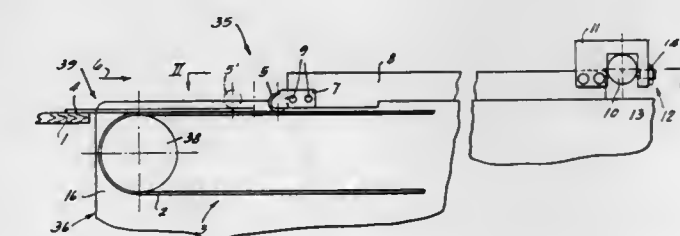
Filed Sept. 11, 1975, Ser. No. 612,571

Claims priority, application Switzerland, Oct. 2, 1974, 013250/74

Int. Cl.<sup>2</sup> B65H 5/02

U.S. Cl. 271—272

10 Claims



1. A sheet transporting apparatus for use in a sheet processing machine, comprising means for receiving a sheet, means including a transporting surface for transporting the sheet from the means for receiving the sheet, pressing means cooperating with the means for transporting to ensure nipping of a leading edge of a sheet between the pressing means and the transporting surface of the means for transporting, and means for shifting the pressing means along the transporting surface between an advanced position engaging a leading edge of the sheet and a retracted position clear of the leading edge of the sheet as the leading edge is deposited on the transporting means.

4,009,879

## BARNSTORMER GAME

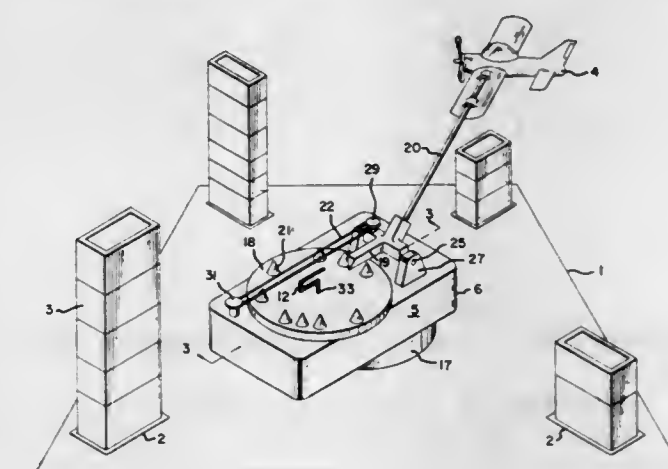
Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055

Filed Feb. 27, 1975, Ser. No. 553,690

Int. Cl.<sup>2</sup> A63H 17/00

U.S. Cl. 272—31 A

10 Claims



1. A toy or game which includes a base, a platform rotatable on said base about a first axis, camming means rotatable on said platform about a second axis displaced from and parallel to the first axis and provided with a plurality of randomly spaced lobes, drive means means cooperating with the drive means to effect simulta-



neously rotation of the platform and said camming means about their respective axes.  
 an object, means mounting said object to the platform to rotate therewith about said first axis and to have motions normal to the plane of said platform,  
 said object being provided with a cam follower cooperating with each of said lobes for effecting said motions of the object normal to the plane of said platform at random intervals upon operation of said drive means.

4,009,880

## RECREATIONAL DEVICE

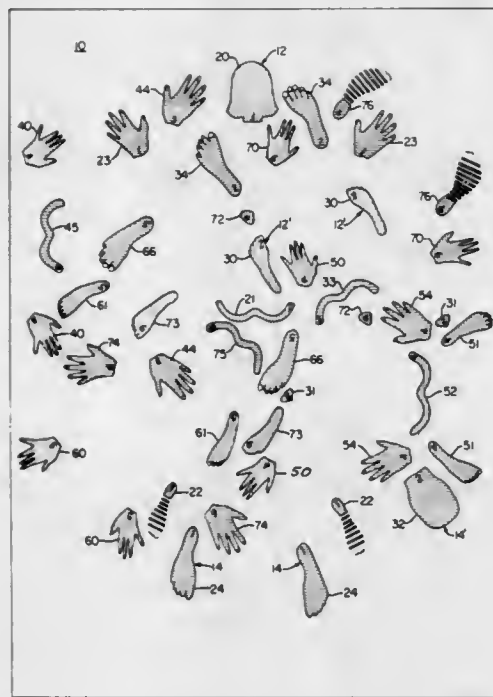
William B. Lammersen, Littleton, Colo., assignor to Patterns to Play By, Inc., Golden, Colo.

Filed Nov. 17, 1975, Ser. No. 632,503

Int. Cl.<sup>2</sup> A63F 9/00

U.S. Cl. 273-1 R

4 Claims



1. In combination, an amusement device comprising:  
 a substantially flat horizontal surface portion,  
 outlines of at least a pair of human forms represented on the surface portion, the outline of each human form being defined by representations of extremities of the human body with distinctive patterns to represent face-up and face-down positions of the human form, and each having a different distinctive representation than each other outline so as to be readily distinguishable therefrom, said outlines being arranged in different predetermined patterns on said sheet of material whereby to permit two or more persons to simultaneously occupy the outlines on said sheet and to assume different positions on said surface portion.

4,009,881

## GAME APPARATUS

Orville J. Potter, III, Star Rte. 1 Box 333B, Bremerton, Wash. 98310

Filed May 30, 1975, Ser. No. 582,196

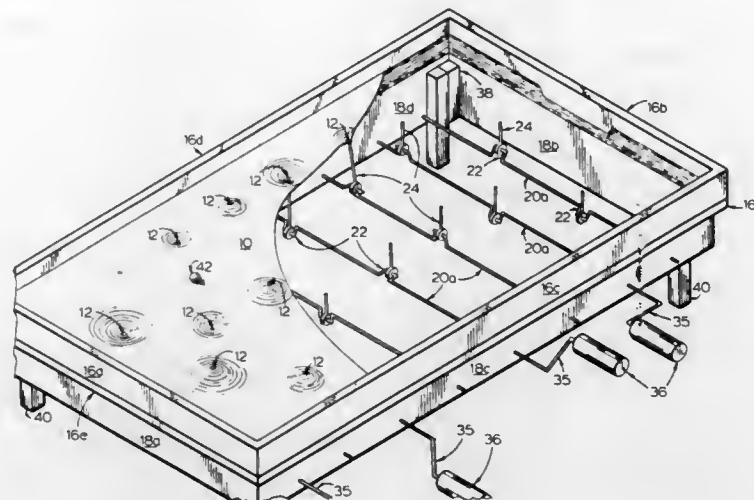
Int. Cl.<sup>2</sup> A63F 7/06

U.S. Cl. 273-115

2 Claims

2. In a game apparatus wherein a ball adapted to roll upon the top surface of a horizontally disposed, flexible sheet stretched across a rectangular frame is propelled across the surface of said sheet by actuating means for producing vertical displacements of said sheet at localized areas, said sheet having goals positioned at opposite ends thereof, the improvement whereby each of said goals comprise an area of said sheet depressed beneath the mean level surface of said sheet and having a sufficient depth to retain said ball, said depressed

areas conforming to indentations in the top edge of said frame at opposite ends thereof having a width equal to the width of



said goal whereby balls entering said goals are retained against the respective end walls of said frame.

4,009,882

## THREE-DIMENSIONAL WORD GAME APPARATUS

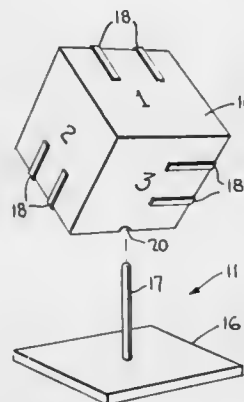
James E. Rader, R.F.D. One, Plainfield, Vt. 05667

Continuation-in-part of Ser. No. 494,984, Aug. 5, 1974, Pat. No. 3,930,651. This application Jan. 5, 1976, Ser. No. 646,478

Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273-135 D

10 Claims



1. A three-dimensional word game apparatus, which comprises:

a cubical solid having six faces defining respectively six different playing surfaces; and  
 paper means upon which is formed indicia indicative of six individual playing areas, each area including a plurality of playing spaces, and location identification indicia uniquely identifying each of said plurality of playing spaces, said paper means sized such that each of said six individual playing areas covers respectively each of said six faces of said cubical solid.

4,009,883

## BALL GAME PRACTICING DEVICE

Stuart Yellowlees, 64 Oxford St., and William Neil Dey, c/o Yellowlees, 64 Oxford St., both of Whitley Bay, Tyne & Wear, England

Filed June 13, 1975, Ser. No. 586,701

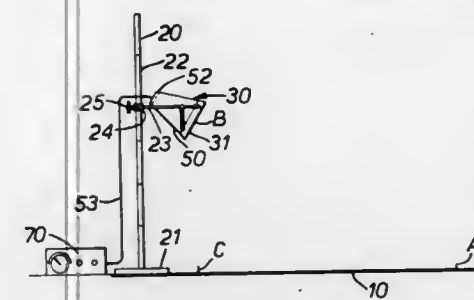
Int. Cl.<sup>2</sup> A63B 69/36

U.S. Cl. 273-181 C

7 Claims

1. Apparatus for practising ball games comprising: a base line, defined on a board or sheet defining a ball striking position and a vertical axis position for a target; target supporting means adjustably supported on vertical support means and the target being adjustably supported on the target support means; a microphone positioned at a predefined distance and orientation from the centre of the target, said microphone serving to receive a sound produced by a ball impacting against said

target; and measuring means connected to said microphone for receiving output signals therefrom and measuring such



signals and in response providing an indication of the intensity of the impact of a ball.

4,009,884

## BRIDGE GAME

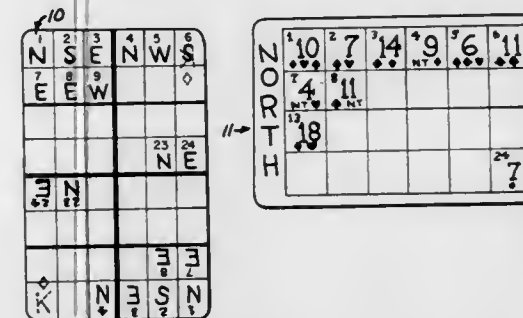
William Weigl, 11033 Greenhaven Parkway, Brecksville, Ohio 44141

Filed Oct. 25, 1973, Ser. No. 409,640

Int. Cl.<sup>2</sup> A63F 1/00

U.S. Cl. 273-149 P

12 Claims



1. In a contract bridge game for play by two or three players, wherein an unexposed predetermined thirteen-card dummy hand is preliminarily established at each hand played for bidding thereon by at least one of said players and thereafter thirteen cards are dealt to each player,

a standard four-suit bridge deck of fifty-two cards,  
 coding means associated with the cards of said deck for selecting, without viewing the faces thereof, a plurality of different predetermined dummy hands from said deck, and

means associated with the faces of the cards of each different predetermined dummy hand of said deck for indicating the general strength without revealing the specific contents of each predetermined dummy hand to provide at least each bidding player with an approximate indication of the combined strength of his specific hand and a given unexposed predetermined dummy hand, as a basis from which each bidding player may contract for the number of individual tricks such bidding player expects to take subsequently upon laying open said dummy hand and actually playing a game.

10. The method of playing a two-handed bridge game utilizing a standard four-suit bridge deck of fifty-two cards, comprising the steps of,

selecting from said deck, without viewing the faces of the cards thereof, a predetermined thirteen-card dummy hand in accordance with an established coding system associated with said cards,  
 dealing a thirteen-card hand to each player and setting aside the remaining thirteen cards,

making available to at least one of said players general, but not specific, information relative to the approximate contents of said predetermined dummy hand while said hand remains unexposed,

contract bidding for said dummy hand by each bidding player combining the specific strength of his hand with the approximate strength of said unexposed dummy hand,

exposing said dummy hand by laying it open opposite the bidder to whom the dummy is awarded upon completion of bidding, and  
 playing said hand in accordance with the established rules of bridge.

4,009,885

## STEREO PHONOGRAPH PICK-UP CARTRIDGE

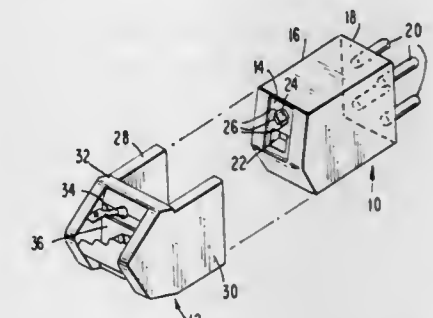
Peter E. Pritchard, New Milford, Conn., assignor to Sonic Research Inc., Danbury, Conn.

Filed Sept. 8, 1975, Ser. No. 611,214

Int. Cl.<sup>2</sup> G11B 3/46; H04R 1/16, 1/108

U.S. Cl. 274-37

8 Claims



1. An electromagnetic pick-up cartridge for phonograph records comprising:

a housing containing sensing means and having a noncircular aperture in the forward wall thereof;  
 a stylus assembly including a rearwardly-extending boss adapted for insertion into said aperture in a slight interference fit, whereby said assembly may be secured to said housing;  
 a stylus cantilever mounted in said stylus assembly on a resilient pivot block, said pivot block comprising an outer, cylindrical portion and an inner, inwardly-tapering portion terminating in a square, stylus cantilever-engaging aperture, said engagement defining the pivot point of said cantilever;  
 a magnetically permeable armature forming part of said cantilever; and  
 a magnet mounted in said stylus assembly to magnetically energize said armature.

4,009,886

## SPINDLE ADAPTER

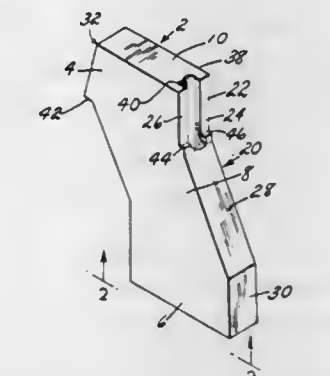
Gerald Shirley, 111 Lake Ave., Tuckahoe, N.Y. 10707

Filed Sept. 18, 1975, Ser. No. 614,641

Int. Cl.<sup>2</sup> G11B 17/04

U.S. Cl. 274-10 S

11 Claims



1. A flat spindle adapter for use with a record changer having a rotatable turntable and a small diameter spindle adapted to receive a record with a small diameter central opening, said spindle having means for supporting a record at a proximal edge thereof, said proximal edge defining the small diameter central opening of the record, said spindle also having means for shifting a record laterally relative to said spin-



dle, said spindle adapter having a body with a passageway to receive said small diameter spindle, said passageway having an exposed segment at least at the said spindle supporting means, means associated with said spindle supporting means, to fix the position of the spindle adapter so that the line defining the path of movement of the said record shifting means is at an angle of from about 5° to about 45° relative to the line formed by extending a diameter line of the spindle through the midpoint of the exposed segment of said passageway.

4,009,887

## HYDRAULIC PRESS SEAL

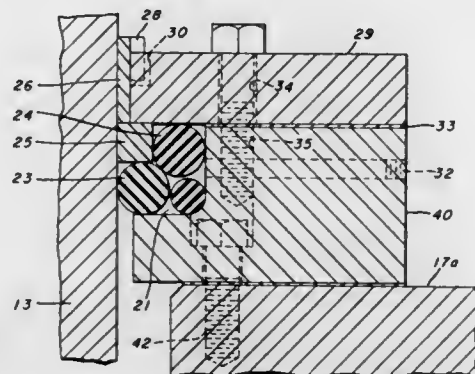
Paul D. Hanson; Jack E. Binning, and Harry J. Kent, all of Pittsburgh, Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1975, Ser. No. 645,670

Int. Cl.<sup>2</sup> F16J 1/00; B30B 1/32

U.S. Cl. 277-187

5 Claims



1. A seal assembly for sealing the peripheral gap between a vertically movable ram and a stationary fluid reservoir of a hydraulic press to prevent fluid leakage therebetween, said seal assembly comprising:

- a first elongated, resilient, cylindrical member longitudinally disposed in a longitudinally extending, generally semi-circular channel formed in the top edge of the fluid reservoir and confronting the side wall of the ram;
- a second elongated, resilient, cylindrical member disposed parallel to and in abutting relationship with the first cylindrical member;
- a third elongated, resilient, cylindrical member disposed parallel to, overlying and in abutting relationship with the first and second cylindrical members;
- a plurality of adjacent elongated metal strips, with a narrow gap between adjacent strips, each of said strips being rectangular in transverse section and disposed parallel to said cylindrical members, one vertical face of said strip bearing against the third cylindrical member, the other vertical face bearing against the side wall of the ram and the bottom face bearing against the second cylindrical member; and
- an elongated cover plate secured to the top surface of side wall, one edge of the cover plate overhanging edge bearing both against the top surface of the elongated metal strip and the third cylindrical member.

4,009,888

## SELF-CONTAINED POWER CHUCK WITH CENTRIFUGALLY BALANCED JAWS

Walter Wallace, Kensington, Conn., assignor to Cushman Industries, Incorporated, Hartford, Conn.

Filed Nov. 24, 1975, Ser. No. 634,621

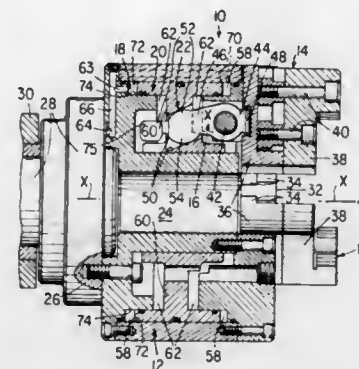
Int. Cl.<sup>2</sup> B23B 31/14

U.S. Cl. 279-1 C

6 Claims

1. A chuck providing jaws; a body having a longitudinal axis and a front face with ways for guiding said jaws for movement radially of said axis; a cylinder chamber in said body cross-sectionally ring-shaped about said axis; a sleeve-type piston in said cylinder chamber; levers pivoted in said body about axes

normal to said body axis and providing on opposite sides of their pivot axes first and second arms extending substantially longitudinally of said body axis, of which said first arms are operatively connected with said jaws, respectively, and said second arms are spaced closer from said body axis than said cylinder chamber; a drawhead on and projecting inwardly



from said piston and having cam surfaces inclined to said body axis, with said second lever arms having follower surfaces in engagement with said cam surfaces, respectively, for moving said jaws into and from gripping engagement with work on movement of said piston in opposite directions; and weights on said second lever arms for centrifugally balancing said jaws.

4,009,889

## TRAILER COUPLING

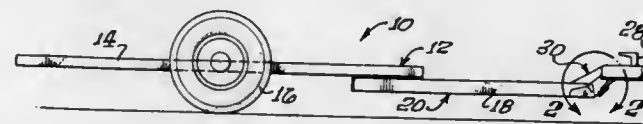
Marjorieann M. Smith, 3825 Valley, Sp. 56, Walnut, Calif. 91789

Filed June 16, 1975, Ser. No. 587,159

Int. Cl.<sup>2</sup> B62D 63/06; B60D 1/00

U.S. Cl. 280-423 R

6 Claims



1. A trailer to be towed by a vehicle having a rear trailer hitch including a coupling ball, comprising:

- a generally flat frame including a relatively low-slung bed and front converging tongue members forming a hitch tongue at the front end of said bed,
- a coupling member located above and forwardly of the front ends of said tongue members and having a socket for rotatably receiving said coupling ball,
- connecting means fabricating separately from and extending between said tongue members and coupling member and having upper and lower ends rigidly joined to said coupling member and tongue member ends, respectively;
- said connecting means comprising a pair of upper and lower generally U-section channels having side flanges and arranged with their open sides facing one another, their lower ends straddling the upper and lower sides of said tongue member ends and their flanges disposed in overlapping face to face contacting relation, means joining said overlapping flanges to one another, means rigidly securing said lower channel ends to said front tongue member ends, and means rigidly securing the upper channel ends to said coupling member, and
- wheels mounted on said frame bed along the sides of the bed.

4,009,890

## DEVICE FOR CONNECTING WORKING IMPLEMENT TO TRACTOR

Hiroaki Kawakita, and Shigeru Morita, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

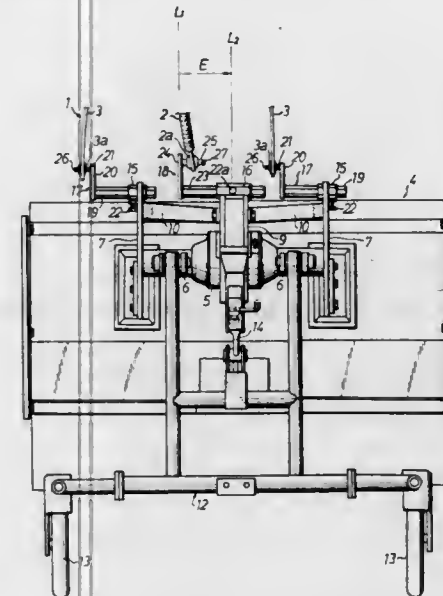
Filed Mar. 12, 1976, Ser. No. 666,510

Claims priority, application Japan, Mar. 19, 1975, 50-37326; May 21, 1975, 50-69627

Int. Cl.<sup>2</sup> B60D 1/16

U.S. Cl. 280-467

5 Claims



1. A device for connecting a working implement to a tractor including a three-point link, the device comprising generally L-shaped connectors each including a base plate with a projecting connecting rod and hitch pin, said hitch pins to be inserted into respective hitch holes at the rear end of the three-point link and each projecting from the connector eccentrically of the connecting rod, the connecting rod being slidably and fixedly mountable in a connecting bore formed in a frame of the implement laterally thereof to render the working implement connectable to the tractor in either of interchangeable tandem and offset arrangements.

4,009,891

## HAND TRUCKS

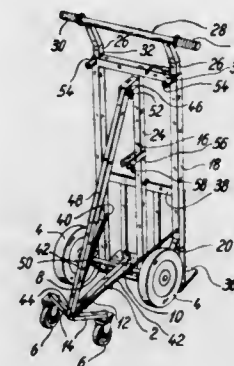
Oystein Jensen, 8355 Ny Solbjerg, Onstedvej 9, Denmark

Filed July 1, 1974, Ser. No. 485,040

Int. Cl.<sup>2</sup> B62B 3/02

U.S. Cl. 280-651

7 Claims



1. A hand truck comprising a driving chassis having a front end portion and a rear end portion and a telescopic tube arranged therebetween so as to allow the distance between said front and rear end portions to be varied, front wheel means mounted on said front end portion and rear wheel means mounted on said rear end portion so as to be operable to support the driving chassis on the ground with said telescopic tube substantially parallel therewith, an article carrier frame element pivotally secured to said front end portion of said chassis so as to be pivotal relative to the ground supported

driving chassis between an upright loading position substantially perpendicular to the driving chassis and a tilted transport position in which the carrier frame is inclined rearwardly over the carrier chassis so as to form an acute angle therewith, carrier frame element support means interposed between said carrier frame element and said driving chassis so as to be operable to support the frame element in its said transport position relatively to the driving chassis, and a connector rod hinged at its opposite ends to said rear chassis end portion and a point of said frame element above the pivoting axis of the frame element, respectively, so as to be operable to cause said telescopic tube to expand and said rear chassis end portion to be displaced away from said front chassis end portion in direct response to the carrier frame element and the driving chassis being mutually pivoted to diminish the angle therebetween, while correspondingly being operable to cause said telescopic tube to contract and said rear chassis end portion to be displaced towards said front chassis end portion in direct response to the carrier frame element and the driving chassis being mutually pivoted to enlarge the angle between them.

4,009,892

## METHOD AND PRODUCT FOR PREVENTING FRAUD IN DOCUMENT IDENTIFICATION

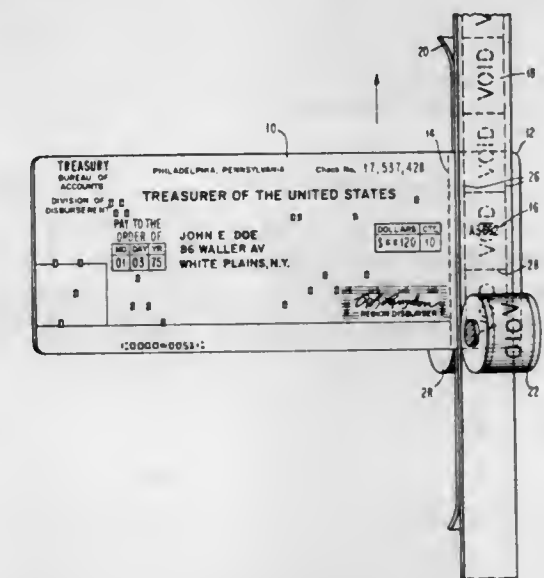
Eugene W. Nickerson, III, 19 Colvin Road, Scarsdale, N.Y. 10583

Filed Feb. 3, 1975, Ser. No. 546,595

Int. Cl.<sup>2</sup> B42D 15/00; C09D 11/00

U.S. Cl. 283-6

13 Claims



1. A method for protecting a payment order or similar instruments against collection by unauthorized persons comprising the steps of

- placing on a portion of said payment order a secret code designation known only to the correct payee,
- covering said secret code designation with a light impervious cover having a light-sensitive material micro-encapsulated in the surface thereof adjacent to the surface of said payment order, said material becoming irreversibly developed upon exposure to light,
- and exerting pressure in a pattern on the combination of said cover and said payment order to cause the micro-encapsulated light-sensitive material to be released from said cover and to be adhered to the adjacent surface of said payment order in the localized areas of the pattern of pressure so that whenever said cover is removed to expose said light-sensitive material said pattern of pressure soon becomes visible to thereby make premature removal detectable.



4,009,893

## TUBING OR CASING JOINT

Paul Schatton, Dusseldorf, and Wolfgang Hellmund, Viersen, both of Germany, assignors to Mannesmannrohren-Werke AG, Dusseldorf, Germany

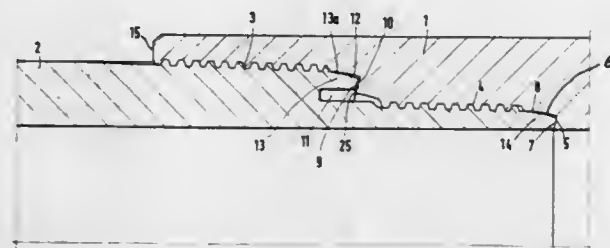
Filed Sept. 29, 1975, Ser. No. 617,795

Claims priority, application Germany, Sept. 27, 1974, 2446783; Dec. 3, 1974, 2457541

Int. Cl.<sup>2</sup> F16L 15/00

U.S. Cl. 285—110

7 Claims



1. In a joint between a pin tubing or casing member and a box casing member in oil field equipment or the like, wherein each of the members has two, axially spaced threaded portions for threaded engagement with the respective two threaded portions of the respective other member, a radial step defining transition zone between the two threaded portions for the two members, comprising:

an annulus of one of said members extending axially between the two threaded portions of the one member, leaving a radial recess between the annulus and a portion of the one member as continuing into one of the threaded portions, the annulus having a radially outwardly bulging surface portion and an axial end face, the other one of the members having a non-complementary surface portion in the step zone, but ahead of a radial step proper of said other member in said zone for metallic engagement with said bulging surface portion of the annulus, the bulging portion rolling on said non-complementary surface portion upon engagement, the other member further having a complementary face serving with said axial end face as thread stop.

4,009,894

## FITTING FOR INSULATED DUCT

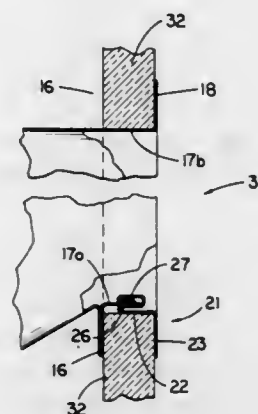
Ralph L. Marquette, and James E. Jones, both of Indianapolis, Ind., assignors to Mutz Corporation, Indianapolis, Ind.

Filed Jan. 16, 1976, Ser. No. 649,789

Int. Cl.<sup>2</sup> F16L 41/00

U.S. Cl. 285—183

3 Claims



1. A tubular fitting assembly adapted for end-to-side panel attachment to a duct whose side panels are formed of relatively thick but somewhat fragile thermal insulating material and which has a generally rectangular aperture cut therein to receive the fitting, said assembly comprising a tubular body having a rectangular end portion inserted into the duct aperture, said end portion being defined by a flange extending outwardly around three sides of the rectangular perimeter of the fitting and spaced from the end margin of the fitting by a

distance substantially equal to the duct panel thickness adjacent the duct aperture so that said flange bears against the outer face of the duct panel, an integral tab extending outwardly from the end margin of the section of said end portion forming the fourth side of the rectangular perimeter of the fitting so as to closely overlie the adjacent inner face of the duct panel, and a member which is generally L-shaped in cross-section, one of its leg portions being formed to receive and hold a section of the marginal area of the inserted portion of the fitting, said member being manually applied to the fitting margin by access through the tubular fitting after it has been inserted in the duct aperture, and said member being positioned diametrically opposite said tab with the other of its leg portions closely overlying the adjacent inner face of the duct panel to thereby secure the fitting to the panel.

4,009,895

## KNOCK-DOWN DUCT COLLAR

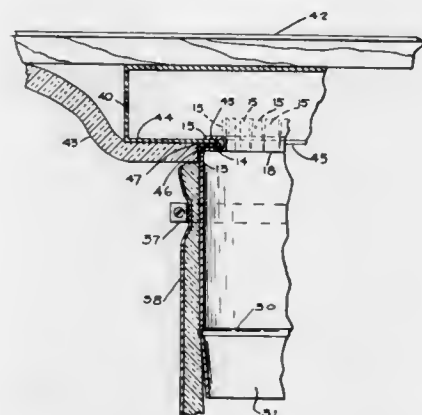
Nick J. Koskolos, Afton, Mo., assignor to Intertherm, Inc., St. Louis, Mo.

Filed Aug. 21, 1975, Ser. No. 606,537

Int. Cl.<sup>2</sup> F16L 41/00

U.S. Cl. 285—189

2 Claims



1. A knock-down duct connector collar adapted for easy assembly within a rounded opening in a duct planar surface, comprising

a generally rectangular sheet metal workpiece having two opposite side edges, each of said side edges being bent back at 180° from which margins extend, each of said margins having a first cut-out to provide a tab projecting endwise, one of its end edges being a duct-entrant edge, said workpiece being characterized in having along its outer end edge

an outer marginal portion extending to a closer parallel bend line, and an inner marginal portion extending therefrom to a farther inward parallel bend line, and bent in the opposite direction, together with

a plurality of second cut-outs extending from said end edge through both said marginal portions and narrowing to vertices at said farther bend line, thereby dividing both said marginal portions into segments, those segments between the two bend lines being trapezoidal, the total of the angles of their said vertices being at least 360°,

whereby on rounding the workpiece to form a collar with said bent-back margins on the inner side and bringing said edges into abutment and on joining said margins with a drive cleat, the tab on each said edge abuts the outer surface of the bent-back edge so brought into abutment with it thereby preventing the 180° bent edges from riding over each other when hoop compressive forces are applied, the said trapezoidal segments between said inner and outer bands form in effect a transverse planar inward flange which may be presented against the margin of such rounded duct surface opening, and the segments of the outer marginal portion form a nearly circular projecting flange of lesser diameter to be inserted through such rounded opening for bending back on the inside thereof.

4,009,896

## QUICK CONNECT COUPLING

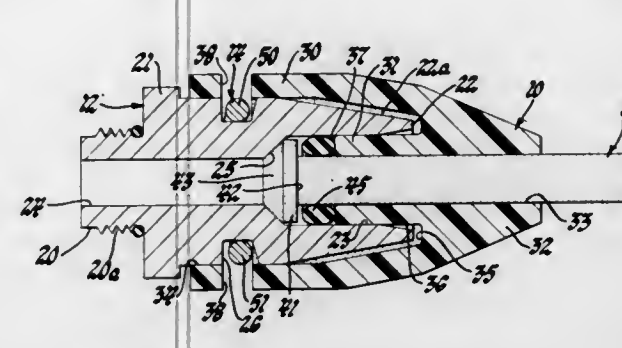
Robert W. Brewer, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 10, 1976, Ser. No. 685,042

Int. Cl.<sup>2</sup> F16L 37/00

U.S. Cl. 285—305

2 Claims



1. A quick connect coupling comprising in combination an adapter of tubular configuration having a stepped cylindrical opening therethrough defining at one end thereof a socket, a connector having body means at one end thereof defining an annular collar encircling a tubular plug and forming therewith a cavity to slidably receive one end of said adapter with said tubular plug slidably received in said socket of said adapter, a flexible tube slidably received by said tubular plug, said tube having an upset annular bead at one end thereof extending axially outward of said tubular plug in position to be encircled by said collar and receivable in said socket, an annular seal ring encircling said tube between said upset bead and the end of said tubular plug enclosed by said collar, said annular seal ring, when inserted into said socket, being radially compressed between an inner peripheral wall of said socket and the outer peripheral surface of said tube, said collar of said connector having diametrically opposed slots extending therethrough, said adapter having an annular groove on the outer peripheral surface thereof aligned with said slots in said connector when said connector is fully coupled relative to said adapter and, a spring retainer means encircling said connector, said spring retainer means having spaced apart leg portions loosely received in said slots for yielding engagement in said annular groove of said adapter.

4,009,897

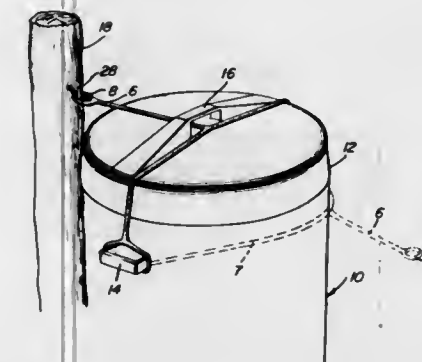
GARBAGE CAN AND LID TIE DOWN APPARATUS  
Michael P. Spellman, Rte. 1, E. Lake Ida, Alexandria, Minn. 56308

Filed Apr. 23, 1976, Ser. No. 679,665

Int. Cl.<sup>2</sup> B65D 45/30; E05C 19/18

U.S. Cl. 292—258

9 Claims



1. An integrally formed resilient tension strap constituting a hold down for garbage can lids and a can retainer, comprising a main stem having a loop formed at one end and bifurcated at the other end to provide two leg members each terminating in an elongated loop which leg members are adapted to be stretched across a garbage can lid and which elongated loops

are adapted to encircle the side handles of a garbage can, the first loop and main stem may be threaded through the cover handle to the side opposite the leg extension to provide a three point hold down arrangement to prevent removal of the lid and upset of the can.

4,009,898

## DRUM LIFTING ATTACHMENT

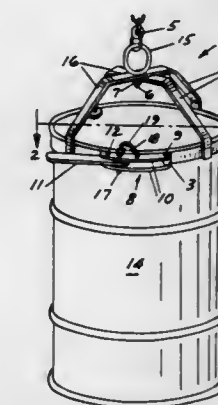
Harvie G. Hampton, 1863 S. Brookwood Drive, Shreveport, La. 71108

Filed Oct. 2, 1975, Ser. No. 618,821

Int. Cl.<sup>2</sup> B66C 1/18

U.S. Cl. 294—31.2

2 Claims



1. A drum lifting attachment comprising:  
a. a drum collar shaped to substantially encircle a drum and having a first flange means and a second flange means fitted to the ends thereof, respectively;  
b. a clamp lever having one end pivotally carried by said first flange means of said drum collar and the other end free, and a pair of clamp lock plates disposed in essentially parallel relationship, each of said clamp lock plates having one end pivotally carried by said second flange means of said drum collar and the other end pivoted to said clamp lever;  
c. two lift straps attached to said drum collar and spanning a diameter of said drum collar, and disposed at essentially a 90° angle with respect to each other and coinciding at the approximate center of and above the circle defined by said drum collar; and  
d. a lift ring pivotally secured to said lift straps at the coincidence of said lift straps.

4,009,899

## WAFFER TONGS

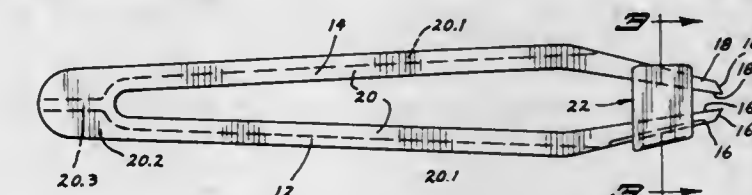
Douglas M. Johnson, Waconia, Minn., assignor to Fluoroware, Inc., Chaska, Minn.

Filed Oct. 16, 1975, Ser. No. 623,091

Int. Cl.<sup>2</sup> B25B 9/02

U.S. Cl. 294—33

10 Claims



1. Wafer tongs for gently but firmly grasping a delicate semiconductor wafer or the like, and comprising a pair of molded plastic resiliently joined handles terminating forwardly in normally spaced jaws arranged to grasp a wafer therebetween, the jaws having forwardly converging, confronting inner surfaces, an elongate stop carried by one of the jaws adjacent but spaced from its forward end and extending transversely of the jaws and entirely across the space between the jaws in position to contact the edge of a wafer to be grasped and to limit the distance to which the jaws may reach



inwardly of the wafer edge, the elongate stop being in non-interfering relation with the other jaw to permit wide separation of the jaws, and the jaws being resiliently flexible at a location forwardly of the stop to bow and resiliently flatten against opposed wafer surfaces to provide surface-to-surface contact of the jaws with the wafer to distribute the grasping force of the jaws over a significant area of the wafer.

4,009,900

## VERTICAL SNUBBER SHIPPING DEVICE

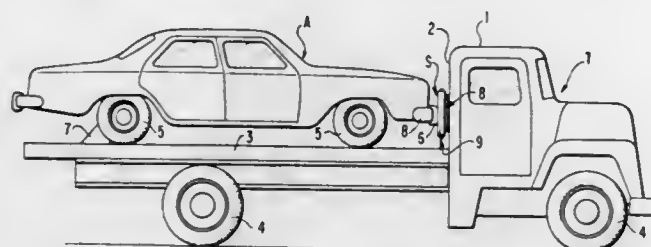
Thomas P. Didato, 32 Washington Ave., Middlesex, N.J. 08846

Filed Feb. 19, 1976, Ser. No. 659,406

Int. Cl.<sup>2</sup> B61D 3/16, 43/00; B62D 39/00; F16C 15/00

U.S. Cl. 296-1 A

24 Claims



1. For combination with a transporting vehicle having a relatively horizontal carrying surface and a relatively vertical surface extending upwardly from said carrying surface and generally transversely to the line of travel of said transporting vehicle, and a transported vehicle supported on said transporting vehicle relatively horizontal surface and having an end member, the transporting vehicle being subject to vertical shocks during ground travel which are transmitted to the transported vehicle with consequent relative vertical movements between said vehicles occurring; a snubber for interpositioning between said transporting vehicle relatively vertical surface and said transported vehicle end member, said snubber comprising a first element for securing to said transporting vehicle relatively vertical surface; a second element mounted on said first element for vertical both up-and-down movements relative thereto and having a vertical surface engageable by the end member of a transported vehicle supported on said relatively horizontal surface of said transporting vehicle for establishing the relative positions of said vehicles in the direction of travel of said transporting vehicle; and means for cushioning the up-and-down movements of said second element relative to said first element, whereby said second element and said transported vehicle end member in engagement therewith will move up and down substantially in unison without undue vertical rubbing of said transported vehicle end member on said second element.

11. In combination, a transporting vehicle having a relatively horizontal carrying surface and a relatively vertical surface extending upwardly from said carrying surface and generally transversely to the line of travel of said transporting vehicle; a transported vehicle supported on said transporting vehicle relatively horizontal surface and having an end member, the transporting vehicle being subject to vertical shocks during ground travel which are transmitted to the transported vehicle with consequent relative vertical movements between said vehicles occurring; and a snubber interposed between said transporting vehicle relatively vertical surface and said transported vehicle end member, said snubber comprising:

- a first element secured to said transporting vehicle relatively vertical surface;
- a second element mounted on said first element for vertical both up-and-down movements relative to said first element and having a vertical surface engaged by said transported vehicle end member for establishing the relative positions of said vehicles in the direction of travel of said transporting vehicle; and
- means cushioning the up-and-down movements of said second element relative to said first element, whereby said second element and said transported vehicle end

member in engagement therewith all move up-and-down substantially in unison without undue vertical rubbing of said transported vehicle end member on said second element.

24. In a snubber, the combination of a first element comprising a panel having openings therein, two side walls, spaced end walls, and rollers mounted between said side walls and having portions projecting partially through said openings; a second element comprising a roller engageable part and spaced end walls; guide rods attached to and extending between the end walls of one of said elements; guideway apertures in the end walls of the other of said elements through which said guide rods extend to mount said second element on said first element for sliding movements relative thereto with the end walls of said second element respectively overlapping the end walls of said first element and respectively being spaced therefrom, said guide rods and said guideway apertures positioning said second element relatively to said first element to provide engagement between said roller engageable part of said second element with said projecting roller portions; and coil springs surrounding said guide rods and being respectively interposed between and engaging the overlapping end walls of said first and second elements.

4,009,901

## DISCONNECT AND STORAGE MEANS FOR A WINDSHIELD WIPER ARM ASSEMBLY

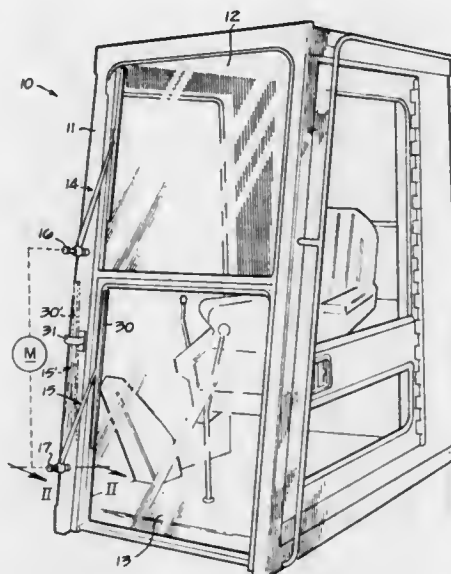
Gail G. Barbee, Montgomery, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 27, 1975, Ser. No. 608,296

Int. Cl.<sup>2</sup> B60S 1/34

U.S. Cl. 296-28 C

9 Claims



- A windshield wiper arm assembly comprising an elongated shaft adapted to oscillate about a longitudinal axis thereof, a wiper arm movably mounted on said shaft for selective longitudinal displacement between first and second positions thereon, means for normally coupling said wiper arm to said shaft for simultaneous oscillation therewith when said wiper arm is disposed at said first position and for permitting said shaft to oscillate relative to said shaft when said wiper arm is moved to said second position, an operator's cab comprising a frame and a windshield mounted on said frame to be moved between opened and closed positions thereon and wherein said wiper arm assembly is mounted on a side of said frame adjacent to said windshield, clip means secured on the side of said frame for retaining said wiper arm in the second position thereof on said frame and remote from said windshield retaining means releasable mounted in a groove on said shaft and abutting an outboard end of said wiper arm to retain it in its first position

on said shaft, and a second groove formed on said shaft in axially spaced relationship relative to said first-mentioned groove to retain said wiper arm in its second position.

4,009,902

## CONVERTIBLE ROOF FOR A MOTOR VEHICLE

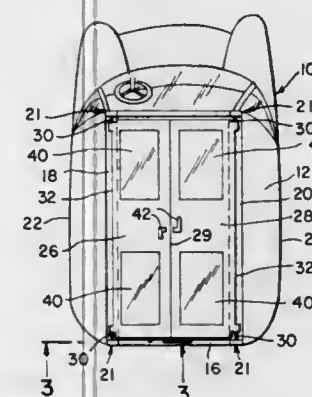
Robert Yoxheimer, 177 Devoe Ave., Yonkers, N.Y. 10705

Filed Oct. 15, 1975, Ser. No. 622,759

Int. Cl.<sup>2</sup> B60J 7/10

U.S. Cl. 296-137 B

2 Claims



1. A convertible roof for a motor vehicle having an opposed pair of sidewalls comprising:

- a rectangular opening in the roof of the vehicle; a pair of track means running generally vertically within the vehicle along said opposite sidewalls, said track means having upper extremes positioned along opposite sides of said roof opening; a pair of doors respectively mounted in said track means for enabling generally vertical movement of said doors, said doors being positionable along said track means and when so positioned having lower ends; pivot means carried on the lower ends of said doors; and means on the upper extremes of said track means for engaging said pivot means, said doors being dimensioned so that when said pivot means are engaged in the upper extremes of said track means, said doors can be rotated downward toward each other for closing the roof opening.

4,009,903

## RETRACTABLE SEAT

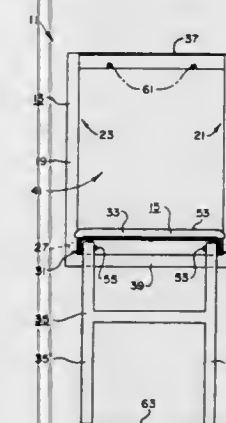
Robert O. Manspeaker, 2160 Pendleton, Memphis, Tenn. 38114

Filed June 22, 1972, Ser. No. 265,172

Int. Cl.<sup>2</sup> A47C 9/06

U.S. Cl. 297-14

6 Claims



- A retractable seat for movement between an open position and a closed, compact and out of the way position, said retractable seat comprising frame means for attachment to a vertical support, said frame means including first and second vertical members defining first and second vertical tracks, first and second bearing means respectively movably contacting

said first and second vertical tracks, first and second arm means respectively attached to said first and second bearing means, a seat member attached to said first and second arm means, leg means pivotally attached to said first and second arm means and adapted to rest on a horizontal support when said retractable seat is in said open position; said first and second arm means with said seat member attached thereto and with said leg means pivoted into a substantially parallel and nesting relationship therewith being retractable from said open position to said closed position with said seat member being substantially flat against and parallel with the vertical support; said frame means including a top member, a bottom member and said first and second vertical members defining an open-centered rectangle, each of said first and second vertical members including a front member, a rear member and a side member defining a channel opening towards the center of said frame means and said front and rear members defining first and second vertical tracks, each of said first and second arm means including a top member and a side member defining a right angle opening towards the center of said frame means, and said first and second arm means with said leg means pivoted into said right angle substantially parallel to and nesting within said first and second arm means being retractable into said open-centered rectangle of said frame means by downward pivoting action and upward sliding action at said bearing means and said first and second vertical track means of said frame means.

4,009,904

## SAFETY LEG FOR A CHAIR

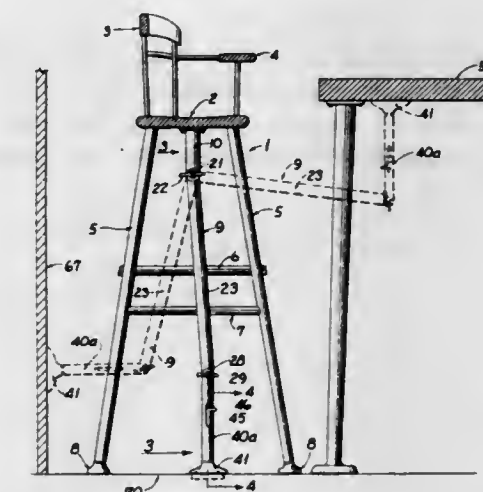
Wesley E. Sheldon, 1835 - 31st St., Greeley, Colo. 80631

Filed May 21, 1975, Ser. No. 579,682

Int. Cl.<sup>2</sup> A47C 7/62

U.S. Cl. 297-217

3 Claims



1. In combination with a chair having a seat and downwardly extending legs to rest upon a floor and an anchoring surface adjacent to the chair,

a safety holding leg secured to the undersurface of said seat, with said leg having a top portion, an intermediate and a terminal portion,

said safety holding leg including a first articulated joint near the undersurface of the seat to permit the intermediate leg portion, below the said top portion, to be angled laterally from the top portion, and including a second articulated joint remote from the undersurface of the seat to define the extended end of the intermediate portion, with said terminal portion extended beyond the end of the intermediate portion, to be angled with respect to the intermediate portion, whereby the safety holding leg can be shifted to various positions to permit the extended end of the terminal portion to reach and engage an anchoring surface, by a holding means carried by that end of the terminal portion, with said holding means being adapted to connect the terminal portion to the anchoring surface.



4,009,905

## SAFETY BELT ACCESSORY

Désiré Jean-Marie Bejeannin, 12, rue Gai Sejour, Longchaumois - Jura, France

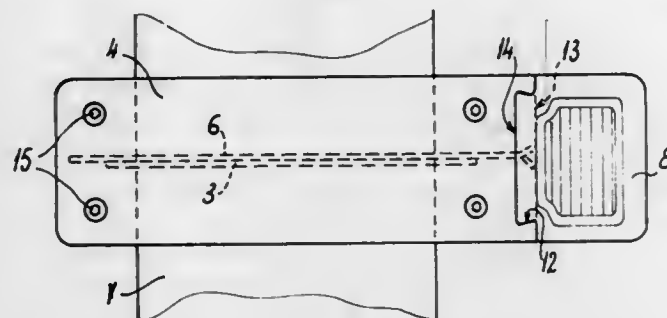
Filed Oct. 29, 1975, Ser. No. 626,874

Claims priority, application France, Oct. 30, 1974, 74.40157; Aug. 11, 1975, 75.25584

Int. Cl.<sup>2</sup> A62B 35/00

U.S. Cl. 297—385

11 Claims



1. In combination with an automotive seat belt, an apparatus comprising:

a housing securable to said seat belt, at least one elongated blade displaceable in said housing across said seat belt, said blade reaching across said belt along one side thereof,

means having a displaceable actuating element and connected to said blade at one end thereof for drawing same completely across said belt on actuation of said element with a force exceeding a predetermined minimum level, said blade having at the opposite end thereof a cutting edge inclined to said belt and positioned to slice through the same when said blade is drawn across said belt.

4,009,906

## METERING GATE FOR METERING A FLUID MATERIAL AS IT IS DISCHARGED FROM A HOPPER

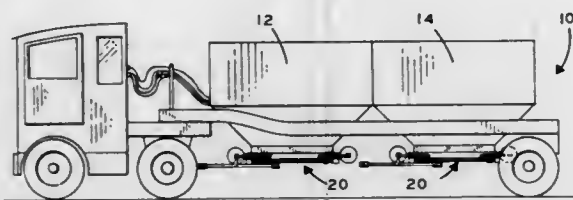
Philip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Inc., Fresno, Calif.

Filed Sept. 15, 1975, Ser. No. 613,055

Int. Cl.<sup>2</sup> B60P 1/56

U.S. Cl. 298—27

4 Claims



1. In combination with a hopper adapted to confine a fluid material including a vertically oriented discharge opening located in the bottom thereof, an improved metering gate for metering a fluid material as it is discharged from said hopper comprising:

A. means including a pair of closure panels arranged in coplanar relation for selectively closing said discharge opening;

B. means for supporting said pair of panels for rectilinear displacement in opposite directions along a pair of aligned linear paths including a pair of linear tracks extended in mutual parallelism along opposite sides of said discharge opening for receiving in supported relationship the opposite end portions of said closure panels;

C. drive means for simultaneously displacing said closure panels in opposite directions along said pair of paths including a first ram connected to one closure panel of said pair, and a second ram connected to the other closure panel of said pair;

D. motion balancing means interconnecting said closure panels for equalizing the distances through which said panels are displaced along said paths by said first and second rams;

E. a bell crank supported for oscillating displacement and a pair of connecting rods interconnecting the opposite arms of said bell crank with said pair of closure panels; and

F. lag-elimination means interconnecting the opposite ends of each closure panel of said pair for equalizing the displacement imparted thereto by said drive means, comprising a rotatable drive shaft extended between the opposite ends of each of the panels, a pair of racks mounted on each panel of the pair of closure panels, near the opposite ends thereof, and extended in parallelism with the path of the panel, and a pinion gear meshed with each rack of said pair of racks and rigidly affixed to the drive shaft extended between the opposite ends of the closure panel on which the rack is mounted.

4,009,907

## BOTTOM DISCHARGE HOPPER SEAL

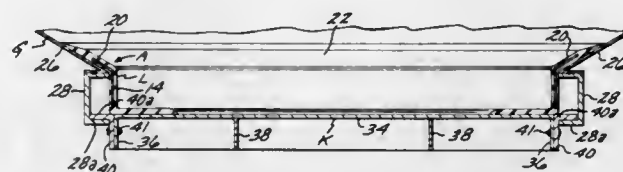
Gary Lee Stanfill, Bakersfield, Calif., assignor to Midway Fishing Tool Co., Long Beach, Calif.

Filed Feb. 26, 1976, Ser. No. 661,484

Int. Cl.<sup>2</sup> B61D 7/04

U.S. Cl. 298—27

5 Claims



1. In combination with a rectangular hopper having a cover and a lower portion defined by two laterally spaced longitudinally extending walls that taper downwardly and inwardly towards one another, a forward wall that tapers downwardly and rearwardly, a rearward wall that tapers downwardly and forwardly, said walls at their lower extremities defining an opening through which granular material in said hopper may discharge by gravity, said longitudinally extending walls having two parallel guides of channel shape transverse cross section secured to the lower extremities thereof, a gate in the form of a rectangular plate slidably supported in said guides, said gate when in a first position completely closing said opening, said gate when in any one of a plurality of second positions allowing discharge of said granular material downwardly through at least a portion of said opening, means for sliding said gate longitudinally in said guides between said first position and any one of said second positions, a device for sealing and opening to prevent the entry of moisture or water there-through when said gate is in said first position, said device including:

a. a four-sided hollow first frame of an elastomeric material that snugly engages said opening and extends downwardly therebelow, said first frame having upper and lower edges;

b. four first flanges of an elastomeric material that extend upwardly and outwardly from said upper edges of said first frame at substantially the same angle as the interior surfaces of said walls adjacent said opening, said first flanges in abutting contact with said surfaces and serving to support said first frame in said depending position through said opening when said gate is moved to one of said second positions;

c. a flat web of elastomeric material that extends between said lower edges of said first frame, said first frame of such depth that said web rests on said gate when the latter is in said first position, said web having a discharge opening therein through which said granular material in said hopper may discharge by gravity when said gate is in one of said second positions; and

4,009,909

## UPWARD TUNNELING

Richard J. Robbins, Seattle, and Hans A. Adami, Vashon, both of Wash., assignors to The Robbins Company, Seattle, Wash.

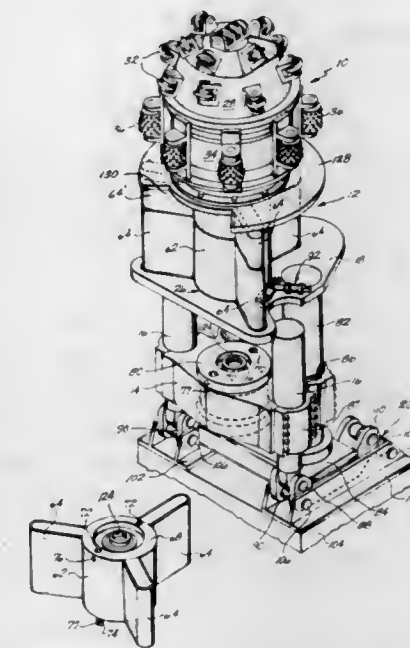
Filed Jan. 10, 1975, Ser. No. 540,009

Int. Cl.<sup>2</sup> E21D 9/02

U.S. Cl. 299—56

21 Claims

d. rigid reinforcing means embedded in said first frame and first flanges for preventing said first flanges being deformed relative to said first frame by the weight of said granular material on said web when said gate is in one of said second positions that said first frame, first flanges and web will be forced downwardly out of engagement with said hopper, said web due to the weight of said material thereon bowing downwardly when said gate is in one of said second positions, and said gate when it moves from one of said second positions to said first position slidably contacting the portions of said gate adjacent said guides on opposite sides of said discharge opening to force portions upwardly to horizontal positions where they rest on said gate; and the weight of said granular material in said hopper forcing said first flanges into sealing contact with the interior surfaces of said walls of said hopper and said web into sealing contact with said gate.



4,009,908

## CARPET AND TILE STRIPPER

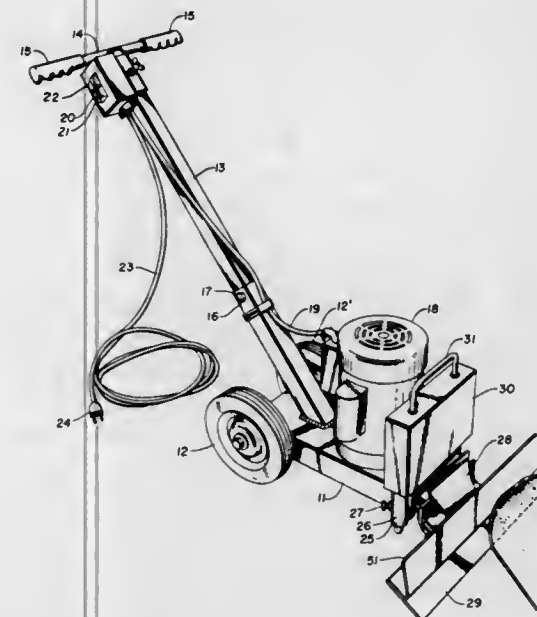
Gilbert L. Alinder, and Lloyd E. Anderson, both of Minneapolis, Minn., assignors to Taylor Manufacturing, Inc., City of Industry, Calif.

Filed Oct. 20, 1975, Ser. No. 623,902

Int. Cl.<sup>2</sup> A47L 11/12

U.S. Cl. 299—37

10 Claims



1. A power operated carpet and tile stripping machine comprising:

a. a supporting frame;

b. motor means supported on said frame, said motor means including a cam means driven by said motor means;

c. a pair of wheels rotatably mounted to the rear portion of said frame;

d. a handle bar for guiding and maneuvering said machine attached to said frame;

e. cutting blade mounting head pivotably mounted to the forward portion of said machine on a shaft for partial rotation about an axis generally vertical to the floor, said head having the blade mounting portion thereof extending outwardly therefrom to form an acute angle with said floor; and

f. connecting means linking said cam means to said mounting head means so as to produce an oscillating arcuate motion of said head means.

1. Mechanism for boring upwardly through ground material from an underground location, comprising:

a cutterhead assembly comprising a cutterhead support including a tail section which is directed downwardly during boring and rotary cutterhead means rotatably mounted onto said cutterhead support, said rotary cutterhead means including cutter means which is directed upwardly during boring and a rotary input shaft which is directed downwardly during boring; and

means for advancing said cutterhead assembly and rotating said rotary cutterhead means, comprising:

a sectional support column positionable below said cutterhead assembly, and connectable to said tail section;

thrust ram means positionable at the underground location for forcing said sectional support column upwardly to in that manner advance the cutterhead support and the rotary cutterhead means carried thereby, said thrust ram means including torque transfer connector means connectable to said sectional support column, for restraining said sectional support column against rotation during advancement of the sectional support column and the cutterhead assembly carried thereby;

a holding table positionable at the underground location above said thrust ram means, said holding table including means for securing said sectional support column to said holding table while a section is being added to or removed from it;

a rotary drive means carried by and movable with said thrust ram means, including a rotary output shaft; and

a separate rotary drive shaft section for each section of the support column, each of which is journaled for rotation inside of its section of the support column, each said rotary drive shaft section including joint means at its upper and lower ends, with the joint means at its upper end being detachably connectable to the input shaft of the rotary cutterhead means and the joint means at the lower end of each other rotary drive shaft section, and with the joint means at the lower end of each section being detachably connectable to the output shaft of the rotary drive means and the joint means at the upper end of each other drive shaft section.



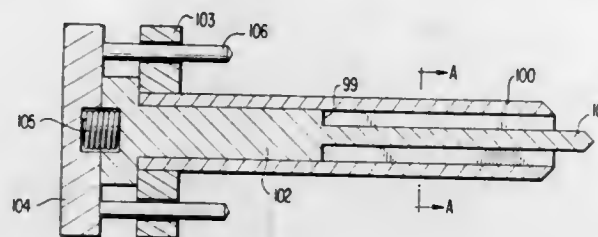
4,009,910

## TUFT FORMING DEVICE

John C. Lewis, Jr., Middlebury, Vt., assignor to Tucel Industries, Inc., Middlebury, Vt.  
Continuation-in-part of Ser. No. 453,315, March 21, 1974, Pat. No. 3,910,637, which is a continuation-in-part of Ser. Nos. 186,659, Oct. 5, 1971, Pat. No. 3,799,616, and Ser. No. 154,055, June 17, 1971, Pat. No. 3,798,699. This application Oct. 10, 1975, Ser. No. 618,284  
Int. Cl.<sup>2</sup> A46D 1/08

U.S. Cl. 300-2

10 Claims



1. In an apparatus for making tufted constructions including a stock box for supporting parallel cut-to-length synthetic fibers, means for picking a plurality of said fibers from said stock box to form a tuft thereof, means for heat-sealing and fusing the nonworking end of said tuft, and means for mounting the nonworking end upon a support, the improvement comprising:

- an elongated, hollow tuft picking element having a fiber receiving opening therein and having a preselected, internal cross-sectional configuration, said element adapted to be inserted into said stock box through an aperture therein and to receive at least the end portions of the plurality of said fibers;
- trim means disposed within said element for imparting a preselected trim configuration to the ends of the tufted form therein;
- ejection means carried by said element for ejecting the hollow tuft formed from said element after the exposed end thereof is heat-sealed; means carried by said ejection means for forming a hollow tuft of unsupported fibers as said fibers are received in said element.

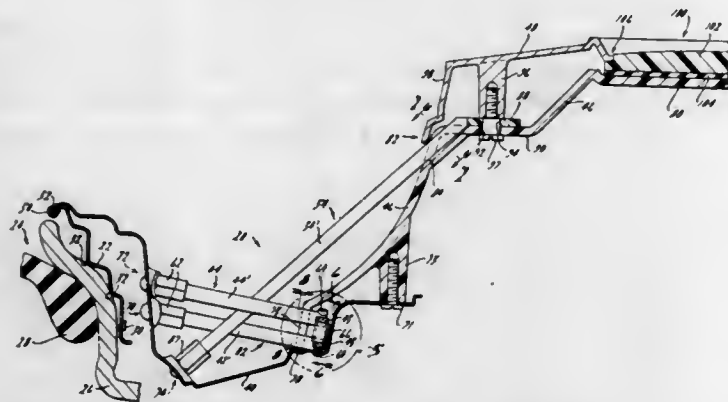
4,009,911

## WHEEL TRIM AND METHOD

Frederick A. Apczynski, Livonia, Mich., assignor to Norris Industries, Inc., Ypsilanti, Mich.  
Filed Mar. 7, 1975, Ser. No. 556,466  
Int. Cl.<sup>2</sup> B60B 7/00

U.S. Cl. 301-37 SS

35 Claims



33. A wheel structure comprising a vehicle wheel having an outer face and a simulated wire wheel cover detachably secured to said outer face, said wheel cover having a plurality of rows of spokes positioned thereon with each of said rows of spokes having a plurality of spoke members, the improvement comprising a plurality of spoke sections forming each of the rows of spokes, each of said spoke sections comprising a plurality of spoke members connected at one end to an arcu-

ately shaped base member, and means integral with at least one of said base members for spacing two of said rows of spokes from each other at their radially inner ends.

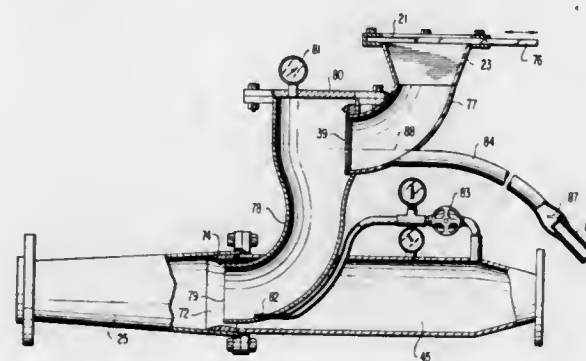
4,009,912

## PNEUMATIC CONVEYING APPARATUS AND METHOD

Joseph Mraz, 501 E. Lee St., Plant City, Fla. 33566  
Continuation-in-part of Ser. No. 520,943, Nov. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 327,640, Jan. 29, 1973, abandoned, and Ser. No. 193,630, Oct. 29, 1971, abandoned. This application Feb. 3, 1976, Ser. No. 654,796  
Int. Cl.<sup>2</sup> B65G 53/14

U.S. Cl. 302-25

14 Claims



11. Apparatus for transferring large quantities of material in a gas stream at low power consumption rates and without the need for screw conveyor or rotary vane devices for introducing the material into the gas stream, comprising:

- means for providing a supply of material to be handled;
- a pipeline for conveying the material to a distant location;
- a source of gas under pressure operatively connected to said pipeline for flowing gas along a path extending through said pipeline to entrain said material;
- means for providing a reduced cross sectional area for said gas flow path and thereby increasing the velocity of said gas at a portion of said path; and
- means for feeding said material from said supply of material into said gas flow path while preventing blowback of gas from said pipeline to said supply of material, said means for feeding being provided with a material flow passage and comprising:
- means for discharging the material into the high velocity gas stream in the vicinity of said reduced cross sectional area portion of said gas flow path,
- a chute section forming a portion of said material flow passage upstream of said discharging means and terminating in an outlet end portion at which the material flow passage therethrough has a first cross sectional area, said outlet end portion having an end wall extending around the periphery of the material flow passage therethrough,
- a valve member mounted adjacent said outlet end of said chute section for swinging movement about an axis, said valve member having an upstream face of an area greater than said first cross sectional area for closing against said end wall of the outlet end portion of said chute section in one position and being movable about said axis in a downstream direction away from said end wall, and
- means for providing on opposite sides of said valve member a first gas pressure differential when it is desired to feed material through said chute section and a second gas pressure differential at times of pipeline blockage events, said first and second gas pressure differentials being in opposite directions and being sufficient both to hold said valve member away from said chute section end wall when it is desired to feed material through said chute section and to close said valve member against said chute section end wall under pipeline blockage conditions to prevent blowback.

4,009,913

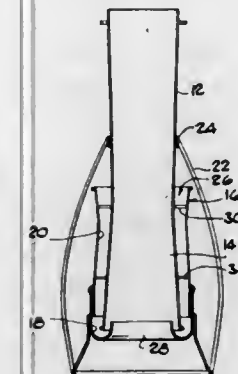
## SUCTION NOZZLES FOR DRY-FISH OFF LOADING

Frank Beugelink, Durbanville, South Africa, assignor to Aher Holdings S.A., Luxembourg, Luxembourg  
Filed Apr. 30, 1975, Ser. No. 573,055  
Claims priority, application South Africa, Sept. 26, 1974, 74/6135

Int. Cl.<sup>2</sup> B65G 53/42

U.S. Cl. 302-58

1 Claim



1. A suction nozzle for use in handling fish, said suction nozzle comprising a tubular inner casing defining a chamber between top and bottom ends thereof, the top end forming an outlet having means for connection to a hose, a sleeve slidable on the outside of the tubular inner casing between the two ends thereof, a tubular outer casing of shorter length and larger diameter than the inner casing, said outer casing being spaced from the inner casing to form an annulus between the two casings and being positioned between the sleeve and the bottom end of the chamber, a collar fast with the bottom end of the outer casing, said collar having an inwardly-directed lip which extends partly into the interior of the tubular inner casing to define a first inlet into the chamber, as well as an annular space bounded by the lip and the collar as one wall and the tubular inner casing as the other wall, said annular space leading from the annulus between the inner and outer tubular casing into the chamber to define a second inlet into the chamber, said collar being attached by stays to the sleeve positioned on the outside of the tubular inner casing, thereby enabling the tubular outer casing and collar to be moved with respect to the tubular inner casing and so vary the cross-sectional area of the said annular space, and means for locking the sleeve to the tubular inner casing to enable the cross-sectional area of the second inlet to be adjusted to and locked at a predetermined value.

4,009,914

## ALARM SYSTEM FOR A SKID CONTROL SYSTEM

Takefumi Sato, and Yuji Dohi, both of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1975, Ser. No. 557,241

Claims priority, application Japan, Mar. 12, 1974, 49-28756; Apr. 3, 1974, 49-38337; Mar. 25, 1974, 49-34260[U]

Int. Cl.<sup>2</sup> B60T 8/00

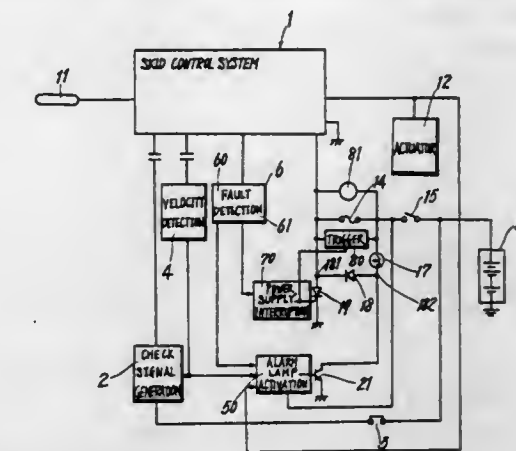
U.S. Cl. 303-92

17 Claims

1. In an alarm system for a wheeled vehicle including a power source, a skid control system for controlling brake pressure with the use of output signals from a wheel revolution sensor, a fuse for connecting the skid control system with the power source, and an indication unit, a combination comprising:

- a dangerous fault condition detection unit connected to receive output signals from the skid control system;
- a first switching means included within the dangerous fault condition detection unit for enabling the indication unit and tearing the fuse when the skid control system is placed in its dangerous fault condition;
- a negligible fault condition detection unit; and a second

switching means included within the negligible fault condition detection unit for enabling the indication unit



without tearing the fuse when the alarm system or the skid control system is placed in its slight fault condition.

4,009,915

## SELF-LEVELING KITCHEN AND FOOD SERVICE EQUIPMENT

Alan Roy Whitelaw, 4A Warriston St., Brighton, Victoria, and Henry Alfred Jennings, 4 Scammell Close, Mount Waverley, Victoria, both of Australia

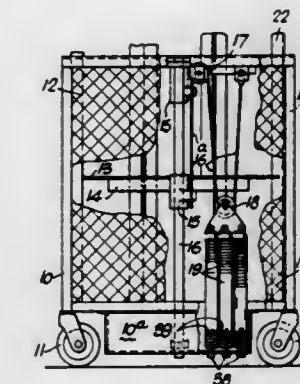
Filed Oct. 15, 1974, Ser. No. 515,054

Claims priority, application Australia, Oct. 16, 1973, 5257/73

Int. Cl.<sup>2</sup> A47F 1/06

U.S. Cl. 312-71

3 Claims



1. A mobile dispenser of the type in which a stack of crockery, trays, glass ware, food serving equipment are stored with the top item to be dispensed at a substantially constant height relative to floor level comprising a frame or body, support plate means mounted relative to the frame or body, tension spring means having coils mounted on the frame or body, said support plate means guided by guide means for vertical slidable movement relative to the frame or body between a bottom and top position under the influence of said spring means, the total deflection of said spring means being less than the total movement of said support plate means between said positions, said spring means being mounted beside the path of movement of the support plate means, means including an adjusting plate disposed to engage each spring between a predetermined pair of said coils to adjust the spring deflection rate and a bolt extending longitudinally of the spring and being threaded in an opening in said adjusting plate to apply preload forces to said spring means to selectively adjust the position of the support plate means; the guide means including at least one vertical guideway mounted relative to the frame or body and including a linear motion ball bearing connected to the support plate means for maintaining the support plate means substantially in a horizontal plane irrespective of the loading on the plate means, a base in the dispenser supported on wheels, a well in the base extending between the wheels, the well adapted to accommodate said ball bearing and at least



part of the support plate means when in its lowermost position whereby the space between the bottom and upper position of the support plate means is usable for goods to be handled by the dispenser, said wheels supporting the dispenser being mounted on the base plate to be within the confines of the dispenser perimeter whereby permanent projection beyond said perimeter is avoided.

4,009,916

# CHIPCORE PANEL WITH ROUNDED AND BEVELLED EDGES OVERLAID WITH A SHEET OF PLASTIC MATERIAL

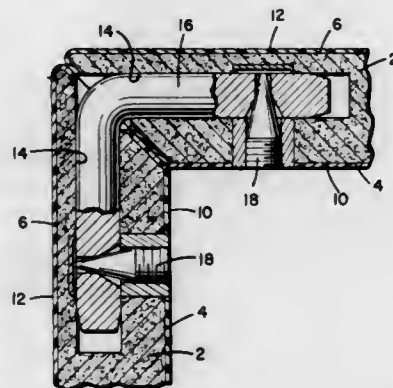
Marco Fantoni, Udine, Italy, assignor to McClure Furniture Industries, Inc., Milton, Pa.

Filed Aug. 28, 1974, Ser. No. 501,256

Claims priority, application Italy, Sept. 21, 1973, 83428/73  
Int. Cl.<sup>2</sup> A47B 17/04

U.S. Cl. 312-204

4 Claims



1. In an article of furniture composed of a plurality of panels, each of said panels comprising: first and second opposite major parallel surfaces; edge surfaces connecting said first and second major parallel surfaces and bevelled outwardly from said first to said second surface; a first layer of plastic sheet material fixed to said first major surface and trimmed to substantially the same dimensions as said first surface; and a second layer of plastic sheet material fixed to said second major surface and extending over and fixed to said bevelled edge surfaces; said second layer having substantially the same dimensions as the combined dimensions of said second major surface and said bevelled edge surfaces, said first and second layers being trimmed to meet at the intersection of said bevelled edge surfaces and said first major surface; wherein the bevelled edge surface of one of said panels lies adjacent a complementary bevelled edge surface of another of said panels such that the second major surfaces of the two panels face outwardly of said furniture article and the exposed edges of said panels are covered by said second layers of sheet material.

4,009,917

# COMPRESSION STRESSED LINER FOR REFRIGERATION EQUIPMENT AND METHOD OF MAKING SAME

Edward H. Yonkers, and Wilford D. Harris, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 361,904, May 21, 1973, which is a continuation of Ser. No. 123,133, March 11, 1971, abandoned.

This application Feb. 10, 1975, Ser. No. 548,501

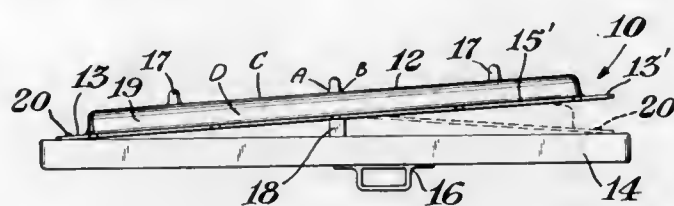
Int. Cl.<sup>2</sup> B23P 11/02

U.S. Cl. 312-214

6 Claims

1. A method for preventing tensile stress failure in an interior liner of refrigeration equipment comprising:  
a. placing said liner in compressive stress; and  
b. securely attaching said liner while maintaining said com-

pressive stress to an outer shell portion in said refrigeration equipment thereby substantially counter-acting ten-



sile stress in said liner caused by shrinkage of said liner as said equipment cools down to operating temperature.

4,009,918

# HEIGHT ADJUSTABLE CABINET

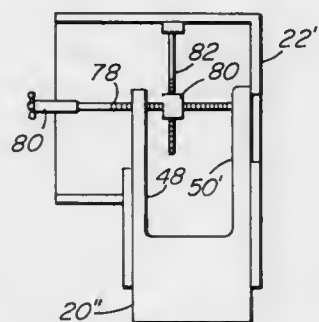
Kenneth A. MacDonald, 251 York St., Canton, Mass. 02021, and Edward J. MacDonald, 180 Border St., Scituate, Mass. 02066

Filed Jan. 22, 1976, Ser. No. 651,342

Int. Cl.<sup>2</sup> A47B 43/00, 48/00; F16M 11/24

U.S. Cl. 312-255

8 Claims



1. A height adjustable leg for use with cabinets or the like, comprising  
a. a thin, flat and relatively fixed section having a floor-engaging lower edge adapted to be supported upright by a fixed horizontal surface,  
b. a thin, flat relatively movable hollow housing section telescopically and vertically connected to said fixed section,  
c. said movable section adapted to be connected to said cabinets,  
d. movable mechanical advantage means operatively connected between said fixed and movable sections for selectively raising and lowering said movable section with respect to said fixed section,  
e. said movable section generally corresponding in profile with the end walls of said cabinet and being substantially coextensive therewith,  
f. the upper edge of said movable section being substantially level with the top of said cabinets, and,  
g. connecting means at the rear portion of said leg for fastening said leg to a fixed vertical wall.

4,009,919

# TRAVELING HOLDER FOR TEXTILE COILS

Hans Raasch, Rheydt, Germany, assignor to Schlafhorst & Co., Monchen-Gladbach, Germany

Continuation of Ser. No. 441,337, Feb. 11, 1974, abandoned.

This application Aug. 20, 1975, Ser. No. 606,336

Claims priority, application Germany, Feb. 10, 1973, 2306688

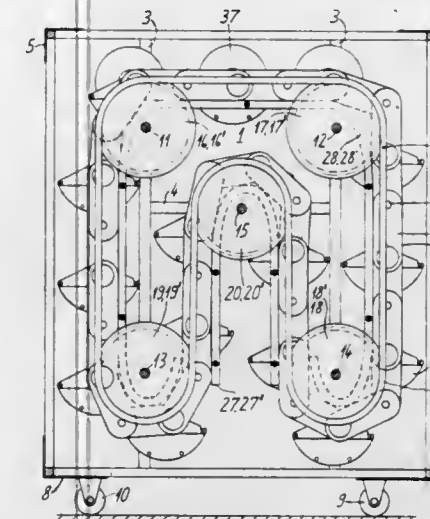
Int. Cl.<sup>2</sup> A47B 49/00

U.S. Cl. 312-268

4 Claims

1. Traveling holder for textile coils comprising a receptacle, and an elevator disposed in the interior of said receptacle, said elevator comprising endless conveyor means having at least two adjacent runs extending in a wave-shaped loop along a substantially sinusoidal travel path within said receptacle for

maximum utilization of space within said receptacle, said endless conveyor means comprising a pair of endless conveyor chains, each having said two adjacent runs, and a multiplicity of troughs articulately suspended between said conveyor chains, said elevator further including endless stabilizing chains respectively connected to said conveyor chains and



extending adjacent and in substantially parallel relationship thereto along the entire length thereof, and guide rails adjacent to said stabilizing chains, said stabilizing chains being in gliding engagement with said guide rails along said travel path so as to travel together with said conveyor chains simultaneously along said travel path.

4,009,920

# POWER TAP-OFF UNIT FOR USE AT A SINGLE-BOLT JOINT IN A BUSWAY SYSTEM

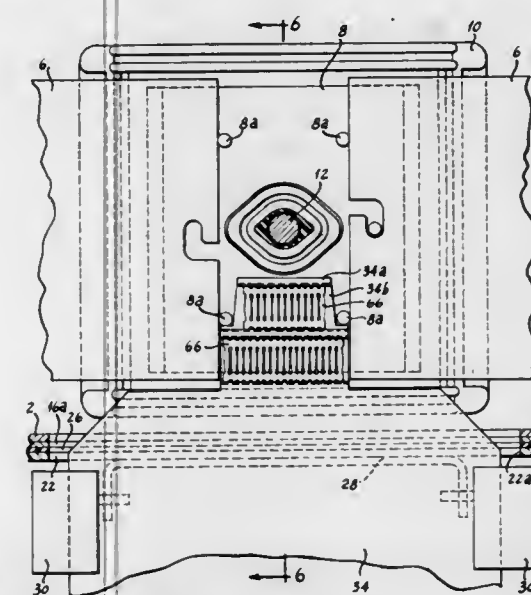
Loy A. Hicks, Jr., Cedarburg, and Franklin R. Welch, Wauwatosa, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 26, 1976, Ser. No. 680,594

Int. Cl.<sup>2</sup> H01R 9/12

U.S. Cl. 339-22 B

10 Claims



1. A branch connection for an electrical busway system comprising, in combination:  
a first set of bus bars arranged in aligned correspondence with and longitudinally spaced from a second set of bus bars;  
electrically conductive splice plates joining corresponding bus bars of said first and second sets, said splice plates being arranged in cooperative pairs disposed on opposite sides of respective corresponding bus bars;  
means compressing said splice plates together upon said respective corresponding bus bars to form a rigid connection therewith, each connection establishing a lateral

opening defined by the longitudinal space between the respective bus bars and by the associated pair of said splice plates;

branch connector plates arranged transversely to and in aligned correspondence with the bus bars of said first and second sets, said connector plates having portions received within said lateral openings; and  
a multiplicity of electrical connectors resiliently disposed between said connector plate portions and said splice plates within the respective lateral openings, each of said connectors providing an electrical connection between said splice plates and respective ones of said connector plates.

4,009,921

# ELECTRICAL CONTACT AND SUPPORT MEANS THEREFOR

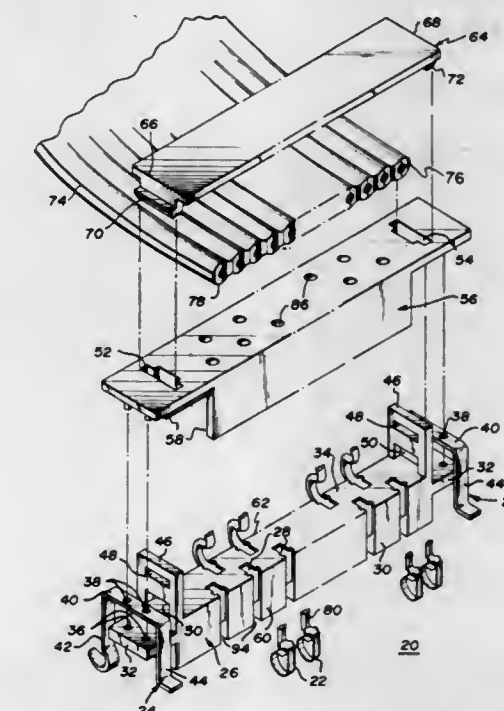
Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed July 31, 1975, Ser. No. 600,825

Int. Cl.<sup>2</sup> H01R 9/08

U.S. Cl. 339-99 R

4 Claims



1. An electrical connector comprising, in combination: a base member having an elongate body portion, a first end portion and a second end portion, said first and second end portions being located at opposite ends of said body portion, said body portion having a plurality of transverse contact receiving slots therein extending along the length of said body portion, a plurality of contacts, one for each of said contact receiving slots and seated therewithin, said contacts each having a head portion, a tail portion, and a web portion joining said head portion to said tail portion, said head portion and said tail portion extending from opposite surfaces of said body portion, said tail portion having a generally flat spiral configuration, a segment of said tail portion furthest from said head portion extending outwardly from said body portion for engagement with a conductive surface, said contact receiving slots each having a selectively dimensioned tail receiving cavity having sidewalls and a bottom surface and communicating therewith, said tail portion of each of said contacts being partially contained within a respective one of said tail receiving cavities and deflectably movable from a first position wherein the free end of said tail portion is spaced from said bottom surface to a second position wherein the free end of said tail portion is caused to contact said bottom surface; means for securing said contacts in position in said body portion; and means for mounting said connector adjacent a conductive surface; said mounting means comprising a pair of generally U-shaped resilient metallic members each attached



to a respective one of said first and said second end portions of said base member, each of said U-shaped members comprising a pair of leg portions joined to one another by a first bridge portion attached to a respective one of said first and said second end portions of said body portion, at least one of said leg portions terminating in an outwardly facing foot portion arranged to extend through a transverse aperture in and engage the underside of a planar part upon which said connector is mounted.

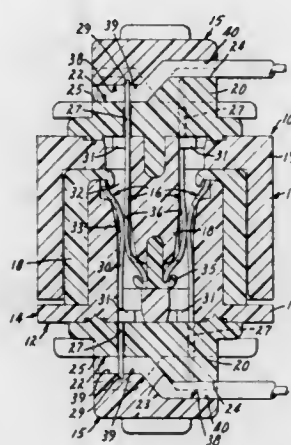
#### 4,009,922 CONNECTOR

James E. Aysta, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Filed Nov. 10, 1975, Ser. No. 630,220

Int. Cl.<sup>2</sup> H01R 9/08

U.S. Cl. 339—99 R

3 Claims



#### 1. A connector comprising:

an insulating body formed on one surface with a plurality of parallel wire support channels, each of said channels being formed with a transverse step defining upper and lower wire support levels, adjacent channels being formed with steps rising from generally coplanar lower wire support levels to generally coplanar upper wire support levels in opposite directions lengthwise of said channels to position a lower wire support level between two upper wire support levels, said body being formed with a plurality of apertures therethrough, one aperture extending across the lower wire support level of each said channel,

a plurality of spring compression reserve contact elements carried by said body, each contact having a bifurcate insulation stripping and conductor connecting end, a bifurcate contact connecting end of a contact element extending through each said aperture in said body to make electrical connection to a wire supported on a said lower wire support level and terminating below the adjoining upper wire support levels with the outer edges of the legs thereof abutting the adjoining upper support levels of said body,

a cover formed on one surface with parallel stepped wire support channels complementary to said channels on said body, and

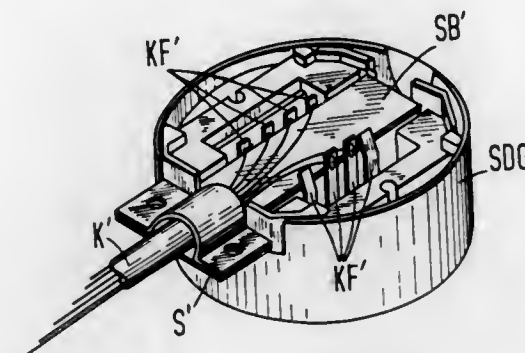
means for retaining said cover on said body with said complementary channels aligned and the wires in the bifurcations of said contact elements to support and retain the wires in said channels and to make electrical connection between said contact elements and the wires.

4,009,923  
**CONNECTOR FOR SHIELDED ELECTRIC CABLES**  
Olaf Aistleitner, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany  
Filed Nov. 4, 1975, Ser. No. 628,586  
Claims priority, application Germany, Dec. 23, 1974, 2461282

Int. Cl.<sup>2</sup> H01R 3/06

U.S. Cl. 339—143 R

1 Claim



1. An electrical connector for removably joining together first and second cables, comprising a plug member and a socket member, the plug member having a plurality of pins and the socket member having a corresponding plurality of sockets engageable with said pins, the pins and sockets extending substantially transversely of said cables, wherein each of said plug and socket members is adapted for use with a shielded cable having a lesser plurality of conductors, by said members each further comprising:

an electrically-conductive cable clamp connectable to a shield on a respective cable; and

an electrically-conductive, flat screening plate affixed to and extending along said member outwardly adjacent the respective pins or sockets and having electric contact with said cable clamp and with at least one of said pins and sockets,

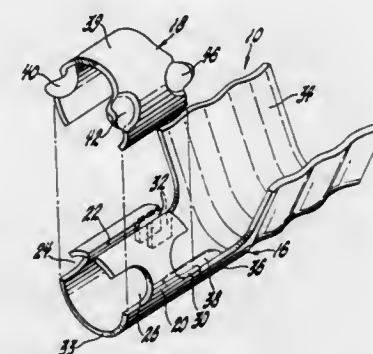
whereby the cable screens are simultaneously removably joined together at said electrical connector with joining of the conductors of said cables.

4,009,924  
**SPARK PLUG CONNECTOR ASSEMBLY**  
Edward M. Bungo, Warren, Ohio, and Lloyd D. Jack, Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.  
Filed Mar. 18, 1976, Ser. No. 668,031

Int. Cl.<sup>2</sup> H01T 13/04

U.S. Cl. 339—223 S

7 Claims



1. A connector assembly for detachably connecting an ignition wire to a spark plug stud terminal comprising, a terminal having an attachment portion at a rearward end for permanently attaching said terminal to an electrical wire and a barrel portion at a forward end for detachable connection to a stud terminal, said barrel portion having a longitudinal split and at least one slot which is open at the forward end of the terminal

and which is circumferentially spaced from said longitudinal split, and  
a C-shaped spring clip embracing said barrel portion and spanning said longitudinal split to inhibit expansion of said barrel portion in the circumferential direction, said clip having a dimple portion at a forward end thereof disposed in said slot to limit rearward movement of said clip with respect to said barrel portion,  
said dimple portion extending radially inwardly of said barrel portion and having a leading edge which is substantially coplanar with or ahead of the forward end of the terminal,  
said clip further having a rearward portion engaging portions of said barrel portion spaced rearwardly of said slot to limit forward movement of said clip with respect to said barrel portion.

4,009,925  
**DETACHABLE CONNECTION BETWEEN TWO ELECTRIC CONDUCTORS**

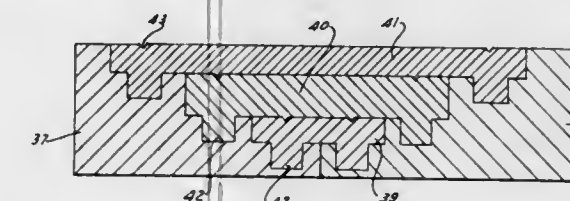
Frank Hoogeveen, Rohrmoos, Germany, assignor to Maschinenfabrik Augsburg-Nürnberg AG, Munich, Germany  
Division of Ser. No. 560,912, March 21, 1975, abandoned.  
This application July 22, 1976, Ser. No. 707,782

Claims priority, application Germany, Mar. 27, 1974, 2414822; Aug. 16, 1974, 2439370

Int. Cl.<sup>2</sup> H01R 7/02

U.S. Cl. 339—273 R

14 Claims



1. A detachable electrical connection comprising two electrical conductor ends to be connected, and a connector means fastened between said conductor ends, the cross-sectional dimension of said connector means being no larger than the corresponding cross-sectional dimensions of said conductor ends, each of said conductor ends having a multiple stepped configuration tapering toward the other conductor end, each step of each conductor end cooperating with the corresponding step of the other conductor end to define an axially extending groove, each groove being longer than the groove immediately beneath it, and each step of each conductor having a transverse bore, and said connector means having a stepped configuration corresponding to that of said grooves, each step of said connector means having a pin extending into the bore in the corresponding step of one of said conductor ends.

4,009,926  
**SOLDERLESS TERMINAL**  
Robert C. Tarrant, 2828 W. Genesee St., Millington, Mich. 48746

Continuation of Ser. No. 461,953, April 18, 1974, abandoned.  
This application Aug. 15, 1975, Ser. No. 604,998

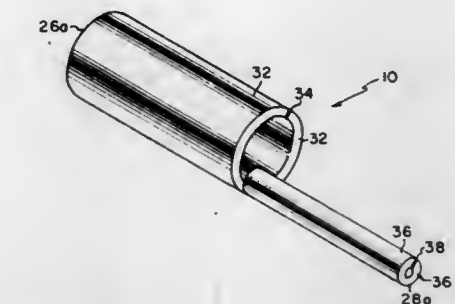
Int. Cl.<sup>2</sup> H01R 11/08

U.S. Cl. 339—276 T

6 Claims

1. An electrical terminal comprising:  
electrically conductive, conductor receiving crimpable cylindrical ferrule means, being of predetermined perimetrical length, and having a pair of opposed free edge portions in confronting relation with each other; and  
male plug means for insertion into a complemental electrical receptacle, said plug means including an intermediate portion integral with a portion of said ferrule means interjacent said free edge portions, said male plug means including distal edge portions in confronting relation with each other and separated from said free edge portions by

gaps on opposite sides of said intermediate portion to permit the free edge portions and distal edge portions to be freely and independently rolled into said confronting relation, the perimetrical length of said plug means being substantially less than the perimetrical length of said cylindrical ferrule means;



said male plug means comprising an additional hollow cylinder having a diameter substantially less than the diameter of said cylindrical ferrule means; said cylinder having an axial passage therethrough, the diameter of said passage being substantially less than the external diameter of said cylinder.

4,009,927  
**SPIRAL CRIMP FOR RETAINING A WIRE CONDUCTOR IN A METAL CONTACT**

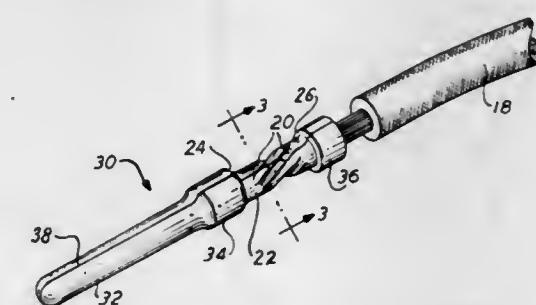
Robert Gordon Knowles, Litchfield, Conn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation-in-part of Ser. No. 493,862, Aug. 2, 1974, abandoned. This application Oct. 21, 1975, Ser. No. 624,436

Int. Cl.<sup>2</sup> H01R 11/08

U.S. Cl. 339—276 T

6 Claims



1. An electrical connector system comprising:  
a pair of axially mating contacts, one having a male and one a female mating portion and each having a central portion and an open barrel portion joined to said male and female mating portions by said central portion;  
said open barrel portion having a reduced outer diameter compared to said central portion for forming an indent receiving surface with a first shoulder formed between said central portion and said open barrel portion and an opposing second shoulder formed on the opposite end of said indent receiving surface;  
wire conductor means received by said open barrel portion; multiple opposed indents in said indent receiving surface of said open barrel portion for closing said indent receiving surface of said open barrel portion upon said wire conductor means;  
said multiple opposed indents arranged at an angle to said contact axis, each indent long enough to deform an arc of said outer diameter of said indent receiving surface such that the full periphery thereof is deformed by said multiple indents; and  
said multiple opposed indents each having a bottom surface that decreases in depth below said outer diameter of said indent receiving surface to tangentially and smoothly merge with said surface for forming a spiraling, stress-free crimp characterized by the absence of end shoulders.

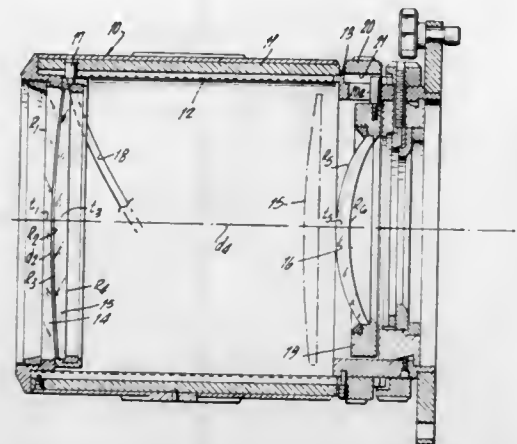


4,009,928

**THREE ELEMENT VARIFOCAL LENS SYSTEMS**  
 Frank G. Back, 55 Sea Cliff Ave., Glen Cove, N.Y. 11560  
 Filed June 27, 1975, Ser. No. 590,805  
 Int. Cl.<sup>2</sup> G02B 15/14

U.S. Cl. 350-2

1 Claim



1. A long back focal length varifocal lens system comprising three air spaced lens elements disposed along the optical axis of the system formed of a material having a high infrared wave length transmission comprising in the order of the entrant light beam, a stationary negative front lens, a longitudinally movable positive inner lens element and a stationary positive back lens element in which the lens system has the following optical characteristics:

Lens No.	Radius R in mm	Thickness (t) Spacing (d) in mm	
		(Wide Angle)	(Telephoto)
14	$R_1 = 1504.24$	$t_1 = 5$	$t_1 = 5$
	$R_2 = -476.17$	$d_2 = 102.0$	$d_2 = 2.35$
	$R_3 = 476.17$		
15	$R_4 = 3159.56$	$t_3 = 7$	$t_3 = 7$
	$R_5 = 63.13$	$d_4 = 5$	$d_4 = 104.65$
16	$R_6 = -75.72$	$t_5 = 5$	$t_5 = 5$
		EFL = 48.17	EFL = 97.725
		BFL = 65.92	BFL = 65.92

Material-Germanium-Refractive Index 4.003

4,009,929

**BINOMIAL MICROSCOPE**

Kuniomi Abe, Kobe, and Yuji Maekawa, Nishinomiya, both of Japan, assignors to Konan Camera Research Institute, Nishinomiya, Japan

Filed Sept. 30, 1975, Ser. No. 618,058

Claims priority, application Japan, Apr. 24, 1975, 50-56684[U]

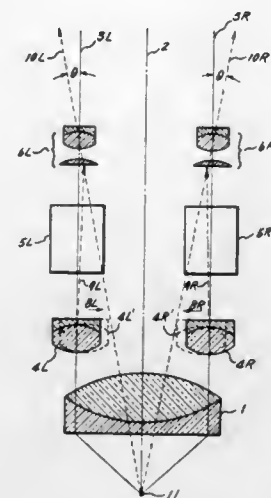
Int. Cl.<sup>2</sup> G02B 21/22

U.S. Cl. 350-35

1 Claim

1. A binomial microscope comprising an auxiliary objective and a pair of optical systems having substantially parallel optical axes and being arranged in the rear of said auxiliary objective, each of said optical systems including an objective

and an ocular, and said optical system further includes means for moving said objective in the direction substantially perpen-



dicular to said optical axis while maintaining the remaining optical elements in fixed positions.

4,009,930

**BINOMIAL MICROSCOPE**

Kuniomi Abe, Kobe, and Yuji Maekawa, Nishinomiya, both of Japan, assignors to Konan Camera Research Institute, Nishinomiya, Japan

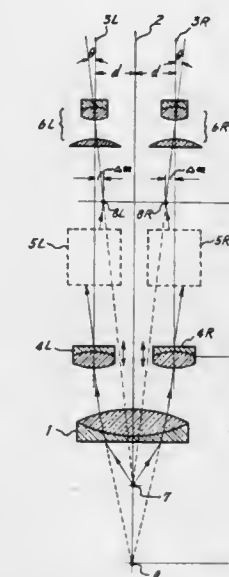
Filed Oct. 20, 1975, Ser. No. 623,575

Claims priority, application Japan, Apr. 23, 1975, 50-55922[U]

Int. Cl.<sup>2</sup> G02B 21/22

U.S. Cl. 350-35

1 Claim



1. A binomial microscope comprising an auxiliary objective lens and a pair of optical systems having substantially parallel optical axes and being arranged in the rear of said auxiliary objective, each of said optical systems including an objective lens, an erect prism and an ocular, wherein said optical system further includes means for moving the last said objective lens in a direction substantially parallel to said optical axis while maintaining the remaining optical elements in fixed positions.

4,009,931

**OPTICAL WAVEGUIDE CONNECTOR**

Marc W. Malsby, Lake Arrowhead, and Kenneth M. Clark, Beaumont, both of Calif., assignors to The Deutsch Company Electronic Components Division, Banning, Calif.

Division of Ser. No. 452,837, March 20, 1974, abandoned.

This application May 8, 1975, Ser. No. 575,977

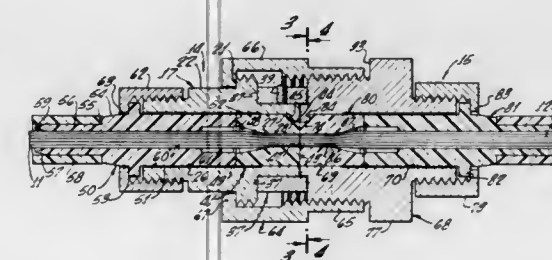
Int. Cl.<sup>2</sup> G02B 5/16

U.S. Cl. 350-96 C

4 Claims

1. A connector for optical waveguides comprising a first means,

a second means, a first bundle of a plurality of discrete optical fibers, a second bundle of a plurality of discrete optical fibers, said first means having an opening of predetermined size and shape, dimensioned and proportioned to receive a predetermined number of said fibers in abutting relationship with said fibers in predetermined positions in said opening, said second means having an opening of the same size and shape as said opening in said first means, each of said bundles of discrete optical fibers containing said predetermined number of fibers, said first bundle of discrete optical fibers being received in said opening in said first means, said second bundle of discrete optical fibers being received in said opening in said second means, connecting means for connecting said first and second means together with said first and second bundles of discrete optical fibers substantially in end-to-end alignment,



adjustable means for rotationally positioning said first means relative to said second means for adjusting said first bundle of discrete optical fibers relative to said second bundle of discrete optical fibers for minimizing light attenuation therebetween, said adjustable means including an element rotatable about a portion of said first means, said portion of said first means having a cylindrical surface, said element being a sleeve circumscribing said surface, and having projecting portions engaging said second means for coupling said element to said second means for rotation therewith, said second means having slot means therein, said projecting portions of said sleeve including lugs received in said slot means, and means for selectively locking said element to said first means for preventing said element from rotating relative to said first means.

4,009,932

**COMPOSITE OPTICAL FIBER ELEMENT FOR TELECOMMUNICATION CABLES**

Antonio Ferrentino, Monza (Milan), Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 468,765, May 10, 1974. This application July 25, 1975, Ser. No. 598,753

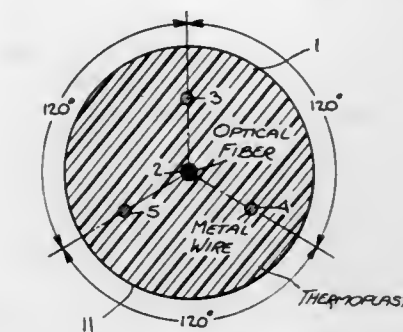
Claims priority, application Italy, Aug. 2, 1974, 25886/74 Int. Cl.<sup>2</sup> G02B 5/16

U.S. Cl. 350-96 B

13 Claims

1. A composite optical fiber element comprising a light-transmitting optical fiber and at least three continuous, reinforcing filaments embedded in and surrounded by a synthetic thermoplastic resin, said filaments being made of a material having a modulus of elasticity at least equal to the modulus of elasticity of said fiber, being spaced from and around said fiber, being substantially parallel to said fiber and respectively lying substantially in planes parallel to and intersecting said fiber and inclined with respect to each other at substantially equal angles, said filaments stiffening said element and ab-

sorbing the greatest part of the stresses when said element is subjected to bending whereby said filaments substantially



reduce the stress which would otherwise be applied to said optical fiber with bending of said element.

4,009,933

**POLARIZATION-SELECTIVE LASER MIRROR**

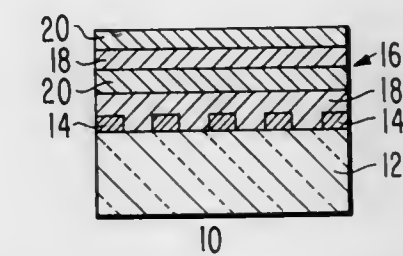
Arthur Herbert Firester, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 7, 1975, Ser. No. 575,364

Int. Cl.<sup>2</sup> G02B 5/30

U.S. Cl. 350-152

8 Claims



1. A polarization-selective laser mirror comprising: an optical substrate; a light reflective and electrically conductive grating on one surface of the substrate; and a partial light reflector on the substrate over the grating which will reflect the same wavelength of light as the grating.

4,009,934

**ELECTRO-OPTIC DISPLAY DEVICES AND METHODS**

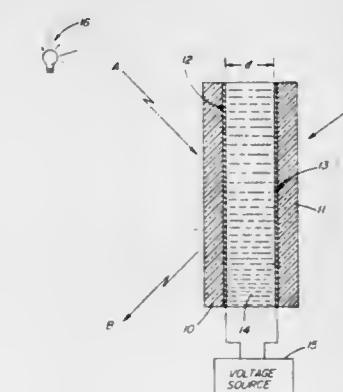
Robert M. Goodwin; Richard T. Klingbiel, and Hermann K. Bucher, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 432,717, Jan. 11, 1974, abandoned. This application June 28, 1974, Ser. No. 478,990

Int. Cl.<sup>2</sup> G02F 1/13

U.S. Cl. 350-160 LC

11 Claims



1. A method of scattering incident light comprising the steps of:

1. illuminating a liquid crystalline composition  
 a. having a positive, zero frequency dielectric anisotropy,



- b. exhibiting a dielectric loss in the component of permittivity parallel to the optic axis of said composition, and
- c. exhibiting a dielectric anisotropy inversion when subjected to an electric field greater than the crossover frequency at which the dielectric anisotropy is zero;
2. alternately at a rate of change faster than about 20 changes per second subjected said composition to
- a. an electric field of a first frequency within the audio range below said crossover frequency, and
- b. an electric field of a second frequency within the audio range above said crossover frequency to provide transient molecular reorientation of said composition thereby scattering incident light.

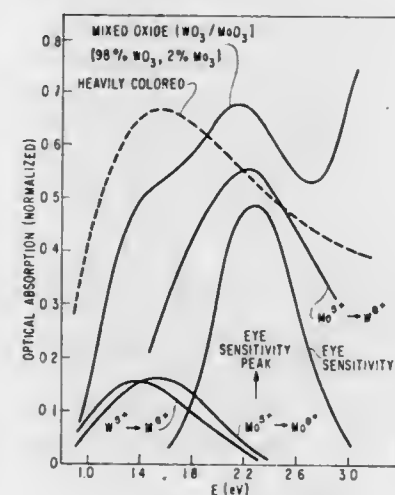
4,009,935

**ELECTROCHROMIC DEVICE HAVING A DOPANT THEREIN TO IMPROVE ITS COLOR CENTER ABSORPTION CHARACTERISTICS**  
 Brian Wilfred Faughnan, and Richard Seely Crandall, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 11, 1975, Ser. No. 595,286  
 Int. Cl.<sup>2</sup> G02B 5/23

U.S. Cl. 350—160 R

17 Claims



1. In an electrochromic display device of the type having a substrate, a first electrode on the substrate, a layer of electrochromic material on the first electrode, an electrolyte on the layer of electrochromic material, and a second electrode on the electrolyte, wherein the improvement comprises:

said layer of electrochromic material including less than about 50% of a dopant by atomic weight such that the natural color center absorption peak of said layer of electrochromic material in a pure colored state is shifted upward in energy toward the ideal color center absorption peak of about 2.3 eV when said doped layer of electrochromic material is in a colored state.

4,009,936

**ELECTROCHROMIC DISPLAY DEVICE FREE OF LIQUID COMPONENTS**  
 Yoshihiko Kasai, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 19, 1975, Ser. No. 605,954

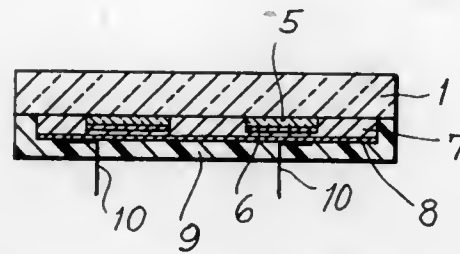
Claims priority, application Japan, Aug. 27, 1974, 49-95795  
 Int. Cl.<sup>2</sup> G02B 5/23

U.S. Cl. 350—160 R

13 Claims

1. A display device free of liquid components, comprising a solid electrochromic material, a solid electrolyte having electrical conductivity based at least in part on ionic conduction

and making contact with said electrochromic material and electrodes making contact with said electrolyte and with said



electrochromic material for activating said electrochromic material.

4,009,937

**MULTIPLEX ADDRESSING OF COLLOIDAL LIGHT VALVES**

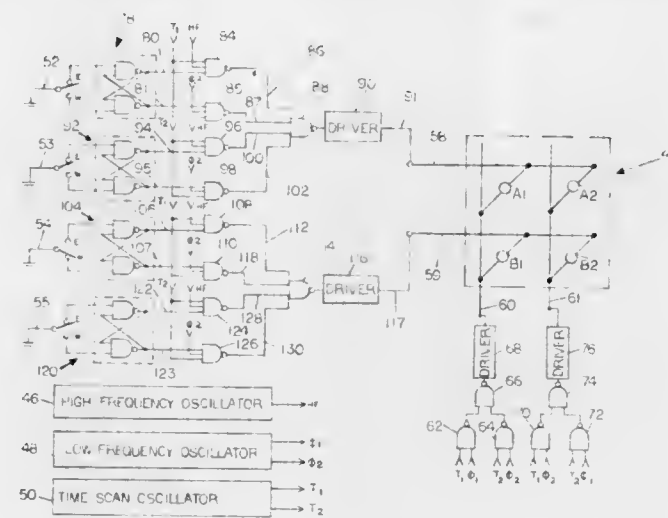
Ellsworth M. Murley, Jr., and Allen Davis, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 8, 1975, Ser. No. 611,032

Int. Cl.<sup>2</sup> G02F 3/16

U.S. Cl. 350—160 R

8 Claims



1. A method for operating a matrix of dimensions M×N, of a colloidal light valve material which is frequency responsive to exhibit greater light transmission in response to high frequency electrical signals than to low frequency electrical signals which comprises the steps of:

- defining a matrix of a plurality of unique sites of dimensions M×N of said colloidal light valve material;
- connecting each matrix site in each M row in series to a single input electrical conductor to thereby give a total of M row input conductors;
- connecting each matrix site in each N column in series to a single input electrical conductor to thereby give a total of N column input conductors; and
- multiplex addressing any selected M<sub>i</sub>, N<sub>j</sub> one of said matrix sites by the steps of:
  - individually supplying an individual M<sub>i</sub> row or N<sub>j</sub> column electrical conductor with a high frequency electrical signal and supplying the other of said M<sub>i</sub> row and N<sub>j</sub> column intersecting electrical conductors with a low frequency electrical signal during one time period and supplying both the M<sub>i</sub> row and the N<sub>j</sub> column electrical conductors with a low frequency electrical signal during another time period in a repeating cycle; and
  - supplying non-selected sites in said M×N matrix with combinations of high frequency and low frequency electrical signals during said two time periods to force the average light transmission of said non-selected sites to be the complement of the average light transmission of said M<sub>i</sub>, N<sub>j</sub> selected site.

4,009,938

**LIQUID CRYSTAL DISPLAY DEVICE**

Yoshio Yamazaki, Shimotsuwa; Toshihiro Suzuki, and Sadao Kanbe, both of Suwa, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

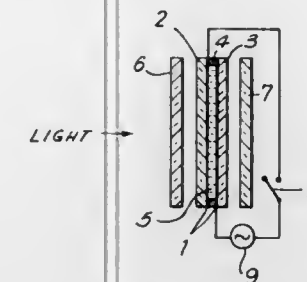
Filed Dec. 6, 1973, Ser. No. 422,373

Claims priority, application Japan, Dec. 6, 1972, 47-122164

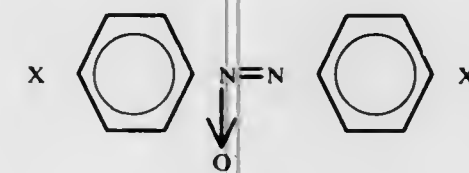
Int. Cl.<sup>2</sup> G02F 1/13; C09K 3/34

U.S. Cl. 350—160 LC

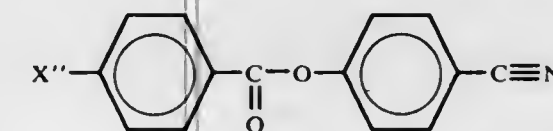
10 Claims



1. A liquid crystal display device having a low-threshold voltage for altering the transit of polarized light therethrough comprising two opposed transparent plates, unidirectionally-oriented transparent electrodes on the inner faces of said plates, the directions of orientation of said electrodes differing by about 90°, said electrodes being connectable to a voltage source, polarizing filters disposed at the outer surfaces of said plates and a nematic liquid crystal composition between said plates, said composition comprising a first compound having the structural formula



where X and X' are selected from the group consisting of alkyl radicals having 2-7 carbon atoms, alkoxy radicals having 1-2 carbon atoms and acyloxy radicals having 4-7 carbon atoms in the alkyl portions thereof and a second liquid crystal compound having the formula



where X'' is selected from the group consisting of alkyl radicals having 3-6 carbon atoms and acyloxy radicals and alkyl carbonate groups having 4-7 carbon atoms in the alkyl portions thereof.

4,009,939

**DOUBLE LAYERED OPTICAL LOW PASS FILTER PERMITTING IMPROVED IMAGE RESOLUTION**  
 Yukio Okano, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 3, 1975, Ser. No. 583,475

Claims priority, application Japan, June 5, 1974, 49-64221

Int. Cl.<sup>2</sup> G02B 5/18; H04N 9/06

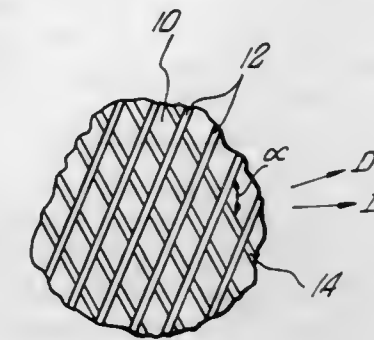
U.S. Cl. 350—162 SF

10 Claims

1. An optical low pass filter for use in a color video system for monitoring an object scene having a color encoding striped filter for spatially modulating at least two selected primary color signals while passing a third luminance signal at a higher spatial frequency comprising:

a first phase retarding filter layer; and  
 a second phase retarding filter layer, and respective filter

layers including a plurality of phase retarding grating stripes, the respective first and second stripes having a nonparallel alignment relative to each other and providing a combined optical transfer function value characteristic of preventing the transmittance of the high spatial frequency signal components of the two selected primary



colors while transmitting luminance signals at spatial frequencies above the cut off frequencies of the primary colors, the nonparallel grating stripes preventing spurious primary color signals not representative of the object scene while higher spatial frequency luminance signals are transmitted to provide an improved image resolution.

4,009,940

**APPARATUS FOR PRODUCING OPTICAL INTERFERENCE PATTERN WITH CONTINUOUSLY VARIABLE FRINGE SPACING**

Hitoshi Ohzu, Hino, Japan, assignor to Takata Ophthalmic Instruments Co., Ltd., Tokyo, Japan

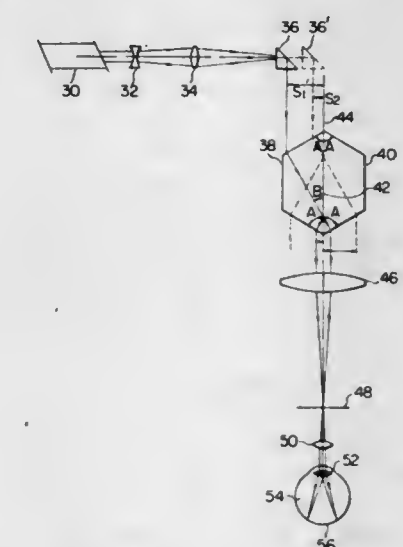
Filed Apr. 22, 1975, Ser. No. 570,920

Claims priority, application Japan, Apr. 27, 1974, 49-4904809

Int. Cl.<sup>2</sup> G02B 27/00; A61B 3/10

U.S. Cl. 350—163

14 Claims



1. Apparatus for producing an interference pattern of continuously variable fringe spacing, comprising:

a coherent light beam source;  
 a plane semi-transparent reflecting means;  
 first and second prisms, the bases of the first and second prisms being parallel to the semi-transparent reflecting means and disposed closely adjacent to the opposite sides thereof, the beam source being arranged to radiate a coherent light beam onto the first prism at an angle so that the coherent light beam is refracted by the first prism so as to be incident on the semi-transparent reflecting means at a predetermined angle and split by the semi-transparent reflecting means into first and second beam components, the first beam component being reflected by the semi-transparent reflecting means and refracted by the first prism into a first beam path parallel to the semi-transparent reflecting means, the second beam compo-



nent passing through the semi-transparent reflecting means and being refracted by the second prism into a second beam path parallel to the first beam path; and beam converging means to converge the first and second beam components to overlap and produce an interference pattern, the beam source being operative to displace the coherent light beam relative to the semi-transparent reflecting means in such a manner that the spacing between the first and second beam paths of the first and second beam components and thereby the fringe spacing are continuously variable.

4,009,941

**COLOR-SEPARATING PRISM ARRANGEMENT OF WHICH SOME SURFACES ADJOIN DICHROIC LAYERS**  
Leonardus Petrus Gerardus Verdijk, and Engbert Tienkamp, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

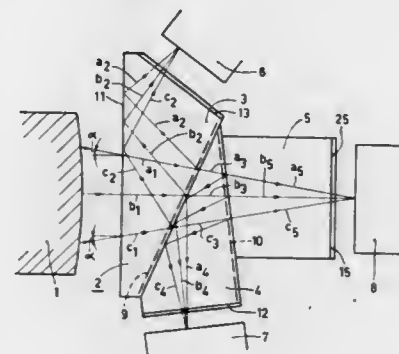
Filed Jan. 6, 1975, Ser. No. 538,719

Claims priority, application Netherlands, Jan. 7, 1974, 7400148

Int. Cl.<sup>2</sup> G02B 27/10

U.S. Cl. 350—173

4 Claims



1. An optical system for tri-color separation for use in a color television camera comprising a plurality of prisms arranged in succession along a non-reflecting optical axis for separating the light directed toward said prism arrangement into a plurality of components, a first prism having a green-reflective dichroic layer along one boundary surface forming a given angle with the non-reflecting optical axis, said green reflective dichroic layer having upper and lower limits of reflectivity at which 50% of the light at wave-lengths corresponding to said limits is reflected and 50% is transmitted to a second boundary surface opposing said first boundary surface and adapted by virtue of an air-glass transition to totally reflect the green light component of the impinging light reflected back by said green reflective dichroic layer, a second prism having a first boundary surface adjacent said first boundary surface of the first prism and having a second boundary surface provided with a second dichroic layer forming an angle with the non-reflecting optical axis opposed to the angle formed by the first dichroic layer for separating the red light component from the blue light component in the light transmitted through said first dichroic layer, said first boundary surface of said second prism adjacent to said first boundary surface of the first prism being adapted by virtue of the air-glass transition to totally reflect the light component reflected back by the second dichroic layer, said second dichroic layer having upper and lower limits of reflection at which 50% of the light at wavelengths corresponding to said limits is reflected and 50% is transmitted, one of said upper and lower limits of reflection of the second dichroic layer substantially equaling the other corresponding limit of reflection of the first layer, said second dichroic layer having a transmission band with a secondary reflection peak for green light whereby a portion of the green light component transmitted by the first dichroic reflector is respectively transmitted and reflected by the second dichroic layer to compensate for increased sensitivity of the camera tubes to green light.

4,009,942

**ZOOM LENS DEVICE**

Ryusho Hirose, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

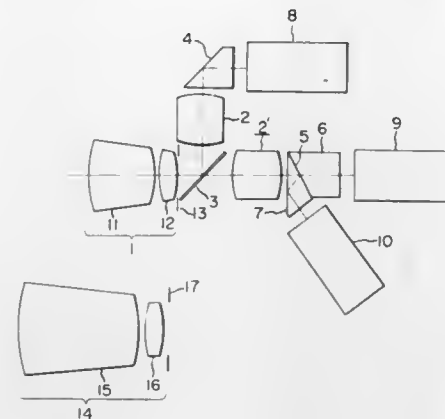
Filed May 1, 1975, Ser. No. 573,562

Claims priority, application Japan, May 9, 1974, 49-51493

Int. Cl.<sup>2</sup> G02B 15/06

U.S. Cl. 350—184

8 Claims



1. A zoom lens comprising:

a first zooming section having a predetermined value of aberration affecting its image forming capability, said first zooming section including a group of focusing lenses, a group of variator lenses and a group of compensator lenses, which lenses together reduce the aberration of the system substantially to said predetermined value;

a second zooming section having the same predetermined value of aberration affecting its image forming capability as said first zooming section, said second zooming section including a group of focusing lenses, a group of variator lenses, a group of compensator lenses, and a group of normally fixed lenses, which lenses together reduce the aberration of the system substantially to said same predetermined value; and

a relay lens section for forming a real image of an object from a light beam projected by said first or said second zooming section when optically coupled thereto and having lenses controlling the aberration of said relay lens section in such a way as to counteract aberration of said predetermined value resulting from said first or said second zooming section, whereby said real image is substantially free of aberration,

said first and second zooming sections being provided with supporting structure for optical coupling to said relay lens section such as to make them mutually interchangeable with respect to said relay lens section.

4,009,943

**FISH EYE LENS SYSTEM**

Mitsuaki Horimoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 20, 1975, Ser. No. 606,123

Claims priority, application Japan, Sept. 5, 1974, 49-102571

Int. Cl.<sup>2</sup> G02B 13/04

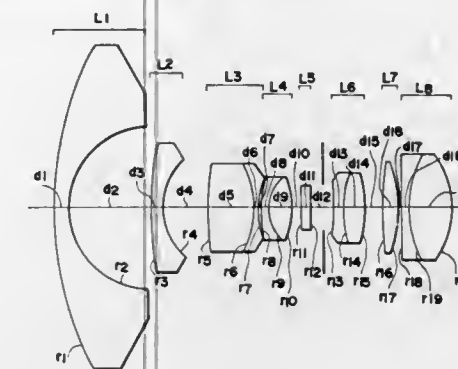
U.S. Cl. 350—207

18 Claims

1. A fish eye lens system having a diaphragm on its optical axis and an object and image side to the lens system comprising:

a first lens group positioned on the object side of the diaphragm including a first negative meniscus lens having a convex surface on the object side, a second negative meniscus lens having a convex surface on the object side, a third negative doublet lens having a concave surface on the image side and a fourth positive lens having a convex surface on the object side, the concave surface of the third lens and the convex surface of the fourth lens forming a space of positive meniscus shape therebetween; and

a second lens group positioned on the image side of the diaphragm including at least three lenses of which two of



the lenses are doublets composed of positive and negative components.

4,009,944

**MINIATURE AND LARGE APERTURE RETROFOCUS WIDE-ANGLE LENS**

Yasuo Takahashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

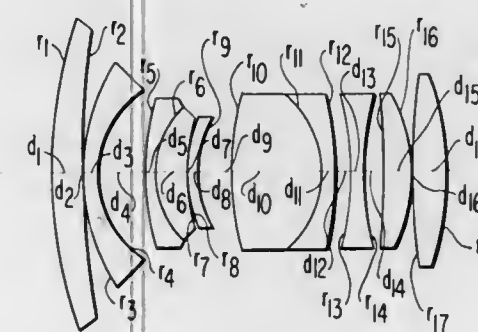
Filed Aug. 21, 1975, Ser. No. 606,676

Claims priority, application Japan, Aug. 23, 1974, 49-96911

Int. Cl.<sup>2</sup> G02B 13/04

U.S. Cl. 350—214

2 Claims



1. A miniature and large aperture retrofocus wide-angle lens comprising ten lenses forming eight components wherein the radii of curvature  $r_1$  to  $r_{18}$ , the lens thicknesses and the lens separations  $d_1$  to  $d_{17}$ , the refractive indices  $n_1$  to  $n_{10}$ , and Abbe numbers  $\nu_1$  to  $\nu_{10}$  of said first to tenth lenses  $L_1$  to  $L_{10}$ , respectively, satisfy the following conditions:

$$F = 100$$

$$F_{1.2.3.4.5} = -\frac{F}{1.294} = -77.28$$

$$F_{1.2.3.4.5.6.7} = \frac{F}{0.538} = 185.87$$

$$\Sigma_p = 0.126$$

$$f_b = 1.618F$$

where  $F$  is the composite focal length,  $\Sigma_p$  is the Petzval sum and  $f_b$  is the back focal length

Lens L	Radius of Curvature r	Lens Thickness or Spacing d	Refractive Index n	Abbe No. $\nu$
$L_1$	$r_1 = 69.94$	$d_1 = 16.33$	$n_1 = 1.80610$	$\nu_1 = 40.9$
	$r_2 = 787.86$			
$L_2$	$r_3 = 103.54$	$d_2 = 0.41$	$n_2 = 1.73400$	$\nu_2 = 51.5$
	$r_4 = 46.49$	$d_3 = 6.12$		

-continued

Lens L	Radius of Curvature r	Lens Thickness or Spacing d	Refractive Index n	Abbe No. $\nu$
$L_3$	$r_5 = 147.79$	$d_4 = 27.11$	$n_3 = 1.78590$	$\nu_3 = 44.1$
	$r_6 = 48.09$	$d_5 = 4.98$		
$L_4$	$r_7 = 123.70$	$d_6 = 15.68$	$n_4 = 1.71736$	$\nu_4 = 29.5$
	$r_8 = 80.02$	$d_7 = 0.98$		
$L_5$	$r_9 = 55.52$	$d_8 = 4.82$	$n_5 = 1.78590$	$\nu_5 = 44.1$
	$r_{10} = 133.60$	$d_9 = 17.72$		
$L_6$	$r_{11} = -53.07$	$d_{10} = 49.48$	$n_6 = 1.75700$	$\nu_6 = 47.9$
	$r_{12} = -176.35$	$d_{11} = 6.12$		
$L_7$	$r_{13} = -144.49$	$d_{12} = 7.47$	$n_7 = 1.54072$	$\nu_7 = 47.2$
	$r_{14} = 178.09$	$d_{13} = 7.35$		
$L_8$	$r_{15} = -457.68$	$d_{14} = 8.61$	$n_8 = 1.80518$	$\nu_8 = 25.4$
	$r_{16} = 82.64$	$d_{15} = 14.92$		
$L_9$	$r_{17} = 571.54$	$d_{16} = 0.73$	$n_9 = 1.61800$	$\nu_9 = 63.4$
	$r_{18} = 123.54$	$d_{17} = 19.03$		
$L_{10}$			$n_{10} = 1.56873$	$\nu_{10} = 63.1$

4,009,945

**MICROSCOPE OBJECTIVE**

Walter Klein, Auf der Hohl 36., Wissmar, Kreis Wetzlar, Germany

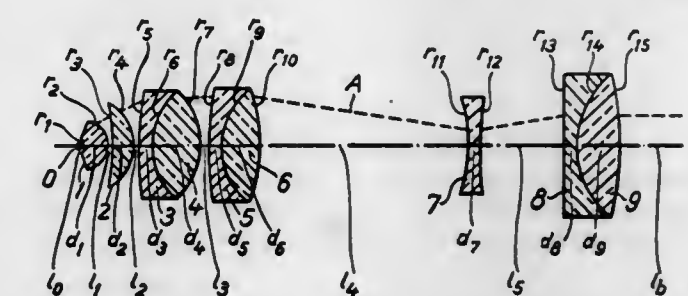
Continuation-in-part of Ser. No. 306,759, Sept. 5, 1963, Pat. No. 3,380,793. This application Sept. 1, 1967, Ser. No. 664,969

The portion of the term of this patent subsequent to Apr. 30, 1985, has been disclaimed.

Int. Cl. G02b 21/02, 9/62, 9/64

U.S. Cl. 350—215

2 Claims



1. In a microscope objective, the improved optical system which consists of two groups of lenses

a first group of positive lenses positioned on the side of the object, and

a second group of lenses positioned on the side of the image, the first group of lenses consisting, in the following order, of a thick negative meniscus front lens concave towards the object, said lens being effective to correct the image field curvature and positioned adjacent the object, a meniscus lens concave towards the object and having an axial thickness smaller than that of the preceding lens, both said lenses having positive refractive power, a first cemented doublet of a concavo-convex lens element, the concave side facing the object, the element being fitted to a biconvex lens on the convex side facing the object, a second cemented doublet of a concavo-convex lens element, the concave side facing the object, the element being fitted to a biconvex lens on the convex side facing the object,

the second group of lenses consisting of two lenses,



a biconvex negative lens positioned at an axial distance at least twice the focal length of the objective from the second doublet of the first group of lenses and a cemented doublet of a plano-concave lens element fitted to a biconvex lens element, the lenses of the first group of lenses being effective to correct the aperture aberrations and the chromatic variation of the image and being positioned from each other at an axial distance smaller than the axial thickness of the preceding lens for correction of the isoplane condition, the biconvex negative lens and the doublet of the second group of lenses being positioned at an axial distance from each other at least twice the focal length of the objective.

4,009,946

## IRIS LEAF FOR OPTICAL COMPONENT

Hermann Geyer, Lengfeld, Wurzburg; Albert Baab, and Paul Himmelsbach, both of Bad Kreuznach, all of Germany, assignors to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Germany

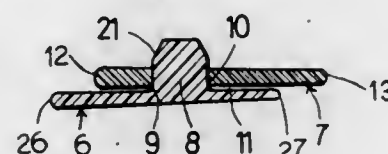
Filed Feb. 21, 1975, Ser. No. 551,722

Claims priority, application Germany, Feb. 23, 1974, 2408793

Int. Cl.<sup>2</sup> G05D 25/00

U.S. Cl. 350—266

12 Claims



1. An iris leaf for an optical component, comprising at least one curved foil of thermoplastic material with major surfaces bounded by a concave edge and a convex edge and with a stud rising integrally from at least one of said major surfaces, said stud broadening toward the body of the foil for maintaining a clearance between said one of said major surfaces and a confronting surface of an adjoining member articulated thereto by said stud.

4,009,947

## REFLECTING MIRROR

Keiziro Nishida, Kanagawa; Susumu Itoh, Tokyo, and Katsuhiro Konno, Kanuma, all of Japan, assignors to Canon Kabushiki Kaisha and Tochigi Canon Co., Inc., both of Japan

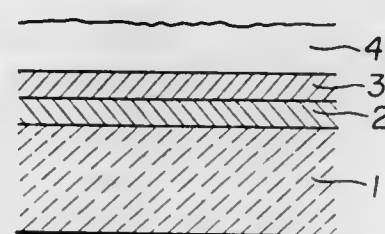
Continuation-in-part of Ser. No. 440,028, Feb. 6, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,526

Claims priority, application Japan, Feb. 15, 1973, 48-18538

Int. Cl.<sup>2</sup> G02B 5/08

U.S. Cl. 350—288

2 Claims



1. A reflecting mirror comprising a glass base body, a reflecting silver layer formed on the surface of said glass base body, and a protective layer alloy composed of 30 to 70 percent by weight copper and 70 to 30 percent by weight tin being formed on the surface of said reflecting layer opposite to said glass body.

4,009,948

## APPARATUS FOR ENHANCING VISIBILITY IN FOG OR UNDERWATER

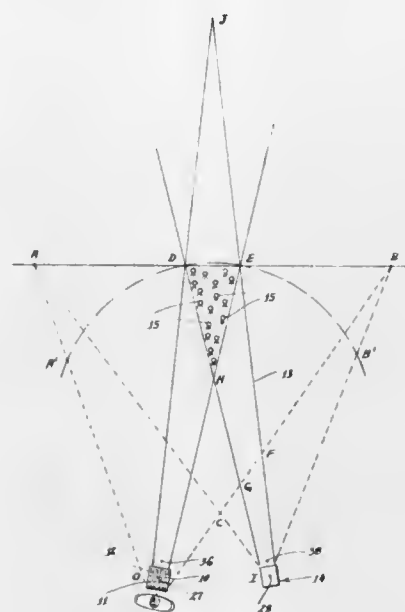
Gerard E. Boyan, Redding, and John L. Rawlings, Westport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 18, 1975, Ser. No. 550,268

Int. Cl.<sup>2</sup> G02B 27/17

U.S. Cl. 350—319

6 Claims



1. Apparatus for enhancing the visibility of a region that is at a distance and separated from an observer by an intervening medium containing light scattering particles, comprising:

means for illuminating successive incremental areas of said region, said incremental areas being narrow relative to the extent of said region in the direction in which the successive illumination progresses and substantially coextensive with said region transversely of said direction; and a viewing element for restricting the observer's field of view to correspond spatially and temporally with the successively illuminated areas of said region, said viewing element being displaced from said illumination means in said direction in which successive illumination progresses, said viewing element including:

a. a plurality of plates arranged in spaced parallel relation to form a plurality of slots defining the field of view of the observer and

b. means for directing said field of view to the successively illuminated areas of said region while maintaining the spaced parallel relation between said plates to cause said field of view to scan across said region contemporaneously with the progression of illumination of said incremental areas, thus enhancing visibility of said region by limiting the illumination back scattering reaching the observer.

4,009,949

## THREADING AND SYNCHRONIZATION SYSTEM FOR SOUND MOTION PICTURE PROJECTOR

Arthur E. Nupnau, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 518,328, Oct. 29, 1974, abandoned.

This application Oct. 30, 1975, Ser. No. 627,320

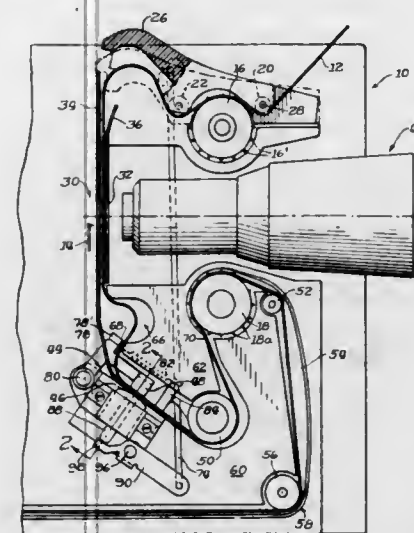
Int. Cl.<sup>2</sup> G03B 1/56

U.S. Cl. 352—159

3 Claims

1. In a motion picture projector having a projection station, a sound station, a fixed film guide surface for guiding film along a film path connecting the projection station and the sound station, a leading sprocket for feeding film along the film path to said projection station, and a trailing sprocket for feeding film from said sound station, a sound and image synchronization system comprising:

a film threading path defining block fixed intermediate said projection station and said sound station relative to said fixed film guide surface to define a fixed threading path for guiding film from said projection station toward said sound station during film threading and film projection; a throat recess formed in the surface of said block opposite said fixed film guide surface past which said film is moved for threading and relative to which said film pulses during



transport to and through said sound station toward said trailing sprocket; and

a pulsation smoothing portion formed on said surface of said block proximate said throat recess in the direction in which said film is moved along said block during threading and against which said film is moved to isolate intermittent film movement as said film is transported from said projection station toward said sound station during projection.

4,009,950

## MOTION PICTURE PROJECTION APPARATUS WITH FILM FEEDING SPEED CHANGING APPARATUS

Kuniyoshi Suzuki, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

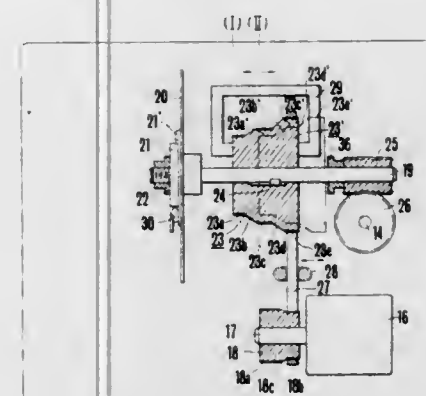
Filed Jan. 2, 1975, Ser. No. 538,163

Claims priority, application Japan, Jan. 8, 1974, 49-5507

Int. Cl.<sup>2</sup> G03B 1/00

U.S. Cl. 352—166

14 Claims



1. In a motion picture projection apparatus, the improvement comprising:

1. a driving means having at least one AC motor which can use at least a first and a second power source having different frequencies,

2. a first rotary shaft rotated by said driving means,

3. a film feeding means,

4. a second rotary shaft co-working with said film feeding means, and

5. a power transmission correction means to transmit the rotation of said first rotary shaft to said second rotary shaft, being able to select rotational speeds of said second

rotary shaft to prescribed values  $M_1$  and  $M_2$  and transmit the same even if said motor uses said first power source and the rotational speed of said first rotary shaft becomes  $S_1$ , and even if the motor uses said second power source and the rotational speed of said first rotary shaft becomes  $S_2$ , having:

having pulley means having the following integrally rotating with said rotary shaft:

a first pulley having a diameter dimension formed as  $r_1$ , and

a second pulley having a diameter dimension formed as  $r_2$ ,

a second pulley means having the following integrally rotating with said second rotary shaft:

a first pulley having a diameter dimension  $R_1$  formed as  $R_1 = r_2 M_1 S_1$ ,

a second pulley having a diameter dimension  $R_2$  formed as  $R_2 = r_2 M_1 S_1 = r_1 M_2 S_1$ , and

a third pulley having a diameter dimension  $R_3$  formed as  $R_3 = r_1 M_2 S_2$ .

a power transmission belt means having at least one or more endless belt disposed in tension

a. between the second pulley of said first pulley means and the first pulley of said second pulley means when said motor uses said first power source and the rotational speed of said second rotary shaft is expected to be  $M_1$ ;

b. between the first pulley of said first pulley means and the second pulley of said second pulley means when said motor uses said first power source and the rotational speed of said second rotary shaft is expected to be  $M_2$ ;

c. between the second pulley of said first pulley means and the second pulley of said second pulley means when said motor uses said second power source and the rotational speed of said second rotary shaft is expected to be  $M_1$ , or

d. between the first pulley of said first pulley means and the third pulley of said second pulley means when said motor uses said second power source and the rotational speed of said second rotary shaft is expected to be  $M_2$ , and

a change over means to change over said tensioned position of said endless belt according to the type of the power source used by said motor and the rotational speed expected for said second rotary shaft, wherein said means can slidingly shift at least one of said endless belt and said second pulley means in the axial direction of said second rotary shaft.

4,009,951

## APPARATUS FOR STEREOSCOPIC PHOTOGRAPHY

James E. Ihms, 1569 W. Hazelwood, Phoenix, Ariz. 85015

Continuation-in-part of Ser. No. 412,760, Nov. 5, 1973,

abandoned, which is a continuation-in-part of Ser. No.

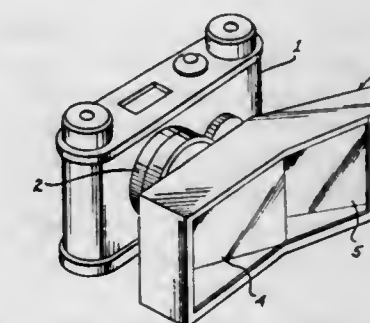
375,335, July 2, 1973, Pat. No. 3,846,810. This application

Dec. 26, 1974, Ser. No. 536,448

Int. Cl.<sup>2</sup> G03B 35/08, 35/18; G02B 27/24

U.S. Cl. 353—7

51 Claims



1. Apparatus for simultaneously combining a first non-color filtered image of an object and a second non-color filtered image of the object to form a non-anaglyph colored composite image having a three dimensional quality, said first and second images being received by said apparatus along first and second light ray paths, respectively, said first and second light ray



paths being angularly displaced from one another, said apparatus comprising in combination:

- a. a light reflective means intercepting the first light ray path for reflecting said first image along a third light ray path to intersect said second light ray path;
- b. color filter means for color filtering only one of said first and second images;
- c. combining means disposed at the intersection of said second light ray path and said third light ray path for combining said second image and said reflected first image, said combining means being angularly oriented to transmit a part of said first image along an extension of said third path and to reflect the remaining part of said first image along an extension of said second path to become a portion of said composite image and to transmit a part of said second image through said combining means along said extension of said second path to become the remaining portion of said composite image and to reflect the remaining part of said second image along said extension of said third path; and
- d. means for displaying said composite image; whereby, an interaction of light results at said combining means between the color filtered one and the non-color filtered one of said first and second images to produce said composite image formed of two non-mutually color exclusive colored images.

4,009,952

## INTERMITTENT ROTARY MOTION DEVICE

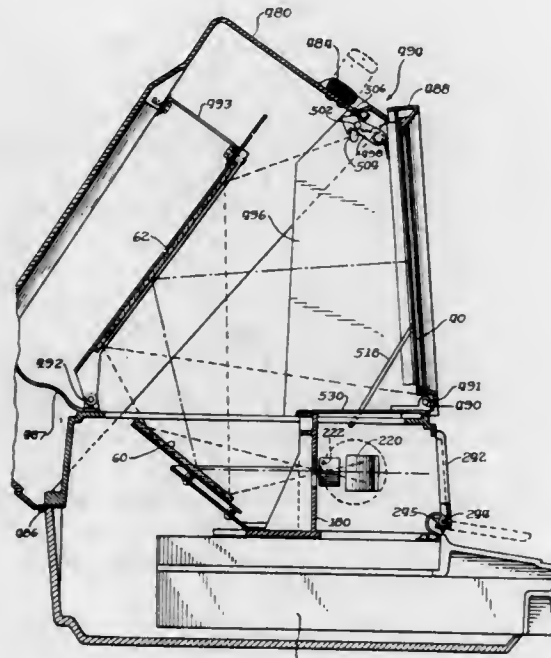
Frank C. Badalich, Chicago, and George J. Pawl, Norridge, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 9, 1975, Ser. No. 539,875

Int. Cl.<sup>2</sup> G03B 23/08

U.S. Cl. 353-109

12 Claims



1. An intermittent rotary motion device, comprising: a rotatable drive gear having at least one segmental arcuate toothed portion with gear teeth thereabout, and a cylindrical surface about the remaining periphery of the drive gear and a detent formed in the cylindrical surface adjacent each end of the segmental arcuate toothed portion, said detents protruding radially inwardly a greater distance than the root diameter of the toothed portions; drive means drivingly connected to said drive gear; a driven gear including a plurality of arcuate toothed portions each of which is spaced apart by a cam locking means for engagement with the cylindrical surface of said drive gear to provide sliding lost motion therebetween, said cam locking means including a pair of spaced apart arcuate tip portions for engaging the cylindrical surface of the drive gear, the engaging tip portions protruding

radially outwardly a greater distance than the gear teeth on the toothed portions of the driven gear so as to mesh and engage the detents of said drive gear adjacent the toothed portions thereof, whereby continued rotation of the drive gear by the drive means causes the toothed portion of said drive gear to sequentially engage one of the toothed portions of said driven gear to cause rotation thereof through an angle determined by the length of the toothed portions thereof whereafter the next adjacent cam locking means engages the cylindrical surface of the drive gear and prevents a rotational movement of the driven gear during the period that the cam locking means engages the drive gear; and

stop means operatively associated with said drive gear to de-energize and stop the drive means after a predetermined angular rotation thereof, said stop means comprising a pair of protrusions on the drive gear protruding parallel to the axis thereof, switch means to de-energize the drive means, and a pivotally mounted stop lever, having an arcuate cam surface alternately engageable with one of said protrusions during a predetermined angular rotation of said drive gear for movement between a drive position wherein said protrusions are out of engagement with said stop lever and said drive means is energized, and a stop position wherein one of said protrusions engage said arcuate cam surface whereby the stop lever actuates the switch means to de-energize the drive means.

4,009,953

## FIXING UNIT FOR ELECTROSTATIC COPIERS

Martino Ravizza, and Giancarlo Abate-Daga, both of Turin, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Torino, Italy

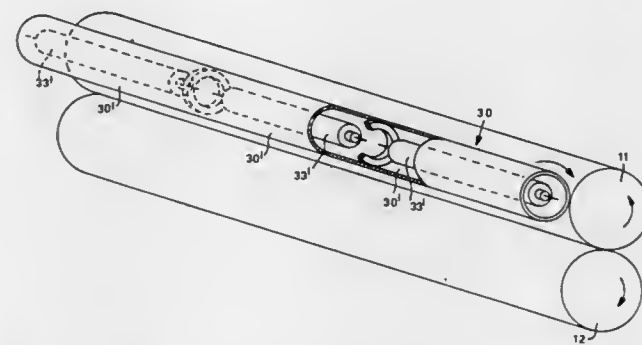
Filed Oct. 14, 1975, Ser. No. 621,715

Claims priority, application Italy, Nov. 6, 1974, 70256/74

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-3 R

3 Claims



1. In a copying machine having means for making powder images on copying sheets of different selectable formats, a device for fixing the powder to a copy sheet comprising: a first roller having its outer surface covered with a layer of material adapted to resist adhesion of the powder thereto; a second roller cooperative with said first roller to define with said first roller a nip through which the copy sheet is advanced by the rotation of said rollers with the sheet face bearing the powder in contact with said first roller; and at least one heating roller rotated in contact with said first roller for heating said layer to a temperature sufficient to cause fusing of the powder to the copy sheet, said heating roller comprising a tube of good thermal conductive material having a plurality of axially adjacent cylindrical portions, each portion contactable with a different part of the periphery of the first roller and each portion having therein a heating unit, each heating unit selectively activatable in accordance with the selected format of the copy sheet for heating the corresponding part of the peripheral surface of the first roller, whereby for a selected format of the copy sheet only a corresponding part of said layer is heated.

4,009,954

## ELECTROSTATIC COPIER

Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Germany

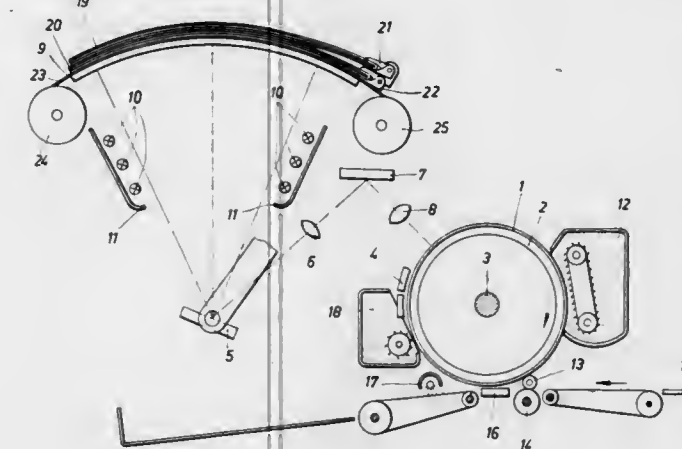
Filed Sept. 11, 1975, Ser. No. 618,685

Claims priority, application Germany, Sept. 17, 1974, 2444941; Nov. 1, 1974, 2452429

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-7

24 Claims



1. In an electrostatic copier, a combination comprising a transparent support member having a support surface and an opposite surface; light source means for directing light against said opposite surface; pattern sheet holding means for holding on said support surface first pattern sheet means which defines an elongated gap and for also holding second pattern sheet means overlying said first pattern sheet means and provided with lines of indicia parallel to said gap; transporting means for transporting said second pattern sheet means stepwise relative to said first pattern sheet means in direction normal to said gap so as to expose succeeding ones of said lines in said gap; and third pattern sheet means intermediate said first pattern sheet means and said light source means and being provided with pattern portions, including moving means for moving different ones of said pattern portions into predetermined positions relative to said first and second pattern sheet means.

4,009,955

## COPYING APPARATUS FOR SHEET ORIGINALS AND THICKER ORIGINALS

Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Continuation of Ser. No. 461,104, April 15, 1974, abandoned, which is a continuation of Ser. No. 258,820, June 1, 1972, Pat. No. 3,804,512. This application June 3, 1975, Ser. No. 583,247

Claims priority, application Japan, June 9, 1971, 46-48632[U]; June 3, 1971, 46-38917; June 3, 1971, 46-38918; June 10, 1971, 46-41195; June 10, 1971, 46-41196; June 10, 1971, 46-41197; June 21, 1971, 46-44611; Aug. 30, 1971, 46-66740

The portion of the term of this patent subsequent to Apr. 16, 1991, has been disclaimed.

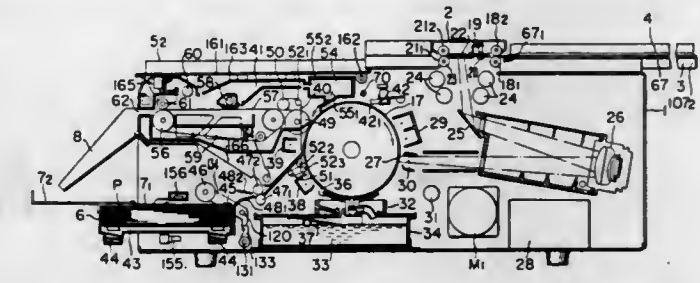
Int. Cl.<sup>2</sup> G03G 15/30

U.S. Cl. 355-8

2 Claims

1. In a copying apparatus having an original carriage, means for reciprocating said original carriage, a photosensitive medium, an optical system for projecting an original image on said photosensitive medium, means for forming an image on said photosensitive medium, developing means, transfer means, means for feeding transfer mediums, means for conveying transfer mediums from said feed means to a discharge port, fixing means, and a housing for accommodating therein

all of said means, comprising the improvement wherein said original carriage includes sheet original transport means integral therewith and having means for advancing a sheet original; said apparatus further comprising means for automatically reciprocating said original carriage, means for releasably



locking said carriage against reciprocating movement, and means for generating a start signal coupled to said original carriage for initiating reciprocal movement of said carriage upon release thereof when a thick original is to be copied, and for energizing said advancing means to advance said sheet original when a sheet original is to be copied.

4,009,956

## ELECTROSTATIC OR XEROGRAPHIC COPYING OR DUPLICATING MACHINE WITH BUILT-IN ARRANGEMENT FOR CUTTING A SHEET ALONG A SELECTED LINE OR LINES

Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Germany

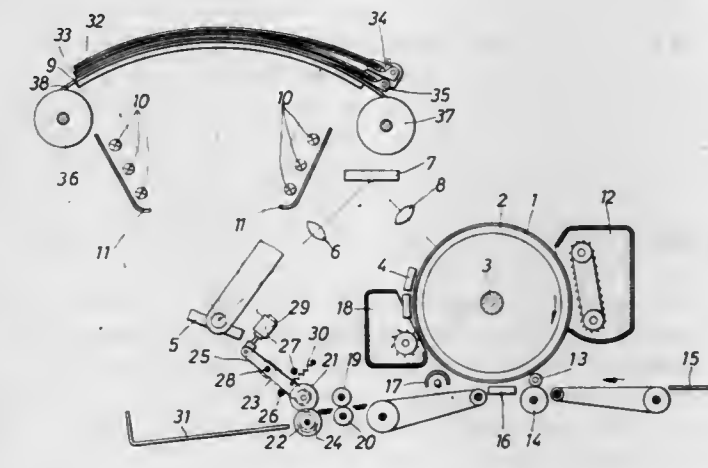
Filed Sept. 11, 1975, Ser. No. 612,579

Claims priority, application Germany, Sept. 18, 1974, 2445153

Int. Cl.<sup>2</sup> G03G 15/00; B23D 19/00

U.S. Cl. 355-13

5 Claims



1. An electrostatic or xerographic copying or duplicating machine, comprising, in combination, supporting means for supporting an original to be copied in a predetermined position; a delivery station for copies; transport means for transporting a sheet of copying paper through the machine in a predetermined travel direction along a predetermined travel path and into said delivery station; copying means for illuminating the original and forming an image thereof on the sheet of copying paper as the latter travels along said path; cutting means arranged upstream of said delivery station, said cutting means comprising a plurality of cutter units spaced from each other in direction transverse to the sheet travel direction and each operative when activated for cutting the sheet along a respective one of a plurality of different cut lines each extending parallel to the travel direction as the sheet leaves said copying means and travels to said delivery station; and activating means operable by the user of the machine for activating said cutting means, said activating means comprising means for selecting the line along which the sheet is to be cut.



4,009,957

## COPY PAPER FEED SYSTEM

Shigeru Suzuki; Minoru Iwamoto; Koichi Noguchi; Kyoji Omi, and Tatsuo Nishikawa, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

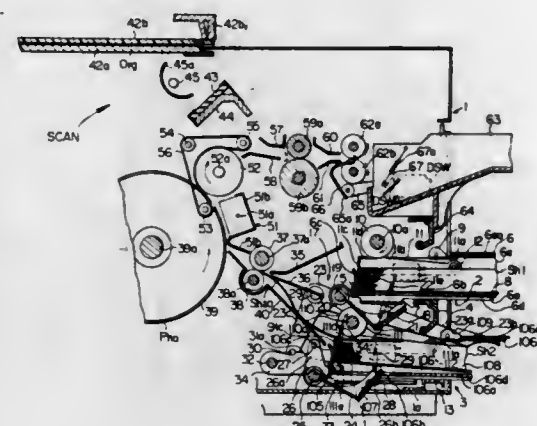
Filed Nov. 7, 1974, Ser. No. 521,822

Claims priority, application Japan, Dec. 27, 1973, 49-2080

Int. Cl.<sup>2</sup> G03G 15/28, 15/32

U.S. Cl. 355-14

9 Claims



1. An electrophotographic copying machine comprising, in combination:

- scanning means for scanning an original document;
- a seamless photoconductive member moving at constant speed and imaged by the scanning means;
- first drive means for moving a copy medium from a storage position to a synchronizing position;
- second drive means for moving the copy medium from the synchronizing position into contact with said photoconductive member to receive an image of the document produced by the scanning means, the image being transferred to the copy medium as the copy medium is moved in contact with the photoconductive member by the second drive means;
- sensing means responsive to the scanning means and operative to sense when the scanning means reaches a predetermined scan synchronizing point;
- control means operative to actuate the scanning means to initiate scanning and actuate the first drive means to move the copy medium from the storage position to the synchronizing position in a length of time less than that required for the scanning means to reach the scan synchronizing point; and
- actuating means responsive to the sensing means and operative to actuate the second drive means when the scanning means reaches the scan synchronizing point, so that the copy medium is moved by the second drive means in synchronism with the operation of the scanning means.

4,009,958

## BELT SUPPORT STRUCTURE IN COPYING MACHINE

Takaji Kurita, Kawachinagano, and Takao Fujiwara, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed Mar. 19, 1975, Ser. No. 560,091

Claims priority, application Japan, Apr. 20, 1974, 49-44754

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-16

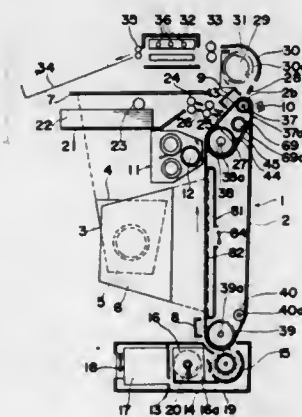
7 Claims

1. A belt support structure in a photoelectrostatic copying machine comprising a housing structure having an access opening in a plane and adapted to be selectively closed and opened, said access opening leading into the interior of said housing structure in which necessary operating elements of the copying machine are arranged, which belt support structure comprises:

- a photoreceptor belt assembly including a photoreceptor belt and first and second side plates and a plurality of rolls rotatably supported between said first and second side

plates in spaced relation to each other, tension adjusting means for adjustment of tension imparted to said photoreceptor belt, said photoreceptor belt being suspended around said rolls, one of said rolls being adapted to be drivingly coupled to a source of driving force when said belt assembly is inserted into said housing structure, and said first side plate being situated remote from said access opening when said belt assembly is inserted into said housing structure and having alignment elements thereon, counter-alignment elements stationarily held in position within the housing structure and engaged by said alignment elements when said belt assembly is within said housing structure for accurately positioning said belt assembly when the latter is inserted into said housing structure;

stationary guide means rigidly secured at least at two spaced points to a wall member of the housing structure within said housing structure, said stationary guide means extending in a direction substantially intersecting the plane of said access opening;



intermediate guide means telescopically movably mounted on said stationary guide means;

movable guide means telescopically mounted on said intermediate guide means; and

hinge means for hingedly mounting said photoreceptor belt assembly on one end portion of said movable guide means for pivotal movement between an operative position, in which the plane of a portion of said photoreceptor belt onto which the incoming light carrying an optical image of an original to be copied is projected lies at right angles to said incoming light when said belt assembly is held in position within said housing structure, and a released position in which said portion of said photoreceptor belt is angularly displaced from the direction of the telescopic movement of said intermediate and movable guide means when said belt assembly is in position outside said housing structure,

said belt assembly being selectively drawn out of and inserted into said housing structure with said intermediate and movable guide means fully extended and folded relative to said stationary guide means, respectively.

4,009,959

## EXPOSURE CONTROL UNIT

Charles J. Watson, Elgin; Larry L. Langrehr, Chicago, and John H. Steiner, Evanston, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed June 26, 1975, Ser. No. 590,472

Int. Cl.<sup>2</sup> G03B 27/76, 21/36

U.S. Cl. 355-71

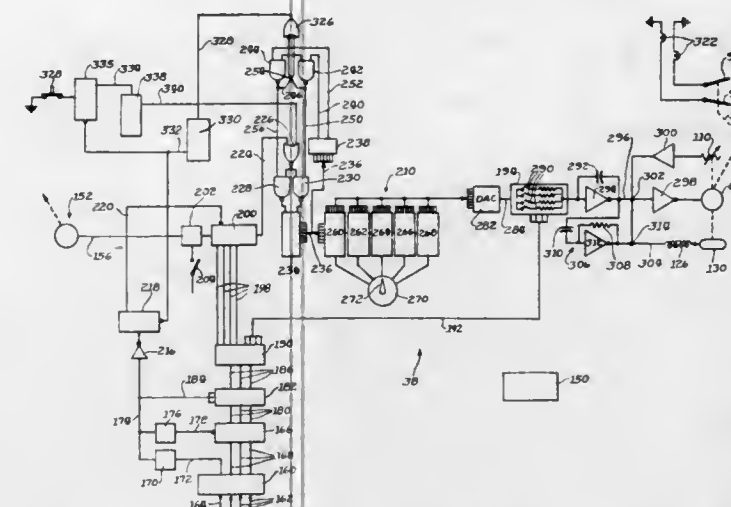
26 Claims

1. An exposure control device for a photographic film printer having a light beam for exposure of the film, comprising:

- shutter means positioned in the path of said light beam and mounted for movement between a first position wherein the intensity of said light beam is substantially unaffected and a second position wherein the intensity of said light beam is substantially cut off, to thereby vary the intensity of the light beam for exposing the film;

control means for moving the shutter means between said positions; and

programmable means for said control means including



storage means for storing a plurality of preselected operating rates to effect operation of said shutter means to vary the intensity of said light beam in accordance with a predetermined film exposure characteristic.

4,009,960

## PASSIVE OPTICAL RANGEFINDER

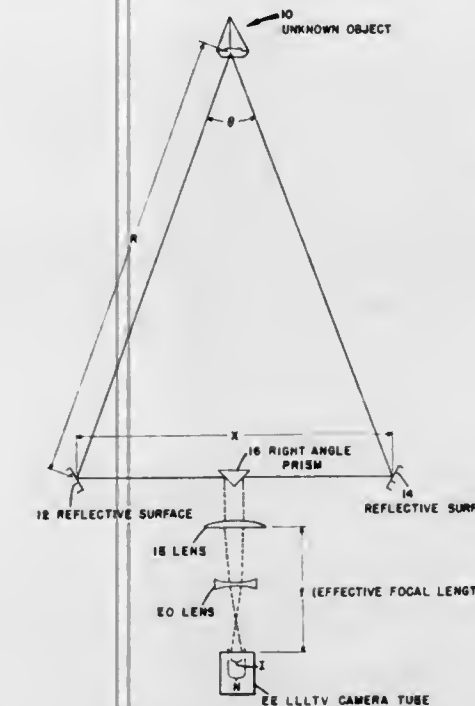
Sidney Feldman, Silver Spring, Md., and George G. Barton, Jr., Harkers Island, N.C., assignors to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1975, Ser. No. 549,422

Int. Cl.<sup>2</sup> G01C 3/00

U.S. Cl. 356-1

8 Claims



1. A passive optical rangefinder for supplying both image and range information in digital form on a remotely located monitor, comprising:

- optical means for producing a dual image of an object located at a distance from said rangefinder wherein images of said dual image are spaced by an amount proportional to said distance;
- means for transforming said dual image into an electrical signal representative thereof;
- control means including means for eliminating all components of said electrical signal but those components representing pairs of parallel features of said dual image having a preferred orientation, means for displaying the pairs of parallel features by scanning a display surface, means for selecting from the display surface a field-of-view containing a pair of said parallel features, and means

for producing a control signal varying in proportion to the spacing between said pair of parallel features; means controlled by said control signal for producing a signal representative of said spacing of said pair of parallel features and said range.

4,009,961

## CONTOUR LINE PLOTTING DEVICES

Takashi Maruyama, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

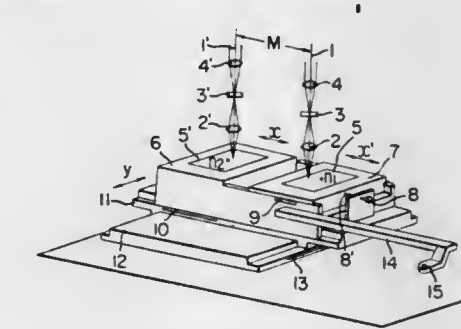
Continuation-in-part of Ser. No. 502,949, Sept. 4, 1974,

abandoned. This application Mar. 11, 1976, Ser. No. 665,816

Int. Cl.<sup>2</sup> G01C 11/12

U.S. Cl. 356-2

7 Claims



1. A device for deriving the contour lines of an object from a pair of stereophotographic records of the object, the device comprising:

- means for comparing the stereophotographic records to locate the points on the object which have a selected height and for generating first position signals representing the positions of the points;
- a correction mechanism rotatably supported about an axis through a point (N) and responsive to the first position signals for generating second position signals which represent corrected positions of the points for defining a contour line corresponding to the selected height, the correction mechanism including means for operating on the first position signals in accordance with the following equation to produce the second position signals:

$$P' = \left(1 - \frac{\Delta H}{H}\right) P,$$

where  $P$  is the first position signal and represents the distance between the points and the principal point of the one stereophotographic record, the principal point being the point of intersection of the stereophotographic record with the optical axis of the associated lens through which the record was taken,  $H$  represents the distance between the lens and a reference plane of the object when the stereophotographic records were made,  $\Delta H$  represents the selected height as measured from the reference plane, and  $P'$  is the second position signal and represents the distance between the associated points defining the contour line and a reference point; and

indicating means for detecting and indicating the second position signal from said correction mechanism.

4,009,962

## EMISSION SPECTROSCOPIC SYSTEM HAVING COMPENSATION FOR BACKGROUND RADIATION

James L. Lauer, Penn Wynne, and Melvin E. Peterkin, Brookhaven, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Oct. 3, 1975, Ser. No. 619,270

Int. Cl.<sup>2</sup> G01J 3/36

U.S. Cl. 356-82

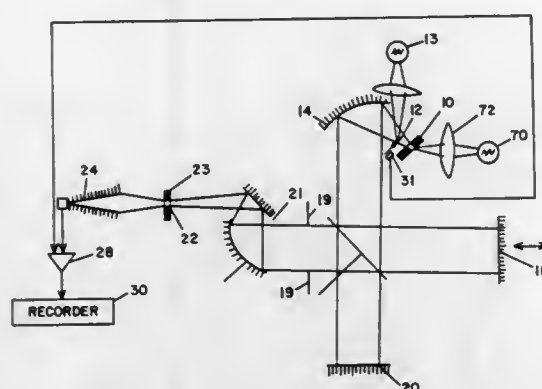
18 Claims

1. A method of detecting discontinuous radiation emitted



from a test object which is radiating both continuous and discontinuous radiation and comprising the following steps:

- detecting both continuous and discontinuous radiation emitted from the test object;
- detecting continuous radiation emitted from a second object;
- balancing the radiation detected from said test and second objects such that the continuous radiation detected from said test and second objects are substantially equal; and



- subtracting the radiation detected from said second object from the radiation detected from said test object such that the remainder of the detected radiation from said test object is only substantially discontinuous radiation emitted therefrom.

4,009,963

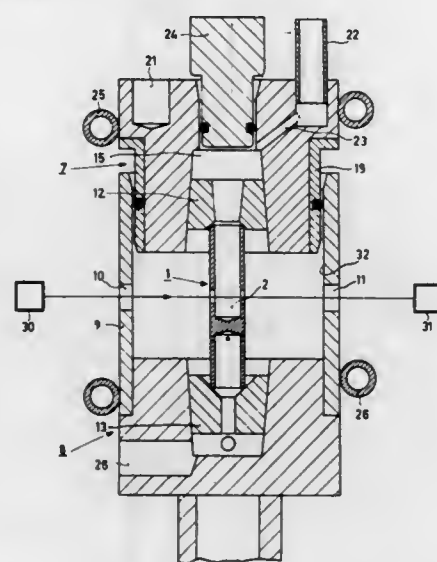
**ARRANGEMENT FOR PRODUCING FREE ATOMS OF A SUBSTANCE FOR ATOMIC SPECTROSCOPY PURPOSES**  
Richard Alexander George, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,824

Claims priority, application Netherlands, Mar. 25, 1974, 7403968

Int. Cl.<sup>2</sup> G01J 3/30

U.S. Cl. 356—85



1. An apparatus for producing free atoms of a substance for atomic spectroscopy purposes, comprising an oven and an oven element that contains said substance, said apparatus further comprising cooling means adapted to maintain said oven at a temperature level such that there exists therein the situation where

$$\rho_{cr} L t > m,$$

$\rho_{cr}$  is the critical water vapor density,  
 $L$  is the volume velocity of a carrier gas through said oven,  
 $t$  is the duration of the drying phase for said oven, and  
 $m$  is the mass of the water in said oven.

4,009,964

**ATOMIC SPECTROSCOPY**

Stephen Archbold Bergen, St. Ives, England, assignor to U.S. Philips Corporation, New York, N.Y.

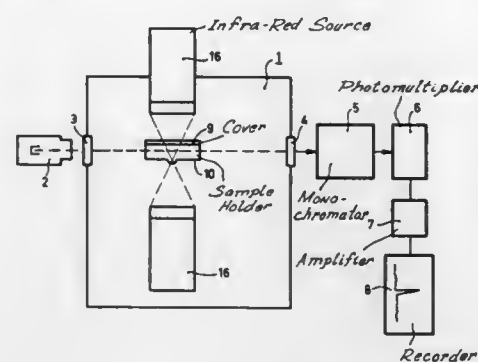
Filed Aug. 4, 1975, Ser. No. 601,640

Claims priority, application United Kingdom, Aug. 14, 1974, 35776/74

Int. Cl.<sup>2</sup> G01J 3/30; G01N 21/16

U.S. Cl. 356—85

5 Claims



1. Atomic absorption spectroscopic apparatus comprising a chamber adapted to be purged by an inert gas and having windows transparent to a beam of monochromatic light, a source of focused infra-red radiation within said chamber having a focal point adjacent the path of said light beam and means for holding a sample at said focal point.

4,009,965

**METHOD AND APPARATUS FOR DETERMINING OBJECT DIMENSION AND OTHER CHARACTERISTICS USING DIFFRACTION WAVES**

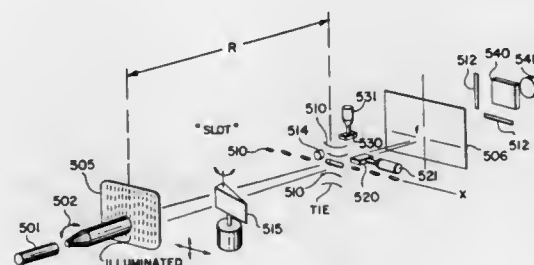
Timothy Reed Pryor, 1578 Cherrylawn Crescent, Windsor, Ontario, Canada (N9E 1P4)

Continuation-in-part of Ser. Nos. 253,421, May 15, 1972, Pat. No. 3,884,581, and Ser. No. 358,547, May 9, 1973, Pat. No. 3,883,249. This application Sept. 13, 1974, Ser. No. 505,777

Int. Cl.<sup>2</sup> G01B 9/02

U.S. Cl. 356—109

21 Claims



1. A method of determining at least one of the average dimensions of elements within an array of like elements, said method comprising the steps of:  
illuminating the boundaries of said elements with electromagnetic radiation to produce diffraction waves,  
converging, via a lens or lens system, the waves diffracted from said elements to form an interference pattern in a first plane containing the focal point of said lens or lens system, and  
analyzing the diffraction pattern formed in a second plane, spaced from said first plane, to determine at least one of the average dimensions of the illuminated elements.

4,009,966

**HEADLAMP FOCUSING METHOD**

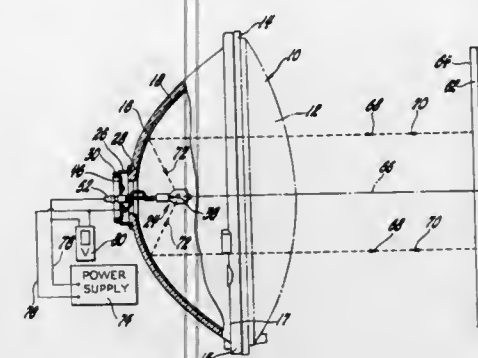
Gale M. Craig, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 24, 1975, Ser. No. 616,384

Int. Cl.<sup>2</sup> G01J 1/00

U.S. Cl. 356—123

3 Claims



1. A method for aligning a filament light source at a focal point of a reflector to produce parallel light rays from the reflector comprising the steps of preforming a reflector with a filament support opening, supporting a filament support for axial and angular movement with respect to said opening, locating a flat mirror in facing relationship with the light reflecting surface of the reflector with a flat reflecting surface on said mirror being located normal to the optic axis of the reflector to reflect light rays back to the filament to heat the filament, connecting a reference power supply across the terminals of the filament to energize the filament to direct light rays from the reflector for return from the flat mirror back to the light source, adjusting the position of the filament with respect to the reflector, sensing the power supply to produce an electrical signal therefrom reflecting maximum filament temperature and resultant change in the electrical resistance of the filament as produced by the location of the filament on the reflector focal point, and thereafter fixing the filament support at its axially adjusted position in the opening.

4,009,967

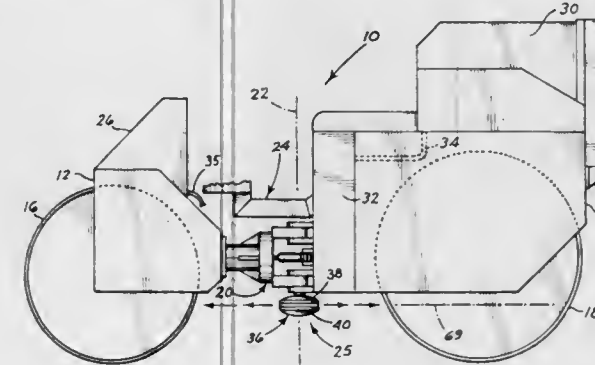
**ROAD ROLLER VEHICLE WITH WATER APPLICATOR**  
Claude D. Layton, Salem, Oreg., assignor to Layton Manufacturing Co., Inc., Salem, Oreg.

Filed Dec. 8, 1975, Ser. No. 638,747

Int. Cl.<sup>2</sup> E01C 19/26

U.S. Cl. 404—129

8 Claims



2. In a ground-traveling vehicle including a frame, a wheel rotatably mounted on said frame for rotation about a substantially horizontal axis extending transversely of the longitudinal axis of the vehicle adapted to transport the vehicle over the ground, said wheel including a ground-contacting face extending about the perimeter of the wheel, and a spin-operated water-delivery means mounted on said frame at a location spaced longitudinally along said vehicle from the wheel rotation axis, and intermediate the laterally opposite sides of said wheel,

said water-delivery means including a rotatable spray ejecting member rotatable about an upright axis and adapted when rotated and with water supplied thereto to throw such from the periphery of the member as a spray, said member producing a spray pattern impinging on the perimeter of said wheel in a zone substantially paralleling its axis and extending across the face which forms the perimeter of the wheel,  
said water-delivery means including means confining the spray pattern to substantially the lateral dimensions of said face.

4,009,968

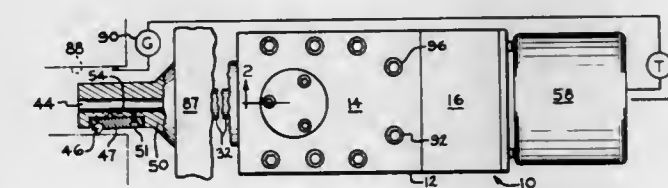
**ELECTRICALLY DRIVEN TOOL COMPENSATOR**  
John Vandenkiesboom, St. Clair Shores, Mich., assignor to LaSalle Machine Tool, Inc., Warren, Mich.

Filed Nov. 28, 1975, Ser. No. 636,114

Int. Cl.<sup>2</sup> B23B 47/20

U.S. Cl. 408—12

10 Claims



1. In machine tool adjusting apparatus for automatically extending and retracting a machine tool, reversible electric motor means, means interconnecting said tool with said motor means, said interconnecting means being operable to provide for adjusting movements of said tool in response to operation of said motor means, gaging means operable to detect the position of said tool and provide for operation of said motor means, and timer means having a preset time cycle operatively associated with said motor means for terminating motor means operation after operation thereof in response to said gaging means to move said tool through a preset increment of adjusting movement.

4,009,969

**SUPPORTING RING FOR STATOR VANES IN AN AXIAL COMPRESSOR**

Vaclav Kadera, Jiri Penkava, and Miloslav Vondruska, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

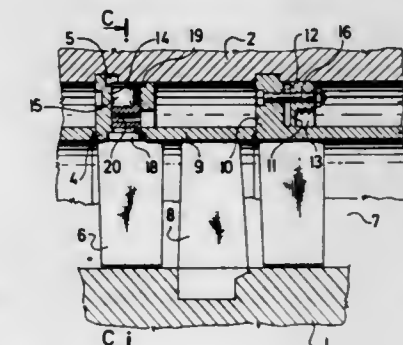
Filed Sept. 26, 1975, Ser. No. 617,192

Claims priority, application Czechoslovakia, Sept. 26, 1974, 6617/74

Int. Cl.<sup>2</sup> F01D 1/02

U.S. Cl. 415—217

6 Claims



1. A support structure for stator vanes of an axial compressor adapted to be mounted in the stator case of the compressor, comprising in combination, at least one supporting ring having a plurality of bores located along a row on a circumference of said ring, and at least one first annular recess traversing said plurality of bores in said ring;



a plurality of studs adjustably mounted in said bores and having stator vanes extending therefrom into the flow-through space of the compressor, said first annular recess forming elastic wall means in said supporting ring for clampingly supporting said studs in said supporting ring, said supporting ring having a ring portion and a cylindrical fin portion, said annular recess extending radially inwardly from the radially outer periphery of said ring portion to the radially outer periphery of said cylindrical fin portion, and said ring portion having a second annular recess which extends parallel to the axis of the compressor and having a diameter corresponding substantially to the radial thickness of said cylindrical fin portion.

4,009,970

## RESILIENT FAN HUB

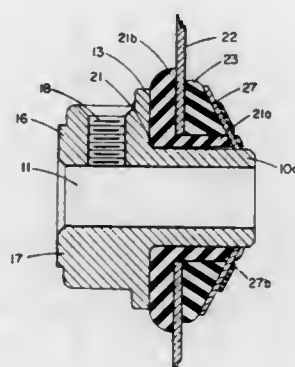
Claude A. Forth, Jr., 777 Park Drive, Fortville, Ind. 46040

Filed Jan. 15, 1975, Ser. No. 541,155

Int. Cl.<sup>2</sup> F04D 29/20

U.S. Cl. 416—134 R

2 Claims



1. In combination, a hub assembly, a drive shaft, a driven element such as a fan spider having a center disc with a central aperture therein, said hub comprising a body having a central bore therethrough and an integral flange extending radially from the body intermediate its ends, an embossment formed on said body adjacent one face of said flange adapted to accommodate a set screw engaging said driving shaft when received in said central bore, a resilient grommet having a tubular portion through and beyond which said hub body extends and a radially extending portion contiguous with said body flange on one face, said tubular portion extending through said center disc aperture with a face of said disc contiguous with the outer face of said radially extending portion of the grommet, an annular resilient washer received on said tubular portion of the grommet and contiguous with the other face of said disc, and a single annular slide-on fastener received on the portion of the hub body which extends beyond said grommet, said fastener having a plurality of gripping radial legs extending away from said center disc and engaging said hub body, said fastener forming the sole means for compressing said resilient washer and grommet against said fan center disc and said integral body flange.

4,009,971

## ELECTRIC MOTOR-DRIVEN, DOUBLE-ACTING PUMP HAVING PRESSURE-RESPONSIVE ACTUATION

Duane D. Krohn, and Samuel W. Culbertson, both of Arvada, Colo., assignors to Binks Manufacturing Company, Franklin Park, Ill.

Continuation-in-part of Ser. No. 477,216, June 7, 1974, abandoned, which is a continuation of Ser. No. 415,865, Nov. 13, 1973, abandoned, which is a continuation of Ser. No. 184,359, Sept. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 150,445, June 7, 1971, abandoned. This application Aug. 27, 1974, Ser. No. 500,948

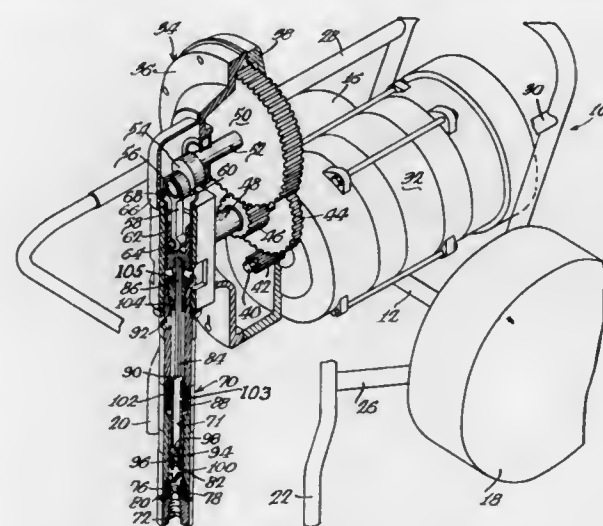
Int. Cl.<sup>2</sup> F04B 49/00

U.S. Cl. 417—43

7 Claims

1. In a liquid pumping system for an airless spray gun

wherein liquid is to be supplied to the gun under substantially uniform pressure in the range of up to 3000 pounds per square inch and the gun is intermittently turned off and on thereby tending to cause fluctuations in the liquid pressure at the gun, a pump and operating mechanism therefor comprising, in combination, a double-acting positive displacement pump having a cylinder with an inlet at its lower end and an outlet adjacent its upper end, a piston reciprocable in said cylinder between said inlet and said outlet, a piston rod connected to and reciprocable with said piston extending from the upper end of said cylinder, a passage through said piston, and check valves in said inlet and said passage, said piston and piston rod being proportioned to displace half the volume of said cylinder whereby said cylinder is filled with liquid on alternate strokes of said piston and one half of a cylinder full of liquid is discharged from said outlet on each stroke of said piston; a crosshead housing at the upper end of said pump cylinder having a cylinder therein aligned with said pump cylinder, a crosshead reciprocably and guidably mounted in said crosshead cylinder and connected to the upper end of said piston rod, and a connecting rod pivotally connected at its lower end



to said crosshead; a high speed electric motor having a drive shaft; a speed-reducing power-multiplying gear train connected to said drive shaft and including an electric clutch; said gear train having an output shaft including an eccentric pivotally connected to the upper end of said connecting rod for positively interconnecting said motor and said piston for reciprocating said piston in said cylinder; said crosshead isolating said pump and said piston and piston rod from the gyratory movement of said eccentric and said connecting rod; an outlet manifold having an inlet connected to said pump outlet and an outlet, an adjustable pressure responsive switch on said manifold responsive to the pressure of the liquid flowing through said manifold, an electric circuit connected to said clutch including said switch and responsive thereto to cause said pump to start and stop operating as a function of pressure, said switch being operative to activate and deactivate said clutch for causing said pump to stop operating when the liquid pressure exceeds a preselected pressure and for causing said pump to start operating when the liquid pressure falls below said preselected pressure, and means for adjusting said switch to respond to any selected pressure over a range of pressures.

4,009,972

## TURBOCHARGER LUBRICATION AND EXHAUST SYSTEM

Charles Richard Sarle, Noblesville, Ind., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed July 10, 1975, Ser. No. 594,646

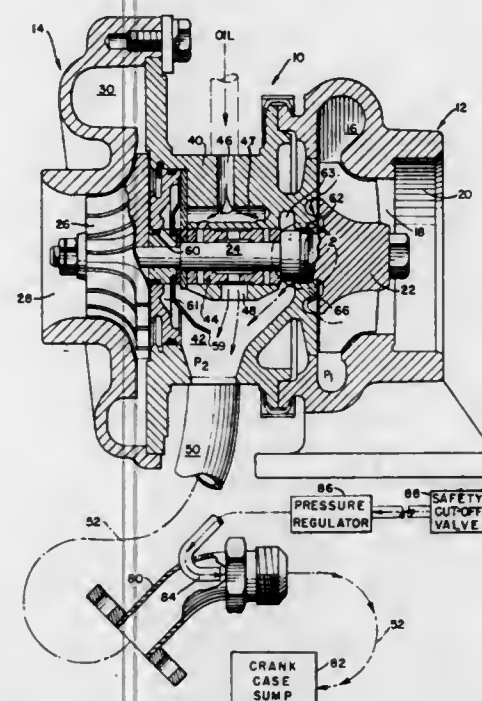
Int. Cl.<sup>2</sup> F04B 17/00

U.S. Cl. 417—407

4 Claims

1. A turbocharger including a housing adapted to be driven by exhaust gases from an internal combustion engine, the turbocharger including two spaced impeller wheels mounted

on a common shaft and each rotatable within a respective impeller chamber including each impeller wheel, a lubrication chamber through which said common shaft passes, spaced bearings and seals positioned adjacent said lubrication chamber, an input oil passage leading to and an output passage



leading from said lubrication chamber, the improvement comprising, one of said spaced seals being in the form of a ring having a through passageway therein, the through passageway establishing fluid communication between said lubrication chamber and the adjacent impeller chamber.

4,009,973

## SEAL FOR HYDRAULIC PUMPS AND MOTORS

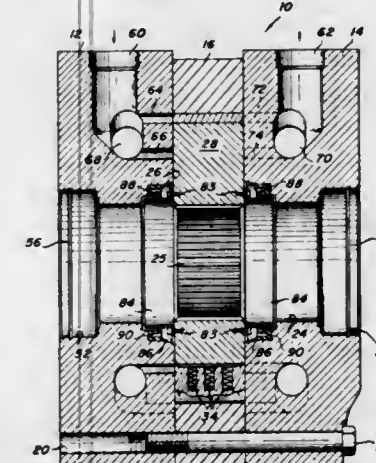
Allan E. Heinrich, Oconomowoc, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 21, 1975, Ser. No. 606,638

Int. Cl.<sup>2</sup> F01C 19/00

U.S. Cl. 418—104

7 Claims



1. A fluid pressure translator comprising a rotor, a cam ring surrounding said rotor and defining a plurality of working chambers therewith, slidable vanes received in radial slots in said rotor and normally biased into abutment with said cam ring, a housing for said rotor defining a rotor chamber having sidewall surfaces facing the side walls of said rotor, a central axially extending bore in said housing and said rotor and adapted to receive a shaft, means for drivingly engaging said rotor with said shaft, and sealing means on each side of said rotor for preventing leakage of fluid from the area between said side wall surfaces and rotor side walls and into said bore, said sealing means each comprising a cylindrical sleeve attached to said rotor and extending axially therefrom in said

bore and radially spaced from said housing, and an annular elastomeric sealing member disposed between said sleeve and said housing.

4,009,974

## METHOD AND APPARATUS FOR PUMPING VISCOUS MATERIAL

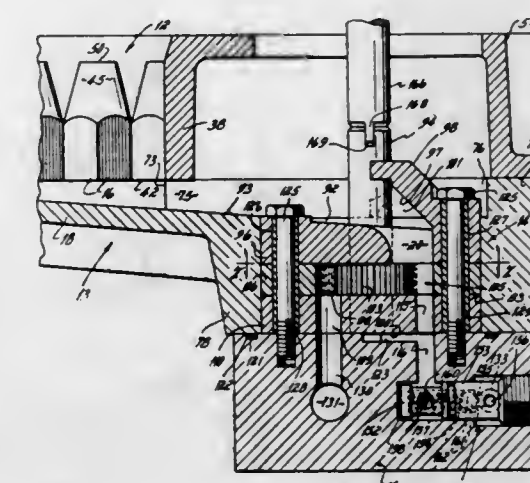
Charles H. Scholl, Vermilion, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 549,189, Feb. 12, 1975, Pat. No. 3,964,645. This application Dec. 15, 1975, Ser. No. 640,555

Int. Cl.<sup>2</sup> F04C 13/00, 11/14, 15/00

U.S. Cl. 418—181

12 Claims



1. The method of pumping viscous liquid material which comprises, supplying the liquid material into contact with a rotating shaft to which it adheres upon contact, shearing said liquid material from contact with the rotating shaft by means of a shear surface located in close proximity to the peripheral surface of said shaft, said shear surface being inclined relative to the peripheral surface of said shaft, entrapping said liquid material as it is sheared from said shaft within an entrapment chamber, which entrapment chamber communicates with a pump inlet passage, and causing liquid material as it is sheared from said rotating shaft to force material contained within said entrapment chamber to exit through said pump inlet.

4,009,975

## DEVICE FOR PRODUCING AN OBLIQUELY ORIENTED FILM OF THERMOPLASTIC SYNTHETIC RESIN

Tomokazu Ninomiya; Syuzo Sasagawa, both of Iwakuni; Hideo Washio, Odawara, and Nobuhiko Hirata, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jan. 2, 1976, Ser. No. 646,015

Claims priority, application Japan, Jan. 6, 1975, 50-33

Int. Cl.<sup>2</sup> B29C 17/02; B29D 23/04

U.S. Cl. 425—66

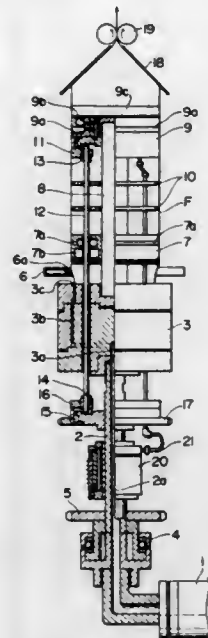
8 Claims

1. A device for producing an obliquely oriented film of thermoplastic synthetic resin comprising:

- an extruder;
- an annular die for forming the resin extruded from the extruder to a tubular film, said annular die being rotated by a power source;
- a first mandrel provided at the lower side of the annular die and rotated integral with the annular die;
- a second mandrel provided at the lower side of the first mandrel, said second mandrel having an integral gear which is driven by a driving shaft extending through the annular die at the portion thereof where the center of the



die is not located, said driving shaft being driven by a driving system individual to that for the annular die; and



drawing rolls for drawing the resinous film passed over the second mandrel.

4,009,976

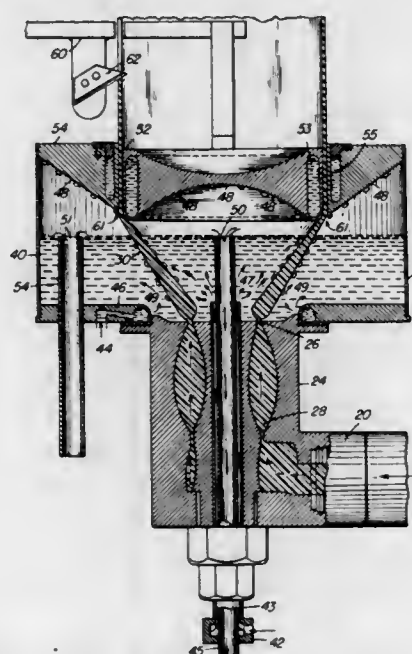
# APPARATUS FOR PRODUCING A FOAMED POLYSTYRENE SHEET HAVING A DENSITY GRADIENT DECREASING FROM THE EXTERNAL SURFACES INWARDLY

David Emil Johnson, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 394,039, Sept. 4, 1973, Pat. No. 3,864,444. This application Nov. 21, 1974, Ser. No. 526,015 Int. Cl.<sup>2</sup> B29D 23/04

U.S. Cl. 425-68

2 Claims



1. In combination with an apparatus comprising a die having an inlet and an outlet, said outlet being annular and being further characterized as positioned at the top of said die thereby allowing a hot cylindrical thermoplastic to be extruded upwardly through said die outlet; and an annular calender ring located above said die, said calender ring having the same centerline as said annular die outlet, said calender ring having an inside diameter larger than the outlet outside diameter of said die, thereby allowing an extrudate from said die to be biaxially stretched as said extrudate is drawn from said die and through said calender ring, the improvement which comprises: A chamber located between and immediately adjacent to said die and said calender ring; a stationary first hollow duct extended upward through said die and inside said inner diameter of said annular die outlet into said chamber; a vertically

moveable second hollow duct positioned within said first duct and thereby creating an annular space between said first duct and said second duct; a vertically moveable third hollow duct extended upward into said chamber and being located outside the outer diameter of said annular die outlet; a cooling fluid discharge located at the base of said chamber and outside said outer diameter of said die outlet; pumping means to circulate said coolant through said chamber; a coolant temperature control means associably connected with the pumping means; discharge piping connecting said pumping means to said cooling fluid discharge and said annular space between said first and second ducts; a reservoir containing a quantity of said coolant; piping connecting said reservoir to said second and third moveable ducts; and suction piping connecting said reservoir to said pumping means.

4,009,977

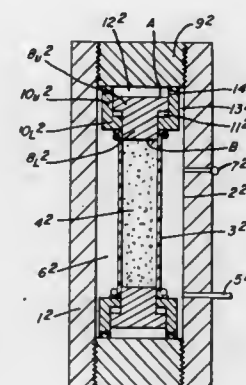
# APPARATUS FOR THE TRIAXIAL COMPRESSION OF PARTICULATE MATERIAL

Hung-Chi Chao, Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1976, Ser. No. 681,310 Int. Cl.<sup>2</sup> B30B 5/02, 11/00

U.S. Cl. 425-78

5 Claims



1. A triaxial compression apparatus for the compaction of particulate material feed, said apparatus comprising, a non-deformable enclosure, the inner portion of which defines a substantially right circular cylindrical bore, a non-deformable floating plunger axially disposed and supported within said bore approximal the upper end thereof, said plunger (i) being comprised of an upper section and a right circular cylindrical lower section, and (ii) having top and bottom planar surfaces perpendicular to the axis of said bore, the ratio of the area of the top planar surface of said upper section to the area of the bottom base surface of said cylindrical lower section being other than 1, said plunger lower section fitting slidably within a deformable tube supported within said bore, whereby said plunger bottom base surface forms the top surface of a confine for containing said feed, the outer diameter of said tube being smaller than the diameter of said bore, so that the annular region between the outer surface of said tube and the surface of said bore forms a chamber for containing media under pressure, said plunger being supported within a member having upper and lower sleeve portions, in which (i) the perimeteric surface of the plunger upper section and the inner surface of the upper sleeve portion mate, and (ii) the perimeteric surface of the plunger lower section and the inner surface of the lower sleeve portion, mate in fluid tight engagement to provide a cavity bound by said perimeteric surfaces and sleeve portions, which cavity is isolated from said chamber, a non-deformable means sealing the lower end of said bore, said lower end seal means including a substantially right circular cylindrical element, the top base diameter of

which is approximately equal to the inner diameter of said tube, said cylindrical element being fitted within said tube so that the top base surface of said element forms the bottom enclosure of said feed confine, a non-deformable capping means sealing the upper end of said bore, said capping means having a substantially planar surface oppositely facing said plunger top planar surface and being spaced therefrom a distance sufficient to permit ready ingress of said media in the region therebetween, means for the admission of media to said chamber, and means for the admission of media to said therebetween region, whereby upon pressurization, an isostatic pressure will be exerted on the circumferential surface of said tube while the pressurization of said therebetween region will exert a pressure on the top surface of said plunger upper section.

4,009,978

# MOLDING SYSTEM WITH AUTOMATIC FLUID TREATMENT OF MOLD CAVITY

Michael Hanning, Oerlinghausen, Germany, assignor to Hanning-Elektro-Werke Robert Hanning, Bielefeld, Germany

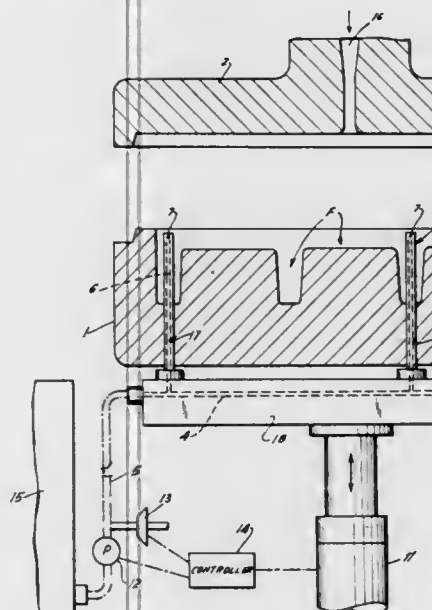
Filed Apr. 16, 1975, Ser. No. 568,735

Claims priority, application Germany, Apr. 18, 1974, 2418658

Int. Cl.<sup>2</sup> B29C 1/04, 7/00

U.S. Cl. 425-98

4 Claims



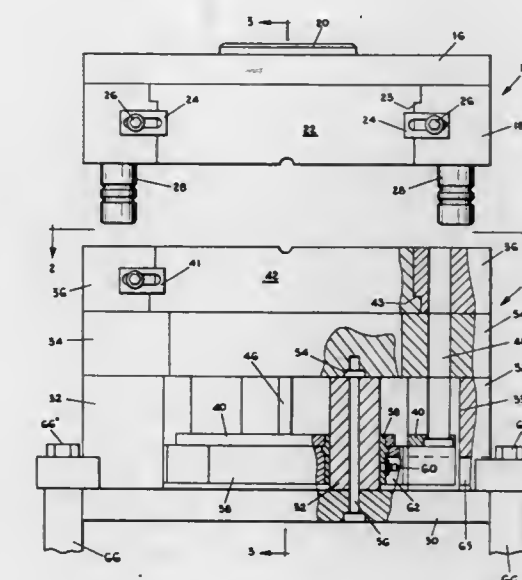
1. A molding apparatus comprising:

a first mold half; a second mold half forming with said first half a mold cavity and formed with a bore between said cavity and the exterior; means operatively connected to said first mold half for moving same toward and away from said second mold half to open and close said cavity; an elongated ejector element in said bore having an inner end displaceable into said cavity and an outer end lying outside said mold halves, said element being formed with a passage extending between said ends; means operatively connected to said element and shiftable relative to said second mold half for displacing said element between a first position with said inner end within said cavity to eject a molded article from said cavity and a second position with said inner end generally flush with an inner surface of said cavity; and means including a source of mold-wall treating release liquid connected to said passage at said outer end for injecting a portion of said liquid into said cavity in said first position of said element, said ejector element being formed with means for training a spray of the liquid from said passage upon a wall of said cavity.

4,009,979  
MOLDING DIE APPARATUS  
Roger G. Martin, Greenville, Mich., assignor to Master Unit Die Products, Inc., Greenville, Mich.  
Filed June 26, 1974, Ser. No. 483,238  
Int. Cl.<sup>2</sup> B29F 1/14

U.S. Cl. 425-107

9 Claims



1. In a die frame assembly for molding parts from heated fluid material, said die frame assembly comprising: a first frame including a first mold half; a second frame including a second mold half, said second frame including a clamp plate through which said frame is secured to a molding machine and a support plate spaced from said clamp plate; at least one of said first and second mold halves having a mold cavity forming a part to be molded; at least one of said first and second mold halves having means passing the fluid molding material from a sprue opening to the mold cavity; at least one support post extending between the clamp plate and the support plate to provide rigid support for the support plate; an ejector plate mounted within the second frame with the support post extending through the ejector plate; ejector pins mounted on the ejector plate and extending through the second mold half; means mounting the ejector plate for reciprocatory movement within the second frame between a retracted position and an ejected position, the ejector pins being positioned at the surface of the mold cavity or the fluid material passing means when the ejector plate is in a retracted position, the ejector pins extending into the mold cavity or the fluid material passing means when the ejector plate is in the ejected position to eject the molded part from the second die half as the mold separates; the improvement which comprises: a bushing mounted to said ejector plate and snugly engaging said at least one support post to permit smooth guided movement of the ejector plate within the second die frame during ejection of the molded parts and return of the ejector plate to the retracted position, said ejector plate riding on and being guided within the second frame essentially only by said at least one support post.



4,009,980

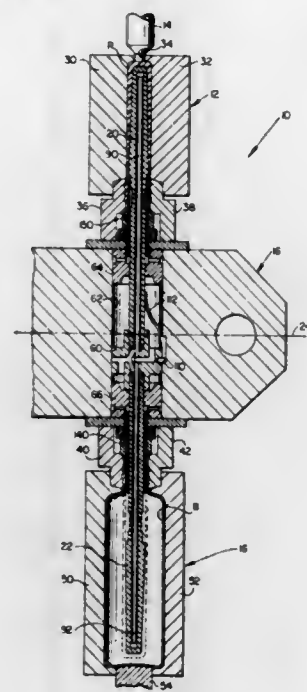
INJECTION BLOW MOLDING MACHINE HAVING  
MOVABLE PARISON PINSDonald F. Armour, Bloomfield, Conn., and William B. Nleml,  
East Longmeadow, Mass., assignors to Package Machinery  
Company, East Longmeadow, Mass.

Filed July 23, 1975, Ser. No. 598,330

Int. Cl.<sup>2</sup> B29C 17/07

U.S. Cl. 425-242 B

8 Claims



1. In an injection blow molding machine having an injection nozzle cooperating with a parison mold to inject a quantity of settable material into the mold cavity to form a parison and a blow mold having a cavity in which the parison is received from the parison mold and which blow mold cavity defines the shape of an article formed from the parison in a blowing operation, the improvement comprising:

- a parison arm movable in relation to the parison and blow molds;
- a parison pin mounted on the parison arm for movement relative to the arm along and about the longitudinal pin axis and movable with the arm relative to the cavities of the parison and blow molds, the parison being formed over the parison pin in the cavity of the parison mold;
- separable neckring segments forming a neckring mounted on the arm about the parison pin and engaging an end portion of the parison formed on the pin and operable to hold said end portion in a fixed position relative to said arm during movement of the parison with the pin and arm from the parison mold to the blow mold; and
- actuating means mounted on the parison arm and connected with the parison pin and operable to move the pin along and about the longitudinal pin axis relative to the parison arm for axially stretching and twisting the portion of the parison extending beyond the neckring segments during movement of the parison with the pin and arm from the parison mold to the blow mold.

4,009,981

UNIVERSAL MOLD TOOLING SYSTEM FOR  
THERMOFORMING MOLDSStanley R. Rosen, 8 Gerardine Place, Spring Valley, N.Y.  
10977

Filed Nov. 10, 1975, Ser. No. 630,154

Int. Cl.<sup>2</sup> B29C 17/00

U.S. Cl. 425-388

3 Claims

1. Thermoforming apparatus adapted to accommodate molds of different lengths to form molded parts in a horizontal web, comprising:

- a vertically movable support;
- a mold base assembly, comprising:

a flat-topped rectangular basic mold base secured horizontally to said support,

a plurality of flat-topped straight mold base extension segments,

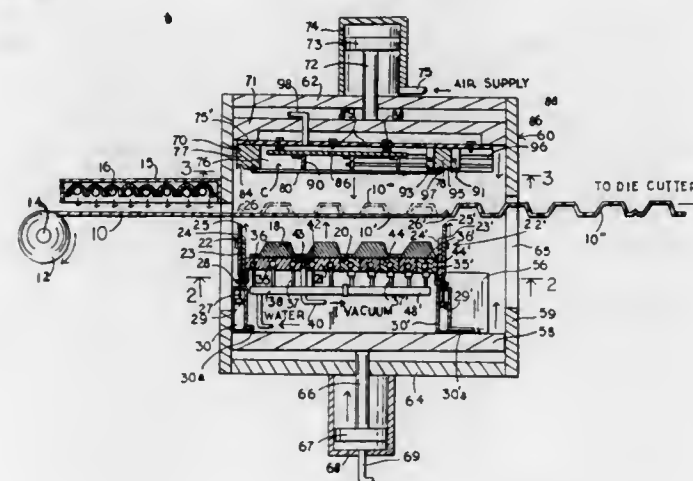
means for removably securing said segments together in side-by-side position to form a rectangular array of predetermined length, and

means for removably securing one end of said array to one end of said basic mold base to define therewith a flat-topped horizontal platform for supporting a mold of desired length;

a first vertically movable straight gate secured to the other end of said basic mold base and disposed to engage said web transversely;

a second vertically movable straight gate;

means removably securing said second gate to a front one of said segments at the other end of said array to engage said web transversely a predetermined distance from said first gate,



whereby any number of said segments can be removed from said array to shorten said mold base assembly without disturbing the position of said basic mold base and the remaining segments in said array for supporting a different mold of different length, and whereby said second gate can then be secured to a remaining one of said segments at the other end of the shortened mold base assembly;

a manifold assembly connected to said basic mold base, and having branch members removably connected to all of said mold base extension segments in said array for passing a fluid coolant through said basic mold base and said segments for cooling said mold on said mold base assembly while molding said web; and means for quickly detaching said branch members from those of said segments to be removed for quickly adjusting said manifold assembly in length corresponding to the length of the shortened mold base assembly.

4,009,982

MECHANISM FOR FORMING AN ENLARGED  
COUPLING ON THE ENDS OF PLASTIC PIPEJohann H. Maier, Miami Beach, Fla., assignor to Universal  
Plastic Pipe Bending Corporation, Miami, Fla.

Filed Feb. 11, 1974, Ser. No. 441,161

Int. Cl.<sup>2</sup> B29C 17/02

U.S. Cl. 425-389

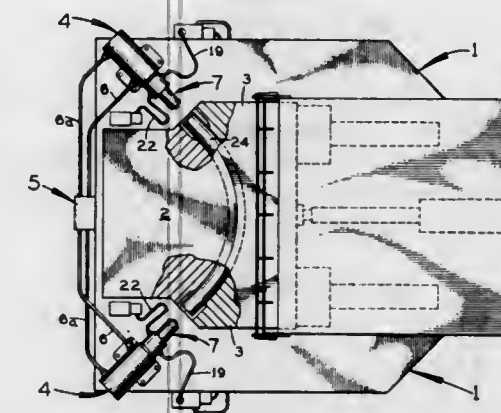
7 Claims

1. An apparatus for uniformly expanding the ends of sections of pre-formed and pre-heated plastic pipe which comprises:

cooperating die means for retaining said sections of pre-heated plastic pipe, said die means including an open central portion having a cross-sectional diameter corresponding with the outer diameter of said sections of pre-heated plastic pipe, so that said sections of pre-heated plastic pipe may be securely retained within said cooperating die means;

at least one mandrel adapted for axial reciprocation into the

end of said cooperating die means, so that said mandrel, upon the insertion into the end of said cooperating die means, corresponds to only a portion of said section of said plastic pipe retained therein, said mandrel including an outer cylindrical sleeve forming the portion of said mandrel insertable into said cooperating die means, and conforming in configuration to the inner surface of said sections of plastic pipe, and said mandrel further including an expandable elastomeric jacket disposed substantially over the entire surface of said outer cylindrical sleeve, said mandrel having an outside diameter comprising said expandable elastomeric jacket which is less than the inside diameter of said sections of plastic pipe, so that said mandrel may be inserted into said sections of plastic pipe retained within said cooperating die means without deforming said sections of said plastic pipe; and



means for expanding said elastomeric jacket after said mandrel has been inserted into the end of said cooperating die means, so that when said sections of plastic pipe are retained within said cooperating die means the portions of said plastic pipe corresponding to said mandrel are uniformly expanded outwardly into conformity with the cross-sectional diameter of said die means, said means for expanding said elastomeric jacket including means for injecting pressurized air within said mandrel, said mandrel including a bore axially disposed therein, and a plurality of apertures through said outer cylindrical sleeve communicating with said axial bore so that when said pressurized air is applied to said bore, said expandable elastomeric jacket disposed over said outer cylindrical sleeve is expanded substantially uniformly outwardly against said sections of preheated plastic pipe.

4,009,983

HYDRAULIC MOLD CLAMPING MECHANISM FOR  
INJECTION MOLDING MACHINEArthur William Jacobs, 5994 Columbia Road, North Olmsted,  
Ohio 44070

Filed Jan. 16, 1976, Ser. No. 649,592

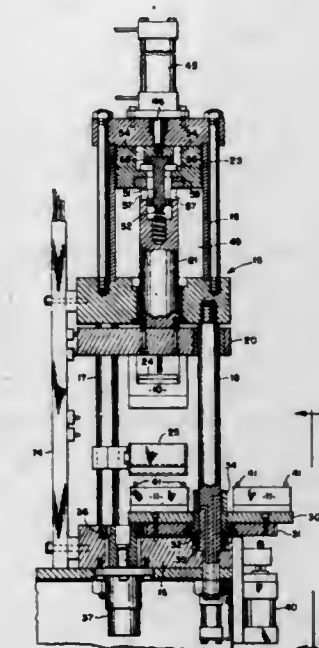
Int. Cl.<sup>2</sup> B29F 1/06

U.S. Cl. 425-451.2

12 Claims

1. A hydraulic mold actuating mechanism for an injection molding machine of the type having an injection assembly operative to inject plasticized material into a cavity defined between a pair of mating mold sections of which one is movable into and out of mating engagement with the other, said mold actuating mechanism being operative to move said one mold section as aforesaid and to clamp said one mold section against the other mold section to resist separation of said mold sections upon injection of plasticized material under pressure into said cavity, said mechanism comprising coaxial tandem relatively small and large piston-cylinder assemblies of which the piston rod of the latter is connected to said one mold section and of which the piston rod of the former is connected to said large piston whereby actuation of said small piston-cylinder assembly in opposite directions imparts movement of said one mold section into and out of mating engagement with said other mold section; said large piston having a passage

communicating the rod and head ends of said large cylinder with each other; a makeup fluid tank having fluid communication with the rod end of said large cylinder and having a capacity at least equal to the displacement of the piston rod of said large piston whereby, during movement of said large piston in opposite directions, fluid is conducted through said passage from said rod end and makeup fluid tank into said head end and vice versa according to the direction of movement of said large piston; a fluid pressure actuated valve in said large piston operative when actuated by fluid under pressure to close said passage when said mold sections are in mating engagement; said large cylinder having an inlet port to conduct fluid under pressure into said large piston to actuate said valve as aforesaid and into said large cylinder to pressurize the fluid trapped in the head end of said large cylinder thereby to firmly hold



said mold sections in mating engagement during injection of plasticized material into said cavity; said inlet port comprising an axially extending outer tubular member which is secured to said cylinder head to extend parallel to and alongside the cylinder of said small piston-cylinder assembly and into which fluid under pressure is conducted from its axially outer end, an axially extending inner tubular member which is secured to said large piston to extend into said outer tubular member in all positions of said large piston, said inner tubular member defining with said cylinder head an orifice through which fluid under pressure in said outer tubular member is conducted into said head end and providing a passageway through which fluid under pressure in said tubular member upstream of said orifice is conducted into said large piston to actuate said valve as aforesaid.

4,009,984

## VAPOR INJECTION SYSTEM FOR FUEL COMBUSTION

Charles F. Morrison, 25 Pearl St., Malden, Mass. 02148

Filed Mar. 8, 1976, Ser. No. 664,967

Int. Cl.<sup>2</sup> F23J 7/00

U.S. Cl. 431-4

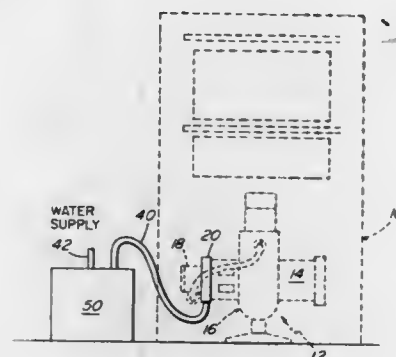
10 Claims

1. An apparatus for adding water vapor to a fossil fuel combustion system, which system has an air intake assembly for introducing a flow of air into the combustion area of the combustion system, which comprises:

- a. a housing having a reservoir of water disposed therein;
- b. a platform disposed in the housing and in vacuum-sealing floating engagement with the reservoir, the platform including:
  - i. a depending sleeve-like member fixedly secured to the platform and extending into the reservoir, the inner surface of the member and the upper surface of the reservoir defining a vapor chamber;
  - ii. a depending tube-like member fixedly secured to the platform and extending through the vapor chamber and into the reservoir;



- c. first valve means to seal the tube-like member, said valve means in communication with the ambient environment, which valve means opens when there is a pressure differential between the vapor chamber and the ambient environment;
- d. second valve means to seal the vapor chamber from the ambient environment, said valve means adapted to open when there is a pressure differential between the vapor chamber and the ambient environment;



- e. a conduit secured to the second valve means and the air intake assembly of the combustion system; and
- f. means to create a pressure differential between the ambient environment about the housing and the vapor chamber to draw air through the first valve, through the water, and into the vapor chamber, forming a saturated air stream, which air stream flows through the second valve and into the air intake assembly.

4,009,985

# METHOD AND APPARATUS FOR ABATEMENT OF GASOLINE VAPOR EMISSIONS

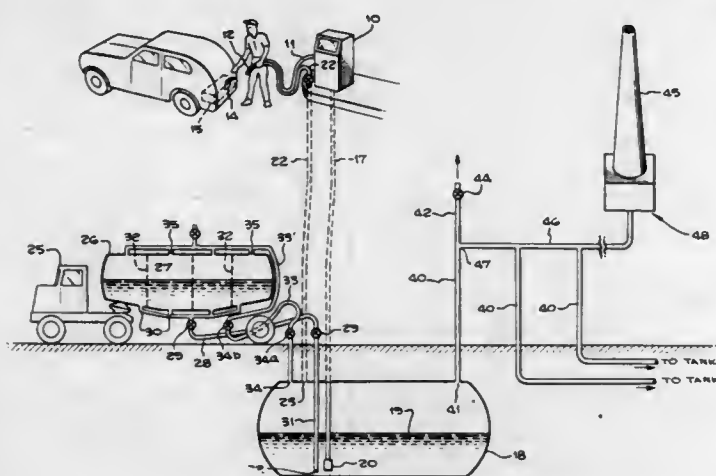
John H. Hirt, Monterey Park, Calif., assignor to Hirt Combustion Engineers, Montebello, Calif.

Filed Aug. 8, 1975, Ser. No. 603,002

Int. Cl.<sup>2</sup> F23G 7/06

U.S. Cl. 431—5

19 Claims



1. In a method of abating emissions of gasoline vapors at a gasoline service station at which liquid gasoline is transferred between a storage tank and a supply tank by flowing through a liquid gas line means having vapor tight sealed connections with said tanks; the steps of:

- providing gasoline vapor line means between said tanks for communication between vapor space above liquid levels in said tanks;
- providing a gas vapor vent line from vapor space in said storage tank to a burner means;
- passing gasoline vapors from said supply tank into and through said vapor space in said storage tank;
- sensing vapor pressure at said vent line means;
- causing gasoline vapors in said vent line means to be directed to the burner means when a preselected vapor pressure is sensed;

and igniting and burning said gasoline vapors at said burner means.

4,009,986

# AIR CONTROL VALVE FOR EXHAUST GAS PURIFYING APPARATUS

Konrad Eckert, Stuttgart-Feuerbach, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

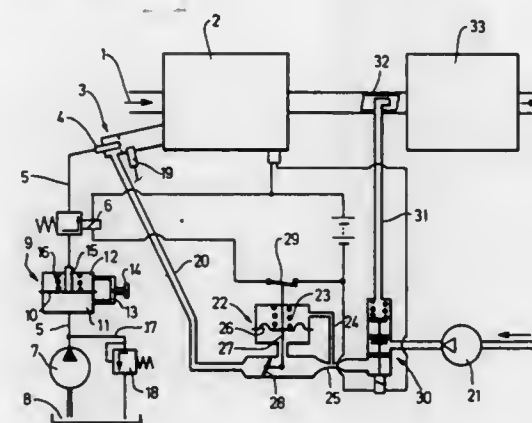
Division of Ser. No. 322,861, Jan. 11, 1973, Pat. No. 3,945,802. This application May 12, 1975, Ser. No. 576,265

Claims priority, application Germany, Jan. 14, 1972, 2201739

Int. Cl.<sup>2</sup> F23H 1/02

U.S. Cl. 431—90

4 Claims



1. In combination, a heating burner for heating a reactor of an exhaust gas purifying apparatus to operating temperatures, fuel supply means for delivering burner fuel to said heating burner, said fuel supply means including a fuel conduit, air supply means for delivering combustion air to said heating burner, said air supply means including a burner air conduit and an air pump disposed in the latter, and an air control valve, the air control valve including:

- a. a movable valve member situated in said burner air conduit downstream of said air pump; and
- b. regulating means coupling to said movable valve member for regulating the air quantities delivered to said heating burner to a constant value independently from the counterpressure at said heating burner and independently from the output delivery of said air pump, said regulating means including:
- i. venturi nozzle disposed in said burner air conduit upstream of said movable valve member, said venturi nozzle having a narrowest flow passage section;
- ii. a diaphragm having first and second sides;
- iii. linkage means connecting said diaphragm with said movable valve member;
- iv. means for communicating the pressure prevailing in said narrowest flow passage section with said first side of said diaphragm;
- v. a spring means in engagement with said first side of said diaphragm; and
- vi. means for communicating the pressure prevailing in said burner air conduit downstream of said venturi nozzle and upstream of said movable valve member with said second side of said diaphragm.

4,009,987

# ELECTRIC LAMP HAVING AN INTERNAL SWITCHING MECHANISM

Anton Boekkooi; Adrianus Antonius Hurx, and Johannes Maria Josephus van Lieshout, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 463,729, April 24, 1974, abandoned.

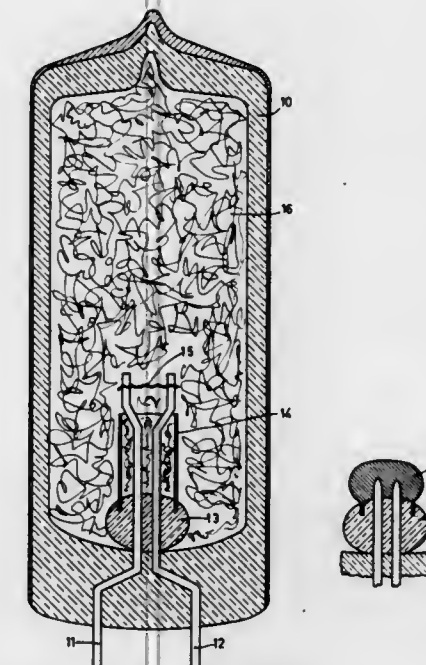
This application Oct. 10, 1975, Ser. No. 621,483

Claims priority, application Netherlands, May 1, 1973, 7306018

Int. Cl.<sup>2</sup> F21K 5/02

U.S. Cl. 431—95 R

4 Claims



1. A combustion flash lamp, having two lead-in conductors extending to the interior of the lamp envelope, at least one of the conductors being connected in a place inside the lamp envelope to means for igniting said conductors being completely surrounded over at least an axial part thereof by a common sleeve member of an electrically conducting material, said member including means for deforming to electrically connect said conductors responsive to heat resulting from the ignition of said lamp, said means including a material having a softening temperature lower than the normal temperature in said flash lamp during ignition, said softening temperature being the temperature at which said member will bend without the imposition of external forces, said member having a sleeve contour and disposed in axially spaced relation from said heat source, said sleeve having a fixed relationship relative to said conductors prior to firing, and disposed in spaced relationship to at least one of the conductors prior to firing.

4,009,988

# GAS VALVE AND MIXING TUBE ASSEMBLY FOR GAS BURNER

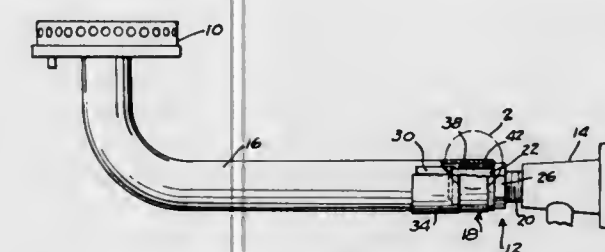
Donald E. Duperow, and Norbert Hughes, both of Detroit, Mich., assignors to Lincoln Brass Works, Inc., Detroit, Mich.

Filed Dec. 29, 1975, Ser. No. 644,896

Int. Cl.<sup>2</sup> F23D 11/00

U.S. Cl. 431—114

21 Claims



1. In an assembly of a valve and a mixing tube for a burner, the valve having a metal body which includes an outlet hood

for fuel gas, the mixing tube being formed of metal and having an upstream end portion into which the hood is inserted, improved structure which comprises, plastic bushing means having an inner surface portion frictionally fitted against the exterior of said hood, said bushing means having an outer surface portion frictionally fitted against the interior of said upstream end portion of said mixing tube, said bushing means forming a retainer which frictionally retains said hood and tube in assembled relation and forming a spacer which maintains the adjacent metal surfaces of said hood and tube out of contact with each other.

4,009,989

# COMBINATION GAS AND OIL BURNERS

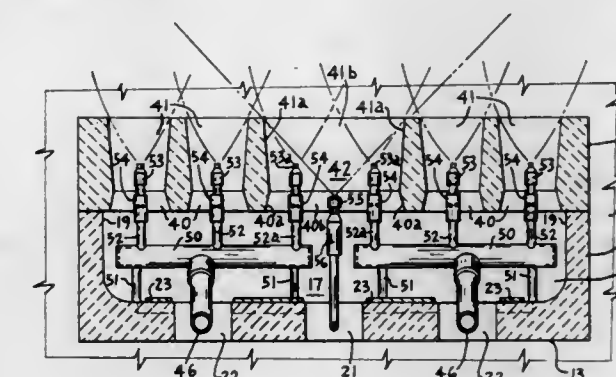
Gordon M. Bitterlich, Tredyffrin Township, Chester County, Pa., assignor to National Airoil Burner Company, Inc., Philadelphia, Pa.

Filed Mar. 11, 1976, Ser. No. 665,888

Int. Cl.<sup>2</sup> F23C 5/20

U.S. Cl. 431—178

11 Claims



1. Combustion apparatus for heating an exposed inner face of an upwardly extending wall of a furnace comprising support means associated with said wall having an opening communicating with the exterior of said wall, register members or controlling the introduction of air into said opening, said support means having a burner block portion with a plurality of spaced air delivery openings directed upwardly along said wall, certain of said openings being frustoconical and flaring towards their outlets, one of said openings being elongated and flaring toward its outlet, an oil burner assembly having an oil burner nozzle disposed within said elongated opening for delivery of atomized oil for combustion upwardly within said elongated opening, and a plurality of gas burners each disposed within one of said openings.

4,009,990

# METHOD FOR IMPROVING THE INCORPORATION OF RADIOACTIVE WASTES INTO A VITREOUS MASS

Roger Bonniaud, Goudargues; Antoine Jouan, Bagnols-sur-Ceze, and Claude Sombret, Courthezon, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 27, 1975, Ser. No. 554,231

Claims priority, application France, Feb. 28, 1974, 74.06887

Int. Cl.<sup>2</sup> F27B 14/00, 15/00

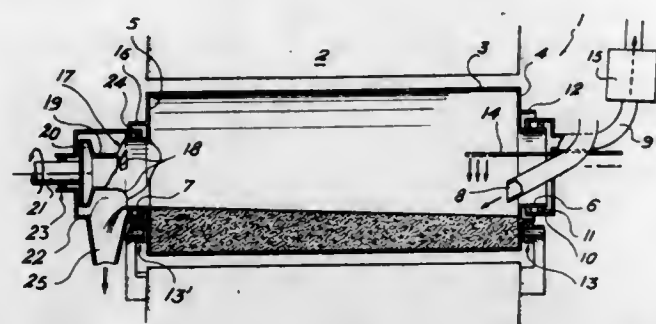
U.S. Cl. 432—13

3 Claims

1. In a process for incorporating radioactive waste into glass by melting glass and the waste together in a smelting furnace to form a vitrified mass, the improvement consisting of pre-treating the glass and waste to form a calcinated feed for the smelting furnace by:



simultaneously and continuously feeding the radioactive waste in liquid form and particulate glass into the inlet of a rotating cylinder inclined with respect to the horizontal to form a moving bed of a mixture of particulate glass and radioactive waste; and



heating said mixture within the rotating cylinder to produce a calcinate, suitable for feeding the smelting furnace, in the form of a coating on the glass particles.

4,009,991

**PROCESS FOR PRODUCING CARBON FIBERS**  
Yasuo Matsumura, Soichiro Kishimoto, and Masahiko Ozaki,  
all of Okayama, Japan, assignors to Japan Exlan Company  
Limited, Osaka, Japan

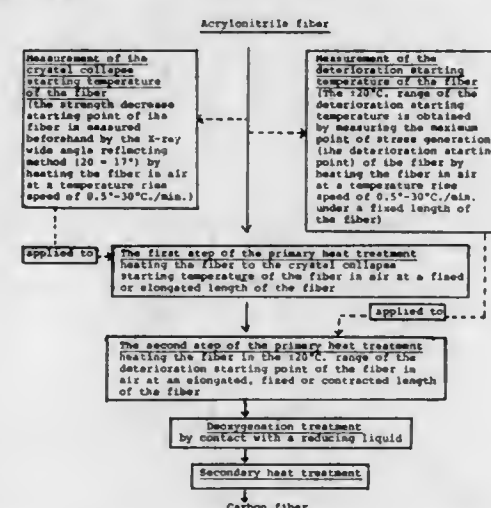
Filed Sept. 17, 1975, Ser. No. 614,153

Claims priority, application Japan, Sept. 20, 1974, 49-109163

Int. Cl.<sup>2</sup> F27B 9/04

U.S. Cl. 432-23

11 Claims



1. A process for producing carbon fibers which comprises continuously heat-treating acrylonitrile fibers up to the crystal collapse starting temperature of said fibers while maintaining said fibers under a fixed length or tension in an oxidizing atmosphere, then sufficiently thermally stabilizing said fibers by further subsequently continuously heat-treating them in a temperature range gradually elevated up to a fixed temperature in a range from a temperature about 20° C. lower than the deterioration starting temperature of said fibers to a temperature about 20° C. higher than said deterioration starting temperature in an oxidizing atmosphere, treating the thus obtained thermally stabilized fibers with a reducing liquid and subsequently carbonizing or graphitizing said fibers in a non-oxidizing atmosphere or under a vacuum.

4,009,992

**INSTALLATION AND METHOD FOR MANUFACTURING CEMENT**

Gerd Eicke, Kaarst, Germany, assignor to Loesch Hartzke-leinungs- und Zementmaschinen KG, Dusseldorf, Germany  
Filed Nov. 20, 1974, Ser. No. 525,634

Claims priority, application Germany, Dec. 7, 1973, 2361060

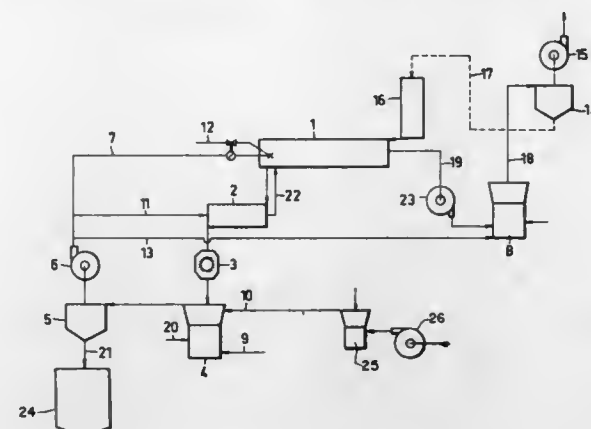
Int. Cl.<sup>2</sup> F27B 7/20, 7/38

U.S. Cl. 432-106

5 Claims

1. In an installation for producing cement including first milling means for grinding a mixture of limestone and clay

minerals to raw flour, means for calcining and firing said raw flour in a rotary kiln to form clinker, means for cooling said clinker, means for grinding said clinker to cement flour and means for storing said cement flour, the improvement comprising means downstream of said rotary kiln for substantially simultaneously cooling and grinding said clinker to cement



flour, said cooling and grinding means including means for receiving said clinker, second milling means for grinding said clinker, and duct means communicating with said second milling means for supplying fresh air thereto for cooling said clinker during milling, and further comprising filter means interposed between said simultaneous cooling and grinding means and said cement flour storage means for separating said cement flour from said cooling air.

4,009,993

**AUTOMATIC PLANT FOR THE DRIVING AND FAST SINGLE-PHASE FIRING OF CERAMIC TILES**  
Pietro Marazzi, V.le Giacobazzi 3, Sasuolo (Modena), Italy,  
41049

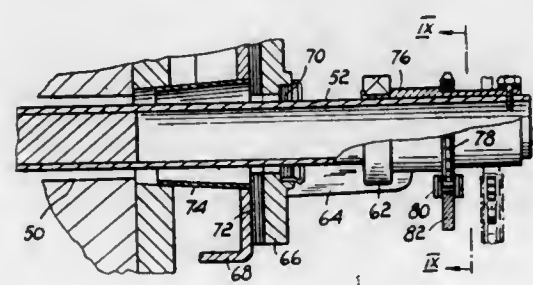
Filed June 20, 1975 Ser. No. 588,812

Claims priority, application Italy, July 2, 1974, 24711/74

Int. Cl. F 27B 9/14; F 27D 3/00

U.S. Cl. 432-122

11 Claims



1. An apparatus for firing ceramic tiles by continuously progressively advancing the tiles coated on their upper face with a glaze composition along a horizontal transfer plane through an elongated treatment chamber, comprising an elongated thermally insulated tunnel-like structure defining said treatment chamber having a side wall on each side, a succession of rollers aligned with their axes on a horizontal plane and perpendicular to the longitudinal axis of said treatment chamber for supporting and advancing the tiles thereon, support means supporting said rollers adjacent their ends in said side walls and permitting their axial movement, an annular toothed driven member detachably secured to at least one end of said rollers and located outside of said structure, and a toothed drive member disposed along the common side of said rollers and engaged with said tooth driven member to rotate said rollers, said driven member being individually disengageable from said rollers to allow each roller to be individually removed or introduced by motion parallel to its axis.

## CHEMICAL

4,009,994

**PROCESS AND PRODUCT OF OPTICAL BRIGHTENING WITH QUATERNIZED BENZOFURANYL-BENZIMIDAZOLES**

Hans Schlaepfer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

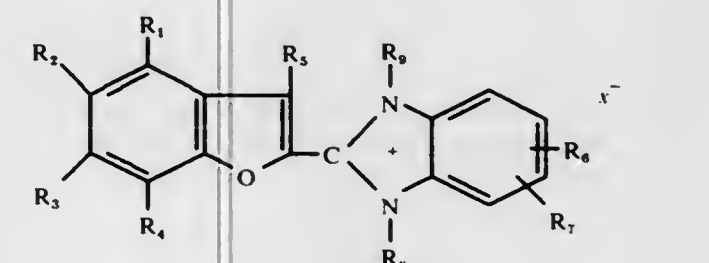
Division of Ser. No. 499,687, Aug. 22, 1974, Pat. No. 3,940,417, which is a continuation of Ser. No. 205,303, Dec. 6, 1971, abandoned. This application Oct. 2, 1975, Ser. No. 618,869

Int. Cl.<sup>2</sup> D06P 1/38; C07D 235/12; D06P 3/70

U.S. Cl. 8-1 W

6 Claims

1. A process for the optical brightening of organic materials, comprising the step of homogeneously distributing in the material or uniformly distributing on the material an optical brightener of the formula



wherein

R<sub>1</sub> denotes hydrogen or a lower alkyl group or together with R<sub>2</sub> denotes a fused benzene radical,  
R<sub>2</sub> denotes hydrogen, a lower alkyl or alkoxy group, chlorine, bromine, carboxyl, aminocarbonyl sulphonic acid, aminosulphonyl, or together with R<sub>3</sub> denotes a fused benzene radical,  
R<sub>3</sub> denotes hydrogen, lower alkyl, alkoxy or together with R<sub>4</sub> denotes a fused benzene radical,  
R<sub>4</sub> denotes hydrogen, a lower alkyl group, chlorine or bromine,  
R<sub>5</sub> denotes hydrogen, a lower alkyl group or phenyl,  
R<sub>6</sub> denotes hydrogen, lower alkyl, lower alkoxy, chlorine, bromine, phenyl or alkylsulphonyl with one to four carbon atoms,  
R<sub>7</sub> is hydrogen,  
R<sub>8</sub> denotes a lower alkyl group, a hydroxy-lower-alkyl group, cyanoethyl, phenyl which is unsubstituted or substituted by a chlorine, bromine, a lower alkyl or lower alkoxy group, or phenyl loweralkyl,  
R<sub>9</sub> denotes a lower alkyl group, a hydroxy-lower-alkyl group, phenyl lower-alkyl which is unsubstituted or substituted by chlorine or lower alkoxy, or the —CH<sub>2</sub>CN, —CH<sub>2</sub>CONH<sub>2</sub>, or —CH<sub>2</sub>COOR radical, wherein R represents alkyl with one to four carbon atoms, and  
X denotes halogen, lower alkylsulphonic acid or substituted by lower alkyl.

4,009,995

**PROCESS FOR DYEING MOLDED ARTICLES CONTAINING UREA FORMALDEHYDE RESIN OR MELAMINE FORMALDEHYDE RESIN**

Hans Dressler, 1236 Catalina Drive, Monroeville, Pa. 15146  
Filed Dec. 5, 1975, Ser. No. 637,891

Int. Cl.<sup>2</sup> D06P 1/382, 3/02

U.S. Cl. 8-4

13 Claims

1. A process for dyeing molded articles containing urea formaldehyde resin or melamine formaldehyde resin comprising:

a. treating the molded articles in an aqueous dye bath containing one or more dyes selected from the group consisting of dichlorotriazinyl dyes or premetallized dyes at a temperature in the range of 50° to 100° C.

4,009,996

**REACTION PRODUCTS OF PHENOLSULPHONIC ACID-UREA-FORMALDEHYDE AS TANNING AGENTS AND PROCESS FOR THEIR MANUFACTURE**

Albert Würmli, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1974, Ser. No. 520,995

Claims priority, application Switzerland, Nov. 8, 1973, 15715/73

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C08G 75/20, 75/24; C14C 3/20

U.S. Cl. 8-94.24

13 Claims

1. Reaction product of phenolsulphonic acid-urea-formaldehyde from

A 100 parts by weight of a condensation product from  
a. 1 mole of a hydroxyphenylsulphone-hydroxyphenylmonosulphonic acid having 1 to 4 hydroxyphenylsulphone groups per molecule, and  
b. 0.1 to 0.6 mole of an alkoxybenzene having 1 to 4 carbon atoms in the alkoxy radical, and  
B 10 to 40 parts by weight of a reaction product or of a mixture of  
c. 1 mole of urea and/or of a urea derivative and  
d. 1 to 4 moles of formaldehyde or of an agent releasing formaldehyde.

4,009,997

**LEVELLING AUXILIARIES FOR ACID DYES**  
Norbert Greif, Ludwigshafen; Michele Vescia, Limburgerhof; Manfred Daeuble, Frankenthal, and Hans Heinrich, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 15, 1974, Ser. No. 497,571

Claims priority, application Germany, Aug. 29, 1973, 2343418

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> D06P 1/649, 5/06

U.S. Cl. 8-169

6 Claims

1. In a process for dyeing a fibrous material consisting essentially of polyamide fibers with an acid dye in an acid pH range, the improvement which comprises: carrying out the dyeing in the presence of a levelling auxiliary mixture which, based on the solids in each case, contains:

a. from 30 to 90% by weight of a surfactant containing one or more sulfonic acid groups in salt form; and  
b. from 10 to 70% by weight of an oxyethylated synthetic linear polyamide which has been prepared by the reaction of 1 part by weight of polyamide with from 2.5 to 3.5 parts by weight of ethylene oxide.

4,009,998

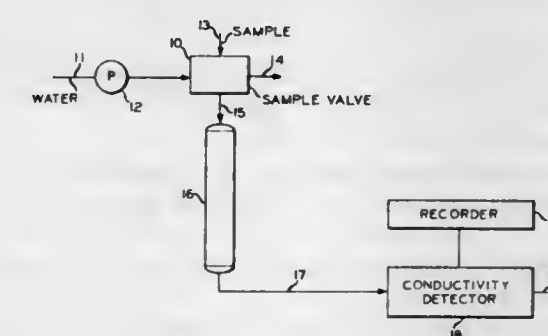
**ACID CONCENTRATION MEASUREMENT**  
L. V. Benningfield, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 5, 1975, Ser. No. 610,800

Int. Cl.<sup>2</sup> G01N 27/06

U.S. Cl. 23-230 R

6 Claims



1. The method of measuring the concentration of hydrofluoric acid



oric acid in a test material which contains hydrofluoric acid, acid-soluble oils and light paraffins, which method comprises passing through a mixing device at a predetermined rate a first stream of water containing a water-miscible solvent capable of dissolving the hydrocarbons present in the test material, introducing a predetermined volume of said test material into said first stream upstream from said mixing device, and measuring the electrical conductivity of the resulting mixed effluent stream from said mixing device.

4,009,999

# REAGENT SUPPLY CONTROL IN AUTOMATED FLUID ANALYSIS

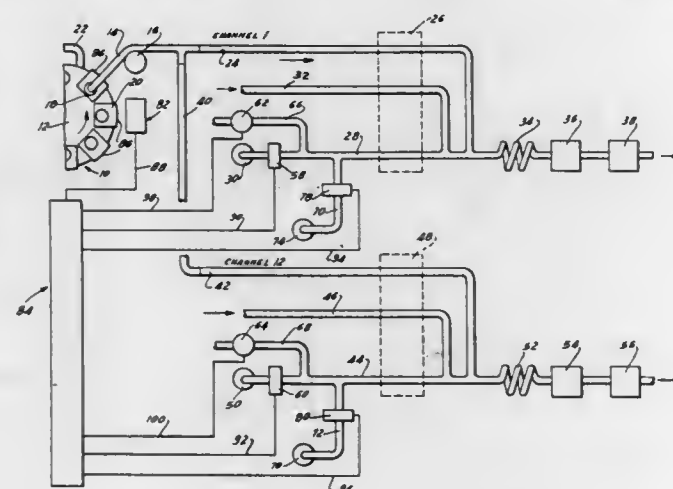
Kent M. Negersmith, Carmel, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed May 29, 1975, Ser. No. 582,059

Int. Cl.<sup>2</sup> G01N 31/00, 33/00

U.S. Cl. 23—230 R

6 Claims



4. A method of analyzing liquid samples comprising the steps of:

flowing a stream of discrete aliquots of successive samples along respective first and second conduits from a source, each of which conduits includes a portion for reacting the successive samples with reagents and a portion for viewing the reaction product;

introducing a different reagent into said first and second conduits upstream of the reaction portion of each of the said conduits to form a sample-reagent mixture;

identifying the successive samples at the source; and responsive to such identification discontinuing the introduction of said different reagent into either one of said first and second conduits and substituting therefor a pilot fluid for said reagent in one of said first and second conduits while introducing said reagent into the other of said first and second conduits for flow in phased relation at the same flow rate along the reacting and viewing portions.

4,010,000

# APPARATUS FOR PRODUCING HALIDE PARTICLES

Scott Anderson, 1116 W. Church St., Champaign, Ill. 61820  
Division of Ser. No. 259,858, June 5, 1972, Pat. No. 3,948,793, which is a division of Ser. No. 861,408, Sept. 26, 1969, Pat. No. 3,676,534. This application Apr. 23, 1975, Ser. No. 570,777

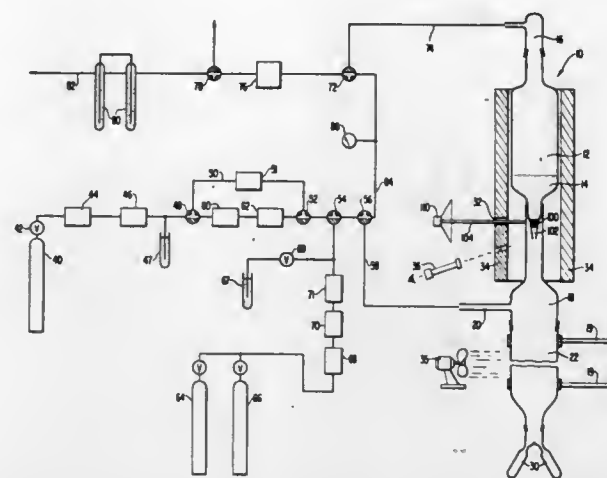
Int. Cl.<sup>2</sup> B01J 1/00

U.S. Cl. 23—252 R

16 Claims

1. Apparatus for producing discrete particles of purified metal halide, which apparatus comprises:  
vessel means for holding molten halide;  
conduit means in communication with said vessel means;  
means for heating said vessel means and said conduit means;  
a quenching chamber disposed downwardly from said conduit means  
means for selectively passing a gas through molten halide within said vessel means and for selectively creating a

pressure gradient between said vessel means and said chamber to urge molten halide to pass from said vessel means through said conduit means to discharge molten halide into said chamber; and,



means for vibrating said conduit means whereby molten halide discharges from said conduit means in a continuous stream which separates in said chamber into droplet form.

4,010,001

# CARBON BLACK PELLETIZING APPARATUS

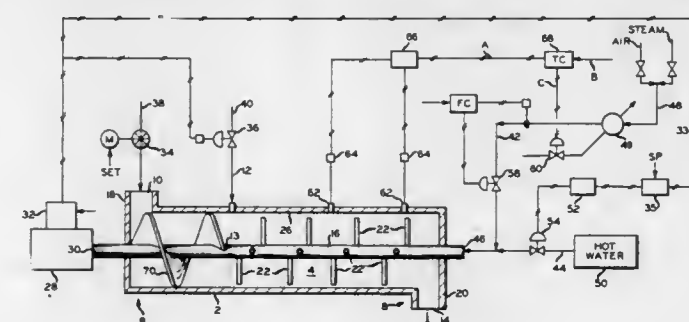
Robert E. Dollinger, Bedford, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 396,815, Sept. 13, 1973, Pat. No. 3,931,377. This application Oct. 31, 1975, Ser. No. 627,717

Int. Cl.<sup>2</sup> B01J 2/00

U.S. Cl. 23—252 R

2 Claims



1. An apparatus for forming carbon black pellets comprising:

a housing having walls forming a longitudinal chamber extending therethrough, first and second end portions, a carbon black feed inlet and a pelleting fluid inlet positioned at the first end portion, and a pellet outlet positioned at the second end portion;

a main conduit for a supplemental fluid extending through the chamber and being rotatably mounted through the housing wall, said main conduit being connected to a source of heated supplemental fluid;

a plurality of secondary conduits extending radially outwardly from the main conduit along the length thereof, said secondary conduits being in fluid communication with the main conduit, terminating a preselected spaced distance from an inner surface of the housing wall and being open ended for discharge of said heated supplemental fluid therefrom;

means for rotating said main conduit and passing said secondary conduits along said housing wall;

means for measuring the temperature in said chamber and generating a signal responsive thereto;

means for controlling the temperature of said heated supplemental fluid responsive to said signal for maintaining the temperature in said chamber in a preselected range; and

means for moving the carbon black and pelleting fluid through said housing.

4,010,002

# REACTOR FOR THE CONTINUOUS REACTIVATION OF ACTIVATED CARBON PARTICLES

Josef Degel, Hattingen; Joachim Karweil, and Dietrich George, both of Essen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

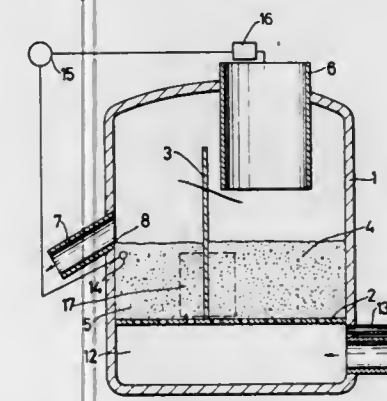
Filed Oct. 3, 1975, Ser. No. 619,398

Claims priority, application Germany, Oct. 5, 1974, 2447603

Int. Cl.<sup>2</sup> B01D 15/06; B01J 8/28, 8/36

U.S. Cl. 23—284

7 Claims



2. In a fluidized-bed reactor for continuous reactivation of activated carbon particles, a combination comprising a closed housing having a peripheral wall and a transverse perforated wall which divides said housing into a reaction chamber located above said perforated wall and a second chamber located below said perforated wall; outlet means communicating with said reaction chamber for discharging from the same carbon particles which have been reactivated; first inlet means communicating with said reaction chamber for admitting into the same carbon particles which are to be reactivated and which travel from said inlet means to said outlet means, said first inlet means including an inlet opening having a cross-sectional area equal to between substantially 5 - 25% of the surface area of said perforated transverse wall; second inlet means communicating with said second chamber below said perforated transverse wall for admitting into the same hot gases required for reactivating of said carbon particles; and a substantially planar partition wall extending across the path of travel of said carbon particles in said reaction chamber and subdividing the latter into one compartment with which said first inlet means communicates and another compartment with which said outlet means communicates, said partition wall having free ends spaced from respective juxtaposed portions of said peripheral wall by distances equal to between substantially 10 - 30% of the cross-sectional dimension of said reaction chamber in a plane passing through said wall portions, said partition wall being laterally offset from the center of said reaction chamber in such a manner that said one compartment with which said first inlet means communicates is larger than said another compartment with which said outlet means communicates, the offset being between substantially 10 - 30% of the diameter which said reaction chamber has in the direction of offset, thereby providing in said one compartment a space which is sufficiently large so that the incoming spent carbon particles extending through said first inlet means are immediately distributed over a relatively large surface area in said one compartment of the reactor chamber.

4,010,003

# REGENERATION APPARATUS

Richard P. Pulak, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

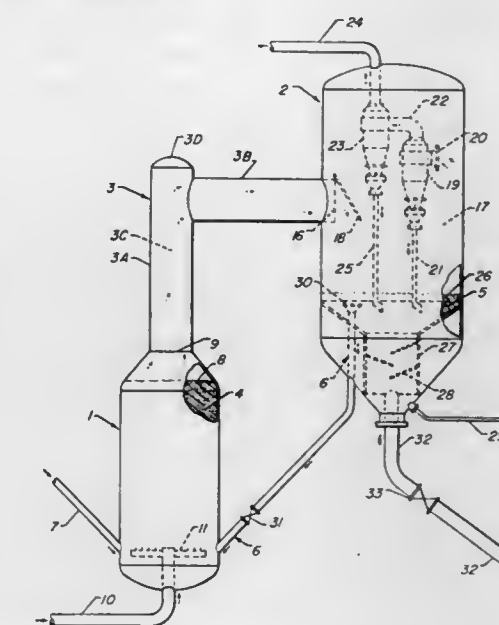
Continuation-in-part of Ser. No. 429,422, Dec. 28, 1973, Pat. No. 3,953,175. This application Dec. 15, 1975, Ser. No. 640,995

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> B01J 8/08, 8/18, 37/14

U.S. Cl. 23—288 B

5 Claims



1. An apparatus for oxidizing coke on spent catalyst which comprises in combination:

a. a spent-catalyst receiving chamber for containing a dense-phase fluidized bed of catalyst having a spent catalyst inlet means and a fresh-regeneration gas inlet means connected thereto to allow passage of spent catalyst and fresh regeneration gas respectively into said chamber and having a regenerated-catalyst/regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and regeneration gas from said chamber;

b. a transfer conduit positioned above said spent-catalyst receiving chamber and having a substantially vertical portion and a substantially horizontal portion in interconnection with said vertical portion, said vertical portion extending above said horizontal portion and having an inlet connected to the regenerated-catalyst/regeneration-gas outlet means and said horizontal portion extending into the side of a hereinafter described regenerated-catalyst receiving chamber and being provided with an outlet means within said chamber whereby regenerated catalyst and regeneration gas are carried from said spent-catalyst receiving chamber in admixture to said regenerated-catalyst receiving chamber, said portions of said transfer conduit being of sufficient internal volume to permit substantially complete CO oxidation and transfer of the heat of combustion to said catalyst therein;

c. a regenerated-catalyst receiving chamber for containing a dense-phase bed or regenerated catalyst, said chamber having a regenerated-catalyst outlet means and a spent-regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and spent regeneration gas from said chamber and said chamber being positioned adjacent to and at an elevation above said spent-catalyst receiving chamber sufficient to maintain at least a portion of said dense-phase bed of regenerated catalyst above said dense-phase fluidized bed of catalyst in said spent-catalyst receiving chamber; and

d. a regenerated-catalyst recycle means to allow passage of regenerated catalyst directly from the regenerated-catalyst receiving chamber to the spent-catalyst receiving chamber.



#### 4,010,004 VELVET FABRIC

Perry H. Brown, Villa Park, Calif., and Maurice H. Tremblay, Cockeysville, Md., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 483,240, June 26, 1974, Pat. No. 3,953,913, which is a division of Ser. No. 418,116, June 21, 1973, Pat. No. 3,838,983, which is a continuation of Ser. No. 212,468, Nov. 27, 1971, abandoned, which is a continuation of Ser. No. 861,024, Sept. 25, 1969, abandoned. This application Aug. 6, 1975, Ser. No. 602,255

Int. Cl.<sup>2</sup> B21C 37/04; B21F 31/00; B23P 3/10  
U.S. Cl. 29—191.6 23 Claims



1. A velvet fabric made essentially solely of metal and comprising a base, pile connected to the base, the velvet fabric being formed of a plurality of textile metal fibers, each fiber having a diameter of less than 50 microns and a rough, unmachined, unburnished, fracture free outer surface.

#### 4,010,005 COPPER FOIL HAVING BOND STRENGTH

Shigeyoshi Morisaki, Ageo, and Kazuo Mase, Tokyo, both of Japan, assignors to Mitsui-Anaconda Electro Copper Sheet Co., Ltd., Japan

Filed June 10, 1974, Ser. No. 477,587

Claims priority, application Japan, June 23, 1973, 48-70447  
Int. Cl.<sup>2</sup> B32B 15/20

U.S. Cl. 29—195 11 Claims

1. A plated copper foil having high bond strength comprising a copper foil and an insoluble fine particle-containing metal plating formed thereon.

#### 4,010,006 FLOW IMPROVERS

Roger Charles Price, Wantage, England, assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 35,320, May 7, 1970, abandoned.

This application Oct. 18, 1973, Ser. No. 407,812

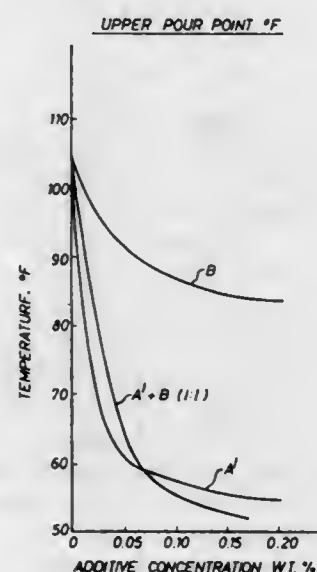
Claims priority, application United Kingdom, May 9, 1969, 23776/69

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl. C10I 1/16

U.S. Cl. 44—62

1 Claim



1. A fuel oil comprising 35 to 100 wt. % residue from the distillation of crude oil which is improved in its flow properties

by containing in the range of about 0.01 to about 1 wt. % of a synergistic flow improving combination of a polymer blend comprising: a first polymer which is an oil soluble flow improving copolymer of ethylene and vinyl acetate having a molecular weight in a range of about 1000 to about 60,000 and containing about 86 to 97 mol % of ethylene; in combination with a second oil soluble flow improving polymer which is acyl polystyrene having a number average molecular weight in the range of 1000 to 25,000 and wherein at least half of said styrene units are acylated with C<sub>22</sub>-C<sub>30</sub> straight chain acyl groups; and wherein the weight ratio of said second polymer to said first polymer is in the range of about 5:1 to 1:5, said synergistic combination in said oil giving a pour point improvement greater than a like amount of either said first or second polymer alone.

#### 4,010,007 THERMALLY LABILE RUST INHIBITORS

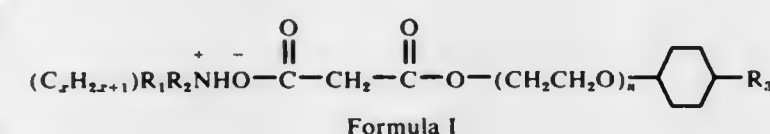
Joseph M. Bollinger, North Wales; Richard H. Hanauer, Furlong, and Warren H. Machleder, Blue Bell, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 14, 1975, Ser. No. 577,269

Int. Cl.<sup>2</sup> C10L 1/22

U.S. Cl. 44—71 5 Claims

1. A distillate hydrocarbon fuel composition comprising a mixture of the surface active, thermally labile additive represented by the formula



wherein R<sub>1</sub> = R<sub>2</sub> = H or C<sub>1-4</sub> alkyl; x = 4 to 30; R<sub>3</sub> = C<sub>4</sub>H<sub>9</sub> to C<sub>12</sub>H<sub>25</sub>; and n = 1 to 12; with a distillate hydrocarbon fuel or multipurpose hydrocarbon fuel additive mixture wherein the additive is used at a treating level effective to provide rust inhibition to the hydrocarbon fuel composition.

#### 4,010,008 SUBSTITUTED NATURAL GAS VIA HYDROCARBON STEAM REFORMING

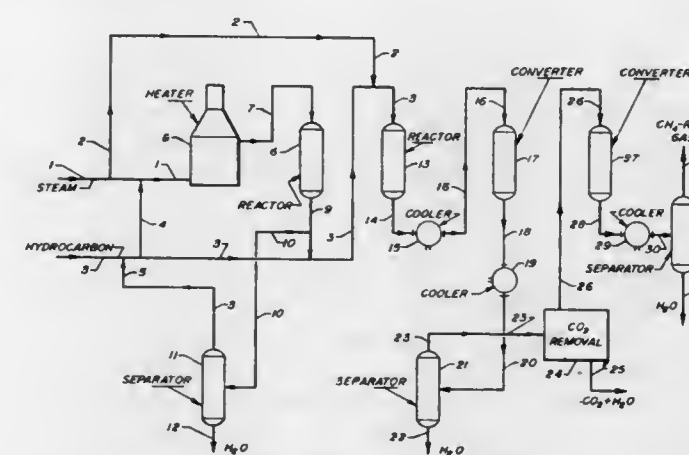
Hong-Kyu Jo, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 550,900, Feb. 18, 1975, abandoned. This application Mar. 1, 1976, Ser. No. 662,984

Int. Cl.<sup>2</sup> C10G 11/28; C10K 3/06

U.S. Cl. 48—214 A

7 Claims



1. A multiple-stage process for producing a methane-rich substitute natural gas which comprises the sequential steps of:  
a. reacting a first portion of a fluid hydrocarbon charge stock with steam, in a first catalytic reaction zone, at steam reforming conditions including a temperature in the range of about 800° F. to about 1,025° F.;  
b. removing at least about 90.0% of the steam from a first

portion of the resulting first reaction zone effluent, and then recycling the substantially steam-free first portion to said first reaction zone;

c. reacting a second portion of said fluid hydrocarbon charge stock with steam and a second portion of said first reaction zone effluent, in a second catalytic reaction zone, at steam reforming conditions including a temperature in the range of about 800° F. to about 1,025° F.; and  
d. recovering said methane-rich substitute natural gas from the resulting second reaction zone effluent.

#### 4,010,009 GLYCOL REGENERATION

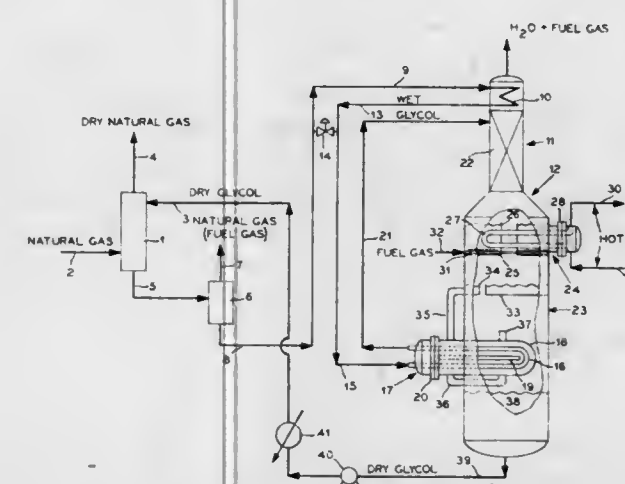
G. A. Moyer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 21, 1975, Ser. No. 634,107

Int. Cl.<sup>2</sup> B01D 53/14

U.S. Cl. 55—32

14 Claims



1. A desiccant regenerator comprising  
a. a regenerator vessel having a dry desiccant reservoir in the lower portion thereof.  
b. first means for introducing wet desiccant into the upper portion of the regenerator vessel,  
c. second means for withdrawing H<sub>2</sub>O from the upper portion of the regenerator vessel,  
d. third means for withdrawing of dry desiccant from said dry desiccant reservoir,  
e. fourth means to reboil desiccant,  
f. a collecting tray for collecting regenerated dry desiccant arranged  
aa. within said regenerator vessel, and  
bb. at an elevation between said fourth means to reboil the desiccant and said third means,  
g. an indirect heat exchanger arranged at a lower elevation than said collecting tray,  
h. a first fluid conduit establishing a fluid connection between said collecting tray and said heat exchanger so that the regenerated desiccant flows by gravity from the collecting tray through said first fluid conduit and said heat exchanger into indirect heat exchange with said wet desiccant before it is introduced into the regenerator vessel in step (b).  
i. a second fluid conduit establishing a fluid connection between a source of wet desiccant and said heat exchanger.  
j. a third fluid conduit establishing a fluid connection between said heat exchanger and said first means for introducing wet desiccant into said regenerator vessel, and  
k. a fourth fluid conduit establishing a fluid connection between said indirect heat exchanger and said dry desiccant reservoir so that the regenerated desiccant after the indirect heat exchange with the wet desiccant flows by gravity from the heat exchanger into said dry desiccant reservoir.  
9. A process for drying gas comprising

a. contacting said gas with a dry desiccant such as to produce a dry gas stream and a wet desiccant stream,  
b. regenerating said wet desiccant stream by,  
aa. passing it into the upper portion of a stripper,  
bb. reboiling desiccant in reboiling means in said stripper,  
cc. withdrawing an H<sub>2</sub>O stream from the upper portion of said stripper,  
dd. collecting dry desiccant at an intermediate level on a collecting tray arranged within said stripper below said reboiling means,  
ee. passing the dry desiccant collected on said collecting tray by gravity flow through indirect heat exchange relationship with the wet desiccant before it enters the stripper, and  
ff. recovering the dry desiccant.

#### 4,010,010 GAS-VAPOR SEPARATION PROCESS AND APPARATUS WITH LOW ENERGY CONSUMPTION

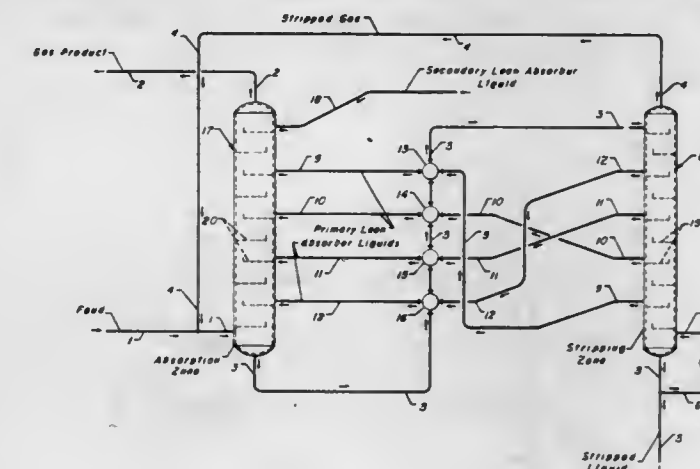
Dennis J. Ward, South Barrington, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 17, 1975, Ser. No. 559,277

Int. Cl.<sup>2</sup> B01D 3/26

U.S. Cl. 55—37

7 Claims



1. A process for the continuous removal of gaseous constituents from a feed comprising gaseous and vaporous constituents which process comprises the steps of:  
i. passing said feed, stripped gases, a plurality of primary lean absorber liquids, and a secondary lean absorber liquid to a multistage absorption zone;  
ii. absorbing into said primary and secondary lean absorber liquids at least a part of said vaporous constituents of said feed within said absorption zone;  
iii. withdrawing from said absorption zone a rich absorber liquid comprising said lean absorber liquids, absorbed vapors and absorbed gases;  
iv. withdrawing from said absorption zone a gas stream comprising gaseous feed constituents;  
v. passing said rich absorber liquid to a multistage stripping zone and therein stripping said absorbed gases from said rich absorber liquid;  
vi. withdrawing said absorbed gases from said stripping zone as stripped gases and passing said stripped gases to said absorption zone;  
vii. withdrawing each of said primary lean absorber liquids from a separate stage of said multistage stripping zone and passing each of said primary lean absorber liquids to a separate stage of said multistage absorption zone; and  
viii. withdrawing and recovering from said stripping zone a liquid stream substantially free from gaseous feed constituents, said liquid stream comprising secondary lean absorber liquid and absorbed vaporous feed constituents.  
4. An absorber-stripper for recovery of vaporous components from a feed containing gaseous and vaporous components which comprises in combination:  
i. a vertically oriented multistage absorber vessel, having a lower inlet for absorber feed and stripped gas, an upper



- inlet for secondary lean absorber liquid, a top outlet for a gas product, a bottom outlet for rich absorber liquid and vertically spaced intermediate inlets for primary absorber liquid;
- ii. a vertically oriented multistage stripper vessel, having means for heat input situated in a lower part of said stripper vessel, a bottom outlet for stripped liquid, a top outlet for stripped gas, an upper inlet for rich absorber liquid and vertically spaced intermediate outlets for primary absorber liquid, the number of said intermediate outlets of said stripper vessel corresponding to the number of said intermediate inlets of said absorber vessel;
- iii. conduits communicating said absorber liquid outlets in said stripper vessel with said absorber liquid inlets in said absorber vessel;
- iv. a conduit communicating said bottom outlet of said absorber vessel with said upper inlet of said stripper vessel; and,
- v. a conduit communicating said top outlet of said stripper vessel with said lower inlet of said absorber vessel.

4,010,011

**ELECTRO-INERTIAL AIR CLEANER**

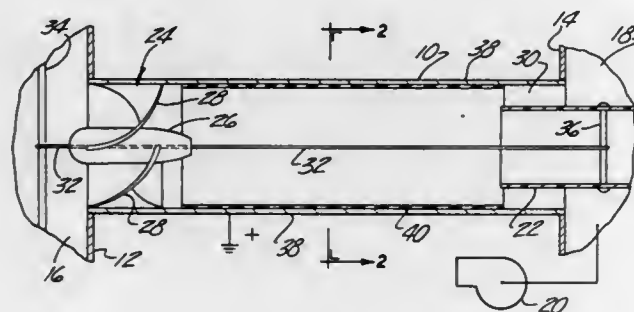
Robert B. Reif, Grove City, Ohio, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 573,291

Int. Cl.<sup>2</sup> B03C 3/14

U.S. Cl. 55-127

1 Claim



1. An air cleaner comprising a cylindrical flow tube having an inlet end for receiving dust-laden air, said flow tube also having an outlet end for discharging clean air and concentrated dust therethrough;
- air spinner means within the inlet end of the flow tube for imparting circumferential swirl to the dust-laden air, whereby dust particles in the air stream are caused to migrate toward the tube wall as the stream moves toward the tube outlet end;
- a clean air take-off pipe extending into the outlet end of the flow tube for directing clean air out of the tube to an engine, said pipe having a smaller diameter than the flow tube whereby concentrated dust is enabled to flow through the annular space between the pipe and flow tube; suction means communicating with the annular space for promoting dust concentrate flow therethrough;
- said air spinner means and clean air take-off pipe being formed of dielectric material; said take-off pipe having a wire anchorage connected therein;
- means for imparting an electrical charge to the flowing dust particles, comprising a negatively charged ionizer wire located on the longitudinal axis of the flow tube, said wire extending through the spinner means along the length of the flow tube and connected to said anchorage in the clean air take-off pipe to provide particle-charging corona along the entire length of the flow tube; means grounding the tube wall to maintain a particle-ionizing potential between the wire and wall; said tube wall being comprised of an outer conductive layer and an inner dielectric layer; said dielectric layer having sufficient thickness as to significantly weaken the electrostatic attractive force between the outer conductive layer and

dust particles deposited on the surface of the dielectric layer, whereby aerodynamic forces are enabled to continuously move the deposited particles through the aforementioned annular space without allowing them to remain on the dielectric surface; said flow tube having an internal diameter of about one and one half inch, and said dielectric layer being Pyrex glass having a thickness of approximately one sixteenth inch.

4,010,012

**TOTAL GAS CONTAINMENT SYSTEM**

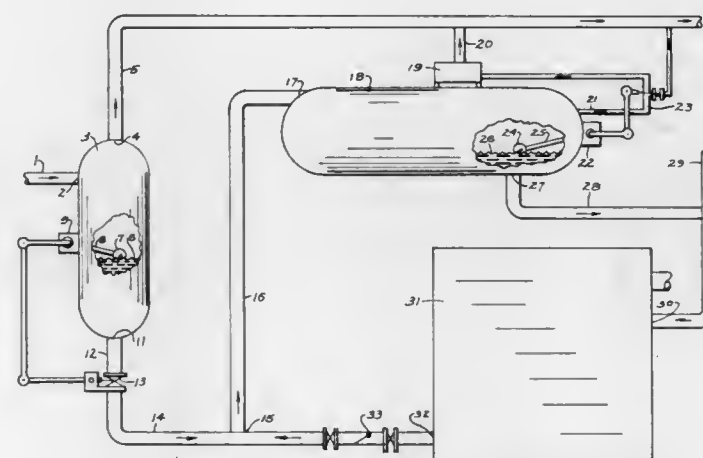
Phil H. Griffin, III; William A. Rehm; Martin L. Talley; Martin J. Sharki, and Woodrow E. Renfro, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 3, 1975, Ser. No. 546,249

Int. Cl.<sup>2</sup> B01D 19/00

U.S. Cl. 55-169

8 Claims



1. A system for removing gas from drilling mud without allowing said gas to escape to the atmosphere before treatment to prevent contamination, comprising:
- an enclosed mud-gas separator vessel;
- a drilling mud inlet in said mud-gas separator vessel;
- means for maintaining a minimum mud level in said mud-gas separator vessel;
- a separator vessel gas outlet in said mud-gas separator vessel;
- a separator vessel drilling mud outlet in said mud-gas separator vessel;
- degassing means;
- a degassing means drilling mud inlet in said degassing means, said degassing means drilling mud inlet located higher than said minimum mud level; and
- enclosed conduit means connecting said separator vessel drilling mud outlet to said degassing means drilling mud inlet thereby preventing said gas from escaping to the atmosphere.

4,010,013

**EQUIPMENT FOR TREATING WASTE GAS CONTAINING TAR MIST**

Takao Murayama, Yokohama, Japan, assignor to Taisei Kensei Kabushiki Kaisha and Tokyo Gas Company Limited, both of Tokyo, Japan

Filed May 28, 1975, Ser. No. 582,413

Claims priority, application Japan, Apr. 8, 1975, 50-41792

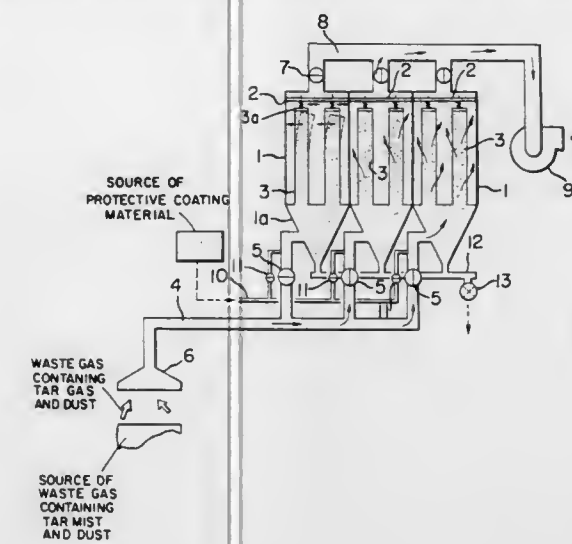
Int. Cl.<sup>2</sup> B01D 46/04

U.S. Cl. 55-286

2 Claims

1. Equipment for treating waste gas containing tar mist, comprising at least one bag housing, a valved waste gas supply duct connected to a source of waste gas having tar mist and dust therein and coupled to said housing for supplying waste gas containing tar mist to said housing, a valved discharge duct coupled to said housing for discharging treated waste gas from the housing, a filter bag mounting means in said housing and a filter bag mounted thereon in a position for filtering the waste gas passing through said housing from said waste gas

supply duct to said discharge duct, filter vibrating means operatively associated with said filter bag mounting means for removing accumulated filter material from the filter bag, a valved protective coating material supply duct connected to a source of protective coating material for a waste gas containing tar mist and coupled to said equipment for feeding said



protective coating material to said housing on the same side of said filter bag as said supply duct for coating the side of said filter bag which is exposed to the tar mist containing waste gas, and a valved filtered material discharge duct coupled to said housing for removing filtered material removed from said filter bag by the operation of said filter vibrating means.

4,010,014

**FLUID FILTER WITH SUBMERGED PASSAGES**

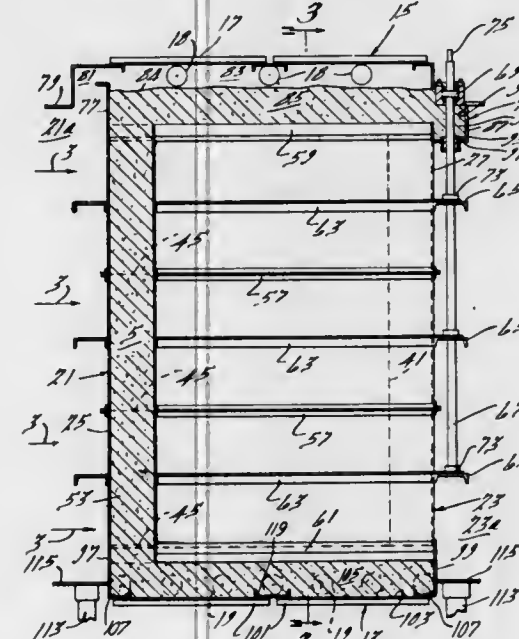
Herbert L. Barnebey, Columbus, and Bertrand Japikse, Reynoldsburg, both of Ohio, assignors to Barnebey-Cheney Co., Columbus, Ohio

Continuation of Ser. No. 402,969, Oct. 3, 1973, abandoned, which is a continuation of Ser. No. 122,970, March 10, 1971, abandoned. This application June 5, 1975, Ser. No. 584,120

Int. Cl.<sup>2</sup> B01D 41/00

U.S. Cl. 55-300

6 Claims



6. A filter construction characterized by the substantial elimination of gaskets to prevent bypass leakage of unfiltered fluid comprising a container having an inlet chamber for incoming fluid and having an outlet side spaced from the inlet chamber, said container having a horizontally disposed bottom wall and a vertically disposed side wall, a substantially uniform density mass of granular filter material substantially filling said container and supported on said bottom wall and confined by said side wall, flow guiding wall means embedded in said mass and supported in the container including an inlet

area and an outlet area and acting to direct fluid flow through said mass from said inlet chamber to said outlet side and defining a filter zone in said mass consisting of all normal paths of fluid flow through said mass from said inlet area to said outlet area, said filter zone being located centrally within the mass of filter material and being bounded by a thick layer of filter material, said thick layer providing a sealing zone of filter material and all portions of said layer being at least as thick as any portion of the filter zone traversed by fluid flowing from the inlet area to the outlet area, said sealing zone serving to prevent bypassing of unfiltered fluid from the inlet area out of the mass and from the inlet chamber to the outlet side, and wedge shaped members embedded in the filter mass to provide for flow of all the granular filter material and eliminate formation of pockets wherein there is no flow of filter material.

4,010,015

**INDUSTRIAL VACUUM CLEANER**

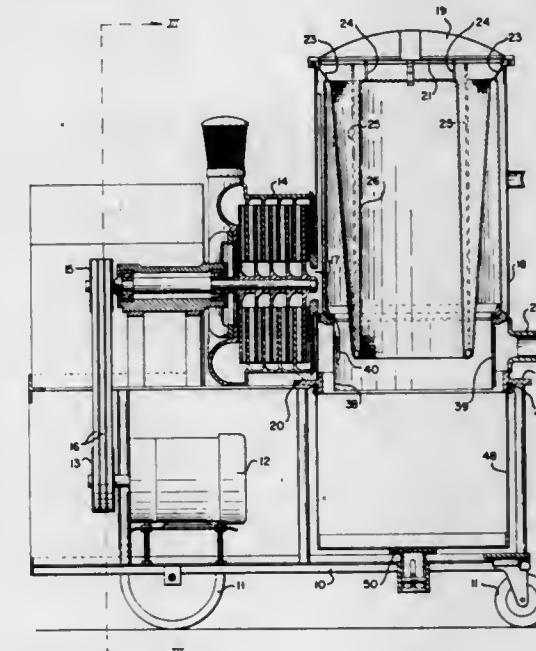
Forrest W. Brown, Dover, Ohio, assignor to Invincible Vacuum Corporation, Dover, Ohio

Filed Jan. 30, 1976, Ser. No. 653,770

Int. Cl.<sup>2</sup> B01D 50/00

U.S. Cl. 55-335

5 Claims



1. In a vacuum cleaner comprising a closed upper end upper tank portion, suction-producing means connected thereto, a removable closed lower end lower tank portion, means for bringing the lower tank portion into sealing contact at its upper end with the lower end of the upper tank portion and for moving it away therefrom, an air inlet and means for holding an inverted dust bag filter in the upper tank portion with the open end of the bag downward, the improvement comprising an interior ledge surrounded by the upper tank portion intermediate its upper and lower ends, a frame adapted to fit and positioned against the upper surface of the ledge and to seal against that ledge, the frame projecting above that ledge, means to attach the open end of a dust bag to the upright projecting frame portion, a deflector skirt adapted to fit and positioned against a lower surface of the ledge, the skirt projecting below the ledge to the lower end of the upper tank portion and spaced from the upper tank portion wall, the air inlet being positioned in the upper tank portion wall between its lower end and the interior ledge and opening into the lower tank portion in the space between the upper tank portion wall and the deflector skirt, whereby air may flow from the air inlet into the deflector skirt, and a plurality of means detachably connecting the deflector skirt to the frame operable from inside the deflector skirt.



4,010,016

## GAS COMPRESSOR

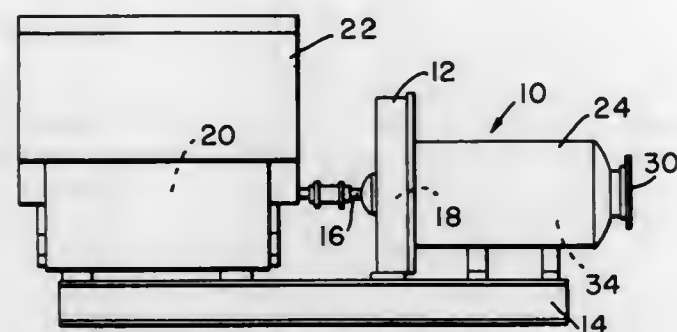
Ronald L. Haugen, Mayfield, Ky., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 27, 1975, Ser. No. 581,218

Int. Cl.<sup>2</sup> B01D 46/00

U.S. Cl. 55—473

1 Claim



1. A gas compressor, comprising:

- a gear housing;
- a driving gear and at least one driven gear enclosed within said housing;
- said gears being in mutual engagement for rotation in parallel axes;
- said housing having parallel walls;
- a power input shaft, in penetration of one of said walls, drivingly coupled to said driving gear;
- an impeller for compressing gas coupled to said one driven gear externally of said housing, for common rotation with said driven gear;
- first means for admitting gas to said impeller; and
- second means for discharging gas from said impeller; wherein
- said first and second means comprise an integral structure replaceably coupled to said housing in envelopment of, and concentric with, said impeller;
- one of said first and second means defines an annular chamber;
- said chamber has a closure head; and
- the other of said first and second means is in penetration of said closure head; further including
- a second driven gear enclosed within said housing and in mutual engagement with said driving gear;
- a second impeller for compressing gas coupled to said second driven gear, externally of said housing, for common rotation with said second driven gear;
- third means for admitting gas to said second impeller; and
- fourth means for discharging gas from said second impeller; wherein
- said third and fourth means comprises an integral structure replaceably coupled to said housing in envelopment of, and concentric with, said second impeller;
- one of said third and fourth means defining a further annular chamber;
- said further annular chamber has a closure head; and
- the other of said third and fourth means is in penetration of said closure head of said further annular chamber;
- a third driven gear enclosed within said housing and in mutual engagement with said driving gear;
- a third impeller for compressing gas coupled to said third gear, externally of said housing, for common rotation with said third gear;
- fifth means for admitting gas to said third impeller; and
- sixth means for discharging gas from said third impeller; wherein
- said fifth and sixth means comprises an integral structure replaceably coupled to said housing in envelopment of, and concentric with, said third impeller;
- one of said fifth and sixth means defines another annular chamber;
- said another annular chamber has a closure head; and
- the other of said fifth and sixth means is in penetration of

said closure head of said another annular chamber; and wherein

said second, fourth, and sixth means each include demister means for entraining and removing moisture from gas.

4,010,017

RECOVERY OF HYDROGEN CHLORIDE FROM CHLORINATED HYDROCARBONS SUCH AS CHLOROMETHANES

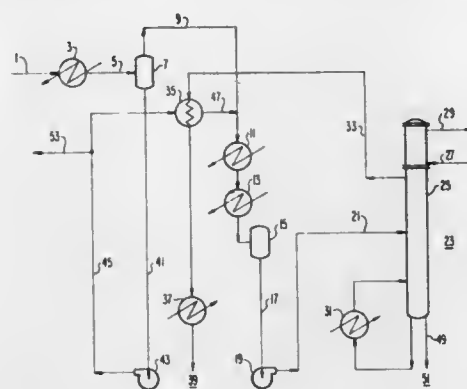
James E. Loyless, Baton Rouge, La., assignor to Vulcan Materials Company, Birmingham, Ala.

Filed Apr. 15, 1975, Ser. No. 568,242

Int. Cl.<sup>2</sup> F25J 3/02, 3/06; C07C 19/00; C01B 7/00

U.S. Cl. 62—28

7 Claims



4. In a process for the recovery of hydrogen chloride from a methyl chloride thermal chlorinator gaseous product stream consisting essentially of from about 5 to about 30% hydrogen chloride and correspondingly from about 95% to about 70% of a chloromethanes mixture consisting essentially of from about 20% to about 60% methyl chloride, from about 20% to about 30% methylene chloride, from about 5% to about 15% chloroform and from about 1% to about 25% carbon tetrachloride, the improvement which comprises the following steps:

- a. in a first zone cooling the gaseous stream to form a first gaseous phase portion and a first liquid phase portion;
- b. passing the first gaseous phase portion and the first liquid phase portion from the first zone to a second zone and in the second zone separating the first gaseous phase portion from the first liquid phase portion;
- c. passing the first liquid phase portion from the second zone to a third zone and in the third zone cooling the first liquid phase portion by passing the first liquid phase portion into indirect heat exchange relationship with a hydrogen chloride product recovery stream;
- d. passing the first liquid phase portion after cooling from the third zone to a fourth zone and admixing the cooled first liquid phase portion with the first gaseous phase portion to form an admixed gaseous phase portion/liquid phase portion stream;
- e. passing the admixed stream from the fourth zone to a fifth zone and condensing essentially all of the gaseous phase portion of the admixed stream to form a liquid phase feed stream wherein the liquid phase consists essentially of hydrogen chloride and chloromethanes;
- f. passing essentially all of the condensed liquid phase feed stream at a temperature between about  $-30^{\circ}\text{C}$  and about  $-10^{\circ}\text{C}$  at a pressure between about 200 psia and 250 psia to a stripping zone;
- g. maintaining the stripping zone at a pressure between about 200 psia and about 250 psia and at a temperature profile sufficient to retain essentially all of the chloromethanes in a liquid phase and to allow essentially all of the hydrogen chloride to separate in a vapor phase;
- h. removing a first hydrogen chloride product recovery stream consisting of the hydrogen chloride vapor phase from the stripping zone;
- i. passing the hydrogen chloride product recovery stream into said indirect heat exchange relationship in the third zone to cool the first liquid phase portion;

- j. passing the hydrogen chloride product recovery stream from the third zone to a recovery zone; and
- k. removing a second recovery stream consisting of the chloromethanes liquid phase from the stripping zone; the condensing of essentially all of the gaseous phase portion in step (e) and the stripping in step (g) allowing stripping at a temperature level substantially preventing any ice and hydrogen chloride hydrate buildup in the stripping zone.

4,010,018

ROTARY THERMODYNAMIC APPARATUS AND METHOD

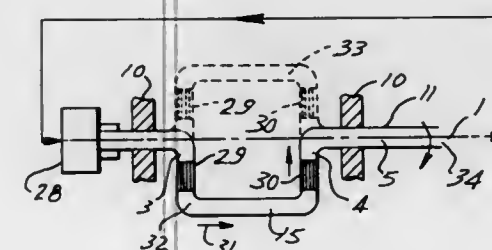
Frederick W. Kantor, 2875 Broadway, New York, N.Y. 10025

Continuation of Ser. No. 78,552, Oct. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 864,112, Oct. 6, 1969, Pat. No. 3,808,828, which is a continuation-in-part of Ser. No. 608,323, Jan. 10, 1967, Pat. No. 3,470,704. This application Apr. 18, 1975, Ser. No. 569,478

Int. Cl.<sup>2</sup> F25B 3/00

U.S. Cl. 62—499

19 Claims



1. A rotary thermodynamic system including a rotatable fluid flow conduit having radially outwardly-directed and inwardly-directed sections in which conduit the thermodynamic pressure drop decreases with an increase in the rate of flow of working fluid through said system, and impedance control means for providing an increase of pressure drop for an increase in the rate of flow of working fluid through said conduit, the amount of said increase in pressure drop being effective to cause the overall pressure drop for said system to increase with an increase in said rate of flow, and thereby stabilizing the flow of working fluid through said conduit.

4,010,019

METHOD OF MAKING MICROCHANNEL PLATES

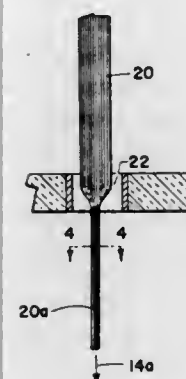
Henry B. Cole, East Woodstock, Conn., and Colin K. Yates, Dudley, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Nov. 19, 1971, Ser. No. 203,099

Int. Cl.<sup>2</sup> C03B 23/20

U.S. Cl. 65—36

3 Claims



1. The method of making microchannel plates of a multiplicity of relatively large tubes of glass each having a preselected ratio of wall thickness to inner diametral size, said tubes being arranged in parallel side-by-side relationship with each other as a bundle and drawn longitudinally sufficiently to

render openings through said tubes of desired microchannel size wherein the improvement comprises maintaining said ratio of wall thickness to inner diametral size of said tubes substantially constant throughout said method by the practice of no less than two drawing operations including the steps of: heating said bundle in a zone adjacent one end thereof to a temperature such that the glasses of said tubes are substantially non-flowable and minimally softened for drawing with large pulling force; drawing said heated bundle of glass tubes with said large pulling force slowly into a first section of reduced cross-sectional size having openings therethrough approaching but larger than said desired microchannel size with said ratio of wall thickness to inner diametral size of said tubes substantially unaltered; heating a length of said first section of said bundle in a zone adjacent one of its ends to a higher drawing temperature such that the glasses of said tubes are sufficiently softened for drawing into a second section of further reduced cross-sectional size with a substantially smaller pulling force than said first mentioned pulling force to prevent breakage of said second section; and redrawing said heated first section with said smaller pulling force sufficiently to reduce the size of said openings through said tubes to said desired microchannel size, said redrawing being effected relatively rapidly to maintain said ratio of wall thickness to the inner diametral size of said tubes substantially unaltered by minimizing the time of exposure of said tubes to said latter drawing temperature.

4,010,020

APPARATUS FOR FORMING CURVED SURFACES BY ROTATION

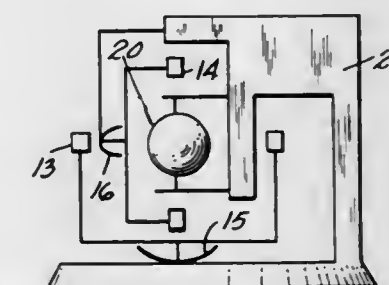
Stephen Wyden, 16 Court St., Brooklyn, N.Y. 11241

Continuation-in-part of Ser. No. 70,298, Sept. 3, 1970, abandoned. This application Dec. 18, 1973, Ser. No. 425,901

Int. Cl.<sup>2</sup> C03B 19/04, 13/14

U.S. Cl. 65—142

8 Claims



1. An apparatus for forming curved surfaces, wherein the material being formed is responsive to magnetic fields, comprising:

- a frame,
  - a vessel rigidly attached to the frame,
  - a track of circular section attached to the frame,
  - a pair of rotatable magnets attached to the track,
  - means of moving each of the pair of magnets along the track attached between the magnets and the track, and
  - means of rotating each of the magnets around the vessel attached between each of the magnets and the track, whereby a magnetically responsive material may be rotated in a plane by the rotation of the pair of magnets.
7. An apparatus for forming curved surfaces on material, comprising:
- a support frame forming a supporting track of circular section,
  - means to control eccentricity of a vessel attached to the track,
  - an upper supporting member attached to the eccentricity control means,
  - a vessel attached to the supporting member,



a lower supporting member attached to the vessel, means of controlling eccentricity and centering of the vessel attached to the support frame and to a lower end of the roller supporting member, means of driving the support members attached to the upper support member and to the track, and rotation of the support members when the axis of rotation is set at an angle of 45° to form a hyperboloid surface.

4,010,021

# TRANSFER MECHANISM FOR HIGH SPEED PRESS AND BLOW INDIVIDUAL SECTION GLASSWARE FORMING MACHINE

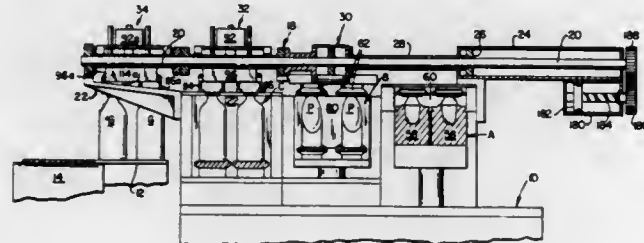
Thomas Vincent Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 462,078, April 18, 1974, Pat. No. 3,914,120. This application Aug. 18, 1975, Ser. No. 605,738  
Claims priority, application United Kingdom, Nov. 23, 1973, 54389/73

Int. Cl.<sup>2</sup> C03B 9/00

U.S. Cl. 65—229

10 Claims



1. In a glassware forming machine section comprising a frame having at least two stations horizontally spaced apart longitudinally of the frame and wherein the first of such stations is utilized to form a parison and another of said stations is utilized to further form the parison, a transfer mechanism for moving a parison from the first such station to said another station including at least one guide rod extending longitudinally of the frame over the said stations, a carriage supported on said rod for substantially horizontal reciprocation therealong, a reversible motor connected with the carriage for reciprocating the carriage on the guide rod, a neck ring structure supported by said carriage and having parts movable toward each other to engage a parison at said first station and away from each other to release a parison at said another station, rack and pinion means for so moving said neck ring parts including a rack which is connected with at least one neck ring part and which is carried by and slidable on said carriage and a pinion which is rotatable with said guide rod and slidable therealong with the carriage, and driven reversible means connected with said guide rod for rotating said guide rod.

4,010,022

# APPARATUS FOR MAKING FUSED SILICA TUBING

Herbert Schul, Hanau am Main, Germany, assignor to Heraeus-Schott Quarzschmelze GmbH, Hanau am Main, Germany

Filed June 16, 1975, Ser. No. 587,449

Claims priority, application Germany, June 25, 1974, 2430428

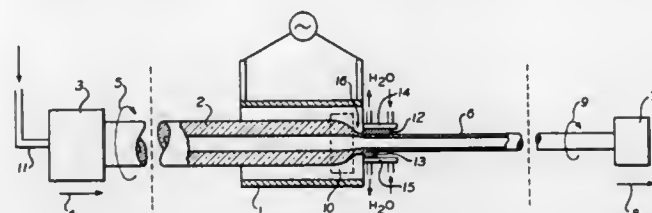
Int. Cl.<sup>2</sup> C03B 23/04, 21/00

U.S. Cl. 65—277

9 Claims

1. An apparatus for making fused silica tubes from a hollow cylindrical tube of fused silica which comprises a heating zone, means for supplying heat to said heating zone, means for continuously feeding said hollow cylindrical tube to said heating zone, means for rotating said hollow cylindrical tube as it is fed to said heating zone, means downstream of said heating zone for continuously withdrawing said tube from said heating zone, means for rotating the same about its own longitudinal

axis as it is withdrawn from said heating zone, means for applying pressure to the interior of said tube while it is being withdrawn from said heating zone and rotated, and calibrating means downstream of said heating zone for calibrating the still-plastic tube immediately upon leaving the heating zone, said calibrating means being disposed adjacent to said heating



zone, said calibrating means comprising at least two tube confronting flat graphite plate means disposed upon a support and at a distance from one another corresponding to the desired outside diameter of said tube, said support means including a conduit therein and means for passing a coolant through said conduit.

4,010,023

# MANUFACTURE OF ALUMINA FOR USE IN THE BASIC OXYGEN FURNACE

James J. Bowden, P.O. Box 127, Cortland, Ohio 44410

Filed July 2, 1975, Ser. No. 592,393

Int. Cl.<sup>2</sup> C22B 1/08; C21C 7/00

U.S. Cl. 75—3

5 Claims

1. The method of producing low-cost alumina for use as a flux in the manufacture of steel in a steel-making furnace, comprising:

skimming the slag from the top of a melt of scrap aluminum, permitting the skimmed slag to solidify, subjecting the solidified slag to an agitating operation to remove at least some of the large particles of aluminum therefrom for remelting and for reducing the remainder of the solidified slag to particle and powdery form, and screening the remainder of the agitated slag to separate the particle form from the powdery form the latter being adapted for use in the steel-making furnace.

4,010,024

# PROCESS FOR PREPARING METAL HAVING A SUBSTANTIALLY UNIFORM DISPERSION OF HARD FILLER PARTICLES

Sanford Baranow, Souquoit, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed June 16, 1975, Ser. No. 587,026

Int. Cl.<sup>2</sup> B22F 9/00

U.S. Cl. 75—5 BC

4 Claims

1. A process for preparing metal having a substantially uniform dispersion of hard filler particles, which comprises the steps of: admixing metal powder from the group consisting of nickel, cobalt and alloys thereof and oxide particles having a negative free energy of formation at 1000° C of at least as great as that of aluminum oxide; milling the mixture for a period of time sufficient to effect a substantially uniform dispersion of said oxide particles in said metallic powder, said milling being in an oxygen containing atmosphere, said atmosphere containing sufficient oxygen to substantially preclude welding of particles of said metallic powder to other particles of said metallic powder, said oxygen being present in an amount greater than that encountered when powders are milled in the air often present in a mill, said oxygen being supplied from an external gaseous source or from an oxygen-bearing compound which is admixed with said metal powder and oxide particles; said dispersion strengthened powder having a Fisher No. of less than 15; heat treating said dispersion strengthened powder to remove excess oxygen therefrom; and subsequently blending said dispersion strengthened powder with powder which is not readily reducible by hydrogen.

4,010,025

# OXIDATION AND SINTER-RESISTANT METAL POWDERS AND PASTES

Anthony V. Fraioli, Essex Fells, N.J., and John A. DeRosa, Queens Village, N.Y., assignors to Plessey Incorporated, Melville, N.Y.

Division of Ser. No. 565,835, April 7, 1975, Pat. No. 3,966,463, which is a continuation-in-part of Ser. No. 496,714, Aug. 12, 1974, abandoned. This application Feb. 6, 1976, Ser. No. 655,847

Int. Cl.<sup>2</sup> B22F 9/00; B01J 23/74

U.S. Cl. 75—5 AC

4 Claims

1. The method of preparing finely divided nickel powder of increased oxidation resistance comprising:

forming an acidic solution of nickel and a minor proportion of a zirconium oxide precursor; forming an alkaline hydrazine reducing solution; adding said acidic nickel solution to said reducing solution very slowly under conditions of agitation; separating, washing and drying the resulting precipitate; firing said precipitate in a reducing atmosphere at about 450° C.

4,010,026

# ARC FURNACE STEELMAKING

David Engledow, Rotherham, England, assignor to British Steel Corporation, London, England

Filed July 7, 1975, Ser. No. 593,272

Claims priority, application United Kingdom, July 22, 1975, 32354/75

Int. Cl.<sup>2</sup> C21C 5/52

U.S. Cl. 75—11

13 Claims

13. A method of steelmaking in an electric arc furnace, in which a blend of particulate high carbon and low carbon iron-bearing material is continuously charged into a furnace at a rate dependent on the electrical and chemical energy reactions therein, the continuous charging being effected after melt-down of an initial scrap basket charge, and in which a cycle is completed after a number of tappings concluding a like number of sub-cycles, continuous charging additionally being effected immediately after each said sub-cycle (except the last) on to a residue of molten metal left in the furnace after the previous tap.

4,010,027

# PROCESSES FOR STEEL MAKING BY OXYGEN REFINING OF IRON

James White, Ranby Retford, England, assignor to Lafarge Fondu International, Neuilly sur Seine, France

Filed May 15, 1975, Ser. No. 577,840

Claims priority, application France, May 15, 1974, 74.16937

Int. Cl.<sup>2</sup> C21C 7/02; C22B 9/10

U.S. Cl. 75—52

9 Claims

1. A process for obtaining low phosphorus steel by oxygen refining of liquid iron in the presence of a slag containing lime, alumina, silica and iron oxides characterized in that at the beginning of the operation is added to the liquid metal a charge of a composition calculated such that during all the refining operation the slag contains a solid phase consisting substantially only of calcium oxide, which disappears at the end of operation and only at this moment, and a liquid phase which remains substantially saturated in magnesium oxide and such that at the end of the operation a slag is obtained containing:

CaO	40 to 60 %
SiO <sub>2</sub>	5 to 25 %
MgO	2.5 to 15 %
Al <sub>2</sub> O <sub>3</sub>	5 to 25 %
Iron oxides expressed as Fe <sub>2</sub> O <sub>3</sub>	10 to 35 %

-continued

P<sub>2</sub>O<sub>5</sub> 0.5 to 10 %

with

MgO/R<sub>2</sub>O<sub>3</sub> less than .65R<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub> + P<sub>2</sub>O<sub>5</sub> greater than 0.8MgO/SiO<sub>2</sub> between 0.3 and 0.7Al<sub>2</sub>O<sub>3</sub>/Fe<sub>2</sub>O<sub>3</sub> between 0.10 and 3.0, wherein R<sub>2</sub>O<sub>3</sub> is the sum of Al<sub>2</sub>O<sub>3</sub> and iron oxides in said slag.

4,010,028

# BONDED CALCIUM CARBIDE ARTICLE AND METHOD FOR MAKING THE SAME

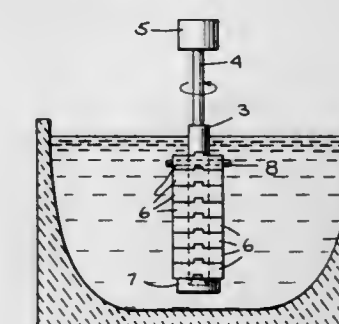
Donald A. Irwin, Sr., Naugatuck; Gordon H. Madge, Watertown; Charles F. Kloss, Waterbury, and Allen L. Stone, Cheshire, all of Conn., assignors to Uniroyal Inc., New York, N.Y.

Filed July 29, 1974, Ser. No. 492,801

Int. Cl.<sup>2</sup> C21C 7/02

U.S. Cl. 75—53

22 Claims



1. A non-circular, self-sustaining shaped article, useful for reducing the sulfur content of molten steel, comprising granular calcium carbide bonded with a crosslinked polymeric bonding agent selected from the group consisting of polyurethane, polyesters, phenolic resins, epoxy resins, liquid styrene-butadiene copolymers, polybutadiene, isobutylene-diene copolymers, polysulfide polymers and ethylene-propylene-non-conjugated diene terpolymers.

4,010,029

# METHOD FOR INCREASING THE USE OF SCRAP AND IRON OXIDES BY BASIC OXYGEN FURNACE

David L. McBride, Pittsburgh, Pa., assignor to Energy and Materials Conservation Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1975, Ser. No. 632,071

Int. Cl.<sup>2</sup> C21C 5/28

U.S. Cl. 75—60

5 Claims

1. A method for producing steel in oxygen converter whereby the relative proportion of scrap metal used is increased which comprises charging scrap metal into said converter, superheating molten iron in a separate vessel to a temperature of 2600° to 3000° F without altering the initial composition of the molten iron, and then charging said superheated molten iron into said scrap containing converter, followed by the injection of gaseous oxygen and fluxes to obtain a steel product of desired composition.

4,010,030

# REMOVAL OF ARSENIC, ANTIMONY AND BISMUTH FROM MOLTEN COPPER WITH SULFUR HEXAFLUORIDE

Robert O. French, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Sept. 8, 1975, Ser. No. 611,154

Int. Cl.<sup>2</sup> C22B 15/00

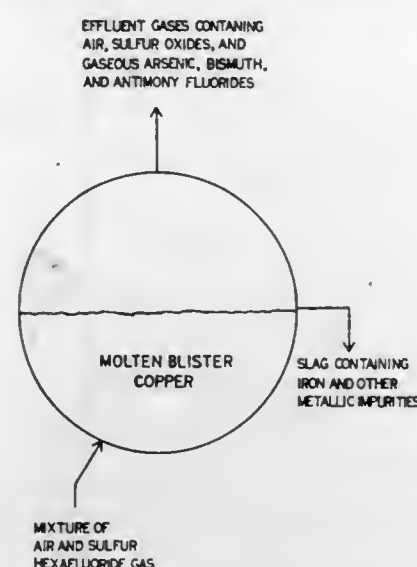
U.S. Cl. 75—76

6 Claims

1. A process for removing impurities selected from the



group consisting of bismuth, antimony, arsenic, and mixtures thereof from molten copper, comprising contacting said mol-



ten copper with sulfur hexafluoride gas; forming gaseous fluorides of said impurities; and discharging said gaseous fluorides from said copper while it is still molten.

4,010,031

## ELECTROPHOTOGRAPHIC SYSTEM

Masaru Onishi, and Koichi Tomura, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1975, Ser. No. 542,906

Claims priority, application Japan, Jan. 23, 1974, 49-10543

Int. Cl.<sup>2</sup> G03G 0/00

U.S. Cl. 96—1 TE

8 Claims

1. An electrophotographic apparatus comprising: a photoconductive layer of a predetermined conductivity type having a pair of first and second main surfaces opposite to each other and including majority carriers having a predetermined polarity for receiving an imaging light to be recorded to generate hole-electron pairs in that portion of said layer adjacent to said second main surface, a transparent electrode layer disposed on the side of the second main surface of the photoconductive layer, a dielectric recording medium disposed in spaced opposed relationship with the first main surface of the photoconductive layer with a gap therebetween, a source of DC recording voltage coupled across said transparent electrode layer and said dielectric recording medium for applying a DC recording voltage with a polarity making said transparent electrode layer identical in polarity to the majority carriers present in said photoconductive layer, said DC recording voltage being for transferring those carriers of said hole-electron pairs identical in polarity to said majority carriers present in said photoconductive layer to said first main surface of said photoconductive layer thereby to form an electrostatic latent image corresponding to said imaging light on said first main surface of said photoconductive layer and also to transfer said electrostatic latent image to said dielectric recording medium, and a carrier transparent blocking layer sandwiched between said second main surface of said photoconductive layer and said transparent electrode layer, said carrier blocking layer being for permitting said imaging light to pass to the second main surface of the photoconductive layer and also to prevent those carriers identical in polarity to said majority carriers present in said photoconductive layer from being injected into said photoconductive layer from said transparent electrode layer.

2. An electrophotographic apparatus as claimed in claim 1 wherein said transparent carrier blocking layer is polyvinyl carbazole.

3. An electrophotographic apparatus as claimed in claim 1 wherein said transparent carrier blocking layer is a photoconductive material having the opposite polarity from the material of said photoconductive layer.

# 4,010,032 PROCESS FOR PRODUCING COLOR SEPARATION RECORD UTILIZING ELECTROLUMINESCENT MATERIAL

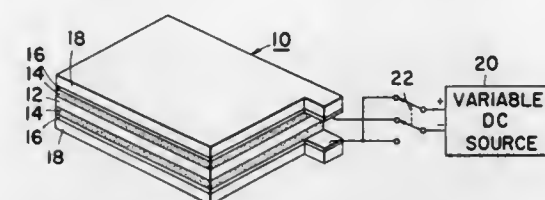
Yoshio Ono, No. 25-2, Nishirendaino-cho, Murasakino, Kita, Kyoto, and Takashi Sakamoto, No. 16, Sagasono-cho, Narutaki, Ukyo, Kyoto, both of Japan

Filed Mar. 31, 1975, Ser. No. 563,647

Int. Cl.<sup>2</sup> G03C 7/00; G03F 1/00; G03C 1/92

U.S. Cl. 96—31

4 Claims



1. A process for producing a color separation record for color printing comprising the ordered steps of:

radiating a color image onto a photosensitive material through a color separation filter;

placing an electroluminescent member onto said photosensitive material;

applying an electrical potential to the electroluminescent member of a given magnitude and a predetermined polarity;

radiating said color image onto said electroluminescent member and said photosensitive material through the color separation filter;

reversing the polarity of and lowering the value of the electrical potential applied to the electroluminescent member;

radiating the color image onto said electroluminescent member through a color compensating filter; and increasing the magnitude of the electrical potential applied to the electroluminescent member to radiate the luminescent image thereof onto the photosensitive material in alignment with the color image.

4,010,033

# PHOTOSENSITIVE LAYER AND METHOD OF FORMING A PHOTOGRAPHIC IMAGE THEREFROM

Jacques V. Metzger, Marseille, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Continuation of Ser. No. 492,487, July 29, 1974, abandoned.

This application Mar. 10, 1976, Ser. No. 665,388

Claims priority, application France, Aug. 3, 1973, 73.28538

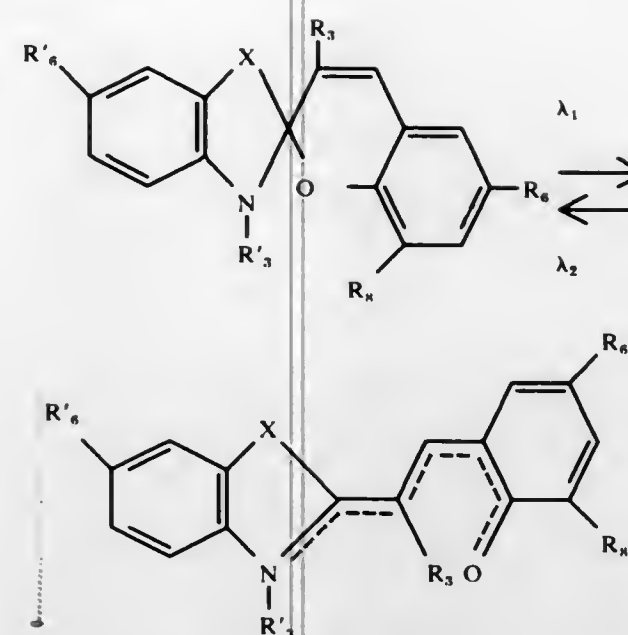
Int. Cl.<sup>2</sup> G03C 5/24, 1/72, 1/52

U.S. Cl. 96—48 R

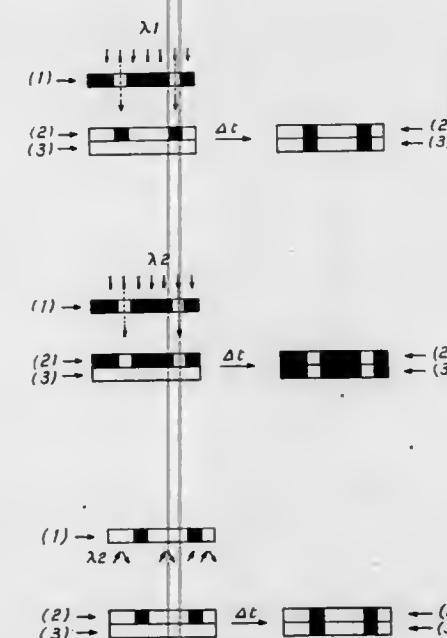
22 Claims

1. A photographic element comprising a support having thereon a photosensitive layer which contains:

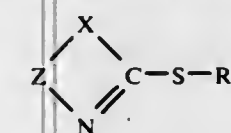
a. at least one heterocyclic photochromic spiropyran which can exist in two forms and is selectively converted from one form to the other on irradiation according to the scheme



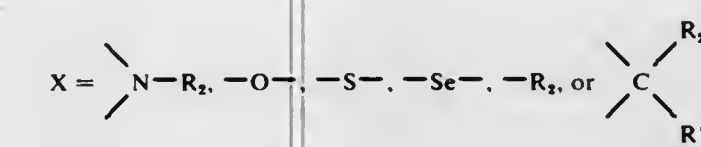
wherein R<sub>3</sub> is methyl, phenylthio, phenyl, chloro, bromo, methoxy, hydroxy, naphthyl, 4-chlorophenyl, 4-bromophenyl, 4-hydroxyphenyl, or 4-methoxyphenyl;



R<sub>3</sub>' is methyl, isopropyl, n-hexyl, benzyl, or phenylethyl; R<sub>6</sub> is nitro; R<sub>6</sub>' is hydrogen, methylthio or phenylthio; R<sub>8</sub> is methoxy; and X is thio, seleno, imido, oxo, aza, or dialkylcarbo; λ<sub>1</sub> is a wavelength in the ultraviolet range and λ<sub>2</sub> is a wavelength in the visible range; b. at least one ortho-substituted nitrogen-containing heterocyclic thioether of the following formula:

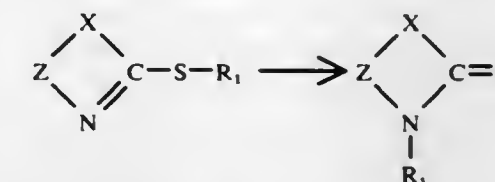


wherein



Z is a group of atoms required to complete a five-membered ring or a five-membered substituted ring, R<sub>1</sub>, R<sub>2</sub>, and R<sub>2</sub>' are alkyl or acylalkyl groups, the open form of the spiropyran being capable of acting as a catalyst in the conver-

sion of the thioether to a thione in accordance with the following reaction:



so that a latent image produced on exposure of the spiropyran to light is amplified,

c. at least one agent for producing a visible image from the amplified latent image, such agent comprising

f. at least one metal salt of a carboxylic acid which can be reduced by thiones and is a behenate, resinate, naphthenate, benzoate, or stearate of silver, cadmium, calcium, copper, cobalt, tin, manganese, magnesium, nickel, lead, or zinc, or

2. at least one compound which together with the thione, forms a complex of the formula:

ML<sub>2</sub>

where M represents halide or thiocyanate and L represents the thione, and is zinc, cobalt, or nickel halide or zinc or cobalt thiocyanate, and

d. at least one component which will fix the spiropyran in the open form, such component being a semiconducting oxide or a cobalt, copper, or nickel salt.

4,010,034

# METHOD FOR ADJUSTING THE BROMIDE ION CONCENTRATION IN A PHOTOGRAPHIC PROCESSING SOLUTION

Tsuneo Suga, Tokyo; Masaru Kanbe; Shinobu Korematsu, both of Hachioji; Toshiaki Takahashi, Musashimurayama, and Ken-ichi Kishi, Machida, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 398,187, Sept. 17, 1973, abandoned.

This application July 8, 1975, Ser. No. 594,128

Claims priority, application Japan, Sept. 22, 1972, 47-94600

Int. Cl.<sup>2</sup> G03C 5/32, 5/38, 5/30

U.S. Cl. 96—60 BF

7 Claims

1. A method for adjusting the bromide ion concentration in a photographic processing solution selected from a developer, a bleach-fixing solution and a fixing solution, which comprises:

contacting said processing solution with particles consisting essentially of an insoluble bismuth compound selected from the group consisting of bismuth trioxide, bismuth tetroxide, and bismuth pentoxide so that said particles adsorb an excess bromide ion in said processing solution; separating said particles from said processing solution; and removing the adsorbed bromide ion from the separated particles whereby said particles are made reusable for repeating said contacting step in order to adjust the bromide ion concentration.

4,010,035

# LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND A PROCESS FOR DEVELOPING THEREOF

Mitsuto Fujiwara; Takaya Endo, and Ryosuke Satoh, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 15, 1975, Ser. No. 577,931

Claims priority, application Japan, May 29, 1974, 49-60411

Int. Cl.<sup>2</sup> G03C 5/30, 1/06

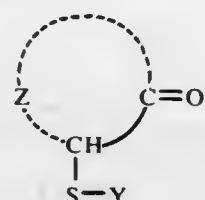
U.S. Cl. 96—66.3

10 Claims

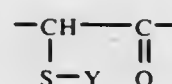
1. A light-sensitive silver halide colour photographic mate-



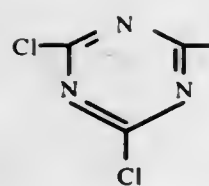
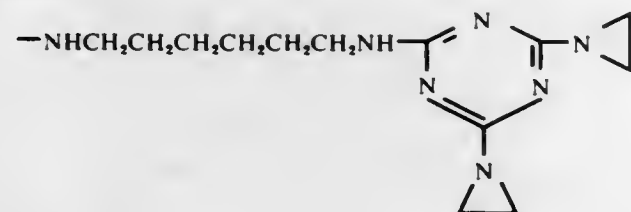
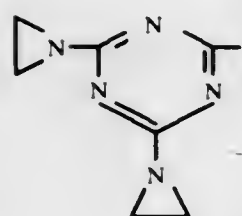
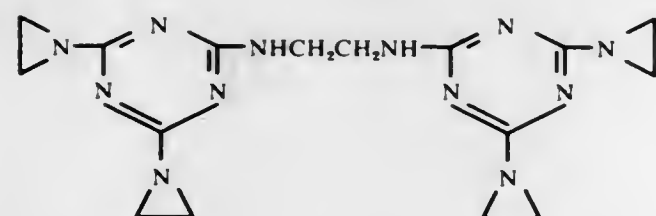
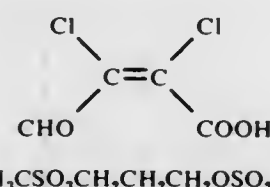
rial, which comprises a development releasing inhibitor compound which liberates a development inhibitor and simultaneously produces a colorless compound on reacting with an oxidation product of a color developing agent, and a photographic hardening agent, said development releasing inhibitor compound comprising:



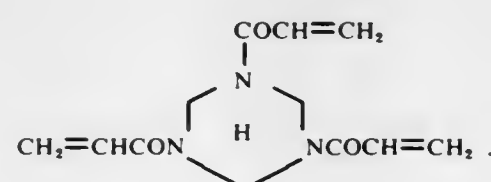
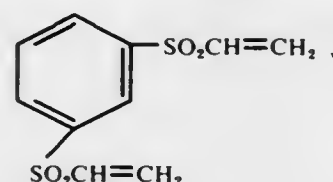
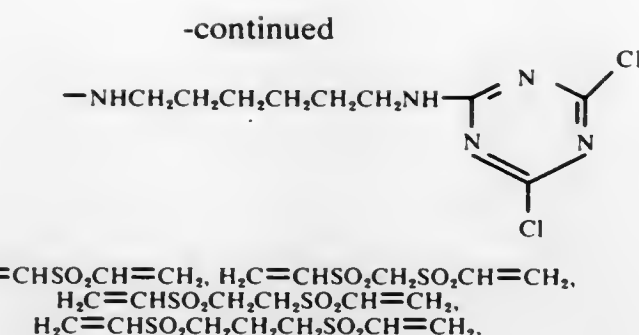
wherein Z, together with the



group, represents an alicyclic ring selected from the group consisting of 5-, 6- and 7-membered rings; and a heterocyclic ring selected from the group consisting of a piperidone, a lactone having a 4- to 7-membered ring, a pyrrolidone, a hydantoin and an oxyindole, each of which ring may be substituted and may have condensed rings, and Y represents a group that forms a development inhibitor when the sulfur atom of the thioether bond is split from the said ring to release an aryl mercapto compound, a heterocyclic mercapto compound, a thioglycol, cysteine or glutathione, and said hardening agent is selected from the group consisting of



and

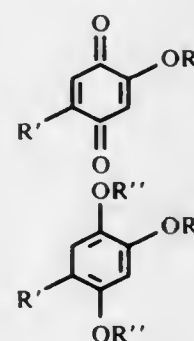


4,010,036

#### LITH-TYPE SILVER HALIDE PHOTOSENSITIVE MATERIAL CONTAINING A P-BENZOQUINONE DERIVATIVE

Tsuneo Suga; Ken-ichi Kishi; Shinobu Korematsu; Masaru Kanbe, and Toshiaki Takahashi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan  
Continuation-in-part of Ser. No. 371,853, June 20, 1973, abandoned. This application May 22, 1975, Ser. No. 579,792  
Claims priority, application Japan, June 30, 1972, 47-64957  
Int. Cl.<sup>2</sup> G03C 1/06, 1/28, 5/30

U.S. Cl. 96—66.3 4 Claims  
1. A lith-type silver halide photosensitive material comprising high contrast silver halide grains containing at least 50 mole per cent of silver chloride, less than 40 mole percent of silver bromide and less than 5 mole per cent of silver iodide based on total silver halide, the size of said grains being 0.05 to 0.5 microns in average diameter, said material further comprising, in an amount of 10 mg to 10g per mole of silver halide, a compound represented by the following general formula I or II:

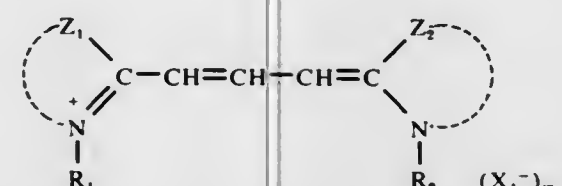


wherein R is alkyl, aryl, aralkyl or acyl; R' is hydrogen or —OR; and R'' is hydrogen or acyl.

#### 4,010,037 SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

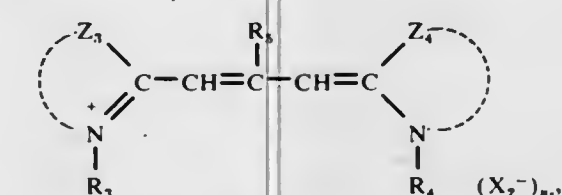
Masanao Hinata; Haruo Takei; Tadashi Ikeda, and Mitsuo Iwamoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan  
Continuation of Ser. No. 530,125, Dec. 6, 1974, abandoned.  
This application Jan. 28, 1976, Ser. No. 653,995  
Claims priority, application Japan, Dec. 6, 1973, 48-138345  
Int. Cl.<sup>2</sup> G03C 1/14

U.S. Cl. 96—100 12 Claims  
1. A silver halide photographic emulsion containing, in combination, supersensitizing amounts of at least one sensitizing dye of the following general formula (I)



wherein Z<sub>1</sub> and Z<sub>2</sub> each represents an atomic group required for forming a benzimidazole ring and the ring formed by Z<sub>2</sub> or the ring formed by Z<sub>1</sub> is substituted in the 5-position with a chlorine atom, a methoxycarbonyl group, an ethoxycarbonyl group, a propoxycarbonyl group, a butoxycarbonyl group, a methylcarbonyl group or an ethylcarbonyl group; R<sub>1</sub> and R<sub>2</sub> each represents an aliphatic group and at least one of R<sub>1</sub> and R<sub>2</sub> represents an alkyl group having a sulfo group; X<sub>1</sub> represents an acid anion; and m is 1 or 2, and when m is 1 the dye forms an inner salt;

and at least one sensitizing dye of the following general formula (II)



wherein Z<sub>3</sub> represents an atomic group required for forming a benzoxazole ring or a β-naphthoxazole ring; Z<sub>4</sub> represents an atomic group required for forming a benzothiazole ring, a benzoselenazole ring, a β-naphthothiazole ring or a β-naphthoselenazole ring; R<sub>3</sub> and R<sub>4</sub> represents an alkyl group having a carboxy group or an alkyl group having a sulfo group; R<sub>5</sub> represents a hydrogen atom or an alkyl group; X<sub>2</sub> represents an acid anion; and n is 1 or 2, and when n is 1 the dye forms an inner salt.

#### 4,010,038 PROCESS FOR PRODUCING MICROCAPSULES

Hiroshi Iwasaki, Kawanishi; Shunsuke Shioi, Daito, and Jujiro Kouno, Takatsuki, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan  
Filed Apr. 1, 1975, Ser. No. 563,974  
Claims priority, application Japan, Apr. 10, 1974, 49-41306  
Int. Cl.<sup>2</sup> B01J 73/02; C09D 11/00

U.S. Cl. 106—22 6 Claims  
1. In a process for producing microcapsules of complex hydrophilic colloid material enclosing fine particles of a hydrophobic substance, the improvement characterized by: forming a mixture containing an acid-treated gelatin and at least one carboxy-modified cellulose derivative used as the hydrophilic colloid material for coacervation, the amount of the cellulose derivative being 1/7 to 1/40 the amount of the gelatin by weight, the cellulose derivative having an average polymerization degree of 50 to 1,000 and a carboxyl substitution degree of 0.4 to 1.5, and

effecting coacervation of the colloid material solution at a pH of 4.8 to 6.0 and at a temperature higher than the gelling point of the acid-treated gelatin.

#### 4,010,039 REFRACTORIES

Salvador de Aza, Madrid, Spain; Colin Richmond, Workson, and James White, Retford, both of England, assignors to Gr-Stein Refractories Limited, United Kingdom  
Continuation-in-part of Ser. No. 351,949, April 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 98,272, Dec. 15, 1970, abandoned. This application Nov. 8, 1974, Ser. No. 522,225

Claims priority, application United Kingdom, Feb. 17, 1970, 61383/70

Int. Cl.<sup>2</sup> C04B 35/48

U.S. Cl. 106—57 8 Claims

1. A solid-solid bonded basic refractory having a chemical composition (calculated as the oxides) consisting essentially of MgO in the amount 25% to 97% by weight; CaO 0.9% to 44% by weight; ZrO<sub>2</sub> 2% to 57% by weight; and SiO<sub>2</sub> 0.5% to 23.5% by weight; the said basic refractory containing a silicate and an alkaline earth metal zirconate, the CaO/SiO<sub>2</sub> ratio being greater than 1.4, there being at least one part by weight of said alkaline earth metal zirconate for each three parts by weight of said silicate, and the CaO to SiO<sub>2</sub> + ZrO<sub>2</sub> ratio being between 0.32 and 1.40, said alkaline earth metal zirconate being capable of co-existing with any basic solid refractory phase at a temperature of at least 1700°C. in which solid-solid bonding is maintained between said zirconate and said solid refractory phase in the presence of a liquid phase at a temperature of at least 1700°C. and in which said refractory forms a skeleton of said zirconate bonded to said refractory phase at a temperature of at least 1700°C.

4,010,040

#### MODIFIED MIXING TECHNIQUE FOR CARBONACEOUS STOCK

Roy E. Booth, Berea, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1974, Ser. No. 529,889

Int. Cl.<sup>2</sup> C08L 95/00

U.S. Cl. 106—281 R 1 Claim

1. A method of compounding graphitizable compositions which comprise introducing a carbon particle filler into a hot-shear mixer, adding from about 25 to about 70 pph of water, adding from about ¼ to about 5 pph of a dispersant, premixing at a temperature at least about the boiling point of water (100°C) until most of the moisture is eliminated, adding a binder, and mixing for about an additional one hour at a temperature above the melting point of the binder.

4,010,041

#### ANHYDRIDE DERIVATIVES

Malcolm Leslie Dean, Bayswater, and Bruce Leary, Frankston, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Filed Nov. 29, 1974, Ser. No. 528,548

Claims priority, application Australia, Dec. 11, 1973, 5950/73

Int. Cl.<sup>2</sup> C09K 3/00

U.S. Cl. 106—287 R 3 Claims

1. A liquid paint composition which has a viscosity of less than 10 poise at 25°C and at a non-volatile content of at least 80% by weight and which comprises a hydroxy-group containing derivative of a polybasic acid anhydride selected from trimellitic anhydride and pyromellitic anhydride together with a cross-linking agent suitable for curing the said derivative by reaction with hydroxy groups in said derivatives, said derivative containing carboxyl groups in addition to hydroxy groups and comprising two monoesters per derivative molecule of



diols selected from ethylene glycol, propylene glycol, butane diol and hexane diol and di-hydroxy esters of said diols with dicarboxylic acids, the derivative being further characterised in that it has an acid value of 40 mgm KOH per gm minimum and comprises two hydroxyl groups, which are the sole hydroxyl groups in the molecule, depending from separate carbon atoms which constitute part of a chain of not more than 40 covalently linked carbon and oxygen atoms, the said separate carbon atoms being located at opposite ends of and not more than three atoms from the extremities of the chain.

4,010,042

# PROCESS FOR REMOVING PHOSPHOSILICATE COATINGS

Charles D. Boyer, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Jan. 15, 1976, Ser. No. 649,382

Int. Cl.<sup>2</sup> B08B 3/08

U.S. Cl. 134—2

9 Claims

1. A process for removing a phosphosilicate coating from a metallic substrate, without deleteriously affecting the substrate, comprising contacting the coating with an aqueous solution containing an alkali metal fluoride in a concentration effective to remove the phosphosilicate coating and maintaining said solution in contact with said coating for a time sufficient to remove the phosphosilicate coating without deleteriously affecting the substrate.

4,010,043

# LITHIUM-IODINE CELLS AND METHOD FOR MAKING SAME

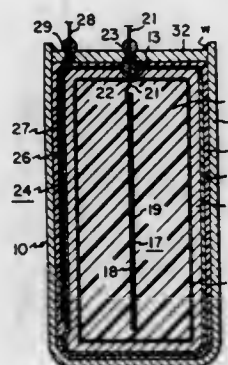
Alan A. Schneider, Reisterstown, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Division of Ser. No. 564,755, April 3, 1975. This application Mar. 12, 1976, Ser. No. 666,161

Int. Cl.<sup>2</sup> H01M 21/00

U.S. Cl. 29—523.2

6 Claims



1. A method for making a lithium iodine cell comprising:
  - A. forming a lithium metal sheet into a receiving vessel having an aperture therethrough and an opening thereinto, said vessel including at least one extending portion having a shape conforming dimensionally to said opening for sealing closed said opening;
  - B. forming a cathode current collector by welding a plastic coated lead wire to a metallic screen-like material;
  - C. positioning the cathode current collector within the receiving vessel and the lead wire through said aperture;
  - D. heating a cathode material to a flowable consistency;
  - E. completely filling said receiving vessel with the heated cathode material and chilling said filling vessel to solidify said material; and
  - F. while said material is solidified, positioning said extending portion in abutting relationship with the solidified material to sealing closed said opening under pressure to form an anode encasing member.

4,010,044

# BATTERY VENT

Ernest C. Schaumburg, West Lakeland, Minn., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 545,032, Jan. 29, 1975, abandoned. This application Mar. 4, 1976, Ser. No. 664,017

Int. Cl.<sup>2</sup> H01M 2/12

U.S. Cl. 429—82

15 Claims

1. A battery vent comprising:
  - a. a first member;
  - b. a second member positioned adjacent to said first member;
  - c. a vent means;
  - d. a narrow passage formed between said first and second members in gaseous communication with said vent means, said narrow passage having a depth between 0.001 and 0.015 inch and a length such that venting gases must travel at least 0.18 inch through said narrow passage; and
  - e. means on said second member for attachment to a battery through which gas can pass from the battery to said narrow passage, wherein said battery vent acts to inhibit battery explosions.

4,010,045

# PROCESS FOR PRODUCTION OF III-V COMPOUND CRYSTALS

Robert A. Ruehrwein, 67 Hilton Ave., Garden City, N.Y. 11530

Division of Ser. No. 424,565, Dec. 13, 1973, Pat. No. 3,975,218, and a continuation-in-part of Ser. No. 248,724, April 28, 1972, abandoned. This application Apr. 27, 1976, Ser. No. 680,854

Int. Cl.<sup>2</sup> H01L 7/36

U.S. Cl. 148—174

5 Claims

1. A process for the production of crystalline III-V compounds selected from the group consisting of the nitrides, phosphides, arsenides and antimonides of aluminum, gallium, indium, and mixtures thereof, which comprises combining in the vapor phase, while excluding oxidizing gases, first and second gas streams,
  - said first gas stream comprising an inert carrier gas and a gaseous mixture formed by the reaction in the absence of hydrogen of a Group III trihalide and a Group III element, said first gas stream being hydrogen-free; and
  - said second gas stream comprising an inert carrier gas and a gaseous substance selected from the group consisting of a Group V element and a volatile Group V compound; thereby to obtain a crystalline form of at least one of said III-V compounds.

4,010,046

# METHOD OF EXTRUDING ALUMINUM BASE ALLOYS

William C. Setzer, Creve Coeur, Mo.; Richard D. Lanam, Hamden; Joseph Winter, New Haven, both of Conn., and Douglas L. Graham, Ballwin, Mo., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 4, 1976, Ser. No. 663,661

Int. Cl.<sup>2</sup> C22D 1/04

U.S. Cl. 148—11.5 A

13 Claims

1. A method for extruding high strength aluminum base alloys which comprises providing a cast alloy billet, the alloy billet consisting essentially of from 0.04 to 1.0% iron, from 0.02 to 0.2% silicon, from 0.1 to 1.0% copper, from 0.001 to 0.2% boron, balance essentially aluminum, conducting a hot extrusion of said billet at a temperature between 600°-950° F., cooling the extruded product and stretching the cooled product less than 3 percent of the length of the extruded shape.

4,010,047

# METHOD FOR STABILIZING A SUPERCONDUCTOR

Sigrun Frohmader, and Günther Ziegler, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 30, 1975, Ser. No. 573,075

Claims priority, application Germany, May 16, 1974, 2423712

Int. Cl.<sup>2</sup> C21D 1/56; 1/00

U.S. Cl. 148—20.3

13 Claims

1. A method for stabilizing a superconductor having at least one core which consists at least partially of an intermetallic superconductive compound of the type A<sub>3</sub>B consisting of at least two elements and which is provided with a sheath of an alloy containing an electrically highly normal conducting metal and one element of the compound comprising:
  - a. disposing the superconductor and a gaseous transport agent within a vessel containing no other active gases;
  - b. heating said vessel to the point where a chemical transport reaction takes place in which the element of the compound in the sheath reacts with the transport agent to form a gaseous reaction product, and where at another point within the vessel a reverse reaction takes place depositing the element of another surface therein.

4,010,048

# BONDING AGENT FOR FUSING PORCELAIN TO NONPRECIOUS METAL ALLOY

John A. Tesk, Woodridge; Henrietta M. Severa, Chicago; Ronald P. Dudek, River Grove, and Peter Kosmos, Alsip, all of Ill., assignors to Howmedica, Inc., New York, N.Y.

Filed Dec. 24, 1974, Ser. No. 536,327

Int. Cl.<sup>2</sup> B23K 35/34

U.S. Cl. 148—24

15 Claims

1. A bonding agent for fusing a metal alloy with porcelain consisting essentially of the following constituents in percentages by weight:

Constituent	Proportional Range
Gold Powder (15 microns)	34.0-52.0
Porcelain	13.1-30.6
Zirconium Oxide (10 microns)	4.4-8.74
Liquid Flux (capable of reaction to form layers of tenacious oxides on alloy to which porcelain adheres)	Balance

4,010,049

# COLUMBIUM-STABILIZED HIGH CHROMIUM FERRITIC STAINLESS STEELS CONTAINING ZIRCONIUM

Charles R. Rarey, Eighty-Four, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1975, Ser. No. 619,732

Int. Cl.<sup>2</sup> C22C 38/22, 38/28

U.S. Cl. 148—37

3 Claims

1. A stabilized fully ferritic stainless steel in the wrought condition having good ductility, and characterized by a minimal amount of surface streaking, consisting essentially of:
  - Carbon, 0.10% maximum;
  - Chromium, from 11% to 30%;
  - Molybdenum, up to 3.0%;
  - Nitrogen, residual quantities;
  - Columbium, from about 0.1% total to 0.3% in solid solution, and in no event less than (7.7 × % carbon - % zirconium in excess of 6.5 × % nitrogen);
  - Zirconium, from 6.5 × % nitrogen to 0.25% in excess of (6.5 × % nitrogen × 7.6% carbon); and
  - balance iron and residual impurities.

4,010,050

# PROCESSING FOR ALUMINUM NITRIDE INHIBITED ORIENTED SILICON STEEL

Edward G. Choby, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Sept. 8, 1975, Ser. No. 611,060

Int. Cl.<sup>2</sup> H01F 1/04

U.S. Cl. 148—113

8 Claims

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1850 (G/O<sub>e</sub>) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel containing, by weight, up to 0.07% carbon, from 2.8 to 4.0% silicon, from 0.03 to 0.24% manganese, from 0.01 to 0.09% of material from the group consisting of sulfur and selenium, from 0.015 to 0.04% aluminum, up to 0.02% nitrogen, up to 0.5% copper and up to 0.0035% boron; casting said steel; hot rolling said steel; cold rolling said steel at a reduction of at least 75% decarburizing said steel; and final texturing said steel; the improvement comprising the steps of coating the surface of said steel with a base composition consisting essentially of:
  - a. 100 parts, by weight, of at least one substance from the group consisting of boron, boron compounds, sulfur, sulfur compounds, selenium, selenium compounds, and oxides and hydroxides of magnesium, calcium, aluminum, titanium and manganese; and
  - b. 4 to 120 parts, by weight, of at least one substance from the group consisting of amides and imides of organic and inorganic acids;
 and final texture annealing said steel with said coating thereon; said steel's texture and magnetic properties being, in part, attributable to said substance from the group consisting of amides and imides.

4,010,051

# BEDDING OF LOAD-CARRYING MEMBERS ON LOAD-SUPPORTING FOUNDATIONS

Michael H. Ingrey, and Donald J. Watson, both of Chessington, England, assignors to Corrosion Technical Services Limited, Brentford, England

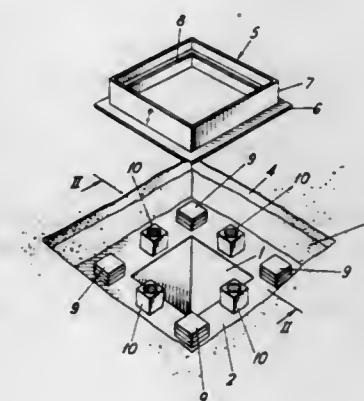
Filed Sept. 4, 1975, Ser. No. 610,346

Claims priority, application United Kingdom, Sept. 9, 1974, 39215/74

Int. Cl.<sup>2</sup> E03F 5/02

U.S. Cl. 156—71

8 Claims



1. A method of bedding a load-carrying member on a supporting foundation comprising the steps of:
  - a. providing at least one axially compressible mould having two open ends;
  - b. placing one of said open ends of said mould on said foundation with the other of said open ends directed upwardly;
  - c. providing a bonding agent, said bonding agent including a thermosetting resin capable of bonding to both the underside of said member and to said foundation;
  - d. placing said bonding agent in said mould;
  - e. placing said member on said upwardly directed open end of said mould filled with said bonding agent after said mould has been placed on said foundation;



- f. causing said member to compress said mould axially until said member is itself pressed into contact with said bonding agent through said upwardly directed open end, and said bonding agent is pressed into contact with said foundation through one of said open ends;
- g. containing said bonding agent laterally by said mould; and,
- h. effecting hardening of said bonding agent.

4,010,052

## MOLDING VALVE STEMS TO RUBBER ARTICLE

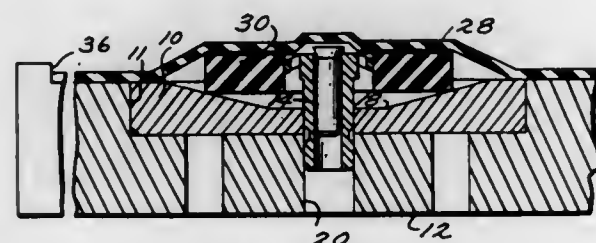
Charles E. Edwards, Muscatine, Iowa, assignor to Bandag Incorporated, Muscatine, Iowa

Filed Sept. 24, 1974, Ser. No. 508,995

Int. Cl.<sup>2</sup> B29H 15/06

U.S. Cl. 156—120

10 Claims



1. A method of attaching a valve stem having a passageway therethrough to a curable rubber article comprising inserting a valve stem in a mold plate having a chamber therein, setting the stem and plate in a main mold leaving a portion of one end of the stem exposed in said chamber, inserting a valve stem plug in the passageway at the exposed end of the valve stem, surrounding the exposed end of the valve stem in the chamber of the mold plate with a ring of uncured valve base material, placing an uncured rubber article in the main mold and covering the plugged exposed end of the valve stem and the valve base material with the uncured rubber article, applying pressure and curing the rubber article and the valve base material simultaneously in the main mold and then pushing the plug entirely clear of said exposed end of the valve stem to separate a generally circular portion of the cured article material positioned over the plug from the remainder of the article to provide a unitary fully opened passageway through the valve stem.

4,010,053

## PROCEDURE FOR THE PRODUCTION OF A HOLLOW BODY OF ROTATION FOR COATING EQUIPMENT

Horst Bokelmann, Bad Wildungen, Germany, assignor to Metzeler Kautschuk AG, Munich, Germany

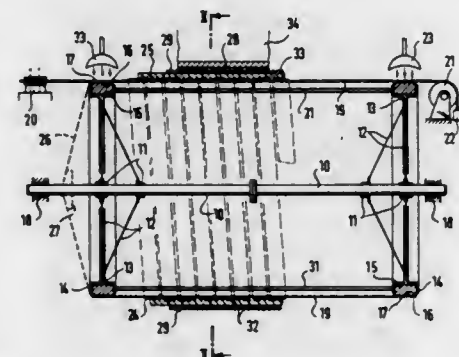
Filed Nov. 22, 1974, Ser. No. 526,384

Claims priority, application Germany, Nov. 22, 1973, 2358212; May 14, 1974, 7476815

Int. Cl.<sup>2</sup> B21B 31/08; B31C 1/00; B65H 81/00

U.S. Cl. 156—154

13 Claims



1. A procedure for the production of a self-supporting, hollow body of rotation which can be used for processing by way of coating, doubling, dyeing, cleaning, production or

other pertinent processes applied on products having large, plane surface areas, such as units or webs of textiles and particularly of floor covering, carpets, woven, knitted or braided goods and further on thin sheets, paper, photographic paper, cardboard, etc., which body of rotation is not suitable for transportation and which could not otherwise be manufactured on known type of machine tools, which comprises mounting immediately in the intended operating position of the body of rotation wheel tires in parallel distance of and centered arrangement to each other on a shaft; adjointly placing a plurality of fiber-glass fabric strips along the outer circumference of said tires and perpendicular thereto so that they extend longitudinally in parallel to said shaft; bonding one end of said strips to the contact surface of the outer circumference of one of the wheel tires; pulling said strips under an adjustable tension over the contact surface of the other wheel tire and then bonding the other end of said strip to the last mentioned contact surface while the tension is maintained, so that the strips form an enveloping cylinder which is only contacted and supported by said wheel tires; consolidating said cylinder by impregnation with plastics or synthetic resins suitable for setting; and upon setting, increasing the wall thickness and stiffness of the cylinder jacket by helical application of layers of impregnated fiber-glass strips which are preferably applied on tangential direction; applying reinforcing belt of wire or tape or of other sections followed by a finishing coat of plastic material or synthetic resin to form an outer skin which will compensate for any irregularities of the fiber-glass fabric strips and of the reinforcing belt; upon subsequent setting subjecting the finishing coat to mechanical surface treatment; and permanently retaining the wheel tires and shaft in the body of rotation.

4,010,054

## THERMOPLASTIC FILAMENT WINDING PROCESS

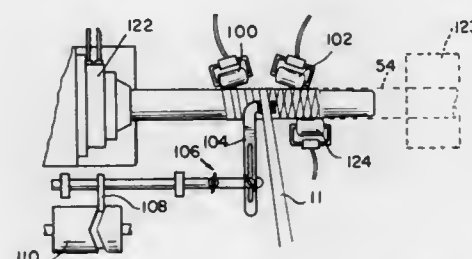
Rexford H. Bradt, Claypool, Ind., assignor to Albert L. Jeffers, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 139,441, May 3, 1971, abandoned. This application Oct. 3, 1973, Ser. No. 403,052

Int. Cl.<sup>2</sup> B65H 81/00, 81/08

U.S. Cl. 156—173

8 Claims



1. A method for continuously forming cylindrical articles, such as pipe, from a continuous strand of thermoplastic material, which comprises the steps of conveying the strand to a rotating mandrel heating at least the surface of the strand prior to the strand reaching said mandrel and to a temperature high enough to make at least the surface of the thermoplastic material of the strand sticky, wrapping the hot strand on the mandrel at a pre-selected rate using a reciprocatory motion to form a crossed helical wrap thereon, internally chilling said mandrel thereby to chill the inner surface of the formed pipe to a temperature at which the thermoplastic material adjacent the mandrel becomes rigid, and sequentially and incrementally removing the pipe from the mandrel while the pipe is being continuously formed with a rotating gripper means turning at substantially the same speed as the mandrel.

4,010,055

## METHOD OF PRODUCING THREE-DimensionALLY SHAPED INFLATABLE SAFETY BAG

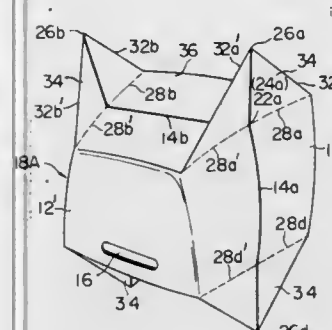
Takashi Oka, Tokyo; Hiroshi Iwasaki, Kamakura, and Eiichi Kato, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd.; Ikeda Bussan Co., Ltd. and Toray Industries, Inc., all of Japan

Filed June 6, 1975, Ser. No. 584,342

Int. Cl.<sup>2</sup> B31F 1/00

U.S. Cl. 156—226

14 Claims



1. A method of producing a three-dimensionally shaped inflatable bag for the protection of a vehicle passenger in collision of the vehicle, the method comprising the steps of:

- making a flat quadrilateral bag of a flexible and substantially gas impermeable sheet material so as to provide the bag with a flat front sheet, a flat back sheet, and four sides surrounding said sheets, the front sheet having, in a corner region thereof, two curved joint lines imaginarily drawn respectively to intersect two of the four sides which define said corner region and to meet at a point on an imaginary and straight third line drawn obliquely to said two sides to divide said corner region into two portions thereof, said two curved lines being symmetrical with respect to said third line;
- sealing the flat bag;
- folding the two portions of said corner region along said third imaginary line so that said two curved lines overlap each other;
- making a joint in the folded corner region along the overlapped curved joint lines;
- similarly folding a corner region and making a joint in the back sheet of said flat bag in a corner region thereof opposite said corner region of the front sheet; and thereby producing a three-dimensionally shaped inflatable bag which fits into a vehicle.

4,010,056

## PROCESS FOR CONTINUOUSLY BONDING STAPLE FIBERS INTO AN ESSENTIALLY NON-TWISTED YARN

Werner Naegeli, Winterthur, Switzerland, assignor to Pavena AG, Basel, Switzerland

Filed June 19, 1972, Ser. No. 263,935

Claims priority, application Germany, Dec. 22, 1971, 2163958

Int. Cl.<sup>2</sup> D06M 13/00

U.S. Cl. 156—296

16 Claims

1. A process for the continuous bonding of staple fibers into an essentially non-twisted yarn, comprising the steps of introducing an excess amount of liquid containing an adhesive in distributed form into a fiber arrangement composed of staple fibers, squeezing out the excess liquid from the fiber arrangement, compacting the fiber arrangement by application of pressure into a moist slubbing, feeding the moist slubbing into contact with a condensing vapor atmosphere for condensing vapor of the vapor atmosphere at the slubbing and setting the adhesive by drying of the slubbing for transforming the slubbing into an adhesively bonded yard.

4,010,057

## PRINTING APPARATUS

Motoyasu Nakanishi, Isezakishi, Japan, assignor to Kabushiki Kaisha Kobayashi, Isezakishi, Japan

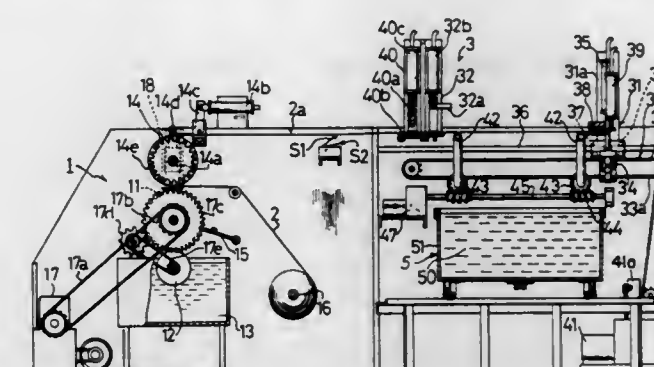
Filed July 11, 1975, Ser. No. 595,305

Claims priority, application Japan, Aug. 12, 1974, 49-92127; Dec. 26, 1974, 50-148426

Int. Cl.<sup>2</sup> B44C 1/16

U.S. Cl. 156—384

26 Claims



1. A printing apparatus comprising:
- a printing means for printing a pattern on a surface of a thin film;
  - a basin containing a liquid;
  - feeding means for feeding said printed thin film with the printed surface face up onto the surface of said liquid so that the thin film floats on the liquid;
  - means for submerging at least a part of an object, the surface of which is to be printed with said pattern into said liquid while said object is kept in contact with the upwardly facing pattern-printed surface of said thin film for transferring the pattern onto the surface of the object by the pressure of said liquid; and
  - a thin film removing means for removing said thin film from the surface of said object on which said pattern is printed.

4,010,058

## TIRE BUILDING DRUM

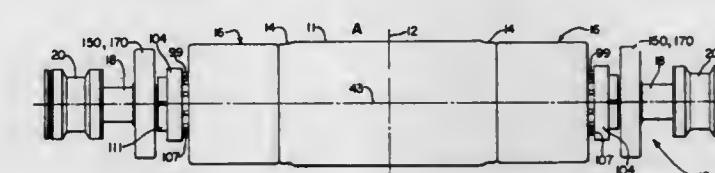
Donald C. Kubinski, Wadsworth, and Robert S. Riggs, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 16, 1975, Ser. No. 578,282

Int. Cl.<sup>2</sup> B29H 17/16, 17/22

U.S. Cl. 156—415

23 Claims



1. A tire building drum including a shaft and a pair of drum end assemblies each having a plurality of segments disposed about the shaft which cooperate to form shoulders of the drum, and a plurality of bead positioning fingers disposed about the shaft adjacent to and axially outward of the shoulders which cooperate to position the tire bead, a righthand-lefthand screw disposed coaxially of the shaft, a nut disposed within the shaft adjacent to each end assembly, each nut being cooperable with a respective threaded portion of said screw to move axially of the shaft in response to rotation of the screw and characterized by means for actuating the segments and the fingers of the drum comprising a plurality of slides rigidly connected to each nut and disposed slidably in the respective end assemblies for movement parallel to the shaft, a first rigid link associated with each said slide and pivotally connected at its respective ends to one of said segments and to the associated slide, and a second rigid link associated with each said slide and pivotally connected at its respective ends to one of said fingers and to the associated slide.



4,010,059

## TIRE BAND BUILDING DRUM

Toshinori Yabe, Kodaira, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

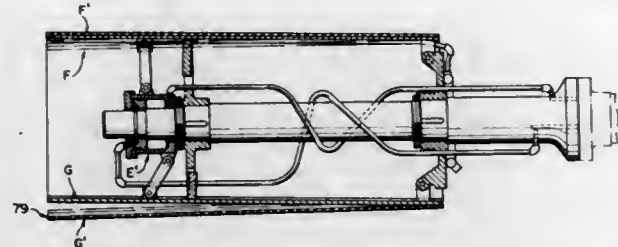
Filed Oct. 10, 1975, Ser. No. 621,611

Claims priority, application Japan, Oct. 11, 1974, 49-117554

Int. Cl.<sup>2</sup> B29H 17/14, 17/20

U.S. Cl. 156-420

5 Claims



1. A tire band building drum for manufacturing a tire band of a carcass structure for a green tire, which comprises:

- a drive shaft located axially of said drum;
- a collapsible drum portion axially extending over a predetermined length from the forward end thereof, said collapsible drum portion including a plurality of first arcuate drum segments circumferentially equi-distantly spaced apart from each other and a plurality of second arcuate drum segments each interposed between said first arcuate drum segments to collectively define said collapsible drum portion surface in a substantially cylindrical form during building said tire band thereon;
- a flange member securely mounted on said drive shaft and pivotally supporting at its outer peripheral edge the rear ends of said first and second arcuate drum segments for allowing said first and second arcuate drum segments to pivot around their pivotal points thereby making both sets of said first and second arcuate drum segments movable in opposite directions in inclined relation with said drive shaft; and
- drum collapsing means mounted on said drive shaft forwardly of said flange member to rotate with said first and second arcuate segments about said drive shaft and to rotate said first and second arcuate drum segments around their pivotal points.

4,010,060

## METHOD AND APPARATUS FOR MAKING A COAXIAL ELECTRIC CABLE

Eduard Bochenek, Hofheim, Taunus; Heinz Heumann, Rheydt, and Viktor Pohl, Walsum, all of Germany, assignors to AEG-Telefunken Kabelwerke AG, Rheydt, Germany

Continuation of Ser. No. 459,327, April 9, 1974, abandoned.

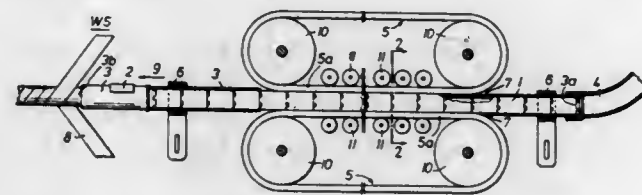
This application June 16, 1975, Ser. No. 586,859

Claims priority, application Germany, Apr. 9, 1973, 2317766; Apr. 9, 1973, 7313416[U]

Int. Cl.<sup>2</sup> B65H 8/00

U.S. Cl. 156-425

6 Claims



1. An apparatus for making an axially hollow, coaxial electric cable including support sleeves arranged in an axial series in an unattached end-to-end contacting relationship and a conductor helically wound on the support sleeves; comprising in combination:

- a. a winding station for helically winding the conductor about the support sleeves;

- b. a guide tube accommodating and maintaining the support sleeves within its confines in an axially aligned relationship; said guide tube including
  1. an inlet end through which the support sleeves are introduced in sequence into said guide tube;
  2. a discharge end situated in said winding station in the immediate vicinity of a location where the conductor runs onto the support sleeves;
  3. means defining a longitudinal, slotlike, throughgoing opening extending in the length dimension of said guide tube along at least one length portion thereof;
- c. means connected to said inlet end for introducing the support sleeves in unattached succession into said guide tube; and
- d. a feeding mechanism including means projecting through said opening for continuously engaging successive support sleeves in said guide tube for continuously shifting them towards and up to said discharge end in an end-to-end contacting relationship.

4,010,061

## PAPER ROLL SPLICING METHOD AND APPARATUS

Masatero Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

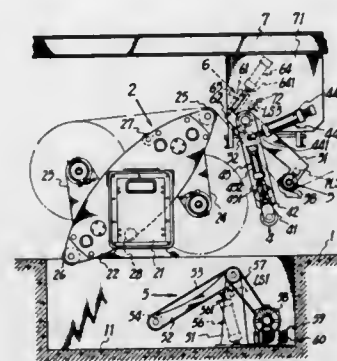
Filed Apr. 18, 1973, Ser. No. 352,313

Claims priority, application Japan, Dec. 16, 1972, 47-126594

Int. Cl.<sup>2</sup> B65H 19/16

U.S. Cl. 156-504

10 Claims



1. An apparatus for splicing a leading end of a fully wound web roll, which has not yet been unwound, with a web running from an exhausting web roll which is being continuously unwound, comprising:

- a mill roll stand which contains opposing side frames, a rotary frame rotatably mounted between said opposing side frames, said rotary frame being provided with means for rotatably mounting said fully-wound web roll and said exhausting web roll in a mutually opposing relationship, means for rotating the rotary frame to place the fully-wound web roll in the splicing position and the exhausting web roll in the unwinding position;
- web guiding means disposed on the rotary frame for guiding the web from the exhausting web roll placed in the unwinding position;
- means for rotating, up to the speed of the running web, the fully wound web roll which is placed in the splicing position prior to the splicing operation;
- a web pushing roll provided near the fully-wound web roll placed in the splicing position, the web pushing roll being rotatably supported by a pair of arms pivotally suspended from a stationary member disposed above the mill roll stand, and being adapted to move toward and away from the fully-wound web roll while guiding the web from the exhausting web roll on a portion of the web pushing roll surface facing toward the fully-wound web roll;
- an intermediate roll disposed between the fully-wound web roll placed in the splicing position and the web being guided on the surface of the web pushing roll, said intermediate roll being rotatably supported by a pair of arms

which are pivotally suspended from said stationary frame so as not to interfere with the movement of said pair of arms supporting the web pushing roll, said pair of arms supporting said intermediate roll being adapted to be shortened and lengthened so as to place the intermediate roll into and out of the path of the motion of the web pushing roll;

means for moving the arms supporting the web pushing roll to push the running web by said web pushing roll toward the fully-wound web roll placed in the splicing position or to push the intermediate roll toward the fully-wound web roll with the running web interposed between the web pushing roll and the intermediate roll placed in the path of the web pushing roll; and

means for cutting the running web from the exhausting roll.

4,010,062

## METHOD OF AND APPARATUS FOR SPLICING THE ENDS OF FILM STRIPS

Hermann Müller, Munich; Dieter Sandl, Ottobrunn; Jürgen Sylla, Munich, and Rolf Schröder, Baldham, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

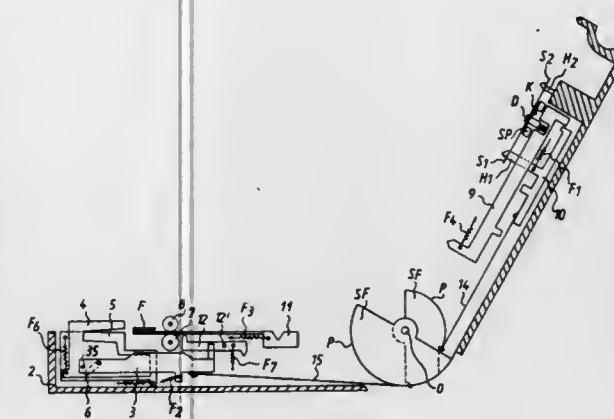
Filed Nov. 26, 1974, Ser. No. 527,288

Claims priority, application Germany, Nov. 28, 1973, 2359363

Int. Cl.<sup>2</sup> B31F 5/00; B65H 19/00; G03D 15/04

U.S. Cl. 156-506

26 Claims



1. An apparatus for making a splice joint at the ends of a pair of film strips, comprising a film press having two parts which are hinged together for relative swinging movement about an axis between an open position and a closed position; first means on said press for holding said ends of said film strips in overlapping relationship with each other; second means on said press for holding a self-adhesive film splice having a release paper; and third means, also on said press and actuated by relative movement of said parts from said open to said closed position, for sequentially cutting through said overlapped film ends to form a butt joint, stripping said release paper from said film splice, and pressing said film splice over said butt joint, so that the splice joint is completed and the film ready for removal from said press prior to subsequent relative movement of said parts from said closed position back to said open position.

4,010,063

## PEDAGOGIC THERMAL PULSE SEALING APPARATUS

Howard Natter, c/o Honatech, Inc. 400 Walnut St., Yonkers, N.Y. 10701

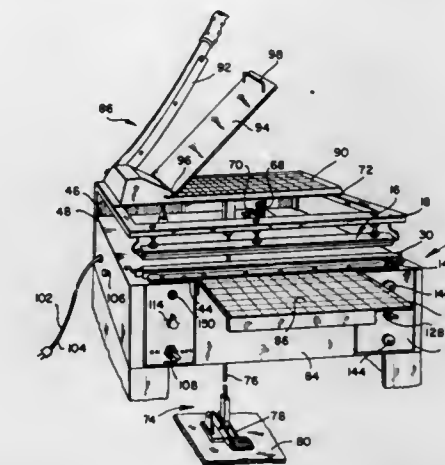
Filed Apr. 2, 1975, Ser. No. 564,411

Int. Cl.<sup>2</sup> B32B 31/06; B26D 5/08

U.S. Cl. 156-510

9 Claims

1. A pedagogic pulse thermal sealing apparatus comprising a sealing station and a trimming station, the sealing station including two jaws, at least one of the jaws including means adapted to provide a pulse heat output, the one jaw including a covering sheath, clamping means adapted to retain the sheath in position, the clamping means comprising a pair of



clamping means to a first position adapted to receive a work piece, the clamping means being movable to a second position securing the work piece for trimming, the clamping means being unrestrained from returning to its first position in the absence of constant manually applied force, whereby both hands of the operator are engaged during the trimming thus assuring safe operation.

4,010,064

## CONTROLLING THE OXYGEN CONTENT OF CZOCHRALSKI PROCESS OF SILICON CRYSTALS BY SANDBLASTING SILICA VESSEL

William John Patrick, Poughkeepsie; Salvatore James Scilla, Marlboro, and Wolfgang Alfred Westdorp, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 27, 1975, Ser. No. 581,307

Int. Cl.<sup>2</sup> B01J 17/18; C01B 33/02

U.S. Cl. 156-617 SP

2 Claims

1. A process for increasing the oxygen content and reducing the oxygen concentration gradient through the length of a silicon crystal, which is drawn from a silicon melt contained in a silica vessel according to the Czochralski process, comprising: treating said vessel to change the characteristics of the silica surface which is in contact with said melt by roughening said surface by sandblasting until said surface becomes opaque, so as to provide a more uniform dissolution rate of said silica surface by said melt during the crystal growing process.

4,010,065

## PROCESS AND APPARATUS FOR REGENERATING WET GLYCOLS

Carl E. Alleman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 20, 1975, Ser. No. 560,393

Int. Cl.<sup>2</sup> B01D 1/16, 1/00, 53/02; C07C 29/26

U.S. Cl. 159-4 CC

9 Claims

5. Apparatus for regenerating a wet, oxygen-containing glycol comprising

- a. a source of oxygen-containing wet glycol;
- b. a first stripping unit means for stripping oxygen from said wet oxygen-containing glycol maintained at a temperature of about 70° to 150° F;
- c. a second stripping unit means for removing water from said wet glycol;
- d. first conduit means connecting said source with an inlet of said first stripping unit for wet glycol;
- e. a source means for a stripping gas selected from the group







centrate having a minimum diastatic activity of 12,500 SKB units with a sufficient amount of a dried starch containing a maximum of 3% moisture to obtain a free-flowing fungal  $\alpha$ -amylase composition having a diastatic activity of at least 1,000 SKB units/gram thereby obtaining maximum water content of 8.4%.

4,010,074

# METHOD FOR PURIFICATION AND RECOVERY OF UROKINASE

Yahiro Uemura, Ikeda; Katuhiro Uriyu, Sakai, and Satoshi Funakoshi, Katano, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Continuation of Ser. No. 537,331, Dec. 30, 1974, abandoned.

This application May 4, 1976, Ser. No. 683,239

Claims priority, application Japan, Jan. 22, 1974, 49-10022; Jan. 28, 1974, 49-12016

Int. Cl.<sup>2</sup> C07G 7/02

U.S. Cl. 195—66 B

14 Claims

1. A method for the purification and concentration of urokinase which comprises selectively adsorbing urokinase from an impurity-containing aqueous urokinase solution at a pH ranging from about 4.0 to about 6.0 on a water-insoluble polysaccharide selected from the group consisting of agar and agarose, and thereafter eluting the adsorbed urokinase with an aqueous alkaline solution or a concentrated aqueous salt solution.

4,010,075

# PROCESS FOR PRODUCING 4-THIOURACIL

John H. Coats; Alma Dietz, both of Kalamazoo; Lester A. Dolak, Plainwell; Oldrich K. Sebek, and Walter T. Sokolski, both of Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 24, 1976, Ser. No. 689,376

Int. Cl.<sup>2</sup> C12D 9/00

U.S. Cl. 195—80 R

8 Claims

1. A process for preparing 4-thiouracil which comprises cultivating *Streptomyces libani* subsp. *soldani*, having the identifying characteristics of NRRL 8173 in an aqueous nutrient medium under aerobic conditions until substantial antibiotic activity is imparted to said medium.

4,010,076

# REACTOR FOR STABILIZED MICROBES HAVING PHOTOMETABOLIC ACTIVITY

Howard H. Weetall, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,631

Int. Cl.<sup>2</sup> C12B 1/00

U.S. Cl. 195—115

13 Claims

1. A method for the continuous photometabolic production of a useful product which comprises the steps of immobilizing whole cells of a photometabolically active organism on a medium to form a stabilized composite, supportably placing the composite within a reactor having at least one light transmitting wall, and, in the presence of light being transmitted through the wall, continuously passing into the reactor a substance capable of being photometabolized by the cells under conditions sufficient to assure the production of the useful product.

9. A reactor for the continuous photometabolic production of a useful substance comprising, in combination, a hollow body having at least one light transmitting wall and an inner chamber, inlet and outlet passageways in communication with the inner chamber and the environment external to the body, and, disposed within said chamber and, in communication with said inlet and outlet passageways, a support means supporting an immobilized, photometabolically active microbe system, said system disposed in a position to receive light transmitted through the light transmitting wall.

4,010,077

# BACTERIOLOGICAL TRANSFER LOOP

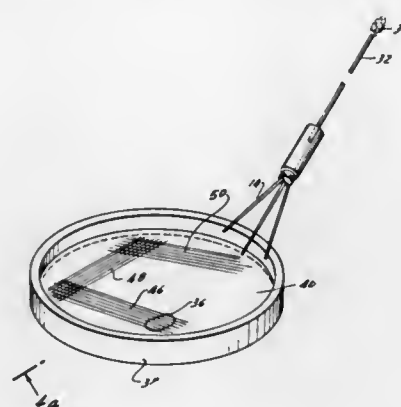
George Pardos, Whalers Point, East Haven, Conn. 06512

Filed Feb. 24, 1975, Ser. No. 552,213

Int. Cl.<sup>2</sup> C12B 1/02

U.S. Cl. 195—127

8 Claims



1. A disposable bacteriological transfer and inoculating loop comprising a base and a plurality of circumferentially spaced fingers extending generally in a common axial direction from said base and diverging from one another to free ends spaced further from one another than the portions of the fingers adjacent said base, whereby said fingers are adapted to be used successively to plate or streak a bacteriological specimen on a growth medium; means in said base opposite said fingers for removably securing an elongated rod to said base whereby said rod may serve as a manipulating handle for said loop; said rod having an enlargement formed at one end thereof and said means comprising a keyhole type slot in said base adapted to receive said one end of said rod and a recess formed in the base behind the slot to receive said enlargement when the rod is inserted in the slot whereby rotation of the rod in said slot will cause the base to be positively secured to said one end of the rod.

4,010,078

# DEVICE FOR USE IN THE IDENTIFICATION OF MICROORGANISMS

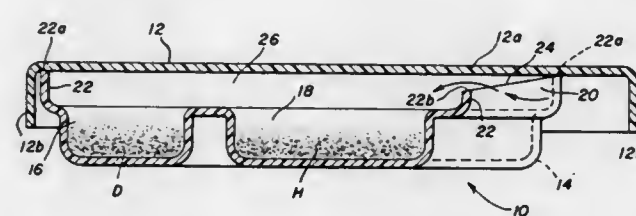
Welton I. Taylor, 7621 S. Prairie, Chicago, Ill. 60619

Filed Feb. 23, 1976, Ser. No. 660,480

Int. Cl.<sup>2</sup> C12K 1/10

U.S. Cl. 195—139

8 Claims



1. A device for use in the identification of microorganisms, comprising: a microorganism culture medium receiving portion having a plurality of culture medium receiving compartments formed therein, and a cover for the culture medium receiving portion having a top wall and a depending side wall, said culture medium receiving portion having an outer, upwardly extending side wall the upper margin of which engages and maintains the top wall of the cover in spaced apart relation to the upper surface of a microorganism culture medium contained in the compartments of the culture medium receiving portion, said culture medium receiving portion side wall having a section which extends inwardly along the horizontal plane of the culture medium receiving portion toward the center thereof to provide a culture medium orienting recess in the culture medium receiving portion between at least two of the compartments formed therein, said inwardly extending section of the side wall being of reduced height in relation to the remainder of the side wall along its inward extension

toward the center of the culture medium receiving portion to provide, in cooperation with the cover, a covered air-passage-way at said recess in communication with the space between the upper surface of the compartments formed in the culture medium receiving portion and the top wall of the cover for enabling an atmosphere which favors the growth of microorganisms to be selectively established over the culture medium in the compartments of the culture medium receiving portion while the culture medium is shielded from culture medium contaminants by the cover.

4,010,079

# COKE OVEN CHARGING GAS CLEANING AND COLLECTING APPARATUS AND PROCESS

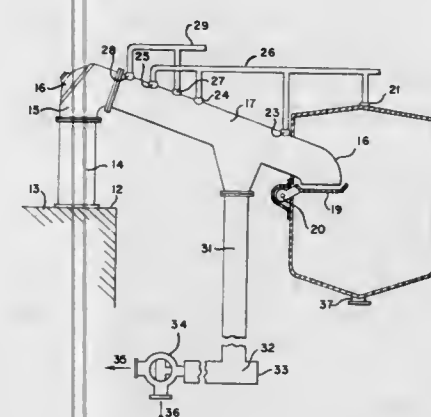
Paul V. Faber, Morristown, N.J., assignor to Wilputte Corporation, Murray Hill, N.J.

Continuation-in-part of Ser. No. 392,873, Aug. 30, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,020

Int. Cl.<sup>2</sup> C10B 27/04, 27/06

U.S. Cl. 201—4

7 Claims



1. In a by-product coke oven battery comprising a plurality of coke ovens, a coking gas collecting main, a standpipe opening out of the top of each oven and comprising a vertical portion, a laterally extending portion and a terminal portion discharging through first liquor seal valve means into the coking gas collecting main, and means for introducing flushing liquor into the gas in the standpipe, the improvement comprising means for injecting charging liquor separate from the flushing liquor into the gases in the standpipe, an offtake pipe for liquor and solid particles only separate from the coking gas collecting main opening downwardly out of the laterally extending portion of the standpipe upstream of and adjacent the terminal portion thereof, and downstream of the means for injecting charging liquor and second valve means in the offtake pipe discharging into a charging liquor collecting main.

6. In the treatment of gases from coke ovens including the steps of spraying the coking gas with flushing liquor and spraying the charging gas with charging liquor, the improvement comprising passing charging gas and coking gas sequentially along a common path into a common collecting main, spraying the coking gas in that path with flushing liquor, spraying the charging gas in that path with charging liquor so as to scrub solid particles therefrom, drawing off charging liquor and solid particles from the charging gas in that path into a single stream before the charging gas enters the common collecting main, and drawing off flushing liquor from the coking gas in that common collecting main.

4,010,080

# SOLAR POWERED DISTILLING DEVICE

Yaw Jenn Tsay, and Kuo-Chuan Lin, both of No. 10, Lane 177, Pei Hsing Street, Chia I, Taiwan, China /Taiwan

Filed Mar. 3, 1976, Ser. No. 663,633

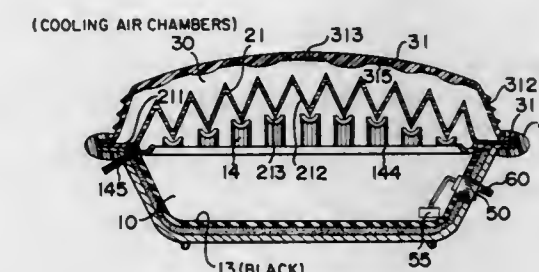
Int. Cl.<sup>2</sup> C02B 1/06, 1/08

U.S. Cl. 202—83

16 Claims

1. A distilling device powered by solar energy comprising: a housing for defining a vaporization chamber; a transparent cover on said housing;

a transparent condensation plate mounted on said housing to define a pair of separated chambers including a cooling air chamber defined by one side of said plate and said cover, said vaporization chamber being defined by the other side of said plate and said housing; fluid inlet means on said housing for conducting fluid to be vaporized into said vaporization chamber; a plurality of solar energy focusing lenses on said cover focusing solar energy through said cooling air chamber and said condensation plate onto the fluid located in said vaporization chamber to form vapor;



air inlet means on said cover for conducting cooling air into said cooling air chamber to contact said condensation plate one side for maintaining said plate at a temperature below the condensation temperature of the fluid in said vaporization chamber so that vapor formed in said vaporization chamber is condensed into condensate upon contact with said plate other side; a condensate collecting means connected to said housing for collecting for condensate formed on said condensation plate; and outlet means connected to said condensate collecting means for withdrawing the collected condensate from said housing.

4,010,081

# APPARATUS FOR QUENCHING AND COOLING COKE

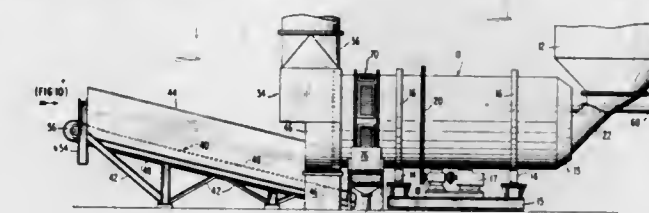
Judson W. Martt, Amsterdam, Ohio, assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Mar. 14, 1975, Ser. No. 558,353

Int. Cl.<sup>2</sup> C10B 39/04, 39/10, 39/12

U.S. Cl. 202—228

13 Claims



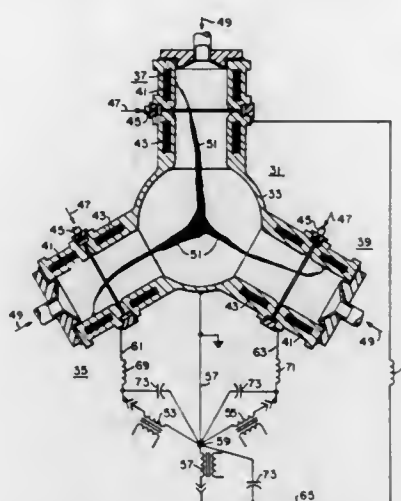
1. Apparatus for quenching and cooling coke comprising a. a rotary drum for receiving hot coke having a cylindrical interior wall, a coke entry end and a coke discharge end, b. means for supporting the drum for rotation about a substantially horizontal axis coinciding with the axis of symmetry of the drum, c. a stationary coke restraining means having lower marginal portions disposed in closely spaced relation to the lower portion of the interior wall of the drum at the coke entry end of the drum to prevent escape of entering coke, the spacing between the coke restraining means and the upper portion of the interior wall of the drum at the entry end of the drum being greater for ingress of sweeping air into the drum, d. hot coke feeding spout means having a coke delivery portion positioned to feed hot coke into the coke entry end of the drum at the lowermost portion of the drum, e. conveyor means at the coke delivery end of the drum for conveying cooled coke away from the drum, f. rigid helical vane means having an inner free edge and an outer free edge.







the free hydrocarbon radical ions from the hydrocarbon gas and to cause the arc in each arc heater to flash through the central housing chamber and into another arc heater; feeding into one end of the central housing chamber natu-



rally occurring coal or oil through the arc chamber and into the region of the free hydrocarbon radical ions to thereby chemically react with the free radical ions to produce a stream of gaseous hydrocarbon fuel; and withdrawing the stream of gaseous hydrocarbon fuel from an exhaust port at the other end of the arc chamber.

4,010,091

## NOVEL ELECTRODE FOR ELECTROLYSIS CELL

Dominique Ravier, Paris, and Pierre Bouy, Enghien-les-Bains, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 12, 1976, Ser. No. 685,691

Claims priority, application France, May 30, 1975, 75.16966

Int. Cl.<sup>2</sup> C25B 11/08, 11/10

U.S. Cl. 204—290 F

10 Claims

1. A novel electrode suitable for use in cells for electrolysis characterized in that it comprises at least one compound of perovskite structure of the general formula:



wherein M is an ion of a metal from the group comprising yttrium and lanthanides, M' is an ion of a metal chosen from the group comprising ruthenium, rhenium, osmium, iridium, platinum, lead and palladium, and x is a number less than 1.

4,010,092

## OIL SHALE RETORTING-GASIFICATION PROCESS

Roland F. Deering, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 10, 1974, Ser. No. 468,927

Int. Cl.<sup>2</sup> C10G 1/02

U.S. Cl. 208—11 R

6 Claims

1. In a process for producing shale oil and a hydrogen-containing product gas, wherein a stream of raw crushed shale is first countercurrently contacted in an eduction zone with a stream of essentially oxygen-free, hot eduction gas to thereby produce shale oil, an eduction off-gas and hot, essentially oil-free, coke-containing spent shale, and wherein said hot spent shale is thereafter countercurrently contacted in a gasification zone with a conversion gas mixture comprising steam and oxygen to partially combust the coke on said spent shale and thereby heat said spent shale to sufficiently high peak temperatures, between about 1200° and 1800° F., to react said stream with remaining coke, thereby producing an essentially oxygen-free, hydrogen-containing water gas, and wherein said eduction gas comprises a mixture of water gas and a recycle

portion of said eduction off-gas, the improvements which comprise:

1. passing said raw shale upwardly through said eduction zone, and said spent shale downwardly through said gasification zone;
2. maintaining an essentially oxygen-free transition zone between said eduction zone and said gasification zone;
3. passing said spent shale through said transition zone into said gasification zone;
4. passing a first portion of said water gas through said transition zone into said eduction zone;
5. contacting a second portion of said water gas, comprising about 20–50% of the total thereof, with liquid water in a steam generation zone to effect simultaneous cooling and steam-enrichment thereof;
6. recycling the steam-enriched water gas from step (5) through said gasification zone;
7. injecting said recycle portion of eduction off-gas into said transition zone to mingle therein with said first portion of water gas and form said eduction gas; and
8. withdrawing the non-recycled portion of said eduction off-gas as said hydrogen-containing product gas, none of said eduction off-gas being recycled through said gasification zone.

4,010,093

## METHOD OF OPERATING A PLATINUM REFORMER COMPRISING A SELECTIVE ZEOLITE CATALYST IN THIRD REACTOR

John Maziuk, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

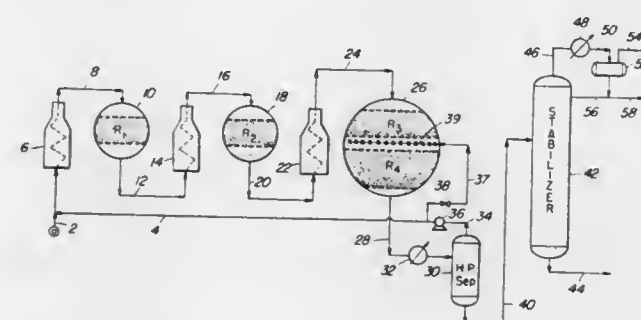
Continuation of Ser. No. 338,465, March 6, 1973, abandoned.

This application Feb. 4, 1975, Ser. No. 547,070

Int. Cl.<sup>2</sup> C10G 39/00

U.S. Cl. 208—65

9 Claims



1. In a processing combination comprising a bed of crystalline zeolite conversion catalyst downstream of a plurality of separate sequentially arranged beds of naphtha reforming catalyst, the method for altering the product distribution obtained from the combination processing naphtha boiling material in the presence of hydrogen rich gas which comprises:

1. promoting the formation of gasoline boiling range material of higher octane rating than the naphtha charged to the combination process by operating the catalytic reforming portion under reduced recycled hydrogen partial pressure to promote dehydrogenation and the formation of gasoline boiling products in combination with relying upon a major portion of recycle hydrogen rich gas as quench fluid to reduce the temperature of the effluent obtained from catalytic reforming below about 650° F. before contacting the zeolite conversion catalyst and
2. promoting the formation of LPG and aromatic rich concentrates with the catalytic combination by raising the hydrogen partial pressure of the catalytic reforming operation with hydrogen rich recycle gas sufficient to promote hydrocracking during reforming in combination with reducing the hydrogen gas quench fluid to raise the temperature of the effluent of reforming to at least 650° F.

4,010,094

## COMBUSTING FLUE GAS IN A CRACKING CATALYST REGENERATION PROCESS

Claude O. McKinney, Munster, Ind., assignor to Standard Oil Company, Chicago, Ill.

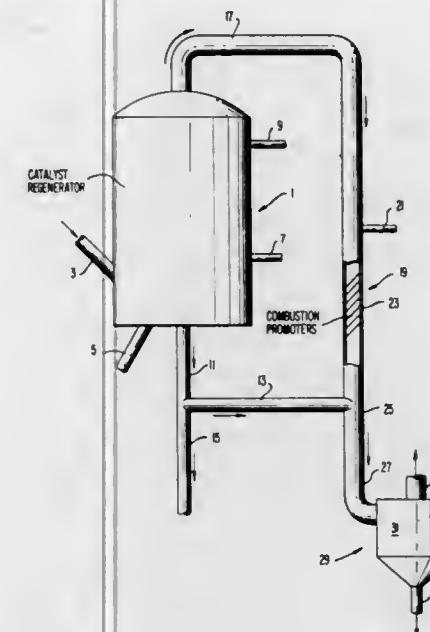
Continuation of Ser. No. 451,140, March 14, 1974,

abandoned. This application May 9, 1975, Ser. No. 576,122

Int. Cl.<sup>2</sup> C10G 11/18

U.S. Cl. 208—164

15 Claims



1. A hydrocarbon catalytic cracking process, including hydrocarbon cracking and catalyst regeneration, comprising: regenerating fluidized hydrocarbon cracking catalyst particles, which have been deactivated with coke deposits while employed in said hydrocarbon cracking, in a catalyst regenerator at regeneration temperature by contact with an oxygen-containing gas stream to combust coke on the catalyst and produce a carbon monoxide-containing flue gas, passing said carbon monoxide-containing flue gas from the catalyst regenerator, oxidizing said carbon monoxide-containing flue gas from the catalyst regenerator to substantially completely combust carbon monoxide contained therein to form a combusted effluent of reduced carbon monoxide content, withdrawing catalyst from the catalyst regenerator separately from said carbon monoxide-containing flue gas, passing said withdrawn catalyst, which is relatively free of carbonaceous material, in heat exchange relation with said combusted effluent to transfer heat generated from the carbon monoxide combustion to said cracking catalyst particles, and conveying the resulting heated catalyst particles to said catalytic cracking process.

4,010,095

## HYDRODYNAMIC METHOD FOR SEPARATION OF SOLID BODIES OR CRYSTALS

Joseph O. Hirschfelder; Edwin N. Lightfoot, both of Madison, Wis., and David W. Howard, Aiken, S.C., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 1, 1974, Ser. No. 493,760

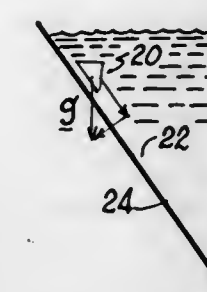
Int. Cl.<sup>2</sup> B03B 5/00

U.S. Cl. 209—132

8 Claims

1. A method of employing hydrodynamic principles for separating solid bodies, at least one of which does not possess a center of hydrodynamic resistance and which have a number of faces, subjecting said solid bodies, while immersed in a viscous fluid of different specific gravity than that of the solid bodies, to gravitationally influence relative linear movement between said bodies and fluid, supporting said bodies on a non-horizontal surface for maintaining said bodies in a com-

mon face relation with respect to each other and to said surface in such a manner that they do not twist, during such relative movement establishing in response to such relative movement between the solid bodies and fluid a resultant force



4,010,096

## PNEUMATIC CLASSIFIER FOR REFUSE MATERIAL WITH ADJUSTABLE AIR INTAKE

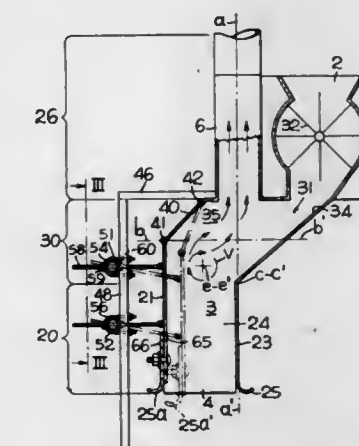
Donald L. Murray, Greenfield; John N. Lees, Jr., Wauwatosa, and Frank W. Toman, Jr., Milwaukee, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 9, 1975, Ser. No. 621,225

Int. Cl.<sup>2</sup> B07B 4/02, 11/04

U.S. Cl. 209—139 R

2 Claims



1. An apparatus for classifying particles of refuse material and the like to separate relatively light and heavy solid particles and having a column, means connected to the upper end of the column for drawing a stream of air into the lower end of the column and upwardly through the column, a chute that opens into the column intermediate the column ends for admitting mixed light and heavy solid particles, the column beneath the discharge end of the chute having vertical walls defining an air intake zone rectangular in horizontal cross-section and with at least the vertical wall of the air intake zone opposite the chute being movable and pivotally connected along a horizontal upper edge to a lower edge of an incline member which is in turn pivotally supported by the column along an upper horizontal edge so that the movable wall can move toward and away from the opposite wall of the air intake zone with the movable wall remaining vertical, and including an improvement which comprises:

- a. the chute having an air lock feeder and a downwardly inclined material feeding chute from the feeder to a mid-portion of the column where the chute opens into the column and cooperates with the column to define a zone of expanded volume having a horizontal cross-sectional area greater than the cross-sectional area of the column above and below the expanded zone, the vertical walls



which define the air intake zone are arranged with one of such vertical walls opposite the movable wall intersecting with the material feeding surface of the chute along a horizontal axis of intersection, and with such one wall being in vertical alignment with a vertical center line through a portion of the column above the expanded zone, to thereby define for upwardly ascending air and particles a tortuous path with a turn toward the material feeding surface of the chute; and

- b. adjustable support means connected to the movable wall and adapted to position the movable wall to in turn position the inclined member with its inner surface facing both downwardly and toward the chute, whereby a movement of the movable wall toward or away from the chute adjusts the angle of the inclined member beneath which air and particles moving upwardly are turned toward the chute in the course of following said tortuous path.

4,010,097

### PNEUMATIC CLASSIFIER FOR REFUSE MATERIAL WITH DOUBLE VORTEX AIRFLOW

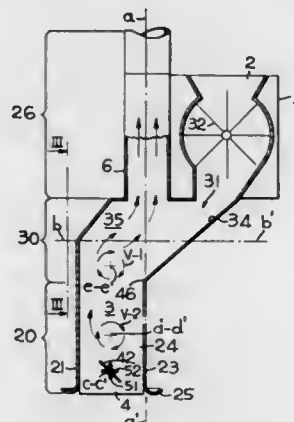
Donald L. Murray, Greenfield; John N. Lees, Jr., Wauwatosa, and Frank W. Toman, Jr., Milwaukee, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 9, 1975, Ser. No. 621,226

Int. Cl.<sup>2</sup> B07B 4/02, 11/04

U.S. Cl. 209—139 R

6 Claims



1. An apparatus for classifying particles of refuse material and the like to separate relatively light and heavy solids and having a column, means connected to the upper end of the column for drawing a stream of air into the lower end of the column and upwardly through the column, a chute that opens into the column intermediate the column ends and having an air lock feeder with a downwardly inclined material feeding surface from the air lock feeder to the column for admitting mixed light and heavy solids particles, the chute cooperating with the column to define a zone of expanded column volume and in which air drawn upwardly turns toward the chute and forms a vortex before resuming upward flow and including an improvement which comprises:

- a. a baffle pivotally journaled in the lower end of the column below an intersection of the feed chute and the column, about a journal axis disposed in a generally horizontal plane; and
- b. An actuating mechanism connected to the baffle and operative to pivot the airfoil about the general horizontal journal axis, whereby air drawn upwardly through the column from the lower end and passing upwardly over the baffle, turns to form a second vortex beneath the first vortex and pivoting the baffle about its journal axis provides a control of turbulence created by the second vortex and the separation characteristics of material introduced through the chute which result in heavier particles dropping from the column while lighter particles are carried upwardly in the air stream.

### 4,010,098 RESOURCE RECOVERY FROM DISPOSAL OF SOLID WASTE AND SEWAGE SLUDGE

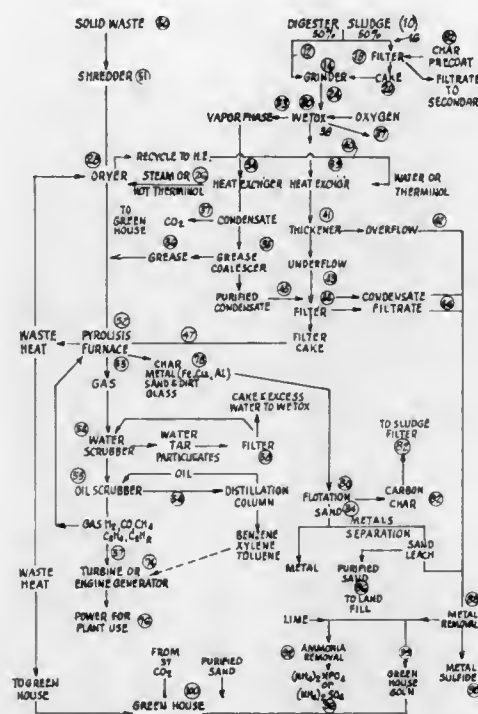
Wayne Martin Fassell, Newport Beach, Calif., assignor to Barber-Colman Company, Rockford, Ill.

Filed May 29, 1975, Ser. No. 581,903

Int. Cl.<sup>2</sup> C02B 3/08

U.S. Cl. 210—10

23 Claims



1. Resource recovery method for use in the treatment of collected sewage sludge dissolved or dispersed in aqueous medium and municipal solid waste comprising the combination of steps of subjecting at least a portion of the sewage sludge to exothermic wet oxidation by introduction of the aqueous medium into an enclosed space at a temperature within the range of 150°–450° C and pressure within the range of 300–3000 psi, said portion being in an amount to generate heat sufficient to substantially dry the solid waste and the remainder of the sewage sludge, introducing oxygen containing gas into the aqueous medium to cause oxidation of said sewage sludge contained in the aqueous medium until 10–95% reduction in COD is achieved, subjecting the wet oxidation reaction products to separation into a solid phase and a liquid phase, heating the solid waste and any remainder of said sewage sludge with heat derived from the exothermic wet oxidation of the sewage sludge, flowing a stream of molten lead in one direction from a head end to a foot end within a pyrolysis chamber, depositing the heated solid waste and remainder of the sewage sludge plus the solid phase from the wet oxidation onto the stream of molten lead at the head end portion to form a layer thereon, maintaining non-oxidizing conditions in the pyrolysis chamber whereby during travel with the stream of molten lead from the head end to the foot end, organic components of the material fed onto the stream of molten lead are thermally decomposed to gases and vapors and a carbonaceous component containing char, while metals and inorganic materials, including silica and sand, which are insoluble in molten lead and of a lower specific gravity remain on the surface of the stream of molten lead, metals and inorganic materials which are soluble in molten lead dissolve in the molten lead to become a part of the stream, and metals and materials insoluble in molten lead and of a higher specific gravity fall to the bottom of the stream, removing said gases and vapors from said pyrolysis chamber, and separating the char, metals, and inorganic materials from said stream of molten lead.

### 4,010,099 SETTLERS FOR COPPER LIQUID EXTRACTION SYSTEMS

Bruce E. Leach, and Leroy Rose, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed July 10, 1975, Ser. No. 594,882

Int. Cl.<sup>2</sup> B01D 11/04

U.S. Cl. 210—21

4 Claims

1. A method for counter-current phase separation of aqueous copper sulfate solutions and organic phases in substantially vertical settler tanks and substantially horizontal settler pipes wherein the aqueous copper sulfate solution and organic phase are contacted counter-currently to the direction of phase separation, comprising compartmenting the bottoms of said tanks and pipes, flowing said solutions and organic phases over said compartments to coalesce the organic phase to form droplets, said droplets then rising to contact the aqueous solution and facilitate phase disengagement.

### 4,010,100 ISOTOPE SEPARATION BY PHOTOCHROMATOGRAPHY

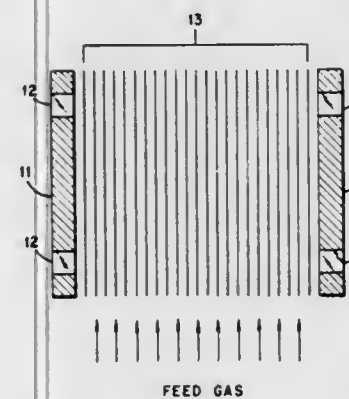
Kenneth S. Suslick, Stanford, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 3, 1975, Ser. No. 619,156

Int. Cl.<sup>2</sup> B01D 15/08

U.S. Cl. 55—67

8 Claims



1. A method for isotope separation which comprises:
- physically adsorbing on an adsorptive surface an isotopically mixed molecular species consisting of a desired isotopic species and at least one undesired isotopic species;
  - irradiating the adsorbed isotopically mixed molecular species with radiation of a predetermined wavelength which will excite the adsorbed desired isotopic species without substantially exciting adsorbed undesired isotopic species, thereby desorbing the desired isotopic species to produce a fraction enriched in the desired isotopic species and a fraction depleted in the desired isotopic species; and
  - separating the fraction enriched in the desired isotopic species from the fraction depleted in the desired isotopic species.

### 4,010,101 LIQUID TRAP

Cyril Davey, 4 Tamara Flats, Tamara St., Tamara Park, Verwoerdburg, Transvaal, South Africa

Filed July 19, 1976, Ser. No. 706,492

Int. Cl.<sup>2</sup> B01D 29/00

U.S. Cl. 210—86

9 Claims

1. A trapping device for a liquid supply line for trapping foreign liquids contained in a supply liquid, said foreign liquids having a specific gravity greater than that of the supply liquid, the device comprising

- a tubular side wall having upper and lower ends,

a lower end piece defining a socket releasably receiving the lower end of the side wall,

an upper end piece defining a socket releasably receiving the upper end of the side wall,

sealing means forming seals between the end pieces and the side wall,

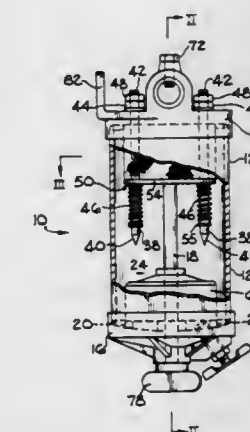
a settling chamber defined primarily by the side wall and the end pieces,

inlet and outlet chambers in said settling chamber and adjacent to said upper end piece,

an inlet leading through the upper end piece into said inlet chamber,

an outlet leading through the upper end piece from said outlet chamber,

a substantially impermeable wall separating said inlet and outlet chambers, said impermeable wall comprising a tubular hub and a pair of wing means at opposite sides of the hub and each diverging outwardly away from the hub,



flow paths connecting said settling chamber with said inlet and outlet chambers,

foraminous wall means partly defining said inlet and outlet chambers, said foraminous wall means being arranged across said flow paths whereby fluid passing through the chambers from the inlet to the outlet passes through at least one said foraminous wall means,

a pair of spaced contact means extending through the upper end piece and through said wing means into the settling chamber, said contact means having connector portions outside said settling chamber and connectable to an electrical warning signal circuit,

a float in the settling chamber having a specific gravity higher than that of the supply liquid and lower than that of the foreign liquids, and

a bridge member on the float for bridging the space between the contact means to establish an electrical path between said contact means when the float is raised to a predetermined level by floating on the foreign liquids.

### 4,010,102 LIQUID TREATMENT APPARATUS HAVING PARALLEL ROTATING BAFFLES

Nils Göran Jarvström, Daggkapebacken 1, 552 46 Jonkoping, Sweden

Filed Feb. 10, 1975, Ser. No. 548,664

Claims priority, application Sweden, Feb. 14, 1974, 7401946

Int. Cl.<sup>2</sup> C02C 1/02

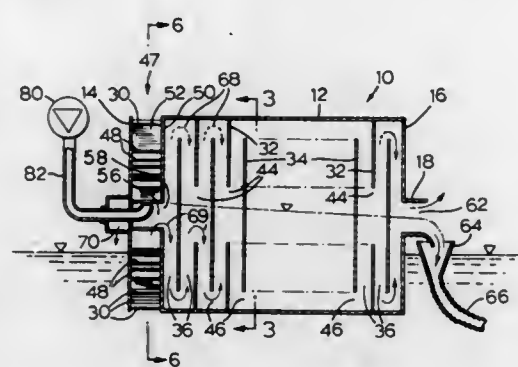
U.S. Cl. 210—151

12 Claims

1. Apparatus for the biological treatment of waste liquid, said apparatus including an elongated substantially circular housing for containing said liquid, said housing having an inlet opening, an outlet opening, and a central axis, a stack of disc elements in said housing and positioned substantially parallel to each other and at right angles to said axis, some of said disc elements have central apertures at said axis and fitting closely at their peripheries to said housing to prevent passage of liquid therebetween, others of said disc elements being closed at



their centres and defining second apertures located at their peripheries adjacent said housing said housing including both such types of disc elements alternating with each other, adjacent disc elements defining channels therebetween, and means for rotating said disc elements in the liquid in said



housing, whereby liquid and air impelled into said housing through said inlet opening will flow through said housing to said outlet opening in respective revolving tortuous paths, and means for rotating said disc elements in the liquid in said housing.

4,010,103

## AUTOMATIC OIL-WATER SEPARATING DEVICE

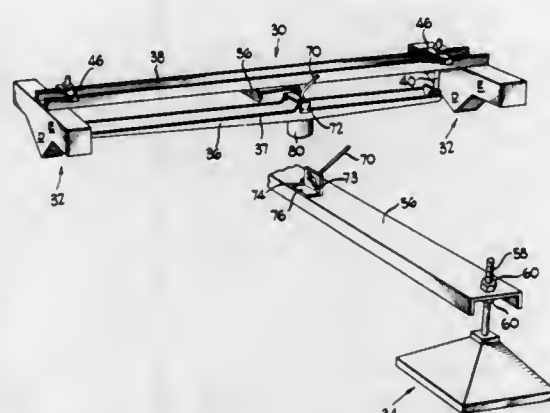
Jerry E. Morgan, 352 67th St., Clarendon Hills, Ill. 60514; William M. Lynch, 621 Western Ave., Glen Ellyn, Ill. 60137, and Paul M. Pelton, 1209 South Gates, West Chicago, Ill. 60185

Filed Aug. 12, 1974, Ser. No. 496,515

Int. Cl.<sup>2</sup> E02B 15/04

U.S. Cl. 210—242 R

8 Claims



1. Apparatus for skimming a lighter liquid floating on the surface of a more dense liquid, said apparatus comprising: an elongate structural member supported by first float means located at each end thereof, each of said first float means consisting of a shape comprising a greater volumetric displacement means in its upper portion as compared to its lower portion, a U-shaped skimming trough having a horizontal skimming edge, said trough being pivotally supported from said structural member along its elongate length, an elongate arm with a first end connected to the central portion of said elongate structural member and extending at right angles to the central axis of said skimming trough, means adjustably connecting said arm near said first end to the central portion of said U-shaped skimming trough and being constructed and arranged to dispose said arm approximately in the same horizontal plane as the horizontal skimming edge of said U-shaped trough, second float means adjustably connected to a second end of said elongate arm, said second float means consisting of a shape comprising a greater volumetric displacement means in its lower portion as compared to its upper portion,

and said skimming trough having formed in its lowermost portion an outlet through which lighter liquid skimmed into the trough over the horizontal skimming edge is removed to a separate location.

4,010,104

## SOLUTIONS OF NEW COMPLEX ANTIMONY COMPOUNDS

Eduard Radlmann; Heinz Schaffner; Günter Lorenz, and Günther Nischk, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 8, 1975, Ser. No. 575,698

Claims priority, application Germany, May 8, 1974, 2422141

Int. Cl.<sup>2</sup> B27K 3/00; C09D 5/18; C07F 9/90

U.S. Cl. 252—8.1

14 Claims

1. A fire retardant solution in a polar organic solvent of a complex reaction product of an antimony oxide with an  $\alpha$ -hydroxy carboxylic acid which reaction product has been further reacted with a monoisocyanate.

4,010,105

## OIL-IN-WATER EMULSION HYDRAULIC FLUID

Rosauro V. Holgado, Philadelphia, Pa., assignor to E. F. Houghton and Company, Norristown, Pa.

Filed Apr. 21, 1975, Ser. No. 569,661

Int. Cl.<sup>2</sup> C10M 1/06, 1/32

U.S. Cl. 252—77

6 Claims

1. A fire-resistant hydraulic fluid of the oil-in-water type having the property of relatively uniform viscosity over a broad range of water contents comprising (1) from about 5 to about 15% by weight of an emulsifier which is the condensation product of a dialkanol amine having from 2 to 4 carbon atoms in the alkanol chains, with a fatty acid chosen from the group consisting of aliphatic monocarboxylic acids having from 16 to 22 carbon atoms in the aliphatic chain, and reactive esters and halides thereof; said dialkanol amine being present in an amount between about 0.75 and 1.25 equivalents per equivalent of acid; (2) from about 10 to about 30% by weight of a mineral oil; (3) from about 5 to about 15% of a water soluble polyglycol selected from the group consisting of polyoxyalkylene glycols and their lower monoalkyl derivatives having a molecular weight of at least about 400; (4) from about 10 to about 25% of glycol selected from the group consisting of mono- and di-ethylene and propylene glycols, and (5) from about 30 to about 50% water, the molecular weight of said polyglycol and the viscosity of said mineral oil being such that the viscosity of said hydraulic fluid is within the range of from about 100 to about 600 SUS at 100° F., and said viscosity varies less than about 120 SUS at 100° F. with changes in water content within said range of from about 30 to about 50% water.

4,010,106

## CORROSION-RETARDING FUNCTIONAL FLUID

Kenneth Rothert, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 2, 1976, Ser. No. 654,666

Int. Cl.<sup>2</sup> C10M 1/48

U.S. Cl. 252—32.7 E

8 Claims

1. A lubricating oil composition comprising:  
a. an oil of lubricating viscosity, and  
b. an effective amount of each of the following:  
1. an alkenyl succinimide,  
2. a Group II metal salt of a dihydrocarbyl dithiophosphoric acid,  
3. a friction modifier,  
4. a basic sulfurized alkaline earth metal alkyl phenate, and  
5. a chlorinated olefin.

4,010,107

## CORROSION-INHIBITING FUNCTIONAL FLUID

Kenneth Rothert, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 2, 1976, Ser. No. 654,667

Int. Cl.<sup>2</sup> C10M 1/48

U.S. Cl. 252—32.7 E

7 Claims

1. A lubricating oil composition comprising:  
a. an oil of lubricating viscosity, and  
b. an effective amount of each of the following:  
1. an alkenyl succinimide,  
2. a Group II metal salt of a dihydrocarbyl dithiophosphoric acid,  
3. a friction modifier,  
4. a Group II metal salt of a hydrocarbyl sulfonic acid, and  
5. a chlorinated olefin.

4,010,108

## RADIOACTIVE WASTE DISPOSAL OF WATER CONTAINING WASTE USING UREA-FORMALDEHYDE RESIN

Kenneth A. Gablin, Burton, and Larry J. Hansen, Tacoma, both of Wash., assignors to Nuclear Engineering Company, Inc., Louisville, Ky.

Continuation of Ser. No. 220,449, Jan. 24, 1972, abandoned.

This application Nov. 29, 1973, Ser. No. 420,008

Int. Cl.<sup>2</sup> G21F 9/16, 9/12; C02B 1/32

U.S. Cl. 252—301.1 W

21 Claims

1. The method of solidifying radioactive waste material containing free water into a free standing body, comprising:  
A. providing a mixture of radioactive waste material and water in a controlled amount sufficient to meet a desired low hazard radiation classification when solidified with urea-formaldehyde and urea-formaldehyde in a partially polymerized state in an amount sufficient to solidify substantially all of the water present,  
B. adding an acidic curing agent capable of promoting polymerization of said urea-formaldehyde in an amount sufficient to solidify said urea-formaldehyde in said mixture, and  
C. stirring the materials together to provide the desired distribution of radioactive waste material and allowing the mixture to gel and set whereby a solid mass of the resin is obtained with the water and the radioactive components of the resulting mixture distributed therein.

4,010,109

## DEVICE FOR MARKING FLUENT MATERIALS

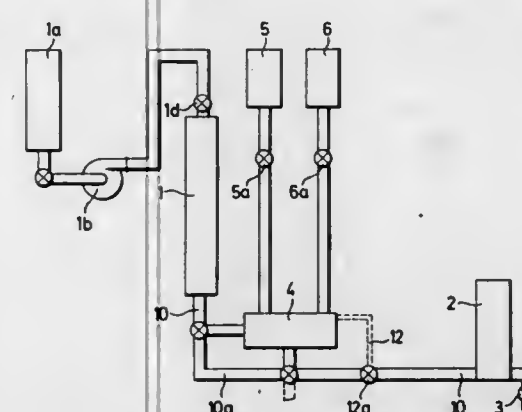
Karol Akerman, and Kurt Sauerwein, both of Dusseldorf, Germany, assignors to Kurt Sauerwein, Dusseldorf, Germany

Filed July 2, 1973, Ser. No. 375,635

Int. Cl.<sup>2</sup> B65C 3/00

U.S. Cl. 252—301.15

7 Claims



1. A device for marking contained industrial fluent materials with a radio-active substance, said device comprising, in

combination, an isotope generator charged with a radio-active substance with continuously produces a relatively short-life radio-active daughter substance, means for feeding a solvent for said daughter substance in controlled quantities under pressure into said generator to dissolve said daughter substance and form an isotope carrier, an equalizing reservoir for temporarily storing an isotope carrier conducted thereto, a mixing and reaction vessel adapted to be connected to at least one storage container containing an additive which reacts with said isotope carrier, a fixed pipe leading from said generator to said equalizing reservoir, means interconnecting the generator with the mixing and reaction vessel for selectively shunting the isotope carrier from the pipe to the mixing and reaction vessel, means for selectively coupling the output of the mixing and reaction vessel to the pipe, and a dosing valve permanently coupled between the output of said equalizing reservoir and the container for said fluent material for controlling the release of said carrier from said reservoir to said container.

6. A device for use in marking contained industrial fluent material with a radioactive substance, comprising in combination,

an isotope generator charged with a radioactive substance which continuously produces a relatively short-life radio-active daughter substance;  
automatically controlled dosing means connected to said isotope generator for feeding a solvent for said daughter substance into said generator to dissolve said daughter substance and thereby form an isotope carrier;  
an equalizing reservoir for temporarily storing an isotope carrier conducted thereto;  
a mixing and reaction vessel adapted to be connected to at least one storage container containing an additive which reacts with said isotope carrier;  
a fixed pipe leading from said generator to said equalizing reservoir;  
means interconnecting the generator with the mixing and reaction vessel for selectively shunting the isotope carrier from the pipe to the mixing and reaction vessel;  
means for selectively coupling the output of the mixing and reaction vessel to the pipe;  
and a dosing valve permanently coupled between the output of said equalizing reservoir and the container for said fluent material for controlling the release of said carrier from said reservoir to the container for said fluent material.

4,010,110

## PROCESS FOR DISPERSING CONTAMINANTS IN CIRCULATING WATER OR POLAR ORGANIC LIQUID SYSTEM

Joseph P. Cosentino, Nutley, and Frederick R. Mahn, Verona, both of N.J., assignors to Drew Chemical Corporation, Parsippany, N.J.

Division of Ser. No. 169,820, Aug. 6, 1971, Pat. No. 3,962,119.

This application Mar. 5, 1976, Ser. No. 664,073

Int. Cl.<sup>2</sup> B01J 13/00

U.S. Cl. 252—314

11 Claims

1. A process for dispersing contaminants in a circulating water or polar organic liquid system, comprising:  
adding to the system a dispersing composition consisting essentially of:  
a. an oxyalkylene polymer having a molecular weight from about 500 to about 5000 wherein the recurring units consist of a member selected from the group consisting of oxypropylene, oxyethylene and mixtures thereof; and  
b. a polysiloxane-polyoxyalkylene block copolymer having a molecular weight from about 500 to about 10,000 wherein the polysiloxane block consists essentially of recurring units of a dialkyl siloxane wherein the alkyl group has from 1—3 carbon atoms and the oxyalkylene block consists essentially of recurring units of a member selected from the group consisting of oxypropylene.



ene, oxyethylene and mixtures thereof, said components (a) and (b) being present in an amount effective to disperse contaminants in aqueous and polar organic liquid systems.

4,010,111

# CORROSION INHIBITOR USED IN BRINES CONTAINING OXYGEN

George D. Chappell, Rosenberg, and James R. Stanford, Sugar Land, both of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 441,614, Feb. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 271,462, July 13, 1972, abandoned. This application Mar. 29, 1976, Ser. No. 671,456

Int. Cl.<sup>2</sup> C23F 11/16, 11/14, 11/12

U.S. Cl. 252—391

9 Claims

1. A corrosion inhibiting composition for aqueous brine water containing dissolved oxygen therein, said corrosion inhibiting composition prepared by the following steps:

- A. reacting at from 200° to 250° C for 1 to 3 hours a carboxylic acid from the group consisting of acyclic monocarboxylic acid and polycarboxylic acid containing from 1 to 48 carbon atoms with a polyamine having the structure  $H_2N(R-NH)_xH$  wherein R is an alkylene group containing from 2 to 6 carbon atoms and x is a small whole number greater than 1, wherein the molar ratio of said carboxylic acid to said polyamine ranges from 1:1 to 5:1;
- B. cooling the composition formed in step A;
- C. adding with mixing from 1 to 50% by weight based on polyamine of an alcohol from the group consisting of methanol, n-propanol, butanol and mixtures thereof;
- D. adding from 1 to 5% by weight based on said polyamine of dodecylbenzene sulfonic acid;
- E. adding with mixing from 1 to 10% by weight based on said polyamine of a high molecular weight organic acid from the group consisting of dimer and trimer acids and mixtures thereof having from 36 to 54 carbon atoms; and
- F. adding with mixing from 0.01 to 0.5% by weight based on said polyamine of an organic water-in-oil emulsion breaker.

4,010,112

# PRODUCTION OF AQUEOUS SOLUTIONS OF CHLORINE DIOXIDE AND CHLORINE

Gerald Cowley, and Maurice C. J. Fredette, both of Mississauga, Canada, assignors to Erco Industries Limited, Islington, Canada

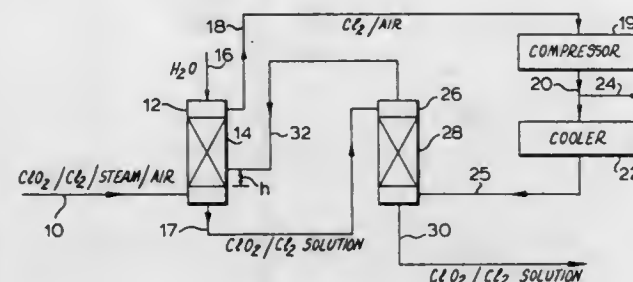
Filed Oct. 20, 1975, Ser. No. 623,773

Claims priority, application Canada, Sept. 18, 1975, 235827

Int. Cl.<sup>2</sup> C01B 11/02

U.S. Cl. 252—187 R

29 Claims



1. A method of forming an aqueous solution of chlorine dioxide and chlorine from a gaseous mixture thereof, which comprises:

- contacting a gaseous mixture of chlorine dioxide and chlorine with water to dissolve all the chlorine dioxide therefrom and part of the chlorine therefrom to form an aqueous solution of chlorine dioxide and chlorine,
- recovering gaseous chlorine substantially free from chlorine dioxide from said contacting step,

increasing the partial pressure of said gaseous chlorine to a value exceeding that of chlorine in said gaseous mixture of chlorine dioxide and chlorine to provide chlorine of increased partial pressure,

contacting said aqueous solution of chlorine dioxide and chlorine with said chlorine of increased partial pressure to cause an increase in the dissolved concentration of chlorine in said solution, and

recovering the resulting chlorine-enriched aqueous solution of chlorine dioxide and chlorine.

4,010,113

# CATALYST FOR METATHESIS OF CYCLOOLEFINS

Eilert A. Ofstead, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 456,913, April 1, 1974, Pat. No. 3,945,986. This application Nov. 17, 1975, Ser. No. 632,553

Int. Cl.<sup>2</sup> B01J 31/02

U.S. Cl. 252—429 B

3 Claims

1. A metathesis catalyst composition comprised of (A) at least one transition metal salt selected from the group consisting of tungsten halides, tungsten oxyhalides, molybdenum halides and molybdenum oxyhalides, (B) at least one compound selected from the group consisting of dialkylaluminum halides, alkylaluminum sesquihalides and alkylaluminum dihalides, and (C) at least one compound of the general formula ROH wherein R is selected from the group consisting of alkyl and cycloalkyl, and wherein R contains a nitrile substituent situated on the carbon atom adjacent to that bearing the hydroxy group, and wherein the molar ratio of A:B:C lies within the range of 1:0.5–10:0.5–3.

4,010,114

# OXIDATIVE DEHYDROGENATION CATALYST

Darrell W. Walker, and Floyd E. Farha, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1975, Ser. No. 573,210

Int. Cl.<sup>2</sup> B01J 27/14

U.S. Cl. 252—437

9 Claims

1. An oxidative dehydrogenation catalytic material consisting essentially of from about 26 to about 75 weight percent of nickel, in association with from about 1 to about 50 weight percent of tin, from about 0.5 to about 10 weight percent of lead, from about 0.5 to about 10 weight percent of phosphorus, from about 0.5 to about 6 weight percent of potassium, and sufficient oxygen to satisfy the valence requirements of the elements, wherein the weight percent values are based on weight of the unsupported catalytic material and wherein at least one of said nickel, said tin, said phosphorus or said potassium is combined with oxygen.

4,010,115

# CATALYST FOR THE OXIDATION OF ETHYLENE TO ETHYLENE OXIDE

Robert P. Nielsen, Houston, Tex., and John H. La Rochelle, Baton Rouge, La., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 480,896, June 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,349, Dec. 21, 1972, abandoned, which is a

continuation-in-part of Ser. No. 216,188, Jan. 7, 1972, abandoned. This application Oct. 10, 1975, Ser. No. 621,268 The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> B01J 21/04, 21/08, 23/04, 23/50

U.S. Cl. 252—454

27 Claims

1. A catalyst article comprising a porous refractory support having deposited on its exterior and pore surfaces from about 2% by weight to about 20% by weight of silver and, coincidentally deposited with silver, a total of from about  $4.0 \times 10^{-5}$  gew per kilogram of total catalyst to about  $8.0 \times 10^{-3}$  gew per

kilogram of total catalyst of alkali metal present in final form on the support in the form of an oxide in which the said oxide consists of the oxide of potassium optionally combined with a minor amount of an oxide of rubidium or cesium or mixtures of rubidium and cesium oxides relative to said potassium oxide.

4,010,116

# FLUID CRACKING CATALYSTS

Robert B. Secor, Whittier; Robert A. Van Nordstrand, Pasadena, and David R. Pegg, Montebello, all of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Filed Oct. 15, 1974, Ser. No. 514,567

Int. Cl.<sup>2</sup> B01J 29/06

U.S. Cl. 252—455 Z

37 Claims

1. A cracking catalyst comprising a cation exchanged zeolite of the faujasite type in the range of about 10 parts by weight to about 25 parts by weight, peptized pseudoboehmite substantially free of sodium in the range of from about 10 parts by weight to about 25 parts by weight, and SMM in the range from about 20 parts by weight to about 65 parts by weight; and clay in the range of about 10 to about 50 parts by weight, the sum of the parts all equaling 100 parts by weight.

4,010,117

# ELECTROCONDUCTIVE MATERIAL

Motokazu Maruhashi, Takatsuki; Shuji Tsutsumi, Kusatsu, and Shinichi Komazawa, Kobe, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 28, 1975, Ser. No. 608,719

Claims priority, application Japan, Sept. 2, 1974, 49-101189; Sept. 19, 1974, 49-108987

Int. Cl.<sup>2</sup> H01B 1/04

U.S. Cl. 252—500

5 Claims

1. An electroconductive material comprising a copolymer of (A) 50 to 70% by mole of styrene-sulfonic acid salt and (B) 50 to 30% by mole of at least one member selected from the group consisting of alkyl acrylates having an alkyl group of 1 to 10 carbon atoms, alkyl methacrylates having an alkyl group of 1 to 10 carbon atoms, acrylonitrile and methacrylonitrile.

4,010,118

# HIGH TEMPERATURE HOT CONDUCTORS

Horst Walch, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

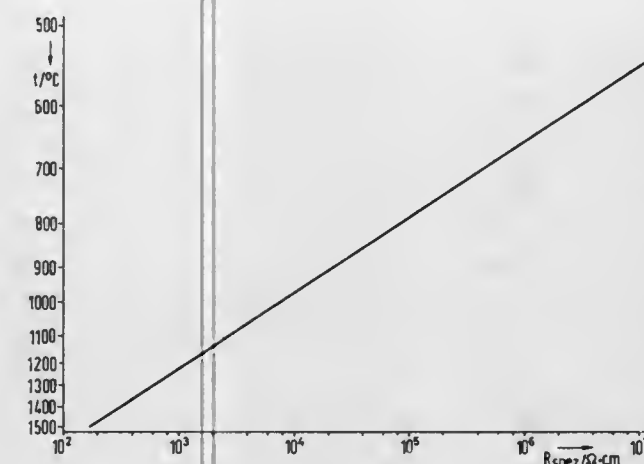
Filed Apr. 19, 1976, Ser. No. 678,067

Claims priority, application Germany, Apr. 28, 1975, 2518865

Int. Cl.<sup>2</sup> H01B 1/08

U.S. Cl. 252—521

3 Claims



1. A hot conductor for use in high temperature environments comprised of a sintered oxide material consisting essentially of containing a mixture of cerium oxide and gadolinium oxide.

4,010,119

# HIGH TEMPERATURE HOT CONDUCTORS

Horst Walch, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

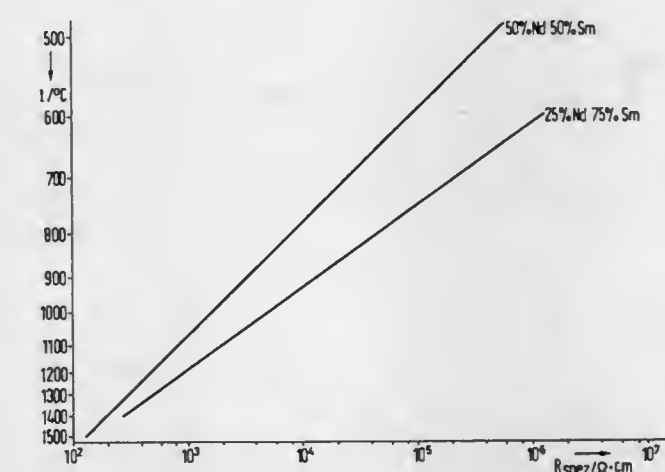
Filed Apr. 19, 1976, Ser. No. 678,068

Claims priority, application Germany, Apr. 28, 1975, 2518894

Int. Cl.<sup>2</sup> H01B 1/08

U.S. Cl. 252—521

5 Claims



1. A hot conductor for use in high temperature environments comprised of a sintered oxide material consisting essentially of a mixture of neodymium oxide and samarium oxide.

4,010,120

# HIGH TEMPERATURE HOT CONDUCTORS

Horst Walch, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

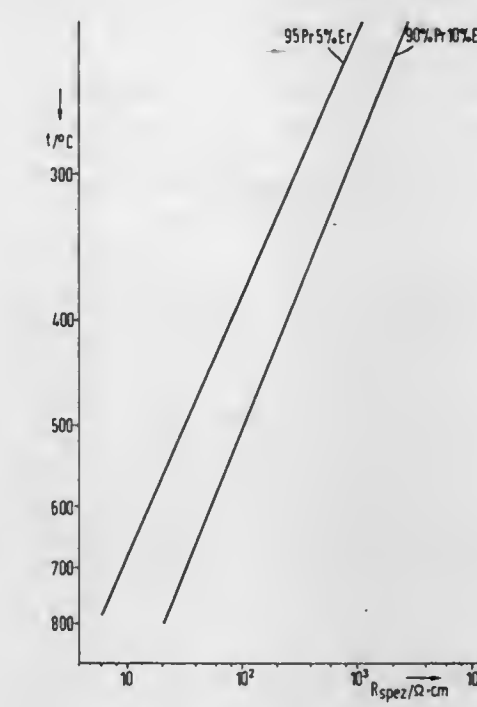
Filed Apr. 19, 1976, Ser. No. 678,069

Claims priority, application Germany, Apr. 28, 1975, 2518901

Int. Cl.<sup>2</sup> H01B 1/08

U.S. Cl. 252—521

5 Claims



1. A hot conductor for use in high temperature environments comprised of a sintered oxide material consisting essentially of a mixture of praseodymium oxide and erbium oxide.



4,010,121

## HIGH TEMPERATURE HOT CONDUCTORS

Horst Walch, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

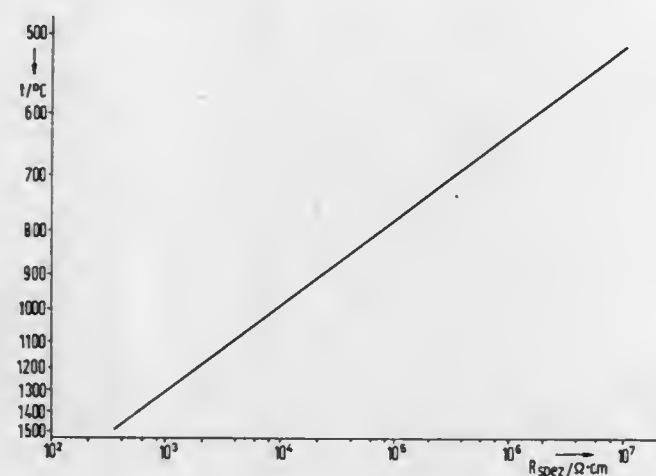
Filed Apr. 19, 1976, Ser. No. 678,070

Claims priority, application Germany, Apr. 28, 1975, 2518856

Int. Cl.<sup>2</sup> H01B 1/08

U.S. Cl. 252-521

3 Claims



1. A hot conductor for use in high temperature environments comprised of a sintered oxide material consisting essentially of containing a mixture of neodymium oxide and gadolinium oxide.

4,010,122

## HIGH TEMPERATURE HOT CONDUCTORS

Horst Walch, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

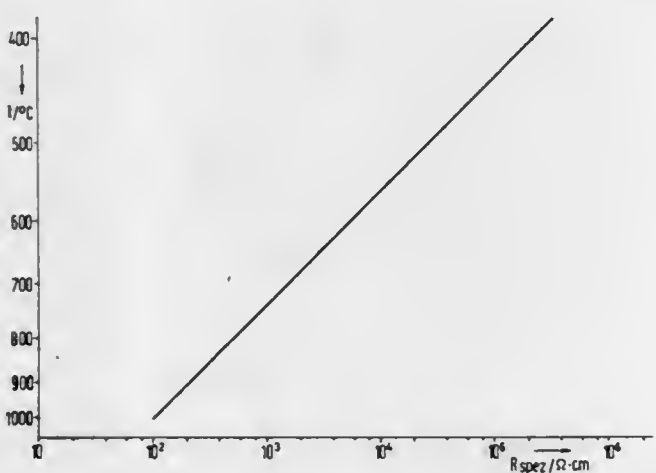
Filed Apr. 19, 1976, Ser. No. 678,076

Claims priority, application Germany, Apr. 28, 1975, 2518837

Int. Cl.<sup>2</sup> H01B 1/08

U.S. Cl. 252-521

3 Claims



1. A hot conductor for use in high temperature environments comprised of a sintered oxide material consisting essentially of a mixture of terbium oxide and erbium oxide.

4,010,123

## CELLULAR MATERIAL

Geoffrey Vincent Dallow Blunt; Newton John Hodges, and Robert James Pragnell, all of Cheltenham, England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 345,575, March 28, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 547,328

Claims priority, application United Kingdom, Apr. 6, 1972, 15942/72

Int. Cl.<sup>2</sup> C08J 9/06; C08L 21/00, 95/50

U.S. Cl. 260-2.5 H

10 Claims

1. A process for the production of a cellular material by vulcanizing a mixture containing between 10% and 50% of a mixture of rubber together with sufficient vulcanizing agents to form an ebonite with the rubber, not more than 10% of a solid filler, and a chemical blowing agent, whereby an ebonite structure is formed, so that, during the vulcanization, the chemical blowing agent decomposes or reacts to produce a gas, the viscosity of the composition during the procedure of the gas increasing whereby cells are retained in the composition wherein the mixture further contains between about 52% and 87% of a bituminous material.

7. A cellular plastics material containing between about 52% and 87% of a bituminous material, and between 10% and 50% of an ebonite matrix formed of rubber and a vulcanizing agent filler and including at least 25% by volume of closed cells.

4,010,124

## PROCESS FOR FLAMEPROOFING POLYURETHANES

Peter Hofmann, and Peter Rohringer, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 399,577, Sept. 21, 1973, abandoned, which is a continuation of Ser. No. 266,194, June 26, 1972, abandoned. This application Apr. 2, 1975, Ser. No. 564,410

Claims priority, application Switzerland, July 5, 1971, 9829/71

Int. Cl.<sup>2</sup> C08K 5/53

U.S. Cl. 260-2.5 AJ

7 Claims

1. An improved process for flameproofing polyurethanes using 1 to 15 percent by weight based on the polyurethane of a reactive phosphonate as flameproofing agent wherein the improvement comprises

incorporating as the flameproofing agent the reaction product based on a molar ratio of (1) 1 to 2 mols of dimethyl methanephosphonate; (2) 0.75 to 1 mol of an alkanediol or alkanetriol of 2 to 6 carbon atoms; and (3) 0 to 1 mol of an epoxide having 2 to 4 carbon atoms; into a mixture of polyol and diisocyanate components from which the polyurethane is produced.

4,010,125

[D-TRP<sup>6</sup>]-LH-RH AND INTERMEDIATES THEREFOR

Andrew V. Schally, 2500 Whitney Place, Apt. 319, Metairie, La. 70002, and David H. Coy, 3823 B. St. Charles Ave., New Orleans, La. 70115

Filed June 12, 1975, Ser. No. 586,437

Int. Cl.<sup>2</sup> C07C 103/52; C08L 100

U.S. Cl. 260-8

7 Claims

5. A compound selected from the group consisting of R<sup>6</sup>-(pyro)-Glu-His-(N<sup>1</sup>-R<sup>3</sup>)-Trp-Ser(R<sup>4</sup>)-Tyr(R<sup>3</sup>)-D-Trp-Leu-Arg(N<sup>6</sup>-R<sup>2</sup>)-Pro-Gly-A, R<sup>2</sup>-His(N<sup>1</sup>-R<sup>3</sup>)-Trp-Ser(R<sup>4</sup>)-Tyr(R<sup>3</sup>)-D-Trp-Leu-Arg(N<sup>6</sup>-R<sup>2</sup>)-Pro-Gly-A, R<sup>2</sup>-Trp-Ser(R<sup>4</sup>)-Tyr(R<sup>3</sup>)-D-Trp-Leu-Arg(N<sup>6</sup>-R<sup>2</sup>)-Pro-Gly-A, R<sup>2</sup>-Ser(R<sup>4</sup>)-Tyr(R<sup>3</sup>)-D-Trp-Leu-Arg(N<sup>6</sup>-R<sup>2</sup>)-Pro-Gly-A, R<sup>2</sup>-Tyr(R<sup>3</sup>)-D-Trp-Leu-Arg(N<sup>6</sup>-R<sup>2</sup>)-Pro-Gly-A, and R<sup>2</sup>-D-Trp-Leu-Arg(N<sup>6</sup>-R<sup>2</sup>)-Pro-Gly-A, in which [R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are protective groups capable of being removed by one or more chemical treatments which do not effect (pyro)-Glu-His-Trp-Ser-Tyr-D-Trp-Leu-Arg-Pro-Gly-NH<sub>2</sub>.] R<sup>2</sup> is a protective group for the N<sup>1</sup>, N<sup>2</sup>, and N<sup>3</sup> nitrogen atoms of arginine selected from the

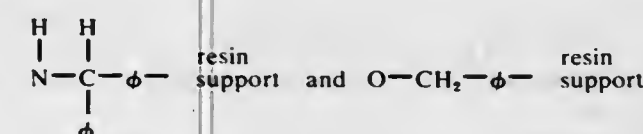
group consisting of tosyl, nitro, benzyloxycarbonyl and adamantyloxycarbonyl;

R<sup>3</sup> is a protective group for the hydroxyl of tyrosine selected from the group consisting of 2-bromo-benzyloxycarbonyl, benzyl, acetyl, tosyl, benzoyl, t-butyl, tetrahydropyran-2-yl, trityl, 2,4-dichlorobenzyl and benzyloxycarbonyl;

R<sup>4</sup> is a protective group for the hydroxyl group of serine and is selected from the group defined hereinbefore for R<sup>3</sup>;

R<sup>5</sup> is a protective group for the imidazole nitrogen atoms of histidine selected from the group of dinitrophenyl, tosyl, 2,2,2-trifluoro-1-benzyloxycarbonylaminoethyl and 2,2,2-trifluoro-t-butyloxycarbonylaminoethyl; and

R<sup>6</sup> is hydrogen or an α-amino protective group and R<sup>7</sup> is an α-amino protective group, and A is selected from the class consisting of:



4,010,126

## AQUEOUS EMULSION COPOLYMERS OF VINYL ALKANOATES, ALKYL ACRYLATES, AND ACRYLIC MODIFIED ALKYDS

Edward J. Kuzma, Woodbridge, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,212

Int. Cl.<sup>2</sup> C08L 94/00

U.S. Cl. 260-22 CB

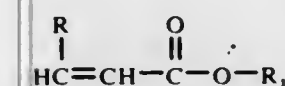
4 Claims

1. An aqueous emulsion vehicle comprising the interpolymerization reaction product of

a. from about 60 to about 90% by weight based on the total monomer/resin weight of at least one monomer having the polymerization-reactive CH<sub>2</sub>=C< grouping selected from the group consisting of

1. Vinyl acetate and  
2. alkyl acetate and methacrylate monomers wherein the alkyl radical contains from 1 to 10 carbon atoms; and  
b. from about 10 to about 40% by weight based on the total monomer/resin weight of an acrylic modified alkyd resin produced by the condensation reaction of at least one of each of the following:

1. an esterifiable polyhydric alcohol,  
2. saturated, mono-unsaturated, or poly-unsaturated fatty acid or fatty acid oil;  
3. A polycarboxylic acid or anhydride thereof; and  
4. a monomer selected from the class of compounds having the formula:



wherein R is -H or -CH<sub>3</sub> and R<sub>1</sub> is -H or a branched or unbranched lower alkyl group of from 1 to 10 carbon atoms.

4,010,127

## POLYETHYLENE COMPOSITION

Toshio Taka, Fujisawa, and Hideaki Toda, Kawasaki, both of Japan, assignors to Showa Yuka K.K., Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,569

Claims priority, application Japan, Oct. 15, 1974, 49-117675; Mar. 20, 1975, 50-32925

Int. Cl.<sup>2</sup> C08L

U.S. Cl. 260-23 R

10 Claims

1. A high-molecular-weight polyethylene composition having superior processability which consists essentially of:

A. 100 parts by weight of a high-density polyethylene having a density of at least 0.93 g/cc, a melt index of less than

0.1 g/10 minutes and a molecular weight distribution, M<sub>w</sub>/M<sub>n</sub>, of not more than 10,

B. 0.1 to 5.0 parts by weight of a C<sub>10</sub>-C<sub>25</sub> aliphatic monocarboxylic acid and/or a zinc salt thereof, and

C. 0.1 to 5.0 parts by weight of at least one compound selected from the group consisting of polybutene, mineral oils and epoxy plasticizers.

4,010,128

## FLEXIBLE PRINTING PLATE

Michael Frank Saggese, Nashville, Tenn.; Gerald Levine, Brooklyn, and William E. Beckman, Hopewell Junction, both of N.Y., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Apr. 2, 1975, Ser. No. 564,525

Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 260-23.7 M

10 Claims

1. A thermoplastic composition of matter suitable for the production of flexible printing plates which comprises a homogeneous blend of a mixture of polymers and at least one lubricant selected from the group consisting of metal salts of fatty acids, fatty acids, fatty alcohols, and waxes; said mixture of polymers comprising from about 30 to 50% by weight of a copolymer of an alpha-olefin having from 2 to 6 carbon atoms and a monoethylenically-unsaturated ester having from 4 to 12 carbon atoms, from about 15 to 35% by weight of a block copolymer selected from the group consisting of block copolymers of a mono-alkenyl aromatic hydrocarbon and a conjugated diene hydrocarbon and hydrogenated block copolymers of a mono-alkenyl aromatic hydrocarbon and a conjugated diene hydrocarbon, and from about 25 to 40% of a random copolymer of 1,3-butadiene and acrylonitrile; and said lubricant being present in an amount from about 0.1 parts to 10 parts by weight per 100 parts by weight of polymer mixture.

4,010,129

## NOVEL PROCESSING AIDS FOR NATURAL AND SYNTHETIC RUBBER COMPOUNDS

Erwin Aron, Clifton, N.J., assignor to Technical Processing, Inc., Paterson, N.J.

Continuation-in-part of Ser. No. 430,556, Jan. 3, 1974, Pat. No. 3,882,062, which is a continuation-in-part of Ser. No. 421,689, Dec. 4, 1973, abandoned, which is a

continuation-in-part of Ser. No. 411,975, Nov. 1, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,326

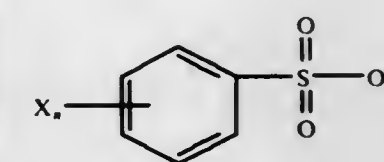
Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 260-23.7 M

8 Claims

1. An improved rubber processing aid comprising:

a. an alkali or amine salt of an aromatic sulfonic acid having the formula:



where X is hydrogen or alkyl of from 4 to 14 carbon atoms and n has a value of from 1 to 5, and

b. optionally a long chain fatty organic acid having a maximum of about 22 carbon atoms in the chain the improvement wherein the amount by weight of said fatty acid present is less than the amount by weight of said sulfonic acid salt, and said processing aid includes a thioether in an amount sufficient to catalyze the peptizing action of said salt.



4,010,130

**HYDROGENATED RESIN AND COMPOSITIONS CONTAINING THE SAME**

Kotaro Matsuo, Mino; Katsuhisa Shimizu, Kyoto; Michimasa Hoshiba, Takarazuka, and Machio Chihara, Osaka, all of Japan, assignors to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 517,660, Oct. 24, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 614,934

Claims priority, application Japan, Oct. 24, 1973, 48-120236

Int. Cl.<sup>2</sup> C08L 9/00; C08L 91/06

U.S. Cl. 260—28.5 AV

4 Claims

1. A hotmelt composition containing a copolymer of ethylene and ethylenically unsaturated monoester in an amount of 30 to 95% by weight and a tackifier in an amount of 70 to 5% by weight, said tackifier being a hydrogenated copolymer of a cyclopentadiene and an ethylenically unsaturated ester having a softening point of up to 150° C, an iodine value of 0 to 50, a saponification value of 4 to 330, a number average molecular weight of 200 to 800 and a ratio of weight average molecular weight to number average molecular weight of 1 to 2.5.

4,010,131

**QUATERNARY MODIFIED ACRYLAMIDE POLYMERS**

Kenneth G. Phillips, River Forest; Edward G. Ballweber, Glenwood; Karen A. Nordquist, Clarendon Hills, and Robert A. Miller, Chicago, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 486,715, July 8, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 560,435

Int. Cl.<sup>2</sup> C08G 51/24

U.S. Cl. 260—29.4 UA

10 Claims

1. A process for preparing a stable water soluble quaternary modified acrylamide polymer which comprises the steps of:

- A. preparing a formaldehyde adduct of a secondary amine containing 2-8 carbon atoms by mixing together an aqueous formaldehyde solution and a secondary amine containing 2-8 carbon atoms in a mole ratio of from 1:2 to 2:1 so as to produce a 0.1 to 55% by weight aqueous solution of the formaldehyde adduct of a secondary amine;
- B. reacting said formaldehyde adduct of Step A with a 5-50% aqueous solution of an acrylamide polymer having an intrinsic viscosity of from 0.1 to 0.7 in a mole ratio of from 1:2 to 2:1 with mixing at ambient temperatures to produce a cationically modified acrylamide polymer;
- C. reacting the cationically modified acrylamide of Step B with an alkylating agent, containing 1-7 carbon atoms at alkaline pH and at temperatures between 0-100° C in a mole ratio of alkylating agent to tertiary amine groups on said cationically modified acrylamide polymer of from 1:1 to 2:1 to produce a stable water soluble quaternary modified acrylamide polymer; and then,
- D. adding to said water soluble quaternary modified acrylamide polymer a halogen free oxygen containing inorganic acid to a pH of 0-6 to produce a stable water soluble quaternary modified acrylamide polymer.

4,010,132

**PROCESS FOR THE MANUFACTURE OF UREA-FORMALDEHYDE CONDENSATION POLYMERS CONTAINING SULPHO GROUPS**

Alfred Renner, Munchenstein, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed May 12, 1975, Ser. No. 576,938

Claims priority, application Switzerland, June 7, 1974, 7809/74

Int. Cl.<sup>2</sup> C08L 61/24, 61/34

U.S. Cl. 260—29.4 R

11 Claims

1. In a process for the manufacture of urea-formaldehyde condensation products the improvement according to which

highly disperse, solid urea-formaldehyde condensation products are formed which contain sulpho groups and consist of compact, spherical, agglomerated primary particles having a diameter of less than 1  $\mu$ m, the process comprising polycondensing a precondensate (P) of urea and formaldehyde and a condensation polymer (N) of naphthalenesulphonic acid and formaldehyde in aqueous solution at temperatures of 20° to 100° C to form a gel, the components being added in such ratio that the molar ratio of formaldehyde to urea in the reaction mixture at the moment of gelling is 1.25 to 2, these molar ratios taking into account both the free starting products (formaldehyde and urea) and the monomeric starting products chemically bound in the intermediate products.

4,010,133

**LOW-FIRE GREEN CERAMIC ARTICLES AND SLIP COMPOSITIONS FOR PRODUCING SAME**

Takashi Nakayama, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 147,215, May 6, 1971, abandoned. This application Mar. 22, 1973, Ser. No. 343,686

Int. Cl.<sup>2</sup> C08L 33/02; C08K 3/00

U.S. Cl. 260—29.6 TA

13 Claims

1. In a slip composition for formation of green ceramic articles, a slurry comprising a finely divided inorganic powder blended with an organic polymeric binder and a volatile liquid medium; wherein said inorganic powder consists essentially of, by weight,

- A. 85-99% barium titanate,
- B. 0.5-10% bismuthate glass frit, and
- C. 0.5-5% Fe<sub>2</sub>O<sub>3</sub>;

components (A), (B) and (C) being sufficiently finely divided to pass through a No. 325 screen, and said organic polymeric binder is 1-15% of the weight of the inorganic powder; said organic polymeric binder being selected from the class consisting of, by weight,

- i. acrylate copolymers of 50-75% alkyl acrylate ester, 25-50% alkyl methacrylate ester, and 0.2-2% acrylic acid and methacrylic acid, wherein in said esters alkyl is one or more radicals selected from among methyl, ethyl, propyl, butyl or 2-ethylhexyl;
- ii. ethylene copolymers of
  - i. 20-79.5% ethylene;
  - ii. 20-79.5% of one or more comonomers from among vinyl esters of saturated 1-6 carbon atoms aliphatic monobasic carboxylic acids; butyl acrylate; vinyl-2-ethylhexoate; and dibutyl maleate; and
  - iii. 0.5-10% of one or more comonomers from among acrylic acid, methacrylic acid, N-methylol acrylamide, itaconic acid; and glycidyl methacrylate;
3. and mixtures of (1) and (2); said slip composition on drying producing green ceramic articles which exhibit excellent storage life and which are fireable to ceramic articles at temperatures substantially below the sintering temperature of barium titanate.

2. A slip composition according to claim 1 wherein said volatile liquid medium consists essentially of water and said organic polymer binder is said acrylate copolymer.

4,010,134

**PLASTER MIXTURE CONSISTING OF AN AQUEOUS POLYMER DISPERSION CONTAINING PIGMENT AND FILLER**

Herbert Braunisch, Diedenbergen, Taunus, and Heinz Lehmann, Krißtel, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 13, 1975, Ser. No. 577,090

Claims priority, application Germany, May 15, 1974, 2423618

Int. Cl.<sup>2</sup> C08L 33/00

U.S. Cl. 260—29.6 S

5 Claims

1. In a plaster composition for preparing sound absorbing

4,010,137

**PHOSPHORUS-CONTAINING FLAME RETARDANT FOR SYNTHETIC RESINS**

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 382,169, July 24, 1973, Pat. No. 3,936,416. This application Dec. 15, 1975, Ser. No.

641,042

Int. Cl.<sup>2</sup> C08K 5/52

U.S. Cl. 260—45.8 NT

50 Claims

1. A phosphorus-containing flame retardant for synthetic resins comprising the product which results when 1-100 parts by weight of phosphorus oxide having the formula (P<sub>2</sub>O<sub>5</sub>)<sub>0.5-1.0</sub>(H<sub>2</sub>O)<sub>0.0-1.5</sub>, 1-100 parts by weight of melamine, and 1-100 parts by weight of polyol selected from at least one saturated open-chain polyol containing from 5 to 15 carbon atoms and from 4 to 8 hydroxyl groups are combined and heated under such conditions that when said product is incorporated into a synthetic resin in an amount sufficient to impart flame retardance said product will not cause significant foaming of the synthetic resin composition when said composition is subjected to molding conditions.

23. A flame retardant according to claim 1 comprising the product that results when about 30 to about 100 parts by weight of orthophosphoric acid is added to about 5 to about 90 parts by weight of polyol selected from at least one of pentaerythritol, dipentaerythritol, and tripentaerythritol, and to that is added 40 to about 125 parts by weight of urea and then the admixture is heated until substantially all the esterification has taken place to yield an esterification product, then said esterification product is combined with melamine in such an amount that the weight ratio of said esterification product to the melamine is in the range of 10:1 to 1:2 and then the mixture is heated under such conditions that sufficient foaming occurs to insure that after the flame retardant is incorporated into a synthetic resin there will be no significant foaming when said synthetic resin composition is subjected to molding conditions.

4,010,135

**COMPOSITION AND METHOD FOR DISPERSING HIGH MOLECULAR WEIGHT FLOCCULANT POLYMERS IN WATER**

Thomas R. Tutein, Cary, Ill., assignor to Chemed Corporation, Cincinnati, Ohio

Filed Sept. 3, 1975, Ser. No. 610,034

Int. Cl.<sup>2</sup> C08L 33/02

U.S. Cl. 260—29.6 HN

14 Claims

1. A new and improved composition for preparing solutions of high molecular weight polymers or copolymers, such solutions to be used in treating water and waste systems which consists of a combination of the flocculant polymer or copolymer with an inert additive and a bonding agent selected from the group consisting of ethylene glycol, propylene glycol, diethylene glycol, or acetic acid; said compositions, when added to water, producing initial slowing of the rate of solution of the polymer or copolymer, allowing time for dispersion and separation of the solid particles, thereby expediting final solution, and preventing the formation of agglomerates of the polymers or copolymers.

4,010,136

**LOW DUROMETER SILOXANE ELASTOMERS CONTAINING POLYTETRAFLUOROETHYLENE POWDER**

John D. Blizzard, and Carl M. Monroe, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed June 30, 1975, Ser. No. 591,906

Int. Cl.<sup>2</sup> C08L 83/04

U.S. Cl. 260—37 SB

14 Claims

1. A composition consisting essentially of,
  - a. 100 parts by weight of polydiorganosiloxane gum having a Williams plasticity of from 0.040 to 0.100 inches and having an average of from 1.999 to 2.001 organic radicals per silicon atom, at least 95 percent of the organic radicals being methyl, any remaining organic radical being selected from the group consisting of 3,3,3-trifluoropropyl and monovalent hydrocarbon radicals having from 1 to 6 carbon atoms, no more than 0.1 percent of all organic radicals in (a) having aliphatic unsaturation, said gum being endblocked with radicals selected from the group consisting of silicon-bonded hydroxyl radicals and silicon-bonded vinyl radicals,
  - b. from 15 to 25 parts by weight of a reinforcing silica filler having a surface area of at least 50 square meters per gram,
  - c. from 0.3 to 1.0 parts by weight, for every 100 parts by weight of the total of (a) plus (b) of a polytetrafluoroethylene powder having an average particle diameter of less than 1,000 microns and,
  - d. from 0 to 3.0 percent by weight, based on the total weight of said composition of an organic peroxide curing agent.

4,010,138

**METHOD FOR IMPROVING THE HEAT STABILITY OF POLYVINYL CHLORIDE**

Adam J. Ejik, Piscataway, and Robert C. Ringwood, Jr., Sewaren, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 454,364, March 25, 1974, abandoned.

This application Dec. 6, 1974, Ser. No. 530,357

Int. Cl.<sup>2</sup> C08K 5/52

U.S. Cl. 260—45.75 S

6 Claims

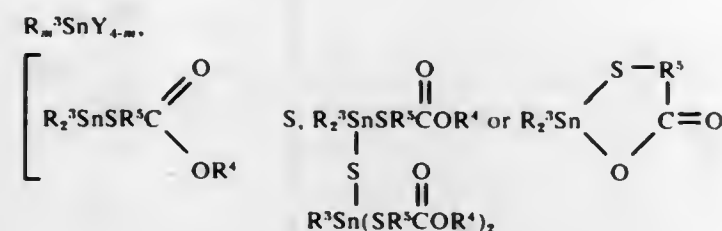
1. A method for improving the heat stability exhibited by shaped articles prepared using plasticized vinyl chloride polymer compositions consisting essentially of

- a. a vinyl chloride homopolymer or a copolymer wherein at least 50% of the repeating units are derived from vinyl chloride, the remaining repeating units being derived from one or more ethylenically unsaturated compounds which are copolymerizable with vinyl chloride;
- b. between 5 and 60%, based on the weight of said composition of a plasticizer for vinyl chloride polymers;
- c. between 0.5 and 5%, based on the weight of said composition, of an organic ester of phosphorous acid, said ester exhibiting the general formula P(OR<sup>1</sup>)<sub>3</sub> or P(OR<sup>1</sup>)<sub>2</sub>(OR<sup>2</sup>) wherein R<sup>1</sup> and R<sup>2</sup> are each selected from the group consisting of alkyl radicals containing between 1 and 20 carbon atoms, cycloalkyl, aralkyl, aryl, alkaryl radicals and hydrogen atoms with the proviso that the number of hydrogen atoms is 0 or 1,

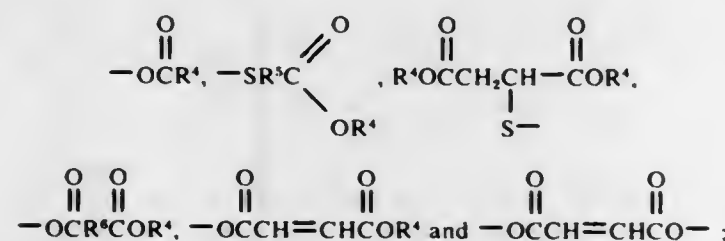
the method comprising (1) adding to said polymer composition between 0.1 and 1%, based on the weight of said composition



tion, of an organotin compound corresponding to the general formula  $R_m^3SnY_{4-m}$ .



wherein  $m$  represents the integer 1, 2 or 3 and  $Y$  represents a radical exhibiting a formula selected from the group consisting of  $-SR^4$ ,



$R^3$  and  $R^4$  are each individually selected from the group consisting of alkyl radicals containing between 1 and 20 carbon atoms, cycloalkyl, aralkyl, aryl and alkaryl radicals and  $R^5$  is a methylene or ethylene radical and  $R^6$  is an alkylene radical containing between 1 and 8 carbon atoms, inclusive, with the proviso that the organotin compound constitutes between 3 and 45% of the combined weight of the organotin compound and the organic ester of phosphorous acid, and (2) subsequently converting said composition into a product selected from the group consisting of shaped articles, films and coatings, wherein the conversion is accomplished in the absence of significant amounts of shear.

4,010,139

#### SELF-EXTINGUISHING POLYOLEFINIC COMPOSITIONS

Guido Bertelli, and Pierpaolo Roma, both of Ferrara, Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Oct. 24, 1975, Ser. No. 625,771

Claims priority, application Italy, Oct. 28, 1974, 28851/74; Aug. 11, 1975, 26281/75; Aug. 11, 1975, 26280/75

Int. Cl.<sup>2</sup> C08K 3/26, 5/56

U.S. Cl. 428-35

10 Claims

1. Polyolefinic compositions suited for the manufacture of self-extinguishing articles, comprising:

1. a polyolefin selected from the group consisting of homopolymers and copolymers of ethylene, alpha olefins and styrene; and
2. a mixture of:
  - a. a bismuth compound selected from the group consisting of basic bismuth carbonate and triphenyl-bismuthine; and
  - b. a partially halogenated compound, thermically unstable, which on heating decomposes with the formation of the corresponding hydrogen halide; component (a) being present in such an amount as to have a bismuth content in the composition lower than 5% by weight, while component (b) is present in an amount com-

prised between 1% and 10% by weight of the composition.

4,010,140

#### AGE RESISTANT RESIN COMPOSITIONS AND ADMIXTURES USEFUL AS ADHESIVES

Herbert L. Bullard, Norton Village, and Robert A. Osborn, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

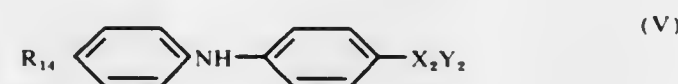
Filed Oct. 2, 1974, Ser. No. 511,412

Int. Cl.<sup>2</sup> C08F 15/02, 15/40; C08C 9/14

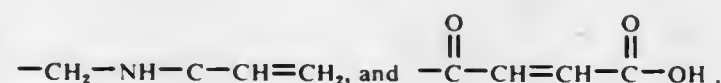
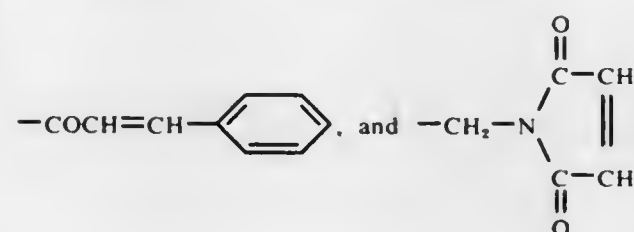
U.S. Cl. 260-47 UA

6 Claims

1. An age resistant tackifying resin which comprises a composition having a softening point in the range of 0° C. to about 140° C. comprising (1) about 40 to about 80 weight percent units derived from aliphatic diolefins selected from piperylene, 1,3-butadiene and 2,3-dimethyl-1,3-butadiene, (2) about 60 to about 20 weight percent units derived from aliphatic monoolefins selected from isobutylene, 2-methyl-1-butene, 2-methyl-2-butene, 2,3-dimethyl-1-butene, 2,3-dimethyl-2-butene, 2-methyl-1-pentene, and 2-methyl-2-pentene, where the mole ratio of diolefin to monoolefin is about 0.7/1 to about 2/1, (3) about 0 to about 40 weight percent units derived from at least one of dicyclopentadiene and a vinyl aromatic compound selected from styrene and  $\alpha$ -methyl styrene and (4) about 0.2 to about 2 weight percent units derived from at least one selected amine type compound, where said amine compounds are selected from an amine compound having the structure



where  $R_{14}$  is selected from hydrogen, methyl, ethyl and methoxy radicals, where  $X_2$  is selected from the groups consisting of  $-\text{NH}-$ ,  $-\text{N}-\text{CH}(\text{CH}_3)-\text{CH}_2-\text{CH}_2-\text{CH}_3$ , and oxygen and where  $Y_2$  is selected from the group consisting of  $-\text{COCH}=\text{CH}_2$ ,



4,010,141

#### ANTI-FOULING COMPOSITION FOR USE IN WATER COMPRISING A POLYMER AND AN ORGANO TIN COMPOUND

Mitsuo Onozuka; Yasuo Hayashi, and Yoshiaki Adachi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 248,270, April 17, 1972, Pat. No. 3,861,949. This application Jan. 10, 1975, Ser. No. 540,202

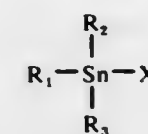
Claims priority, application Japan, Apr. 27, 1971, 46-27158; Nov. 1, 1971, 46-86263; Dec. 27, 1971, 47-105482 Int. Cl.<sup>2</sup> C08K 5/57

U.S. Cl. 260-45.75 K

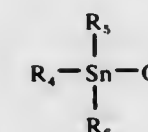
3 Claims

1. An article to be used on or in the water, at least the surfaces of said article comprising an anti-fouling composition comprising a synthetic resin and an amount of a substance

effective to prevent fouling which comprises 0.5-200 parts by weight based on 100 parts by weight of said synthetic resin of an organo-tin compound of the formula:



wherein  $R_1$  is n-dodecyl,  $R_2$  and  $R_3$  are methyl and X stands for a.



wherein  $R_1$  is a  $C_8-C_{12}$  alkyl group and  $R_5$  and  $R_6$  are  $C_1-C_3$  alkyl groups, the total number of alkyl carbon atoms in  $R_4$ ,  $R_5$  and  $R_6$  being less than 15;

- b. halogen;
- c. an alkoxyl radical selected from the group consisting of a residue of a saturated or unsaturated straight chain or branched aliphatic alcohol, a saturated or unsaturated cycloaliphatic alcohol and an aromatic alcohol, the number of carbon atoms being 3-24;
- d. a thioalkoxyl radical selected from the group consisting of a residue of a saturated or unsaturated straight chain or branched aliphatic thioalcohol, a saturated or unsaturated cycloaliphatic thioalcohol and an aromatic thioalcohol, the number of carbons included in the alcohol being 3-24; or
- e. an organic acid radical selected from the group consisting of a mono-, di- or tribasic  $C_2-C_{24}$  saturated, unsaturated, straight chain or branched chain aliphatic, cycloaliphatic and aromatic carboxylic acid.

4,010,142

#### PURIFICATION OF ACRYLAMIDE VIA CRYSTALLIZATION WITH CENTRIFUGAL LIQUOR SEPARATION

John R. Hurlock, Hickory Hills, and Kenneth G. Phillips, River Forest, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 15, 1975, Ser. No. 641,062

Int. Cl.<sup>2</sup> C07C 103/133

U.S. Cl. 260-561 N

7 Claims

1. A method for purifying an aqueous solution of acrylamide from organic impurities produced by the catalytic hydration of acrylonitrile to acrylamide which comprises:

- a. concentrating said aqueous solution by vacuum stripping in the range  $>25^\circ\text{C}$  to  $50^\circ\text{C}$  to produce an acrylamide concentration of about 80 percent;
- b. cooling to about  $25^\circ\text{C}$  to produce a slurry of acrylamide crystals;
- c. centrifuging said acrylamide crystals to express mother liquor and to produce a crystal cake of acrylamide;
- d. washing crystal cake with water wash to produce an aqueous rinse liquor; and
- e. recycling the mother liquor and aqueous rinse liquor to the vacuum stripping, step (a), for  $n$  times where  $n = 4-20$ .

4,010,143

#### MOLDING COMPOUND CONTAINING N-METHYL-2-PYRROLIDONE AND METHOD

Dervin L. Flowers, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Dec. 26, 1973, Ser. No. 428,472

Int. Cl.<sup>2</sup> C08G 30/06

U.S. Cl. 260-59 EP

2 Claims

2. A molding compound consisting essentially of 0.1 to 10 percent N-methyl-2-pyrrolidone and the balance a semiconductor molding resin selected from the group consisting of epoxy, phenolic and silicone resin.

4,010,144

#### FLAME RETARDANT PHOSPHATE ESTER DERIVATIVES OF ORTHO NOVOLAKS

Bobby F. Dannels, and Alvin F. Shepard, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

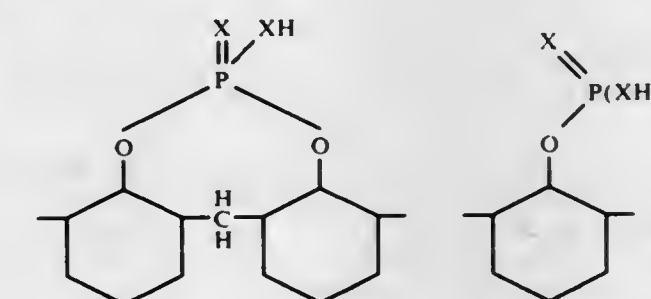
Continuation-in-part of Ser. No. 451,670, March 13, 1974, abandoned. This application Dec. 3, 1975, Ser. No. 637,338

Int. Cl.<sup>2</sup> C08G 12/44

U.S. Cl. 260-59 R

11 Claims

1. A novolak resin wherein at least 90% of the alkylidene linkage is ortho to ortho and at least 25% of the phenolic hydroxyl groups are esterified and which comprises the following moieties:



wherein X is selected from the group consisting of O or S.

5. The method of producing a flame-retardant polymer which comprises the step of esterifying a novolak resin containing at least 90% of the alkylidene linkage as ortho to ortho with a member selected from the group consisting of  $\text{P}_2\text{O}_5$ ,  $\text{P}_2\text{O}_3$ ,  $\text{P}_2\text{O}_3$  or mixtures thereof to provide the novolak resins of claim 1.

4,010,145

#### PROCESS AND CATALYST INHIBITOR SYSTEMS FOR PREPARING SYNTHETIC LINEAR POLYESTERS

Nicholas C. Russin; Ronald A. Tershansy, and Charles J. Kibler, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 576,415, May 12, 1975, Pat. No. 3,962,189, and a continuation-in-part of Ser. No. 519,953, Nov. 1, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,672

Claims priority, application Canada, Oct. 1, 1975, 236847; Germany, Oct. 30, 1975, 2548630; Italy, Oct. 30, 1975, 28846/75; Japan, Oct. 30, 1975, 50-130951; France, Oct. 31, 1975, 75.33316; United Kingdom, Oct. 31, 1975, 45353/75

Int. Cl.<sup>2</sup> C08G 63/14

U.S. Cl. 260-75 R

22 Claims

1. Process for producing poly(ethylene terephthalate) comprising reacting dimethyl terephthalate and ethylene glycol at a temperature sufficient to effect ester interchange and in the presence of a catalyst system comprising a mixture of salts of manganese and cobalt with a titanium alkoxide and an anti-mony compound, the manganese salts being present in the amount of about 25-110 ppm Mn, the cobalt salts being present in the amount of about 10-100 ppm Co, the titanium alkoxide being present in the amount of about 20-60 ppm Ti,



and the antimony compound being present in the amount of about 50-300 ppm Sb, all parts by weight based on the acid fraction of the polyester.

4,010,146

# POLYOL BLENDS AND POLYURETHANE PREPARED THEREFROM

David D. Russell, Atwater, and George Shkapenko, Akron, both of Ohio, assignors to Samuel Moore and Company, Aurora, Ohio

Filed Sept. 29, 1975, Ser. No. 617,655

Int. Cl.<sup>2</sup> C08G 18/00

U.S. Cl. 260-77.5 AM

7 Claims

1. A thermoplastically processible polyurethane prepared by reacting an organic diisocyanate, a low molecular weight glycol chain extender having only primary hydroxyl groups and a blend of from about 5 to about 95 parts by weight per 100 parts of a block copolymer of ethylene oxide and 1,2-propylene oxide having the formula

$\text{HO}[(\text{C}_2\text{H}_5 - \text{O})_x(\text{C}_3\text{H}_6 - \text{O})_y(\text{C}_2\text{H}_5 - \text{O})_z]_n\text{H}$   
wherein  $x$  and  $z$  are integers of from 0 to 22 and  $y$  is an integer of from 1 to 20 and the molecular weight of the copolymer is between 500 and 3000 and the remainder poly(tetramethylene ether)glycol having a molecular weight of from about 500 to about 3000, said block copolymer containing from about 60 to about 100 percent primary hydroxyl groups.

4,010,147

# AROMATIC POLYMERS CONTAINING KETONE LINKING GROUPS AND PROCESS FOR THEIR PREPARATION

John Brewster Rose, Letchworth, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 467,798, May 7, 1974, Pat. No. 3,928,295. This application Dec. 22, 1975, Ser. No. 643,082

Claims priority, application United Kingdom, May 25, 1973, 25202/73; May 25, 1973, 25205/73; June 22, 1973, 29682/73; Oct. 12, 1973, 47684/73; Dec. 20, 1973, 59060/73; Mar. 14, 1974, 11443/74

The portion of the term of this patent subsequent to Dec. 23, 1992, has been disclaimed.

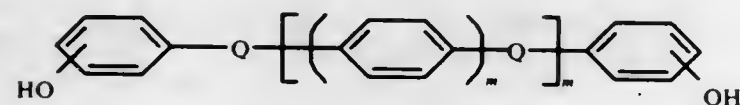
Int. Cl.<sup>2</sup> C08G 2/00, 75/20

U.S. Cl. 260-79.3 M

1 Claim

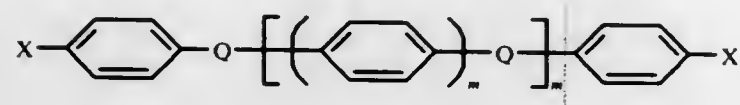
1. A process for the preparation of aromatic polymers having reduced viscosity of between 0.8 and 3.0, as measured at 25° C on a solution of polymer in concentrated sulphuric acid of density 1.84 g/cm<sup>3</sup> containing 1 g of polymer in 100 cm<sup>3</sup> of solution, which comprises heating at a temperature of 250° to 400° C a monomer mixture comprising

1. 49 to 50% molar of a di(alkali metal) salt of at least one bisphenol of the formula



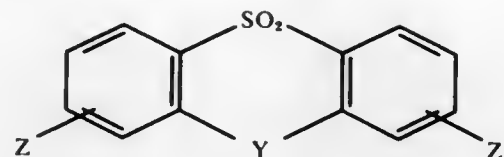
at least 95% of the phenolic OH groups being in the para position, and

2. 51 to 50% molar at least one dihalo compound of the formula



where  $Q$  is  $\text{SO}_2$  or  $\text{CO}$ ,  $X$  is  $\text{F}$ ,  $\text{Cl}$  or  $\text{Br}$ ,  $n$  is a positive integer not exceeding 3 and  $m$  is 0 or 1, and the molar percentages of said di(alkali metal) salt and said at least one dihalo compound sum to 100%, said di(alkali metal)

salt being present as a suspension in a diaryl sulphone having the formula



in which  $Y$  is a direct link, an oxygen atom or two hydrogen atoms (one attached to each benzene ring) and  $Z$  and  $Z'$  are selected from hydrogen atoms and phenyl groups and may be the same or different, the proportion of  $\text{SO}_2$  to  $\text{CO}$  groups in the monomer mixture being not greater than 25%.

4,010,148

# PURIFIED THYMOSIN AND PROCESS

Allan Leonard Goldstein, Galveston, Tex., assignor to Board of Regents of the University of Texas System, Galveston, Tex.

Filed May 12, 1975, Ser. No. 576,509

Int. Cl.<sup>2</sup> C07C 103/52; C07G 7/00

U.S. Cl. 260-112 R

9 Claims

1. In a process for recovering a biologically active protein component from thymus tissue, said process comprising

i. homogenizing and extracting thymic tissue in aqueous saline solution, then centrifuging to remove undissolved material;

ii. heat treating the centrifuge supernatant at about 80° C., which treatment precipitates undesired fraction then centrifuging to remove the precipitated portions;

iii. admixing the supernatant with a large excess of cold acetone, thereby precipitating the active fraction, and collecting said precipitate;

iv. dissolving the acetone precipitate in phosphate buffer, then adding ammonium sulfate to about 25% of saturation and removing non-soluble impurity; and

v. increasing the ammonium sulfate content to about 50% of saturation, thereby precipitating the active fraction; the improvement which comprises in combination

A. dissolving the collected precipitate from step (v) in phosphate buffer and ultrafiltering the solution using a membrane having a molecular weight cut-off of 15,000;

B. concentrating the ultrafiltration filtrate and treating the residue by column chromatography to thereby separate salt and nucleotides;

C. isolating the protein peak from (B) and then additionally purifying the protein material by column chromatography followed by gel filtration and then gel electrophoresis.

4,010,149

# ANALOGS OF LH-RH AND PROCESS FOR PREPARING THE SAME

Yoshihiko Baba; Yutaka Okada; Hiroyoshi Horikoshi, and Yuichiro Yabe, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Apr. 7, 1975, Ser. No. 565,362

Claims priority, application Japan, Apr. 26, 1974, 49-48174

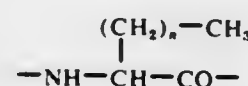
Int. Cl.<sup>2</sup> C07C 103/52; C07G 7/00

U.S. Cl. 260-112.5 LH

8 Claims

1. A peptide having the formula N-Acetyl-N-methylglycyl-L-histidyl-L-tryptophyl-L-seryl-L-tyrosyl-Y-L-leucyl-L-arginyl-L-prolyl-Z

wherein  $Y$  is a D- $\alpha$ -alkylglycine residue of the formula



in which  $n$  is an integer of 0 through 3 inclusive and  $Z$  is ethylamino group or an ethylamino group which is substituted with 1 to 3 fluorine atoms at the 2-position.

4,010,150

# RED COPPER COMPLEXES OF DISAZO COMPOUNDS CONTAINING TRIAZINE GROUPS

Tooru Tabei, Ohmiya; Yasuhiko Arisaka, Yono, and Yutaka Iizuka, Mitaka, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1973, Ser. No. 421,581

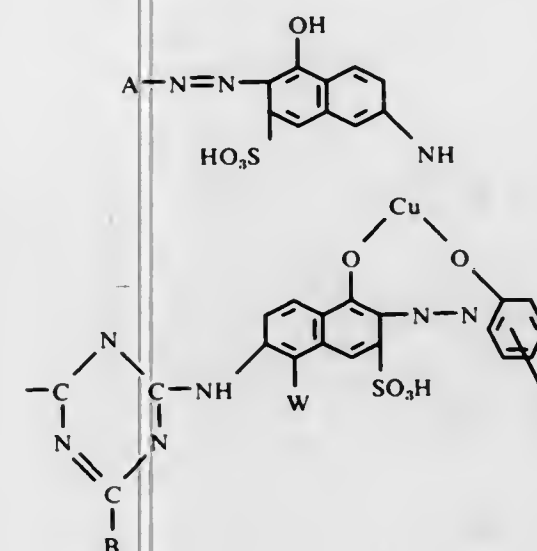
Claims priority, application Japan, Dec. 6, 1972, 47-121694; Dec. 9, 1972, 47-123701; July 10, 1973, 48-77066; July 19, 1973, 48-82271

Int. Cl.<sup>2</sup> C09B 45/28, 62/08; D06P 1/10, 3/60

U.S. Cl. 260-146 T

13 Claims

1. An azo dye having the following formula:



wherein

A is a group selected from 4-methoxy-2-sulphophenyl, 4-methoxy-3-sulphophenyl, 2- or 3-sulphophenyl, tolyl, 4-nitro-2,2'-disulphostilbyl, sulfonaphthyl and 4-(4-sulphophenylazo)-2-sulphophenyl;

B is selected from monoethanolamino, diethanolamino, morpholino, and N-methylamino;

W is hydrogen or sulfonic acid; and

Z is sulfonic acid attached at the meta or para position relative to the pendant diazo.

4,010,151

# WATER INSOLUBLE MONO AZO AND DISAZO DYES CONTAINING CINNAMONITRILE GROUP

Claude Marie Henri Emile Brouard, Sotteville les Rouen; Jean Marie Louis Leroy, St. Etienne du Rouvray, and Jean-Pierre Henry Stiot, Saint Pierre les Elbeuf, all of France, assignors to Produits Chimiques Ugine Kuhlmann, St. Denis, France

Continuation-in-part of Ser. No. 123,414, March 11, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 459,147

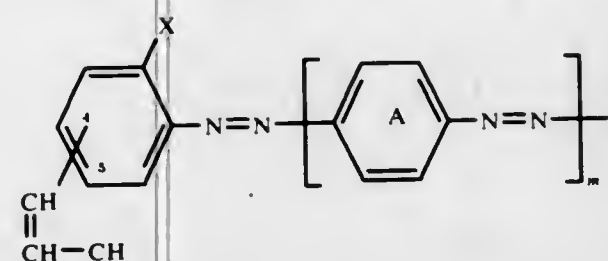
Claims priority, application France, Mar. 12, 1970, 70.08829; Apr. 13, 1973, 73.13392

Int. Cl.<sup>2</sup> C09B 29/08, 29/36, 29/38, 33/12

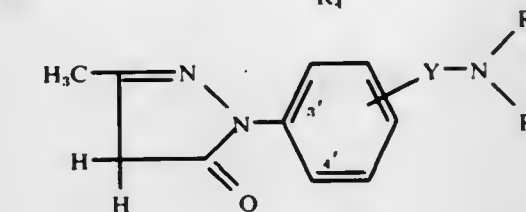
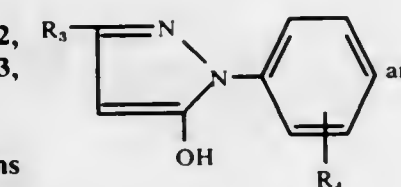
U.S. Cl. 260-160

3 Claims

1. A dyestuff of the formula:



in which  $-\text{CH}=\text{CH}-\text{CN}$  is fixed in the 4- or 5- position,  $X$  is hydrogen or chlorine,  $m$  is zero or one, the benzene nucleus A is unsubstituted or substituted by one chlorine, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, acetyl amino, propanoyl amino, benzoyl amino or cinamoyl amino, and B is selected from the group consisting of hydroxycarbazole, N-alkyl-4-hydroxy-2-quinolones with 1 to 4 carbon atoms in the alkyl group,



wherein  $Y$  is  $\text{CO}$  or  $\text{SO}_2$ , the group  $-\text{Y}-\text{NR}_2$  is fixed in the 3' or 4' position,  $R_1$  is alkyl containing 1 to 4 carbon atoms,  $R_2$  is hydrogen or alkyl containing 1 to 4 carbon atoms,  $R_3$  is hydrogen, methyl, alkoxy carbonyl, carbonamide, N-alkyl- or N,N-dialkylcarbonamido, the alkyl and alkoxy groups containing 1 to 4 carbon atoms, and  $R_4$  is hydrogen, chlorine, cyano, nitro, methyl or sulphonamido.

4,010,152

# ALIPHATIC ALPHA-(HYDROPEROXY) AZO COMPOUNDS AND SALTS THEREOF

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 88,249, Nov. 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 725,180, April 29, 1968, abandoned, which is a

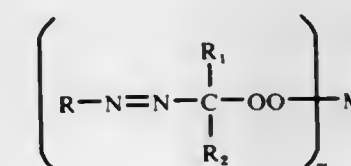
continuation-in-part of Ser. No. 616,158, Feb. 15, 1967, abandoned. This application Mar. 21, 1974, Ser. No. 453,445

Int. Cl.<sup>2</sup> C07C 107/02

U.S. Cl. 260-192

9 Claims

1. A compound of the formula



where  $M$  is hydrogen, alkali metal or alkaline earth metal;  $m$  is the valence of  $M$ ;

$R$  is  $\text{C}_1 - \text{C}_{12}$  alkyl,  $\text{C}_3 - \text{C}_{12}$  cyclo-, bicyclo- or tricycloalkyl, or  $\text{C}_7 - \text{C}_9$  aralkyl;

$R_1$  and  $R_2$  are separately selected from hydrogen,

$\text{C}_1 - \text{C}_8$  alkyl,  $\text{C}_3 - \text{C}_{12}$  cyclo-, bicyclo- or tricycloalkyl,  $\text{C}_7 - \text{C}_{12}$  aralkyl and,  $\text{C}_6 - \text{C}_{14}$  aryl,

and  $R_1$  and  $R_2$  taken together form  $\text{C}_3 - \text{C}_7$  alkylene; and one or more of each of  $R$ ,  $R_1$  and  $R_2$  can be substituted with

lower alkoxy, hydroxy, carboxy, lower alkoxy carbonyl, lower alkyl carbonyloxy, halogen, cyano, dimethylamido or lower alkylsulfonate.



4,010,153

**PREPARATION OF CHIRAL  
1,4-BENZODIAZEPIN-2-ONE-DERIVATIVES BY  
REACTION OF (S)- $\alpha$ -AMINO ACID CHLORIDE  
HYDROCHLORIDES ETC.**

Franjo Kajfež, and Vitomir Šunjić, both of Chiasso, Switzerland, assignors to CRC Compagnia di Ricerca Chimica S.A., Chiasso, Switzerland

Filed July 29, 1974, Ser. No. 492,912

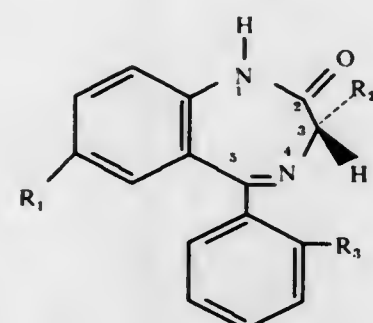
Claims priority, application Switzerland, July 30, 1973, 11056/73

Int. Cl.<sup>2</sup> C07D 243/48

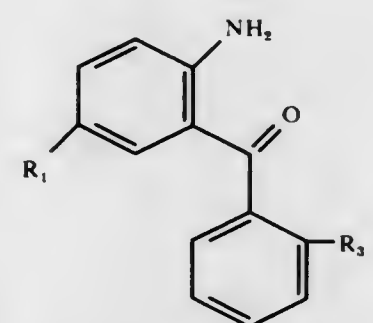
U.S. Cl. 260—239.3 D

9 Claims

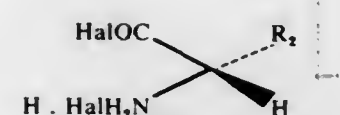
1. A process preparing optically active 1,4-benzodiazepin-2-ones with (S)-configuration in the 3-position having the formula I



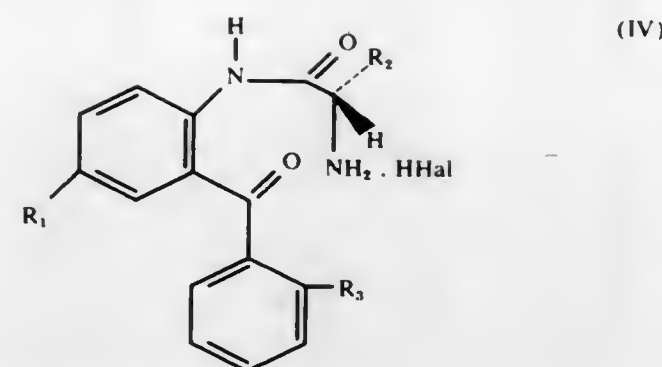
wherein R<sub>1</sub> is a hydrogen atom, or a halogen atom, R<sub>2</sub> is an n- or iso- lower alkyl radical with at most 4 carbon atoms, a benzyl, p-hydroxybenzyl, or 3'-methyleneindolyl group, R<sub>3</sub> is a hydrogen atom or a halogen atom, comprising the steps of (a) reacting, in an inert solvent selected from methylene chloride and tetrahydrofuran at about room temperature, a compound of the formula II



wherein R<sub>1</sub> and R<sub>3</sub> have the same significance as in Formula I with a compound of the formula III in the (S)-configuration



in which R<sub>2</sub> has the same significance as in Formula I and Hal is a halogen atom, whereby an intermediate compound of the formula IV in the (S)-configuration is formed, and



(b) cyclizing said intermediate compound in an inert solvent selected from the group consisting of a homogeneous mixture of water and an organic solvent and non-polar organic solvents, at a temperature of up to about 40° C whereby the compound of Formula I, in the (S)-configuration is formed.

4,010,154

**BENZODIAZEPINONES**

Hisao Yamamoto, Nishinomiya; Shigeo Inaba, Takarazuka; Toshiyuki Hirohashi, Ashiya; Michihiro Yamamoto, Toyonaka; Kikuo Ishizumi, Minoo; Mitsuhiko Akatsu, Ikeda; Isamu Maruyama, Minoo; Kazuo Mori, Kobe; Yoshiharu Kume, Neyagawa, and Takahiro Izumi, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 111,141, Jan. 29, 1971, Pat. No. 3,867,372. This application Aug. 16, 1974, Ser. No. 497,936

Claims priority, application Japan, Feb. 3, 1970, 45-9691; Feb. 5, 1970, 45-10533; June 24, 1970, 45-55529; June 24, 1970, 45-55530

Int. Cl.<sup>2</sup> C07D 243/20

U.S. Cl. 260—239.3 D

7 Claims

1. 1-( $\beta$ -Methylsulfonyl-ethyl)-5-phenyl-7-chloro-1,3-dihydro-2H-1,4-benzodiazepin-2-one.

4,010,155

**ANTIBIOTIC SF-1623 SUBSTANCE**

Shigeharu Inouye; Takashi Shomura, both of Yokohama; Michio Kojima, Tokyo; Yasuaki Ogawa, Yokohama; Hiroshi Watanabe, Yokohama; Yasumitsu Kondo, Yokohama, all of Japan; Kazuo Saito, deceased, late of Fujisawa, Japan (by Nobuko Saito, administratrix); Yujiro Yamada, and Taro Niida, both of Yokohama, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

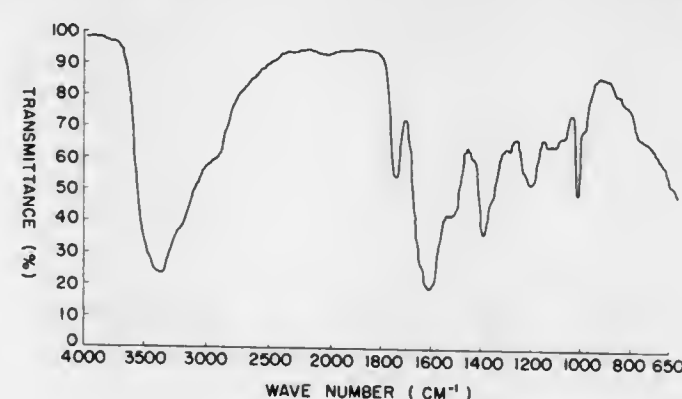
Filed Nov. 25, 1974, Ser. No. 526,731

Claims priority, application Japan, Nov. 28, 1973, 48-132594

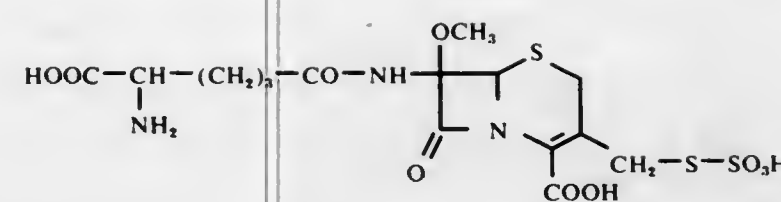
Int. Cl.<sup>2</sup> C07D 501/36; C12D 9/00

U.S. Cl. 260—243 C

5 Claims



1. A substance designated as SF-1623 substance and identified as a compound of the formula:



and its non-toxic pharmaceutically acceptable salt.

4,010,156

**PROCESS FOR THE REARRANGEMENT OF  
PENICILLINS TO CEPHALOSPORINS AND  
INTERMEDIATE COMPOUNDS THEREOF**

Abraham Nudelman, Bala Cynwyd, and Ronald J. McCaully, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

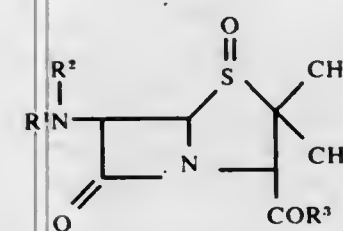
Division of Ser. No. 352,850, April 19, 1973, Pat. No. 3,932,398. This application Aug. 7, 1975, Ser. No. 602,623

Int. Cl.<sup>2</sup> C07D 501/10

U.S. Cl. 260—243 C

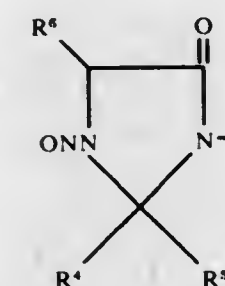
7 Claims

1. A process for the preparation of a 3-halo-3-methyl-cepham-4-carboxylic acid ester or amide which comprises heating from between 50° to 150° C. for from 10 to about 50 hours a penicillin sulfoxide of the formula



in which

R<sup>1</sup> is a member selected from the group consisting of acetyl, phenylacetyl, phenoxyacetyl, thiophenoxyacetyl, 2-thienylacetyl, tetrazolylacetyl, cyanoacetyl, sydnone-3-acetyl, pyridylthioacetyl, alpha-hydroxyphenylacetyl and alpha-hydroxy-2-thienylacetyl, R<sup>2</sup> represents hydrogen or a radical that in conjunction with R<sup>1</sup>N forms a phthalimido radical, or



in which

R<sup>4</sup> and R<sup>5</sup> are hydrogen or a lower alkyl group and R<sup>6</sup> is phenyl or 1,4-cyclohexadienyl; R<sup>3</sup> is a substituent selected from the group consisting of lower alkoxy, 2,2,2-trichloroethoxy, aryloxy of 6 to 10 carbon atoms, aralkoxy of 7 to 12 carbon atoms, alkox-arylalkoxy of 9 to 14 carbon atoms, mono- or di-lower alkylamino, arylamino of 6 to 10 carbon atoms, saccharimido and phthalimido radicals,

in a polyhaloalkane solvent in the presence of at least an equimolar amount of a quaternary ammonium catalyst of the formula



in which the groups

R<sup>7</sup>, when taken alone, are independently selected from the group consisting of lower alkyl, aryl of 6 to 10 carbon

atoms, aralkyl of 7 to 12 carbon atoms, and the three R<sup>7</sup> groups, when taken with the nitrogen atom to which they are attached form a pyridinyl, picolinyl, quinolinyl, isoquinolinyl or lutidinyl radical;

Y is a member selected from the group consisting of —Cl, —Br, —I, lower alkanoyloxy, lower thioalkanoyloxy, p-toluenesulfonyloxy, azido or a quaternary ammonium group, and

A is a member of the group consisting of Cl, —Br and —I.

4,010,157

**O-ALKYL-S-[1,6-DIHYDRO-3-METHYL-6-OXO-PYRIDAZIN-(1-YLMETHYL)(THIONO)  
(DI)THIOL-PHOSPHORIC ACID ESTERS AND  
ESTER-AMIDES**

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe, all of Wuppertal, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 13, 1974, Ser. No. 505,801

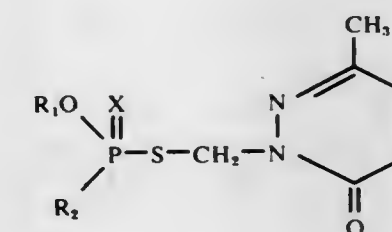
Claims priority, application Germany, Sept. 28, 1973, 2348736

Int. Cl.<sup>2</sup> C07F 9/24

U.S. Cl. 260—250 AP

6 Claims

1. An S-[1,6-dihydro-3-methyl-6-oxo-pyridazin-(1)-ylmethyl]-(thiono)-(di)-thiol-phosphoric acid ester or ester-amide of the formula



in which

R<sub>1</sub> is alkyl with up to 6 carbon atoms, R<sub>2</sub> is monoalkylamino, dialkylamino, alkenylamino or alkynylamino with up to 6 carbon atoms per alkyl, alkenyl or alkynyl moiety, and X is oxygen or sulfur.

4,010,158

**1-(2'-ETHYNYL-PHENOXY)-2-HYDROXY-3-BUTYLAMINO-PROPANES AND SALTS**

Herbert Köppe; Karl Zeile; Werner Kummer; Helmut Stahle, all of Ingelheim am Rhein, and Albrecht Engelhardt, Mainz (Rhine), all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 727,078, May 6, 1968, abandoned. This application Jan. 18, 1973, Ser. No. 324,844

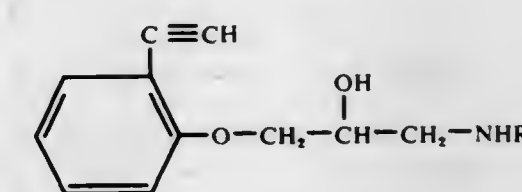
Claims priority, application Germany, May 18, 1967, 92594

Int. Cl.<sup>2</sup> C07C 93/06; C07D 473/00

U.S. Cl. 260—253

3 Claims

1. A compound of the formula



wherein R is secondary butyl or tertiary butyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.



4,010,159

**PYRROLO[3,4-D]PYRIMIDINES AND METHODS FOR THEIR PREPARATION**

Giorgio Tarzia, Rome, and Gianbattista Panzone, Cornaredo (Milan), both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

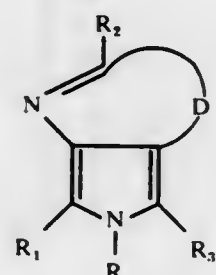
Filed Mar. 17, 1975, Ser. No. 559,192

Claims priority, application United Kingdom, Mar. 20, 1974, 12369/74

Int. Cl.<sup>2</sup> C07D 487/04

U.S. Cl. 260—256.4 F

1. Compound of formula



wherein:

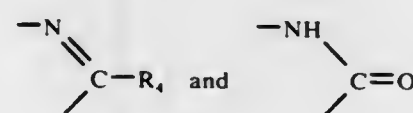
R represents hydrogen, (C<sub>1-4</sub>)alkyl, benzyl or chloro substituted benzyl;

R<sub>1</sub> stands for hydrogen, (C<sub>1-4</sub>)alkyl, phenyl, or phenyl substituted with methyl, ethyl, methoxy, hydroxy, chloro, fluoro or bromo;

R<sub>2</sub> may be hydrogen, (C<sub>1-4</sub>)alkyl, phenyl or amino;

R<sub>3</sub> is selected from hydrogen or (C<sub>1-4</sub>)alkyl;

D represents a divalent radical selected from the groups



wherein the carbon atoms are linked to the carbon atom of the pyrrole nucleus and R<sub>4</sub> represents hydroxy, (C<sub>1-4</sub>)alkyl or phenyl;

and a salt thereof with a pharmaceutically acceptable acid.

4,010,160

**PROCESS FOR THE MANUFACTURE OF 1,3-BIS-(β-ETHYLHEXYL)-5-AMINO-5-METHYL-HEXAHYDROPYRIMIDINE**

Fritz-Walter Lange, Gauting; Gert Haffner, Laupheim, and Jens Muller, Gauting, all of Germany, assignors to Meditest Institut für Medizinisch Pharmazeutische Untersuchungen GmbH, Neu, Ulm, Germany

Filed Jan. 27, 1975, Ser. No. 544,217

Int. Cl.<sup>2</sup> C07D 239/04

U.S. Cl. 260—256.4 H

5 Claims

1. A process for the manufacture of high purity 1,3-bis-(β-ethylhexyl)-5-amino-5-methyl-hexahydropyrimidine comprising steps of:

a. providing a solution containing 1,3-bis-(β-ethylhexyl)-5-nitro-5-methyl-hexahydropyrimidine in a suitable solvent therefor;

b. adding naphthalene-1,5-disulphonic acid to said 1,3-bis-(β-ethylhexyl)-5-nitro-5-methyl-hexahydropyrimidine in said solution, whereby a reaction mixture is formed and 1,3-bis-(β-ethylhexyl)-5-nitro-5-methyl-hexahydropyrimidine-naphthalene-1,5-disulphonate is produced as a reaction product;

c. separating said reaction product from said reaction mixture by selective precipitation;

d. treating said reaction product with an aqueous alkali solution to effect conversion of said reaction product into 1,3-bis-(β-ethylhexyl)-5-nitro-5-methyl-hexahydropyrimidine;

e. separating said 1,3-bis-(β-ethylhexyl)-5-nitro-5-methyl-hexahydropyrimidine from said aqueous alkali solution; and

f. effecting hydrogenation of said 1,3-bis-(β-ethylhexyl)-5-nitro-5-methyl-hexahydropyrimidine to form said high purity 1,3-bis-(β-ethylhexyl)-5-amino-5-methyl-hexahydropyrimidine.

4,010,161

**1 Claim PIPERAZINOETHYL-N-(2,3-DIMETHYL-5-OXO-1-PHENYL-3Δ-PYRAZOLIN-4-YL)CARBAMATES**

Don Pierre René Lucien Giudicelli, Fontenay-sous-Bois; Henry Najer; Bogdan Iliesco-Branceni, both of Paris; Philippe Michel Jacques Manoury, L'Hay-les-Roses, and Jean Louis Christian Binet, Ballainvillers, all of France, assignors to Synthelabo, Paris, France

Filed Dec. 20, 1974, Ser. No. 534,792

Claims priority, application France, Dec. 21, 1973, 73.45925

Int. Cl.<sup>2</sup> C07D 403/12

U.S. Cl. 260—268 PH

5 Claims

1. A compound which is 2-(4-m-chlorophenyl-piperazino)-ethyl N-(2,3-dimethyl-5-oxo-1-phenyl-3Δ-pyrazolin-4-yl)-carbamate or its tartrate.

4,010,162

**SUBSTITUTED PHENANTHROLINE PIGMENTS**

James J. Jordan, Jr., Livingston, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

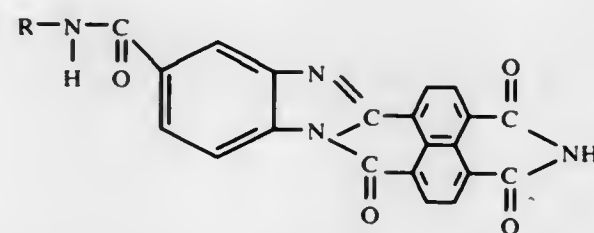
Continuation-in-part of Ser. No. 508,481, Sept. 23, 1974, abandoned. This application Oct. 20, 1975, Ser. No. 623,701

Int. Cl.<sup>2</sup> C07D 471/16

U.S. Cl. 260—272

19 Claims

1. A compound having the formula



wherein R is phenyl, anthraquinonyl, chlorophenyl, dichlorophenyl, trichlorophenyl, methylphenyl, dimethylphenyl, trimethylphenyl, methoxyphenyl, dimethoxyphenyl, trimethoxyphenyl, (chloro)-(methyl)phenyl, (chloro)(methoxy)-phenyl, (chloro)(dimethoxy)phenyl, (methyl)(methoxy)phenyl, (methoxy)(nitro)phenyl, (chloro)(nitro)-phenyl or (methyl)(nitro)phenyl.

4,010,163

**PHENOLIC RESINS**

Wolfgang Hesse, Wiesbaden, and Paul Jacobi, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Mar. 24, 1975, Ser. No. 561,339

Claims priority, application Germany, Mar. 23, 1974, 2414097

Int. Cl.<sup>2</sup> C08G 2/34, 8/10; C08L 61/10

U.S. Cl. 260—29.3

10 Claims

7. A hardenable phenolic resin composition which is substantially free from unreacted phenol and unreacted formaldehyde and which liberates at most only trace quantities of formaldehyde during a hardening process which comprises a liquid phase selected from the group consisting of (a) a solution and (b) an aqueous emulsion of the reaction product of

A. a novolak wherein the molar ratio of phenol(s) to formaldehyde is from 1:0.1 to 1:0.8 containing methylene bridges, being not predominantly cross-linked in the

ortho-position and being substantially free from unreacted phenol with

B. formaldehyde in the presence of from 0.15 to 1 equivalent (based on the number of phenolic hydroxy groups) of a basic catalyst at a temperature of from 20° to 70° C the formaldehyde being added in an amount such that 2 to 2½ of the three o- and p-positions in the phenolic nuclei are occupied by methylol groups, methylene bridges, alkyl or other substituents.

4,010,164

**N-(FURYL-METHYL)-2-HYDROXY-5,9,9-TRIMETHYLBENZOMORPHANS AND SALTS THEREOF**

Adolf Langbein; Herbert Merz; Gerhard Walther, and Klaus Stockhaus, all of Ingelheim, Rhine, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim, Rhine, Germany, Continuation-in-part of Ser. No. 454,964, March 27, 1974, abandoned. This application July 28, 1975, Ser. No. 599,427

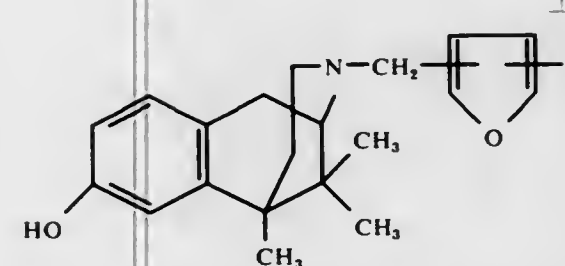
Claims priority, application Germany, Mar. 28, 1973, 2315339

Int. Cl.<sup>2</sup> C07D 405/06

U.S. Cl. 260—293.54

7 Claims

1. An optically inactive or optically active compound of the formula



wherein R is hydrogen or methyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,010,165

**MANUFACTURE OF THIOPHEN-3-ALDEHYDE**

Horst Koenig, and Ulrich Ohnsorge, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 24, 1975, Ser. No. 616,447

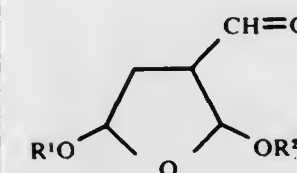
Claims priority, application Germany, Oct. 3, 1976, 2447253

Int. Cl.<sup>2</sup> C07D 333/16

U.S. Cl. 260—332.3 R

10 Claims

1. A process for the manufacture of thiophen-3-aldehyde, which comprises reacting a 2,5-dialkoxy-3-formyl-tetrahydrofuran of the formula I



in which R<sup>1</sup> and R<sup>2</sup> may be identical or different and each is straight-chain or branched alkyl of 1 to 5 carbon atoms, with hydrogen sulfide in the presence of an acid whose pK in aqueous solution is at most 5.0 at elevated temperatures of from 50° to 320° C.

4,010,166  
1,4-OXAZEPINES

Robert Mathews Bowman, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

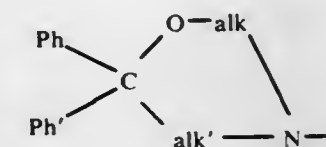
Continuation-in-part of Ser. No. 526,758, Nov. 25, 1974. This application Sept. 22, 1975, Ser. No. 615,255

Int. Cl.<sup>2</sup> C07D 267/10

U.S. Cl. 260—333

6 Claims

1. A compound of the formula



wherein each of alk and alk' is ethylene, R is lower alkyl, lower alkenyl, lower alkynyl, (lower cycloalkyl, lower cycloalkenyl or Ph)-C<sub>m</sub>H<sub>2(m-q)</sub>, (hydroxy, halogeno, amino, mono- or di-lower alkylamino)C<sub>p</sub>H<sub>2p</sub> or halogeno-C<sub>p</sub>H<sub>2p-2</sub>; each of Ph and Ph' is phenyl, unsubstituted or substituted by up to three members of lower alkyl, lower alkoxy, lower alkylmercapto, hydroxy, halogeno or trifluoromethyl; m is an integer from 0 to 4; p such from 2 to 4; q such from 0 to 2 and (m-q) is positive; or a therapeutically acceptable acid addition salt thereof.

4,010,167

**METHOD FOR THE RECOVERY OF ZEARELENONE**

Vernon V. Young; John S. Kosewicz, and Frederick William Schmitz, all of Terre Haute, Ind., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Aug. 22, 1975, Ser. No. 606,957

Int. Cl.<sup>2</sup> C07D 313/00

U.S. Cl. 260—343.2 F

35 Claims

1. A method for recovering zearalenone from an aqueous mixture including an aqueous phase and a solid phase, containing, in the solid phase, zearalenone and other undissolved solids, which comprises:

a. contacting the zearalenone with a zearalenone-selective aqueous solvent mixture consisting essentially of a water-miscible, organic solvent and water in amounts sufficient to selectively dissolve and transmit the zearalenone from the solid phase to the aqueous solvent phase and provide a pumpable zearalenone solution;

b. removing the undissolved solids from the zearalenone solution at a temperature sufficiently high to maintain the zearalenone in solution and sufficiently low to avoid dissolving the solids, thereby forming a clarified zearalenone solution;

c. increasing the proportion of water-to-water miscible, organic solvent in the clarified zearalenone solution to precipitate the zearalenone; and

d. separating the precipitated zearalenone from its mother liquor at a temperature at which zearalenone is substantially insoluble in its mother liquor.

4,010,168

**NAPHTHALIDE INDICATOR DYES**

Richard B. Greenwald, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 204,350, Dec. 2, 1971, Pat. No. 3,862,128. This application Nov. 4, 1974, Ser. No. 520,247

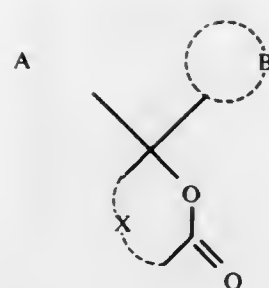
Int. Cl.<sup>2</sup> C07D 305/14

U.S. Cl. 260—343.2 R

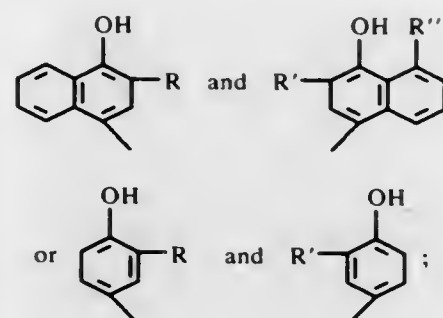
11 Claims

1. An indicator dye having the formula:

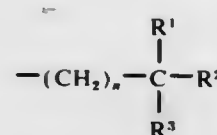




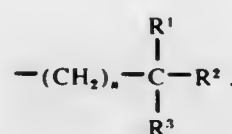
wherein A and B are



X represents the carbon atoms necessary to complete phthalide or naphthalide; R is the group



wherein R<sup>1</sup> is —OH, —SH or —NH<sub>2</sub>, R<sup>2</sup> is hydrogen, alkyl having 1 to 20 carbon atoms, aryl selected from phenyl and naphthyl, alkaryl having 1 to 20 carbon atoms or perhalomethyl, R<sup>1</sup> and R<sup>2</sup> when taken together represent =O, R<sup>3</sup> is an electron-withdrawing group and n is an integer 0 or 1; and R' and R'' each are selected from hydrogen, carboxy, hydroxy, o-hydroxyphenyl, sulfonamido, sulfamoyl and said group



at least one of said R' and R'' being hydrogen.

4,010,169

**(E)-4-HYDROXY-11,15-DIOXOPROSTA-8(12),13-DIEN-1-OIC ACID γ-LACTONES**

Leland J. Chinn, Morton Grove, and Karlene W. Salamon, Chicago, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

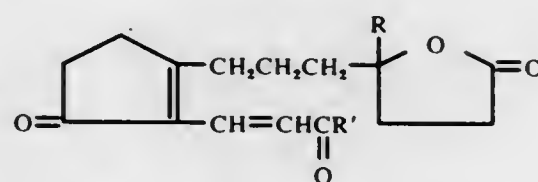
Filed Mar. 10, 1976, Ser. No. 665,363

Int. Cl.<sup>2</sup> C07D 307/32

U.S. Cl. 260—343.6

1. A compound of the formula

5 Claims



wherein R represents hydrogen, methyl, or ethyl and R' represents alkyl containing more than 4 and fewer than 8 carbons.

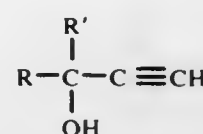
**4,010,170  
BUTENOLIDE SYNTHESIS VIA CARBONYLATION OF VINYL MERCURIALS**

Richard Craig Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa  
Filed Sept. 24, 1975, Ser. No. 616,436  
Int. Cl.<sup>2</sup> C07D 307/58

U.S. Cl. 260—343.6

11 Claims

1. A method of preparing B-halobutenolide, and gamma substituted derivatives thereof, said method comprising, reacting a compound of the formula:



wherein R and R' are organic moieties selected to represent the gamma substituents of the particular butenolide being prepared with a mercuric halide to provide a vinylmercuric halide, and carbonylating said vinylmercuric halide, in the presence of a carbonylating agent selected from the group consisting of noble metals and noble metal salts to provide B-halobutenolide or a gamma substituted derivative thereof.

4,010,171

**PROCESS FOR PREPARING TETRAHYDROFURAN**  
William Edward Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 420,853, Dec. 3, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 623,905  
Int. Cl.<sup>2</sup> C07D 307/08

U.S. Cl. 260—346.1 R

3 Claims

1. A process for preparing tetrahydrofuran which comprises heating a carboxylic acid diester of 1,4-butanediol in the vapor phase in the presence of water and a hydrolysis-dehydroacyloxylation catalyst selected from the group consisting of alumina, silica, silica-alumina, and silica-magnesia at a temperature in the range of from 200° C to about 325° C.

4,010,172

**SUBSTITUTED KETO AND ALKOXY 16-PHENOXY AND 17-PHENYL PGE<sub>2</sub>-TYPE COMPOUNDS**

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

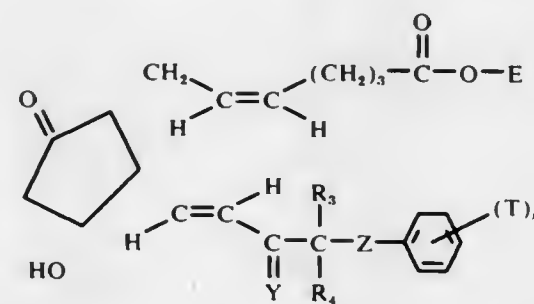
Division of Ser. No. 523,568, Nov. 14, 1974. This application Nov. 21, 1975, Ser. No. 634,121

Int. Cl.<sup>2</sup> C07C 69/76; C09B 11/10

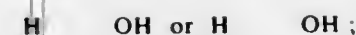
U.S. Cl. 260—390

11 Claims

1. An optically active compound of the formula



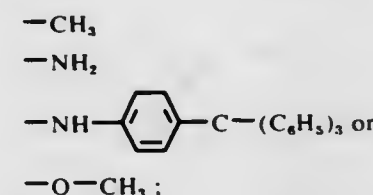
or a racemic mixture of that compound and the enantiomer thereof, wherein R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, or ethyl; T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR<sub>5</sub>, wherein R<sub>5</sub> is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; Y is



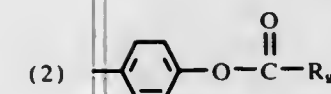
and Z represents an oxa atom (—O—) or C<sub>1</sub>H<sub>2</sub>, wherein C<sub>1</sub>H<sub>2</sub> is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive, between —CR<sub>3</sub>R<sub>4</sub>— and the ring; and E is



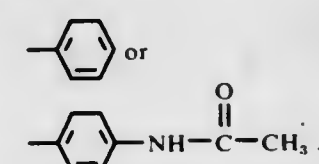
wherein R<sub>n</sub> is



or



wherein R<sub>n</sub> is



4,010,173

**SYNTHESIS OF 4-CYANTHIAZOLES**

George D. Hartman, Plainsboro, and Leonard M. Weinstock, Belle Mead, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

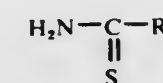
Filed Feb. 26, 1975, Ser. No. 553,185

Int. Cl.<sup>2</sup> C07D 277/28

U.S. Cl. 260—302 R

9 Claims

1. A method for the synthesis of a 4-cyanthiazole which comprises reacting in the presence of an acidic catalyst β,β-dichloro-α-amino-acrylonitrile with a compound of the formula



wherein R is hydrogen, straight or branched alkyl of form 1 to 10 carbon atoms, phenyl alkyl wherein the alkyl group is from 1 to 10 carbon atoms, phenyl or substituted phenyl wherein the substituent is methyl, F, Cl, Br, I or nitro, the acidic catalyst being hydrochloric acid, sulfuric acid, or p-toluene-sulfonic acid.

4,010,174

**THIAZOLINONE-(2)-CARBOXYLIC ACID ESTERS AND PROCESS THEREFOR**

Klaus Grohe, Cologne, and Paul-Ernst Frohberger, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

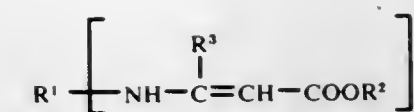
Division of Ser. No. 271,104, July 12, 1972, Pat. No. 3,925,400. This application Sept. 5, 1975, Ser. No. 610,818  
Claims priority, application Germany, July 28, 1971, 2137649

Int. Cl.<sup>2</sup> C07D 277/14

U.S. Cl. 260—306.7 R

7 Claims

1. Process for producing thiazolinone-(2)-carboxylic acid esters which comprises reacting chlorocarbonyl sulphenyl chloride having the formula COCl—SCl with a β-amino acrylic acid ester having the formula:



wherein,

n is 1 or 2 and, when n is 1,

R<sup>1</sup> is selected from the group of hydrogen, C<sub>1</sub> to C<sub>12</sub>-alkyl, C<sub>5</sub> to C<sub>6</sub>-cycloalkyl, the foregoing substituted by phenyl which may itself be substituted one or more times by fluorine, chlorine or bromine atoms or by C<sub>1</sub> to C<sub>3</sub>-alkyl, phenyl, phenyl substituted one or more times by fluorine, chlorine or bromine atoms or by C<sub>1</sub> to C<sub>3</sub>-alkyl,

and, when n is 2,

R<sup>1</sup> is a polymethylene group with from 2 to 6 carbon atoms or a meta- or para-phenylene group;

R<sup>2</sup> is selected from the group of C<sub>1</sub> to C<sub>12</sub>-alkyl, C<sub>5</sub>- or C<sub>6</sub>-cycloalkyl, the foregoing substituted by one or more C<sub>1</sub> to C<sub>3</sub>-alkoxy, nitrile or C<sub>1</sub> to C<sub>3</sub>-alkoxy carbonyl groups or by a phenyl radical which is itself optionally substituted one or more times by fluorine, chlorine or bromine atoms or by C<sub>1</sub> to C<sub>3</sub>-alkyl; and

R<sup>3</sup> is the same as R<sup>2</sup> or is selected from the group of C<sub>1</sub>-C<sub>3</sub>-alkoxy carbonyl, phenyl, phenyl substituted one or more times by fluorine, chlorine or bromine atoms or by C<sub>1</sub> to C<sub>3</sub>-alkyl.

4,010,175

**THIO-β-LACTAM PENICILLINS**

Christopher M. Cimarusti, Hamilton, N.J.; Paul Wojtkowski, Wilmington, Del., and Joseph E. Dolfini, Cincinnati, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

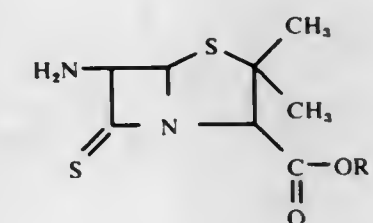
Division of Ser. No. 551,221, Feb. 19, 1975, Pat. No. 3,971,776. This application Apr. 5, 1976, Ser. No. 673,777

Int. Cl.<sup>2</sup> C07D 499/42

U.S. Cl. 260—306.7 C

2 Claims

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, trihaloethyl, alkali metal or alkaline earth metal.

4,010,176

**ISOXAZOLE SUBSTITUTED NITROIMIDAZOLES**

Peter Kulsa, Scotch Plains, N.J., and Clarence S. Rooney, Beaconsfield, Canada, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 301,420, Oct. 27, 1972, Pat. No. 3,915,978, and a continuation of Ser. No. 1,307, Jan. 7, 1970, Pat. No. 3,711,495. This application July 30, 1975, Ser. No. 600,252

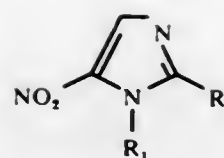
Int. Cl.<sup>2</sup> C07D 413/04

U.S. Cl. 260—307 H

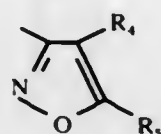
2 Claims

1. A 1,2-disubstituted 5-nitroimidazole having the following structure:





wherein  $R_1$  is hydrogen, loweralkyl having 1 to 6 carbon atoms, or  $\text{CH}_2\text{—CH}_2\text{—OH}$  and  $R$  is



wherein  $R_4$  and  $R_5$  are the same or different and are each hydrogen, loweralkyl having 1–6 carbon atoms, carboxyalkyl, carboxamido, carboxamidoalkyl, carboxamidodialkyl, amino, phenyl, aminoalkyl, or aminodialkyl wherein the alkyl group is carboxyalkyl, carboxamidoalkyl, carboxamidodialkyl, aminoalkyl and aminodialkyl contains 1 to 6 carbon atoms; or  $R_4$  and  $R_5$  are a ring structure of:  
 $-\text{CH}_2\text{—}$ ,  $n$  being an integer from 3–10;  
 provided that when only one of  $R_4$  and  $R_5$  are hydrogen, the substituent other than hydrogen is in the 5-position of the ring.

4,010,177

**[3-SUBSTITUTED-5-[(DI-METHYLAMINO)METHYL]-4H-1,2,4-TRIAZOL-4-YL]BENZOPHENONES AND PROCESS**

Martin Gall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 6, 1975, Ser. No. 584,616

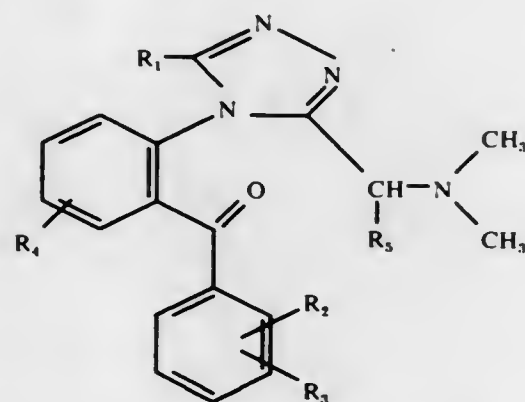
The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 249/08, 401/06, 403/06, 413/06

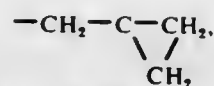
U.S. Cl. 260—308 R

14 Claims

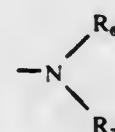
1. A compound of the formula I:



wherein  $R_1$  is hydroxymethyl or  $-\text{CH}_2\text{NR}_6\text{R}_7$ , in which  $R_6$  is  $-\text{CH}_2\text{—C} \equiv \text{CH}$ ,  $-\text{CH}_2\text{—CH}=\text{CH}_2$ ,



or alkyl of 1 to 3 carbon atoms inclusive,  $R_7$  is hydrogen or alkyl of 1 to 3 carbon atoms, or together



is pyrrolidino, piperidino, or morpholino, wherein  $R_2$  is hydrogen, chlorine or fluorine; wherein  $R_3$  is hydrogen or fluorine if  $R_2$  is fluorine; wherein  $R_4$  is fluorine, chlorine, bromine, nitro,

or trifluoromethyl; and wherein  $R_5$  is hydrogen, methyl or ethyl, and the pharmacologically acceptable acid addition salts thereof.

4,010,178

**CARBONIC ACID ESTERS, AND THE PREPARATION THEREOF AND THEIR USE**

Takashi Kamiya, Suita; Masumi Itoh, Takatsuki, and Daijiro Hagiwara, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 26, 1975, Ser. No. 607,759

Claims priority, application Japan, Aug. 27, 1974, 49-98702; Sept. 21, 1974, 49-109362; Oct. 10, 1974, 49-115856

Int. Cl.<sup>2</sup> C07D 249/18

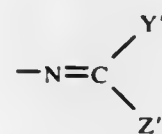
U.S. Cl. 260—308 B

22 Claims

1. Carbonic acid esters of the formula:

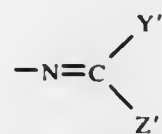


wherein  $R_1'$  is lower alkyl which may have substituent(s) selected from the group of halogen, lower alkoxy and aryloxy, or ar(lower)-alkyl which may have substituent(s) selected from the group of lower alkoxy, halogen, nitro and cyano, and  $R_2'$  is benzotriazolyl which may have halogen as a substituent; or a group represented by the formula:



wherein  $Y'$  and  $Z'$  are each cyano, nitro, carbamoyl, esterified carboxy, lower alkanoyl, aroyl or disubstituted carbamoyl; provided that when

$R_2'$  is a group represented by the formula:



wherein  $Y'$  and  $Z'$  are each cyano, nitro, carbamoyl or esterified carboxy,

$R_1'$  is ar(lower)alkyl having substituent(s) selected from the group of lower alkoxy, halogen, nitro and cyano.

4,010,179

**1-(PARA-SUBSTITUTED-PHENYL)-1H-TETRAZOLES**

William Vincent Curran, Pearl River, N.Y.; Andrew Stephen Tomcufcik, Old Tappan, N.J., and Adma Schneller Ross, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

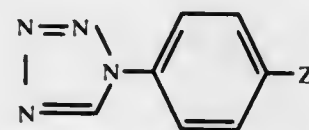
Continuation-in-part of Ser. No. 470,083, May 15, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,563

Int. Cl.<sup>2</sup> C07D 257/04

U.S. Cl. 260—308 D

7 Claims

1. A compound of the formula:



wherein  $Z$  is selected from the group consisting of fluoromethylthio, difluoromethylthio, fluoromethylsulfinyl, difluoromethylsulfinyl, fluoromethylsulfonyl and difluoromethylsulfonyl.

4,010,180

**PROCESS FOR THE PURIFICATION OF COPPER PHTHALOCYANINE**

Siegfried Schiessler, Frankfurt am Main; Ernst Spietschka, Oberauroff, Taunus, and Wolfgang Tronich, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 21, 1973, Ser. No. 427,316

Claims priority, application Germany, Dec. 22, 1972, 2262895

Int. Cl.<sup>2</sup> C09B 47/04

U.S. Cl. 260—314.5

6 Claims

1. In a process for purifying an unsubstituted or halogenated copper phthalocyanine by transforming it into its sulfate and recovering it by hydrolysis with water, the improvement comprising: introducing an unsubstituted or halogenated copper phthalocyanine into (1) a 4 to 10-fold amount of sulfuric acid of an initial strength of 84 to 88% by weight, or (2) a more concentrated sulfuric acid and diluting it to said concentration range, and heating the so-obtained copper phthalocyanine sulfate in an inert gas atmosphere to a temperature of 60° to 100° C.

4,010,181

**PROCESS FOR THE ASYMMETRIC HYDROGENATION OF A SUBSTITUTED ACRYLIC ACID OR ESTER THEREOF**

Paul Airon-Violet, Saint Genis Laval, France, assignor to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 470,866, May 17, 1974, Pat. No.

3,949,000. This application June 25, 1975, Ser. No. 590,091

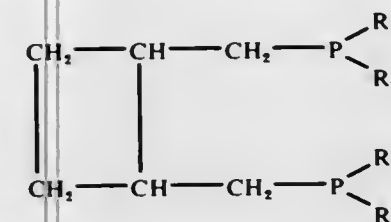
Claims priority, application France, May 21, 1973, 73.18319

Int. Cl.<sup>2</sup> C07B 1/00

U.S. Cl. 260—326.14 T

3 Claims

1. A process for the asymmetric hydrogenation of a substituted acrylic acid or ester thereof, which comprises hydrogenating a mixture of the said acid or ester and a rhodium complex in which the rhodium is bound to halogen and a diphosphine of the formula:



in which the phosphinomethyl groups are in the trans-position relative to one another, and the radicals  $R_1$ ,  $R_2$ ,  $R'_1$  and  $R'_2$ , which may be identical or different, each represent straight or branched alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 or 6 ring carbon atoms, or aryl consisting of one or more benzene rings which are bonded to one another by a valency bond or which form with one another an ortho- or peri-condensed system, the said aryl being unsubstituted or substituted by straight or branched alkyl of 1 to 4 carbon atoms.

4,010,182

**METHOD FOR PRODUCING N-(4-FLUOROPHENYL)-2,3-DICHLOROMALEIMIDE**

Kazuo Matsui, Fujisawa; Taichiro Shigematsu, Machida; Tet-suya Shibahara, Kawasaki, and Makoto Nakazawa, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed May 7, 1975, Ser. No. 575,389

Claims priority, application Japan, May 15, 1974, 49-53978

Int. Cl.<sup>2</sup> C07D 207/44

U.S. Cl. 260—326.5 FM

6 Claims

1. In a process for the preparation of N-(4-fluorophenyl)-

2,3-dichloromaleimide by reaction of a first reactant selected from the group consisting of 2,3-dichloromaleic acid, 2,3-dichloromaleic anhydride and esters of 2,3-dichloromaleic acid with 4-fluoroaniline as a second reactant or by dehydrative-cyclization reaction of N-(4-fluorophenyl)-2,3-dichloromaleamic acid or 4-fluoroanilinium-2,3-dichloromaleate, the improvement characterized by conducting the reaction in water.

4,010,183

**ANHYDROUS SOLVENT SEPARATION IN PRODUCTION OF POLYOL MONOACYLATES**

Camilo Quesada, Parma Heights, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,130

Int. Cl.<sup>2</sup> C11B 7/00

U.S. Cl. 260—428.5

9 Claims

1. In a process for separating crystallizable  $C_{2-26}$  polyol monoacylates having  $C_{2-26}$  acyl groups from a feed mixture thereof with related polyol polyacylates by fractionally crystallizing said monoacylate as a crystal crop from a solution of said feed mixture in fugitive aprotic solvent therefor, the improvement for substantially precluding degradation of said cropped monoacylate which comprises:

- restricting said solvent to one having no hydroxyl groups;
- melting said crystal crop; and
- subjecting the resulting melt to a stripping operation under reduced pressure and anhydrous conditions at a temperature not substantially above about 150° C. until there is virtually no solvent residual in said melt, at least the final phase of said stripping being performed with inert gas sparging of said melt.

4,010,184

**THIENODIAZEPINES**

Michio Nakanishi, Nakatso; Kazuhiko Araki, Yoshitomi; Tet-suya Tahara, Yoshitomi, and Masami Shiroki, Yoshitomi, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Mar. 20, 1974, Ser. No. 453,117

Claims priority, application Japan, Mar. 20, 1973, 48-32159; Apr. 18, 1973, 48-44423

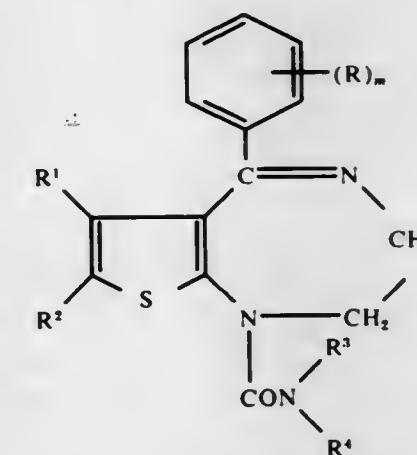
The portion of the term of this patent subsequent to Oct. 8, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 333/24

U.S. Cl. 260—332.2 R

9 Claims

1. Thienodiazepines of the formula:



wherein  $R$  is a halogen atom; each of  $R^1$  and  $R^2$  is a hydrogen atom or an alkyl group having 1 to 4 carbon atoms; each of  $R^3$  and  $R^4$  is an alkyl group having 1 to 4 carbon atoms; and  $m$  is an integer of one or two; and pharmaceutically acceptable acid addition salts thereof.



4,010,185

## STABLE OIL-SOLUBLE METAL SULFONATE ANALYTICAL STANDARDS

William L. Groves, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

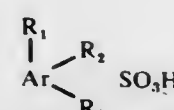
Filed May 22, 1975, Ser. No. 579,761

Int. Cl.<sup>2</sup> C07F 3/12

U.S. Cl. 260—433

4 Claims

1. A stable oil soluble metal sulfonate analytical standard prepared by sequentially reacting
- an alkyl diamine compound represented by the structural formula  $R-NH-(CH_2)_3-NH_2$  wherein R is an alkyl group containing from about 10 to 18 carbon atoms;
  - an inert diluent;
  - an alkyl substituted aryl sulfonic acid having the structural formula



wherein Ar is an aryl group, R<sub>1</sub> is hydrogen or an alkyl group containing from about 1 to 4 carbon atoms and R<sub>2</sub> and R<sub>3</sub> are alkyl groups containing from about 10 to 18 carbon atoms each;

- carbon disulfide; and
- an organic metal acetate wherein the metal is selected from the group consisting of mercury, vanadium, iron, lead, barium, beryllium, tin, silver, titanium, copper, magnesium, and sodium.

4,010,186

## REMOVAL OF LEAD FROM AQUEOUS SOLUTION USING METALLIC MAGNESIUM

Thorowgood T. Broun, Jr., Beaumont, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 5, 1971, Ser. No. 131,548

Int. Cl.<sup>2</sup> C07F 7/24

U.S. Cl. 260—437 R

12 Claims

1. A method of reducing the dissolved organic lead content of aqueous solution resulting from manufacture of alkyllead compound, said aqueous solution containing contaminating quantities of dissolved organic lead and having a pH of from 7 to 11, comprising contacting said solution with at least 0.50 moles of metallic magnesium per mole of dissolved organic lead, said solution containing at least 0.1 weight percent added chloride ions, for a period of time sufficient to produce lead compounds that are insoluble in said solution, and separating insoluble lead compounds from the aqueous solution, thereby providing an aqueous solution containing substantially reduced levels of dissolved organic lead.

4,010,187

## CHEMICAL PROCESS

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 512,120, Oct. 4, 1974. This application Nov. 20, 1974, Ser. No. 525,500

Int. Cl.<sup>2</sup> C07F 5/06

U.S. Cl. 260—448 A

40 Claims

1. A process for producing alkali metal aluminum dihydrocarbon dihydride which comprises reacting alkali metal and hydrogen in the presence of an inert aromatic hydrocarbon solvent for the alkali metal aluminum dihydrocarbon dihydride and a catalytic amount of at least about 0.001 percent by weight of alkali metal aluminum dihydrocarbon dihydride, under conditions suitable to form alkali metal hydride, thereby producing alkali metal hydride, and then reacting the alkali metal hydride with trihydrocarbon aluminum, aluminum and hydrogen, in the presence of said solvent under conditions suitable to form alkali metal aluminum dihydrocarbon dihydride thereby producing alkali metal aluminum dihydrocarbon dihydride.

4,010,188

## CATALYTIC CONVERSION OF SATURATED HYDROCARBONS TO UNSATURATED PRODUCTS BY OXIDATION IN THE PRESENCE OF A HALOGEN

Robert K. Grasselli, Warrensville Heights, and Robert C. Miller, Northfield, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed June 24, 1968, Ser. No. 739,166

Int. Cl.<sup>2</sup> C07C 120/14

U.S. Cl. 260—465 C

9 Claims

1. A process for the production of acrylonitrile or methacrylonitrile wherein a hydrocarbon consisting essentially of propane or isobutane is reacted with ammonia and a molecular oxygen containing gas, at a temperature of 250° C to 800° C, in the presence of an ammoxidation catalyst and a minor quantity of a halogen containing component wherein said ammoxidation catalyst is antimony oxide in combination with at least one other metal oxide selected from the group consisting of tin oxide, uranium oxide or manganese oxide and wherein said halogen component consists essentially of at least one of Cl<sub>2</sub>, Br<sub>2</sub>, I<sub>2</sub>, HCl, HBr, HI, NH<sub>4</sub>Cl, NH<sub>4</sub>Br, NH<sub>4</sub>I, a lower alkyl chloride, a lower alkyl bromide or a lower alkyl iodide.

4,010,189

## ALKANOLAMINE DERIVATIVES

Leslie Harold Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 421,669, Dec. 4, 1973, Pat. No. 3,928,412.

This application Aug. 26, 1975, Ser. No. 607,995

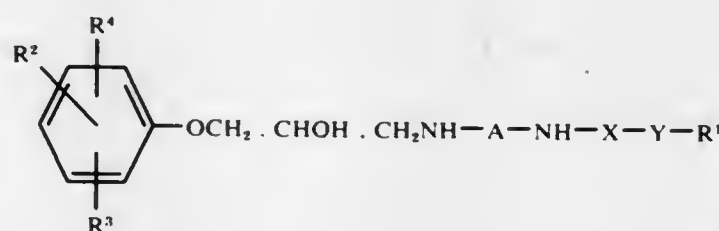
Claims priority, application United Kingdom, Dec. 15, 1972, 57970/72; Sept. 17, 1973, 43478/73

Int. Cl.<sup>2</sup> C07C 103/82, 121/80, 125/06

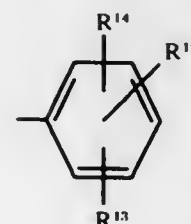
U.S. Cl. 260—465 D

14 Claims

1. An alkanolamine selected from compounds of the formula:



wherein A is alkylene of from 2 to 12 carbon atoms, wherein R<sup>1</sup> is hydrogen, or alkyl, halogenoalkyl, alkenyl or cycloalkyl each of up to 10 carbon atoms, or aryl of the formula:



wherein R<sup>2</sup>, R<sup>3</sup>, R<sup>12</sup> and R<sup>13</sup>, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, alkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms, or aryl, aryloxy or aralkoxy each of up to 12 carbon atoms; or wherein R<sup>2</sup> and R<sup>3</sup> together, and/or R<sup>12</sup> and R<sup>13</sup> together, are trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with two adjacent carbon atoms of the benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; wherein R<sup>4</sup> is hydrogen, hydroxy or hydroxymethyl or aralkoxy of up to 12 carbon atoms;

wherein R<sup>14</sup> is hydrogen, amino or dialkylamino of up to 12 carbon atoms; wherein X is carbonyl (-CO-) and wherein Y is a direct link, or alkylene, oxyalkylene or alkyleneoxy each of up to 6 carbon atoms, or except when R<sup>1</sup> is hydrogen is oxygen; and the acid-addition salts thereof.

4,010,190

## PRECURSORS FOR INSECTICIDES

Royston H. Davis; Derek A. Wood; Herbert P. Rosinger, all of Sittingbourne, and Ronald F. Mason, Ashford, all of England, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 30, 1976, Ser. No. 681,939

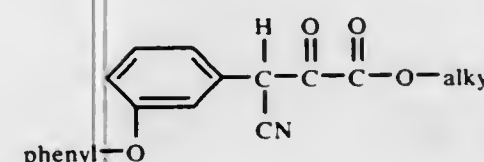
Claims priority, application United Kingdom, May 2, 1975, 18438/75

Int. Cl.<sup>2</sup> C07C 121/66

U.S. Cl. 260—465 D

2 Claims

1. A compound of the formula



wherein the alkyl moiety contains from one to six carbon atoms.

4,010,191

## ACYL DERIVATIVES OF SUBSTITUTED BIS-ARYLALKYLAMINO COMPOUNDS

Kurt Thiele, Barcelona, Spain; Walter Von Bebenburg, Frankfurt, and Klaus Posselt, Bergen-Enkheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roesler, Frankfurt (Main), Germany

Continuation of Ser. No. 128,623, Dec. 17, 1970, abandoned.

This application Dec. 14, 1973, Ser. No. 424,835

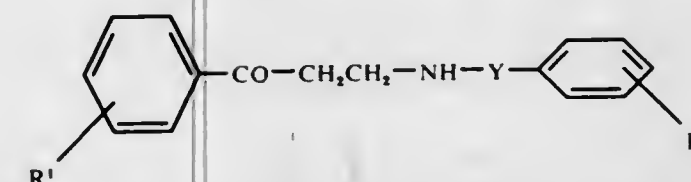
Claims priority, application Austria, Dec. 18, 1969, 787/69

Int. Cl.<sup>2</sup> C07C 103/44, 103/64, 103/82, 125/00

U.S. Cl. 260—471 C

7 Claims

1. A compound selected from the group consisting of compounds having the formula



in which R<sup>1</sup> is an acetamino, ethoxycarbonylamino, phenoxycarbonylamino, β,β-dimethylacrylamino, cinnamylamino, 4-methylcinnamylamino, chlorocinnamylamino, methoxycinnamylamino, or α-methylcinnamylamino radical, R<sup>2</sup> is a hydrogen, methyl, hydroxyl, methoxy, fluoro, or chloro radical, and Y is a 1-methyl-2-hydroxyethylene or 1-ethyl-2-hydroxyethylene radical, and pharmaceutically acceptable salt of these compounds and optically active isomers and diastereoisomers thereof.

4,010,192

5-OXA PHENYL- AND PHENOXY-SUBSTITUTED PROSTAGLANDIN E<sub>1</sub> ANALOGS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

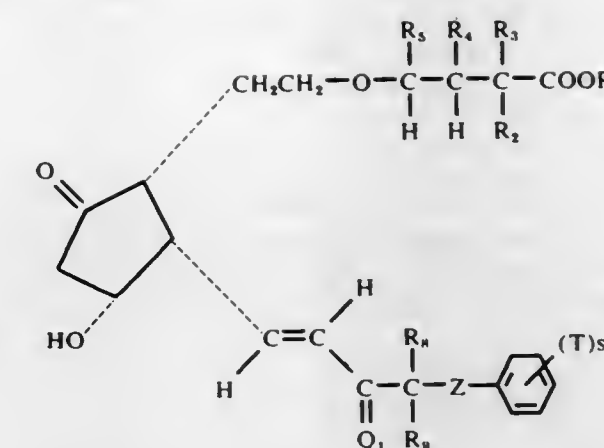
Continuation of Ser. No. 524,952, Nov. 18, 1974, abandoned, which is a division of Ser. No. 361,990, May 21, 1973, Pat. No. 3,864,387. This application Feb. 23, 1976, Ser. No. 660,214

Int. Cl.<sup>2</sup> C07C 69/76

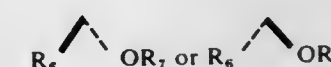
U.S. Cl. 260—473 G

17 Claims

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein Z represents an oxa atom (-O- or C<sub>2</sub>H<sub>2</sub>) wherein C<sub>2</sub>H<sub>2</sub> is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive, between -CR<sub>10</sub>- and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or -OR<sub>10</sub>, wherein R<sub>10</sub> is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; wherein Q<sub>1</sub> is



wherein R<sub>6</sub> and R<sub>7</sub> are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein when Z is oxa (-O-), R<sub>8</sub> and R<sub>9</sub> are hydrogen or alkyl of one to 4 carbon atoms, being the same or different, and, when Z is C<sub>2</sub>H<sub>2</sub>, R<sub>8</sub> and R<sub>9</sub> are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that R<sub>9</sub> is fluoro only when R<sub>8</sub> is hydrogen or fluoro; wherein R<sub>3</sub> is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro; wherein R<sub>2</sub> is hydrogen or fluoro, with the proviso that R<sub>2</sub> is fluoro only when R<sub>3</sub> is hydrogen or fluoro; and wherein R<sub>4</sub> and R<sub>5</sub> are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of R<sub>3</sub>, R<sub>4</sub>, and R<sub>5</sub> is alkyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R<sub>1</sub> is hydrogen.

4,010,193

## BASIC ESTER

Kálmán Harsányi, Budapest; László Szekeres, Szeged; Gergely Héja, Budapest; Gyula Papp, Szeged; Dezső Korbonits, and Pál Kiss, both of Budapest, all of Hungary, assignors to Chinoin Gyógyszer-és Vegyeszeti Termékek Gyára RT, Budapest, Hungary

Filed Apr. 26, 1973, Ser. No. 354,732

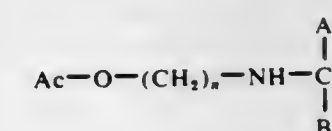
Claims priority, application Hungary, Apr. 28, 1972, CI1231

Int. Cl.<sup>2</sup> C07C 93/24, 93/20

U.S. Cl. 260—473 R

4 Claims

1. A compound of the formula:



wherein:



Ac is substituted benzoyl wherein the substituents are selected from one of the groups which consists of:  
 at least two halogen atoms,  
 at least two lower alkoxy,  
 at least two hydroxy,  
 chloro and sulfamoyl,  
 chloro, nitro and sulfamoyl, and  
 at least one methoxy together with a hydroxy; or  
 Ac is unsubstituted or substituted phenylacetyl, beta-phenylpropionyl or gamma-phenylbutyryl wherein the substituents are selected from one of the groups which consists of:  
 at least one halogen,  
 lower alkoxy,  
 hydroxy,  
 nitro,  
 sulfamoyl, and  
 nitro and sulfamoyl;  
 n is an integer of from 2 to 4; and  
 A and B together with the carbon atom to which they are attached form a cycloalkyl ring having from 3 to 7 carbon atoms.

4,010,194

5-OXA PHENYL- AND PHENOXY-SUBSTITUTED PROSTAGLANDIN A<sub>1</sub> ANALOGS

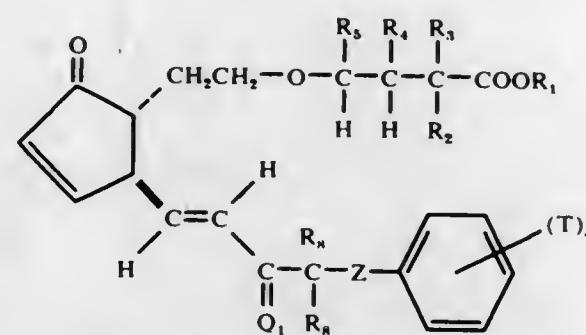
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 524,549, Nov. 18, 1974, abandoned, which is a division of Ser. No. 361,990, May 21, 1973, Pat. No. 3,864,387. This application Feb. 23, 1976, Ser. No. 660,273  
 Int. Cl.<sup>2</sup> C07C 69/76

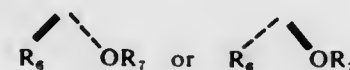
U.S. Cl. 260—473 G

17 Claims

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein Z represents an oxa atom (—O—) or C<sub>j</sub>H<sub>2j</sub> wherein C<sub>j</sub>H<sub>2j</sub> is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive, between —CR<sub>8</sub>R<sub>9</sub>— and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR<sub>10</sub>, wherein R<sub>10</sub> is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; wherein O<sub>1</sub> is



wherein R<sub>6</sub> and R<sub>7</sub> are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different; wherein R<sub>1</sub> is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein when Z is oxa (—O—), R<sub>8</sub> and R<sub>9</sub> are hydrogen or alkyl of one to 4 carbon atoms, being the same or different, and, when Z is C<sub>j</sub>H<sub>2j</sub>, R<sub>8</sub> and R<sub>9</sub> are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or differ-

ent, with the proviso that R<sub>6</sub> is fluoro only when R<sub>8</sub> is hydrogen or fluoro; wherein R<sub>3</sub> is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro; wherein R<sub>2</sub> is hydrogen or fluoro, with the proviso that R<sub>2</sub> is fluoro only when R<sub>3</sub> is hydrogen or fluoro; and wherein R<sub>4</sub> and R<sub>5</sub> are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of R<sub>3</sub>, R<sub>4</sub>, and R<sub>5</sub> is alkyl; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R<sub>1</sub> is hydrogen.

4,010,195

## PROCESS FOR PRODUCING METHYL P-TOLUATE

Nobuo Isogai, Takashi Okawa, and Takako Takeda, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Division of Ser. No. 562,805, March 27, 1975, Pat. No. 3,981,909. This application Jan. 12, 1976, Ser. No. 648,027  
 Claims priority, application Japan, Apr. 8, 1974, 49-40799; June 26, 1974, 49-73119; June 26, 1974, 49-73120  
 Int. Cl.<sup>2</sup> C07C 69/76

U.S. Cl. 260—476 R

5 Claims

1. A process for simultaneously producing methyl p-toluate and hydrogen peroxide, which comprises autooxidizing at a temperature of from 10° to 50° C p-tolualdehyde containing less than 300 ppm of aromatic hydrocarbons, less than 200 ppm of non-aromatic hydrocarbons, less than 300 ppm of high boiling point substances and less than 5 ppm of acidic substances in a form of solution having a concentration of 10 to 50% by weight in acetone or ethyl acetate as a solvent with a gas containing molecular oxygen under a pressure of 1 to 60 kg/cm<sup>2</sup> in the absence of catalyst, thereby producing per-p-toluic acid, and reacting the resulting per-p-toluic acid with methanol in the presence of an esterification catalyst at a temperature of from 50° to 100° C.

4,010,196

## LINEAR POLYESTER SALTS

Andrew G. Tsuk, Plattsburg, N.Y., assignor to American Home Products Corporation, New York, N.Y.

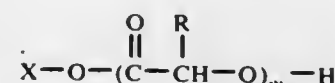
Filed June 25, 1975, Ser. No. 590,357

Int. Cl.<sup>2</sup> C07L 69/66

U.S. Cl. 260—484 A

4 Claims

1. Polyester salts having the formula:



wherein X is an alkali metal, hydrogen or a mixture of both; R is methyl or hydrogen and the average value of m is from about 3 to about 30 with the proviso that at least 20% of X is an alkali metal and at least 20% of R is methyl.

4,010,197

## PROCESS FOR PRODUCING DIACETOXYBUTANES AND BUTANEDIOLS

Jun Toriya, and Ken Shiraga, both of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Ltd., Japan

Filed Aug. 25, 1975, Ser. No. 607,482

Claims priority, application Japan, Sept. 2, 1974, 49-100778

Int. Cl.<sup>2</sup> C07C 29/00, 67/28

U.S. Cl. 260—491

9 Claims

1. In a process for producing a diacetoxybutane by hydrogenating a diacetoxybutene compound in the presence of a supported hydrogenation catalyst, the improvement which comprises,

introducing said compound and hydrogen into a first reaction zone having said hydrogenation catalyst in a fixed bed therein, hydrogenating said compound under adiabatic conditions at a first temperature of 50° to 150° C to form a first reaction product,

dividing said reaction product into a first portion and a second portion, cooling said first portion, recirculating said first portion to said first zone to maintain said first temperature,  
 introducing said second portion and hydrogen into a second reaction zone having said hydrogenation catalyst in a fixed bed therein, further hydrogenating said second portion at a second temperature higher than said first temperature and up to 200° C.

4,010,198

## PROCESS FOR THE PREPARATION OF ALLYL ACETATE

Günter Roscher, Kelkheim, Taunus, and Heinz Schmitz, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 167,182, July 29, 1971, abandoned.

This application Oct. 3, 1974, Ser. No. 511,677

Claims priority, application Germany, July 31, 1970, 2038120

Int. Cl.<sup>2</sup> C07C 67/04

U.S. Cl. 260—497 A

3 Claims

1. In a process for the preparation of allyl acetate from acetic acid, propylene and oxygen in the presence of carbon dioxide wherein a vapor phase mixture of said components is reacted, in a reaction zone, over a catalyst consisting essentially of

- a metal or salt of a metal selected from the group consisting of palladium, platinum, ruthenium, rhodium and iridium;
- an alkali metal or alkaline earth metal salt; and
- a support for said components (a) and (b) selected from the group consisting of silicic acid, aluminum oxide and aluminum silicate, the improvement which comprises: reacting a mixture of said components in said reaction zone in which the concentration of propylene is below 50 percent by volume and propane is present in an amount of from 0.2 to 5.0 times that of propylene.

4,010,199

## MITICIDAL DITHIOBIURETS

Russell F. Bellina, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 358,394, May 8, 1973, Pat. No. 3,890,322.

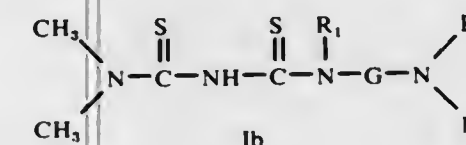
This application Apr. 17, 1975, Ser. No. 568,903

Int. Cl.<sup>2</sup> A01N 9/12; C07C 157/13; C07F 3/02, 3/06

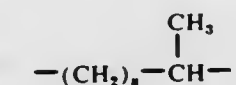
U.S. Cl. 260—552 R

4 Claims

1. Compounds of the formula



G is —(CH<sub>2</sub>)<sub>m</sub>— or



m is 0 through 6;

n is 1 or 2;

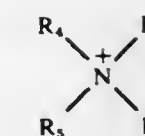
R<sub>1</sub> is methyl, —(CH<sub>2</sub>)<sub>2</sub>—NR<sub>2</sub>R<sub>3</sub> or —(CH<sub>2</sub>)<sub>3</sub>—NR<sub>2</sub>R<sub>3</sub>;

R<sub>2</sub> is methyl or ethyl;

R<sub>3</sub> is alkyl of 1 through 6 carbon atoms;

with the provision that the sum of carbon atoms in G, R<sub>1</sub>, R<sub>2</sub>,

and R<sub>3</sub> is not more than 10; and  
 salts of these compounds with acids or bases, the acids being selected from those having an ionization constant of at least 1 × 10<sup>-7</sup> and the salts formed with bases containing the cation selected from Li<sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>++</sup>, Cu<sup>++</sup>, Zn<sup>++</sup>, Mg<sup>++</sup>, Mn<sup>++</sup>, and



where

R<sub>4</sub>, R<sub>5</sub>, and R<sub>6</sub> can be the same or different and each can be hydrogen, alkyl of 1 through 4 carbon atoms, or hydroxy alkyl of 2 through 4 carbon atoms; and  
 R<sub>7</sub> is hydrogen, alkyl of 1 through 12 carbon atoms, benzyl, amino, methyl amino, or dimethylamino;  
 R<sub>4</sub> and R<sub>5</sub> can be taken together to form a ring that is —(CH<sub>2</sub>)<sub>2</sub>—O—(CH<sub>2</sub>)<sub>2</sub>— or —(CH<sub>2</sub>)<sub>j</sub>— where j is 4–6 and R<sub>6</sub> and R<sub>7</sub> are H.

4,010,200

## N,N-DIARYL ALKYLENEDIAMINE OXIDATION DYE COMPOUNDS

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne-sur-Seine, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

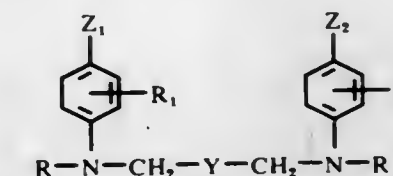
Continuation of Ser. No. 277,035, Aug. 1, 1972, abandoned, which is a division of Ser. No. 846,577, July 31, 1969, Pat. No. 3,694,138. This application Dec. 5, 1974, Ser. No. 529,922  
 Claims priority, application Luxembourg, Aug. 2, 1968, 56631

Int. Cl.<sup>2</sup> C07C 91/28

U.S. Cl. 260—570.5 P

6 Claims

1. A dye compound base for dyeing live human hair, said compound having the formula



wherein Z<sub>1</sub> is selected from the group consisting of —NH<sub>2</sub>, —NHCH<sub>3</sub> and —OH, Z<sub>2</sub> is selected from the group consisting of —NH<sub>2</sub> and —NHCH<sub>3</sub>, R<sub>1</sub> and R<sub>2</sub> each independently are selected from the group consisting of hydrogen and methyl, R is selected from the group consisting of hydrogen, hydroxyethyl and diethylaminoethyl with R being diethylaminoethyl when Z<sub>1</sub> and Z<sub>2</sub> are both —NH<sub>2</sub> and Y is —(CH<sub>2</sub>)<sub>n</sub>— wherein n is 0 or 2; and the salt of said compound with an acid selected from the group consisting of hydrochloric and hydrobromic acids.

4,010,201

## ORGANIC COMPOUNDS

Daniel Lednicher, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

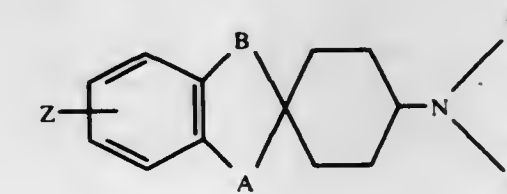
Division of Ser. No. 460,449, April 12, 1974, Pat. No. 3,932,425. This application Oct. 16, 1975, Ser. No. 623,172

Int. Cl.<sup>2</sup> C07C 97/10

U.S. Cl. 260—570.5 CA

3 Claims

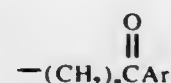
1. A compound of the formula



wherein the sum of A and B is an integer of from 2 to 8; A is —(C<sub>4</sub>H<sub>2n-2</sub>XY)— wherein X is hydroxy, and Y is hydrogen, and X, when taken together with Y, is selected from the group



consisting of  $=O$  and  $=CR^3R^4$  wherein  $R^3$  and  $R^4$  are selected from the group consisting of hydrogen and lower alkyl of 1 through 3 carbon atoms; B is absent or  $-(CH_2)_n-$  wherein  $n$  is 1 through 3;  $R^1$  is selected from the group consisting of hydrogen and lower alkyl of 1 through 3 carbon atoms;  $R^2$  is



wherein  $n$  is 2 through 5 and Ar is phenyl having zero through three substituents selected from the group consisting of lower alkyl of 1 through 3 carbon atoms, lower alkoxy of 1 through 3 carbon atoms, bromine, chlorine and fluorine; Z is selected from the group consisting of hydrogen, lower alkyl of 1 through 3 carbon atoms, lower alkoxy of 1 through 3 carbon atoms, nitro, bromine, chlorine and fluorine; and a pharmaceutically acceptable acid addition salt thereof.

4,010,202

**5,6-DIHYDROXY AMINOTETRALOL COMPOUNDS**  
Hirotsada Sugihara; Masazumi Watanabe, both of Osaka; Michio Motohashi, Kobe; Masao Nishikawa, Kyoto, and Yasushi Sanno, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 4, 1975, Ser. No. 555,128

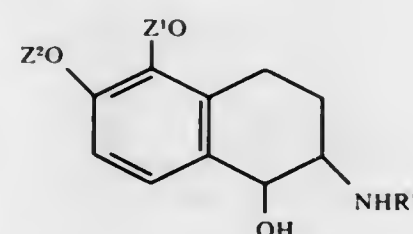
Claims priority, application Japan, Apr. 25, 1974, 49-47211

Int. Cl.<sup>2</sup> C07C 91/06, 91/42, 93/14; A61K 31/135

U.S. Cl. 260—573

23 Claims

1. A compound of the formula



wherein each of  $Z^1$  and  $Z^2$  is hydrogen or alkyl of 1-6 carbon atoms and  $R^1$  is (1) cycloalkyl of 3-7 carbon atoms or (2) alkyl of 1-6 carbon atoms substituted by (a) unsubstituted cycloalkyl of 3-7 carbon atoms, (b) cycloalkyl of 3-7 carbon atoms substituted by alkyl of 1-4 carbon atoms, hydroxyl, alkoxy of 1-4 carbon atoms or halogen, (c) hydroxyl, (d) alkoxy of 1-4 carbon atoms or (e) halogen, or a pharmaceutically acceptable salt thereof.

4,010,203

**ADHESIVE-APPLYING APPARATUS**

Norman N. Aylon, Willowdale, Canada, assignor to General Concrete of Canada Limited, Hamilton, Canada  
Division of Ser. No. 454,792, March 26, 1974, Pat. No. 3,928,114. This application Dec. 3, 1975, Ser. No. 637,198

Int. Cl.<sup>2</sup> B65C 11/04

U.S. Cl. 156—578

5 Claims

1. An apparatus for the application of adhesive to building blocks comprising:

a substantially horizontal planar supporting surface, an upright frame member extending perpendicularly of the plane of said supporting surface and to one side thereof, a transverse frame member extending substantially transverse to but vertically spaced from said supporting surface substantially perpendicularly of said upright frame member,

first adhesive applying means mounted to said upright frame member and vertically movable relative thereto between said supporting surface and said transverse frame member for applying adhesive to selected portions of one side face of a building block on said supporting surface,

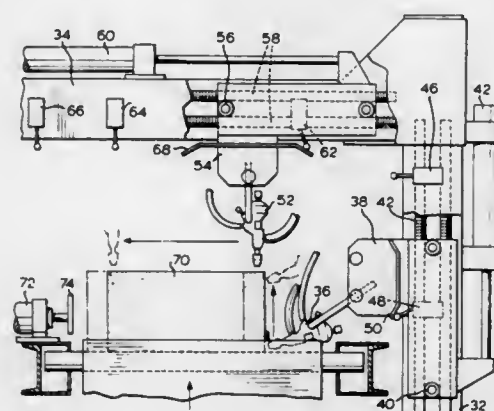
said first adhesive applying means comprising a first pair of nozzles spaced apart slightly less than the width of the side face of the building block,

second adhesive applying means mounted to said transverse frame member and movable longitudinally thereof towards and away from said upright frame member for applying adhesive to selected portions of the top face of a building block on said supporting surface,

said second adhesive applying means comprising a second pair of nozzles spaced apart slightly less than the width of the top face of the building block,

first pneumatically controlled means for reciprocation of said first pair of nozzles through the height of said block, second pneumatically controlled means for reciprocation of said second pair of nozzles through the length of said top face,

holding means for holding said building block on said supporting surface for application of adhesive thereto, said holding means comprising a stop member disposed adja-



cent said upright frame member and a movable, pusher plate disposed on the opposite transverse side of said supporting surface from said stop member and cooperating with said stop member to apply lateral pressure to a block on said supporting surface to grip said block therebetween, and

removable stop means located at the downstream end of said supporting surface to prevent discharge of a building block from said apparatus until adhesive has been applied thereto,

said stop means including a vertically disposed plate and movable between a first position wherein it extends from the underside of said supporting surface to a position projecting above the plane of said supporting surface and thereby preventing movement of a block situated on the supporting surface out of the apparatus and a second position wherein said plate does not extend above the plane of said supporting surface and thereby a block situated on said supporting surface may be discharged from the apparatus.

4,010,204

**PROCESS FOR PREPARING CONDENSATION PRODUCTS**

Roland Köster, and Ali-Akbar Pourzal, both of Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

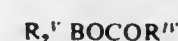
Continuation-in-part of Ser. No. 523,285, Nov. 13, 1974, abandoned. This application Nov. 13, 1974, Ser. No. 523,283

Int. Cl.<sup>2</sup> C07C 45/00; C07B 5/02

U.S. Cl. 260—586 C

8 Claims

1. In the aldol condensation reaction wherein a ketone or aldehyde group having an alpha methylene group is reacted with a ketone or aldehyde group to form an alpha-, beta-unsaturated ketone or aldehyde, the improvement which comprises carrying out said reaction in the presence of a dialkyl boryl carboxylate of the formula:



wherein

$R^{IV}$  is  $C_1-C_4$  hydrocarbon and  
 $R^V$  is each  $C_1-C_4$  alkyl.

4,010,205

**PROCESS FOR THE PREPARATION OF A DIKETONE DERIVATIVE**

Joseph J. Becker, Geneva; Karl-Heinrich Schulte-Elte, Onex Geneva; Hugo Strickler, Dardagny Geneva, and Gunther Ohloff, Bernex Geneva, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Nov. 26, 1974, Ser. No. 527,450

Claims priority, application Switzerland, Dec. 7, 1973, 17172/73

Int. Cl.<sup>2</sup> C07C 27/00, 45/00

U.S. Cl. 260—586 P

1 Claim

1. A process for the preparation of 2,2,6-trimethyl-cyclohex-5-en-1,4-dione which comprises oxidizing, in a heterogeneous phase, 3,3,5-trimethyl-cyclohex-4-en-1-one by means of oxygen or an oxygen containing gas mixture, in the presence of a metal catalyst selected from the organic acid salts of a transition metal or copper which has been deposited on an inert solid support selected from silicon dioxide, carbon, magnesium or calcium carbonate or hydrogen-carbonate, and a diatomaceous earth.

4,010,206

**METHOD FOR PRODUCING CYCLOHEXANONE AND ALKYL-SUBSTITUTED OR UNSUBSTITUTED PHENOL**

Ichiro Mikami, Chiba; Sadao Danno, Ichihara; Izuhiko Uchida, Ichihara; Yasutaka Tasaki, Ichihara; Junichi Kugimoto, Ichihara, and Satoru Fujitsu, Yamaguchi, all of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Jan. 22, 1976, Ser. No. 651,455

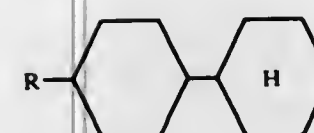
Claims priority, application Japan, Jan. 31, 1975, 50-12349

Int. Cl.<sup>2</sup> C07C 27/12, 37/00, 45/02

U.S. Cl. 260—586 P

18 Claims

1. A method for producing cyclohexanone and alkyl-substituted or unsubstituted phenol, comprising oxidizing, in the liquid phase, an alkyl-substituted or unsubstituted phenylcyclohexane of the formula (I):



wherein R represents either a hydrogen atom or a methyl radical by bringing an oxidizing gas containing molecular oxygen into contact with alkyl-substituted or unsubstituted phenylcyclohexane in the presence of hydrogen bromide, and isolating the resultant cyclohexanone and alkyl-substituted or unsubstituted phenol from the oxidation mixture.

4,010,207

**PROCESS FOR THE ALKYLATION OF  $\alpha$ ,  $\beta$ -UNSATURATED ALDEHYDES**

John B. Hall, Rumson, and Wilhelmus Johann Wieggers, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

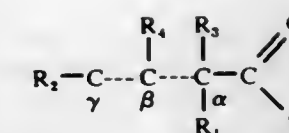
Filed Jan. 15, 1976, Ser. No. 649,552

Int. Cl.<sup>2</sup> C07C 47/20

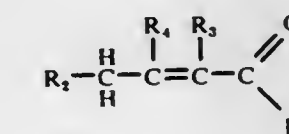
U.S. Cl. 260—601 R

7 Claims

1. A process for preparing at least one aldehyde represented by the structure:

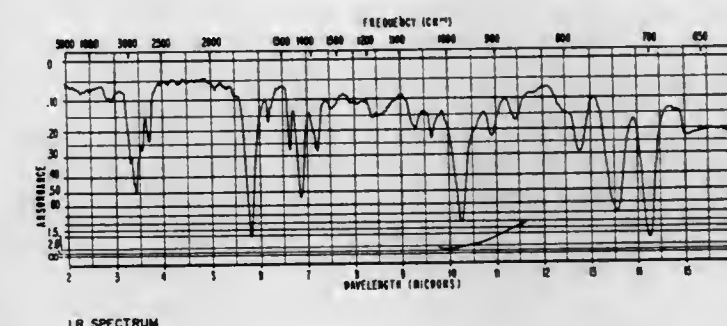


comprising the step of intimately admixing a halide having the structure  $R_1X$  wherein X is chloro with an unsaturated aldehyde having the structure:

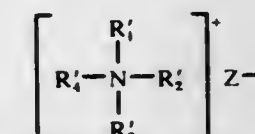


in the presence of an alkali metal hydroxide, an inert solvent and a "phase transfer agent", wherein one of the dashed lines is a double bond and the other of the dashed lines is a single bond; wherein  $R_1$  is prenyl or benzyl,  $R_2$  is methyl, n-propyl, 4-methyl-3-pentenyl or n-hexyl, and  $R_3$  and  $R_4$  are each the

EXAMPLE II



same or different and are hydrogen, methyl or ethyl with the proviso that when  $R_3$  is methyl or ethyl the dashed line between the beta carbon atom and the gamma carbon atom represents a double bond and when  $R_3$  is hydrogen, either of the dashed lines is a double bond; said phase transfer agent having the structure:



(I) wherein at least one of the groups  $R'_1$ ,  $R'_2$ ,  $R'_3$  and  $R'_4$  is  $C_6-C_{14}$  alkaryl or  $C_6-C_{20}$  alkenyl, and the other of  $R'_1$ ,  $R'_2$ ,  $R'_3$  and  $R'_4$  is  $C_1-C_4$  alkyl, and Z represents halogen, the temperature of the reaction being in the range of from about  $10^\circ$  up to about  $150^\circ$  C, the mole ratio of unsaturated aldehyde:halide being from 0.5:1.5 up to about 1.5:0.5, the mole ratio of alkali metal hydroxide:halide being from about 0.75:1 up to about 1.5:1 and the concentration of "phase transfer agent" in grams per mole of unsaturated aldehyde being from 0.5 up to 25.

4,010,208

**PRODUCTION OF FORMALDEHYDE**

Albrecht Aicher, Frankenthal; Hans Haas, Ludwigshafen; Heinrich Sperber, Ludwigshafen; Hans Diem, Ludwigshafen; Guenther Matthias, Ludwigshafen, and Gunter Lehmann, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 25, 1974, Ser. No. 464,182

Claims priority, application Germany, May 5, 1973, 2322757

Int. Cl.<sup>2</sup> C07C 45/02

U.S. Cl. 260—603 HF

10 Claims

1. In a process for the production of formaldehyde by oxidative dehydrogenation of methanol vapor with oxygen gas in



the presence of a silver catalyst at elevated temperature, the improvement which comprises carrying out the reaction by passing the reacting methanol and oxygen gases downwardly through a layered catalyst bed having a total catalyst thickness of from 15 to 35 mm. the catalyst bed being maintained in three superimposed portions, each of which consist of one or more layers of catalyst particles differing in size from layer to layer, with the proviso that the lower portion contains from 72.5 to 89% by weight of the catalyst as particles of a particle size of from 1 to 2.5 mm. the central portion contains 2.5 to 7.5% by weight of the catalyst as particles of a particle size of from 0.75 to 1 mm. and the remaining upper portion contains from 8.5 to 20% by weight of the catalyst as particles of a particle size of from 0.2 to 0.75 mm.

#### 4,010,209 PROCESS

Curtis P. Smith, Cheshire, and Henri Ulrich, Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 15, 1975, Ser. No. 640,716  
Int. Cl.<sup>2</sup> C07F 9/53

U.S. Cl. 260—606.5 P 13 Claims  
1. A process for the preparation of a phospholene-1-chalcogenide having an aliphatic hydrocarbyl substituent attached to the phosphorus atom, having a double bond in the 2-or 3-position, and having the carbon atoms in the ring of said phospholene free of substituents other than inert substituents, and wherein the chalcogen is selected from the group consisting of oxygen and sulfur, which process comprises reacting the corresponding 1-(2-chloroalkoxy)-3-phospholene with at least one equivalent, per mole of the latter phospholene, of a member selected from the group consisting of aliphatic alcohols and aliphatic thiols at a temperature within the range of about -20° to about 160° C.

#### 4,010,210

METHOD OF PREPARING AROMATIC AND HETEROCYCLIC SULPHIDES AND DISULPHIDES  
Mikhail Grigorievich Voronkov, ulitsa Lermontova, 315, kv. 32; Eleonora Nikolaevna Deryagina, ulitsa Lermontova, 313a, kv. 79, both of Irkutsk; Evgeny Andreevich Chernyshev, Leninsky prospekt, 61/1, kv. 54; Valentina Ivanovna Savushkina, ulitsa Vavilova, 12, kv. 19, both of Moscow; Anatoly Samuilovich Nakhmanovich, Rossiiskaya ulitsa, 6, kv. 26, Irkutsk, and Bella Moiseevna Tabenko, ulitsa Metalurgov, 48, korpus 5, kv. 49, Moscow, all of U.S.S.R.  
Filed Apr. 29, 1975, Ser. No. 572,850  
Int. Cl.<sup>2</sup> C07C 149/00

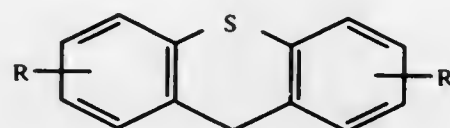
U.S. Cl. 260—609 D 5 Claims  
1. A method of preparing aryl sulphides and disulphides, comprising reacting a bromoaryl compound with hydrogen sulphide in the liquid phase at a temperature of about from 200° C. to 300° C. by bubbling the hydrogen sulphide through a solution of the bromine compound in a high boiling solvent which is inert with respect to the hydrogen sulphide, and isolating the reaction product.

#### 4,010,211

STABILIZATION OF POLYETHER POLYOLS  
Frank J. Preston, Meriden, and Peter P. Priga, Oxford, both of Conn., assignors to Olin Corporation, New Haven, Conn.  
Filed May 12, 1975, Ser. No. 576,839  
Int. Cl.<sup>2</sup> C07C 41/12

U.S. Cl. 260—611.5 6 Claims  
1. In a polyether polyol composition which is stabilized against degradation by the inclusion therein of about 500–10,000 parts per million by weight of a mixture of (1) about 15–75 percent by weight of 2,6-di-tertiarybutyl-4-methyl phenol and (2) correspondingly about 85–25 percent by weight of p,p'-dioctyl diphenyl amine, said polyether polyol having a molecular weight of about 250–8,000 and being the

product of reacting a polyhydric alcohol having 2–8 hydroxy groups with an alkylene oxide having a 1,2-epoxide ring and selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide and a mixture thereof, the improvement of including in said composition, as a partial replacement for said 2,6-di-tertiarybutyl-4-methyl phenol, about 25–600 parts, per million parts by weight of said polyether polyol, of a phenothiazine compound represented by the formula:



in which each R is independently hydrogen or alkyl of 1–12 carbon atoms.

#### 4,010,212

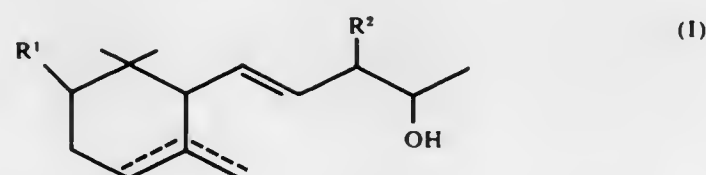
PERFLUOROTERTIARYALKYL ETHERS  
Frank J. Pavlik, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Division of Ser. No. 32,477, April 13, 1970, Pat. No. 3,981,928, which is a division of Ser. No. 538,556, March 30, 1966, abandoned, which is a continuation-in-part of Ser. No. 246,022, Dec. 20, 1962, abandoned, which is a continuation-in-part of Ser. No. 234,222, Oct. 30, 1962, Pat. No. 3,385,904. This application June 14, 1976, Ser. No. 695,901

Int. Cl.<sup>2</sup> C07C 43/12 2 Claims  
U.S. Cl. 260—615 F 1. 3(perfluoro-tertiary-butoxy)dihydroxy propanol-1,2.

#### 4,010,213

NOVEL ODORANTS  
Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.  
Filed Apr. 17, 1975, Ser. No. 569,121  
Claims priority, application Switzerland, Mar. 25, 1975, 5752/75

Int. Cl.<sup>2</sup> C07C 31/13 6 Claims  
U.S. Cl. 260—617 R 1. Alcohols of the general formula:



wherein R<sup>1</sup> represents a hydrogen atom or a methyl group and R<sup>2</sup> represents a C<sub>1-6</sub> alkyl group and wherein one of the two additional bonds indicated by dots may be present.

#### 4,010,214

PROCESS FOR THE PREPARATION OF 2,5-DICHLORO-P-XYLENE  
Samuel Gelfand, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.  
Filed Feb. 4, 1975, Ser. No. 547,067  
Int. Cl.<sup>2</sup> C07C 25/02

U.S. Cl. 260—650 R 7 Claims  
1. A process for the preparation of 2,5-dichloro-p-xylene comprising the steps of:  
A. reacting p-xylene with chlorine at a temperature of about 0° to about 100° Celsius in the presence of about 0.1 to about 1.0 percent by weight, based on the weight of p-xylene, of a catalyst system comprising a catalyst selected from the group consisting of FeCl<sub>2</sub>, FeCl<sub>3</sub>, FeBr<sub>3</sub>,

SbCl<sub>3</sub>, SbCl<sub>5</sub>, SbOCl and SbBr<sub>3</sub> and a co-catalyst selected from the group consisting of dialkyl sulfides, diaryl sulfides, alkylaryl sulfides and cyclic sulfides, said catalyst and co-catalyst being present in a molar proportion of catalyst: co-catalyst of about 1:4 to about 1:1, to form a crude 2,5-dichloro-p-xylene product; and  
B. mixing said crude product, in the liquid phase, with about 0.5 to about 5.0 parts by weight of isopropanol, per part of crude product, to remove by solution the soluble portions thereof; and  
C. recovering therefrom, as a solid, insoluble product, a purified 2,5-dichloro-p-xylene product.

#### 4,010,215

PROCESS FOR THE PREPARATION OF TRICHLOROETHYLENE  
René Clair, Savigny-sur-Orge, and Yves Correia, Saint-Auban, both of France, assignors to Produits Chimiques Pechiney-Saint Gobain, Neuilly-sur-Seine, France  
Filed Feb. 13, 1970, Ser. No. 11,118  
Claims priority, application France, Feb. 21, 1969, 69.04472

Int. Cl.<sup>2</sup> C07C 21/00 18 Claims  
U.S. Cl. 260—654 D 1. A process of preparing trichloroethylene from 1,1,1,2-tetrachloroethane comprising continuously introducing 1,1,1,2-tetrachloroethane in the liquid state into a metallic walled reaction zone, decomposing said 1,1,1,2-tetrachloroethane under a pressure within the range of 3 to 6 bars and at a temperature within the range of 135° to 250° C to maintain in ebullition the liquid phase containing 1,1,1,2-tetrachloroethane introduced into said reaction zone.

#### 4,010,216

CODIMERIZATION PROCESS USING A SUPPORTED NICKEL CARBONYL CATALYST  
Jin Sun Yoo, South Holland, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.  
Division of Ser. No. 314,147, Dec. 11, 1972, Pat. No. 3,907,923, which is a division of Ser. No. 49,968, June 25, 1970, Pat. No. 3,725,306. This application Apr. 14, 1975, Ser. No. 568,211  
Int. Cl.<sup>2</sup> C07C 11/12, 3/10

U.S. Cl. 260—680 R 18 Claims  
1. In a process for the codimerization of alphaolefins of 2 to 10 carbon atoms and 1,3-conjugated dienes of 4 to about 12 carbon atoms, the improvement which comprises conducting the polymerization in contact with a catalytically effective amount of a catalyst composition comprising:  
a. a minor, catalytically effective amount of a nickel complex of the formula  
(L)<sub>n</sub>Ni(CO)<sub>m</sub>

wherein L is a tertiary, hydrocarbyl-substituted monodentate ligand of a Group V-A element, m is an integer having a value from 1 to 3 and n is an integer having a value of 1 to 4 the sum of m and n being 4; and  
b. a major amount of an acidic, solid, silica-based support material as an essential catalyst component.

#### 4,010,217 OLEFIN CONVERSION

Ernest A. Zuech, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.  
Continuation of Ser. No. 267,998, June 30, 1972, abandoned, which is a division of Ser. No. 73,231, Sept. 17, 1970, Pat. No. 3,691,144, which is a division of Ser. No. 717,023, March 28, 1968, Pat. No. 3,558,518, which is a continuation-in-part of Ser. No. 694,873, Jan. 2, 1968, abandoned, and Ser. No. 635,700, May 3, 1967, abandoned. This application Feb. 10, 1975, Ser. No. 548,582  
Int. Cl.<sup>2</sup> C07C 3/62

U.S. Cl. 260—683 D 13 Claims  
1. A process for converting a feed olefin hydrocarbon having non-tertiary unsaturation selected from the group consisting of:

1. acyclic monoolefins, including those with aryl, cycloalkyl, and cycloalkenyl substituents, having 3–20 carbon atoms per molecule with no branching closer than about the 3- position and no quaternary carbon atoms or aromatic substitution closer than the 4- position to the double bond, and mixtures of such unsubstituted acyclic monoolefins;
2. a mixture of ethylene and one or more acyclic unsubstituted internal monoolefins of (1);
3. acyclic, nonconjugated polyenes having from 5 to about 20 carbon atoms per molecule, containing from 2 to about 4 double bonds per molecule and having at least one double bond with no branching nearer than the 3- position and no quaternary carbon atom nearer than the 4- position to that double bond, or mixtures of such polyenes;
4. a mixture of ethylene and one or more acyclic polyenes of (3) which contain at least one internal double bond;
5. a mixture of one or more monocyclic or bicyclic monoolefins having 7 to 12 ring carbon atoms, including those substituted with up to 3 alkyl groups having up to about 5 carbon atoms, with no branching closer than the 3- position and with no quaternary carbon atoms closer than the 4- position to that double bond with either ethylene or with one or more unsubstituted acyclic monoolefins of (1);
6. monocyclic and bicyclic nonconjugated polyenes having up to 12 ring carbon atoms, including those substituted with up to 3 alkyl groups having up to about 5 carbon atoms each, having at least one double bond with no branching closer than the 3- position and with no quaternary carbon atoms closer than the 4- position to that double bond, and mixtures thereof;
7. a mixture of one or more monocyclic polyenes of (6) with one or more acyclic 1-olefins having from 2 to about 10 carbon atoms, having no branching nearer than the 3- position and no quaternary carbon atoms nearer than the 4- position to the double bond;
8. polar group-substituted olefinic compounds of classes (1) through (7) containing from about 5 to about 20 carbon atoms per molecule in which the polar group, such as a halogen atom, is sufficiently removed from the active double bond (generally, no nearer to the double bond than the 5- position) so as not to interfere with the reaction, and mixtures with unsubstituted members of class (1);

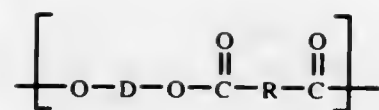
which comprises contacting said feed olefin hydrocarbon with a catalyst system which forms on admixture of

a. a metal complex represented by the formula [(L)<sub>m</sub>M<sub>n</sub>(NO)<sub>z</sub>]<sub>x</sub> wherein M is molybdenum or tungsten; each Z is a halogen, CN, SCN, OCN, SnCl<sub>3</sub> or a hydrocarbon carboxylic acid radical having 1 to about 30 carbon atoms; L is a ligand represented by the formula R<sub>3</sub>Q; R<sub>3</sub>QO; R<sub>2</sub>Q—QR<sub>2</sub>; CO; NO; O; S;









where G is a divalent radical remaining after the removal of terminal hydroxyl groups from at least one long chain glycol having a molecular weight of about 400-6000; R is a divalent radical remaining after removal of carboxyl groups from at least one dicarboxylic acid having a molecular weight less than about 300; and D is a divalent radical remaining after removal of hydroxyl group from at least one low molecular weight diol having a molecular weight of less than 250, said short chain ester units being present in the polyester to the extent of between about 15 and 95% by weight of the polyester, and 0.2 to 20% by weight of a copolymer containing ethylene units and carboxylic acid containing units, said copolymer containing between about 25 and 98.5% by weight ethylene units, and about 1.5 and 30% by weight carboxylic acid containing units, said carboxylic acid units being from 10 to 100% neutralized with metallic ions, said blend having a melt tension of at least 0.4 gm.

4,010,223

#### ADDUCTS CONTAINING SUCCINIC GROUPS ATTACHED TO ELASTOMERIC COPOLYMERS

Stanley William Caywood, Jr., Wilmington, Del. assignor to E. I. DuPont de Nemours and Co., Wilmington, Del. Continuation-in-part of Ser. No. 322,360, Jan. 10, 1973, Pat. No. 3,884,882. This application May 16, 1975, Ser. No. 578,136

The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C08L 13/00, 55/04

U.S. Cl. 260-875

9 Claims

1. An adduct containing succinic groups attached to an elastomeric copolymer of ethylene, at least one C<sub>3</sub> to C<sub>6</sub> α-olefin, and at least one nonconjugated diene; the adduct having an inherent viscosity of at least one as measured on 0.1 gram of adduct dissolved in 100 milliliters of perchloroethylene at 30° C. and having a gel content less than about 5% as measured by weight percent adduct insoluble in boiling tetrahydrofuran at atmospheric pressure after 48 hours.

4,010,224

#### PREPARATION OF GRAFT, BLOCK AND CROSSLINKED UNSATURATED POLYMERS AND COPOLYMERS BY OLEFIN METATHESIS

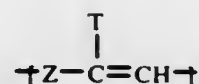
Kenneth W. Scott, Cuyahoga Falls, and Nissim Calderon, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio Division of Ser. No. 435,405, Jan. 21, 1974, abandoned, which is a division of Ser. No. 259,881, June 5, 1972, Pat. No. 3,891,816, which is a division of Ser. No. 882,270, Dec. 4, 1969, Pat. No. 3,692,872. This application Nov. 18, 1974, Ser. No. 524,730

Int. Cl.<sup>2</sup> C08L 23/00

U.S. Cl. 260-878 R

2 Claims

1. A crosslinking reaction wherein at least one polymeric material that is free of non-aromatic conjugation and comprised of structural units of the general formula:



(V)

wherein:

- A. T is
  1. hydrogen; or
  2. a substituent corresponding to the formula D-CH<sub>2</sub>—,

wherein D is any member of the group: alkyl, aryl, aralkyl, alkaryl, alkenyl, cycloalkyl, cycloalkenyl, bicycloalkyl, bicycloalkenyl, and hydrogen; and

B. Z represents hydrogen or a structure having at least one carbon atom and any of the said Z carbons may be:

1. interconnected by single or double bonds;
2. substituted by one or more members of the group: alkyl, aryl, aralkyl, alkaryl, alkenyl, cycloalkyl, bicycloalkyl, cycloalkenyl and bicycloalkenyl;
3. constituents of aromatic, alicyclic or chlorinated alicyclic rings;

in the presence of a multicyclic multiolefin possessing at least two interconnected unsaturated rings that contain 4, 5, 7, 8, 9, 10 and 12 carbon atoms, each of said rings possessing at least one —CH=CH— grouping, and said multicyclic multiolefin being free of non-aromatic conjugation, is exposed to a catalyst capable of inducing ring-opening polymerization and olefin metathesis reaction, said catalyst which will convert 2-pentene into 2-butene and 3-hexene at temperatures lower than about 100° C., leading to a predominantly crosslinked polymeric substance.

4,010,225

#### BROMINE CONTAINING TELOMERIC PHOSPHONIC ACID ESTERS AS FLAME RETARDANT AGENTS

Siegfried Noetzel, Kelkheim, Taunus; Horst Jastrow, Niederhochstadt, Taunus, and Edgar Fischer, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

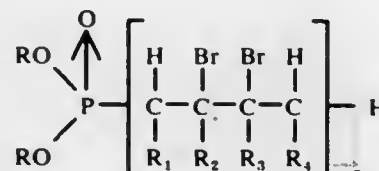
Division of Ser. No. 478,262, June 11, 1974, Pat. No. 3,950,458. This application Sept. 3, 1975, Ser. No. 610,087 Claims priority, application Germany, June 13, 1973, 2329924

Int. Cl.<sup>2</sup> C08K 5/53; C08L 9/02, 9/06

U.S. Cl. 260-880 R

3 Claims

1. A flame-repellent thermoplastic composition comprising a thermoplastic polymer containing a flame repelling amount of a bromine-containing phosphonic acid ester of the formula



where R is a lower straight-chain or branched aliphatic hydrocarbon radical having from 1 to 8 carbon atoms; R<sub>1</sub> to R<sub>4</sub> are hydrogen, halogen or lower alkyl having from 1 to 4 carbon atoms; and n is an integer of from 2 to 30.

4,010,226

#### BLOCK POLYMERS AND THEIR PREPARATION

Ronald K. Crossland; Jaroslav G. Balas, and Arthur R. Bean, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed July 17, 1975, Ser. No. 596,774

Int. Cl.<sup>2</sup> C08L 9/06

U.S. Cl. 260-880 B

6 Claims

1. A polymerization process comprising:
  - a. polymerizing at least one polymerizable compound of the group consisting of conjugated dienes having from 4 to 12 carbon atoms and mono alkenyl-substituted aromatic hydrocarbons having from 8 to 20 carbon atoms under polymerization conditions at a temperature between about -75° C and +150° C with a hydrocarbyl monolithium initiator, the proportions of initiator and polymerizable compound being such as to give a monolithium terminated polymer having an average molecular weight of at least about 7,500;
  - b. contacting the monolithium terminated polymer with a

4,010,229

#### PROCESS FOR THE MANUFACTURE OF SHORT FIBRILS

Jean-Pierre Pleska, Paturages, and Michel Marechal, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Jan. 16, 1975, Ser. No. 541,622

Claims priority, application Luxembourg, Jan. 18, 1974, 69196

Int. Cl.<sup>2</sup> D01D 5/04

U.S. Cl. 264-13

25 Cls.ms



4,010,227

#### O-ALKYL-S-ALKYL-O-(SUBSTITUTED PHENYL)THIOLPHOSPHATES

Jozef Drabek, Allschwil, Switzerland; Manfred Böger, Hattin-gen, Germany, and Odd Kristiansen, Mohlin, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 455,458, March 27, 1974, Pat. No. 3,917,752. This application Aug. 6, 1975, Ser. No. 601,886 Claims priority, application Switzerland, Apr. 3, 1973, 4737/73; Mar. 5, 1974, 3154/74

Int. Cl.<sup>2</sup> C07F 9/18

U.S. Cl. 260-940

1 Claim

1. O-Ethyl-S-n-propyl-O-(2-chloro-4-cyano-3,5-dimethyl-phenyl)-thiolphosphate.

4,010,228

#### CARBURETOR

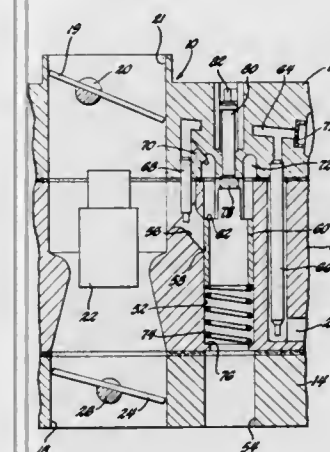
Jack L. Seaman, Fairport, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed June 20, 1975, Ser. No. 588,886

Int. Cl.<sup>2</sup> F02M 9/04

U.S. Cl. 261-23 A

6 Claims



1. A carburetor comprising a fuel bowl, a main induction passage, a main fuel passage extending from said bowl to said main induction passage, a main throttle in said main induction passage for controlling flow therethrough, an auxiliary induction passage formed as a cylindrical bore, a transfer passage extending from said main induction passage to the side of said auxiliary induction passage and opening therein through an inlet port, an auxiliary fuel passage extending from said bowl to said transfer passage, an auxiliary throttle formed as a cylinder conforming to said cylindrical bore, said auxiliary throttle being axially reciprocable in said bore and having an edge traversing said port for controlling flow therethrough, and means operably connecting said auxiliary throttle and said main throttle whereby as said main throttle opens to permit increased flow through said main induction passage said auxiliary throttle is axially displaced in said bore to permit increased flow through said transfer passage, said inlet port and said auxiliary induction passage.

4,010,230

#### METHOD FOR PRODUCING A DRUM TYPE CONTAINER WITH AIR CUSHION

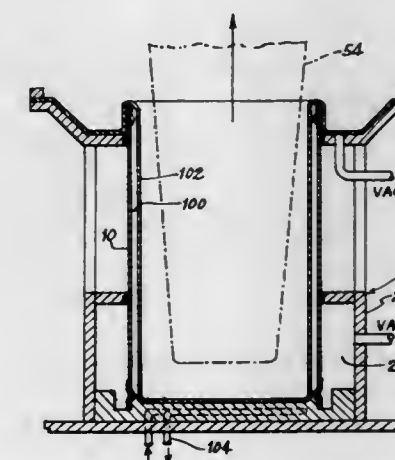
William Repenning, Haddonfield, N.J., assignor to Natico, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 342,696, March 19, 1973, Pat. No. 3,893,882. This application Nov. 29, 1974, Ser. No. 528,202

Int. Cl.<sup>2</sup> B29C 17/04, 25/00; B29D 3/02

U.S. Cl. 264-25

10 Claims



1. In the method of producing a drum container of large capacity formed of a drum forming shell of structurally strong material open at the upper end and closed at the bottom end by a bottom wall, and an inner container of flexible thin plastic joined at its upper end portion about the upper rim of the shell, dimensioned to have a length corresponding to the length of the shell so that the bottom end will rest upon the bottom wall of the shell, and a diameter less than the diameter of the shell to provide an annular space between the outer side



walls of the plastic container and the inner side walls of the shell to define an air cushion in between, the steps of positioning the cylindrical outer drum shell, while open at the top and closed at the bottom, in a frame member which engages the outer walls of the shell in sealing relation, heating to the stretchable stage a film of thermoplastic material dimensioned to extend across the open top end of the shell and for a distance beyond, effecting a sealing engagement between the portion of the film extending between the open end of the shell and the frame, drawing a vacuum in the space between the interior of the shell and the heated film to stretch the film by vacuum forming into the interior of the shell and towards the walls thereof until the film just engages the walls without bonding thereto and about the upper rim of the shell, terminating the vacuum drawing while the film material is still above its stretchable stage, rapidly cooling the portions of the film stretched about the upper rim of the shell and in engagement with the bottom wall while the remainder of the film is still in the stretchable stage, and allowing the remainder of the film to cool down to set stage with corresponding shrinkage in the circumferential direction to form an annular air space between the outer walls of the film and the side walls of the shell to function as an air cushion.

4,010,231

# METHOD OF SEALING LEAKS IN METAL OIL STORAGE CONTAINERS

Kenneth G. Phillips, River Forest, and Alvin J. Frisque, La Grange, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed May 22, 1974, Ser. No. 472,398

Int. Cl.<sup>2</sup> E04B 1/16

U.S. Cl. 264—35

3 Claims

1. A method of sealing small leaks in metal oil storage containers which comprises applying to the orifice of the leak a dosage of from about 10–1000 ppm of a water-in-oil emulsion of a water-soluble vinyl addition polymer containing small polymer spheres of an effective size of about 0.5–500 microns.

4,010,232

# METHOD OF MAKING A COMPOSITE URETHANE FOAM AND CONCRETE CONSTRUCTION PANEL

Roger Labrecque, 4667 Garnier St., Montreal, Quebec, Canada

Filed Sept. 11, 1974, Ser. No. 505,039

Int. Cl.<sup>2</sup> B29D 27/04

U.S. Cl. 264—46.4

2 Claims

1. A method of making a construction panel comprising the steps of:

- spreading a layer of wet cement mixture into a mold;
- powdering dry cement mixture onto said wet cement mixture until a dry blanket of said dry cement mixture is formed on said wet cement mixture;
- pouring a foamable urethane reaction mixture onto said dry blanket;
- closing a cover of said mold;
- allowing said foamable urethane reaction mixture to foam into a urethane foam while the ingress of moisture from said wet cement mixture into said foaming reaction urethane mixture is prevented by said dry cement mixture into which said moisture migrates;
- opening said cover after setting of the urethane foam; and
- removing a panel of bonded urethane and cement from the mold and allowing the cement to dry outside of said mold.

4,010,233

# PRODUCTION OF INORGANIC FIBERS

Gerhard Winter; Manfred Mansmann, both of Krefeld, and Hans Zirngibl, Duisburg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 195,501, Nov. 3, 1971, abandoned.

This application Dec. 12, 1973, Ser. No. 424,229

Claims priority, application Germany, Nov. 6, 1970, 2054573

Int. Cl.<sup>2</sup> D01D 5/04; C04B 35/10

U.S. Cl. 264—63

39 Claims

1. In the production of inorganic fibres by dry spinning a solution, sol or dispersion of the fibre-forming material in a solvent to convert the fibre-forming material to solid homogeneous fibre, collecting the fibre and thereafter heat treating the fibre to enhance its physical properties, the improvement which comprises using as said fibre-forming material a composition which upon heating to a temperature of about 500° to 1600° C in an inert or reducing atmosphere in the form of fibre, forms at least two phases with a miscibility gap, of which one phase is a crystalline metal oxide phase containing the other non-oxide phase in very finely disperse form in about 0.5 to 50% by weight of the fibre, and then heating said fibre to about 500° to 1600° C in said inert or reducing atmosphere to form said two phases in the initially homogeneous fibre.

4,010,234

# PRODUCTION OF HIGHLY POROUS ACTIVE ALUMINIUM OXIDE GRANULATE

Ernst Podschus, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 12, 1975, Ser. No. 604,014

Claims priority, application Germany, Aug. 17, 1974, 2439543

Int. Cl.<sup>2</sup> B01J 2/00

U.S. Cl. 264—117

2 Claims

1. A process for producing active aluminum oxide granulate having a pore volume of greater than 50 cc/100 g and up to about 100 cc/100 g which comprises grinding a mixture of ground aluminum oxide powder with at least one ground additive selected from the group consisting of water-soluble salts and non-ionic substances which do not react with aluminum oxide, which are not hygroscopic at room temperature and below 60% relative humidity and which do not undergo phase transformation at temperatures of up to about 100° C., the ratio by weight of aluminum oxide to additive in said mixture being from about 90:10 to 30:70 and said grinding continuing until the mixture has a residue on a 40  $\mu$  screen of less than 20%, granulating the thusly ground mixture in the presence of at least 50% by weight of water, based on the aluminum oxide, ageing resulting granulate for at least 5 hours at 50° to 100° C., washing out said selective additive from the resulting aged granulate, drying the resulting washed granulate and activating the resulting dried granulate in a dry gas stream at a temperature of from 200° to 500° C.

4,010,235

# MOULDED PLASTIC-RUBBER COMPOSITES

James Frank Yardley, Shenston near Lichtfield, and Allen Frederick Nightingale, Birmingham, both of England, assignors to Dunlop Limited, London, England

Division of Ser. No. 303,782, Nov. 6, 1972, abandoned. This application Apr. 17, 1975, Ser. No. 569,318

Claims priority, application United Kingdom, Nov. 18, 1971, 52555/71; Sept. 20, 1972, 43526/72

Int. Cl.<sup>2</sup> B29H 9/00

U.S. Cl. 264—241

7 Claims

1. A method of producing a bonded molded plastic-rubber composite comprising injection or transfer molding a thermoplastic, high pressure polymerized ethylene polymer having a melt index or minimum flow rate of not less than 0.25, when measured

according to the test conditions specified in ASTM Standard D 1238-65T, so that it is brought, in a molten state, into contact with

a prevulcanized rubber component containing from 5 to 55 per cent by volume of a rubbery olefin polymer selected from the group consisting of ethylene/propylene copolymers containing from 20 to 85 mole per cent units derived from ethylene, ethylene/alpha-olefin/diene terpolymers containing from 20 to 85 mole per cent units derived from ethylene and from 0.1 to 10 mole per cent units derived from the diene, and a blend containing one or more of these with up to 80 per cent by weight of at least one other rubber selected from the group consisting of styrenebutadiene rubber, polybutadiene, and polyisoprene, the remainder of the composition comprising ingredients normally used in compounding rubbery olefin polymers.

4,010,236

# MANGANESE ORE REDUCTION

Jay Y. Welsh, Catonsville, Md., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed July 21, 1975, Ser. No. 597,824

Int. Cl.<sup>2</sup> C01G 45/02

U.S. Cl. 423—49

10 Claims

PHASE	MnO <sub>x</sub> REACTIONS	GAS COMPOSITION	CARBON REACTIONS
SURFACE	COLD NEW FEED LAYER	N <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , O <sub>2</sub> (Traces CO, H <sub>2</sub> )	UNREACTED CARBON
I	2 MnO <sub>2</sub> → Mn <sub>2</sub> O <sub>3</sub> + 1/2 O <sub>2</sub>	N <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, H <sub>2</sub>	H <sub>2</sub> + 1/2 O <sub>2</sub> → H <sub>2</sub> O CO + 1/2 O <sub>2</sub> → CO <sub>2</sub> C + 1/2 O <sub>2</sub> → CO 1/2 C + 1/2 H <sub>2</sub> O → 1/2 H <sub>2</sub> + 1/2 CO (Limited Reaction Below 1000°K.)
II	3 Mn <sub>2</sub> O <sub>3</sub> + CO → 2 Mn <sub>2</sub> O <sub>3</sub> + CO <sub>2</sub> 3 Mn <sub>2</sub> O <sub>3</sub> + H <sub>2</sub> → 2 Mn <sub>2</sub> O <sub>3</sub> + H <sub>2</sub> O Mn <sub>2</sub> O <sub>3</sub> + CO → 3 MnO + CO <sub>2</sub> Mn <sub>2</sub> O <sub>3</sub> + H <sub>2</sub> → 3 MnO + H <sub>2</sub> O	N <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, H <sub>2</sub>	1/2 C + 1/2 CO <sub>2</sub> → CO 1/2 C + 1/2 H <sub>2</sub> O → 1/2 H <sub>2</sub> + 1/2 CO
III	Mn <sub>2</sub> O <sub>3</sub> + CO → 3 MnO + CO <sub>2</sub> Mn <sub>2</sub> O <sub>3</sub> + H <sub>2</sub> → 3 MnO + H <sub>2</sub> O MnO	N <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, H <sub>2</sub>	1/2 C + 1/2 CO <sub>2</sub> → CO 1/2 C + 1/2 H <sub>2</sub> O → 1/2 H <sub>2</sub> + 1/2 CO
IV	MnO	N <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub> , CO, H <sub>2</sub>	1/2 C + 1/2 CO <sub>2</sub> → CO 1/2 C + 1/2 H <sub>2</sub> O → 1/2 H <sub>2</sub> + 1/2 CO (Limited Unreacted Carbon Residue)
V	MnO	N <sub>2</sub> , H <sub>2</sub> O, CO <sub>2</sub>	NO CARBON

1. A process for the pile reduction of higher oxides of manganese in manganese ore, which comprises passing non-oxidizing gas at 700°–1000° C. into and through an initial bed of solid carbonaceous fuel and manganese ore which has been at least partially reduced to MnO, then directing the resulting hot reducing gas mixture into a contiguous layer of unreduced manganese ore mixed with solid carbonaceous fuel.

4,010,237

# EXTRACTION OF NICKEL FROM NICKEL-BEARING ORES

David Alan Harbourn, Kingston, Canada, assignor to Du Pont of Canada Limited, Montreal, Canada

Continuation-in-part of Ser. No. 519,356, Oct. 30, 1974, abandoned. This application May 10, 1976, Ser. No. 684,933

Claims priority, application Canada, Nov. 7, 1973, 185246

Int. Cl.<sup>2</sup> C01G 53/00

U.S. Cl. 423—150

8 Claims

1. In a process for the extraction of nickel values from a nickel oxide/silicate ore having a magnesia content measured as MgO greater than the iron content measured as Fe<sub>2</sub>O<sub>3</sub>, the improvement which comprises contacting the ore in the presence of oxygen with an aqueous solution of a polyalkylenehex-

amine having a pH in the range from about 7 to about 12, said amine having the formula NH<sub>2</sub>(CH<sub>2</sub>)<sub>n</sub>NH(CH<sub>2</sub>)<sub>m</sub>NH(CH<sub>2</sub>)<sub>n</sub>NH(CH<sub>2</sub>)<sub>m</sub>NH(CH<sub>2</sub>)<sub>n</sub>NH<sub>2</sub> wherein n and m are 2 or 3, n and m being the same or different.

4,010,238

# PROCES FOR SELECTIVE REMOVAL OF NITROGEN OXIDES FROM WASTE GASES

Tatsuo Shiraishi; Shinkichi Shimizu; Hiroshi Ichihashi, and Tadashi Shindo, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Mar. 19, 1974, Ser. No. 452,659

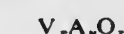
Claims priority, application Japan, Mar. 26, 1973, 48-34895

Int. Cl.<sup>2</sup> B01J 8/00; C01B 21/00

U.S. Cl. 423—239

13 Claims

1. A process for the selective removal of nitrogen oxides from waste gases containing nitrogen oxides, which comprises contacting the waste gases with ammonia in the presence of a metal oxide catalyst for the reduction of nitrogen oxides with ammonia, said catalyst consisting essentially of a composition having the following formula



wherein V is vanadium; A is at least one element selected from the group consisting of copper, zinc, tin, lead, titanium, phosphorus, chromium, iron, cobalt and nickel; x and y are each a numeral of 0.5 to 12; and z is determined by the valence requirements of the other elements in said compound.

4,010,239

# IRON OXIDE SORBENTS FOR SULFUR OXIDES

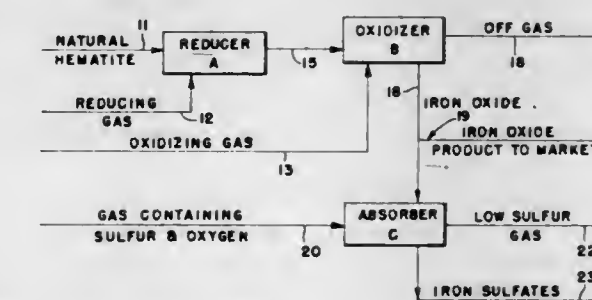
Abraham A. Dor, Lakewood, Ohio, assignor to The Hanna Mining Company, Cleveland, Ohio

Filed Oct. 5, 1973, Ser. No. 403,952

Int. Cl.<sup>2</sup> C01B 17/60; C01G 49/06

U.S. Cl. 423—244

5 Claims



1. In a process for removing sulfur oxides from a gas containing sulfur oxides and oxygen by contacting said gas with an iron oxide sorbent in an absorption zone at a temperature of from about 250° to about 700° C. to form iron sulfate-bearing solids and a gas reduced in sulfur oxide content, the improvement comprising the use of an iron oxide prepared by the process comprising the steps of

- providing a quantity of hematite,
- heating the hematite in the presence of reducing agents at a temperature below about 1000° C. to produce magnetite-bearing solids, and
- oxidizing said magnetite-bearing solids at a temperature below about 600° C. to produce an iron oxide-bearing sorbent.



4,010,240

## PROCESS FOR THE REGENERATION OF SULFURIC ACID

Helmold von Plessen, Kelkheim, Taunus; Eberhard Fischer, Hofheim, Taunus, and Siegfried Schiessler, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 12, 1974, Ser. No. 478,631

Claims priority, application Germany, June 14, 1973, 2330281

Int. Cl.<sup>2</sup> C01B 17/90; C23F 11/04

U.S. Cl. 423—269

10 Claims

1. A two-step process for the continuous regeneration of contaminated aqueous 65 to 95% sulfuric acid to obtain essentially pure 95 to 98% sulfuric acid, which comprises adding to said contaminated sulfuric acid a hexavalent chromium compound as a corrosion inhibitor and in a first step continuously feeding said contaminated 65 to 95% sulfuric acid containing metal salt contaminants and a small amount of up to 4% by weight organic impurities, calculated as carbon, to a cast iron dephlegmator mounted on an external heated vessel containing concentrated boiling sulfuric acid at atmospheric pressure, removing overhead water vapor and volatile organic contaminants, continuously withdrawing as a bottoms product 95 to 98% concentrated contaminated acid and continuously feeding the withdrawn acid, in a second step, to a cast iron distillation unit in which boiling concentrated sulfuric acid is maintained, continuously removing and recovering overhead essentially pure 95 to 98% concentrated sulfuric acid and withdrawing and removing from the distillation step nonvolatile metal salt contaminants as a bottoms product.

4,010,241

## PROCESS FOR THE PRODUCTION OF HYDROGEN FLUORIDE, PHOSPHORIC ANHYDRIDE, CALCIUM POLYPHOSPHATES AND NITRIC ACID

Alfred Lvovich Mosse, Leninsky prospekt, 72a, kv. 66; Vladimir Vasilievich Pechkovsky, ulitsa Derevoobdelochnaya, 27, kv. 55; Anatoly Ivanovich Teterevov, ulitsa Kalinovskogo, 5, kv. 4; Igor Sergeevich Burov, ulitsa Yakuba Kolosa, 39, kv. 48, all of Minsk; Jury Nikolaevich Vilks, prospekt Energetikov, 60, kv. 65; Vadim Andreevich Ershov, prospekt Veteranov, 105, kv. 29, both of Leningrad; Alexandr Antonovich Chelnokov, ulitsa Knorina, 11/2 kv. 114, Minsk; Oleg Iosifovich Yasko, ulitsa Kalinovskogo, 73, korpus 2, kv. 5, Minsk; Vladimir Vladimirovich Bysjuk, ulitsa Ostrovskogo, 27, kv. 56, Minsk, and Elena Dmitrievna Dzjuba, ulitsa Very Khorunzhei, 18, kv. 19, Minsk, all of U.S.S.R.

Filed Aug. 27, 1974, Ser. No. 501,081

Int. Cl.<sup>2</sup> C01B 25/12, 15/16, 21/38, 7/22

U.S. Cl. 423—304

3 Claims

1. A process for the simultaneous production of hydrogen fluoride, phosphoric anhydride, calcium polyphosphates and nitric acid, comprising the steps of:

- heating dispersed natural phosphate in the presence of water vapors by a plasma stream of working gas of a bulk temperature of at least 2500° K to a temperature ensuring the recovery of fluorine from said phosphate to form hydrogen fluoride, the bulk temperature of said stream decreasing;
- separating said cooled stream containing the hydrogen fluoride from the heated defluorinated phosphate and recovering the hydrogen fluoride from the stream;
- heating the defluorinated dispersed phosphate by a stream of air plasma having a bulk temperature of at least 3500° K and containing nitrogen oxides, said phosphates decomposing to form phosphoric anhydride and calcium oxide, and the nitrogen oxides being quenched;
- dividing the stream of air plasma, containing nitrogen oxides, phosphoric anhydride and calcium oxide into two separate streams;
- cooling one of said streams to a bulk temperature that is not lower than the point at which reaction starts between

calcium oxide and phosphoric anhydride; recovering calcium oxide; further cooling the stream to the condensation point of phosphoric anhydride and recovering the latter, and absorbing the nitrogen oxides from the stream by a weak nitric acid or water so that nitric acid is formed; f. cooling the other stream to a bulk temperature that is below the point at which reaction between phosphoric anhydride and calcium oxide starts, but not below the condensation temperature of phosphoric anhydride; recovering the resulting calcium polyphosphates in the form of solid particles, and absorbing nitrogen oxides from the stream by weak nitric acid or water so that nitric acid is formed.

4,010,242

## UNIFORM OXIDE MICROSPHERES AND A PROCESS FOR THEIR MANUFACTURE

Ralph K. Iler, and Herbert J. McQueston, both of Wilmington, Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

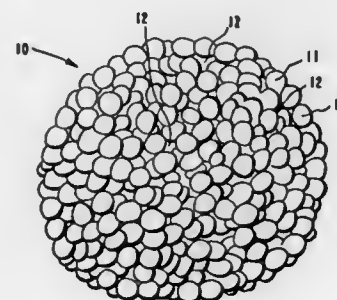
Division of Ser. No. 242,039, April 7, 1972, Pat. No.

3,855,172. This application Nov. 20, 1973, Ser. No. 417,595

Int. Cl.<sup>2</sup> C01B 33/12; C04B 21/04

U.S. Cl. 423—335

6 Claims



1. A process for forming uniform-sized inorganic microspheres comprising the steps of:

- forming an aqueous sol containing uniform-sized inorganic refractory colloidal particles which have hydroxylated surfaces and which are dispersible in said aqueous sol, said colloidal particles being isodimensional or rod-shaped particles with at least two dimensions in the range of 5 to 500 millimicrons and a third dimension in the range of 5 to 1,000 millimicrons;
- forming a homogeneous solution of said aqueous sol with a polymerizable material comprising formaldehyde and a second organic material selected from the group consisting of urea and melamine;
- reducing the pH of said solution to a level at which polymerization of said polymerizable materials occurs to cause coacervation of said organic material and said colloidal particles into substantially spherical microspheres having a diameter of about 0.5 to about 20.0 microns and to initiate copolymerization of said organic materials, said colloidal particles being insoluble in the acid medium at the selected pH;
- solidifying the microspheres so formed;
- collecting, washing and drying said microspheres; and
- oxidizing said microspheres at elevated temperatures to burn off the organic material without melting said colloidal particles, whereby forming uniform-sized porous inorganic microspheres.

4,010,243

## PREPARATION FOR POTASSIUM BICARBONATE FROM POTASSIUM HALIDE

Ian M. Thomas, Temperance, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 28, 1975, Ser. No. 638,225

Int. Cl.<sup>2</sup> C01D 7/16

U.S. Cl. 423—424

17 Claims

9. A method of manufacturing potassium bicarbonate comprising reactively combining a potassium halide, an alkylamine and carbon dioxide in the presence of a miscible aqueous alcoholic medium, and wherein said alkylamine is employed in at least stoichiometric amounts relative to said halide, so as to form said bicarbonate, said medium being so selected that said bicarbonate is more insoluble therein than in water alone, and separating said bicarbonate and wherein said amine contains from 1 to 12 carbon atoms.

4,010,245

## PRODUCTION OF HYDROGEN FLUORIDE AND CALCIUM SULFATE

Bernhard Spreckelmeyer, Leverkusen; Hans Guth, Bergisch-Neukirchen; Werner Schabacher, and Hermann Rohe, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

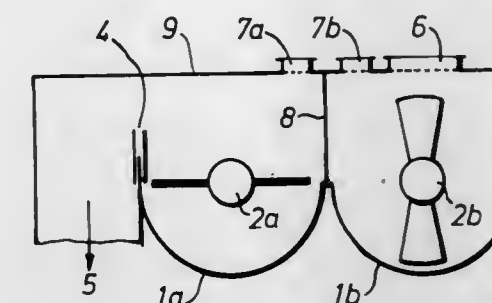
Filed July 15, 1975, Ser. No. 596,050

Claims priority, application Germany, July 24, 1974, 2435512

Int. Cl.<sup>2</sup> C01B 7/22; C01F 11/46

U.S. Cl. 423—485

8 Claims



1. In the production of hydrofluoric acid and calcium sulfate by subjecting sulfuric acid and fluorspar to a partial preliminary reaction in a preliminary reaction zone and the reaction is completed in an after-reaction zone at a temperature from about 100° to 500° C, the improvement which comprises effecting the preliminary reaction by circulating preliminary reaction product comprising partially reacted fluorspar mixed with calcium sulfate through said preliminary reaction zone comprising first and second adjacent beds connected together at their ends, continuously adding to the circulating preliminary reaction product at spaced locations in the preliminary reaction zone sulfuric acid preheated to a temperature of about 80° to 200° C and fluorspar preheated to a temperature of about 400° to 800° C, removing from said preliminary reaction zone gaseous hydrofluoric acid, continuously removing from the first bed a portion of the material comprising a substantially dry mixture of calcium sulfate, unreacted sulfuric acid and fluorspar, passing said dry mixture of calcium sulfate, unreacted sulfuric acid and fluorspar to said after-reaction zone, the balance of the material from the first bed being returned to the second bed, therein being first mixed with sulfuric acid and at a downstream location spaced therefrom being mixed with fluorspar, the resultant mixture being passed to the first bed, and therein being mixed with additional sulfuric acid prior to removal of another portion of the material, at least about 50% but less than 100% of the quantity of sulfuric acid required for the complete reaction being introduced into the preliminary reaction zone and the remaining sulfuric acid being introduced into the after reaction zone.

4,010,244

## HYPOCHLORITE PRODUCTION

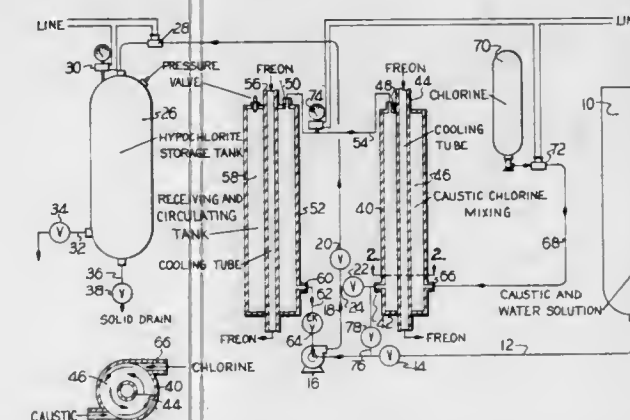
Arthur Shelley King, 8021 Cherokee Lane, Leawood, Kans. 66206

Filed July 16, 1975, Ser. No. 596,319

Int. Cl.<sup>2</sup> C01B 11/06

U.S. Cl. 423—473

4 Claims



1. In a method of producing hypochlorite solution, the steps of:

- introducing a stream of liquid chlorine into the lower end of an upright, cylindrical, reactor-mixer vessel for immediate change into the gaseous state within the vessel;
  - introducing a stream of aqueous sodium hydroxide into the lower end of the vessel simultaneously with said introduction of the chlorine for reaction and mixing with the latter to produce a hypochlorite solution;
  - removing the finished hypochlorite solution from the vessel adjacent the upper end of the latter;
  - cooling the solution as the chlorine and sodium hydroxide streams react by exposing the same to a centrally disposed, upright cooling tube within the vessel; and
  - causing said streams to swirl upwardly through the vessel and around said tube in laminar flow relationship as said reaction, mixing and cooling take place by effecting said introduction of the streams at substantially diametrically opposed locations on the vessel and in tangential relationship with the latter,
- said production of the solution being carried out with an absence of air space in the vessel to prevent escape of the chlorine gas from the solution.

4,010,246

## PROCESS FOR PREPARING SULFUR DIOXIDE

Heinz Steinrötter, Eppstein, Taunus; Karl Walderbach, Frankfurt am Main, and Hansjorg Mathieu, Schneidhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 10, 1975, Ser. No. 621,583

Claims priority, application Germany, Oct. 12, 1974, 2448676

Int. Cl.<sup>2</sup> C01B 17/58; B01D 47/00

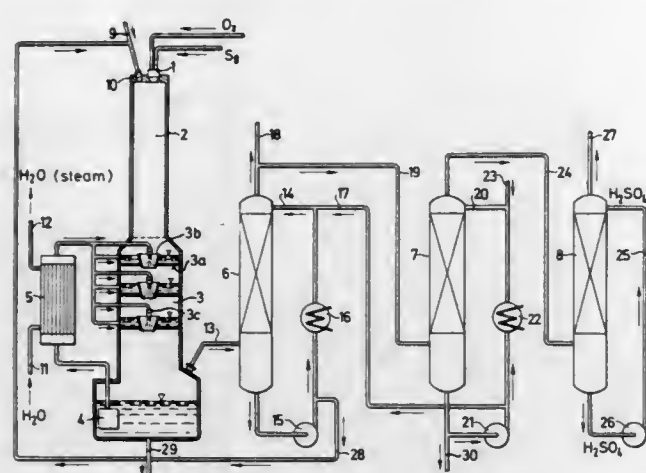
U.S. Cl. 423—542

7 Claims

1. A process for the preparation of essentially pure sulfur dioxide from waste sulfuric acid containing metal salt impurities and at least 50% by volume sulfuric acid, which consists essentially of burning finely divided liquid sulfur with an oxygen-containing gas, containing at least 70% by volume oxygen, to produce not flame gases and directly heating the waste sulfuric acid with the hot flame gases to a temperature of



1,000° to 1,500° C to obtain a combustion gas consisting essentially of SO<sub>2</sub>, water, O<sub>2</sub>, metal salt impurities and a small amount of SO<sub>3</sub>, cooling the hot gases to a temperature of



about 300° to 500° C by direct contact with a salt melt quench coolant to condense metal salt impurities and to separate the metal salt impurities from the combustion gas.

4,010,247

#### METHOD FOR MAKING WATER DISPERSIBLE ALUMINUM HYDROXIDE

Martin Wilhelm Wassermann, Hamburg, and Arnold Wilhelm Meyer, St. Michaelisdonn, both of Germany, assignors to CONDEA Petrochemie-Gesellschaft m.b.H., Brunsbüttel, Germany

Filed Feb. 10, 1975, Ser. No. 548,804

Claims priority, application Germany, Feb. 21, 1974, 2408233

Int. Cl.<sup>2</sup> C01F 7/02

U.S. Cl. 423—626

15 Claims

1. A process for making water dispersible aluminum hydroxide comprising contacting an acid dispersible Boehmite aluminum hydroxide powder having a content of 65 to 85 weight % of Al<sub>2</sub>O<sub>3</sub>, a bulk density of 500 to 700 g/l, a specific surface area by the B.E.T. procedure of 140 to 350 m<sup>2</sup>/g and an average particle size below 100 μm and which has been formed by the hydrolysis of an aluminum alcoholate with a gaseous acid at an addition concentration of about 1 to 9 weight %, said gaseous acid being hydrogen chloride NO<sub>2</sub>, a mixture of NO<sub>2</sub>/N<sub>2</sub>O<sub>4</sub> or acetic acid vapor.

4,010,248

#### PROCESS FOR PRODUCING TRIALKALI METAL ALUMINUM HEXAHYDRIDE

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 512,120, Oct. 4, 1974. This application Nov. 20, 1974, Ser. No. 525,394

Int. Cl.<sup>2</sup> C01B 6/04

U.S. Cl. 423—644

18 Claims

1. A process for producing trialkali metal aluminum hexahydride which comprises:

1. alkali metal
2. aluminum and
3. hydrogen

in the presence of a catalytic amount of at least about 0.001 percent by weight of alkali metal aluminum dihydrocarbon dihydride, based on the alkali metal fed to the process, and of an inert aromatic hydrocarbon solvent for alkali metal aluminum dihydrocarbon dihydride, under conditions suitable to form trialkali metal aluminum hexahydride, thereby producing trialkali metal aluminum hexahydride.

4,010,249

#### PROCESS FOR THE PREPARATION OF HYDROGEN

Anthony A. duPont, 8 Georgeff Road, Rolling Hills, Calif. 90274

Filed Sept. 15, 1975, Ser. No. 613,236

Int. Cl.<sup>2</sup> C01B 1/08; C01G 53/02, 53/04, 53/00

U.S. Cl. 423—657

5 Claims

1. A process for generating hydrogen which comprises: (a) reacting nickel metal with water to form nickel hydroxide and hydrogen; (b) decomposing the hydroxide to the oxide and water with the addition of heat; (c) reacting iodine with the nickel oxide to form nickel iodide and nickel iodate; (d) decomposing the nickel iodate by the introduction of heat to form nickel oxide; (e) decomposing the nickel iodide by the introduction of heat to recover the original nickel; and (f) recycling the recovered nickel into step (a) of the process.

4,010,250

#### RADIOACTIVE IODINE (125I) LABELING OF LATEX PARTICLES

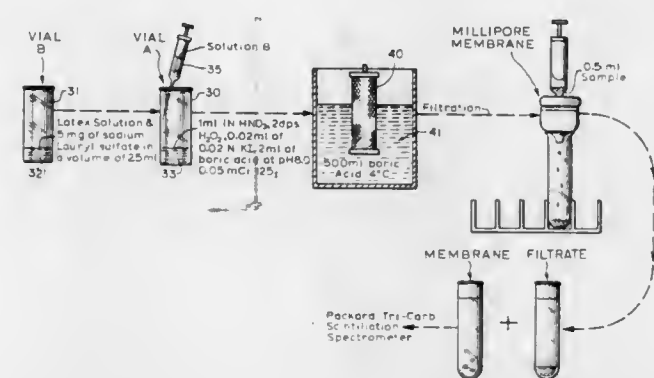
Gokaldas C. Parikh, and Chi Kuan Ho, both of Brookings, S. Dak., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1975, Ser. No. 556,061

Int. Cl.<sup>2</sup> A61K 43/00

U.S. Cl. 424—1

2 Claims



1. The method of preparing radioactive iodine 125 labeled latex particles of polyvinyl toluene in a predetermined size range of 2.02 μm to 0.37 μm in diameter comprising the following steps:

- Step 1, prepare a first solution which contains 1 ml of 1 N nitric acid, 2 drops of concentrated hydrogen peroxide, 0.02 ml of 0.02 N potassium iodide, 2 ml of boric acid buffer at pH 8.0, and 0.05 mCi of carrier-free <sup>125</sup>I;
- Step 2, prepare a second solution which contains 0.1 ml of 1:200 dilution polyvinyltoluene latex, 5 mg of sodium lauryl sulfate and 2.4 ml of ionized water;
- Step 3, add a drop of 0.1 N sodium nitrite to said first chemical solution;
- Step 4, transfer said first chemical solution to said second chemical solution in a drop by drop process, said solution being stirred constantly for a predetermined period of time;
- Step 5, add 1.02 ml of 1 N sodium hydroxide;
- Step 6, add the material thus compounded to a dialysis bag by a very slow drop by drop process, said material being maintained in said dialysis bag up to 36 hours while suspended in a dialysis solution of boric acid, said dialysis solution being periodically changed and analyzed;
- Step 7, said material being removed from said dialysis bag for use subsequently in the process of tagging certain virus.

4,010,251

#### SCANNING AGENT COMPOSITION AND USE IN IMAGING LIVER AND FOR BILIARY FUNCTION

Allan M. Green, Cardinal Lane, Gates Mill, Ohio 44040

Filed Dec. 16, 1974, Ser. No. 533,109

Int. Cl.<sup>2</sup> A61K 29/00, 43/00

U.S. Cl. 424—1.5

15 Claims

1. A scanning agent composition comprising glycoproteins and glycopeptides having glycosidic side chains terminating in a sialic acid moiety followed by a galactose, said glycoproteins and glycopeptides having been desialylated and chemically combined with a compatible radioisotope suitable for hepatobiliary imaging.

4,010,252

#### ANTIMICROBIAL COMPOSITIONS

Gordon Trent Hewitt, Upper Montclair, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

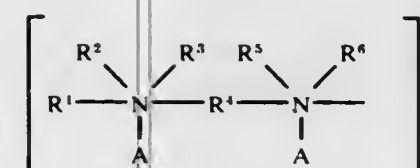
Filed Dec. 19, 1974, Ser. No. 534,270

Int. Cl.<sup>2</sup> A61K 7/34, 7/36, 7/38

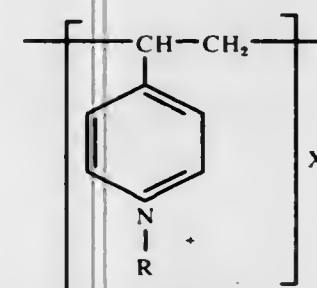
U.S. Cl. 424—47

14 Claims

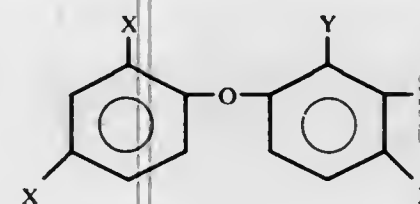
1. An antimicrobial composition comprising the product resulting from admixing (1) a compound selected from the group consisting of a poly (quaternary ammonium) compound having the formula



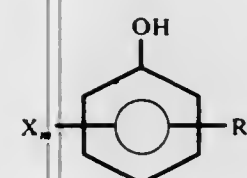
wherein  $n$  is about 2–200,  $A$  is the anion of an acid, and  $R^1$  and  $R^4$  are polymethylene containing 6 to 20 carbon atoms and  $R^2$ ,  $R^3$ ,  $R^5$  and  $R^6$  are alkyl containing 1 to 3 carbon atoms



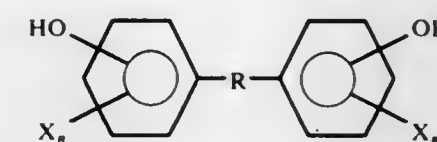
wherein  $n = 10^2$  to  $5 \times 10^3$ ;  $R$  is alkyl containing 6 to 15 carbon atoms,  $x$  is halide metho-sulfate or etho-sulfate and (2) at least one compound selected from the group consisting of compounds having the formula



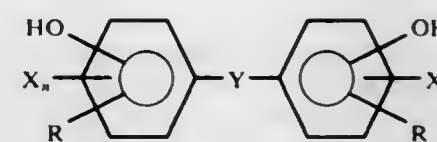
wherein  $Y$  is hydrogen or hydroxy and  $X$  halogen,  $-\text{CF}_3$  or  $-\text{H}$ ,



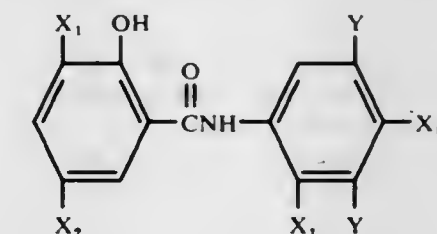
wherein  $R$  is a substituent selected from the group consisting of methyl and phenyl, each  $X$  is at least one of bromine and chlorine,  $y$  is 0 or 1, and  $m$  is an integer of about 1 to 5 (5- $y$ ), inclusive;



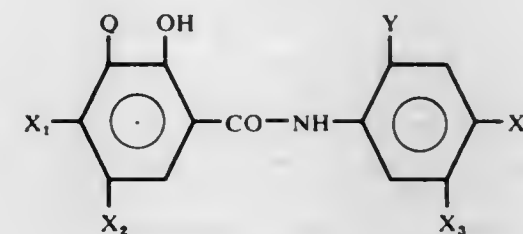
wherein  $X$  represents a halogen such as chlorine or bromine,  $n$  represents an integer of about 1 to 3, and  $R$  represents  $S$  or a divalent alkylene radical having about 1 to 4 carbon atoms;



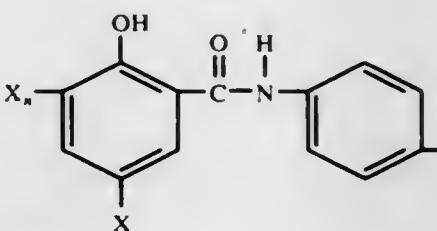
wherein  $X$  represents a halogen such as chlorine or bromine,  $n$  is an integer of about 1 to 3,  $R$  is an alkyl group containing about 1 to 4 carbon atoms and  $Y$  is  $S$  or a divalent radical having about 1 to 4 carbon atoms;



wherein each  $X_1$  represents hydrogen or halogen,  $X_2$  represents a halogen, and  $Y$  represents hydrogen, halogen or trifluoromethyl;

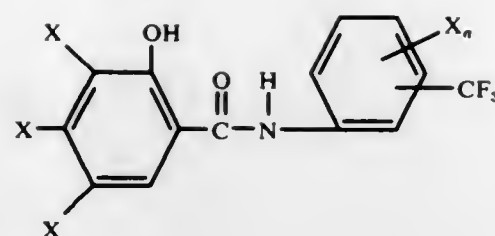


wherein  $Q$  represents a member selected from the group consisting of hydrogen, chlorine, bromine, and iodine,  $X_1$  and  $X_2$  each represent a member selected from the group consisting of hydrogen, chlorine, bromine, iodine and  $\text{CH}_3$ ,  $X_3$  represents a member selected from the group consisting of hydrogen, chlorine, bromine and  $\text{CH}_3$  and  $X_4$  and  $Y$  each represent a member selected from the group consisting of hydrogen, chlorine and bromine, there being at least two halogen substituents in the  $X$  positions;



wherein  $X$  is chlorine, bromine or iodine and  $n$  is 0 to about 1;





wherein X is chlorine, bromine, iodine or hydrogen and  $a$  is 0 to about 2, with the proviso that there is at least one and not more than three directly attached halogen atoms, none of which is adjacent to any of the others or to the  $\text{CF}_3$  group.

4,010,253

**PROCESS OF SUPPRESSING ODORS EMPLOYING DEODORANTS CONTAINING ESTERS OF CITRIC ACID**  
Günter Reese, Dusseldorf-Holthausen, and Rainer Osberghaus, Dusseldorf-Urdenbach, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany  
Filed Apr. 2, 1975, Ser. No. 564,555

Claims priority, application Germany, Apr. 16, 1974, 2418338

Int. Cl.<sup>2</sup> A61K 7/32

U.S. Cl. 424-47

6 Claims

1. A process for suppressing body odor in a warm-blooded animal comprising applying topically to said warm-blooded animal an effective deodorizing amount of a substantially anhydrous cosmetic preparation containing from 1 to 25% by weight based upon the total weight of at least one citrate ester of an acid selected from the group consisting of citric acid and acetylcitric acid with an alcohol selected from the group consisting of alkanol having from 1 to 6 carbon atoms, a cycloalkanol having from 5 to 6 carbon atoms and an alkanepolyol having 2 to 6 carbon atoms and 2 to 6 hydroxy groups; and the remainder of inert cosmetic ingredients.

4,010,254

**GELS BASED ON VINYL ETHER-MALEIC ANHYDRIDE COPOLYMER NEUTRALIZED BY A BASIC AMINO ACID**  
Constantin Koulbanis, Arlette Zabotto, both of Paris, and Jean-Claude Contamin, Chilly Mazarin, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France  
Filed July 7, 1975, Ser. No. 593,243

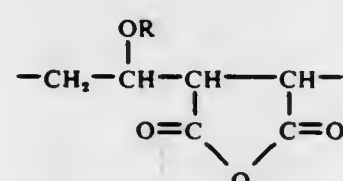
Claims priority, application Luxembourg, July 8, 1974, 70487

Int. Cl.<sup>2</sup> A61K 7/48

U.S. Cl. 424-78

10 Claims

1. A gel comprising an aqueous solution of a vinyl ether-maleic anhydride copolymer, a 0.5-5 weight percent aqueous solution of said copolymer having a viscosity ranging between 1 and 1000 poises measured at 25° C and at a pH of 7, said copolymer having a repeating unit of the formula



wherein R is alkyl having from 1-4 carbon atoms, and at least one amino acid having a basic character, said copolymer being present in an amount such that the viscosity of said gel is between 10 and 100 poises and said amino acid being present in an amount effective to impart to said solution a pH ranging between 3 and 9.

4,010,255

**SEX PHEROMONE FOR POTATO TUBEWORM MOTH, *PHTHORIMEA OPERCULELLA***

Ring T. Carde; Jan P. Kochansky, and Wendell L. Roelofs, all of Geneva, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed June 19, 1975, Ser. No. 588,343

Int. Cl.<sup>2</sup> A01N 17/14

U.S. Cl. 424-84

3 Claims

1. In a method for control of the male potato tuberworm moth, *Phthorimea operculella*, by subjecting said moth to a sex attractant in an amount sufficient to attract the moth to a particular location, the improvement which comprises the use as said sex attractant of an effective amount of trans-4, cis-7-tridecadienyl acetate.

4,010,256

**MALE CONTRACEPTIVE AND METHOD OF ACHIEVING MALE CONTRACEPTION**

Albert F. Parlow, Torrance, Calif., assignor to Professional Staff Association of the Los Angeles County Harbor General Hospital, Torrance, Calif.

Filed July 30, 1975, Ser. No. 600,301

Int. Cl.<sup>2</sup> A61K 37/38, 39/00

U.S. Cl. 424-88

5 Claims

1. A method of immunization of human males to achieve contraception which includes the step of administering, periodically, predetermined amounts of, non-primate, highly purified FSH having a biologic potency of at least 1,000 I.U./mg., an LH contamination of below 1 I.U./mg. and a TSH contamination of less than 0.1 I.U./mg. to a human male until his sperm production declines below about twenty million per cc.

4,010,257

**BIOLOGICAL EXTRACTS**

Christopher Adlam, Farnborough, and David Eric Reid, West Wickham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Feb. 22, 1974, Ser. No. 445,309

Claims priority, application United Kingdom, Feb. 23, 1973, 9149/73

Int. Cl.<sup>2</sup> A61K 39/02, 39/04

U.S. Cl. 424-92

17 Claims

1. A pharmaceutical composition comprising a glycopeptide which glycopeptide is obtainable from the cell wall of an immunostimulating bacterium belonging to the Actinomycetaceae or Mycobacteriaceae families of Prevot's classification, which glycopeptide is substantially insoluble in water, physiological saline, methanol, ethanol, phenol, chloroform, dioxan, pyridine, dimethylformamide, diethylene glycol, and hexane; has an absorption in the infra-red spectrum at 1550 and 1660  $\text{cm}^{-1}$  consistent with the presence of peptide; has an absorption in the infra-red spectrum between 950 and 1100  $\text{cm}^{-1}$  with a maximum absorption at 1050 to 1070  $\text{cm}^{-1}$  consistent with the presence of carbohydrate; has little or no lipid absorption in the infra-red spectrum at 2850 to 2950  $\text{cm}^{-1}$ , and which glycopeptide after intravenous administration increases the liver and spleen weight of mice, and increases the life expectancy of mice with tumour in association with a pharmaceutically acceptable carrier therefor.

4,010,258

**MICROBIAL AMYLASE INHIBITOR AND PREPARATION THEREOF WITH THE USE OF STREPTOMYCES DIASTICUS VAR. AMYLOSTATICUS**

Sawao Murao, Sakai, Japan, assignor to Ajinomoto Co., Inc. and Eisai Co., Ltd., both of Tokyo, Japan

Filed Mar. 12, 1975, Ser. No. 557,555

Claims priority, application Japan, Mar. 15, 1974, 49-29646; Mar. 15, 1974, 49-29647

Int. Cl.<sup>2</sup> A61K 35/00; G07F 3/02

U.S. Cl. 424-115

15 Claims

1. A process for producing an amylase inhibitor, Amylostatin-A, of claim 2 which comprises aerobically cultivating *Streptomyces diasticus* var. *amylostaticus* FERM P-2499 in a medium containing an assimilable carbon source, nitrogenous material and inorganic salts, accumulating an effective amount of Amylostatin-A in the broth, and recovering the accumulated Amylostatin-A.

2. An amylase inhibitor, Amylostatin-A, prepared by the process of claim 1 having an oligo- or poly-saccharide constitution and characterized by the following physicochemical and biological properties:

- having a specific activity on certain amylases; the capability of inactivating  $\alpha$ -amylase and glucoamylase, but the incapability of inhibiting  $\beta$ -amylase and isoamylase,
- being stable at room temperature as well as being heat resistant at a range of pH from 1 to 12,
- having an infrared absorption spectrum when pelleted with potassium bromide exhibiting the absorption band shown in appended FIG. 1,
- having an apparent molecular weight of about 2000 calculated on the basis of gel filtration and employing reference proteins,
- being soluble in water and pyridine but substantially insoluble in methanol, ethanol, chloroform and acetone,
- having adsorbability on active carbon in a pH range of 1 to 12 but in aqueous solution of pH 1 to 14 not being adsorbed on strongly acidic and strongly basis ion-exchange resins.

14. A method of treating living creatures of the group consisting of humans and animals to inhibit the digestion and absorption of starch ingested thereby which comprises orally administering to the human or animal the amylase inhibitor of claim 1 in a dosage sufficient to mitigate the disorder or symptom without causing toxicity.

4,010,259

**DISINFECTANTS CONTAINING IODINE COMPLEXED TO A HYDROPHILIC ORGANIC CARRIER**

J. A. Olof Johansson, Ejderavagen 14, Veberod, Sweden

Filed July 17, 1975, Ser. No. 596,725

Int. Cl.<sup>2</sup> A61L 13/00

U.S. Cl. 424-150

7 Claims

1. A disinfectant containing up to 20% iodine in complexed form, wherein iodine is complexed to a hydrophilic organic carrier, which

is a cross-linked polymerisation product of a poly-hydroxylic organic material and a bi-functional cross-linking agent, which forms a three dimensional lattice, kept together by covalent bonds, and which is insoluble in water, but capable of swelling in water to form a gel, the swelling capacity of the carrier being such that 1 g of the dry carrier forms a gel having a volume of from 2 to 100 ml when completely swelled in water.

4,010,260

**DERIVATIVES OF RETRO-ENANTIO-SOMATOSTATIN, INTERMEDIATES THEREFOR, AND PROCESS THEREFOR**

Hans U. Immer, Mount Royal; Nedumparambil A. Abraham, Dollard des Ormeaux, and Verner R. Nelson, Kirkland, all of Canada, assignors to Ayerst McKenna & Harrison Ltd., Montreal, Canada

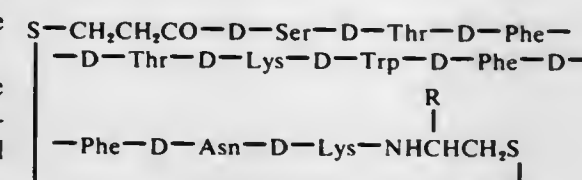
Filed July 28, 1975, Ser. No. 599,448

Int. Cl.<sup>2</sup> C07C 103/52; A61K 37/00

U.S. Cl. 424-177

52 Claims

17. A compound of the formula I



in which R is hydrogen or  $\text{CONHCH}_2\text{CONHCH}_2\text{CH}_3$ .

51. A method of treating diabetes which comprises administering a therapeutically effective amount of a compound of formula I as claimed in claim 17 together with a pharmaceutically acceptable carrier therefor.

4,010,261

**METHOD TO PREVENT REPRODUCTION WITH  $[\text{DES-GLY}]^{10}$ -GN-RH NONAPEPTIDE AMIDE ANALOGS IN POSITION**

Edwin Samuel Johnson, Antioch, and Riemon Henry Rippel, Jr., Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 25, 1974, Ser. No. 526,482

Int. Cl.<sup>2</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424-177

6 Claims

1. The process for preventing reproduction consisting essentially in administering to a female, warm-blooded animal in or before reaching the reproductive age, between 2 - 200  $\mu\text{g./kg./day}$  of the nonapeptide L-pGlu-L-His-L-Trp-L-Ser-L-Tyr-X-L-Leu-L-Arg-L-Pro-NH-R wherein X denotes the optically active D-form of an amino acid of the formula  $-\text{NH}-\text{CHR}'-\text{CO}-$  with R' being a linear or branched carbon chain of 1 - 4 carbon atoms and wherein R is loweralkyl for at least one day in the period before said female produces one or more mature ova or after ovulation has occurred.

4,010,262

**METHOD FOR REDUCING THE INCIDENCE OF SCOURS IN MONOGASTRIC ANIMALS AND FOR THE TREATMENT OF SCOURS**

Bartley P. Cardon, and Howard M. Frederick, both of Tucson, Ariz., assignors to Arizona Feeds, Tucson, Ariz.

Filed Oct. 6, 1975, Ser. No. 619,903

Int. Cl.<sup>2</sup> A61K 31/715

U.S. Cl. 424-180

9 Claims

1. The method of reducing the incidence of scours in monogastric animals, comprising feeding to the animal an effective amount of pregelatinized starch.



4,010,263

## INSECTICIDAL ACTIVE THIOPHENE PHOSPHOROUS DERIVATIVES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

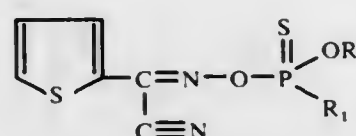
Continuation-in-part of Ser. No. 406,042, Oct. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 325,491, Jan. 22, 1973, abandoned, which is a division of Ser. No. 179,233, Sept. 9, 1971, abandoned. This application May 5, 1975, Ser. No. 574,781

Int. Cl.<sup>2</sup> A01N 9/36

U.S. Cl. 424—202

4 Claims

1. A method of killing insects selected from the insect orders of Diptera, Orthoptera, Hemiptera, Homoptera, Coleoptera and Lepidoptera selected from the group consisting of Cabbage Looper and Beet Armyworm comprising applying to the habitat thereof an insecticidally effective amount of a compound of the formula



wherein R is a lower alkyl group having from 1 to 4 carbon atoms and R<sub>1</sub> is selected from the group of lower alkyl and lower alkoxy having from 1 to 4 carbon atoms.

4,010,264

7-[3-SUBSTITUTED

## ISOXAZOL-5-YL]-ACETAMIDO-CEPHALOSPORANIC ACIDS AND THEIR ANTI-BACTERIAL USE

Peter Wolfgang Henniger, Leiden, and Peter Max Smid, Delft, both of Netherlands, assignors to Koninklijke Nederlandsche Gist-en Spiritusfabriek N.V., Delft, Netherlands

Continuation-in-part of Ser. No. 195,482, Nov. 3, 1971, Pat. No. 3,891,635. This application Dec. 17, 1974, Ser. No. 533,708

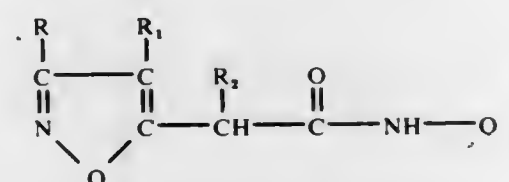
Claims priority, application United Kingdom, Nov. 6, 1970, 53040/70

Int. Cl.<sup>2</sup> C07D 501/20; A61K 31/545

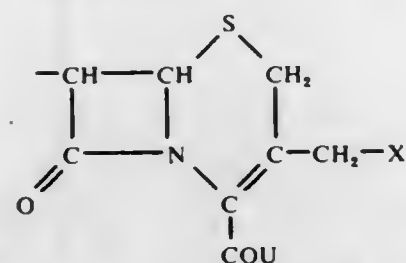
U.S. Cl. 424—246

11 Claims

1. A compound of the formula



wherein R is lower alkyl of 1 to 4 carbon atoms, R<sub>1</sub> is selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbon atoms, cyano, amino and chlorine, R<sub>2</sub> is selected from the group consisting of hydrogen, amino, lower alkyl of 1 to 4 carbon atoms, bromo and chloro and Q is



wherein X is selected from the group consisting of hydrogen, hydroxy and lower alkanoyloxy and U is OY, wherein Y is selected from the group consisting of hydrogen and non-toxic, pharmaceutically acceptable salt forming groups and alkyl of 1 to 4 carbon atoms.

4,010,265

## 8-ALKYLPYRIDO[3,4-d]PYRIDAZINES

Shojiro Yurugi, Kyoto, and Shintaro Kikuchi, Hyogo, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 25, 1975, Ser. No. 562,032

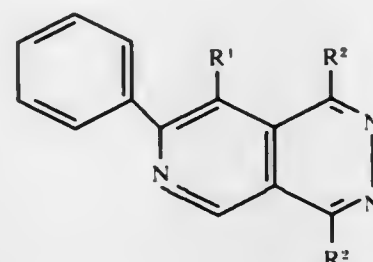
Claims priority, application Japan, Mar. 28, 1974, 49-35255

Int. Cl.<sup>2</sup> C07D 413/14

U.S. Cl. 424—248.4

9 Claims

1. A pyrido[3,4-d]pyridazine of the formula:



wherein R<sup>1</sup> stands for methyl or ethyl, R<sup>2</sup> stands for pyrrolidino, morpholino, methyl-morpholino, ethyl-morpholino, piperidino, methyl-piperidino or ethyl-piperidino, or a pharmaceutically acceptable acid salt thereof.

9. A method of treating ascites which consists essentially of administering to a patient suffering therefrom a medicinally effective amount of a compound of claim 1.

4,010,266

## PHENYLVINYL MORPHOLINE COMPOUNDS

Bernard Joseph McLoughlin, and Allen John Guildford, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 10, 1975, Ser. No. 567,011

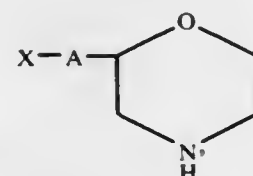
Claims priority, application United Kingdom, May 7, 1974, 20013/74

Int. Cl.<sup>2</sup> C07D 265/30; A61K 31/535

U.S. Cl. 424—248.4

4 Claims

1. A morpholine derivative of the formula:



wherein A stands for the trans vinylene radical and X stands for a phenyl radical which is unsubstituted or which is substituted by a methyl, methoxy, ethoxy or phenoxy radical in the 2- or 4-position or by a fluorine, chlorine or bromine atom; and the pharmaceutically-acceptable acid-addition salts thereof.

4. A method of relieving depression in a warm-blooded animal which comprises administering thereto an effective amount of a compound of claim 1.

4,010,267

## BENZODIOXOLE COMPOUNDS

Gilbert Regnier, Hatenay-Malabry; Roger Canevari, Villebon-sur-Yvette; Michel Lauble, Vaucresson, and Jean-Claude Poignant, Bures-sur-Yvette, all of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medical, Suresnes, France

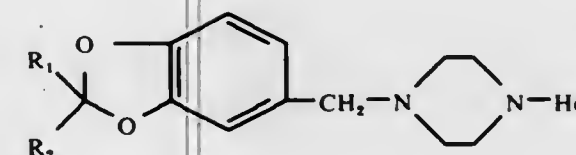
Division of Ser. No. 342,284, March 16, 1973, Pat. No. 3,917,597. This application Mar. 26, 1975, Ser. No. 562,226 Claims priority, application United Kingdom, Apr. 7, 1972, 16098/72

Int. Cl.<sup>2</sup> C07D 295/08

U.S. Cl. 424—250

13 Claims

1. A compound selected from the group consisting of:  
A. benzodioxole compounds of the general formula:



wherein:

R<sub>1</sub> is selected from the group consisting of hydrogen and alkyl having 1 to 5 carbon atoms inclusive;

R<sub>2</sub> is selected from the group consisting of alkyl having 1 to 5 carbon atoms inclusive and phenyl; or

R<sub>1</sub> and R<sub>2</sub> together represent a polymethylene chain —(CH<sub>2</sub>)<sub>n</sub>— wherein n is selected from 4, 5 and 6; and

Het is selected from the group consisting of 2-thiazolyl, methyl-2-thiazolyl, phenyl-2-thiazolyl, and dimethyl-2-thiazolyl, and

B. physiologically tolerable acid addition salts thereof.

4,010,268

## DERIVATIVES OF HEXAHYDRODIBENZOFURAN-3-ONE, THEIR PREPARATION AND USE IN PHARMACEUTICAL COMPOSITIONS

Saroop Singh Matharu, Highworth; David Alun Rowlands, Cirencester; Robert Westwood, Cricklade, and John Bodenhams Taylor, Down Ampley, all of England, assignors to Roussel-UCLAF, Paris, France

Filed Apr. 24, 1975, Ser. No. 571,236

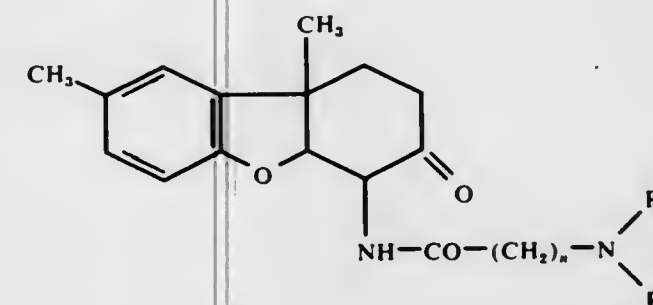
Claims priority, application United Kingdom, Apr. 26, 1974, 18459/74

Int. Cl.<sup>2</sup> C07D 405/12

U.S. Cl. 424—250

9 Claims

1. A compound of the formula:



wherein R<sup>1</sup> and R<sup>2</sup>, which may be the same or different, represent methyl, ethyl, benzyl or dimethylaminoethyl groups or together with the intervening N represents a pyrrolidino, piperidino, morpholino, piperazino, or piperazino having in the 4-position a methyl, ethyl, hydroxyethyl, phenyl, benzyl, acetyl or ethoxycarbonyl group, n is an integer less than 6, and a pharmaceutically acceptable salt thereof.

4,010,269

## ANTIVIRAL QUINAZOLINE COMPOSITIONS AND METHODS OF USE

Harold E. Renis, Portage, and Louis L. Skaletzky, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

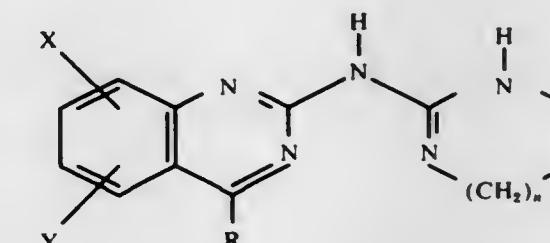
Filed June 16, 1975, Ser. No. 586,887

Int. Cl.<sup>2</sup> A61K 31/505

U.S. Cl. 424—251

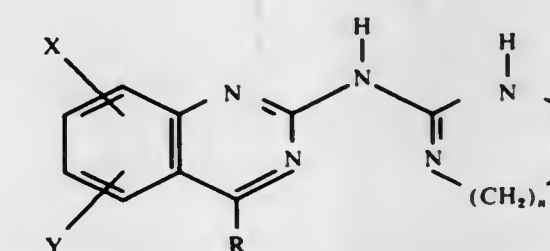
20 Claims

1. A pharmaceutical composition suitable for local or topical delivery which comprises about 0.01 to about 50 mg. of a compound of the formula:



and the non-toxic pharmaceutically acceptable acid addition salts thereof, wherein X and Y are the same or different and are selected from the group consisting of hydrogen, halogen, alkyl of one to six carbon atoms, inclusive, alkoxy of one to six carbon atoms, inclusive; R is alkyl of one to six carbon atoms, inclusive; and n is 0 or 1, in association with a pharmaceutically acceptable carrier.

10. A method for treating viruses in a mammal, said viruses selected from the group consisting of rhinovirus, influenza, parainfluenza 1, 2 and 3 and Coxsackie A-21 which comprises locally or topically administering to the infected mammal an antiviral effective amount of a compound of the formula:



and the non-toxic pharmaceutically acceptable acid addition salts thereof, wherein X and Y are the same or different and are selected from the group consisting of hydrogen, halogen, alkyl of one to six carbon atoms, inclusive, alkoxy of one to six carbon atoms, inclusive; R is alkyl of one to six carbon atoms, inclusive; and n is 0 or 1, in association with a pharmaceutical carrier.

4,010,270

## 4-OXO-4H-PYRANO[3,2-c]QUINOLINE-2-CARBOXYLIC ACIDS AND SALTS THEREOF

Friedrich Karl Hess, Pointe Fortune, and Patrick Brian Stewart, St. Andrews East, both of Canada, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Sept. 23, 1975, Ser. No. 615,912

Claims priority, application Germany, Sept. 28, 1974, 2446497

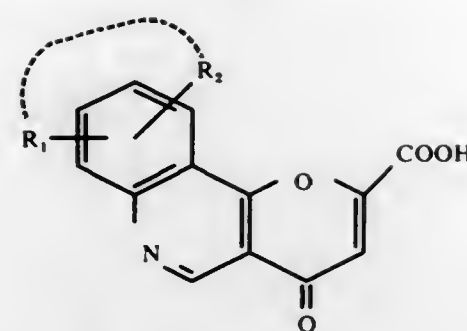
Int. Cl.<sup>2</sup> C07D 491/04

U.S. Cl. 424—258

7 Claims

1. A compound of the formula

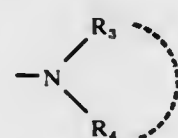




wherein

$R_1$  is alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, fluorine or chlorine,

$R_2$  is alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, fluorine, chlorine, phenyl, hydroxyl, alkyl of 1 to 3 carbon atoms-mercapto, carboxyl or



where

$R_3$  and  $R_4$  are each alkyl of 1 to 4 carbon atoms or, together with each other and the nitrogen atom to which they are attached, morpholino, piperidino or methylpiperidino; or

$R_1$  and  $R_2$ , together with each other and when attached to adjacent carbon atoms of the benzene ring, are  $-\text{CH}=\text{CH}-\text{CH}=\text{CH}-$ ,  $-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-$  or  $-\text{O}-\text{CH}_2-\text{O}-$ ;

or a non-toxic, pharmacologically acceptable salt thereof.

6. An antiallergic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antiallergic amount of a compound of claim 1.

7. The method of suppressing allergic reactions in a warm-blooded animal, which comprises administering topically, perorally, parenterally or by the respiratory route to said animal an effective antiallergic amount of claim 1.

4,010,271

#### NOVEL PYRAZOLINE COMPOUNDS HAVING INSECTICIDAL ACTIVITY

Rudolf Mulder, and Kobus Wellinga, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y. Division of Ser. No. 547,991, Feb. 7, 1975. This application May 30, 1975, Ser. No. 582,308

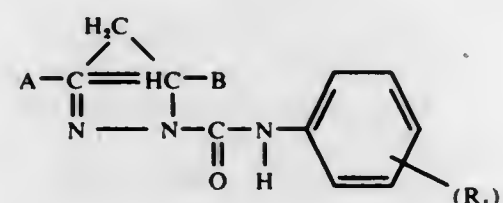
Claims priority, application Netherlands, Feb. 9, 1972, 7201674

Int. Cl.<sup>2</sup> A01N 9/22

U.S. Cl. 424-273

32 Claims

1. A biocidal composition for controlling insects and mites, said composition containing, in addition to a solid or liquid inert carrier material, an insecticidally or miticidally effective amount of a pyrazoline of the formula



wherein

A is a moiety selected from the group consisting of phenyl and phenyl substituted by 1 or 2 substituents selected from the group consisting of halogen, cyano, alkyl of from 1 to 4 carbon atoms halogenated alkyl of from 1 to 4

carbon atoms, cyclohexyl, alkoxy of from 1 to 4 carbon atoms, alkylthio of from 1 to 4 carbon atoms and amino group substituted by 1 or 2 alkyls of 1 to 4 carbon atoms; each B is a moiety selected from the group consisting of hydrogen, phenyl and phenyl substituted by from 1 to 3 substituents selected from the group consisting of halogen, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, optionally substituted with halogen thioalkyl of 1 to 4 carbon atoms, sulfonylalkyl of 1 to 4 carbon atoms, dioxy alkylene of 1 to 4 carbon atoms and amino substituted by 1 or 2 alkyl groups each alkyl having from 1 to 4 carbon atoms;

$R_1$  is a moiety selected from the group consisting of a halogen atom, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, optionally substituted with halogen, thioalkyl of 1 to 4 carbon atoms, sulfonylalkyl of 1 to 4 carbon atoms, cyano, nitro and an amino group substituted by 1 or 2 alkyl groups,

$n$  is 1 or 2, with the proviso that when A represents a phenyl group containing two substituents, these substituents do not occupy the 2,6 positions of the phenyl group, and that  $(R_1)_n$  must not be a 2,6-di-substitution.

4,010,272

#### ANTHELMINTICALLY ACTIVE BASICALLY SUBSTITUTED

#### 2-CARBALKOXY-AMINO-BENZIMIDAZOLYL-5(6)-PHENYL ETHERS AND -KETONES

Heinz Loewe, Kerkheim, Taunus; Josef Urbanietz, Schwalbach, Taunus; Dieter Dliwel, Hofheim, Taunus, and Reinhard Kirsch, Niederjosbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany Filed Sept. 8, 1975, Ser. No. 611,325

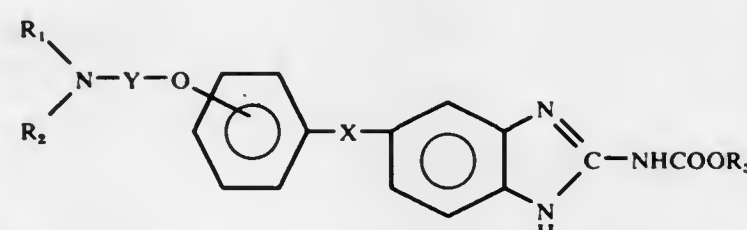
Claims priority, application Germany, Sept. 10, 1974, 2443297

Int. Cl.<sup>2</sup> C07D 235/32

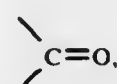
U.S. Cl. 424-273

12 Claims

1. A basically substituted 2-carbalkoxyamino-benzimidazolyl 5(6)-phenyl ether or -ketone of the formula



wherein  $R_3$  is alkyl having 1 to 4 carbon atoms, X is oxygen, sulfur or



Y is a straight-chained or branched alkylene of 1 to 4 carbon atoms and  $R_1$  and  $R_2$  represent alkyl having 1 to 4 carbon atoms, whereby  $R_1$  and  $R_2$  together with the supporting nitrogen atom may also represent pyrrolidine, piperidine, morpholine or thiomorpholine, and a salt thereof with a physiologically tolerable acid.

4,010,273

#### 5-SULFAMOYL-BENZOIC ACID DERIVATIVES CARRYING A HETEROCYCLIC SUBSTITUENT

Dieter Bormann, Kerkheim, Taunus; Wulf Merkel, Neuenhain, Taunus; Roman Muschaweck, Frankfurt am Main, and Mania, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 23, 1975, Ser. No. 570,649

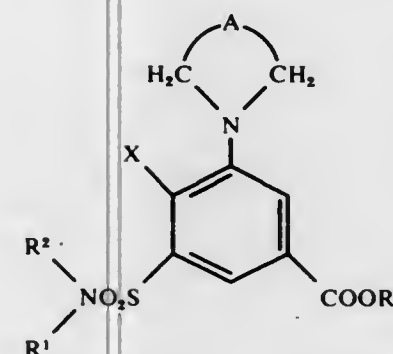
Claims priority, application Germany, Apr. 25, 1974, 2419970

Int. Cl.<sup>2</sup> C07D 295/14

U.S. Cl. 424-274

8 Claims

1. A 5-sulfamoylbenzoic acid derivative carrying a heterocyclic substituent and corresponding to the formula



in which  $R^1$ ,  $R^2$  and  $R^3$  are hydrogen or alkyl of 1 to 4 carbon atoms; X is phenoxy, the phenyl ring of which may be substituted by halogen, OH, NO<sub>2</sub>, NH<sub>2</sub>, CF<sub>3</sub>, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, or dimethylamino; and A is  $-\text{CH}_2-\text{CH}_2-$  which may be substituted by halogen, lower alkyl, or phenyl, and the physiologically tolerated salts thereof.

4,010,274

#### ISOINDOLINE DERIVATIVES HAVING PLATELET ANTI-AGGREGATING ACTIVITY

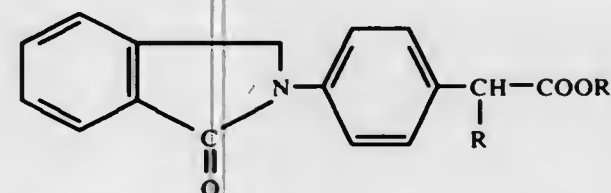
Pier Nicola Giraldi; Giuliano Nannini, both of Milan; Giovanni Riasoli, Vanese; Anna Spelta, Milan, and Aurelio Contone, Como, all of Italy, assignors to Carlo Erba, Milan, Italy Continuation of Ser. No. 537,429, Dec. 30, 1974, abandoned, which is a continuation of Ser. No. 483,780, June 26, 1974, abandoned. This application Oct. 16, 1975, Ser. No. 622,828

Claims priority, application Italy, July 27, 1973, 27151/73 Int. Cl.<sup>2</sup> A61K 31/40

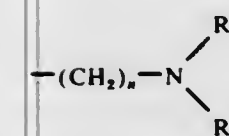
U.S. Cl. 424-274

6 Claims

1. A method for the prevention and treatment of platelet aggregation comprising administering to a patient in need thereof of a therapeutically effective amount of a compound of the formula:

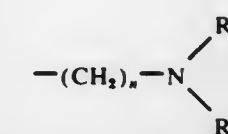


wherein R is hydrogen or alkyl of 1-4 carbon atoms,  $R_1$  is hydrogen, alkyl of 1-4 carbon atoms or a group of the formula:



wherein  $n$  may be 1 or 2 and each of  $R_2$  and  $R_3$ , being the same or different, are hydrogen or alkyl of 1-4 carbon atoms or a

salt of the compound wherein  $R_1$  is hydrogen with a physiologically acceptable base or a salt of the compound wherein  $R_1$  is



with a physiologically acceptable acid.

4,010,275

#### TREATMENT OF OSTEOARTHRITIS

Gerhard Wilhelm, Reichen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

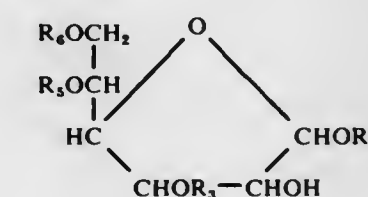
Filed Mar. 18, 1975, Ser. No. 559,608

Int. Cl.<sup>2</sup> A61K 31/34

U.S. Cl. 424-285

7 Claims

1. A method of treatment of osteoarthritis which is characterized by orally administering to warm-blooded animals a pharmaceutical preparation containing a therapeutically effective amount of a furanoside of the formula I



wherein  $R_1$  is hydrogen or alkyl with up to 7 carbon atoms, and  $R_2$ ,  $R_3$  and  $R_4$  each independently is hydrogen, alkyl with up to 7 carbon atoms, alkenyl with up to 7 carbon atoms, benzyl, halogeno-benzyl,  $(C_1-C_7\text{-alkyl})$ -benzyl,  $(C_1-C_7\text{-alkoxy})$ -benzyl or trifluoromethyl-benzyl.

4,010,276

#### CERTAIN TRIORGANOTIN COMPOUNDS USED TO COMBAT MITES

Melvin H. Giltz, Edison, N.J., assignor to M & T Chemicals Inc., Greenwich, Conn.

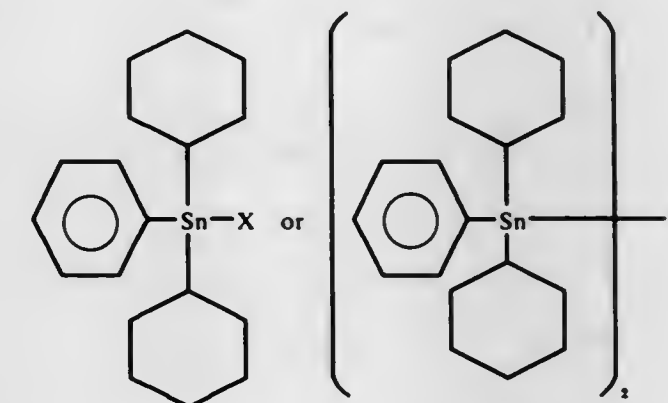
Division of Ser. No. 487,053, July 10, 1974, Pat. No. 3,923,998, which is a continuation-in-part of Ser. No. 311,509, Dec. 4, 1972, abandoned. This application June 16, 1975, Ser. No. 587,034

Int. Cl.<sup>2</sup> A01N 9/00

U.S. Cl. 424-288

1 Claim

1. A method for killing mites by contacting the mites on their plant habitat with a composition comprising a liquid or solid inert carrier and a miticidally effective but non-phytotoxic amount of a dicyclohexylphenyltin compound of the general formula



wherein X represents a monovalent radical selected from the group consisting of chlorine, bromine, fluorine, hydroxyl,



carboxylate, phenoxy, alkoxy ( $-OR^1$ ) and mercaptide ( $-SR^2$ ), wherein  $R^1$  represents an alkyl radical containing between 1 and 12 carbon atoms, inclusive,  $R^2$  represents a radical selected from the same group as  $R^1$  or a phenyl radical and Y is selected from the group consisting of oxygen, sulfur and sulfate radicals.

4,010,277

# SYNERGISTIC COMPOSITIONS CONTAINING A POLYOXYETHYLENE SORBITOL HEXAOLEATE AND THEIR USE

Paul Swered, and Mary Anne Girard, both of Philadelphia, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.  
Continuation-in-part of Ser. No. 545,678, Jan. 30, 1975, abandoned. This application Feb. 13, 1976, Ser. No. 657,795  
Int. Cl.<sup>2</sup> A01N 9/00, 9/24

U.S. Cl. 424—298

10 Claims

1. A composition for controlling the growth of the microorganism *Aerobacter aerogenes* which comprises a mixture of 1,3-dichloroacetone oxime acetate and polyoxyethylene sorbitol hexaoleate having an average of 40 oxyethylene groups wherein the weight ratio of the acetate to the hexaoleate ranges from about 95:5 to about 5:95 respectively.

4,010,278

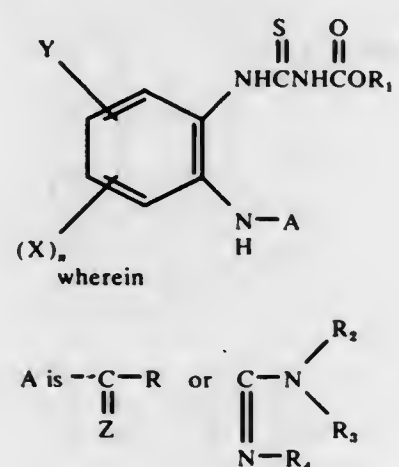
# COMPOSITIONS OF ALKYL 4-[O-(SUBSTITUTED AMINO)PHENYL]-3-THIOALLOPHANATES AND METHODS OF USE

Charles De Witt Adams, Newark, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.  
Division of Ser. No. 865,984, Oct. 13, 1969, Pat. No. 3,927,069. This application Apr. 20, 1972, Ser. No. 245,901  
Int. Cl.<sup>2</sup> A01N 9/24

U.S. Cl. 424—309

10 Claims

1. The method of preventing injury due to mites or fungi consisting essentially of applying to the locus to be protected from fungi and mites a fungicidally and mite ovicidally effective amount of a compound of the formula:



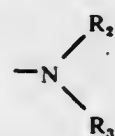
X is hydrogen, fluorine, chlorine, or bromine;

Y is hydrogen or alkyl of 1 to 4 carbon atoms;

$R_1$  is alkyl of 1 to 12 carbon atoms;

Z is oxygen or sulfur;

R is hydrogen, alkyl of 1 to 12 carbon atoms, alkyl of 1 to 12 carbon atoms substituted with fluorine, chlorine, bromine, alkoxy of 1 to 3 carbon atoms or acetyl; alkoxy of 1 to 4 carbon atoms; or



$R_2$  is hydrogen or methyl;

$R_3$  is hydrogen or alkyl of 1 to 4 carbon atoms;

$R_4$  is hydrogen or methyl;

When y is alkyl, n is O and when Y is hydrogen, n is 1, 2, or 3; and the sodium, potassium, lithium, calcium, barium, copper, zinc and manganese salts of these compounds.

4,010,279

# BIPHENYLOXY DERIVATIVES AND ANTIHYPERLIPIDEMIC USE

Gerhart Griss; Wolfgang Grell; Rudolf Hurnaus, all of Biberach, Riss; Robert Sauter, Laupheim; Bernhard Eisele, Biberach, Riss; Nikolaus Kaubisch, Biberach, Riss, and Matyas Leitold, Biberach, Riss, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany  
Filed Dec. 23, 1975, Ser. No. 643,700

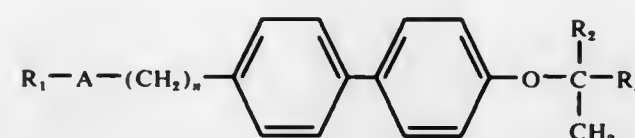
Claims priority, application Germany, Jan. 9, 1975, 2500692; Oct. 25, 1975, 2547872

Int. Cl.<sup>2</sup> A61K 31/24; C07C 103/84

U.S. Cl. 424—309

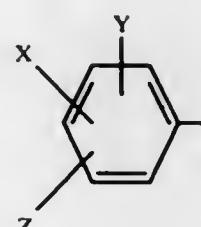
7 Claims

1. A compound of the formula



wherein

$R_1$  is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenylalkyl, phenylalkenyl or



where X, Y and Z are each hydrogen, halogen, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms,  $R_2$  is hydrogen or alkyl of 1 to 4 carbon atoms,  $R_3$  is alkoxy carbonyl of 2 to 7 carbon atoms or cycloalkoxy carbonyl of 4 to 8 carbon atoms, A is  $-CO-NH-$  or  $-NH-CO-$ , and n is 1, 2 or 3.

7. The method of lowering the level of lipids in the blood of a warm-blooded animal in need of such treatment, which comprises perorally, parenterally or rectally administering to said animal an effective antihyperlipidemic amount of a compound of claim 1.

4,010,280

# PHENOXYALKYLAMINE DERIVATIVES AND PREPARATION THEREOF

Isamu Maruyama, Minoo; Masaru Nakao; Kikuo Sasajima, both of Toyonaka; Shigeo Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan  
Filed Sept. 27, 1974, Ser. No. 509,952

Claims priority, application Japan, Sept. 28, 1973, 48-109983

Int. Cl.<sup>2</sup> A01N 9/20; C07C 91/16, 93/06

U.S. Cl. 424—316

6 Claims

1. A compound selected from the group consisting of

N- 2-(2-ethoxyphenoxy)ethyl -3-(4-fluorophenoxy)propylamine,

N- 2-(2-ethoxyphenoxy)ethyl -3-(4-fluorophenylthio)propylamine,

N- 2-(2-(2-ethoxyphenoxy)ethyl -3-(4-fluoroanilino)propylamine,

N- 2-(2-ethoxyphenoxy)ethyl -3-(N-ethyl-4-fluoroanilino)propylamine and pharmaceutically acceptable salts thereof.

4,010,281

# N-(4-HALOBENZYL)-N-BRANCHED ALKYL-N'-PHENYLUREAS AND FUNGICIDAL USE THEREOF

Yasuo Yamada; Junichi Saito; Tatsuo Tamura, and Yoshio Kurahashi, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany  
Filed Oct. 1, 1975, Ser. No. 618,716

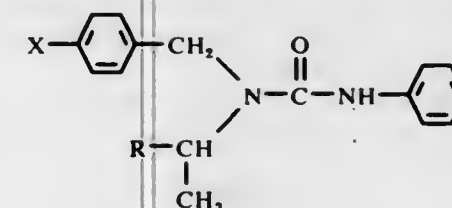
Claims priority, application Japan, Oct. 7, 1974, 49-114659

Int. Cl.<sup>2</sup> A01N 9/20; C07C 127/17

U.S. Cl. 424—322

12 Claims

1. An N-(4-halobenzyl)-N-branched alkyl-N'-phenylurea of the formula



in which

R is a  $C_1-C_6$  alkyl radical, and

X is a halogen atom.

10. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,010,282

# ANTI-ARRHYTHMIC AGENTS

Fritz Binnig, Fussgoenheim, and Manfred Raschack, Weisenheim am Sand, both of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany  
Filed June 25, 1975, Ser. No. 590,156

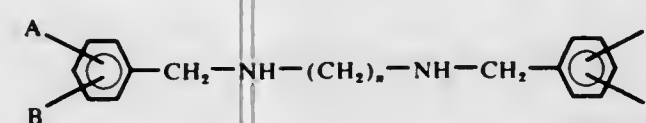
Claims priority, application Germany, Aug. 9, 1974, 2438288

Int. Cl.<sup>2</sup> A61K 31/135

U.S. Cl. 424—330

3 Claims

1. The method of treating cardiac arrhythmia in a patient suffering therefrom which comprises orally or parenterally administering a therapeutically effective amount of an N,N'-dibenzyl alkylene diamine compound of the formula



or of a salt thereof with a physiologically tolerable acid, wherein A, B, D, and E are hydrogen, chlorine, or methoxy, and n is 2, 3, or 4.

4,010,283

# COATING METHOD IMPROVING PRESERVATION AND ENABLING OVERTASTING OF CONFECTIONERY ARTICLES WITH A BASE OF GUM ARABIC OR SIMILAR PRODUCTS

Jacques Edmond Marie Canonne, Geneva, Switzerland, assignor to Soreat S.A., Geneva, Switzerland

Filed Oct. 15, 1975, Ser. No. 622,645

Claims priority, application France, Mar. 5, 1975, 75.06926  
Int. Cl.<sup>2</sup> A23G 1/00, 9/00

U.S. Cl. 426—100

5 Claims

1. In the method for producing confection articles having a base of gum arabic comprising molding and drying the articles in a conventional manner, the improvement in preservation and over-aromatization comprising:

after the drying step, immediately refrigerating the articles at a temperature within the range of from 0° to 10° C to give the articles a rigid consistency;

coating the refrigerated articles in at least one step with a varnish;

drying the varnish in air at a temperature lower than 20° C; and

coating with coats of sugar syrup which after drying constitute a sugar coating of noticeable thickness.

4,010,284

# METHOD FOR FORMING NUT CLUSTER CONFECTIONS AND THE LIKE

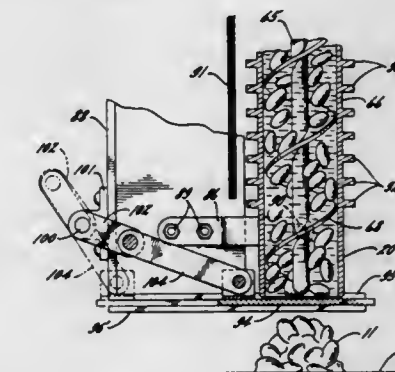
Lawrence Bellew, Secane, Pa., assignor to W. C. Smith & Sons, Inc., Philadelphia, Pa.

Division of Ser. No. 357,013, May 3, 1973, Pat. No. 3,918,862.  
This application Aug. 28, 1975, Ser. No. 608,737

Int. Cl.<sup>2</sup> A23L 1/09

U.S. Cl. 426—285

6 Claims



1. A method of making confections of the type having solids held in an irregular free formed cluster by a fluid binder that sets upon cooling comprising the steps of continuously feeding a controlled quantity of said solids into a mixing zone, continuously feeding a separate controlled quantity of said fluid binder into said mixing zone, mixing said fluid binder and solids in said mixing zone while simultaneously moving said mixture through mixing zone and extruding it out an outlet thereof, successively cutting said extruded mixture into predetermined sized pieces as said mixture is extruded, moving a run out conveyor in spaced relation below said mixing zone outlet, and successively dropping said cut pieces of said extruded mixture onto said moving run out conveyor so that the pieces assume an irregular free formed shape.



4,010,285

**CONCENTRATES FOR CARBONATED SOFT DRINKS**  
Georgé A. Van Doren, Jr., Dallas, Tex., assignor to Fred M. Van Doren, Minneapolis, Minn., a part interest  
Continuation-in-part of Ser. No. 490,914, July 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 384,698, Aug. 1, 1973, abandoned. This application Mar. 25, 1976, Ser. No. 670,126  
Int. Cl.<sup>2</sup> C02D 1/02

U.S. Cl. 426—534

3 Claims

1. In an aqueous base carbonated soft drink concentrate formulation comprising an aqueous solution of a flavoring concentrate based upon natural or artificial color and natural or artificial flavor and flavoring constituents selected from the group consisting of sodium chloride, sodium gluconate, gluconic delta lactone, caffeine, phosphoric acid, stannous chloride, citric acid, and sodium citrate; sodium benzoate in a concentration in said soft drink concentrate of about 0.3% by weight based upon total bottled concentrate; wherein:

- a. an artificial sweetener is provided selected from the group consisting of saccharin and sodium saccharin in a concentration in said soft drink concentrate ranging from between 0.03% and 0.18% by weight based upon total bottled concentrate, and natural sugar, with from 0% to less than about 50% of the total sweetening requirement being obtained from natural sugar, depending on strength of the concentrate; and
- b. carbon dioxide in a concentration ranging from greater than one up to seven volumes of carbon dioxide per volume of soft drink concentrate wherein the carbonated concentrate is prepared by introducing the carbon dioxide as a gas directly into the concentrate.

4,010,286

**FLAVORING WITH 4-METHYL-1-OXASPIRO[5.5] UNDECANE**

John B. Hall, Rumson; Denis E. Hruza, Sr., Brick Town, both of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Manfred Hugo Vock, Locust, and Joaquin Francisco Vinals, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 547,057, Feb. 4, 1975, abandoned. This application Nov. 20, 1975, Ser. No. 633,796  
Int. Cl.<sup>2</sup> A23L 1/226

U.S. Cl. 426—536

2 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from 0.5 ppm up to about 0.1 percent by weight of said foodstuff of the spiropyran compound, 4-methyl-1-oxaspiro[5.5]undecane.

4,010,287

**PROCESS FOR PREPARING METAL-CARBIDE-CONTAINING MICROSPHERES FROM METAL-LOADED RESIN BEADS**  
Ronald L. Beatty, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 18, 1974, Ser. No. 480,324  
Int. Cl.<sup>2</sup> G21C 3/06

U.S. Cl. 427—6

4 Claims

1. In a process for producing discrete porous spheroidal particles consisting of a dispersion of a metal carbide or oxide-carbide mixture within a carbon matrix, the improvement which comprises carbonizing a metal-loaded ion-exchange resin microsphere within a fluidized bed to create a carbonized microsphere consisting essentially of a dispersion of metal oxide within a carbon matrix, coating the carbonized microsphere with a buffer carbon layer resulting from the thermal decomposition of acetylene, and then heating the coated oxide-containing microsphere at a temperature for a time sufficient to convert at least a portion of the oxide to carbide.

4,010,288

**METHOD OF PREVENTING EVAPORATION OF LIQUID ON AN IMAGE-BEARING MEMBER**  
Ikuro Souma, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 614,962  
Claims priority, application Japan, Oct. 4, 1974, 49-114367; Oct. 4, 1974, 49-114368

Int. Cl.<sup>2</sup> B05D 3/00, 1/26

U.S. Cl. 427—15

10 Claims

1. A method for preventing evaporation of evaporative liquid from an endless surface of a rotatable member wherein said surface bears an electrostatic latent image or a visualized image, and wherein means are provided for supplying evaporative liquid to said surface and for removing evaporative liquid from said surface, said supplying means and said removing means being circumferentially spaced along said endless surface, said method comprising the steps of removing all evaporative liquid from said surface between said supplying means and said removing means and then stopping the rotation of said rotatable member, whereby no evaporative liquid remains on the surface of said rotatable member when said member is stopped.

4,010,289

**METHOD OF MANUFACTURING SYNTHETIC RESIN FILM HAVING HIGH WRITABILITY AND PRINTABILITY**

Yukio Kobayashi; Seiitiro Sakimoto, and Nobuyoshi Tanaka, all of Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,738  
Claims priority, application Japan, Nov. 14, 1973, 48-127162

Int. Cl.<sup>2</sup> B05D 3/06

U.S. Cl. 427—54

66 Claims

1. A method of preparing synthetic resin film of high writability and printability which comprises the steps of: reacting together to produce unsaturated polyester compound:

1. alicyclic polybasic acids or anhydrides thereof,
2. polyepoxides containing at least two epoxy groups and
3. at least one compound selected from the group consisting of:
  - a. unsaturated monobasic acids,
  - b. glycidyl compounds containing radical polymerizable unsaturated bonds, and
  - c. unsaturated polybasic acids, the proportions of said reactants based on 1 mol of reactant (1) being 0.1 to 3.0 mols of reactant (2) and 0.1 to 2.0 mols of reactant (3);

mixing the resulting unsaturated polyester compound with fillers;

coating the resulting filler containing mixture on the surface of a base synthetic resin film; and irradiating ultraviolet rays on the surface of the coated mixture to produce photopolymerization thereof.

2. A method of preparing a synthetic resin film of high writability and printability which comprises the steps of: reacting together to produce an organic compound containing unsaturated group

1. a compound selected from the group consisting of:
  - a. polyepoxides containing at least two epoxy groups and
  - b. alicyclic polybasic acids or anhydrides thereof, and
2. compounds containing both vinyl and hydroxyl groups in the molecule, the proportions of said reactant (b) when used in the reaction being between 0.5 to 1.8 mols for each mol equivalent of hydroxyl group in reactant (2) and the proportion of said reactant (2) being between 0.5 to 2.0 gram equivalent per epoxy group per molecule of any reactant (a) used in the reaction;

mixing the resulting unsaturated group containing organic compound with fillers; coating the resulting filler containing mixture on the surface of a base synthetic resin film; and irradiating ultraviolet rays on the surface of the coated mixture to produce photopolymerization thereof.

4,010,290

**METHOD OF FABRICATING AN INSULATED GATE FIELD-EFFECT DEVICE**

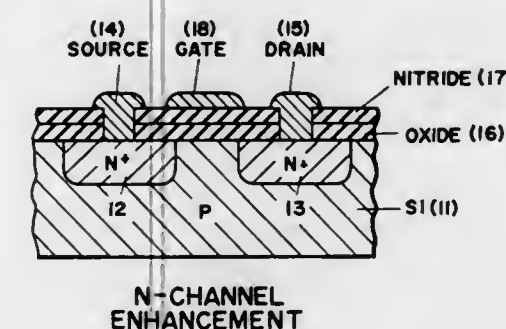
Bernard W. Boland, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 57,401, Sept. 22, 1971, abandoned, which is a division of Ser. No. 740,967, June 28, 1968, abandoned. This application June 20, 1973, Ser. No. 371,635  
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> B05D 5/12

U.S. Cl. 427—93

5 Claims



2. A method for the manufacture of an insulated gate field-effect transistor which includes thermal growth of an oxide layer on a silicon substrate comprising the steps of:

- passing a mixture of oxygen and hydrogen, in which the percentage of oxygen in the mixture is maintained within the range of 0.1% up to 4.0% by volume, in contact with the substrate while maintaining the substrate at a temperature between 800°C and 1400°C;
- forming a silicon nitride layer by pyrolytic deposition on the oxide layer by passing a mixture of hydrogen, silane and ammonia in contact with the oxide and substrate while maintaining the latter at a temperature between 800°C and 1100°C.

4,010,291

**METHOD OF MAKING A LOW RESISTANCE INDIUM OXIDE CONDUCTIVE FILM**

Yoshiyuki Katsube, and Shizuko Katsube, both of Ikeda, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 20, 1975, Ser. No. 624,189

Claims priority, application Japan, Dec. 16, 1974, 49-144804

Int. Cl.<sup>2</sup> B05D 5/12; C23C 15/00

U.S. Cl. 427—126

4 Claims

1. A method of making low resistance indium oxide conductive films on a substrate by a vacuum evaporation or sputtering process using indium oxide or metallic indium as starting material in a chamber having an atmosphere comprising aqueous vapor or gas mixed with aqueous vapor.

4,010,292

**PROCESS FOR THE PRODUCTION OF SELF-CONTAINED CARBONLESS COPY RECORD SHEETS**

Dale Richard Shackle, Box 151, Rte. 5, Scottsboro, Ala. 35768, and Gerhart Schwab, Rte. 9, Box 750, Chillicothe, Ohio 45601

Filed Aug. 28, 1975, Ser. No. 608,768

Int. Cl.<sup>2</sup> B41M 5/16

U.S. Cl. 427—150

21 Claims

1. A process for making pressure sensitive sheets comprising the steps of:

- a. forming a dispersion of microcapsules, said microcapsules being the product of microencapsulating a solution of a color precursor in an oil carrier, the walls of said microcapsules being substantially oil and water impermeable;
- b. forming an aqueous mixture containing a color developer for said color precursor;
- c. adding a color suppressant to said aqueous mixture in an amount equal to from about 0.1 percent to about 5.0 percent of the dry weight of the coating composition, said color suppressant being a nitrogen containing basic organic compound selected from the group consisting of: amines, polyethylenimines and aziridines;
- d. mixing said dispersion of microcapsules and said aqueous mixture to form an aqueous coating composition; and
- e. applying said aqueous coating composition to a substrate.

4,010,293

**ENHANCEMENT OF IRIDESCENT COLORS TO PROVIDE VIVID COLORANTS AND PRINTING INKS**

Chester Davis, 1685 Atson Lane, Cincinnati, Ohio 45205

Filed Feb. 13, 1975, Ser. No. 549,707

Int. Cl.<sup>2</sup> B05D 5/06; C09C 1/28

U.S. Cl. 427—214

13 Claims

1. A method of enhancing the interference reflection color of an iridescent pigment of the type comprising an essentially transparent plate-like base substrate having thereon at least one overcoating of an essentially transparent material having a refractive index which is substantially greater than that of said base substrate,

said method comprising: applying to said iridescent pigment a solution of a solvent-soluble coloring matter which possesses an absorption band complementary to the interference reflection color of said pigment.

4,010,294

**COMPLEX PHOSPHATES**

James Derek Birchall; John Edward Cassidy; Nicholas Rolfe, and Clifford Granville Miles, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 296,985, Oct. 12, 1972, Pat. No. 3,899,342. This application Apr. 24, 1975, Ser. No. 571,320  
Claims priority, application United Kingdom, Oct. 19, 1971, 48576/71; June 8, 1972, 26803/72

Int. Cl.<sup>2</sup> B05D 3/02

U.S. Cl. 427—226

15 Claims

1. A solid water-soluble aluminium phosphate binder which dissolves in water to form a solution containing aluminium ions, orthophosphate ions and additionally the anions of a carboxylic acid or a mineral oxyacid said ions being present in the solution in such proportions as to provide an Al:P ratio of substantially 1:1 and an additional anion:aluminium ion ratio in the range 0.5:1 to 4:1.



15. A method of coating a surface with an aluminium phosphate according to claim 1 which comprises applying to the surface a solution containing aluminium ions, orthophosphate ions and, additionally, the anions of a carboxylic acid or mineral oxyacid, the ions being present in such proportions as to provide an Al:P ratio of substantially 1:1 and an additional anion:aluminium ion ratio in the range 0.5:1 to 4:1 and decomposing the solution, by heating to provide a coating of aluminium phosphate on the surface.

4,010,295

**PROCESS FOR CONTINUOUSLY BONDING STAPLE FIBERS INTO A STABLE BAND AND STABLE BAND PRODUCED ACCORDING TO THE AFORESAID PROCESS**

Werner Naegeli, Winterthur, Switzerland, assignor to Pavena AG, Basel, Switzerland

Filed June 20, 1972, Ser. No. 264,622

Claims priority, application Germany, Dec. 22, 1971, 2163960

Int. Cl.<sup>2</sup> B32B 19/00, 27/02

U.S. Cl. 428—361

10 Claims

1. Process of adhesively bonding hydrophilic staple fibers into a stable band, comprising the steps of introducing into a fiber arrangement composed of staple fibers an excess of a liquid containing an adhesive distributed therein, squeezing off the excess liquid from the fiber arrangement, compacting the fiber arrangement into a moist compact by application of pressure thereto, contacting the moist band with a condensing vapor atmosphere formed from the liquid introduced into the fiber arrangement, and forming liquid from the condensing vapor atmosphere at the moist band for suppressing a sandwich-effect, and drying the band by evaporating the liquid of the band for setting the adhesive and transforming the band into the stable band.

4,010,296

**COMPOSITIONS FOR IMPARTING FIRE RETARDANCE TO WOOD**

William J. Oberley, 414 Cyra Drive, Monroeville, Pa. 15146

Division of Ser. No. 510,408, Sept. 30, 1974, Pat. No.

3,986,881. This application June 7, 1976, Ser. No. 693,188

Int. Cl.<sup>2</sup> B05D 3/02, 1/18

U.S. Cl. 427—393

2 Claims

1. Method of treating wood to impart non-hygroscopic, leach resistant fire retardant properties thereto comprising impregnating the wood with an aqueous solution of partially reacted monomethylol dicyandiamide, melamine, and phosphoric acid wherein the solution has a ratio of monomethylol dicyandiamide to melamine of from about 11.5:1.0 to about 3.0:1.0 and a molar ratio of phosphoric acid to monomethylol dicyandiamide plus melamine of from about 1.0:1.0 to 1.0:1.5 and curing the impregnated wood.

4,010,297

**COMPOSITE DECORATIVE TRIM STRIP FOR AUTOMOBILE SIDE BODIES**

Brian A. Wenrick, Dayton, Ohio, assignor to Protective Treatments, Inc., Dayton, Ohio

Filed Feb. 23, 1976, Ser. No. 660,005

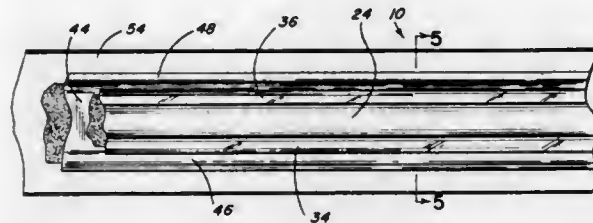
Int. Cl.<sup>2</sup> B32B 7/06, 3/30; B60R 13/04; B61F 19/04

U.S. Cl. 428—31

16 Claims

1. A trim strip structure comprising: first and second adhesively bonded plastic longitudinal body portions, said first body portion having an upper surface and a lower surface, said second body portion having an upper surface which is adhesively bonded to the lower surface of said first body portion by means of a first resilient adhesive layer underlying the lower surface of said first body portion, said second body portion

having a lower surface adapted to contact and be adhesively bonded to a surface of an article to be decorated, and a second



resilient adhesive layer underlying the lower surface of said second body portion.

4,010,298

**UNDERGROUND IRRIGATION DEVICES AND METHODS OF MAKING AND USING THE SAME**

William M. Angle, Rte. 2, Box 249, Troy, Mo. 63379

Filed Dec. 3, 1975, Ser. No. 637,475

Int. Cl.<sup>2</sup> B29D 23/10

U.S. Cl. 428—36

2 Claims



1. In a method of making perforated pipe by steps including rolling perforated flat sheet material into tubular form, the improvement comprising: indenting said flat sheet material to form a depression therein, forming a jagged edge about an aperture within said depression by punching said material from a side opposite said depression and rolling said sheet material into a tube with said depression opening exteriorly of said tube.

4,010,299

**MULTI-PANEL OUTSERT FOR ATTACHMENT TO A CONTAINER**

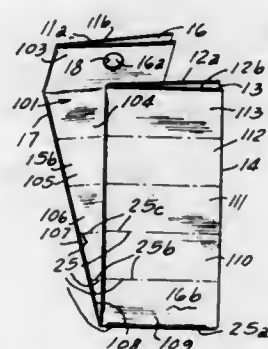
Charles J. Hershey, Jr., Libertyville, and George W. Lippincott, Zion, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill., by said Hershey and Nosco, Inc., Waukegan, Ill., by said Lippincott

Filed Aug. 25, 1975, Ser. No. 607,193

Int. Cl.<sup>2</sup> B32B 3/10, 7/12; G09F 3/00; B65D 73/00

U.S. Cl. 428—44

7 Claims



1. An outsert comprising: a sheet form article having flat surfaces on opposite sides for bearing indicia,

at least one longitudinal fold formed in said article to partition the article into a plurality of panels overlying one another, a through opening in each of said panels except one outside panel and said through opening being formed near one end of said article corresponding to a top or a bottom of the article, a plurality of parallel folds disposed at right angles to said longitudinal fold to partition the article into a plurality of panel sections overlying one another, said parallel folds being made so that inside surface of the said outside panel is in registered adjacency with the outside surface of the outer panel on the body of the completely folded outsert through said through opening, and an adhesive between said inside and said outside surfaces at said through opening to secure the folded panels into an integral unit.

4,010,300

**HEAT WELDED JOINTS BETWEEN WEBS OF REINFORCED PLASTIC FOIL**

Erik Wilhelm Wallin, Gamleby, Sweden, assignor to Baracudaverken Aktiebolag, Djursholm, Sweden

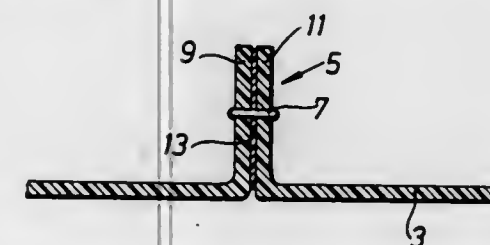
Filed Jan. 3, 1974, Ser. No. 430,406

Claims priority, application Sweden, Jan. 3, 1973, 7300082

Int. Cl.<sup>2</sup> B32B 3/04, 7/08; E04F 13/00

U.S. Cl. 428—61

8 Claims



1. A cover comprising at least two elongated webs of reinforced plastic foils for use as a stretched ceiling cover with each web having edges extending in the elongated direction of the web and with the surfaces of said webs disposed in generally planar relationship and the elongated edges of said webs disposed in parallel relation, wherein the improvement comprises that the elongated edges of said webs being bent out of the plane of said webs and extending angularly outwardly from the plane of said webs, adjacent said elongated edges on adjacent webs being disposed in contacting relationship and heat welded together along their lengths forming a heat welded joint therebetween, means extending through the outwardly bent portions of said elongated edges of said webs forming the heat welded joint for securing the outwardly bent portions together, and said means positioned at spaced intervals along the length of the joint for reinforcing the joint.

4,010,301  
CARPET TILE

Ray C. Anderson, and Joseph H. Kyle, both of LaGrange, Ga., assignors to Carpets International-Georgia (Sales), Inc., LaGrange, Ga.

Continuation-in-part of Ser. No. 524,813, Nov. 18, 1974, abandoned. This application Apr. 9, 1976, Ser. No. 675,341

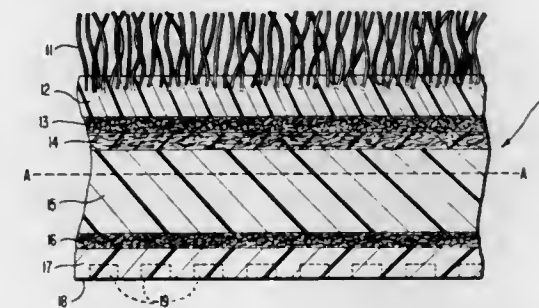
Int. Cl.<sup>2</sup> D03D 27/00; D04H 11/00; D05C 17/00

U.S. Cl. 428—95

20 Claims

1. A carpet tile comprising a facing portion including carpet pile projecting from said facing and a layer of resilient thermoplastic material; a first stiffening and stabilizing portion of glass fibers; an intermediate stabilizing layer consisting essentially of from about 70 to about 90 weight percent non-woven

glass fibers and concomitantly, from about 30 to about 10 weight percent of a polyester; a resilient backing portion including a second stiffening and stabilizing portion of glass fibers and a layer of resilient thermoplastic material; and



said carpet tile including a layer of resilient thermoplastic material between said stiffening and stabilizing portions of glass fibers, said stiffening and stabilizing portions of glass fibers providing substantial heat shielding effects to the carpet tile.

4,010,302

**TUFTED FACE CARPET TILE**

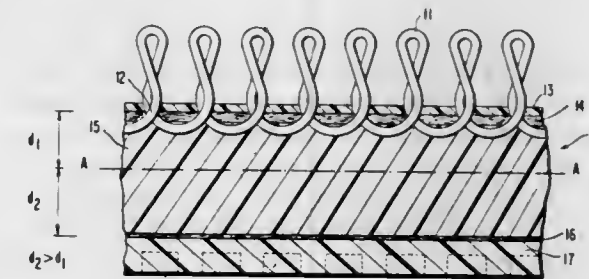
Ray C. Anderson, and Joseph H. Kyle, both of Troup County, Ga., assignors to Carpets International-Georgia (Sales), Inc., LaGrange, Ga.

Continuation-in-part of Ser. No. 524,813, Nov. 18, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 675,888

Int. Cl.<sup>2</sup> D03D 27/00; D04H 11/00; D05C 17/00

U.S. Cl. 428—95

16 Claims



1. A tufted face carpet tile comprising: a facing portion including tufted carpet yarn projecting from said facing portion, a primary backing portion and a first stiffening and stabilizing portion of glass fibers; a resilient backing portion including a second stiffening and stabilizing portion of glass fibers and a layer of resilient thermoplastic material; and said carpet tile including a layer of resilient thermoplastic material between said stiffening and stabilizing portions of glass fibers, said stiffening and stabilizing portions of glass fibers providing substantial heat shielding effects to the carpet tile.

4,010,303

**TUFTED CARPET WITH WOVEN RIBBON BACKING OF POLYAMIDE AND POLYESTER**

Otto Ramsauer, Wuppertal; Heribert Dau, Elsenfeld; Willi Gumbmann, Obernburg, and Ulrich Schulze, Immenstadt, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 14, 1976, Ser. No. 676,845

Claims priority, application Germany, Apr. 16, 1975, 7512027[U]

Int. Cl.<sup>2</sup> B32B 3/02, 33/00

U.S. Cl. 428—95

5 Claims

1. Tufted nylon carpet having a backing of ribbon-shaped warp and filling yarns having a reduced splitting tendency comprising a matrix-fibril structure of a mixture of 65 to 80%



by weight polyamide and 20 to 35% by weight polyester, wherein the matrix consists of polyamide and the fibrils, consisting of polyester, are discontinuous.

4,010,304

# HEATED WINDOWS HAVING VACUUM-DEPOSITED LAYERS

Sabatino Cohen, Sceaux, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

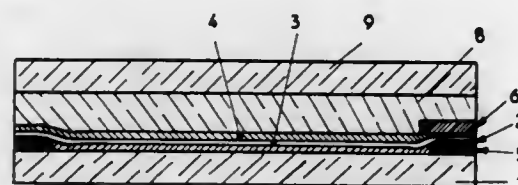
Filed July 24, 1975, Ser. No. 598,740

Claims priority, application France, July 26, 1974, 74.26023

Int. Cl.<sup>2</sup> B32B 7/02, 15/04

U.S. Cl. 428—213

12 Claims



1. A glazing comprising a glass sheet coated with an auxiliary dielectric anchoring layer, a metallic layer in contact with the anchoring layer, and a second auxiliary dielectric layer in contact with the metallic layer, in which at least one of the dielectric layers is formed of a deposit of a trioxide of tungsten or molybdenum.

4,010,305

# LAMINATES OF PLASTICIZED PVC AND ACRYLONITRILE: ALKYL ACRYLATE COPOLYMERS

Jin-Liang Wang, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 31, 1975, Ser. No. 563,756

Int. Cl.<sup>2</sup> B32B 7/10, 27/22, 27/26, 27/30

U.S. Cl. 428—215

4 Claims

1. A composite consisting of a polyvinyl chloride containing 20 to 100 parts of plasticizer and one to 50 parts of a polyisocyanate composition for each 100 parts of polyvinyl chloride adhered to a copolymer of 60 to 30 parts of acrylonitrile and 40 to 70 parts of alkylacrylate or alkyl methacrylate where the alkyl radical contains 1 to 30 carbon atoms.

4,010,306

# PROCESSES FOR IMPREGNATING AND COATING TRIAXIAL WEAVE FABRICS

Joseph P. Fagan, Huntington, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 2, 1975, Ser. No. 582,792

Int. Cl.<sup>2</sup> B05D 7/22

U.S. Cl. 428—236

2 Claims

2. A laminate consisting of: lightweight nonwoven sheet structure based on continuous filament synthetic organic fiber, laminated to a triaxial weave fabric; being impregnated and coated with a polymeric composition, wherein the triaxial weave fabric is selected from the group of glass, polyester, polyamide, or aromatic amide; and weighs no more than about two ounces per square yard; the sheet structure is of a yarn selected from the group of polyester or polypropylene, and weighs no more than about 0.5 ounces per square yard and has a thickness of no more than about 3 mil; and the polymeric composition is selected from the group of polychloroprene, chlorosulfonated polyethylene, polyurethane, or polyvinylchloride.

4,010,307

# COATING OF PAPER, CARDBOARD AND THE LIKE AND COMPOSITION

Pierre Canard, Versailles, and Albert Levy, Orly, both of France, assignors to Rhone-Progil, Courbevoie, France

Filed Nov. 13, 1974, Ser. No. 523,368

Claims priority, application France, Nov. 15, 1973, 73.40635; Mar. 1, 1974, 74.07018; Oct. 2, 1974, 74.33180

Int. Cl.<sup>2</sup> B32B 5/16; D21H 1/28

U.S. Cl. 428—327

5 Claims

1. A composition for coating paper, cardboard and the like, consisting essentially of an aqueous dispersion of a binder and a pigment in which 70 to 95% by weight of the pigment is calcium carbonate particles having a size within the range of 0.6 to 2 microns and 5 to 30% by weight of the pigment comprises particles of a non-filmogenic synthetic polymer which is insoluble in the binder, the particles of non-filmogenic synthetic polymer being dimensioned within the range of 0.05 to 0.30 microns in which the binder is selected from the group consisting of starches, proteins, casein, polyvinyl alcohol, styrene-butadiene copolymers, alkyl acrylate - styrene copolymers, alkyl acrylate - vinyl acetate copolymers and vinyl acetate homopolymers, and in which the non-filmogenic synthetic polymer is selected from the group consisting of aromatic polyvinyl compounds, polyolefins, polyhaloolefins, polyesters and polysulphones.

4. Paper and cardboard coated with the composition claimed in claim 1.

4,010,308

# FILLED POROUS COATED FIBER

Sol B. Wiczer, 1600 S. Eads St., Arlington, Va. 22202

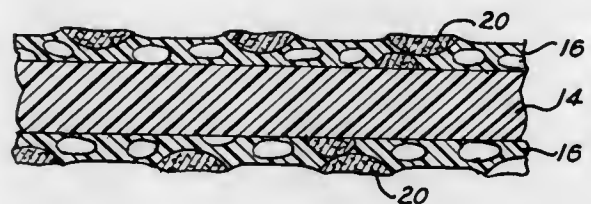
Continuation-in-part of Ser. No. 871,747, July 11, 1969, Pat. No. 3,889,038, which is a continuation of Ser. No. 515,806, Dec. 21, 1965, abandoned, which is a continuation-in-part of Ser. No. 157,591, Dec. 6, 1961, Pat. No. 3,278,328, which is a continuation-in-part of Ser. No. 777,344, Dec. 1, 1958, abandoned, which is a continuation-in-part of Ser. No. 353,003, May 4, 1953, Pat. No. 2,862,284. This application

June 9, 1975, Ser. No. 584,934

Int. Cl.<sup>2</sup> A46B 1/00; B32B 15/00; D02G 3/00

U.S. Cl. 428—372

11 Claims



1. A fiber comprising a fibrous core substance having a foamed coating thereon selected from the group consisting of thermoplastic and thermo-setting resins, the foamy surface being interrupted with open pores of said foam, at least said open pores being filled with a member of the group consisting of a gas applied under pressure, a liquid, solid particles and mixtures thereof.

4,010,309

# WELDING ELECTRODE

Walter Adrian Petersen, Ridgewood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 477,900, June 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 386,488, Aug. 8, 1973, abandoned. This application Oct. 30, 1975, Ser. No. 627,238

Int. Cl.<sup>2</sup> B32B 15/00; B23K 35/34

U.S. Cl. 428—386

17 Claims

1. A flux composition adapted to provide all-position covered electrode welding capability consisting essentially of, in weight percent from about 10% to about 26% calcium carbonate, from about 5% to about 20% barium carbonate, from

about 10% to about 23% titanium dioxide, up to about 4% aluminum oxide, from about 24% to about 26% cryolite, from about 10% to about 18% manganese, from about 1.8% to about 7.2% columbium, and chromium present in an amount up to about 10%.

4. An all-position welding electrode having a core wire containing, by weight, up to about 1% carbon, up to about 15% manganese, up to about 50% chromium, up to about 5% titanium, up to about 2% aluminum, up to about 70% iron, up to about 90% copper, up to about 10% molybdenum, up to about 6% columbium and the balance essentially nickel, and a flux coating consisting essentially of, in parts by weight of the dry flux, about 10 to about 26 parts calcium carbonate, about 5 to about 20 parts barium carbonate, about 10 to about 23 parts titanium dioxide, up to about 4 parts aluminum oxide, from about 24 to about 26 parts cryolite, about 10 to about 18 parts manganese, about 2.4 to about 7.2 parts columbium and up to about 10 parts chromium.

10. A flux composition adapted to provide covered electrode welding capability consisting essentially of, in weight percent from about 10% to about 26% calcium carbonate, from about 5% to about 20% barium carbonate, from about 10% to about 23% titanium dioxide, up to about 4% aluminum oxide, from about 20% to about 30% cryolite, from about 4% to about 18% manganese, from about 2.4% to about 7.2% columbium, and chromium present in an amount up to about 10%.

14. An all-position welding electrode having a core wire containing, by weight, up to about 1% carbon, up to about 15% manganese, up to about 50% chromium, up to about 5% titanium, up to about 2% aluminum, up to about 70% iron, up to about 90% copper, up to about 10% molybdenum, up to about 6% columbium, up to about 3% silicon, and the balance essentially nickel, and a flux coating consisting essentially of, in parts by weight of the dry flux, about 10 to about 26 parts calcium carbonate, about 5 to about 20 parts barium carbonate, about 10 to about 23 parts titanium dioxide, up to about 4 parts aluminum oxide, about 24 to about 26 parts cryolite, about 4 to about 18 parts manganese, about 1.8 to about 7.2 parts columbium, up to about 10 parts chromium, up to about 2 parts chromium oxide, and up to about 7.2 parts molybdenum.

4,010,310

# MAGNETIC POWDER

Yuichi Kubota; Shinji Umeki, and Yasumichi Tokuoka, all of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Continuation of Ser. No. 446,750, Feb. 28, 1974, abandoned.

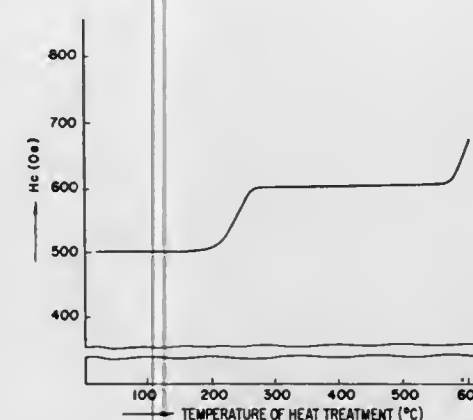
This application July 21, 1975, Ser. No. 597,636

Claims priority, application Japan, Mar. 20, 1973, 48-31486

Int. Cl.<sup>2</sup> H01F 1/36

U.S. Cl. 427—403

5 Claims



1. A magnetic powder prepared by a process, which consists essentially of:

mixing a cobalt compound selected from the group consisting of  $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ ,  $\text{CoSO}_4 \cdot 6\text{H}_2\text{O}$ ,  $\text{Co}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$ ,  $\text{Co}(\text{OH})_2$  and  $\text{CoO}$  and 1-10 mole percent of a complexing agent selected from the group consisting of oxy acids containing a hydroxyl group and a carboxyl group or a salt thereof, ethylenediamine, ethylenediaminetetraacetic acid, acetylacetone, pyridine, dipyrilidyl, hydrazine, ammonia and derivatives thereof per mole of said cobalt compound, which form a cobalt complex, with acicular iron oxide characterized by a  $\text{Fe}^{+2}/\text{Fe}^{+3}$  ratio of 0.1-0.35; and isolating and heating said acicular iron oxide at a temperature from 200°-500° C under an inert gas such that acicular iron oxide is obtained having cobalt oxide adsorbed thereon.

4,010,311

# IMPACT-RESISTANT GLASS-POLYESTERURETHANE LAMINATES

Charles W. Lewis, Pittsburgh, and Earl E. Parker, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 14, 1973, Ser. No. 397,507

Int. Cl.<sup>2</sup> B32B 27/40; C08G 63/12

U.S. Cl. 428—424

21 Claims

1. An optically clear laminate, comprising a sheet of relatively rigid, transparent polyesterurethane consisting essentially of the reaction product of (a) hydroxy-terminated polyester composition that is the esterification reaction product of an aliphatic dicarboxylic acid containing from 4 to 10 carbon atoms and an aliphatic diol containing from 4 to 8 carbon atoms, said polyester composition having a number average molecular weight of between about 500 and about 800 and containing no more than about 7 percent by weight residual, unreacted aliphatic diol, and (b) dinuclear cycloaliphatic diisocyanate, the mole ratio of diisocyanate to polyester being such that said polyesterurethane is substantially free of unreacted isocyanate groups.

4,010,312

# HIGH RESISTANCE CERMET FILM AND METHOD OF MAKING THE SAME

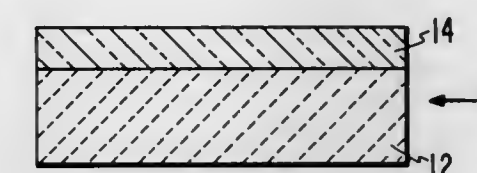
Harry Louis Pinch; Benjamin Abeles, both of Princeton, and Jonathan Isaac Gittleman, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,629

Int. Cl.<sup>2</sup> B32B 9/06, 3/06

U.S. Cl. 428—450

15 Claims

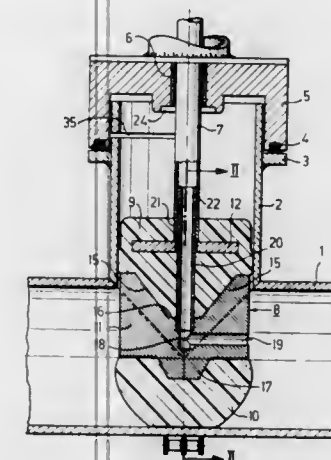


1. An article of manufacture comprising a high resistance cermet film on a refractory substrate, said cermet film being composed of a metal and a refractory insulator, said metal being selected from the group consisting of molybdenum, tungsten, cobalt and nickel, said metal being in the form of particles having an average diameter of from about 30 Å to about 120 Å, said film having a metal percent volume of less than about 50 per cent, said cermet film having been annealed in a reducing atmosphere wherein the resistivity of said cermet film is increased without an increase in the temperature coefficient of resistivity.



## ELECTRICAL

**4,010,313**  
**DEVICE FOR EFFECTING A GASTIGHT CLOSURE**  
 Helmut Marchhart, Landeck, Austria, assignor to Donau Chemie Aktiengesellschaft, Vienna, Austria  
 Filed Feb. 25, 1976, Ser. No. 661,298  
 Claims priority, application Austria, Mar. 4, 1975, 1643/75  
 Int. Cl.<sup>2</sup> F27D 3/00; H05B 7/06  
 U.S. Cl. 13—33 11 Claims

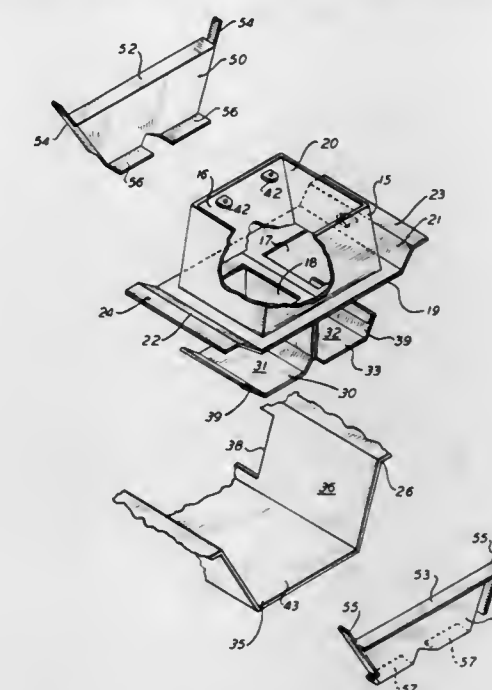


1. A device for effecting a gastight closure of an inner tube of a hollow electrode of an electrothermal smelting furnace, comprising a stub tube attached to the inner tube with the axis of the stub tube being substantially perpendicular to the axis of the inner tube; a deformable closure plug of elastomeric material so disposed as to be movable by means of an actuator rod from a position within the stub tube and clear of the flow path through the inner tube, to a position in the inner tube and for sealing whereby it is capable of being forced by pressure on the actuator rod so that the plug expands into sealing contact with the inner wall of the inner tube, the plug containing an embedded pressure transmitter body of rigid material which subdivides the plug into an end section which forms a closed sealing zone of elastomeric material lying against the inner wall of the inner tube, and a section at an end adjacent the stub tube which forms a closed sealing zone of elastomeric material lying against the inner wall of the stub tube, the two sealing zones lying substantially perpendicular to one another and being interconnected; and the actuator rod being coupled directly to the section of the plug which is at the end adjacent the stub tube and being coupled indirectly via this section and the pressure transmitter body to the end section of the plug.

**4,010,314**  
**INSERT DEVICE FOR CABLES**  
 John E. Kohaut, West Orange, N.J., assignor to Raceway Components, Inc., Nutley, N.J.  
 Filed Aug. 15, 1974, Ser. No. 497,551  
 Int. Cl.<sup>2</sup> H02G 3/12  
 U.S. Cl. 174—48 14 Claims

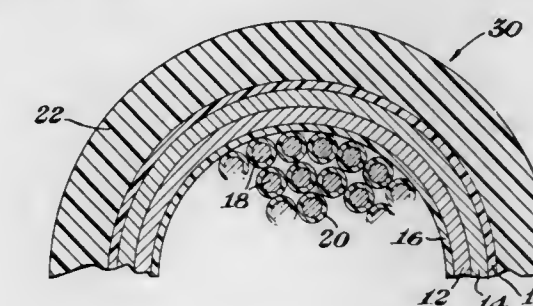
1. An insert device for use in connection with a cable source means for passage of cables into the insert device, said source having registration means, said insert device comprising:  
 a. an insert top assembly having a side wall defining the height of said top assembly, said assembly having an opening therein for passage of cables therethrough, and including plate means at the bottom of said top assembly having means extending upwardly therefrom in spaced relation to the sidewall and offset from the plane of said plate means, for registration with the cable source means, and

b. an insert bottom assembly comprising a dividing barrier device for registration with the cable source means for



separate passage of the cables therethrough and thence through the insert top assembly.

**4,010,315**  
**SHIELDING TAPE FOR CABLES**  
 Raymond C. Mildner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.  
 Filed Apr. 25, 1975, Ser. No. 571,839  
 Int. Cl.<sup>2</sup> H01B 7/22  
 U.S. Cl. 174—107 30 Claims



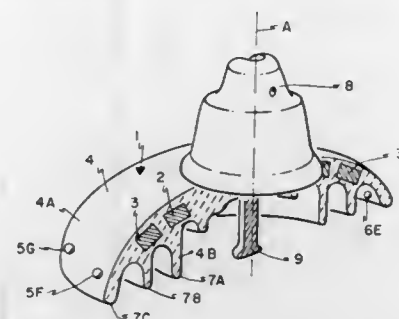
21. A cable for the transmission of electric power or communications comprising a core including insulated conductor means, a shield completely surrounding the circumference of said core and an outer jacket of insulation over the outside of said shields, said shield comprising a tape having a first layer of substantially pure aluminum bonded to a second layer of aluminum alloy, said aluminum alloy having an elongation to break of at least about 15 percent, a yield strength of at least about 13,000 pounds per square inch, a brinell hardness of at least about 30 and an electrolytic solution potential within about 0.05 volts of the substantially pure aluminum on the basis of N/10 calomel electrodes.

**4,010,316**  
**HIGH VOLTAGE ELECTRICAL INSULATOR HAVING MAGNETIC ELEMENTS TO PREVENT FLASHOVER**  
 David C. Jolly, Boston, and Daniel J. King, Allston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.  
 Filed Mar. 12, 1976, Ser. No. 666,368  
 Int. Cl.<sup>2</sup> H01B 17/42  
 U.S. Cl. 174—140 R 16 Claims

13. An insulator that comprises, in combination, an electrically insulating skirt or shed or shell formed in such a way that an arc in the course of flashover with respect to the skirt or



shred or shell must occur by moving generally radially across one surface of the skirt or shed or shell to the other surface thereof; and means for creating a closed-path magnetic field at



at least one said surface, having a component perpendicular to said at least one surface and creating a region wherein the magnetic field is present such that an arc in the course of incipient flashover must pass through the magnetic field.

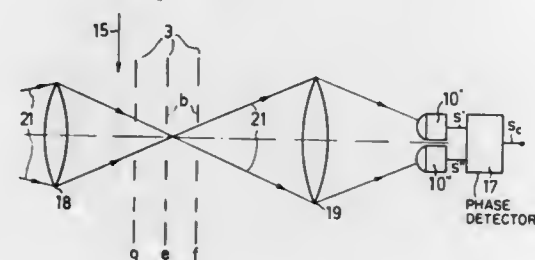
#### 4,010,317 APPARATUS FOR READING A RECORD CARRIER IN WHICH INFORMATION, FOR EXAMPLE VIDEO AND/OR AUDIO INFORMATION, IS RECORDED IN AT LEAST ONE TRACK

Gijsbertus Bouwhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 340,977, March 14, 1973, abandoned. This application Apr. 16, 1975, Ser. No. 568,708  
Claims priority, application Netherlands, Mar. 29, 1972, 7204204

Int. Cl.<sup>2</sup> H04N 5/76; G11B 7/00  
U.S. Cl. 358—127

8 Claims



1. In an apparatus for reading a record carrier in which information is recorded in at least one optically interrogatable longitudinally moving track, a focus detection system comprising a source of radiation providing a read beam of radiation, at least two optical detection elements spaced along the longitudinal direction of said track for converting optically modulated light into electrical signals, a lens system means in the path of said read beam for focussing said read beam to a radiation spot on said track that is substantially the same size as the smallest recorded detail on said record carrier whereby said information on said track modulates said read beam and for converging the radiation beam modulated by said track towards said two optical detection elements, whereby said optical detection elements receive radiation modulated by different portions of said track when said read beam is improperly focussed, and a phase detector connected to said at least two optical detection elements for measuring the phase difference between said electrical signals from said optical detection elements, said phase difference indicating the extent of the improper focus of said read beam on said track.

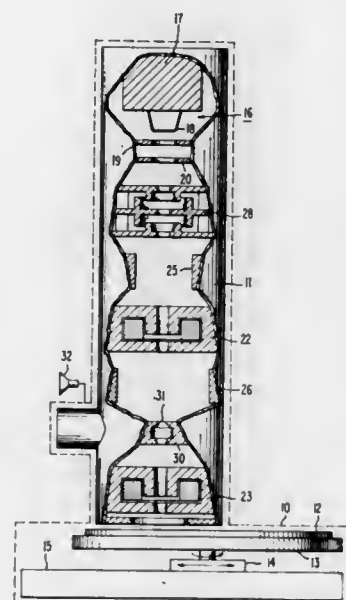
#### 4,010,318 PROBE FORMING ELECTRON OPTICAL COLUMN HAVING MEANS FOR EXAMINING MAGNIFIED IMAGE OF THE PROBE SOURCE

George Herbert Needham Riddle, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 15, 1975, Ser. No. 613,535  
Claims priority, application United Kingdom, May 20, 1975, 21550/75

Int. Cl.<sup>2</sup> H04N 5/76; G11B 9/00  
U.S. Cl. 358—178

10 Claims



1. A dual mode electron optical column apparatus operable in either a probe or a setup mode comprising:
  1. a source of providing a beam of electrons along a path toward an object surface to be probed;
  2. means for providing a demagnified image of the source on the object surface when the electron optical column apparatus is in the probe mode;
  3. means for providing a magnified image of the source in an image plane when the electron optical column apparatus is in the setup mode;
  4. means, including sampling means selectively subject to location in the image plane in the path of the electron beam and subject to removal from the path, for determining the current density of the portion of the magnified image which is intercepted by the sampling means when the sampling means is located in the image plane in the path of the electron beam while the electron optical column apparatus is in the setup mode; and
  5. means for varying the position of the magnified image of the source in the image plane relative to the sampling means while the sampling means is located in the path of the electron beam to permit determination of the current distribution of the magnified image by the current density determining means as various portions of the magnified image are, a seriatim, intercepted by the sampling means.

#### 4,010,319 SMEAR REDUCTION IN CCD IMAGERS

Peter Alan Levine, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,689  
Int. Cl.<sup>2</sup> H04N 5/38; H01L 29/78

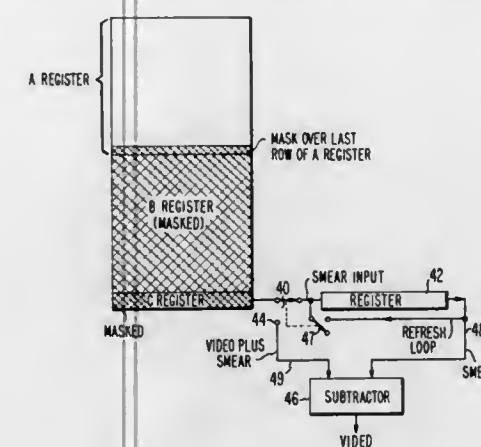
U.S. Cl. 358—213

13 Claims

1. In a CCD imager of the type having an imaging region onto which an image is projected for producing a charge pattern field and in which, after the pattern is produced, it is transferred out of the imaging region while the image remains projected thereon, whereby smear charge signals are produced during such transfer, and wherein the transferred pat-

tern is subsequently read-out, a method for substantially reducing the effect of the smear charge signals comprising the steps of:

producing a signal pattern representing the smear charge signal pattern present in one line of a field;



storing that signal pattern for an interval equal to at least the time required to read out the following lines of a field; and  
as said following lines of said field are read-out, subtracting from the line of charge signals being read the stored signal pattern.

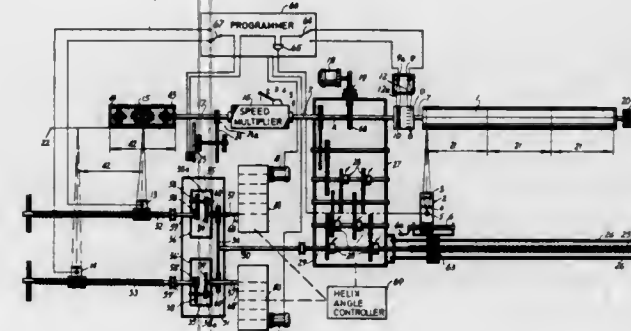
#### 4,010,320 DRUM RECORDING MEANS WITH DUAL SCANNING HEADS

Hans Kudlich, Kufstein, Austria, assignor to Schablonen Technik Kufstein Ges.m.b.H., Kufstein-Schafftenau, Austria

Continuation-in-part of Ser. No. 402,826, Oct. 2, 1973, abandoned. This application July 25, 1975, Ser. No. 599,054  
Claims priority, application Austria, Oct. 6, 1972, 8630/72

Int. Cl.<sup>2</sup> H04N 1/06  
U.S. Cl. 358—289

7 Claims



1. An apparatus for reproducing a pattern on a recording medium, said apparatus comprising:
  - a master cylinder adapted to carry said pattern and having an axis;
  - a copy cylinder adapted to carry said recording medium and having an axis, said copy cylinder being subdivided into a plurality of axially adjoining zones each adapted to receive a replica of said pattern;
  - main drive means connected to both of said cylinders for continuously jointly rotating same about their respective axes;
  - reading means including first and second reading heads axially spaced and axially displaceable along said master cylinder in a forward direction for scanning said pattern along a respective first set of helixes;
  - scribing means connected to said reading means and axially displaceable along said copy cylinder for replicating said pattern at least once in each of said zones by marking said medium along a second helix extending over all of said zones;

a first reader leadscrew parallel to the axis of said master cylinder and coupled with said first reading head for displacing same;  
a first reader transmission means having a differential gear train with an output operatively connected to said first reader leadscrew, a main input operatively connected to said main drive means, and an auxiliary input;  
auxiliary drive means coupled with said auxiliary input and effective in one operational mode for axially displacing said reader means at a predetermined rate in a reverse direction opposite said forward direction;  
a scribe leadscrew parallel to the axis of said copy cylinder coupled with said scribing means for displacing same;  
scribe transmission means operatively connecting said scribe leadscrew with said main drive means for axially displacing said scribe means with said drive means;  
a second such reader leadscrew adjacent and parallel to the first-mentioned reader leadscrew;  
a second such reader transmission means having a differential gear train with an output operatively connected to said second reader leadscrew, a main input operatively connected to said main drive means, and an auxiliary input; said second reading head being driven by said second reader leadscrew, said auxiliary drive means including first and second servomotors respectively connected to the auxiliary inputs of said first and second reader transmission means; and  
switching means for alternately connecting said reading heads to said scribing means and for alternately operating said motors to drive the head not connected to said scribing means in said reverse direction at a speed in excess of its speed in said forward direction to restore the axial spacing of said reading heads for further displacement thereof in said forward direction.

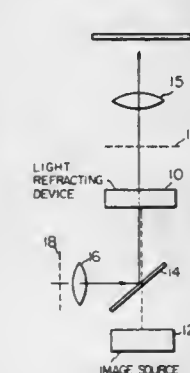
#### 4,010,321 LIGHT MODULATING DEVICE USING SCHLIERN LENS SYSTEM

Tadao Kohashi, Kawasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 19, 1973, Ser. No. 407,834  
Claims priority, application Japan, Oct. 20, 1972, 47-105491; Dec. 12, 1972, 47-125596

Int. Cl.<sup>2</sup> H04N 5/66  
U.S. Cl. 358—233

39 Claims



1. A light modulating device comprising: a support; a layer of electrokinetically mobile liquid on said support; and a pair of electrodes extending parallel to said liquid layer and adapted to be biased at potentials of opposite polarities, one of said electrodes adjacent said liquid layer being provided with a plurality of apertured regions to produce electric fields therein, a portion of each electric field extending parallel to said liquid layer to produce therein a plurality of lateral flows of current to disturb surface contour of the liquid.
18. A light modulating device comprising an electrokinetic mobile liquid, and means including a photoelectrical conversion surface for supporting the liquid in the form of layer, the conversion surface having discrete regions in electrical contact with the liquid layer and sensitive to an imagewise



radiation incident thereon to produce lateral current flows in said liquid layer.

4,010,322

# HIGH RESOLUTION LOW BANDWIDTH PORTABLE TELECOMMUNICATION SYSTEM

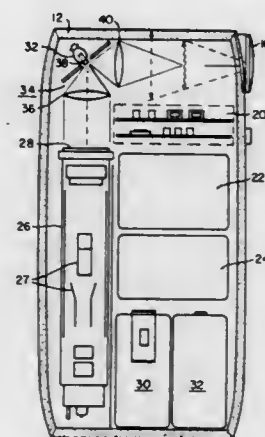
Harvey C. Nathanson, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 28, 1975, Ser. No. 599,492

Int. Cl.<sup>2</sup> H04N 5/64, 5/74

U.S. Cl. 358—233

5 Claims



1. A high resolution telecommunicator display receiver comprising:

- input signal receiver means;
- a high resolution cathode ray tube, which includes a light transmissive faceplate from which is closely internally spaced an electrostatically deflectable, light reflective, light valve array target;
- the light array target includes an array of spaced apart, individually electronic charge addressable members which are deflectable as a function of an electronic charge thereon;
- cathode ray tube drive means connected between the input signal receiver means and the cathode ray tube for establishing an electron charge pattern on the light valve target array corresponding to the communicated display image input signal, which charge pattern is maintained thereon without additional power input;
- display image readout means comprising optical means and a light source coupled to the cathode ray tube faceplate for projecting light upon the light valve target, with the reflected light from such target being modulated in correspondence to the degree of deflection of individual light valves, which reflected light is focused in an image viewing plane;
- integral power supply means for providing power to the receiver means and the cathode ray tube drive means, of less than about 5000 milliwatts, and power for the light source.

4,010,323

# DIGITAL TIMING RECOVERY

Richard John Peck, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1975, Ser. No. 626,658

Int. Cl.<sup>2</sup> H04L 7/00, 27/22

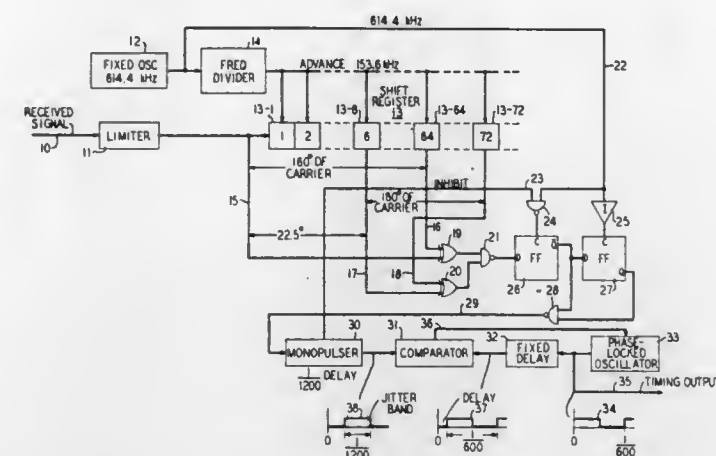
U.S. Cl. 178—88

6 Claims

5. In combination with a demodulator for synchronous phase-shift-keyed digital data signals modulated on a carrier wave of substantially constant frequency, said demodulator including a delay medium storing a plurality of samples of a received wave extending over more than a half-cycle of said carrier wave,

first means for comparing phases measured between pairs of samples points on said delay medium, each pair separated by integral half-cycles of said carrier wave, a failure of

comparison being indicated by a change of state in the output of said comparing means, monostable pulsing means triggered by said first comparing means to provide output pulses related to the synchronous data signaling rate, and



phase-locked oscillator means having a nominal frequency equal to that of the synchronous data signaling rate and a phase controlled by a second means for comparing responsive to said nominal frequency and said output pulses from said monostable means.

4,010,324

# BACKGROUND NOISEMASKING SYSTEM

John P. Jarvis, 19120 Nordhoff St., Northridge, Calif. 91324, and Ludwig W. Sepmeyer, 1862 Comstock Ave., Los Angeles, Calif. 90025

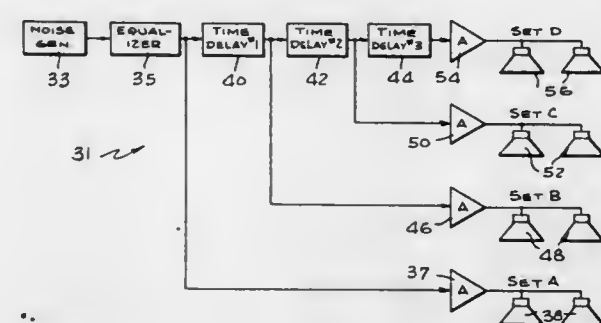
Continuation-in-part of Ser. No. 534,214, Dec. 19, 1974, Pat. No. 3,980,827. This application Apr. 12, 1976, Ser. No.

675,770

Int. Cl.<sup>2</sup> H04R 3/00

U.S. Cl. 179—1 P

10 Claims



1. A system for noisemasking having a noise generation and masking system comprising of:

a single noise generator for producing random noise; a single equalizer connected to the output of said noise generator for producing electronic noise signals equivalent to equalized non-delayed audio noise in a first channel; and

means connected to said first channel for receiving the equalized audio noise electronic signal and for introducing a first time delay therein to produce a second channel and for introducing a second time delay therein for producing a third channel of equalized audio noise electronic signals, each channel driving selected speakers of an array.

4,010,325

# FRAMING CIRCUIT FOR DIGITAL SIGNALS USING EVENLY SPACED ALTERNATING FRAMING BITS

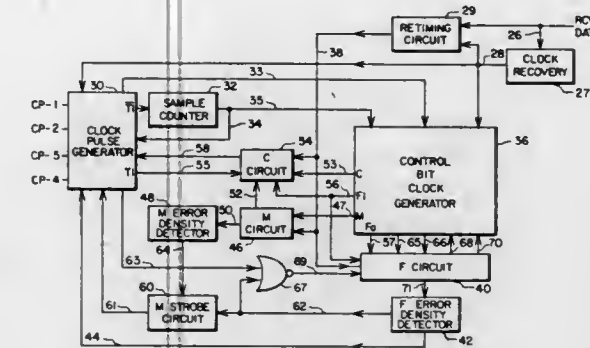
Ralph LeRoy Kline, Los Altos, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 30, 1975, Ser. No. 627,323

Int. Cl.<sup>2</sup> H04J 3/06

U.S. Cl. 179—15 BS

9 Claims



1. In a digital multiplexer system wherein a plurality of lower-speed bit streams are combined in a single high-speed bit stream for transmission, the high-speed bit stream containing information bits, stuffed bits, and signaling bits, said signaling bits further including evenly spaced winking framing bits, apparatus for reframing which comprises:

means for deriving timing information from said high-speed bit stream;

framing error detection means responsive to the received high-speed bit stream and to said timing information means for detecting errors in the framing pattern, said error detection means providing an error output signal for each error occurrence, within a predetermined time after the last error occurrence, only after a predetermined number of errors have occurred, said error output signals initiating a reframing cycle;

means for counting a predetermined number of bits in said high-speed bit stream and providing a first output signal in the time slot following the last bit in the predetermined count, said counting means being also responsive to error output signals of said framing error detection means, which signals cause signal outputs following said first output signal;

preview means, including means for storing the bit immediately following the framing bit, said preview means being responsive to the timing information means, the counting means, the framing detection means, and the high-speed bit stream, said preview means including means for comparing the preview bit with the next winking framing bit; and

means responsive to the output of said preview means to inhibit the reframing cycle once the comparing means indicates an in-frame condition has been obtained.

4,010,326

# LINE SELECTIVE TIME DIVISION COMMUNICATION SYSTEM

Norman L. Schwartz, Stony Brook, N.Y., assignor to Multiplex Communications, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 414,434, Nov. 9, 1973, Pat. No. 3,916,108, and a continuation-in-part of Ser. No. 555,562, March 5, 1975. This application May 29, 1975, Ser. No.

581,972

Int. Cl.<sup>2</sup> H04J 5/00

U.S. Cl. 179—15 BA

5 Claims

1. A time-division multiplex communication system comprising:

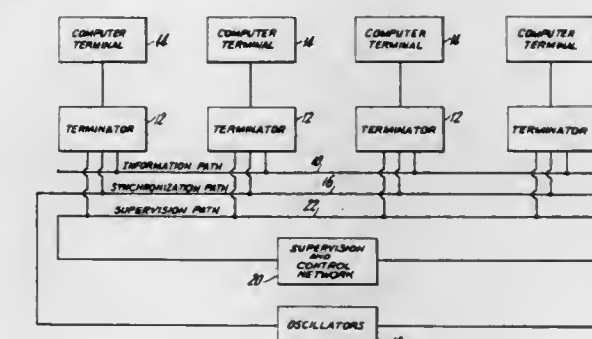
an information path consisting of a plurality of discrete lines each carrying samples of signals transmitted within selected time slots recurring once per frame;

oscillator means for generating a recurring series of syn-

chronization signals that identify occurring time slots by unique combinations of phase relationships;

a synchronization path for carrying synchronization signals generated by the oscillator means;

a supervision path for carrying supervisory signals which indicate interconnections to be made within the system; and a plurality of terminator means for providing data inputs to the information path and receiving data outputs from the information path, each terminator means including a supervisory comparator means for producing an output in response to a unique combination of phase relationship occurring in the synchronization path, latch means for accepting a signal from the supervisory path in response to an output received from the supervisory comparator



means and for producing first and second latch outputs in response thereto, multiplexer comparator means for receiving the first latch output whereby said comparator is temporarily set to be responsive to a unique combination of phase relationships in the synchronization path, said multiplexer comparator also being connected to the synchronization path for producing an output in response to the occurrence of said unique combination, demultiplexer means for activating one or more selected information path lines in response to the second latch output and for summing successive input samples sequentially received from the activated line or lines, and multiplexer means also responsive to the second latch output for activating one or more selected information path lines in response thereto and for sequentially supplying successive output samples to the activated line or lines.

4,010,327

# COMMUNICATION SYSTEM INTERFACE CIRCUIT

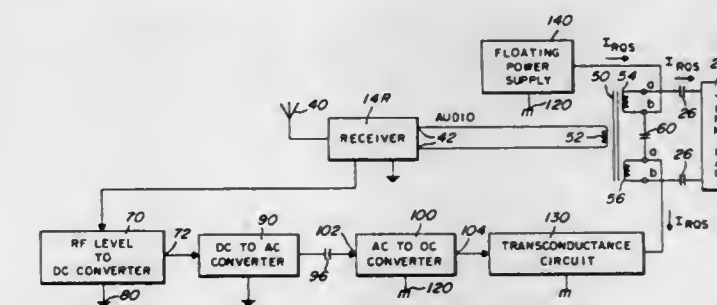
Anthony Kobrinetz, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 11, 1976, Ser. No. 685,223

Int. Cl.<sup>2</sup> H04Q 7/04

U.S. Cl. 179—41 A

15 Claims



1. In a communication system having first and second stations, the first station generating a DC signal voltage referenced to a ground potential, the two stations being intercoupled by a balanced line which is isolated from the ground potential, the improvement comprising:

DC-to-AC converter means for converting said DC signal voltage to a corresponding AC signal voltage;



AC-to-DC converter means for converting AC signals, at its input, to corresponding DC signals, at its output; AC coupling means for AC coupling, but DC blocking, the AC signal voltage, from the DC-to-AC converter, to the input of the AC-to-DC converter; and line coupling means for coupling the output of the AC-to-DC converter to the balanced line for transmission to the second station thereon.

4,010,328

# OUT-OF-BAND SIGNALING METHOD AND APPARATUS TO ADAPT PAYPHONES TO TELEPHONE SYSTEMS

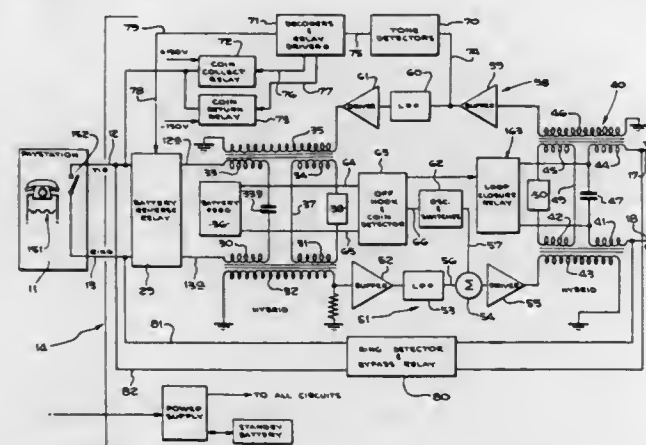
Ronald F. McGuire, Fairfax, Va., assignor to The Anaconda Company, New York, N.Y.

Filed June 13, 1975, Ser. No. 586,733

Int. Cl.<sup>2</sup> H04M 1/00, 17/02

U.S. Cl. 179—81 R

17 Claims



1. Appique circuitry for adapting a telephone system to operate with a paystation, comprising
  - a. a first hybrid transformer connectible with said paystation,
  - b. a second hybrid transformer connectible with the telephone system,
  - c. a voice frequency transmit branch connected between certain coils of said first and second transformers, and including a first low pass filter to limit transmit voice frequencies to a selected band with an upper cut-off frequency  $f_1$ ,
  - d. a voice frequency receive branch connected between other coils of said first and second transformers and including a second low pass filter, and
  - e. signaling circuitry connected between said first transformer and said voice frequency transmit branch at a location between said first filter and said second hybrid transformer to transmit signal tones above  $f_1$ .

4,010,329

# CRESCENDO CONTROL OF SIGNALLING DEVICES

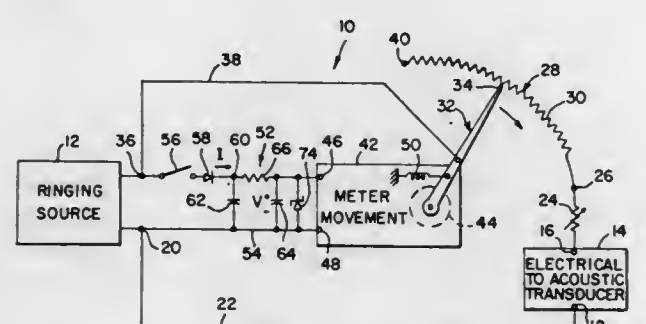
Frederick Gaylord Draper, 1263 Redwood Court, Herndon, Va. 22070

Filed Oct. 29, 1975, Ser. No. 626,838

Int. Cl.<sup>2</sup> H04M 1/00

U.S. Cl. 179—84 T

2 Claims



1. A crescendoing signalling device responsive to a source producing a train of signal pulsations said device comprising:

an electrical to acoustical transducer; a potentiometer including a resistor means and a wiper for movement along said resistor means, said potentiometer having a wiper terminal and a terminal connected to said resistor means; said potentiometer being connected in series with said transducer via said terminals; an electric motor means having a rotor coupled to said wiper for moving said wiper along said resistor means; passive circuit means responsive to said source and driving said motor means in a manner for rotating said rotor as said pulsations continue.

4,010,330

# AUTOMATIC TELEPHONE DIALER

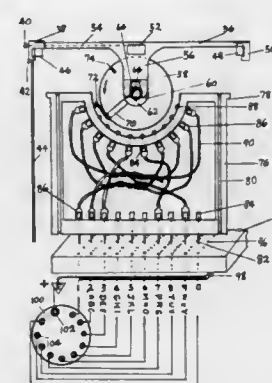
Cheng Shio, 145-34 34th Ave., Flushing, N.Y. 11354

Filed Aug. 11, 1975, Ser. No. 603,748

Int. Cl.<sup>2</sup> H04M 1/45

U.S. Cl. 179—90 B

8 Claims



1. An automatic telephone dialing apparatus for use with a conventional telephone to be mounted thereon, said apparatus comprising a control box for generating a series of electrical signals for accomplishing said automatic dialing, automatic dialing means mounted on said telephone, cable means connected between said automatic dialing means and said control box, said control box comprising a plurality of storage means, a plurality of programmable modules storing respective telephone numbers to be dialed, said storage means accommodating said modules, each of said modules being manually adjusted to set the telephone number to be automatically dialed, said control box further comprising a dialing wheel and a contact mounted and carried thereon in a circular path, each of said storage means comprising a circular support, said circular support being concentric with said dialing wheel, a plurality of contacts attached to said circular support, each of said modules comprising means to connect each of said plurality of contacts mounted on said circular support to a respective selected dial command signal for generating a series of electrical signals, said plurality of contacts being adapted to be touched by said contact on said dialing wheel, such that said series of electrical signals are generated to accomplish said automatic dialing.

4,010,331

# TELEPHONE INTERCOMMUNICATION SYSTEM INCORPORATING IMPROVED DIALING ARRANGEMENT

Michael Geoffrey Cleeve Taylor, Teston; Bloomfield James Warman, Wandsworth, and Francis Charles Hackett-Jones, near Rochester, all of England, assignors to GTE International Incorporated, Stamford, Conn.

Filed Mar. 28, 1975, Ser. No. 563,044

Claims priority, application United Kingdom, Apr. 3, 1974, 14879/74

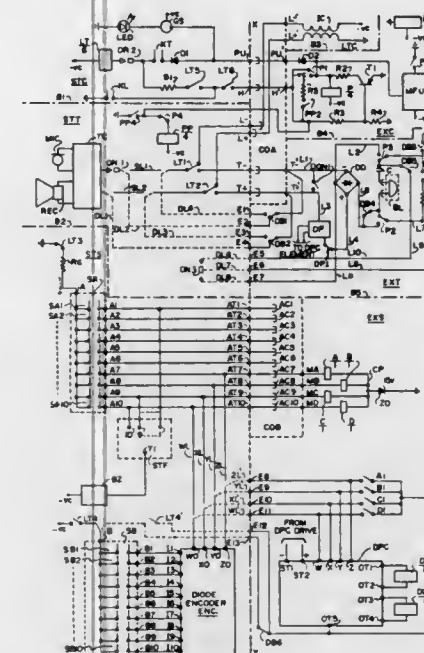
Int. Cl.<sup>2</sup> H04M 1/72

U.S. Cl. 179—99

4 Claims

1. A telephone system comprising, a plurality of extension telephone stations each including line switching means providing individual access to one or more common exchange lines; manually operable means individual to each telephone station

for keying digits to set a call and encoding means connected to said digit keying means operable in response to said keying means to generate coded input signals; pulse generating means exclusive to each common exchange line, comprising an integrated circuit arranged to draw operational power from said associated common exchange line, pulse repeating means connected between said integrated circuit and said exchange line and input signal repeating means connected between said



encoding means and said integrated circuit adapted to generate and apply to said line, dial pulses in response to receipt of corresponding input signals; and means adapted to respond to connection of each telephone station to an exchange line and to place the said manually operable keying means of said station in operative relation with the integrated circuit exclusive to said exchange line, whereby when said keying means is actuated to key a digit a corresponding input signal is applied to said integrated circuit.

4,010,332

# LINK CIRCUIT FOR INTERCOM UNIT

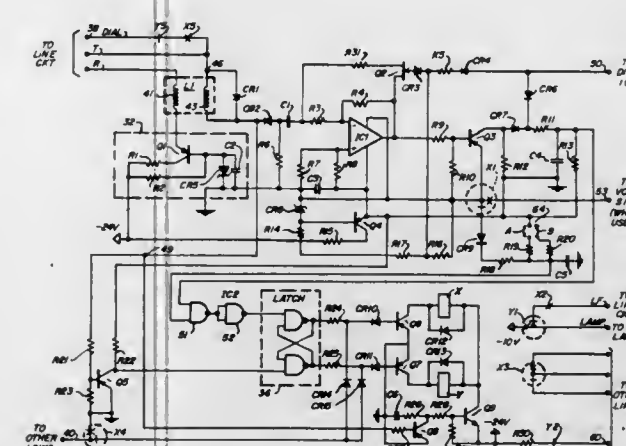
Coy Edwin Matheny, Fulton, Ky., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,397

Int. Cl.<sup>2</sup> H04M 1/72, 9/04

U.S. Cl. 179—99

6 Claims



1. An intercom circuit including a plurality of link circuits for controlling supervisory signalling between respective calling and called station pairs, each link circuit including a first relay, the first relay in one link circuit responsive to a calling station signalling a called station to attempt the completion of an intercom call over said one link circuit between said stations, means in said one link circuit responsive to operation of said first relay in said one link circuit for disabling the first

4,010,333

# RECORD DISC RECORDING SYSTEM WITH A DISTORTION SIGNAL

Teruo Muraoka, Sagamiyama; Kazunori Nisikawa, Fujisawa, and Kohji Seki, Ichikawa, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

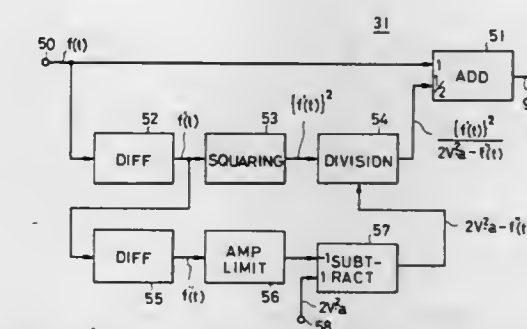
Filed July 28, 1975, Ser. No. 599,581

Claims priority, application Japan, June 28, 1974, 49-86233

Int. Cl.<sup>2</sup> G11B 3/00

U.S. Cl. 179—100.4 C

6 Claims



1. A record disc recording system comprising:
  - a cutter head for recording a signal in a sound groove on a disc;
  - means for producing a signal which varies in accordance with the position of the cutter head as it travels over the disc, said signal being substantially represented by  $2V^2 \cdot a$ , where  $V$  is the relative linear velocity between the cutter head and the disc, and  $a$  is a specific coefficient;
  - means responsive to an original signal  $f(t)$  and the signal  $2V^2 \cdot a$  for forming a distortion signal represented by  $\{f'(t)\}^2 / \{2V^2 \cdot a - f''(t)\}$ , which constantly conforms to the condition  $|2V^2 \cdot a| > |f''(t)|$ ; and
  - means responsive to the original signal  $f(t)$  and the distortion signal  $\{f'(t)\}^2 / \{2V^2 \cdot a - f''(t)\}$  for producing a recording signal with a distortion represented by  $g(t) = f(t) + \{f'(t)\}^2 / \{2V^2 \cdot a - f''(t)\}$  which is applied to the cutter head.

4,010,334

# MOVING MAGNET CONTACT ACOUSTIC TRANSDUCER

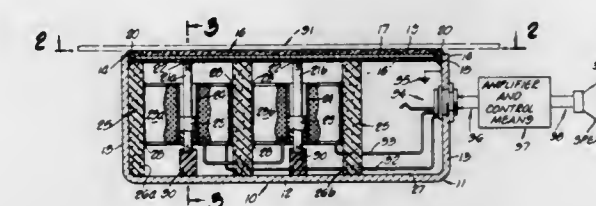
James K. Demeter, 8542 Penfield, Canoga Park, Calif. 91306

Filed Jan. 27, 1975, Ser. No. 544,407

Int. Cl.<sup>2</sup> H04R 1/46, 10/04

U.S. Cl. 179—114 M

13 Claims



1. A dynamic acoustic transducer device, comprising:
  - a. a rigid body defining a support;
  - b. an elongated permanent magnet element;
  - c. an electric coil element surrounding said magnet and having terminals for connection to a signal circuit, said magnet having pole ends axially projecting beyond the ends of said coil;
  - d. a flat rigid diaphragm having its periphery elastically connected to said support;
  - e. said permanent magnet element being wholly positioned



on one side of said diaphragm and being attached thereto for vibrational axial movements therewith; and  
f. elastic means supporting said electric coil on said support and constituting means resiliently isolating said coil from vibrational movements of said diaphragm.

4,010,335

## MICROPHONE APPARATUS

Hiroshi Yasuda, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

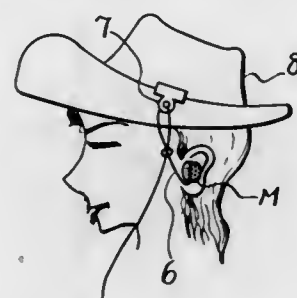
Filed Oct. 24, 1975, Ser. No. 625,504

Claims priority, application Japan, Oct. 31, 1974, 49-125873

Int. Cl.<sup>2</sup> H04R 1/02; H04M 1/05

U.S. Cl. 179—156 R

6 Claims



1. A microphone assembly comprising:
  - a. a housing consisting of a capsule and a projection extending from said capsule;
  - b. a cavity formed in said capsule;
  - c. a plurality of apertures bored through said capsule;
  - d. a microphone unit supported in said capsule, and being positioned in said cavity so as to communicate with the outside of said housing through said apertures; and
  - e. said projection being arranged to be inserted into the auditory canal and having a bore therethrough which communicates with said cavity.

4,010,336  
HAND LAMP

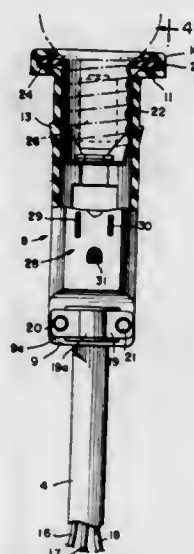
Tony Trevithick, Gurnee, Ill., assignor to Daniel Woodhead, Inc., Northbrook, Ill.

Filed July 10, 1974, Ser. No. 487,215

Int. Cl.<sup>2</sup> H01R 13/70

U.S. Cl. 200—51 R

5 Claims



1. A hand lamp comprising,
  - a. a one-piece, elongated body member formed of a molded, impact-resistant elastomer and having a cavity there-through open at both ends.
  - b. a separate, unitary socket member received within said cavity, said socket member including
    1. a threaded recess at one end thereof to receive a light bulb,

2. a two part cord clamp at the other end thereof adapted to receive and clamp thereon an electrical cord, one of the parts of said clamp being formed integral with said socket member,
3. terminals thereon, including a ground terminal to which electrical conductors in the cable may be connected, and
4. a ground strip connected at its inner end to said ground terminal and extending along the side of said socket member toward the end thereof having the threaded recess, and terminating in a return bend which receives the end of the wall of said body member when assembled therewith,
- c. said socket member being pre-bussed and pre-wired between said terminals and said threaded recess, and adapted to be assembled with said cord and conductors connected to said terminals outside of said body member and then inserted into said cavity through the other of the open ends thereof, and
- d. cooperating means in said cavity and on said socket member to retain said socket within said cavity.

4,010,337

## TOGGLE DEVICE

Paige W. Thompson, Morrison, and James P. Frank, Rock Falls, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

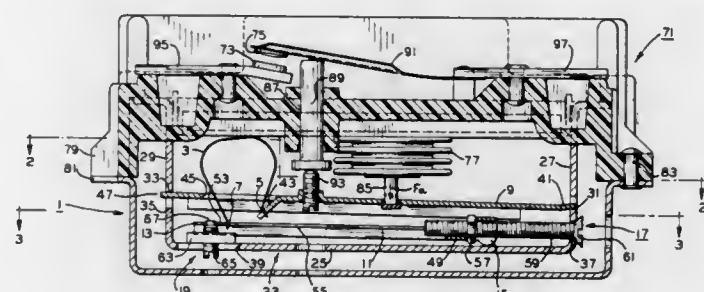
Continuation of Ser. No. 442,838, Feb. 15, 1974, abandoned.

This application June 9, 1975, Ser. No. 585,149

Int. Cl.<sup>2</sup> H01H 13/36

U.S. Cl. 200—67 D

16 Claims



1. A toggle device comprising a support, a pair of abutments on the support, a toggle arm mounted on the support and pivotally movable in response to a variable motive force applied thereon between the abutments into motion limiting engagement therewith, respectively, a toggle spring having one of a pair of opposite ends thereof engaged with the toggle arm and adapted to be compressed for transmitting a force applied thereto onto the toggle arm generally in opposition to the motive force so as to urge the toggle arm toward engagement with one of the abutments, adjusting means pivotally mounted on the support and engaged with the other of the opposite ends of the toggle spring so as to compress the one opposite end thereof against the toggle arm for adjustably establishing the magnitude of applied force, and other adjusting means mounted on the support and engaged with the first named adjusting means for pivoting it and the toggle spring so as to adjust the other opposite end thereof with respect to the opposite end and angularly direct the applied force through the toggle spring onto the toggle arm.

4,010,338

## VACUUM SWITCH HAVING AXIALLY DISPOSED SWITCHING ELEMENTS

Joachim Amsler, Seon, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

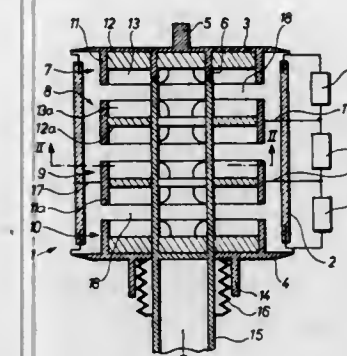
Filed May 29, 1975, Ser. No. 581,928

Claims priority, application Switzerland, June 13, 1974, 8114/74

Int. Cl.<sup>2</sup> H01H 9/42

U.S. Cl. 200—144 R

10 Claims



1. A vacuum switch comprising a switch housing having a central axis, switching elements substantially axially arranged in said switch housing, a number of individual sheet metal electrodes fixedly mounted on said switch housing, said sheet metal electrodes incorporating a plurality of substantially radially directed sheet metal members extending radially inwardly along said electrodes towards the central axis of the housing there being formed a set of gaps between the latter, respectively, said sheet metal electrodes including electrode end-surfaces confronting one another and serving to take up base points of an arc formable therebetween, said sheet metal electrodes being arranged in said switch housing in the form of a column with the electrode end surfaces situated opposite one another, respectively, there being formed a separation gap between said sheet metal electrodes, metallic chip layers being provided at the individual sheet metal electrodes, said switching elements including engageable contacts, at least one of said contacts being fixedly mounted, the other of said contacts being movable, said switching elements forming a separation gap extending within the height of the electrode column.

4,010,339

## SPRING CONTACT SWITCH

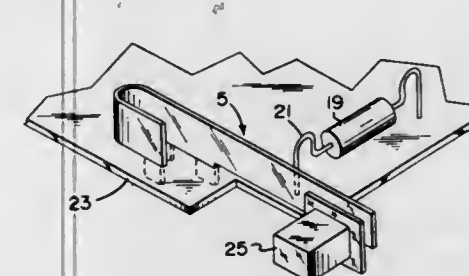
Allan B. Owen, Montoursville, and Thomas M. Lynch, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 9, 1975, Ser. No. 594,327

Int. Cl.<sup>2</sup> H01H 3/12

U.S. Cl. 200—292

1 Claim



1. A spring contact switch for direct printed circuit board mounting comprising:
  - a flexible spring contact member affixed to a printed circuit board at one end and operatively available at the other end, said flexible spring contact member being substantially J-shaped with a U-shaped portion having two leg members with one of the leg members attached to an extended flat portion and having two mounting members

extending outwardly therefrom and the other leg member having a third mounting member extending outwardly therefrom; and  
electrical component means affixed to said circuit board and having a lead member formed for contact by said flexible spring contact member.

4,010,340

## SWITCH MEMBER FOR PORTABLE, BATTERY-OPERATED APPARATUS

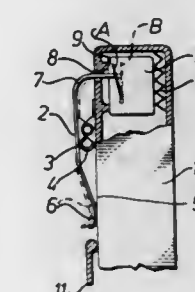
Tore Georg Palmar, Smultronvagen 28, S-331 00 Varnamo, Sweden

Filed May 5, 1975, Ser. No. 574,700

Int. Cl.<sup>2</sup> H01H 3/20

U.S. Cl. 200—330

4 Claims



1. An automatic switch for portable battery operated radio receivers and the like comprising a housing in which said receiver or the like is located, an attachment member affixed to said housing for supporting said housing in use, a movable contact and a fixed contact located within said housing in a circuit between the receiver and the battery, said movable contact being spring biased in normally open position with respect to said fixed contact, said attachment member for supporting said housing being movable with respect to said housing into engagement with said movable contact to displace the same from its biased position into contact with said fixed contact.

4,010,341

## HOT AIR OVEN

Nils Gosta Sigvard Ishammar, Malmö, Sweden, assignor to IFO Kampri AB, Sweden

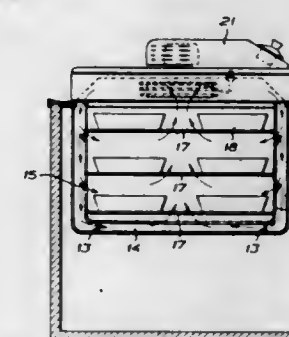
Filed Nov. 12, 1973, Ser. No. 415,280

Claims priority, application Sweden, Nov. 13, 1972, 14692/72

Int. Cl.<sup>2</sup> H05B 1/00; F24C 7/00, 15/32

U.S. Cl. 219—400

2 Claims



1. An oven for treating of food comprising in combination a well of metal sheet material having a bottom and side walls and open at the top thereof, a removable insert of metal sheet material having vertical side wall means and a bottom and an open mouth at the top thereof in said well, said side wall means and said bottom of said insert being spaced from the side walls and the bottom of the well to define air circulating passages therebetween with the top of the circulating passages being open, said insert having gill openings formed in the portion of the vertical wall means of the insert defining the air passages and disposed substantially uniformly along and



around the vertical limiting surfaces of said insert at different levels thereof and having the mouth thereof facing upwards on the outer side of the insert to divert air from said passages into the interior of the insert, said insert further having means for defining opening means at the bottom thereof for communicating the air passages with the interior of said insert, a lid removably fitted over the well to form a top closure thereof, an air circulating fan mounted on the lower side of the lid for drawing air upwardly out of the insert through the open mouth thereof, said fan propelling the air laterally to the open top of the air passages for circulation downwardly through the air passages for entry into the interior of the insert for circulation over the object to be heated, an electrical heater mounted on the lower side of the lid for heating air circulated by said fan, and said insert being provided with air previous support means for supporting the object to be heated.

4,010,342

# INDUCTION COOKING APPLIANCE HAVING IMPROVED PROTECTION CIRCUITS

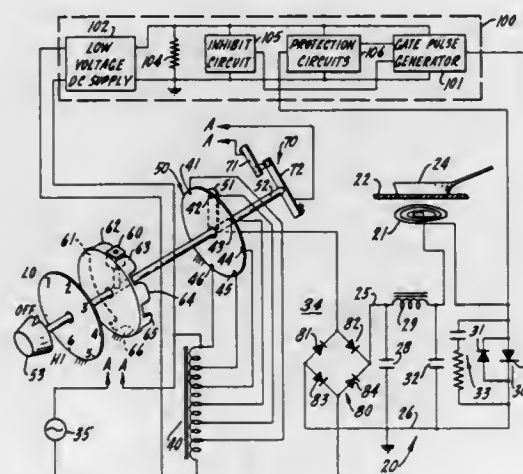
Buddy Julian Austin, Lafayette, Ind., assignor to Roper Corporation, Kankakee, Ill.

Filed Oct. 29, 1974, Ser. No. 518,772

Int. Cl.<sup>2</sup> H05B 5/04

U.S. Cl. 219-10.49

25 Claims



1. An induction cooking appliance for use with metallic utensils comprising in combination, a solid state inverter circuit including a gate controlled thyristor for producing ultrasonic frequency current pulses in a work coil to generate an ultrasonic frequency magnetic field, a substantially non-metallic cooktop for supporting the metallic utensil over the work coil, said utensil serving as an inverter load, a d.c. power supply for energizing the inverter, means for selecting the operating power level of the inverter, and a protection circuit, said protection circuit including sensing means coupled to the inverter circuit for sensing a condition indicative of the nature of the inverter load, means for varying the sensitivity of the sensing means in accordance with the operating power level of the inverter, and means responsive to the sensing means for disabling the inverter in the absence of a proper inverter load.

4,010,343

# MICROWAVE OVENS

Junzo Tanaka, Fujidara; Tsuyoshi Takami, Nara, and Toshio Kai, Yamatokoriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 4, 1975, Ser. No. 637,703

Claims priority, application Japan, Dec. 9, 1974, 49-141802; Apr. 23, 1975, 50-56020

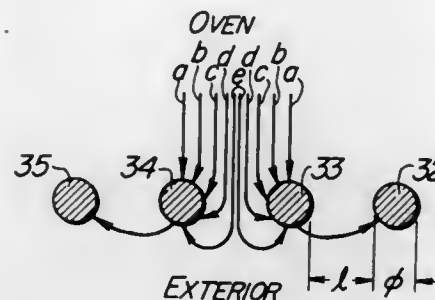
Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219-10.55 D

5 Claims

1. A microwave oven comprising a body having a heating chamber formed therein, a door mounted on said body and adapted to close and open a front opening of said heating chamber, a microwave generator for emitting microwave

energy into said heating chamber and a door screen provided in said door, characterized in that said door screen comprises an electromagnetic wave shielding means composed of a metal mesh interposed between transparent plates, wherein said metal mesh is made of wires having a diameter  $\phi$  in the range of 0.1 to 0.4 mm with a space  $l$  between the wires being



in the range of 0.18 to 0.92 mm, and that said diameter and said space are so selected that a ratio  $l/\phi$  takes a value smaller than values represented by an interpolation curve passing through points corresponding to the values of ratio  $l/\phi$  equal to 2.2, 3.3 and 4.3 for the values of said diameter  $\phi$  equal to 0.4, 0.2 and 0.1 mm, respectively.

4,010,344

# APPARATUS FOR TRANSFERRING A WORKPIECE OVER A ROUGH SURFACE

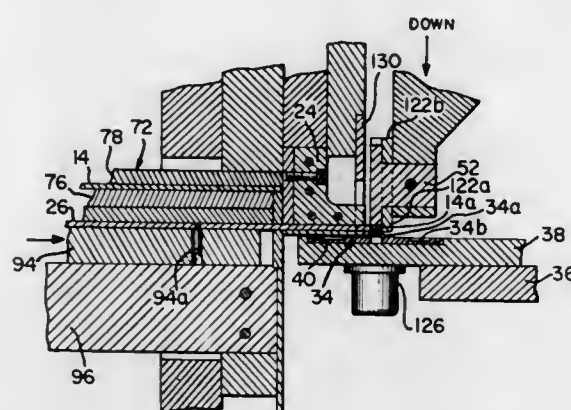
Edward D. Riordan, Hillsborough, and John R. Menges, Bricktown, both of N.J., assignors to Joyal Products, Incorporated, Linden, N.J.

Filed Mar. 28, 1975, Ser. No. 563,145

Int. Cl.<sup>2</sup> B23K 9/12

U.S. Cl. 219-80

19 Claims



1. Apparatus for joining a first workpiece to a second workpiece, said apparatus comprising a supply station for receiving the first workpiece, a work station for receiving the second workpiece, and positioning means for accurately positioning the first workpiece in engagement with the second workpiece at a predetermined location spaced from the periphery of the second workpiece, said positioning means including a transfer guide and a transfer device for transferring the first workpiece along said transfer guide to the work station in a manner such that said transfer guide is between the first workpiece and the second workpiece during the transfer along said transfer guide until the first workpiece is moved to said predetermined location in engagement with the second workpiece.

4,010,345

# GAS DELIVERY MEANS FOR CUTTING WITH LASER RADIATION

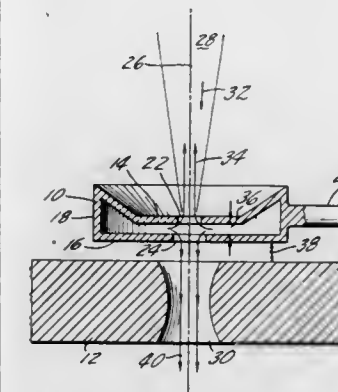
Conrad M. Banas, Bolton, and Aristotle Parasco, South Glastonbury, both of Manchester, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1975, Ser. No. 574,132

Int. Cl.<sup>2</sup> B23K 27/00

U.S. Cl. 219-121 L

4 Claims



1. Gas handling means for use in cutting materials with laser radiation and comprising:

a hollow structure capable of withstanding an internal gas pressure, and directing gas at a workpiece along a flow axis as a moving stream of cutting assist medium, the structure capable also of allowing a beam of focused laser radiation propagated along a laser axis to pass there-through without interference, the hollow structure having an upper plate and a lower plate and including:

inlet means for receiving the gas from a source and admitting the gas under pressure to the interior of the structure, and

gas outlet means for releasing the pressurized gas through the upper and lower plates along the flow axis and delivering a stream of the gas to the location on the workpiece at which the radiation is focused, the outlet means having a first gas port positioned in the upper plate and a second gas port positioned in the lower plate.

4,010,346

# SELF-PROPELLED TRACTOR FOR WELDING AND CUTTING APPARATUS AND THE LIKE

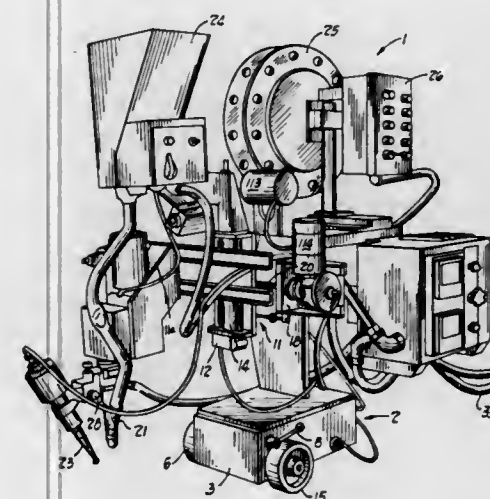
Shelby Cecil, Medina, and Donald Geringer, Parma, both of Ohio, assignors to Cecil Equipment Co., Inc., Medina, Ohio

Filed Apr. 14, 1975, Ser. No. 567,866

Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219-125 PL

24 Claims



1. A self-propelled, free moving tractor or carriage adapted to carry a tool along a work path in a predetermined relative

position therewith, said tractor comprising a base member, a plurality of wheel means supporting said base member for travel, drive means rotating at least one said wheel means for causing said tractor to travel, at least one said wheel means being mounted for rotation about an axis perpendicular to the axis of said driven wheel means for steering said tractor, motor means for rotating said steering wheel means about said perpendicular axis to steer said tractor, cross slide assembly means mounted on said tractor, said cross slide assembly means including a cross slide means mounted for movement in a direction transverse of said steering wheel axis, said cross slide means including reversible, motor driven screw means, and probe means carried on said screw means for movement therealong in response to rotation thereof, said probe means being adapted to follow a predetermined surface or abutment comprising a path, template, guide member or the like, and being responsive to changes or deviations in the direction of said surface or abutment transverse to said perpendicular axis to cause rotation of said screw means, said steering motor means being responsive to the responses of said probe to steer said tractor in a direction and to a distance substantially equal to each said change or deviation, respectively, in said surface or abutment.

4,010,347

# COATED TUBULAR ELECTRODES

James Arlen Cole, El Monte, Calif., assignor to Cabot Corporation, Kokomo, Ind.

Filed Sept. 23, 1974, Ser. No. 508,521

The portion of the term of this patent subsequent to July 8, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> B23K 35/22

U.S. Cl. 219-146

6 Claims



1. A filled electrode comprising an elongated hollow metal tube, a particulate hard filler material filling the interior of said hollow metal tube, said metal tube being reduced in cross section and frictionally engaging said filler material at each end to prevent spilling, a dried slurry deposited coating covering a major portion of the exterior of one end of said tube and a minor portion of the other end of said tube, said major and minor coatings being spaced apart at said other end by an uncoated grip portion to be engaged by an electrode holder, said coatings filling the interstices of the filler material at both ends of said hollow tube.



4,010,348

**HEATER ROD SUPPORT BRACKET FOR RADIANT HEATER ASSEMBLY**

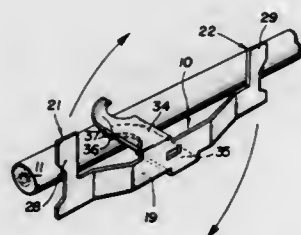
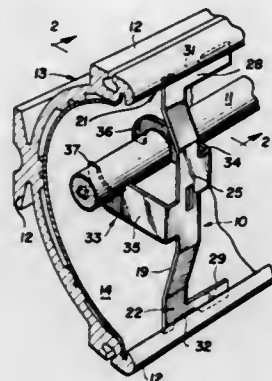
Fred G. Salinger, Baltimore, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Filed Oct. 31, 1974, Ser. No. 519,462

Int. Cl.<sup>2</sup> H05B 302; F24H 9/02; F16L 3/08

U.S. Cl. 219—347

8 Claims



1. In an electric radiant heater assembly of the type which includes a housing having an open front defined between at least two spaced apart housing edges at least one heater rod disposed within the housing and bracket means for supporting the rod in the housing, the improvement residing in said bracket means comprising at least one bracket having an elongate, generally flat, planar brace portion, clip means at each end of said brace portion for removably engaging the housing thereby removably to mount said bracket in the housing, at least one support arm which is integral with said brace portion, which is located intermediate the ends of said brace portion and which extends outwardly from said brace portion at an angle of approximately 90° thereto, said support arm having at least one arcuate surface which engages, and serves as a seat for, the rod, and said bracket being configured and arranged (a) for being inserted into the housing through the open front thereof in a first position where said brace portion is parallel to the heater rod and where said support arm projects inwardly but does not engage the rod, said insertion being without rod removal, and (b) for being rotated approximately 90° within the housing in a plane generally parallel to a plane containing the open front defining edges to a second position constituting said mounted position where said clip means engage the housing edges to secure said bracket in place and said arcuate rod seating surface of said support arm engages the rod.

4,010,349

**PROOFING CABINET**

Robert E. Lee, Huntington, Ind., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Feb. 27, 1975, Ser. No. 553,619

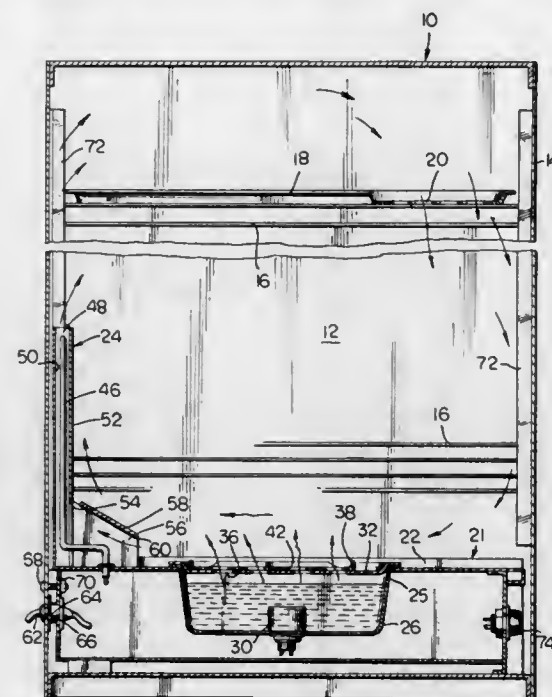
Int. Cl.<sup>2</sup> H05B 1/00; A21C 13/00

U.S. Cl. 219—401

8 Claims

1. A cabinet, especially for use in proofing dough prior to baking, and comprising: a cabinet structure having side, rear, top and bottom walls, a swingable front door and support

means distributed along the side walls on the inside for supporting dough trays, first means near the bottom wall of the cabinet for generating water vapor to humidify the interior of the cabinet including a tray having electric heating means and adapted for receiving water, and second means near one wall of the cabinet for supplying heat to the interior of the cabinet to inhibit condensation of the generated water vapor therein including an electric heater in a vertical plane and at least one vertical panel adjacent to the last mentioned electric heater defining a vertical air flow channel in which said last mentioned electric heater is disposed, said first and second means being parts of an assembly removable from said cabinet as a



unit, said assembly comprising a frame having a horizontal portion slidable into the cabinet from the front above said bottom wall and a vertical portion upstanding from the rearward end of said horizontal portion, the tray being disposed in the horizontal portion and the at least one vertical panel comprising a part of said vertical portion with the lower end of the at least one vertical panel terminating above the said horizontal portion to define an air inlet opening to the air flow channel near the lower end of the vertical portion, the vertical portion including an air outlet for discharging heated air from the air flow channel in a direction upwardly along a wall of the cabinet.

4,010,350

**ELECTRIC HEATING ELEMENTS**

Donald M. Cunningham, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed June 16, 1976, Ser. No. 696,789

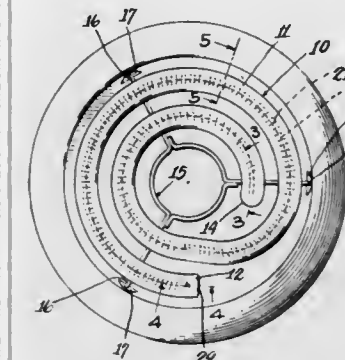
Int. Cl.<sup>2</sup> H05B 3/68

U.S. Cl. 219—465

6 Claims

1. An electric heating element, comprising:  
a tubular metallic sheath formed to non-rectilinear shape and having an active heating portion, one end of said sheath being closed and the other end constituting a terminal leg projecting laterally from said active heating portion, said sheath being adapted for mounting in grounded relation on an appliance,  
a coiled resistance member extending longitudinally within said sheath throughout said active heating portion, having one end terminating adjacent to the closed end of said sheath and the opposite end terminating adjacent to the sheath terminal leg,  
a bare return conductor within said coiled resistance member and generally coextensive therewith, one end of said return conductor being electrically connected to said one end of said resistance member,  
the other end of said return conductor and said opposite end of said resistance member having terminals which

extend outwardly of said terminal leg and through an insulating bushing which closes the open end of said terminal leg, said terminals being adapted for connection to a source of electrical energy to energize said resistance member and thereby create heat,  
compacted refractory material entirely filling said sheath between said return conductor, resistance member and said sheath and maintaining said sheath, said resistance member and said return conductor in electrically insulated relation while conducting heat from said resistance member to said sheath,



the geometry of a cross-section taken anywhere through said sheath in said active heating portion being such that, during energization of said resistance member to create heat, the insulation resistance between said resistance member and said return conductor is less than the insulation resistance between said resistance member and said sheath, whereby voltage breakdown caused by a hot spot in said active heating portion will occur between said resistance member and said return conductor to short therebetween until the voltage stress causes one of said resistance member and said return conductor to rupture and create an open electrical circuit.

4,010,351

**CARTRIDGE HEATER WITH IMPROVED THERMOCOUPLE**

David E. Williams, and Edwin D. Hoyt, both of Hemet, Calif., assignors to Rama Corporation, San Jacinto, Calif.

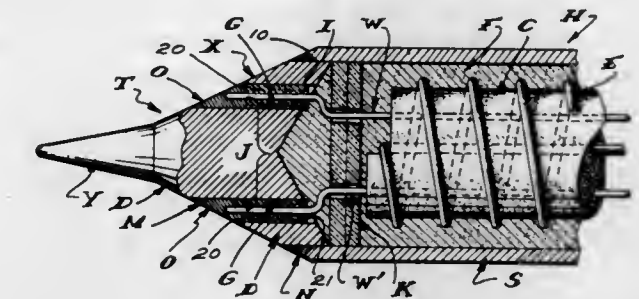
Filed Mar. 18, 1976, Ser. No. 668,236

Int. Cl.<sup>2</sup> H05B 3/80

U.S. Cl. 219—523

7 Claims

1. A cartridge heater with improved thermocouple comprising a tubular metal sheath with a front end, a metal plug closing the front end, a filler of dielectric material in the sheath rearward of the plug and an elongate resistance wire supported by the filler, said plug having a pair of spaced axially extending through holes, elongate insulating tubes with front and rear ends and engaged in said holes with their front ends spaced predetermined limited distances from the open front ends of the holes, a pair of elongate thermocouple wires with front end portions engaged through the tubes and projecting forwardly therefrom and rear portions supported in



ducting contact with the thermocouple wires, said metal deposits being fused with the plug in said holes and with said thermocouple wires.

4,010,352

**ZrO<sub>2</sub>-BASE HEATING ELEMENTS**

Bert Phillips, 1220 S. Garner St., State College, Pa. 16801

Filed May 21, 1975, Ser. No. 579,553

Int. Cl.<sup>2</sup> H05B 3/10

U.S. Cl. 219—553

4 Claims



1. An electric resistance heating element for operating in oxidizing atmospheres to at least 1900° C, comprising a shaped element of stabilized ZrO<sub>2</sub> having a central heating section with long and larger terminal ends, said terminal ends being treated with liquid containing conduction-improving metal ions, incoming lead wires of high temperature metal alloy, being attached directly to, the terminal ends being surrounded with ZrO<sub>2</sub>-base material containing conduction-improving oxides, and electrically insulating tubes attached directly to and covering most of the terminal ends and the ZrO<sub>2</sub>-base material.

4,010,353

**ELECTRONIC VOTING MACHINE WITH CATHODE RAY TUBE DISPLAY**

Michael Terrance Moldovan, Jr., Lakewood; Charles Jerome Lindros, Jamestown; Robert Dean Wescott, Jamestown; Benedict Stewart Snyder, III, Jamestown; Richard John Cusimano, Jamestown, and Michael Kristan, Frewsburg, all of N.Y., assignors to AVM Corporation, Jamestown, N.Y.

Filed Sept. 11, 1974, Ser. No. 505,199

Int. Cl.<sup>2</sup> G07C 13/00

U.S. Cl. 235—54 F

86 Claims

1. An electronic voting machine comprising, in combination:  
processor means for processing selections made by a voter;  
visual display means connected to said processor means for displaying a ballot to a voter; and







- iii. operating the engine on each fuel at a narrower series of feed-rate settings than employed in (i), such settings bracketing the approximate maximum knock intensity setting as determined in (ii), to produce a refined feed-rate setting at which the maximum knock intensity signal is generated for each fuel,
- iv. storing the refined feed-rate setting of maximum knock intensity,
- v. operating the test engine on each fuel at the stored refined feed-rate setting at which the maximum knock intensity is generated, for a time sufficient to generate a new knock intensity signal, the test engine being operated on the fuels of known and unknown octane numbers in alternating sequence, and
- vi. calculating the octane numbers of the fuels of unknown octane numbers by comparing the new knock intensity signals produced in (v).

4,010,359

## CIRCUIT ARRANGEMENT FOR ADDING AND SUBTRACTING

Gerald Weber, Braunschweig, and Jurgen Sorgenfrei, Braunschweig-Volkmare, both of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

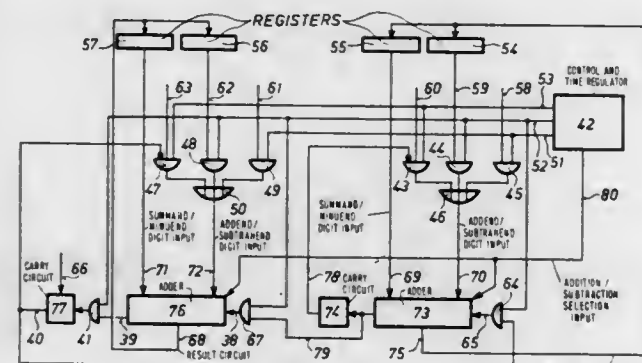
Filed Dec. 11, 1975, Ser. No. 639,891

Claims priority, application Germany, Dec. 21, 1974, 2460897

Int. Cl.<sup>2</sup> G06F 7/50

U.S. Cl. 235-169

11 Claims



1. A circuit arrangement for selectively adding or subtracting two binary coded decimal numbers, said circuit comprising: a plurality of stages each associated with a different respective order decimal digit and each including a binary adder circuit having two inputs each arranged to receive the binary bit signals representing a corresponding decimal digit of a number to be added, and a carry circuit connected to said adder circuit; and operation control means connected to each said stage for causing at least one of an addition operation and a subtraction operation to be carried out simultaneously in all said stages; the addition operation being performed, in each said stage, by first adding, in said adder circuit, the signals representing the corresponding decimal digit of one of the numbers to the binary coded decimal digit representing the decimal value 6, then adding, in said adder circuit, the resulting sum value, a carry signal present in said carry circuit, and the signals representing the corresponding decimal digit of the other number, and then adding, in said adder circuit, that result to a correction value constituted by the binary coded decimal digit representing the decimal value 10 whenever no carry is produced by the preceding addition, and the subtraction operation being carried out, in each said stage, by first adding, in said adder circuit, the binary bit signals representing a decimal digit of the number constituting the minuend, the unit complement of the binary bit signals representing the corresponding decimal digit of the other number, which constitutes the subtrahend, and the carry value present in said carry circuit, while storing any resulting carry in said carry circuit, and then adding, in said adder circuit, the result of the first addition and the correction value constituted by the

binary coded decimal digit representing the decimal value 10, based on the signal in said carry circuit.

4,010,360

## CARRIER-COMPATIBLE CHIRP-Z TRANSFORM DEVICE

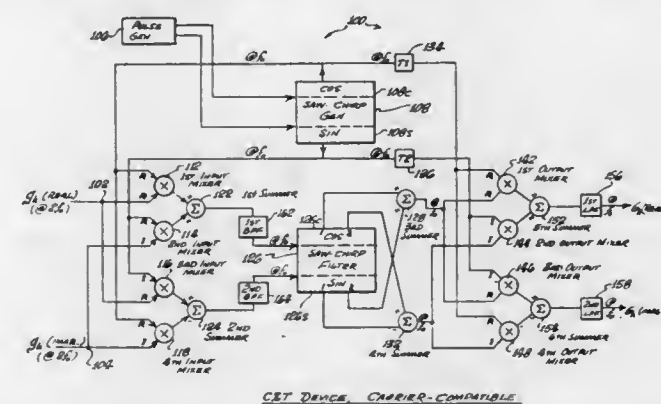
James M. Alsup, and Harper J. Whitehouse, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1976, Ser. No. 672,107

Int. Cl.<sup>2</sup> G06F 15/34; G06G 7/12

U.S. Cl. 235-193

8 Claims



1. A carrier-compatible device for computing the discrete Fourier transform of a complex input signal  $g_k$  having a real part and an imaginary part, using the chirp-Z transform (CZT) algorithm, comprising:

means for connecting to the real and imaginary parts of the input signal  $g_k$ ;

a pulse generator, for generating a sequence of short rectangular pulses;

a chirp generator, whose input is connected to the output of the pulse generator, which generates cosine chirp signals and sine chirp signals;

means connected to the real and imaginary parts of the signal  $g_k$  and the cosine and sine chirp signals from the chirp generator, for mixing the four combinations of two input signals at a time;

means connected to the mixing means, for summing the outputs of the mixing means;

a chirp filter, whose input is connected to the output of the summing means, which filters out the higher frequency components from its input signal and passes the lower frequency components, the lower frequencies having a real component and an imaginary component;

a second summing means whose input is connected to the output of the SAW chirp filter;

means whose input is connected to the output of the chirp generator, for delaying its input signal an amount of time such that its output signal is coincident in time with the output signals from the second summing means;

second mixing means, whose inputs comprise the output of the delaying means and the output of the second summing means;

a third summing means, whose input comprises the output from the second mixing means; and

means whose input is connected to the output of the third summing means, for filtering the output of the third summing means, whose output comprises the real and imaginary parts of a complex number  $G_k$  at zero frequency.

4,010,361

## LIGHT DEFLECTION APPARATUS

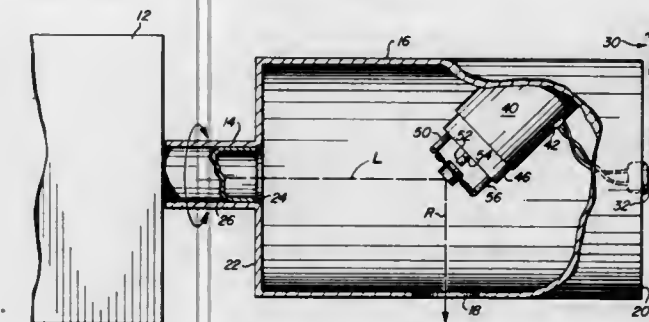
Robert C. Latterman, 1720 E. LaDonna, Tempe, Ariz. 85283, and Stuart G. Mirell, 407 W. University Drive, Tempe, Ariz. 85281

Filed Mar. 3, 1975, Ser. No. 554,470

Int. Cl.<sup>2</sup> A63J 17/00

U.S. Cl. 240-10 R

3 Claims



1. Apparatus for deflecting light in response to electromagnetic signals, comprising, in combination:

movable transducer means for converting electrical signals into magnetic pulses, including

a winding for transmitting electrical signals, and

a core disposed in the winding and linearly movable in response to the electrical signals in the coil;

support means secured to the core and movable therewith, including a plurality of posts secured to the core and a plurality of tension springs, including a tension spring secured to each post;

a mass secured to the plurality of the posts of the support means by the tension springs and movable in a nonlinear manner in response to the movement of the core and the support means; and

a mirror secured to the mass and movable therewith to deflect light.

4,010,362

## LUMINAIRE SHIELD DEVICE

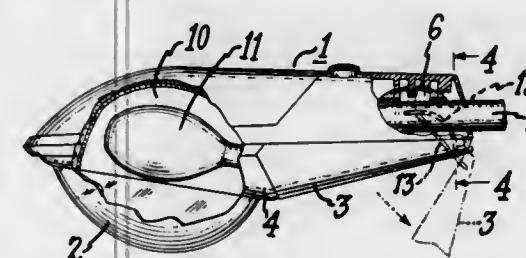
Thomas A. Fletcher, Dana, N.C., assignor to General Electric Company, New York, N.Y.

Filed Dec. 4, 1975, Ser. No. 637,757

Int. Cl.<sup>2</sup> F21V 17/00

U.S. Cl. 240-147

6 Claims



1. A luminaire comprising, in combination, a housing having an open end defining an axis and adapted to freely receive along said axis an elongated support member on which the luminaire is to be mounted, bearing means on said housing for engaging the top of the elongated support member, a movable clamp in said housing extending transverse said axis for engaging the bottom of the elongated support member, a pair of adjusting bolts on said housing respectively adjustably engaging said movable clamp on opposite sides of said axis, and a shield member comprising a generally U-shaped bendable sheet arranged in said housing for substantially covering the opening between said housing and the elongated support member, said sheet formed with a main shield portion and a pair of apertured legs extending therefrom, said sheet arranged in said housing with its main shield portion extending below and transverse said axis and its legs respectively inserted on said pair of adjusting bolts above said movable clamp.

4,010,363

## LASER ALIGNMENT SYSTEM

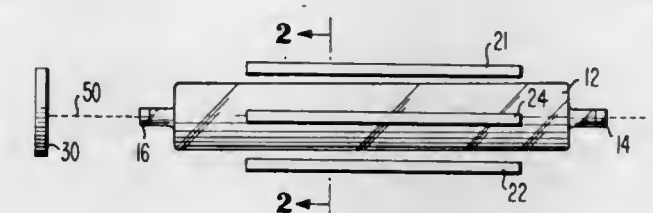
Karl Gerhard Hernqvist, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,800

Int. Cl.<sup>2</sup> G01J 1/20

U.S. Cl. 250-201

9 Claims



1. A system for maintaining the alignment of a gas laser comprising:

a gas discharge tube for producing a laser beam; and

a plurality of heaters extending longitudinally along the exterior of the tube spaced around the tube's longitudinal axis for selectively heating the tube.

4,010,364

## OPTICAL SCANNING SYSTEM

Jyoichi Fuwa, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

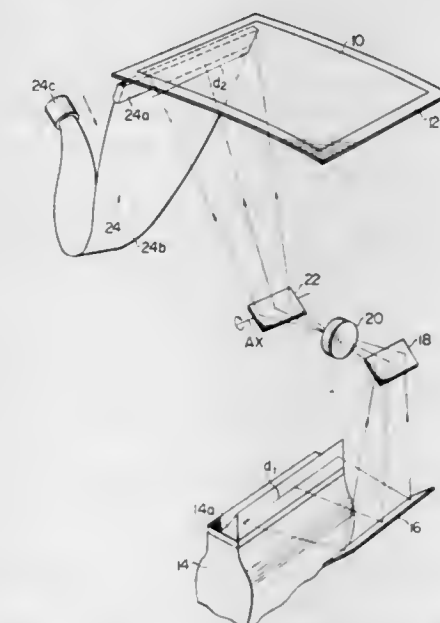
Filed May 29, 1975, Ser. No. 582,030

Claims priority, application Japan, June 1, 1974, 49-62291

Int. Cl.<sup>2</sup> H01J 3/14

U.S. Cl. 250-234

9 Claims



1. A scanning system comprising:

fixed light beam generating means to produce a light beam and move the light beam along a first linear path;

movable reflecting means to reflect the light beam onto a fixed surface to be scanned so that the light beam moves in a second linear path along the surface;

elongated light receiving means disposed parallel to the second linear path and closely adjacent to both the surface and the second linear path to receive the light beam reflected from the surface; and

drive means to move the reflecting means to displace the light beam in a direction perpendicular to the second linear path and to move the receiving means in synchronism with the movement of the reflecting means so that the receiving means moves in said direction perpendicular to the second linear path at the same speed as the displacement of the light beam in said direction so that the receiving means is maintained closely adjacent to both the surface and the second linear path to receive the light beam reflected from the surface.



4,010,365

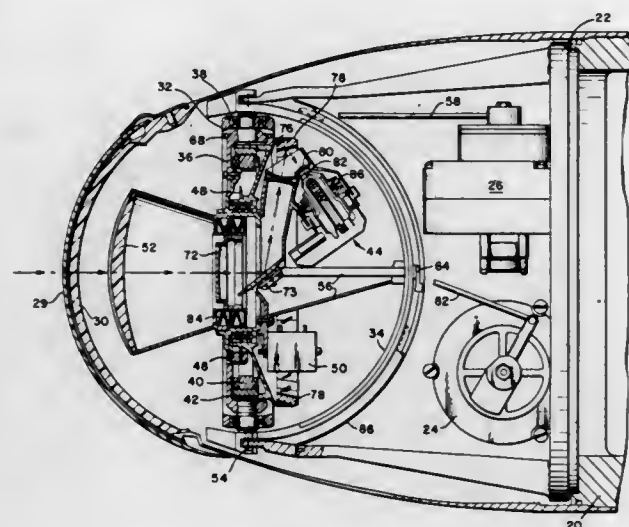
## SELF-STABILIZING IMAGE SCANNER

Franklin J. Meyers, Canoga Park, and Gino R. Sturiale, Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 26, 1973, Ser. No. 346,523  
Int. Cl.<sup>2</sup> G01J 1/00

U.S. Cl. 250-236

17 Claims



1. A scanner adapted for being gimbal mounted, for providing electrical signals representative of the relative energy distribution within a field of view encompassing an optical axis, said scanner comprising:

a gyroscope adapted for being gimbal mounted, said gyroscope having a rotor;

a multi-faceted scan mirror disposed for rotation with said rotor, said multi-faceted scan mirror having mirror facets which make various angles with the spin axis of said rotor; first optical means for directing energy received from said field of view to said multi-faceted scan mirror whereby as said rotor revolves the field of view is scanned in a two-dimensional pattern;

detector means for providing electrical signals representative of the relative intensity of energy applied thereto; and second optical means for directing energy reflected from said multi-faceted scan mirror to said detector means; whereby as said rotor revolves said detector means provides electrical signals representative of the relative energy distribution along at least one dimension of said field of view.

4,010,366

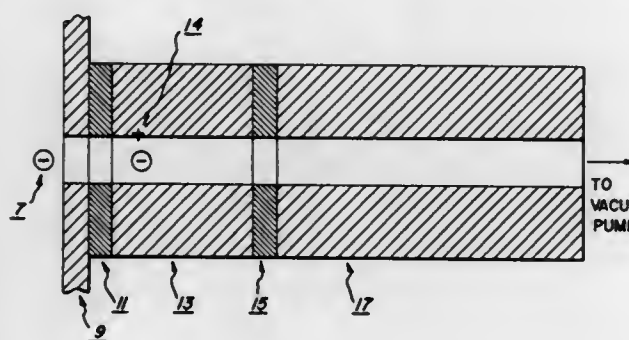
## MEASUREMENT OF THE MASS AND CHARGE OF CHARGED PARTICLES

Armand P. Neukermans, Palo Alto, Calif., and Dale R. Ims, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,612  
Int. Cl.<sup>2</sup> H01J 39/34

U.S. Cl. 250-282

8 Claims



1. A method of measuring the mass of a charged particle which comprises:

- providing a tubular member having a first region which comprises a grounded conductive material and a second region which is in the form of a Faraday cage, said first and second regions being separated by an insulator;
- introducing the charged particle into the first region of said tube while causing a stream of gas to flow through the tube in a direction away from the first region and toward the second region to and through the second region and induce a charge on the wall of the second region;
- measuring the time the particle spends in the second region by measuring the duration of the induced charge; and
- obtaining the mass of the charged particle by determining the mass of the particle as a function of the time it takes to pass through the second region by comparing the time the particle spends in the second region with the time particles of known mass spend in the region under similar conditions.

4,010,367

## THERMOGRAPHIC CAMERA

Koji Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

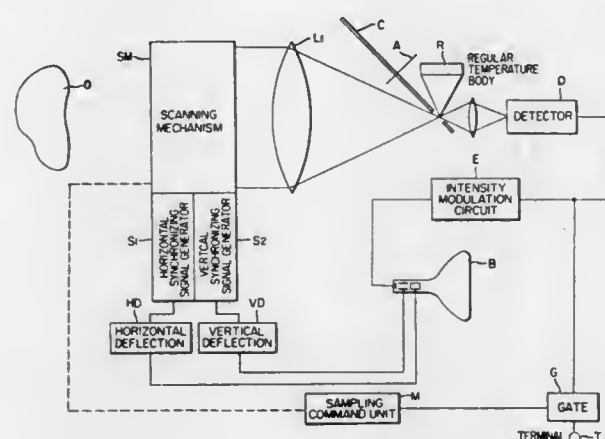
Filed Dec. 11, 1975, Ser. No. 639,699

Claims priority, application Japan, Dec. 18, 1974, 49-145199

Int. Cl.<sup>2</sup> H01J 31/49

U.S. Cl. 250-334

2 Claims



1. A thermographic camera comprising:
- a scanning mechanism for two-dimensionally scanning an object on a frame by frame basis;
  - an infrared detector for detecting infrared light from said scanning mechanism, and
  - a two-dimensional scanning display device for displaying detection signals, as temperature information, from said infrared detector,
- wherein there is made the improvement consisting of the provision, in said camera, of:
- sampling command means for generating in every frame sampling instruction signals, whenever respective points of a previously selected plurality of points on the object, distributed in any desired way over the aspect of the object, are scanned by said scanning mechanism;
  - sampling means for sampling the detection signals from said infrared detector in response to said sampling instruction signals generated by said sampling command means; and
  - means for indicating information corresponding to successive samples for/of each of said points, segregated from other information contained in said detection signals.

4,010,368

## TEST APPARATUS

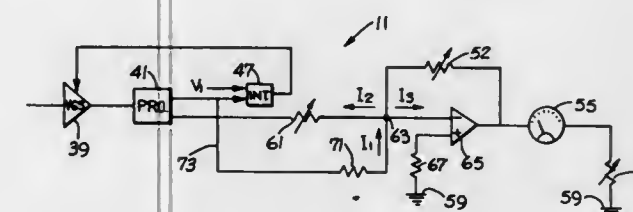
Edmond R. Pelta, Pacific Palisades, Calif., assignor to Autoscans, Inc., Culver City, Calif.

Continuation of Ser. No. 463,364, April 23, 1974, abandoned.  
This application Apr. 28, 1976, Ser. No. 680,920

Int. Cl.<sup>2</sup> G01J 1/00; G01N 21/24, 21/26, 21/28

U.S. Cl. 250-343

8 Claims



1. A combination for determining a percentage of concentration of a particular gas in a gas mixture, including:
  - a gas cell adapted to receive the gas mixture;
  - a source of infrared energy positioned with respect to the gas cell to introduce the infrared energy through the gas cell;
  - the particular gas in the cell having properties for reducing the magnitude of the infrared energy emanating from the cell in an amount dependent upon the percentage of concentration of a particular gas in a gas mixture;
  - amplifier means having a variable gain;
  - first means including the amplifier means for receiving the infrared energy emanating from the gas cell and for providing an electrical signal having particular characteristics dependent upon the percentage of concentration of the particular gas in a gas mixture;
  - second means responsive to the electrical signal and having a variable impedance for providing a modified electrical signal having the particular characteristics;
  - a reference cell positioned with respect to the source of infrared energy to receive the infrared energy and having a reference gas to provide a particular reduction in the infrared energy emanating from the cell;
  - third means including the amplifier means for receiving the infrared energy emanating from the reference cell and for providing a reference signal representative of such infrared energy;
  - fourth means for providing a reference voltage;
  - fifth means responsive to any difference between the reference voltage and the reference signal from the third means for adjusting the gain of the amplifier means to provide the reference signal with characteristics corresponding to the reference voltage;
  - sixth means for comparing particular characteristics of the reference signal and the modified electrical signal and for providing an output signal having at least one characteristic dependent upon the difference of the particular characteristics of the modified electrical signal and the reference signal;
  - a meter responsive to the output signal for providing an indication of the percentage of concentration of the particular gas in the gas mixture; and
  - seventh means for controlling the variable impedance of the second means for varying the magnitude of the modified electrical signal to provide the output signal with a particular magnitude representative of the absence of the particular gas in the gas mixture for providing the meter with a zero indication and for calibrating the analyzer for the span of the meter.

4,010,369

## METHOD FOR RAPID PARTICLE SIZE ANALYSIS BY HYDROSIZING AND NUCLEAR SENSING

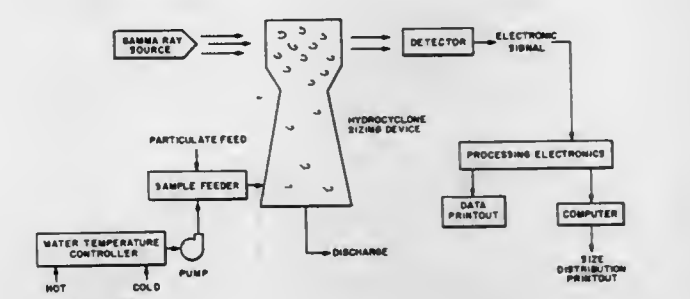
Charles B. Daellenbach, and Warren M. Mahan, both of Burnsville, Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 29, 1974, Ser. No. 438,152

Int. Cl.<sup>2</sup> G01F 1/00

U.S. Cl. 250-356

6 Claims



1. A system for determining the particle size and mass distribution of a sample of randomly sized particles from a known total mass comprising:
  - a series of interconnected liquid cyclones for separating the randomly sized particles into a series of discrete fractions according to their size, said particles being fed into said cyclones in a liquid slurry at a controlled velocity;
  - said interconnections comprising a series of conduits that are progressively smaller in cross-sectional area between any two liquid cyclones when measured perpendicular to the liquid flow;
  - means for detecting the particle mass of each of said discrete size fractions; and
  - means for indicating the detected mass of said fractions.

4,010,370

## COMPUTERIZED TOMOGRAPHY APPARATUS WITH MEANS TO PERIODICALLY DISPLACE RADIATION SOURCE

Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

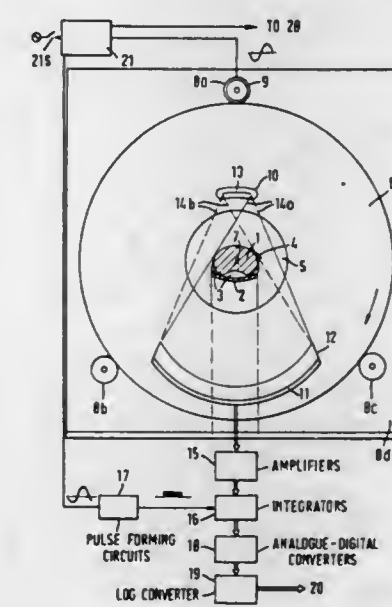
Filed Nov. 11, 1975, Ser. No. 630,779

Claims priority, application United Kingdom, Nov. 13, 1974, 49074/74

Int. Cl.<sup>2</sup> G01N 21/34, 23/04; G01T 1/20; H05G 1/00

U.S. Cl. 250-366

7 Claims



1. An apparatus for examining a substantially planar section of a body by means of penetrating radiation such as X- or  $\gamma$ -radiation including a source of a fan of radiation lying in the plane of the said section and originating substantially from a



point, a plurality of detectors for detecting the radiation after passage through the body along a plurality of beams at different angles within the fan, means for angularly displacing the source and detectors about a common axis perpendicular to the said plane and means for subjecting the said point of origin to a periodic displacement, relative to the detectors and in the said plane, such that during each of a series of increments of said angular displacement, said periodic displacement causes a further angular displacement of said beams, substantially equal and opposite to said first mentioned angular displacement to cause each of said beams to remain parallel to its position at the start of the respective increment.

4,010,371

# METHOD AND APPARATUS FOR SCANNING IN COMPUTERIZED TOMOGRAPHY

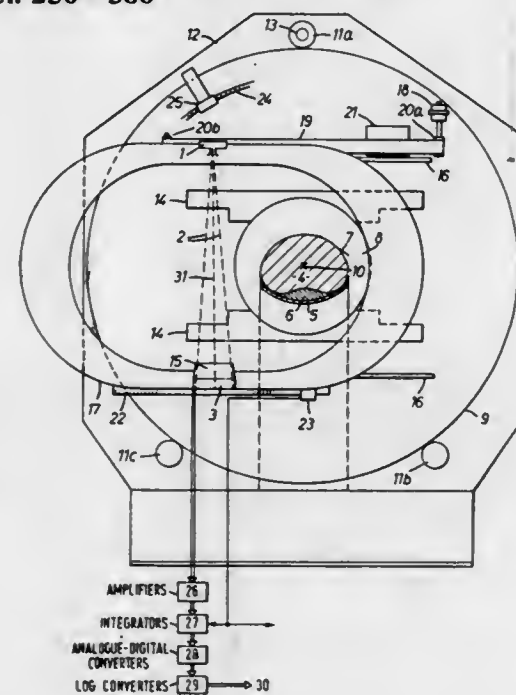
Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England  
Filed Dec. 10, 1975, Ser. No. 639,478

Claims priority, application United Kingdom, Dec. 19, 1974, 55060/74

Int. Cl.<sup>2</sup> G01N 23/08

U.S. Cl. 250—366

4 Claims



1. A method of examining a planar slice of a body by means of penetrating radiation such as X-radiation including the steps of irradiating the slice by means of a fan-shaped spread of the radiation in the plane of the slice, determining the absorption suffered by the radiation in passing through the body along a plurality of beams within said spread, scanning the said fan-shaped spread laterally in the said plane to provide values of the absorption suffered by the radiation along a plurality of sets of beam paths, each set provided by one of said beams in the course of the lateral scan, simultaneously rotating said fan-shaped spread about an axis normal to the said plane to change the angular positions of the said sets in successive lateral scans and providing a corrected absorption value for a beam path of a set, in view of absorption values for other beam paths of the set, suitable for allocation to locations of a data store, representing a notional matrix of elements in the said plane, at locations representing elements within a predetermined distance of that beam path, wherein the corrections for each set are derived as if the set were parallel (in the absence of said rotation) but the corrected values are allocated to element in the region of the actual path followed by the radiation taking into account the said rotation.

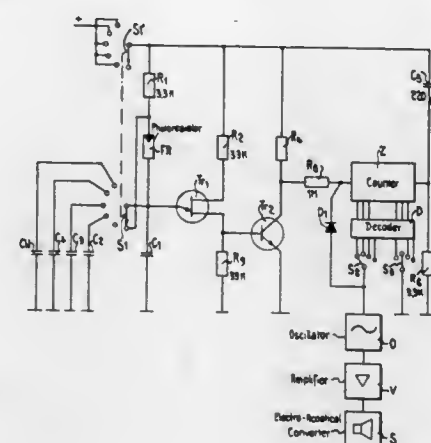
4,010,372  
DEVICE FOR MEASURING THE ULTRA-VIOLET RADIATION IN THE UV-A AND/OR UV-B RANGE  
Karl Adler, Grenchen, and Ernst Strutz, Zurich, both of Switzerland, assignors to Bivator AG, Grenchen, Switzerland  
Filed July 10, 1975, Ser. No. 594,647

Claims priority, application Switzerland, July 16, 1974, 9757/74

Int. Cl.<sup>2</sup> G01J 1/42

U.S. Cl. 250—372

4 Claims



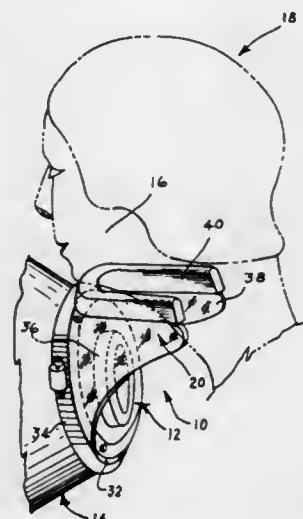
1. A device for measuring the ultra-violet radiation in the UV-A and UV-B ranges, comprising at least one optical filter for passing radiation in one of the ranges of 280–315 nm and 315–380 nm, a radiation detector receiving radiation from said filter and responsive to at least said one of said ranges, electronic means for receiving the signals from the detector and providing an output representative of radiation received from said filter, first switching means connected to said electronic means for programming the same to the skin sensitivity of the user, means coupled to said electronic means for displaying the dose of said radiation and second switching means connected to said electronic means for calibrating the same to the characteristics of different line intensities of at least two different radiation sources in the UV-A and UV-B ranges.

4,010,373  
PATIENT RESTRAINING DEVICE FOR THE PINHOLE COLLIMATOR AND GAMMA SCINTILLATION CAMERA  
Thomas D. Kay, 2814 Knight Robin, San Antonio, Tex. 78209  
Filed Oct. 10, 1975, Ser. No. 621,328

Int. Cl.<sup>2</sup> G01N 21/00, 23/00; G01T 1/20

U.S. Cl. 250—456

8 Claims



5. A restraining device comprising a holder and an adapter, said adapter having a scaled mounting element, said scaled element having a plurality of reference marks thereon, said holder having a body portion, said body portion being adjustably mounted upon said scaled element and being slideable with respect to said reference marks on said scaled element,

said body portion of said holder having a base containing a split therein, a clamp encompassing said holder base for adjustably securing said holder to said scaled element and said holder having a configuration capable of fixedly positioning a specific area of a patient in operative alignment with the collimator of a Gamma Scintillation Camera.

4,010,374

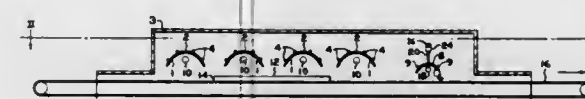
# ULTRAVIOLET LIGHT PROCESSOR AND METHOD OF EXPOSING SURFACES TO ULTRAVIOLET LIGHT

Warren J. Ramler, Elmhurst, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.  
Filed June 2, 1975, Ser. No. 583,311

Int. Cl.<sup>2</sup> H01J 37/20

U.S. Cl. 250—492 R

30 Claims



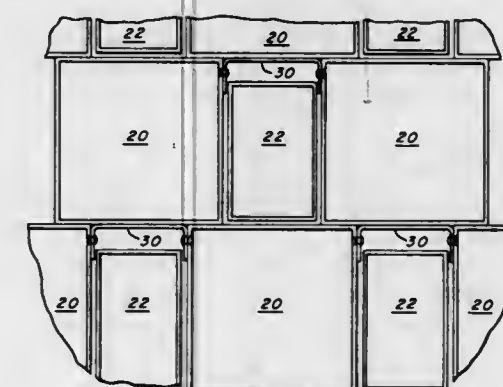
1. In the method wherein the surface of a workpiece is exposed to ultraviolet light from at least one primary optical system comprising a first source of ultraviolet light and a reflector for reflecting ultraviolet light from said first source to said surface such that the ultraviolet flux from said primary optical system incident per unit area of said surface is greater at the central region of said surface than at an edge thereof, the improvement comprising: exposing said surface to ultraviolet light from at least one secondary optical system comprising a second source of ultraviolet light and a reflector for reflecting ultraviolet light from said second source to said surface such that the ultraviolet flux from said secondary optical system incident per unit area of said surface is greater at said edge than at said central region thereof, to thereby cause said central region and said edge to be exposed to approximately equal total amounts of ultraviolet energy per unit area.

4,010,375  
STORAGE RACK FOR NUCLEAR FUEL ASSEMBLIES  
William J. Wachter, R.D. 4, English Road, Wexford, Pa. 15090, and Thomas R. Robbins, 1528 Crofton Parkway, Crofton, Md. 21114  
Filed May 27, 1975, Ser. No. 580,949

Int. Cl.<sup>2</sup> G21F 5/00

U.S. Cl. 250—507

13 Claims

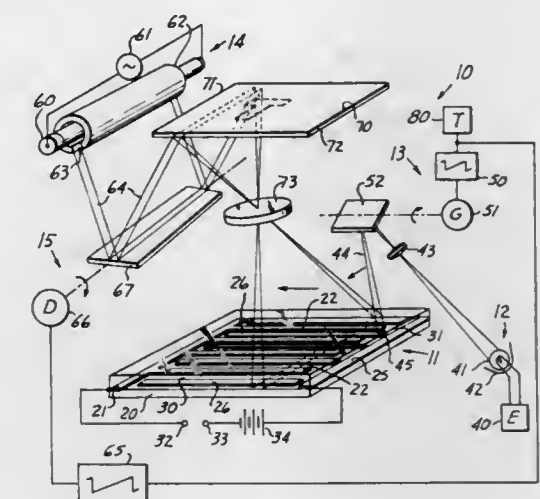


1. A storage rack for nuclear fuel assemblies comprising a plurality of storage cells each arranged to contain at least one fuel assembly, and a plurality of poison boxes, each of said poison boxes comprising an enclosure containing a moderator and having walls incorporating a neutron-absorbing material, said storage cells and poison boxes being disposed in an array such that each cell is immediately adjacent at least one poison box.

4,010,376  
PHOTOCONDUCTIVE COMMUTATORS  
Sherman W. Duck, Sunnyvale, Calif., assignor to Bell & Howell Company, Chicago, Ill.  
Filed Apr. 4, 1975, Ser. No. 565,313

Int. Cl.<sup>2</sup> H01J 39/12; 250 211 R; 578; 559; 567; 235; 233; 236  
U.S. Cl. 250—578

26 Claims



1. In a method of selectively addressing points in a coordinate system, the improvement comprising in combination: providing a coordinate system of a plurality of first electrodes and a plurality of second electrodes by arranging said first and second electrodes in mutually parallel planes; providing a further first electrode adjacent said first electrodes; providing a further second electrode adjacent said second electrodes; providing photoconductor material between said further first electrode and said plurality of first electrodes; providing photoconductor material between said further second electrode and said plurality of second electrodes; connecting said further first electrode and said further second electrode to electrical equipment with respect to which said points are to be addressed; scanning a first beam of radiant energy along an edge of said further first electrode in a continuous scanning path and selectively rendering photoconductor material between said further first electrode and said plurality of first electrodes photoconductive with said first beam of radiant energy to selectively connect said further first electrode to said plurality of first electrodes; and scanning a second beam of radiant energy along an edge of said further second electrode in a continuous scanning path and selectively rendering photoconductor material between said further second electrode and said plurality of second electrodes photoconductive with said second beam of radiant energy to selectively connect said further second electrode to said plurality of second electrodes.

4,010,377  
COMBINED GENERATOR AND BOAT PROPULSION SYSTEM

James W. McKenzie, P.O. Box 504, Rogers, Ark. 72756  
Filed Feb. 20, 1975, Ser. No. 551,312

Int. Cl.<sup>2</sup> H02P 9/04

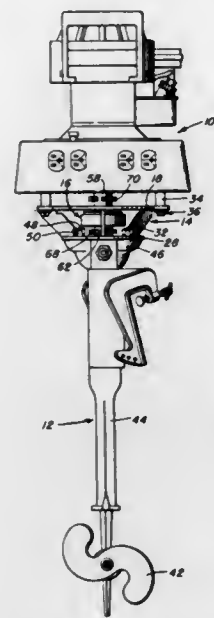
U.S. Cl. 290—1 R

10 Claims

1. A power system comprising a power driven generator, a propulsion unit incorporating a driven shaft, an adaptor mounting said generator on said propulsion unit, said generator including a drive shaft, and clutch means selectively cou-



pling said generator drive shaft and said propulsion unit driven shaft upon attainment, by said generator drive shaft, of a



predetermined rotational speed for a direct driving of the propulsion unit by the generator.

4,010,378

#### INTEGRATED ELECTRIC GENERATING AND SPACE CONDITIONING SYSTEM

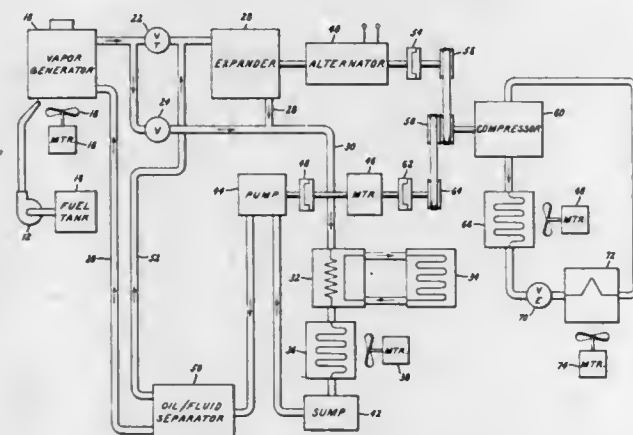
Bobby J. Tharpe, Phoenixville, and James C. Graf, Fort Washington, both of Pa., assignors to General Electric Company, Fairfield, Conn.

Filed Dec. 20, 1974, Ser. No. 534,711

Int. Cl.<sup>2</sup> F01K 15/00

U.S. Cl. 290—2

4 Claims



1. An integrated electric generating and space conditioning system comprising:

- generating means for generating electrical power;
- vapor generator means for vaporizing a motive fluid;
- rotary prime mover means for driving said generator means;
- means for supplying at a controlled rate said vaporized motive fluid to said rotary prime mover means;
- heat exchange means for heating fluid with vapor;
- means for conveying vapor directly to said heat exchange means from said vapor generator;
- means for conveying vapor exhausted from said rotary prime mover means to said heat exchange means;
- condenser means for receiving vapor from said heat exchange means and condensing it;
- pump means for delivering condensed vapor from said condenser means to said vapor generator means;
- a motor for driving said pump; and

heating means for producing sensible heat for space heating from said heated fluid.

4,010,379

#### SAFETY DEVICE FOR A MOTORCYCLE

Takeshi Shimamoto, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

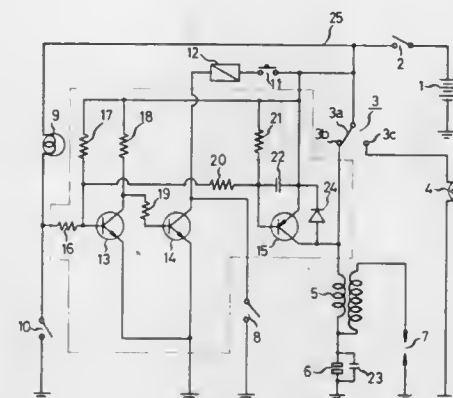
Filed Dec. 15, 1975, Ser. No. 640,762

Claims priority, application Japan, Dec. 20, 1974, 49-155331

Int. Cl.<sup>2</sup> B60L 1/00

U.S. Cl. 307—9

5 Claims



1. A safety device for a motorcycle having a stand movable between operative and inoperative positions, said safety device comprising, in combination, an ignition circuit composed of a primary winding of an ignition coil and a circuit breaker; a battery; a main switch connected to said battery and operable to connect said ignition circuit in parallel with said battery; a motorcycle stand switch connected in series with said ignition circuit and said main switch and operable to break said ignition circuit when the motorcycle stand is in an operative position and to complete the ignition circuit when the motorcycle stand is in an inoperative position; a first electronic switching element connected in parallel with said motorcycle stand switch; a neutral switch connected in parallel with said battery through said main switch and operable to an operative position only when a transmission is in the neutral position; and circuit means connecting said neutral switch to said first electronic switching element and operable, responsive to said neutral switch being operated to its operative position, to bring said first electronic switching element to an on state.

4,010,380

#### COMBINED LIGHT AND WINDSHIELD WIPER SWITCH

Edmund F. Bailer, 2185 NE. 123rd St. No. 104, Miami, Fla. 33181, and Albert G. Makdad, 6604 Tarrega St., Coral Gables, Fla. 33146

Filed Nov. 13, 1975, Ser. No. 631,423

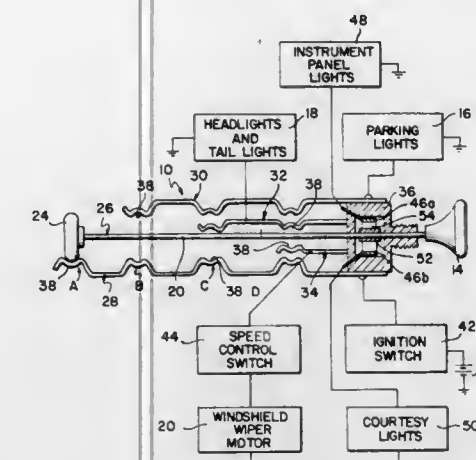
Int. Cl.<sup>2</sup> B60G 1/02

U.S. Cl. 307—10 LS

2 Claims

1. In a vehicle having headlights, parking lights, a windshield wiper motor and an electrical supply system, a combined light and windshield wiper control apparatus comprising a switch having a sliding core carrying a generally circular contact element positionable in at least three discrete positions, means for coupling said contact element to said electrical system in each of said three positions, three elongated conductive strips spaced angularly about said core, said strips carrying contact means for engaging said contact element, a first of strips being coupled to said parking lights, the contact means of said first strip being located for engaging said contact element in each of said three position, a second of said strips being coupled to said headlights, the contact means of said second strip being located for engaging said contact element in two of said three positions, a third of said strips

being coupled to said windshield wiper motor, the contact means of said third strip being located for engaging said



contact element in one of the two contact means positions associated with said second strip.

4,010,381

#### NO-BREAK AC POWER SUPPLY

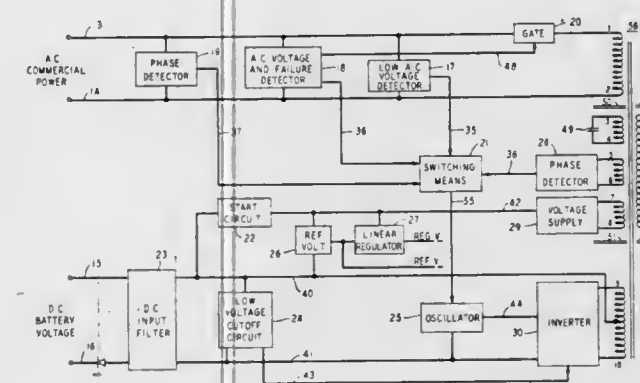
Hermann Fickenschner, Morristown, and Rudolph Scuderi, Mountain Lakes, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 24, 1975, Ser. No. 571,092

Int. Cl.<sup>2</sup> H02J 9/00

U.S. Cl. 307—66

24 Claims



1. An uninterruptible power supply comprising a power transformer including a first primary winding, a second primary winding, and a secondary winding, signal sensing means coupled to said first primary winding and responsive to detect a signal amplitude below a desired normal amplitude threshold, generating means to generate a periodic power signal and being coupled to said second primary winding, power flow control means to selectively control power transfer from said first and second primary windings to said secondary winding including first phase detection means to monitor a signal phase of said secondary winding, phase control means coupled to said first phase detection means and to said generating means and normally operative to align the phase of said periodic signal with said signal phase of said secondary winding, second phase detection means to monitor a signal phase of said first primary winding, said phase control means coupled to said second phase detection means and to said signal sensing means and operative in response to a signal amplitude below a desired normal amplitude detected by said signal sensing means to align the phase of said periodic signal with a signal of said first primary winding.

4,010,382

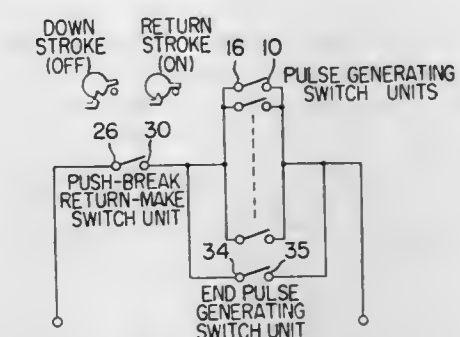
PUSH-BUTTON TYPE PULSE GENERATING SWITCH  
Matsuo Nishioka, and Shunzo Oka, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan  
Filed Dec. 26, 1974, Ser. No. 536,374

Claims priority, application Japan, Dec. 29, 1973, 48-2696; Dec. 29, 1973, 48-3379; Dec. 29, 1973, 48-3380; Dec. 29, 1973, 48-3381; Dec. 29, 1973, 48-3382; Dec. 29, 1973, 48-3383

Int. Cl.<sup>2</sup> H03K 3/00

U.S. Cl. 307—106

24 Claims



1. A push-button type pulse generating switch comprising
  - a. pulse generating switching means including an operating shaft for generating number pulses in the return stroke of said operating shaft,
  - b. end pulse generating switching means electrically connected in parallel to said pulse generating switching means for generating an end pulse in response to the end of said return stroke
  - c. push-break return-make switching means electrically connected in series to both said pulse generating switching means and said end pulse generating switching means for disabling said pulse generating switching means in response to the forward stroke of said operating shaft and for energizing said pulse generating switching means and said end pulse generating switching means in response to the return stroke of said operating shaft, and
  - d. the number pulses and the end pulse thereby being generated when said push-break return-make switching means is closed in said return stroke of said operating shaft.

4,010,383

#### PRECIPITATION DETECTOR FOR ARRANGEMENTS WHICH CONTROL WINDSHIELD WIPERS AND/OR WASHERS, AND THE LIKE

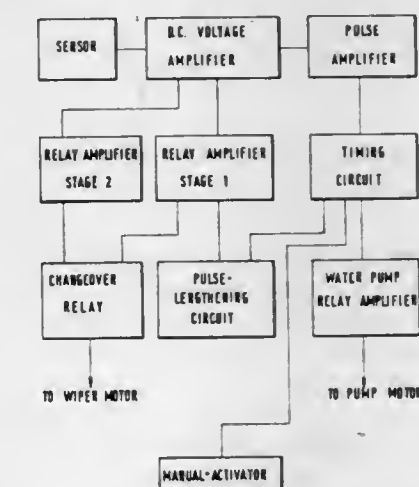
Günter Grassmann, 3151 Eddesse Nr. 40, Germany  
Filed Aug. 15, 1975, Ser. No. 605,176

Claims priority, application Germany, Aug. 17, 1974, 2439590; Mar. 13, 1975, 2510885

Int. Cl.<sup>2</sup> H02G 3/00

U.S. Cl. 307—118

19 Claims



1. In an arrangement for controlling the operation of a



windshield wiper motor on a vehicle, in combination, at least one upper and one cooperating lower sensor element, each sensor element being comprised of a naked electrically conductive portion which adjoins the naked electrically conductive portion of the other sensor element of the pair of sensor elements to define an interelectrode gap, the naked electrically conductive portions being exposed to precipitation, the space between the electrically conductive portion of the upper sensor element and that of the lower sensor element being empty both between such conductive portions and also rearwardly of the interelectrode gap, so that precipitation bridging the interelectrode gap will not be supported from behind against the force of oncoming wind and thus not tend to become protractedly caught in the gap, the lower sensor element being of comb-like configuration and the naked electrically conductive portion of the lower sensor element comprising upwardly projecting comb teeth having pointed ends closely adjoining the naked electrically conductive portion of the upper sensor element, whereby water droplets bridging the interelectrode gap will tend not to cling to the electrically conductive portion of the lower sensor element because of the pointed configuration of the ends of the upwardly projecting comb teeth thereof; and circuit means operative for detecting the existence of precipitation by detecting the interelectrode gap resistance changes resulting from the bridging of the interelectrode gap by precipitation and in response to such detection generating a control signal for the windshield wiper motor.

4,010,384

**BINARY FREQUENCY DIVIDER FOR MICROWAVES**  
Roger Charbonnier, Meudon, France, assignor to Ardet Electrique, France

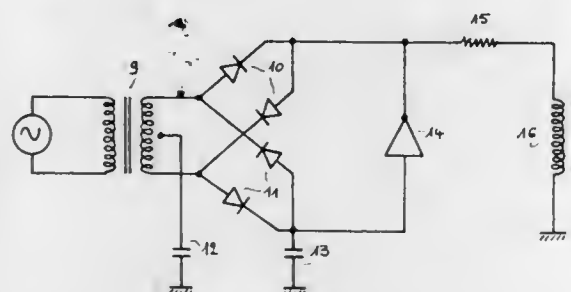
Filed Aug. 15, 1975, Ser. No. 605,091

Claims priority, application France, Oct. 29, 1974, 74.36047

Int. Cl.<sup>2</sup> H03K 21/00, 5/08

U.S. Cl. 307—220 R

4 Claims



1. A binary frequency divider including at least one trigger circuit comprising switching means having first, second and third terminals and control means responsive to a periodic control signal, for periodically connecting the first terminal alternately to the second terminal and to the third terminal, an input circuit connected to said control means and providing said control signal; first storage means connecting the first terminal to the earth; second storage means connecting the third terminal to the earth; an amplifier having a negative gain whose absolute value exceeds unity, said amplifier having an input connected to the third terminal and an output connected to the second terminal; and an output circuit connected to the output of the amplifier.

#### 4,010,385 MULTIPLEXING CIRCUITRY FOR TIME SHARING A COMMON CONDUCTOR

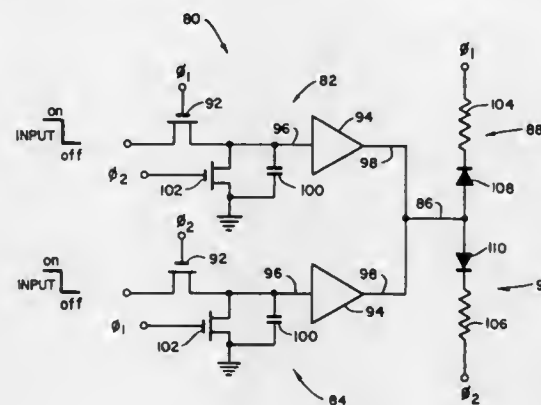
William S. Krol, Park Ridge, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Jan. 9, 1976, Ser. No. 647,689

Int. Cl.<sup>2</sup> H03K 17/54; H04L 15/34

U.S. Cl. 307—243

4 Claims



1. A multiplexing circuit for time sharing signals over a common conductor comprising:  
a plurality of individual passive circuit paths each having a predetermined resistance characteristic with one end of each circuit path being connected to a common conductor;  
a plurality of sampling circuits each corresponding to one of said passive circuit paths, each of said sampling circuits being connected to said common conductor;  
means for applying a distinct phase of a multiphase clock signal to each of said passive circuit paths for coupling to said common conductor and for applying the same phase of said multiphase clock signal to the corresponding sampling circuit; and  
a selectively operable switch connected in series with each of said passive circuit paths for interrupting the coupling of the associated clock phase to the common conductor so that each of the sampling means will provide a signal related to the condition of the switch in its corresponding passive circuit path.

4,010,386

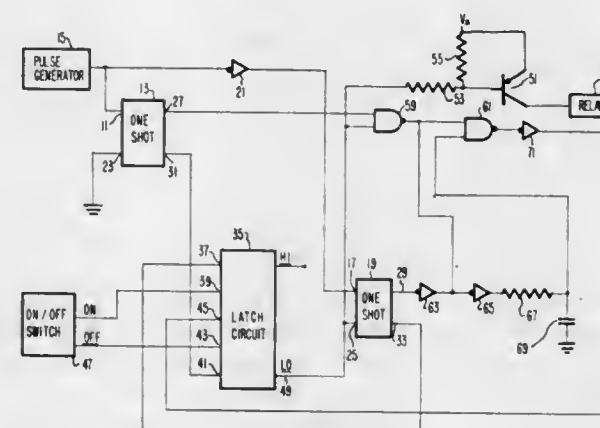
**SYNCHRONOUS SWITCH CONTROL CIRCUIT**  
Allen J. Rossell, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 20, 1976, Ser. No. 650,629

Int. Cl.<sup>2</sup> H03K 17/00

U.S. Cl. 307—252 UA

17 Claims



1. A switching control circuit for timing the selective energization of a load by an AC power source in response to the actuation of an ON/OFF switch comprising:  
means for generating pulses having transitions synchronous with the voltage zero-crossings of the AC power source;

timing means triggered by said pulse generating means for generating a first timed signal which begins on the occurrence of a positive-going voltage zero-crossing and a second timed signal which begins on the occurrence of a negative-going voltage zero-crossing;  
output means responsive to said timing means and the actuation of the ON/OFF switch for generating turn-on and turn-off signals, said turn-on signal being generated after the first timing of said first timed signal subsequent the actuation of an ON condition and said turn-off signal being generated after the first timing out of said second timed signal subsequent the actuation of an OFF condition; and  
switching means for electrically coupling and uncoupling the load from the AC power source in response to said turn-on and turn-off signals, respectively.

4,010,387

**POWER TRANSISTOR SWITCHING APPARATUS**  
Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Toyko, Japan

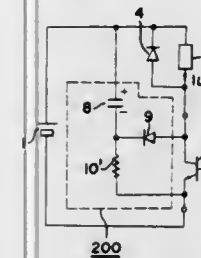
Filed Apr. 14, 1975, Ser. No. 567,995

Claims priority, application Japan, May 11, 1974, 49-52517

Int. Cl.<sup>2</sup> H03K 17/64, 17/60

U.S. Cl. 307—253

3 Claims



1. A power transistor switch comprising:  
a transistor having an emitter, a collector and a base for ON-OFF switching, the transistor being connected in series to a path connecting a power source and a load, means for controlling reappplied voltage which is reappplied between the emitter and the collector of the transistor during the transition period when the transistor is switched to the OFF state to suppress the reappplied voltage at the time the collector current is substantially broken,  
said means comprising a resistor, a capacitor and a diode, means connecting the diode and the resistor in series between the emitter and the collector of the transistor, means connecting the capacitor between the power source and the junction of the resistor and the diode.

4,010,388

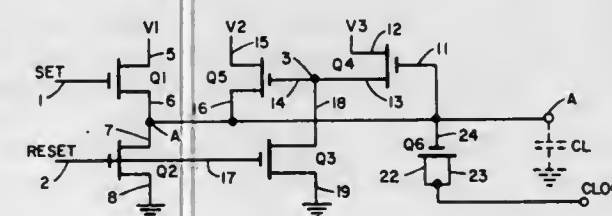
**LOW POWER ASYNCHRONOUS LATCH**  
Cesar E. Alvarez, Jr., Griffith, Ind., assignor to Teletype Corporation, Skokie, Ill.

Filed Feb. 18, 1976, Ser. No. 659,068

Int. Cl.<sup>2</sup> H03K 3/286, 3/353, 17/04, 17/10

U.S. Cl. 307—279

10 Claims



1. A latch circuit comprising:  
a first input terminal;  
a second input terminal;

an output terminal;  
set means connected to the first input terminal and responsive to a first input pulse applied thereto for establishing a first selected output voltage at the output terminal;  
detecting means connected to the output terminal for sensing the presence of the first selected output voltage and for producing an enabling signal exclusively in response to the presence of the first selected output voltage;  
switch means responsive to the enabling signal for providing an additional voltage to the output terminal to maintain the voltage at the output terminal at the first selected output voltage;  
reset means connected to the second input terminal and responsive to a second input pulse applied thereto for establishing a second selected output voltage, different from the first selected output voltage, at the output terminal; and  
means connected to the switch means and operating in conjunction with the reset means, for preventing the switch means from responding to the enabling signal.

4,010,389

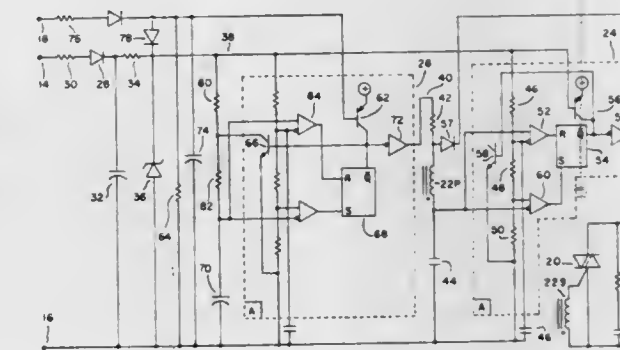
**SOLID STATE TIME DELAY AND HOLDING CIRCUIT**  
William B. Mason, Arlington, Tex., assignor to TECCOR Electronics, Inc., Euless, Tex.

Filed Nov. 24, 1975, Ser. No. 634,421

Int. Cl.<sup>2</sup> H03K 5/13, 17/60

U.S. Cl. 307—293

2 Claims



1. Circuitry for establishing a connection between a pair of terminals and for opening said connection a predetermined time interval after receiving a predetermined signal comprising:  
switch means including a bilateral thyristor connected across said terminals, said switch means including a control input, said switch means being responsive to an enabling signal applied to said control input for establishing said connection and responsive to the removal of said enabling signal from said control input for opening said connection;  
pulse generating means connected to said control input, said pulse generating means having an enabling input and responsive to a signal at a predetermined level at said enabling input for generating said enabling signal, said pulse generating means including a pulse transformer having its secondary winding connected to the control input of said switch means; and  
timing means for providing said predetermined level signal to said pulse generating means, said timing means including means for receiving said predetermined signal and responsive thereto for removing said predetermined level signal a predetermined time interval after receipt of said predetermined signal, said timing means comprising:  
a flip-flop;  
a capacitor;  
means for charging said capacitor;  
discharge means selectively controllable for providing a discharge path for said capacitor;  
means for conditioning said flip-flop to a first state when the charge on said capacitor is below a first level;



means for conditioning said flip-flop to a second state when the charge on said capacitor is above a second level, said second level being above said first level; means responsive to said flip-flop being in said first state for providing said predetermined level signal to said pulse generating means; means responsive to said flip-flop being in said second state of controlling said discharge means to provide said discharge path; and means controlling said discharge means to provide said discharge path while said flip-flop is in said first state and responsive to receipt of said predetermined signal for controlling said discharge means to open said discharge path and allow said capacitor to charge.

4,010,390

## ELECTROMAGNETIC ACTUATOR COMPRISING A PLUNGER CORE

Harald Stampfli, Petit-Saconnex, Switzerland, assignor to Lucifer S.A., Carouge-Geneva, Switzerland

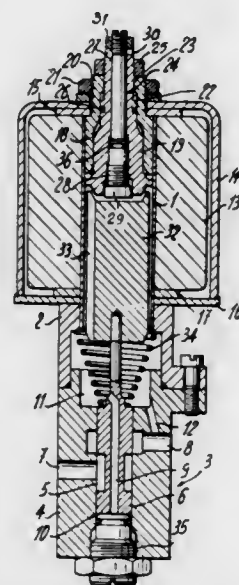
Filed May 16, 1975, Ser. No. 578,362

Claims priority, application Switzerland, May 24, 1974, 7094/74

Int. Cl.<sup>2</sup> H02K 33/02

U.S. Cl. 310—30

4 Claims



1. An electromagnetic actuator with a plunger core and a stationary ferromagnetic core, both surrounded by an electrical winding, said actuator comprising means for adjusting the axial position of the stationary core in relation to the winding and adjusting the initial attraction force without changing the initial position of the plunger core in relation to the winding, said means being operable from outside the actuator, said stationary core comprising two ferromagnetic parts, one of which is located partly inside the other and is axially displaceable in relation to the outer part, the latter being fixed in relation to the winding and to the external magnetic circuit.

4,010,391

## METHOD OF USING MULTIPLE STRESSED SEALING PLUGS TO FILTER POLYMERIC MATERIAL

Peter Gabor Kalman, 51, Compayne Gardens, London, N.W.6, England

Division of Ser. No. 344,414, March 23, 1973, Pat. No. 3,856,674. This application Sept. 24, 1974, Ser. No. 508,813

Claims priority, application United Kingdom, Apr. 19, 1972, 18194/72; Oct. 10, 1972, 46683/72

The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> B01D 29/02, 33/32, 35/18, 33/04

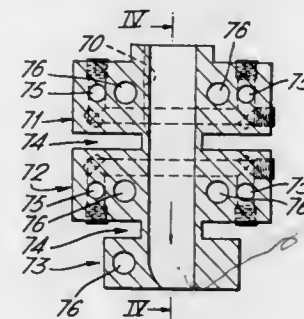
U.S. Cl. 210—71

6 Claims

3. In a process for filtering a substance which is capable of being annealed by heating and cooling same, which has a high

coefficient of friction, and which exhibits negligible shrinkage or positive expansion characteristics upon cooling from an elevated temperature flowing through a passage in a filter housing, including the steps of introducing an elongated filter medium in said passage by passing it through inlet and outlet ports which flank said passage and communicate therewith so that a part of the filter extends across the passage, forcing the substance under elevated pressure and temperature conditions through the filter part of the passage to filter the substance, while providing temperature conditions at said inlet and outlet ports resulting in the formation therein of sealing plugs of said substance and, when desired, effecting movement of said filter medium through said ports to introduce another part of said filter into said passage under conditions providing for movement of the plugs of sealing at said inlet and outlet ports, the improvement comprising the steps of:

- providing at least an outlet port having first, second and third spaced sections in uninterrupted communication with each other for sealing purposes extending away from the passage, the sections being thermally isolated from each other and from the filter housing, with said first section being positioned nearest to the filtering passage



and said third section being positioned furthest from the filtering passage, and said sections being initially filled with substance being filtered under elevated pressure and at an elevated temperature;

- cooling said port while the substance therein is subjected to elevated pressure to a sufficient extent that a stressed plug is formed therein, the stressed plug being attached to the filter medium and normally blocking the movement of the filter medium through the port;
- heating and then cooling said second and third sections to substantially anneal the substance in said second and third sections to form a substantially unstressed sealing plug therein, while the stressed plug in said first section remains in place in sealed engagement with the port and in cooled condition;
- subsequently, when movement of the filter across the passage is required, heating said first section to enable movement of the stressed plug therein along the port and heating said third section while said first section is in such heated condition, the heating of said third section being carried out only to the extent necessary to enable the annealed sealing plug therein to be controllably extruded from the port

4,010,392

## SUBMERSIBLE MOTOR

Alexandr Antonovich Bogdanov, Strastnoi bulvar, 7, kv. 39; Valentin Vasilievich Rodkin, Staro-Kashirskoe shosse, 2, korpus 12, kv. 19, and Anatoly Andreevich Chudinovsky, Khlebozavodskoi proezd, 5, korpus 4, kv. 21, all of Moscow, U.S.S.R.

Filed Jan. 20, 1975, Ser. No. 542,398

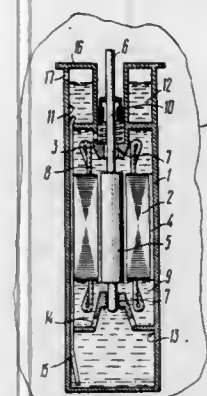
Int. Cl.<sup>2</sup> H02K 5/12

U.S. Cl. 310—87

5 Claims

1. A submersible motor for immersion in a surrounding medium comprising, in combination, a housing having a cavity, a motor disposed in said housing cavity, said motor including a rotor and a stator in surrounding relationship with said rotor, a first chamber in the upper portion of said housing

adjacent the upper end face of said motor in sealed relationship with said housing cavity, said first chamber being provided with an opening at the upper portion thereof for communication with the surrounding medium, a second chamber in the lower portion of said housing adjacent the lower end face of said motor and communicating with said housing cavity, a liquid dielectric in said housing cavity and in the upper portion of said second chamber, conduit means within the interior of said housing communicating at opposite ends



with said first and second chambers respectively and a liquid in said first chamber, said conduit means and the lower portion of said second chamber in intimate contact with the liquid dielectric in the upper portion of said second chamber, said liquid having a specific weight greater than that of and unmixable with the liquid dielectric and the surrounding medium for pressurizing said liquid dielectric in said cavity to prevent the penetration of the surrounding medium into said housing cavity.

4,010,393

## DYNAMO-ELECTRIC MACHINES

Hugh Olaf Lorch, and Albert Benjamin John Reece, both of Stafford, England, assignors to The English Electric Company, Limited, London, England

Filed Dec. 12, 1974, Ser. No. 532,047

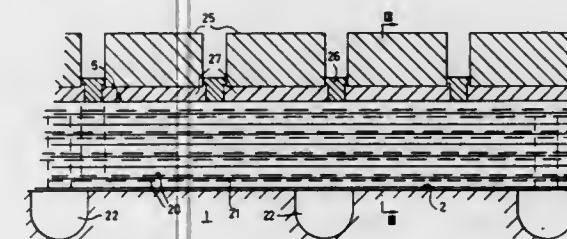
Claims priority, application United Kingdom, Jan. 11, 1974, 1357/74

The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> H02K 1/32

U.S. Cl. 310—194

11 Claims



1. A dynamo-electric machine rotor comprising:

- a rotor body;
- a winding on the rotor body including a multiplicity of conductors extending axially along the length of the rotor body;
- a plurality of annular members encircling said conductors at respective positions axially spaced along the rotor body to constrain the conductors against the effects of centrifugal force; and
- at least one expansible device interposed between the annular members and the conductors of the rotor winding, the expansible device being held in an expanded condition to prestress the annular members to a tensioned condition to clamp the conductors to the rotor body, and to an extent such that stretching of the annular members at the maximum speed of the rotor is substantially prevented.

4,010,394

## SUPPORT FOR AN END WINDING OF A ROTOR OF A DYNAMO-ELECTRIC MACHINE

Hugh Olaf Lorch, and Albert Benjamin John Reece, both of Stafford, England, assignors to The English Electric Company Limited, London, England

Filed Dec. 12, 1974, Ser. No. 532,048

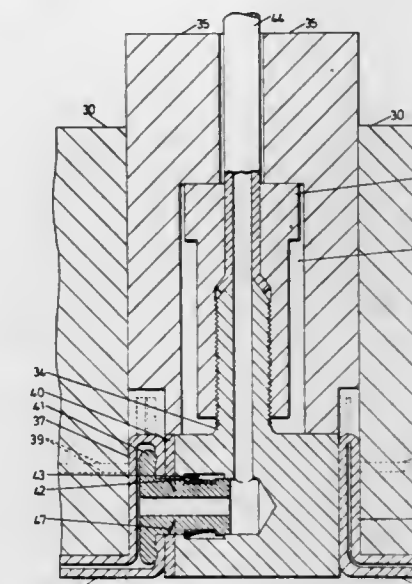
Claims priority, application United Kingdom, Jan. 11, 1974, 01358/74

The portion of the term of this patent subsequent to Dec. 12, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> H02K 1/32

U.S. Cl. 310—194

12 Claims



1. A dynamo-electric machine comprising:

- a rotor body;
- an overhang region at an end of the rotor body;
- an end-winding including a multiplicity of conductors which extend axially along the overhang region;
- annular support means interposed between the said conductors of the end winding and the overhang region;
- a plurality of annular members encircling said conductors at spaced positions along the overhang region to constrain the conductors against the effects of centrifugal force; and
- at least one expansible device interposed between the encircling annular members and the conductors forming the end-winding, the expansible device being held in an expanded condition to prestress the annular members to a tensioned condition to clamp the conductors to the support means, and to an extent such that stretching of the annular members at the maximum speed of the rotor is substantially prevented.

4,010,395

## GAS DISCHARGE DISPLAY PANEL WITH CELL-FIRING MEANS HAVING GLOW SPREADING ELECTRODE

George E. Holz, North Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 9, 1976, Ser. No. 656,656

Int. Cl.<sup>2</sup> H01J 61/067, 61/54

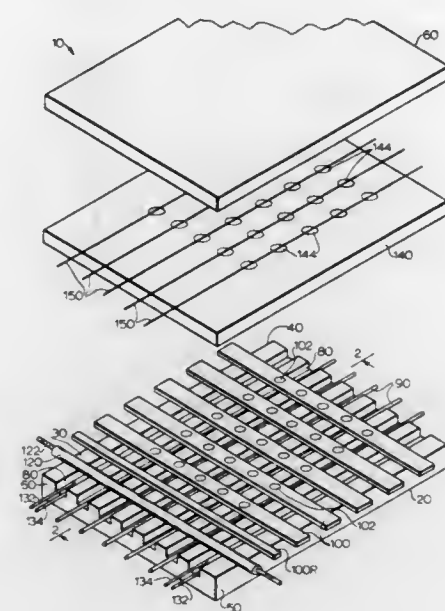
U.S. Cl. 313—188

5 Claims

1. A display panel comprising a gas-tight envelope containing an ionizable gas, a plurality of gas discharge cells, each having spaced-apart discharge electrodes, disposed within said envelope in an array of rows and columns, there being a first column of cells, a last column of cells, and a plurality of intermediate columns of cells therebetween, said cells being adapted to be energized sequentially column by column, beginning with the first and continuing to the last, a column of reset cells, each having spaced-apart discharge electrodes, adjacent to said first column of gas discharge cells to turn on at the beginning of a scanning cycle,



an auxiliary electrode in said envelope insulated from the gas in said envelope and positioned adjacent to said column of reset cells, and



means for producing glow and excited particles along the length of said auxiliary electrode, said excited particles assisting all of the cells in said column of reset cells to exhibit glow and to generate excited particles.

4,010,396

## DIRECT ACTING PLASMA ACCELERATOR

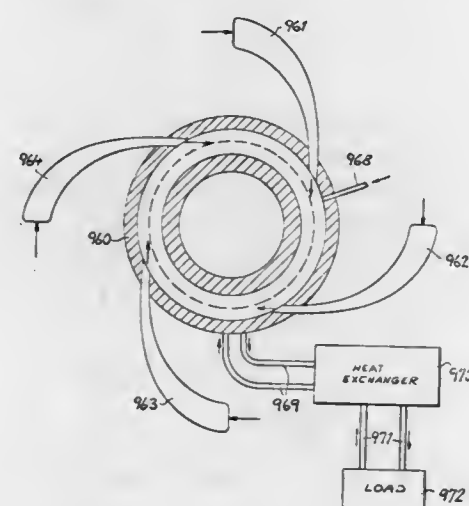
Thomas I. Ress, Buena Park, and George V. Nolde, Santa Monica, both of Calif., assignors to Kreidl Chemico Physical K.G., Schaan, Liechtenstein

Filed Nov. 26, 1973, Ser. No. 418,857

Int. Cl.<sup>2</sup> H01J 3/34; H05H 1/10, 1/12

U.S. Cl. 313-231.3

13 Claims



1. In a reactor for charged particles, comprising in combination:

- a central storage vessel enveloping a closed track for the circulation of positively and negatively charged particles, and
- a plurality of branch channels opening into said central storage vessel in a tangential direction to said closed track at spaced apart locations, each of said branch channels having an end remote from said central storage vessel provided with a source of substantially equal numbers of positive and negative particles injected in the general direction of the centerline of the respective branch channel and with a set of electromagnets disposed along said centerline; and

control means for periodically energizing the source of

particles and the electromagnets of each of said branch channels for producing a dense stream of positive and negative particles circulating in said central storage vessel.

11. A method for accelerating a mixture of positive and negative particles along an open-ended track, comprising the step of injecting a plasma of positive and negative particles into an open-ended track, while applying a magnetic field traveling in a preselected direction relative to each point of said track, with the magnetic flux vector of said field transverse to said track at all points.

4,010,397

## FLASHLAMP TRIGGERING ARRANGEMENTS FOR PRESSURIZED GAS COOLED LASERS

David T. Hon, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 30, 1975, Ser. No. 627,419

Int. Cl.<sup>2</sup> H01J 7/44, 13/46, 17/34, 19/78

U.S. Cl. 315-57

8 Claims



1. In combination with a flashlamp having an elongated substantially tubular hermetically sealed housing of dielectric material, an ionizable gas within said housing, and first and second spaced coaxially aligned substantially cylindrical electrodes disposed within said housing at opposite ends thereof, each of said first and second electrodes having a rounded end facing the other of said electrodes, a triggering arrangement comprising:

an electrically conductive patch in intimate contact with a portion of the outer lateral surface of said housing extending over a portion of said first electrode and terminating at a longitudinal location along said housing substantially aligned with the inner end of said first electrode, said first electrode defining a sharp-edged annular rim projecting outwardly from its lateral surface adjacent to said end, an electrically conductive wire electrically connected to said patch and extending along the outer lateral surface of said housing from said patch to at least the vicinity of said second electrode, and means for applying a dc voltage between said first and second electrodes and a trigger voltage between said first electrode and said patch.

4,010,398

## ELECTRIC DEVICE PROVIDED WITH A GAS AND/OR VAPOR DISCHARGE LAMP

Willy Frans Lucia Meuwes, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1975, Ser. No. 607,773

Claims priority, application Netherlands, Sept. 18, 1974, 7412330

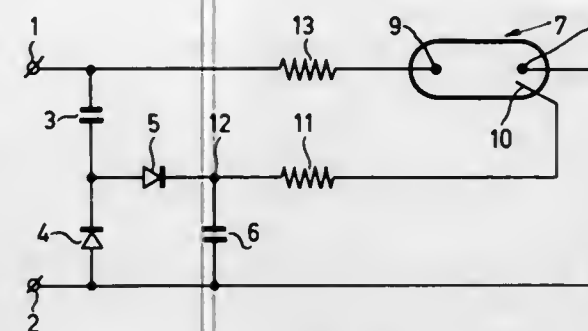
Int. Cl.<sup>2</sup> H05B 39/00, 41/14

U.S. Cl. 315-101

14 Claims

1. An electric device comprising a discharge lamp having an electric discharge tube with at least two main electrodes and an auxiliary electrode, two input terminals adapted for connection to an AC voltage source to supply the lamp with power, a cascade circuit including two series circuits each of which comprises a rectifier and a capacitor in series, means connecting the second series circuit to form a closed circuit with the rectifier of the first series circuit, a first resistor, means connecting an electrode path of the discharge tube and said first resistor in shunt with the capacitor of the second series circuit, said electrode path being formed between the auxiliary electrode and a main electrode of the discharge tube, means connecting the main electrode path formed between

the main electrodes of the discharge tube in series with a current limiting circuit element and in shunt with a part of the cascade circuit, which part comprises at least the capacitor of



the second series circuit, and means connecting the first series circuit of the cascade circuit directly to the input terminals of the device.

4,010,399

## SWITCHING CIRCUIT FOR A FLUORESCENT LAMP WITH HEATED FILAMENTS

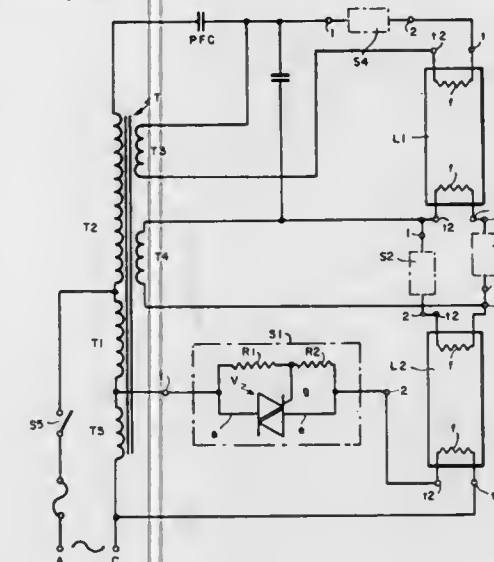
Carlo S. Bessone, Cambridge, and Frank M. Latassa, Magnolia, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 22, 1975, Ser. No. 643,098

Int. Cl.<sup>2</sup> H05B 41/23

U.S. Cl. 315-101

3 Claims



1. An alternating current rapid start fluorescent lamp ballast circuit comprising:

- a rapid start fluorescent lamp including an envelope, emissive filaments spaced apart within the envelope and two leads into the envelope to each filament, the leads comprising primary and secondary lamp terminals for supplying rated arc discharge current between filaments and current through each filament to heat the filament to arc supporting emissive state,
  - a transformer including a primary winding for alternating line current, a secondary winding connected to the primary lamp terminals, and a tertiary winding in a secondary, heating circuit through secondary lamp terminals and a filament; and
  - switching means in the secondary circuit including a voltage divider with a junction intermediate the divider, and an electronic valve connected in parallel with the divider, the valve having a control coupled to the junction for causing conduction on each half cycle of alternating current applied across the valve when a break down voltage is applied from the junction to the control,
- The voltage divider and valve respectively being in series with the lamp terminals and filament such that rated operating current through the lamp produces a voltage at

the control lower than the breakdown voltage of the valve, thereby to stop conduction of the valve and limit current through the lamp filaments after the lamp conducts rated operating current.

4,010,400

## LIGHT GENERATION BY AN ELECTRODELESS FLUORESCENT LAMP

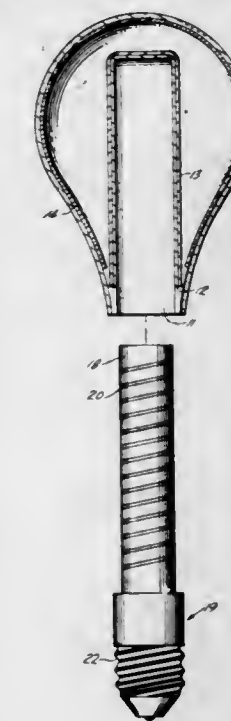
Donald D. Hollister, 2031 Tweed St., Placentia, Calif. 92670

Filed Aug. 13, 1975, Ser. No. 604,226

Int. Cl.<sup>2</sup> H05B 41/16, 41/24

U.S. Cl. 315-248

28 Claims



1. A method for producing light from an electrodeless discharge established in an ionizable medium within a sealed envelope including at least one particular ionizable gas at a given pressure capable of emitting radiant energy when subjected to a radio frequency field, the method comprising the steps of:

- coupling to the medium an electric field having a magnitude sufficient to initiate ionization of the medium to form a radiation emitting discharge; and
  - simultaneously coupling to the medium a radio frequency magnetic induction field for maintaining said ionization, said field having a frequency and peak magnitude such that on the average, the free electrons in the medium are accelerated to ionizing velocity in a distance equal to one-quarter of the period of said magnetic field, wherein both of said steps of coupling to the medium an electric field and coupling to the medium a radio frequency magnetic induction field comprise the steps of:
- positioning an induction coil wrapped around a non-magnetic core in close physical proximity to said medium in said envelope; and
- connecting to said induction coil a radio frequency signal.



4,010,401

**CONSTANT-VOLTAGE CONVERTER HAVING BEAM CURRENT DETECTOR**

Noboru Yasumatsuya, and Mitsuo Isobe, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

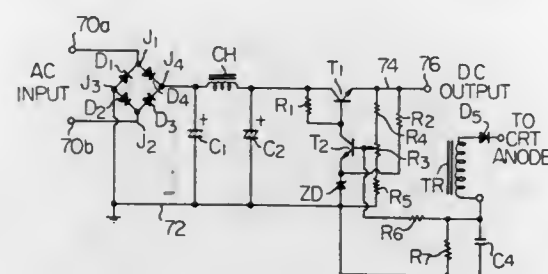
Continuation-in-part of Ser. No. 205,627, Dec. 7, 1971, abandoned. This application Dec. 6, 1973, Ser. No. 422,156 Claims priority, application Japan, Dec. 13, 1970, 45-110818

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> H01J 29/52

U.S. Cl. 315—379

8 Claims



1. A power supply system for supplying a high voltage to an anode of a display tube and a relatively low voltage to deflection circuits of the display tube, which comprises:

rectifying means for rectifying an a.c. input into pulsating d.c.;

beam current detecting means for producing a beam current signal representative of intensity of the beam current of said display tube;

low voltage supplying means coupled to said rectifying means and responsive to the beam current signal of said detecting means for converting pulsating d.c. into a relatively low voltage and for supplying the low voltage to said deflection circuits of said display tube, while regulating the level of said low voltage in accordance with said beam current signal;

high voltage supplying means coupled to said low voltage supplying means for converting the relatively low voltage into a constant high voltage and for supplying the high voltage to said anode of said display tube; and feedback means coupled to said high voltage supplying means for stabilizing the high voltage of said high voltage supplying means.

4,010,402

**LOAD PROTECTIVE CIRCUIT**

Toshihiko Miyata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

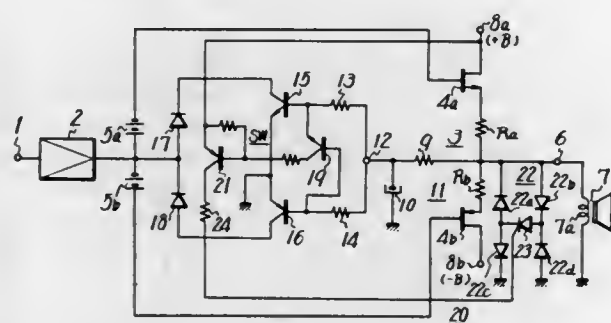
Filed May 15, 1975, Ser. No. 577,950

Claims priority, application Japan, May 21, 1974, 49-57749[U]

Int. Cl.<sup>2</sup> H02H 7/20

U.S. Cl. 361—56

8 Claims



1. A load protective circuit comprising:

a. a first voltage source of a first polarity;

b. a second voltage source of a second polarity;

c. first and second amplifying elements connected in series between said first and second voltage sources for amplifying input signals derived from an input circuit;

d. an output point connected between said first and second amplifying elements;

e. a load connected between said output point and ground;

f. means for detecting an undesirable DC voltage appearing at said load so as to produce a control signal;

g. a first protective means for shunting the input signals to ground in response to said control signal when said DC voltage becomes greater than a first predetermined value; and

h. a second protective means connected between said output point and ground for clamping said output point to a predetermined potential in response to said control signal when said DC voltage becomes greater than a second predetermined value which is greater than said first predetermined value.

4,010,403

**RADIATION PROTECTED SOLID STATE VOLTAGE REGULATING APPARATUS**

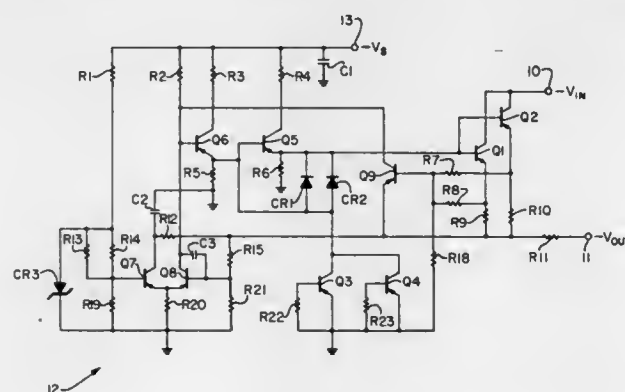
Albert H. Ashley, Holliston, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 27, 1974, Ser. No. 483,777

Int. Cl.<sup>2</sup> H02H 7/12; G05F 1/58

U.S. Cl. 361—18

7 Claims



1. Voltage regulating apparatus comprising an input terminal adapted to have a potential applied thereto;

an output terminal;

pass transistor means connected between the input terminal and the output terminal, current flow through the pass transistor means being controlled by a control signal applied thereto;

voltage reference means coupled to the output terminal for producing a control signal related to the potential at the output terminal;

coupling means for coupling the control signal from the voltage reference means to the pass transistor means;

a change in the potential at the output terminal causing the voltage reference means to change the control signal so as to change the current flow through the pass transistor means to restore the potential at the output terminal to its original value whereby the potential at the output terminal is stabilized; and

protective transistor means coupled to the pass transistor means, said protective transistor means being normally biased in a non-conducting condition and being operable in response to radiation causing the pass transistor means and the protective transistor means to become highly conductive to bias the pass transistor means to a non-conducting condition;

wherein

said pass transistor means includes a pass transistor having a control input electrode connected to the coupling means for receiving the control signal therefrom; and said protective transistor means includes a protective tran-

sistor connected in series between said control input electrode and a point of fixed potential, whereby when said protective transistor becomes highly conductive in response to radiation the potential at the control input electrode approaches the fixed potential biasing the pass transistor to a non-conducting condition.

4,010,404

**TRAFFIC ERROR CORRECTING CIRCUIT FOR TRAFFIC DISPATCHING SYSTEM**

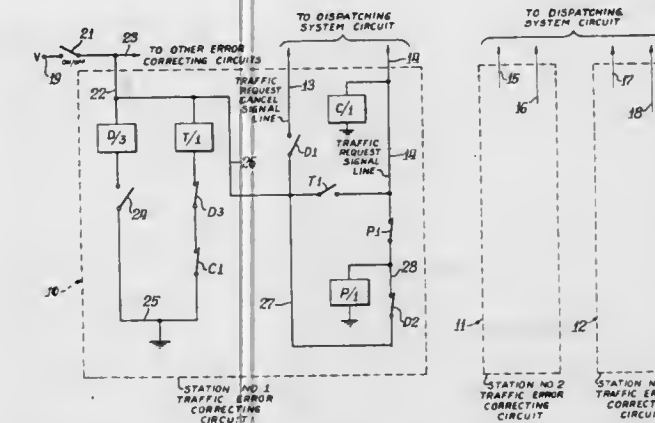
Ronald Louis Lach, Arlington Heights, Ill., assignor to Electro-Tec, Inc., Elk Grove Village, Ill.

Filed June 6, 1975, Ser. No. 584,360

Int. Cl.<sup>2</sup> H01H 47/00

U.S. Cl. 361—179

7 Claims



1. For use with a dispatching system circuit operable to control instructing means for selectively assigning traffic to a plurality of receiving stations in response to electrical traffic request signals and request cancel signals from said stations, a traffic error correcting circuit for each said station, comprising: a voltage source; traffic detector means for operating a switch in response to presence of traffic at said station; and first switching means, second time-delay switching means and traffic request signal generating means in circuit with said source; said first switching means being in circuit with said switch and being actuated upon operating thereof in response to presence of traffic at said station to provide a traffic request cancel signal at a first output to the dispatching circuit; de-actuation of said first switching means in response to absence of traffic at said station serving to energize said signal generating means from said source to provide a first traffic request signal at a second output to said dispatching circuit; de-actuation of said first switching means also serving to energize said second time-delay switching means in order to provide an additional traffic request signal at said second output after a predetermined time interval in the absence of traffic at said station during said interval.

4,010,405

**ELECTROLYTIC CAPACITORS WITH PRESSURE-RELIEF AND ELECTRODE STRUCTURE RETAINING MEANS**

Fred H. West, Sanford, N.C., assignor to Cornell-Dubilier Electric Corporation, Newark, N.J.

Filed May 8, 1975, Ser. No. 575,487

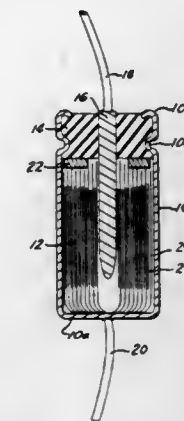
Int. Cl.<sup>2</sup> H01G 9/00; H01M 2/12

U.S. Cl. 361—433

9 Claims

1. An electrolytic capacitor, including a cylindrical case, an electrode assembly in the case impregnated with electrolyte, a terminal extending outside the case from said electrode assembly and a resilient plug forming an end closure of the case, said case embodying sealing means for squeezing the resilient plug and for thereby enforcing sealing contact of the plug to the case and to said terminal and including at least one formation of the case about the plug, said plug and said sealing means being proportioned to release the plug bodily from its position as an end closure in response to internal pressures

1. An electrolytic capacitor, including a cylindrical metal can, an electrode assembly in the can impregnated with electrolyte, a terminal extending outside the can from said electrode assembly and a resilient plug forming an end closure of the can, said can embodying sealing means for squeezing the resilient plug and for thereby enforcing sealing contact of the plug to the can and to said terminal and including at least one formation of the can about the plug, said plug and said sealing means being proportioned to release the plug bodily from its position as an end closure in response to internal pressures well below case-rupturing pressures, and rigid metal barrier means separate from said plug interposed between said electrode assembly and plug and cooperating with an inward-projecting portion of the cylindrical wall of the can for preventing expulsion of said electrode assembly from the can upon release of said plug, said capacitor incorporating a passage bypassing said barrier means for transmitting gas pressure from the electrode assembly to the internal end of the plug.



4,010,406

**ELECTROLYTIC CAPACITORS WITH PRESSURE-RELIEF AND METAL ELECTRODE STRUCTURE RETAINING MEANS**

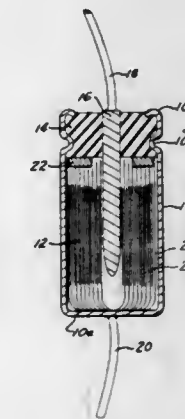
Fred H. West, Sanford, and Edward L. Bowling, Broadway, both of N.C., assignors to Cornell-Dubilier Electric Corporation, Newark, N.J.

Filed May 8, 1975, Ser. No. 575,495

Int. Cl.<sup>2</sup> H01G 9/00, 9/16; H01M 2/12

U.S. Cl. 361—433

10 Claims





4,010,407

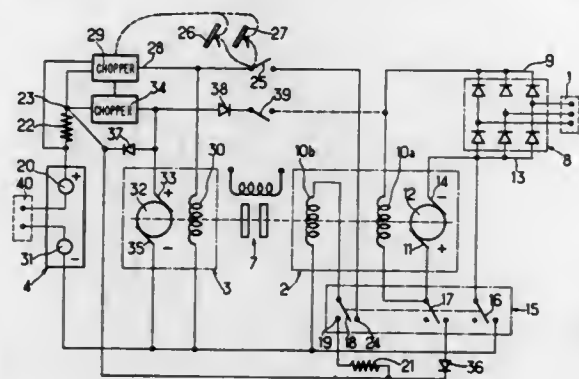
# ENERGY EXCHANGER FOR AN ELECTRICAL VEHICLE

Claude Lombard, Le Chesnay, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France  
Filed Mar. 6, 1975, Ser. No. 556,113

Claims priority, application France, Mar. 7, 1974, 74.07789  
Int. Cl.<sup>2</sup> H02P 3/00

U.S. Cl. 318—63

6 Claims



1. An energy exchanger for an electrical vehicle comprising battery means including a first high voltage D.C. rotatable electrical machine with a series excitation coil and a separate excitation coil; a second low voltage D.C. rotatable electrical machine with a separate excitation coil; means for mechanically coupling both said electrical machines with each other and means for coupling both machines with the vehicle's wheels; means for connecting said first machine to an external electrical supply source during battery charging periods; first chopper means for supplying a variable current to said separate excitation coils from said battery; second chopper means for supplying a variable current to the rotor of said second machine and to said series excitation coil; switch means for connecting the separate excitation coil of said first machine to said first chopper means during vehicle drive periods, and connecting said coil to the battery during charging or regenerative periods.

4,010,408

# SWITCH MECHANISM FOR DOOR OPERATOR

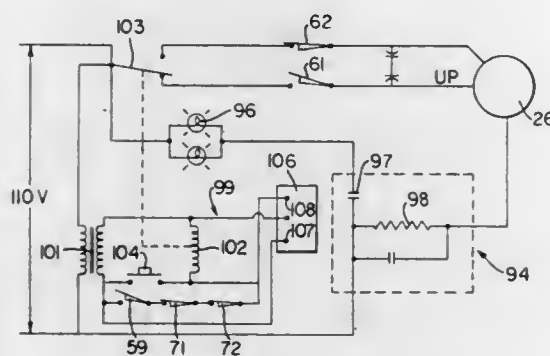
Morris W. Bailey, Fort Worth, Tex., assignor to Overhead Door Corporation, Dallas, Tex.

Filed Mar. 13, 1975, Ser. No. 557,929

Int. Cl.<sup>2</sup> H02P 1/42

U.S. Cl. 318—266

17 Claims



1. In a device including a reversible electrical motor connectible to a source of electrical potential for opening and closing a door connected to the motor by drive means, the motor being rotatable in a first direction when the door is being moved toward a first end position wherein it is closed, the motor being rotatable in a second direction opposite said first direction when the door is being moved toward a second end position wherein the door is open, and a mechanism for controlling the motor rotation, said mechanism comprising: first circuitry means including a first normally-closed switch for connecting the motor in series with the source of potential for rotating the motor in said first direction;

first means responsive to movement in said first direction for opening said first switch as said door moves into said first end position;  
second circuitry means including a second normally-closed switch for connecting the motor in series with the source of potential for rotating the motor in said second direction;  
second means responsive to movement in said second direction for opening said second switch as said door moves into said second end position;  
relay means alternately connecting said source to one of said first and second circuitry means;  
third circuitry means connected to said source for operating said relay means, said third circuitry means including normally-open activating switch means for permitting selective actuation of said relay means to permit said door to be selectively moved between its open and closed position;  
said third circuitry means further including normally-open safety switch means connected in parallel with said activating switch means for operating said relay means independently of said activating switch means for permitting control of said motor during movement in said first direction;

first override means for overriding said safety switch means to prevent reversing of said motor when the door is moving in said first direction and is within a first preselected distance from said first end position, said first override means including a third normally-closed switch connected in series with said safety switch means and a first actuator for moving said third switch into its open position when the door is moving in said first direction and is spaced said first predetermined distance from said first end position; and  
second override means for overriding said safety switch means to prevent reversing of said motor when said door is within a second predetermined distance from said second end position, said second override means including a fourth normally-closed switch connected in series with said safety switch means and said third switch, and a second actuator for moving said fourth switch into its open position when said door is moving in said second direction and is spaced said second predetermined distance from said second end position.

4,010,409

# AUTOMATIC VEHICLE GUIDANCE SYSTEMS

Stephen Peter Waites, Maidenhead, England, assignor to EMI Limited, Hayes, England

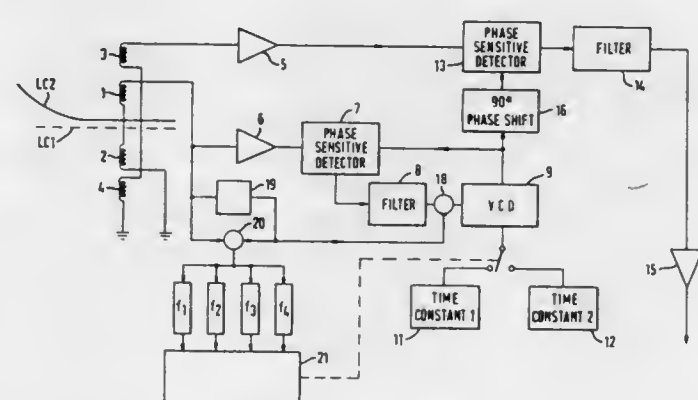
Filed July 31, 1973, Ser. No. 384,171

Claims priority, application United Kingdom, Aug. 2, 1972, 36070/72

Int. Cl.<sup>2</sup> G05B 19/100

U.S. Cl. 318—587

5 Claims



1. An automatic vehicle guidance system comprising at least two leader cables, capable of being energized with alternating current of different frequencies and defining different routes to be followed by a vehicle or vehicles, and at least one vehicle having

- a. sensing means responsive to the current in said cables,
- b. means for deriving from said sensing means first and second signals each containing frequency components dependent on alternating currents present in the cables being sensed wherein the phase of said first signal is dependent on the direction of displacement of said vehicle from said cables and the phase of said second signal is substantially independent of displacement,
- c. oscillation generating means, comprising a voltage control oscillator having a number of time constant circuits,
- d. selection means for deriving from said oscillation generating means an oscillation signal, whose frequency is substantially equal to that of the cable to be followed, by selectively connecting one of said time constant circuits to said voltage control oscillator,
- e. phase control means responsive to said second signal for maintaining said oscillation signal in a predetermined phase relationship with that component of said second signal whose frequency is the same as that of said oscillation signal,
- f. comparison means, responsive to said first signal and to said oscillation signal, including
  - i. a first phase sensitive detector having an output signal comprising a D.C. component, due to phase differences between said oscillation signal and a first component, of said first signal, whose frequency is the same as that of said oscillation signal, and one or more A.C. components, due to frequency differences between said oscillation signals and the remaining components of said first signal, and
  - ii. means for separating said D.C. component from said A.C. components to derive an error signal whose sense is dependent only on the phase relationship between said oscillation signal and said first component, and
- g. control means responsive to said error signal for reducing the displacement of said vehicle from the cable to be followed.

4,010,410

# RECREATIONAL VEHICLE CONVERTER-BATTERY FAST CHARGING CIRCUIT

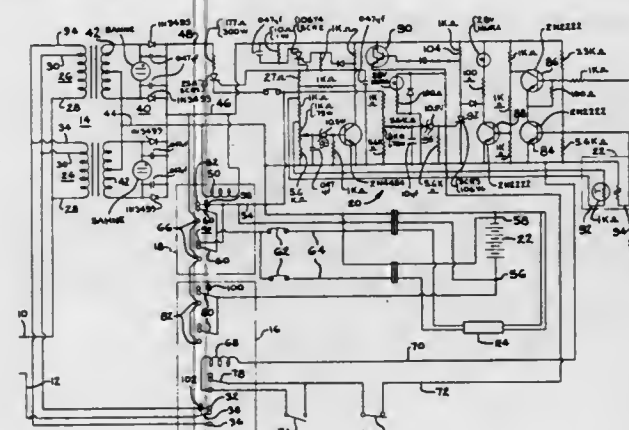
Eugene L. Kilbourn, Marshall, Mich., assignor to Progressive Dynamics, Inc., Marshall, Mich.

Filed Apr. 9, 1975, Ser. No. 566,351

Int. Cl.<sup>2</sup> H02J 7/00, 9/00

U.S. Cl. 320—31

11 Claims



1. A recreational vehicle direct current power supply system comprising, in combination, converter means for converting alternating current to direct current, said converter means having an alternating current input and output rectifying means selectively having a direct current output of a first normal operating voltage or a second lower fast charge voltage, an alternating current power supply connected to said converter means input, first switch means connected to said converter means selectively controlling the output voltage thereof, a rechargeable battery having positive and negative electrodes, second switch means selectively connecting said battery to said converter means output second voltage, a

recreational vehicle load circuit, a battery fast charging control circuit connected to said converter means output energized thereby having a control output and connected to said battery sensing the voltage thereof, said control circuit control output operatively connected to and controlling said first and second switch means whereby said control output selectively operates said first switch means to produce said converter means second lower fast charge voltage and said second switch means to connect said battery to said converter means output second voltage, and operates said first switch means to produce said converter means first normal operating voltage and said second switch means to disconnect said battery from said converter means output second voltage when said battery attains a predetermined voltage as sensed by said fast charging control circuit, and third switch means selectively connecting said vehicle load circuit to said battery or said converter means output.

4,010,411

# POWER CONVERSION APPARATUS

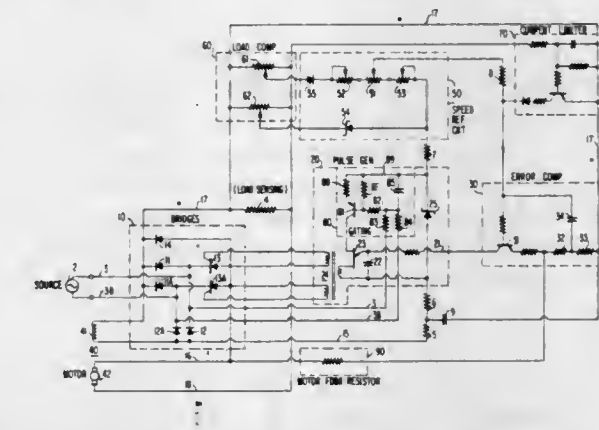
Franklin O. Wisman, Chambersburg, Pa., assignor to T. B. Wood's Sons Company, Chambersburg, Pa.

Filed Aug. 13, 1975, Ser. No. 605,621

Int. Cl.<sup>2</sup> H02P 5/16

U.S. Cl. 323—4

24 Claims



1. A power conversion apparatus comprising, controllable rectifier means, means for regulating the voltage output of said rectifier means responsive to a voltage signal level developed in a reference circuit means, means for developing a voltage signal indicative of said rectifier means load current, said reference circuit means including a resistance means having a first terminal at a potential corresponding to a lesser output voltage and a second terminal at a potential corresponding to a greater output voltage, a first connecting means for connecting said load indicative signal to said first terminal, and a second connecting means for transmitting said load indicative signal to said second terminal.

4,010,412

# CONTROL OF ELECTRICAL POWER SUPPLIES

George Donald Forman, West Wickham, England, assignor to St. Paul's Engineering Company, London, England  
Continuation-in-part of Ser. No. 459,598, April 10, 1974, abandoned, which is a continuation of Ser. No. 345,290, March 27, 1973, abandoned. This application May 8, 1975, Ser. No. 575,712

Claims priority, application United Kingdom, Mar. 27, 1972, 14168/72

Int. Cl.<sup>2</sup> G05D 23/01

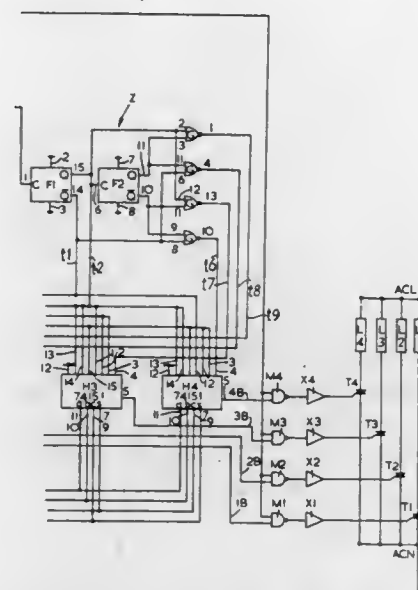
U.S. Cl. 323—18

9 Claims

5. In electrical power distribution apparatus for sharing power between loads having respective independent power controls, said loads being connected in series with respective thyristors each having control electrodes to control the conductive and non-conductive states thereof, said power being derived from a single AC source and shared by said apparatus between said loads so as to avoid exceeding a predetermined



maximum power demand, the apparatus including means for generating a continuous series of pulses timed substantially to coincide with the zero crossing points of the AC supply for controlling said thyristors, the improvement comprising programming means, said programming means including gating means responsive to the state of said independent power controls of said loads to derive respective signals, and pulse steering means connected to receive said respective signals



and said continuous series of pulses to steer pulses in a cyclic manner to said control electrodes of any combination of said thyristors according to a power sharing program, said program depending on the state of said independent power controls and on said maximum power demand, whereby said different thyristor combinations sequentially provide said respective loads with an integral number of half waves of said AC power according to their individual demands.

4,010,413

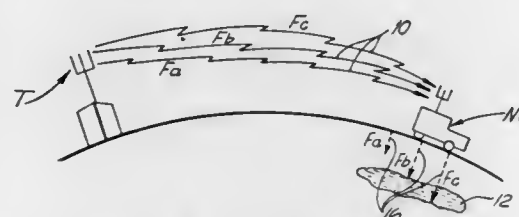
**PLURAL FREQUENCY GEOLOGICAL EXPLORATION SYSTEM AND METHOD WITH PHASE COMPARISON**  
Donald B. Daniel, Northridge, Calif., assignor to Geo-Nav, Inc., Oklahoma City, Okla.

Continuation of Ser. No. 173,937, Aug. 23, 1971, abandoned.  
This application Mar. 7, 1975, Ser. No. 556,252

Int. Cl.<sup>2</sup> G01V 3/12

U.S. Cl. 324-6

10 Claims



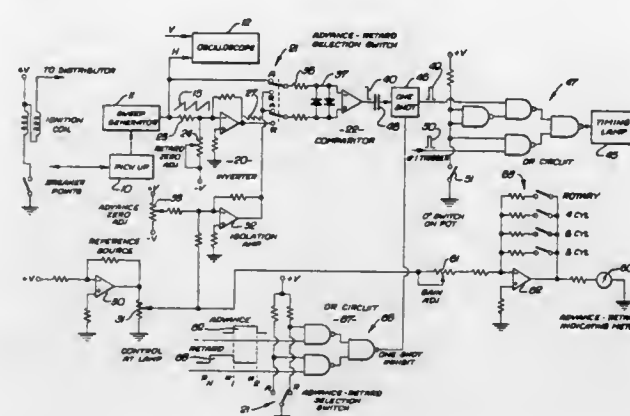
1. An exploration system for indicating subterranean formations on the basis of at least one plurality of similarly-polarized, low-frequency radiated commensurate signals of respectively different frequencies radiated from a single transmitting station, comprising:

receiver means for sensing said radiated signals of different frequencies and having a frequency of less than 450 kilohertz, as sensed signals, at a location above a formation of interest;  
means for processing said sensed signals of different frequencies as sensed by said receiver means to provide a plurality of electrically phase-comparable signals; and  
means for electrically phase-comparing said phase-comparable signals to provide at least one manifestation of phase difference as in indication of the medium through which said commensurate signals are transmitted and accordingly said formation of interest.

**4,010,414**  
**ADVANCE AND RETARD TIMING LIGHT**  
George I. Reeves, and Jack J. Keegan, both of Fullerton, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.  
Filed Nov. 26, 1975, Ser. No. 635,740  
Int. Cl.<sup>2</sup> F02P 17/00

U.S. Cl. 324-16 T

15 Claims



1. A timing control circuit for a strobe lamp for use in the adjustment of an internal combustion engine having a fixed reference mark and a moving reference mark with an engine adjustment reference point occurring when said reference marks are aligned, comprising:

means for producing an increasing ramp voltage synchronized with the engine ignition timing;

means for producing a decreasing ramp voltage synchronized with the engine ignition timing;

means for producing a reference voltage including means for varying said reference voltage as a function of the desired amount of deviation of lamp flash from the occurrence of the engine adjustment reference point;

a comparator having first and second input terminals and providing an output pulse when a positive going voltage applied to said first terminal equals a reference voltage applied to said second terminal and when a negative going voltage applied to said second terminal equals a reference voltage applied to said first terminal;

first switch means for connecting said increasing ramp voltage and said reference voltage to said first and second terminals respectively of said comparator when in a first position and connecting said decreasing ramp voltage and said reference voltage to said second and first terminals respectively when in a second position whereby advance or retard deviation of lamp flash can be selected; and  
means for connecting said comparator output to the strobe lamp as a trigger voltage.

4,010,415

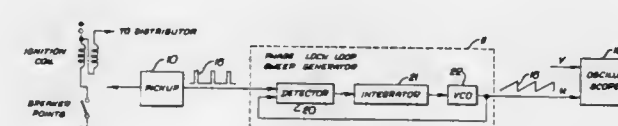
**SWEEP GENERATOR FOR ENGINE ANALYZERS**  
George I. Reeves, Fullerton, and Hoke R. Chism, Jr., Anaheim, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 26, 1975, Ser. No. 635,741

Int. Cl.<sup>2</sup> G01R 29/00

U.S. Cl. 324-16 S

13 Claims



1. An improved sweep generator for the oscilloscope of an engine ignition analyzer comprising:

a voltage controlled oscillator having an output and an input, said oscillator generating a ramp voltage at its output having a slope which is a function of the signal applied at its input;

means for connecting the output of said oscillator to the oscilloscope as the sweep signal;  
a comparator circuit having a first reference voltage and said ramp voltage output of said oscillator as inputs and producing a feedback signal output when said inputs are equal;

an integrator having a pair of inputs and an output connected to said input of said oscillator whereby the output of said integrator will determine the slope of said ramp voltage output of said oscillator, one of said pair of inputs of said integrator being connected to a second reference voltage;

logic circuit means having a pair of inputs and an output, one of said inputs being connected to the output of said comparator circuit and the other of said inputs being connected to the ignition of an engine being analyzed, said logic circuit means producing an output equal to said second reference voltage when the signals at said pair of inputs are in coincidence, an output greater than said second reference voltage when the signal at one of said inputs is leading the signal at the other of said inputs and an output less than said second reference voltage when the signal at said one input is lagging the signal at said other input;

means connecting the output of said logic circuit means to the other of said pair of inputs of said integrator, and, resetting means connected to said input to said oscillator.

4,010,416

**METHOD AND APPARATUS FOR TESTING DIELECTRIC ADEQUACY AND FOR INDICATING PHYSICAL DEFECTS IN A NONCONDUCTING MATERIAL**

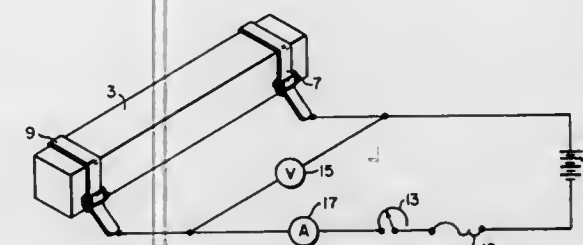
Robert W. Thompson, Pearland, Tex., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1975, Ser. No. 603,074

Int. Cl.<sup>2</sup> G01R 31/12, 31/16

U.S. Cl. 324-54

7 Claims

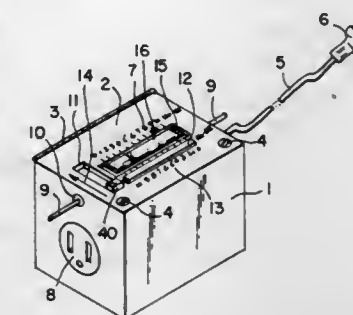


1. A method for testing a nonconductor for dielectric adequacy and for physical defects comprising the steps of:  
placing a first conductor adjacent said nonconductor;  
placing a second conductor adjacent said nonconductor and in a spaced relationship with said first conductor;  
connecting individual leads from a variable DC voltage power source to each of said conductors;  
increasing the DC voltage between said conductors to some predetermined value;  
indicating the voltage between said conductors as the voltage is increased;  
indicating the current flowing between said conductors as said voltage is increased;  
responding to a nonlinear increase in the rate of increase of the current relative to a linear increase in the rate of voltage to decrease the rate at which the voltage is increased;  
continuing to increase the voltage at a much lower rate until there is a visible mark on the nonconductor outlining the defect.

**4,010,417**  
**WATT HOUR METER**  
Istrate Ionescu, 35-31 85th St., Jackson Heights, N.Y. 11372  
Filed Jan. 27, 1976, Ser. No. 652,893  
Int. Cl.<sup>2</sup> G01R 27/22

U.S. Cl. 324-94

7 Claims

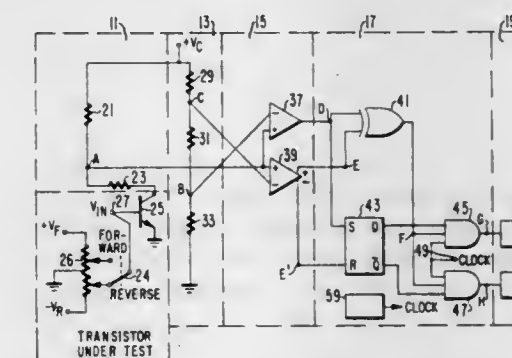


1. A watt hour meter comprising a coulombmeter employing two columns of mercury interposed by an electrolyte solution confined within an extended hollow glass tube having substantially elongated coaxial metallic ferrules at each free end of said glass tube, each of said metallic ferrules electrically contacting the non-electrolyte contacting end of each column of mercury, said ferrules are manually detachably contacting two stationary snap-in type mounting contacting clips adapted to permit axial lateral motion of said coulombmeter while said contacting clips grasp a portion of said ferrules, an electrical circuit adapted with a full wave bridge rectifier circuit in series with a utility outlet receptacle and a line cord whose free end is terminated with a utility electrical plug, said bridge rectifier circuit providing a direct current component proportional to an alternating flow through the input terminals of said bridge rectifier circuit when an external electrical lead apparatus is energized during the time period that it is electrically connected to said series utility outlet receptacle accompanied by the simultaneous application of alternating voltage to the terminals of said plug, said bridge rectifier circuit further adapted to provide a proportional direct current component through said coulombmeter when a source of non-periodically reversing voltage is applied to said plug and an electrical load operated by direct current is electrically energized by connection to said utility outlet receptacle, said coulombmeter adapted for convenient manual electrical reversal by interchanging said ferrules in contact with said stationary mounting clips.

**4,010,418**  
**TRANSISTOR CIRCUITS**  
Leonard Robert Salvatore, Greenbrook, N.J., assignor to RCA Corporation, New York, N.Y.  
Filed Mar. 13, 1975, Ser. No. 558,147  
Int. Cl.<sup>2</sup> G01R 31/26

U.S. Cl. 324-158 T

7 Claims









4,010,424

PHASE-SENSITIVE DETECTOR CIRCUIT WITH  
COMPENSATION FOR OFFSET ERROR

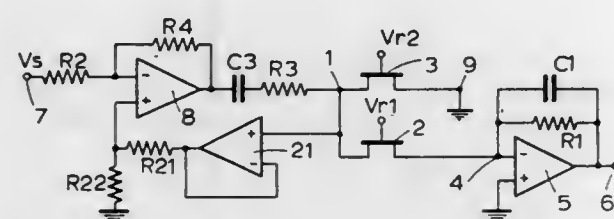
Eric Andrew Faulkner, Cookham Dean, England, assignor to Brookdeal Electronics Limited, Bracknell, England  
Filed Apr. 8, 1975, Ser. No. 566,680

Claims priority, application United Kingdom, Apr. 8, 1974, 15468/74

Int. Cl.<sup>2</sup> H03F 1/02

U.S. Cl. 330—9

12 Claims



1. A phase-sensitive detector circuit characterised in that it comprises in combination a pair of switching devices joined at a switching point and arranged for control by reference switching signals in antiphase, an a.c. coupling between a signal input terminal and the said switching point, an output operational amplifier including a feedback path from the output thereof to an input thereof whereby to hold said input virtually at ground potential in the absence of any offset voltage in said operational amplifier, a connection from one of the switching devices to an input of the output operational amplifier, a connection from the other of the switching devices to a terminal which is at ground potential, and a compensation circuit the input to which is supplied from the said switching point and the output from which is applied to the input side of said a.c. coupling for the purpose of providing a compensating signal to tend to eliminate the effect of any offset voltage occurring in the output operational amplifier.

4,010,425

## CURRENT MIRROR AMPLIFIER

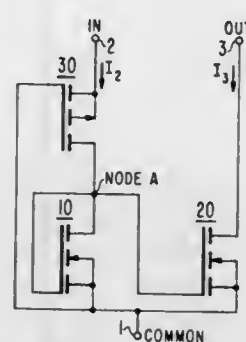
Andrew Gordon Francis Dingwall, Somerville, and Bruce David Rosenthal, Highland Park, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 618,763

Int. Cl.<sup>2</sup> H03F 3/16

U.S. Cl. 330—35

10 Claims



1. A current mirror amplifier, comprising, in combination: an input terminal, a common terminal, an output terminal and a node;

first and second field effect transistors of a first conductivity type, the source electrode of each being coupled to said common terminal, the gate electrode of each and the drain electrode of the first being coupled to said node, the drain electrode of the second being coupled to said output terminal; and amplifier means having an input electrode coupled to said input terminal, an output electrode coupled to said node and a control electrode coupled to said common terminal for maintaining the impedance between said input terminal and said common terminal at a value less than the reciprocal of the transconductance of said first field effect transistor.

4,010,426

RF POWER AMPLIFIER PARALLEL REDUNDANT  
SYSTEM

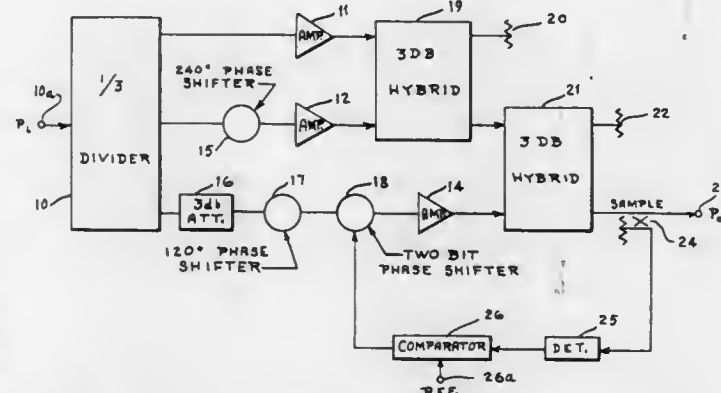
Sheldon I. Rambo, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 12, 1975, Ser. No. 631,290

Int. Cl.<sup>2</sup> H03F 3/60

U.S. Cl. 330—53

2 Claims



1. RF power amplifier parallel redundant system being comprised of means to divide input power into equal first, second, and third drive powers, first, second and third power amplifiers of equal gain and equal phase length, each power amplifier providing four times the desired power, said first drive power being fed to said first power amplifier, first means to phase shift said second drive power 240° prior to reception thereof by said second power amplifier, second means to phase shift 120° said third drive power, a two bit 0°, 60° phase shifter normally in the 60° position with said three power amplifiers in operation, the output of said two bit 0°, 60° phase shifter being connected to the input of said third amplifier, the 120° phase shifted drive power passing through said two bit phase shifter, first and second 3 db hybrids, said first 3 db hybrid combining the output powers from said first and second power amplifiers, a first load for said first 3 db hybrid absorbing a portion of the drive powers combined in said first 3 db hybrid, the remainder being applied to said second 3 db hybrid, the output power of said third power amplifier also being applied to said second 3 db hybrid, a second load for said second 3 db hybrid absorbing a portion of the two powers combined in said 3 db hybrid, and the remainder being the system output power, a directional coupler sampling said system output power, means to detect said system output power, and means to compare the sampled system output power to a preselected reference to provide a control signal therefrom to said two bit 0°, 60° phase shifter for shifting thereof upon the malfunctioning of at least one of said power amplifiers.

4,010,427

## LASER OUTPUT CONTROL SYSTEM

Diarmuid H. Douglas-Hamilton, and Ethan D. Hoag, both of Boston, Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Mar. 8, 1976, Ser. No. 664,656

Int. Cl.<sup>2</sup> H01S 3/10

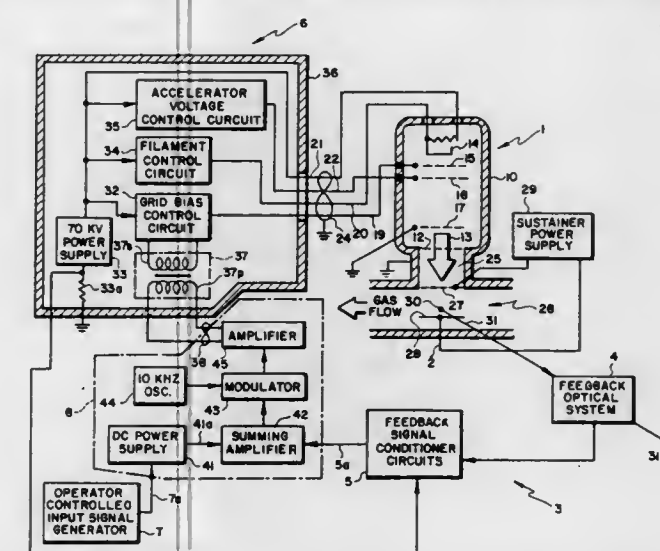
U.S. Cl. 331—94.5 S

9 Claims

1. In a method of producing a coherent beam of radiation from a gaseous medium in an enclosure, the steps comprising:  
a. providing said gaseous medium at a predetermined pressure in a working region in the enclosure;  
b. generating external of said enclosure a substantially broad area electron beam having a cross section area conforming substantially to said working region;  
c. introducing said electron beam to said enclosure to produce in the working region a substantially spatially uniform predetermined density of secondary electrons in the medium;

- d. providing an electric field in the working region which increases the average energy of said secondary electrons therein without substantially increasing the electron density therein;
- e. the energy of said secondary electrons being sufficient to stimulate the emission of said coherent beam of radiation;
- f. causing said beam of coherent beam of radiation to emanate from the enclosure;
- g. sequentially intercepting the emanating beam of coherent

tance, and provided with an adjustable capacitance connected in series with the resonant circuit inductance in the collector circuit, with the collector-base capacitance forming a part of the capacitance reactance of the frequency-determining elements of the oscillator circuit, the combination of an additional small capacitance disposed between the transistor base and ground and connected in series with the collector-base capacitance, operative to reduce the effective circuit capacitance and thereby increase the oscillator frequency, and line sections of  $\lambda/4$  in length forming the direct current feed to the transistor, of which the end connected to the voltage source is short-circuited over a blocking condenser.



- radiation at substantially regular intervals by elongated small diameter wires spaced one from another and having an outer surface substantially reflective to said coherent radiation to provide reflected pulses of radiation;
- h. collecting and converting said reflected pulses of radiation into an electrical feedback signal representative of the power thereof; and
- i. employing said electrical feedback signal to control the electron beam, thereby providing a feedback system for controlling the coherent beam of radiation.

4,010,428

TRANSISTOR OSCILLATOR UTILIZING CLAPP  
CIRCUIT CONFIGURATION FOR OPERATION IN THE  
MICROWAVE BAND

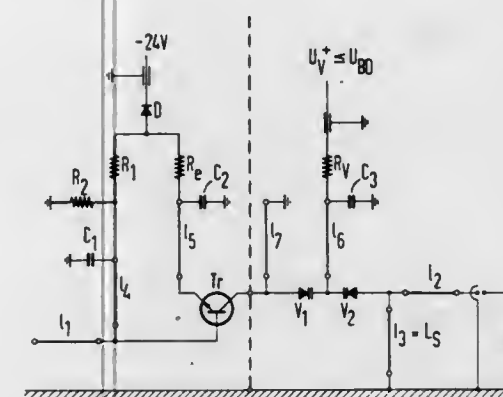
Anton Sunkler, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 15, 1975, Ser. No. 613,515

Int. Cl.<sup>2</sup> H03B 5/24; H03C 3/22

U.S. Cl. 331—117 R

11 Claims



1. In a transistor oscillator for the microwave band, utilizing CLAPP circuit configuration, the combination of a small capacitance in series with the collector-base capacitance and disposed between the base and ground, said additional capacitance comprising a line section open at the end, the electrical length of which line is smaller than  $\lambda/4$ .

2. In a transistor oscillator, constructed in strip-line technique, for the microwave range, utilizing CLAPP-circuit configuration, having a capacitive voltage divider comprising the collector-emitter capacitance and the emitter-base capaci-

4,010,429  
COAXIAL DISC-JUNCTION POWER DIVIDER

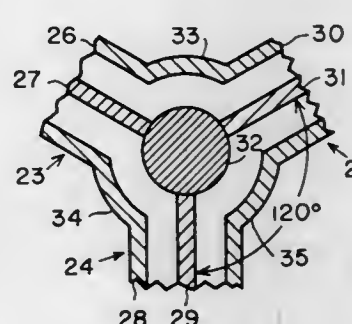
Aare Kivi, Massapequa, N.Y., and Louis Feit, Fairlawn, N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 7, 1976, Ser. No. 647,019

Int. Cl.<sup>2</sup> H01P 5/12

U.S. Cl. 333—9

8 Claims



1. A coaxial transmission line power divider consisting of: three coaxial transmission lines extending outwardly from a junction area, each of said transmission lines having an outer conductor and an inner conductor, and a solid single element metallic disc disposed at said junction area directly connected to said inner conductors of said three transmission lines, said outer conductors of said three transmission lines being directly interconnected to each other to surround said disc.

4,010,430

LOW LOSS, BROADBAND SWITCHABLE MICROWAVE  
STEP ATTENUATOR

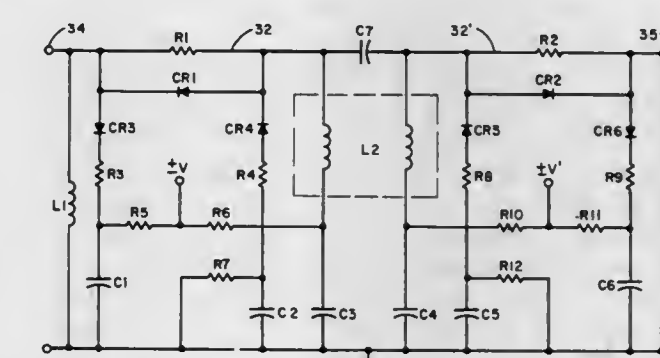
Allen Robert Wolfe, Sauquoit, N.Y., assignor to General Electric Company, Utica, N.Y.

Filed Oct. 17, 1975, Ser. No. 622,923

Int. Cl.<sup>2</sup> H01P 1/22

U.S. Cl. 333—81 A

7 Claims



7. A switchable, microwave step attenuator comprising, in combination:  
an insulative substrate having a ground plane conductor on one surface;  
a transmission line including attenuation resistance means



supported on the surface of said substrate opposite said ground plane surface;  
 diode switching means connected to said transmission line for altering the impedance properties thereof; and  
 a pair of open end stub networks connected to said transmission line on either side of said attenuation resistance means for selectively providing an impedance-matched ground shunt connection under control of said diode switching means, said open end stub networks comprising a plurality of conductive segments connected to each other and to said transmission line by resistive elements, the resistance values of said elements and the line length and impedance values of said conductive segments being such that the impedance value of said network is substantially constant over a broadband of microwave frequencies.

4,010,431

# SWITCH FOR ELECTRICAL WALL RECEPTACLE WITH GROUND FAULT PROTECTION

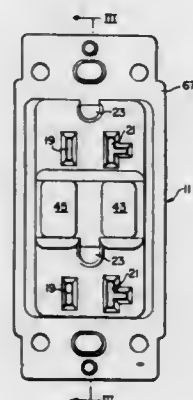
Gopal J. Virani, Bridgeport; John J. Misencik, Shelton, and Roy O. Wiley, Huntington, all of Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1975, Ser. No. 609,134

Int. Cl.<sup>2</sup> H01H 83/02

U.S. Cl. 335—18

10 Claims



1. An electric receptacle for mounting in a wall outlet box for connecting an electrical load to the conductors of a power source, comprising socket means for receiving a plug of an electrical load, a first pair of cooperable contacts operable between open and closed positions, a second pair of cooperable contacts operable between open and closed positions, an operating mechanism including a contact arm carrying one contact of each pair of contacts and movable between open and closed positions of the contacts, a latch member releasably holding the arm in the closed position, bias means engaging the arm for urging the arm to the open position when the latch member is released, a pivot rib for the contact arm, the bias means urging the arm to pivot about the first pair of contacts during an initial movement of the arm when released to open the second pair of contacts and to then pivot about the pivot rib during a final movement of the arm to open the first pair of contacts, ground fault sensing means for monitoring the flow of current through the socket means, and release means responsive to the fault sensing means for releasing the latch member from the contact arm, whereby the first and second pairs of contacts are opened sequentially.

4,010,432

# ELECTRICAL RECEPTACLE EQUIPPED WITH GROUND FAULT PROTECTION

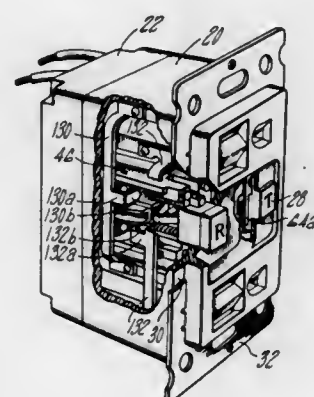
Keith W. Klein, Simsbury; Joseph M. Palmieri, Southington, both of Conn., and George J. Lawrence, North Kingstown, R.I., assignors to General Electric Company, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,720

Int. Cl.<sup>2</sup> H01H 73/06

U.S. Cl. 335—18

11 Claims



1. An electrical receptacle equipped to provide ground fault protection, said receptacle comprising, in combination:

- A. an insulative housing;
- B. means forming at least one socket in a front wall of said housing, said socket including a pair of connectors within said housing for making electrical contact with the stabs of an appliance cord plug inserted into said socket;
- C. a pair of stationary contacts mounted within said housing and respectively electrically connected to said socket connectors;
- D. a support plate mounted within said housing;
- E. an electronics-magnetics module mounted to the side of said plate opposite said housing front wall; and
- F. an operating mechanism including
  1. a mounting structure affixed to the side of said plate facing said housing front wall,
  2. an elongated arm mounted for movement between first and second positions,
  3. a pair of movable contacts for electrical connection to a power distribution circuit, said movable contacts mounted by said arm adjacent one of its ends for engagement with said stationary contacts as said arm assumes said first position,
  4. a first spring biasing said arm toward said second position to separate said stationary and movable contacts,
  5. a reset operator mounted by said structure for reciprocating movement,
  6. a second spring biasing said operator toward said housing front wall for protrusion through an opening therein,
  7. a latch mounted by said operator, said latch engaging said arm to enable said second spring to move said arm to its first position, and
  8. a trip solenoid mounted by said structure and including a plunger arranged to strike said latch upon energization of said solenoid under the control of said module, thereby releasing said arm for movement to its second position by said first spring.

4,010,433

# ELECTROMAGNETIC RELAY

Hiromi Nishimura, Takaishi; Kenji Ono, Neyagawa; Katsumi Tachibana, Tsu, and Satoru Furukawa, Kadoma, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

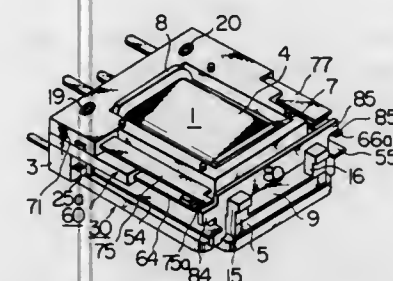
Filed July 28, 1975, Ser. No. 599,640

Claims priority, application Japan, Aug. 22, 1974, 49-97316

Int. Cl.<sup>2</sup> H01H 50/04

U.S. Cl. 335—129

9 Claims



1. An electromagnetic relay comprising an electromagnet assembly including means for positioning respective component members to be stacked providing thereto a single assembling direction, said assembly comprising an iron core and coil frame formed integral and having a coil wound substantially in the middle, an armature to be attracted to said iron core of the electromagnet assembly when said coil is excited, a balance spring formed to provide a constant spring force to said armature resistive to attracting force thereto of said electromagnet assembly and stacked on the electromagnet assembly through said positioning means, first and second contact spring blocks having normally closed contacts and normally opened contacts respectively positioned on each side along longitudinal axis of said electromagnet assembly and stacked on said balance spring through the positioning means, a card normally biased by said balance spring to non-attracted position of the armature and adapted to open said normally closed contacts and to close said normally opened contacts in response to the attracted movement of the armature, and a casing adapted to house therein a stacked assembly unit of respective said members, said positioning means including guide posts and respective said members to be stacked on the electromagnet assembly are provided with holes through which said guide posts are inserted.

4,010,434

# RADIALLY ANISOTROPIC MAGNET BODY

Franciscus Xaverius Nicolaus Maria Kools, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 507,366, Sept. 18, 1974, abandoned.

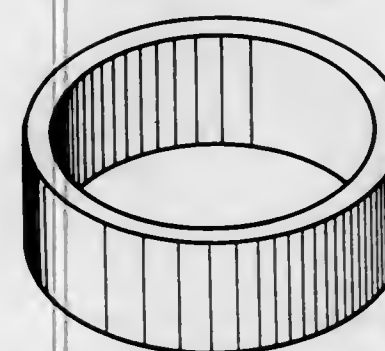
This application Jan. 14, 1976, Ser. No. 649,140

Claims priority, application Netherlands, Sept. 26, 1973, 7313231

Int. Cl.<sup>2</sup> H01F 7/02

U.S. Cl. 335—302

1 Claim



1. A curved, sintered, radially anisotropic, permanently magnetisable body essentially consisting of a ferrite of the formula  $\text{MeO} \cdot 6\text{Fe}_2\text{O}_3$ , wherein Me is at least one of the metals

barium, strontium and lead, said body having a closed annular shape with an inside diameter which is at least 0.8 times the outside diameter.

4,010,435

# TERMINALS FOR COIL BOBBIN

Katumi Shigehara, 1729, Kashiya, Ebina, Kanagawa, Japan

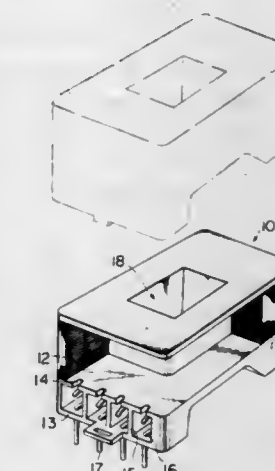
Filed June 3, 1976, Ser. No. 692,434

Claims priority, application Japan, June 4, 1975, 50-66403; Dec. 10, 1975, 50-165628

Int. Cl.<sup>2</sup> H01F 15/10

U.S. Cl. 336—192

5 Claims



1. Terminals and a coil bobbin comprising a flange plate provided on one end of the tubular portion of a coil bobbin and provided with notches of a number corresponding to the number of required terminals, an another flange plate spaced from said flange plate and provided with holes for passing terminal pins of a number corresponding to the number of required terminals, and terminal elements each composed of a pin formed into a substantially U-shape and pressed in between said flange plates with an end passing through said hole.

4,010,436

# ELECTRICAL INDUCTIVE APPARATUS

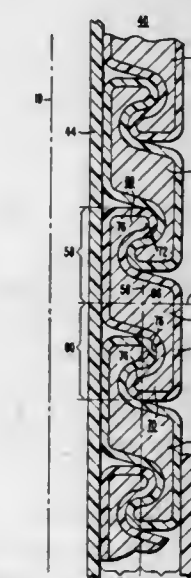
Garlington C. Wilburn, South Boston; John G. Aldworth, Halifax, both of Va.; Robert Lugosi, Monroeville, and Alan T. Male, Franklin Borough, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1976, Ser. No. 677,332

Int. Cl.<sup>2</sup> H01F 27/28

U.S. Cl. 336—223

11 Claims



1. A transformer, comprising:  
 a magnetic core,  
 and a winding structure disposed in inductive relation with said magnetic core,



said winding structure including a plurality of conductor turns formed of an electrically conductive material having a predetermined cross sectional configuration, said plurality of conductors turns being arranged such that at least certain of the conductor turns are aligned in a first axially extending layer of conductor turns, with said predetermined cross sectional configuration of the electrically conductive material providing an interlocking structure in which each conductor turn includes at least two portions which axially overlap other conductor turns of said winding to restrain the conductor turns of the first axially extending layer against relative axial movement.

4,010,437

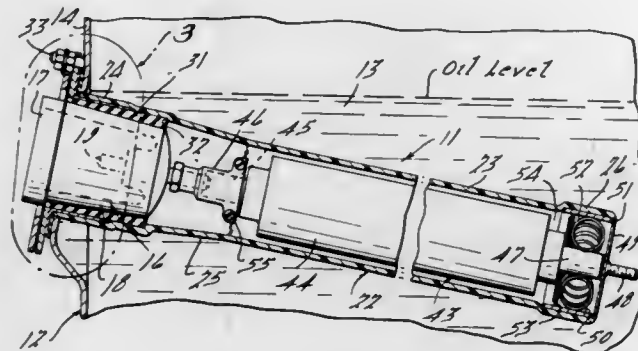
**FUSE HOLDERS FOR TRANSFORMERS**

Herbert J. Macemon, Versailles, Ky.; Vance Martin, Charlotte, N.C., and John L. Fisher, Lexington, Ky., assignors to Kuhlman Corporation, Troy, Mich.

Filed Aug. 26, 1974, Ser. No. 500,584  
Int. Cl.<sup>2</sup> H01H 85/02

U.S. Cl. 337—204

10 Claims



1. In a fuse holder for a transformer having a front plate, a housing of dielectric material for enclosing a fuse, the outer end of this housing passing through an apertured portion of the transformer front plate, means securing the outer end of the housing to the front plate, an adapter sleeve of resilient material mounted within the outer end of the housing, the inner surface of this adapter sleeve being tapered in an inward direction, a bushing well with a complementary taper disposed within said adapter sleeve, means connecting said bushing well to a fuse, and means removably clamping the bushing well in compressed relation with the adapter sleeve, whereby removing said clamping means will permit the bushing well and fuse to be withdrawn from the housing, said clamping means comprising a flange on said bushing well, a disc like clamp engaging said flange, a plurality of studs secured to said front wall, and nuts on said studs engaging said clamp.

2. The combination according to claim 1, said housing securing means comprising a flange on said housing, a gasket between said housing flange and front plate, a disc-like fuse holder clamp, and nuts on said studs holding said fuse holder clamp against said housing flange.

4,010,438

**TERMINATOR MEMBER FOR FUSIBLE ELEMENT OF A HIGH VOLTAGE FUSE**

Henry W. Scherer, Mount Prospect, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Nov. 19, 1975, Ser. No. 633,486  
Int. Cl.<sup>2</sup> H01H 85/38

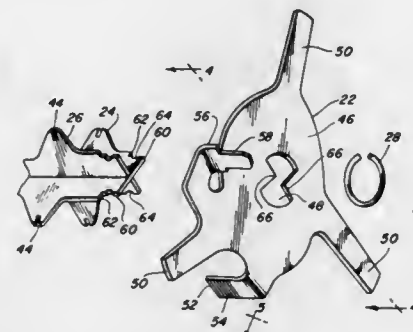
U.S. Cl. 337—232

2 Claims

1. In a high voltage fuse including a hollow cylindrical insulator housing, metallic end ferrules closing the ends of said housings, a support assembly for supporting at least one helically wound fusible element within the housing, granular electrically non-conducting insulating material in the housing surrounding the fusible element; an improved terminator arrangement for positioning the at least one fusible element within the fuse comprising:

a flat portion having an opening at the center thereof, said opening for receiving an end of the support assembly and said opening having engaging projections extending outwardly toward one another from opposite sides thereof for engaging and positioning the support assembly in a predetermined position;

positioning fingers joined to and extending from said flat portion in the same plane as said flat portion, said positioning fingers positioned around said flat portion, said fingers dimensioned to rest against the interior of the hollow cylindrical insulator housing so that said terminator arrangement is retained in a fixed position with respect to the interior of the housing, said fingers permitting the granular electrically non-conducting insulating mate-



rial to be inserted around the fusible element after the terminator arrangement has been positioned in the housing;

a first tab joined to and extending from an edge of said flat circular portion in a direction essentially perpendicular to the path of the helically wound fusible element, said first tab having serrations on at least one surface thereof whereby said fusible element can be welded to said first tab without distortion or bending and at reduced welding temperatures;

a second tab joined to and extending from said flat central portion in a direction perpendicular to said flat portion and in an opposite direction from said first tab, said second tab being adapted to be connected with the end ferrules to provide an electrical connection therewith.

4,010,439

**PLANETARY POTENTIOMETER ASSEMBLY**

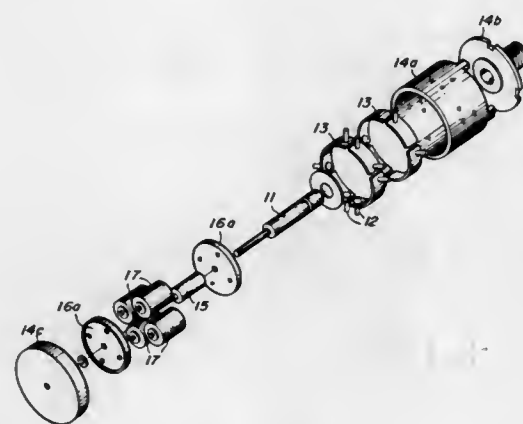
Melvin Arthur Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1975, Ser. No. 627,643

Int. Cl.<sup>2</sup> H01C 10/20, 10/28

U.S. Cl. 338—125

7 Claims



1. A multiple, ganged variable resistance assembly having a single cylindrical housing and comprising:  
a multiplicity of resistance elements in two circumferential lines around the interior of the curved housing wall and forming substantially parallel pairs;  
terminal means penetrating the housing wall for making contact with the resistance elements;

a shaft rotatably and axially mounted on the housing and extending through the top thereof;  
an insulating, resilient, friction drive surface surrounding and fixably mounted on a portion of the shaft within the housing;

a multiplicity of substantially cylindrical members equally spaced around and with axes parallel to the shaft axis, the cylindrical members being electrically conductive, each member being arranged to contact and be driven by the friction drive surface on the shaft and being dimensioned to contact one pair of resistance elements in any rotational position of the shaft; and

two spaced apart insulating members mounted on the shaft adjacent the ends of the friction drive surface for supporting the cylindrical members.

4,010,440

**ELECTRICAL RESISTOR COMPONENT ASSEMBLY WHICH IS HERMETICALLY SEALED**

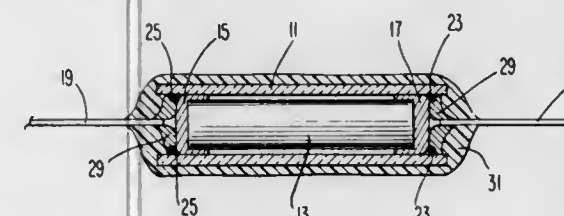
Charles L. Wellard, Cape May Court House, N.J., assignor to American Components Inc., Conshohocken, Pa.

Filed Feb. 10, 1975, Ser. No. 548,668

Int. Cl.<sup>2</sup> H01C 1/02

U.S. Cl. 338—237

8 Claims



1. An hermetically sealed electrical resistor component assembly comprising in combination: A sleeve shaped member having first and second open ends and being fabricated from high-density, non-porous and non-hydroscopic material, said sleeve shaped member having an inside surface; an electrical resistor component including first and second end caps and first and second conducting wires respectively connected thereto, said electrical resistor component formed and disposed to have its first and second end caps fitting tightly against said inside surface of and within said sleeve shaped member with said first and second conducting wires respectively extending from said first and second open ends; and first and second solder means formed to respectively cling to said first and second end caps, to said inside surface of said sleeve shaped member and to said first and second conducting wires to thereby close, in sealed form, said first and second open ends of said sleeve shaped member with said electrical resistor component therebetween and further formed to permit said first and second conducting wires to respectively pass through but in sealed contact therewith to protrude beyond the ends of said sleeve shaped member.

4,010,441

**FLEXION-PLATE HYDROPHONES**

Jeanne-Marie Monique Richard, Sanary-sur-Mer, France, assignor to Etat Francais, France

Filed Mar. 5, 1975, Ser. No. 555,592

Claims priority, application France, Mar. 5, 1974, 74.07351  
Int. Cl.<sup>2</sup> H04B 13/00

U.S. Cl. 340—10

10 Claims

1. A bidirectional flexion-plate hydrophone comprising:  
only a single flexible circular membrane of substantially constant thickness,  
two rigid rings enclosing the periphery of said membrane, a piezoelectric disc on at least one face of said membrane, the exterior diameter of which is smaller than the interior

diameter of said rigid rings wherein said membrane, said rings and said discs being completely embedded in an



elastomeric material forming a unit attached to a rigid support only through said elastomeric material.

4,010,442

**STATUS DISPLAY FOR SEISMOMETER-GROUP RECORDER OPERATIONS**

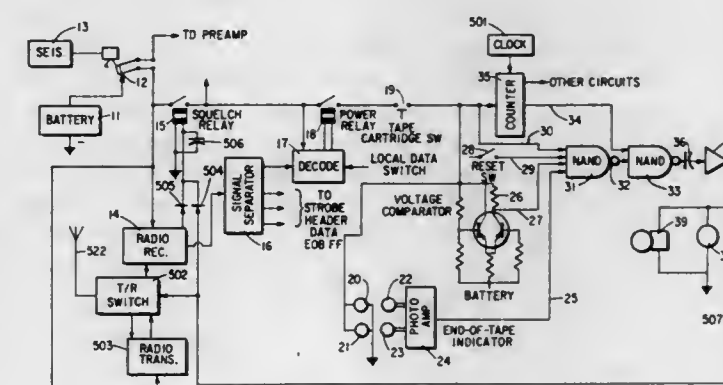
Robert A. Broding, Tulsa, Okla., assignor to Standard Oil Company, Tulsa, Okla.

Filed Apr. 25, 1975, Ser. No. 572,493

Int. Cl.<sup>2</sup> G01V 1/22; H04B 7/14

U.S. Cl. 340—15.5 TS

1 Claim



1. In apparatus for seismic geophysical surveying comprising means for generating seismic waves in the earth at one source location within a survey area that includes a plurality of spaced source locations, a plurality of transducer means distributed over said area for receiving said seismic waves after travel through the earth from each of said source locations to each of a plurality of receiving locations spaced from each other within said area, a plurality of recorder units each being connected to the output of at least one of said receiving transducer means and adapted to reproducibly record the output from those transducer means connected to it, all of said units being in a standby status to receive only communications until energized by connection to a supply of electrical power to record a trace, each said unit being positioned in said area near the receiving location occupied by said connected receiving-transducer means, each of said recorder units including means responsive to one of a set of coded signals transmitted over a communications link from a control point, to connect said recorder unit to a supply of electrical power, means for recording a first sequence of signals representing record-identification and recording parameter data, and means for recording a second sequence of signals representing wave-amplitudes characterizing the seismic waves arriving at said connected receiving-transducer means, said apparatus including also means at said control point for transmitting at a frequency  $f_1$ , a set of coded signals to energize only those of said recorder units, forming a recording array having a desired relationship to said one source location, to record the plurality of traces forming one multitrace seismic record, the improvement comprising

automatic means in each of said units interconnected with



the recording system thereof for producing a status signal only where

- a. at least one of said transducer means is operatively connected to said unit,
- b. a cartridge containing a reproducible recording medium is inserted into said unit,
- c. said medium is not exhausted, and
- d. said supply of electric power has at least a predetermined voltage,

a transmitter in each of said units transmitting at a frequency  $f_2$  differing from  $f_1$ ,

automatic means in each of said units responsive to said status signal for energizing said transmitter to form a communications path to said control point and to transmit over said path a status ready signal,

receiving means at said control point responsive to said path to receive each said status ready signal from each said unit energized, and

automatic means at said control point connected to said control-point receiving means and responsive separately to each transmitted status ready signal to produce a separate visual indication of each of said status ready signals received,

a. said means to produce said separate visual indication including a plurality of indicator lights mounted on a panel at said control point in a pattern at least approximately similar to the location pattern of a plurality of said units, and

b. said status ready signal responsive means including (1) a separate circuit for each indicator light activated upon transmission of only one of said coded signals, but said circuit being energized to turn on the corresponding indicator light only upon reception during transmission of the next coded signal of a status ready signal from one of said units, and (2) latch means in said circuit for prolonging the energizing of said light for at least the majority of time in which said unit is recording,

whereby at said control point, one may ascertain at a glance and in advance of recording said outputs from said transducers either that all units in a predetermined pattern (less than the total number of said units) are in status ready condition, or, in the alternative, the pattern position of any of said units that are not ready.

4,010,443

#### VELOCITY PICKUPS OF THE HORIZONTAL SEISMOMETER TYPE

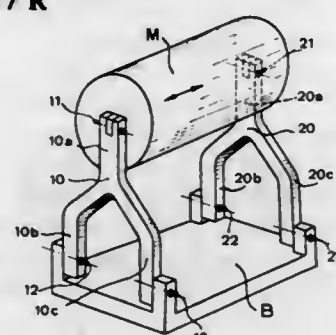
Jean-Baptiste Lacorre, Carquefou, France, assignor to Societe d'Etudes, Recherches et Constructions Electroniques Sercl, Carquefou, France

Filed Nov. 25, 1974, Ser. No. 526,880

Int. Cl.<sup>2</sup> G01V 1/16; H04R 23/00

U.S. Cl. 340—17 R

3 Claims



1. A seismic pickup comprising:

- a. a base,
- b. two rigid beams pivotally mounted on said base, the pivot axes of said beams being parallel and said beams being spaced apart in a direction perpendicular to the pivot axes,
- c. a mass spaced above said base and mounted between said

beams, said mass being connected to each beam by a pivot,

- d. said base, beams, and mass defining a parallelogram articulated at all four of its corners,
- e. each beam being articulated to said base on two spaced apart pivots located on a single pivot axis, and
- f. at least one of said pivots being an elastic pivot which constantly urges said beams and mass to a particular position with respect to said base,
- g. said mass having a resonant frequency below one cycle per second.

4,010,444

#### AUTOMOTIVE BURGLAR ALARM WITH GAS SIPHONING DETECTOR

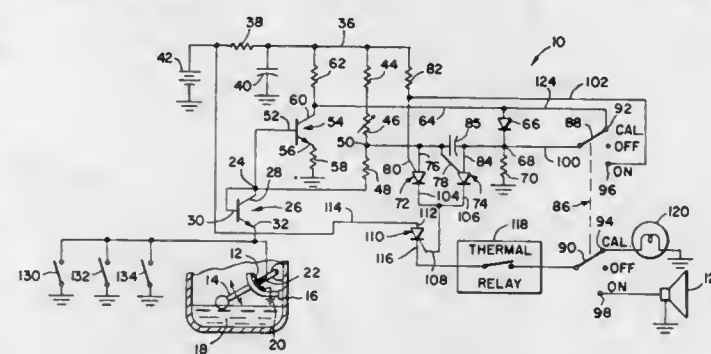
Aroon C. Shah, 15 Spruce St., Waltham, Mass. 02154

Filed Mar. 29, 1976, Ser. No. 671,320

Int. Cl.<sup>2</sup> B60R 25/10

U.S. Cl. 340—63

2 Claims



1. A security alarm apparatus for warning of attempted siphoning of gasoline in an automotive vehicle having a battery, an electrically energizable sonic alarm, and a first variable resistor whose resistance is varied by a gas tank float, said apparatus comprising: a window comparator means having first and second input terminals and an output terminal, a resistive voltage divider means including said first resistor and a second manually adjustable resistor; means for connecting said voltage divider means across said battery; said voltage divider means having output signal means coupled without inversion to the first terminal of said window comparator means to form a first signal at said first input terminal, an inverting amplifier means fed by said output signal means of said voltage divider means and feeding the second input terminal of said window comparator means to form a second signal at said second input terminal; said second resistor being variable to initially set said alarm apparatus in a manner that said first and second signals are substantially equal, said window comparator means being configured in a manner that said output terminal has a predetermined output signal state in response to the absolute value of the difference between said first and second signals being greater than a predetermined constant, and means responsive to the output of said window comparator means for coupling said sonic alarm across said battery in response to said predetermined state.

4,010,445

#### WORD RECOGNITION APPARATUS

Yukio Hoshino, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 614,984

Claims priority, application Japan, Sept. 25, 1974, 49-110295

Int. Cl.<sup>2</sup> G06K 9/00

U.S. Cl. 340—146.3 WD

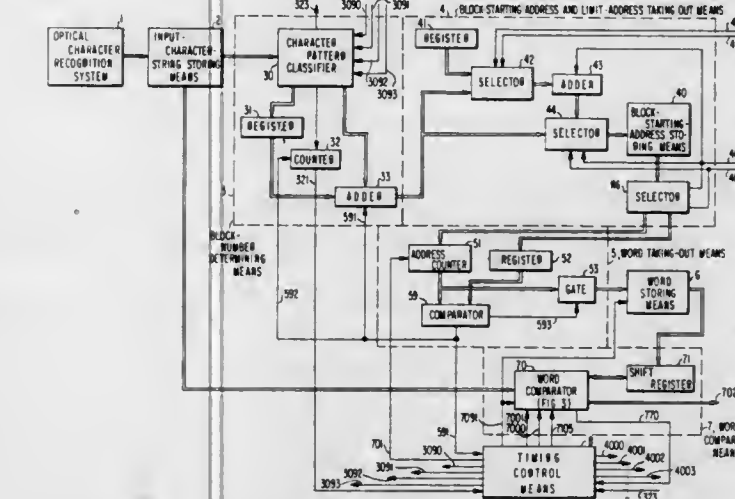
4 Claims

1. A word recognition apparatus for use with a character recognition system, comprising:

- a. word storing means for storing a plurality of words to be retrieved in block units in the order of block numbers so that characters placed in one or more given positions of a

word forming an input character string are used as a retrieving key corresponding to one of said block numbers;

- b. block-starting-address storing means for storing starting addresses of the block units in said word storing means;
- c. block-starting-address and limit-address taking-out means for taking out a block starting address and a block limit address corresponding to a block number next to the designated block number from the block-starting-address storing means;
- d. input-character-string storing means for storing the input character string recognized by said character recognition system;



- e. block-number determining means for sequentially designating the block numbers of blocks containing words having recognized characters placed in said given positions of said input character string;
- f. word taking-out means for sequentially taking out words stored in the addresses from the block starting address of said word storing means to an address short of said block limit address by using the starting address and the block limit address which are taken out from the block-starting-address storing means with a block number used as the retrieving key; and
- g. word comparing means for detecting a word similar to the input character string to a degree over a given value by the comparison of the words thus taken out with said input character string.

4,010,446

#### CHARACTER PATTERN LINE THICKNESS REGULARIZING DEVICE

Ryuichi Kawa, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

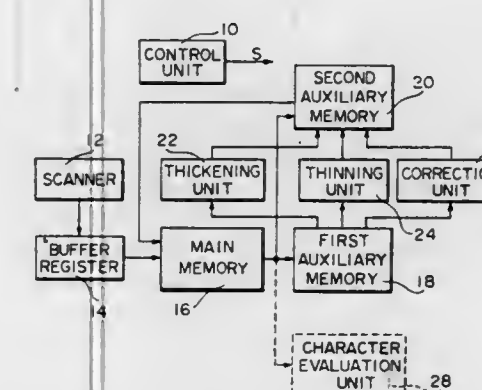
Filed June 27, 1974, Ser. No. 483,740

Claims priority, application Japan, July 2, 1973, 48-74649

Int. Cl.<sup>2</sup> G06K 9/12

U.S. Cl. 340—146.3 H

16 Claims



1. In a character recognition system in which a document on which a character is printed is scanned and a character pattern

representing the scanned document is obtained in the form of electrical signals arranged in a matrix of rows and columns constituting a quantized representation of the scanned document, the system being operative to compare the character pattern with at least one known character pattern to determine the degree of correspondence therewith, a line thickness regularizing device, comprising:

thickening means operative to sense the electrical signals representing the character pattern and thicken the line thickness of a portion of the character having a line thickness less than a predetermined value to the predetermined value by modifying the electrical signals;

thinning means operative to sense the electrical signals representing the character pattern and uniformly thin the line thickness of the character by modifying the electrical signals;

control means operative to control said thickening and thinning means so that the electrical signals are sequentially operated upon by the thickening means, the thinning means and again by the thickening means; and correction means arranged to operate on the electrical signals before operation thereon by said thinning means, said correction means being operative to thicken the line thickness of a portion of the character so that the line continuity of the character will be maintained while the electrical signals are operated upon by the thinning means.

4,010,447

#### SIGNAL TRANSMITTER USING AN ACTIVE THICK FILM SUBSTRATE

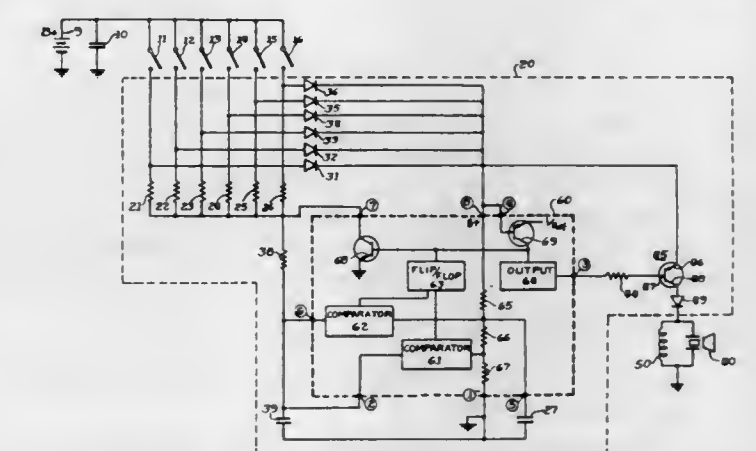
Robert R. Podowski, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 7, 1976, Ser. No. 647,291

Int. Cl.<sup>2</sup> H04Q 9/14, 9/10

U.S. Cl. 340—167 R

5 Claims



1. A portable transmitter for selectively generating different frequency signals to control corresponding functions in a television receiver comprising:

- a battery;
- a plurality of resistors;
- a corresponding plurality of switches connected between said battery and said resistors;
- a pulse producing circuit;
- a timing capacitor coupled to said pulse producing circuit for varying the frequency thereof in cooperation with said resistors and switches;
- an output circuit including a transducer for developing acoustic signals corresponding in frequency to the pulses developed by said pulse producing circuit; and
- a plurality of diodes arranged to electrically connect said battery to said pulse producing circuit and to said output circuit responsive to closure of any of said switches.



4,010,448

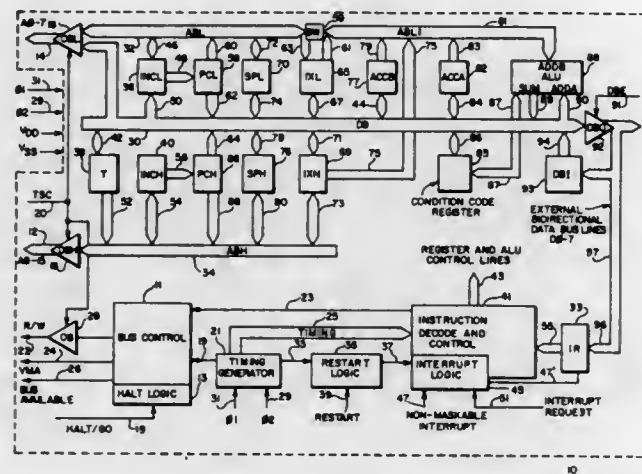
**INTERRUPT CIRCUITRY FOR MICROPROCESSOR CHIP**  
 Thomas H. Bennett; Earl F. Carlow, both of Scottsdale; Anthony E. Kouvousis, Phoenix, all of Ariz.; Rodney H. Orgill, Norristown, Pa., and Michael F. Wiles, Phoenix, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 30, 1974, Ser. No. 519,140

Int. Cl.<sup>2</sup> G06F 9/18

U.S. Cl. 340—172.5

5 Claims



1. In a microprocessor, circuitry for effecting execution of an interrupt operation of said microprocessor in response to a interrupt request signal comprising:

data bus means for transferring digital information, said data bus means being capable of being coupled to a memory means having an interrupt routine program stored therein;

register storage means coupled to said data bus means for temporarily storing digital information in accordance with execution of various instructions by said microprocessor, including an instruction for setting an interrupt mask bit;

an interrupt request conductor for conducting said interrupt request signal;

instruction register means coupled to said data bus means for temporarily storing each instruction as it is received from said data bus means;

instruction decode means coupled to said instruction register means for controlling said register storage means and said data bus means to effect execution of the instruction stored in said instruction register means;

interrupt means coupled to said interrupt request conductor and said instruction register means for inhibiting said temporary storing of the next instruction to be executed in response to said interrupt request signal;

means responsive to said interrupt means for internally generating a fixed code instruction within said instruction register means; and

circuit means in said instruction decode means for effecting transferring digital information in said register storage means to said memory means and causing said microprocessor to branch to said interrupt routine program.

4,010,449

**MOS COMPUTER EMPLOYING A PLURALITY OF SEPARATE CHIPS**

Federico Faggin, Cupertino; Masatoshi Shima, Santa Clara, both of Calif., and Stanley Mazor, Brussels, Belgium, assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 31, 1974, Ser. No. 537,648

Int. Cl.<sup>2</sup> G06F 13/00

U.S. Cl. 340—172.5

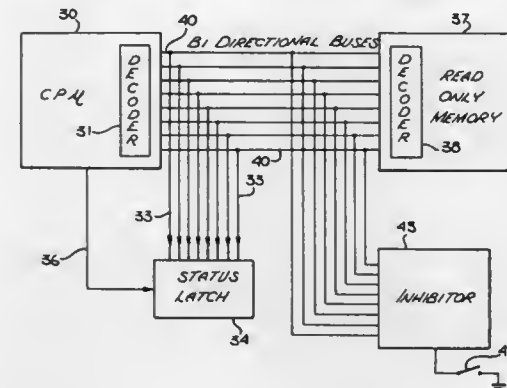
3 Claims

1. In an MOS computer employing a plurality of separate chips including a separate central processing unit chip (CPU chip) and a plurality of bidirectional data bus lines coupled to

said CPU chip and one or more of said plurality of separate chips, the improvement comprising:

a CPU status storage means for storing signals representative of the status of said CPU chip; and

a plurality of lines coupled to said CPU status storage means



and said bidirectional data bus lines for interconnecting said bidirectional data bus lines with said CPU status storage means:

whereby said signals representative of the status of said CPU chip are communicated to said CPU status storage means through said bidirectional data bus lines.

4,010,450

**FAIL SOFT MEMORY**

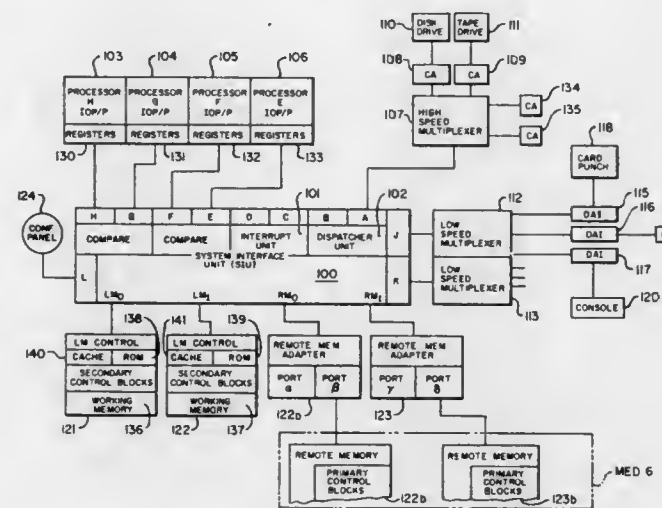
Marion G. Porter, Phoenix; Garvin Wesley Patterson, and Jaime Calle, both of Glendale, all of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 26, 1975, Ser. No. 562,361

Int. Cl.<sup>2</sup> G06F 11/04, 13/06, 9/16

U.S. Cl. 340—172.5

15 Claims



1. A fail soft mechanism in a general purpose computer system having at least one processor, said fail soft mechanism for automatically providing an alternate addressing path for addressing data in a second portion of main memory when a failure is detected in a first portion of main memory, said mechanism comprising:

a. first means for addressing a first control block means in a first portion of main memory of said computer system, said first means further comprising:

1. a first interrupt control block addressing means for storing signals indicating a first part of the address of the first control block means in said first portion of said main memory;

2. a first control block addressing means for storing signals indicating a second part of the address of said first control block means in said first portion of said main memory; and

3. a first combining means coupled to be responsive to said first interrupt control block addressing means and to said first control block addressing means for combin-

ing the first part and second part of the address of said first control block means;

b. second means coupled to be responsive to said first means, for detecting a failure in the first portion of main memory addressed by said first means; and

c. third means, coupled to be responsive to said second means, for automatically providing an alternate path to a second portion of main memory upon detection of a failure in said first portion of main memory, said third means further comprising:

1. a second interrupt control block addressing means for storing signals indicating a first part of the address of a second interrupt control block means in said second portion of said main memory;

2. a second control block addressing means for storing signals indicating a second part of the address of the second interrupt control block means in said second portion of said main memory; and

3. second combining means coupled to be responsive to said second interrupt control block addressing means and to said second control block addressing means, for combining the first and second part of the address of the second interrupt control block means in said second portion of said main memory.

4,010,451

**DATA STRUCTURE PROCESSOR**

David John Kibble, Burgess Hill, and Richard Lawrence Grimsdale, Brighton, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 401,612, Sept. 28, 1973. This

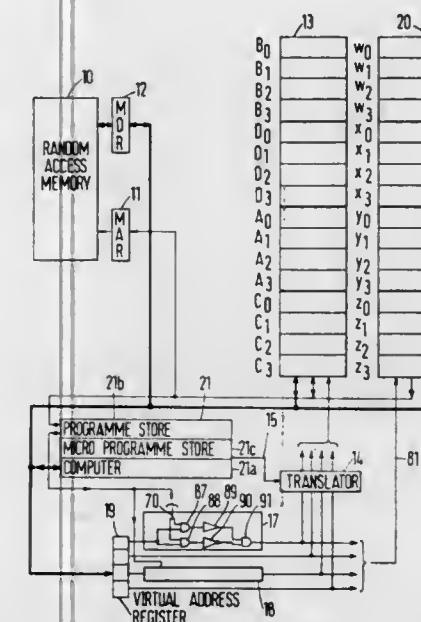
application July 24, 1975, Ser. No. 598,877

Claims priority, application United Kingdom, Oct. 3, 1972, 45494/72

Int. Cl.<sup>2</sup> G06F 9/20, 9/10

U.S. Cl. 340—172.5

9 Claims



1. Apparatus for use in carrying out data processing operations in which data items are called from storage by an address, the apparatus including a primary store for storing items of data at a plurality of storage locations, the primary store having an address input and each location having a unique real address which when applied to the said address input in the form of a real address allows transfer of data items to and from that location of the primary store, a main store having a greater number of storage locations than the primary store, means for allowing transfer of stored items between the primary and main stores, an address translator, having its output coupled to the address input of the primary store, for translating into real addresses for data items from virtual addresses for said items to allow programs of data processing operations which use virtual addresses to be used, and a program storage means for storing said programs which use virtual addresses,

4,010,452

**ASSOCIATIVE DATA PROCESSING APPARATUS AND METHOD**

Jean Cazanove, Barentin, France, assignor to Burroughs Corporation, Detroit, Mich.

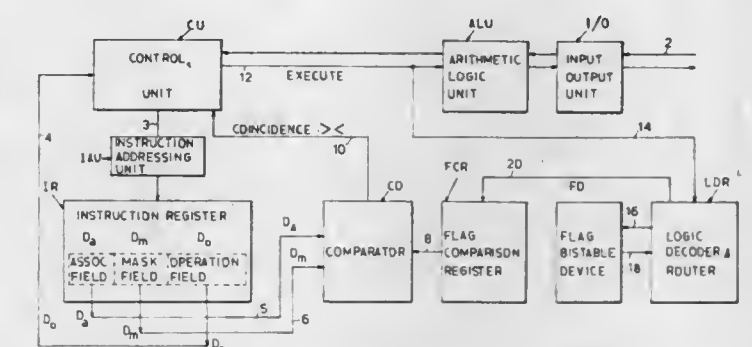
Filed Sept. 16, 1975, Ser. No. 613,906

Claims priority, application France, Oct. 15, 1974, 74.34590

Int. Cl.<sup>2</sup> G06F 9/00

U.S. Cl. 340—172.5

23 Claims



1. Data processing apparatus having the ability to process by association, comprising:

A. a control unit for receiving instructions and controlling the execution thereof;

B. flag register means for registering one or more flag criteria;

C. an instruction register for storing a series of multi-bit instruction words each including:

i. an association field of one or more bits designating the one or more flag criteria;

ii. a masking field of one or more bits for designating the flag criteria to be honored by unmasking the respective association-field bit;

iii. and an operation field of a plurality of bits for designating a particular data processing operation;

D. an instruction register addressing means responsive to the control unit for addressing the instruction register to read out the instruction words therefrom;

E. flag comparator means connected to the control unit for comparing the flag criteria registered in the flag register means with the unmasked association-field bits of each instruction word read out of the instruction register; and

F. instruction execution means controlled by the control unit to execute the operation designated in the instruction word upon the finding by the comparator means of a match between the unmasked association-field bits of the instruction word and the flag criteria registered in the flag register means.



4,010,453

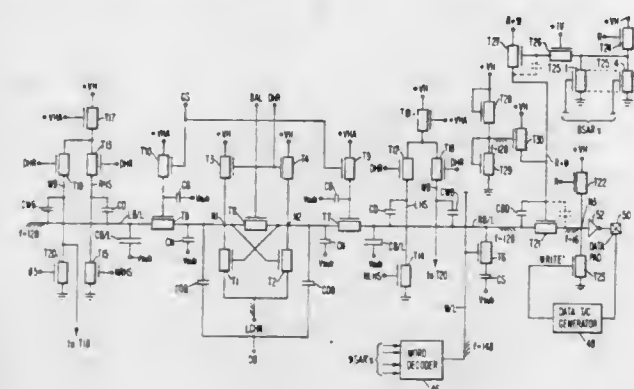
# STORED CHARGE DIFFERENTIAL SENSE AMPLIFIER

Scott Clarence Lewis, Essex Junction, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Dec. 3, 1975, Ser. No. 637,440

Int. Cl.<sup>2</sup> G11C 11/40

U.S. Cl. 340—173 R

20 Claims



8. In the memory system including first and second groups of charge storage means, each group being associated, respectively, with first and second bit/sense lines, the improvement comprising:

- an information signal source;
- a differential sense amplifier coupled to said bit/sense lines, said sense amplifier including a pair of charge transfer amplifying input means;
- decoding means for coupling a decoded information signal corresponding to a first logical state to said first bit/sense line during at least a portion of a write cycle; and
- write bias means coupled to said second bit/sense line for unconditionally causing at least the one of said charge transfer amplifying input means coupled to said second bit/sense line to become conductive during said portion of the write cycle to cause an information signal of a second logical state to be stored in one of said charge storage means associated with said second bit/sense line in response to said decoded information signal.

4,010,454

# MAGNETIC BUBBLE SIGNAL GENERATOR

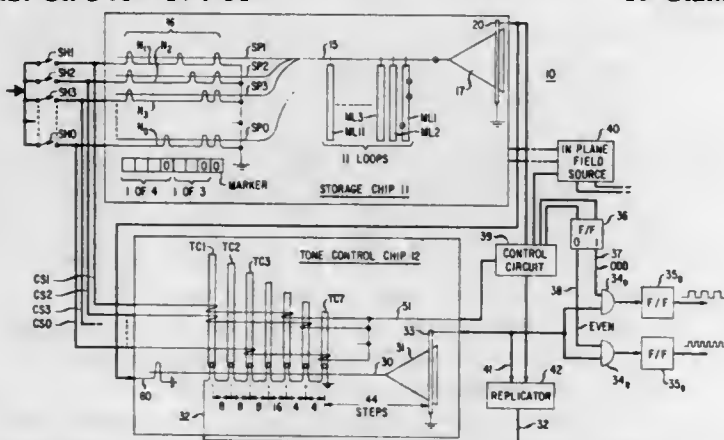
Andrew Henry Bobeck, Chatham, and Irynej Danylichuk, Morris Plains, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 30, 1974, Ser. No. 474,703

Int. Cl.<sup>2</sup> G11C 11/14; H04M 1/46

U.S. Cl. 340—174 TF

19 Claims



1. Magnetic apparatus comprising a layer of material in which single wall domains can be moved, means for defining in said layer  $n > 3$  multistage loops for recirculating domains thereabout periodically through first positions therein response to a magnetic field varying cyclically at frequency  $f_1$ , said loops being organized into  $m < n$  groups of loops, means responsive to a first signal for selectively providing a domain in a coded loop of each of said  $m$  groups of loops, accessing

means for said loops, said accessing means comprising a multi-stage channel including a domain detector, said channel being operative responsive to said field for moving domains to said detector, said accessing means also including a plurality of spaced-apart first stages therein each associated with one of said first positions and spaced-apart coded numbers of stages from said detector, said  $n$  loops including  $n$  different numbers of stages.

4,010,455

# CYCLICAL BI-DIRECTIONAL ROTARY ACTUATOR

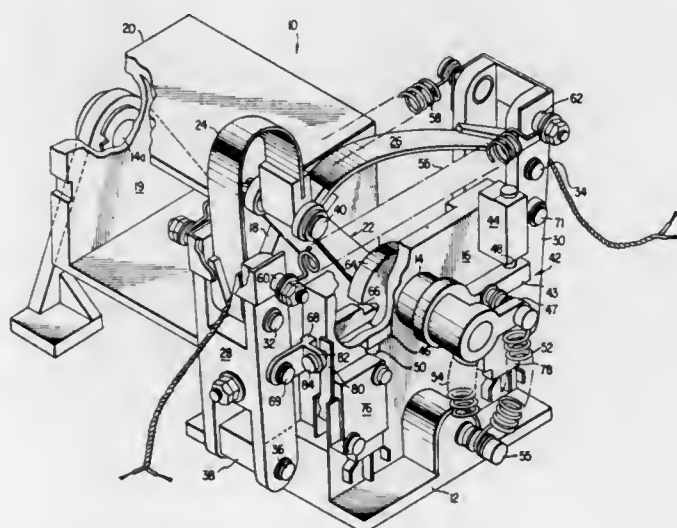
William C. Stange, Ellicott City, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 17, 1975, Ser. No. 596,787

Int. Cl.<sup>2</sup> G08B 1/08

U.S. Cl. 340—224

25 Claims



1. A thermally powered actuator comprising:
  - a. frame means;
  - b. shaft means rotatably supported in said frame means;
  - c. means for positioning said shaft means in first and second rotary positions disposed 180° apart;
  - d. at least one pair of heat extensible spring means having first and second ends, said first ends being coupled to said rotatable shaft means, said spring means respectively applying clockwise or counterclockwise torque to said shaft means upon application of heat thereto;
  - e. heating means bonded to each of said spring means for applying heat thereto to cause their selective extension;
  - f. spring crank means coupled to said rotatable means and pivotally coupled to said second ends of said spring means; and
  - g. coupling means disposed between said shaft means and said crank means, said coupling means permitting free rotation of said crank means with respect to said shaft means for a predetermined angular displacement of said crank means with respect to said shaft means and unitary rotation of said crank means and said shaft means for angular rotations of said crank means with respect to said shaft means which are greater than said predetermined angular displacement.

4,010,456

# LOW BATTERY VOLTAGE INDICATOR FOR A PORTABLE DIGITAL ELECTRONIC INSTRUMENT

Ernst R. Erni, Portola Valley, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 10, 1975, Ser. No. 556,753

Int. Cl.<sup>2</sup> G09F 9/32

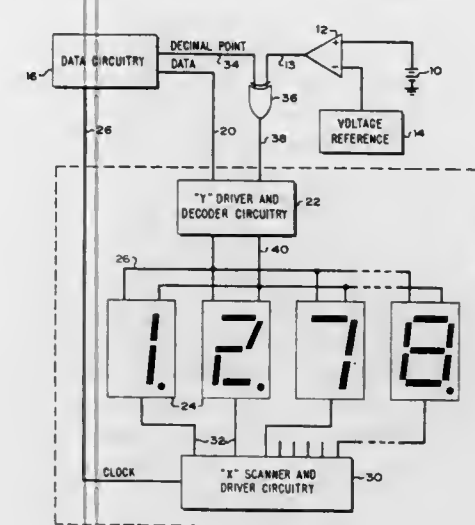
U.S. Cl. 340—248 B

1 Claim

1. A digital electronic instrument comprising:
  - a battery;
  - digital circuit means responsive to an input stimulus, said digital circuit means having a digital output;

a digital display including a plurality of display modules responsive to the output of the digital circuit means, each display module having a plurality of light emitting segments for selectively displaying numerals and a decimal point, said decimal point being normally displayed in combination with a numeral on the same display module of the digital display;

a reference voltage supply; and



a comparator having a first input connected to the reference voltage supply, a second input connected to the battery, and an output for giving an output signal when the battery voltage is below the reference voltage, the output being connected to the digital display circuit means for causing the true decimal point to be extinguished and a plurality of the adjacent decimal points to be illuminated in response to an output signal from the comparator.

4,010,457

# OVERLOAD PROTECTION DEVICE

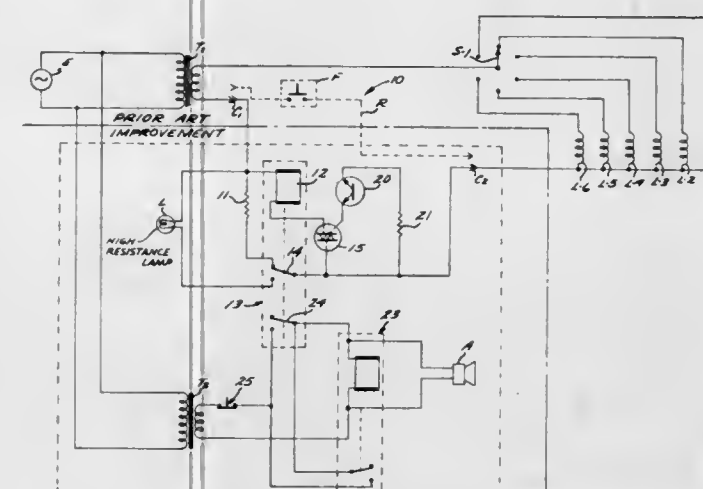
Bobby Rollene Simpson, 915 Chippewa, Anaheim, Calif. 92801

Filed Mar. 17, 1975, Ser. No. 559,162

Int. Cl.<sup>2</sup> G08B 21/00

U.S. Cl. 340—253 A

8 Claims



1. A circuit protection device for a circuit that includes a plurality of loads alternatively selectable and connectable to a lead of said circuit comprising:

- a selector switch in one of said leads for selectively and alternatively connecting said loads into said circuit and opening said circuit to effect change of the load connected therein;
- sensing means connected in one of said leads of said circuit for sensing the current drawn therethrough and developing an electrical potential indicative thereof;
- relay means connected in parallel across said sensing means and conductive when said electrical potential thereacross exceeds a predetermined amplitude;

a high resistance likewise connected in parallel with said sensing means;

a first switch having first and second contacts disposed with said first contact in series with said sensing means and said second contact in series with said high resistance, whereby said first switch is operable under the control of said relay means to break the circuit through said sensing means while said relay means is rendered conductive during which condition said first switch establishes a circuit path through said high resistance and said second contact;

an alarm circuit having an alarm mechanism and having a second switch disposed therein for dependent operation with said first switch under the control of said relay means whereby said second switch is opened when said first switch conducts through said sensing means and is closed when said first switch conducts through said high resistance;

latching means associated with said second switch for latching said second switch into a conductive mode upon closure of said second switch to maintain said alarm circuit in a conductive state; and

reset means for manually resetting said latching means.

4,010,458

# LIGHT GATE SYSTEM

Markus Köpfli, Wil, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland

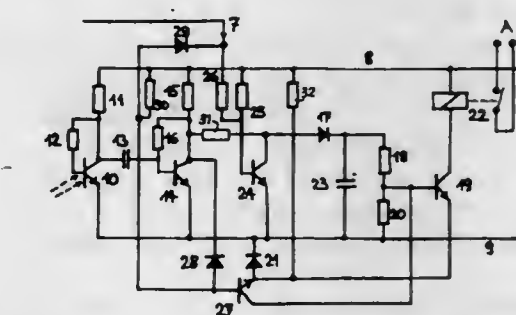
Filed July 10, 1975, Ser. No. 594,880

Claims priority, application Switzerland, July 15, 1974, 9742/74

Int. Cl.<sup>2</sup> G08B 13/18

U.S. Cl. 340—258 R

9 Claims



1. Light gate system having a radiation transmitter (2), a radiation receiver (3, 10), an output stage (19), and an evaluation circuit (4, 5) comprising

- a pulse source (1) connected to and controlling the radiation transmitter (2) to emit a radiation pulse in the time interval during persistence of a control pulse from the source (2); and wherein the evaluation circuit (4, 5) comprises circuit means (13, 14, 17, 18, 20) connecting the radiation receiver (3, 10) to said output stage (19), controlling said output stage to assume a first state upon presence of radiation pulses detected by the radiation receiver (3, 10) and an alarm state upon absence of detection of radiation pulses, said circuit means including a controllable switch (24) connected across the input of the output stage (19) and controlled by the pulse source (1) to block transmission of pulses from the radiation receiver (3, 10) to the output stage (19) during the gaps between control pulses from the pulse source (1); and
  - a phasing supervision stage (27) connected to the output stage (19) and connected to and controlled by the pulse source (1), the phasing supervision stage being open during pulse gaps between control pulses from the pulse source (1) and permitting application of radiation pulses received from the radiation receiver (10) during said gaps to the output stage (19) to control the output stage to assume the alarm state so that the output stage (19) will logically provide an alarm output signal
- a. upon failure of the radiation receiver (3, 10) to detect a



- radiation pulse when the control pulse coupled from the pulse source (1) is present, or
- b. upon detection by the radiation receiver (3, 10) of radiation when the control pulse coupled from the pulse source (1) is absent.

4,010,459

# SYSTEMS FOR THE DETECTION OF MOVING OBJECTS WITHIN A SURVEY AREA BY MICROWAVE DIFFRACTION

Jorgen Pontoppidan; Erik Tue Sorensen, both of Lyngby, and Erik Kjaer Nielsen, Ballerup, all of Denmark, assignors to Børge Schløger; Oluf Tvede-Jensen; Erik Landert; Hans Børge Hansen and Niels Ove Wrist, all of, Denmark

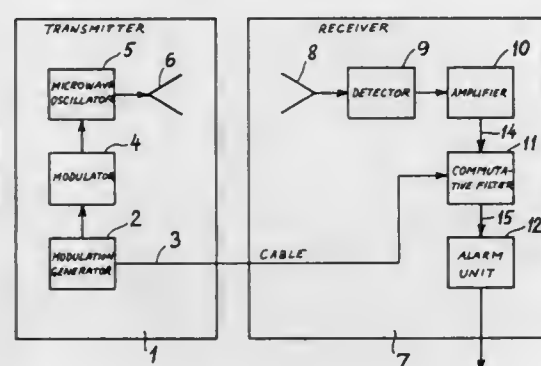
Filed Nov. 5, 1975, Ser. No. 628,973

Claims priority, application Denmark, Nov. 7, 1974, 5815/74

Int. Cl.<sup>2</sup> G08B 13/24

U.S. Cl. 340—258 A

6 Claims



1. A system for detecting moving objects within a survey area by microwave diffraction, comprising:
- a. a transmitter, said transmitter including a microwave oscillator, a modulator and a transmitting antenna;
- a. a receiver, said receiver including a receiving antenna, a detector, an amplifier and a commutative filter;
- said filter having a number of capacitors, said capacitors being successively connected, one at a time, into said receiver in a continuous cycle and serving as filter shunt capacitors;
- alarm means connected to the output of said filter; and,
- a modulation generator coupled to both said receiver and said transmitter for providing synchronized control signals to both said modulator and said commutative filter.

4,010,460

# ALERTING SYSTEM WITH MEMORY

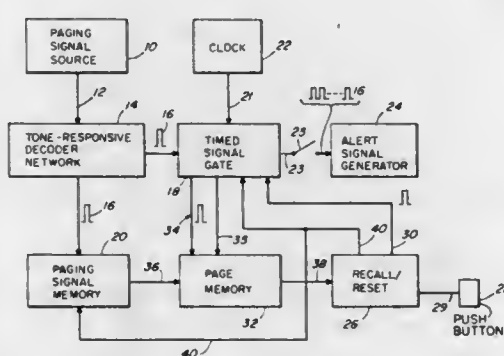
James DeRosa, Westford, Mass., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 12, 1974, Ser. No. 532,059

Int. Cl.<sup>2</sup> H04M 11/02

U.S. Cl. 340—311

14 Claims



1. In an alerting device that is responsive to a calling signal to initiate an alerting signal and having reset means to terminate the alerting signal, means including time interval measur-

ing means responsive to said calling signal to initiate said alerting signal, said time interval measuring means including means automatically to terminate said alerting signal after a prescribed time interval, said reset means having alternatively a normal reset state and a recall state into which said reset means can be set, an input for setting said reset means alternatively into said reset state or said recall state, said reset means having operator means, a reset output means and recall output means, means coupling said reset means via said reset output means to said time interval measuring means for terminating operation of the latter and thereby terminating said alerting signal if said operator means is operated when said reset means is in said reset state, means coupling said reset means via said recall output means to said time interval measuring means for initiating a time interval measuring cycle thereof and thereby initiating said alerting signal if said operator means is operated when said reset means is in said recall state, alerting signal memory means that is settable into a stored-page state, said time interval measuring means including means for setting said alerting signal memory means in said stored-page-state upon automatically terminating said alerting signal in the absence of operation of said operator means of said reset means during the time when the latter is in said reset state, said alerting signal memory means being coupled to said reset means via said input thereof for setting said reset means into said recall state when said alerting signal memory means is set into said stored-page state.

4,010,461

# ALERTING SYSTEM WITH DUAL-ADDRESS MEMORY

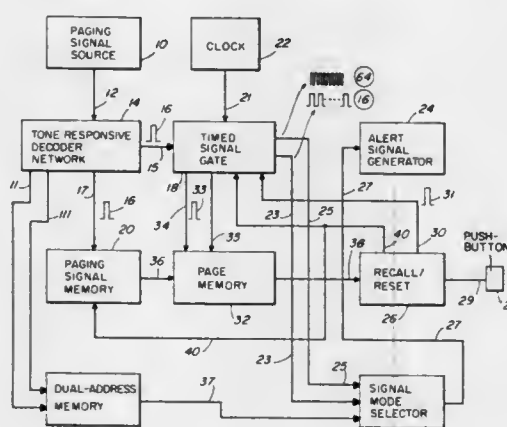
Thomas Raymond Stodolski, Cambridge, Mass., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 17, 1975, Ser. No. 541,873

Int. Cl.<sup>2</sup> H04M 11/02

U.S. Cl. 340—311

17 Claims



1. In an alerting device that is responsive to a calling signal of the multi-address type to initiate an alerting signal which indicates address information contained in said calling signal, means including time interval measuring means responsive to said calling signal to provide said alerting signal for a predetermined time interval, said device including means to provide at least a first alerting signal of a first mode and a second alerting signal of a second mode, an alerting signal output, and signal mode selector means which is settable to select one of said modes for application to said alerting signal output, means to sense an address indicator in a calling signal and to provide an address-responsive output signal, address-responsive means to receive said address-responsive output signal and correspondingly to set said signal mode selector means to select said one of said modes, said time interval measuring means including means automatically to terminate said alerting signal after said predetermined time interval, alerting signal memory means, said time interval measuring means including means for setting said alerting signal memory means in a stored-page state upon automatically terminating said alerting signal, and recall means to institute operation of said device while said alerting signal memory means is in said stored-page state for again initiating said alerting signal in said selected mode.

4,010,462

# SEISMIC PLAYBACK SYSTEM

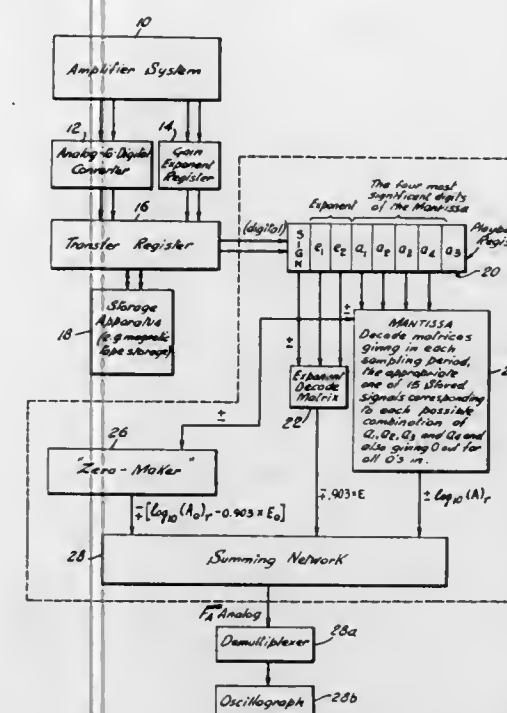
Fontaine C. Armistead, Darien, Conn., assignor to Texaco Development Corporation, New York, N.Y.

Continuation of Ser. No. 153,078, June 14, 1971. This application Oct. 29, 1973, Ser. No. 410,735

Int. Cl.<sup>2</sup> H03K 13/04

U.S. Cl. 340—347 DA

4 Claims



1. A seismic playback system adapted to receive wide dynamic range seismic signals, comprising means for receiving at least one seismic analog signal; means for converting at least one received seismic signal to digital signals representing the general algebraic equation:

$$Q_i = \pm A G^{-E}$$

where  $Q_i$  represents the amplitude, either positive or negative, of the received seismic signal;  $A$  represents a mantissa,  $G$  represents a radix,  $E$  represents an exponent, and where some of the digital signals represent the four most significant digits of  $A$  and some represent  $E$ ; first means connected to the converting means for decoding the digital signals representative of  $E$  to provide an analog signal of one polarity corresponding to  $E \log G$ , second means connected to the converting means for decoding the digital signals corresponding to the four most significant digits of  $A$  to provide a signal corresponding to  $\log A$  having a polarity opposite to that of the  $E \log G$  signal; zero-making means connected to the converting means for providing an analog signal  $Z$  in accordance with the following equation:

$$Z = \pm [\log_{10}(A_0) - 0.903E_0]$$

and having the same polarity as the signal from the first decoding means, where  $(A_0)_0$  is a predetermined rounded off minimum value for the mantissa  $A$  and  $E_0$  is a predetermined maximum value of the exponent  $E$ ,

means connected to the first and second decoding means and to the zero-making means for providing an analog output signal in accordance with the three signals and the following equation:

$$\log Q_i = \log A - E \log G - Z.$$

4,010,463

# PHASE LOCKED LOOP RESOLVER TO DIGITAL CONVERTER

Robert M. Kay, Seminole, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 21, 1975, Ser. No. 570,065

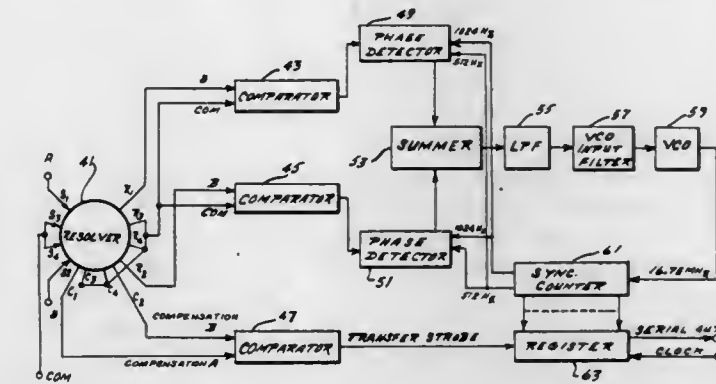
Int. Cl.<sup>2</sup> H03K 13/02

U.S. Cl. 340—347 SY

1 Claim

1. A resolver to digital converter comprising:
- a. a counter for frequency dividing an input signal;

- b. logic means for generating a predetermined rectangular waveform;
- c. a phase splitter fed by the logic means and having a pair of orthogonal outputs;
- d. a pair of operational amplifiers fed by the orthogonal outputs of the phase splitter;
- e. first and second matched amplitude detectors, each fed by one of the pair of operational amplifiers;
- f. first and second integrating comparators fed one each by the first and second matched amplitude detectors and fed back respectively to the first and second operational amplifiers;
- g. a resolver including compensation windings fed by each of the operational amplifiers;
- h. first and second zero crossing differential comparators fed by the orthogonal outputs of the resolver;



- i. first and second phase detectors fed by first and second zero crossing differential comparators;
- j. a summer fed by the first and second phase detectors producing error signals;
- k. a voltage controlled oscillator fed by the summer;
- l. a synchronous digital counter fed by the voltage controlled oscillator and fed back to the first and second phase detectors for reference signals forming a second order phase locked loop;
- m. a serial output register fed by the synchronous digital counter; and
- n. a third zero crossing differential comparator interposed between the compensation windings of the resolver and the serial output register for a strobe pulse whereby the count in said synchronous digital counter when strobed is a digital representation of the analog input.

4,010,464

# MAGNETICALLY OPERATED REED SWITCH TYPE DIGITAL ENCODER

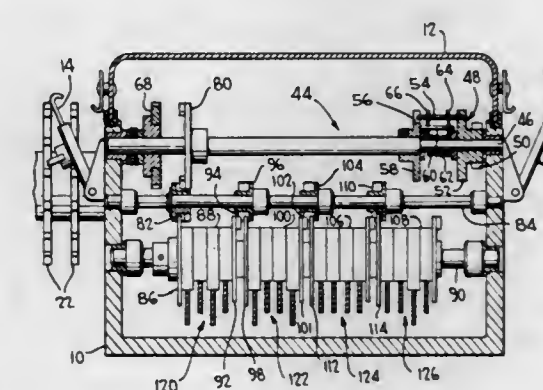
Harold O. Wires, Picayune, Miss., and Samuel E. Rickly, Slidell, La., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 21, 1975, Ser. No. 624,358

Int. Cl.<sup>2</sup> H03K 13/02; B60K 41/24; F16D 67/02

U.S. Cl. 340—347 P

2 Claims



1. A shaft position digitizer comprising:
- a. a rotatable input shaft,



magnetically operated reed switch means for providing an electrical digit output representative of rotation of said input shaft,

magnet means movable to operate said reed switch means, means for moving said magnet means which dispose said magnet means in arrangements which are indicative of said input shaft rotation,

jump transfer means having lost motion means for producing a jump advance of said magnet moving means in response to a predetermined rotation of said input shaft whereby least significant digit ambiguity in said digital output is eliminated, said jump transfer means including a rotatable jump transfer shaft, a plain disk rotatable on said jump transfer shaft by rotation of said input shaft, a further disk fixed to said jump transfer shaft and having a recess therein, a torsion spring having as parts thereof spaced extensions and coiled about said jump transfer shaft disposed between said disks, a torsion spring loading means constituted by a pin fixed to said plain disk and having portions thereof extending between said disks and disposed in said recess, a torsion spring retaining means constituted by a further pin fixed to said recessed disk and extending approximately to said plain disk, and wherein said torsion spring is operatively maintained on said jump transfer shaft between said disks by engagement of said extensions thereof with said pin and said further pin respectively,

a jump transfer shaft rotation restraining detent means including a component thereof fixed to said jump transfer shaft and having a plurality of spaced camming elements, and a separately supported plunger means normally biased against said component at between said camming elements so as to resist rotational displacement of said component and of said jump transfer shaft,

wherefore said jump advance is produced in response to a rotation of said input shaft and said plain disk therewith which moves said extended portion of said pin to engage said recess and thereby drive said recessed disk together with said jump transfer shaft and said component fixed thereto so as to temporarily interpose a said camming element of said component at said plunger which negates said plunger bias restraint and frees said component for rotation together with said jump transfer shaft and said recessed disk by energy of said torsion spring stored therein prior to a release thereof following displacement of said further pin by said drive to said recessed disk.

#### 4,010,465

### CHANNEL ENCODING FOR DISTANCE MEASUREMENT EQUIPMENT

Sven H. Dodington, Mountain Lakes, and Jesse S. LeGrand, Clifton, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 4, 1975, Ser. No. 565,311

Int. Cl.<sup>2</sup> G01S 9/56

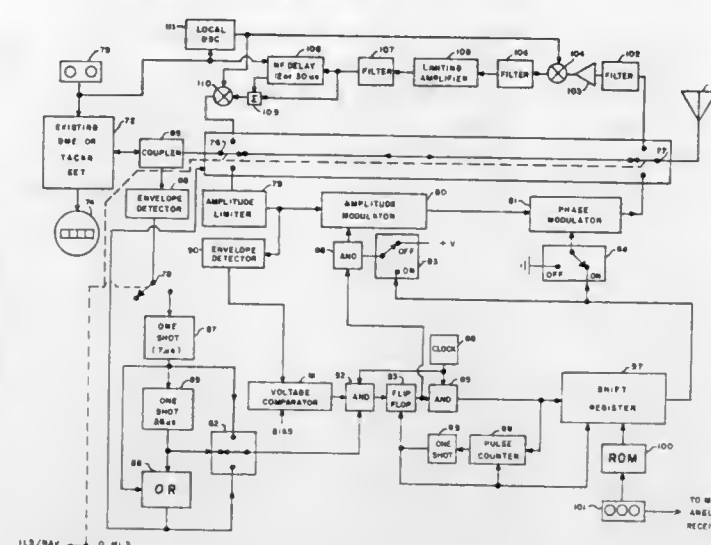
U.S. Cl. 343—5 LS

8 Claims

1. An Apparatus for generating interrogation signals for use with airborne equipment of the type which transmits interrogation signals containing at least one pulse of a first type to a ground beacon, said beacon of a type which responds to interrogation signals of a second type with reply signals of said second type, and wherein said airborne equipment processes reply signals of said first type, said airborne equipment including a transmitter, a receiver, an interrogator and an antenna, said apparatus comprising:

means for detecting said first type of interrogation signal;  
means for converting said at least one pulse to at least one second pulse having a reduced amplitude;  
means for generating a coded signal; and

means for modulating said at least one second pulse with



said coded signal to produce an interrogation signal of said second type.

#### 4,010,466

### METHOD AND SYSTEM OF ELECTRONIC IMAGE STORAGE AND DISPLAY

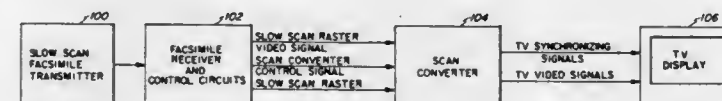
Steven R. Hofstein, North Brunswick, N.J., assignor to Princeton Electronic Products, Inc., North Brunswick, N.J.

Filed Aug. 4, 1975, Ser. No. 601,615

Int. Cl.<sup>2</sup> G01S 7/04; H04N 3/00

U.S. Cl. 343—5 SC

120 Claims



1. A method of operating a system to display an image on a raster scan TV display wherein an incoming signal comprises a sequence of scan lines whose line rate is lower than the horizontal TV line rate within a field of the TV display, the method comprising:

selecting an incoming signal line rate to be an odd integer submultiple of the horizontal TV line rate;

applying the incoming signal to a scan converter having a memory therein and storing the incoming signal in segments in the memory by writing each segment into the memory during the time required to scan one horizontal TV line of the field; and

scanning the memory and displaying the signal stored therein on the TV display by reading from the memory during the time required to scan the next horizontal TV line in the field to thereby write and read during alternate horizontal TV lines of the same field.

#### 4,010,467

### MISSILE POST-MULTIPLE-TARGET RESOLUTION GUIDANCE

Lawrence P. Slivka, Santa Monica, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 2, 1972, Ser. No. 231,430

Int. Cl.<sup>2</sup> F42B 15/02; G01S 7/46, 9/02

U.S. Cl. 343—7.4

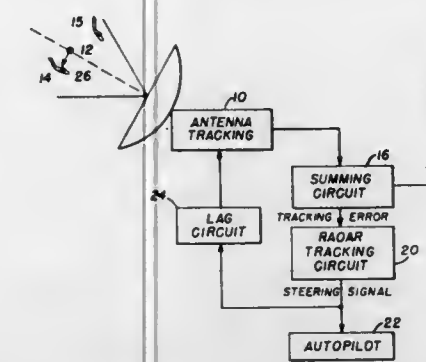
3 Claims

1. In an infrared tracking loop for use in the guidance system of a guided missile against multiple targets, the combination comprising:

a. an input terminal adapted to receive signals proportional to heading of the guided missile with respect to a reference plane,

b. a tracking antenna means for generating output signals proportional to the pointing direction of said antenna with respect to said reference plane,

- c. a summing circuit coupled to said input terminal and to said tracking antenna for providing an output tracking error signal,
- d. signal processing circuit means coupled to said summing circuit means for generating an output steering signal,



- e. time lag circuit means coupled between the output of said signal processing means and said tracking antenna means and being responsive to a step change in the output signal from said antenna tracking means to provide a feedback signal to cause said steering signal to be equal to said step change.

#### 4,010,468

### METHODS AND APPARATUS FOR ELIMINATING INTERFERENCE IN RADAR SYSTEMS

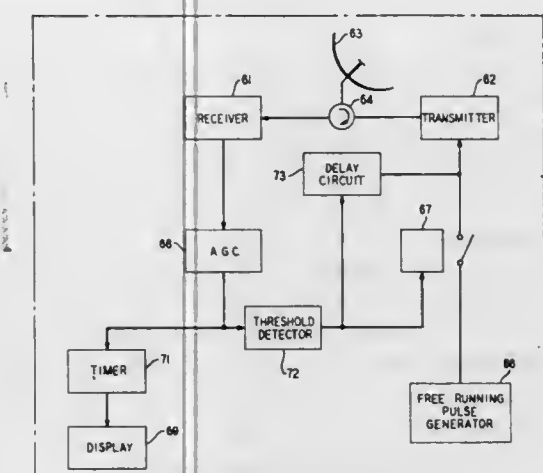
William Fishbein, Elberon; Reinhard Olesch, Englishtown, and Otto Rittenbach, Neptune, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 10, 1975, Ser. No. 621,260

Int. Cl.<sup>2</sup> G01S 7/28, 9/02

U.S. Cl. 343—7.5

9 Claims



7. Apparatus for eliminating interference between radar systems operating on a common frequency, each radar system including a transmitter and a receiver coupled by a circulator to a rotatable antenna, said apparatus comprising:

means connected to said receiver for detecting an interfering pulse which exceeds a preset threshold; and

means connected to said detecting means for delaying the generation of the output pulse from said transmitter next following receipt of said interfering pulse, said delaying means including

a free-running pulse generator connected to the triggering input of said transmitter,

a normally-closed switch means interposed between said pulse generator and said transmitter and responsive to the output of said detecting means for interrupting said pulse generator upon occurrence of said interfering pulse exceeding said threshold, and

a delay circuit connected between the output of said detector and the triggering input of said transmitter.

#### 4,010,469 INTERFERENCE SUPPRESSION

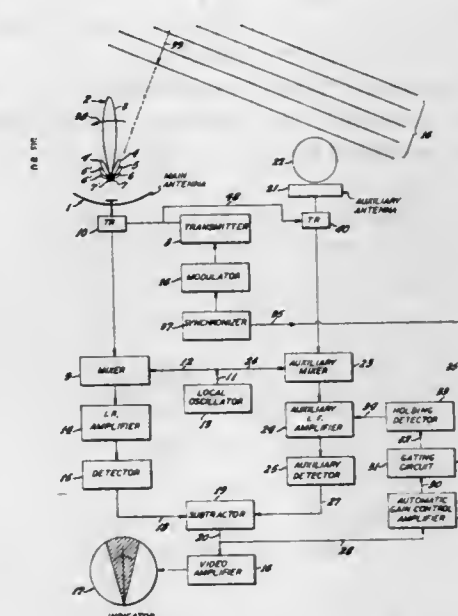
Jess I. Marcum, Santa Monica, Calif., assignor to The Rand Corporation, Santa Monica, Calif.

Filed June 20, 1951, Ser. No. 232,615

Int. Cl.<sup>2</sup> G01S 7/36; H04B 7/00

U.S. Cl. 343—18 E

4 Claims



4. A system for reducing the effect of unwanted signals directed toward a receiver intended to receive reflected pulsed signals through an antenna having a radiation pattern that includes a desired main lobe and undesired additional areas, which includes; means for receiving said reflected pulsed signals; other means for receiving said unwanted signals; means for combining the outputs of both said receiving means in opposition; means periodically adjusting the output of one of said receiving means relative to the other to provide a minimum output of said combining means; and means holding constant the adjustment of said adjusting means between said periodic adjustments.

#### 4,010,470

### MULTI-FUNCTION INTEGRATED RADOME-ANTENNA SYSTEM

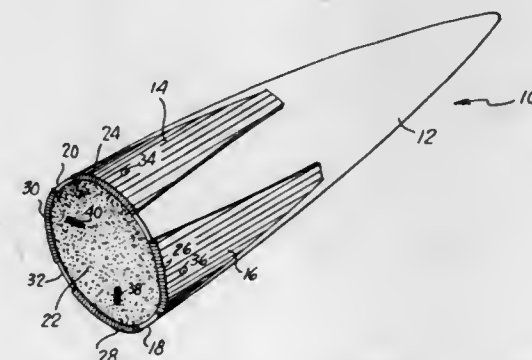
Howard S. Jones, Jr., Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 10, 1976, Ser. No. 665,665

Int. Cl.<sup>2</sup> H01Q 1/28

U.S. Cl. 343—708

10 Claims



1. A radome-integrated conformal parallel plate radiator for a projectile which comprises:

a dielectric radome shape to conform to the forward portion of said projectile, said radome having a non-planar exterior wall and an interior wall substantially parallel therewith;



metallic ground plane means formed on said interior wall of said dielectric radome; and wedge-shaped metallic coating means deposited on said exterior wall of said dielectric radome, said wedge-shaped metallic coating means being electrically short-circuited to said metallic ground plane means.

4,010,471

# POLARIZATION ROTATOR FOR PHASE ARRAY ANTENNAS

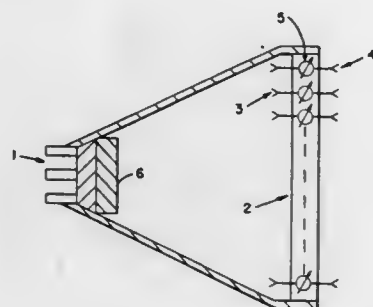
Bob L. Smith, deceased, late of Huntsville, Ala. (Capt. Allen Bond Adams, executor), assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 20, 1975, Ser. No. 588,983

Int. Cl.<sup>2</sup> H01G 3/14, 19/10, 19/18

U.S. Cl. 343-754

1 Claim



1. A system comprising feedhorn subsystem; a two dimensional array of polarization insensitive antenna elements arranged as an adjustable feed through lens; electromagnetic energy being space-fed between said subsystem and said antenna elements; polarization control means connected to said feedhorn subsystem so as to control the polarization of said energy; said polarization control means is a polarization rotator spatially located between said subsystem and said antenna elements; said feedhorn subsystem comprises a plurality of horn monopulse feeds; and said rotator being located adjacent to said plurality of feeds.

4,010,472

# ANTENNA SCANNING APPARATUS

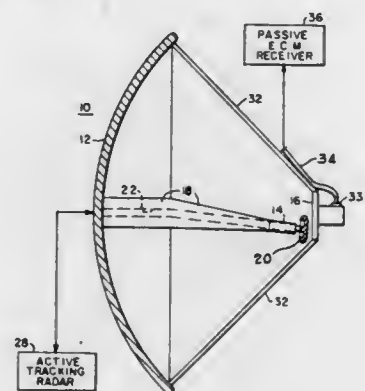
Paul H. Mountcastle, Glen Burnie, and William A. O'Berry, Severna Park, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1975, Ser. No. 631,972

Int. Cl.<sup>2</sup> H01Q 3/18

U.S. Cl. 343-761

7 Claims



1. Antenna apparatus for imparting predictable scanning motion to the antenna beam pattern, said apparatus comprising:

- a concave parabolic reflector for r.f. energy collimation, said reflector having boresight axis and a predetermined point of focus along said axis,
- first feed means movably mounted relative to the reflector, said first feed means being movable along a predeter-

mined scan path relative to the boresight axis, said first feed means having its aperture facing the reflector, and being constructed of a material which is opaque to the transmission of r.f. energy; and

- second feed means fixedly mounted relative to the reflector and disposed along the boresight axis at a position outwardly from the first feed means, said second feed means having its aperture feeding the reflector, such that the first feed means, when under motion along said predetermined path, forms a partial obstruction masking out ray paths between different portions of the aperture of the second feed means and the reflector to cause the second feed means to produce a scanned directivity beam.

4,010,473

# ANTENNA CONSTRUCTION

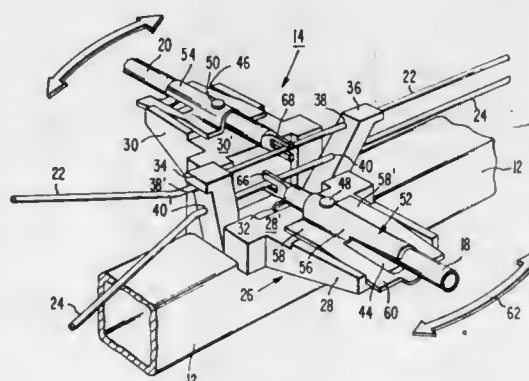
Franklin Roosevelt DiMeo, Woodbury, and William John Bachman, Mount Laurel, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,261

Int. Cl.<sup>2</sup> H01Q 11/10

U.S. Cl. 343-792.5

17 Claims



1. An antenna construction comprising:

- a support member,
- a signal element including a wire contacting end portion, a signal wire,
- first and second wire securing means mounted in spaced relationship on and along the length of said member to suspend said wire therebetween while insulating said wire from said member, and
- means for pivotally mounting said element on while insulating said element from said member to permit said contacting portion to wipe against and engage said suspended wire between said first and second securing means when said element is pivoted from a first non-contacting position to a second wire contacting position.

4,010,474

# TWO DIMENSIONAL ARRAY ANTENNA

Joseph H. Provencher, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1975, Ser. No. 574,216

Int. Cl.<sup>2</sup> H01Q 3/26

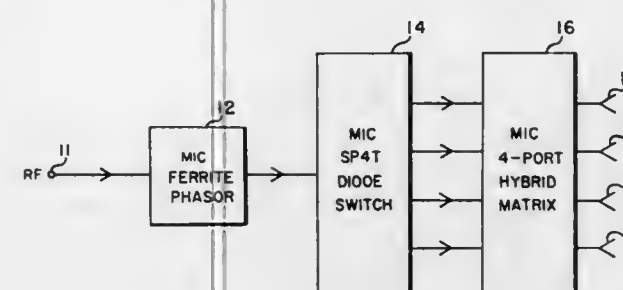
U.S. Cl. 343-814

7 Claims

1. A two dimensional antenna array system for simultaneous scanning in the azimuth and vertical comprising:

- phase shift circuit means having an input coupled to an RF energy source and having an output,
- a plurality of radiating elements positioned to form columns and rows,
- hybrid matrix circuit means having a plurality of outputs corresponding to the number of said radiating elements, each of said plurality of outputs being connected to a corresponding one of said corresponding plurality of radiating elements, and
- switch means coupling the output of said phase shift

circuit means to said hybrid circuit means whereby said RF energy is caused to be simultaneous radiated in azimuth and in elevation from said radiating elements, the



number of each of said phase shift circuit means, hybrid circuit means and switch means respectively equal the number of columns formed.

4,010,475

# ANTENNA ARRAY ENCASED IN DIELECTRIC TO REDUCE SIZE

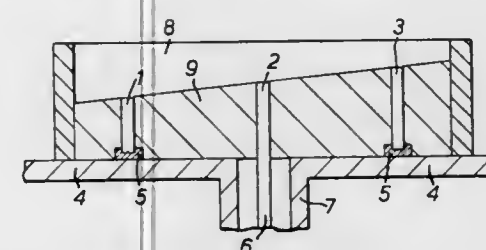
James Roderick James, Swindon, England, assignor to The Plessey Company Limited and Plessey Handel und Investments A.G., both of Essex, England

Continuation-in-part of Ser. No. 478,622, June 12, 1974, Pat. No. 3,924,238. This application Aug. 7, 1975, Ser. No. 602,724

Int. Cl.<sup>2</sup> H01Q 1/40

U.S. Cl. 343-830

2 Claims



1. A radio antenna comprising an active monopole a reflector monopole and at least one director monopole, and low-loss high-permittivity dielectric material surrounding the active monopole and the director monopole, the reflector monopole including a grid of conductive wires, and providing a closure wall for the dielectric material.

4,010,476

# METHODS AND APPARATUS FOR RECORDING WELL LOGGING MEASUREMENTS

Jennings W. Elliott, West Redding, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 15,790, March 2, 1970, abandoned, which is a continuation of Ser. No. 520,956, Nov. 4, 1974. This application Nov. 4, 1974, Ser. No. 520,957

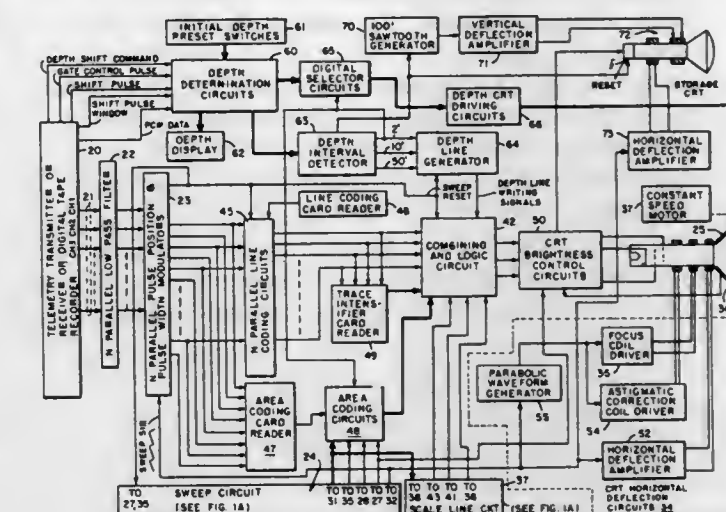
Int. Cl.<sup>2</sup> G01D 9/00

U.S. Cl. 346-1

27 Claims

1. The method of producing a graphic display of the condition of a signal, comprising the steps of analyzing said signal to derive a succession of values, each of which represents a successive condition of said signal, and producing successive substantially parallel lines on a display

medium, each of said lines being substantially continuous and extending between two points, the positions of which



represent, respectively, a corresponding two, consecutively derived ones, of said values.

4,010,477

# HEAD ASSEMBLY FOR A JET DROP RECORDER

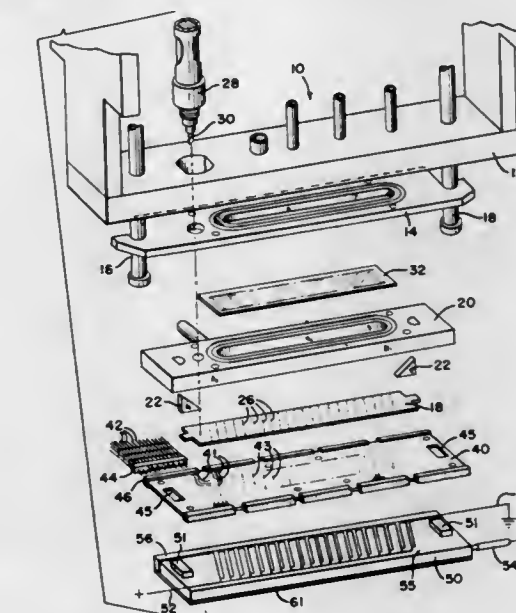
James A. Frey, Kettering, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 29, 1976, Ser. No. 653,443

Int. Cl.<sup>2</sup> G01D 15/18

U.S. Cl. 346-75

6 Claims



1. Jet drop recording apparatus comprising:

- a recording liquid supply manifold,
- an elongated orifice plate communicating with said manifold and provided with a plurality of orifice sets each comprising a plurality of uniformly sized and regularly spaced orifices arranged along a placement line extending angularly relative to the main axis of said orifice plate, said placement lines being parallel and having orifices placed therein such that members of a set of evenly spaced spacing lines parallel to said axis each pass through one orifice in each of said orifice sets,
- a charge plate mounted in parallel relation to said orifice plate and provided with a series of charging electrodes in alignment with said orifices,
- drop generating means for causing streams of recording liquid to flow continuously through said orifices and break up into drops at a regular frequency, said stream break-up into drops occurring in the region of said charging electrodes,
- charge control means electrically connected to said charging electrodes for charging selected ones of said drops in accordance with image information to be recorded,



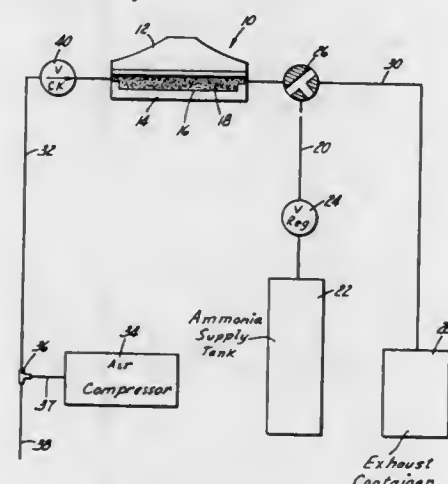
- f. a deflection electrode assembly comprising angularly extending deflection electrodes arranged parallel to said placement lines and positioned for passage therebetween of the drops generated by streams issuing from said orifice sets,
- g. means for generating electrical fields between paired sets of said deflection electrodes and creating deflected and non-deflected drop trajectory characterizations corresponding respectively to charged and uncharged drop conditions, and
- h. catching means for catching all drops having one of said trajectory characterizations while permitting passage of all drops having the other of said trajectory characterizations.

4,010,478

**PURGING SYSTEM FOR DIAZOTYPE FILM DEVELOPER**  
Johannes K. Jantzen, Mountain View, Calif., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio  
Filed Aug. 14, 1975, Ser. No. 601,009  
Int. Cl.<sup>2</sup> G03D 7/00

U.S. Cl. 354—300

6 Claims



6. A system for purging contaminants from a developer station using ammonia gas for developing diazo type materials, comprising:

- developer means actuable from an inoperative to an operative position to perform a development cycle and return to the inoperative position;
- an ammonia gas supply for supplying gas under pressure to the developer station during a development cycle;
- valve means operable between a first position to permit flow of gas from the gas supply to the developer station during a development cycle, and a second position to permit exhausting the gas from the developer station;
- a check valve operable between a closed position to prevent escape of the gas from the developer station during a development cycle, and an open position to permit flow of compressed air therethrough when the valve means is in the second position;
- a compressed air supply means for supplying air to the developer station when the check valve is in the open position to perform a purging operation for purging the developer station of contaminants;
- an exhaust container for collecting the contaminants from the developer station; and
- an exhaust flow extending from the valve means to the exhaust container for delivering the contaminants to the exhaust container when the valve means is in the second position;
- said developer means being actuated from the operative to the inoperative position following a purging operation of the developer station while the compressed air continues to be supplied to the developer station until a subsequent development cycle is initiated.

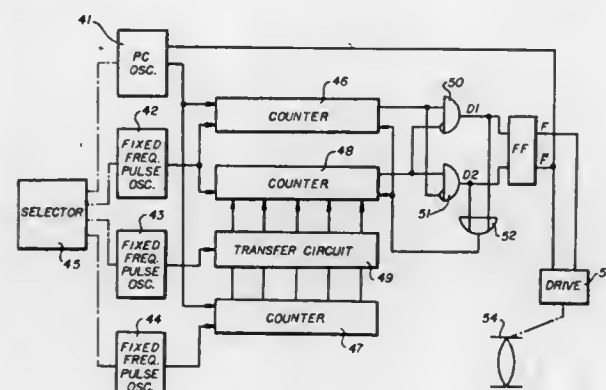
**4,010,479**  
**FOCUSING APPARATUS FOR OPTICAL SYSTEMS**  
Tsukumo Nobusawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed June 30, 1975, Ser. No. 591,464

Claims priority, application Japan, July 10, 1974, 49-78212; Apr. 23, 1975, 50-49268

Int. Cl.<sup>2</sup> G03B 7/08

U.S. Cl. 354—25

24 Claims



1. Focusing apparatus for use in an optical system comprising:

- at least one photoconductive element mounted such that an imaging lens forming part of an optical system directs light onto its photosensitive surface and having an internal resistance that varies in accordance with the intensity of light impinging onto its photo sensitive surface;
- pulse generating means for generating pulse trains, said pulse generating means connected to said at least one photoconductive element such that the frequency of the pulses generated by said pulse generating means is related to the internal resistance of said at least one photoconductive element;
- counting means connected to said pulse generating means for counting two pulse trains generated by said pulse generating means during a predetermined time period;
- comparing means connected to said counting means for comparing said two pulse trains counted by said counting means; and,
- output means connected to said comparing means for providing one form of output when said comparing means determines that said two pulse trains include an equal number of pulses and a different form of output when said comparing means determines that said two pulse trains include different numbers of pulses, said equality of pulses occurring when said optical system is in focus.

4,010,480

**CONTROL CIRCUIT FOR AUTOMATICALLY CONTROLLING A DIAPHRAGM OF A CAMERA**  
Takayoshi Sato, Tokyo, Japan, assignor to Yugenkaisha Sato Kenkyusho, Tokyo, Japan  
Filed Aug. 12, 1975, Ser. No. 604,067

Claims priority, application Japan, Aug. 19, 1974, 49-94240; Aug. 19, 1974, 49-94241

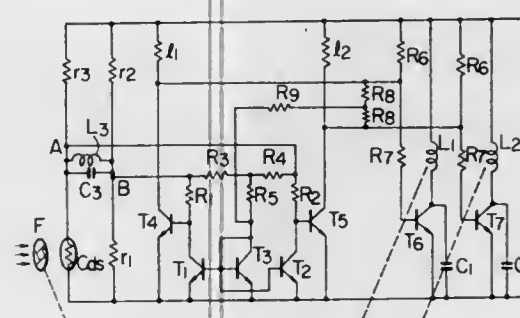
Int. Cl.<sup>2</sup> G03B 7/08

U.S. Cl. 354—43

6 Claims

1. Control circuit for automatically controlling a diaphragm of a camera for proper exposure comprising a pair of coils for actuating diaphragm adjusting means coupled with said diaphragm, one of said coils, when energized, actuating said adjusting means in one direction for opening said diaphragm while the coil, when energized, actuates said adjusting means in the opposite direction for closing said diaphragm, and a circuit having photoelectric element for generating a first input and a second input for the respective one of said coils varying oppositely to each other depending upon the scene light quantity received by said photoelectric element through said diaphragm so that said diaphragm is driven and held at

the proper exposure condition at the balance point of said first and said second input under the condition of said scene light quantity received by said photoelectric element through said diaphragm, a first transistor with its emitter grounded while its collector is connected to the base thereof to effect diode connection, a first pair of transistors of the same characteristics as said first transistor with their emitters grounded while the bases thereof are connected to the base of said first transistor, a second pair of transistors of the same characteristics as said first transistor with their emitters grounded while the bases thereof are connected to the collectors of the respective transistors of said first pair to form emitter grounded amplifiers, each of the collectors of the transistors of said first pair



being connected to said first input and said second input through a resistor, respectively, while the collector of said first transistor is connected through a resistor to the midpoint of a resistor connected between said first input and said second input, each of the collectors of the transistors of said second pair being connected to the respective one of said pair of coils, a first resistor connected between said collectors of the transistors of said second pair, the midpoint of said first resistor being connected through a second resistor to the midpoint of said resistor connected between said first and second input so as to effect negative feedback, the current flowing through said pair of coils being thereby reduced to the minimum at the balance point of said first and said second input at which said diaphragm is held at the proper exposure condition.

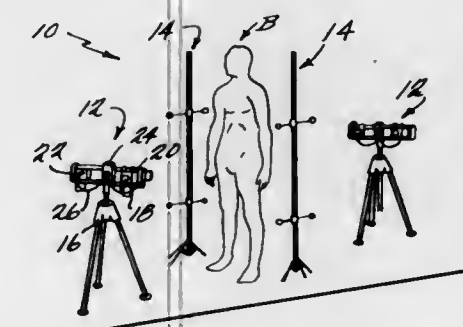
4,010,481

**STEREOMETRIC CAMERA SYSTEM**  
Joseph O. Danko, Jr., Baltimore, Md., and Jaime R. Cuzzi, Houston, Tex., assignors to Danko Arlington, Inc., Baltimore, Md.  
Filed Oct. 14, 1975, Ser. No. 621,785

Int. Cl.<sup>2</sup> G03B 35/08

U.S. Cl. 354—113

21 Claims



1. A camera for a stereophotogrammetric assembly, comprising:

- a. a camera housing,
- b. a flat transparent plate in said camera housing,
- c. a lens associated with said housing, said lens being adjustable with respect to said flat plate,
- d. means for adjusting the distance of said lens from said glass plate, and
- e. means for holding a film length flatly against said flat transparent plate during exposure of said film, said means comprising (i) a film engaging member, (ii) a shaft operatively connected at one end thereof to said film engaging

member by means for allowing pivotal movement therebetween, (iii) means for biasing said film engaging member into engagement with said flat plate, for flatly pressing a film length located between said transparent plate and said member against said transparent plate, and (iv) means located exteriorly of said housing attached to said shaft for moving said film engaging member from a position pressing said member into engagement with said film to a position wherein said member is spaced from said glass plate and film disposed between said plate and said member may be removed therefrom.

4,010,482

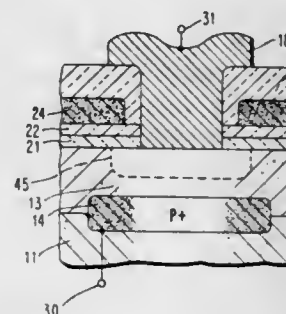
**NON-VOLATILE SCHOTTKY BARRIER DIODE MEMORY CELL**

Shakir Ahmed Abbas, Wappingers Falls; Narasipur Gundappa Anantha, Hopewell Junction, and Robert Charles Dockerty, Highland, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Dec. 31, 1975, Ser. No. 645,767

Int. Cl.<sup>2</sup> H01L 29/48, 29/56, 29/64, 29/78

U.S. Cl. 357—15

5 Claims



1. A non-volatile memory element comprising a substrate of one conductivity type, a region of opposite conductivity type provided within said substrate having a first electrode in ohmic contact therewith, an epi layer of said first conductivity type formed upon said substrate, a second electrode in contact with said epi layer through a Schottky barrier, a thin layer of insulating material upon said epi layer adjacent to said Schottky barrier, said layer including electron trapping centers and trapped electrons therein when a bias exceeding a critical value is applied across said Schottky barrier, and a layer of conductive material deposited on said layer of insulating material and having a third electrode in ohmic contact therewith.

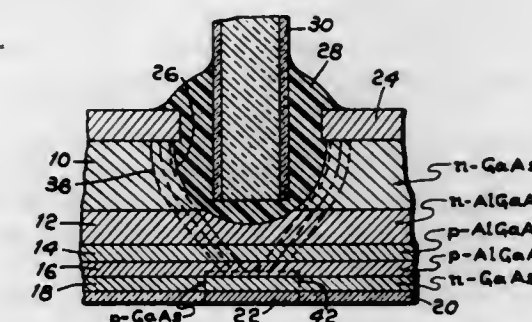
4,010,483

**CURRENT CONFINING LIGHT EMITTING DIODE**  
Yet-Zen Liu, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.  
Filed Aug. 8, 1974, Ser. No. 495,488

Int. Cl.<sup>2</sup> H01L 33/00

U.S. Cl. 357—17

7 Claims



1. A light emitting gallium arsenide-gallium aluminum arsenide diode comprising:  
a substrate layer of GaAs of a first conductivity type, a first layer of AlGaAs of said first conductivity type over said substrate layer,



a second layer of AlGaAs on said first layer of AlGaAs, said second layer having a different Al concentration than said first layer,  
 a third layer of AlGaAs of a second conductivity type on said second layer of AlGaAs,  
 a fourth layer of GaAs on said third layer of AlGaAs,  
 a first metal contact electrode in a central area on said fourth layer,  
 a second metal contact electrode on the opposite side of said substrate layer,  
 a light emitting well hole in a central area of said metal electrode on said substrate layer and in said substrate layer, and  
 an area of proton bombardment induced high resistivity in said first, second, third and fourth layers surrounding said central area adjacent said first metal electrode on said fourth layer, said resistivity being sufficient to provide a current conduction barrier, said central area adjacent said first electrode being of a low resistivity within said surrounding high resistivity area.

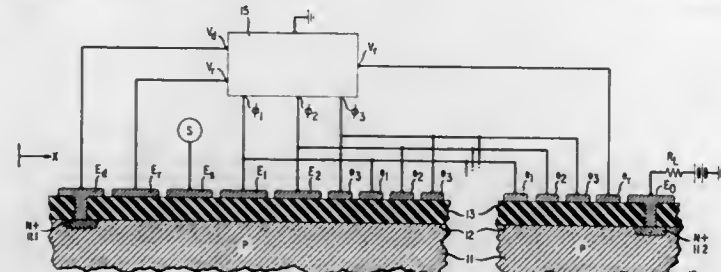
4,010,484

## CHARGE INJECTION INPUT NETWORK FOR SEMICONDUCTOR CHARGE TRANSFER DEVICE

Amr Mohamed Mohsen, North Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
 Filed Aug. 16, 1974, Ser. No. 498,052  
 Int. Cl.<sup>2</sup> H01L 29/78

U.S. Cl. 357-24

8 Claims



1. Apparatus including an input network for a charge transfer device medium which comprises:
  - a. an input region in the medium for periodically injecting charge into the medium;
  - b. a reference region contiguous to the input region;
  - c. a signal region contiguous to the reference region and spatially followed by the bulk of the charge transfer device, the potential of the signal region being controlled by a signal, the signal region thereby collecting charges injected by the input region through the reference region in accordance with the signal for subsequent transfer of said charges as packets through the bulk of the charge transfer device, and the reference region serving as a constant reference potential region both for transfer of charges from the input region to the signal region and for containing said charges in the signal region after transfer into the signal region, said input region, reference region, and signal region located in a spatial sequence at the input end of the device;
  - d. circuit means for applying voltages to an input electrode associated with and contacting the input region sufficient for periodically injecting charges into the medium during a time interval in each off phase of a clock pulse sequence of voltages applied to a first transfer electrode of the bulk of the charge transfer device, and for applying voltages to a reference electrode associated with and in proximity to the reference region sufficient to maintain said reference region at the reference potential  $V_r$  which is constant in time, the electrodes associated with the signal region, the first transfer electrode and a next in sequence second transfer electrode of the bulk of the transfer device being all at least about twice as long in the charge transfer direction in the device as the other electrodes in the bulk

of the charge transfer device, said other electrodes all being substantially of the same length in the charge transfer direction; and  
 e. circuit means for applying voltages to an electrode associated with the signal region in accordance with the signal.

4,010,485

## CHARGE-COUPLED DEVICE INPUT CIRCUITS

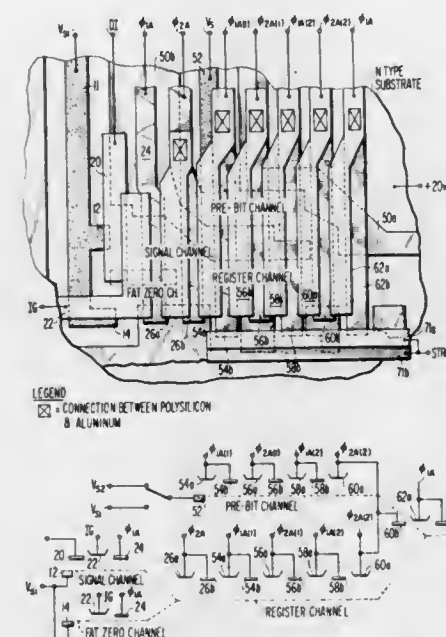
Donald Jon Sauer, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 13, 1974, Ser. No. 479,050

Int. Cl.<sup>2</sup> H01L 29/78

U.S. Cl. 357-24

6 Claims



1. A charge coupled device shift register comprising, in combination:

- a first charge coupled device register channel including a source of minority charge carriers, means for periodically introducing into said channel a fixed amount of charge signal from said source and means for shifting said charge signal down said channel;
  - a second charge coupled device register channel including a second source of minority charge carriers, means for periodically introducing into said second channel, concurrently with the introduction of said fixed amount of charge into said first channel, one of a charge signal from said second source in fixed proportion to that introduced into said first channel to represent one binary value, and no charge signal from said second source to represent the other binary value, and means for shifting the  $a$  and  $b$  charge signals down said second channel concurrently with the shifting of signals down said first channel;
  - a third charge coupled device register channel at the output end of said first and second channel for receiving each charge signal transmitted down said first channel and combining it with the corresponding charge signal  $a$  or  $b$ , as the case may be, received from the second channel, and including means for propagating the combined charge signal down said third channel;
  - a fourth charge coupled device register channel including a third source of minority charge carriers, means for introducing into said channel a charge signal from said third source, and means for propagating said charge signal down said fourth channel, said fourth channel connected at its output end to said third channel at a point beyond where said first and second channels join said third channel; and
- means for controlling said fourth charge coupled register channel to introduce one charge signal from said third

source into said fourth channel only at the start of each stream of  $M$  charge signals introduced at said second channel, each such stream having a leading end, and timed so that said one charge signal reaches said third channel before and within, at most, several periods of the periodically introduced charge signals, of the time the leading end of said stream reaches the point where said fourth channel joins said third channel, where  $M$  is an integer equal to at least 10.

4,010,486

## SENSING CIRCUITS

Sadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

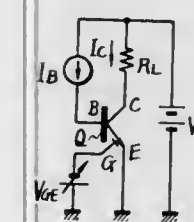
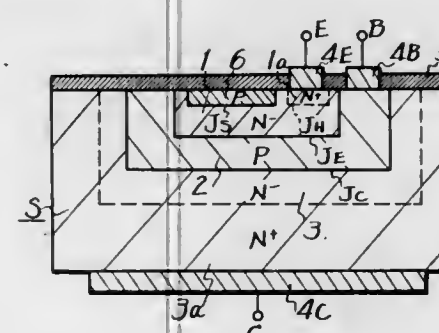
Filed Apr. 25, 1975, Ser. No. 571,688

Claims priority, application Japan, May 10, 1974, 49-52116

Int. Cl.<sup>2</sup> H01L 29/66, 27/22, 29/74; H03K 3/26

U.S. Cl. 357-25

7 Claims



1. A sensing circuit for detecting a change in a characteristic of an object comprising a semiconductor device having a first semiconductor region of one conductivity type forming an emitter region, a second semiconductor region of the opposite conductivity type forming a base region adjacent said first region with a first semiconductor junction therebetween, a third semiconductor region of the same conductivity type of said first region forming a collector region adjacent said second region with a second semiconductor junction therebetween, an insulating layer on the outer surface of said emitter region, a gate electrode on said insulating layer forming a gate over said emitter region only, said semiconductor device having an emitter grounded current amplification variation in response to changes in voltage between said emitter region and said gate, said variation exhibiting a minimum value at a first voltage between said emitter region and gate and an increasing value for voltages higher and lower than said first voltage, an output circuit connected to said collector region, a base bias circuit connected to said base region, a gate bias circuit connected to said gate, one of said bias circuits including a sensing element for detecting the change in characteristic of said object and the other bias circuit including a bias adjustment element, whereby a change in the object characteristic creates a variation in the current amplification which changes a voltage level in the output circuit.

4,010,487

## SEMICONDUCTOR ARRANGEMENT

Gunter Absalon; Konrad Fischer, both of Heilbronn, and Rainer Grosholz, Heilbronn-Bockingen, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

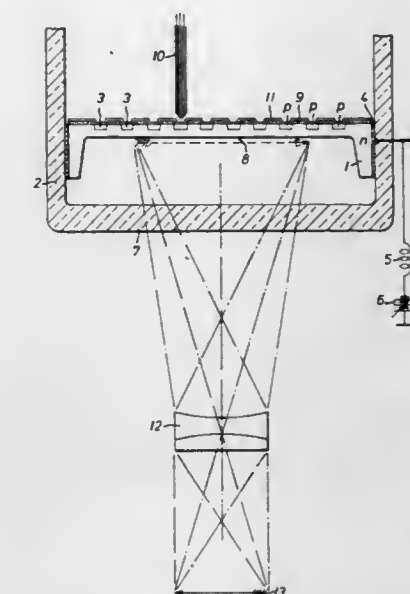
Filed Feb. 23, 1972, Ser. No. 228,645

Claims priority, application Germany, Mar. 2, 1971, 2109814

Int. Cl.<sup>2</sup> H01L 27/14

U.S. Cl. 357-31

11 Claims



1. A multidiode charge store for an electron beam picture pickup tube comprising in combination; a semiconductor body of a first type of conductivity, a plurality of juxtaposed regions of a second type of conductivity formed in said semiconductor body from one surface thereof and forming respective diodes therewith, an insulating layer on said surface of said semiconductor body and defining an opening above each of said plurality of regions of said second type of conductivity which openings extend to said surface of said semiconductor body, and a resistance layer provided on said one surface of said semiconductor body, said resistance layer covering the exposed portions of said regions within said openings in said insulating layer and extending over at least the adjacent portions of said insulating layer surrounding said openings, said resistance layer having a resistance which is sufficiently high so as to constitute a means for avoiding an interfering charge of said insulating layer by the electron beam scanning said surface of said semiconductor body and a discharge of the barrier layer capacitance of the diodes between two successive scans, said resistance layer comprising a metal silicide compound with the metal being selected from the subgroups of groups V and VI of the periodic table which contain tantalum, molybdenum or tungsten.

4,010,488

## ELECTRONIC APPARATUS WITH OPTIONAL COUPLING

Raymond F. Gruszka, Reading, and Clarence A. Warczyglowa, Laureldale, both of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 21, 1975, Ser. No. 634,211

Int. Cl.<sup>2</sup> H01L 23/48, 29/44, 29/52, 29/60

U.S. Cl. 357-70

12 Claims

1. Electronic apparatus comprising a circuit element and means providing preselected electrical coupling to said element, said means including first and second spaced apart coupling sites and first and second conductive members individually coupled to said first and second sites, respectively; and  
 a third coupling site disposed between and spaced from said







# DESIGN PATENTS

GRANTED MARCH 1, 1977

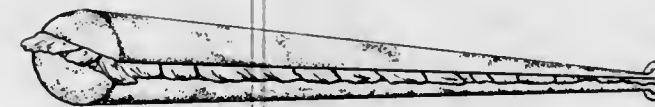
## ERRATA

For CLASS	See PATENT NO.
023-090 .....	243,510
014-042 .....	243,534
064-011 B .....	243,535
014-057 .....	243,536
014-095 .....	243,537
014-006 .....	243,538
024-029 .....	243,542
024-029 .....	243,543
015-199 .....	243,551
015-092 .....	243,552
015-199 .....	243,553
014-075 .....	243,554
015-072 .....	243,555
024-009 .....	243,556
028-018 .....	243,558
028-038 .....	243,559

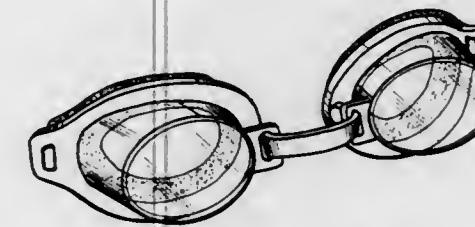
# DESIGNS

MARCH 1, 1977

<p>243,481 SANDWICH Melvin A. Benedict, 1228 Long Run Road, McKeesport, Pa. 15121 Filed Sept. 9, 1974, Ser. No. 504,171 Term of patent 14 years Int. Cl. D1-99 U.S. Cl. D1-15</p>	<p>243,484 PROTECTIVE HELMET, OR THE LIKE Jhoon Goo Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207 Filed Oct. 21, 1975, Ser. No. 624,412 Term of patent 14 years Int. Cl. D2-03 U.S. Cl. D2-232</p>
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<p>243,482 SWIM GOGGLES Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass. Filed Jan. 14, 1976, Ser. No. 649,029 Term of patent 14 years Int. Cl. D2-03 U.S. Cl. D2-234</p>	<p>243,485 STOCKING Sonja E. Hedgepeth, 2118 Walnut St., Philadelphia, Pa. 19103 Filed Jan. 8, 1975, Ser. No. 539,534 Term of patent 14 years Int. Cl. D2-04 U.S. Cl. D2-330</p>
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<p>243,483 BOOT Thaddeus A. Pietraszek, Waterbury; Richard J. Van Twisk, Naugatuck, and Algis B. Brazdzionis, Oakville, all of Conn., assignors to Uniroyal Inc. Filed Oct. 1, 1975, Ser. No. 618,530 Term of patent 14 years Int. Cl. D2-04 U.S. Cl. D2-275</p>	<p>243,486 CHAIR Randall P. Buhk, Wyoming, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich. Filed Sept. 5, 1975, Ser. No. 610,837 Term of patent 14 years Int. Cl. D6-01 U.S. Cl. D6-30</p>
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243,487  
SECRETARIAL ARM CHAIR

Randall P. Buhk, Wyoming, Mich., assignor to Steelcase, Inc., Arden R. Reusink, 6339 Brooks Drive, Arvada, Colo. 80004  
Grand Rapids, Mich.

Filed Sept. 5, 1975, Ser. No. 610,836

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-31



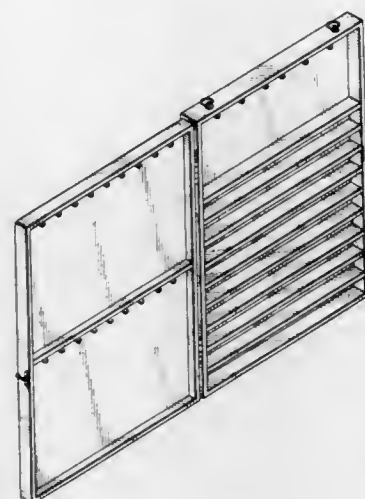
243,490  
JEWELRY CABINET

Filed May 19, 1976, Ser. No. 688,099

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-127



243,488  
COMBINATION FAUCET EXTENDER AND GARDEN  
HOSE RACK

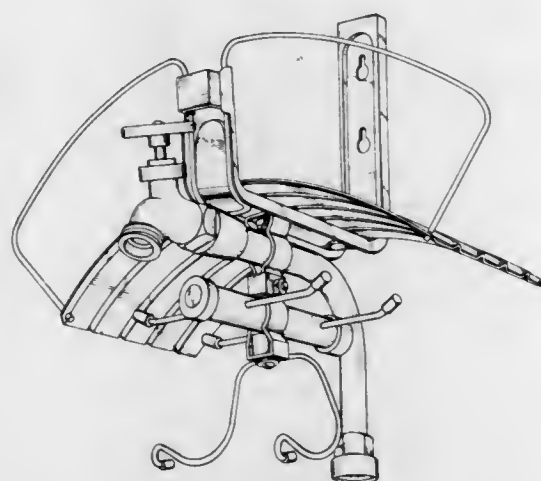
Lincoln L. Linse, 13625 NW. Westlawn Terrace, Portland, Oreg. 97229

Filed Sept. 22, 1975, Ser. No. 615,296

Term of patent 14 years

Int. Cl. D6-06; D23-01

U.S. Cl. D6-112



243,491  
MIRRORED BATHROOM CABINET

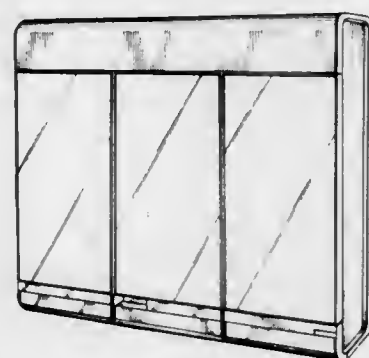
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France

Filed June 21, 1974, Ser. No. 481,863

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-129



243,489  
HANGING SUPPORT FOR POTS, PANS, OR THE LIKE

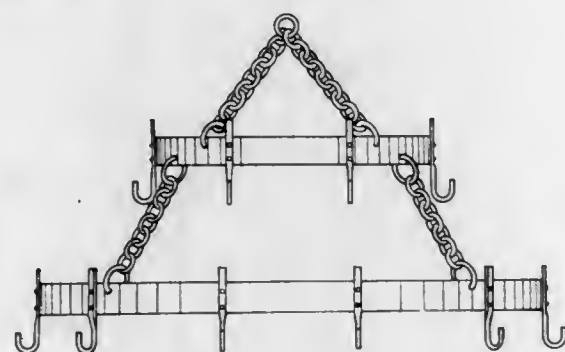
Jacque E. Moore, P.O. Box 1791, Spokane, Wash. 99207

Filed May 27, 1975, Ser. No. 581,290

Term of patent 7 years

Int. Cl. D6-04

U.S. Cl. D6-113



243,492  
DISPLAY STAND

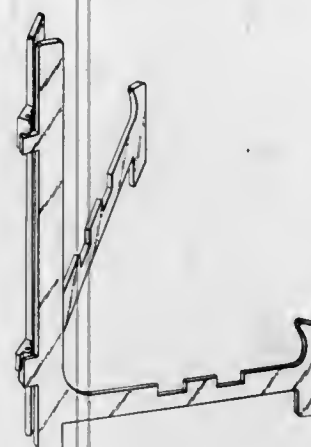
Michael Stewart Gorwits, 32 Allerton Grove, Leeds LS17 6RQ, England

Filed May 21, 1976, Ser. No. 688,913

Term of patent 14 years

Int. Cl. D6-04; D20-02

U.S. Cl. D6-140



243,493  
MIXING AND CASTING TABLE

Maurice E. Meisner, 3107 Millers Lane, Louisville, Ky. 40216

Continuation-in-part of Ser. No. 508,424, Sept. 23, 1974, abandoned, and a continuation-in-part of Ser. No. 273,811, July 21, 1972, abandoned. This application Oct. 15, 1975, Ser. No. 622,694

Term of patent 14 years

Int. Cl. D6-03

U.S. Cl. D6-177



243,494  
HOLDER FOR COINS

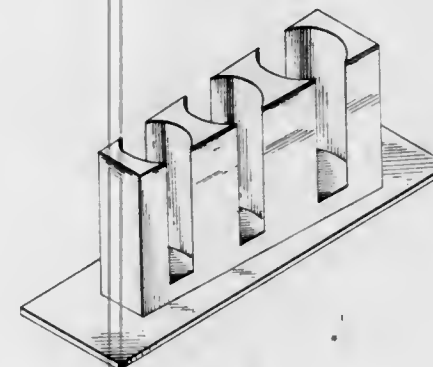
Hsio Wang, 2850 Citadel Drive NE., Warren, Ohio 44483

Filed Sept. 2, 1975, Ser. No. 609,345

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-188



243,495  
DISPLAY APPARATUS FOR AUTOMOBILE SOUND  
ENTERTAINMENT PRODUCTS OR THE LIKE

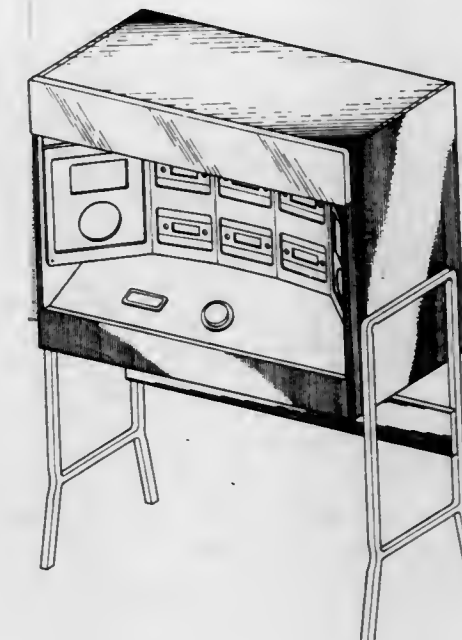
Paul Dean McGee, Medinah, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1975, Ser. No. 601,110

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-190



243,496  
VENTILATED COVER FOR MOTORCYCLE SEAT

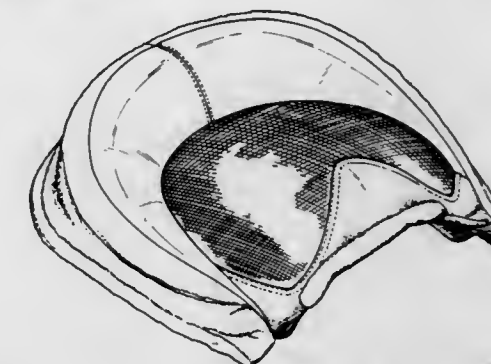
Robert E. Flowers, Rte. 1, 3 Mile Lake, Bayshore Drive, Paw Paw, Mich. 49079

Filed Oct. 3, 1975, Ser. No. 619,194

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D6-191



243,497  
CLOTHES HANGER BODY

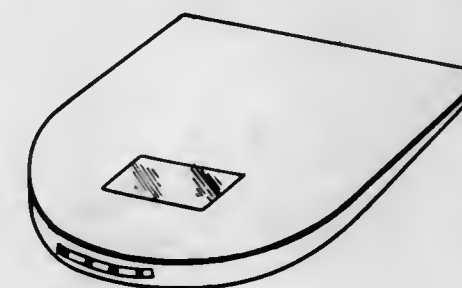
José Brufau, 19, Santa Magdalena Sofia St., Barcelona, Spain

Filed Nov. 16, 1973, Ser. No. 416,411

Term of patent 3½ years

Int. Cl. D6-08

U.S. Cl. D6-257

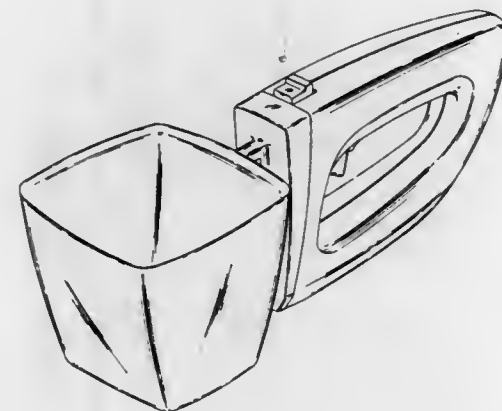




243,498

**CORDLESS ELECTRICALLY HEATED CUP**Pino Pianezza, 1129 S. Spring St., Springfield, Ill. 62704  
Filed June 26, 1975, Ser. No. 590,464Term of patent 14 years  
Int. Cl. D7-01

U.S. Cl. D7-9



243,500

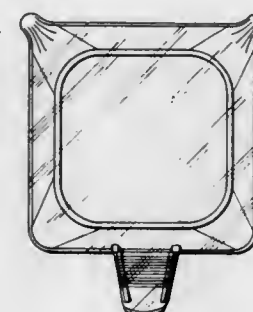
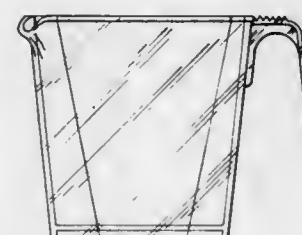
**MEASURING CUP**

Jack P. Cooper, 118 Riviera Drive South, Massapequa, Nassau, N.Y. 11758

Filed Apr. 21, 1975, Ser. No. 569,598  
Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D7-50



243,499

**WATER METERING APPARATUS FOR A COFFEE MAKER OR SIMILAR ARTICLE**

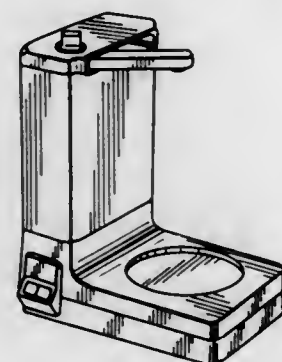
Hans Joachim Hugo Julkenbeck, Wijnjetep, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,395

Claims priority, application Switzerland, Aug. 19, 1974, 59307/74

Term of patent 14 years  
Int. Cl. D7-02

U.S. Cl. D7-41



243,501

**COFFEEMAKER**

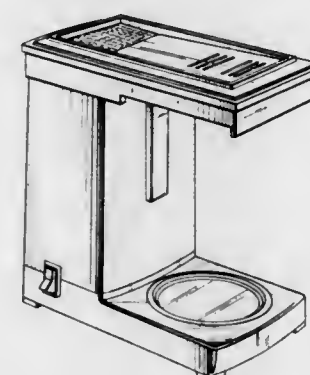
David L. Painter, Glenview, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed June 6, 1975, Ser. No. 584,541

Term of patent 14 years

Int. Cl. D7-02

U.S. Cl. D7-62



243,502

**BURNER ASSEMBLY FOR A PORTABLE COOKING STOVE**

Ming Kong Chan, 58 Pau Chung St., Tokwawan, Kowloon, Hong Kong

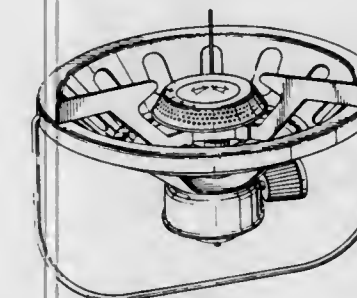
Filed June 11, 1975, Ser. No. 585,984

Claims priority, application United Kingdom, Feb. 21, 1975, 969974/75

Term of patent 14 years

Int. Cl. D7-04

U.S. Cl. D7-136



243,504

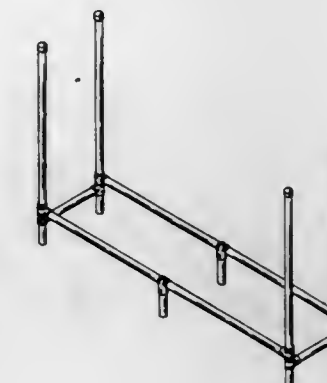
**WOOD RACK, OR SIMILAR ARTICLE**

Sammy C. Morrison, Rte. 1, Rogers, Ark. 72756

Filed Aug. 28, 1975, Ser. No. 608,711

Term of patent 14 years

Int. Cl. D7-08



243,505

**DRILL GUIDE**

Ronald Price Hickman, "Badgers", Middle St., Nazeing, Waltham Abbey, Essex, England

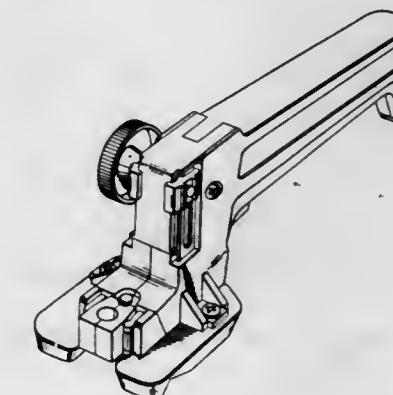
Filed Aug. 20, 1975, Ser. No. 606,334

Claims priority, application United Kingdom, Feb. 21, 1975, 969979/75

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-14



243,503

**SPOON OR SIMILAR ARTICLE**

Colin B. Richmond, II, Oneida, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 25, 1975, Ser. No. 604,393

Term of patent 14 years

Int. Cl. D7-03

U.S. Cl. D7-137



243,506

**SKATE BOARD ADJUSTMENT TOOL**

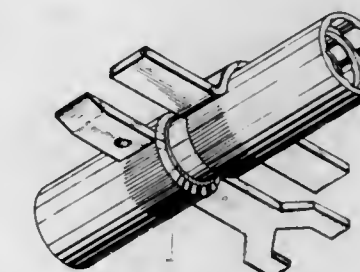
Albert J. Hess, 8837 Brookdale Drive, Garden Grove, Calif. 92644

Filed Nov. 3, 1975, Ser. No. 628,080

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-87

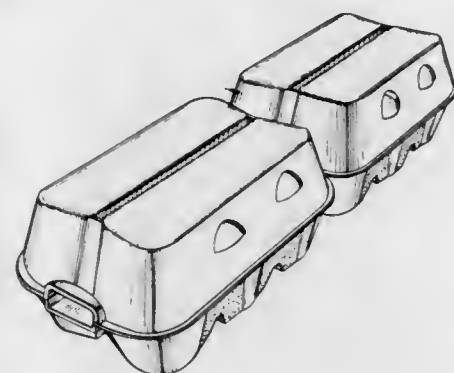




243,507  
EGG CARTON

Jorgen Nilas Petersen, Lyngby, Denmark, assignor to Ak-tieselskabet Brodrene Hartmann, Lyngby, Denmark  
Filed Dec. 2, 1974, Ser. No. 528,668  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-190



243,509  
PLANT STAKE

Philip T. Wheeler, DeWitt, Mich., assignor to The John Henry Company, Lansing, Mich.  
Filed Mar. 18, 1976, Ser. No. 668,211  
Term of patent 14 years  
Int. Cl. D31-00

U.S. Cl. D8-1

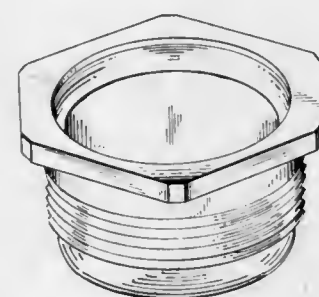


243,510  
SCREW PLUG MOUNTING FOR AN ELECTRIC  
IMMERSION HEATER

Robert D. Shirey, 207 Ennerdale Drive, Pittsburgh, Pa. 15208, and Joseph L. Lohman, 108 Ringold Ave., Pittsburgh, Pa. 15205

Filed Mar. 22, 1976, Ser. No. 669,153  
Term of patent 14 years  
Int. Cl. D8-08

U.S. Cl. D23-90

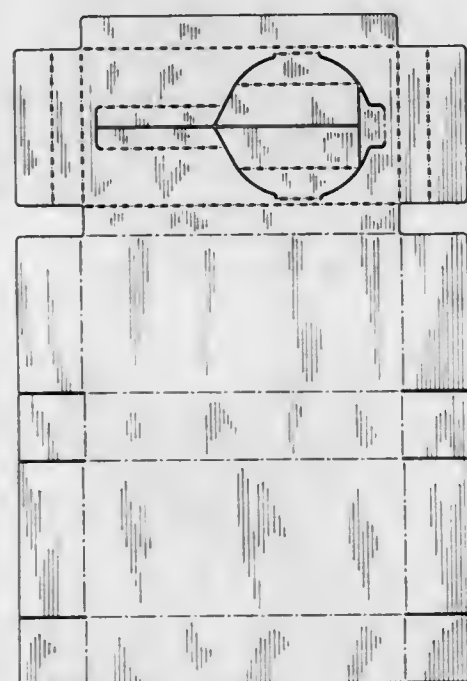


243,508  
BOX BLANK

Earl J. Kilby, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed Aug. 13, 1975, Ser. No. 604,419  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-245

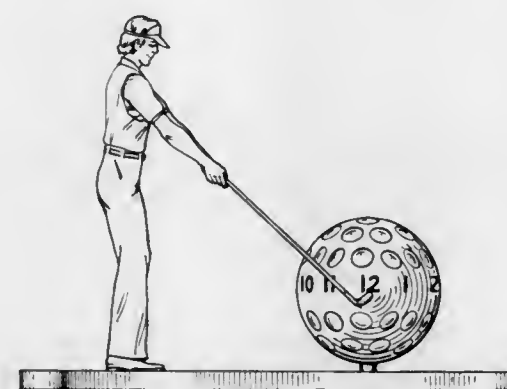


243,511  
CLOCK OR SIMILAR ARTICLE

James O. O'Brien, 2101 Hawk Lane, Rolling Meadows, Ill. 60008

Continuation-in-part of Ser. No. 545,323, Jan. 30, 1975, abandoned. This application Jan. 23, 1976, Ser. No. 651,849  
Term of patent 14 years  
Int. Cl. D10-01

U.S. Cl. D10-8

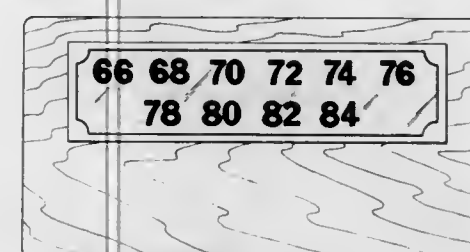


243,512  
CARD-MOUNTED THERMOMETER

Philip L. Van Kersen, P.O. Box 40423, Indianapolis, Ind. 46240

Filed June 16, 1975, Ser. No. 586,875  
Term of patent 14 years  
Int. Cl. D10-04

U.S. Cl. D10-57

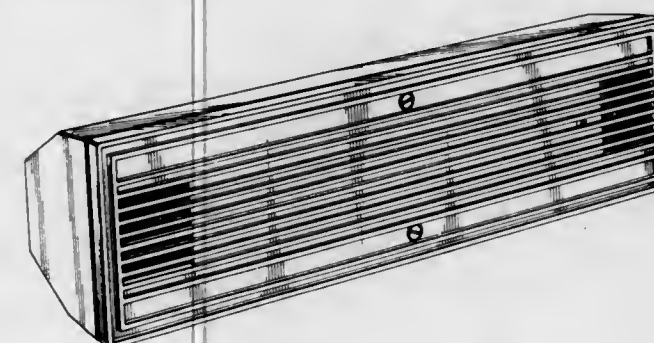


243,513  
INTRUSION ALARM

Aaron A. Galvin, Lexington, and Francis R. Keeler, Needham, both of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed Feb. 12, 1976, Ser. No. 657,709  
Term of patent 14 years  
Int. Cl. D10-05

U.S. Cl. D10-106

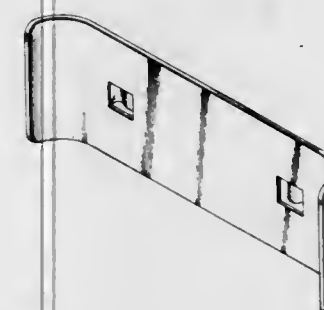


243,514  
CLIP-ON WHEEL REFLECTOR FOR BICYCLES

Joseph L. Coulombe, 4351 Drew Ave. South, Apt. No. 3, Minneapolis, Minn. 55410

Filed June 9, 1975, Ser. No. 585,027  
Term of patent 14 years  
Int. Cl. D26-06

U.S. Cl. D10-111

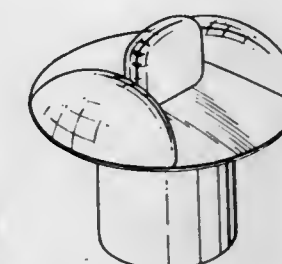


243,515  
ROAD MARKER

Mendel King, 46 Primley Park Ave., Leeds 17, Yorkshire, England

Filed Feb. 23, 1976, Ser. No. 660,277  
Claims priority, application United Kingdom, Sept. 5, 1975, 972467/75

Term of patent 14 years  
Int. Cl. D10-06  
U.S. Cl. D10-113

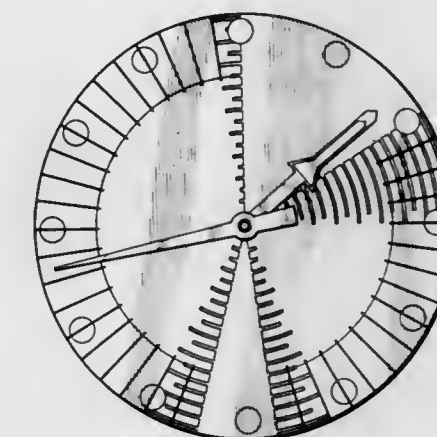


243,516  
COMBINED DIAL AND HANDS FOR A TIMEPIECE

Hugo Vajk, Kerlaz, France, assignor to Regent Marine & Instrumentation, Inc., Buffalo, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,467  
Term of patent 14 years  
Int. Cl. D10-07

U.S. Cl. D10-126

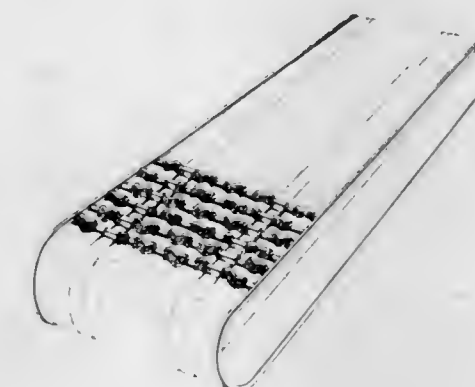


243,517  
SNOWMOBILE TRACK

Jean-Rock Belanger, Drummondville, Canada, assignor to Bombardier Limited

Filed July 1, 1975, Ser. No. 592,272  
Claims priority, application Canada, Mar. 21, 1975, 210375  
Term of patent 14 years  
Int. Cl. D12-14

U.S. Cl. D12-7





243,518

**MULTIPLE USE SERVICE CART**

Richard R. Dillon, Marlboro, and John F. Graham, Sudbury, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Nov. 3, 1975, Ser. No. 627,957

Term of patent 14 years

Int. Cl. D12-02

U.S. Cl. D12-29



243,521

**CAR BODY**

Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault

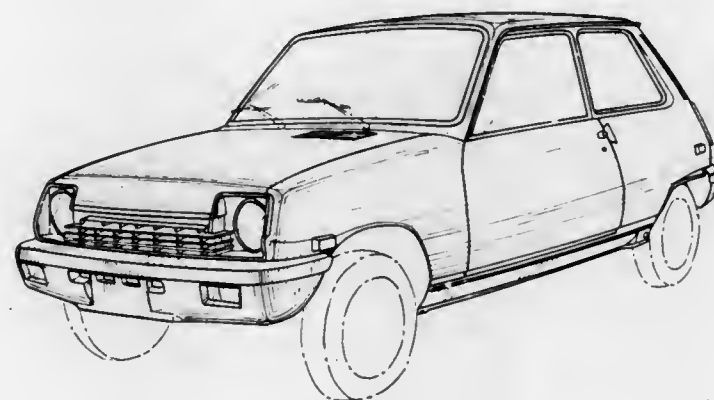
Filed Dec. 1, 1975, Ser. No. 636,458

Claims priority, application France, June 2, 1975, 73.921

Term of patent 14 years

Int. Cl. D12-08

U.S. Cl. D12-91



243,522

**ELECTROSTATIC COPIER**

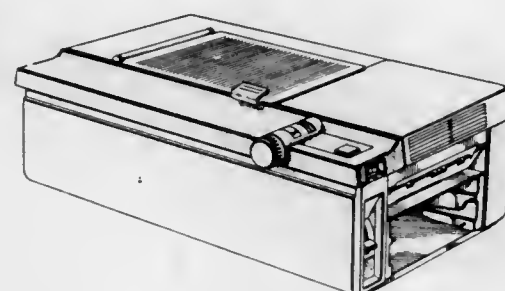
Kenichi Nakade, Tokyo, Japan, assignor to Ricoh Co., Ltd.

Filed Oct. 17, 1975, Ser. No. 623,347

Term of patent 7 years

Int. Cl. D16-03

U.S. Cl. D16-31



243,519

**BOAT**

Charles W. Sherburne, 3409 S. Patton Ave., San Pedro, Calif. 90731

Filed Apr. 15, 1976, Ser. No. 677,228

Term of patent 14 years

Int. Cl. D12-06

U.S. Cl. D12-63



243,520

**HELICOPTER TANK**

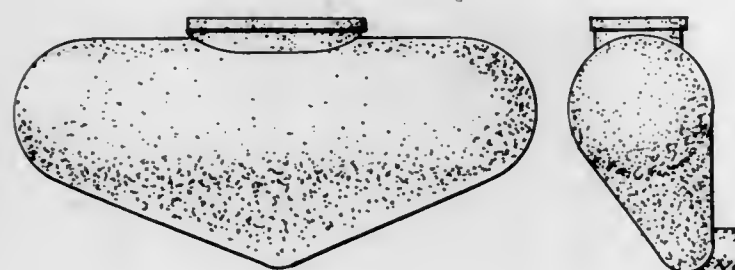
Erben G. Brown, San Marcos, Calif., assignor to Golden State Helicopters, Inc., San Marcos, Calif.

Filed Jan. 8, 1976, Ser. No. 647,397

Term of patent 14 years

Int. Cl. D12-99

U.S. Cl. D12-81



243,523

**PAIR OF SPECTACLES**

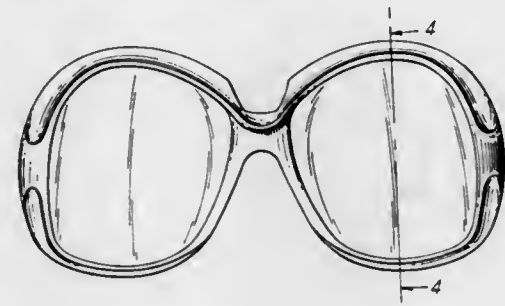
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 8, 1975, Ser. No. 638,487

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-65



243,524

**COMBINED CALENDAR HOLDER AND NOTE PAPER DISPENSER**

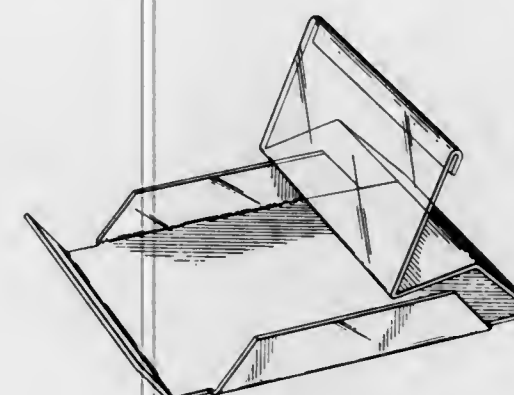
Thomas Intini, Ville Brossard, Canada, assignor to Maypack Inc., St. Laurent, Canada

Filed July 9, 1975, Ser. No. 594,253

Term of patent 14 years

Int. Cl. D19-02

U.S. Cl. D19-21



243,526

**MICROFICHE FILE**

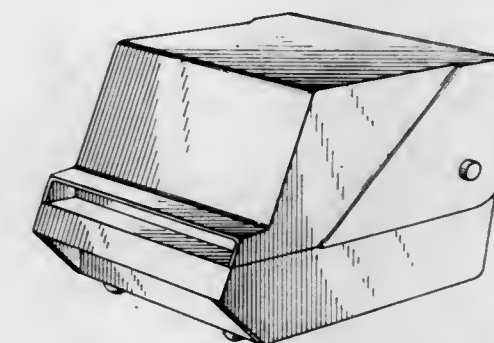
John W. Overman, Colgate, Wis., assignor to Bell & Howell Company, Chicago, Ill.

Filed Mar. 31, 1975, Ser. No. 563,559

Term of patent 14 years

Int. Cl. D19-02

U.S. Cl. D19-76



243,527

**ARTIFICIAL ARROW FLETCH**

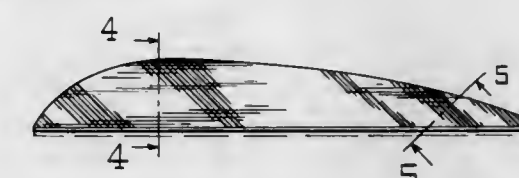
Leonard Henery Schnipke, Rte. No. 1, P.O. Box 89, Cloverdale, Ohio 45827

Filed Aug. 20, 1975, Ser. No. 606,306

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-12



243,525

**MENU HOLDER**

Robert A. Summers, 5 Coventry Drive, Freehold, N.J. 07728, and Henry Leong, 6 Waller Court, Kendall Park, N.J. 08824

Division of Ser. No. D. 284,570, Aug. 29, 1972, Pat. No. D. 233,804. This application Sept. 13, 1974, Ser. No. 505,941

Term of patent 14 years

Int. Cl. D19-04

U.S. Cl. D19-26



243,528

**FISH LURE**

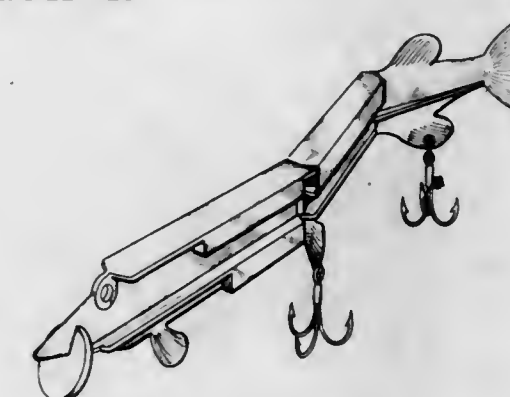
Francis E. Ryder, Elmhurst; and Michael D. Thomas, Barrington, both of Ill., assignors to Ryder International Corporation, Schaumburg, Ill.

Filed Nov. 19, 1975, Ser. No. 633,502

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-28





243,529

## SNAKE HEAD SLIP SINKER

Richard D. Woodard, 224 S. 16th, Guthrie, Okla. 73044

Filed July 23, 1975, Ser. No. 598,174

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-30



243,530

## PORTABLE AIR SUPPLY TANK

Kenneth E. Bodine, 660 E. Geddes, Littleton, Colo. 80122, and

Verle A. McDowell, 4675 S. Lincoln, Englewood, Colo. 80110

Filed July 24, 1975, Ser. No. 598,705

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-2



243,531

## FILTER MEDIA

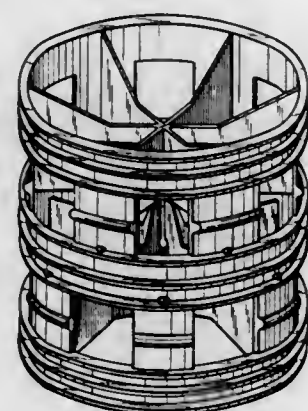
Ralph F. Strigle, Jr., Akron, Ohio, assignor to Norton Company, Worcester, Mass.

Filed June 4, 1975, Ser. No. 583,752

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-4



243,532

## SPRAY GUN FOR WASHING VEHICLES

Billy D. Fyffe, 7423 E. 30th St., Tulsa, Okla. 74129

Filed July 21, 1975, Ser. No. 597,717

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-17



243,533

## RESTAURANT BUILDING

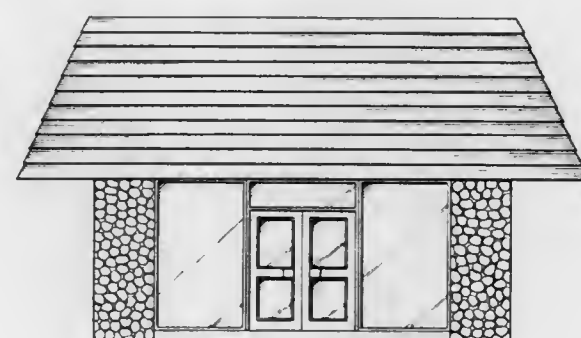
Alvin C. Copeland, 5001 Folse Drive, Metairie, La. 70002

Filed Apr. 15, 1975, Ser. No. 568,380

Term of patent 14 years

Int. Cl. D25-03

U.S. Cl. D25-25



243,534

## DATA INPUT CONSOLE FOR CONSTRUCTION COST ESTIMATOR SYSTEM

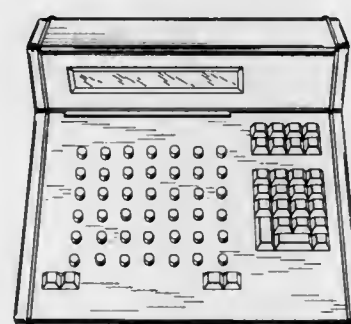
John Blesch, Los Altos, Calif., assignor to Varian Associates

Filed July 16, 1975, Ser. No. 596,500

Term of patent 14 years

Int. Cl. D14-02

U.S. Cl. D14-42



243,535

## ELECTRONIC CALCULATING MACHINE

Matafumi Ikeda, Osaka, Japan, assignor to Sharp Kabushiki

Kaisha (Sharp Corporation)

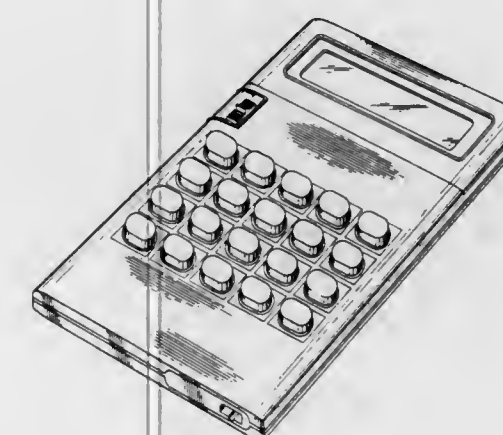
Filed May 21, 1976, Ser. No. 688,635

Claims priority, application Japan, Nov. 28, 1975, 50-47658

Term of patent 14 years

Int. Cl. D18-01

U.S. Cl. D64-11 B



243,537

## ELECTRONIC TRANSMITTER DEVICE FOR USE IN THE OPENING OR CLOSING OF GARAGE DOORS

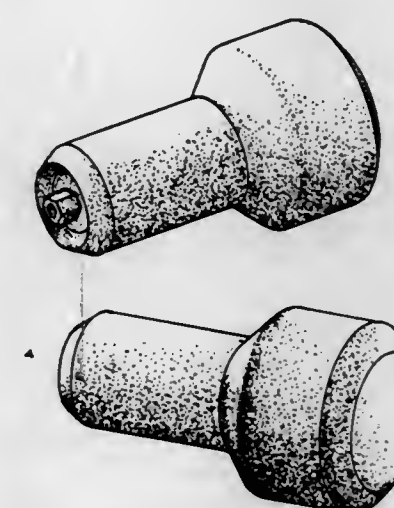
John F. Wahl, Sterling, Ill., assignor to Mallard Manufacturing Corporation, Sterling, Ill.

Filed Aug. 4, 1975, Ser. No. 601,351

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-95



243,538

## PORTABLE TAPE PLAYER

Yoichi Hisano, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

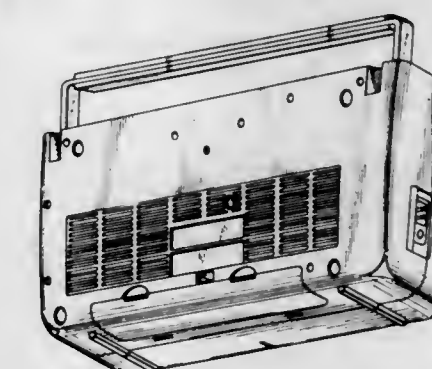
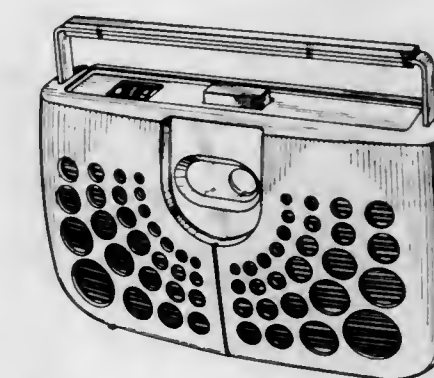
Filed Feb. 11, 1976, Ser. No. 657,328

Claims priority, application Japan, Nov. 20, 1975, 50-46226

Term of patent 14 years

Int. Cl. D14-01

U.S. Cl. D14-6



243,536

## INTERCOMMUNICATION APPARATUS

Rebertus van de Poel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

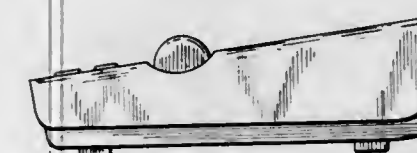
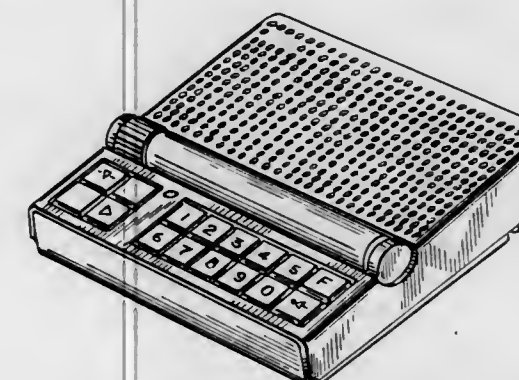
Filed Sept. 11, 1974, Ser. No. 504,913

Claims priority, application Netherlands, Mar. 13, 1974, 7458203

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-57





243,539

## TABLE LIGHTER BASE

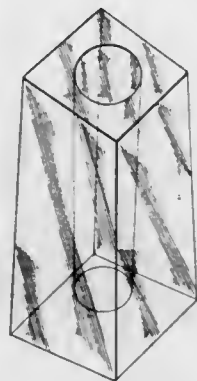
Robert G. Cornell, Norfolk, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 12, 1975, Ser. No. 631,113

Term of patent 14 years

Int. Cl. D27-05

U.S. Cl. D27-39



243,540

## AQUARIUM

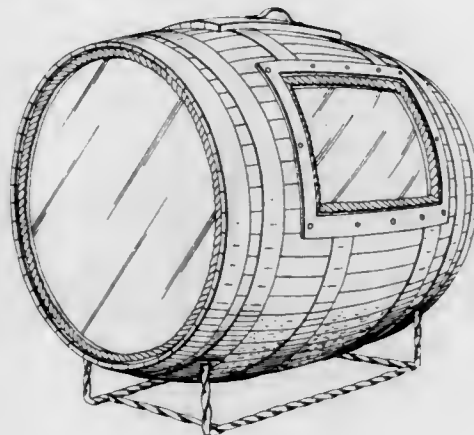
George M. Barrett, P.O. Box 2150, Hendersonville, N.C. 28739

Filed May 12, 1975, Ser. No. 576,293

Term of patent 14 years

Int. Cl. D30-02

U.S. Cl. D30-39



243,541

## HOOF PICK

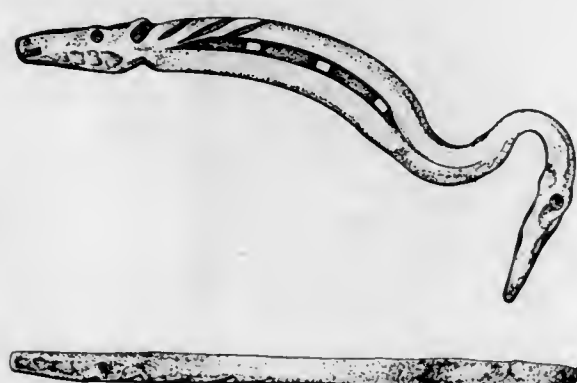
Clint C. Cullen, 2191 W. Palos Court, Newbury Park, Calif. 91320

Filed Oct. 20, 1975, Ser. No. 623,898

Term of patent 14 years

Int. Cl. D30-99

U.S. Cl. D30-40



243,542

## ANTIMICROBIAL SUSCEPTIBILITY CARD FOR USE WITH AN AUTOMATED MICROBIAL IDENTIFICATION MACHINE

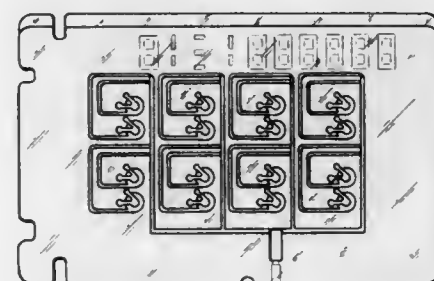
Norman L. Fadler, St. Charles County; Paul W. Jones, and Jack R. Kirchner, both of St. Charles, all of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Feb. 20, 1976, Ser. No. 659,682

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D24-29



243,543

## URINE SCREENING CARD FOR USE WITH AN AUTOMATED MICROBIAL IDENTIFICATION MACHINE

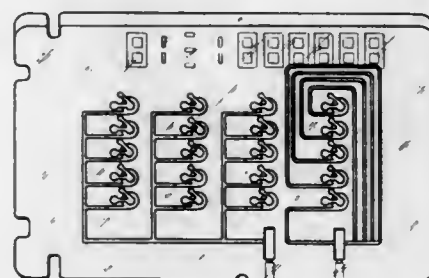
Norman L. Fadler, St. Charles County; Paul W. Jones, and Jack R. Kirchner, both of St. Charles, all of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Feb. 20, 1976, Ser. No. 659,922

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D24-29



243,544

## GAME BOARD

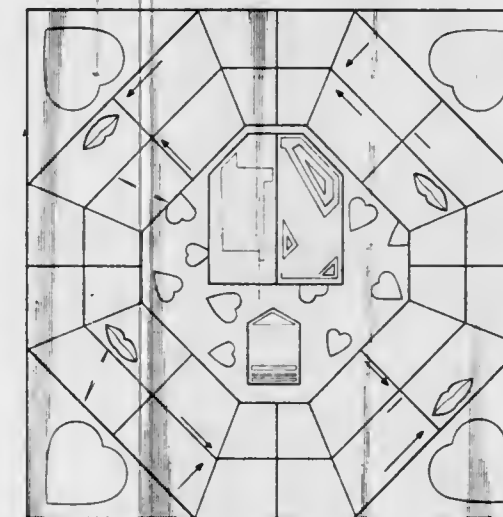
Nathan J. Hope, 1123 W. Jefferson St., Fort Wayne, Ind. 46804

Filed Sept. 11, 1975, Ser. No. 612,360

Term of patent 14 years

Int. Cl. D2-01

U.S. Cl. D34-5 SS



243,546

## TOY FORK LIFT VEHICLE

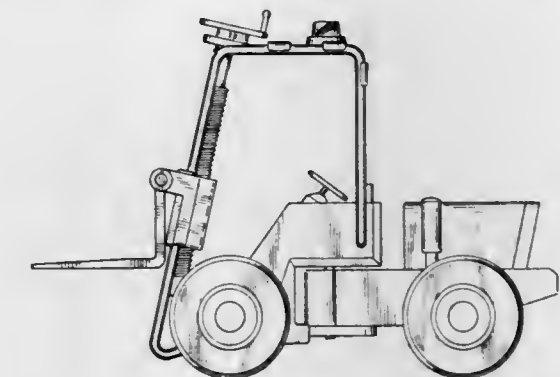
Vernon A. Peterson, Minneapolis, Minn., assignor to Tonka Corporation, Hopkins, Minn.

Filed May 5, 1975, Ser. No. 574,261

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-15 AJ



243,547

## RATTLE

David Day, Hill Cottage, Pippingford, Nutley, Sussex, and David William Chisnall, Thirlestane, Stadhampton, Oxfordshire, both of England

Filed July 24, 1975, Ser. No. 599,940

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-15 AG



243,548

## COMBINED LIGHT AND VASE STANDARD

Alton T. Shippee, Monroe, Mich., assignor to The Shippee Corporation, Monroe, Mich.

Filed Oct. 20, 1975, Ser. No. 623,603

Term of patent 14 years

Int. Cl. D26-05; D11-02

U.S. Cl. D48-20 R



243,545

## ROCKING TOY

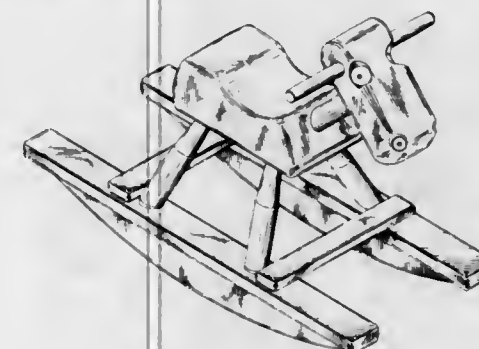
George S. Seegers, Sr., 1239 Goodwin Ave., Charlotte, N.C. 28205

Filed Apr. 10, 1975, Ser. No. 566,938

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-15 AE



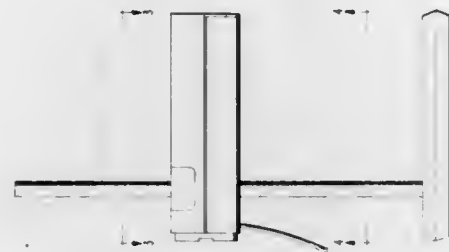


243,549

**DESK LAMP**

René Neveux, Les Clayes-Sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France  
 Filed Jan. 29, 1976, Ser. No. 653,510  
 Claims priority, application France, Aug. 1, 1975, 75.74082  
 Term of patent 14 years  
 Int. Cl. D26-05

U.S. Cl. D48-20 F



243,550

**LAMP SUPPORT**

Joseph Oster, Allentown, Pa., assignor to Keystone Lamp Manufacturing Corporation, Slatington, Pa.  
 Filed Mar. 3, 1976, Ser. No. 663,319  
 Term of patent 14 years  
 Int. Cl. D26-05

U.S. Cl. D48-20 R



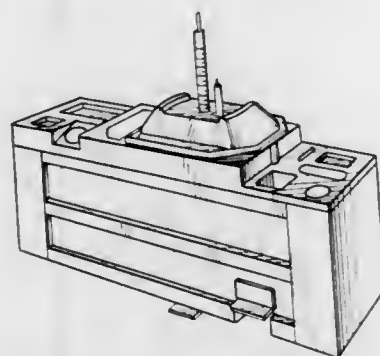
243,551

**TIRE CHANGING APPARATUS OR SIMILAR ARTICLE**

John F. Wood, and Charles L. Cunningham, both of Nashville, Tenn., assignors to The Coats Company, Inc., La Vergne, Tenn.

Filed Oct. 28, 1975, Ser. No. 626,076  
 Term of patent 14 years  
 Int. Cl. D15-99

U.S. Cl. D15-199

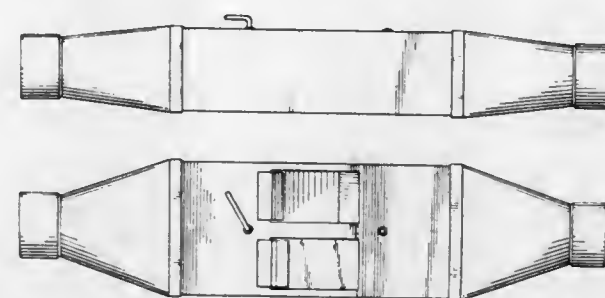


243,552

**BIRD DROP STATION FOR LIVE POULTRY MOVER**

Gary L. Squier, Gaylord, Minn. 55334  
 Filed Sept. 23, 1974, Ser. No. 508,191  
 Term of patent 14 years  
 Int. Cl. D15-99

U.S. Cl. D15-92



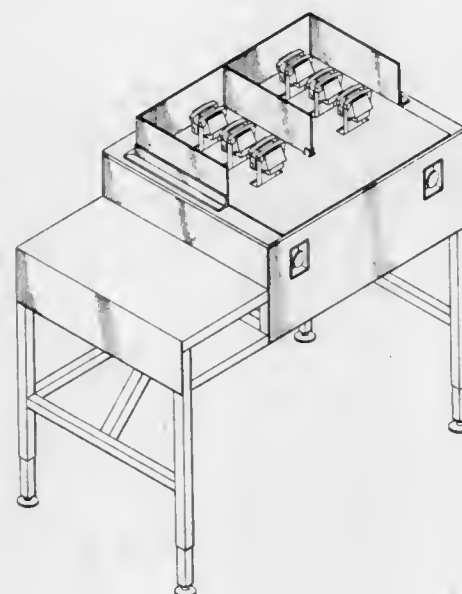
243,553

**TELEPHONE HANDLE MOLDING CORE REMOVAL APPARATUS**

Darrell E. Pluntz, 3039 Santiago Drive, Greenwood, Ind. 46142

Filed Nov. 19, 1975, Ser. No. 633,437  
 Term of patent 14 years  
 Int. Cl. D15-99

U.S. Cl. D15-199



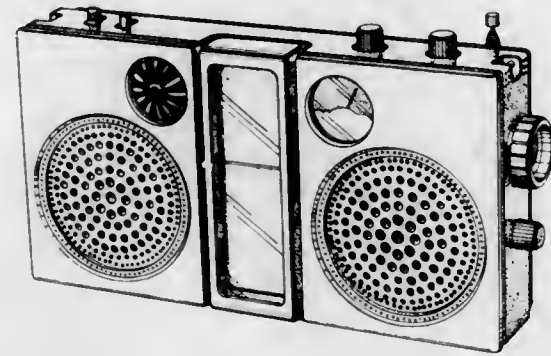
243,554

**RADIO RECEIVER**

Kunio Hoshino, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan  
 Filed June 18, 1975, Ser. No. 588,111

Claims priority, application Japan, Dec. 26, 1974, 50-996  
 Term of patent 14 years  
 Int. Cl. D14-03

U.S. Cl. D14-75

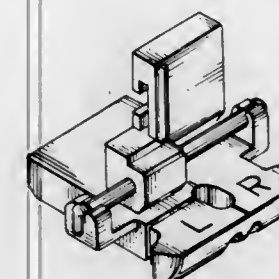


243,555

**SLIDE FASTENER PRESSER FOOT**

Donald G. Drew, 161 131st Ave. NE., Bellevue, Wash. 98005  
 Filed Aug. 30, 1974, Ser. No. 502,145  
 Term of patent 14 years  
 Int. Cl. D15-06

U.S. Cl. D15-72



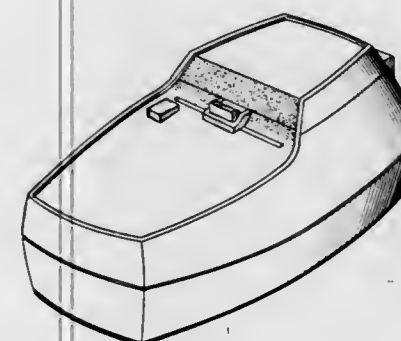
243,556

**AUTOClave STERILIZER UNIT**

Michael D. Thomas, Elmhurst, and Francis E. Ryder, Barrington, both of Ill., assignors to Ryder International Corporation, Schaumburg, Ill.

Filed Apr. 28, 1975, Ser. No. 572,617  
 Term of patent 14 years  
 Int. Cl. D24-01

U.S. Cl. D24-9

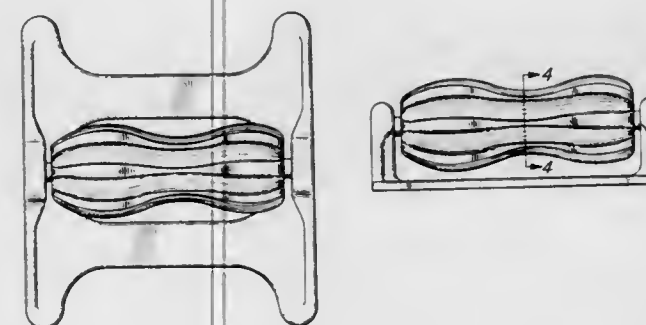


243,557

**FOOT MASSAGE ROLLER**

Henry A. Kientz, 34961 Avenue "A", Yucaipa, Calif. 93299  
 Filed Mar. 1, 1976, Ser. No. 662,501

Term of patent 14 years  
 Int. Cl. D28-03; D21-02  
 U.S. Cl. D83-1 S

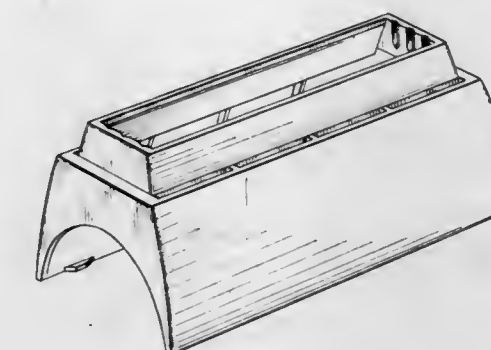


243,558

**DRYER ATTACHMENT**

Douglas A. Long, Wilton, and Frederick A. Burke, Riverside, both of Conn., assignors to Clairol Incorporated  
 Filed Dec. 16, 1974, Ser. No. 533,398  
 Term of patent 14 years  
 Int. Cl. D28-03

U.S. Cl. D28-18

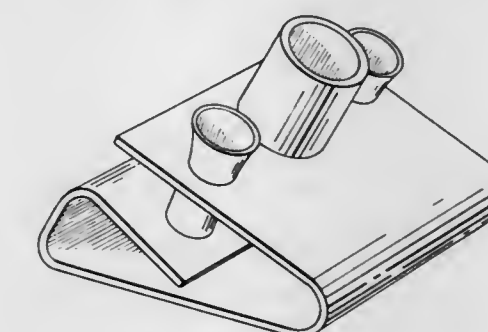


243,559

STAND FOR HAIR DRYER AND CURLING IRON  
 James Irwin Hoyle, 2360 Trenton Drive, San Bruno, Calif. 94066, and Andre Bob Balic, 40 Chadwick Court, Millbrae, Calif. 94030

Filed Aug. 15, 1975, Ser. No. 604,917  
 Term of patent 14 years  
 Int. Cl. D28-03

U.S. Cl. D28-38

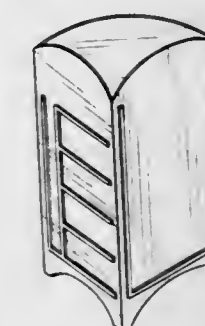


243,560

MENU AND RECORD TITLE DISPLAY DEVICE  
 Kenneth P. Vogelheim, Rogers City, Mich., assignor to Ken Vogelheim Sales Co.

Filed Dec. 10, 1975, Ser. No. 639,279  
 Term of patent 14 years  
 Int. Cl. D20-03

U.S. Cl. D96-12 R





# LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1ST DAY OF MARCH, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. Pierburg Autogerätebau KG: *See—*  
Engels, Uwe; Fröhberg, Gunther; Klotzbach, Peter; Kühlen, Ernst;  
and Rossel, Helmut. 4,009,700.
- AB Hammars Mekaniska Verkstad: *See—*  
Ekholm, Rolf. 4,009,630.  
Ekholm, Rolf. 4,009,631.  
Ekholm, Rolf. 4,009,726.
- Abate-Daga, Giancarlo: *See—*  
Ravizza, Martino; and Abate-Daga, Giancarlo. 4,009,953.
- Abbas, Shakir Ahmed; Anantha, Narasipur Gundappa; and Dockerty,  
Robert Charles, to International Business Machines Corporation.  
Non-volatile Schottky barrier diode memory cell. 4,010,482, Cl.  
357-15.000.
- Abbott Laboratories: *See—*  
Hershey, Charles J., Jr.; and Lippincott, George W. (said Hershey  
assors. to). 4,010,299.
- Johnson, Edwin Samuel; and Rippel, Riemond Henry, Jr.,  
4,010,261.
- Abe, Kuniomi; and Maekawa, Yuji, to Konan Camera Research Insti-  
tute. Binomial microscope. 4,009,526, Cl. 350-35.000.
- Abe, Kuniomi; and Maekawa, Yuji, to Konan Camera Research Insti-  
tute. Binomial microscope. 4,009,929, Cl. 350-35.000.
- Abe, Kuniomi; and Maekawa, Yuji, to Konan Camera Research Insti-  
tute. Binomial microscope. 4,009,930, Cl. 350-35.000.
- Abeles, Benjamin: *See—*  
Pinch, Harry Louis; Abeles, Benjamin; and Gittleman, Jonathan  
Isaac. 4,010,312.
- Abraham, Nedumparambil A.: *See—*  
Immer, Hans U.; Abraham, Nedumparambil A.; and Nelson, Ver-  
ner R., 4,010,260.
- Absalon, Gunter; Fischer, Konrad; and Grosholz, Rainer, to Licentia  
Patent-Verwaltungs-G.m.b.H. Semiconductor arrangement.  
4,010,487, Cl. 357-31.000.
- Ackerman, Leonard D. Roofing tool. 4,009,743, Cl. 145-1.00A.
- Adachi, Yoshiaki: *See—*  
Onozuka, Mitsuo; Hayashi, Yasuo; and Adachi, Yoshiaki,  
4,010,141.
- Adami, Hans A.: *See—*  
Robbins, Richard J.; and Adami, Hans A., 4,009,909.
- Adams, Capt. Allen Bond, executor: *See—*  
Smith, Bob L., deceased. 4,010,471.
- Adams, Charles De Witt, to Du Pont de Nemours, E. I., and Company.  
Compositions of alkyl 4-[o-(substituted amino)phenyl]-3-thioallo-  
phanates and methods of use. 4,010,278, Cl. 424-309.000.
- Adams, Fred M. Nutcracker. 4,009,651, Cl. 99-579.000.
- Addressograph Multigraph Corporation: *See—*  
Jantzen, Johannes K., 4,010,478.
- Adee, Raymond A., to Hesston Corporation. Windrower having shift-  
able tongue pivot. 4,009,554, Cl. 56-1.000.
- Adlam, Christopher; and Reid, David Eric, to Burroughs Wellcome Co.  
Biological extracts. 4,010,257, Cl. 424-92.000.
- Adler, Karl; and Strutz, Ernst, to Biviator AG. Device for measuring  
the ultra-violet in the uv-a and/or uv-b range. 4,010,372, Cl.  
250-372.000.
- AEG-Telefunken Kabelwerke AG: *See—*  
Bochenek, Eduard; Heumann, Heinz; and Pohl, Viktor. 4,010,060.
- Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*  
Metzger, Jacques V., 4,010,033.
- Agency of Industrial Science & Technology: *See—*  
Katsube, Yoshiyuki; and Katsube, Shizuko. 4,010,291.
- AGFA-Gevaert, A.G.: *See—*  
Muller, Hermann; Sandl, Dieter; Sylla, Jürgen; and Schroder, Rolf,  
4,010,062.
- Agnew, Paul G.; and Becker, Stephen P., to Learncor, Inc. Slide tray  
and tape cassette container. 4,009,781, Cl. 206-387.000.
- Aher Holdings S.A.: *See—*  
Beugelink, Frank. 4,009,913.
- Aicher, Albrecht; Haas, Hans; Sperber, Heinrich; Diem, Hans; Matth-  
ias, Guenther; and Lehmann, Gunter, to BASF Aktiengesellschaft.  
Production of formaldehyde. 4,010,208, Cl. 260-603.0HF.
- Ainoura, Masato. Hobbing machine. 4,009,636, Cl. 90-4.000.
- Aistleitner, Olaf, to Siemens Aktiengesellschaft. Connector for  
shielded electric cables. 4,009,923, Cl. 339-143.00R.
- Ajinomoto Co., Inc.: *See—*  
Murao, Sawao. 4,010,258.
- Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Power  
transistor switching apparatus. 4,010,387, Cl. 307-253.000.
- Akatsu, Mitsuhiro: *See—*  
Yamamoto, Hisao; Inaba, Shigeo; Hirohashi, Toshiyuki; Yama-  
moto, Michihiro; Ishizumi, Kikuo; Akatsu, Mitsuhiro;  
Maruyama, Isamu; Mori, Kazuo; Kume, Yoshiharu; and Izumi,  
Takahiro. 4,010,154.
- Akerman, Karol; and Sauerwein, Kurt, to Sauerwein, Kurt. Device for  
marking fluent materials. 4,010,109, Cl. 252-301.150.
- Aktiengesellschaft "Weser": *See—*  
Kura, Herbert. 4,009,676.
- Akzona Incorporated: *See—*  
Ramsauer, Otto; Dau, Heribert; Gumbmann, Willi; and Schulze,  
Ulrich. 4,010,303.
- Alberny, Robert, to Institut de Recherches de la Siderurgie Francaise  
(IRSID). Thin-walled mold for the continuous casting of molten  
metal. 4,009,749, Cl. 164-147.000.
- Albert, William Charles; and Zoltan, Bart Joseph, to Singer Company,  
The. Gyro seeker. 4,009,848, Cl. 244-3.160.
- Alcidi, Mario, to Pacer S.n.C. of Cerchiai Vanna & C. Artificial pace-  
maker. 4,009,721, Cl. 128-419.0PG.
- Alco Standard Corporation: *See—*  
McCoy, John F., 4,009,872.
- Aldrich, Paul Edward; Berezin, Gilbert Harvey; and Dittmar, Bruce  
Ivor, to Du Pont de Nemours, E. I., and Company. 1-Tertiary-alkyl-  
3-(substituted thienyl)ureas and 1-tertiary-alkyl-3-(substituted thie-  
nyl)ureas as antihypertensive agents. 4,009,847, Cl. 424-275.000.
- Aldworth, John G.: *See—*  
Wilburn, Garlington C.; Aldworth, John G.; Lugosi, Robert; and  
Male, Alan T., 4,010,436.
- Alinder, Gilbert L.; and Anderson, Lloyd E., to Taylor Manufacturing,  
Inc. Carpet and tile stripper. 4,009,908, Cl. 299-37.000.
- Allegheny Ludlum Industries, Inc.: *See—*  
Boyer, Charles D., 4,010,042.  
Choby, Edward G., Jr., 4,010,050.
- Alleman, Carl E., to Phillips Petroleum Company. Process and appara-  
tus for regenerating wet glycols. 4,010,065, Cl. 159-4.0CC.
- Allen, Clayton H. Retaining fluids. 4,009,717, Cl. 128-294.000.
- Allen, John L. Cooling tower blowdown heat exchange system.  
4,009,577, Cl. 60-692.000.
- Allen, Ralph Samuel, III. Prosthetic adapter for ski poles and the like.  
4,009,496, Cl. 3-12.800.
- Allied Chemical Corporation: *See—*  
Jordan, James J., Jr., 4,010,162.
- Allis-Chalmers Corporation: *See—*  
Murray, Donald L.; Lees, John N., Jr.; and Toman, Frank W., Jr.,  
4,010,096.  
Murray, Donald L.; Lees, John N., Jr.; and Toman, Frank W., Jr.,  
4,010,097.
- Alpha Metals, Inc.: *See—*  
Feuchtbach, Robert B.; and Disque, Fredrick C., 4,009,816.
- Alsup, James M.; and Whitehouse, Harper J., to United States of  
America, Navy. Carrier-compatible chirp-Z transform device.  
4,010,360, Cl. 235-193.000.
- Alvarez, Cesar E., Jr., to Teletype Corporation. Low power asynchro-  
nous latch. 4,010,388, Cl. 307-279.000.
- American Carrier Equipment, Inc.: *See—*  
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,009,873.  
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,009,906.
- American Components Inc.: *See—*  
Wellard, Charles L., 4,010,440.
- American Cyanamid Company: *See—*  
Curran, William Vincent; Tomcufcik, Andrew Stephen; and Ross,  
Adma Schneller. 4,010,179.
- Shaughnessey, Paul Eugene. 4,009,706.
- American Home Products Corporation: *See—*  
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- Tsuk, Andrew G., 4,010,196.
- American Newspaper Publishers Association, Inc.: *See—*  
Matalia, Harshad D., 4,009,841.
- American Optical Corporation: *See—*  
Cole, Henry B.; and Yates, Colin K., 4,010,019.
- Link, William Trevor; Rugge, Henry Ferdinand; and Jansen, Wil-  
liam David. 4,009,709.
- American Pulverizer Company: *See—*  
Strom, Sven B.; and Graveman, Donald F., 4,009,836.
- American Tack & Hardware Co., Inc.: *See—*  
Lee, Martin. 4,009,797.
- Amsler, Joachim, to Sprecher & Schuh AG. Vacuum switch having  
axially disposed switching elements. 4,010,338, Cl. 200-144.00R.
- Anaconda Company, The: *See—*  
McGuire, Ronald F., 4,010,328.
- Anantha, Narasipur Gundappa: *See—*  
Abbas, Shakir Ahmed; Anantha, Narasipur Gundappa; and Dock-  
erty, Robert Charles. 4,010,482.
- Andersen, Bjorn A. Production of warp of textured yarns of uniform  
properties. 4,009,513, Cl. 28-72.600.
- Anderson, John. Apparatus for trimming fat from a Boston style butt.  
4,009,652, Cl. 99-590.000.
- Anderson, Lloyd E.: *See—*  
Alinder, Gilbert L.; and Anderson, Lloyd E., 4,009,908.



Anderson, Ray C.; and Kyle, Joseph H., to Carpets International-Georgia (Sales), Inc. Carpet tile. 4,010,301, Cl. 428-95.000.

Anderson, Ray C.; and Kyle, Joseph H., to Carpets International-Georgia (Sales), Inc. Tufted face carpet tile. 4,010,302, Cl. 428-95.000.

Anderson, Scott. Apparatus for producing halide particles. 4,010,000, Cl. 23-252.00R.

Anderson, Stanley E., Jr.: See—  
Rohde, Robert P.; Christ, John H.; and Anderson, Stanley E., Jr., 4,009,641.

Angle, William M. Underground irrigation devices and methods of making and using the same. 4,010,298, Cl. 428-36.000.

Aoyama, Toshikazu; Okasaka, Hotuma; and Kodama, Hiroshi, to Toray Industries, Inc. Flame retardant polyester composition. 4,010,219, Cl. 260-835.000.

Apczynski, Frederick A., to Norris Industries, Inc. Wheel trim and method. 4,009,911, Cl. 301-37.05S.

Apicella, Anthony M., Jr.; Davis, Melvin H.; and Stan, Aurel V., to Goodyear Tire & Rubber Company, The. Method and apparatus for tire identification. 4,010,354, Cl. 235-61.60R.

Apollo Chemical Corporation: See—  
Kober, Alfred E., 4,009,605.

Applied Power Inc.: See—  
Heinrich, Allan E., 4,009,973.

Arad, Avi; and Stephens, William. Combined shower head and dispenser. 4,009,831, Cl. 239-315.000.

Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha: See—  
Matsuo, Kotaro; Shimizu, Katsuhisa; Hoshiba, Michimasa; and Chihara, Machio, 4,010,130.

Araki, Kazuhiko: See—  
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Arizona Feeds: See—  
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Arman, Dario. Support of the wiper blades in the windshield wiper installations on motor vehicles in general. 4,009,504, Cl. 15-250.420.

Armistead, Fontaine C., to Texaco Development Corporation. Seismic playback system. 4,010,462, Cl. 340-347.0DA.

Armour, Donald F.; and Niemi, William B., to Package Machinery Company. Injection blow molding machine having movable parison pins. 4,009,980, Cl. 425-242.00B.

Aron, Erwin, to Technical Processing, Inc. Novel processing aids for natural and synthetic rubber compounds. 4,010,129, Cl. 260-23.70M.

Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
Nobusawa, Tsukumo, 4,010,479.

Takahashi, Yasuo, 4,009,944.

Ashley, Albert H., to GTE Sylvania Incorporated. Radiation protected solid state voltage regulating apparatus. 4,010,403, Cl. 361-18.000.

Ashton, Walter G., to Star Industries, Inc. Floor scrubbing apparatus. 4,009,500, Cl. 15-50.00R.

Atlantic Richfield Company: See—  
Yoo, Jin Sun, 4,010,216.

Audi NSU Auto Union Aktiengesellschaft: See—  
Ruf, Max; and Steinwart, Johannes, 4,009,701.

Austin, Buddy Julian, to Roper Corporation. Induction cooking appliance having improved protection circuits. 4,010,342, Cl. 219-10.490.

Autoscan, Inc.: See—  
Pelta, Edmund R., 4,010,368.

Autovox S.p.A.: See—  
Cicatelli, Rodolfo, 4,010,493.

Avco Everett Research Laboratory, Inc.: See—  
Douglas-Hamilton, Diarmuid H.; and Hoag, Ethan D., 4,010,427.

Aviron-Violet, Paul, to Rhone-Poulenc S.A. Process for the asymmetric hydrogenation of a substituted acrylic acid or ester thereof. 4,010,181, Cl. 260-326.14T.

AVM Corporation: See—  
Moldovan, Michael Terrance, Jr.; Lindros, Charles Jerome; Westcott, Robert Dean; Snyder, Benedict Stewart, II; Cusimano, Richard John; and Kristan, Michael, 4,010,353.

Ayerst McKenna & Harrison Ltd.: See—  
Immer, Hans U.; Abraham, Nedumparambil A.; and Nelson, Verner R., 4,010,260.

Aylon, Norman N., to General Concrete of Canada Limited. Adhesive-applying apparatus. 4,010,203, Cl. 156-578.000.

Aysta, James E., to Minnesota Mining and Manufacturing Company. Connector. 4,009,922, Cl. 339-99.00R.

Azinger, Frederick A., Jr.: See—  
Fey, Maurice G.; Kemeny, George A.; and Azinger, Frederick A., Jr., 4,010,090.

Baeb, Albert: See—  
Geyer, Hermann; Baeb, Albert; and Himmelsbach, Paul, 4,009,946.

Baba, Hirohito. Method for sizing warp yarns. 4,009,512, Cl. 28-72.600.

Baba, Tsutomu; and Inukai, Shinpei, to Shin Meiwa Industry Co., Ltd. Apparatus for cutting an insulated wire, stripping the end thereof and twisting the wire strands. 4,009,738, Cl. 140-149.000.

Baba, Yoshihiko; Okada, Yutaka; Horikoshi, Hiroyoshi; and Yabe, Yuichiro, to Sankyo Company Limited. Analogs of LH-RH and process for preparing the same. 4,010,149, Cl. 260-112.5LH.

Bachman, William John: See—  
DiMeo, Franklin Roosevelt; and Bachman, William John, 4,010,473.

Back, Frank G. Three element varifocal lens systems. 4,009,928, Cl. 350-2.000.

Badalich, Frank C.; and Pawl, George J., to Bell & Howell Company. Intermittent rotary motion device. 4,009,952, Cl. 353-109.000.

Bailer, Edmund F.; and Makdad, Albert G. Combined light and wind-shield wiper switch. 4,010,380, Cl. 307-10.0LS.

Bailey, John M.; Cychul, John J., Jr.; and Stratton, Michael K., to Caterpillar Tractor Co. Air purging and cooling system for internal combustion engines. 4,009,693, Cl. 123-41.82A.

Bailey, Morris W., to Overhead Door Corporation. Switch mechanism for door operator. 4,010,408, Cl. 318-266.000.

Bailey, Thomas R., to Bailey, Thomas R. Valve liner for a knife gate valve. 4,009,727, Cl. 137-454.200.

Bakker, Martinus Antonius Maria; and Klerks, Leonardus Henricus, to U.S. Philips Corporation. Method of local electroplating of strip material. 4,010,083, Cl. 204-15.000.

Balas, Jaroslav G.: See—  
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Ball Corporation: See—  
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Ballweber, Edward G.: See—  
Phillips, Kenneth G.; Ballweber, Edward G.; Nordquist, Karen A.; and Miller, Robert A., 4,010,131.

Bama Pie, Inc.: See—  
Marshall, Paul W.; Singleton, Harold C.; Copp, Clyde L.; Lankford, Floyd L.; and George, Patsy L., 4,009,817.

Banas, Conrad M.; and Parasco, Aristotle, to United Technologies Corporation. Gas delivery means for cutting with laser radiation. 4,010,345, Cl. 219-121.00L.

Bandag Incorporated: See—  
Edwards, Charles E., 4,010,052.

Bangert, Albert C. Pan for baking hamburger rolls. 4,009,859, Cl. 249-122.000.

Baram, Martin: See—  
Zurrer, Hans; and Baram, Martin, 4,009,822.

Baranow, Sanford, to Special Metals Corporation. Process for preparing metal having a substantially uniform dispersion of hard filler particles. 4,010,024, Cl. 75-5BC.

Barbee, Gail G., to Caterpillar Tractor Co. Disconnect and storage means for a windshield wiper arm assembly. 4,009,901, Cl. 296-28.00C.

Barber-Colman Company: See—  
Fassell, Wayne Martin, 4,010,098.

Barmore, Thomas C. Toggle fastening device and process for its manufacture. 4,009,634, Cl. 85-3.00R.

Barnard, Walter C.; and Dahlstrom, Kenneth J., to Whirlpool Corporation. Ice maker component mounting means. 4,009,595, Cl. 62-300.000.

Barnebey-Cheney Co.: See—  
Barnebey, Herbert L.; and Japikse, Bertrand, 4,010,014.

Barnebey, Herbert L.; and Japikse, Bertrand, to Barnebey-Cheney Co. Fluid filter with submerged passages. 4,010,014, Cl. 55-300.000.

Barracudaverken Aktiebolag: See—  
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Barrett, Leo Donald; and Schram, Irwin Herbert, to Man-Gill Chemical Company. Electrocleaning method and composition. 4,010,086, Cl. 204-141.500.

Barton, George G., Jr.: See—  
Feldman, Sidney; and Barton, George G., Jr., 4,009,960.

BASF Aktiengesellschaft: See—  
Aicher, Albrecht; Haas, Hans; Sperber, Heinrich; Diem, Hans; Matthias, Guenther; and Lehmann, Gunter, 4,010,208.

Greif, Norbert; Vescia, Michele; Daeuble, Manfred; and Heinrich, Hans, 4,009,997.

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Battelle Memorial Institute: See—  
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Bayer Aktiengesellschaft: See—  
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Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; Rohe, Lothar; and Homeyer, Bernhard, 4,010,157.

Lenz, Hans; Muschelkautz, Edgar; Herold, Heiko; Bernklau, Kurt; and Georgias, Lutz, 4,009,563.

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Spreckelmeyer, Bernhard; Guth, Hans; Schabacher, Werner; and Rohe, Hermann, 4,010,245.

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Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Kurahashi, Yoshio, 4,010,281.

Beal, Ira W., to Funk Seeds International, Inc. Pallet former. 4,009,787, Cl. 214-10.50R.

Bean, Arthur R.: See—  
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Beatty, Ronald L., to United States of America, Energy Research and Development Administration. Process for preparing metal-carbide-

containing microspheres from metal-loaded resin beads. 4,010,287, Cl. 427-6.000.

Becker, Joseph J.; Schulte-Elte, Karl-Heinrich; Strickler, Hugo; and Ohloff, Gunther, to Firmenich S.A. Process for the preparation of a diketone derivative. 4,010,205, Cl. 260-586.00P.

Becker, Stephen P.: See—  
Agnew, Paul G.; and Becker, Stephen P., 4,009,781.

Beckman Instruments, Inc.: See—  
Reeves, George I.; and Keegan, Jack J., 4,010,414.

Reeves, George I.; and Chism, Hoke R., Jr., 4,010,415.

Reeves, George I.; and Richards, Donald D., 4,010,419.

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Beckman, William E.: See—  
Sagge, Michael Frank; Levine, Gerald; and Beckman, William E., 4,010,128.

Bejeannin, Desire Jean-Marie. Safety belt accessory. 4,009,905, Cl. 297-385.000.

Bell & Howell Company: See—  
Badalich, Frank C.; and Pawl, George J., 4,009,952.

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Persha, Thomas J.; and Jagielski, David, 4,009,842.

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Bell Telephone Laboratories, Incorporated: See—  
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Bellew, Lawrence, to W. C. Smith & Sons, Inc. Method for forming nut cluster confections and the like. 4,010,284, Cl. 426-285.000.

Bellina, Russell F., to Du Pont de Nemours, E. I., and Company. Miticidal dithiobiurets. 4,010,199, Cl. 260-552.00R.

Beloit Corporation: See—  
Brenner, Lawrence A.; and Scholl, Charles H., 4,009,773.

Benckiser-Knapsack GmbH: See—  
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Bendix Corporation, The: See—  
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Bennett, Thomas H.; Carlow, Earl F.; Kouvoissis, Anthony E.; Orgill, Rodney H.; and Wiles, Michael F., to Motorola, Inc. Interrupt circuitry for microprocessor chip. 4,010,448, Cl. 340-172.500.

Benningfield, L. V., Jr., to Phillips Petroleum Company. Acid concentration measurement. 4,009,998, Cl. 23-230.00R.

Bense, William Malcolm, to Leeson Corporation. Winding apparatus. 4,009,839, Cl. 242-18.0DD.

Berezin, Gilbert Harvey: See—  
Aldrich, Paul Edward; Berezin, Gilbert Harvey; and Dittmar, Bruce Ivor, 4,009,847.

Bergen, Stephen Archbold, to U.S. Philips Corporation. Atomic spectroscopy. 4,009,964, Cl. 356-85.000.

Bergwerksverband GmbH: See—  
Degel, Josef; Karweil, Joachim; and George, Dietrich, 4,010,002.

Bernal Incorporated: See—  
Pfaff, Paul D., 4,009,625.

Bernard, James A.; and Smith, Roy R., to General Motors Corporation. Automatic treating agent dispenser for washing appliance. 4,009,598, Cl. 68-12.00R.

Bernklau, Kurt: See—  
Lenz, Hans; Muschelkautz, Edgar; Herold, Heiko; Bernklau, Kurt; and Georgias, Lutz, 4,009,563.

Bertelli, Guido; and Roma, Pierpaolo, to Montedison Fibre S.p.A. Self-extinguishing polyolefinic compositions. 4,010,139, Cl. 428-35.000.

Bessone, Carlo S.; and Latassa, Frank M., to GTE Sylvania Incorporated. Switching circuit for a fluorescent lamp with heated filaments. 4,010,399, Cl. 315-101.000.

Betz Laboratories, Inc.: See—  
Swered, Paul; and Girard, Mary Anne, 4,010,277.

Beugelin, Frank, to Aher Holdings S.A. Suction nozzles for dry-fish off loading. 4,009,913, Cl. 302-58.000.

Binet, Jean Louis Christian: See—  
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Iliesco-Branceni, Bogdan; Manoury, Philippe Michel Jacques; and Binet, Jean Louis Christian, 4,010,161.

Binks Manufacturing Company: See—  
Krohn, Duane D.; and Culbertson, Samuel W., 4,009,971.

Binnig, Fritz; and Raschack, Manfred, to Knoll A.G. Chemische Fabrik. Anti-arrhythmic agents. 4,010,282, Cl. 424-330.000.

Binning, Jack E.: See—  
Hanson, Paul D.; Binning, Jack E.; and Kent, Harry J., 4,009,887.

Bio-Medicus, Inc.: See—  
Kletschka, Harold D.; Rafferty, Edson H.; and Clausen, Earl W., 4,009,719.

Birchall, James Derek; Cassidy, John Edward; Rolfe, Nicholas; and Miles, Clifford Granville, to Imperial Chemical Industries Limited. Complex phosphates. 4,010,294, Cl. 427-226.000.

BISOCA Societe de Recherches: See—  
Courier de Mere, Henri Edouard Francois Marie, 4,009,565.

Bitterlich, Gordon M., to National Airoil Burner Company, Inc. Combination gas and oil burners. 4,009,989, Cl. 431-178.000.

Bittner, Hans-Joachim, to H. Putsch & Comp. Milling device. 4,009,637, Cl. 90-11.00B.

Bivator AG: See—  
Adler, Karl; and Strutz, Ernst, 4,010,372.

Bjerkgard, Bjorn, to Lawrence Peska Associates, Inc., a part interest. Convertible ladder-carrier vehicle assembly. 4,009,762, Cl. 182-20.000.

Black, James B.; and Steinhagen, Horst G., to Twin Disc, Incorporated. Torque converter having adjustably movable stator vane sections and actuator means therefor. 4,009,571, Cl. 60-354.000.

Blind, James P., to Panavision Co. Front-discharge transit concrete mixer. 4,009,868, Cl. 259-172.000.

Blizzard, John D.; and Monroe, Carl M., to Dow Corning Corporation. Low durometer siloxane elastomers containing polytetrafluoroethylene powder. 4,010,136, Cl. 260-37.05B.

Blunt, Geoffrey Vincent Dallow; Hodges, Newton John; and Pragnell, Robert James, to Coal Industry (Patents) Limited. Cellular material. 4,010,123, Cl. 260-2.50H.

Bobeck, Andrew Henry; and Danylichuk, Irynej, to Bell Telephone Laboratories, Incorporated. Magnetic bubble signal generator. 4,010,454, Cl. 340-174.0TF.

Bochenek, Eduard; Heumann, Heinz; and Pohl, Viktor, to AEG-Telefunken Kabelwerke AG. Method and apparatus for making a coaxial electric cable. 4,010,060, Cl. 156-425.000.

Boeckman, Maynard A.; and Singer, Richard M., to Kane Manufacturing Corporation. Bit key lock. 4,009,600, Cl. 70-355.000.

Boehringer Ingelheim GmbH: See—  
Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Sauter, Robert; Eisele, Bernhard; Kaubisch, Nikolaus; and Leitold, Matyas, 4,010,279.

Hess, Friedrich Karl; and Stewart, Patrick Brian, 4,010,270.

Koppe, Herbert; Zeile, Karl; Kummer, Werner; Stahl, Helmut; and Engelhardt, Albrecht, 4,010,158.

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Boekkool, Anton; Hurx, Adrianus Antonius; and van Lieshout, Johannes Maria Josephus, to U.S. Philips Corporation. Electric lamp having an internal switching mechanism. 4,009,987, Cl. 431-95.00R.

Boerger, David H., to Ford Motor Company. Multiple stage expansion valve for an automotive air conditioning system. 4,009,592, Cl. 62-222.000.

Bogdanov, Alexandr Antonovich; Rodkin, Valentin Vasilievich; and Chudinovsky, Anatoly Andreevich. Submersible motor. 4,010,392, Cl. 310-87.000.

Boger, Manfred: See—  
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Bokelmann, Horst, to Metzeler Kautschuk AG. Procedure for the production of a hollow body of rotation for coating equipment. 4,010,053, Cl. 156-154.000.

Boland, Bernard W., to Motorola, Inc. Method of fabricating an insulated gate field-effect device. 4,010,290, Cl. 427-93.000.

Bollinger, Joseph M.; Hanauer, Richard H.; and Machleder, Warren H., to Rohm and Haas Company. Thermally labile rust inhibitors. 4,010,007, Cl. 44-71.000.

Bonanno, Frank Joseph; Kaiser, Richard B.; and Kroon, Pieter J., to Scott Paper Company. Apparatus for applying fluid to an intaglio roll for transfer to a soft, absorbent fibrous web. 4,009,657, Cl. 101-157.000.

Bonniaud, Roger; Jouan, Antoine; and Sombret, Claude, to Commissariat a l'Energie Atomique. Method for improving the incorporation of radioactive wastes into a vitreous mass. 4,009,990, Cl. 432-13.000.

Booth, Roy E., to United States of America, Navy. Modified mixing technique for carbonaceous stock. 4,010,040, Cl. 106-281.00R.

Borianne, Henri Marie Leon. Device for the teaching and/or training in the game of bridge. 4,009,522, Cl. 35-8.00B.

Bormann, Dieter; Merkel, Wulf; and Muschaweck, Roman, to Hoechst Aktiengesellschaft. 5-Sulfamoylbenzoic acid derivatives carrying a heterocyclic substituent. 4,010,273, Cl. 424-274.000.

Borsuk, Alvin; Heydn, Hans H.; and Johnson, Charles H., to Oscar Mayer & Co. Inc. Loaf mold magazine assembly. 4,009,858, Cl. 249-120.000.

Boughton, Stephen G.: See—  
Webb, William M.; and Boughton, Stephen G., 4,009,589.

Bourbeau, Frank J.; Meredith, Barton L.; and Rakowski, Arnold J., to General Motors Corporation. High power semiconductor device cooling apparatus and method. 4,010,489, Cl. 357-82.000.

Bouwhuis, Gijbertus, to U.S. Philips Corporation. Apparatus for reading a record carrier in which information, for example video and/or audio information, is recorded in at least one track. 4,010,317, Cl. 358-127.000.

Bouy, Pierre: See—  
Ravier, Dominique; and Bouy, Pierre, 4,010,091.

Bowden, James J. Manufacture of alumina for use in the basic oxygen furnace. 4,010,023, Cl. 75-3.000.

Bowling, Edward L.: See—  
West, Fred H.; and Bowling, Edward L., 4,010,406.

Bowman, Robert Mathews, to Ciba-Geigy Corporation. 1,4-Oxazepines. 4,010,166, Cl. 260-333.000.

Bowthorpe Hellerman Limited: See—  
McCormick, Mathew, 4,009,509.

Boyan, Gerard E.; and Rawlings, John L., to Perkin-Elmer Corporation, The. Apparatus for enhancing visibility in fog or underwater. 4,009,948, Cl. 350-319.000.

Boyer, Charles D., to Allegheny Ludlum Industries, Inc. Process for removing phosphosilicate coatings. 4,010,042, Cl. 134-2.000.

Bozzo, Richard J.: See—  
Wolfelsperger, Robert; and Bozzo, Richard J., 4,009,775.

Braden, Ralph S.; Stienecker, Edgar W.; and Weibel, John, Jr., to General Motors Corporation. Air conditioner air flow control mechanism. 4,009,648, Cl. 98-40.00V.



Bradt, Gordon E. Kinetic sculpture. 4,009,534, Cl. 40-106.300.  
 Bradt, Rexford H., to Jeffers, Albert L. Thermoplastic filament winding process. 4,010,054, Cl. 156-173.000.  
 Brady, Donnie G., to Phillips Petroleum Company. Phosphorus-containing flame retardant for synthetic resins. 4,010,137, Cl. 260-45.8NT.  
 Branham, Doud Roger. See—  
 Koffer, George Warren; and Branham, Doud Roger, 4,009,611.  
 Brass, Ronald William; and Hansen, Harold Valentine, to Deere & Company. Planter apparatus and method for planting. 4,009,668, Cl. 111-85.000.  
 Braunsch, Herbert; and Lehmann, Heinz, to Hoechst Aktiengesellschaft. Plaster mixture consisting of an aqueous polymer dispersion containing pigment and filler. 4,010,134, Cl. 260-29.60S.  
 Breneman, Inc.: See—  
 Erpenbeck, Paul J., 4,009,745.  
 Brenner, Lawrence A.; and Scholl, Charles H., to Beloit Corporation. Paper roll handling apparatus. 4,009,773, Cl. 198-344.000.  
 Brewer, Robert W., to General Motors Corporation. Quick connect coupling. 4,009,896, Cl. 285-305.000.  
 Bridgestone Tire Company Limited: See—  
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- Detjen, Robert K., to McDonough Manufacturing Company. Sawmill log-handling system. 4,009,632, Cl. 83-731.000.
- Deutsch Company Electronic Components Division, The: See—  
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- Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: See—  
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- Dey, William Neil: See—  
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- Diamond Shamrock Corporation: See—  
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- Dickey-john Corporation: See—  
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- Didato, Thomas P. Vertical snubber shipping device. 4,009,900, Cl. 296-1.00A.
- Diem, Hans: See—  
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- Dietz, Alma: See—  
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- Diffenderfer, Walter L., to K-D Manufacturing Company. Spring compressor. 4,009,867, Cl. 254-10.500.
- Dills, Raymond L.: See—  
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- DiMeo, Franklin Roosevelt; and Bachman, William John, to RCA Corporation. Antenna construction. 4,010,473, Cl. 343-792.500.
- Dingwall, Andrew Gordon Francis; and Rosenthal, Bruce David, to RCA Corporation. Current mirror amplifier. 4,010,425, Cl. 330-35.000.
- Disque, Fredrick C.: See—  
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- Dittmar, Bruce Ivor: See—  
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- Do All Company: See—  
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- Dockerty, Robert Charles: See—  
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- Dodd, Imrie. Missile warheads. 4,009,661, Cl. 102-61.000.
- Dodginton, Sven H.; and LeGrand, Jesse S., to International Telephone and Telegraph Corporation. Channel encoding for distance measurement equipment. 4,010,465, Cl. 343-5.0LS.
- Doerner, William Allen; and Van Buskirk, Oral R., to Du Pont de Nemours, E. I., and Company. Regenerator for rotary Rankine cycle engines. 4,009,576, Cl. 60-669.000.
- Dohi, Yuji: See—  
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- Dolak, Lester A.: See—  
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- Dolfini, Joseph E.: See—  
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- Dollinger, Robert E., to Phillips Petroleum Company. Carbon black pelletizing apparatus. 4,010,001, Cl. 23-252.00R.
- Donau Chemie Aktiengesellschaft: See—  
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- Donnelly, James E.: See—  
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- Dor, Abraham A., to Hanna Mining Company, The. Iron oxide sorbents for sulfur oxides. 4,010,239, Cl. 423-244.000.
- Douglas-Hamilton, Diarmid H.; and Hoag, Ethan D., to Avco Everett Research Laboratory, Inc. Laser output control system. 4,010,427, Cl. 331-94.50S.
- Dow Chemical Company, The: See—  
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- Mildner, Raymond C., 4,010,315.
- Yonkers, Edward H.; and Harris, Wilford D., 4,009,917.
- Dow Corning Corporation: See—  
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- Dowse, Brian Edward Wesley, to Golder Hock and Associates Limited. Underwater structure. 4,009,580, Cl. 61-88.000.
- Drabek, Jozef; Boger, Manfred; and Kristiansen, Odd, to Ciba-Geigy Corporation. O-alkyl-s-alkyl-o-(substituted phenyl)thiophosphates. 4,010,227, Cl. 260-940.000.

- Drake, Billy B., to Rohm and Haas Company. Free-flowing enzyme composition. 4,010,073, Cl. 195-64.000.
- Draper, Frederick Gaylord. Crescendo control of signalling devices. 4,010,329, Cl. 179-84.00T.
- Dravo Corporation: See—  
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- Dreibelbis, Richard C.; and Turner, Warren E., to Emerson Electric Co. (H & H Thermostats Div.). Dispensing head for fluid dispensing systems having elements made from plastic material. 4,009,806, Cl. 222-545.000.
- Dresser Industries, Inc.: See—  
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- Dressler, Hans. Process for dyeing molded articles containing urea formaldehyde resin or melamine formaldehyde resin. 4,009,995, Cl. 8-4.000.
- Drew Chemical Corporation: See—  
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- Ducellier & Cie: See—  
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- Dudek, Ronald P.: See—  
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- Dulux Australia Ltd.: See—  
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- Duperow, Donald E.; and Hughes, Norbert, to Lincoln Brass Works, Inc. Gas valve and mixing tube assembly for gas burner. 4,009,988, Cl. 431-114.000.
- duPont, Anthony A. Process for the preparation of hydrogen. 4,010,249, Cl. 423-657.000.
- Du Pont de Nemours, E. I., and Company: See—  
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- E.Z. Mfg. Co.: See—  
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- Eastman Kodak Company: See—  
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- Russin, Nicholas C.; Tershansy, Ronald A.; and Kibler, Charles J., 4,010,145.
- Eckert, Konrad, to Robert Bosch G.m.b.H. Air control valve for exhaust gas purifying apparatus. 4,009,986, Cl. 431-90.000.
- Edwards, Charles E., to Bandag Incorporated. Molding valve stems to rubber article. 4,010,052, Cl. 156-120.000.
- Eftefield, Larry G., to Caterpillar Tractor Co. Apron lift linkage. 4,009,530, Cl. 37-126.0AD.
- Eicke, Gerd, to Loesche Hartzerkleinerungs- und Zementmaschinen KG. Installation and method for manufacturing cement. 4,009,992, Cl. 432-106.000.
- Eickmann, Karl. Fluid-stream driven aircraft. 4,009,849, Cl. 244-53.00R.
- Eisai Co., Ltd.: See—  
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- Ejk, Adam J.; and Ringwood, Robert C., Jr., to M & T Chemicals Inc. Method for improving the heat stability of polyvinyl chloride. 4,010,138, Cl. 260-45.75S.
- Ekholm, Rolf, to AB Hammars Mekaniska Verkstad. Device with movable end stop means for pieces of lumber to be cut into shorter pieces. 4,009,630, Cl. 83-369.000.
- Ekholm, Rolf, to AB Hammars Mekaniska Verkstad. Device for holding pieces of lumber when they are cut. 4,009,631, Cl. 83-375.000.
- Ekholm, Rolf, to AB Hammars Mekaniska Verkstad. Device for elongate soaking basins. 4,009,726, Cl. 134-46.000.
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- Electro-Therm, Inc.: See—  
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- Elias, Abram G.; and Elias, Peter G. Document hanging apparatus. 4,009,784, Cl. 211-46.000.
- Elias, Peter G.: See—  
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- Elliott, Jennings W., to Schlumberger Technology Corporation. Methods and apparatus for recording well logging measurements. 4,010,476, Cl. 346-1.000.
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- Emerson Electric Co. (H & H Thermostats Div.): See—  
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- Engledow, David, to British Steel Corporation. Arc furnace steelmaking. 4,010,026, Cl. 75-11.000.
- English Electric Company, Limited, The: See—  
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- Ericson, Ivan Leo; and Morean, James Elroy, to GTE Sylvania Incorporated. Apparatus for maintaining vertically moving strip at established tension. 4,009,815, Cl. 226-113.000.
- Erlanson, Roger S. Fletching jig. 4,009,875, Cl. 269-38.000.
- Ermi, Ernst R., to Hewlett-Packard Company. Low battery voltage indicator for a portable digital electronic instrument. 4,010,456, Cl. 340-248.00B.
- Ernst, Arnold E. Cultivator apparatus. 4,009,759, Cl. 172-395.000.
- Erpenbeck, Paul J., to Breneman, Inc. Window shade support roller and method of assembling. 4,009,745, Cl. 160-297.000.
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- Faber, Paul V., to Wilputte Corporation. Coke oven charging gas cleaning and collecting apparatus and process. 4,010,079, Cl. 201-4.000.
- Fagan, Joseph P., to Du Pont de Nemours, E. I., and Company. Processes for impregnating and coating triaxial weave fabrics. 4,010,306, Cl. 428-236.000.
- Faggini, Federico; Shima, Masatoshi; and Mazor, Stanley, to Intel Corporation. MOS computer employing a plurality of separate chips. 4,010,449, Cl. 340-172.500.
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- Farris, George A.: See—  
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- Fassell, Wayne Martin, to Barber-Colman Company. Resource recovery from disposal of solid waste and sewage sludge. 4,010,098, Cl. 210-10.000.
- Fathauer, George H., to Dickey-john Corporation. Monitor for seed planting apparatus. 4,009,799, Cl. 221-3.000.
- Faughnan, Brian Wilfred; and Crandall, Richard Seely, to RCA Corporation. Electrochromic device having a dopant therein to improve its color center absorption characteristics. 4,009,935, Cl. 350-160.00R.
- Faulkner, Eric Andrew, to Brookdeal Electronics Limited. Phase-sensitive detector circuit with compensation for offset error. 4,010,424, Cl. 330-9.000.
- Faust, Martin H., to Penn-Dale Knitting Mills, Inc. Ventilated briefs. 4,009,495, Cl. 2-406.000.
- Fay, John J., Jr. Pulse rate recorder. 4,009,708, Cl. 128-2.05P.
- Fearon, Joseph G., to Morrison-Knudsen Company, Inc. Closure actuating device for railway hopper car doors. 4,009,664, Cl. 105-239.000.
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- Fekete, Kalman; and Bruderer, Werner, to Concast AG. Apparatus for controlling the cooling of a strand emanating from a continuous casting mold. 4,009,750, Cl. 164-154.000.
- Feldman, Sidney; and Barton, George G., Jr., to United States of America, Navy. Passive optical rangefinder. 4,009,960, Cl. 356-1.000.
- Fengler, Werner H. Apparatus for producing high wear-resistant composite seal. 4,009,680, Cl. 118-49.100.
- Ferrentino, Antonio, to Industrie Pirelli S.p.A. Composite optical fiber element for telecommunication cables. 4,009,932, Cl. 350-96.00B.
- Feuchtbaum, Robert B.; and Disque, Fredrick C., to Alpha Metals, Inc. Method and apparatus for increasing efficiency of a foam fluxer used in wave soldering of printed wiring boards. 4,009,816, Cl. 228-207.000.
- Fey, Maurice G.; Kemeny, George A.; and Azinger, Frederick A., Jr., to Westinghouse Electric Corporation. Process for converting naturally occurring hydrocarbon fuels into gaseous products by an arc heater. 4,010,090, Cl. 204-170.000.
- Fiber Controls Corporation: See—  
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- Ficken, William H., to Bendix Corporation. The Force measuring system including combined electrostatic sensing and torquing means. 4,009,607, Cl. 73-141.00R.
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- Fletcher, Thomas A., to General Electric Company. Luminaire shield device. 4,010,362, Cl. 240-147.000.
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- Forth, Claude A., Jr. Resilient fan hub. 4,009,970, Cl. 416-134.00R.
- Foster, Thomas Vincent, to Emhart Industries, Inc. Transfer mechanism for high speed press and blow individual section glassware forming machine. 4,010,021, Cl. 65-229.000.
- Fraioli, Anthony V.; and DeRosa, John A., to Plessey Incorporated. Oxidation and sinter-resistant metal powders and pastes. 4,010,025, Cl. 75-5AC.
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- Frye, Norman V. Kit for use in playing volleyball or the like. 4,009,779, Cl. 206-315.00R.
- Frye, Norman V. Volleyball or like kit. 4,009,780, Cl. 206-315.00R.
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- Gablin, Kenneth A.; and Hansen, Larry J., to Nuclear Engineering Company, Inc. Radioactive waste disposal of water containing waste using urea-formaldehyde resin. 4,010,108, Cl. 252-301.10W.
- Gall, Martin, to Upjohn Company, The. [3-Substituted-5-[(dimethylamino)methyl]-4H-1,2,4-triazol-4-yl]benzophenones and process. 4,010,177, Cl. 260-308.00R.
- Gauntt, Sibbly Paul, to Du Pont de Nemours, E. I., and Company. Process for drawing polyamide monofilaments. 4,009,511, Cl. 264-210.00F.
- Gebhart, Charles J.; Gleim, Clyde E.; and Wiener, Maria V., to Good-year Tire & Rubber Company, The. Polyvinyl chloride/copolyester compositions. 4,010,221, Cl. 260-873.000.
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Horimoto, Mitsuaki, to Minolta Camera Kabushiki Kaisha. Fish eye lens system. 4,009,943, Cl. 350-207.000.  
Horn, Robert E. Barbering tool. 4,009,517, Cl. 30-30.000.  
Horner, Joseph L., to United States of America, Transportation. Analog visibility computer. 4,010,357, Cl. 235-151.300.  
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Matsuo, Kotaro; Shimizu, Katsuhisa; Hoshiba, Michimasa; and Chihara, Machio, 4,010,130.  
Hoshino, Yukio, to Nippon Electric Company, Ltd. Word recognition apparatus. 4,010,445, Cl. 340-146.3WD.  
Houck, Theodore B., to Parker Drilling Company, Inc. Drilling rig with improved mast support structure. 4,009,544, Cl. 52-120.000.  
Houston, Alvin J., to Hutton Developments Ltd. Footings and foundations for building. 4,009,542, Cl. 52-73.000.  
Howard, David W.: See—  
Hirschfelder, Joseph O.; Lightfoot, Edwin N.; and Howard, David W., 4,010,095.  
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- Loy, John S.; Hankel, Melvin C.; and Robbins, Elmer A., to Tokheim Corporation. Fluid dispenser. 4,009,800, Cl. 222-28.000.
- Loyless, James E., to Vulcan Materials Company. Recovery of hydrogen chloride from chlorinated hydrocarbons such as chloromethanes. 4,010,017, Cl. 62-28.000.
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- Ludszewietz, Dieter: *See—*  
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- Lugosi, Robert: *See—*  
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- Lutz, David E. Conveyor. 4,009,774, Cl. 198-773.000.
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- Lytton, Kenneth G.; Miller, George J.; and Donnelly, James E., to Fiber Controls Corporation. Web former. 4,009,803, Cl. 222-200.000.
- M & T Chemicals Inc.: *See—*  
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- Macemon, Herbert J.; Martin, Vance; and Fisher, John L., to Kuhlman Corporation. Fuse holders for transformers. 4,010,437, Cl. 337-204.000.
- Machleder, Warren H.: *See—*  
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- MacLeay, Ronald Edward; and Sheppard, Chester Stephen, to Penwalt Corporation. Aliphatic alpha-(hydroperoxy) azo compounds and salts thereof. 4,010,152, Cl. 260-192.000.
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- Mahn, Frederick R.: *See—*  
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- Maier, Johann H., to Universal Plastic Pipe Bending Corporation. Mechanism for forming an enlarged coupling on the ends of plastic pipe. 4,009,982, Cl. 425-389.000.
- Makdad, Albert G.: *See—*  
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- Malsby, Marc W.; and Clark, Kenneth M., to Deutsch Company Electronic Components Division, The. Optical waveguide connector. 4,009,931, Cl. 350-96.00C.
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- Marazzi, Pietro. Automatic plant for the drying and fast single-phase firing of ceramic tiles. 4,009,993, Cl. 432-122.000.
- Marchhart, Helmut, to Donau Chemie Aktiengesellschaft. Device for effecting a gastight closure. 4,010,313, Cl. 13-33.000.
- Marcum, Jess L., to Rand Corporation, The. Interference suppression. 4,010,469, Cl. 343-18.00E.
- Marechal, Michel: *See—*  
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- Marshall, Paul W.; Singleton, Harold C.; Copp, Clyde L.; Lankford, Floyd L.; and George, Patsy L., to Bama Pie, Inc. Tray for shipment of frozen items. 4,009,817, Cl. 229-2.50R.
- Martin, Adolf: *See—*  
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- Martin, Luther W.; and Smith, Richard L. Methods of sealing annular space between inner and outer gas mains for tie-overs. 4,009,732, Cl. 138-97.000.
- Martin, Roger G., to Master Unit Die Products, Inc. Molding die apparatus. 4,009,979, Cl. 425-107.000.
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- Martt, Judson W., to National Steel Corporation. Apparatus for quenching and cooling coke. 4,010,081, Cl. 202-228.000.
- Maruhashi, Motokazu; Tsutsumi, Shuji; and Komazawa, Shinichi, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Electroconductive material. 4,010,117, Cl. 252-500.000.
- Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Phenoxalkylamine derivatives and preparation thereof. 4,010,280, Cl. 424-316.000.
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- Maruyama, Takashi, to Nippon Kogaku K.K. Contour line plotting devices. 4,009,961, Cl. 356-2.000.
- Marzetta, Louis A., to United States of America, Commerce. Cool-touch cooking surfaces. 4,009,704, Cl. 126-221.000.
- Maschinenfabrik Augsburg-Nurnberg AG: *See—*  
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- Mason, William B., to TECCOR Electronics, Inc. Solid state time delay and holding circuit. 4,010,389, Cl. 307-293.000.
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- Mast, Aquila D., to Sperry Rand Corporation. Synchronizing roll forming and wrapping operations in a crop material roll forming machine. 4,009,559, Cl. 56-343.000.
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- Matalia, Harshad D., to American Newspaper Publishers Association, Inc. Manual flying paster. 4,009,841, Cl. 242-58.300.
- Matharu, Saroop Singh; Rowlands, David Alun; Westwood, Robert; and Taylor, John Bodenham, to Roussel-UCLAF. Derivatives of hexahydrodibenzofuran-3-one, their preparation and use in pharmaceutical compositions. 4,010,268, Cl. 424-250.000.

- Matheny, Coy Edwin, to International Telephone and Telegraph Corporation. Link circuit for intercom unit. 4,010,332, Cl. 179-99.000.
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- Matsui, Kazuo; Shigematsu, Taichiro; Shibahara, Tetsuya; and Nakazawa, Makoto, to Mitsubishi Chemical Industries Ltd. Method for producing N-(4-fluorophenyl)-2,3-dichloromaleimide. 4,010,182, Cl. 260-326.5FM.
- Matsumura, Yasuo; Kishimoto, Soichiro; and Ozaki, Masahiko, to Japan Exlan Company Limited. Process for producing carbon fibers. 4,009,991, Cl. 432-23.000.
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- Maziuk, John, to Mobil Oil Corporation. Method of operating a platinum reformer comprising a selective zeolite catalyst in third reactor. 4,010,093, Cl. 208-65.000.
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- McBride, David L., to Energy and Materials Conservation Corporation. Method for increasing the use of scrap and iron oxides by basic oxygen furnace. 4,010,029, Cl. 75-60.000.
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- McCoy, John F., to Alco Standard Corporation. Energy-conserving, fast-cooling heat treating furnace. 4,009,872, Cl. 266-250.000.
- McDonough Manufacturing Company: *See—*  
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- McGill, Howard L.; Randermann, Ervin, Jr.; and Musik, Olgiert J., to Schlumberger Technology Corporation. Subsea master valve apparatus. 4,009,753, Cl. 166-55.100.
- McGuire, Ronald F., to Anaconda Company, The. Out-of-band signaling method and apparatus to adapt payphones to telephone systems. 4,010,328, Cl. 179-81.00R.
- McKenzie, James W. Combined generator and boat propulsion system. 4,010,377, Cl. 290-1.00R.
- McKinney, Claude O., to Standard Oil Company. Combusting flue gas in a cracking catalyst regeneration process. 4,010,094, Cl. 208-164.000.
- McLoughlin, Bernard Joseph; and Guildford, Allen John, to Imperial Chemical Industries Limited. Phenylvinyl morpholine compounds. 4,010,266, Cl. 424-248.400.
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- Metzeler Kautschuk AG: *See—*  
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- Meuwes, Willy Frans Lucia, to U.S. Philips Corporation. Electric device provided with a gas and/or vapor discharge lamp. 4,010,398, Cl. 315-101.000.
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- Meyers, Franklin J.; and Sturiale, Gino R., to Hughes Aircraft Company. Self-stabilizing image scanner. 4,010,365, Cl. 250-236.000.
- Michielli, Joseph Frank. Ice cream dispensing machine. 4,009,740, Cl. 141-172.000.
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- Mikami, Ichiro; Danno, Sadao; Uchida, Izuhiko; Tasaki, Yasutaka; Kugimoto, Junichi; and Fujitsu, Satoru, to UBE Industries, Ltd. Method for producing cyclohexanone and alkyl-substituted or unsubstituted phenol. 4,010,206, Cl. 260-586.00P.
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- Moldovan, Michael Terrance, Jr.; Lindros, Charles Jerome; Wescott, Robert Dean; Snyder, Benedict Stewart, II; Cusimano, Richard John; and Kristan, Michael, to AVM Corporation. Electronic voting machine with cathode ray tube display. 4,010,353, Cl. 235-54.00F.
- Molny, Marvin J., to Sperry Rand Corporation. Zero speed calibration method and apparatus for use with an electro-magnetic underwater log for marine vessels. 4,009,603, Cl. 73-3.000.
- Molzahn, Herbert W., to International Harvester Company. Crop harvester drive and control system. 4,009,556, Cl. 56-10.700.
- Monjo, Jacques Yves. Machine for filling pockets. 4,009,553, Cl. 53-160.000.
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- Morisaki, Shigeyoshi; and Mase, Kazuo, to Mitsui-Anaconda Electro Copper Sheet Co., Ltd. Copper foil having bond strength. 4,010,005, Cl. 29-195.000.
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- Morozowich, Walter, to Upjohn Company, The. Substituted keto and alkoxy 16-phenoxo and 17-phenyl PGE<sub>2</sub>-type compounds. 4,010,172, Cl. 260-390.000.
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- Mott, William E. Method of and apparatus for rapidly lining containers. 4,009,646, Cl. 93-36.010.
- Mountcastle, Paul H.; and O'Berry, William A., to Westinghouse Electric Corporation. Antenna scanning apparatus. 4,010,472, Cl. 343-761.000.
- Moyer, Charles G. Police officer's club holder for vehicle door. 4,009,854, Cl. 248-300.000.
- Moyer, G. A., to Phillips Petroleum Company. Glycol regeneration. 4,010,009, Cl. 55-32.000.
- Mraz, Joseph. Pneumatic conveying apparatus and method. 4,009,912, Cl. 302-25.000.
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- Muller, Hermann; Sandl, Dieter; Sylla, Jurgen; and Schroder, Rolf, to AGFA-Gevaert, A.G. Method of and apparatus for splicing the ends of film strips. 4,010,062, Cl. 156-506.000.
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- Murao, Sawao, to Ajinomoto Co., Inc.; and Eisai Co., Ltd. Microbial amylase inhibitor and preparation thereof with the use of streptomycetes diasticus var. amylostaticus. 4,010,258, Cl. 424-115.000.
- Muraoka, Teruo; Nisikawa, Kazunori; and Seki, Kohji, to Victor Company of Japan, Limited. Record disc recording system with a distortion signal. 4,010,333, Cl. 179-100.40C.
- Murayama, Takao, to Taisei Kensetsu Kabushiki Kaisha; and Tokyo Gas Company Limited. Equipment for treating waste gas containing tar mist. 4,010,013, Cl. 55-286.000.
- Murley, Ellsworth M., Jr.; and Davis, Allen, to Owens-Illinois, Inc. Multiplex addressing of colloidal light valves. 4,009,937, Cl. 350-160.00R.
- Murray, Donald L.; Lees, John N., Jr.; and Toman, Frank W., Jr., to Allis-Chalmers Corporation. Pneumatic classifier for refuse material with adjustable air intake. 4,010,096, Cl. 209-139.00R.
- Murray, Donald L.; Lees, John N., Jr.; and Toman, Frank W., Jr., to Allis-Chalmers Corporation. Pneumatic classifier for refuse material with double vortex airflow. 4,010,097, Cl. 209-139.00R.
- Muschaweck, Roman: See—  
Bormann, Dieter; Merkel, Wulf; and Muschaweck, Roman, 4,010,273.
- Muschelknautz, Edgar: See—  
Lenz, Hans; Muschelknautz, Edgar; Herold, Heiko; Bernklau, Kurt; and Georgias, Lutz, 4,009,563.
- Musik, Olgierd J.: See—  
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- Mutz Corporation: See—  
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- Naegeli, Peter, to Givaudan Corporation. Novel odorants. 4,010,213, Cl. 260-617.00R.
- Naegeli, Werner, to Pavena AG. Process for continuously bonding staple fibers into an essentially non-twisted yarn. 4,010,056, Cl. 156-296.000.
- Naegeli, Werner, to Pavena AG. Process for continuously bonding staple fibers into a stable band and stable band produced according to the aforesaid process. 4,010,295, Cl. 428-361.000.
- Nagatomo, Masatugu, to Kabushiki Kaisha Komatsu Seisakusho. Automatically adjusting braking device. 4,009,769, Cl. 188-77.00R.
- Najer, Henry: See—  
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Iliesco-Branzeni, Bogdan; Manoury, Philippe Michel Jacques; and Binet, Jean Louis Christian, 4,010,161.
- Nakagawa, Yasuhiko: See—  
Sakai, Yasuo; and Nakagawa, Yasuhiko, 4,009,692.
- Nakamura, Toshihiko: See—  
Kato, Takashi; Oono, Eishi; and Nakamura, Toshihiko, 4,009,698.
- Nakanishi, Michio; Araki, Kazuhiko; Tahara, Tetsuya; and Shiroki, Masami, to Yoshitomi Pharmaceutical Industries, Ltd. Thienodiazepines. 4,010,184, Cl. 260-332.20R.
- Nakanishi, Motoyasu, to Kabushiki Kaisha Kobayashi. Printing apparatus. 4,010,057, Cl. 156-384.000.
- Nakano, Toshikazu: See—  
Matsubara, Toru; Nakano, Toshikazu; and Nomura, Kazuo, 4,009,655.
- Nakao, Masaru: See—  
Maruyama, Isamu; Nakao, Masaru; Sasajima, Kikuo; Inaba, Shigeo; and Yamamoto, Hisao, 4,010,280.
- Nakayama, Takashi, to Du Pont de Nemours, E. I., and Company. Low-fire green ceramic articles and slip compositions for producing same. 4,010,133, Cl. 260-29.6TA.
- Nakazawa, Makoto: See—  
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- Nakhmanovich, Anatoly Samuilovich: See—  
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- Nalco Chemical Company: See—  
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- Hurlock, John R.; and Phillips, Kenneth G., 4,010,142.
- Phillips, Kenneth G.; Ballweber, Edward G.; Nordquist, Karen A.; and Miller, Robert A., 4,010,131.
- Phillips, Kenneth G.; and Frisque, Alvin J., 4,010,231.

- Nannini, Giuliano: See—  
Giraldi, Pier Nicola; Nannini, Giuliano; Riasoli, Giovanni; Spelta, Anna; and Contone, Aurelio, 4,010,274.
- Narozny, Ronald S., to Thomas & Betts Corporation. Electrical contact and support means therefor. 4,009,921, Cl. 339-99.00R.
- Nathanson, Harvey C., to Westinghouse Electric Corporation. High resolution low bandwidth portable telecommunication system. 4,010,322, Cl. 358-233.000.
- Natico, Inc.: See—  
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- National Airoil Burner Company, Inc.: See—  
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- National Controls, Inc.: See—  
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- National Patent Development Corporation: See—  
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- National Research Development Corporation: See—  
Kibble, David John; and Grimsdale, Richard Lawrence, 4,010,451.
- National Steel Corporation: See—  
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- Natter, Howard. Pedagogic thermal pulse sealing apparatus. 4,010,063, Cl. 156-510.000.
- Negersmith, Kent M., to Technicon Instruments Corporation. Reagent supply control in automated fluid analysis. 4,009,999, Cl. 23-230.00R.
- Nelson, Gunner E., to Ethyl Corporation. Chemical process. 4,010,187, Cl. 260-448.00A.
- Nelson, Gunner E., to Ethyl Corporation. Process for producing trialkal metal aluminum hexahydride. 4,010,248, Cl. 423-644.000.
- Nelson, Norman A., to Upjohn Company, The. 5-Oxa phenyl- and phenoxy-substituted prostaglandin E<sub>1</sub> analogs. 4,010,192, Cl. 260-473.00G.
- Nelson, Norman A., to Upjohn Company, The. 5-Oxa phenyl- and phenoxy-substituted prostaglandin A<sub>1</sub> analogs. 4,010,194, Cl. 260-473.00G.
- Nelson, Verner R.: See—  
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- Nemec, Joseph W.; and Stewart, Thomas, to Rohm and Haas Company. Divinylacetylenes as polymerization inhibitors for acrylic and methacrylic acid. 4,010,082, Cl. 203-8.000.
- Neukermans, Armand P.; and lms, Dale R., to Xerox Corporation. Measurement of the mass and charge of charged particles. 4,010,366, Cl. 250-282.000.
- Newcomb, Robert K.: See—  
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- Nickerson, Eugene W., III. Method and product for preventing fraud in document identification. 4,009,892, Cl. 283-6.000.
- Nickey, George Allen: See—  
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- Nielsen, Erik Kjaer: See—  
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- Nielsen, Robert P.; and La Rochelle, John H., to Shell Oil Company. Catalyst for the oxidation of ethylene to ethylene oxide. 4,010,115, Cl. 252-454.000.
- Niemi, William B.: See—  
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- Nightingale, Allen Frederick: See—  
Yardley, James Frank; and Nightingale, Allen Frederick, 4,010,235.
- Niida, Taro: See—  
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- Nimmo, Bruce G.: See—  
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- Ninomiya, Tomokazu; Sasagawa, Syuzo; Washio, Hideo; and Hirata, Nobuhiro, to Mitsui Petrochemical Industries, Ltd. Device for producing an obliquely oriented film of thermoplastic synthetic resin. 4,009,975, Cl. 425-66.000.
- Nippon Electric Company, Ltd.: See—  
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- Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: See—  
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- Nippon Kayaku Kabushiki Kaisha: See—  
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- Nippon Kogaku K.K.: See—  
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- Nippondenso Co., Ltd.: See—  
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- Nischk, Gunther: See—  
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- Nishida, Keiziro; Itoh, Susumu; and Konno, Kathuhiro, to Canon Kabushiki Kaisha; and Tochigi Canon Co., Inc. Reflecting mirror. 4,009,947, Cl. 350-288.000.
- Nishikawa, Masao: See—  
Sugihara, Hirotsada; Watanabe, Masazumi; Motohashi, Michio; Nishikawa, Masao; and Sanno, Yasushi, 4,010,202.
- Nishikawa, Tatsuo: See—  
Suzuki, Shigeru; Iwamoto, Minoru; Noguchi, Koichi; Omi, Kyoji; and Nishikawa, Tatsuo, 4,009,957.
- Nishimura, Hiromi; Ono, Kenji; Tachibana, Katsumi; and Furukawa, Satoru, to Matsushita Electric Works, Ltd. Electromagnetic relay. 4,010,433, Cl. 335-129.000.
- Nishino, Tatsuji. Apparatus for mending a puncture in a tubeless tire. 4,009,624, Cl. 81-15.700.
- Nishioka, Matsuo; and Oka, Shunzo, to Matsushita Electric Industrial Co., Ltd. Push-button type pulse generating switch. 4,010,382, Cl. 307-106.000.
- Nisikawa, Kazunori: See—  
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- Nissan Motor Co., Ltd.: See—  
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- Sakai, Yasuo; and Nakagawa, Yasuhiko, 4,009,692.
- Takeuchi, Yasuhisa; and Iizuka, Haruhiko, 4,009,640.
- Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focusing apparatus for optical systems. 4,010,479, Cl. 354-25.000.
- Noetzel, Siegfried; Jastrow, Horst; and Fischer, Edgar, to Hoechst Aktiengesellschaft. Bromine containing telomeric phosphonic acid esters as flame retardant agents. 4,010,225, Cl. 260-880.00R.
- Noguchi, Koichi: See—  
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- Nolde, George V.: See—  
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- Nomura, Kazuo: See—  
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- Nordquist, Karen A.: See—  
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- Nordson Corporation: See—  
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- Norris Industries, Inc.: See—  
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- North, Irving William, to Brunswick Corporation. Multiple push-pull cable transmission apparatus. 4,009,678, Cl. 115-18.00R.
- Nosco, Inc.: See—  
Hershey, Charles J., Jr.; and Lippincott, George W. (said Lippincott assors. to), 4,010,299.
- Novet, Hanspeter: See—  
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- Nozdrovsky, Andrei Stepanovich. Bowl of solids-concentration centrifuge. 4,009,823, Cl. 233-7.000.
- Nuclear Engineering Company, Inc.: See—  
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- Nudelman, Abraham; and McCauly, Ronald J., to American Home Products Corporation. Process for the rearrangement of penicillins to cephalosporins and intermediate compounds thereof. 4,010,156, Cl. 260-243.00C.
- Nupnau, Arthur E., to Bell & Howell Company. Threading and synchronization system for sound motion picture projector. 4,009,949, Cl. 352-159.000.
- Nusbaum, Max J. Protective covering. 4,009,494, Cl. 2-2.000.
- Obenchain, Richard F. Metallurgical shaft furnace. 4,009,870, Cl. 266-192.000.
- Obenchain, Richard F. Metallurgical furnace. 4,009,871, Cl. 266-193.000.
- Oberley, William J. Compositions for imparting fire retardance to wood. 4,010,296, Cl. 427-393.000.
- O'Berry, William A.: See—  
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- Ostead, Eilert A., to Goodyear Tire & Rubber Company, The. Catalyst for metathesis of cycloolefins. 4,010,113, Cl. 252-429.00B.
- Ogawa, Yasuaki: See—  
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- Ohkuo, Masahiro; and Fukutake, Heiji, to Kabushiki Kaisha Daikin Seisakusho. Torque converter. 4,009,570, Cl. 60-341.000.
- Ohloff, Gunther: See—  
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- Ohnsorge, Ulrich: See—  
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- Ohzu, Hitoshi, to Takata Ophthalmic Instruments Co., Ltd. Apparatus for producing optical interference pattern with continuously variable fringe spacing. 4,009,940, Cl. 350-163.000.
- Oil States Rubber Company: See—  
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- Oka, Shunzo: See—  
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- Oka, Takashi; Iwasaki, Hiroshi; and Kato, Eiichi, to Nissan Motor Co., Ltd.; Ikeda Bussan Co., Ltd.; and Toray Industries, Inc. Method of producing three-dimensionally shaped inflatable safety bag. 4,010,055, Cl. 156-226.000.
- Okada, Yutaka: See—  
Baba, Yoshihiko; Okada, Yutaka; Horikoshi, Hiroyoshi; and Yabe, Yuichiro, 4,010,149.
- Okano, Yukio, to Minolta Camera Kabushiki Kaisha. Double layered optical low pass filter permitting improved image resolution. 4,009,939, Cl. 350-162.05F.
- Okasaka, Hotuma: See—  
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- Okawa, Takashi: See—  
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Okubo, Hiroshi; Kato, Masamichi; and Ito, Akihiko, to Japan Atomic Energy Research Institute. Process for preparing highly-cured transparent resin molded products. 4,010,088, Cl. 204-159.240.

Olesch, Reinhard: See—  
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Olson, Ulf Torbjorn; and Hagglund, Erik Olof Sture, to Mo och Domsjo. Method for improving heat economy in the batchwise digestion of lignocellulosic material by adjusting the level of free digestion liquor. 4,010,066, Cl. 162-49.000.

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Onishi, Masaru; and Tomura, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Electrophotographic system. 4,010,031, Cl. 96-1.0TE.

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Ono, Yoshio; and Sakamoto, Takashi. Process for producing color separation record utilizing electroluminescent material. 4,010,032, Cl. 96-31.000.

Onozuka, Mitsuo; Hayashi, Yasuo; and Adachi, Yoshiaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Anti-fouling composition for use in water comprising a polymer and an organo tin compound. 4,010,141, Cl. 260-45.75K.

Oono, Eishi: See—  
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Otterbeck, Finn. Awning system or the like. 4,009,746, Cl. 160-323.00R.

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Palmaer, Tore Georg. Switch member for portable, battery-operated apparatus. 4,010,340, Cl. 200-330.000.

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Parikh, Gokaldas C.; and Ho, Chi Kuan, to United States of America, Navy. Radioactive iodine (125I) labeling of latex particles. 4,010,250, Cl. 424-1.000.

Parise, Carl, to Parise & Sons, Inc. Water valve assembly. 4,009,728, Cl. 137-594.000.

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Parker-Hannifin Corporation: See—  
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Parlow, Albert F., to Professional Staff Association of the Los Angeles County Harbor General Hospital. Male contraceptive and method of achieving male contraception. 4,010,256, Cl. 424-88.000.

Patel, Savinay; and Szuhaj, Bernard F., to Central Soya Company, Inc. Web dispenser. 4,009,682, Cl. 118-118.000.

Patrick, William John; Scilla, Salvatore James; and Westdorp, Wolfgang Alfred, to International Business Machines Corporation. Controlling the oxygen content of Czochralski process of silicon crystals by sandblasting silica vessel. 4,010,064, Cl. 156-617.0SP.

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Pennwalt Corporation: See—  
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Perkin-Elmer Corporation, The: See—  
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Pfaff, Paul D., to Bernal Incorporated. Self-stripping punch with ears. 4,009,625, Cl. 83-97.000.

Phillips, Bert. ZrO<sub>2</sub>-base heating elements. 4,010,352, Cl. 219-553.000.

Phillips, Kenneth G.; Ballweber, Edward G.; Nordquist, Karen A.; and Miller, Robert A., to Nalco Chemical Company. Quaternary modified acrylamide polymers. 4,010,131, Cl. 260-29.4UA.

Phillips, Kenneth G.; and Frisque, Alvin J., to Nalco Chemical Company. Method of sealing leaks in metal oil storage containers. 4,010,231, Cl. 264-35.000.

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Pinch, Harry Louis; Abeles, Benjamin; and Gittleman, Jonathan Isaac, to RCA Corporation. High resistance cermet film and method of making the same. 4,010,312, Cl. 428-450.000.

Pinsky, Gordon P., to Owens-Corning Fiberglass Corporation. Thermal insulation. 4,009,735, Cl. 138-147.000.

Pleska, Jean-Pierre; and Marechal, Michel, to Solvay & Cie. Process for the manufacture of short fibrils. 4,010,229, Cl. 264-13.000.

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- Ress, Thomas I.; and Nolde, George V., to Krellid Chemico Physical K.G. Direct acting plasma accelerator. 4,010,396, Cl. 313-231.300.
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- Company. Polyol blends and polyurethane prepared therefrom. 4,010,146, Cl. 260-77.5AM.
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- Sayer, Wayne L.; and Wright, Pat. Method and apparatus for testing a subsurface formation for fluid retention potential. 4,009,609, Cl. 73-155.000.
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- Schablonen Technik Kufstein Ges.m.b.H.: See—  
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- Schaffner, Heinz: See—  
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- Schapker, Richard L.: See—  
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- Schaumburg, Ernest C., to Standard Oil Company. Battery vent. 4,010,044, Cl. 429-82.000.
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- Scherer, Henry W., to S & C Electric Company. Terminator member for fusible element of a high voltage fuse. 4,010,438, Cl. 337-232.000.
- Schenayder, Lawrence F., to Caterpillar Tractor Co. Throttling slot configuration for a valve spool. 4,009,864, Cl. 251-282.000.
- Schiessler, Siegfried; Spietschka, Ernst; and Tronich, Wolfgang, to Hoechst Aktiengesellschaft. Process for the purification of copper phthalocyanine. 4,010,180, Cl. 260-314.500.
- Schiessler, Siegfried: See—  
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- Schlachter, Kurt, to Kramer & Grebe GmbH & Co. KG Maschinen-und Modellfabrik. Device for packaging of goods. 4,009,552, Cl. 53-86.000.
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- Schlafhorst & Co.: See—  
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- McGill, Howard L.; Randermann, Ervin, Jr.; and Musik, Olgierd J., 4,009,753.
- Schmidt, Dietrich F., to Capitol Products Corporation. Storage locker. 4,009,796, Cl. 220-84.000.
- Schmitt, Paul: See—  
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- Schmitz, Frederick William: See—  
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- Schnabel, Ernst. Pressure hose. 4,009,733, Cl. 138-103.000.
- Schneider, Alan A., to Catalyst Research Corporation. Lithium-iodine cells and method for making same. 4,010,043, Cl. 29-523.200.
- Schneider, Georg, to Koenig & Bauer Aktiengesellschaft. Mechanism for securing printing plate clamping devices on forme cylinders. 4,009,659, Cl. 101-415.100.
- Schnyder, Auxilius P. Wood chipping apparatus. 4,009,837, Cl. 241-93.000.
- Schoenfeld, David Robert: See—  
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- Scholl, Charles H., to Nordson Corporation. Method and apparatus for pumping viscous material. 4,009,974, Cl. 418-181.000.
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- Scholl, Margaret: See—  
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- Schreyer, Kenneth D., to Columbus McKinnon Corporation. Hoist brake construction featuring cam devices. 4,009,770, Cl. 188-82.740.
- Schroder, Rolf: *See—*  
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- Schul, Herbert, to Heraeus-Schott Quarzschmelze GmbH. Apparatus for making fused silica tubing. 4,010,022, Cl. 65-277.000.
- Schulte-Elte, Karl-Heinrich: *See—*  
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- Schulze, Rudolf; Schumacher, Horst; and Simora, Ferdinand, to VEB Kombinat Fortschritt. Crop-feed arrangement for hay baler. 4,009,558, Cl. 56-341.000.
- Schulze, Ulrich: *See—*  
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- Schwartz, Norman L., to Multiplex Communications, Inc. Line selective time division communication system. 4,010,326, Cl. 179-15.0BA.
- Science Union et Cie, Societe Francaise de Recherche Medical: *See—*  
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- Scott, Camilla Ann; and Zimmerman, Elizabeth L., to United States of America, Interior. Coordinated color chart system, and method for producing same. 4,009,527, Cl. 35-28.300.
- Scott, Kenneth W.; and Calderon, Nissim, to Goodyear Tire & Rubber Company, The. Preparation of graft, block and crosslinked unsaturated polymers and copolymers by olefin metathesis. 4,010,224, Cl. 260-878.00R.
- Scott Paper Company: *See—*  
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- Sealed Power Corporation: *See—*  
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- Sebek, Oldrich K.: *See—*  
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- Secor, Robert B.; Van Nordstrand, Robert A.; and Pegg, David R., to Filtror Corporation. Fluid cracking catalysts. 4,010,116, Cl. 252-455.00Z.
- Segawa, Takashi, to Shimano Industrial Company, Limited. Assembly of chain sprockets and cranks for bicycle. 4,009,621, Cl. 74-243.0DR.
- Seki, Kohji: *See—*  
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- Setzer, William C.; Lanam, Richard D.; Winter, Joseph; and Graham, Douglas L., to Swiss Aluminium Ltd. Method of extruding aluminum base alloys. 4,010,046, Cl. 148-11.50A.
- Severa, Henrietta M.: *See—*  
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- Shackle, Dale Richard; and Schwab, Gerhart. Process for the production of self-contained carbonless copy record sheets. 4,010,292, Cl. 427-150.000.
- Shah, Aroon C. Automotive burglar alarm with gas siphoning detector. 4,010,444, Cl. 340-63.000.
- Sharki, Martin J.: *See—*  
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- Sharp, Andrea H. Baby pack. 4,009,808, Cl. 224-6.000.
- Sharp, Bernard C., to Parker-Hannifin Corporation. Wiper blade unit with fastening clip. 4,009,503, Cl. 15-250.420.
- Sharp Kabushiki Kaisha: *See—*  
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- Shaughnessey, Paul Eugene, to American Cyanamid Company. Synthetic organic flocculants to clarify raw sugar liquor. 4,009,706, Cl. 127-48.000.
- Sheldon, Wesley E. Safety leg for a chair. 4,009,904, Cl. 297-217.000.
- Shell Internationale Research Maatschappij B.V.: *See—*  
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- Sheppard, John D.; and Tong, Long S., to United States of America, Energy Research and Development Administration. Apparatus for monitoring two-phase flow. 4,009,614, Cl. 73-195.000.
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- Shigematsu, Taichiro: *See—*  
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- Shiley Laboratories, Inc.: *See—*  
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- Shima, Masatoshi: *See—*  
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- Shimamoto, Takeshi, to Kawasaki Jukogyo Kabushiki Kaisha. Safety device for a motorcycle. 4,010,379, Cl. 307-9.000.
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- Shimizu, Katsuhisa: *See—*  
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- Shimizu, Sadaichi, to K.K. Shimizu Seisakusho. Method of and apparatus for bending a double pipe. 4,009,601, Cl. 72-369.000.
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- Shio, Cheng. Automatic telephone dialer. 4,010,330, Cl. 179-90.00B.
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- Shirley, Gerald. Spindle adapter. 4,009,886, Cl. 274-10.00S.
- Shiroki, Masami: *See—*  
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- Simmons, Raymond L.; Williams, David E.; Hoyt, Edwin D.; and Davis, Eugene B., to Rama Corporation. Nebulizer. 4,009,713, Cl. 128-193.000.

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- Skaletzky, Louis L.: *See—*  
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- Skvarenina, John A. Method and apparatus for preventing condensation from forming about the periphery of a freezer door. 4,009,586, Cl. 62-80.000.
- Slivka, Lawrence P., to United States of America, Navy. Missile post-multiple-target resolution guidance. 4,010,467, Cl. 343-7.400.
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- Smith, Bob L., deceased (Adams, Capt. Allen Bond, executor), to United States of America, Army. Polarization rotator for phase array antennas. 4,010,471, Cl. 343-754.000.
- Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. Process. 4,010,209, Cl. 260-606.50P.
- Smith, Donald L., to Thrifty-Vent, Inc. Venting system for a gas-fired heating plant. 4,009,705, Cl. 126-307.00A.
- Smith, Grover C.; and Smith, Thomas M., to Interstate Sports, Inc. Foot lever construction having controlled flexibility. 4,009,623, Cl. 74-512.000.
- Smith, Leslie Harold, to Imperial Chemical Industries Limited. Alkanolamine derivatives. 4,010,189, Cl. 260-465.00D.
- Smith, Marjorieann M. Trailer coupling. 4,009,889, Cl. 280-423.00R.
- Smith, Richard L.: *See—*  
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- Sobel, Jay E., to UOP Inc. Maintaining HF solubility in alkylation isobutane recycle. 4,010,218, Cl. 260-683.480.
- Societe Anonyme dite: L'Oreal: *See—*  
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- Sokolski, Walter T.: *See—*  
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- Staats, Henry N.; and Newcomb, Robert K., to General Binding Corporation. Bookbinding system. 4,009,498, Cl. 11-1.0AD.
- Stadigh, Hans-Goran, to Linden-Alimak AB. Magnetically actuated locking system for elevator doors. 4,009,767, Cl. 187-31.000.
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- Stampfli, Harald, to Lucifer S.A. Electromagnetic actuator comprising a plunger core. 4,010,390, Cl. 310-30.000.
- Stan, Aurel V.: *See—*  
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- Standard Oil Company: *See—*  
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- McKinney, Claude O., 4,010,094.
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- Steinwart, Johannes: *See—*  
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- Stephens, William: *See—*  
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- Stewart, Patrick Brian: See—  
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- Stewart, Thomas: See—  
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- Stock, William. Illuminated house number sign. 4,009,535, Cl. 40-130.00K.
- Stockel, Richard F.: See—  
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- Stowell, William R.; and Sagsmuller, Joseph R., to Battelle Memorial Institute. Reacting coil. 4,010,089, Cl. 204-168.000.
- Stratton, Michael K.: See—  
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- Ström, Sven B.; and Graveman, Donald F., to American Pulverizer Company. Material reducing machine. 4,009,836, Cl. 241-73.000.
- Strutz, Ernst: See—  
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- Sturiale, Gino R.: See—  
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- Sukup, Eugene G. Grain drying systems. 4,009,520, Cl. 34-233.000.
- Sullivan, Dennis W., to Parker-Hannifin Corporation. Coiled tubing. 4,009,734, Cl. 138-125.000.
- Sumitomo Chemical Company, Limited: See—  
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- Suslick, Kenneth S., to United States of America, Energy Research and Development Administration. Isotope separation by photochromatography. 4,010,100, Cl. 55-67.000.
- Suzaki, Kuniyoshi, to Canon Kabushiki Kaisha. Motion picture projection apparatus with film feeding speed changing apparatus. 4,009,950, Cl. 352-166.000.
- Suzuki, Koji, to Canon Kabushiki Kaisha. Thermographic camera. 4,010,367, Cl. 250-334.000.
- Suzuki, Sadao, to Sony Corporation. Sensing circuits. 4,010,486, Cl. 357-25.000.
- Suzuki, Shigeru; Iwamoto, Minoru; Noguchi, Koichi; Omi, Kyoji; and Nishikawa, Tatsuo, to Ricoh Co., Ltd. Copy paper feed system. 4,009,957, Cl. 355-14.000.
- Suzuki, Toshihiro: See—  
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- Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,009,906.
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- Takai, Hiromitsu. Vents-making dispenser carton. 4,009,811, Cl. 225-7.000.
- Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Carpet securing device. 4,009,505, Cl. 16-7.000.
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- Voronkov, Mikhail Grigorievich; Deryagina, Eleonora Nikolaevna; Chernyshev, Evgeny Andreevich; Savushkina, Valentina Ivanovna; Nakhmanovich, Anatoly Samuilovich; and Tabenko, Bella Moiseevna. Method of preparing aromatic and heterocyclic sulphides and disulphides. 4,010,210, Cl. 260-609.00D.
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- Waldhofer, Reinhard, to Shell Internationale Research Maatschappij B.V. Apparatus for transferring fuel between spaces which are at differential pressures. 4,009,788, Cl. 214-17.00B.
- Walker, Darrell W.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Oxidative dehydrogenation catalyst. 4,010,114, Cl. 252-437.000.
- Walker, Jordan E. Variable value constant volume flow device. 4,009,826, Cl. 236-49.000.
- Wall, Cothran D.; and Overly, John L., to Southern Webbing Mills, Inc. Elastic tape with ravel resistant edge and method of knitting. 4,009,597, Cl. 66-193.000.
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- Walters, Leslie K., to General Motors Corporation. Rotary combustion engine exhaust gas recirculation system. 4,009,689, Cl. 123-8.130.
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- Ward, John W., to Teledyne Avionics, a division of Teledyne Industries Inc. Automatic acoustic impedance meter. 4,009,707, Cl. 128-2.00Z.
- Ward, John Wesley, Jr., to International Business Machines Corporation. Document transport device. 4,009,877, Cl. 271-272.000.
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- Weatherford, Danny J. Gasoline and vapor return hose system for delivery truck. 4,009,739, Cl. 141-59.000.
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- Webb, William M.; and Boughton, Stephen G., to General Electric Company. Single evaporator, single fan combination refrigerator with independent temperature controls and method of adjustment. 4,009,589, Cl. 62-180.000.
- Webb, William M.; and Hester, William F., to General Electric Company. Single evaporator, single fan combination refrigerator with independent temperature controls. 4,009,590, Cl. 62-180.000.
- Weber, Gerald; and Sorgenfrei, Jurgen, to Olympia Werke AG. Circuit arrangement for adding and subtracting. 4,010,359, Cl. 235-169.000.
- Weetall, Howard H., to Corning Glass Works. Reactor for stabilized microbes having photometabolic activity. 4,010,076, Cl. 195-115.000.
- Weibel, John, Jr.: See—  
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- Welch, Franklin R.: See—  
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- Wells, John B., to Xerox Corporation. Inking in litho printing through a non-imaged screen. 4,009,660, Cl. 101-450.000.
- Welsh, Jay Y., to Diamond Shamrock Corporation. Manganese ore reduction. 4,010,236, Cl. 423-49.000.
- Wenrick, Brian A., to Protective Treatments, Inc. Composite decorative trim strip for automobile side bodies. 4,010,297, Cl. 428-31.000.
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- Wolff, Horst, to Carl Walther Sportwaffenfabrik. Trigger mechanism for firearms. 4,009,536, Cl. 42-84.000.
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- Wyden, Stephen. Apparatus for forming curved surfaces by rotation. 4,010,020, Cl. 65-142.000.
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- Yardley, James Frank; and Nightingale, Allen Frederick, to Dunlop Limited. Moulded plastic-rubber composites. 4,010,235, Cl. 264-241.000.
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- Yoshitomi Pharmaceutical Industries, Ltd.: *See—*  
 Nakanishi, Michio; Araki, Kazuhiko; Tahara, Tetsuya; and Shioki, Masami, 4,010,184.
- Young, Frank Edward, to West's Piling and Construction Company Limited. Modular piling system. 4,009,550, Cl. 52-726.000.
- Young, Geoffrey Stanley, to Camesa, S.A. Method of forming cables. 4,009,561, Cl. 57-6.000.
- Young, Vernon V.; Kosewicz, John S.; and Schmitz, Frederick William, to IMC Chemical Group, Inc. Method for the recovery of zeaxenone. 4,010,167, Cl. 260-343.20F.
- Yoxheimer, Robert. Convertible roof for a motor vehicle. 4,009,902, Cl. 296-137.00B.
- Yugenkaisha Sato Kenkyusho: *See—*  
 Sato, Takayoshi, 4,010,480.
- Yurugi, Shojiro; and Kikuchi, Shintaro, to Takeda Chemical Industries, Ltd. 8-Alkylpyridol[3,4-d]pyridazines. 4,010,265, Cl. 424-248.400.
- Yutani, Kiyohiko: *See—*  
 Miura, Yuichi; Yutani, Kiyohiko; and Izumi, Yusuke, 4,010,072.
- Zabotto, Arlette: *See—*  
 Koulbanis, Constantin; Zabotto, Arlette; and Contamin, Jean-Claude, 4,010,254.
- Zapp, Walter, to I D F Company Ltd. Lever-actuated closure device. 4,009,794, Cl. 215-210.000.
- Zehren, James N., to TRW, Incorporated. Method and apparatus for flooding of oil-bearing formations by downward inter-zone pumping. 4,009,756, Cl. 166-250.000.
- Zeile, Karl: *See—*  
 Koppe, Herbert; Zeile, Karl; Kummer, Werner; Stahle, Helmut; and Engelhardt, Albrecht, 4,010,158.
- Zelnik, Andrej, to Slovenska vysoka skola tehnika. Method of and

- apparatus for high intensity heat and/or mass transfer between two or more phases. 4,009,751, Cl. 165-1.000.
- Zenith Radio Corporation: *See—*  
 Collins, Johnny; and Heuer, Charles H., 4,010,423.
- Podowski, Robert R., 4,010,447.
- Zickel, Thomas A.: *See—*  
 Hetzler, Lewis R.; Huntzinger, Gerald O.; Winstead, William P., III; and Zickel, Thomas A., 4,009,699.
- Zieglmeyer, Harold R. Wood-working mechanism. 4,009,742, Cl. 144-230.000.
- Ziegler, Gunther: *See—*  
 Frohmader, Sigrun; and Ziegler, Gunther, 4,010,047.
- Zilg, Jochen: *See—*  
 Reiner, Udo; and Zilg, Jochen, 4,010,420.
- Zimmerman, Edwin H., to E.Z. Mfg. Co. Woodworking machine. 4,009,741, Cl. 144-41.000.
- Zimmerman, Elizabeth L.: *See—*  
 Scott, Camilla Ann; and Zimmerman, Elizabeth L., 4,009,527.
- Zirngibl, Hans: *See—*  
 Winter, Gerhard; Mansmann, Manfred; and Zirngibl, Hans, 4,010,233.
- Zollner, Nikolaus Waki; and Schwark, Hanfried F. Float device with at least one float body. 4,009,675, Cl. 114-267.000.
- Zoltan, Bart Joseph: *See—*  
 Albert, William Charles; and Zoltan, Bart Joseph, 4,009,848.
- Zuech, Ernest A., to Phillips Petroleum Company. Olefin conversion. 4,010,217, Cl. 260-683.00D.
- Zurcher, Rudolf F., to Hughes Aircraft Company. Electronic watch construction. 4,009,564, Cl. 58-23.00R.
- Zurrer, Hans; and Baram, Martin, to Escher Wyss Limited. Weir in a path of conveyance. 4,009,822, Cl. 233-3.000.



# CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977	B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976	B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977	B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976	B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977	B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976	B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977



**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED**

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 433,034	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976	B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976	B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976	B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977	B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976	B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976	B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976	B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977	B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976	B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976	B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976	B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976	B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976	B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977	B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976	B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976	B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976	B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977	B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976	B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976	B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976	B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977	B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976	B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976	B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976	B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976	B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976	B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976	B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976	B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976	B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976

**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976	B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977	B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976	B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977	B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977	B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976	B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1



**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976	B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977	B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976	B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977	B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976	B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 498,820	3,996,607	Mar. 9, 1976	Dec. 14, 1976	B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976	B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976	B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 506,167	3,990,652	Feb. 3, 1976	Oct. 26, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
				B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977	B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976	B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977	B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976	B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976	B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976	B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976	B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976	B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976	B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976	B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976	B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976	B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976	B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976	B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976	B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976	B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976	B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976	B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976	B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977	B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977	B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976	B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976	B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976	B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976	B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976	B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976	B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976	B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977	B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976	B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976	B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976	B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976	B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976	B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977	B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977	B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976	B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976	B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976	B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976	B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976	B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976	B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976	B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976	B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976	B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976	B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976	B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976	B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976	B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976	B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976	B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976



PI 38 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976	B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976	B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976	B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976	B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976	B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976	B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976	B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976	B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976	B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976	B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976	B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976	B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976	B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976	B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977	B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976	B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976	B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976	B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976	B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976	B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977	B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976	B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976	B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976	B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976	B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976	B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976	B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976	B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976	B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976	B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976	B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976	B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977	B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976	B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976	B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977	B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977	B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976	B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976	B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976	B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976				



## LIST OF DEFENSIVE PUBLICATIONS

### APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 1ST DAY OF  
MARCH, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Ballard, Denis George Harold; Jones, Eric; and Padget, John Christopher, to Imperial Chemical Industries Limited. Ethylene polymers. T956,004, 3-1-77, Cl. 526-350.000.

Continental Oil Company: *See—*  
Sias, Roy C., T956,002.

Imperial Chemical Industries Limited: *See—*  
Ballard, Denis George Harold; Jones, Eric; and Padget, John Christopher, T956,004.

Jones, Eric: *See—*  
Ballard, Denis George Harold; Jones, Eric; and Padget, John Christopher, T956,004.

Kasper, George P.; and O'Brien, Robert J. Electrographic apparatus and process for humidity stabilized development. T956,001, 3-1-77, Cl. 96-1.0SD.

National Semiconductor Corporation: *See—*  
Simone, Richard B., T956,003.

O'Brien, Robert J.: *See—*  
Kasper, George P.; and O'Brien, Robert J., T956,001.

Padget, John Christopher: *See—*  
Ballard, Denis George Harold; Jones, Eric; and Padget, John Christopher, T956,004.

Sias, Roy C., to Continental Oil Company. Waterflooding method using sulfonates. T956,002, 3-1-77, Cl. 252-8.5SD.

Simone, Richard B., to National Semiconductor Corporation. Interconnect logic for a serial processor. T956,003, 3-1-77, Cl. 340-172.500.

## LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 1<sup>ST</sup> DAY OF MARCH, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bayer Aktiengesellschaft: *See—*  
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased; Rubsam, Ralph Wilhelm, heir; Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

Bunger, David A., to D. H. Baldwin Company. Automatic chord and rhythm system for electronic organ. Re. 29,144, Cl. 84-1.010.

D. H. Baldwin Company: *See—*  
Bunger, David A., Re. 29,144.

Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased (by Rubsam, Marianne); by Rubsam, Ralph Wilhelm, heir; by Rubsam, Marion Mathilde Emilie, heir; and by Rubsam, Bernd Friedrich Konrad, heir, to Bayer Aktiengesellschaft. Catalyst for sulfuric acid contact process. Re. 29,145, Cl. 252-452.000.

Heinze, Gerhard: *See—*  
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased; Rubsam, Ralph Wilhelm, heir; Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

Moller, Wilhelm: *See—*  
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased; Rubsam, Ralph Wilhelm, heir; Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

Rubsam, Bernd Friedrich Konrad, heir: *See—*  
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased; Rubsam, Ralph Wilhelm, heir; Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

Rubsam, Franz, deceased: *See—*  
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased; Rubsam, Ralph Wilhelm, heir; Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

Rubsam, Marianne: *See—*  
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased; Rubsam, Ralph Wilhelm, heir; Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

Rubsam, Marion Mathilde Emilie, heir: *See—*  
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased; Rubsam, Ralph Wilhelm, heir; Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

Rubsam, Ralph Wilhelm, heir: *See—*  
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased; Rubsam, Ralph Wilhelm, heir; Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

Wokulat, Jurgen: *See—*  
Dorn, Ludwig; Heinze, Gerhard; Wokulat, Jurgen; Moller, Wilhelm; Rubsam, Franz, deceased; Rubsam, Ralph Wilhelm, heir; Rubsam, Marion Mathilde Emilie, heir; and Rubsam, Bernd Friedrich Konrad, heir, Re. 29,145.

## LIST OF PLANT PATENTEES

Johnson, Harold A., Jr., to Driscoll Strawberry Associates, Inc. Strawberry plant. 4,020, 3-1-77, Cl. 49,000.

## LIST OF DESIGN PATENTEES

Exploitation Societe Anonyme: See—  
 Vignaud, Guy, 243,491.  
 American District Telegraph Company: See—  
 Galvin, Aaron A.; and Keeler, Francis R., 243,513.  
 American Optical Corporation: See—  
 Canavan, Richard W., III, 243,523.  
 Aqua-Leisure Industries, Inc.: See—  
 Fireman, Simon C., 243,482.  
 Balic, Andre Bob: See—  
 Hoyle, James Irwin; and Balic, Andre Bob, 243,559.  
 Barrett, George M. Aquarium. 243,540, 3-1-77, Cl. D30-9.000.  
 Belanger, Jean-Rock, to Bombardier Limited. Snowmobile tank. 243,517, 3-1-77, Cl. D12-7.000.  
 Bell & Howell Company: See—  
 Overman, John W., 243,526.  
 Benedict, Melvin A. Sandwich. 243,481, 3-1-77, Cl. D1-15.000.  
 Blesch, John, to Varian Associates. Data input console for construction cost estimator system. 243,534, 3-1-77, Cl. D14-42.000.  
 Bodine, Kenneth E.; and McDowell, Verle A. Portable air supply tank. 243,530, 3-1-77, Cl. D23-2.000.  
 Bombardier Limited: See—  
 Belanger, Jean-Rock, 243,517.  
 Brazdzionis, Algis B.: See—  
 Pietraszek, Thaddeus A.; Van Twisk, Richard J.; and Brazdzionis, Algis B., 243,483.  
 Brown, Erben G., to Golden State Helicopters, Inc. Helicopter tank. 243,520, 3-1-77, Cl. D12-81.000.  
 Brufau, Jose. Clothes hanger body. 243,497, 3-1-77, Cl. D6-257.000.  
 Buhk, Randall P., to Steelcase, Inc. Chair. 243,486, 3-1-77, Cl. D6-30.000.  
 Buhk, Randall P., to Steelcase, Inc. Secretarial arm chair. 243,487, 3-1-77, Cl. D6-31.000.  
 Burke, Frederick A.: See—  
 Long, Douglas A.; and Burke, Frederick A., 243,558.  
 Canavan, Richard W., III, to American Optical Corporation. Pair of spectacles. 243,523, 3-1-77, Cl. D16-65.000.  
 Chan, Ming Kong. Burner assembly for a portable cooking stove. 243,502, 3-1-77, Cl. D7-136.000.  
 Chisnall, David William: See—  
 Day, David; and Chisnall, David William, 243,547.  
 Clairol Incorporated: See—  
 Long, Douglas A.; and Burke, Frederick A., 243,558.  
 Coats Company, Inc.: See—  
 Wood, John F.; and Cunningham, Charles L., 243,551.  
 Cooper, Jack P. Measuring cup. 243,500, 3-1-77, Cl. D7-50.000.  
 Copeland, Alvin C. Restaurant building. 243,533, 3-1-77, Cl. D25-25.000.  
 Cornell, Robert G., to Gillette Company, The. Table lighter base. 243,539, 3-1-77, Cl. D27-39.000.  
 Coulombe, Joseph L. Clip-on wheel reflector for bicycles. 243,514, 3-1-77, Cl. D10-111.000.  
 Cullen, Clint C. Hoof pick. 243,541, 3-1-77, Cl. D30-40.000.  
 Cunningham, Charles L.: See—  
 Wood, John F.; and Cunningham, Charles L., 243,551.  
 Dart Industries Inc.: See—  
 Painter, David L., 243,501.  
 Day, David; and Chisnall, David William. Rattle. 243,547, 3-1-77, Cl. D34-15.0AG.  
 Dillon, Richard R.; and Graham, John F., to Honeywell Information Systems, Inc. Multiple use service cart. 243,518, 3-1-77, Cl. D12-29.000.  
 Drew, Donald G. Slide fastener presser foot. 243,555, 3-1-77, Cl. D15-72.000.  
 Fadler, Norman L.; Jones, Paul W.; and Kirchner, Jack R., to McDonnell Douglas Corporation. Antimicrobial susceptibility card for use with an automated microbial identification machine. 243,542, 3-1-77, Cl. D24-29.000.  
 Fadler, Norman L.; Jones, Paul W.; and Kirchner, Jack R., to McDonnell Douglas Corporation. Urine screening card for use with an automated microbial identification machine. 243,543, 3-1-77, Cl. D24-29.000.  
 Fireman, Simon C., to Aqua-Leisure Industries, Inc. Swim goggles. 243,482, 3-1-77, Cl. D2-234.000.  
 Flowers, Robert E. Ventilated cover for motorcycle seat. 243,496, 3-1-77, Cl. D6-191.000.  
 Fyffe, Billy D. Spray gun for washing vehicles. 243,532, 3-1-77, Cl. D23-17.000.  
 Galvin, Aaron A.; and Keeler, Francis R., to American District Telegraph Company. Intrusion alarm. 243,513, 3-1-77, Cl. D10-106.000.  
 General Mills, Inc.: See—  
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 Gorvits, Michael Stewart. Display stand. 243,492, 3-1-77, Cl. D6-140.000.  
 Graham, John F.: See—  
 Dillon, Richard R.; and Graham, John F., 243,518.  
 Hedgepeth, Sonja E. Stocking. 243,485, 3-1-77, Cl. D2-330.000.  
 Hess, Albert J. Skate board adjustment tool. 243,506, 3-1-77, Cl. D8-87.000.  
 Hickman, Ronald Price. Drill guide. 243,505, 3-1-77, Cl. D8-14.000.  
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 Hoshino, Kunio, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 243,554, 3-1-77, Cl. D14-75.000.  
 Hoyle, James Irwin; and Balic, Andre Bob. Stand for hair dryer and curling iron. 243,559, 3-1-77, Cl. D28-38.000.  
 Ikeda, Matafumi, to Sharp Kabushiki Kaisha (Sharp Corporation). Electronic calculating machine. 243,535, 3-1-77, Cl. D64-11.00B.  
 Intini, Thomas, to Maypack Inc. Combined calendar holder and note paper dispenser. 243,524, 3-1-77, Cl. D19-21.000.  
 John Henry Company, The: See—  
 Wheeler, Philip T., 243,509.  
 Jones, Paul W.: See—  
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 King, Mendel. Road marker. 243,515, 3-1-77, Cl. D10-113.000.  
 Kirchner, Jack R.: See—  
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 Long, Douglas A.; and Burke, Frederick A., to Clairol Incorporated. Dryer attachment. 243,558, 3-1-77, Cl. D28-18.000.  
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 McDowell, Verle A.: See—  
 Bodine, Kenneth E.; and McDowell, Verle A., 243,530.  
 McGee, Paul Dean, to Motorola, Inc. Display apparatus for automobile sound entertainment products or the like. 243,495, 3-1-77, Cl. D6-190.000.  
 Meisner, Maurice E. Mixing and casting table. 243,493, 3-1-77, Cl. D6-177.000.  
 Moore, Jacques E. Hanging support for pots, pans, or the like. 243,489, 3-1-77, Cl. D6-113.000.  
 Morrison, Sammy C. Wood rack, or similar article. 243,504, 3-1-77, Cl. D7-212.000.  
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 Nakade, Kenichi, to Ricoh Co., Ltd. Electrostatic copier. 243,522, 3-1-77, Cl. D16-31.000.  
 Neveux, Rene, to Societe Anonyme Francaise du Ferodo. Desk lamp. 243,549, 3-1-77, Cl. D48-20.00F.  
 Norton Company: See—  
 Strigle, Ralph F., Jr., 243,531.  
 O'Brien, James O. Clock or similar article. 243,511, 3-1-77, Cl. D10-8.000.  
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 Oster, Joseph, to Keystone Lamp Manufacturing Corporation. Lamp support. 243,550, 3-1-77, Cl. D48-20.00R.  
 Overman, John W., to Bell & Howell Company. Microfiche file or similar article. 243,526, 3-1-77, Cl. D19-76.000.  
 Painter, David L., to Dart Industries Inc. Coffeemaker. 243,501, 3-1-77, Cl. D7-62.000.  
 Petersen, Jorgen Nilas, to Aktieselskabet Brodrene Hartmann. Egg carton. 243,507, 3-1-77, Cl. D9-190.000.  
 Peterson, Vernon A., to Tonka Corporation. Toy fork lift vehicle. 243,546, 3-1-77, Cl. D34-15.0AJ.



Strigle, Ralph F., Jr., to Norton Company. Filter media. 243,511, 3-1-77, Cl. D23-4.000.

Summers, Robert A., and Leong, Henry. Menu holder. 243,525, 3-1-77, Cl. D19-26.000.

Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Autoclave sterilizer unit. 243,556, 3-1-77, Cl. D24-9.000.

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Van Kersen, Philip L. Card-mounted thermometer. 243,512, 3-1-77, Cl. D10-57.000.

Van Twisk, Richard J.: See—  
Pietraszek, Thaddeus A.; Van Twisk, Richard J.; and Brazdzionis, Algis B., 243,483.

Varian Associates: See—  
Blesch, John, 243,534.

Vogelheim, Kenneth P., to Ken Vogelheim Sales Co. Menu and record title display device. 243,560, 3-1-77, Cl. D96-12.00R.

Vrignaud, Guy, to Allibert Exploitation Sociale Anonyme. Mirrored bathroom cabinet. 243,491, 3-1-77, Cl. D6-129.000.

Wahl, John F., to Mallard Manufacturing Corporation. Electronic transmitter device for use in the opening or closing of garage doors. 243,537, 3-1-77, Cl. D14-95.000.

Wang, Hsio. Holder for coins. 243,494, 3-1-77, Cl. D6-188.000.

Wheeler, Philip T., to John Henry Company, The. Plant stake. 243,509, 3-1-77, Cl. D8-1.000.

Wood, John F.; and Cunningham, Charles L., to Coats Company, Inc., The. Tire changing apparatus or similar article. 243,551, 3-1-77, Cl. D15-199.000.

Woodard, Richard D. Snake head slip sinker. 243,529, 3-1-77, Cl. D22-30.000.

ISSUED MARCH 1, 1977

<b>CLASS 2</b>	<b>CLASS 42</b>	<b>CLASS 4</b>	<b>CLASS 8</b>	<b>CLASS 11</b>	<b>CLASS 13</b>	<b>CLASS 15</b>	<b>CLASS 16</b>	<b>CLASS 19</b>	<b>CLASS 23</b>	<b>CLASS 24</b>	<b>CLASS 28</b>	<b>CLASS 29</b>	<b>CLASS 30</b>	<b>CLASS 32</b>	<b>CLASS 34</b>	<b>CLASS 35</b>	<b>CLASS 36</b>	<b>CLASS 37</b>	<b>CLASS 40</b>
2 4,009,494 406 4,009,495	84 4,009,536	62 4,010,006 71 4,010,007	1 W 4,009,994 4 4,009,995 94.24 4,009,996 169 4,009,997	1 AD 4,009,498	33 4,010,313	21 D 4,009,499 50 R 4,009,500 84 4,009,501 250.27 4,009,502 250.42 4,009,503 4,009,504	7 4,009,505 126 4,009,506 171 4,009,507	155 4,009,508	230 R 4,009,998 4,009,999 252 R 4,010,000 4,010,001 284 4,010,002 288 B 4,010,003	16 PB 4,009,509 196 4,009,510	72.6 4,009,512 4,009,513	191.6 4,010,004 195 4,010,005 265 4,009,515 523.2 4,010,043 592 4,009,516 751 4,009,514	30 4,009,517 43.92 4,009,518	5 4,009,519	233 4,009,520	8 B 4,009,522 8 R 4,009,521 10.4 4,009,523 13 4,009,524 22 R 4,009,525 28.3 4,009,527	44 4,009,528	117.5 4,009,529 126 AD 4,009,530 189 4,009,531	11 A 4,009,532 28 B 4,009,533 106.3 4,009,534 130 K 4,009,535
<b>CLASS 3</b>	<b>CLASS 44</b>	<b>CLASS 48</b>	<b>CLASS 8</b>	<b>CLASS 11</b>	<b>CLASS 13</b>	<b>CLASS 15</b>	<b>CLASS 16</b>	<b>CLASS 19</b>	<b>CLASS 23</b>	<b>CLASS 24</b>	<b>CLASS 28</b>	<b>CLASS 29</b>	<b>CLASS 30</b>	<b>CLASS 32</b>	<b>CLASS 34</b>	<b>CLASS 35</b>	<b>CLASS 36</b>	<b>CLASS 37</b>	<b>CLASS 40</b>
12.8 4,009,496	62 4,010,006 71 4,010,007	214 A 4,010,008	1 W 4,009,994 4 4,009,995 94.24 4,009,996 169 4,009,997	1 AD 4,009,498	33 4,010,313	21 D 4,009,499 50 R 4,009,500 84 4,009,501 250.27 4,009,502 250.42 4,009,503 4,009,504	7 4,009,505 126 4,009,506 171 4,009,507	155 4,009,508	230 R 4,009,998 4,009,999 252 R 4,010,000 4,010,001 284 4,010,002 288 B 4,010,003	16 PB 4,009,509 196 4,009,510	72.6 4,009,512 4,009,513	191.6 4,010,004 195 4,010,005 265 4,009,515 523.2 4,010,043 592 4,009,516 751 4,009,514	30 4,009,517 43.92 4,009,518	5 4,009,519	233 4,009,520	8 B 4,009,522 8 R 4,009,521 10.4 4,009,523 13 4,009,524 22 R 4,009,525 28.3 4,009,527	44 4,009,528	117.5 4,009,529 126 AD 4,009,530 189 4,009,531	11 A 4,009,532 28 B 4,009,533 106.3 4,009,534 130 K 4,009,535
<b>CLASS 4</b>	<b>CLASS 48</b>	<b>CLASS 49</b>	<b>CLASS 8</b>	<b>CLASS 11</b>	<b>CLASS 13</b>	<b>CLASS 15</b>	<b>CLASS 16</b>	<b>CLASS 19</b>	<b>CLASS 23</b>	<b>CLASS 24</b>	<b>CLASS 28</b>	<b>CLASS 29</b>	<b>CLASS 30</b>	<b>CLASS 32</b>	<b>CLASS 34</b>	<b>CLASS 35</b>	<b>CLASS 36</b>	<b>CLASS 37</b>	<b>CLASS 40</b>
18 R 4,009,497	214 A 4,010,008	319 4,009,537	1 W 4,009,994 4 4,009,995 94.24 4,009,996 169 4,009,997	1 AD 4,009,498	33 4,010,313	21 D 4,009,499 50 R 4,009,500 84 4,009,501 250.27 4,009,502 250.42 4,009,503 4,009,504	7 4,009,505 126 4,009,506 171 4,009,507	155 4,009,508	230 R 4,009,998 4,009,999 252 R 4,010,000 4,010,001 284 4,010,002 288 B 4,010,003	16 PB 4,009,509 196 4,009,510	72.6 4,009,512 4,009,513	191.6 4,010,004 195 4,010,005 265 4,009,515 523.2 4,010,043 592 4,009,516 751 4,009,514	30 4,009,517 43.92 4,009,518	5 4,009,519	233 4,009,520	8 B 4,009,522 8 R 4,009,521 10.4 4,009,523 13 4,009,524 22 R 4,009,525 28.3 4,009,527	44 4,009,528	117.5 4,009,529 126 AD 4,009,530 189 4,009,531	11 A 4,009,532 28 B 4,009,533 106.3 4,009,534 130 K 4,009,535
<b>CLASS 4</b>	<b>CLASS 48</b>	<b>CLASS 49</b>	<b>CLASS 8</b>	<b>CLASS 11</b>	<b>CLASS 13</b>	<b>CLASS 15</b>	<b>CLASS 16</b>	<b>CLASS 19</b>	<b>CLASS 23</b>	<b>CLASS 24</b>	<b>CLASS 28</b>	<b>CLASS 29</b>	<b>CLASS 30</b>	<b>CLASS 32</b>	<b>CLASS 34</b>	<b>CLASS 35</b>	<b>CLASS 36</b>	<b>CLASS 37</b>	<b>CLASS 40</b>
18 R 4,009,497	214 A 4,010,008	319 4,009,537	1 W 4,009,994 4 4,009,995 94.24 4,009,996 169 4,009,997	1 AD 4,009,498	33 4,010,313	21 D 4,009,499 50 R 4,009,500 84 4,009,501 250.27 4,009,502 250.42 4,009,503 4,009,504	7 4,009,505 126 4,009,506 171 4,009,507	155 4,009,508	230 R 4,009,998 4,009,999 252 R 4,010,000 4,010,001 284 4,010,002 288 B 4,010,003	16 PB 4,009,509 196 4,009									



## CLASSIFICATION OF PATENTS

CLASS 187	125 PL	4,010,346	158	4,009,851	302 R	4,010,173	37	4,009,885	18	4,010,412
9 E	4,009,765	146	4,010,347	CLASS 248	306.7 C	4,010,175	CLASS 277	CLASS 324		
29 R	4,009,766	347	4,010,348	68 R	4,009,852	306.7 R	4,009,887	6	4,010,413	
31	4,009,767	400	4,010,341	201	4,009,853	307 H	CLASS 279	16 S	4,010,415	
CLASS 188	401	4,010,349	300	4,009,854	308 B	4,010,178	1 C	4,009,888	16 T	4,010,419
24	4,009,768	465	4,010,350	352	4,009,855	308 D	CLASS 280	54	4,010,414	
77 R	4,009,769	523	4,010,351	382	4,009,856	308 R	423 R	94	4,010,417	
82.74	4,009,770	553	4,010,352	CLASS 249	314.5	4,010,180	467	4,009,890	158 T	4,010,418
CLASS 192	64	4,009,795	102	4,009,857	326.14 T	4,010,181	651	4,009,891	CLASS 325	
105 A	4,009,771	84	4,009,796	120	4,009,858	326.5 FM	CLASS 283	4	4,010,420	
CLASS 195	242	4,009,797	122	4,009,859	332.2 R	4,010,184	6	4,009,892	38 A	4,010,421
7	4,010,071	325	4,009,798	CLASS 250	333	4,010,166	CLASS 285	141	4,010,422	
30	4,010,072	CLASS 221	201	4,010,363	343.2 F	4,010,167	110	4,009,893	391	4,010,423
64	4,010,073	3	4,009,799	234	4,010,364	343.6	183	4,009,894	CLASS 330	
66 B	4,010,074	CLASS 222	236	4,010,365	346.1 R	4,010,170	189	4,009,895	9	4,010,424
80 R	4,010,075	28	4,009,800	282	4,010,366	390	305	4,009,896	35	4,010,425
115	4,010,076	70	4,009,801	334	4,010,367	428.5	CLASS 290	53	4,010,426	
127	4,010,077	108	4,009,802	343	4,010,368	433	1 R	4,010,377	94.5 S	4,010,427
139	4,010,078	200	4,009,803	356	4,010,369	437 R	2	4,010,378	117 R	4,010,428
CLASS 197	391	4,009,804	372	4,010,371	448 A	4,010,186	258	4,009,897	CLASS 331	
1 R	4,009,772	530	4,009,805	456	4,010,372	465 C	CLASS 292	31.2	4,009,898	
CLASS 198	545	4,009,806	456	4,010,373	465 D	4,010,189	CLASS 294	33	4,009,899	
344	4,009,773	CLASS 223	507	4,010,374	471 C	4,010,191	CLASS 296	1 A	4,009,900	
403	4,009,775	96	4,009,807	578	4,010,375	473 G	28 C	4,009,901	129	4,010,433
478	4,009,776	CLASS 224	578	4,010,376	473 R	4,010,193	137 B	4,009,902	302	4,010,434
773	4,009,774	6	4,009,808	CLASS 251	476 R	4,010,195	CLASS 297	14	4,009,903	
CLASS 200	25 A	4,009,809	61.1	4,009,860	484 A	4,010,196	14	4,009,904	217	4,009,904
51 R	4,010,336	39	4,009,810	63	4,009,862	491	385	4,009,905	27	4,009,907
67 D	4,010,337	CLASS 225	172	4,009,863	497 A	4,010,198	CLASS 298	27	4,009,906	
144 R	4,010,338	7	4,009,811	282	4,009,864	552 R	CLASS 299	37	4,009,908	
292	4,010,339	97	4,009,812	318	4,009,865	561 N	56	4,009,909	21	4,009,910
330	4,010,340	103	4,009,813	CLASS 252	570.5 CA	4,010,201	CLASS 300	37	4,009,911	
CLASS 201	4	4,010,079	CLASS 226	8.1	4,010,104	570.5 P	CLASS 301	25	4,009,912	
CLASS 202	83	4,010,080	113	4,009,814	32.7 E	4,010,106	CLASS 302	58	4,009,913	
228	4,010,081	CLASS 203	207	4,009,815	77	4,010,107	CLASS 303	92	4,009,914	
CLASS 203	8	4,010,082	CLASS 228	187 R	4,010,112	601 R	CLASS 307	9	4,010,379	
CLASS 204	15	4,010,083	23 R	4,009,818	301.1 W	4,010,108	10 LS	66	4,010,380	
43 T	4,010,084	15	4,009,819	32	4,009,820	301.15	66	4,010,381	106	4,010,382
128	4,010,085	43 T	33	4,009,821	314	4,010,109	118	4,010,383	220 R	4,010,384
141.5	4,010,086	141.5	36	4,009,822	429 B	4,010,111	243	4,010,385	243	4,010,386
158 HA	4,010,087	158 HA	36	4,009,823	437	4,010,112	252 UA	4,010,386	252 UA	4,010,387
159.24	4,010,088	159.24	36	4,009,824	452	4,010,114	279	4,010,387	279	4,010,388
168	4,010,089	168	36	4,009,824	454	4,010,115	293	4,010,389	293	4,010,389
170	4,010,090	170	36	4,009,824	455 Z	4,010,116	CLASS 310	30	4,010,390	
290 F	4,010,091	290 F	36	4,009,824	500	4,010,117	87	4,010,392	258 A	4,010,457
CLASS 206	5.1	4,009,777	CLASS 233	3	4,009,822	683.48	194	4,010,393	258 R	4,010,458
219	4,009,778	219	7	4,009,823	521	4,010,118	CLASS 312	71	4,009,915	
315 R	4,009,779	315 R	26	4,009,824	521	4,010,119	71	4,009,916	204	4,009,916
387	4,009,781	387	26	4,009,824	521	4,010,120	204	4,009,917	214	4,009,917
CLASS 208	11 R	4,010,092	CLASS 235	54 F	4,010,353	875	255	4,009,918	255	4,009,918
65	4,010,093	65	54 F	4,010,353	61.11 E	4,010,355	268	4,009,919	268	4,009,919
164	4,010,094	164	54 F	4,010,353	61.6 R	4,010,354	CLASS 313	188	4,010,395	
CLASS 209	73	4,009,782	CLASS 236	1 E	4,009,825	4,010,356	CLASS 315	231.3	4,010,396	
108	4,009,783	108	1 E	4,009,825	22 CB	4,010,125	57	4,010,397	101	4,010,398
132	4,010,095	132	49	4,009,826	23 R	4,010,126	101	4,010,398	248	4,010,400
139 R	4,010,096	139 R	8	4,009,827	23.7 M	4,010,127	194	4,010,399	379	4,010,401
CLASS 210	10	4,010,098	CLASS 238	23 R	4,010,128	46.4	CLASS 318	63	4,010,407	
21	4,010,099	21	8	4,009,827	46.4	4,010,129	188	4,010,408	266	4,010,409
71	4,010,391	71	15	4,009,828	28.5 AV	4,010,130	231.3	4,010,409	587	4,010,410
86	4,010,101	86	2 R	4,009,828	29.3	4,010,131	CLASS 320	4	4,010,411	
151	4,010,102	151	2 R	4,009,828	29.4 R	4,010,132	CLASS 323			
242 R	4,010,103	242 R	15	4,009,829	29.4 UA	4,010,133	CLASS 324			
CLASS 211	46	4,009,784	204	4,009,830	29.6 HN	4,010,135	CLASS 325			
CLASS 214	1 BT	4,009,785	315	4,009,831	29.6 S	4,010,134	CLASS 326			
6 S	4,009,789	6 S	542	4,009,832	29.6 TA	4,010,133	CLASS 327			
8.5 C	4,009,786	8.5 C	10 R	4,010,361	37 SB	4,010,136	CLASS 328			
10.5 R	4,009,787	10.5 R	147	4,010,362	45.75 K	4,010,141	CLASS 329			
17 B	4,009,788	17 B	14	4,009,833	45.75 S	4,010,138	CLASS 330			
83.3	4,009,792	83.3	27	4,009,834	45.8 NT	4,010,137	CLASS 331			
317	4,009,790	317	28	4,009,835	47 UA	4,010,140	CLASS 332			
501	4,009,791	501	73	4,009,836	49 EP	4,010,143	CLASS 333			
CLASS 215	210	4,009,794	93	4,009,837	59 R	4,010,144	CLASS 334			
CLASS 219	246	4,009,793	99	4,009,838	75 R	4,010,145	CLASS 335			
10.49	4,010,342	10.49	CLASS 242	18 DD	4,009,839	75.5 AM	CLASS 336			
10.55 D	4,010,343	10.55 D	18 DD	4,009,839	79.3 M	4,010,147	CLASS 337			
80	4,010,344	80	35.6 E	4,009,840	112 R	4,010,148	CLASS 338			
121 L	4,010,345	121 L	58.3	4,009,841	112.5 LH	4,010,149	CLASS 339			
			71.9	4,009,842	146 T	4,010,150	CLASS 340			
			107	4,009,843	160	4,010,151	CLASS 341			
			107.3	4,009,844	192	4,010,152	CLASS 342			
			129.7	4,009,845	239.3 D	4,010,153	CLASS 343			
			201	4,009,846	243 C	4,010,154	CLASS 344			
			CLASS 244	3.16	4,009,848	250 AP	CLASS 345			
			53 R	4,009,849	253	4,010,156	CLASS 346			
			115	4,009,850	256.4 F	4,010,158	CLASS 347			
					256.4 H	4,010,160	CLASS 348			
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					272	4,010,162	CLASS 350			
					293.54	4,010,164	CLASS 351			

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152	4,009,933	13	4,009,956			473	4,010,244	298	4,010,277			
160 LC	4,009,934	14	4,009,957		CLASS 361	485	4,010,245	309	4,010,278		CLASS 428	
	4,009,938	16	4,009,958	18	4,010,403	542	4,010,246		4,010,279	31	4,010,297	
160 R	4,009,935	71	4,009,959	56	4,010,402	626	4,010,247	316	4,010,280	35	4,010,139	
	4,009,936			179	4,010,404	644	4,010,248	322	4,010,281	36	4,010,298	
	4,009,937			433	4,010,405	657	4,010,249	330	4,010,282	44	4,010,299	
					4,010,406					61	4,010,300	
162 SF	4,009,939	1	4,009,960							95	4,010,301	
163	4,009,940	2	4,009,961								4,010,302	
173	4,009,941	82	4,009,962		CLASS 404	1	4,010,250	66	4,009,975		4,010,303	
184	4,009,942	85	4,009,963	129	4,009,967	1.5	4,010,251	68	4,009,976	213	4,010,304	
207	4,009,943		4,009,964		CLASS 408	47	4,010,252	78	4,009,977	215	4,010,305	
214	4,009,944	109	4,009,965				4,010,253	98	4,009,978	236	4,010,306	
215	4,009,945	123	4,009,966	12	4,009,968		4,010,254	107	4,009,979	327	4,010,307	
266	4,009,946				CLASS 415	84	4,010,255	242 B	4,009,980	361	4,010,295	
288	4,009,947	15	4,010,482	217	4,009,969	88	4,010,256	388	4,009,981	372	4,010,308	
319	4,009,948	17	4,010,483		CLASS 416	92	4,010,257	389	4,009,982	386	4,010,309	
		24	4,010,484			115	4,010,258	451.2	4,009,983	424	4,010,311	
CLASS 352			4,010,485	134 R	4,009,970	150	4,010,259			450	4,010,312	
159	4,009,949	25	4,010,486		CLASS 417	177	4,010,260		CLASS 426		CLASS 429	
166	4,009,950	31	4,010,487				4,010,261	100	4,010,283		82	4,010,044
		70	4,010,488	43	4,009,971	202	4,010,263	285	4,010,284			
CLASS 353		82	4,010,489	407	4,009,972	246	4,010,264	534	4,010,285		CLASS 431	
7	4,009,951				CLASS 418	248.4	4,010,265	536	4,010,286			4,009,984
109	4,009,952						4,010,266		CLASS 427	4	5	4,009,985
CLASS 354		4	4,010,490	104	4,009,973		4,010,267			90	95 R	4,009,986
25	4,010,479	127	4,010,317	181	4,009,974	250	4,010,268	6	4,010,287			4,009,987
29	4,009,866	178	4,010,318		CLASS 423	251	4,010,269	15	4,010,288			4,009,988
43	4,009,880	213	4,010,319			258	4,010,270	54	4,010,289	114		4,009,989
113	4,010,481	233	4,010,321	49	4,010,236	273	4,010,271	93	4,010,290	178		
300	4,010,478	289	4,010,322	150	4,010,237		4,010,272	126	4,010,291		CLASS 432	
			4,010,320	239	4,010,238		4,010,273	150	4,010,292	13		4,009,990
CLASS 355				244	4,010,239	274	4,010,274	214	4,010,293	23		4,009,991
				269	4,010,240		4,009,847	226	4,010,294	106		4,009,992
3 R	4,009,953	1	4,010,491	304	4,010,241	275	4,010,275	393	4,010,296	122		4,009,993
7	4,009,954	25	4,010,492	335	4,010,242	285						



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	4,010,471	4,009,985	4,009,825	4,009,543	4,009,699	4,010,348
4 :	4,009,683	4,010,004	4,009,885	4,009,557	4,009,800	4,010,426
	4,009,727	4,010,071	4,009,888	4,009,571	4,009,874	4,010,455
	4,009,739	4,010,092	4,009,927	4,009,579	4,009,894	4,010,472
	4,009,752	4,010,098	4,009,948	4,009,586	4,009,966	4,010,481
	4,009,785	4,010,100	4,009,980	4,009,602	4,009,970	25 : 4,009,516
	4,009,799	4,010,106	4,010,019	4,009,634	4,009,972	4,009,599
	4,009,951	4,010,107	4,010,028	4,009,682	4,010,054	4,009,717
	4,010,143	4,010,116	4,010,046	4,009,693	4,010,094	4,009,718
	4,010,262	4,010,249	4,010,077	4,009,705	4,010,167	4,009,781
	4,010,290	4,010,256	4,010,209	4,009,730	4,010,342	4,009,850
	4,010,355	4,010,263	4,010,211	4,009,732	4,010,349	4,009,918
	4,010,361	4,010,324	4,010,288	4,009,758	4,010,388	4,009,984
	4,010,448	4,010,325	4,010,306	4,009,777	4,010,483	4,010,168
	4,010,450	4,010,328	4,010,345	4,009,787	19 : 4,009,520	4,010,316
5 :	4,009,534	4,010,334	4,010,431	4,009,805	4,009,533	4,010,357
	4,009,694	4,010,347	4,010,432	4,009,827	4,009,617	4,010,399
	4,010,377	4,010,351	4,010,462	4,009,845	4,009,668	4,010,403
6 :	4,009,499	4,010,356	4,010,476	4,009,852	4,009,687	4,010,427
	4,009,532	4,010,360	4,009,576	4,009,864	4,009,778	4,010,444
	4,009,546	4,010,365	4,009,847	4,009,872	4,009,779	4,010,460
	4,009,564	4,010,366	4,010,133	4,009,901	4,009,780	4,010,461
	4,009,566	4,010,368	4,010,199	4,009,949	4,010,052	26 : 4,009,506
	4,009,604	4,010,376	4,010,223	4,009,952	4,010,170	4,009,537
	4,009,608	4,010,396	4,010,242	4,009,959	20 : 4,009,554	4,009,555
	4,009,609	4,010,397	4,010,278	4,010,000	4,009,593	4,009,592
	4,009,611	4,010,400	4,010,358	4,010,003	4,009,703	4,009,596
	4,009,662	4,010,413	11 : 4,010,470	4,010,008	4,010,244	4,009,625
	4,009,686	4,010,414	12 : 4,009,523	4,010,010	21 : 4,009,589	4,009,626
	4,009,695	4,010,415	4,009,575	4,010,048	4,009,590	4,009,641
	4,009,709	4,010,419	4,009,650	4,010,078	4,009,591	4,009,642
	4,009,713	4,010,449	4,009,666	4,010,103	4,009,646	4,009,680
	4,009,714	4,010,456	4,009,667	4,010,131	4,009,723	4,009,689
	4,009,720	4,010,457	4,009,725	4,010,135	4,009,793	4,009,696
	4,009,724	4,010,467	4,009,819	4,010,142	4,009,795	4,009,745
	4,009,755	4,010,469	4,009,838	4,010,169	4,010,016	4,009,856
	4,009,809	4,010,474	4,009,857	4,010,216	4,010,293	4,009,911
	4,009,818	4,010,478	4,009,912	4,010,218	4,010,332	4,009,917
	4,009,824	4,010,485	4,009,982	4,010,231	4,010,437	4,009,926
	4,009,826	4,010,489	4,010,380	4,010,261	22 : 4,009,582	4,009,968
	4,009,828	4,010,491	4,010,463	4,010,299	4,009,651	4,009,979
	4,009,843	4,010,492	13 : 4,009,513	4,010,327	4,009,865	4,009,988
	4,009,844	8 : 4,009,496	4,009,587	4,010,336	4,009,898	4,010,075
	4,009,853	4,009,761	4,009,669	4,010,337	4,010,017	4,010,136
	4,009,861	4,009,782	4,010,301	4,010,374	4,010,125	4,010,172
	4,009,863	4,009,880	4,010,302	4,010,385	4,010,187	4,010,177
	4,009,873	4,009,904	16 : 4,009,664	4,010,404	4,010,248	4,010,192
	4,009,875	4,009,971	17 : 4,009,498	4,010,423	23 : 4,009,612	4,010,194
	4,009,889	9 : 4,009,518	4,009,500	4,010,438	24 : 4,009,704	4,010,201
	4,009,906	4,009,524	4,009,529	4,010,439	4,009,716	4,010,243
	4,009,907	4,009,569	4,009,530	4,010,447	4,009,960	4,010,269
	4,009,921	4,009,804	4,009,538	18 : 4,009,568	4,010,043	4,010,386

## GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

27	4,010,410 4,009,573 4,009,594 4,009,595 4,009,719 4,009,729 4,009,759 4,009,897 4,009,899 4,009,908 4,009,922 4,010,044 4,010,212 4,010,369 4,010,464	4,010,162 4,010,166 4,010,173 4,010,175 4,010,176 4,010,207 4,010,230 4,010,252 4,010,276 4,010,286 4,010,309 4,010,312 4,010,314 4,010,318 4,010,319	4,009,981 4,009,999 4,010,018 4,010,020 4,010,024 4,010,045 4,010,063 4,010,064 4,010,076 4,010,144 4,010,152 4,010,171 4,010,179 4,010,196 4,010,214	4,010,014 4,010,015 4,010,023 4,010,040 4,010,058 4,010,081 4,010,086 4,010,089 4,010,113 4,010,140 4,010,146 4,010,183 4,010,188 4,010,221 4,010,224	4,009,771 4,009,774 4,009,790 4,009,796 4,009,814 4,009,815 4,009,820 4,009,829 4,009,834 4,009,841 4,009,859 4,009,862 4,009,867 4,009,870 4,009,871	48	4,009,551 4,009,581 4,009,613 4,009,623 4,009,690 4,009,736 4,009,753 4,009,754 4,009,798 4,010,001 4,010,012 4,010,085 4,010,111 4,010,115 4,010,148 4,010,186 4,010,226 4,010,285 4,010,315 4,010,373 4,010,389 4,010,408 4,010,416 4,010,030 4,009,882 4,010,453 4,009,511 4,009,527 4,009,654 4,009,685 4,009,707 4,010,308 4,010,329 4,010,436 4,009,627 4,009,740 4,009,881 4,009,909 4,010,108 4,009,760 4,009,632 4,009,677 4,009,678 4,009,744 4,009,773 4,009,842 4,009,858 4,009,876 4,009,920 4,009,973 4,010,095 4,010,096 4,010,097			
28	4,009,517 4,009,629 4,009,764 4,009,821 4,009,836 4,009,868 4,009,895 4,010,298 4,009,728 4,009,784	4,010,323 4,010,344 4,010,363 4,010,381 4,010,395 4,010,418 4,010,425 4,010,440 4,010,454 4,010,465	4,010,228 4,010,255 4,010,326 4,010,330 4,010,353 4,010,418 4,010,429 4,010,430 4,010,482 4,009,497	4,010,239 4,010,251 4,010,297 4,010,305 4,010,346 4,010,354 4,010,477 4,009,544 4,009,578 4,009,756	4,009,887 4,009,962 4,009,977 4,009,989 4,009,995 4,010,007 4,010,029 4,010,042 4,010,049 4,010,050	4,009,870 4,009,871 4,009,887 4,009,962 4,009,977 4,009,989 4,009,995 4,010,007 4,010,029 4,010,042 4,010,049 4,010,050	49	4,009,882 4,010,453 4,009,511 4,009,527 4,009,654 4,009,685 4,009,707 4,010,308 4,010,329 4,010,436 4,009,627 4,009,740 4,009,881 4,009,909 4,010,108 4,009,760 4,009,632 4,009,677 4,009,678 4,009,744 4,009,773 4,009,842 4,009,858 4,009,876 4,009,920 4,009,973 4,010,095 4,010,096 4,010,097		
29	4,009,517 4,009,629 4,009,764 4,009,821 4,009,836 4,009,868 4,009,895 4,010,298 4,009,728 4,009,784	4,010,323 4,010,344 4,010,363 4,010,381 4,010,395 4,010,418 4,010,425 4,010,440 4,010,454 4,010,465	4,010,228 4,010,255 4,010,326 4,010,330 4,010,353 4,010,418 4,010,429 4,010,430 4,010,482 4,009,497	4,010,239 4,010,251 4,010,297 4,010,305 4,010,346 4,010,354 4,010,477 4,009,544 4,009,578 4,009,756	4,009,887 4,009,962 4,009,977 4,009,989 4,009,995 4,010,007 4,010,029 4,010,042 4,010,049 4,010,050	4,009,870 4,009,871 4,009,887 4,009,962 4,009,977 4,009,989 4,009,995 4,010,007 4,010,029 4,010,042 4,010,049 4,010,050	50	4,009,882 4,010,453 4,009,511 4,009,527 4,009,654 4,009,685 4,009,707 4,010,308 4,010,329 4,010,436 4,009,627 4,009,740 4,009,881 4,009,909 4,010,108 4,009,760 4,009,632 4,009,677 4,009,678 4,009,744 4,009,773 4,009,842 4,009,858 4,009,876 4,009,920 4,009,973 4,010,095 4,010,096 4,010,097		
32	4,009,728 4,009,784 4,009,519 4,009,545 4,009,514 4,009,525 4,009,577 4,009,605 4,009,607 4,009,645 4,009,658 4,009,684 4,009,711 4,009,775 4,009,776 4,009,802 4,009,806 4,009,816 4,009,837 4,009,848 4,009,851 4,009,879 4,009,900 4,009,933 4,009,935 4,010,025 4,010,079 4,010,110 4,010,126 4,010,129 4,010,138	4,010,466 4,010,468 4,010,473 4,010,484 4,009,670 4,009,757 4,009,494 4,009,503 4,009,521 4,009,549 4,009,572 4,009,603 4,009,615 4,009,660 4,009,672 4,009,702 4,009,708 4,009,770 4,009,797 4,009,807 4,009,810 4,009,831 4,009,854 4,009,886 4,009,892 4,009,902 4,009,928 4,009,934 4,009,976	37	4,009,508 4,009,597 4,009,663 4,009,674 4,009,803 4,010,362 4,010,405 4,010,406 Re.29,144 4,009,515 4,009,598 4,009,648 4,009,679 4,009,681 4,009,712 4,009,734 4,009,735 4,009,765 4,009,789 4,009,801 4,009,812 4,009,831 4,009,884 4,009,886 4,009,924 4,009,937 4,009,974 4,009,983 4,010,011	40	4,009,544 4,009,578 4,009,756 4,009,817 4,009,998 4,010,009 4,010,065 4,010,099 4,010,114 4,010,137 4,010,185 4,010,217 4,010,222 4,010,442 4,009,742 4,009,783 4,009,808 4,009,967 4,009,495 4,009,528 4,009,547 4,009,559 4,009,567 4,009,600 4,009,616 4,009,620 4,009,649 4,009,657 4,009,706 4,009,741 4,009,743 4,009,763	4,009,870 4,009,871 4,009,887 4,009,962 4,009,977 4,009,989 4,009,995 4,010,007 4,010,029 4,010,042 4,010,049 4,010,050 4,010,068 4,010,073 4,010,082 4,010,090 4,010,093 4,010,105 4,010,156 4,010,277 4,010,284 4,010,296 4,010,311 4,010,322 4,010,339 4,010,350 4,010,352 4,010,375 4,010,378 4,010,411 4,010,488 4,009,635 4,009,839 4,009,560 4,010,250 4,009,548 4,009,614 4,009,903 4,010,128 4,010,145 4,010,287	51	4,009,527 4,009,654 4,009,685 4,009,707 4,010,308 4,010,329 4,010,436 4,009,627 4,009,740 4,009,881 4,009,909 4,010,108 4,009,760 4,009,632 4,009,677 4,009,678 4,009,744 4,009,773 4,009,842 4,009,858 4,009,876 4,009,920 4,009,973 4,010,095 4,010,096 4,010,097	
33	4,009,519 4,009,545 4,009,514 4,009,525 4,009,577 4,009,605 4,009,607 4,009,645 4,009,658 4,009,684 4,009,711 4,009,775 4,009,776 4,009,802 4,009,806 4,009,816 4,009,837 4,009,848 4,009,851 4,009,879 4,009,900 4,009,933 4,009,935 4,010,025 4,010,079 4,010,110 4,010,126 4,010,129 4,010,138	4,010,466 4,010,468 4,010,473 4,010,484 4,009,670 4,009,757 4,009,494 4,009,503 4,009,521 4,009,549 4,009,572 4,009,603 4,009,615 4,009,660 4,009,672 4,009,702 4,009,708 4,009,770 4,009,797 4,009,807 4,009,810 4,009,831 4,009,854 4,009,886 4,009,892 4,009,902 4,009,928 4,009,934 4,009,976	37	4,009,508 4,009,597 4,009,663 4,009,674 4,009,803 4,010,362 4,010,405 4,010,406 Re.29,144 4,009,515 4,009,598 4,009,648 4,009,679 4,009,681 4,009,712 4,009,734 4,009,735 4,009,765 4,009,789 4,009,801 4,009,812 4,009,831 4,009,884 4,009,886 4,009,924 4,009,937 4,009,974 4,009,983 4,010,011	41	4,009,544 4,009,578 4,009,756 4,009,817 4,009,998 4,010,009 4,010,065 4,010,099 4,010,114 4,010,137 4,010,185 4,010,217 4,010,222 4,010,442 4,009,742 4,009,783 4,009,808 4,009,967 4,009,495 4,009,528 4,009,547 4,009,559 4,009,567 4,009,600 4,009,616 4,009,620 4,009,649 4,009,657 4,009,706 4,009,741 4,009,743 4,009,763	4,009,870 4,009,871 4,009,887 4,009,962 4,009,977 4,009,989 4,009,995 4,010,007 4,010,029 4,010,042 4,010,049 4,010,050 4,010,068 4,010,073 4,010,082 4,010,090 4,010,093 4,010,105 4,010,156 4,010,277 4,010,284 4,010,296 4,010,311 4,010,322 4,010,339 4,010,350 4,010,352 4,010,375 4,010,378 4,010,411 4,010,488 4,009,635 4,009,839 4,009,560 4,010,250 4,009,548 4,009,614 4,009,903 4,010,128 4,010,145 4,010,287	53	4,009,527 4,009,654 4,009,685 4,009,707 4,010,308 4,010,329 4,010,436 4,009,627 4,009,740 4,009,881 4,009,909 4,010,108 4,009,760 4,009,632 4,009,677 4,009,678 4,009,744 4,009,773 4,009,842 4,009,858 4,009,876 4,009,920 4,009,973 4,010,095 4,010,096 4,010,097	
34	4,009,514 4,009,525 4,009,577 4,009,605 4,009,607 4,009,645 4,009,658 4,009,684 4,009,711 4,009,775 4,009,776 4,009,802 4,009,806 4,009,816 4,009,837 4,009,848 4,009,851 4,009,879 4,009,900 4,009,933 4,009,935 4,010,025 4,010,079 4,010,110 4,010,126 4,010,129 4,010,138	35	4,009,670 4,009,757 4,009,494 4,009,503 4,009,521 4,009,549 4,009,572 4,009,603 4,009,615 4,009,660 4,009,672 4,009,702 4,009,708 4,009,770 4,009,797 4,009,807 4,009,810 4,009,831 4,009,854 4,009,886 4,009,892 4,009,902 4,009,928 4,009,934 4,009,976	39	Re.29,144 4,009,515 4,009,598 4,009,648 4,009,679 4,009,681 4,009,712 4,009,734 4,009,735 4,009,765 4,009,789 4,009,801 4,009,812 4,009,831 4,009,884 4,009,886 4,009,924 4,009,937 4,009,974 4,009,983 4,010,011	42	4,009,544 4,009,578 4,009,756 4,009,817 4,009,998 4,010,009 4,010,065 4,010,099 4,010,114 4,010,137 4,010,185 4,010,217 4,010,222 4,010,442 4,009,742 4,009,783 4,009,808 4,009,967 4,009,495 4,009,528 4,009,547 4,009,559 4,009,567 4,009,600 4,009,616 4,009,620 4,009,649 4,009,657 4,009,706 4,009,741 4,009,743 4,009,763	4,009,870 4,009,871 4,009,887 4,009,962 4,009,977 4,009,989 4,009,995 4,010,007 4,010,029 4,010,042 4,010,049 4,010,050 4,010,068 4,010,073 4,010,082 4,010,090 4,010,093 4,010,105 4,010,156 4,010,277 4,010,284 4,010,296 4,010,311 4,010,322 4,010,339 4,010,350 4,010,352 4,010,375 4,010,378 4,010,411 4,010,488 4,009,635 4,009,839 4,009,560 4,010,250 4,009,548 4,009,614 4,009,903 4,010,128 4,010,145 4,010,287	54	4,009,527 4,009,654 4,009,685 4,009,707 4,010,308 4,010,329 4,010,436 4,009,627 4,009,740 4,009,881 4,009,909 4,010,108 4,009,760 4,009,632 4,009,677 4,009,678 4,009,744 4,009,773 4,009,842 4,009,858 4,009,876 4,009,920 4,009,973 4,010,095 4,010,096 4,010,097

## DESIGN PATENTS

5 :	243,504		243,523	18 :	243,512	26 :	243,486		243,543		243,532
6 :	243,506		243,558		243,544		243,487	34 :	243,525	41 :	243,488
	243,519	16 :	243,489		243,553		243,496	36 :	243,500	42 :	243,481
	243,520	17 :	243,495	21 :	243,493		243,509		243,503		243,485
	243,534		243,498	22 :	243,508		243,548	37 :	243,540		243,510
	243,541		243,501		243,533		243,560		243,545		243,550
	243,557		243,511	25 :	243,482	27 :	243,514	39 :	243,494	47 :	243,551
8 :	243,490		243,528		243,513		243,546		243,527	51 :	243,484
	243,530		243,537		243,518		243,552		243,531	53 :	243,555
9 :	243,483		243,556		243,539	29 :	243,542	40 :	243,529	55 :	243,526

## PLANT PATENTS

6 :	4,019	4,020			
		<b>DEFENSIVE PUBLICATIONS APPLICATIONS</b> [Notice of Dec. 16, 1969, 869 O.G. 6877]			
36 :	T956.003				
40 :	T956.001				
	T956.002				

U. S. GOVERNMENT PRINTING OFFICE : O - 1977



OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE

March 8, 1977

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Number 2

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## PATENT AND TRADEMARK OFFICE NOTICES

### United States Patent and Trademark Office Before the Commissioner of Patents and Trademarks

IN RE JOHN N. WALTON, RESPONDENT. PROCEEDINGS  
FOR DISBARMENT

#### Final Order

Whereas on December 23, 1976, John N. Walton, respondent, was given a period of one month within which to show cause why his name should not be removed from the roster of agents registered to practice before the United States Patent and Trademark Office and whereas respondent has not submitted any reply, it is ordered that the name of John N. Walton of Toronto, Canada, whose registration number is 25760, be and the same is hereby removed from the roster of agents registered to practice before the United States Patent and Trademark Office.

This action is taken under the provisions of 35 U.S.C. § 32 and 37 CFR § 1.348.

Dated: Feb. 1, 1977.

C. MARSHALL DANN,  
Commissioner of Patents and Trademarks.

#### Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,891,375, Vadamme and Rouyer APPARATUS FOR THE PRODUCTION OF HIGH-BULK YARN; 3,012,397, H. Servage, METHOD OF MAKING HIGH-BULK YARNS; 3,165,881, De Moncuit and Crouzet, PRODUCTION OF HIGH BULK YARNS; 3,232,037, H. Crouzet, FALSE-TWIST SPINDLE; 3,584,450, same, PROCESS AND DEVICE FOR THE MANUFACTURE OF TEXTURED YARNS, filed Oct. 15, 1976, D.C., M.D.N.C. (Greensboro), Doc. C-76-550-G, Deering Milliken Research Corporation and Chavanoz, S.A. v. Sapona Manufacturing Company, Incorporated.

3,012,397. (See 2,891,375.)

3,078,172, L. L. Libby, PREPARED FROZEN FOOD FOR COOKING AND METHOD OF PREPARING THE SAME, filed Oct. 20, 1976, D.C., S.D. Fla. (Fort Lauderdale), Doc. 76-1838-C-NCR, Tra-Way Corp. v. Winn-Dixie Stores, Inc.

3,102,690, G. M. Fee, RAIL ANCHORS; 3,118,327, W. J. Eastman, TRANSFER MECHANISMS; 3,159,198, H. E. Sutch, METHOD OF AND APPARATUS FOR THE MANUFACTURE OF RAIL ANCHORS, filed Sept. 12, 1973, D.C. Colo. (Denver), Doc. C-5347, True Temper Corporation v. C.F. & I. Steel Corporation. Judgment, defendant did not infringe upon plaintiff's patent; certain claims invalid, void and unenforceable; plaintiff enjoined from asserting that patents or claims noted were infringed by defendant; complaint dismissed. Claims for relief with respect to Patent '327 dismissed Mar. 21, 1975. Decision entered Oct. 15, 1976.

3,112,586, A. E. Luetzow, METHOD AND APPARATUS FOR FORMING A COVERING ABOUT A GARMENT, filed July 1, 1976, D.C., E.D. Wis. (Milwaukee), Doc. 76-469, Albert E. Luetzow v. BMT Manufacturing Corporation and Jockey International, Inc. Plaintiff's notice of dismissal with prejudice pursuant to Rule 41(a)(1), F.R.C.P., Sept. 27, 1976.

3,118,327. (See 3,102,690.)

3,159,198. (See 3,102,690.)

3,165,881. (See 2,891,375.)

3,232,037. (See 2,891,375.)

3,311,293, R. A. Moffatt, INTEGRAL VACUUM PUMP AND AIR COMPRESSOR, filed Feb. 24, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c595, Gast Manufacturing Company v. Intl. Telephone & Telegraph Corp. Order, this cause is hereby dismissed without prejudice and with leave to reinstate upon motion of either party, Nov. 25, 1975.

3,319,392, J. V. Fitzgerald, FLEXIBLE CERAMIC TILE UNIT, filed June 7, 1976, D.C., N.D. Tex. (Dallas), Doc. CA-3-76-0786, Tile Council of America, Inc. v. Dallas Ceramic Co.

3,338,286, J. J. McLeod, Jr. PADDED CLAVICLE SPLINT, filed July 29, 1976, D.C., N.D. Calif. (San Francisco), Doc. C-76-1601 GBH, John J. McLeod, Jr. v. Hoamer-Dorrance, Inc., doing business as Chick Orthopedic.

3,584,450. (See 2,891,375.)

3,584,805, L. H. Lee, TAPE TRANSPORT APPARATUS, filed Oct. 20, 1976, D.C., N.D. Tex. (Wichita Falls), Doc. 7-76-0062, Recortec, Inc. v. Graham Magnetics, Inc. and Control Technology, Inc.

3,636,611, I. W. Rosenbaum, APPARATUS FOR SPLICING WIRES, filed June 20, 1973, D.C., S.D.N.Y., Doc. 73-2743, General Staple Co. Inc., etc. v. George Magnifico. Judgment, complaint is dismissed on the merits, entered Mar. 17, 1976. Same, filed Mar. 7, 1975, D.C., S.D.N.Y., Doc. 75-C-1139, General Staple Co., Inc. v. Amtronics Inc. and Jack Garfinkel. Complaint is dismissed on the merits, etc., entered Mar. 17, 1976.

3,651,320, M. L. Lasker, LIGHTING FIXTURES, filed Nov. 2, 1976, D.C. Pa. (Philadelphia), Doc. 76-3411, Wylain, Inc. v. Penns' Landing Corporation.

3,713,926, L. Speer, METHOD FOR PATCHING MATERIALS, filed Oct. 8, 1976, D.C., N.D. Ohio (Toledo), Doc. 76-129, Vyna-Chem (Canada) Ltd. v. Lawrence L. Speer et al.

3,829,935, J. G. Critchfield, BUTTON COLLET, filed Oct. 22, 1976, D.C., W.D.N.C. (Statesville), Doc. ST-C-76-44, Handy Button Machine Company v. Yarrowburgh & Company. Same, filed Oct. 22, 1976, D.C., W.D.N.C. (Statesville), Doc. ST-C-76-45, Handy Button Machine Company v. Granlin Enterprises Limited.

3,876,548, D. P. Welles, Jr., SCREENING METHOD AND APPARATUS, filed May 11, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c1761, Hydrocyclonics Corp. v. The Carborundum Co.

3,986,375, O'Mahoney and Paterson, APPARATUS FOR SPACE DYEING YARN AND PRODUCT, filed Oct. 21, 1976, D.C., N.D. Ga. (Rome), Doc. C76-145R, Interdyne Technology Corporation v. Triad Yarn Dyeing, Inc.

Re. 26,667, E. G. Sarbo, FOOT COVER AND METHOD OF MANUFACTURING THE SAME, filed Oct. 9, 1973, D.C., W.D.N.C. (Statesville), Doc. ST-C-73-24, Wayne-Gossard Corporation v. Moretz Hosiery Mills, Inc. Final judgment, defendants are hereby restrained and enjoined directly or indirectly from manufacturing, using or selling Styles No. 2444, 2445, 2446, 2447, 2448 and 2480 or any other knitted shoe top length foot covers embodying the invention claimed in Claims 4 and 5 of said reissue patent, Oct. 21, 1976.

D. 233,771, R. L. Christophel, POULTRY WATERING VALVE, filed Oct. 21, 1976, D.C.S.C. (Columbia), Doc. 76-1944, Shenandoah Manufacturing Company, Inc. v. Agricultural Manufacturing and Textiles Inc., Hank D. Beesley and Charles D. Little.

Pl. Pat. 3,561, Bringham and Voth, STRAWBERRY PLANT, filed Oct. 18, 1976, D.C., E.D.N.C. (Wilmington), Doc. 76-0070-C-7, State of Calif., L. T. Wallace, Dir. Food & Agriculture, Calif. Strawberry Advisory Bd., and The Regents of the Univ. of Calif. v. C. E. Lewis, doing business as Lewis Strawberry Nursery.

#### Erratum

Under Patent Suits, in the OFFICIAL GAZETTE of August 10, 1976, volume 949, page 433, the entire paragraph beginning with 3,845,389 should be deleted.

## PATENT NOTICES

### Certificates of Correction for the Week of Mar. 8, 1977

Re. 28,912	3,961,617	3,989,068	3,994,583
Re. 28,967	3,962,133	3,989,522	3,994,849
Re. 29,015	3,963,584	3,989,588	3,994,947
3,549,429	3,965,043	3,989,728	3,995,277
3,619,191	3,965,667	3,989,773	3,995,708
3,627,296	3,966,842	3,990,411	3,995,740
3,689,991	3,967,541	3,990,490	3,996,163
3,693,126	3,969,376	3,990,579	3,996,205
3,738,187	3,969,378	3,991,604	3,996,323
3,790,606	3,970,627	3,991,631	3,996,354
3,810,465	3,970,646	3,991,816	3,996,463
3,827,194	3,971,444	3,991,822	3,996,668
3,836,496	3,972,228	3,992,204	3,996,684
3,852,579	3,972,403	3,992,333	3,996,928
3,865,977	3,972,832	3,992,435	3,997,049
3,873,446	3,972,935	3,992,455	3,997,182
3,881,151	3,975,565	3,992,466	3,997,267
3,883,074	3,976,512	3,992,472	3,997,297
3,900,688	3,976,620	3,992,549	3,997,368
3,906,100	3,976,924	3,992,556	3,997,431
3,910,935	3,977,983	3,992,560	3,997,475
3,917,827	3,978,104	3,992,674	3,997,477
3,920,364	3,979,592	3,992,694	3,998,524
3,926,734	3,980,293	3,992,725	3,998,602
3,926,777	3,980,317	3,992,772	3,998,660
3,928,229	3,980,343	3,992,933	3,998,693
3,932,395	3,980,622	3,993,146	3,998,806
3,932,597	3,982,565	3,993,235	3,998,899
3,933,620	3,983,068	3,993,258	3,998,913
3,933,665	3,983,399	3,993,289	3,999,314
3,937,907	3,983,419	3,993,333	3,999,338
3,939,955	3,983,610	3,993,370	3,999,349
3,941,121	3,983,788	3,993,371	3,999,459
3,941,311	3,984,223	3,993,400	3,999,772
3,944,644	3,984,352	3,993,401	3,999,851
3,947,290	3,984,498	3,993,583	3,999,911
3,950,031	3,984,745	3,993,845	3,999,936
3,951,303	3,984,753	3,993,888	4,000,001
3,952,075	3,985,034	3,993,913	4,000,263
3,953,439	3,985,711	3,993,927	4,000,274
3,954,616	3,985,932	3,993,947	4,000,296
3,956,102	3,986,121	3,993,963	4,000,357
3,956,326	3,986,252	3,994,146	4,000,478
3,957,875	3,986,426	3,994,297	4,000,504
3,958,998	3,987,693	3,994,346	4,001,571
3,959,143	3,988,674	3,994,362	
3,959,557	3,988,690	3,994,379	
3,960,970	3,988,939	3,994,449	

#### Disclaimers

3,635,957.—Guido R. Genta, Lock Haven, Pa. STYRYL DYES. Patent dated Jan. 18, 1972. Disclaimer filed Jan. 12, 1977, by the assignee, American Color & Chemical Corporation. Hereby enters this disclaimer to claims 1 and 5 of said patent.

3,680,323.—Ragner Bognaes, Jelo and Olav Solberg, Oslo, Norway. TANKER FOR LIQUIFIED AND/OR COMPRESSED GAS. Patent dated Aug. 1, 1972. Disclaimer filed Dec. 21, 1976, by the assignee, Kvaerner Brug AS. Hereby enters this disclaimer to the term subsequent to July 18, 1989.

3,828,709.—Ragner Bognaes, Jelo, and Olav Solberg, Oslo, Norway. LNG CARGO TANK INSULATION SYSTEM. Patent dated Aug. 13, 1974. Disclaimer filed Dec. 21, 1976, by the assignee, Kvaerner Brug AS.

Hereby enters this disclaimer to the term subsequent to July 18, 1989.

3,890,016.—James T. Stull, Jackson Township, Pa. BEARING CONSTRUCTION FOR IDLER ROLLS AND MAINTENANCE METHOD FOR IDLER ROLL BEARINGS. Patent dated June 17, 1975. Disclaimer filed Jan. 26, 1977, by the assignee, United States Steel Corporation.

Hereby enters this disclaimer to claims 1 to 10 of said patent.

3,895,056.—Ruth E. Billings, Indianapolis, Robert E. McMahon, Greenwood, and Albert Pohland, Indianapolis, Ind. ALPHA-DI-4-ACETOXY-1-METHYL-3,3-DIPHENYLHEXYLAMINE AND SALTS. Patent dated July 15, 1975. Disclaimer filed Jan. 26, 1977, by the assignee, Eli Lilly and Company.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,899,938.—Elmer R. Crabb, Pekin, Ill. PLANETARY TORQUE PROPORTIONAL DIFFERENTIAL. Patent dated Aug. 19, 1975. Disclaimer filed Nov. 11, 1976, by the assignee, Caterpillar Tractor Co.

Hereby enters this disclaimer to claim 1 of said patent.

3,909,902.—Robert W. Peters, Milwaukee, Wis. CELL INSERTING MACHINE. Patent dated Oct. 7, 1975. Disclaimer filed Jan. 19, 1977, by the inventor.

Hereby enters this disclaimer to claims 1 through 11 of said patent.

3,915,174.—Thomas A. Preston, Seattle, Wash. PACING APPARATUS AND IMPROVED CATHETER. Patent dated Oct. 28, 1975. Disclaimer filed Jan. 5, 1977, by the inventor.

Hereby enters this disclaimer to the term subsequent to July 8, 1992.

3,920,525.—Howard A. Fromson, Weston, Conn. PROCESS FOR CONTINUOUSLY ANODIZING ALUMINUM. Patent dated Nov. 18, 1975. Disclaimer filed Jan. 24, 1977, by the inventor.

Hereby enters this disclaimer to claim 1 of said patent.

4,001,786.—Arthur F. Boehm, Roseville, Minn. AUTOMATIC CONFIGURATION OF MAIN STORAGE ADDRESSING RANGES. Patent dated Jan. 4, 1977. Disclaimer filed Jan. 24, 1977, by the assignee, Sperry Rand Corporation.

Hereby enters this disclaimer to claims 1 through 19 of said patent.

#### Dedications

3,586,196.—Raymond W. Barton and Joe Thomas Hertton, Evansville, Ind. NURSER. Patent dated June 22, 1971. Dedication filed Jan. 19, 1977, by the assignee, Mead Johnson & Company.

Hereby dedicates to the Public the remaining term of said patent.

3,173,086.—James S. Kresge, Rome, Ga. APPARATUS INCLUDING MECHANICAL VIBRATION DETECTOR MEANS FOR DETECTING AND LOCATING INCIPENT INTERNAL FAULTS IN ELECTRIC INDUCTION APPARATUS. Patent dated Mar. 9, 1965. Dedication filed Jan. 7, 1977, by the assignee, General Electric Company.

Hereby dedicates to the Public the entire term of said patent.

#### Disclaimer and Dedication

3,898,322.—Bruce E. Leach, Ponca City, Okla. ALUMINA HAVING A BINODAL PORE VOLUME DISTRIBUTION. Patent dated Aug. 5, 1975. Disclaimer and dedication filed Jan. 19, 1977, by the assignee, Continental Oil Company.

Hereby disclaims and dedicates to the Public claims 1 through 5, inclusive, of said patent.



## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 29, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-17-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-16-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-2-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-22-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-20-76
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-15-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-1-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director..... Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-2-76
RECEPTACLES, SANITATION AND CLEANING, WINDING AND MEASURING, GROUP 240—N. ANSHER, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-6-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	7-23-75
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding; Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Trolley; Printing; Typewriters; Stationery; Information Dissemination.	5-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-1-76

**Expiration of patents:** The patents within the range of numbers indicated below expire during February 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 78th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,923,008 to 2,926,351, inclusive  
Plant Patents..... Numbers 1,901 to 1,918, inclusive

## REISSUES

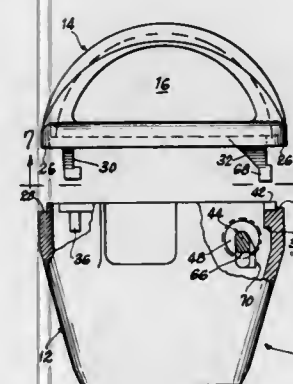
MARCH 8, 1977

Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,146  
**HOUSING FOR COIN OPERATED CONSTRUCTIONS**  
George I. Wimpffen, Wheaton, Ill., assignor to Qonaar Corporation, Elk Grove Village, Ill.  
Original No. 3,782,142, dated Jan. 1, 1974, Ser. No. 276,704, June 31, 1972. Application for reissue Nov. 28, 1975, Ser. No. 636,038

U.S. Cl. 70—170

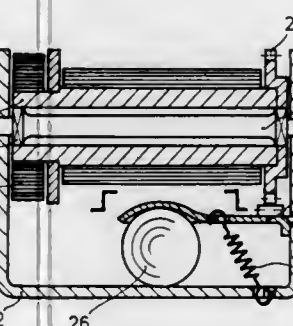
Int. Cl.<sup>2</sup> E05B 65/52



1. In a coin handling construction wherein a housing is provided with a cap for closing access to the interior of the construction, the improvement comprising locking means for securing said cap in place on said housing, said locking means including a rotatable rod positioned within said housing, first locking elements mounted on said cap, second locking elements mounted on said housing, each of said locking elements defining a surface for inter-engagement to thereby prevent separation of the cap and housing, and means defined by said rod for contact with said cap, said rod being rotatable between a first position in contact with said cap whereby said cap is maintained with said elements inter-engaged, and a second position whereat said cap is free for movement to disengage said elements.

Re. 29,147  
**ENERGY ABSORBER FOR AUTOMOBILE SAFETY BELTS**  
Ernst Fiala, Berlin, Germany, assignor to Repa Feinstanzwerk GmbH, Industriegebiet, Germany  
Original No. 3,741,494, dated June 26, 1973, Ser. No. 146,887, May 26, 1971. Application for reissue June 20, 1975, Ser. No. 588,635

Int. Cl.<sup>2</sup> A62B 35/00; B65H 75/48  
U.S. Cl. 242—107.4 A



1. Energy absorber for restraining systems in passenger vehicles comprising a take-up member, a force-transmitting member and a mounting rotatable relative to said take-up member, and an elongated *plastically deformable* torsion bar rotated about its longitudinal axis between said mounting and

said take-up member for absorbing large amounts of energy when the take-up member rotates relative to the mounting.

Re. 29,148  
**COLOR PHOTOGRAPHIC DIFFUSION TRANSFER PROCESS**

Yoshinobu Yoshida, and Atsuki Arai, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan  
Original No. 3,849,131, dated Nov. 19, 1974, Ser. No. 388,670, Aug. 15, 1973. Application for reissue Sept. 17, 1975, Ser. No. 614,468  
Claims priority, application Japan, Aug. 17, 1973, 48-82274  
Int. Cl.<sup>2</sup> G03C 7/00, 5/54, 1/40, 5/30

U.S. Cl. 96—3 6 Claims

1. A color photographic diffusion transfer process comprising:

imagewise exposing a photographic material having at least one silver halide emulsion layer and a dye developer present adjacent to the silver halide in said silver halide emulsion layer and

treating said photographic material in superposed relation with an image-receiving material with an alkaline processing solution whereby the dye developer at the exposed portions of the silver halide emulsion layer is immobilized and the dye developer at the unexposed portions of the silver halide emulsion layer is transferred by diffusion to the image-receiving material, said treatment with said alkaline processing solution being in the presence of 6,6',7,7'-tetrahydroxy-4,4',4'-tetramethyl-bis-2,2'-[spirocumarone] *spirochroman*.

Re. 29,149  
**PRODUCTION OF AMMONIUM PHOSPHATES AND PRODUCT THEREOF**

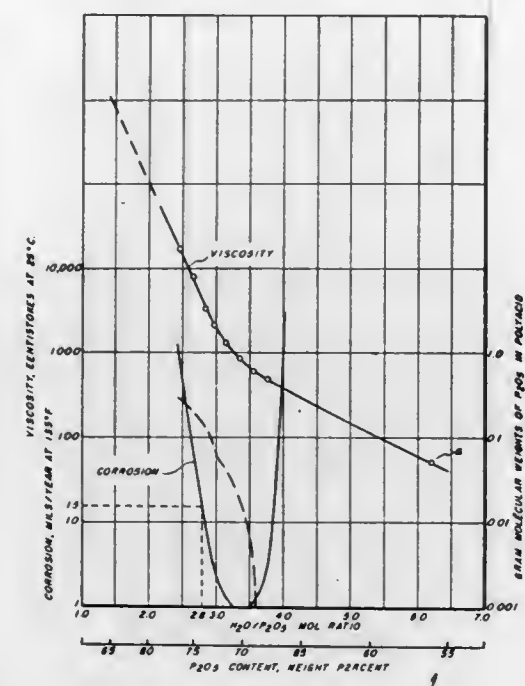
Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.  
Original No. 3,044,851, dated July 17, 1962, Ser. No. 116,161, June 9, 1961. Continuation of Ser. No. 264,008, Feb. 11, 1963, abandoned, said Ser. No. 116,161, is a division of Ser. No. 51,047, Aug. 22, 1960, Pat. No. 3,192,013, which is a continuation-in-part of Ser. No. 649,287, March 29, 1957, abandoned, and Ser. No. 666,479, June 18, 1957, abandoned, and Ser. No. 672,558, July 18, 1957, abandoned. Application for reissue July 3, 1967, Ser. No. 653,602

Int. Cl.<sup>2</sup> C01B 25/28  
U.S. Cl. 423—313

11. A process for the production of a high-analysis liquid mixed fertilizer which comprises the steps of continuously feeding commercially available wet-process phosphoric acid containing up to about 54 weight percent P<sub>2</sub>O<sub>5</sub> into evaporating means; continuously and simultaneously applying heat to said evaporating means; withdrawing from said evaporating means a highly concentrated, fluid, wet-process phosphoric acid substantially free of solids, containing about 65 to 70 weight percent P<sub>2</sub>O<sub>5</sub>, and containing in solution substantially all of the congener impurities ordinarily present in said commercially available wet-process acid fed to said evaporating means and sufficient acyclic polyphosphoric acid to prevent precipitation of said impurities upon neutralization of said acid with ammonia; cooling said concentrated acid to a temperature of about 20°



to 40°C.; subsequently introducing ammoniating fluid to said highly concentrated acid in quantity sufficient to raise the pH of the resulting solution to about 7; maintaining the



resulting solution of unhydrolyzed ammonium salts at a temperature in the range from about 30° to 100°C. during introduction of said ammoniating fluid; and withdrawing the resulting solution as product.

Re. 29,150

#### CONVERGENCE COIL ASSEMBLY FOR COLOR TELEVISION

John T. Harten, Longmeadow, and Frank J. Zoladz, Willimansett, both of Mass., assignors to General Instrument Corporation, Clifton, N.J.

Original No. 3,496,501, dated Feb. 17, 1970, Ser. No. 639,833, May 19, 1967. Application for reissue Nov. 28, 1975, Ser. No. 636,125

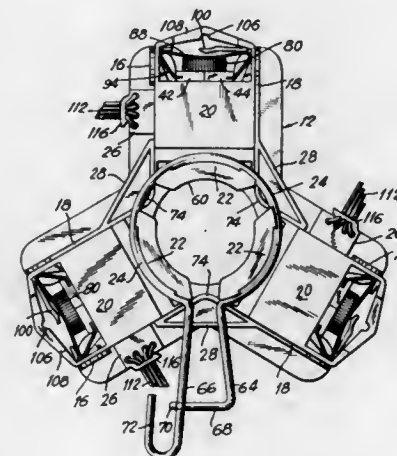
Int. Cl.<sup>2</sup> H01F 7/00

U.S. Cl. 335—212

15 Claims

1. A convergence coil assembly for color television comprising a frame plate [ having ] with a hole large enough to

receive the neck of a color tube of maximum contemplated diameter [ . ] and having a plurality of [ substantially equally spaced ] guide means fixed thereon and [ spaced circumferentially ] substantially equally circumferentially spaced about said hole, and extending generally radially with respect to said hole, and a plurality of housings operatively connected to [ the ] said guide means respectively and movable within said guide means toward and away from said hole, magnet means operatively connected to said [ housing, and means acting on



said housings to urge them radially inward toward said hole to adjust the positions of said housings for tube necks of different diameters, said guide means being fixed during the movement of said housings thereby to maintain the relative spaced positions about said hole of said housings and magnet means during said movement [ housings, flanges on said housings adjacent the inner ends thereof, and a clamp ring engaging said flanges and active to urge them and their respective housings towards one another and against the tube.

## PLANT PATENTS

GRANTED MARCH 8, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,021

### APPLE TREE

William E. Dalton, Rte. No. 2, Box 252, Hendersonville, N.C. 28739

Filed Nov. 24, 1975, Ser. No. 634,441

Int. Cl.<sup>2</sup> A01H 5/03

U.S. Cl. Plt.—34

1 Claim

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by a general resemblance in some respects to the variety "Golden Delicious" (unpatented), but being principally distinguished therefrom by a semi-dwarf habit of growth, with crotch angles of almost 90°; a more spreading spur type fruiting habit which enables better development and easier picking of the fruit; a larger and more uniform fruit size throughout the tree, with most of the fruit grading tray-pack or extra fancy; excellent russet resistance (at least 95% free of russetting) far superior to the normally heavy russetting of the variety "Golden Delicious;" an attractive golden yellow fruit color which has a distinctive and attractive reddish blush even at low altitudes; better hardiness than "Golden Delicious,"

with the ability to withstand lower temperatures during the blooming period; a more prolific fruit bearing habit than "Golden Delicious" when grown under the same climate and soil conditions; a longer harvest period usually ranging for about a full month, beginning in early September and continuing into early October at Hendersonville, N.C.; and a self-fertile habit, with a suitability for use as a pollinator for other varieties.

4,022

### STRAWBERRY PLANT

Harold A. Johnson, Jr., Watsonville, Calif., assignor to Driscoll Strawberry Associates, Inc., Watsonville, Calif.

Filed Apr. 7, 1976, Ser. No. 674,472

Int. Cl.<sup>2</sup> A01H 5/03

U.S. Cl. Plt.—49

1 Claim

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.



# PATENTS

GRANTED MARCH 8, 1977

## ERRATA

For	See
CLASS	PATENT NO.
016-087.2	4,010,503
016-158	4,010,504
028-001.2	4,010,529
051-284	4,010,583
134-104	4,010,774
259-006	4,010,932
065-134	4,011,060
071-029	4,011,061
071-092	4,011,062
358-261	4,011,399
358-127	4,011,400
358-212	4,011,401
358-213	4,011,402
358-209	4,011,403
358-185	4,011,404
361-047	4,011,483
361-059	4,011,484
361-127	4,011,485
361-182	4,011,486

# PATENTS

GRANTED MARCH 8, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

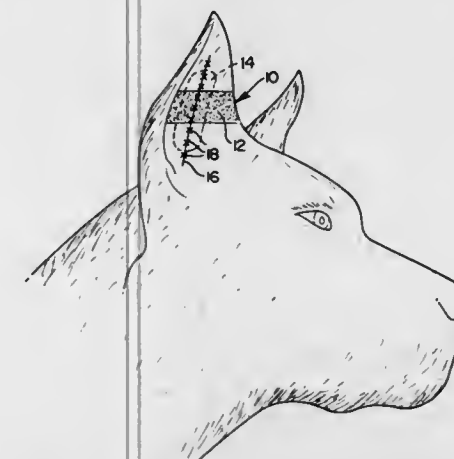
## GENERAL AND MECHANICAL

**4,010,494**  
**CANINE EAR IMPLANT AND METHOD FOR SUPPORTING DEFECTIVE AURICULAR CARTILAGE**  
 Barry W. Sauer, Central, S.C., assignor to Glasrock Products, Inc., Atlanta, Ga.

Filed Aug. 15, 1975, Ser. No. 605,006  
 Int. Cl.<sup>2</sup> A61F 1/24

U.S. Cl. 3—1

5 Claims

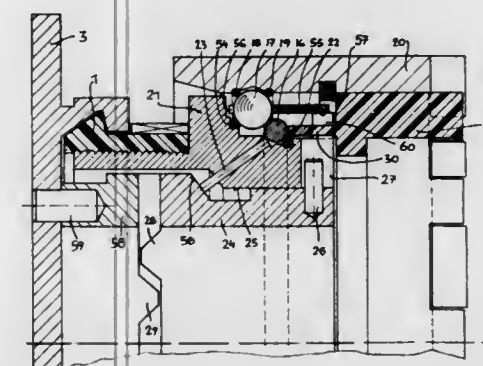


1. Canine ear implant for strengthening a defective auricular cartilage of a canine ear, comprising a sheet of flexible polymeric material adapted in size and shape to be positioned adjacent to either side of the auricular cartilage, the polymeric material having a density of at least 0.912 g./c.c. and being porous throughout and comprising a network of interconnected pores with no straight paths longer than the diameter of the largest pore, the minimum pore volume being 30% and the average pore diameter being 20  $\mu$ m - 300  $\mu$ m, the sheet having a thickness of at least 20/1000 in.

**4,010,495**  
**ARTIFICIAL WRIST AND ARM PROSTHESIS**  
 Eduard Horvath, Vienna, Austria, assignor to Otto Boch Orthopadische Industries KG, Duderstadt, Germany  
 Filed May 15, 1974, Ser. No. 470,080  
 Claims priority, application Austria, May 17, 1973, 4334/73  
 Int. Cl.<sup>2</sup> A61F 1/06

U.S. Cl. 3—12.4

52 Claims



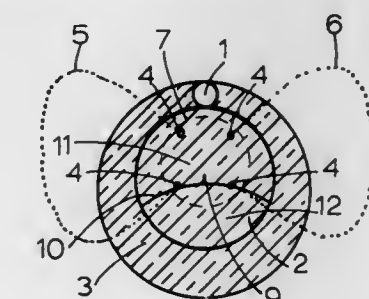
1. An artificial wrist for connecting an arm prosthesis shaft to an implement which comprises  
 distal retaining means;  
 a proximal retaining member adapted to extend into said prosthesis shaft and formed with first and second engaging surfaces;  
 locking means interlocking with said distal retaining means and said first engaging surface to hold said distal retaining means and said proximal retaining member axially together;  
 a sliding surface bearing adapted to rotatably connect an implement to said distal retaining means;

rotatable coupling means which engage said second engaging surface and are adapted to engage said prosthesis shaft, said distal retaining means comprising a distal retaining member,  
 one of said distal and proximal retaining member being provided a track which is engageable by said locking means,  
 said locking means being carried by the other of said distal and proximal retaining members; and  
 an adjusting mechanism operable to move said locking means in a substantially radial direction into and out of engagement with said track.

**4,010,496**  
**BIFOCAL LENS WHICH POSITIONS WITHIN THE ANTERIOR CHAMBER**  
 Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720  
 Filed Oct. 1, 1975, Ser. No. 618,382  
 Int. Cl.<sup>2</sup> A61F 1/16, 1/24

U.S. Cl. 3—13

1 Claim

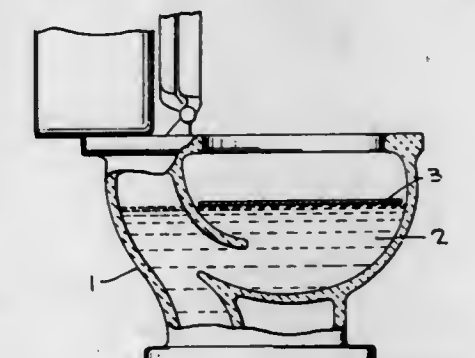


1. An implantable bifocal intra-ocular lens for the anterior chamber of the eye comprising a lenticular shaped body having a transparent optical portion provided with an upper distant refractive segment and a lower near refractive segment, lens support means extending outwardly and rearwardly from said body for positioning through the pupil and posterior to the iris with said body to be positioned anterior to the iris, at least one floatation void at the upper edge of said body whereby when said lens is implanted in the eye it will be positioned at the upper edge of the pupil when the pupil is either dilated or constricted and said near refractive segment will be within the pupil when it is dilated and said near refractive segment will be substantially below the pupil when it is constricted.

**4,010,497**  
**TOILET SPLASH GUARD**  
 Philip Menter, 503 Hillsboro Parkway, Syracuse, and Herbert Bauer, 206 Stoneridge Drive, Dewitt, both of N.Y. 13214  
 Filed May 20, 1974, Ser. No. 471,703  
 Int. Cl.<sup>2</sup> A47K 17/00

U.S. Cl. 4—1

2 Claims



1. An anti-splash device comprising biodegradable paper in



sheet form shaped to conform to the area of the exposed surface of the water contained in a commode and floatable on the water surface, said paper including precut means dimensioned to allow the passage of human excreta therethrough.

4,010,498

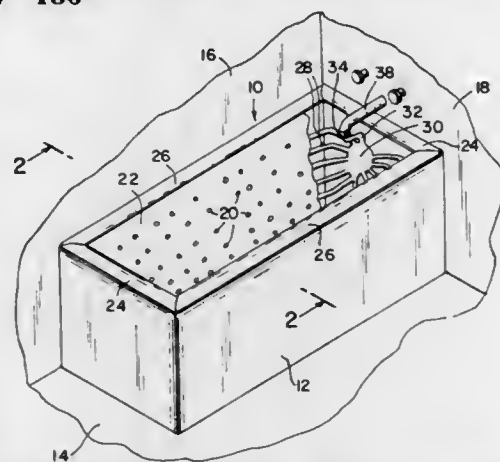
**BATHTUB SAFETY LINER-SPRAY APPARATUS**

Frank W. Jablonski, Miami Springs, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest  
Filed Feb. 6, 1976, Ser. No. 655,788

Int. Cl.<sup>2</sup> A47K 3/00; A61H 33/02

U.S. Cl. 4—180

7 Claims



1. A bathtub safety liner spray apparatus comprising:
  - a. a primary layer;
  - b. a resilient layer bonded to said primary layer;
  - c. a water and soap repellent liner bonded to said resilient layer and having edges of sufficient length to overlap a conventional bathtub;
  - d. a network of tubing within said resilient layer;
  - e. a multiplicity of water jets inserted through said water and soap repellent liner and coupled to said tubing network; and
  - f. a coupling member connector to said tubing network and adapted to cooperate with a conventional bathtub faucet.

4,010,499

**INVALID TRANSPORT**

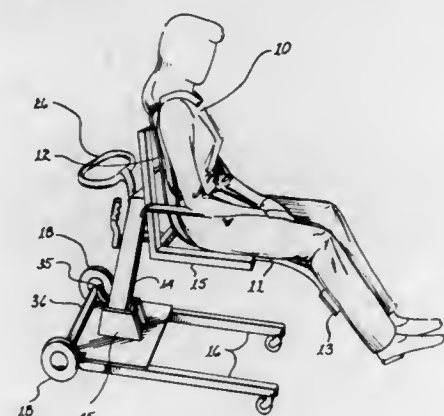
Alden B. Davis, 8022 E. Whitton Ave., Scottsdale, Ariz. 85252; Earl S. Dutmers, 107 W. Broadway, Moulton, Iowa 52540, and Mariane L. Englund, 1627 W. Pierson, Apt. 3, Phoenix, Ariz. 85015

Filed July 17, 1975, Ser. No. 596,580

Int. Cl.<sup>2</sup> A47C 7/50; A47B 83/04; A61G 5/00

U.S. Cl. 5—81 R

3 Claims



1. A vehicle for transporting an invalid passenger, said vehicle comprising in combination:
  - a. a moveable base including
    1. a pair of spaced apart front wheels having a diameter small enough to fit beneath the side frame of an automobile, and
    2. a pair of spaced apart rear wheels having a diameter larger than the diameter of said front wheels;

- b. a pedestal connected to the rear of said base and extending upward at a frontward angle of less than 90° therefrom;
- c. a seat cantilevered frontward from said pedestal for supporting the back and legs of an invalid;
- d. a leg rest extending frontward from said seat and located at a downward angle from said seat for supporting the calves of said invalid, thereby maintaining the heels of said invalid above the top of said front wheels;
- e. means for selectively tilting said seat relative to said base;
- f. means for selectively raising and lowering said seat relative to said base; and
- g. a pair of arm rests connected to said seat and individually moveable to a position which does not obstruct access to the side of said seat.

4,010,500

**MOORING TERMINAL**

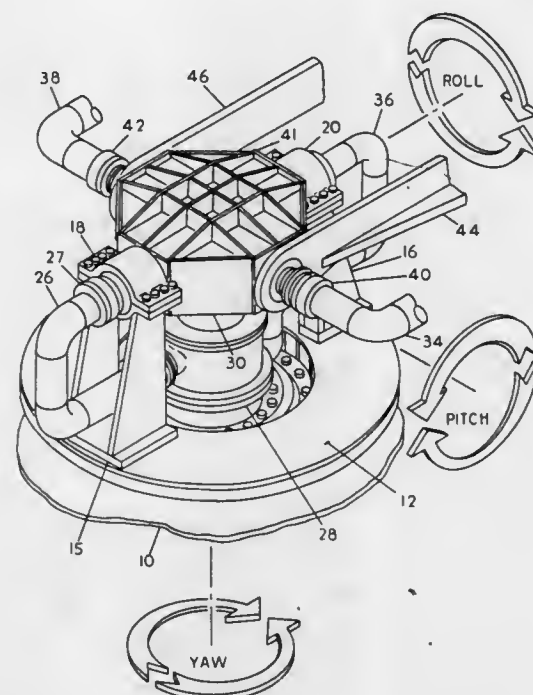
William R. Reid, Jr., Northridge, Calif., assignor to Imodco, Inc., Los Angeles, Calif.

Filed Oct. 28, 1975, Ser. No. 625,862

Int. Cl.<sup>2</sup> B63B 21/00

U.S. Cl. 9—8 P

7 Claims



1. A system for mooring a ship to the top of a rigid column which is attached to and supported on the ocean floor and through which pipes extend to be connected to pipes on a ship moored thereto comprising:
  - a pair of yoke arms extending from the top of said column to a ship to be moored,
  - mooring means connected between said pair of yoke arms and the top of said column including means at the top of said column for affording accommodation to the motion of a ship moored to said yoke arms about at least three orthogonal axes of rotation, and
  - pipe means coupling the pipes extending through said column to said pipes on said ship, said pipe means including means for affording accommodation to the motion of said ship about the same three orthogonal axes of rotation as said mooring means.

4,010,501

**TWO-PIECE BUCKLE AND ITS USE ON BODY-BUOYING EQUIPMENT**

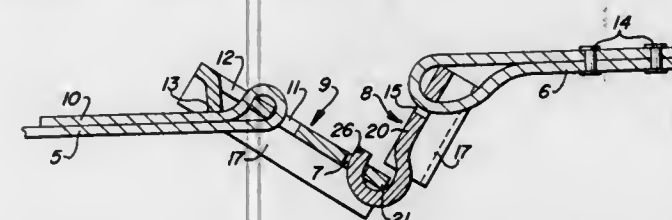
Lawrence G. Cooke, Ashland, Ohio, assignor to Eagle Rubber Co., Inc., Ashland, Ohio

Filed Sept. 2, 1975, Ser. No. 609,273

Int. Cl.<sup>2</sup> A44B 13/00; B63C 9/08

U.S. Cl. 9—338

9 Claims



1. A two-piece buckle which includes a rigid first piece with a hook having a turned back outer end extending from a substantially flat base portion, a rigid second piece with a slot across the same for engagement by the hook, the slot being substantially straight and so spaced from the edge of the second piece that the portion of the piece between the slot and this edge, referred to herein as the engageable portion, is longer than the narrowest portion of the mouth of the hook, with the hook opening widening inwardly from the mouth to a width greater than the width of said engageable portion and the entire portion of the second piece being substantially flat from said end throughout the area that includes the slot so that said engageable portion must be at an angle of less than 90° to said base in order for the slot to become engaged by the hook and disengaged therefrom; the slot being so narrow that when the pieces are substantially parallel, it is not long enough to fit over the turned-back outer end of the hook.

4,010,502

**APPARATUS FOR EDGE PROCESSING WORK AND PARTICULARLY NON-CIRCULAR WORK**

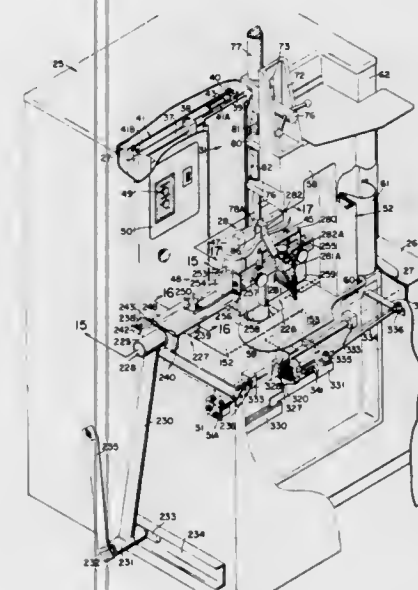
Richard D. Cushing, Newton, and Alfred E. Beck, Jr., Exeter, both of N.H., assignors to Circle Machine Co., Inc., Seabrook, N.H.

Filed May 15, 1975, Ser. No. 577,722

Int. Cl.<sup>2</sup> A43D 7/00

U.S. Cl. 12—86.7

64 Claims



1. Apparatus for removing material from the periphery of work to impart thereto a predetermined, non-circular size and shape, said apparatus comprising a rotatable work holder including a non-circular template of at least the wanted shape, means operable to remove material from the periphery of the work including at least one tool portion operable to remove

material from the periphery of the work and a second portion engageable by the periphery of the template when the unwanted material is removed from the work, a drive operable to so rotate said work holder that the periphery of the non-circular work advances into contact with the tool at a controlled rate, said work holder drive including driving means and a driven member rotatable with the work holder and including a non-circular wall portion that is of a shape to effect said rate and with which the driving means is continuously engaged, said driving means in engagement with said wall portion and means operable to permit relative movement between said work holder and the tool as the work holder turns, the driven member advancing relative to the tool at a constant rate and the rate at which the template advances relative to the tool depending on any difference between its shape and that of said wall portion.

4,010,503

**SHOWER CURTAIN FASTENING DEVICE**

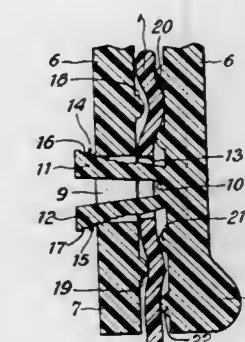
Ron Denton, Portland, Oreg., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 12, 1976, Ser. No. 657,371

Int. Cl.<sup>2</sup> E05D 13/02

U.S. Cl. 16—87.2

2 Claims



1. A shower curtain fastening device for releasably affixing a shower curtain to a curtain rod, said shower curtain having a plurality of spaced holes formed therethrough to facilitate fastening it to the curtain rod, said fastening device comprising

a strip of substantially flexible material of band-like configuration having first and second spaced opposite ends, a hole being formed through the strip in the area of its first end, said strip being adapted to hang over a curtain rod for a shower curtain with its first and second ends in proximity; and

a fastening member comprising a substantially U-shaped member of substantially resilient material having a head end affixed to the strip in the area of the second end thereof and a pair of arms diverging away from each other and from the head end and transversely from the strip whereby when the arms of the fastening member are manually pressed toward each other they pass through a hole through the shower curtain and the hole through the strip and when said arms are released they spread apart to secure said fastening member in said hole; and wherein the arms of the fastening member have outer opposite surfaces, and a plurality of steps formed on the outer opposite surface of each arm of the fastening member and rising vertically along the axis of the fastening member and with the series of steps on each arm mutually converging toward the head end for gripping the strip around the hole therethrough.

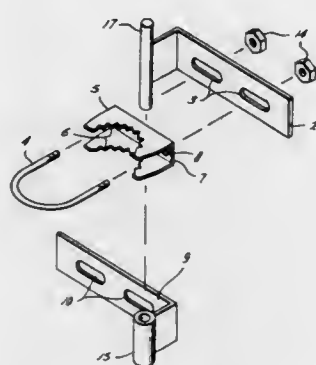


#### 4,010,504 GATE HINGE

Ronald G. Griffin, 1616 W. 13th, Houston, Tex. 77008  
Filed July 3, 1975, Ser. No. 582,995  
Int. Cl.<sup>2</sup> E05D 5/02

U.S. Cl. 16—158

4 Claims



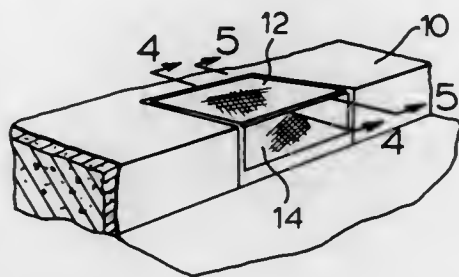
1. A gate hinge having a male and female member, elongated slots in said members, U-bolts having their respective ends externally threaded and adapted to extend through said slots, post gripping means mounted on said U-bolts and abutting said hinge members, and means on said male and female members for pivotally engaging said male and female members.

#### 4,010,505 DOCKBOARDS

Willem J. Bouman, Toronto, Canada, assignor to Richards-Wilcox of Canada Limited, London, Canada  
Filed Sept. 11, 1975, Ser. No. 612,558  
Int. Cl.<sup>2</sup> E01D 1/00

U.S. Cl. 14—71.3

13 Claims



1. A dockboard comprising frame means; a main plate having a front edge; means pivotally connecting the main plate with the said frame means for pivoting movement about a respective first pivot axis; a lip plate; means mounting the lip plate at the main plate front edge for movement relative to the main plate between a stored position and an operative extended position; and lip-extending means operative to move the lip plate from its stored position to its operative position upon downward movement of the main plate about the said first pivot axis; the lip-extending means comprising:

an arm operatively connected with the said lip plate and movable therewith;

guide means mounted to the frame means engaging the arm and guiding it for longitudinal movement and also permitting pivoting movement of the arm relative to the frame means;

and latch means comprising cooperating latch members on respectively the arm and the frame means and engagable with one another upon movement of the main plate to an upper position so that downward movement of the main plate from the upper position will cause the arm to extend the lip plate;

the said first means latch member being movably mounted on the frame means for movement such as to maintain operative engagement of the latch during the downward movement of the main plate from said upper position and to permit disengagement of the latch at a lower position

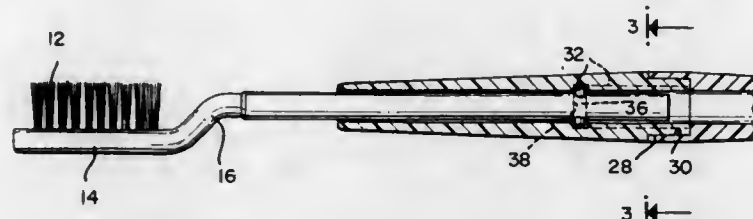
above where the extended lipplate can engage a truck in front of the dockboard.

#### 4,010,506 OSCILLATING TOOTHBRUSH

Stuart Jay Young, 310 Lexington Ave., New York, N.Y. 10016, and Isaac Berger, 159 W. 58th St., New York, N.Y. 10019  
Filed Sept. 25, 1975, Ser. No. 616,566  
Int. Cl.<sup>2</sup> A46B 13/08

U.S. Cl. 15—22 R

2 Claims



1. An oscillating toothbrush comprising a brush head, a shank integrally connected to said brush head with said brush head being offset from said shank, a pair of oppositely projecting removable pin surfaces extending from said shank and adaptable to move in and out of cooperating helical slots, a cylindrical handle member substantially enclosing said shank, one end of said cylindrical handle terminating in a removable circular stop surface with an aperture formed at the center thereof, said circular stop preventing the pin surfaces from moving out of said slots, the end of said shank at said one end of said cylindrical handle forming a cooperating stop surface larger than said aperture and adapted to abut against said circular stop surface, whereby during assembly the shank may be inserted into the cylindrical handle member and the pair of pin surfaces inserted into the shank, the shank pins inserted into the helical slots and the removable stop surface secured to the cylindrical handle member to allow the pins to be moved only within the slots.

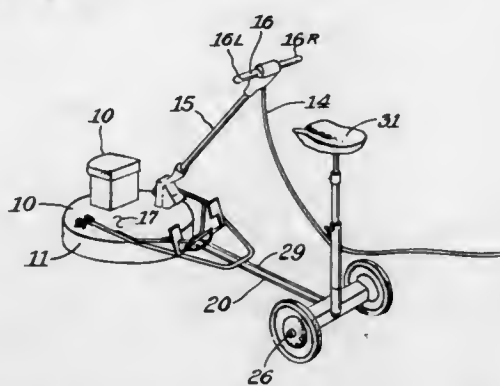
#### 4,010,507

RIDING ATTACHMENT TO FLOOR BUFFER MACHINE  
Ruben M. Johnson, Courtland, Kans., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 14, 1975, Ser. No. 595,513  
Int. Cl.<sup>2</sup> A47L 11/162

U.S. Cl. 15—49 R

1 Claim



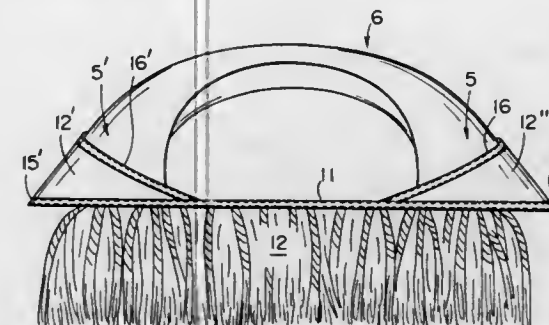
1. For use in combination with a circular rotatable wheel buffing machine which comprises a housing enclosing a motorized buffing wheel which rotates in a horizontal plane about a vertical axis in the normal position of said machine, an attachment comprising a U-shaped yoke frame, said frame terminating in two spaced legs, said legs being pivotally fastened to the housing of the buffing machine on opposed horizontal sides of the vertical axis of rotation of the buffing wheel, a tow bar having a front end and a rear end, said bar being fixed at said front end to said frame, said rear end of said tow bar being supported by wheel means, and a vertical seat support structure mounted on said rear end of said tow bar.

#### 4,010,508 MOP SUITED FOR DUSTING CURVED SURFACES

Toshiyoshi Komatsu, Osaka, Japan, assignor to Duskin Franchise Co., Ltd., Osaka, Japan  
Filed Feb. 20, 1976, Ser. No. 659,904  
Int. Cl.<sup>2</sup> A47L 13/24; B25G 1/02

U.S. Cl. 15—104.94

6 Claims



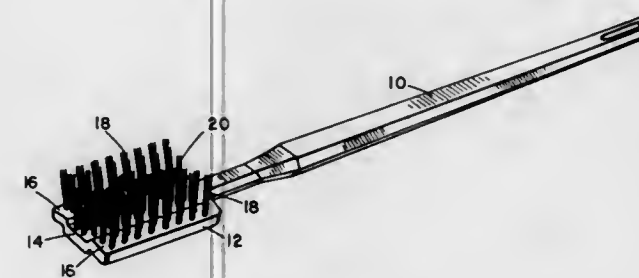
1. A handy mop comprising a mop holder and a mop swab; said mop holder being composed of an integrally molded resilient, foamed product having independent cells inside thereof and a non-permeable continuous skin layer on the outer surface; said mop holder having a convex spherical upper surface and a concave spherical lower surface; said mop holder having sides that are symmetrical in the lengthwise axial direction and concave toward the inside, so that there is formed in the mop holder a grip extending in the lengthwise direction at the central part thereof and a pair of mop holding parts having an arcuate tip and a horse-shoe-shaped bottom at each end integrally with said grip; the bottom surfaces of said mop holding parts being positioned below the grip; the lateral size of said grip being smaller than that of said mop holding parts; said mop holder having resiliency and flexibility sufficient to enable the pair of mop holding parts to be deflected inwardly and downwardly; said mop swab being composed of an oval base cloth, a number of mop cords fastened to the lower surface of said base cloth and impregnated with a dusting oil composition, and a pocket provided at the upper surface and at each end of said base cloth; the holding parts of said mop holder being inserted into the pockets of said mop swab to attach the mop swab to the mop holder; said mop holder in a state attached to the mop swab having a curvature larger than that in a free state; and a space sufficient to insert the fingers of the operator being formed between the grip and the base cloth.

#### 4,010,509

DOUBLE SULCUS TOOTHBRUSH  
Frederic G. Huish, 3771 Ingraham St., San Diego, Calif. 92109  
Continuation-in-part of Ser. No. 635,245, Nov. 25, 1975, abandoned. This application Jan. 9, 1976, Ser. No. 647,998  
Int. Cl.<sup>2</sup> A46B 9/04

U.S. Cl. 15—167 R

1 Claim



1. A double-acting sulcus toothbrush comprising:  
a. an elongated handle;  
b. a head integral with one end of said handle and having a forward face;  
c. an elongated, central bristle group longitudinally extended on said face;  
d. two longitudinally extended elongated sulcus bristle

groups embedded in the forward face of said head on opposite sides of said central bristle group the bristles of said sulcus bristle groups being mutually divergent and having ends extending forwardly beyond the bristles of said central bristle group.

e. the forward face of said head having a flat central area and two rearwardly sloped lateral shoulders;  
f. said central bristles being embedded in said central area and said sulcus bristles being embedded generally orthogonally into said shoulders, said flat central area being rearwardly recessed relative to said shoulders.

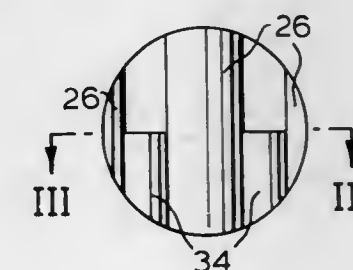
#### 4,010,510 PAINT BRUSH AND THE LIKE

George S. Belza, 22 Carney Road, Willowdale, Ontario, Canada (M2M 1T2)

Filed Mar. 12, 1976, Ser. No. 666,276  
Int. Cl.<sup>2</sup> A46B 3/02

U.S. Cl. 15—192

13 Claims



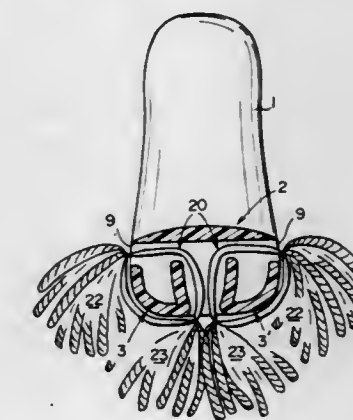
1. A paint brush and the like comprising:  
a handle,  
a ferrule secured to the handle;  
a plurality of bristles having inner end portions received within the ferrule and outer end portions which project from the ferrule;  
a bristle setting material retaining the bristles within the ferrule;  
a plurality of elongate spacer elements arranged inside the ferrule generally parallel to the inner end portions of the bristles and extending in length to substantially the level of said setting material, the bristles and spacer elements being tightly packed in the ferrule and the spacer elements being distributed between the individual bristles so as to mechanically and positively space the bristles and provide a predetermined bristle density.

#### 4,010,511

MOP HAVING SLEEVE TYPE DETACHABLE MOP HEAD  
Toshiyoshi Komatsu, Osaka, Japan, assignor to Duskin Franchise Co., Ltd., Osaka, Japan  
Filed Feb. 6, 1976, Ser. No. 656,081  
Int. Cl.<sup>2</sup> A47L 13/24; B25G 1/00

U.S. Cl. 15—104.94

8 Claims



1. A handy mop comprising in combination (A) a mop holder including a grip, an upper holding plate and a pair of lower holding rods, all of which are integrally molded from a



plastic material, each of said upper holding plate and lower holding rods extending in the horizontal longitudinal direction and having a closed end and an open end, said upper holding plate having a substantially horizontal flat lower face, said lower holding rods being disposed so that they are spaced vertically from said upper holding plate by a small distance and laterally from each other in parallel to each other by a small distance, to thereby form a horizontal mop passage between the upper holding plate and the lower holding rods and a vertical mop passage between the pair of the lower holding rods, a pair of projections being disposed in the vicinity of the closed ends of the pair of the lower holding rods so that they narrow said vertical passage, and a mop head-fixing engaging piece mounted on said mop holder at a position outside the closed ends of said holding plate and rods; and (B) a mop head including a tube open at each end, extending in the longitudinal direction and being capable of receiving said holding rods in the state inserted therein, a plurality of rows of mop cords disposed integrally with said tube and composed of twisted yarns extending outwardly of both sides of the tube in the transverse direction, and a loop cord fixed to each of the open ends of said tube; wherein said mop is attached to said mop holder by inserting the open ends of the pair of said holding rods into the open ends of said tube, engaging the pair of said loop cords with said engaging piece, projecting outwardly the rows of the mop cords on one side through said horizontal passage and projecting outwardly the rows of the mop cords on the other side through the vertical passage.

4,010,512

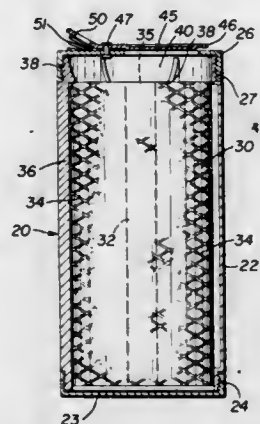
## SELF-CONTAINED RECEPTACLE TYPE DIP STICK CLEANER

F. Clark Addison, and Lee Silk Addison, both of P.O. Box 2462, Estes Park, Colo. 80517

Filed Mar. 29, 1976, Ser. No. 671,120

Int. Cl.<sup>2</sup> G01F 15/12

U.S. Cl. 15—210 B



1. A self-contained receptacle type dip stick cleaner comprising
  - a. a flexible cylindrical body, having upper and lower open ends,
  - b. a core of absorbent material contained within said body and having an open center along its vertical axis,
  - c. a removable bottom closing the lower end of said body,
  - d. a removable top closing the upper end of said body, said top having an opening exposing the open center axis of said core and having a pivotable cover for the top opening, and
  - e. retaining means for holding said core at a predetermined distance from said top, creating an air space allowing the tool to be squeezed without forcing absorbed liquid from said core out of the tool.

4,010,513  
WIPER DEVICE FOR ARCUATE AND FLAT SURFACES

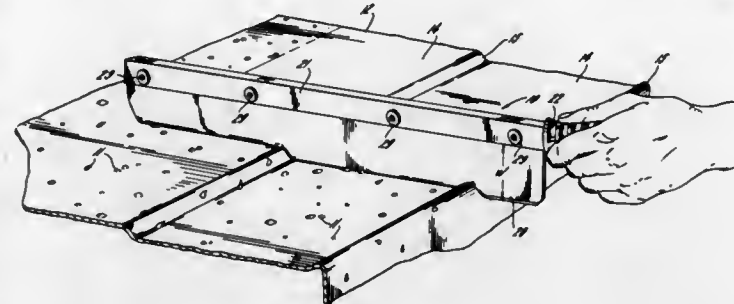
Ralph Sassi, 168 Ardmore, Des Plaines, Ill. 60016

Filed June 9, 1975, Ser. No. 585,253

Int. Cl.<sup>2</sup> A47L 1/06

U.S. Cl. 15—245

7 Claims



1. A wiper apparatus for clearing moisture from both curved and flat surfaces comprising an elongated support member, a handle extending outwardly from an end of said support member, said handle and support member being formed of a unitary plastic piece, a relatively soft rubber elongated wiper blade having a thickness of about 1/8 inch, said support being formed with a channel-shaped cross-section including a pair of spaced parallel legs, means securing one elongated side of said wiper blade in said support member channel such that said wiper blade extends outwardly from said support member with the outer elongated side thereof defining a clearing edge, said wiper blade having a length of at least 12 inches and extends outwardly from said support member a distance of at least 1/10 of its length and has a durometer hardness rating of between 30 and 40 so that the clearing edge thereof can conform closely to both curved and flat surfaces over which it is passed for clearing substantially all moisture thereon, and said handle makes an angle of between 5° and 10° with respect to the longitudinal axis of said support member so that the outermost end of said handle is set back from the support axis on a side opposite that from which said wiper blade extends.

4,010,514

## ARRANGEMENT FOR CONTINUOUSLY CLEANING FLEXIBLE LAYER SUBSTRATES IN TAPE FORM

Josef Fischer; Johann Baarfusser, and Helmut Maier, all of Munich, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

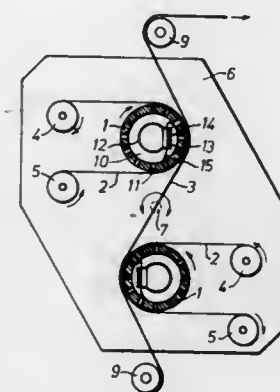
Filed Mar. 31, 1975, Ser. No. 563,504

Claims priority, application Germany, Apr. 4, 1974, 2416419

Int. Cl.<sup>2</sup> B08B 5/04

U.S. Cl. 15—306 A

6 Claims



1. A suction roller arrangement for continuously cleaning surface-sensitive paper or film in web form movably disposed in a path of travel under tension, more especially photographic material and magnetic tapes, said arrangement including a cleaning surface of a travelling flexible ribbon material being in contact with a portion of the web surface to be cleaned, the other surface of the travelling flexible ribbon

material being pressed in contact with the suction roller as the web portion passes under tension thereover, the travelling flexible ribbon material being non-woven and fibrous, and means for directing the travel of the flexible ribbon of fibrous non-woven material at a speed  $V_1$ , in the opposite direction to the direction of the web which travels at a speed  $V_2$ , the ratio between the respective rates of travel  $V_1/V_2$  being between about 1 : 500 and 1 : 10,000, wherein the suction roller includes an outer hollow cylinder, the outer hollow cylinder of the suction roller having bores which are distributed over the entire peripheral surface thereof, and wherein an evacuation duct is arranged inside the suction roller and spaced at a sufficient distance from the hollow cylinder of the suction roller to provide a uniform suction effect on the ribbon in contact therewith, the evacuation duct being provided with bores only in the vicinity of the web portion and ribbon pressed in contact with the suction roller.

4,010,515

## ANIMAL SKINNING APPARATUS

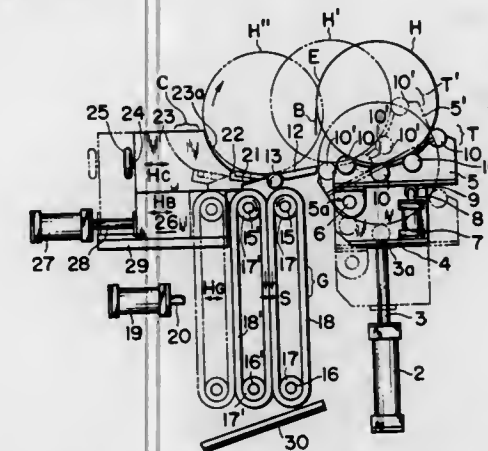
Nobuo Koyama, 238-8, Jone, Toride, Ibaragi, Japan

Filed Oct. 9, 1975, Ser. No. 621,251

Int. Cl.<sup>2</sup> A22B 5/16

U.S. Cl. 17—21

11 Claims



1. An animal skinning apparatus comprising a roller table for supporting the body of a hog or other like animal which can be moved in elevational movement and at the same time can be moved in tilting motion in a plane normal to its axis, a transfer and support table disposed adjacent said roller table, a guide roller disposed adjacent said transfer and support table, a cutter head mounting a cutter and juxtaposed against the guide roller, said cutter head being movable toward and away from the guide roller, and two sets of endless chains arranged beneath the line of contact between the cutter and the guide roller and adapted to pull the skin stripped from the body of the hog by means of the cutter.

4,010,516

## FISH SCALING DEVICE

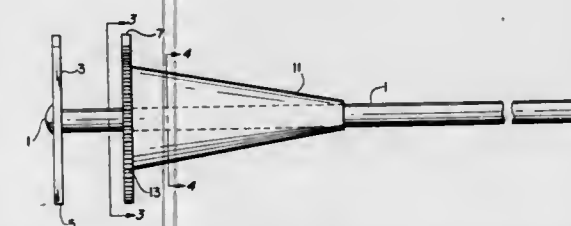
Rayburn J. Campbell, P.O. Box 1475, Pearland, Tex. 77581

Filed Sept. 16, 1975, Ser. No. 613,930

Int. Cl.<sup>2</sup> A22C 25/02

U.S. Cl. 17—66

4 Claims



1. A fish scaling device comprising an elongated, cylindrical handle, a generally rectangular hold down plate affixed to one end of said handle and perpendicular thereto; a scaler plate slidably mounted on said handle for reciprocating movement along said handle; manually operable operator means con-

nected to said scales plate whereby said scaler plate may be moved to and fro along said handle, said operator being of generally funnel-shaped configuration flaring open toward said scaler plate and being oval in cross section, said scaler plate having an oval opening therein with the longer axis of the opening being aligned with the longer axis of the oval, funnel-shaped end of the operator whereby said operator and said scaler plate may be swung in a generally arcuate path in at least one direction to accommodate variations in thickness and contour of the specimens being scaled as the operator traverses to and fro along said elongated, cylindrical handle.

4,010,517

## SHEET SUPPORT APPARATUS

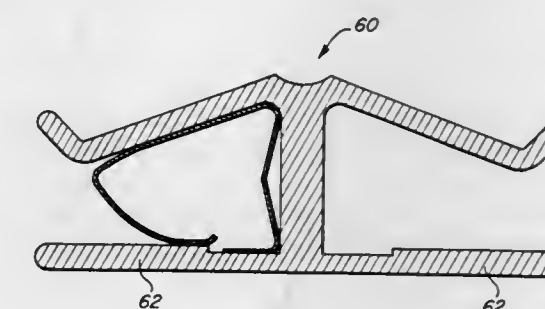
Odd B. Kapstad, 5 Minot Ave., Acton, Mass. 01720

Filed Sept. 12, 1974, Ser. No. 505,420

Int. Cl.<sup>2</sup> B42F 1/00

U.S. Cl. 24—67.11

9 Claims



1. Sheet support apparatus, comprising:
  - a. an elongated, rigid frame, said frame including first, second and third wall members, said wall members having generally planar inner and outer wall surfaces, and said wall members being integrally connected and spaced to define an elongated cavity therebetween for receiving an edge of a sheet to be supported, said first wall member being substantially perpendicular to said third wall member and said second wall member meeting said third wall member at an angle of between about 50° and about 80°;
  - b. resilient anchoring means for anchoring a sheet edge within said cavity, said resilient anchoring means comprising a leaf spring having first and second terminal portions, said first terminal portion slanted towards said third wall member thereby making it easier to insert a sheet edge into its anchored position within said frame cavity than to withdraw it therefrom, said leaf spring also having one of its sides in substantially continuous contact with the inside surface of said second wall member and having another of its sides bent inwardly away from the inner surface of said third wall member; and,
  - c. means for retaining said resilient anchoring means within said cavity, said means for retaining comprising an indented slot forming a shoulder located on the inner surface of said first wall member contiguous to where said first wall member joins said third wall member, said shoulder extending longitudinally along said first wall member, and said second terminal portion of said leaf spring designed to cooperate with said shoulder to retain the leaf spring within the frame cavity.

4,010,518

## CLAMP FOR FLEXIBLE DUCT

William E. Rejeski, Farmington, and Paul D'Aprile, Forestville, both of Conn., assignors to The Wiremold Company, West Hartford, Conn.

Filed June 16, 1975, Ser. No. 587,357

Int. Cl.<sup>2</sup> A44B 21/00

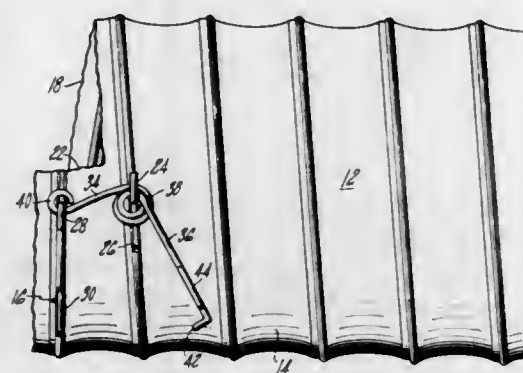
U.S. Cl. 24—73 C

11 Claims

1. For contracting and securing an end of a generally tubular flexible duct having a helically wound reinforcing member



maintaining the duct in a normally extended condition, a spring clamp comprising a continuous resilient wirelike body including an operating arm and a lever arm in offset angular relation to one another, an intermediate coil connecting the operating arm and the lever arm, the operating arm being reversely bent at its extremity relative to the coil to provide a self-locking extension of the operating arm projecting toward



the coil, the self-locking extension of the operating arm having a length sufficient to extend diametrically beyond the center of the coil, and the lever arm having a length greater than the length of the operating arm whereby with the operating arm attached to opposite ends of an end convolution of the reinforcing member, deflection of the lever arm into engagement with the end of the duct reduces the duct diameter.

4,010,519

#### FASTENER STRUCTURES UTILIZING A THERMOPLASTIC ADHESIVE

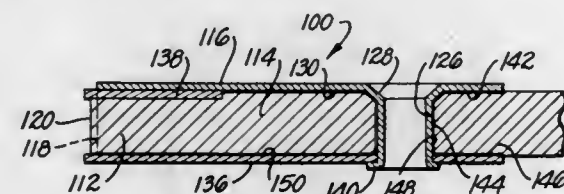
Albert L. Worthing, Tustin, Calif., assignor to Shur-Lok Corporation, Santa Ana, Calif.

Filed Nov. 24, 1975, Ser. No. 634,665

Int. Cl.<sup>2</sup> A43C 5/00; F16B 19/04

U.S. Cl. 24—141

4 Claims



1. A fastener structure for use with a member having opposed surfaces and a hole extending between said surfaces which comprises:

- a metal plate capable of conducting heat having an upper surface and a lower surface, said plate being adapted to be located with respect to said member so that said lower surface is adjacent to said member,
- a metal shank means capable of conducting heat for use in securing said plate to said member, said shank means extending from said plate and being shaped so as to fit through said hole,
- a continuous layer of a thermoplastic adhesive located on said metal parts, said layer being located so as to be adapted to be in engagement with said member as said fastener is located with respect to said member,
- said metal in said plate and said shank means has a thermoconductivity  $k$  of at least 10 within the range of temperatures within which said adhesive is capable of being bonded by the application of heat,
- said range of temperatures is from about 50° to about 200° C.,
- said layers of adhesive are from about 0.005 to about 0.012 inch thick, and
- said adhesive is a nylon modified polyamide adhesive.

4,010,520

#### COUPLING ELEMENT FOR SLIDE FASTENER

Hiroshi Yoshida, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

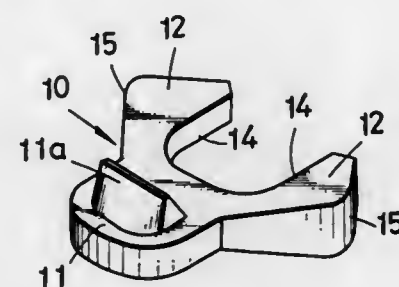
Filed Feb. 24, 1976, Ser. No. 660,915

Claims priority, application Japan, Feb. 27, 1975, 50-27315[U]; Mar. 6, 1975, 50-27764

Int. Cl.<sup>2</sup> A44B 19/02

U.S. Cl. 24—205.13 R

2 Claims



1. A coupling element for a slide fastener having a slider and a pair of element-carrying tapes, the coupling element being adapted to be mounted on either one of the pair of tapes, comprising:

- a head portion of substantially uniform thickness;
- a coupling projection projecting from one surface of said head portion for intercoupling engagement with a coupling element on the other tape; and
- a pair of tape edge clamping legs extending from said head portion in spaced-apart relation to each other, said pair of legs having a pair of inner flat surfaces which face each other and are adapted to grip the tape edge in surrounding relationship therewith, and a pair of outer convex surfaces which face away from each other and with which the slider is slidably engageable when the latter is manipulated to open and close the slide fastener, each of said legs being transversely tapered from said outer surface toward said inner surface to provide trapezoidal transverse cross-sectional shape thereof.

4,010,521

#### MEANS FOR RETAINING ARTICLES

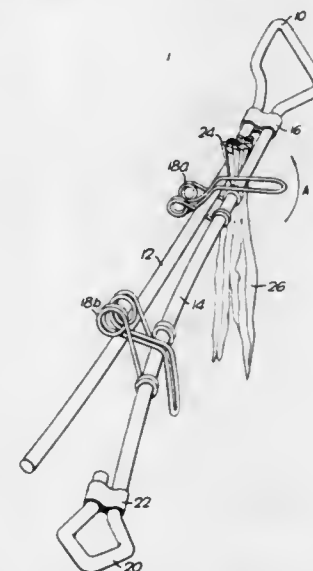
Emlyn John Powell, Salisbury, and James Strathearn Brown, Darwendale, both of Rhodesia, assignors to James Strathearn Brown, Darwendale, Rhodesia

Filed July 14, 1975, Ser. No. 595,431

Int. Cl.<sup>2</sup> A44B 21/00

U.S. Cl. 24—258

6 Claims



1. A device for retaining articles comprising at least two co-operating elongated members and at least one clip formed from a torsion spring having:

- a. at least one outwardly extending arm the free end of which is mounted on one member, and

b. an outwardly extending hook adapted releaseably to engage another or the other member against the torque of the spring thereby gripping the article interposed the members.

4,010,522

#### APPARATUS FOR DRYING WEB-LIKE MATERIAL

Peter Stanislaw, Stockholm, N.J., assignor to Morrison Machine Co., Paterson, N.J.

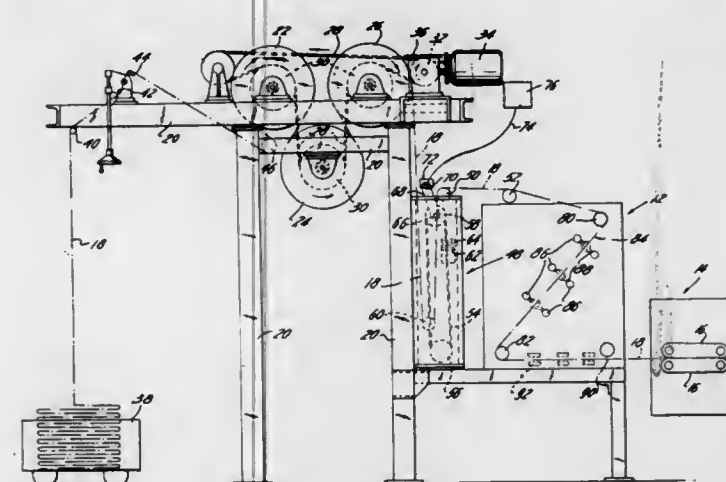
Continuation of Ser. No. 424,778, Dec. 14, 1973, abandoned.

This application Dec. 29, 1975, Ser. No. 644,726

Int. Cl.<sup>2</sup> D06C 21/00

U.S. Cl. 26—18.6

7 Claims



1. Apparatus for pre-shrinking first and second webs of material, including a compressor, first feeding means for feeding the first web of material into the compressor, second feeding means being arranged side-by-side to said first feeding means for feeding the second web of material into the compressor alongside said first web of material while the first feeding means is feeding the first web of material into the compressor, a first adjustable tension responsive control system for maintaining a first predetermined tension on the first web of material as it enters the compressor, and a second adjustable tension responsive control system being arranged side-by-side to said first adjustable tension responsive control system for maintaining a second predetermined tension on the second web of material as it enters the compressor to compensate for the differing characteristics of said first and second webs of material so that they enter said compressor with controlled tension characteristics and are each preshrunk to the desired extent in said compressor.

4,010,523

#### PROCESS FOR THE PRODUCTION OF A NOVELTY YARN

Karl-Hermann Hense, Erlenbach, and Thomas Zang, Hombach, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed July 23, 1975, Ser. No. 598,261

Claims priority, application Germany, July 27, 1974, 2436277

Int. Cl.<sup>2</sup> D02G 1/20

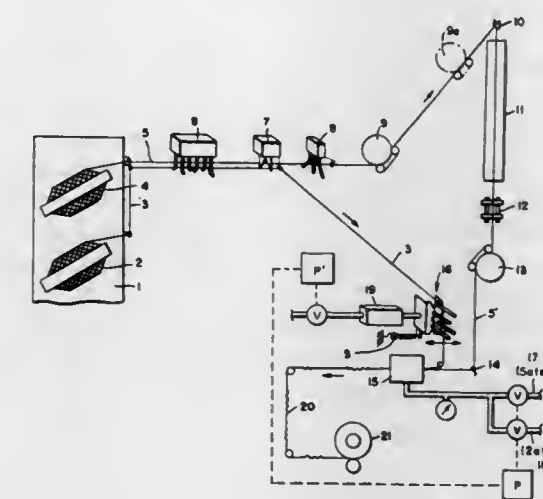
U.S. Cl. 28—72.11

10 Claims

1. A process for the production of a composite novelty yarn which comprises:

- conducting a continuous multifilament base thread together with a continuous multifilament fancy thread through a texturizing jet nozzle operating under an adjustable pressure of a fluid medium and being capable of inducing both an interlacing action and a suction action when applied to said threads, at least said base thread consisting essentially of texturized filaments;
- varying the pressure of the jet fluid medium applied to said threads between a lower value above atmospheric pressure and a distinctly higher value;
- maintaining a relatively high uniform tension on said base thread such that it follows a substantially linear path through the jet nozzle;

maintaining a distinctly lower tension by a light braking on the fancy thread as compared to the tension on the base thread, said light braking taking place during the application of said lower value of the jet pressure; and



maintaining the fancy thread practically tension-free and unbraked during the application of said higher value of the jet pressure.

4,010,524

#### APPARATUS FOR MANUFACTURE OF CONTINUOUS HINGE

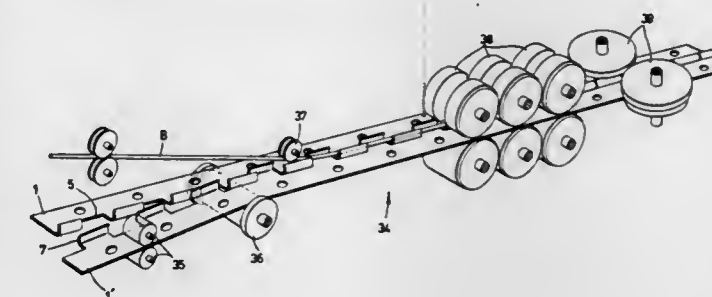
Akashi Osamu, No. 6-22, 5-chome, Momodani, Ikuno, Osaka, and Nakamura Masazo, No. 50, Taihoji-machi-higashinocho, Minami, Osaka, both of Japan

Filed Nov. 6, 1975, Ser. No. 629,373

Int. Cl.<sup>2</sup> B21D 53/40; B21K 13/02

U.S. Cl. 29—11

1 Claim



1. An apparatus for manufacturing a continuous hinge comprising:

- a. an elongated work support having input and output ends disposed to define a travel path and to support first and second moving adjacent strips (1, 1') on said travel path;
- b. pay-off reel means for supplying first and second metal strips along said travel path for forming opposing leaves of a continuous hinge;
- c. a press-machining station (10) including strip receiving roll means (28) for receiving and feeding each of the metal strips intermittently by a predetermined length, a pair of die means, each for simultaneously forming in each of the strips an outer side hole (2), notch (5) defining an inner flap (3) and a partially looped flap (7) by bending said flap (3) so that the notches and partially looped flaps in the first strip are offset from those for the second strip, each of said pair of die means including a punch (12) for forming the hole, a cutting block (11) for cutting the notch, a laterally slidable swaging die (17) biased away from the flap (3) defined by the notches and having an inwardly curved portion and a slant (20), an elevatable block having a curved projection (16) and a slant (19) for hitting and urging the swaging die towards the flap (3) by the slidable engagements of the slants (19) and (20) thereby forming the partially looped flap (7) by



the press of the inwardly curved portion of the swaging die mating the curved projection of the elevatable block which is lowered, and means for lowering the punch, cutting block and elevatable block at the same time in a timed relation with the stoppage of each of the strips;

d. roller means (36) for bringing the partially looped flaps of the first strip into channel-like alignment with the adjacent partially looped flaps of the second strip;

e. guide roll means for guiding a wire pintle into a channel formed by aligned flaps of the first and second strips;

f. grooved rolls (38) to which said channel-like partially looped flaps with the wire pintle therein are directed, so as to constrict said partially looped flaps and close the loops over the wire pintle thereby forming a continuous hinge; and,

g. a pair of laterally opposed squeeze rolls (39) having an annular depression (40) to complete the encircling of the wire serving as a pintle by the formed loops.

4,010,525

# METHOD FOR ASSEMBLING A FUNNEL AND A FLANGELESS FACEPLATE IN THE MANUFACTURE OF A COLOR TELEVISION PICTURE TUBE

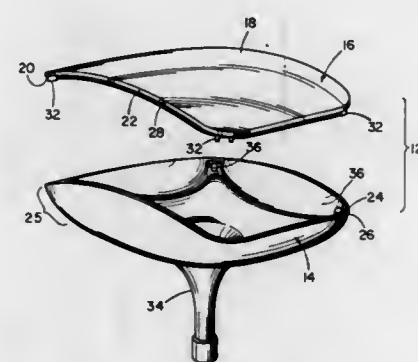
Leslie L. Baur, Glen Ellyn, and Thaddeus J. Hajduk, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed May 3, 1976, Ser. No. 682,947

Int. Cl.<sup>2</sup> H01J 9/26

U.S. Cl. 29—25.13

11 Claims



1. For use in the manufacture of a rectangular shadow mask-type color television picture tube including a flangeless, curved faceplate having a central axis, a convex front surface, and a concave rear surface with a phosphor screen deposited on a central portion thereof, said faceplate also having four shadow mask suspension studs extending from said rear surface of said faceplate, one in each peripheral corner region of said faceplate, and a shadow mask suspended from said studs, said tube also including a funnel having a central axis and a neck attached to a rectangular cross-sectioned flared portion, the flared portion having a seal land which mates with said concave rear surface of said faceplate, said seal land having deposited thereon a cement for sealing said faceplate to said funnel, the flared portion of said funnel also having corner notches in at least three corners of said funnel, said notches receiving said studs on said faceplate when said faceplate and funnel are assembled, said studs and said notches constituting an internal referencing system for said faceplate and said funnel, a method for assembling said faceplate to said funnel comprising:

orienting said faceplate, concave rear surface down, with said faceplate central axis parallel to a predetermined reference axis and said faceplate being angularly positioned to coincide with a predetermined faceplate theta position, said orienting being effected by engaging said studs on said faceplate with simulated funnel inside corner notches on a faceplate aligning means;

orienting said funnel, flared portion up, with said funnel central axis parallel to said predetermined reference axis and with said funnel angularly positioned to coincide with

a predetermined funnel theta position, said orienting being effected by engaging said notches in said funnel with simulated studs on a funnel aligning means, said simulated studs and said simulated notches being theta-referenced each to the other, i.e., the angular orientation of each to the other is at all times known;

locking said faceplate such that said faceplate central axis is parallel to said predetermined reference axis, and such that said theta referencing to said funnel is preserved;

disengaging said faceplate aligning means from said faceplate;

locking said funnel such that said funnel central axis is parallel to said predetermined reference axis and such that said theta referencing to said faceplate is preserved;

disengaging said funnel aligning means from said funnel;

effecting relative motion of said faceplate and said funnel parallel to said reference axis and in planes perpendicular to said reference axis while preserving said theta referencing to cause said studs on said faceplate to engage said notches in said funnel.

4,010,526

# CUT-OFF TOOL

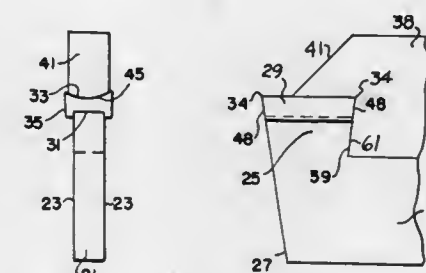
Donald L. Shephard, Memphis, Mich., assignor to Helen I. Shepherd, Memphis, Mich., a part interest

Filed Jan. 12, 1976, Ser. No. 648,071

Int. Cl.<sup>2</sup> B26D 1/00

U.S. Cl. 29—96

6 Claims



1. A cut off tool comprising an elongated support blade of uniform thickness adapted for mounting in a tool holder; a support head on and projecting above said blade at its forward end;

an elongated carbide insert of U shape in cross section wider than said support head and having an undercut slot mounted on and along the length of said head, with said head snugly extending into said slot, and said insert adapted for securing thereon, both lower edges of said insert bearing against side portions of said head;

said insert being of uniform cross section, having side walls tapering downwardly and inwardly;

its opposite end faces tapering downwardly and inwardly, its top surface being transversely concave along its length to define with an end face a concave leading cutting edge;

said insert top edge being hollow ground;

said insert after wear of its cutting edge, adapted for reversal end to end upon said head to provide a second cutting edge;

the leading edge face of said support blade being cut downwardly and rearwardly and coplanar with said insert leading edge face;

and means removably securing said insert upon said head.

4,010,527

# TEXTILE DRAFTING ROLL ASSEMBLY

Kenneth P. Swanson, 2624 Sea Island Drive, Fort Lauderdale, Fla. 33301

Filed May 6, 1976, Ser. No. 683,735

Int. Cl.<sup>2</sup> B21B 13/02

U.S. Cl. 29—116 R

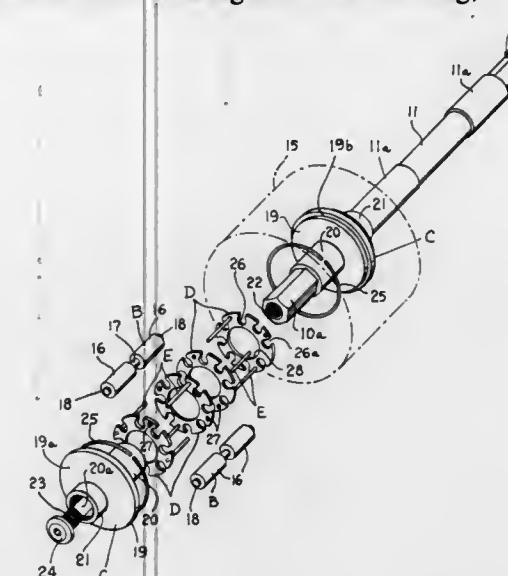
14 Claims

1. An assembly for mounting a textile drafting roll on a shaft for use on a spinning frame and the like, comprising:

a sleeve carrying said roll thereon having;

a bearing race intermediate internally enlarged end portions;

a plurality of circumferentially spaced roller bearings carried within said bearing race each having;



a pair of spaced aligned rollers separated by an enlarged intermediate portion; and

sealing means carried within said enlarged end portions retaining said roller bearings within said bearing race and excluding dirt and lint therefrom.

4,010,528

# MULTI-PARTITE GUIDE ROLL

Eberhard Böhmer, Heilshorn, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

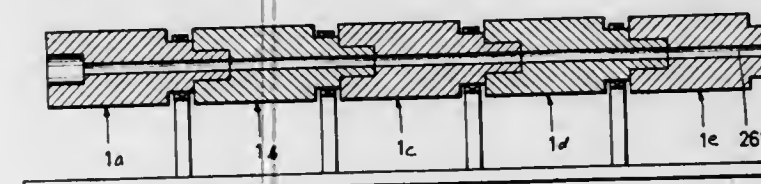
Filed Apr. 18, 1975, Ser. No. 569,174

Claims priority, application Germany, May 14, 1974, 2423224; Apr. 27, 1974, 2420514

Int. Cl.<sup>2</sup> B21B 13/08

U.S. Cl. 29—125

3 Claims



1. A multi-partite guide roll, particularly for use in continuous casting installations, comprising a plurality of axially adjacent discrete roll sections each having two axial ends; a plurality of stems interconnecting the axially adjacent roll sections for enforced joint rotation about a common axis, each of said stems being provided at one of said axial ends of a respective one of said roll sections and received in an axial recess at another axial end of an axially adjacent one of said roll sections; and bearing means in the region of said stems intermediate the axially adjacent ones of said roll sections arranged for mounting said roll for rotation.

4,010,529

# METHOD AND APPARATUS FOR TREATING YARNS

Aldo Honegger, Venissieux, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Dec. 22, 1975, Ser. No. 643,482

Claims priority, application France, Dec. 23, 1974, 74.42812

Int. Cl.<sup>2</sup> D02G 1/00

U.S. Cl. 28—1.2

5 Claims

1. A yarn-treatment unit comprising

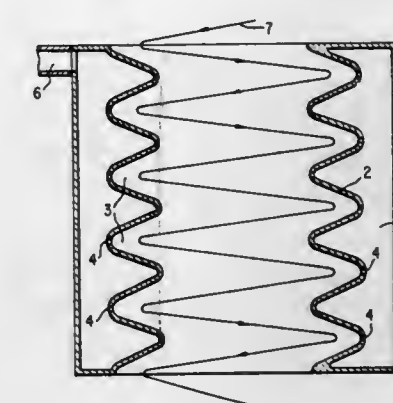
a. a body having

b. a yarn passage therethrough, said passage including

c. a spiral yarn path which is defined, at least in part by a spiral groove in said passage,

d. a plurality of apertures directed inwardly toward said spiral yarn path,

e. means for supplying a yarn to said yarn path, and



f. means for supplying a treating fluid through said apertures and against the yarn in said yarn path.

4,010,530

# METHOD FOR MAKING BLADE PROTECTIVE SHEATHS

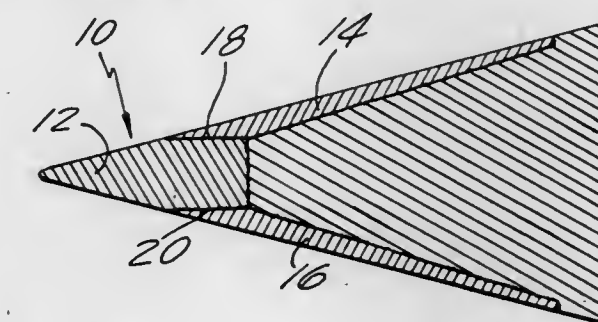
Eugene Joseph Delgrosso, Wallingford; Carl Edwin Carlson, East Hartford, and James Augustus Jennings, West Suffield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 24, 1975, Ser. No. 598,891

Int. Cl.<sup>2</sup> B23P 15/04

U.S. Cl. 29—156.8 B

6 Claims



1. A method for protecting the edge of an aerodynamic blade comprising:

providing a metal sheath mid-section element having a top and a bottom surface, said mid-section element being selected from the group consisting of titanium, nickel and alloys thereof;

covering said top and bottom surface with an aluminum bonding material;

laying up a metal top and bottom sheath cover element on each of said top and bottom surfaces of said mid-section element, said top and bottom cover elements being selected from the group consisting of titanium, nickel and alloys thereof and having contact surfaces wider than said top and bottom surfaces of said sheath mid-section element to overhang opposite sides of the same and thereby form channels adapted to receive the edge of said blade;

said aluminum bonding material having a solidus temperature which is lower than the solidus temperature of each of said mid-section element and said top and bottom cover elements;

subjecting the layup to heat and pressure in a die for a time sufficient to bring the temperature of said bonding material to a temperature which is below but within approximately 20° F of its solidus temperature to solid state diffusion bond said mid-section and cover elements together without forming intermetallics, said temperature being 900°-1075° F, said pressure being 1,000-10,000 psi and said time being 2-90 minutes;

severing the bonded product through said top surface, said

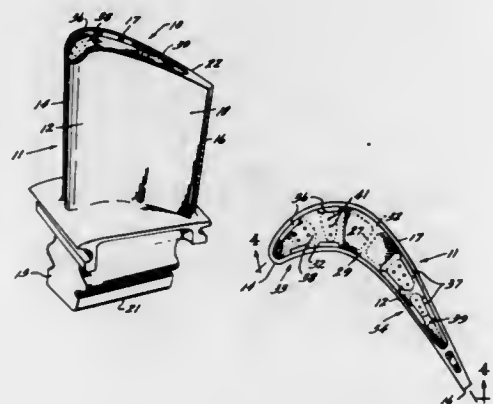


mid-section element and said bottom surface to form two U-shaped protective sheaths;  
finishing said U-shaped protective sheath to final shape; and  
bonding said U-shaped protective sheath to said blade edge.

4,010,531

**TIP CAP APPARATUS AND METHOD OF INSTALLATION**  
Richard H. Andersen; William A. Litzinger, and Robert J. Corsemeier, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio  
Division of Ser. No. 609,346, Sept. 2, 1975, Pat. No. 3,982,851. This application Apr. 2, 1976, Ser. No. 672,887  
Int. Cl.<sup>2</sup> B23P 15/04; F01D 5/18  
U.S. Cl. 29—156.8 H

9 Claims



1. An improved method of constructing a turbomachinery blade of the type having convex and concave side walls defining a cavity with a radially outer tip end, and a tip cap which forms a closure for the tip end comprising the steps of:

- forming a blade having convex and concave side walls defining a cavity with an open tip end;
- providing respective radially spaced platform and retaining means in said cavity on the inner periphery of the side walls, proximate the tip end thereof;
- providing a closure element in the cavity to interconnect the side walls near the tip end to close a portion thereof;
- placing a tip cap in contiguity with the radially outer surface of said closure element; and
- sliding said tip cap to a position wherein it is captured between said platform and said retaining means to close another portion of the tip end.

4,010,532

**PORTABLE RIVET BREAKING DEVICE**  
Albert G. Streeter, P.O. Box 75, Bassett, Ark. 72313  
Filed May 21, 1976, Ser. No. 688,910  
Int. Cl.<sup>2</sup> B23P 19/04

U.S. Cl. 29—267

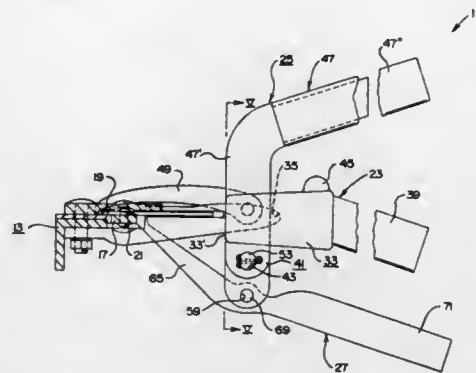
6 Claims

1. A portable rivet breaking device for use with a sickle mower of the type including a base member having a plurality of forwardly projecting guard members fixedly mounted thereon and including a reciprocating drive bar having a plurality of cutting teeth individually riveted thereto, said rivet breaking device comprising:

- guide means for positioning said rivet breaking device on a sickle mower, said guide means including means for selectively fitting over at least one of the forwardly projecting guard members of the sickle mower;
- first shear means including a handle member pivotally

mounted to said guide means and including a hook member for selectively grasping a portion of an individual cutting tooth of a sickle mower, said hook member being pivotally mounted to said handle member at a location above the location where said handle member is pivotally mounted to said guide means; and

- second shear means including a strut member for selectively engaging a portion of the reciprocating drive bar of a sickle mower, said strut member being pivotally



mounted to said handle member of said first shear means at a location below the location where said handle member is pivotally mounted to said guide means whereby downward movement of said handle member will cause said hook member to apply a pulling force to the individual cutting tooth which it is grasping and will cause said strut member to apply a pushing force to the portion of the reciprocating drive bar of the sickle mower that it is engaging thereby shearing any rivet holding that individual cutting tooth to the reciprocating drive bar.

4,010,533

**METHOD OF PRODUCING A TRANSMISSION DEVICE**  
Alfred Pitner, Paris, France, assignor to Nadella, France, a part interest

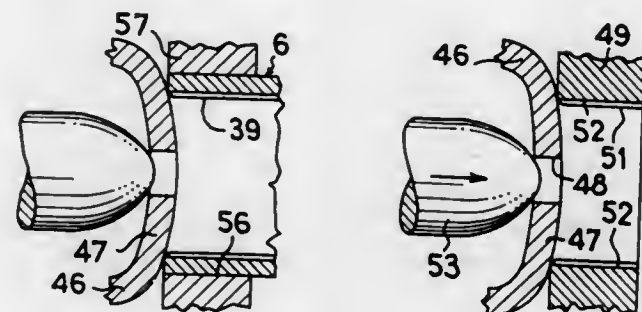
Filed Dec. 4, 1975, Ser. No. 637,655

Claims priority, application France, Dec. 11, 1974, 74.40740

Int. Cl.<sup>2</sup> B21D 39/00; B23P 11/02

U.S. Cl. 29—523

14 Claims



1. A method for producing a transmission device comprising a coupling means, such as a universal joint yoke, having a collar adapted to be connected to a tubular sleeve, comprising producing a blank of the coupling means, forming a centre opening in the blank and forming a collar around the opening from a part of the blank surrounding the opening, cold forming projecting portions on an outer surface of said collar, and connecting the collar to the inside of said tubular sleeve by radially expanding said collar whereby said projecting portions on the outer surface of the collar interengage with projections on the inner surface of said sleeve.

4,010,534

**PROCESS FOR MAKING A DEEP DIODE ATOMIC BATTERY**

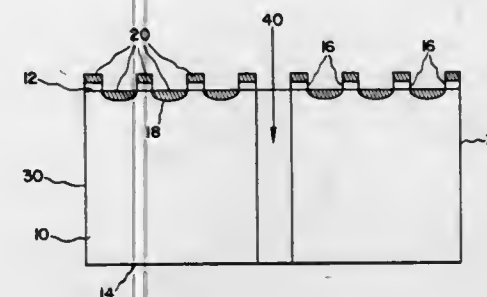
Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 27, 1975, Ser. No. 590,876

Int. Cl.<sup>2</sup> B01J 17/00

U.S. Cl. 29—572

38 Claims



1. A process for making a deep diode atomic battery comprising the steps of:

- selecting a body of single crystal semiconductor material so that the body has a first type conductivity, a selected resistivity, and at least one major surface having a preferred planar crystal structure orientation which is one selected from the group consisting of (100), (110) and (111), the vertical axis of the body being substantially aligned with a first axis of the crystal structure;
- etching selectively the surface having the preferred planar crystal structure orientation to form at least one array of depressions in the surface;
- vapor depositing a layer of a metal in the depressions of the at least one array on the selected surface of the body of semiconductor material;
- heating the body and the metal to a temperature sufficient to form a melt of metal-rich material in each of the depressions on the surface of the body;
- establishing a temperature gradient along substantially the vertical axis of the body and the first axis of the crystal structure;
- migrating the metal-rich melt through the body along the first axis of the crystal structure to divide the body into a plurality of regions of first type conductivity and to form at least one array of regions of recrystallized material of the body having solid solubility of the vapor deposited metal therein, the metal including at least one dopant impurity material therein to impart a second and opposite type conductivity and a selected level of resistivity thereto;
- providing a means for disposing a source of radioactive material within the body in a predetermined relationship with the material of the body and the material of regions of the at least one array;
- electrically connecting the plurality of first type regions into a first internal electrical circuit arrangement, and
- electrically connecting the plurality of second type regions into a second internal electrical circuit arrangement.

4,010,535

**METHOD OF FABRICATING A VOLTAGE MULTIPLIER CIRCUIT ASSEMBLY**

Hideo Hishiki; Shiyousaku Yamaguchi, and Akihisa Miyazaki, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Oct. 29, 1974, Ser. No. 519,052

Claims priority, application Japan, Oct. 31, 1973, 48-122605; Dec. 25, 1973, 48-147254[U]

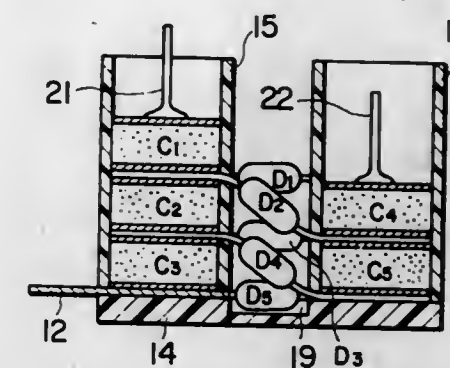
Int. Cl.<sup>2</sup> H05K 13/00

U.S. Cl. 29—577

11 Claims

1. The method of fabricating a voltage multiplier assembly,

comprising: stacking condensers, each comprised of a pair of opposed plate electrodes with a dielectric sandwiched therebetween, alternately on a first and second area with one of the electrodes facing downward so that the upper plate electrode of each condenser is in contact with the lower plate electrode of an adjacent condenser except for the uppermost condenser; placing one of a plurality of diodes having connecting leads to the opposite end thereof alternately with the stacking of each condenser on alternate third and fourth areas between said first and second areas with their connecting leads extending



4,010,536

**METHOD OF ADJUSTING TWO CONCENTRIC WINDINGS IN ELECTRICAL INDUCTION DEVICES**

Toshio Fujita; Katusada Ishida, and Takehiko Funakoshi, c/o Kabushiki Kaisha Meidensha, No. 2-1-17, Ohsaki, Shinagawa, Tokyo, Japan

Continuation of Ser. No. 457,721, April 3, 1974, abandoned.

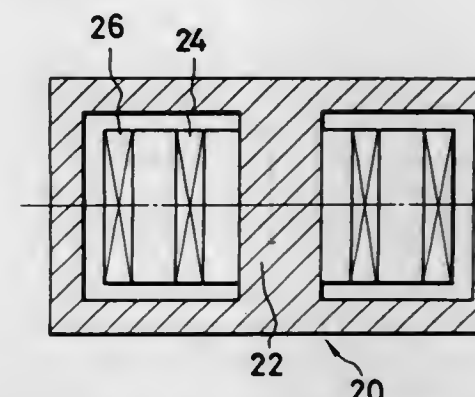
This application Oct. 23, 1975, Ser. No. 625,158

Claims priority, application Japan, Apr. 4, 1973, 48-38966; Apr. 7, 1973, 48-40129

Int. Cl.<sup>2</sup> H01F 41/00

U.S. Cl. 29—593

7 Claims



1. A method of making coincident the electro-magnetic centers of two cylindrical power windings disposed coaxially with a limb of an iron core of an electric induction machine and with each other, the method comprising the steps of: a) exciting one of said windings to put the other winding in electromagnetically coupled relationship to said one winding, thereby causing said other winding to produce a magnetic leakage flux having opposed radial components with opposite signs; and b) moving a given one of said windings axially relative to the remaining one of said windings to a position where the quantities of the opposed radial components of the leakage flux are equal except for their signs; while c) detecting the difference between the quantities of the opposed radial components of the leakage flux.



# 4,010,537 EPOXY SEALED LEAD BATTERY PROBE AND METHOD FOR INSERTING SAME

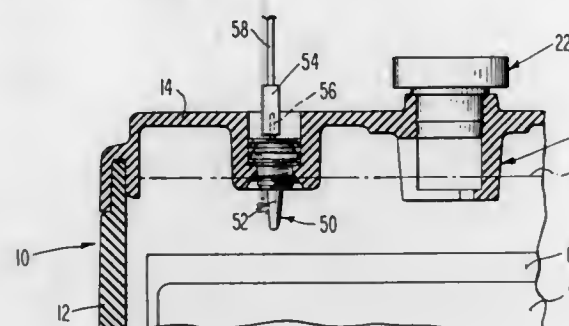
Terry Russel Oxenreider, Wernersville, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed July 3, 1975, Ser. No. 593,000

Int. Cl.<sup>2</sup> H01M 10/48

U.S. Cl. 29—623.2

2 Claims



1. In a method of assembling an electric storage battery comprising the steps of:

- molding a complementally configured case and cover;
- introducing stacks of battery plates and separators into said case;
- forming the desired intercell connections between said stacks;
- applying epoxy resin to the portions of the undersurface of said cover which will engage said case, and placing said cover on a supporting surface so that said undersurface forms the upper surface thereof;
- inverting and placing said case on said cover; and
- allowing said epoxy to cure, thereby sealing said case to said cover;

The improved method:

- wherein step (a) further comprises the step of molding said cover to have a substantially annular boss therein, said boss having a bore defined therethrough being formed having a substantially cylindrical outer section contiguous to the upper surface of said cover, a constricted section of lesser diameter than said outer section, and a beveled section tapering outwardly towards the undersurface of said cover;
- wherein an additional series of steps are performed prior to step (d), said series of steps comprising the steps of:
  - providing a tin plated copper pin;
  - casting said tin plated copper pin into a substantially tapered probe having a flange portion of substantially the same diameter of said outer section, a head portion of larger diameters than said constricted portion and smaller diameters than said outer section, and mid and base portions of smaller diameters than said constricted portion;
  - manually inserting said probe into said bore from the upper side of said cover until cast flash on said probe interferes with the portion of said boss defining the intersection of said outer and said constricted portions, whereby a seal is formed between said flange portion of said probe and said outer section of said bore; and

- wherein step (d) further comprises the steps of:
  - applying epoxy resin between said base portion and said beveled portion, whereby said beveled portion acts as a reservoir for said epoxy resin; and
  - allowing said resin to flow from said reservoir between said mid and head portions of said probe and the portions of said constricted and outer sections adjacent thereto until retained by said seal whereby an hour-glass-like seal is formed between said probe and said bore;

thereby forming a battery having a probe sealed therein to sense the preferred level of electrolyte in said battery.

# 4,010,538 PHONO PLUG

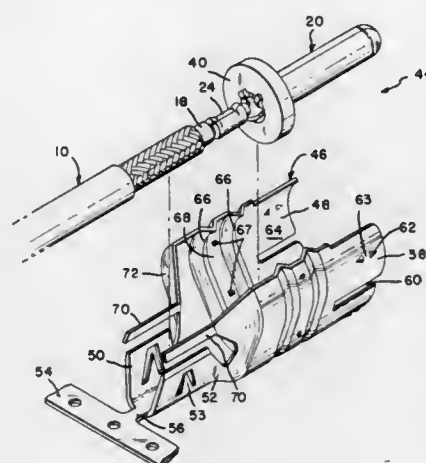
Michael Francis O'Keefe, Mechanicsburg; Dennis Penrose Schwenk, Hummelstown; Ronald Clair Laudig, Mechanicsburg, and Suel Grant Shannon, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 592,160, July 1, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,612

Int. Cl.<sup>2</sup> H01R 9/00

U.S. Cl. 29—630 A

2 Claims



1. A method of assembling a phono plug comprising the steps of:

- stripping a length of coaxial cable to expose the center conductor and the braided shield;
- providing a center contact member having a pin at one end and a wire barrel at another end and crimping the wire barrel around the exposed length of the center conductor;
- slipping an annular insulating disc around the pin on the center contact member;
- providing a shell member having an open housing portion at the forward end with a pair of fingers projecting rearwardly therefrom, and an open wire barrel at the rearward end and placing the disc carrying center contact member into the open housing portion so that the exposed braided shield lies in the open wire barrel;
- forming the open housing portion into a closed cylinder around the insulating disc with the fingers on the housing being placed into the open wire barrel; and
- crimping the wire barrel on the shell member into encompassing relation about the fingers and the braided shield lying therein.

# 4,010,539 METHOD FOR FABRICATING MULTI-FURCATED ELECTRICAL TERMINALS

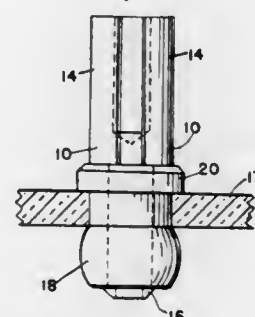
James Iantorno, Mamaroneck, N.Y., assignor to Sealectro Corporation, Mamaroneck, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,988

Int. Cl.<sup>2</sup> H01R 9/00

U.S. Cl. 29—630 D

1 Claim



1. A method for producing an electrical terminal having a

series of parallel extending metal tines integral with an insulated bushing comprising the steps of:

- extruding a length of metal having a generally circular cross section to form spaced channels in the extruded surface; fastening the extruded length of metal in a collet in a screw machine;
- removing by drilling a portion of the central core to create a plurality of spaced tines on one end of the extruded length of metal, said tines being capable of supporting an external connecting conductor;
- removing the extruded length of metal from the collet;
- removing material from the opposite end of the extruded length of metal to produce a spindle;
- cutting the opposite end from the extruded length of metal; and
- inserting said opposite end into an insulated bushing to complete the electrical terminal.

# 4,010,540 METHOD OF CONNECTING ELECTRICAL CONDUCTORS AND CONNECTIONS OBTAINED THEREBY

Andre Savigny, Eaubonne, France, assignor to Societe de Vente de l'Aluminium Pechiney, Paris, France

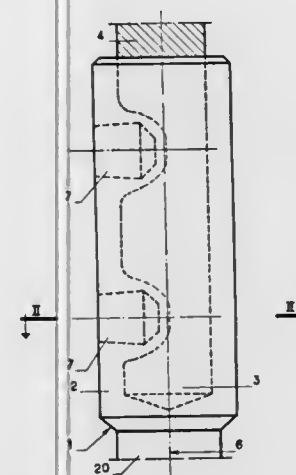
Filed June 30, 1975, Ser. No. 591,869

Claims priority, application France, July 25, 1974, 74.25823

U.S. Cl. 29—630 A

Int. Cl.<sup>2</sup> H01R 9/14

3 Claims



1. A method of connecting electrical conductors by means of a connection comprising a sleeve, including the steps of: engaging the extremity of a conductor into the sleeve, orientating at least one punch perpendicular to the axis of the sleeve at any point about the exterior thereof, retaining the punch in contact with the exterior of the sleeve at the chosen point about the exterior thereof, and driving the punch perpendicularly through the exterior of the sleeve to effect an inward deformation of the aligned area of the sleeve, a permanent seating of the punch within the sleeve, and a corresponding flattening of the conductor.

# 4,010,541 CITRUS FRUIT PEELING IMPLEMENT

Jean Guy Papineau, 2306 Charles Road, Hallandale, Fla. 33009

Filed Jan. 15, 1976, Ser. No. 649,243

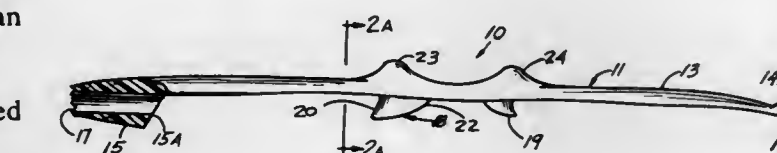
Int. Cl.<sup>2</sup> A47J 17/04

U.S. Cl. 30—123.7

3 Claims

1. A citrus fruit peeling implement comprising, in combination, an elongated body member, cutting means extending outwardly of one side of said body member intermediate the ends thereof for scoring, about its periphery, the rind of a citrus fruit to be peeled, said cutting means comprising a cutting edge directed to an end portion of said body member, said cutting edge terminating in a blunt tip to minimize the

possibility of cutting into the fruit meat of the citrus fruit being scored, one end of said body member being substantially flat, and being terminally rounded to facilitate its wedge-like insertion beneath the rind at a scored cut for prying the rind from the fruit, and a second cutting means substantially identical with said first mentioned cutting means, spaced from said first



cutting means and intermediate the ends of said body member, said second cutting means extending to a lesser distance outwardly of said one side of said body member and being directed to the end thereof opposite the direction of said first cutting means, said first and second cutting means being for selective use depending on the thickness of the citrus rind to be scored.

# 4,010,542 PLASTIC SCORING TOOL

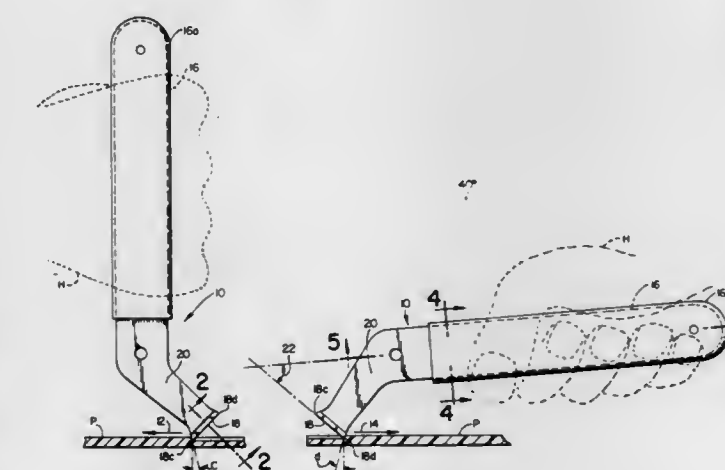
Philip E. Richardson, West Hartford, and Lothar Lenhardt, Manchester, both of Conn., assignors to The Fletcher-Terry Company, Farmington, Conn.

Filed June 27, 1975, Ser. No. 591,173

Int. Cl.<sup>2</sup> B26B 3/00

U.S. Cl. 30—164.9

2 Claims



1. A tool for scoring plastic sheet material by hand, said tool having a flat handle with a longitudinal axis adapted to be held at a small angle to the sheet surface to be scored and also adapted to be held generally normal to the surface of the sheet to be scored, a flat blade having a straight chisel edge with two alternately usable scoring tips defined at opposite ends of said chisel edge, said edge being V-shaped and defined by ground surfaces 18a and 18b, said V-shaped chisel edge oriented at an angle of approximately 45° with respect to said handle axis and being offset with respect thereto, said blade and handle integrally connected to one another by an intermediate flat shank portion providing said offset such that said alternately useable tips have a casting action when the handle is so held, said handle, said blade and said intermediate shank portion being coplanar, and both tips defined in part by said ground



surfaces 18a and 18b and also defined in part by ground end faces 18c and 18d at opposite ends of said chisel edge, each of said ground end faces oriented at an angle such that a 15° forward rake angle (c or d) with respect to a normal reference line drawn to said sheet surface is provided for the tips when the handle is so held to score plastic sheet material.

4,010,543

## HOLE CUTTING APPARATUS

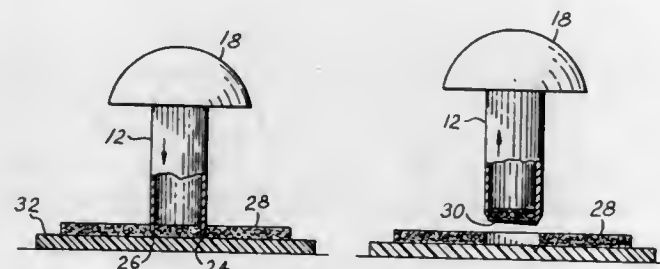
Max J. Nusbaum, 30 Arlo Road, Staten Island, N.Y. 10301

Filed Oct. 28, 1975, Ser. No. 626,311

Int. Cl.<sup>2</sup> B26B 3/00

U.S. Cl. 30—316

9 Claims



1. A hole cutting apparatus comprising, a hollow tube having a top and bottom end, said bottom end being chamfered on the outer surface completely around the circumference thereof and being cut at a shallow angle with respect to a plane transverse to the longitudinal axis of the tube to form a cutting edge, said cut of said bottom end being less than the angle of the chamfer, whereby one portion of the bottom end has a greater chamfer than the rest of the bottom end, and a knob coupled to the top end of the tube to form a handle.

4,010,544

## VIBRATION REDUCING SYSTEM FOR SINGLE CYLINDER FLUID PRESSURE ENGINE

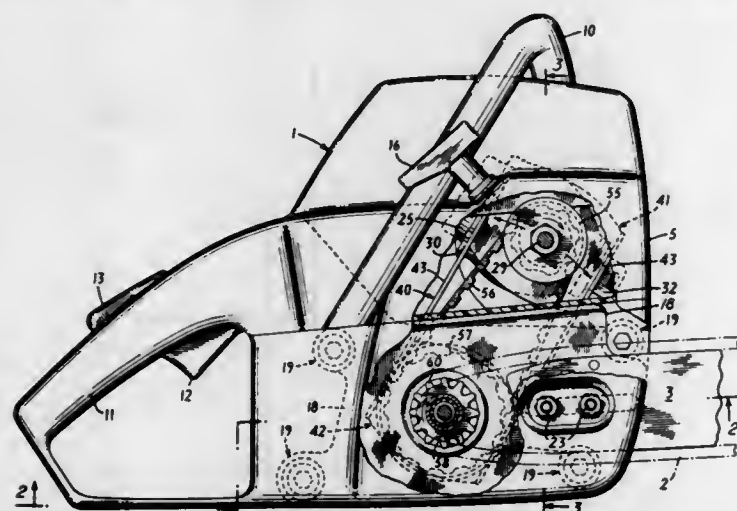
Alfred W. Siman, Rivervale, N.J., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 21, 1975, Ser. No. 560,702

Int. Cl.<sup>2</sup> B27B 17/02; F16F 1/18

U.S. Cl. 30—381

23 Claims



1. A vibration reducing system for a fluid pressure engine having a cylinder, a crankcase, a piston reciprocable in said cylinder, a rotary drive shaft in said crankcase and means connecting said drive shaft and piston for coordinated rotation of said drive shaft and reciprocation of said piston, said system comprising, in combination with said engine, means for rotationally balancing said drive shaft and any parts that revolve with it, a support for said engine, means for mounting said engine on said support for movement relative to said support only in a direction approximately axial of said cylinder, said mounting means comprising parallelogram linkage means connected at one end to said engine and at the other end to said support, and means acting between said support and said engine to bias said engine to a position in which said linkage

means is approximately normal to the axis of said cylinder, a second shaft rotatably mounted on said support laterally spaced from and parallel to said drive shaft with the axes of said shafts lying in a common plane approximately normal to the axis of said cylinder, and means rotationally connecting said second shaft with said drive shaft, said mounting means maintaining the distance between said shafts substantially constant.

4,010,545

## ADHESIVE BONDING TO TEETH OF ORTHODONTIC BRACKETS AND THE LIKE

Robert J. Kilian, East Amwell Township, Hunterdon County, and John S. Gallagher, North Brunswick, both of N.J., assignors to Johnson &amp; Johnson, New Brunswick, N.J.

Filed Jan. 9, 1976, Ser. No. 647,845

Int. Cl.<sup>2</sup> A61C 7/00

U.S. Cl. 32—14 A

8 Claims

1. The method of adhering an attachment to a tooth surface comprising etching said tooth surface in the area to which said attachment is to be secured, placing said attachment on said etched tooth surface with a small amount of highly viscous thixotropic polyacrylic ester monomer composition between said attachment and said tooth surface, pressing said attachment against said tooth with said thixotropic monomer therebetween to wet the opposing surfaces of said tooth and attachment with said monomer and fill surface voids therebetween and curing said thixotropic monomer composition while said attachment is held on said tooth surface thereby.

4,010,546

## ELLIPSE DRAWING INSTRUMENT

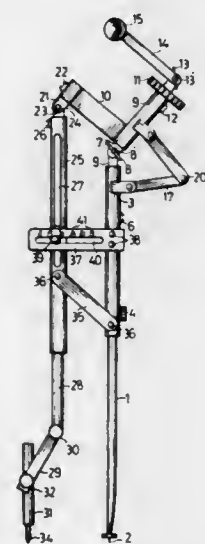
Pi Ching-Tien, No. 34, Lane 98, T'ung Hua St., Taipei, China /Taiwan

Filed Oct. 10, 1974, Ser. No. 505,439

Int. Cl.<sup>2</sup> B43L 11/04

U.S. Cl. 33—30 R

3 Claims



1. An ellipse drawing compass comprising: a first axle with a point adapted to contact a drawing surface, a first sleeve slidably mounted about said first axle, means to releasably secure said first axle to said first sleeve, a second axle rotatably mounted in said first sleeve about said first axle, a third axle with means to adjustably mount same to said second axle at an incline, a second sleeve rotatably mounted about said third axle, means connecting said first sleeve to said second sleeve to synchronize the rotation of said sleeves about said axles comprising two arms pivotally connected to said sleeves and to each other,

a drawing leg comprising an implement holder slidably mounted in a third sleeve, said third sleeve having a longitudinal slot and said holder having a pin which slides in said slot, a first connecting member with means pivotally connecting same to said first sleeve and said third sleeve, a second connecting member with first means rigidly connecting same to said first sleeve and further having a longitudinal slot normally disposed in the horizontal plane said slot further receiving said pin for sliding movement, and a third connecting member with first means to rigidly connect same to said second sleeve and second means to pivotally connect same to said third sleeve.

4,010,547

## DRAFTING MACHINE

Michael Kaitatzidis, 34 Weiherstrasse, D-7775 Bermatingen, Germany

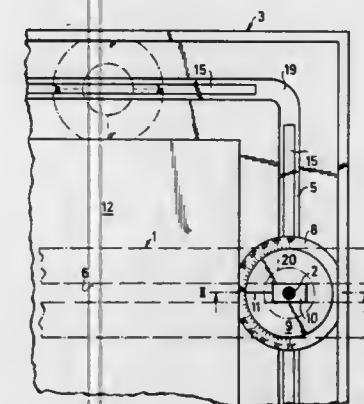
Filed Dec. 23, 1974, Ser. No. 536,021

Claims priority, application Germany, May 14, 1974, 2423306

Int. Cl.<sup>2</sup> B43L 13/04

U.S. Cl. 33—80

13 Claims



1. A drafting machine, comprising a rectangular drafting frame, a continuous and uninterrupted guide groove provided on a drawing surface of said frame and having portions parallel to each side edge thereof, said groove having smooth outer and inner side walls and making a smooth transition at corners of said frame by having smooth rounded corners thereat, a pair of spaced apart slide elements disposed in said groove, bridge means interconnecting said slide elements, at least one drawing instrument being connected to said bridge means, and said slide elements each having a rounded surface facing inwardly of said frame, whereby said instrument may be displaced longitudinally of said guide groove in a rectilinear movement along said portions thereof, and whereby said instrument pivots about a central axis of said bridge means located between said slide elements upon movement of said instrument along said rounded corners.

4,010,548

## SHOCK-ABSORBING MECHANISM FOR DIAL GAGE

Shozo Iwasaki, Ebina, Japan, assignor to Kabushiki Kaisha Akashi Selsakusho, Japan

Filed Mar. 3, 1976, Ser. No. 663,296

Claims priority, application Japan, Mar. 24, 1975, 50-35085

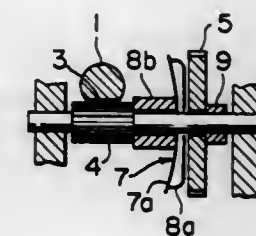
Int. Cl.<sup>2</sup> G01D 5/02

U.S. Cl. 33—172 R

1 Claim

1. A shock-absorbing mechanism for use in a dial gage having a pinion shaft rotated by a spindle that moves along a straight line and a magnifying gear coaxially and idly meshed with the pinion shaft so as to rotate a pointer shaft gear, which comprises a star-shaped pressure spring with radially extending, elastic branches having not only elasticity in the axial direction of said pinion shaft but also high rigidity

in the rotating direction thereof, and a dished spring bearing to deform said pressure spring so as to provide said axial elasticity, said star-shaped pressure spring and dished spring



bearing being disposed coaxially with said magnifying gear and a stopper ring fixed on said pinion shaft so that the magnifying gear is pressed against the stopper ring in a frictionally contacted manner.

4,010,549

## ALL SOLID STATE ANALOG GYROMAGNETIC COMPASS SYSTEM

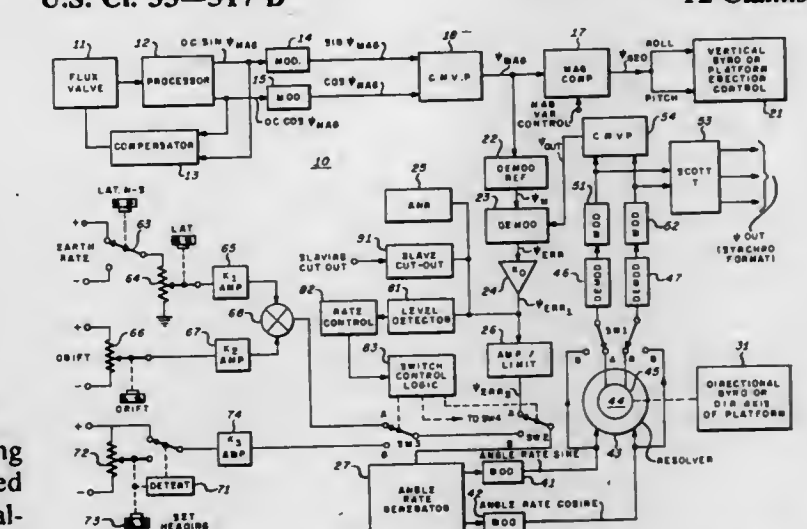
David R. Crocker, and George W. Snyder, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 29, 1975, Ser. No. 626,898

Int. Cl.<sup>2</sup> G01C 17/38

U.S. Cl. 33—317 D

12 Claims



1. In a gyromagnetic compass system for a navigable craft, angle rate generator apparatus responsive to a d.c. error signal for producing therefrom an angular rate signal proportional thereto having sine and cosine component signals and useful for electronically slaving and compensating the inertial directional reference of said compass system wherein said angle rate generator apparatus comprises:

integrator means for integrating said d.c. error signal and generating at the output thereof said sine component signal having a frequency and phase which vary as a function of the amplitude and polarity respectively of said d.c. error signal and wherein said sine component signal in response to a d.c. error signal of zero amplitude maintains a constant amplitude; first polarity control means for alternating the polarity of the d.c. error signal coupled to said integrator means; second polarity control means coupled to the output of said integrator means for varying the polarity of the slope of said sine component signal; amplitude reference source means for producing a d.c. reference signal having a fixed amplitude; third polarity control means for alternating the polarity of said reference signal; summing means for summing said reference signal and said sine component signal as varied by said second polarity control means and producing therefrom said cosine component signal; and quadrant control means responsive to said sine and cosine component signals for actuating said first, second and third polarity control means such that a sine/cosine rela-



tionship is maintained between the amplitudes of said sine and cosine component signals.

4,010,550

# CONTINUOUS PROCESSING APPARATUS AND METHOD FOR TEXTILE FABRICS

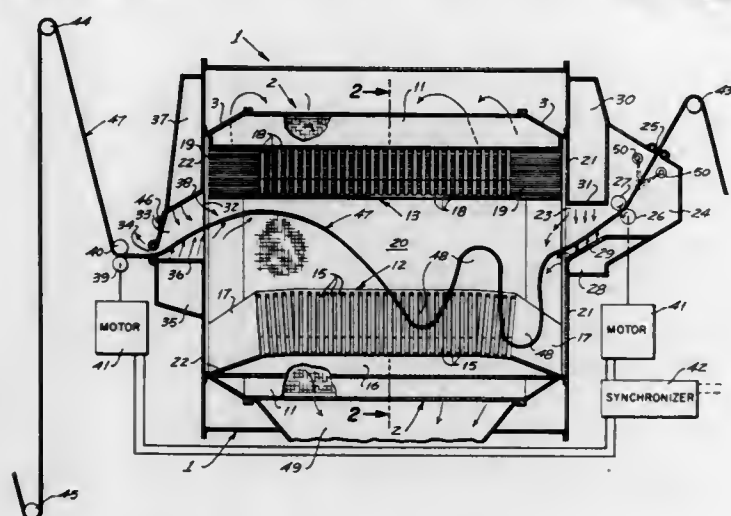
Benjamin H. Freze, Anaheim, Calif., assignor to Challenge-Cook Bros., Incorporated, Industry, Calif.

Filed July 28, 1975, Ser. No. 599,625

Int. Cl.<sup>2</sup> F26B 3/04

U.S. Cl. 34-23

16 Claims



1. An apparatus for processing a continuous web of textile fabric, comprising:

- a drum oscillatable about an essentially horizontal axis and having an entrance end and an exit end;
- the drum further including a pair of confronting grid structures extending between said ends forming a tumbler chamber having axially extending angularly related walls forming a zone having a depth less than the web of textile fabric and a width greater than the web, the grids being movable on oscillation of the drum between essentially vertically and horizontally related positions;
- a housing surrounding the drum and having entrance and exit walls covering the entrance and exit ends of the drum and forming entrance and exit openings;
- means defining an entrance chamber including the housing entrance wall and communicating through the entrance opening with the interior of the drum;
- means defining an exit chamber including the housing exit wall and communicating through the exit opening with the interior of the drum;
- an entrance drive means positioned to feed a continuous web of textile fabric through the entrance chamber into the drum;
- an exit drive means positioned to withdraw the web from the drum through the exit chamber;
- and means for synchronizing the entrance movement and exit movement of the web to maintain within the drum a length of web in excess of the length of the drum;
- said drum, upon oscillation, causing limited twisting and lateral displacement of the web in opposite directions as the web moves between the entrance and exit ends of the drum.

4,010,551

# ARRANGEMENT FOR THE TREATMENT, PARTICULARLY THE DRYING, OF PARTICULATE MATTER BY ENTRAINMENT IN A GAS

Wolfgang Rohde, Essen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany

Filed June 10, 1975, Ser. No. 585,583

Claims priority, application Germany, June 10, 1974, 2427932

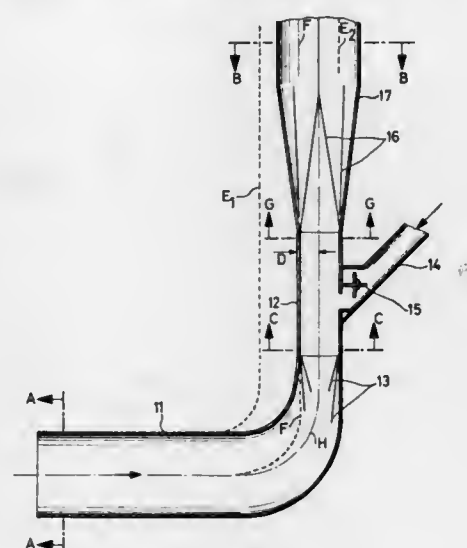
Int. Cl.<sup>2</sup> F26B 17/00

U.S. Cl. 34-57 R

7 Claims

- A pneumatic conveying dryer, comprising a drying zone

having an inlet region for the introduction of a stream of particulate matter which is entrained by a gas; means upstream of said inlet region defining a flow path for the substantially uniform entrainment of particulate matter by a gas, said means including a first section having at least one arcuate part and which is arranged for communication with a source of gas, and said first section comprising an upstream portion of substantially circular cross-section and a downstream end of substantially rectangular cross-section and having a region wherein the flow path cross-section decreases in downstream direction, said means further including a second section of substantially rectangular transverse cross-section communicating with said downstream portion, said second section having a pair of first sides and a pair of second shorter sides, said second section having in a longitudinal cross-section



across said pair of first sides two parallel straight boundary lines spaced transversely from each other, and said arcuate part of said first section having in said longitudinal cross-section two curved boundary lines, each of said straight boundary lines being tangential to a respective one of said curved boundary lines, and said means also including a third section arranged intermediate said second section and said inlet region and communicating therewith, said third section comprising an upstream end of substantially rectangular cross-section and a downstream part of substantially circular cross-section and having a region wherein the flow path cross-section increases in downstream direction; and an admitting arrangement communicating with one of said first sides of said second section for introducing into said second section particulate matter to be entrained by a gas flowing from said first section towards said inlet region.

4,010,552

# GRAIN DRIER

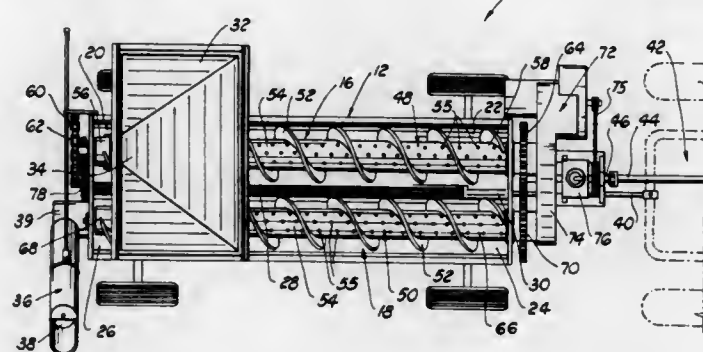
Emery J. Peterson, Clifton, Kans. 66937

Filed Mar. 17, 1976, Ser. No. 667,489

Int. Cl.<sup>2</sup> F26B 11/12

U.S. Cl. 34-179

12 Claims



- A grain drier for drying grain, the drier comprising: an elongated drier housing; a first elongated horizontal cylindrical chamber formed in said housing, said first chamber having a first end portion and a second end portion;

a second elongated horizontal cylindrical chamber formed in said housing, said second chamber having a first end portion and a second end portion, said second chamber adjacently disposed below and parallel to said first chamber, the first end portion of said second chamber communicating through an opening with the second end portion of said first chamber;

a first auger having a hollow shaft with perforations therein, said first auger horizontally mounted in said first chamber;

a second auger having a hollow shaft with perforations therein, said second auger horizontally mounted in said second chamber;

drive means attached to said first and second auger for rotating said augers in said chambers; and

blower means communicating with the hollow shafts of said augers for blowing hot air into said hollow shafts and out the perforations therein for drying said grain,

the grain to be dried is received at the first end portion of said first chamber and conveyed by said first auger to the second end portion of said first chamber, said first auger feeding the grain from the second end portion of said first chamber into the first end portion of said second chamber, said second auger conveying the grain from the first end portion of said second chamber to the second end portion of said second chamber and discharging the grain from said housing.

4,010,553

# PORTABLE QUIZ RESPONSIVE AND DISPLAY DEVICE

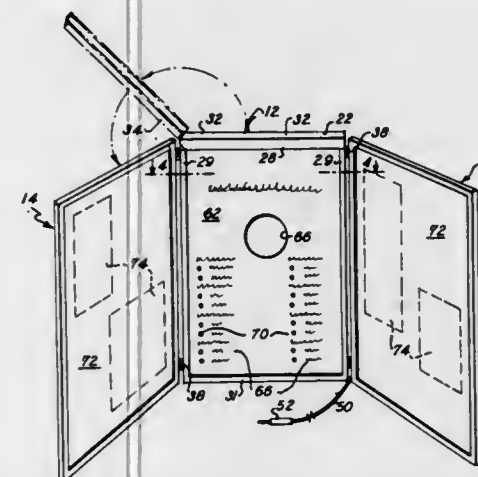
Robert A. Bennett, 312 Ronbru Drive, New Rochelle, N.Y. 10804

Filed Sept. 19, 1975, Ser. No. 614,922

Int. Cl.<sup>2</sup> G09B 7/06

U.S. Cl. 35-9 C

2 Claims



- An electrically operated self-examination device comprising:
  - an electrical circuit including a metal electrical conducting panel, a battery mounted on one side of said panel and electrically connected thereto, an electrical responsive lamp connected to one pole of said battery, and a probing lead connected to the other pole of said battery whereby contact of said probing lead with said panel closes the circuit and activates said lamp.
  - a non-conducting plastic sheet laminated to the other side of said panel and having a plurality of apertures through which said circuit may be closed by contacting said probing lead to said panel.
  - a question card adapted to be in flat registry against said non-conducting sheet, said card having printed questions on the surface opposed to said sheet, each question having multiple choice answers and an opening associated with each answer, said answer card openings having been positioned so that correct answer openings register with plastic sheet apertures whereby said lamp will be lit when said probe is placed through a correct answer aperture, and
  - a case sized to hold in snug registry said conducting panel and said card lying against said non-conducting sheet with

said card facing a front opening side of said case, said conducting panel being spaced from the rear wall of said case a sufficient distance to clear said battery and indicator and further provide space for storage of a plurality of said answer cards, said case being provided with a pivotal wing panel on each side of said front opening that overlap on closing to form a front wall to said case and provide two display panels when open, said card and said conducting panel having an opening in alignment with said lamp for observation thereof from the front of said case, and said rear wall having a pivotal support member to hold said case in standing position.

4,010,554

# ANATOMICAL DISPLAY DEVICE AND PROCESS FOR PREPARING AND DISPLAYING ANATOMICAL ORGAN SPECIMENS

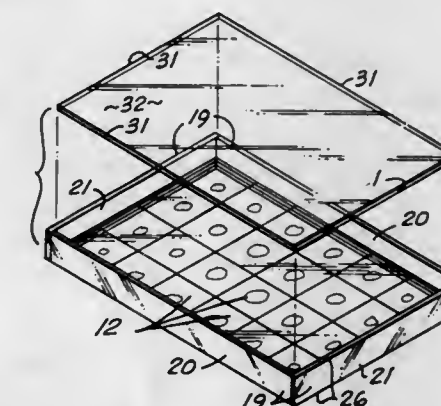
Robert W. Compton, 635 E. State Ave., Meridian, Idaho 83642

Filed Feb. 13, 1976, Ser. No. 657,843

Int. Cl.<sup>2</sup> G09B 23/30

U.S. Cl. 35-20

15 Claims



- A process for preparing and mounting macroscopic sliced anatomical organ specimens comprising the steps of:
  - suspending an anatomical organ within transparent solidifying medium such as agar solution;
  - slicing the suspended organ and surrounding medium into sections of equal thicknesses;
  - pouring a liquid preservative into an upwardly open transparent container;
  - arranging the sliced sections in a prescribed array in the liquid preservative;
  - pressing a transparent cover plate over the sections in the container to remove all air from between the cover plate and container; and
  - affixing the transparent cover plate to the container to hermetically seal the sections and liquid preservative within the container under the transparent plate.

4,010,555

# APPARATUS FOR DEMONSTRATING ELECTRICAL CIRCUITS AND COMPONENTS

Bo Gunnar Paulsson, Nynasgatan 7, 252 52 Helsingborg, Sweden

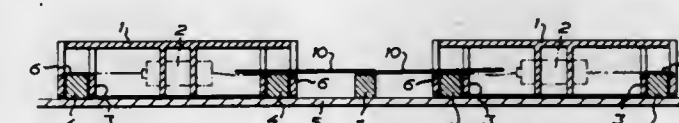
Filed May 23, 1973, Ser. No. 363,000

Claims priority, application Sweden, May 31, 1972, 7127/72; Sept. 13, 1972, 73069/72

Int. Cl.<sup>2</sup> G09B 23/18

U.S. Cl. 35-19 A

11 Claims



- In an apparatus for demonstrating electrical circuit



means and electrical circuit component means, base means including magnetic material, support means for accommodating said circuit means and for mounting on said base means, contact means for electrical connection with said circuit means in each of said support means, each of said contact means being mounted on said support means above said magnetic material and extending in a plane parallel to and spaced a distance from the plane common to said support means and said base means, conductor means for extension between said contact means of said support means and for electrical coupling of them with each other and said conductor means including magnetic material and extending in the same plane as said contact means, said support means being provided with magnetic means for retaining said support means and said conductor means to said base means and holding said conductor means and said contact means together.

4,010,556

## ELECTRONIC MATHEMATICS TRAINER

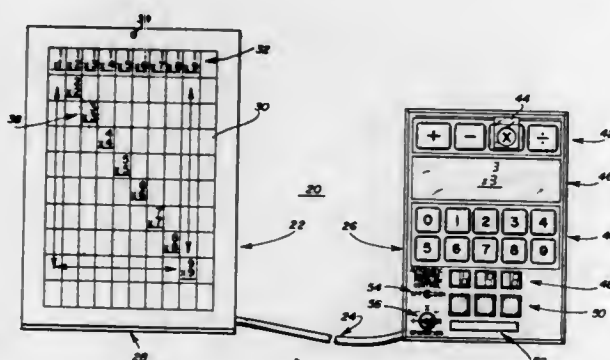
Carolyn Ellsworth, and L. W. Herring, both of Dallas, Tex., assignors to Carolyn Ellsworth, Dallas, Tex.

Filed June 4, 1975, Ser. No. 583,850

Int. Cl.<sup>2</sup> G09B 23/02

U.S. Cl. 35—30

64 Claims



1. An electronic mathematics trainer comprising:
  - means for selectively entering an arithmetic problem to be solved,
  - means for computing the correct answer to the arithmetic problem,
  - means for generating at least one incorrect answer to the arithmetic problem,
  - means for displaying the correct and incorrect answers,
  - means for randomly positioning the correct and incorrect answers on said display means,
  - means operable for selecting one of the displayed answers, and
  - means for clearing the entered arithmetic problem upon the selection of the correct displayed answer.
40. A method of teaching arithmetic skills, comprising the steps of:
  - displaying a plurality of arithmetic problems to be solved,
  - entering the decimal numbers and the arithmetic operation mode of one of the arithmetic problems into an electronic mathematics trainer,
  - displaying the entered arithmetic problem without an answer to the student,
  - computing a correct answer and at least one incorrect answer,
  - randomly displaying the correct answer and at least one incorrect answer,
  - selecting one of said answers, and
  - displaying the correct answer together with the entered problem upon the selection of a correct answer.

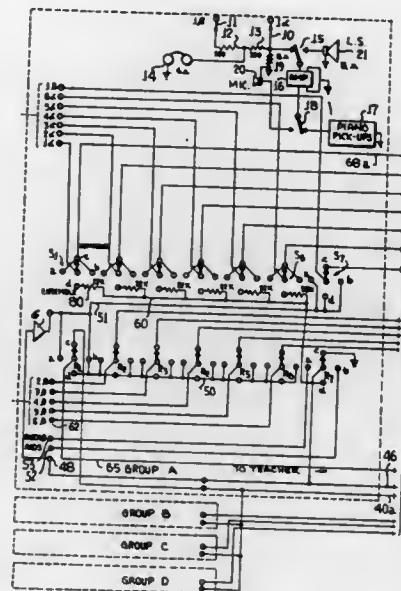
4,010,557  
MUSIC LABORATORY

Daniel W. Martin, and Robert G. Morgan, both of Cincinnati, Ohio, assignors to D. H. Baldwin Company, Cincinnati, Ohio Division of Ser. No. 719,126, April 5, 1968, Pat. No. 3,595,120. This application Apr. 27, 1971, Ser. No. 138,004

Int. Cl.<sup>2</sup> G09B 19/04

U.S. Cl. 35—35 C

8 Claims



1. A system of intercommunication among (1) groups of members of a class or individual members of said class or the entire class with (2) a teacher station, comprising a group amplifier, a teacher station incoming line, an  $n$  position rotary contact switch means having  $m$  pairs of decks wherein  $n$  is a number of stationary switch contacts and  $m$  is one more than the number of members of one group, the groups all having equal numbers of members, wherein each individual member of said class is provided with an outgoing line and an incoming line, and wherein one of the rotary contacts of said pairs of said decks is connected directly to the input of said group amplifier the another to said teacher station incoming line, and the remainder of said rotary contact pairs are connected individually with said outgoing and incoming lines of the members.

4,010,558

## GOLF RUBBER OVERSHOE

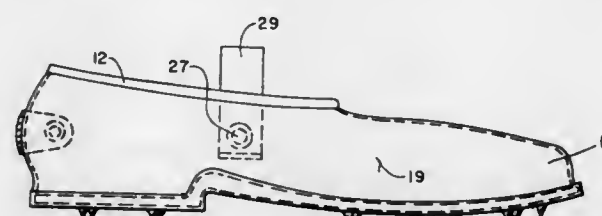
John G. Slusher, Jackson Heights, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 10, 1975, Ser. No. 630,421

Int. Cl.<sup>2</sup> A43B 1/10, 5/00, 21/00

U.S. Cl. 36—7.3

1 Claim



1. An overshoe of flexible rubber or plastic material for fitting about a spiked golf shoe, said overshoe shaped to fit over a golf shoe, with the sole and heel portion of the overshoe shaped with an open section to provide clearance for the spikes on the sole and heel of the golf shoe, said open section bounded by a border strip that is continuous save for a slot in the rear of the heel section, which slot marks the separation of two rear sections forming the rear side of the overshoe.

said two rear sections joined in overlapping fashion along the rear vertical sides of the overshoe by a first detachable strap, together with a second strap mounted to extend over the top of the overshoe which is detachably fastened to each opposed side of the overshoe at the instep section of the overshoe.

4,010,559  
ATHLETIC SHOE

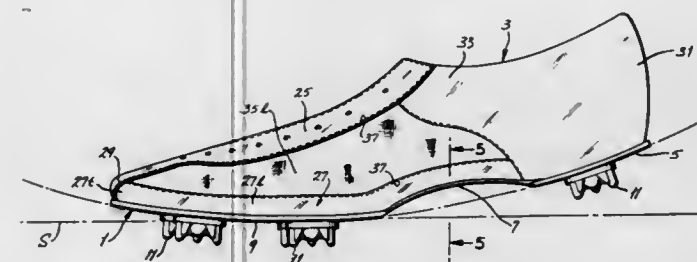
Hal D. Mitchell, Shrewsbury, Mo., assignor to A-T-O Inc., Willoughby, Ohio

Filed May 17, 1976, Ser. No. 687,192

Int. Cl.<sup>2</sup> A43B 5/02

U.S. Cl. 36—128

9 Claims



1. An athletic shoe comprising a sole and an upper, the sole having a heel section for the bottom of the heel of the foot, an arch section forward of the heel section for the bottom of the arch of the foot, and a front section forward of the arch section for the portion of the bottom of the foot forward of the arch and for the toes, the arch section and the heel section being so formed and positioned that, with the front section disposed on a generally flat horizontal surface, and the sole unstressed, the arch section extends upwardly and rearwardly from the rear end of the front section with its rear end raised above said surface, and the heel section extends upwardly and rearwardly from the rear end of the arch section, the heel section being raised above said surface and being inclined upwardly and rearwardly in the direction away from the rear end of the arch section relative to said surface and to the front section, the heel and front sections having cleats on the bottom thereof, the heel section and the front section being relatively stiff, the arch section being relatively flexible and resilient with respect to the heel and front sections, the arch section being adapted relatively readily to twist about an axis extending generally longitudinally of the shoe and to bend upon itself on an axis extending generally transversely of the shoe whereby, on a lateral blow upon the knee when the cleats on the heel and front sections are in the turf of a playing field, the heel section may readily flex upwardly via flexing of the arch section for withdrawal of the cleats on the heel from the turf to tend to avoid injury to the knee.

4,010,560

## DEEP SEA MINING APPARATUS AND METHOD

Richard E. Diggs, 12 A Road, Carthage, Mo. 64836

Filed May 14, 1975, Ser. No. 577,343

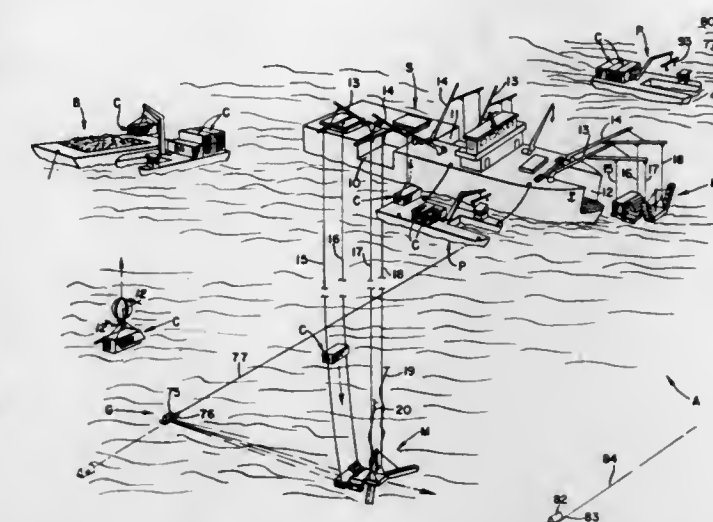
Int. Cl.<sup>2</sup> E02F 7/00

U.S. Cl. 37—54

16 Claims

1. A deep sea mining apparatus for mining mineral nodules on the ocean floor, comprising at least one support ship floating in a body of water, at least one self-propelled nodule mining machine supported from the support ship and resting on the floor of the body of water for movement along the floor, control means connected with the support ship and with the machine for controlling operation of the machine, nodule gathering means carried by the machine for gathering nodules from the ocean floor, nodule collecting crate means carried by the machine for collecting and holding the nodules gathered by the nodule gathering means, said crate means separable from said machine, and lift means connected to the crate

means and comprising an inflatable bag carried by the crate means, and means carried by the crate means for inflating the



inflatable bag for lifting the crate means to the surface of the body of water when the crate means is filled with said nodules whereby said nodules may be recovered.

4,010,561

## EARTH SCRAPER WITH ROUTER BIT

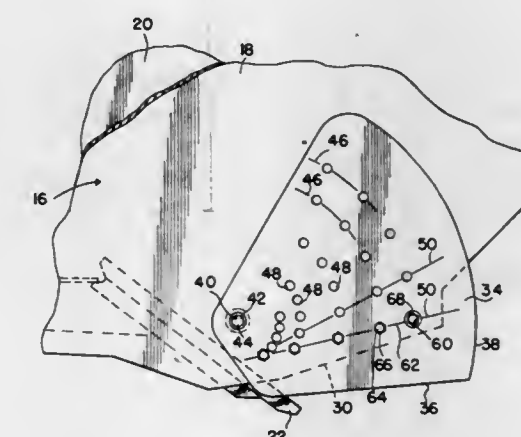
Gene R. Klett, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 21, 1975, Ser. No. 569,915

Int. Cl.<sup>2</sup> E02F 9/00; A01B 23/02

U.S. Cl. 37—141 T

4 Claims



1. In an earthmoving scraper having a bowl with a pair of spaced apart walls, a cutter blade extending between said walls and projecting forwardly for cutting a layer of soil, a router bit carried by one of said walls and having a cutting edge for fracturing the soil adjacent said cutter blade, means for pivotally mounting one end portion of said router bit on said wall, means for securing said router bit to said wall, means for repositioning said router bit to advance said cutting edge to accommodate for wear, said means for repositioning said router bit comprising a plurality of apertures through said bit with at least two of said apertures lying in a straight line offset from said means for pivotally mounting said bit and the wall of said bowl having at least two openings lying in a straight line which line is offset from the pivotal mounting of the bit an amount equal to the offset of the line of apertures, said aligned apertures aligning with said aligned openings and said means for securing said bit to said wall comprising fastening means passing through said apertures and said openings.



4,010,562

## EMBROIDERY HOOP HOLDER

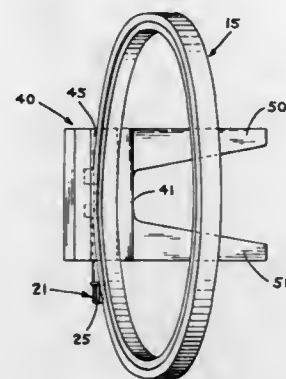
Henry K. Maier, 31 Morris Road, West Orange, N.J. 07052

Filed Aug. 5, 1976, Ser. No. 711,776

Int. Cl.<sup>2</sup> D05C 1/04

U.S. Cl. 38—102.2

8 Claims



1. An embroidery hoop holder for use with an embroidery hoop having an inner hoop and an expandable outer hoop, and means for adjusting said outer hoop in order to position between said inner and outer hoops a cloth to be embroidered, comprising: a main portion having a groove formed therein for receiving a portion of said outer and inner hoops and said means for adjusting said outer hoop of said embroidery hoop; and means extending perpendicularly from said main portion for supporting said main portion so that when said embroidery hoop is mounted in said groove, the embroidery hoop will not cause the main portion to tip.

4,010,563

## ANIMAL IDENTIFICATION TAG

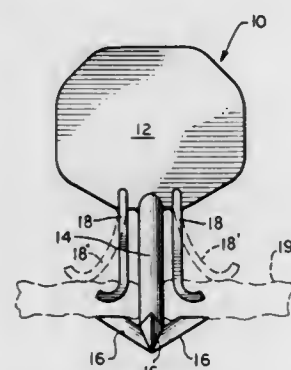
Jackson T. Schwandt, Cody, Wyo., assignor to Y-Tex Corporation, Cody, Wyo.

Continuation-in-part of Ser. No. 459,292, April 9, 1974, abandoned. This application Feb. 6, 1975, Ser. No. 547,478

Int. Cl.<sup>2</sup> B09F 3/00

U.S. Cl. 40—301

37 Claims



1. An improved animal identification tag comprising: a flat information-carrying portion having a surface on which indicia may be placed; a pin extending outwardly from the edge of said information-carrying portion in a direction generally parallel to said surface; laterally extending flexible prongs on the end of said pin; and a pair of flexible, resilient support members extending outwardly from said information-carrying portion adjacent to said pin, said support members being positioned to contact the surface of the ear of an animal when said prongs are passed through said ear.

4,010,564

## SHOTGUN WITH ADJUSTABLE VENTILATED SIGHT RIB

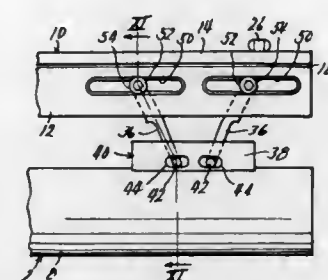
Charles E. Pettit, Olathe, Kans., assignor to Simmons Gun Specialties, Inc., Olathe, Kans.

Filed Mar. 8, 1976, Ser. No. 664,562

Int. Cl.<sup>2</sup> F41G 1/00

U.S. Cl. 42—1 S

7 Claims



1. In a shotgun:  
a. an elongated barrel,  
b. an elongated sight rib assembly extending generally coextensively with and approximately parallel to said barrel, in spaced apart relation thereabove,  
c. means connecting the rearward end of said assembly to said barrel for pivotal movement on a horizontal transverse axis, whereby said assembly may be tilted in a vertical plane relative to said barrel,  
d. connecting means joining the forward end of said assembly to said barrel adjacent the muzzle end of the latter, and adjustable to vary the vertical angle of said assembly relative to said barrel, and  
e. securing means operable to secure said connecting means against adjustment, whereby to secure said assembly at any desired degree of vertical angularity relative to the barrel, said connecting means including a connecting member joining said assembly and said barrel, and being slidably movable relative to said barrel in a direction longitudinal to said barrel, even when said connecting means is secured against adjustment by said securing means.

4,010,565

## GUN CLEANING AND SAFETY DEVICE

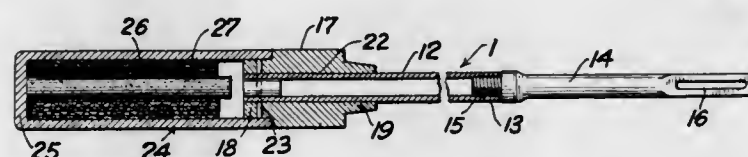
Peter DiProspero, 814 W. 25th St., Erie, Pa. 16502

Filed June 17, 1976, Ser. No. 697,137

Int. Cl.<sup>2</sup> F41C 31/00

U.S. Cl. 42—1 R

4 Claims



1. A cleaning kit and rod comprising a tube made of a thermoplastic material having a first end and a second end, a tip on said first end having a reduced size end received in the first end of said tube and a flattened end on the second end of said tip with a slot for receiving a cleaning patch, said reduced size end being received in said first end of said tube,  
a cylinder member having a reduced size cylindrical end and a tapered end,  
said tapered end being of a suitable size to fit into the muzzle of a gun of a size for which said kit is adapted,  
a hole through said cylinder member, said second end of said tube extending through said hole and means holding said second end of said tube in said hole,  
a hollow, cylindrical cup closed at one end and adapted to fit over said cylindrical end of said cylindrical member for containing cleaning material.

4,010,566

## THUMB TRIGGER AND AUTOMATIC SAFETY

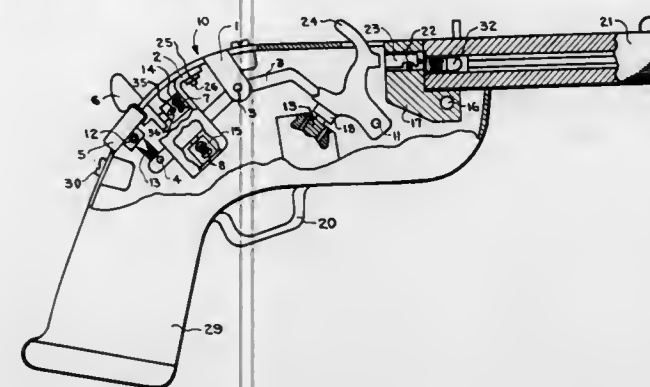
Walter William Edwards, Rte. 1 Box 265, Bruno, Minn. 55712

Filed Mar. 19, 1975, Ser. No. 559,672

Int. Cl.<sup>2</sup> F41C 19/00

U.S. Cl. 42—69 R

8 Claims



1. A thumb trigger and automatic safety comprising: a casing having two tabs for locating a pivot point thereon, a swinging arm pivoted about a pivot pin and secured thereby between said tabs, said arm having a clearance hole at said pivot point for receiving said pivot pin therein, said arm having a slot therein for receiving a perpendicular shaft, said arm having a hole therein for receiving a press fitted pin, said arm having a boss extending downwardly therefrom into a vertically oriented cylindrical tube containing a compression spring, said arm extending through a slot in a partially enclosed bracket mounted on said casing, said arm having an angled bend at one end thereof for engaging a firing striker, and means for mounting said casing in a firearm for actuation by a thumb trigger.

4,010,567

## ILLUMINATED FISHING FLOAT

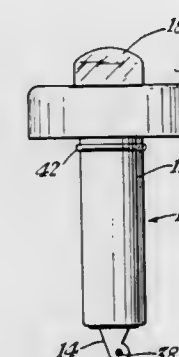
Russell James MacMillan, 4604 SW. 32nd Drive, Hollywood, Fla. 33021

Filed Dec. 22, 1975, Ser. No. 643,526

Int. Cl.<sup>2</sup> A01K 93/00

U.S. Cl. 43—17.5

2 Claims



1. An improved illuminated fishing float comprising:  
an elongated cylindrical receptacle having an open end including a plurality of threaded portions about said open end;  
a translucent cap threadably engageable over the open end of said receptacle, said cap providing a watertight seal for said receptacle;  
a battery mounted within said receptacle;  
an electrical conductor;  
a lightbulb mounted beneath said cap attached to said conductor and moveable to engage the contact of said battery, said conductor providing a complete circuit between said battery terminals and said lightbulb; and  
a reversible donut-shaped floatation collar having an upper surface and a lower surface frictionally engaged about a portion of the exterior surface of said receptacle, said

4,010,568

## FISHING LURE WITH ATTACHABLE FLOAT MEANS

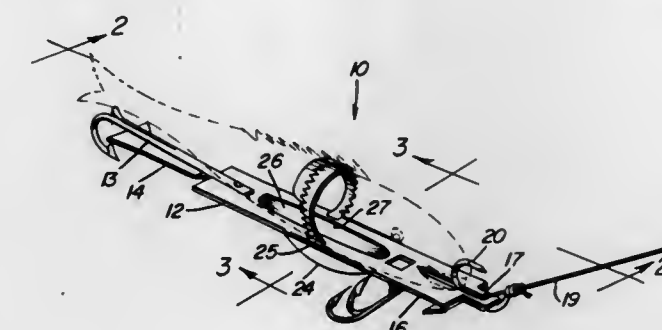
Wilbur W. Mays, 2020 N. 8th St., Philadelphia, Pa. 19122

Filed Nov. 17, 1975, Ser. No. 632,798

Int. Cl.<sup>2</sup> A01K 85/00

U.S. Cl. 43—42.22

9 Claims



1. A live bait fishing lure having an elongated base formed of a length of plate with a fishhook at one end and having line attachment means at the opposite end, a spike projecting from said base closely adjacent to the line attachment point, said spike being adapted for impaling and securing a live bait thereon, said length of plate having fishhook guard means formed therewith, and fastening means in addition to the impaling means for fastening the body of the live bait to the main body of the lure, the fastening means for the body of the live bait includes a flexible fastening strap having leg portions which pass around the live bait and fasten same to the body portion of the lure, and the leg portions are offset from each other.

4,010,569

## CONNECTOR FOR FLEXIBLE LINES

T. J. Finley, and Gwendolyn Finley, both of 506 Countryside Road, Junction City, Kans. 66441

Filed Oct. 15, 1975, Ser. No. 622,768

Int. Cl.<sup>2</sup> A01K 91/04

U.S. Cl. 43—44.83

9 Claims



1. A connector for lines and the like comprising:  
a. an ellipsoidal body, having an elliptical longitudinal cross-section and being substantially uniform about the longitudinal axis with a circular transverse cross-section wherein:  
1. said body is solid, one-piece, and constructed from a resilient material which is substantially impervious to corrosion; and



2. said body has first and second ends;
- b. said body having first and second apertures extending transversely therethrough;
  1. said apertures are cylindrical in shape;
  2. the axes of said apertures define a plane which passes through the longitudinal axis of said body;
  3. the diameters of said apertures are slightly greater in size than the diameters of fishing lines engaged therein, such that said line can freely rotate in said apertures; and
  4. said first and second apertures being spaced an equal distance from said first and second ends respectively, and near thereto; and
- c. said body having a normally closed slot, intersecting said first aperture and extending therefrom obliquely, outwardly and away from said first end in a plane which passes through the first aperture, said slot terminating in a first opening and forming a passage for movement of a line to said first aperture.

4,010,570

## PUPPET ASSEMBLING

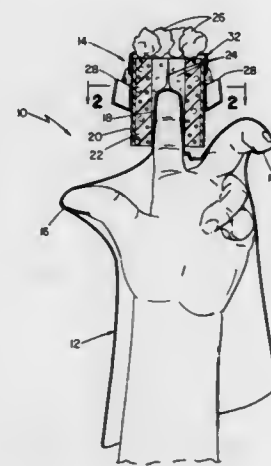
Marc W. Kohler, Providence, R.I., assignor to The Puppet Workshop, Inc., Providence, R.I.

Filed May 14, 1975, Ser. No. 577,410

Int. Cl.<sup>2</sup> A63H 3/14

U.S. Cl. 46—154

4 Claims



1. A puppet comprising:
  - a. an exterior supporting tube and a unitary resilient foam core supported in said tube,
  - at least one end of said tube being opened to expose said foam core,
  - said foam core containing therein a longitudinally extending passage extending axially of said tube for receiving and gripping a finger extending through said one end, said foam core completely filling the crosssection of said tube between said passage and said tube to give stability thereto,
  - said passage being transversely so small in area as to grip reliably even small fingers and said core being so yieldable as to accept reliably even large fingers.

4,010,571

## AUTOMATIC LOADING DOCK

Winston B. McGuire, and Charles W. Mellyn, both of Hudson, N.Y., assignors to W. B. McGuire Co., Inc., Hudson, N.Y.

Filed Sept. 8, 1975, Ser. No. 611,240

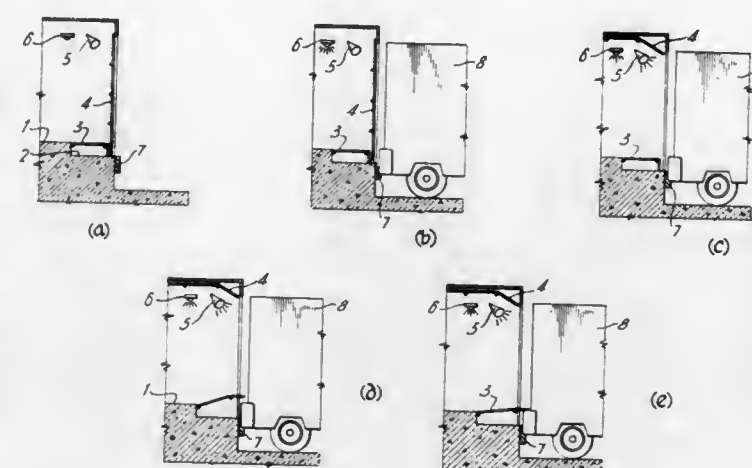
Int. Cl.<sup>2</sup> E06B 7/00

U.S. Cl. 49—70

11 Claims

1. A loading dock assembly adapted to be included in a building comprising:
  - a. a door for closing a loading opening in the building, above said dock,
  - b. automatic dock leveller means for providing a ramp bridging the bed of a truck and the dock, and

- c. automatic control means for opening or closing the door and raising or lowering said dock leveller means,



- d. said control means being arranged to open the door only when the truck bed is in a loading position and to raise the dock leveller upon the door being opened.

4,010,572

## DOOR CLOSER HAVING MEANS TO NEUTRALIZE THE DOOR CLOSING FORCE EXERTED THEREBY

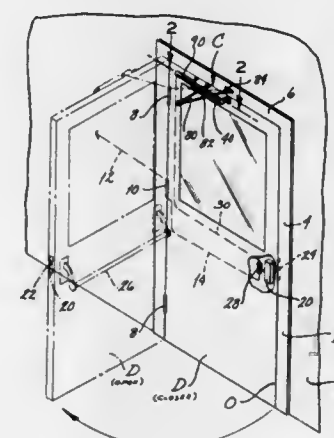
Francis C. Peterson, St. Louis County, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.

Filed June 2, 1975, Ser. No. 582,663

Int. Cl.<sup>2</sup> E05F 15/04, 3/22

U.S. Cl. 49—386

16 Claims



1. In combination with a door which moves between open and closed positions with respect to a door opening in a wall, the improvement comprising: force means for providing a restoring force when the door is opened; transfer means between the force means and the door for causing the restoring force to urge the door to its closed position; neutralizing means for at least in part neutralizing the force exerted by the force means when the door is opened by an individual desiring to pass through the door opening, the neutralizing means being an air cylinder including a barrel and a piston rod which moves relative to the barrel when the barrel is pressurized and which exerts a neutralizing force on the transfer means in opposition to the force exerted by the force means; and a valve carried by the door and connected between the air cylinder and a source of pressurized air for admitting the air to the air cylinder when activated.

4,010,573

## SEALING OR TRIMMING STRIP STRUCTURE

Heinz Andrzejewski, Viersen, Germany, assignor to Draftex Development AG, Zug, Switzerland

Continuation of Ser. No. 330,410, Feb. 7, 1973, abandoned.

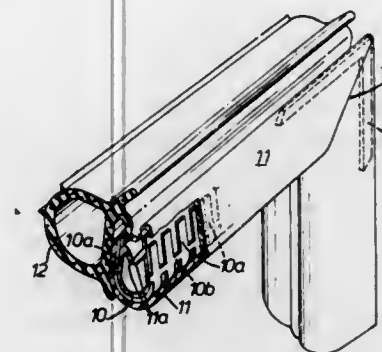
This application Mar. 13, 1975, Ser. No. 558,174

Claims priority, application United Kingdom, Feb. 18, 1972, 7521/72

Int. Cl.<sup>2</sup> E06B 7/232, 7/215

U.S. Cl. 49—479

7 Claims



1. A trimming or sealing strip structure comprising at least two mutually inclined channel-shaped portions each defined by first and second parallel and opposed side wall with a base between them, the two portions being mutually positioned and having respective ends mutually shaped to form a mitered joint between the two said portions with one end of each of the first and second side walls and the base of one channel-shaped portion being in contact with, respectively, one end of the first and second side walls and the base of the other channel-shaped portion, the channel openings of the two portions facing outwardly of the mitered joint,

each said channel-shaped portion comprising carrier means of relatively rigid material defining a U-channel and channel-shaped flexible covering material covering the carrier means, the flexible covering material being free of the relatively rigid material of the carrier means in the marginal regions running along the outer edges of the side walls of the channel-shaped portions, and two longitudinal reinforcing members of substantially rigid material each embedded in a corresponding outboard peripheral part of the said marginal region of a respective one of two said first side walls, the reinforcing members each lying parallel to the outboard surfaces of the channel in which they are respectively embedded and extending along the said regions to the contacting ends of the said first side walls and there meeting each other proximate the outboard portion of the corner which said mitered joint forms whereby the flexible covering material at said outboard portion is stiffened.

4,010,574

## APPARATUS FOR CONTOURING MAGNETIC HEAD SURFACES AND METHOD THEREFOR

Louis B. Feierabend, and Otto R. Luhrs, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1975, Ser. No. 555,650

Int. Cl.<sup>2</sup> B24B 11/00

U.S. Cl. 51—121

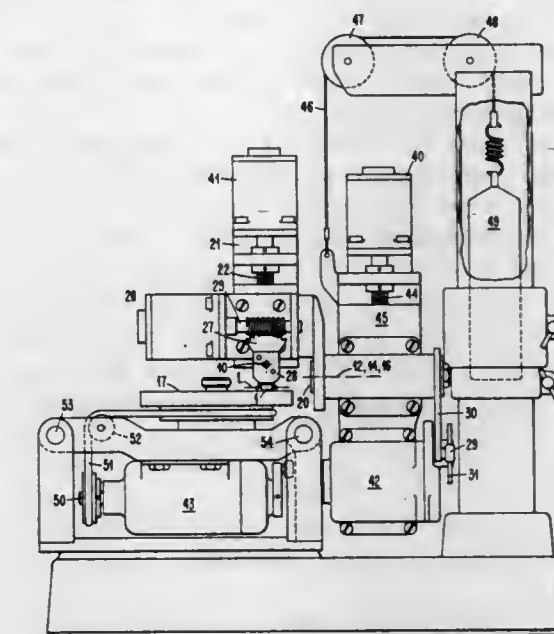
19 Claims

1. Apparatus for forming a contour defined by a first radius and a plurality of second radii originating on different axes, on a transducer surface held in contact at one point with a surface removal device, including:

first drive means for moving the contact point on said transducer surface in a first direction and its reverse along an arc defined by said first radius;

second drive means for reciprocating the contact point on said transducer surface in a second direction, and its reverse, intersecting said first direction along one of said

plurality of second arcs defined by one of said second radii; and



control means, connected to said first and second drive means, for causing the contact point to advance in said first direction while simultaneously reciprocating in the second direction.

4,010,575

## DEVICE FOR GRINDING A CABACHON

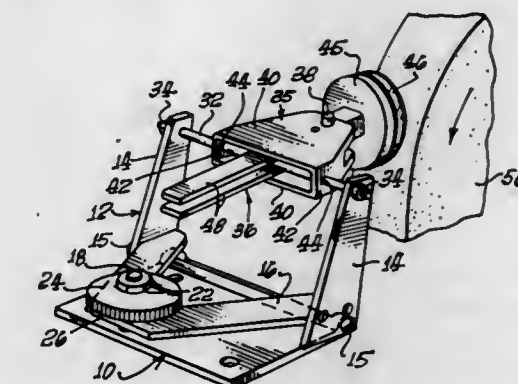
Henry L. Henry, 7839 Aster Ave., Yucca Valley, Calif. 92284

Filed May 19, 1975, Ser. No. 578,924

Int. Cl.<sup>2</sup> B24B 11/00

U.S. Cl. 51—229

3 Claims



1. In a device to facilitate the grinding of the face of a cabochon of generally elliptical plan configuration to a curved convex configuration by a grinding wheel, the combination of:
    - a. a dop stick to hold an unfinished cabochon on one of its ends;
    - a holder for the dop stick;
    - a base structure;
    - first pivot means on the base structure pivotally supporting the holder for manual oscillation thereof about a first axis of rotation in the plane of the transverse center line of the plan configuration of the cabochon; and
    - second pivot means on the holder pivotally supporting the dop stick for manual oscillation relative to the holder about a second axis of rotation in the plane of the longitudinal center line of the plan configuration of the cabochon;
- the distance of the first pivot means from the desired convex face of the cabochon being substantially equal to the desired radius of longitudinal curvature of the convex face of the cabochon,
- the second pivot means being located between the cabochon and the first pivot means,
- the distance of the second pivot means from the desired convex face of the cabochon being substantially equal to the desired radius of transverse curvature of the convex face of the cabochon;



whereby, when said device is positioned for use and the face of an unfinished cabochon on said dop stick is brought into proper grinding contact with said grinding wheel, the holder and dop stick are simultaneously movable about the above-mentioned first and second axes of rotation so that said face can be smoothly ground to said curved convex configuration;

said base structure including a normally fixed base and a support carrying the first pivot means;

the support being pivotally mounted on the base and having a normal forward limit position;

said base structure also including means yieldingly urging the support toward its limit position and permitting retraction of the support from its limit position to avoid damage to the device in the event the rotary grinding wheel exerts a sudden thrust against the cabochon.

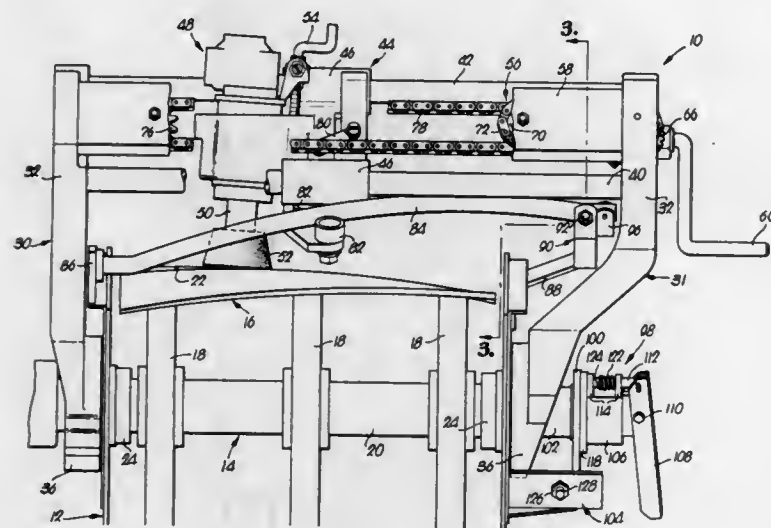
4,010,576

**APPARATUS FOR REBEVELING SPIRAL KNIVES**  
Roland N. Nissen, 112 N. Meridan, Valley Center, Kans. 67147

Filed June 23, 1975, Ser. No. 589,369  
Int. Cl.<sup>2</sup> B24B 3/42

U.S. Cl. 51-249

10 Claims



1. In combination with a cutting reel having a plurality of elongated knives extending helically about the periphery of the reel and presenting longitudinal cutting edges disposed transversely of the direction of rotation of the reel, apparatus for sharpening said edges including:

swingable support structure mounted for swinging movement about the axis of rotation of the reel;

a sharpener mounted on said structure for reciprocation relative to said structure transversely of the direction of swinging movement of the structure and adjacent the periphery of the reel; and

follower means coupled with said sharpener for reciprocation therewith,

said structure rocking about said axis during reciprocation of the sharpener in response to guiding of said follower means along a helical course of travel conforming to the orientation of said knives, thereby permitting the sharpener to remain properly engaged with the edge of an adjacent knife as the sharpener is reciprocated.

4,010,577

**ROOF DRAIN SYSTEM**

Gordon R. Stalter, 511 NE. 2nd St., Hopedale, Ill. 61747

Filed May 3, 1976, Ser. No. 682,332

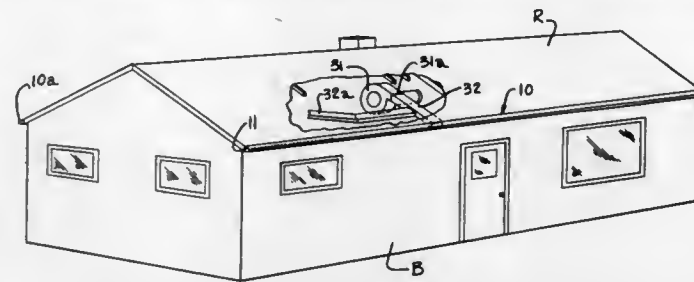
Int. Cl.<sup>2</sup> E04H 9/00

U.S. Cl. 52-1

8 Claims

1. A roof drain system comprising elongated housing means defining air duct having an upper wall portion and adapted for attachment to a building to extend lengthwise of at least a substantial portion of the lower edge of the roof whereby rain water from the roof flows over the upper wall portion of the

housing means, blower means having an outlet communicating with said air duct for supplying air under super atmospheric pressure thereto, said housing means having aperture means along the length thereof for passing air from the air



duct in streams having a substantial component laterally outwardly from the building to substantially disrupt the water as it flows over the housing means and distribute the water in the form of droplets over a wide band outwardly of the roof line of the building, and means for actuating said blower means.

4,010,578

**ROOF FLASHING STRUCTURE**

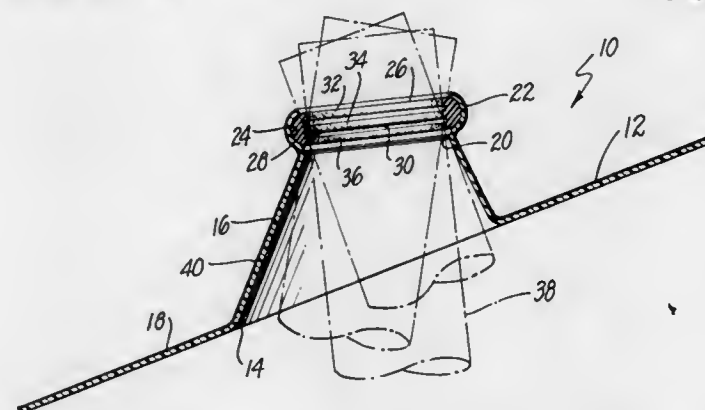
Duane D. Logsdon, 1708 Calavera Place, Fullerton, Calif. 92631

Filed Nov. 11, 1974, Ser. No. 522,788

Int. Cl.<sup>2</sup> E04D 1/36

U.S. Cl. 52-58

2 Claims



1. A roof flashing structure for use on a roof so as to form a seal around a pipe extending through the roof which comprises:

a generally flat, imperforate plate adapted to overlie and fit against a roof, said plate having a centrally located opening of longer dimension than said pipe formed therein, an upstanding, imperforate, tapered housing located on one side of said plate so as to extend outwardly from said side of said plate, said housing extending around said opening, said housing having an open end of larger dimension than said pipe located remote from said plate, said housing being of its largest dimension adjacent to said plate,

an annular retainer means for holding a sealing member located on said open end of said housing, said retainer means being capable of fitting around the exterior of said pipe, said retainer means comprising a ring, the interior of said ring having an inwardly facing groove formed therein, said groove having a curved, circular cross-sectional shape and extending completely around the interior of said ring, and

said plate, said housing and said retainer means being integral with one another and being formed of a rigid material,

a resilient, elastomeric sealing member held by said retainer means and extending from said retainer means towards the interior of said retainer means,

said sealing member having an outer surface conforming to the interior shape of said groove and including a plurality of separate sealing flanges extending therefrom toward the interior of said sealing member, each of said sealing flanges being capable of separately engaging said pipe, said retainer means and said housing being of sufficient dimension so as to permit said plate to be positioned at a right angle to said pipe and at a plurality of other angles to said pipe,

said sealing member projecting inwardly from said retainer means a sufficient distance and being sufficiently flexible to form a seal with said pipe in all positions of said plate relative to said pipe.

4,010,579

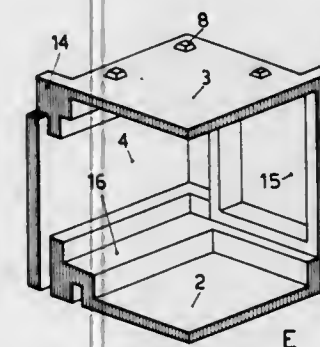
**THREE DIMENSIONAL PRE-FABRICATED STRUCTURAL ELEMENTS FOR BUILDING HABITATION UNITS**

Mario Galvagni, via Leonida Bissolati 22, Milan, Italy  
Continuation-in-part of Ser. No. 452,668, March 19, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,503

Int. Cl.<sup>2</sup> E04H 9/06; E04C 3/10

U.S. Cl. 52-79.8

1 Claim



1. A three-dimensional, pre-fabricated structural element for building habitation units comprising a plurality of self-supporting, sectional elements adapted to have standard sizes whereby to be assembled with other similar self-supporting elements to form a residential structure; each of said elements including a floor part and a ceiling part with two interposed wall parts formed integrally with said floor and ceiling parts to produce one of said self-supporting, sectional elements; said floor parts and wall parts together defining a generally rectangular space; each of said sections forming a complete self-supporting, standard size one-quarter portion of a conventional residential room; certain of said floor, ceiling and wall parts being integrally formed with stiffening ribs and certain of said wall parts having door and window apertures formed therein, other non-stiffening ribs being provided integral with said floor and wall parts, said other ribs being shaped to provide support means for differently shaped pieces of furniture; pre-formed passages being provided within said parts of an element to form channels for receiving pipes and electrical wiring for utilities; interengaging fitting means including fastenings formed integrally on the outside of said floor, wall and ceiling parts; said one-quarter sectional elements being adapted to be fastened together, in groups of four to form any one of a number of conventional residential rooms; and a plurality of such assembled rooms being adapted to be assembled together to form a residential complex; said interengaging fitting means being adapted to be readily disengaged and re-engaged, said self-supporting standard size elements being constructed and arranged to be selectively fitted together to form said different types of rooms in said residential complex and said individual elements being removable from one assembly and then interchangeable with one another, whereby the residential pattern of rooms may be selectively rearranged and altered as desired.

4,010,580

**TUBULAR STRUCTURE**

Gunter Mayr, Wolfschlugenerstrasse 16; Fritz Leonhardt, Lenzhalde 16; Wolfhart Andra, Lenzhalde 16; Willi Baur, Lenzhalde 16; Wilhelm Zellner, Lenzhalde 16, and Jorg Schlaich, Lenzhalde 16, all of Stuttgart, Germany  
Continuation-in-part of Ser. No. 401,121, Sept. 26, 1973, abandoned. This application June 20, 1975, Ser. No. 588,868  
Claims priority, application Germany, Sept. 26, 1972, 2247179

Int. Cl.<sup>2</sup> E04B 7/14, 1/06

U.S. Cl. 52-80

10 Claims



1. An industrial cooling tower comprising a support structure resting on a ground surface and a waisted tubular envelope consisting of a continuous membrane having an unbroken surface of saddle shape and made of a material which is capable of supporting tension in all directions in its plane, said membrane being pre-tensioned and carried with its tubular axis upright from said support structure, an open latticework anchoring the lower border of said membrane to the ground surface and providing an inlet for entry of cooling air into the interior of said membrane, said membrane having an open upper end serving as an air outlet opening and a ring connected to the upper border of said membrane and to said support structure with said envelope stretched in an axial direction between its upper and lower borders, and with said support structure providing the vertical component of said pre-tensioning, said support structure being of sufficient strength to support said membrane in a sufficiently stretched condition to cause said pre-tensioning to create tensile forces in said membrane in all directions in the plane of said waisted envelope, with said tensile forces being greater than the compression forces created by the wind externally to said shell, whereby said tensioned membrane becomes a self-supporting membrane shell.

4,010,581

**CORED SLAB BUILDING CONSTRUCTION**

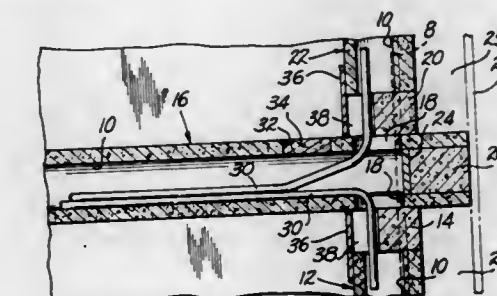
Raymond C. Keturi, 129 Kantishna Way, Fairbanks, Alaska 99701, and Wayne R. Sandstrom, P.O. Box 1993, Fairbanks, Alaska 99707

Filed July 17, 1975, Ser. No. 596,638

Int. Cl.<sup>2</sup> E04B 5/48

U.S. Cl. 52-220

2 Claims



1. In a building construction employing precast concrete



slabs having generally parallel core channels extending there-through from one edge to an opposed edge between opposed faces thereof, the improvement comprising:

- a first of said slabs arranged to define an upstanding wall with its core channels extending vertically;
- a second of said slabs arranged generally horizontally with its core channels extending perpendicular to said first slab and with said second slab extending across the upper edge of said first slab;
- said second slab having at least one opening through its face adjacent said edge of said first slab, said opening being between the faces of said first slab and communicating with one of the core channels of said second slab;
- plug means closing those ends of all the core channels of said second slab adjacent said first slab; and
- a solid precast beam member extending along said edge of said first slab and being of a width to cover only a portion of the ends of the core channels of said first slab and thereby define a channel extending along said edge and open at one side of said first slab.

4,010,582

## BUILDING STRUCTURE

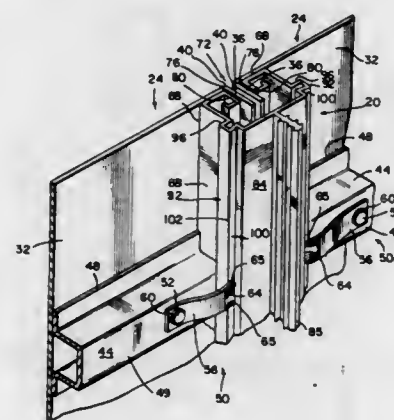
Kermit H. Burgin, Rte. No. 1, Box 334, Whitestown, Ind. 46075

Filed Sept. 24, 1975, Ser. No. 616,394

Int. Cl.<sup>2</sup> E04B 2/60

U.S. Cl. 52—282

8 Claims



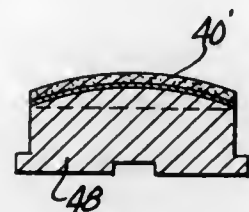
1. In a building structure comprising an elongated frame member having a plurality of longitudinally extending walls, one wall having a longitudinally extending slot therethrough, said frame member further having a pair of opposed parallel walls extending from the side edges of said slotted wall, each of the longitudinal edges of said slot having a planar leg extending therefrom generally perpendicularly into said frame member and parallel to said opposed walls, each said leg terminating interiorly of said member, a pair of elongated enclosing panels each having a longitudinal planar flange extending generally perpendicularly from an edge thereof, said panels being positioned approximately edge to edge along said slot with said flanges entering said slot and lying respectively along each of said legs, each of said panels having at least one cross member thereon, said cross members extending generally perpendicularly to said planar flanges, and means for clamping said cross member to said frame member, the improvement comprising a protrusion on each said opposed wall for bearing said cross members thereagainst, said protrusions extending longitudinally of said frame member, each protrusion having two sides, one of said sides facing said slotted wall for bearing said cross member thereagainst and an opposite rear side, said clamping means including a clip attached to said cross member and engaging said rear side, said rear side being formed to have a longitudinally extending outer edge serving as a ridge and to incline inwardly and toward said slotted wall from said outer edge.

# 4,010,583 FIXED-SUPER-ABRASIVE TOOL AND METHOD OF MANUFACTURE THEREOF

Carle W. Highberg, Sylvania, Ohio, assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.  
Continuation-in-part of Ser. No. 473,915, May 28, 1974, abandoned. This application Apr. 17, 1975, Ser. No. 569,303  
Int. Cl.<sup>2</sup> B24B 13/02; B24D 3/10, 7/10

U.S. Cl. 51—284

3 Claims



1. A method of manufacturing a super-abrasive tool for grinding and polishing purposes and having a curvilinear working surface of predetermined desired conformation comprising the steps of:

- a. providing a substantially-rigid, non-abrasive backing member having a curved support surface determinative of the curvature of said curvilinear working surface;
- b. disposing adjacent said support surface a substantially-malleable, multi-layered, integrally-formed abrasive wafer of predetermined thickness contour having a substantially smooth surface and an abrasive-containing surface, including a thickness in excess of about 1/32 inch, said abrasive wafer comprising
  - i. a layer of super-abrasive particles having uniform surfaces and a Knoop Hardness in excess of about 3000 kg/mm<sup>2</sup> and interspersed and bound in a powdered metal matrix having malleability-imparting properties and comprising a major proportion of copper and a minor proportion of tin and
  - ii. a layer comprising a malleable metal having substantially smooth surfaces and substantially free of said super-abrasive particles,

said wafer being formed by subjecting said layer of malleable metal and said layer of super-abrasive particles interspersed in a powdered metal binder to sintering conditions of pressure and temperature for the metals to form said multi-layered integrally-formed abrasive wafer;

c. causing the substantially smooth surface of said abrasive wafer to conform to said support surface so as to impart said predetermined desired conformation as to the exposed abrasive-containing surface of said abrasive wafer by interposing said wafer between said support surface and an opposed surface conformable to the predetermined desired conformation and thereafter bringing said support surface and said opposed surface towards one another with sufficient force to accomplish such conformation;

d. releasably securing the conformed wafer of (c) to said backing member.

4,010,584

## MOBILE HOME FOUNDATION

Bennett H. Barnes, Jr., Charlottesville, Va., assignor to Barnes Lumber Corporation, Charlottesville, Va.

Filed May 21, 1976, Ser. No. 688,819

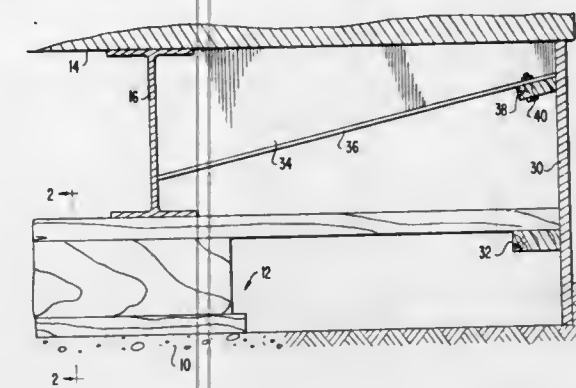
Int. Cl.<sup>2</sup> E02D 27/32; E04C 1/32

U.S. Cl. 52—299

5 Claims

1. A mobile home foundation adapted to be mounted directly on a gravel support bed comprising at least one wood plank adapted to rest on the gravel bed and extend transversely of the longitudinal axis of the mobile home, a wood beam secured to the upper surface of said plank, a wood top

plate secured to the top of the beam and extending into close proximity to the sides of the mobile home, nailing strips se-



cured to the ends of said plate perpendicular thereto and skirt means for the mobile home secured to said nailing strips.

4,010,585

## STRUCTURAL FRAME - WINDOW PANE ASSEMBLY

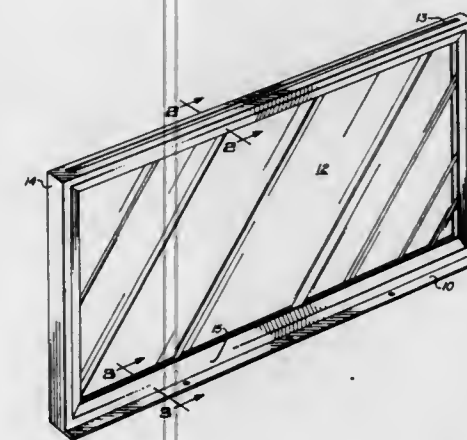
Thomas G. Bliven, 1834 N. 87th St., Scottsdale, Ariz. 85257

Filed Nov. 5, 1973, Ser. No. 412,739

Int. Cl.<sup>2</sup> E06B 3/62; E06B 3/22; E04F 19/06

U.S. Cl. 52—308

1 Claim



1. A combination structural frame - window pane assembly comprising, in combination:

- a. a single-piece continuous frame member formed of moldable plastic and having an elongate slot formed in one side thereof, said slot being shaped and dimensioned to slidably receive a window pane member therethrough, said frame member being shaped and dimensioned to completely enclose the periphery of said pane member when fully inserted through said slot;
- b. a pair of spaced, inwardly projecting, resiliently deformable flanges formed integrally with the inner periphery of said frame member, said deformable flanges being normally spaced a distance smaller than the thickness of said pane and being further shaped and dimensioned to be resiliently deformed and spaced apart by the edges of said pane when inserted therebetween to provide a line of sealing engagement between said flanges and said pane, said line of sealing engagement being at least equal to the thickness of said pane; and
- c. a window pane member shaped and dimensioned to be inserted through said slot and retained within said frame by the line of sealing engagement of the edges thereof between said inwardly projecting flanges,

the complete combination structural frame - window pane assembly being effected by the single step of inserting said window pane member through said slot to said line sealing engagement position.

# 4,010,586 METHOD FOR THE MANUFACTURE OF REINFORCEMENT MEMBERS AND MEMBER MANUFACTURED BY THE METHOD

Fritz W. Brechbühler, Koniz, Switzerland, assignor to Gebr. Zehntner AG (Armierungs-Unternehmung), Bern, Switzerland

Filed Feb. 12, 1975, Ser. No. 549,204

Claims priority, application Switzerland, Feb. 27, 1974, 002872/74

Int. Cl.<sup>2</sup> E04C 1/00

U.S. Cl. 52—309.16

1 Claim



1. A reinforcing member for connecting portions of contiguous structural parts comprising a prismatic body of synthetic foam having an isosceles trapezoidal cross-section, and reinforcing irons each of a U-shaped configuration and having an arch extending at right angles from the widest face of said body and the legs of each iron being bent and embedded in said body in proximity to the narrowest face of said body.

4,010,587

## NAILABLE FLOORING CONSTRUCTION

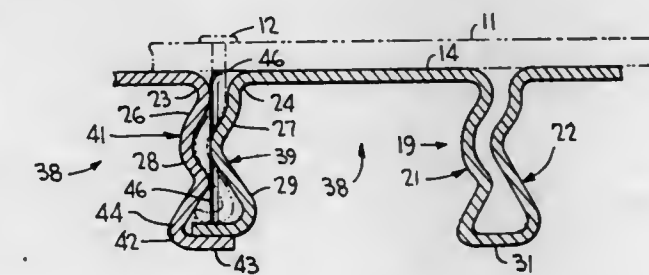
Glen D. Larsen, 9805 Broadmoor Terrace, Upper Marlboro, Md. 20870

Filed Sept. 7, 1976, Ser. No. 720,678

Int. Cl.<sup>2</sup> E04B 5/10

U.S. Cl. 52—377

7 Claims



1. A nailable floor construction unit, comprising: an elongated sheet having an upper wall with opposed longitudinal edges; elongated side walls respectively joined along said edges and extending in a common direction perpendicular to said upper wall; elongated flanges parallel to said upper wall and respectively joined to said side walls; said upper wall having roll-formed therein at least one longitudinal serpentine nailing groove extending in said common direction and defined by a pair of spaced walls, said groove walls including first wall sections respectively joined to said upper wall and being rounded relative thereto, said groove walls further including second wall sections respectively joined to said first wall sections and sloping in a direction toward one of said side walls, said groove walls still further including third wall sections respectively joined to said second wall sections and sloping in a direction toward the other of said side walls, and a bottom wall section having a leg forming together with said side walls a substantially triangular cross-sectional base for said groove, and edge of said bottom wall section joining one of said third wall sections and said leg joining the other of said third wall sections and sloping in a direction parallel to said second wall sections, and said bottom wall section lying in a

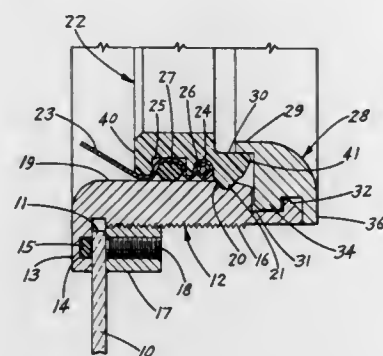


plane common to at least one of said flanges; whereby flooring may be secured to said unit with the use of nail fasteners held in place as they are deformed by said wall sections during insertion into said groove and whereby said triangular base of said groove increases the structural strength of said groove and said bottom wall section closes said groove against the entry therinto of any dirt, debris or heat from fire from outwardly of said bottom wall section.

#### 4,010,588 SEALING DEVICE

Gerald A. Eisert, Hastings, Minn., assignor to Central Research Laboratories, Inc., Red Wing, Minn.  
Filed Oct. 19, 1973, Ser. No. 408,189  
Int. Cl.<sup>2</sup> A61G 11/00

U.S. Cl. 52—398



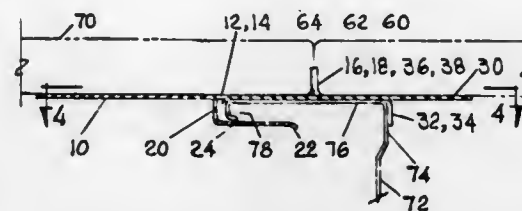
1. A sealing device for joining a detachable component to a rigid wall, said device comprising:

- A. a hand hole bushing having a forward edge and a rearward edge and adapted to be fixedly and sealedly secured within an opening in a rigid wall and having a passageway therethrough, said bushing including:
  1. a continuous sealing surface extending around the perimeter of said passageway, and
  2. a continuous groove adjacent said sealing surface, between said sealing surface and the rearward edge of said bushing; and

B. a detachable component adapted to be mounted in said passageway, said detachable component including:

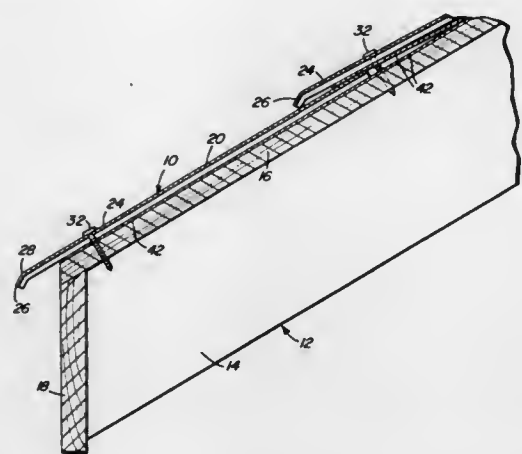
1. an annular support ring having
  - a. an outwardly extending, deformable semi-rigid bead adjacent the rearward edge thereof adapted to be disposed in the continuous groove of said bushing to securely and detachably immobilize said support ring within said passageway,
  - b. a continuous channel spaced from said bead and extending around the outer periphery of said support ring,
  - c. a further continuous groove extending around the outer perimeter of the support ring adjacent to said bead in the space between said bead and channel to facilitate deformation of said semi-rigid bead, and
  - d. a deformable sealing ring of circular cross-section seated in said channel and extending beyond said channel, the outside periphery of said sealing ring being of greater diameter than the periphery of said continuous sealing surface of said passageway, and
2. leak-proof means for preventing the passage of undesired material through the central opening of the support ring, said leak-proof means including a glove of flexible and leak-proof material, said glove having a beaded cuff,
  - a. the cuff of said glove being stretched over the outer periphery of said support ring,
  - b. the bead on the cuff of said glove being disposed in said further continuous groove, and
  - c. a portion of said cuff underlying said sealing ring in said channel.

4,010,589  
PANEL MOUNTING  
Charles Fleming Gross, Montreal, Canada, assignor to Domtar Limited, Montreal, Canada  
Filed Nov. 3, 1975, Ser. No. 628,336  
Claims priority, application Canada, July 18, 1975, 231797  
Int. Cl.<sup>2</sup> E04B 5/52  
U.S. Cl. 52—483 7 Claims



1. A system for securing panels to structural members comprising a first panel, a plurality of discrete first clip means, each having a substantially flat plate with flange means projecting substantially perpendicularly therefrom, means for securing a plurality of said first clip means in spaced relationship to said first panel with said flange means projecting from one face of said first panel, said plate in face to face relationship with said one face and with a portion of said plate projecting laterally beyond one side edge of said first panel, said flange means engaging one side of one of said structural members, an adjacent panel, a plurality of discrete second clip means, means for securing a plurality of said second clip means in spaced relationship to a face and along one marginal edge of said adjacent panel, said faces of said first and said adjacent panels facing towards said structural members, each said second clip means having a plate element secured in face to face relationship with said face of said adjacent panel, a resilient locking member projecting from each said plate element away from said adjacent panel and in a position to cooperate with cooperating means on the side of said one structural member remote from said one side, said adjacent panel having its said marginal edge overlying and its said face in face to face relationship with said projecting portion of said plate of said first clip means.

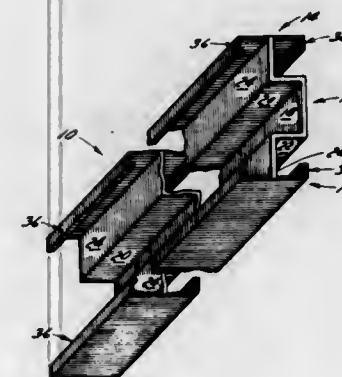
4,010,590  
METAL ROOF SHINGLE  
Richard F. Reinke, Box 566, Deshler, Nebr. 68340  
Filed Apr. 16, 1975, Ser. No. 568,616  
Int. Cl.<sup>2</sup> E04D 1/00  
U.S. Cl. 52—533 7 Claims



1. A shingle comprising a metallic panel having substantially parallel end edges and substantially parallel top and bottom edges arranged perpendicular to the end edges, said panel including a plurality of corrugations formed therein with symmetrically curved transverse surfaces extending between the top and bottom edges, the bottom edge portion of the panel being downwardly bent along a bend line parallel to and adjacent to the bottom edge of the panel, said panel being straight from the bend line to the top edge one end edge of the panel

having a shallow channel formed therein with one wall of the channel being defined by an upturned end edge on the panel, the bottom of the channel being defined by a relatively wide flat surface and the other wall of the channel being defined by a corrugation in the panel with the upturned edge of the panel being substantially equal in height to the height of the corrugations to enable the downwardly facing portion of the end corrugation on an adjacent panel to overlap the upturned end edge on the panel, said corrugations extending through the bend line with the lower edge portion of the shingle overlapping the upper edge portion of an adjacent lower shingle when installed in courses on the exterior of a building or the like.

4,010,591  
MOVABLE PARTITION TRIM PIECE  
Charles Fleming Gross, Montreal, Canada, assignor to Domtar Limited, W. Montreal, Canada  
Filed Nov. 3, 1975, Ser. No. 628,335  
Claims priority, application Canada, Nov. 29, 1974, 214954  
Int. Cl.<sup>2</sup> E04C 3/30, 2/33  
U.S. Cl. 52—732 3 Claims

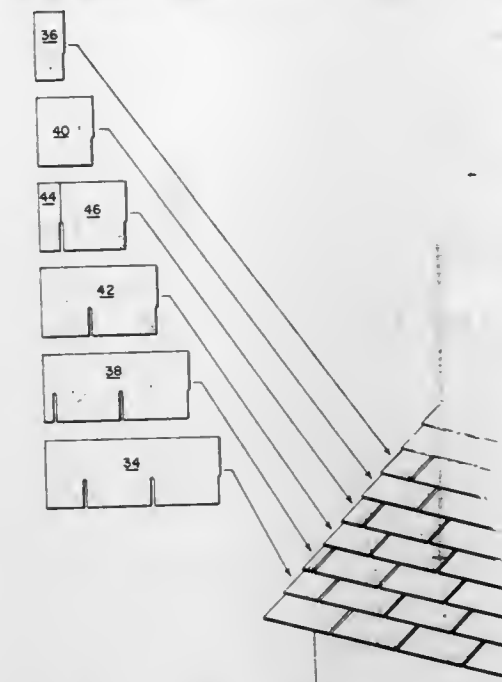


1. A trim piece comprising a central U-shaped base member composed of a pair of arms extending substantially perpendicular to and in substantially the same direction from opposite ends of a base section and a pair of T-shaped members each formed of a trunk section and a pair of branch sections extending perpendicular to and in opposite direction from one end of said trunk section, the opposite end of each trunk section being integrally connected to a free end of one of said arms, said trunk sections extending substantially perpendicular to said arms and said branch sections adjacent said arms terminating in free ends positioned in a plane containing the face of said base section remote from said trunk sections.

4,010,592  
TEMPLATE FOR AND METHOD OF CUTTING  
COMPOSITION SHINGLES FOR RAPID AND  
SCRAP-FREE INSTALLATION  
Roy Nixon, 133 W. Pole Road, Lynden, Wash. 98264  
Filed Jan. 16, 1976, Ser. No. 649,849  
Int. Cl.<sup>2</sup> E04D 3/32, 15/02  
U.S. Cl. 52—748 8 Claims

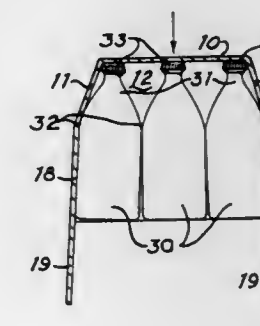
8. A method of applying shingles upon a gabled roof comprising the steps of:
- a. cutting three 18 inches composition shingles into seven pieces of the size 15 1/2 inches, 12 inches, 1 1/4 inches 7 1/2 inches, 6 inches 5 1/2 inches and 2 1/2 inches respectively,
  - b. using the cut shingles in the order of decreasing size to

start the next seven rows following the first which utilizes a full width shingle, and



c. repeating the process for each sequential set of eight rows or part thereof to be peak of the roof.

4,010,593  
METHOD FOR PACKAGING BOTTLES  
Robert H. Graham, E. 1527 Rockwood Blvd., Spokane, Wash. 99203  
Division of Ser. No. 559,782, March 19, 1975. This application  
June 21, 1976, Ser. No. 697,857  
Int. Cl.<sup>2</sup> B65B 21/14, 21/22  
U.S. Cl. 53—29 3 Claims



1. A method of forming a package for two or more rows of upright capped bottles from a carton blank having spaced top, bottom and side panels composed of slightly resilient or compressible material such as corrugated cardboard or the like, the top panel having an interior length and width slightly less than the total length and width, respectively, across the caps of the bottles;

the method comprising the following sequential steps:

- a. folding and securing upper sloping side and end walls depending from the top panel to produce an open enclosure having folded edges located in a plane parallel to the top panel;
- b. locating the enclosure in a downwardly-open position immediately above the rows of bottles;
- c. placing the blank onto the rows of bottles so that the bottle necks are received within the enclosure with the caps engaged against the inner surfaces of the top panel and the respective sloping side and end walls at fold lines connecting them to the top panel, thereby tilting the upper ends of the bottles slightly toward one another;
- d. urging the bases of the bottles toward one another by wrapping lower rectangular side and end wall panels of the carton about them and joining bottom panels of the carton under the bottles to return the bottles to parallel



upright positions in engagement with one another within the completed carton; whereby the bottles within the carton are held tightly against one another and the interior carton surfaces by the resulting resilience or compression of the carton material.

4,010,594

# METHOD FOR SUPPLYING BOXES TO A PLURALITY OF FILLING AND WEIGHING STATIONS AND REMOVAL OF FILLED BOXES THEREOF

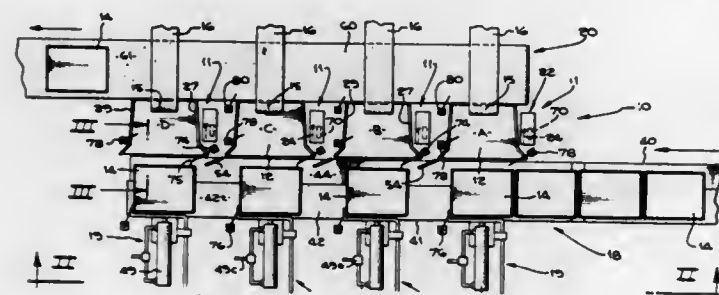
Jerry Lyndell Boyd, Bakersfield, Calif., assignor to Stanley A. McClusky, Bakersfield, Calif.

Division of Ser. No. 580,767, May 27, 1975. This application May 3, 1976, Ser. No. 682,561

Int. Cl.<sup>2</sup> B65B 1/32

U.S. Cl. 53—35

11 Claims



1. In a method of filling and weighing a plurality of boxes at a plurality of weighing scales arranged in a line, article feed means above each scale, each box being filled and discharged independently of the other boxes at said scales, an empty box feed belt, and a filled box discharge belt, the steps of: supplying an empty box at each scale in accordance with the demand for an empty box at each scale including advancing empty boxes in a line parallel to the line of weighing scales and at one side thereof, stopping an empty box in a ready position opposite each scale, laterally moving an empty box onto a scale when the scale measures a selected weight in a preceding box being filled on the scale; filling the empty box to a selected weight, moving the filled box off the scale by pushing the next empty box to be filled against said filled box until said filled box moves onto a discharge conveyor belt, and moving an empty box to each vacated ready position by successively advancing empty boxes in said line to occupy vacated ready positions wherever and whenever the vacated positions occur.

4,010,595

# APPARATUS FOR SUPPLYING BOXES TO A PLURALITY OF FILLING AND WEIGHING STATIONS AND REMOVAL OF FILLED BOXES THEREOF

Jerry L. Boyd, Bakersfield, Calif., assignor to Stanley A. McClusky, Bakersfield, Calif.

Filed May 27, 1975, Ser. No. 580,767

Int. Cl.<sup>2</sup> B65B 1/32, 57/02, 57/10

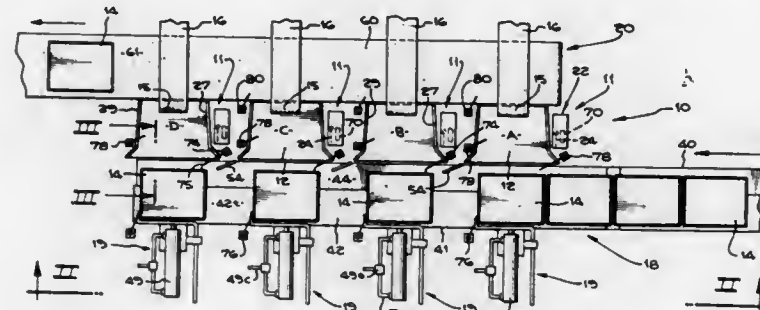
U.S. Cl. 53—55

20 Claims

13. In a machine for filling boxes in which the machine includes a plurality of spaced sequentially arranged filling stations, the provision of:

means for supplying an empty box to each filling station as required by each station; said box supplying means including a conveyor section having a continuously moving belt passing along one side of the filling stations for receiving and advancing boxes to a ready position at each filling station, means for releasably detaining an empty box in said ready position opposite each filling station,

means at each filling station for sensing the fill condition of a box at the station, means for moving a box from ready position toward said filling station upon the sensing of a full box in said station,



and means for causing an empty box to occupy the box ready position on the moving belt when the box ready position is vacated.

4,010,596

# MOLDED PART SEPARATION AND STORAGE

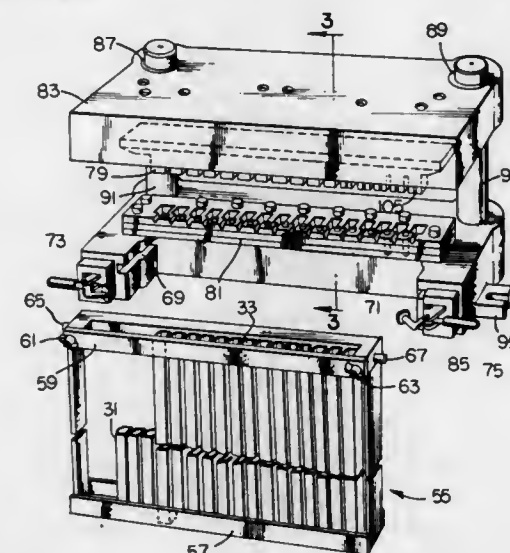
Anthony H. Osterholt, 4608 Euclid Ave., Fort Wayne, Ind. 46806

Filed July 21, 1975, Ser. No. 597,822

Int. Cl.<sup>2</sup> B65B 63/00; B26D 5/08

U.S. Cl. 53—123

8 Claims



1. In a punch and die press to separate molded parts from a common sprue and accumulate like separated parts from successive sprues for subsequent utilization and having cooperating punch and die means actuable by the press for severing the parts from the sprue with a single press stroke, the combination therewith of accumulator means for receiving and retaining like severed parts in a single column stacked relation;

said accumulator means comprising an elongated sheath defining a part-receiving sheath passage and having a cross-section in a plane normal to the direction of elongation of generally the same configuration as the parts; the sheath having first opposed side wall portions for gripping the parts and second opposed side wall portions deformable toward one another to urge the first opposed side wall portions away from one another and release parts gripped therebetween.

4,010,597

# APPARATUS FOR CLOSING AND SEALING TWO-PIECE SLOTTED CONTAINERS

Iver L. Nelson, Minneapolis, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed July 1, 1976, Ser. No. 701,983

Int. Cl.<sup>2</sup> B65B 7/20, 51/02

U.S. Cl. 53—374

4 Claims

1. Apparatus for closing and sealing the flaps of and gluing

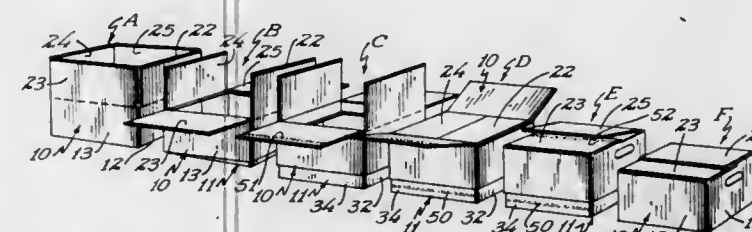
together containers which are of the type assembled from a slotted tray with no top closure flaps and an outer sleeve which telescopes over the erected tray, which outer sleeve has top flaps hingedly attached thereto and foldable into position to form the top closure for the container, wherein said tray is erected and said sleeve is positioned thereon and the contents for the carton are loaded into said tray prior to being placed in said apparatus for sealing, said top closure flaps including major flaps on either lateral side of said container as it is presented to said apparatus and minor closure flaps on both the leading and trailing edges of said container as it is inserted into said apparatus comprising:

a frame supporting said apparatus;

an in-feed conveyor positioned at one end of said apparatus onto which said container may be located, said conveyor adapted to move said container into said apparatus and having positioned above said conveyor first cam rail means for engaging said major top closure flaps on either lateral edge of said container and rotate them outwardly and downwardly into a horizontal position as said container moves along said in-feed conveyor;

means mounted on said frame and positioned along the sides of said conveyor for orienting said container as it moves along said conveyor to properly position said container for entry into said apparatus;

a center section including a stepped support conveyor of freely rotatable rollers having a first section at the same elevation as said in-feed conveyor and a second section positioned vertically lower than said first section; means for advancing said containers through said center section at spaced intervals including a pair of chains driven in unison positioned on either side of said center



section with pairs of bars extending laterally between said pair of chains adapted to contact the trailing edge of said container and push it through said center section; means driving said pair of chains in unison and means for directing said pairs of chains substantially horizontally above the surface of said stepped conveyor in said center section;

means for restraining said containers at the end of said in-feed conveyor, said restraining means automatically disengagable by the passing of said bars on said means for advancing containers as said bars are directed past said restraining means, said restraining means being positioned at the discharge end of said in-feed conveyor and near the point at which said containers are moved into said center section;

means positioned above said center section to engage the outwardly folded lateral major closure flaps of said container and support said outer sleeve in a vertical plane so that when said container is moved onto said lower conveyor section said sleeve and said tray are telescoped apart a predetermined distance;

fixed means for moving the minor closure flap on the leading edge of said container down into position on the top of said sleeve; rotating plow means positioned above said center section and adapted to rotate downwardly and in the direction of the movement of said container in synchronous motion with the passing of said container to fold said trailing closure flap on said container down into position; means for synchronizing the movement of said bars on said means for advancing said containers through said center section and said rotating plow means to insure that said

rotating plow means operates in unison with the passing of each of said containers; means positioned along said center section for sensing the presence of and applying adhesive to the outer lateral sides of said tray after said tray and said sleeve have been telescoped apart;

second plow means positioned above said center section and near the discharge end thereof adapted to engage and fold inwardly the lateral major closure flaps on said sleeve and completely fold them down into horizontal position juxtaposed with the top surface of said leading and trailing minor closure flaps on said container;

means for sensing and applying adhesive to said container closure flaps to hold said major flaps in position against said minor flaps;

a compression section mounted on said frame at the discharge end of said center section, including a series of horizontally positioned freely rotatable rollers to form a support conveyor in said compression section along with top compression means for forcing said sleeve downwardly into position over said tray;

side compression means for exerting force on the sides of said sleeve to enhance the setting of said adhesive and thereby sealing said sleeve to said tray;

said top compression means and side compression means operable in unison and controlled by means for sensing the presence of said container in said compression section together with means for sensing an approaching container in said center section in order to retract said top compression and said side compression means; and

a retention and discharge section comprising rollers mounted at predetermined distances above said container as well as along the sides of said container to hold said top flaps and said sleeve and tray together to insure proper setting of said adhesive prior to removal from said apparatus, said containers moveable into said section by contact with subsequent containers being discharged from said center section.

4,010,598

# DEVICE FOR FOLDING THE CLOSURE FLAP OF ENVELOPES

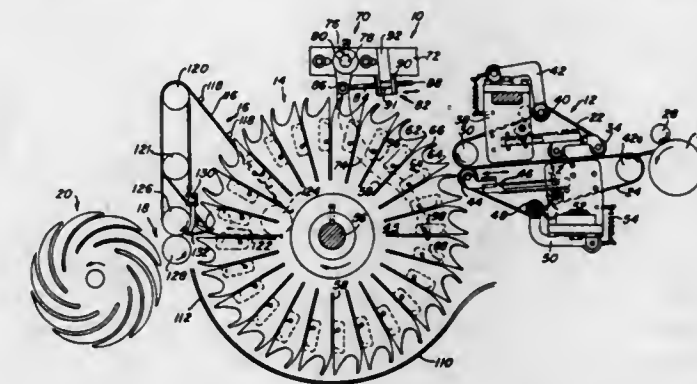
Heinz Jakob Mueller, Hollidaysburg, Pa., assignor to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed Feb. 27, 1975, Ser. No. 553,640

Int. Cl.<sup>2</sup> B65B 7/20

U.S. Cl. 53—376

5 Claims



1. A device for folding the closure flaps of envelopes comprising, a rotatable receiver having a plurality of discs mounted on a shaft, each of said discs having a plurality of radially extending spaced slotted portions with radially extending finger portions therebetween, first conveyor means positioned on one side of said rotatable receiver, said first conveyor means arranged to feed envelopes with open closure flaps into said receiver slotted portion with the envelope bottom edge as the leading edge of the envelope,



an envelope guide member positioned adjacent to said receiver slotted portions, said guide member arranged to abut the envelope bottom edge and move the envelope within the slot to a location where the envelope closure flap extends outwardly beyond the periphery of said receiver member,

an arcuate flap folding member positioned adjacent the periphery of said receiver member, said flap folding member operable to partially fold the envelope closure flap of envelopes positioned in said receiver slotted portions as said receiver member slotted portions rotate away from said first conveying means,

said rotatable receiver finger portions having a generally rectangular edge portion arranged to abut the envelope adjacent the closure flap score line,

second conveying means positioned on the other side of said rotatable receiver,

a pair of pressure rolls positioned adjacent to said second conveying means,

said second conveying means arranged to convey the envelopes with the partially folded closure flap outwardly from said receiver member slotted portions and between said pressure rolls, and

said pressure rolls arranged to crease the envelope closure flap along the closure flap score line and thereby complete the fold of the closure flap.

4,010,599

# PROCESS AND APPARATUS FOR TEXTURING TEXTILE YARNS OF THERMOPLASTIC MATERIAL BY IMPARTING TWIST BY FRICTION

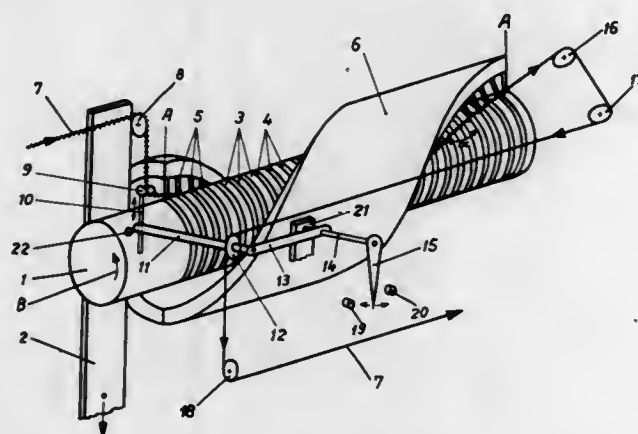
Walter Lüthi, Ebnat-Kappel, Switzerland, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland  
Filed June 9, 1976, Ser. No. 694,437

Claims priority, application Switzerland, June 16, 1975, 7798/75; Feb. 25, 1976, 2350/76

Int. Cl.<sup>2</sup> D01H 7/92, 13/04; D02G 1/04

U.S. Cl. 57—34 HS

20 Claims



1. Apparatus for texturing textile yarns of thermoplastic material by imparting, by means of friction, false-twist to the yarn, comprising a twist impartor consisting of a cylinder mounted to be rotated about its axis and formed at equidistantly spaced intervals along its peripheral surface with circular grooves and also formed with annular friction surfaces respectively located between each pair of adjacent grooves, means for rotating said cylinder about said axis, a fixed support element extending along and spaced from said cylinder, a series of rod-shaped thread-guides allocated respectively to said grooves and fixed to said support element, said thread-guides being of such length and so positioned on said support element that they project into said grooves at points located on a notional helical curve extending along said cylinder, input guide means including first yarn tension sensing means for directing yarn to one end of said cylinder, output guide means including second yarn tension sensing means for directing yarn output from the other end of said cylinder, said input and output guide means being located for the yarn to bear on

at least a portion of said series of thread-guides while contacting said annular friction surfaces along the portion of said cylinder and extending along said portion of said series, and means responsive to said first and second tension sensing means enabling a difference between the input and output yarn tensions to be registered,

4,010,600

# RETIPPED TOP-DRIVE FILLING SPINDLES

Ernest G. Poole, Charlotte, and Lucius M. Hair, Pineville, both of N.C., assignors to The Kendall Company, Boston, Mass.  
Filed Apr. 16, 1975, Ser. No. 568,560

Int. Cl.<sup>2</sup> B65H 54/54

U.S. Cl. 57—129

6 Claims



1. In a top-drive filling spindle having a spindle base, a whorl and an acorn taper, the improvements comprising a spindle blade of steel having a hard outer case and a ductile inner core with a neck portion of reduced diameter at the uppermost portion of said spindle blade; and, a tapered tip portion of uniformly hardened material secured over said neck portion in butting relationship with said spindle blade.

4,010,601

# METHOD FOR MANUFACTURING A FANCY TEXTURED YARN PROVIDED WITH SLUBS

Meiji Anahara, Kyoto; Tsugio Take, Takatsuki, and Yutaka Kajihara, Akashi, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed June 24, 1975, Ser. No. 589,919

Int. Cl.<sup>2</sup> D02G 3/34, 3/38

U.S. Cl. 57—160

12 Claims



1. Method for manufacturing a fancy textured yarn provided with numerous fancy slubs by means of a false twisting apparatus provided with a false twisting member and a heater disposed at a twisting zone upstream of said false twisting member, comprising supplying at least one multifilament yarn

A and at least one multifilament yarn B into said twisting zone independently, combining said yarn B with said yarn A at a wrapping point reciprocally moving along the yarn passage of said yarn A in said twisting zone, displacing said wrapping point toward the running direction of said yarn A at a speed in a range between less than the running speed of said yarn A and approximately 0.5 times that of said running speed and heating the thus formed composite yarn in said twisting zone.

4,010,602

# HIGH FREQUENCY REED TIME GOVERNOR FOR A TIMEPIECE

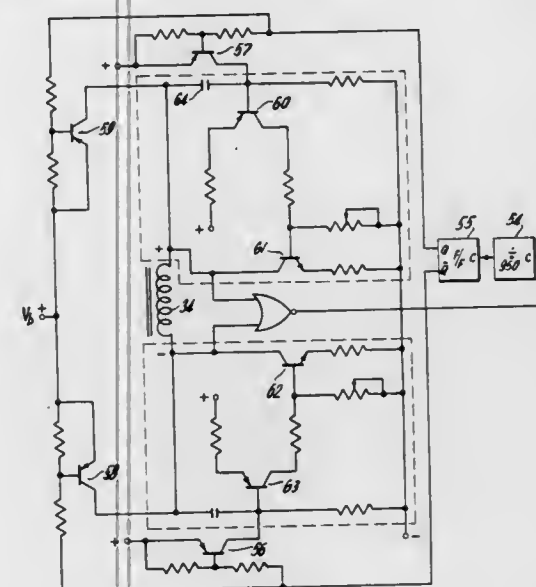
Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Continuation-in-part of Ser. No. 445,172, Feb. 25, 1974, abandoned. This application June 9, 1975, Ser. No. 577,250

Int. Cl.<sup>2</sup> G04C 3/04

U.S. Cl. 58—23 AC

12 Claims



1. In a timepiece having a gear train to drive the hands thereof, the combination comprising:

a high frequency reed fixedly mounted to the timepiece at one end and having a pair of spaced magnets mounted at the other end,

a low frequency reed fixedly coupled to the timepiece at one end and having a pair of spaced magnets mounted at the other end, each of said spaced magnets being located opposite a corresponding magnet of the high frequency reed,

a coil coupled to the timepiece and located symmetrically between the spaced magnets of the high frequency reed and the spaced magnets of the low frequency reed, means connecting the low frequency reed to the gear train for the timepiece, and

drive means for activating the coil with current pulses which reverse polarity after a predetermined number of said current pulses and substantially at a point when the low frequency reed is at a predetermined maximum amplitude swing to interact with the pairs of spaced magnets thereby maintaining said low frequency reed in oscillation synchronized by said high frequency reed.

4,010,603

# TIME MARKING CHRONOMETER

Eric B. Forsyth, Brookhaven, N.Y., assignor to Ensign Electronics, Inc., Brookhaven, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,313

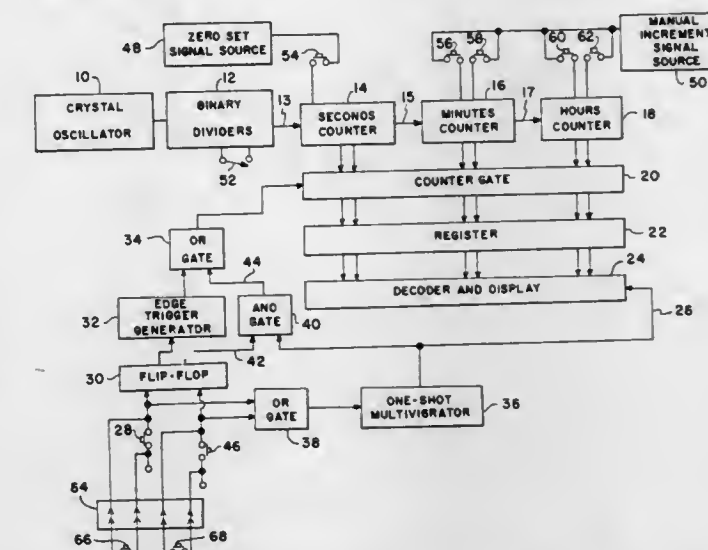
Int. Cl.<sup>2</sup> G04F 10/04; G04B 19/00

U.S. Cl. 58—39.5

12 Claims

1. An improved chronometer for measuring mean time with electronically operated digital displays comprising: timekeeping section producing real time information in the form of hours, minutes and seconds;

gate means connected to said timekeeping section independently controlling the transfer of real time information from the timekeeping section to the digital displays whereby an individual real time reading may be retained upon the digital displays while the timekeeping operation continues uninterrupted with no loss of the reference to real time;



logic means connected to and controlling said gate means for inhibiting further transfer of time information to indicate the exact instant of real time at which a phenomenon takes place and including blocking means for preventing a subsequent attempt to retain a new time reading on the displays from superceding a first time reading; and reset means connected to and controlling said logic means for reestablishing the transfer of time information to the displays after such transfer has been inhibited.

4,010,604

# JOINTED LINK BAND

Bernhard Tesch, Im Baumgarten 4, Ennetbürgen, Switzerland

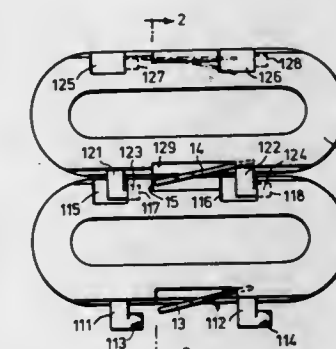
Filed Mar. 17, 1976, Ser. No. 667,829

Claims priority, application Germany, Mar. 18, 1975, 2511722

Int. Cl.<sup>2</sup> F16G 15/04

U.S. Cl. 59—82

6 Claims



1. A jointed link band comprising a plurality of interconnected links, each link having a pair of spaced arms, a first arm of each link having a pair of extensions projecting transversely to the longitudinal axis of said band, a second arm of each link having recess means for receiving said extensions thereby interconnecting said links to each other to form said band, and means for precluding disassembly of said extensions and recess means by relative motion therebetween in a direction transverse to said longitudinal axis.



4,010,605

# ACCURATE, STABLE AND HIGHLY RESPONSIVE GAS TURBINE STARTUP SPEED CONTROL WITH FIXED TIME ACCELERATION ESPECIALLY USEFUL IN COMBINED CYCLE ELECTRIC POWER PLANTS

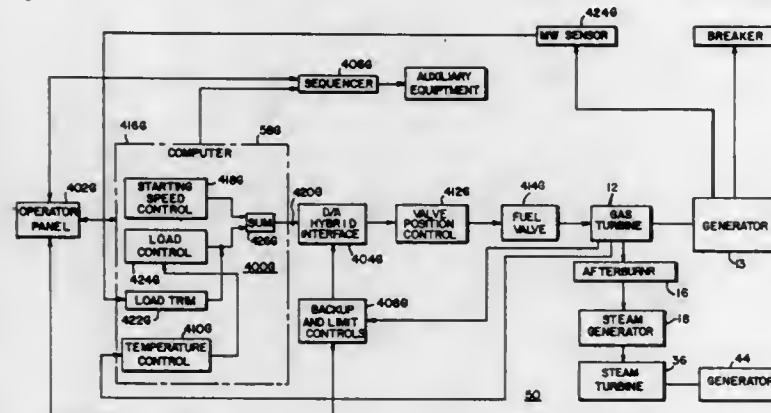
Robert Uram, East Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,729

Int. Cl.<sup>2</sup> F02C 7/26

U.S. Cl. 60—39.14

30 Claims



1. A gas turbine electric power plant comprising a compressor section and a turbine section, a plurality of combustors for energizing the driving gas flow for the turbine section, means for generating electric power under the driving power of the turbine, a gas turbine control system including means for controlling the flow of fuel to the turbine combustors, means for generating a representation of gas turbine speed, means for generating a gas turbine speed reference so that the reference increases from a first predetermined value substantially to the synchronous value normally in a substantially fixed period of time during turbine startup, means for generating a speed error output representing the difference between the speed reference and the actual turbine speed, and means for generating a fuel control signal in response at least to the integral of the speed error so that the actual turbine speed normally increases from the first speed value to the synchronous value in the fixed time period.

4,010,606

# LATCHING VALVE SHUTOFF SYSTEM

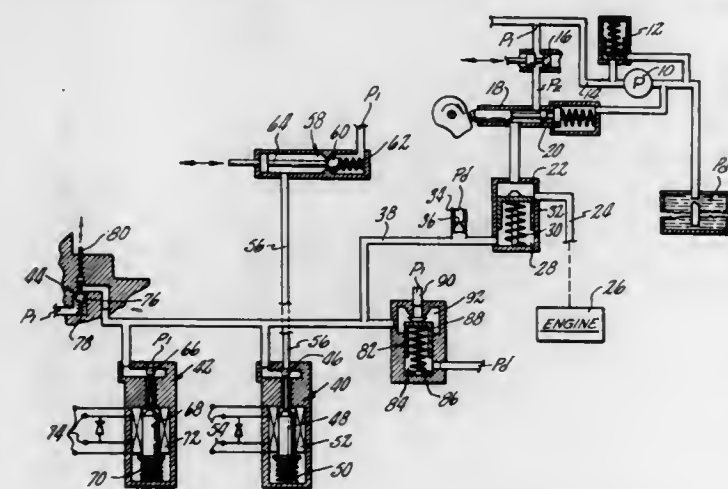
Kenneth Peter Hansen, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 2, 1976, Ser. No. 654,668

Int. Cl.<sup>2</sup> F02C 9/08

U.S. Cl. 60—39.28 R

7 Claims



1. An improved fuel cutoff system for a gas turbine engine comprising:  
means for supplying a flow of fuel to said engine at a first pressure;  
a pilot-operated shutoff valve;  
valve means movable between an open and a closed position disposed to interrupt said flow of fuel to said engine;

first means communicating said valve means to a first source of fluid for supplying fluid to said valve means during an abnormal engine operating condition at a second pressure sufficiently high to urge said valve means to the closed position;  
second means actuated by said fluid for communicating said valve means to a second source of said fluid at a pressure at least as high as said second pressure for initially supplying said fluid to said valve means during said abnormal engine operating condition and continually supplying fluid to said valve means to maintain said valve means in the closed position until said engine is in a starting mode.

4,010,607

# INTERNAL COMBUSTION ENGINE WITH AFTERBURNER, VENTURI COOLER AND EXHAUST TURBINE

Alvin S. Hopping, Nolan's Point, Lake Hopatcong, N.J. 07849

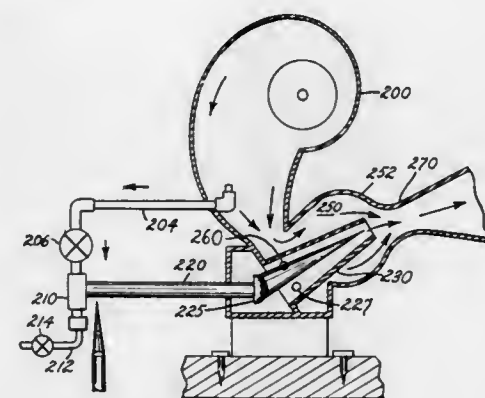
Filed Jan. 2, 1973, Ser. No. 320,435

The portion of the term of this patent subsequent to Jan. 8, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> F02B 37/04; F01N 3/12

U.S. Cl. 60—274

6 Claims



1. A process which comprises burning hydrocarbon fuel in an internal combustion chamber to generate exhaust gases, burning additional fuel with excess compressed air in a secondary combustion chamber, commingling said exhaust gases in said secondary combustion chamber with said burning additional fuel and air under superatmospheric pressure, imparting spiral rotating circulation to the commingled gases in said secondary combustion chamber by directing said exhaust gases through a means tangentially disposed in said secondary combustion chamber and passing said commingled gases through a zone of reduced cross-sectional area, introducing cool air under superatmospheric pressure into said commingled gases in said zone, thereafter passing said mixture of gases and air through a zone of enlarged cross-sectional area further to cool the mixture, directing said cooled mixture into a turbine, discharging substantially completely oxidized gaseous effluent from said turbine, and coupling said turbine to an air compressor from which said air under superatmospheric pressure is derived.

4,010,608

# SPLIT FAN WORK GAS TURBINE ENGINE

John Robert Simmons, Cincinnati, Ohio, assignor to General Electric Company, Lynn, Mass.

Filed June 16, 1975, Ser. No. 587,135

Int. Cl.<sup>2</sup> F02K 3/04

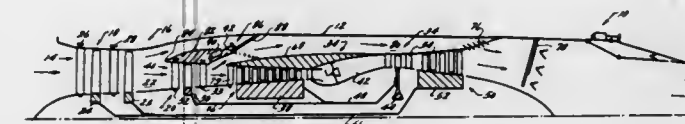
U.S. Cl. 60—226 R

3 Claims

1. In a gas turbine engine having a compressor, combustor, high pressure turbine supplying rotational energy to the compressor and low pressure turbine in serial flow relation, all being circumscribed by an inner engine casing and an outer nacelle spaced apart from the inner engine casing to define a bypass duct therebetween, the outer nacelle extending upstream of the inner engine casing to define an inlet for the

engine and downstream of the inner engine casing to define an exhaust system for the engine, there is provided:

a front fan section disposed in the inlet upstream of the inner engine casing and receiving rotational energy from the low pressure turbine,  
an aft fan section disposed intermediate the front fan section and compressor, receiving rotational energy from the high pressure turbine and circumscribed by an intermediate casing which is spaced radially inward from the outer



nacelle to define a bypass duct around the aft fan section, and  
diverter valve means secured to the aft end of the intermediate casing for selectively distributing the flow compressed by the front fan section between the aft fan section and the bypass duct around the aft fan section and simultaneously therewith selectively distributing the flow compressed by the aft section between the compressor and bypass duct around the compressor.

4,010,609

# JACK-PUMP DEVICE

Marcel Boutroy, Amblainville, and Jacques Neyret, Gennevilliers, both of France, assignors to Hydrelem SA, Lausanne, Switzerland

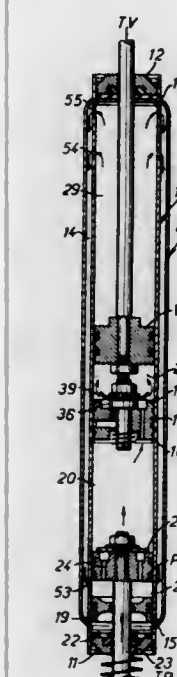
Filed Feb. 24, 1976, Ser. No. 660,794

Claims priority, application France, Feb. 25, 1975, 75.05745; Feb. 16, 1976, 76.04124

Int. Cl.<sup>2</sup> F15B 13/09

U.S. Cl. 60—402

17 Claims



1. A jack-pump device comprising a pump having a sliding piston defining on each side of itself a first and a second chamber respectively, a jack having a sliding piston defining on each side of itself a first and a second chamber respectively, a first valve means between the pump chambers, this first valve means being unidirectional in the direction going from the second to the first pump chamber, a second valve means between the first chambers of the pump and the jack, and communication means between the two second chambers of the pump and the jack, the two pistons being axially in line and mounted slidably in the same cylinder body filled with fluid, a fixed transverse partition being arranged in said cylinder body between the two pistons, said device further com-

4,010,610

# HYDRAULIC LOAD-SENSING SYSTEM

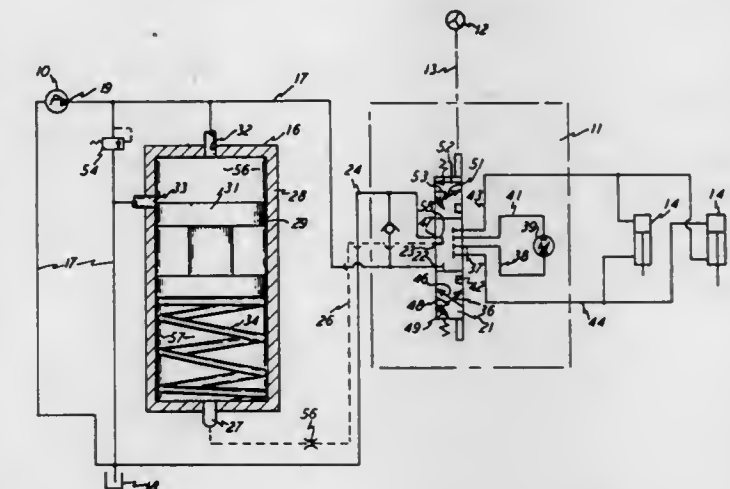
Donnell Lynn Dunn, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 9, 1976, Ser. No. 675,587

Int. Cl.<sup>2</sup> F16D 31/00; F15B 15/18

U.S. Cl. 60—459

8 Claims



1. A hydraulic load-sensing system, comprising a pump, a valve having fluid passageways extending therethrough and with a fluid inlet and a fluid outlet at opposite ends of one of said passageways, a hydraulic load actuator member, hydraulic lines interconnecting all the aforesaid into the system and with said pump being hydraulically connected with said valve inlet and with said load actuator member being hydraulically connected with said valve outlet, said valve having a hydraulic sensing port hydraulically connected with said valve outlet for sensing hydraulic pressure at said valve outlet, a hydraulic pressure compensator having a valve member and two hydraulic chambers on operatively opposite sides of said valve member and with said chambers being respectively hydraulically connected to the outlet of said pump and to said sensing port to have the respective hydraulic pressures applied to said valve member, a biasing member included in said compensator and operative on said valve member urging same thereon in the direction of hydraulic force created thereon from the fluid related to said sensing port, said compensator having a hydraulic outlet in fluid-flow communication with the one of said chambers connected with said pump, said valve member being disposed and operable for controlling fluid flow through said compensator outlet and thereby control the hydraulic pressure in said one chamber in accordance with the hydraulic pressure drop across said valve from said valve inlet to said valve outlet.

4,010,611

# COMPRESSION-EXPANSION POWER DEVICE

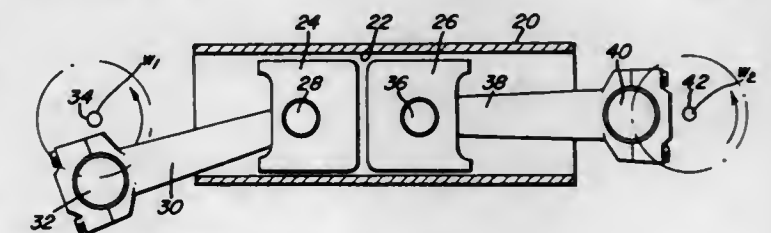
James E. Zachery, P.O. Box 116, Corrales, N. Mex. 87048

Filed Dec. 17, 1974, Ser. No. 533,539

Int. Cl.<sup>2</sup> F01B 7/02

U.S. Cl. 60—516

5 Claims



1. A compression-expansion power device comprising a



chamber of predetermined volume defined by an enclosing structure adapted to receive and exhaust a compressible fluid, said structure including opposed portions movable relative to each other and occupying common spaces over the entire space of the chamber at predetermined, non-simultaneous intervals thereby enabling predetermined changes in the volume of the chamber between the opposed portions at different relative positions thereof, said commonly occupied space in the chamber constituting a substantial portion of the volume defined by the enclosing structure, said chamber being defined by an open-ended cylinder and the opposed portions include a pair of pistons reciprocally disposed in said cylinder, and means reciprocating said pistons whereby a substantial portion of the inner portions of the piston strokes overlap with only one piston disposed in the overlapping portion of the strokes at any particular time, said means reciprocating said pistons including a crankshaft associated with each of the pistons, each of the crankshafts having a crank arm thereon defining a variable length lever arm connected with its respective piston by a connecting rod, said crankshafts being interconnected for rotation at a predetermined ratio for cyclic movement of the pistons in the cylinder to define an intake process, a compression process, an expansion process and an exhaust process, said crankshafts rotating at a ratio of 2:1 whereby one of the pistons reciprocates at twice the frequency of the other piston, said pistons and crankshafts being so phased that, at the beginning of the cycle, the slower moving piston is at its maximum penetration into the common cylinder while the faster moving piston is at its minimum penetration position in the common cylinder and during the compression process, the slower moving piston and crankshaft move from 0° to 80° while the faster moving piston and crankshaft moves from 0° to 160°, during the expansion process, the slower moving piston and crankshaft moves from 160° to 180° while the faster moving piston and crankshaft moves from 180° to 280° while the faster moving piston and crankshaft moves from 360° to 560° and during the intake process, the slower moving piston and crankshaft moves from 280° to 360° while the faster moving piston and crankshaft moves from 560° to 720° thus completing the cycle, such arrangement being the nominal operation and phasing of the device.

#### 4,010,612 THERMAL MOTOR

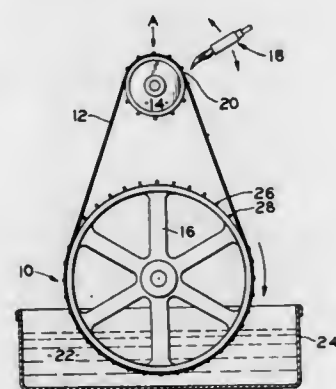
Dante J. Sandoval, Cleveland, Ohio, assignor to Dante J. Sandoval, Cleveland, Ohio

Filed Dec. 13, 1974, Ser. No. 527,254

Int. Cl.<sup>2</sup> F03G 7/06

U.S. Cl. 60—527

12 Claims



1. A device for the conversion of energy into mechanical motion, said device comprising:  
a plurality of rotatable means;  
at least one continuous belt drivingly engaging said rotatable means and being closely fitted thereabout, and means associated with said rotatable means which preclude slippage of said belt thereabout, said belt comprising transducer means adapted to alter its configuration to

a relatively rigid preset configuration upon the application of heat and  
means of selectively applying said heat to said belt, whereby said belt configuration alteration causes said rotatable elements to rotate.

#### 4,010,613 TURBOCHARGED ENGINE AFTER COOLING SYSTEM AND METHOD

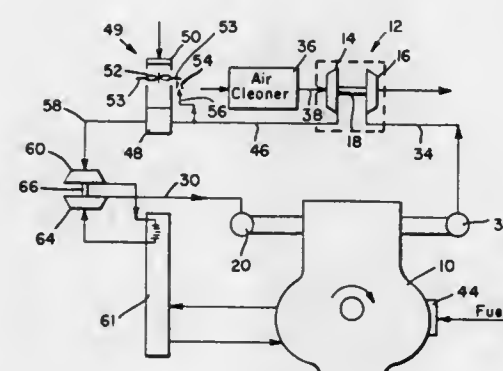
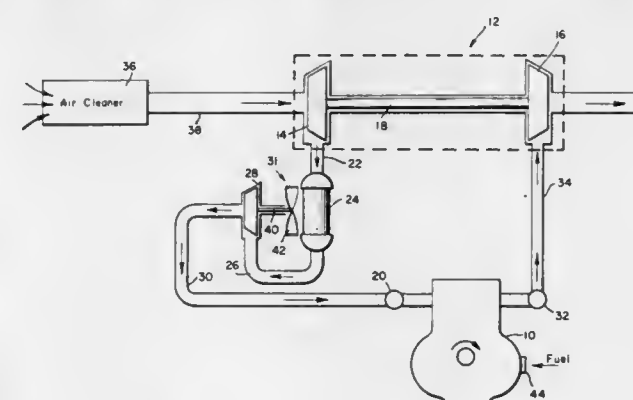
Charles E. McInerney, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 422,108, Dec. 6, 1973, abandoned. This application June 2, 1975, Ser. No. 583,130

Int. Cl.<sup>2</sup> F02B 29/04

U.S. Cl. 60—599

5 Claims



1. A turbocharging system for an internal combustion engine comprising:  
a turbocharger having a turbine driven by hot exhaust gases from said engine and a compressor on a common shaft with said turbine to compress charge air for said engine;  
heat exchanger means to receive compressed charge air from said turbocharger compressor to remove heat from the charge air;  
turbine fan means operably associated with said heat exchanger means to push a flow of ambient air across said heat exchanger means, said turbine fan means driven by a portion of the compressed charge air from said turbocharger compressor;  
compressor means to receive charge air from said heat exchanger means to further compress the charge air; and  
turbine means to receive compressed charge air from said compressor means to expand the charge air to a temperature below ambient temperature and to deliver the cooled compressed charge air to said engine, said turbine means on a common shaft with said compressor means to drive said compressor means.

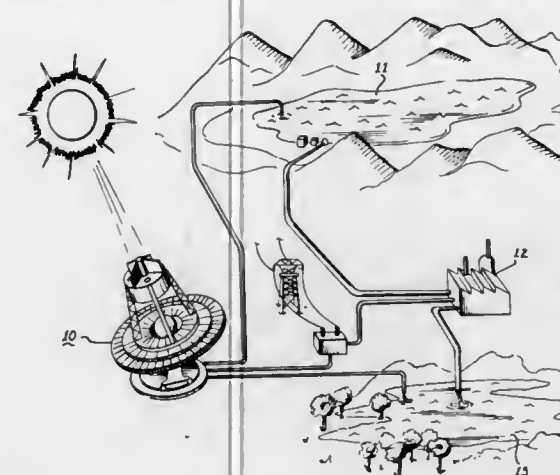
#### 4,010,614 SOLAR RADIATION COLLECTOR AND SYSTEM FOR CONVERTING AND STORING COLLECTED SOLAR ENERGY

David M. Arthur, 4020 N. 14th Ave., Phoenix, Ariz. 85013  
Filed Nov. 13, 1974, Ser. No. 523,262

Int. Cl.<sup>2</sup> F03Q 7/02

U.S. Cl. 60—641

4 Claims



1. Apparatus for converting and storing solar energy comprising, in combination:  
a. collector means for collecting and reflecting incident solar radiation, said collector means including  
1. a generally circular framework having a planar configuration;  
2. a plurality of concentric annuli, each annulus having a plurality of modules, wherein each of said modules includes  
a shape substantially identical to that of every other module comprising said annulus,  
a generally planar rear surface,  
a reflective front surface having a concave shape with a point of focus,  
b. concentrator means for concentrating the reflected solar radiation, said concentrator means including  
1. a reflector located between said collector means and the solar radiation source for directing said solar radiation on a concentrated area, said reflector having a convex surface facing said collector means;  
2. a support for positioning said reflector in axial alignment with said collector means;  
3. a focuser for selectively moving said reflector along the axis of said collector means thereby selectively determining the location of the concentrated area on which said solar radiation is directed; and  
4. tracking means for maximizing the exposure of said collector means to normal incident solar radiation;  
c. converter and storage means for converting the concentrated solar radiation into electrical energy and potential energy and for storing the potential energy, said converter and storage means including  
1. a low elevation reservoir for retaining water,  
2. a high elevation reservoir for retaining water and for collecting surface water,  
3. a boiler positioned at the axis of said collector means for converting water into steam,  
4. a turbine powered by steam from said boiler,  
5. a condenser for converting steam leaving said turbine into water and for returning said converted water to said boiler,  
6. a generator powered by said turbine for producing electrical energy, and  
7. a pump powered by said turbine for producing and storing potential energy by transferring water from said low elevation reservoir to said high elevation reservoir; and  
d. auxiliary conversion means for converting the stored

potential energy into electrical energy, said auxiliary conversion means including a hydroelectric generator powered by water from said high elevation reservoir.

#### 4,010,615 PARTIALLY BURIED TANKS FOR THE STORAGE OF PETROLEUM PRODUCTS

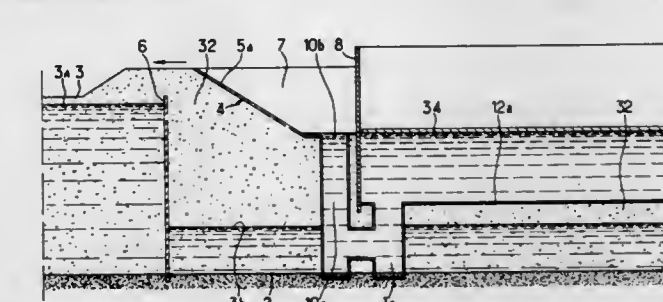
Nestor Leon Pladys, Dunkerque, France, assignor to Societe Francaise des Petroles BP and Soletanche, both of, France  
Filed June 16, 1975, Ser. No. 586,923

Claims priority, application France, June 18, 1974, 74.21158

Int. Cl.<sup>2</sup> B65G 5/00

U.S. Cl. 61—.5

3 Claims



1. A partially buried facility for storing petroleum products, comprising:  
a peripheral equalization basin for containing water, and having a truncated cone-shaped external slope, said basin being rendered liquid-tight by an appropriate covering;  
a liquid-tight enclosure of at least partially dry terrain surrounding said basin, said enclosure being supported on a layer of impermeable or artificially impermeabilized terrain;  
a storage tank located centrally within the confines of said enclosure, said tank comprising a cylindrical wall and, at a level above that of the bottom of said enclosure, a flat bottom covered with an isolating liquid-tight lining;  
at least one lateral equalizing wall interrupting the bottom of said tank at the periphery, said equalizing wall penetrating slightly into the layer of impermeable or artificially impermeabilized terrain supporting said liquid-tight enclosure; and  
a liquid-tight pipe connecting said equalizing well with said peripheral equalization basin, said pipe traversing the layer of dried terrain as well as the phreatic water level of said-liquid tight enclosure.

#### 4,010,616 RIB EXPANDER

Richard Lovat, 42 Grovetree Ave., Rexdale, Canada  
Filed Sept. 23, 1975, Ser. No. 615,899

Int. Cl.<sup>2</sup> E21D 11/12

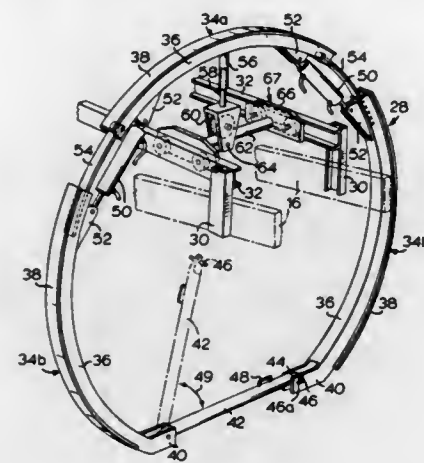
U.S. Cl. 61—45 R

9 Claims

1. A rib expander, for use with tunnelling apparatus where the tunnel being driven is curved, comprising:  
a plurality of elongated arcuate segmental members forming a sectioned ring;  
means to separate at least two of the members longitudinally one from another along the circumferential axis of the ring whereby the ring is radially expandable;  
means for horizontally translating the ring normal to the plane thereof; and  
means carried by the horizontal translating means to support the ring in a vertical plane thereon, said support



means being constructed and arranged whereby the ring is (a) movable on the horizontal translating means trans-



versely in the plane of the ring and (b) movable pivotally about a vertical circumferential axis thereof.

4,010,617

**COMPOSITE ARCH STRUCTURE**

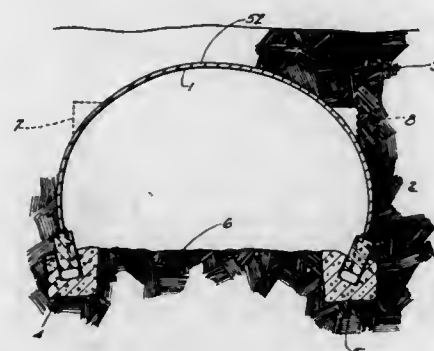
Christopher L. Fisher, Winnipeg, Canada, assignor to Armco Steel Corporation, Middletown, Ohio

Filed May 19, 1975, Ser. No. 578,605

Int. Cl.<sup>2</sup> F16L 9/22; E01G 5/06; E21D 9/00

U.S. Cl. 61-45 R

23 Claims



4,010,618

**MINE ROOF SUPPORT**

John Hirst Walker, Cheltenham, England, and Alan Peacock, Pittsburgh, Pa., assignors to Dowty Mining Equipment Limited, England

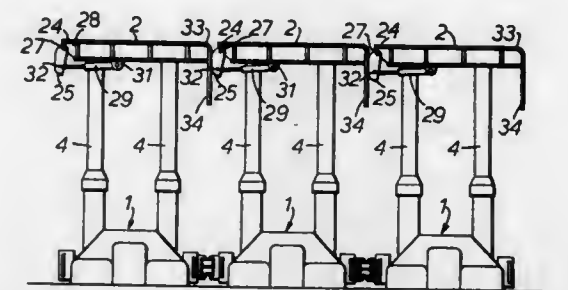
Continuation-in-part of Ser. No. 542,427, Jan. 20, 1975, abandoned. This application Sept. 2, 1975, Ser. No. 609,821 Claims priority, application United Kingdom, Jan. 19, 1974, 2628/74

Int. Cl.<sup>2</sup> E21D 17/10

U.S. Cl. 61-45 D

23 Claims

1. A mine roof support comprising a floor beam, a canopy having a pair of parallel opposed edges extending in the advancing direction of the support, a plurality of extendible struts acting between the floor beam and the canopy, one or



the said one edge of the canopy and means for urging the or each flap outwardly from the canopy.

4,010,619

**REMOTE UNMANNED WORK SYSTEM (RUWS)  
ELECTROMECHANICAL CABLE SYSTEM**

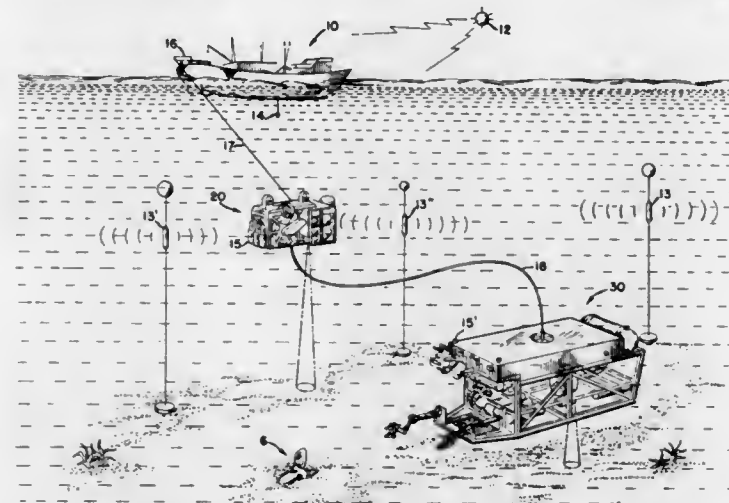
John D. Hightower, Kailua, Hawaii; George R. Beaman, Leucadia, Calif.; George A. Wilkins, Kailua, and Douglas W. Murphy, Kaneohe, both of Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1976, Ser. No. 689,306

Int. Cl.<sup>2</sup> B63C 11/34

U.S. Cl. 61-69 R

27 Claims



1. A remotely controlled underwater work system comprising:

a surface control station;  
a primary cable operatively connected to said surface control station at its upper end and extending vertically downward therefrom and configured to provide mechanical support to loads attached thereto and to provide electrical energy transfer therealong;

primary cable terminating means connected to said primary cable for underwater support thereby and including, attachment means mounted on the lower surface of the primary cable terminating means for releasable support of loads attached thereto,

controllably powered reel means mounted on said primary cable terminating means for paying out and recovering a secondary cable,

a secondary cable wound on said controllably powered reel means,

hydrodynamic thrusting means mounted on said primary cable terminating means in fixed relation thereto for providing stabilization and limited spatial positioning thereof, and

electrical signal distribution means mounted on said primary cable terminating means and electrically connected to said primary cable for receipt of electrical energy therefrom and effectively electrically connected to said controllably powered reel means, said secondary cable, and said hydrodynamic thrusting means for apportioning the electrical energy thereto; and

work vehicle means attached to said secondary cable for providing a work station and including, propulsion means mounted on said work vehicle for moving said work vehicle in a predetermined area and electrically connected to said secondary cable for receipt of electrical energy therefrom, mechanical manipulator means mounted on said work vehicle and effectively connected to said secondary cable means for receipt of control signals therefrom, support means mounted on the upper surface of said work vehicle means and constructed to cooperate with said attachment means for permitting selective attachment of said work vehicle to the primary cable terminating means to establish a unitary assemblage therewith, and communication means mounted on said work vehicle means and electrically connected to said secondary cable for transmission of signals therethrough.

4,010,620

**COOLING SYSTEM**

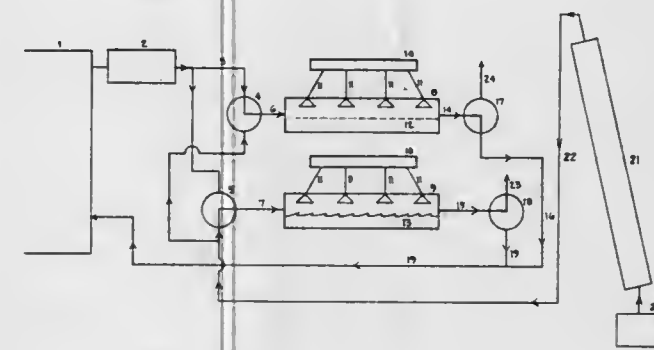
Maria Telkes, Newark, Del., assignor to The University of Delaware, Newark, Del.

Filed Oct. 8, 1975, Ser. No. 620,570

Int. Cl.<sup>2</sup> F25B 27/00

U.S. Cl. 62-2

6 Claims



1. The method for air conditioning buildings which comprises dissolving in water a salt having an endothermic heat of solution, to create a cold solution, passing air in heat exchange relationship with said cold solution to cool the air for introduction into said building, recovering the salt for reuse by evaporation of the water from the solution with hot air, the heating of the air being at least partly provided by solar heat.

4,010,621

**STIRLING CYCLE HEAT PUMP**

Karlheinz Raetz, No. 12, Gassnerstrasse, 33 Braunschweig, Germany

Filed Dec. 30, 1974, Ser. No. 537,530

Claims priority, application Germany, Jan. 4, 1974, 2400256; Nov. 8, 1974, 2452986

Int. Cl.<sup>2</sup> F25B 9/00

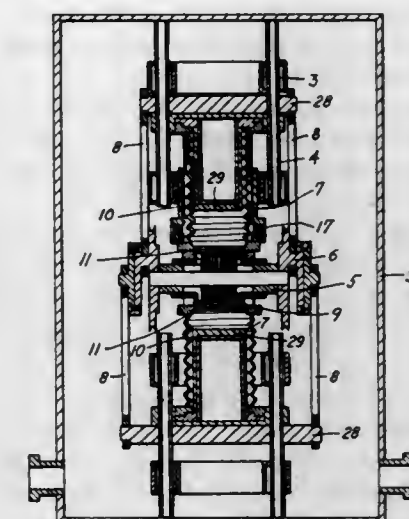
U.S. Cl. 62-6

12 Claims

1. A heat pump which is operationally based on the Stirling cycle and which comprises:

a. a heat regenerator,  
b. two heat exchangers for circulating a heat transferring liquid and disposed adjacent to opposite sides respectively of and communicating with said regenerator,  
c. two pumping chambers, each formed of a flexible metal

bellows and disposed adjacent to and communicating with one of said heat exchangers, and



d. means for driving said bellows to simultaneously expand one, and contract the other of said bellows alternately.

4,010,622

**METHOD OF TRANSPORTING NATURAL GAS**

Berwyn E. Etter, 368 Boca Ciega Point Blvd. South, Madeira Beach, Fla. 33708

Filed June 18, 1975, Ser. No. 587,830

Int. Cl.<sup>2</sup> F17C 7/02

U.S. Cl. 62-48

8 Claims

1. A method of transporting natural gas which eliminates the need for ultra low temperature refrigeration units, said method comprising,

saturation of natural gas at its source with an organic additive which is normally liquid at ambient conditions and is selected from the group consisting of C<sub>3</sub> to C<sub>20</sub> hydrocarbons, alcohols and esters, and mixtures thereof, which when combusted yield only carbon and hydrogen containing products, to provide a mixture which liquefies at substantially higher temperatures than natural gas alone, liquefying all of said mixture for fuel transport, transporting said liquefied mixture to its destination for end useage, vaporizing said mixture, and adding sufficient air to said mixture prior to combustion to provide a fuel of normal Btu capacity.

4,010,623

**REFRIGERANT TRANSFER SYSTEM**

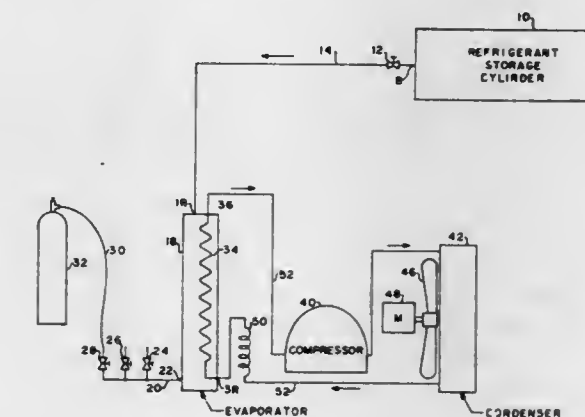
Anthony A. Kaschak, Rte. 5, Box 128-C, Scottsboro, Ala. 35768

Filed Apr. 12, 1976, Ser. No. 676,319

Int. Cl.<sup>2</sup> F17C 7/02

U.S. Cl. 62-55

3 Claims



1. In a system for transferring refrigerant from a large storage container to a smaller service container, the combination comprising:  
an elongated cylinder;



first coupling means for coupling a large, storage, refrigerant container to the interior of said cylinder at a first end of said cylinder;

second coupling means for coupling a smaller, service, container to the interior of said cylinder at the opposite end of said cylinder;

an evaporation coil positioned within said cylinder and having a first end exiting at said first end of said cylinder, and having a second end exiting at said opposite end of said cylinder; and

a compressor, condenser, and flow restriction means connected in series in the named order between said first end of said coil and said second end of said coil, said flow restriction means being positioned adjacent said second end of said coil, whereby a refrigerant loop is defined by said compressor, said condenser, said flow restriction means, and said coil, and a second refrigerant placed in said loop is evaporated in said coil, creating a temperature gradient in said cylinder which is cooler at said opposite end than at said first end of said cylinder, whereby a pressure gradient is created in said cylinder around said coil in which said pressure is greater at the first end of said cylinder than at the opposite end, causing refrigerant from the large storage container to flow into the smaller service container.

4,010,624

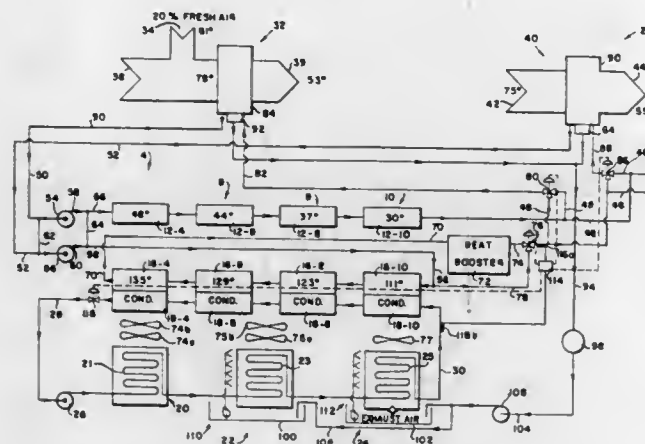
## AIR CONDITIONING SYSTEM

Alden Irving McFarlan, 691 Dorian Road, Westfield, N.J.  
Division of Ser. No. 436,355, Jan. 24, 1974, Pat. No. 3,850,007, which is a continuation of Ser. No. 260,211, June 6, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,815

Int. Cl.<sup>2</sup> F25B 29/00

U.S. Cl. 62—159

11 Claims



1. In an air conditioning system for a conditioned space, the combination of, refrigeration means comprising a plurality of refrigeration units, a first heat sink means for said refrigeration means with air-circulation means to effect cooling solely by the circulation of air in heat exchange relationship therewith, a second heat sink means which includes a heat sink cooling zone which provides evaporative cooling by the circulation of air and the evaporation of water, each of said refrigeration units having an evaporator-chiller and other elements forming an operating unit, air cooling means including an air-cooling coil through which a cooling liquid may flow to said conditioned space to cool and dehumidify air and thereby produce condensate, means to circulate a cooling liquid in series through said evaporator-chillers and thence through said air-cooling coil, and means to supply said condensate to said heat-sink cooling zone of said second heat sink means.

4,010,625

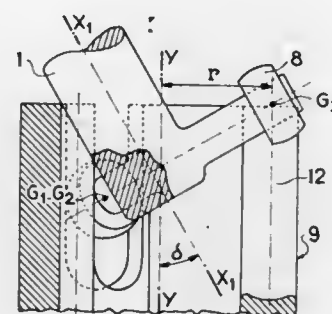
## SLIDING HOMOKINETIC JOINT

Michel Orain, Conflans Sainte Honorine, France, assignor to Glaenger Spicer, Poissy, France  
Filed Sept. 11, 1975, Ser. No. 612,566  
Claims priority, application France, Sept. 27, 1974, 74.32689

Int. Cl.<sup>2</sup> F16D 3/30

U.S. Cl. 64—21

5 Claims



1. In a sliding homokinetic joint comprising a first element rotatable about an axis and integral with one of two shafts to be coupled and having a shaft portion and three trunnions extending from the shaft portion, three rollers respectively rotatably mounted on the trunnions and a second element which is rotatable about an axis and is integral with the other of said shafts to be coupled and has the general shape of a cylindrical ring having an end portion which is remote from said other shaft and defines a radially inner edge and having portions which define three raceways which have a particular cross-sectional shape and in which raceways the three rollers are respectively rollingly engaged; the improvement comprising three recesses which are provided in the second element at least in the region of said inner edge and partly define said inner edge and are interposed between the raceways for clearing said shaft portion of the first element, each recess terminating peripherally of the second element short of said portions defining the three raceways and having a depth radially of the second element which, in a region of the recess located half-way between two adjacent raceways is at least equal to  $E/\cos \sigma$ , wherein E is the distance between the two extreme positions of the axis of the first element in the course of the planetary motion of the first element in joint operation and  $\sigma$  is the maximum break angle of the joint.

4,010,626

## HOSIERY MACHINE WITH TERRY FORMING APPARATUS

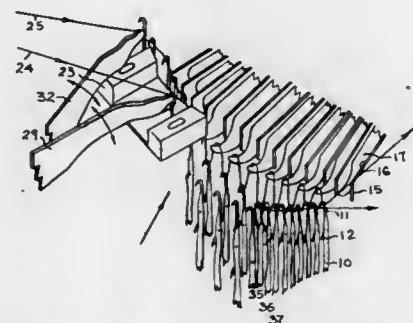
Tibor Feher, 5130 Bourret Ave., Apt. 9, Montreal 252, Quebec, Canada

Filed Feb. 6, 1973, Ser. No. 330,029

Int. Cl.<sup>2</sup> D04B 35/00, 9/12

U.S. Cl. 66—93

5 Claims



1. In a circular knitting machine for producing plain and terry knitted fabric, a rotatable needle cylinder having a top edge, knitting needles movable up and down in said cylinder, a rotatable dial coaxial with said needle cylinder, vertically adjustable relative to said cylinder and disposed above the

latter, said dial having a series of radial slots extending to the outer edge of said dial, a series of loop forming elements located in the slots, a vertically adjustable stationary dial cap defining a cam race engaged by said loop forming elements for radially moving the same at right angles to said needles between a retracted position inwardly of said dial outer edge and inwardly of said needles and an advanced position extending beyond said dial outer edge and beyond said needles, said loop forming elements disposed in a plane above said needle cylinder top edge and each having a hook formed by an upwardly inclined tip capable of retaining a yarn loop thereon and of allowing release of said loop by engagement with the dial outer edge upon retracting movement of said loop forming element within said dial, a stationary throat plate having a radially inner edge disposed outwardly of and close to said needles and located just above the loop forming elements, said throat plate having a slot made therethrough radially inwardly extending and opening at said inner edge of said throat plate, a pair of yarn feeding fingers pivoted about a horizontal stationary axis and each having a yarn carrying and feeding end vertically movable above said throat plate, one of said fingers being a loop yarn feeding finger and pivotable with its feeding end moving between a topmost position well above said throat plate and a lowermost position just above said throat plate, the other of said fingers being a base yarn feeding finger pivotable in a plane in vertical alignment with said throat plate slot with its feeding end moving between a topmost position well above said throat plate and a lowermost position extending through said throat plate slot to feed yarn below said throat plate, the needles between loop forming elements raisable to a regular knitting position above the level of said throat plate, and a variable number of said last-named needles raisable to a topmost position at a higher level than said regular knitting position, said regular knitting position and topmost position being taken by said needles prior to their reaching said base yarn feeding finger, so constructed and arranged that, when said base yarn feeding finger end is in its topmost position, no needle catches the base yarn fed thereby, and when in lowermost position, all raised needles catch the base yarn fed thereby for knitting said base yarn, and when said loop yarn finger end is in lowermost position, all raised needles catch the loop yarn fed thereby, and when said loop yarn finger end is in said topmost position, only the needles selected by said selector cam means in reaching their topmost position catch the loop yarn fed from said loop yarn finger, the loop yarn knitted by said needles being caught by the advanced loop forming elements and released upon retraction of said loop forming elements.

4,010,627

## KNIT GARMENT, KNIT BLANK THEREFOR AND METHOD OF MAKING SAME

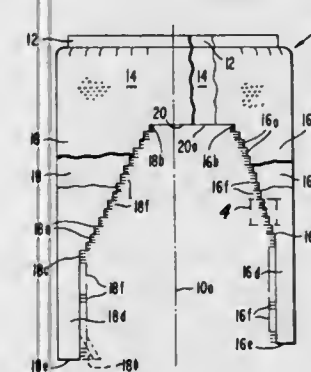
David Pernick, 1020 Shore Blvd., Brooklyn, N.Y. 11235

Filed Jan. 19, 1976, Ser. No. 650,443

Int. Cl.<sup>2</sup> A41B 9/02, 9/04, 9/10

U.S. Cl. 66—177

9 Claims



1. A knitted garment blank having a seamless knitted tubular body portion of predetermined length, said body portion having wales and courses formed of suitable yarn and having

a terminal course, and spaced seamless knitted non-tubular first and second panels of predetermined length interknitted with and extending from correspondingly spaced portions of said terminal course and also having wales and courses formed of suitable yarn, said panels having non-joined separate terminal portions, the wales of said panels being common to wales of said body portion and the courses of said panels being formed of individual lengths of yarn, said panels having non-selvalge edges at the ends of the courses thereof, said edges having fringe-like non-knitted floats of yarn extending therefrom, such floats being formed of end portions of said lengths of yarn extending from the terminal stitches of the courses knit therefrom.

4,010,628

## METHOD AND DEVICE OF MAKING A PROFILED BODY OF AT LEAST ONE BAND OF MATERIALS

Raimund Falkner, Roppen, Austria, and Heinz Grune, Solingen, Germany, assignors to Rapena Patent- und Verwaltungs-AG, Stadtle, Liechtenstein

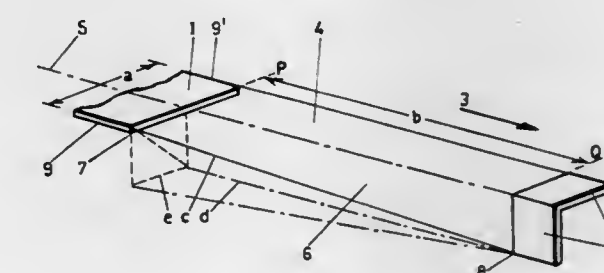
Filed Jan. 17, 1975, Ser. No. 542,020

Claims priority, application Switzerland, Jan. 22, 1974, 810/74; Feb. 13, 1974, 2026/74

Int. Cl.<sup>2</sup> B21D 5/08

U.S. Cl. 72—181

3 Claims



1. A method of making a profiled body from a band of material having two exterior edges, comprising the steps of introducing initial undulations into parts of said band to facilitate profiling of the band during subsequent forming steps, determining at least one directrix on the band, said directrix coinciding with a prominent longitudinal edge of the body to be formed, and said directrix dividing the band into first and second band areas, the first band area extending from one exterior edge of the band to said directrix, and the second area extending from the other exterior edge of the band to said directrix, evening out and minimizing the tensile stresses in said exterior edges and reducing the number of rolls necessary for further forming operation on said band by swinging said first area about said directrix in a first direction and simultaneously swinging said second area about said directrix in a direction opposite to said first direction and towards said first area, and carrying out additional forming steps to form said profiled body.

4,010,629

## ROD SPLICE

Richard J. Wolicki, Buffalo, N.Y., assignor to Buffalo Brake Beam Company, Lackawanna, N.Y.

Division of Ser. No. 565,521, April 7, 1975, Pat. No. 3,969,032. This application Dec. 11, 1975, Ser. No. 639,651

Int. Cl.<sup>2</sup> B21D 53/36

U.S. Cl. 72—368

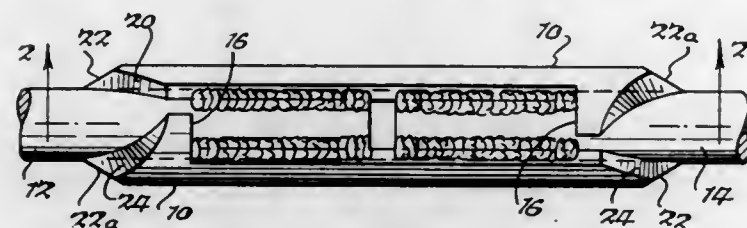
1 Claim

1. The method of making a body member for a rod repair splice means for repairing a rod to be spliced, said method comprising:  
the step of providing a planar blank having in plan view form opposite side edge portions, and opposite end por-



tions wherein at least one of said end portions includes a pair of end edges extending from respectively adjacent side edges towards one another to a point of intersection with said end edges being substantially perpendicular to the plane of said plan view,

the step of forming said blank partially about a cylindrical surface along a longitudinal axis passing through said end portions and thereby forming an axial end face at said point of intersection and first and second camming surfaces extending between said axial end face and said



respectively adjacent side edge portions, said first and second camming surfaces longitudinally receding and extending from the radially outer surface of said formed blank to the inner radial surface thereof, and the step of shaping said axial end face to provide a third camming surface intersecting and disposed between said first and second camming surfaces and extending from the outer radial surface of said formed blank to the inner radial surface thereof so that at least said one end portion includes three camming surfaces which cam radially outward.

4,010,630

## HYDRAULIC ACTUATED POWER TOOL

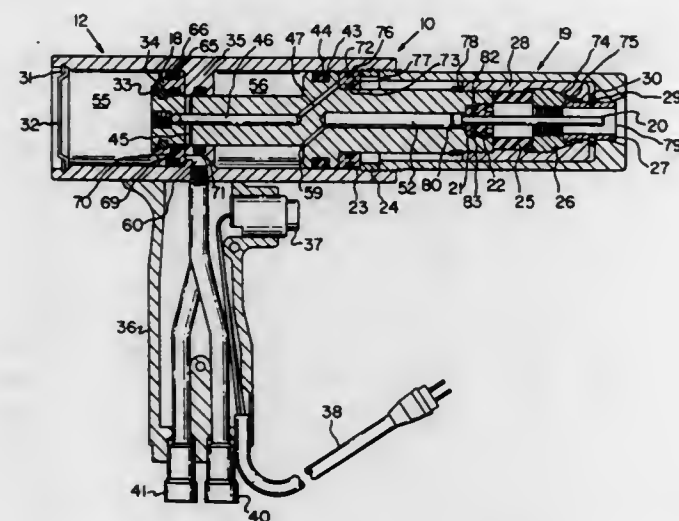
Samuel B. Davis, Jr., New Galilee, and Donald G. Lordo, Beaver Falls, both of Pa., assignors to Textron, Inc., Providence, R.I.

Filed Apr. 8, 1976, Ser. No. 674,967

Int. Cl.<sup>2</sup> B21J 15/34

U.S. Cl. 72—391

8 Claims



1. A hydraulic actuated tool comprising:

A. a barrel having an internal, annular bulkhead separating the barrel into a front cylinder and a rear cylinder, said bulkhead including a first port directed into the front cylinder and a second port directed into the rear cylinder;

B. a handle depending from the barrel in the area of the bulkhead;

C. a piston shaft positioned in the barrel and having a first piston integrally formed intermediate the piston shaft ends to form a first piston rod positioned with the first piston in the front cylinder and a second piston rod extending through the bulkhead into the rear cylinder, said second piston rod having a transverse port extending therethrough and a longitudinal port connecting midway of the transverse port and extending along the second

piston rod and terminating in a bifurcated passageway, each leg of the passageway extending angularly outward from the longitudinal port and clear through the first piston;

D. a second piston mounted at the distal end of said second piston rod, said piston forming the end wall of the rear cylinder;

E. front wall means positioned within the barrel to define the end wall of the first cylinder;

F. a fastener driving assembly secured to the barrel including means associated with the first piston rod to grip a fastener;

G. a first and second pipe extending through the handle, said first pipe connected to the first port and said second pipe connected to the second port;

whereby a first activation of the tool transmits oil through the second port and against the second piston and simultaneously therewith through the transverse and longitudinal ports against the front wall means to simultaneously force the two pistons rearward and a second activation transmits oil through the first port and against the first piston, said oil in the first and second chambers exiting through the second pipe.

4,010,631

## METHOD AND APPARATUS FOR PULSE SHAPING IN BALLISTIC SIMULATORS

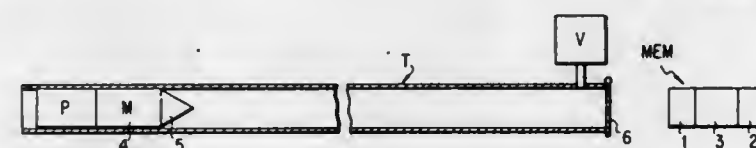
Irvin Pollin, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 9, 1975, Ser. No. 611,776

Int. Cl.<sup>2</sup> G01M 7/00

U.S. Cl. 73—12

6 Claims



1. A ballistic simulation system for projectiles including:

a. an accelerator for said projectiles;

a momentum-exchange member including a resilient component positioned in the path of travel of said projectiles; and

a crushable mitigator mounted on one of said projectiles and said momentum-exchange member and positioned to be crushed therebetween, said mitigator including a cylindrical body and a non-cylindrical crush zone, said crush zone varying in cross-sectional area along its length and including plural areas for engagement by the other of said projectiles and said momentum-exchange member

4,010,632

## PIEZOOPTICAL MEASURING TRANSDUCER

Isaak Isaevich Slezinger, ulitsa Kirova, 40-a, kv. 41; Georgy Mironovich Belitsky, Pervomaiskaya ulitsa 74, kv. 101; Vladimir Alexandrovich Shiryayev, ulitsa Iskra 7, kv. 34, and Jury Vasilievich Mironov, Nagornaya ulitsa, 68 kor. 14, kv. 34, all of Moscow, U.S.S.R.

Filed Feb. 3, 1976, Ser. No. 654,733

Claims priority, application U.S.S.R., Feb. 12, 1975, 2105757

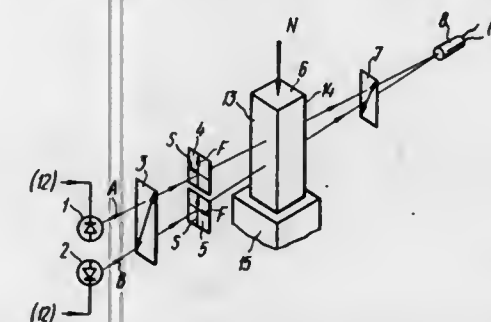
Int. Cl.<sup>2</sup> G01L 1/24

U.S. Cl. 73—141 A

3 Claims

1. A piezooptical measuring transducer comprising: a square-pulse generator having a first and a second outputs; a first light source connected to the first output of said square-pulse generator and producing a first luminous flux; a second light source connected to the second output of said square-pulse generator and producing a second luminous flux; a polarizer placed immediately after the first and second light sources across said luminous fluxes passing therethrough; an elastic element sensitive to variations of mechanical stresses

therein caused by changes in the measurand and having two transparent parallel faces; said elastic element being placed downstream of said polarizer across said first and second luminous fluxes passing through said faces; an analyzer placed downstream of said elastic element across said first and second luminous fluxes passing therethrough; a first phase-shifting plate arranged between said polarizer and analyzer, only said first luminous flux passing therethrough; a second phase-shifting plate also arranged between said polarizer and analyzer and oriented in relation to the first phase-shifting plate so that its axis of maximum velocity of light propagation is perpendicular to that of the first phase-shifting plate, only said second luminous flux passing therethrough; a photocell placed



downstream of said analyzer across said first and second luminous fluxes, said first and second luminous fluxes being incident thereupon; said first and second light sources being connected to said first and second outputs of said square-pulse generator so that said photocell receives alternately either first luminous flux having passed through said polarizer, first phase-shifting plate, elastic element, and analyzer, or the second luminous flux having passed through said polarizer, second phase-shifting plate, elastic element, and analyzer; said photocell converting said first and second luminous fluxes incident thereupon into an electric signal; a recorder coupled to said photocell and receiving said electric signal, its readings being representative of the measurand.

4,010,633

## ANNULAR SEAL

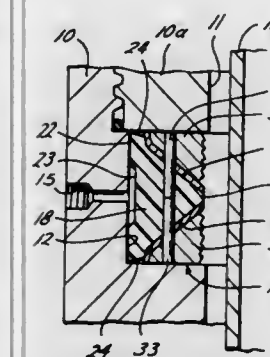
Malvern M. Hasha, 1527 Castlerock, Houston, Tex. 77090

Filed Nov. 17, 1975, Ser. No. 632,790

Int. Cl.<sup>2</sup> G01M 3/04

U.S. Cl. 73—46

2 Claims



1. In a testing apparatus for externally testing a portion of a tubular member, which testing apparatus has an opening longitudinally therethrough for receiving the tubular member and which testing apparatus has at least one annular groove therein in which is secured an annular seal for externally engaging the tubular member, an improved annular seal comprising:

an annular elastomer body having an inner surface for extending generally toward the tubular member to be sealingly engaged and an outer circumferential surface for receiving fluid pressure, said inner surface including two opposing sloping surfaces which taper inwardly to an interfacing surface which physically engages the tubular member when the elastomer body is moved radially inwardly, said annular elastomer body being capable of moving radially inwardly toward the tubular member

responsive to a selected fluid pressure being supplied to its outer circumferential surface and of moving radially outwardly from the tubular member to substantially its original position when the selected fluid pressure is no longer supplied to the outer circumferential surface;

a plurality of tapered segments associated with the inner surface of the annular elastomer body at selected spaced arcuate positions, each of such segments having a first arcuate surface for extending toward the tubular member to be sealingly engaged and having a second surface of preselected shape for extending toward and communicating with a corresponding one of the sloping surfaces of the inner surface of the annular elastomer body, each of such segments being positioned with respect to the elastomer body such that an annular space exists between the inner surface of the elastomer body and the second surface of the segment;

at least some of the segments including an arcuate flange secured to a portion of the second surface of the segment between the second surface of the segment and the first surface of the elastomer body, said arcuate flange extending beyond the segment to which it is secured and into the annular space between the inner surface of the elastomer body and the second surface of an adjacent segment;

whereby when the elastomer body moves radially inwardly toward the tubular member responsive to the selected fluid pressure being supplied to its outer circumferential surface, the segments and the flanges are likewise moved radially inwardly toward the tubular member and each segment as well as any flange secured thereto moves annularly relative to the other segments and flanges to provide a continuous reinforcing barrier for inhibiting undesirable extrusion of the annular elastomer body along the tubular member irrespective of the degree of closure of the annular seal and the co-acting first surfaces on the segments and the sloping portions of the inner surface on the elastomer body are disposed to apply force to the segments and urge the first surfaces of the segments into tighter frictional engagement with the tubular member upon continued application of pressure to the outer circumferential surface of the elastomer body after the interfacing surface of the elastomer body has engaged the tubular member.

4,010,634

## ULTRASONIC INSPECTION METHOD

Franz Baumgartner, Zipt, Austria, assignor to Kretztechnik Gesellschaft m.b.H., Zipt, Austria

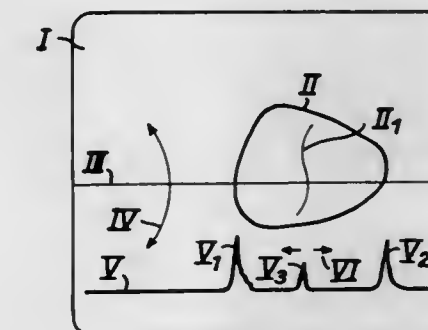
Filed Oct. 28, 1975, Ser. No. 626,066

Claims priority, application Austria, Nov. 6, 1974, 8911/74

Int. Cl.<sup>2</sup> G01N 29/00

U.S. Cl. 73—67.8 S

15 Claims



1. A method of inspecting a moving object, which comprises the steps of

1. transmitting an ultrasonic sound beam into the moving object and moving the sound beam in a scanning plane transversely to the axis of the sound beam, the scanning plane being defined by the moving sound beam axis and the sound beam being moved in the scanning plane at a velocity sufficient for an instantaneous B-scan display of the moving object,



2. displaying the B-scan on a display screen in response to echo pulses produced in the scanning plane by the ultrasonic sound beam in the moving object,
3. producing an adjustable trace line in the B-scan display at a location which corresponds to a predetermined position of the sound beam during the movement thereof in the scanning plane, and
4. selectively displaying on the display screen a display other than the B-scan display in response to echo pulses produced when the sound beam is in the predetermined position.

4,010,635

## SONIC INTERFERENCE SUPPRESSOR

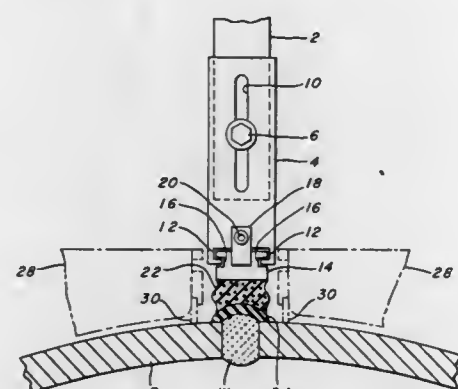
John A. Patsey, Penn Hills Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1976, Ser. No. 667,764

Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73—67.8 S

5 Claims



1. An apparatus for the ultrasonic inspection of a weld joining the edges of material, wherein ultrasonic energy is directed through a liquid couplant and the surface of the material near the weld, the improvement comprising support means mounted for relative movement with respect to the weld in the direction of the longitudinal axis of the weld surface, a layer of flexible wiping material attached to the supporting means and in sliding contact with the weld surface during inspection and a backing member of resilient material located between the layer of wiping material and the support means.

4,010,636

## VESSEL EXAMINATION SYSTEM

Jack Phillip Clark, Thurman Dale Smith, and Alan Carl Foster, all of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 540,607, Jan. 13, 1975. This application Feb. 23, 1976, Ser. No. 660,651

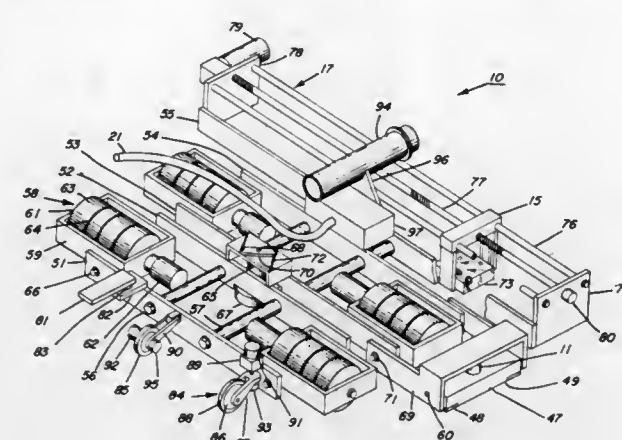
Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73—67.8 S

11 Claims

1. A magnetically adherent trackless vehicle adapted to be remotely propelled and steered over the surface of a magnetic body including curved surfaces thereof, comprising: a frame having a longitudinal axis; a pair of spaced wheels mounted to each of two opposite sides of said frame for supporting said vehicle on said surface, each of said wheels containing magnetic means in the form of permanent magnets for providing adherence of said vehicle to said vessel, each of said wheels being rotatably attached to one end of a suspension bracket extending generally laterally outward from said frame, the other end of said suspension bracket being pivotally attached to said frame whereby said wheels can maintain as flat a position as possible against said surface for increased adherence to

curved surfaces thereof; separate electric drive motors coupled to the wheels on said opposite sides of said frame, said



drive motors being separately and remotely energizable for propelling and steering said vehicle over said surface.

4,010,637

## MACHINE VIBRATION MONITOR AND METHOD

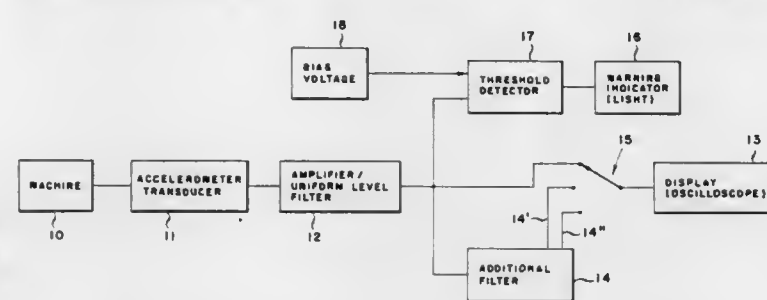
Malcolm J. Harwell, Crawfordville, Fla.; Joe A. McInturff, Marietta, and Herbert J. Rubel, Atlanta, both of Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Oct. 6, 1975, Ser. No. 620,016

Int. Cl.<sup>2</sup> G01P 15/00

U.S. Cl. 73—71.4

10 Claims



1. A monitor to measure the vibrating frequency of a machine caused by the unbalance of its internal rotors vibrating at several frequencies to determine in advance an approach of excessive vibration and an incipient failure of the machine comprising:

an accelerometer transducer connected to said machine to receive the total vibration thereof at all operating speeds and produce a single output signal;  
an amplifier and uniform level filter connected to said transducer to receive said output signal and raise it to a predetermined substantially constant level over the entire speed range of said machine, said filter having components selected to simultaneously compensate for both the frequency dependence of said signal and the variable displacement allowables of said rotors; and  
an oscilloscope adapted to be connected to said filter to receive and display said constant level signal whereby it may be compared with a pre-established reference level of safe operation of said machine.

4,010,638

## MASS AND FORCE METER

Mario Gallo, Zurich, Switzerland, assignor to Wirth Gallo and Company, Switzerland

Filed May 28, 1976, Ser. No. 691,094

Claims priority, application Switzerland, Feb. 9, 1976, 001577/76

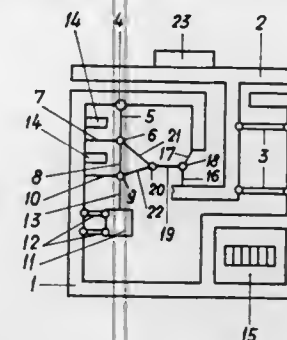
Int. Cl.<sup>2</sup> G01L 1/10

U.S. Cl. 73—141 R

2 Claims

1. A mass and force meter having a frame, a load support and a digital computing device, a first and second electrically excited, transversely vibrating string, first transmission ele-

ments transmitting the mass or force to be measured to said strings, second transmission elements transmitting a pre-loading force to said strings, so that the resultant frequency variations caused by the application of said mass or force are used in the computing and display device for computation of the magnitude of said mass or force, said first transmission elements having a first and a second branch, a first guide fixed to



the frame, said first string having one end fastened to said frame and the other end connected to one end of said second string, to said first guide and to said first branch of said first transmission elements, a second guide fixed to the frame, the other end of said second string being connected to said second guide, to said second transmission elements and to said second branch of said first transmission elements.

4,010,639

## MULTI PURPOSE TORQUE WRENCH

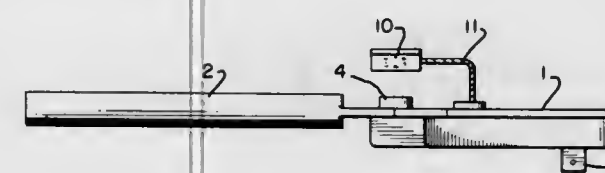
Delo Kwai Kum Chun, Mission Viejo, Calif., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 17, 1975, Ser. No. 641,569

Int. Cl.<sup>2</sup> B25B 23/14

U.S. Cl. 73—139

2 Claims



1. A torque wrench for off position use comprising: a wrench for rotating a fastener; a calibrated dial operatively associated with the wrench for measuring the torque required to rotate the fastener; an adjustably mounted mirror mounted on said wrench for reading said calibrated dial; and a mirror image scale in combination with a conventional image scale on said calibrated dial for facilitating the reading of measured torque in any use position.

4,010,640

## APPARATUS FOR MEASURING THE STIFFNESS CHARACTERISTIC OF STRUCTURAL ADHESIVES

Raymond Buchheimer Krieger, Jr., Abingdon, Md., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 16, 1975, Ser. No. 622,913

Int. Cl.<sup>2</sup> G01N 19/04; G01B 7/24

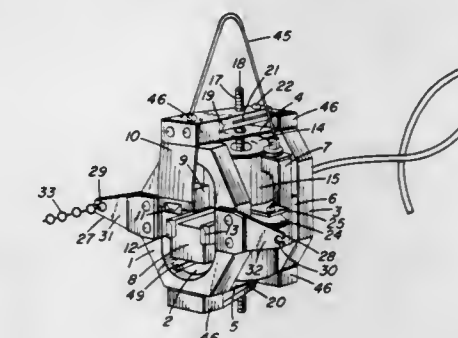
U.S. Cl. 73—150 A

10 Claims

1. An apparatus adapted to be used in conjunction with a second apparatus having the same structure but of a mirror image configuration for the measurement of the shear stiffness characteristic of structural adhesives so as to enable the accurate stress analysis of an adhesive bond comprising
- A. a first frame having an aperture therein,
  - B. a second frame,
  - C. a first plate spring fully fixed at one of its ends to the upper section of said first frame and at the other of its ends to the upper section of said second frame,
  - D. a second plate spring fully fixed at one of its ends to the

lower section of said first frame and at the other of its ends to the lower section of said second frame,

- E. a first supporting member on said second frame extending movably into said aperture,
- F. a second supporting member on said first frame comprising a third spring which is positioned above said first supporting member, pivotally rotates on an axis and is adjacent said aperture,
- G. a first sensor point fixedly mounted on said second supporting member within the confines of said aperture,
- H. second and third sensor points fixedly mounted on said first supporting member within the confines of said aperture,
- I. bracket means attached to said second frame,
- J. adjusting means attached to the top and bottom of said first frame,
- K. a linear, variable, differential transformer comprising a coil and a core, the coil of which is supported by said



bracket means and positioned within the space between said first and second frames and the core of which is affixed to said adjusting means and positioned within the hollow of said coil,

- L. first locking means adjacent said adjusting means and adapted to prevent accidental movement thereof,
- M. interactive, second locking means positioned adjacent to said first and second frames and adapted, when engaged, to minimize flexing of said first and second plate springs,
- N. mounting plate spring means affixed to the first frame at its middle, extending beyond the vertical edges of said first frame and having attaching means within the extending portions thereof,

said sensor points being positioned such that said first point is above said second and third points and moves pivotally around an imaginary line drawn parallel to said second and third sensor points, said second and third points are in the same horizontal plane with respect to said first frame, and the tips thereof touch substantially the same vertical plane.

4,010,641

## APPARATUS FOR MEASURING THE STIFFNESS CHARACTERISTIC OF STRUCTURAL ADHESIVES

Raymond Buchheimer Krieger, Jr., Abingdon, Md., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 16, 1975, Ser. No. 623,141

Int. Cl.<sup>2</sup> G01N 19/04; G01B 7/24

U.S. Cl. 73—150 A

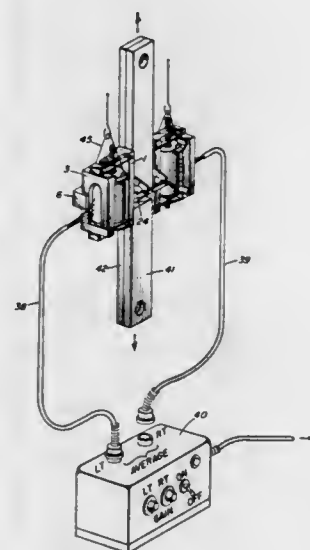
9 Claims

1. An apparatus adapted to be used in conjunction with a second apparatus having the same structure but of a mirror image configuration for the measurement of the shear stiffness characteristic of structural adhesives so as to enable the accurate stress analysis of an adhesive bond comprising

- A. a first frame having an aperture therein,
- B. a second frame,
- C. a first plate spring fully fixed at one of its ends to the upper section of said first frame and at the other of its ends to the upper section of said second frame,
- D. a second plate spring fully fixed at one of its ends to the lower section of said first frame and at the other of its ends to the lower section of said second frame,



- E. a supporting member on said second frame extending movably into said aperture,  
 F. a first sensor point fixedly mounted on said first frame within the confines of said aperture,  
 G. second and third sensor points fixedly mounted on said supporting member within the confines of said aperture,  
 H. bracket means attached to said second frame,  
 I. adjusting means attached to the top and bottom of said first frame,  
 J. a linear, variable, differential transformer comprising a coil and a core, the coil of which is supported by said bracket means and positioned within the space between said first and second plate springs and said first and second frames and the core of which is affixed to said adjusting means and positioned within the hollow of said coil,  
 K. first locking means adjacent said adjusting means and adapted to prevent accidental movement thereof,  
 L. interactive, second locking means positioned adjacent to said first and second frames and adapted, when engaged, to minimize flexing of said first and second plate springs,



- M. a mounting plate spring having an orifice therein commensurate in size with said aperture, being pivotably affixed at its middle to said first frame, extending beyond the vertical edges of said first frame and having attaching means within the extending portions thereof,  
 said sensor points being positioned such that said first and second points are in the same horizontal plane with respect to said first frame, said second and third sensor points are in the same vertical plane with respect to said first frame, said third sensor point is below said second sensor point and the tips of all three sensor points touch substantially the same perpendicular plane and said mounting plate spring being positioned such that the intersection made by a first imaginary line drawn between said attaching means and a second imaginary line drawn through the point of affixation thereof parallel to said second and third sensor points and perpendicular to said first imaginary line falls within the upper portion of the triangle formed by a third imaginary line connecting said three sensor tips and is pivotal only about an axis represented by said second imaginary line.

4,010,642

## BOREHOLE PRESSURE MEASUREMENT

Billy W. McArthur, Wallis, Tex., assignor to Sperry-Sun, Inc., Sugar Land, Tex.

Continuation-in-part of Ser. No. 467,349, May 6, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 606,911  
 Int. Cl.<sup>2</sup> E21B 47/04

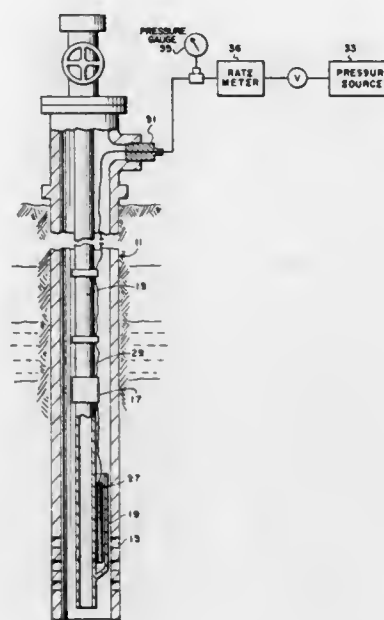
U.S. Cl. 73-151

22 Claims

1. Pressure measuring apparatus for extended, continuous

use in boreholes in which the pressure is greater than the normal hydrostatic pressure, comprising:

- a source of a pressurized test fluid at the surface for initially charging the apparatus;  
 a tube connected to the fluid source and extending into the borehole to a location where pressure is to be measured;  
 a chamber having a volume substantially larger than that of the tube and the ratio of which to the volume of the tube is at least equal to the ratio of the difference between the



maximum and minimum anticipated pressures in the borehole to the minimum anticipated pressure, said chamber being connected on its upper side to the tube and having on its lower side ports open to the borehole environment, said chamber thus being sized to prevent borehole fluids and debris from being forced into surface apparatus and to allow pressure measurement despite pressure fluctuations; and means at the surface for measuring the pressure of the test fluid.

4,010,643

## MEASURING DEVICE FOR TAPPING APPARATUS FOR FOAM-FORMING BEVERAGES

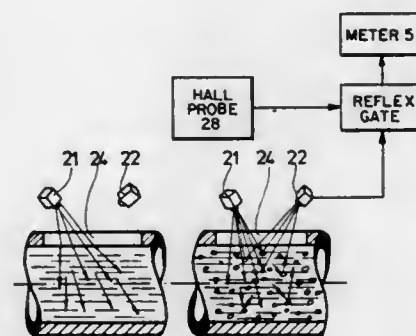
Istvan Dekan, Antonius-Kirchplatz 10, 44 Munster, Germany  
 Filed Jan. 17, 1975, Ser. No. 541,984

Claims priority, application Germany, Jan. 24, 1975, 2439789

Int. Cl.<sup>2</sup> G01F 5/00

U.S. Cl. 73-194 R

8 Claims



1. Measuring device for beverage-tapping apparatus having a feed line from a source of supply of the beverage and connected to said feed line, a measuring chamber, a volume measuring device with a meter connected thereto, and a valve and valve outlet downstream of the measuring chamber, light sensing means positioned upstream of the measuring chamber

adapted to distinguish foam from compact liquid, said volume measuring device having at least one rotating means which revolves proportionately to the beverage flow, said rotating means acting on impulse sender means which sends at least one impulse to electronic gate means with each rotation, said gate means being adapted to also receive a signal from the sensing means and then act upon said meter with impulses to be counted only when compact liquid is present.

4,010,644

## METHOD FOR COMPENSATION OF THE ELECTROCHEMICAL PERTURBING DIRECT CURRENT POTENTIAL IN INDUCTIVE FLOW MEASUREMENT WITH A PERIODICALLY SWITCHED UNIFORM FIELD

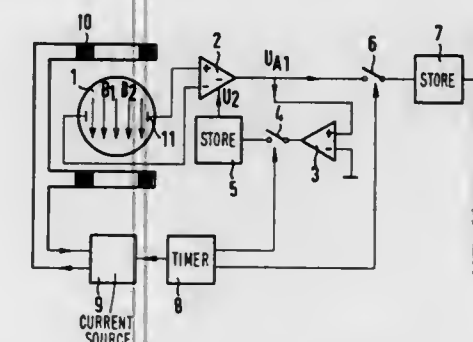
Karl Walter Bonfig, Bochum-Stiepel; Friedrich Hofmann, Duisburg-Grossenbaum; Wolfgang Stelz, Oberhausen, all of Germany, and Ronald van der Pol, Venlo, Netherlands, assignors to Ludwig Krohne K.G., Duisberg, Germany  
 Filed Feb. 28, 1975, Ser. No. 554,005

Claims priority, application Germany, Mar. 5, 1974, 2410407

Int. Cl.<sup>2</sup> G01F 1/58

U.S. Cl. 73-194 EM

12 Claims



1. Method of compensating for a perturbing electrochemical potential present at the electrodes in inductive measurement of fluid flow using a uniform field switched back and forth between two values of induction wherein a required voltage indicative of the fluid flow rate is combined with the electrochemical potential present to form a total signal which is processed by a signal processing chain, said method comprising the steps of:

summing and regulating to zero the total signal of the required voltage and perturbing potential at a first value of the said two values of induction, at the output of a measuring amplifier by applying a corresponding compensating magnitude to a suitable point in the signal processing chain, and

compensating the perturbing potential contained in the total signal from the second of said two induction values, by said magnitude

4,010,645

## DENSITY-RESPONSIVE MASS FLOW VORTEX TYPE METER

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Mar. 19, 1976, Ser. No. 668,457

Int. Cl.<sup>2</sup> G01F 1/32

U.S. Cl. 73-194 B

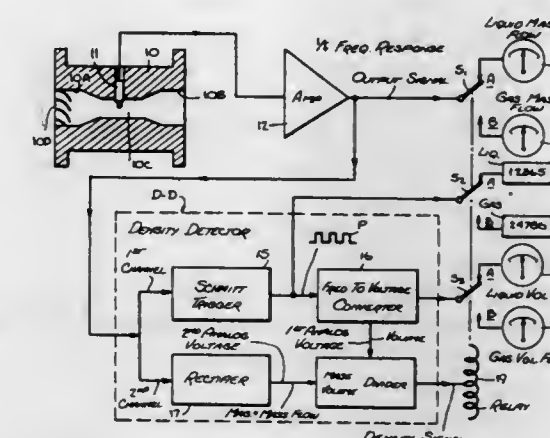
8 Claims

1. A system for measuring a fluid stream wherein gas is interspersed with oil to provide separate mass flow readings of gas and oil, said system comprising:

- A. a vortex meter having a flow tube through which the stream is conducted to produce an output signal whose frequency depends on the volumetric flow and whose amplitude depends on the mass flow of the stream;  
 B. a liquid-mass flow indicator;  
 C. a gas-mass flow indicator;  
 D. a density detector responsive to the frequency of said

output signal which varies as a function of volumetric flow and to the amplitude of said output signal which varies as a function of mass flow to produce a density signal whose level depends on whether there is gas or oil passing through the meter; and

- E. switching means controlled by said density signal to



direct said output signal from said meter to said liquid-mass flow indicator which is responsive to the amplitude thereof to provide a reading of the mass of liquid in said fluid stream or to said gas-mass flow indicator which is responsive to the amplitude thereof to provide a reading of the mass of gas in said fluid stream, whichever indicator is appropriate to the fluid passing through the meter.

4,010,646

## BAROMETRIC NON-LINEAR ALTITUDE COMPENSATOR MEANS

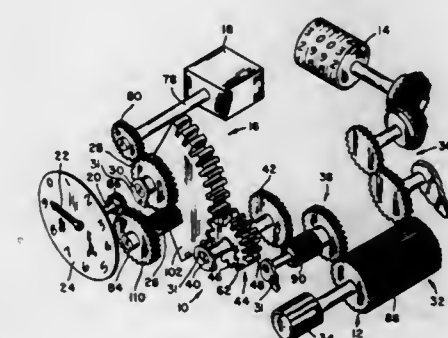
Donald P. Muhs, Davenport, Iowa, assignor to The Bendix Corporation, South Bend, Ind.

Filed Dec. 15, 1975, Ser. No. 640,522

Int. Cl.<sup>2</sup> G01L 7/12

U.S. Cl. 73-387

9 Claims



1. A barometric pressure correction mechanism for providing an altimeter indicating means with a rotative torque to compensate for the non-linear relationship between barometric pressure and pressure altitude, said correction mechanism comprising:

- a housing;  
 first shaft means fixed in said housing and responsive to rotative input torque;  
 first gear means located on said first shaft means having a first plurality of teeth thereon, each of said first plurality of teeth having a corresponding uniform thickness and pitch;  
 second gear means having a second plurality of teeth thereon each of which has a uniform thickness and pitch, said second gear means having a central opening eccentric to said axial center of the peripheral surface of said second plurality of teeth;  
 second shaft means fixed in said housing and extending through said central opening of the second gear means for



aligning said second plurality of teeth with said first plurality of teeth on the first gear means;  
 third gear means located on said second gear means, said third gear means having a third plurality of teeth thereon which drive a pointer associated with the indicator means to provide the altimeter indicating means with an operational input, said eccentric central opening in the second gear means causing the pressure angle of engagement between said first teeth and said second teeth to continually change during rotation whereby said second gear means rotates through an arcuate length for each tooth engagement equal to the tooth space plus a function of the arcuate length modified by the eccentricity of the opening in the second gear means with respect to each tooth to provide the third gear means with a non-linear rotational torque;  
 fourth gear means secured to said first shaft having a fourth plurality of teeth thereon with a uniform thickness and pitch identical to said first plurality of teeth on the first gear means; and  
 a spring connecting the first gear means with the fourth gear means to bias a tooth on the first plurality of teeth and a tooth on the fourth plurality of teeth into continual engagement with a tooth on the second plurality of teeth.

4,010,647

## SAMPLING METHOD AND APPARATUS

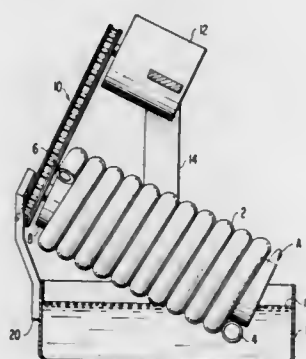
Fred N. Kissell, and Robert P. Vinson, both of Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 24, 1975, Ser. No. 644,265

Int. Cl.<sup>2</sup> G01N 1/22

U.S. Cl. 73—421.5 R

10 Claims



1. The method of obtaining a series of fluid samples which comprises rotating a helical tube means about its helical axis while passing an open end thereof successively through first and second fluids of respectively different densities and thereby screwing a plurality of slugs of the first fluid separated from one another by slugs of the second fluid into the tube along the length thereof, and then withdrawing samples by inserting a hypodermic needle through the tube means wall.

4,010,648

## ADAPTER UNIT FOR USE IN SAMPLING FLUID SPECIMENS

Rano J. Harris, Sr., 1945 Carolyn Sue Drive, Baton Rouge, La. 70815, and Julius P. Averette, Jr., 4332 Delaware St., Baton Rouge, La. 70805

Filed Oct. 1, 1975, Ser. No. 618,373

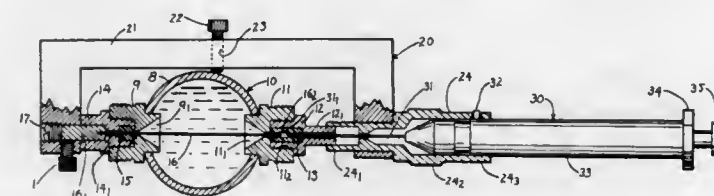
Int. Cl.<sup>2</sup> G01N 1/14

U.S. Cl. 73—423 R

10 Claims

1. An adapter unit for the receipt and containment of a fluid specimen sampled from a source at sub-atmospheric or supra-atmospheric pressure, useful in facilitating transfer of the fluid specimen from said adapter unit to apparatus comprising a valved needle syringe, which adapter unit comprises:

a tubular member formed by a wall which surrounds a void within which fluid can be contained, the wall of which is fitted with oppositely disposed tubular seals, each of which contains an axial opening therethrough, and through the axial openings in at least one of which is mounted a reciprocable plunger,  
 a C-shaped frame one end of which can be secured to a side of the reciprocable plunger mounted within the tubular seals of the tubular member, and the other end of which is provided with a holder within which the needle syringe can be placed, and held such that the needle portion thereof can be partially inserted into the axial opening of



a seal adjacent the non-secured end of the reciprocable plunger of the tubular member which also lies therein, means for receipt of a fluid specimen from the source, and means for containing the fluid specimen within the void of said tubular member, whereby movement of the C-frame will shift the plunger and holder in unison such that the plunger will be moved from the axial opening of one of the seals by the needle portion of the syringe, immersed within the fluid specimen of the tubular member, whereupon a fluid specimen at source pressure can be withdrawn, locked and stored within the syringe for subsequent injection.

4,010,649

## MOLTEN METAL SAMPLERS WITH FLOW DIVERTER

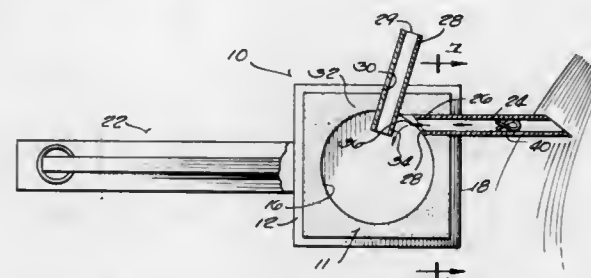
Richard A. Falk, 519 Westminster Drive, Waukesha, Wis. 53186

Filed Nov. 10, 1975, Ser. No. 630,467

Int. Cl.<sup>2</sup> G01N 1/12

U.S. Cl. 73—425.4 R

9 Claims



1. A molten metal sampler comprising wall means defining a mold cavity for forming a sample, wall means defining a sample entry passage having an inlet for receiving molten metal and an outlet communicating with said mold cavity and providing a linear flow path of metal into said cavity, flow diverter means on said wall means defining said mold cavity and located in said mold cavity and positioned in said mold cavity to divert the flow of molten metal within said mold cavity from said linear flow path to afford thorough mixing of the deoxidant and provide a uniform sample free of structural voids.

4,010,650

## APPARATUS FOR GENERATING AN ELECTRICAL SIGNAL INDICATIVE OF LIQUID LEVEL

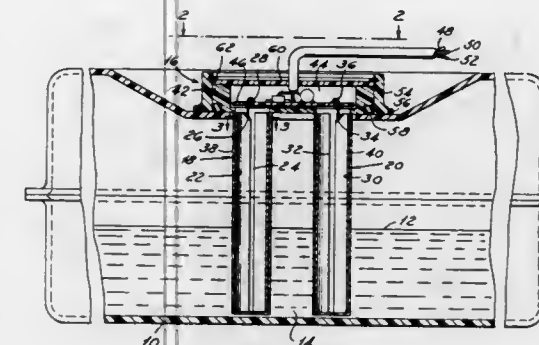
Philip Piatkowski, Jr., Fraser, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1974, Ser. No. 536,663

Int. Cl.<sup>2</sup> G01F 23/26

U.S. Cl. 73—304 C

2 Claims



1. Apparatus for generating an electrical signal indicative of the level of a liquid stored in a reservoir, said apparatus comprising:

first and second probes spaced from one another and extending into said reservoir, said liquid stored in said reservoir contacting said probes, the area of contact between said probes and said liquid varying in proportion to the level of said liquid in said reservoir, each of said probes comprising a metal electrode and a dielectric material covering said electrode over said area of contact between said probe and said liquid, said dielectric material having an electrical conductivity substantially less than that of said liquid, said probes, when in contact with said liquid, forming two series-connected capacitors having said liquid as a common plate of said two capacitors;  
 circuit means for applying a constant amplitude alternating voltage across said electrodes, said alternating voltage having a frequency which produces an impedance of said series-connected capacitors having a reactive component at least about five times greater than the resistive component thereof; and  
 circuit means for generating an electrical signal proportional to the impedance between said electrodes, said electrical signal being indicative of the level of said liquid stored in said reservoir.

4,010,651

## TWO-STAGE WHEEL BALANCER

Wallace F. Mitchell, Mettawa, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed July 28, 1975, Ser. No. 599,826

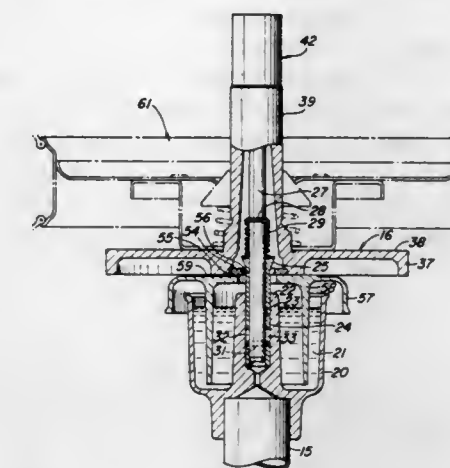
Int. Cl.<sup>2</sup> G01M 1/12

U.S. Cl. 73—483

6 Claims

1. Apparatus for balancing a rotor, comprising a base,  
 a rotor support having an annular planar rotor support surface and an upstanding central tubular section,  
 means for indicating the angular position of said rotor support surface relative to the horizontal plane,  
 a rigid tubular member extending upwardly from said base into said tubular section of said rotor support,  
 a rod mounted in said tubular member for coaxial sliding movement therein,  
 means for pivotally supporting said rotor support on the upper end of said rod,  
 a downwardly facing frusto-conical external annular shoulder on said tubular member,  
 an upwardly facing complimentary frusto-conical internal annular surface disposed on said rotor support below said annular shoulder and surrounding said tubular member, and

spring means compressed between said rod and said tubular member for urging said annular surface into facial en-



gagement with said annular shoulder to lock said rotor support to said base with said planar rotor support surface lying perpendicular to the longitudinal axis of said rod.

4,010,652

## ACTUATOR FOR PUSHBUTTON TUNER

Yoshihiro Sugimoto, and Tsunefusa Suzuki, both of Tokyo, Japan, assignors to Nihon Technical Kabushiki Kaisha, Japan

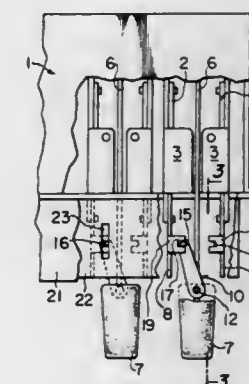
Filed May 15, 1975, Ser. No. 577,766

Claims priority, application Japan, May 20, 1974, 49-56374[U]

Int. Cl.<sup>2</sup> F16H 35/18

U.S. Cl. 74—10.33

2 Claims



1. Tuner actuator mechanism comprising, a plurality of parallel pushbutton slides movable axially between an inoperative position and an operative position, for each pushbutton slide a pair of tuning slides connectable operatively with a common slide therebetween and parallel thereto, for each pushbutton slide an interconnecting member for operatively connecting a corresponding pushbutton slide alternatively with either one of the tuning slides associated therewith and for maintaining the operative connection so that a selected tuning slide can be moved between its inoperative position and its operative position as the pushbutton slide is actuated, shift means for moving each interconnecting member alternatively to a pair of operational positions in order to release an operative connection between a pushbutton slide and a selected tuning slide and to operatively connect the pushbutton slide with the other tuning slide associated therewith, said interconnecting member comprising a single-piece member having a flat body portion with one end pivotally connected with the corresponding pushbutton and an upwardly inclined cam portion as an extension of said body portion terminating in a pin in a plane substantially normal to said flat body portion at a free end of said interconnecting member, said shaft means having individual slots in which individual pins of corresponding interconnecting members are received for actuating of the interconnecting members to said pair of operational



positions thereof, each pair of said tuning slides having opposed notches on opposite sides of the corresponding common pushbutton slide and interconnecting member for alternately receiving the corresponding cam portion thereof for effecting an operative connection between the pair of tuning slides and the corresponding associated pushbutton slide, and said notches each having parallel side edges engaging the inclined cam portion on opposite sides thereof for applying a downward component of force on said inclined cam and corresponding tuning slide when the corresponding pushbutton is actuated to said operative position.

4,010,653

## OVERDRIVE MECHANISM

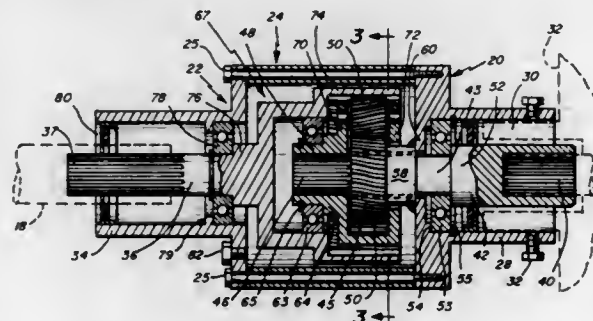
John Mekjian, Watertown, Mass., assignor to Jack Katz, Newton, Mass., a part interest

Filed May 27, 1975, Ser. No. 580,612

Int. Cl.<sup>2</sup> F16H 3/44

U.S. Cl. 74—781 R

7 Claims



1. An overdrive mechanism for coupling between the output transmission shaft and the drive shaft of a motor vehicle comprising:

means defining a housing provided in at least two sections and having means defining an input end and means defining an output end,

means for securing the sections of the housing together to form a unitary housing,

an input shaft driveable from the transmission shaft,

bearing means for supporting the input shaft at the input end of the housing,

an output shaft for coupling to the drive shaft,

bearing means for supporting the output shaft at the output end of the housing,

a sun gear disposed in the housing and having means for securing the sun gear in a non-rotatable position,

a plurality of pinion gears,

means for commonly supporting the pinion gears in spaced relative relationship and intermeshed with the sun gear,

means securing the input shaft to the means for commonly supporting for driving the later when the input shaft is driven,

an integrally toothed ring gear,

means for supporting the ring gear with its teeth intermeshed with said pinion gears,

and means securing the ring gear to the output shaft whereby the output shaft is driven from the ring gear,

said sun gear having a passage therethrough for receiving the input shaft which is supported by the input shaft bearing means on one side of the sun gear extends through the sun gear and connects to the common support means on the other side of the sun gear,

said sun gear having a gear section and a collar extending axially therefrom,

said housing having a wall extending normal to the axis of the sun gear and input shaft and defining an aperture of a diameter large enough to accommodate the input shaft but smaller than the diameter of the collar of the sun gear,

said collar contacting the normal wall of the housing about a circular locus and being secured thereto by a weld between the collar and the normal wall.

# 4,010,654 VARIABLE PULLEY PART FOR A DRIVE ACTING THROUGH A TENSION MEDIUM STRAND, SUCH AS A V-BELT

Paul Maucher, Sasbach, and Karl Keck, Achern, both of Germany, assignors to LuK Lamellen und Kupplungsbau GmbH, Buhl, Germany

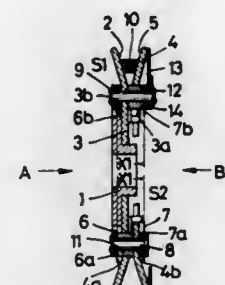
Filed Dec. 15, 1975, Ser. No. 640,650

Claims priority, application Germany, Dec. 14, 1974, 2459258

Int. Cl.<sup>2</sup> F16H 55/52

U.S. Cl. 74—230.17 C

32 Claims



1. Variable pulley for a drive acting through a tension medium strand comprising two pulley parts, at least one of which is displaceable in axial direction relative to the other, each of said pulley parts having a running surface for a tension medium strand, at least one of said pulley parts being mounted on a shaft-like member, at least two systems having means mutually connecting said pulley parts to one another, said at least two systems being axially spaced from one another and affording axial displacement of said at least one pulley part, said systems, on the one hand, being firmly linked to said at least one pulley part and, on the other hand, having means for linking said systems to a part of a drive which is to act through a tension medium strand, said systems being synchronously and concentrically rotatable with the part of the drive.

# 4,010,655 DRIVE BELTING AND DRIVE BELTS MANUFACTURED THEREFROM

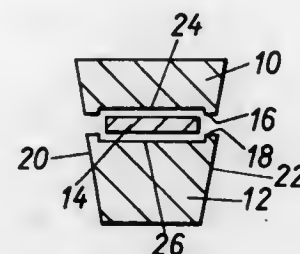
Ernest Pollard, Bank House, Harden, Bingley, Yorkshire, England

Filed Jan. 19, 1976, Ser. No. 649,947

Int. Cl.<sup>2</sup> F16G 1/00, 5/00, 9/00

U.S. Cl. 74—231 P

7 Claims



1. Drive belting comprising at least one elongate polyurethane body element and at least one elongate constraining element of woven tape, the warp threads of said woven tape constraining element having a higher modulus of elasticity than the body element, being resistant to heat shrinkage, and extending throughout the length of the body element but totally enveloped in the body element to resist extension of the body element.

# 4,010,656 POWER TRANSMISSION DRIVE

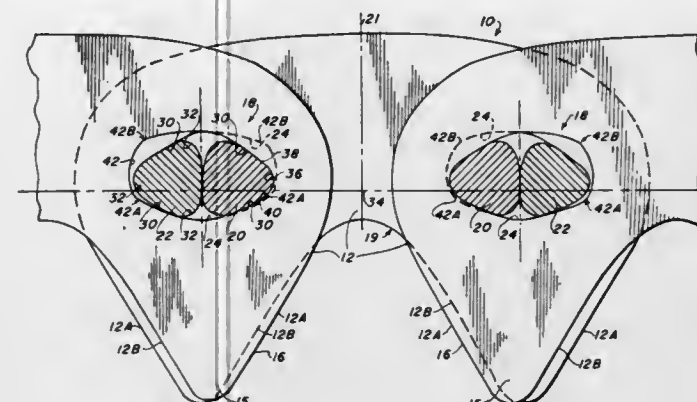
Joseph O. Jeffrey, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 7, 1974, Ser. No. 440,440

Int. Cl.<sup>2</sup> F16G 15/00, 15/12

U.S. Cl. 74—245 S

37 Claims



1. A power transmission chain of the type adapted to cooperatively engage driving means on a rotating member comprising:

a series of overlapping and interlaced sets of links having aligned apertures formed therethrough; and pivot means positioned apertures forming said chain with articulating joints;

said pivot means comprising a pin and a rocker each of which is generally three lobed and generally trilateral in cross-section with three major surfaces, the adjacent ones of which are connected and with at least one of said pin and rocker having an arcuate major surface in rocking engagement with an adjacent major surface of the other.

# 4,010,657 BUTTERFLY FOOT PEDAL CONTROL

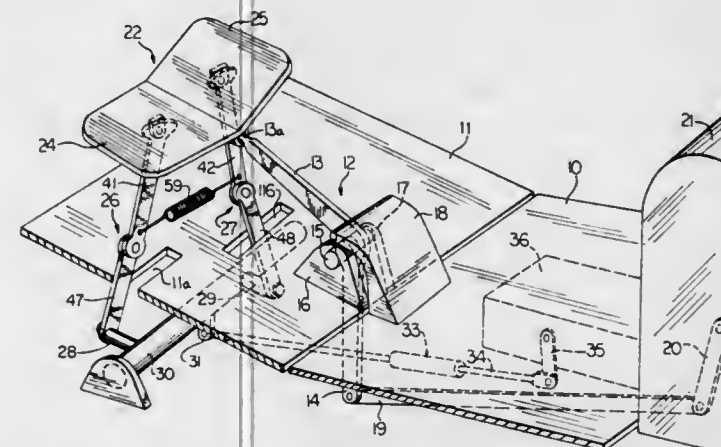
John K. Amdall, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 21, 1975, Ser. No. 634,019

Int. Cl.<sup>2</sup> G05G 9/04, 1/14

U.S. Cl. 74—478

6 Claims



1. A multifunction control pedal and linkage arrangement comprising:

a first lever mounted for pivotal movement about a pivot point and including one end for pivotally supporting a rocker pedal and another end for transmitting motion to an engine throttle linkage;

a rocker pedal pivotally mounted on said one end of said first lever for rocking movement about an axis transverse to the pivot axis of said first lever;

a rocking member mounted for rocking movement about an axis parallel to the pivot axis of said first lever and having an arm extending from each side of the axis thereof; first linkage means having a locked position and a collapsed

position connecting said pedal at one side of the pivot axis of said pedal to one arm of said rocking member; and, second linkage means having a locked position and a collapsed position connecting said pedal at the other side of said axis to the other of said arms, the connection of said first and said second linkage between said pedal and said rocking member being such that said linkages are locked when said pedal is in a centered position and when said pedal is rocked, one side or the other, about the axis thereof one of said linkages is collapsed and the other is locked for transmitting motion to said rocking member.

# 4,010,658 STEERING WHEEL HAVING FLEXIBLE RIM

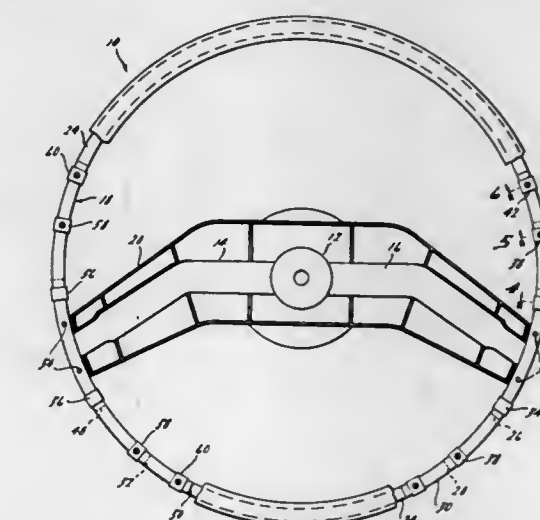
George H. Muller, Ann Arbor, and Lloyd R. Vivian, Jr., Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,644

Int. Cl.<sup>2</sup> B62D 1/04; G05G 1/10

U.S. Cl. 74—552

8 Claims



1. A steering wheel for a motor vehicle having a hub, a spoke connected to said hub and rim means connected to said spoke;

said rim means comprising a circular leaf spring core member;

at least one arcuate leaf spring member positioned with its midportion adjacent the end of said spoke;

securing means securing said core member and said arcuate member to the end of said spoke;

said rim means being resiliently deflectable under an impact load imposed upon said rim means in a direction parallel to the axis of rotation of said wheel and said rim means being substantially rigid against deflection with respect to a force imposed upon said rim means in a plane perpendicular to the axis of said wheel.

# 4,010,659 STEERING WHEEL HAVING HELICAL RIM CORE

George H. Muller, Ann Arbor, and Warren A. VanWicklin, Jr., Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,411

Int. Cl.<sup>2</sup> B62D 1/04; G05G 1/10

U.S. Cl. 74—552

7 Claims

1. A steering wheel for a motor vehicle having a hub, a rim core and a spoke interconnecting said hub and rim core;

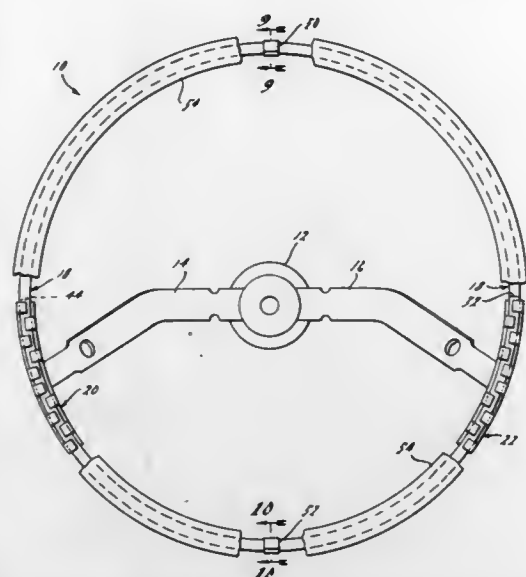
said rim core comprising a one-piece spring metal helix;

a center of said helix lying on the axis of rotation of said steering wheel;

said rim core being resiliently deformable in response to an impact load imposed upon said core in a direction parallel to the axis of said steering wheel;



said rim core being constructed to be substantially rigid with



respect to a tangential force applied by a vehicle operator to said rim core for the purpose of turning said vehicle.

4,010,660

### TRANSMISSION INCLUDING A HYDRODYNAMIC TORQUE CONVERTER

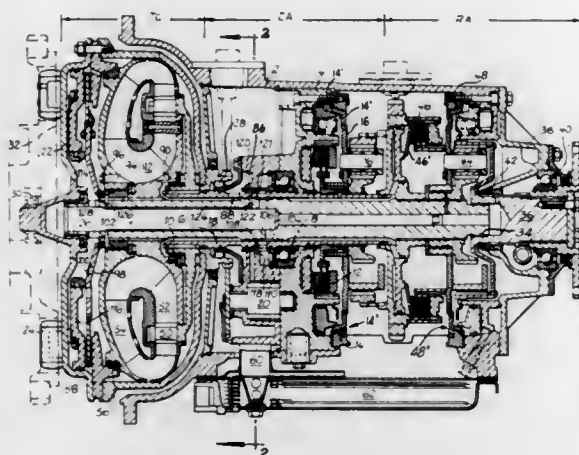
Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm-Vallingby, Sweden  
Filed Feb. 12, 1975, Ser. No. 549,449

Claims priority, application United Kingdom, Feb. 14, 1974, 6856/74

Int. Cl.<sup>2</sup> F16H 47/08

U.S. Cl. 74—688

16 Claims



1. A transmission comprising:

- a stationary housing,
- a torque converter having a rotatable casing forming therein a working chamber which includes therein at least one ring of pump blades adapted to be driven by the rotatable casing, at least one ring of guide blades, and at least one ring of turbine blades, turbine shaft adapted to be drivingly engaged by the ring of turbine blades,
- a guide ring shaft extending axially from said guide ring, a brake operatively engagable with said guide ring shaft for holding the guide ring fixed with respect to said stationary housing,
- a central assembly block surrounding said guide ring shaft and secured to the stationary housing, said brake being mounted in said central assembly block,
- and journal means which comprises the major radial journal of the guide ring shaft, and hence also of the guide ring, constituted by a journal bearing which journals the guide ring shaft in the central assembly block, said journal means also including means for axially journalling the guide vane shaft in the central assembly block, and in-

cluding axial thrust bearings between the guide ring and the other said bladed rings of the torque converter.

4,010,661

### CHAIN SAW SHARPENING TOOL

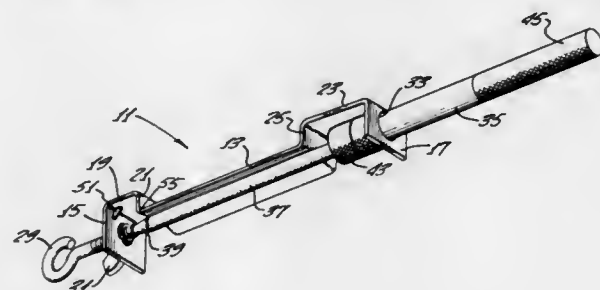
J. Lawrence Fletcher, Santa Ana, Calif., assignor to Fletcher Engineering, Inc., Westminster, Calif.

Continuation-in-part of Ser. No. 522,339, Nov. 11, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 607,049

Int. Cl.<sup>2</sup> B23D 63/16; G01B 5/14

U.S. Cl. 76—36

16 Claims



14. A guide for supporting a cylindrical file for sharpening a chain saw blade, said blade having teeth which include a cutting toe spaced from a depth gage, comprising:

- a beam having a first and second pair of adjacent surfaces, each of said surfaces forming a plane extending in a direction normal to the axis of said beam, each of said pairs of surfaces including a first surface for resting flat on said cutting toe and a second surface for simultaneously resting on said depth gage, said surfaces positioned such that, when the first surface of one of said surface pairs rests on said cutting toe, the second surface of the other of said surface pairs rests on said depth gage if said depth gage is properly calibrated; and
- means for supporting said file on said beam parallel to the axis of said beam and within said notch.

4,010,662

### FLEXIBLE STRAP WRENCH

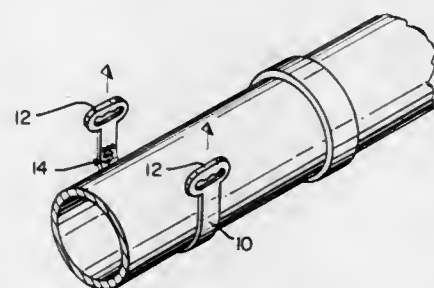
Robert Thomas Perrault, Rockaway, N.J., assignor to R. Thomas Perrault, Rockaway, N.J.

Filed Aug. 28, 1975, Ser. No. 608,781

Int. Cl.<sup>2</sup> B25B 13/52

U.S. Cl. 81—64

8 Claims



1. A flexible strap wrench comprising an elongated substantially rectangularly shaped strip of material, said material having two distal end portions having handle means unitary therewith and at least two surfaces, a plurality of raised ribs dispersed substantially about at least one surface of said material adapted to frictionally engage a workpiece, each of said ribs being cone shaped and including a plurality of annular rings therearound.

4,010,663

### MULTIPLE HAND TOOL

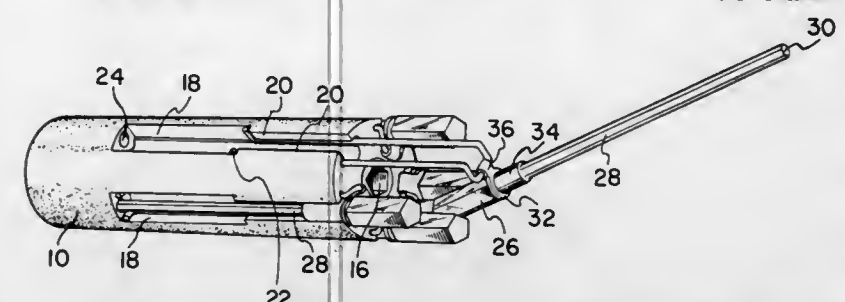
Allan Rydberg, 76 Chapman Ave., Warwick, R.I. 02886

Filed Apr. 28, 1976, Ser. No. 681,130

Int. Cl.<sup>2</sup> B25B 13/48

U.S. Cl. 81—71

10 Claims



1. A multiple hand tool comprising a cylindrical handle, a socket member mounted axially in said handle and having a central axial opening, a plurality of circumferentially spaced grooves in said handle extending rearwardly from the front end, a plurality of hand tools mounted in said grooves, each of said hand tools comprising a base portion adapted to fit into said socket opening, an integral elongated shank extending from said base, the outer end of said shank forming the hand tool, a U-shaped wire supporting member having a short central portion and spaced parallel arms extending integrally at right angles from said central portion, said tool base portion being pivotally mounted on said central portion, said wire arms being slidably mounted in said groove to mount a tool in said groove, whereby said tool can be pivoted to nest in its groove and pivoted outwardly in alignment with said socket opening, said wire arms permitting sliding movement to nest said base in said opening.

4,010,664

### BIAS PLY CUTTER FEED APPARATUS

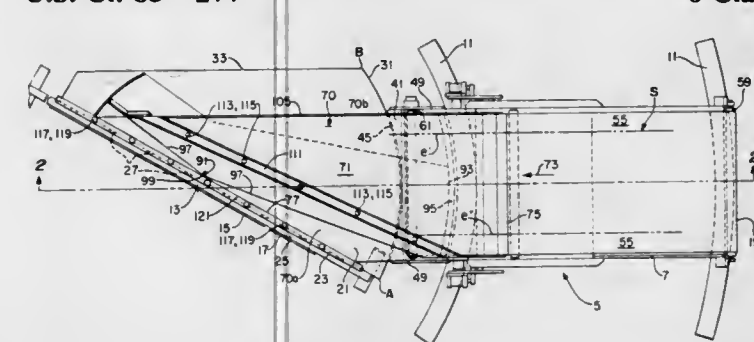
Richard P. Marshall, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 19, 1976, Ser. No. 668,551

Int. Cl.<sup>2</sup> B26D 5/20, 7/06

U.S. Cl. 83—277

6 Claims



1. In apparatus including a bias-ply cutter for bias-cutting tire ply stock along a shear line at a preselected bias angle with respect to the lengthwise direction of the stock, and stock feed mechanism for advancing a predetermined length of stock beyond the shear line from a supply of such stock, said feed mechanism being mounted movably to provide for changing the selected bias angle;

the improvement in said feed mechanism comprising the combination and arrangement of a first plate having a straight line edge fixed adjacent and parallel to the shear line and an arcuate edge;

a second plate coplanar with the first plate having a conjugate edge closely opposed to the arcuate edge of the planar plate and mounted for pivotal movement about an axis normal to the shear line;

a feed pan having a smooth continuous flat top surface extending perpendicularly of said direction beyond the respective longitudinal edges of said stock and extending parallel to said direction to a rear edge normal to said direction and to a forward edge line oblique to said direction, said pan being slidable over the first and second plates parallel to said direction;

means for clamping said stock to said pan, and means for moving said pan a preset distance forwardly toward said shear line.

4,010,665

### MOBILE SAW BENCH FOR FARM USE AND THE LIKE

Archibald Watson Kidd, Seend Close, Seend, Melksham, Wiltshire, England

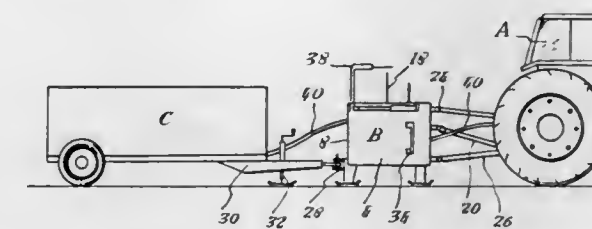
Filed Dec. 2, 1974, Ser. No. 528,898

Claims priority, application United Kingdom, Dec. 10, 1973, 57050/73

Int. Cl.<sup>2</sup> B27B 5/10

U.S. Cl. 83—477.2

8 Claims



1. Equipment for sawing and transporting wood comprising a train of machines, said train comprising a tractor, a saw bench and a trailer connected one to the next in that order, said saw bench having feet firmly engaging the ground in its lowered position, at which position its upper surface is in position to receive a piece of wood for cutting thereof, said tractor having raising means including a three point linkage connecting the tractor to the front of said saw bench for raising said saw bench above the ground and lowering it to the ground while the trailer is connected to the rear of the saw bench with its wheels engaging the ground such that the train can move with the saw bench and hence also the saw bench feet in a raised position between the tractor and trailer.

4,010,666

### PERFORATING BLADE

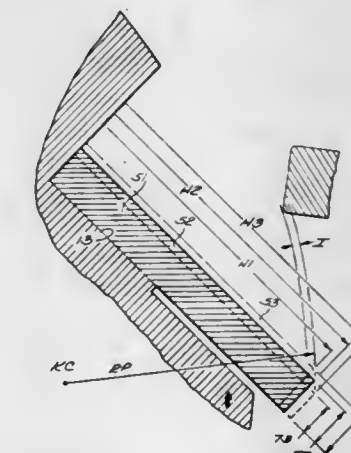
Christopher F. Masters, 2525 S. Shore Drive, Milwaukee, Wis. 53207

Division of Ser. No. 512,839, Oct. 4, 1974, Pat. No. 3,973,452, which is a continuation-in-part of Ser. No. 317,838, Dec. 22, 1972, abandoned. This application Jan. 9, 1976, Ser. No. 647,835

Int. Cl.<sup>2</sup> B26D 1/38

U.S. Cl. 83—678

4 Claims



1. In a knife roll for use in web perforating apparatus, said knife roll including at least two recesses for mounting perforating blades around its periphery, said recesses having surfaces for mounting perforating blades at a common angle greater than 0° but less than 90° with a radial line, and wherein said recesses are formed from intersecting surfaces on the knife roll with the intersections of said recesses being at a common distance from the axis of said roll, the improvement



comprising a plurality of perforating blades loaded in said knife roll recesses, at least one of said blades having a different thickness than the remainder of said blades and in which all blades project from said knife roll face a common distance.

4,010,667

# RHYTHM UNIT WITH PROGRAMMED ENVELOPE WAVEFORM, AMPLITUDE, AND THE LIKE

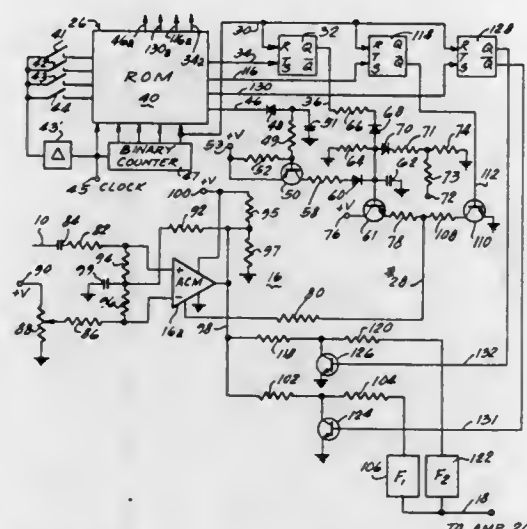
Alberto E. Kniepkamp, 31 N. Prindle, Arlington Heights, Ill. 60004

Continuation of Ser. No. 389,342, Aug. 17, 1973, abandoned. This application Aug. 28, 1975, Ser. No. 608,624

Int. Cl.<sup>2</sup> G10F 1/00

U.S. Cl. 84—1.03

22 Claims



20. An electronic musical instrument comprising:
  - a. a sound output system including an amplifier and a loudspeaker,
  - b. rhythm generator means for producing a series of pulses at times related to each other so as to form rhythm patterns.
  - c. a tone signal source,
  - d. modulator means connected with said tone signal source for modulating said tone signal in response to some of the pulses produced by said rhythm generator means,
  - e. connecting means for connecting said modulator means with said amplifier,
  - f. bi-stable means connected to said rhythm generator for receiving certain ones of said pulses and for changing its state in response to alternate ones of said pulses which are received, and
  - g. control means connected to said bi-stable means and to said modulator means for controlling the amplitude of at least a part of said modulated tone signal in response to the state of said bi-stable device.

4,010,668

# POLYSONIC ELECTRONIC SYSTEM FOR A MUSICAL INSTRUMENT AND METHODS OF UTILIZING AND CONSTRUCTING SAME

John P. Plueddemann, 21370 Inkster Road, Southfield, Mich. 48075

Filed Apr. 21, 1975, Ser. No. 569,835

Int. Cl.<sup>2</sup> G10H 3/08; H04M 1/00

U.S. Cl. 84—1.16

7 Claims

1. An acoustical system for an instrument having a plurality of strings, comprising, in combination:
  - first means for detecting and amplifying sounds produced by a first predetermined number of said plurality of strings;
  - second means for detecting and amplifying sounds produced by a second predetermined number of said plurality of strings;
  - third means for detecting and amplifying sounds produced by a third predetermined number of said plurality of strings; and

fourth means for detecting and amplifying sounds produced by a third predetermined number of said plurality of strings;

said instrument includes a bridge;

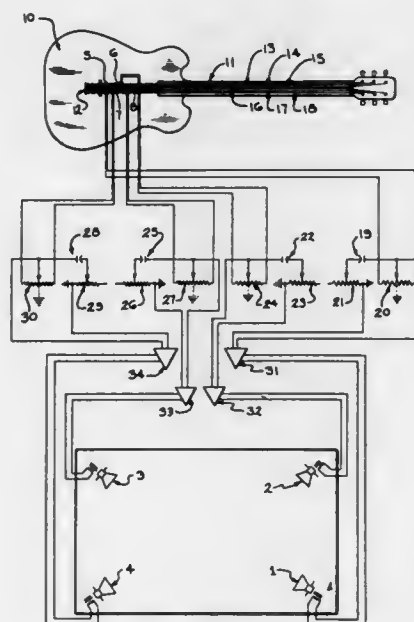
said first means includes a first pick-up electrically connected to a first electrical control circuit which is electrically connected to a first amplifier that is electrically connected to a first speaker;

said second means includes a second pick-up electrically connected to a second electrical control circuit which is electrically connected to a second amplifier that is electrically connected to a second speaker;

said third means includes a third pick-up electrically connected to a third electrical control circuit which is electrically connected to a third amplifier that is electrically connected to a third speaker;

said fourth means includes a fourth pick-up electrically connected to a fourth electrical control circuit which is electrically connected to a fourth amplifier that is electrically connected to a fourth speaker;

said instrument comprises a guitar;



said first means detects and amplifies sounds produced by all of said plurality of strings to provide a rhythm component of the sound;

said second means detects and amplifies the sounds produced solely by the first third of said strings of the guitar;

said third means detects and amplifies the sounds produced solely by the second third of said plurality of strings of the guitar;

said fourth means detects and amplifies the sounds produced solely by the third third of said plurality of strings of the guitar;

said speakers being positioned at the four corners of a room so that as the guitar is strummed, the sound emanating from said speakers would seem to move around the room;

said speakers being so arranged in the room so that the sound emanating from said second, third and fourth speakers harmonizes with the sound emanating from said first speaker to give a stereo effect from the corners of the room; and

each of said first, second, third and fourth means having its own volume and tone control so that the room may be completely filled with sound which is balanced out proportionately at the corners of the room.

4,010,669

# BOLT TENSIONING ARRANGEMENT

Ulrich Klören, Krefeld, Germany, assignor to Ringfeder GmbH, Krefeld-Uerdlingen, Germany

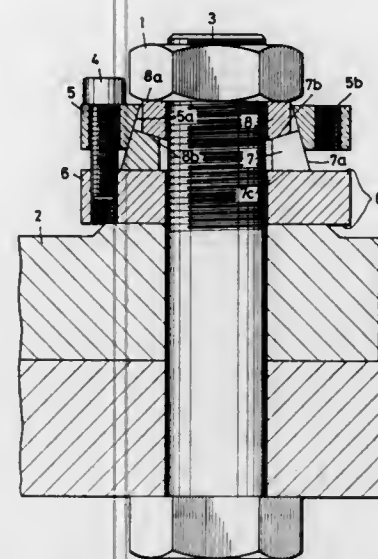
Filed Dec. 17, 1975, Ser. No. 641,702

Claims priority, application Germany, Dec. 21, 1974, 2460961

Int. Cl.<sup>2</sup> F16B 35/00

U.S. Cl. 85—1 T

15 Claims



1. An arrangement for stressing a bolt by applying an axial force which acts between an element from which a portion of the bolt extends and a nut element threaded onto this portion, comprising a first and a second ring adapted to surround said portion axially spaced from one another; first means for applying to said rings an axially acting first force operative for moving said rings relative to one another in direction axially of said portion; and second means for amplifying said first force and for applying to one of said element an axially acting second stressing force which is greater than said first force and acts axially upon said portion and stresses said bolt.

4,010,670

# INTERNAL SPLINE DRIVE CONFIGURATION FOR THREADED FASTENERS

Sixten Harald Lejdegard, Ramnas, Sweden, assignor to Bulten-Kanthal Aktiebolag, Sweden

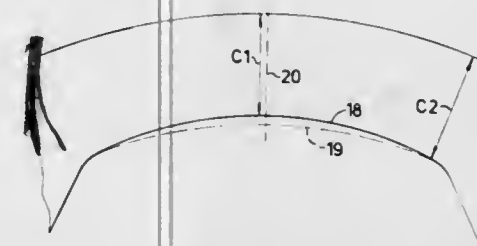
Filed Mar. 7, 1975, Ser. No. 556,286

Claims priority, application Sweden, Mar. 8, 1974, 7403089

Int. Cl.<sup>2</sup> F16B 23/00

U.S. Cl. 85—45

1 Claim



1. A rotatable threaded fastener having an internal spline drive formation, comprising:
  - a. 12 splines equally angularly spaced about the axis of the fastener, said splines being defined at least in part by convexly-curved segments of cylindrical surfaces;
  - b. 12 circumferentially arranged grooves having bottoms alternating with said splines;
  - c. each end of each of said groove bottoms intersecting an adjacent spline surface to define 24 regions of intersection, each region of intersection having a very small radius of curvature and lying at a common radius from said axis of the fastener; and

d. the bottom of each of said grooves being defined by a concavely curved segment of a cylindrical surface having a radius of curvature which is less than the length of said common radius, its center of curvature being located at a point substantially 25 percent of the length of said common radius from said axis, the radius of each groove bottom increasing slightly with respect to said axis from said regions of intersection toward the center of the groove.

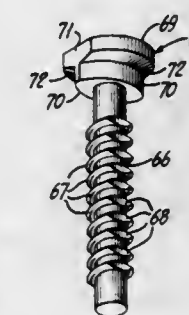
# 4,010,671 WALL CONSTRUCTION

S. Eugene Hubbard, and Lawrence F. Biebuyck, both of Niles, Mich., assignors to Kawneer Company, Inc., Niles, Mich. Continuation of Ser. No. 279,066, Aug. 9, 1972, abandoned, which is a continuation of Ser. No. 41,951, June 1, 1970, abandoned. This application May 4, 1976, Ser. No. 682,969

Int. Cl.<sup>2</sup> F16B 35/04

U.S. Cl. 85—47

6 Claims



1. A fastener for insertion along a longitudinal axis of a screw spline having a noncircular transverse cross-section formed with opposed side walls, said fastener comprising an elongated shank and a head structure at one end of a longitudinal axis of said shank, said shank including segmented thread sections formed on opposite sides thereof and a pair of parallel flattened sides substantially normal to said first mentioned opposite sides, said head portion including an outer end segment extending generally radially outward of said shank and dimensioned to pass through a circular opening in a structural member, said head portion including a first seating surface sloping inwardly toward said shank and away from an outer end surface of said head structure, and a bearing spacer segment intermediate said first seating surface and said shank, said bearing spacer segment having at least one arcuate bearing surface having a radius substantially the same as said circular opening of said structural member for bearing against said member when seated in said hole, said bearing spacer segment including a second seating surface substantially normal to said shank adapted to engage an end surface of said screw spline, said bearing surface formed eccentrically of said longitudinal axis of said shank, said fastener shank insertable longitudinally of said screw spline with said flattened sides facing said opposed side walls and rotatable a quarter turn about said longitudinal axis wherein said thread segment digs into said side walls and draw said second seating surface tightly against said end surface of said screw spline.



4,010,672

**DRIVING MECHANISM FOR THE COVER OF AN AMMUNITION MAGAZINE ON ARMORED LAND VEHICLES**

Hans Kolbinger, Hofolding, and Ulf Wossagk, Taufkirchen, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

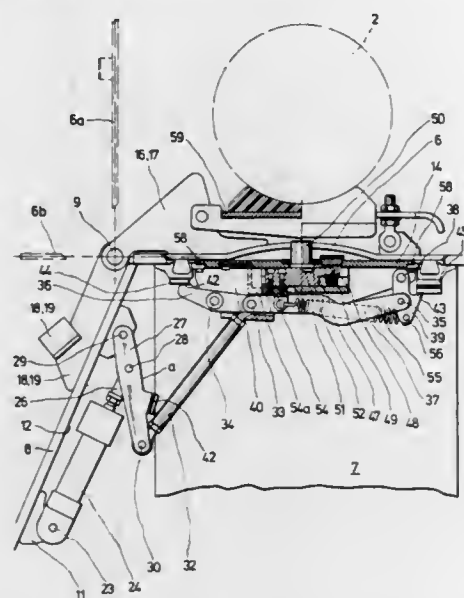
Filed Nov. 4, 1975, Ser. No. 628,771

Claims priority, application Germany, Nov. 28, 1974, 2456186

Int. Cl.<sup>2</sup> F41F 9/06

U.S. Cl. 89—1.802

7 Claims



1. A driving mechanism for the cover of an ammunition magazine for an armored land vehicle including a launching device for said ammunition, means for loading said ammunition into said launching device from said magazine, and means pivotally mounting said cover on said vehicle, said driving mechanism comprising hydraulic driving means for pivotally driving said cover through an angle of about 90° between a generally horizontal closed position and a generally vertical position to open said magazine for loading of said ammunition from said magazine into said launching device, a mechanical locking device for releaseably locking said cover with said hydraulic driving means for enabling driving engagement therebetween, said locking device being releaseable to enable disengagement between said cover and said hydraulic driving means to permit manual pivotal movement of said cover through an angle of 180° to open said magazine for charging thereof with ammunition, said locking device including means for blocking movement of said hydraulic driving means when said locking device is released to disengage said cover from said hydraulic driving means.

4,010,673

**SMALL ARM**

Hannes Kepplinger, Kufstein, and Hermann Schweighofer, Steyr, both of Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Nov. 7, 1975, Ser. No. 629,696

Claims priority, application Austria, Nov. 28, 1974, 9560/74

Int. Cl.<sup>2</sup> F41D 11/12

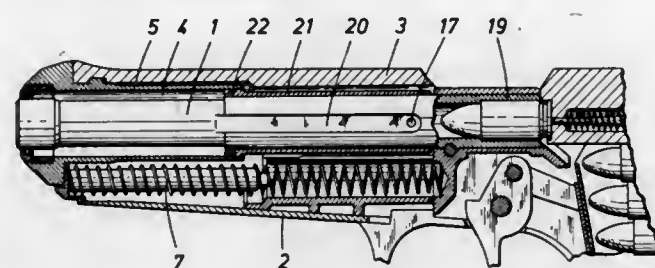
U.S. Cl. 89—191 A

2 Claims

1. A small arm comprising

- a. a grip,
- b. a barrel fixedly inserted in the grip, the barrel having
  1. a forward end protruding from the grip,
  2. a rear end,
  3. a barrel chamber at the rear end, and
  4. transverse bore means adjacent the barrel chamber,
- c. a breechblock surrounding the barrel and reciprocally movable therealong to and from a forward position, the breechblock being resiliently biased into the forward position and including

1. a cylinder surrounding the barrel and defining a sealed annular chamber with the barrel adjacent the forward end thereof, the annular chamber having a rear end spaced from the barrel chamber forwardly of the transverse bore means, and



2. the barrel having affixed thereto a piston disposed at the rear end of the annular chamber when the breechblock is in the forward position, and
- d. circumferentially enclosed and longitudinally extending passage means connecting the rearwardly disposed transverse bore means of the barrel to the forwardly disposed annular chamber.

4,010,674

**SPEED RESPONSIVE SYSTEMS**

John Noddings, and Norman Hunt, both of Leamington Spa, England, assignors to Associated Engineering Limited, England

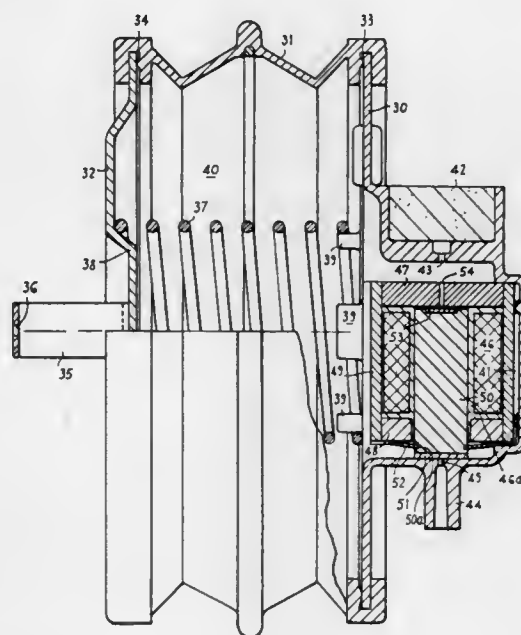
Division of Ser. No. 540,540, Jan. 13, 1975, Pat. No. 3,983,954. This application July 31, 1975, Ser. No. 600,629

Claims priority, application United Kingdom, Jan. 17, 1974, 2156/74; Mar. 4, 1974, 9699/74

Int. Cl.<sup>2</sup> F15B 13/044; F16J 3/04

U.S. Cl. 91—47

6 Claims



1. An actuator device comprising:
  - a chamber having a relatively fixed wall and a relatively movable wall interconnected by a bellows,
  - a spring within said chamber to urge said bellows to an extended position,
  - a permanently open orifice through which said chamber is connected to atmosphere,
  - a cavity provided in said relatively fixed wall outside of said bellows,
  - an electromagnetic valve housed in said cavity and including a solenoid winding surrounding an armature movable in a direction transverse to the direction of movement of said bellows,
  - an aperture in said cavity which is closed by one end of the armature of said electromagnetic valve when said sole-

noid winding is de-energised, and which is opened by retraction of said armature from said aperture when said solenoid winding is energised to enable the connection to said chamber of a volume of gas at subatmospheric pressure to cause said bellows to contract against the force of said spring, and resilient means acting on the other end of said armature for urging said armature to close said aperture when said solenoid is de-energised.

4,010,675

**TWO STROKE MECHANISM WITH ROTARY PISTON AND CYLINDER-PISTON MOVEMENT**

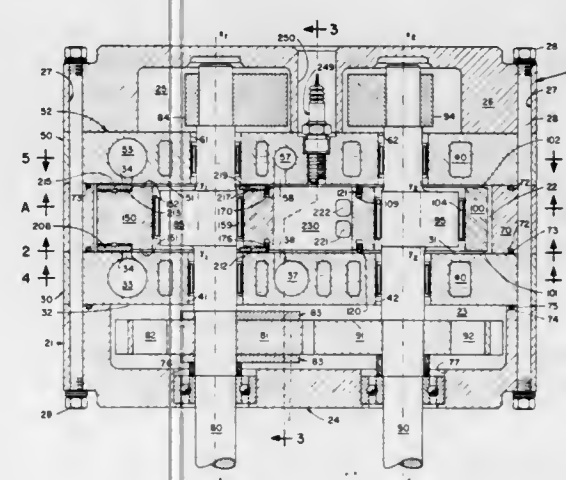
Marek J. Lassota, 4132 W. Roscoe St., Chicago, Ill. 60641  
Continuation of Ser. No. 523,958, Nov. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 506,613, Sept. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 425,507, Dec. 17, 1973, abandoned, which is a

continuation-in-part of Ser. No. 361,472, May 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,198, Jan. 27, 1972, abandoned. This application Sept. 4, 1975, Ser. No. 610,159

Int. Cl.<sup>2</sup> F02B 59/00

U.S. Cl. 92—54

42 Claims



1. A two-stroke mechanism with rotary cylinder-piston and piston movements comprising:

a U-shaped cylinder-piston element having polyhedral body and spaced, parallel arms with parallel, flat opposing surfaces, means for rotatable mounting to an eccentric shaft and means for balancing said cylinder-piston element;

a polyhedral piston element having spaced, parallel sides adjoining said cylinder-piston flat, opposing surfaces of said spaced, parallel arms and means for rotatable mounting to a second eccentric shaft;

said cylinder-piston and piston elements forming movable walls of two variable volume chambers;

two axially spaced, stationary parallel walls adjoining opposite sides of said piston and cylinder-piston elements forming stationary walls of said first variable volume chamber;

sealing means on said cylinder-piston and said piston elements sealing said first variable volume chamber;

a peripheral wall interconnecting said spaced, stationary parallel walls to form with said spaced, stationary parallel walls the stationary walls of a second variable volume chamber;

a rotatable cylinder-piston eccentric shaft mounted in said cylinder-piston element and in said spaced, stationary parallel walls;

balancing means, balancing said cylinder-piston eccentric shaft;

a rotatable piston eccentric shaft mounted in said piston element and in said spaced, stationary parallel walls;

balancing means, balancing said piston eccentric shaft;

gearing means interconnecting said eccentric shafts so said

eccentric shafts and their cylinder-piston and piston elements follow opposite and coordinated rotary paths within said second variable volume chamber;

intake means in said spaced parallel walls and in said cylinder-piston element and discharge means in said spaced parallel walls;

cooling means for cooling said spaced, parallel stationary walls and said piston and cylinder-piston elements;

lubricating means for lubricating coating surfaces; and

lubricating means for lubricating said gearing means.

4,010,676

**APPARATUS FOR FORMING ARTICLES SUCH AS CARTON BLANKS**

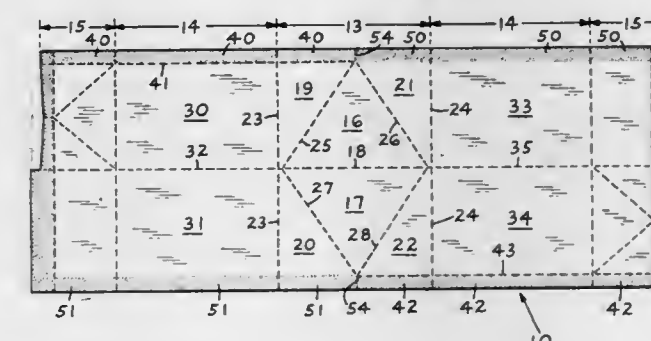
Jon Arthur Eilenberg, Goshen, and George Henry Naugle, Nyack, both of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Apr. 4, 1975, Ser. No. 565,128

Int. Cl.<sup>2</sup> B31B 1/44

U.S. Cl. 93—51 R

14 Claims



1. An apparatus for forming an article comprising:
  - a first article holding member containing therein a cut-out portion sloped downwardly on each side toward its center and open at opposed ends thereof;
  - the cut-out portion in said first article holding member comprising two downwardly sloped triangular sections joined along a first common edge which forms the bottom of the cut-out portion and the remaining two edges of each of said triangular sections being formed by two intersecting sides of said first article holding member;
  - a second article holding member adapted to mate with the cut-out portion of the first member, at least one of said article holding members mounted for movement toward and away from the other to mate and unmate said members;
  - means for moving said article holding members into and out of mating relationship;
  - mating article forming members which, when mated, enclose the article holding members in close fitting relationship, said article forming members mounted for movement into and out of mating relationship about said article holding members; and
  - means for moving said article forming members into and out of mating relationship about said article holding members.

4,010,677

**APPARATUS FOR POSITIONING HEADS**

Tadashi Hirakawa, and Noriyuki Hoshino, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 10, 1975, Ser. No. 585,712

Claims priority, application Japan, June 14, 1974, 49-67046; June 18, 1974, 49-70363[U]

Int. Cl.<sup>2</sup> B26D 3/08

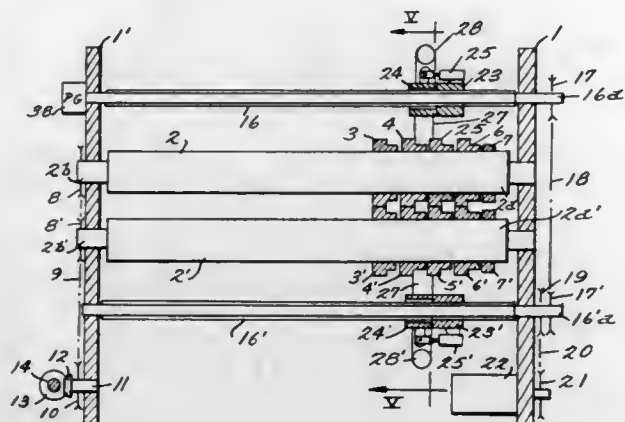
U.S. Cl. 93—58.2 R

6 Claims

1. Apparatus for selectively positioning a plurality of heads along a shaft comprising:
  - an additional shaft located in parallel with said head-carrying shaft;



a master shifter and a slave shifter supported by said additional shaft;  
means operatively connecting said master and slave shifters to selectively vary the spacing between said shifters along said additional shaft;



drive means for displacing said shifters along the additional shaft; and  
means on said slave shifter for selectively engaging a head to position the head along its shaft when said shifters are displaced along the additional shaft.

#### 4,010,678 METHOD AND APPARATUS FOR MAKING COMPOSITE FILTER PLUGS

Heinz Greve, Hamburg, and Harry Sprunk, Geesthacht, both of Germany, assignors to Hauni-Werke Körber & Co., KG, Hamburg, Germany

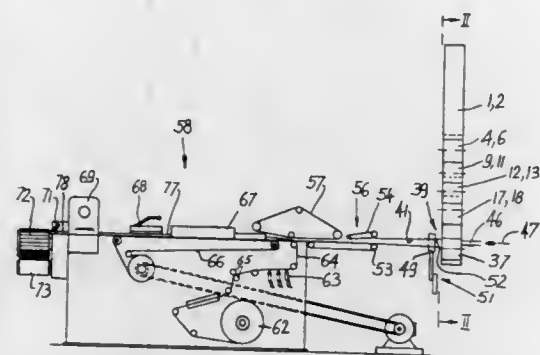
Filed July 17, 1975, Ser. No. 596,812

Claims priority, application United Kingdom, Aug. 2, 1974, 34130/74

Int. Cl.<sup>2</sup> B65G 47/52

U.S. Cl. 93-77 FT

24 Claims



1. A method of making composite filter plugs for cigarettes or the like, comprising the steps of shuffling rod-like filter elements of several types to form a series of groups of assorted coaxial filter elements; moving successive groups of said series sideways; pneumatically conveying successive groups of said series lengthwise, including directing a stream of compressed gaseous fluid against one outermost filter element of each of said successive groups, and converting the pneumatically conveyed groups into a continuous line of filter elements; draping a continuous web around said line to form a continuous filter rod; and subdividing the rod into discrete filter plugs each of which contains at least a portion of at least one filter element of each of said several types.

#### 4,010,679 PIEZOELECTRIC TRANSDUCER SENSOR FOR USE IN A PRESS

Frank R. Dybel, Calumet City, Ill., assignor to International Measurement & Control Co., Park Forest South, Ill.

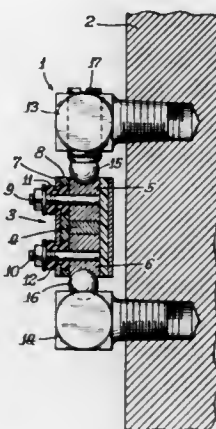
Continuation of Ser. No. 670,189, Sept. 25, 1967, abandoned.

This application May 12, 1969, Ser. No. 832,542

Int. Cl.<sup>2</sup> B30B 15/28

U.S. Cl. 100-53

17 Claims



1. In a machine having two work members movable with respect to each other and subject to repetitive loading forces for transmission to a work piece between said members, at least one force carrying member carrying and transmitting said loading force to one of said work members, and an electrically responsive strain sensing device positioned on said force carrying member, the improvement in combination therewith wherein said sensing device is a piezoelectric transducer,

said piezoelectric transducer comprising a piezoelectric element, a first terminal block positioned against one face of said element, a second terminal block positioned against the opposite side of said element, and means for shielding said piezoelectric element from electric and magnetic noise,

a mounting means attached to and extending from the force carrying member, said mounting means comprising a first and a second bracket spaced from each other, one end of each bracket being attached to said force carrying member, the other ends of said brackets having contact means for engagement with said terminal blocks, at least one of said contact means being electrically nonconductive, said piezoelectric transducer being positioned and clamped between the said other ends of the brackets with the contact means of said first bracket engaging said first terminal block and the contact means of said second bracket engaging said second terminal block so that the clamping force of the brackets is substantially parallel to and aligned with a line normal to the interfaces between said element and terminal blocks, and

an energized electronic circuit electrically connected to the terminal blocks which circuit is predeterminedly activated by the output signal of the piezoelectric transducers when stressed during a work cycle of the machine to activate a machine monitoring means.

#### 4,010,680 COTTON PACKAGING METHOD AND APPARATUS

George S. Buck, Jr., and Roger Russell, both of Memphis, Tenn., assignors to Cotton Incorporated, Raleigh, N.C.

Division of Ser. No. 532,008, Dec. 12, 1974, Pat. No. 3,948,021. This application Jan. 21, 1976, Ser. No. 650,980

Int. Cl.<sup>2</sup> B30B 3/00

U.S. Cl. 100-152

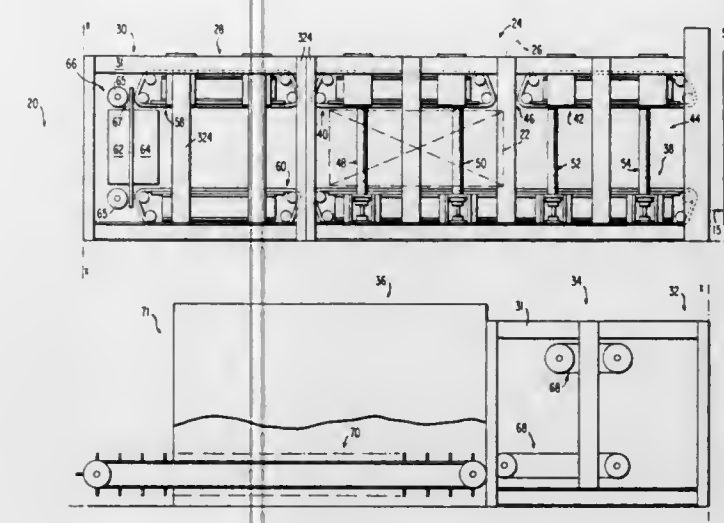
3 Claims

1. Cotton packaging apparatus comprising:

a press section including at least one transient compression and conveying surface;

chain means for moving said compression and conveying surface;

drive means for selectively oscillating said chain means, said drive means comprising:  
a reciprocable rod means,  
chain clutching means carried by said rod means and reciprocable therewith, said chain clutching means including:



pivotable latch means movable between chain engaged and disengaged positions, and  
latch control means for selectively pivoting said latch means between said positions.

#### 4,010,681 CYLINDRICAL ARTICLE PRINTER

Hermann Hamberger, Rielasingen, and Erwin Ulrich, Talheim, both of Germany, assignors to Gesellschaft für Elektro-Feintechnik mbH & Co. KG, Germany

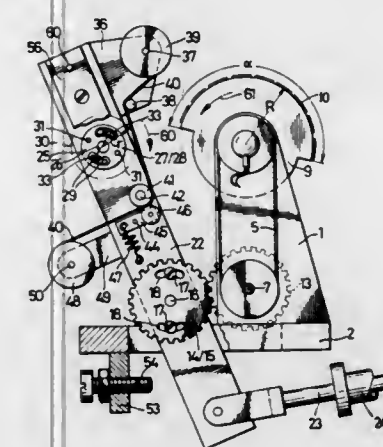
Filed Jan. 29, 1975, Ser. No. 545,180

Claims priority, application Germany, Feb. 8, 1974, 2405944

Int. Cl.<sup>2</sup> B41F 17/08

U.S. Cl. 101-38 R

1 Claim



1. A printing device for printing cylindrical objects, such as wheels, drums, etc. comprising a printing stereotype having a cylindrical arcuate printer surface, first mounting means rotatably supporting said stereotype, a workpiece holder, second mounting means rotatably supporting said workpiece holder, movable support means movably supporting said second mounting means to move said workpiece holder toward and away from said printing stereotype for moving the workpiece into and out of engagement with the printer surface, means for applying ink to said printer surface, and positive gear drive means connected to rotate said stereotype and its printer surface and to rotate said workpiece holder at the same speeds but opposite directions of rotation and to hold said printer surface and said workpiece holder in the same relative angular positions during movement of said second mounting means for engagement and disengagement of the workpiece and said printing surface whereby engagement will always take place at

a predetermined point on the cylindrical circumference of the workpiece and the surfaces of the workpiece and said printing stereotype will move smoothly together in contact during printing, said means for applying ink to said printer surface comprising an inking ribbon, means guiding said ribbon for movement between said workpiece and said printing surface, and inking ribbon drive means connected to said ribbon and to said positive gear drive means for rotation the ribbon in timed relationship to the rotation of the workpiece, said ribbon being disposed between said workpiece and said printer surface and being movable with said workpiece rotation and said printer surface rotation during printing of said workpiece, said positive gear drive means comprising a printing stereotype shaft having a driven gear pulley thereon, a drive shaft having a drive gear pulley thereon, a gear belt interconnecting said drive gear pulley to said driven pulley, said second support means comprising a pivotal support lever pivotally mounted adjacent said stereotype printer and comprising said movable support means carrying said workpiece holder, a transmission shaft rotatably supported on said lever and geared to said drive shaft, a transmission gear pulley affixed to said transmission shaft for rotation therewith, a workpiece pulley affixed to said workpiece shaft for rotation therewith, a workpiece drive gear belt engaged over said transmission shaft pulley and said workpiece shaft pulley to rotate said workpiece support, said workpiece support comprising a disc member, said disc member having means for adjustably angularly positioning a workpiece thereon, and means to shift said support lever for shifting the workpiece toward and away from said printing surface.

#### 4,010,682 LABEL PRINTING AND APPLYING APPARATUS

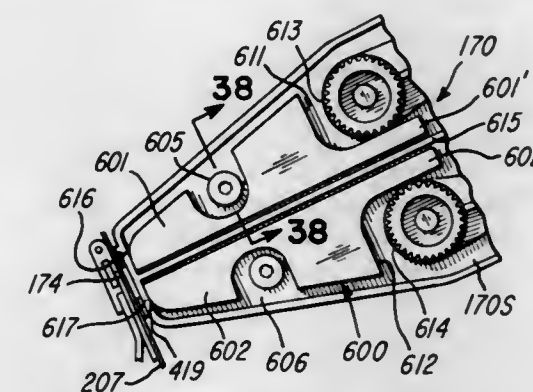
Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 14, 1975, Ser. No. 577,376

Int. Cl.<sup>2</sup> B41K 1/10; B41F 1/02

U.S. Cl. 101-288

10 Claims



1. Hand-held apparatus for printing and applying pressure sensitive labels carried on a web of supporting material, comprising: a frame having a handle, a platen stationarily mounted to the frame, a print head movably mounted to the frame and cooperable with the platen to make a printing impression on a label, the print head having at least one row of side-by-side selectively settable printing members, a delaminator disposed downstream of the platen for delaminating printed labels from the web, an applicator disposed downstream of the delaminator for applying labels to an article to be labeled, a manually operable actuator disposed at the handle, means driven by the actuator for driving the print head toward and away from the platen by exerting an unbalanced driving force on one side of the print head, means driven by the actuator for advancing the web to between the print head and the platen and thereafter to the delaminator in label applying position by the applicator, and means including a weight carried by the print head and effective when the print head and the platen are in cooperation for dampening the rebound of the print head to prevent the print head from making a second printing impression on the label.



4,010,683

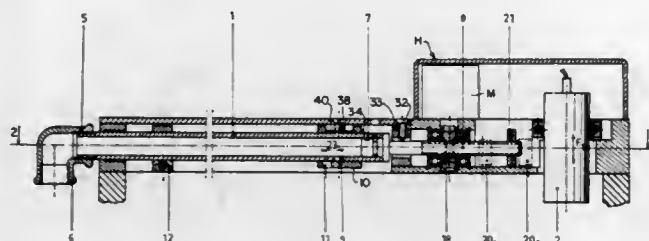
## LIQUID LEVEL CONTROL

Gerard Edouard Lambert, Saint-Cloud, and Roger Begis, Chaville, both of France, assignors to Societe Seveg Etudes Equipments Graphiques, Sevres, France  
Continuation-in-part of Ser. No. 550,346, Feb. 18, 1975, abandoned. This application May 14, 1976, Ser. No. 686,379  
Claims priority, application France, Feb. 19, 1974, 74.05490

Int. Cl.<sup>2</sup> B41F 31/08

U.S. Cl. 101—366

6 Claims



1. In an ink supply and ink level control device for mounting on an ink fountain of a printing machine, the combination comprising:

a control and power head having an output member reciprocably mounted in and extending from said head, a reversible drive motor connected to produce limited linear displacement in one direction or the other of said output member, a pair of spaced limit switches mounted for operation in response to movement of said output member to the limits, respectively, of its linear displacement, and an electronic proximity detector projecting from said head toward the surface of ink in said ink fountain to sense the relative proximity of said surface of said ink; and

an ink supply conduit and casing assembly carried by said control and power head, said assembly including a conduit for receiving ink from a source of ink and connected to said output member for limited linear displacement thereby, an elongated tube-like casing partially enclosing said supply conduit and fixed at one end to said head, a valve sleeve fixed in said casing and surrounding and slidably receiving said supply conduit, said valve sleeve having a radial orifice, said conduit having a wall orifice located for movement into and out of radial registry with said valve sleeve orifice upon linear displacement of said conduit by said output member, said valve sleeve, said conduit and said orifices therein providing valve means for controlling the discharge of ink from said conduit which are opened at one limit of the linear displacement of said conduit by said output member and are closed at the other limit of its linear displacement thereby,

said control and power head further having automatic control means for maintaining a predetermined level of ink in the ink fountain comprising electrical circuit means connecting said proximity detector to activate said motor responsive to the level of ink in the ink fountain falling below a predetermined level to displace said output member and conduit in one linear direction for opening said valve means, and connecting one of said limit switches to deactivate said motor upon movement of said conduit to its limit in said one linear direction for maintaining said valve means opened for supplying ink to the ink fountain, and electrical circuit means connecting said proximity detector to activate said motor responsive to the level of ink in the ink fountain at the predetermined level to displace said output member linearly in the other direction for closing said valve means, and connecting the other of said limit switches to deactivate said motor upon movement of said conduit to its limit in said other direction for maintaining said valve means closed and terminating the supply of ink to the ink fountain.

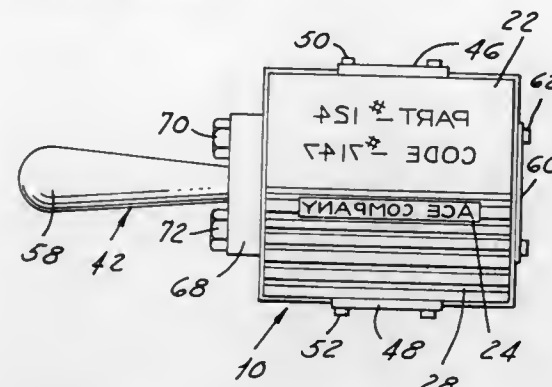
4,010,684

## PRINTING DEVICE

Raymond J. LaPointe, Jr., Bloomfield Hills, Mich., assignor to Detroit Ball Bearing Company, Detroit, Mich.  
Filed Sept. 22, 1975, Ser. No. 615,804  
Int. Cl.<sup>2</sup> B41F 27/02

U.S. Cl. 101—382 MV

1 Claim



1. A printing device, a holder for said printing device, said printing device being mounted in said holder, said printing device comprising a metallic plate having a flat face, permanent magnet means provided on a portion of said face, said permanent magnet means comprising at least three permanent magnets, a plurality of spaced apart recesses provided on said portion of said flat face, each of said magnets being received in one of said recesses, a flat magnetic plate releasably retained on said flat face by said magnet means, said flat metallic plate having protruding indicia stamped thereon, a plurality of parallel spaced apart grooves provided in the remaining portion of said flat face, printing type releasably received in said grooves, said printing type having a generally U-shaped configuration including a pair of leg elements spaced apart by an interconnecting web portion, indicia type protruding from said web portion, said leg elements extending into adjacent grooves.

4,010,685

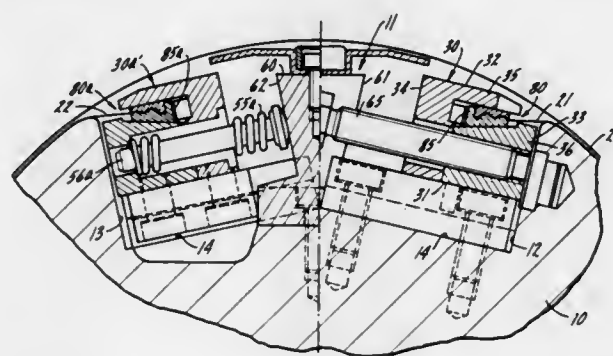
## PRINTING PLATE CLAMPING DEVICE

Karl Trageser, Rodenbach II Krs. Hanau, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany  
Filed June 27, 1975, Ser. No. 591,029  
Claims priority, application Germany, June 28, 1974, 2431133

Int. Cl.<sup>2</sup> B41F 27/06, 7/22

U.S. Cl. 101—415.1

6 Claims



1. In a clamping and tensioning mechanism for mounting a thin flexible printing plate on the surface of a printing cylinder having a longitudinal gap formed therein, the combination comprising a mounting bar extending longitudinally in the gap and having means for guiding the same for broadwise movement peripherally of the cylinder, said mounting bar having a longitudinal groove formed therein oriented in the direction of the end of the plate, the groove being of dovetail cross section presenting spaced opposed smooth wedging surfaces defining a wedge angle between them, a two piece clamping bar extending longitudinally in the groove, the two piece clamping bar being of overall matching wedge cross section with said

groove and formed of mating upper and lower jaws having smooth outer surfaces angled to engage the wedging surfaces and separable one from the other to permit the end of a plate to be shoved between them when contained in the broader region of the groove and presenting opposed gripping surfaces specially shaped to frictionally engage and deform the end of the plate for gripping the end of the plate when they are pressed together, a clamping bar spring for biasing the clamping bar outwardly of the groove, means for forcibly moving the mounting bar broadwise in the gap in the plate tensioning direction, the wedge angle being sufficiently shallow so that when the end of the plate is inserted between the jaws and the mounting bar is moved in the plate tensioning direction, relative sliding takes place at the smooth surfaces and the jaws of the clamping bar are wedgingly pressed together to retain and deform the end of the plate to provide a positive grip and upon continued movement of the mounting bar the end of the plate is bodily drawn to tension the plate about the cylinder, and means mounted on said mounting bar engageable with the upper jaw for subsequently retracting the clamping bar inwardly of the groove for disengagement of the wedging surfaces to permit spreading of the jaws and release of the end of the plate, the jaws having abutting surfaces thereon to keep the jaws in register with one another in all positions thereof.

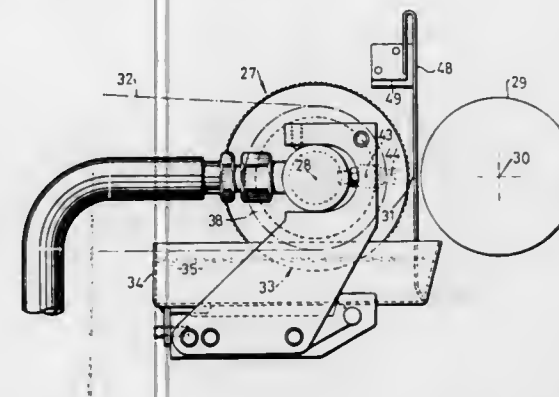
4,010,686

## MEANS FOR APPLYING LIQUID TO A RELATIVELY MOVING SURFACE

John William Harris, Kettering, England, assignor to Timsons Limited, Kettering, England  
Filed Apr. 7, 1975, Ser. No. 565,533  
Int. Cl.<sup>2</sup> B41L 23/00

U.S. Cl. 101—148

7 Claims



1. In a dampening device comprising, a carrier member including a foraminous wall for temporarily retaining dampening liquid, means for supporting the carrier member with portions of said wall disposed respectively at a pick-up station and at a delivery station spaced therefrom, drive means for cyclically moving the carrier member to move said wall along a path through the pick-up station and the delivery station, means for supplying the liquid to the wall portion at the pick-up station, and means for directing a flow of gas onto one face of the wall portion at the delivery station; the improvement wherein:

- said foraminous wall incorporates apertures and is of cylindrical form and comprises
  - an inner foraminous element,
  - an outer foraminous element embracing and supported by said inner foraminous element,
- the apertures of said outer element are of a sufficiently small size to ensure that they will all reliably be spanned by a film of the liquid when travelling between the pick-up station and the delivery station, and thereby ensure that a predetermined quantity of the liquid will be transported to the delivery station in each cycle of movement of the carrier member,
- the minimum aperture size of said inner element is sufficiently large to ensure that the apertures thereof reliably are free from spanning by a film of the liquid when travelling from the pick-up station to the delivery station,

- the means for directing the flow of gas provides for gas flow
  - impinging on the wall portion at the station only between predetermined boundaries extending transversely of the direction of movement of this wall portion and spaced from each other,
  - at a velocity sufficient reliably to dislodge the liquid in each apertures between said boundaries and project the liquid in the form of a spray,
- the drive means provides for rotation of the carrier member about the axis of its cylindrical wall.

4,010,687

## PLANOGRAPHIC PRINTING MASTER

Richard L. Schank, Webster, N.Y., and Richard G. Crystal, Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.  
Filed Apr. 13, 1973, Ser. No. 351,110  
Int. Cl.<sup>2</sup> B41H 1/14; B41C 1/10

U.S. Cl. 101—453

35 Claims



- A method of producing a printing master comprising:
  - providing a suitable substrate;
  - coating said substrate with a layer of an ink releasable material selected from the group consisting of silicone elastomers and heterophase polymeric compositions having a silicone phase;
  - depositing a particulate image pattern on said layer, said image pattern comprising an ink receptive heterophase polymeric composition having a silicone phase; and
  - fusing said image pattern on said layer whereby said image pattern provides ink receptive areas.

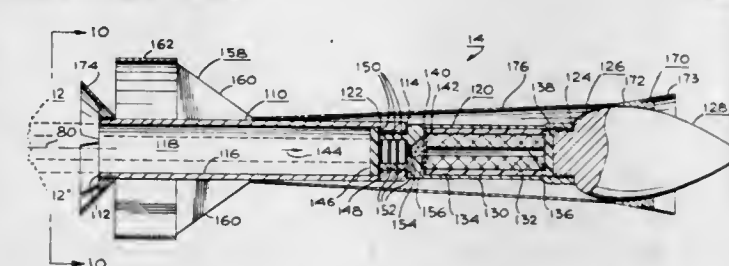
4,010,688

## WEAPON ARRANGEMENT

Matthew S. Smith, 4400 Sarah St., No. 29, Burbank, Calif. 91505, and Ernest A. Filippi, 18776 Kenya St., Northridge, Calif. 91324  
Filed Nov. 17, 1972, Ser. No. 307,444  
Int. Cl.<sup>2</sup> F42B 11/42

U.S. Cl. 102—65.2

2 Claims



1. A rocket boosted warhead round having a center of gravity, a center of pressure and a predetermined non-spinning yawing frequency, for launching from a launcher of the type adapted to fire a blank cartridge and having a barrel portion through which the blank cartridge fires and comprising, in combination:

- a tubular tailpipe means having an aft end, a forward end, and internal walls defining a tubular passageway, and said tubular passageway at said aft end adapted to slidably fit onto the end of the launcher barrel;
- a rocket motor having an aft end coupled to said forward end of said tailpipe, and a forward end, and comprising a solid propellant rocket grain;
- a warhead coupled to said forward end of said rocket motor, and said warhead having a predetermined ogive external configuration;
- a forward drag shroud means detachably mountable adjacent



cent said warhead for providing a first predetermined drag configuration having a drag greater than the drag of the round free of said forward drag shroud to decrease the range thereof, and comprising:

a base section detachably mountable adjacent said warhead for providing a first drag characteristic greater than the drag characteristic of the round free of said forward drag shroud; and

an outer section detachably mountable on said base section for providing a second drag characteristic greater than said first drag characteristic;

a delay means in said rocket motor for providing a predetermined delay to full thrust of said rocket motor, whereby firing a blank cartridge in the launcher provided hot gaseous products of combustion for launching the rocket boosted warhead round from the launcher and ignition of the rocket motor, and

aero-gyro stabilization means coupled to said aft end of said tubular tailpipe for spinning said round to provide aero-gyro stability, said aero-gyro stability comprising wherein said center of pressure is aft of said center of gravity and the round is spinning at a rate at least one order of magnitude greater than said predetermined non-spinning yawing frequency.

4,010,689

## APPARATUS FOR SENSING TARGET DISTANCE

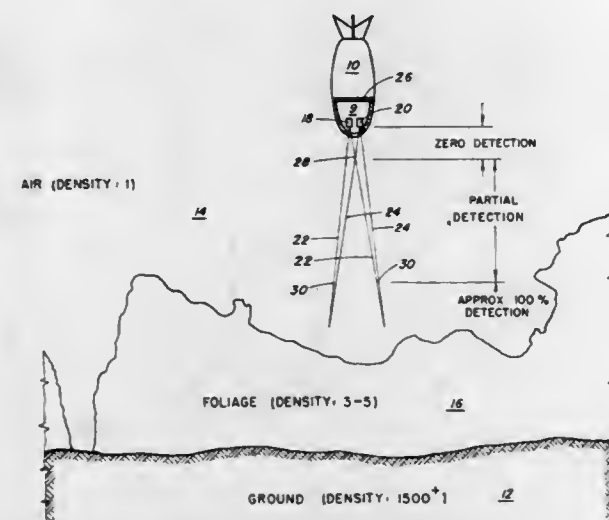
Irving I. Sochard, Chevy Chase; Marcella C. Petree, Silver Spring; Wallace N. Knutsen, Silver Spring; Frederick E. Warnock, Silver Spring, and Edward A. White, Jr., Beltsville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1970, Ser. No. 97,477

Int. Cl.<sup>2</sup> F42C 13/02, 13/04, 13/00

U.S. Cl. 102-70.2 P

2 Claims



1. A distance sensing device comprising a radiation source for producing a radiation signal; a first radiation shield for transmitting said radiation signal to a target in a first predetermined path;

a radiation detector having a second radiation shield for restricting detection of backscatter within a second predetermined path, said first and second predetermined paths intersecting to define zones of detection;

means for detecting a weighted portion of the backscatter of said transmitted radiation signal within each zone of detection, said weighted detected backscatter corresponding to the absolute backscatter of said transmitted signal, and

means for providing an actuation signal when said detected backscatter exceeds a predetermined value corresponding to a predetermined distance to said target.

# 4,010,690 MEANS FOR AND METHOD OF PROVIDING A FIRE PROTECTION FOR A CASELESS AMMUNITION

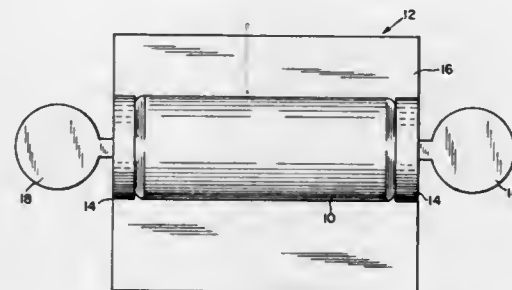
Robert A. Cocozella, Chelmsford; Florindo F. Dal Pan, Nabasset; Thomas M. Finelli, North Andover, all of Mass., and Duane M. Patterson, Nashua, N.H., assignors to Avco Corporation, Cincinnati, Ohio

Filed Apr. 30, 1973, Ser. No. 355,807

Int. Cl.<sup>2</sup> F42B 37/00

U.S. Cl. 102-97

2 Claims



1. A fire protecting means for a caseless ammunition round comprising:

a structural disc having the same diameter as the round positioned adjacent to each end of the round; a foil wrapper for enclosing at least the cylindrical surface of the round, said foil wrapper being made from heat conducting material to form a heat sink; and an outer wrapper encircling the round, the structural disc and the heat sink, said outer wrapper comprising an intumescent material, and terminating in a flap.

4,010,691

## BALLAST LEVELING APPARATUS

Josef Theurer, Vienna, and Karl Folser, Linz-Urfahr, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

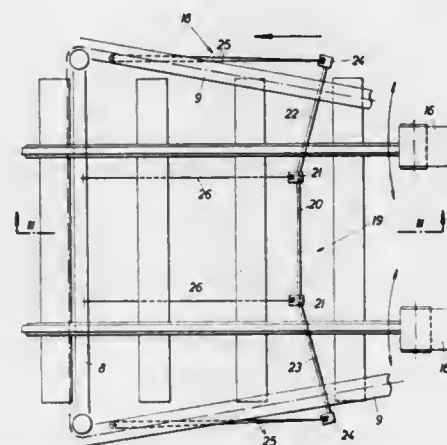
Filed June 18, 1975, Ser. No. 587,892

Claims priority, application Austria, July 5, 1974, 5580/74

Int. Cl.<sup>2</sup> E01B 27/02

U.S. Cl. 104-7 A

6 Claims



1. A ballast leveling apparatus mounted on a machine for treating ballast, the machine being adapted to move in a working direction on a track including ties resting on a ballast bed and the machine comprising a ballast excavating means extending transversely of, and underneath, the track for removing ballast from the ballast bed, a guide frame for the ballast excavating means, a ballast cleaning screen for separating the removed ballast into cleaned ballast and rubble, conveyor means for conveying the removed ballast from the ballast excavating means to the screen and for conveying the cleaned ballast to underneath the track behind the excavating means

in the working direction, the ballast leveling apparatus being mounted behind the ballast excavating means for leveling the cleaned ballast and consisting of an arrangement of bars extending substantially transversely of the track and over the entire length of the track ties, the arrangement consisting of a central one of rod-like bars extending substantially parallel to the ties and two outer ones of the bars, the ends of the central bar being pivotally joined to respective inner ends of the outer bars, and elongated guide elements freely movably connecting the outer ends of the outer bars and the joined ends of the central and outer bars to the guide frame.

4,010,692

## PROCESS FOR TAMPING RAILWAY TRACKS AND A MOVABLE MACHINE FOR EFFECTING THE PROCESS

Pierre Goel, Vaud, Switzerland, assignor to Matisa Materiel Industries S.A., Vaud, Switzerland

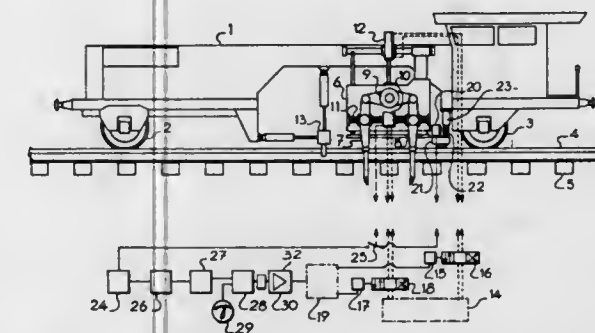
Filed Dec. 19, 1975, Ser. No. 642,353

Claims priority, application Switzerland, Jan. 17, 1975, 568/75

Int. Cl.<sup>2</sup> E01B 27/16

U.S. Cl. 104-12

11 Claims



6. A movable tamping machine for tamping railway tracks in order to achieve the same degree of compactness of the ballast under all the sleepers of the track tamped by said machine, said machine comprising a tamping device with vibratory tamping tools, a control device for stopping the compacting operation of said tools and adapted to receive a control signal, and a measurement circuit including pick-up means for measuring the amplitude of vibrations retransmitted by the ballast across the sleepers and the rails of the track to a part of the machine which is maintained in non-elastic connection with at least one rail of the track, said pick-up being rigidly fixed to said part of said machine, and a computer adapted to emit said control signal to stop the compacting operation of said tools when a predetermined value (K) of increase in amplitude of the vibrations measured by said pick-up means is reached, this value being characteristic of the approach of the desired maximal degree of compactness of the treated ballast.

4,010,693

## TRACKED AIR CUSHION VEHICLE

Denys Stanley Bliss, Cambridge, England, assignor to Bliss Pendarf Limited, London, England

Filed Apr. 30, 1975, Ser. No. 573,304

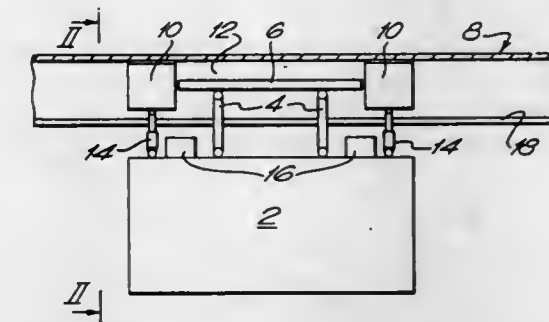
Claims priority, application United Kingdom, May 8, 1974, 20244/74

Int. Cl.<sup>2</sup> B61B 13/08

U.S. Cl. 104-23 FS

25 Claims

6. A tracked air cushion vehicle comprising a vehicle body; a lift platform from which said vehicle body is suspended; end bogies provided at each end of said lift platform, said lift platform and said end bogies being adapted to run within an inverted channel section track including side and top walls so as to define a chamber which can be maintained at subatmospheric pressure; means connected to said chamber for providing said subatmospheric pressure; respective strut means coupled between each of said end bogies and said vehicle



body, each of said strut means including means for biasing said end bogies towards the top wall of said track with a force equal to at least a substantial portion of the weight of the respective end bogie; link means which enable the respective bogie to swivel relative to the platform; pivotal means connected between each link means and the respective bogie, the rotational axis of the pivotal means defining the roll axis of the vehicle; and means responsive to vertical movement of said platform relative to said track for regulating said subatmospheric pressure.

4,010,694

## LOAD TIE-DOWN AND ANCHOR SYSTEM

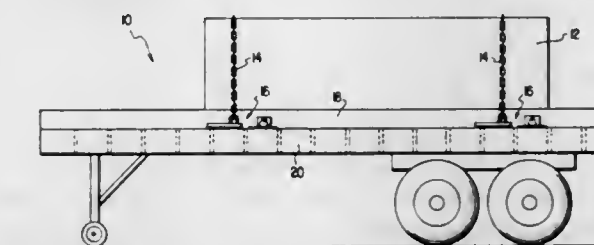
Gerald R. Mooney, 3080 Eldogor Lane, New Castle, Pa. 16105, and Louis A. Mooney, 1002 Ryan Ave., New Castle, Pa. 16101

Filed May 21, 1975, Ser. No. 579,621

Int. Cl.<sup>2</sup> B60P 7/10, 7/16; B61D 45/00, 49/00

U.S. Cl. 105-482

15 Claims



1. A positionally adjustable anchor assembly for use in conjunction with a flat bed load carrying vehicle having a side frame member and a rub rail in spaced, parallel relation to said side frame member, comprising:

a plurality of support plates located between and secured to said side frame member and said rub rail in a uniformly spaced, linear array, said plates being parallel to one another and each plate having an opening therethrough and a slot extending from said opening to an edge of said plate, the width of said slot being less than the maximum width of said opening;

a bar slidably received in said openings of said plates, the width of said bar being greater than the width of said slot and the length thereof being greater than the separation between adjacent ones of said support plates; anchor means secured to said bar; and

locking means connected to said bar and movable between a first position preventing sliding movement of said bar in said support plates openings and a second position permitting sliding movement of said bar in said support plate openings.



4,010,695

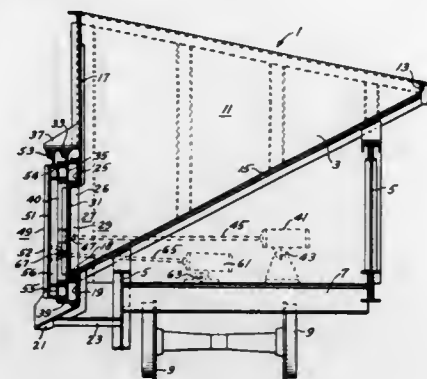
**COKE QUENCHING CAR CLOSURE MECHANISM**  
Anthony F. Mantione, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 516,043, Oct. 18, 1974, Pat. No. 3,924,543. This application May 8, 1975, Ser. No. 575,843

Int. Cl.<sup>2</sup> B61D 3/04, 3/16, 7/08, 9/12

U.S. Cl. 105-254

4 Claims



1. In a coke quench car having a coke basket with a front wall, and a discharge opening in said front wall, the improvement comprising:

- a. channel bar means adjacent the perimeter of said discharge opening;
- b. grate means at said discharge opening movable between an open and closed position for discharging liquid and retaining coke in said basket when in the closed position;
  - i. said grate means including a first contact member means adjacent the edges of said grate means for contacting said channel bar means in substantially liquid-tight fashion;
- c. closure means adjacent said grate means;
  - i. said closure means including a second contact member means adjacent the edges of said closure means for contacting said first contact member means in substantially liquid-tight fashion for retaining coke plus liquid in said basket;
- d. first means for opening and closing said closure means; and
- e. second means for opening and closing said grate means operated to open said grate means when said closure means is opened.

4,010,696

**AUTOMOBILE TRAY**

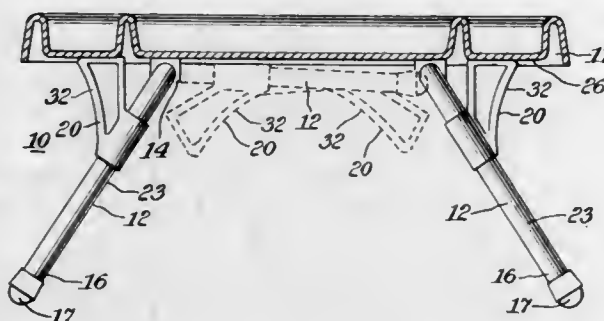
Herman William Priesman, Glendale, Calif., assignor to The Raymond Lee Organization, New York, N.Y., a part interest

Filed Sept. 24, 1975, Ser. No. 616,278

Int. Cl.<sup>2</sup> A47B 85/00

U.S. Cl. 108-19

2 Claims



1. A tray assembly adapted for mounting over a transmission hump in the floor of a vehicle comprising a shaped panel member that serves as a tray, pairs of bearing members fitted to the underside of said panel member, a plurality of pairs of legs, each pair of legs being interconnected by a mid-section to form a C-section, each of such C-sections being rotatably

fastened to a pair of said bearing members, a bracket having a concave edge fastened to each leg of each C-section, said bracket shaped to engage the underside of said panel when the leg is rotated to a fully extended position, and located to hold the C-sections when fully extended in a plane which is at an obtuse angle to the plane of the tray, taken from a mid-section of the tray.

4,010,697

**SHELF BRACKET ASSEMBLY AND BRACKET FOR SAID ASSEMBLY**

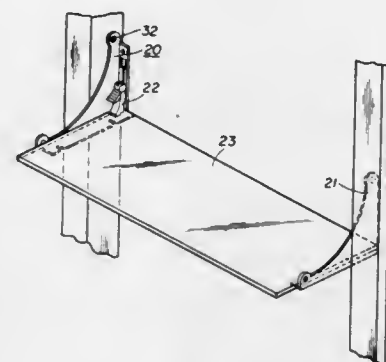
Ruediger Einhorn, Katonah, N.Y., assignor to Coats &amp; Clark, Inc., Stamford, Conn.

Filed Jan. 23, 1976, Ser. No. 651,951

Int. Cl.<sup>2</sup> A47B 57/00

U.S. Cl. 108-93

19 Claims



1. A bracket comprising a plate, one side of which defines a first mounting surface, said plate having first and second adjacent edges which extend at right angles to one another, first and second flanges extending from said first and second edges respectively, in a direction away from said first mounting surface, said first and second flanges defining second and third mounting surfaces respectively extending to said first and second edges respectively, a pair of mounting apertures extending through at least one of said flanges, a mounting hole in said plate adjacent the junction of said first and second edges, said flanges extending given distances along said first and second edges respectively, with said first flange extending to said junction, said plate extending beyond said flanges along said first and second edges in the direction away from said junction, and a pair of first and second holes in said plate adjacent said first and second edges respectively, and beyond said first and second flanges, in the direction away from said junction.

4,010,698

**MULTI-SHELVED DISPLAY ASSEMBLY**

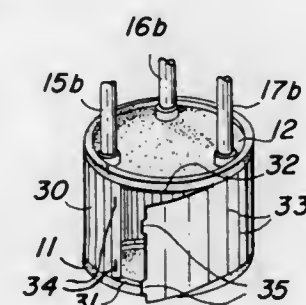
Ronald H. Taub, Highland Park, Ill., assignor to Taub Family Trust U/A dated 9/1/67, Chicago, Ill.

Filed July 29, 1974, Ser. No. 492,513

Int. Cl.<sup>2</sup> A47B 3/00

U.S. Cl. 108-111

3 Claims



1. In a multi-shelved collapsible display assembly including a base, a standard extending upwardly from said base, and an array of shelves spaced longitudinally along the length of said

standard and carried thereby, said shelves being formed with holes extending transversely thereof to receive portions of the standard therethrough,

said base and a lowermost shelf of said array of shelves being generally coextensive, coaxial, and each including a generally circular perimetric edge portion,

said display assembly further comprising a sheetlike display panel adapted to wrap around the display assembly between the base and the lowermost shelf and to bear graphic indicia for advertisement of any articles carried by the shelves of the display assembly, said display panel being formed with a slit extending longitudinally therethrough and further comprising integral tab means, said tab means being adapted to seat within the slit to form a cylindrical display sign surrounding the display assembly between the base and the lowermost shelf,

said base being formed with a groove opening upwardly and extending around an upper perimetric edge portion thereof,

and said lowermost shelf being formed with a groove opening downwardly and extending around a lower perimetric edge portion thereof,

said cylindrical display panel being sized to extend longitudinally between the grooves in the base and in the lowermost shelf, thereby to stabilize the display assembly against objectionable lateral displacement,

said display assembly further comprising shelf weight isolating means to preclude a given shelf of said array from subjection to the weight of any shelf and shelf-carried articles thereabove in said array, said shelf weight isolating means including

a shelf-support standard which is lineally segmented to provide a series of in-line pole segments interconnectable to provide a unitary integrated pole structure,

said standard including a first pole segment defining a socket, a weight support end wall extending transversely of said socket, and a second pole segment adjacent the first pole segment and including a projection adapted to seat within the socket of the first pole segment and to abut said end wall, said projection, said socket, and said end wall comprising in combination coupling means and weight bearing means operative to transfer to each segment of said pole structure the full weight of each segment thereabove, and

pole carried shelf support means to support the shelves in place on the standard in zones adjacent junctures of intercoupled consecutive segments of the pole structure, said support means comprising an annular weight bearing ledge encircling a longitudinal axis of said pole structure and normal thereto, and annular shoulder means on said shelves encircling and concentric with said holes formed therethrough;

whereby said shoulder means bears downwardly upon said ledge to support said shelves and shelf-carried articles on the pole structure, to obviate imposition on any shelf of the weight of the standard and the standard-carried shelves thereabove.

4,010,699

**SELF-ERECTING FOLDING STEP STOOL**

Eino E. Lakso, Box 257, Fitchburg, Mass. 01420

Continuation-in-part of Ser. No. 276,744, July 31, 1972, Pat. No. 3,805,711. This application Jan. 11, 1974, Ser. No. 432,661

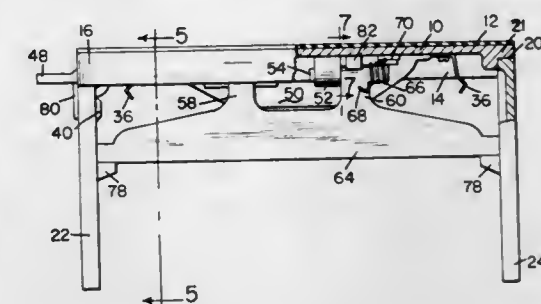
Int. Cl.<sup>2</sup> A47B 3/00

U.S. Cl. 108-133

4 Claims

1. A self-erecting article comprising a top member, legs pivotally associated with said top member at the respective end portions thereof, a handle adjacent each leg, said legs having erect positions generally at right angles with respect to the top member and folded positions generally parallel thereto, a strut having a main body portion, means pivoting said strut to said top member at the underside thereof adjacent

the center of the top member on an axis at right angles to the pivot axes of said legs, and means biasing said main body portion of the strut to extended condition outwardly from the top member, said strut main body portion having a length equal to the distance between the legs when extended, inter-engaging automatic locking means between the ends of the strut main body portion and each of said legs for holding said legs generally fixed with respect to said strut in extended condition thereof, said automatic locking means comprising a pair of wedge shaped locks projecting laterally from the main body portion of said strut there being one of said wedge shaped locks located at each end of said strut, and a pair of



locking blocks one locking block at said pair being rigidly mounted on the inside surface of one of said legs adjacent to said strut in the erected condition thereof and the other locking block being similarly mounted on the other leg, each of said locking blocks having a wedge shaped opening facing said strut for receiving one of said wedge shaped locks when said strut is pivoted to its extended condition, and yielding means lightly holding the legs superimposed on the strut when folded, said yielding means having a strength thereof allowing separation of the legs upon a slight downward shake applied to the top member while grasping the handles, thus bringing the legs into an erected and locked condition.

4,010,700

**PROGRAM CONTROLLED POWER TRANSMISSION**

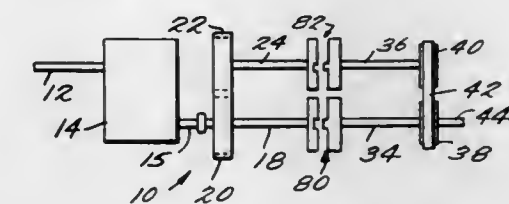
Harley E. Webb, Ooltewah, Tenn., assignor to South-Co Machinery Company, Inc., Chattanooga, Tenn.

Filed Feb. 9, 1976, Ser. No. 656,589

Int. Cl.<sup>2</sup> D05C 15/02

U.S. Cl. 112-79 R

16 Claims



1. An apparatus for controlling a driven rotatable member simultaneously with respect to its direction of rotation and the period of rotation in a selected direction comprising:

- drive means for continuously delivering rotary power at a selected speed,
- transmission means for receiving said rotary power from said drive means and transmitting intermittently said rotary power in selected increments of rotation in a selected direction,
- a first rotatable member connected to said transmission means for rotation thereby,
- a second rotatable member,
- means connecting said first and second rotatable members for rotation in opposite directions,
- a third and a fourth member each mounted for rotation in either a clockwise or a counter-clockwise direction,
- first coupling means for coupling said first and third members so that rotation of said first member will be transmitted to said third member,
- second coupling means for coupling said second and fourth



members so that rotation of said second member will be transmitted to said fourth member, said first and second coupling means each being movable independently of each other between a coupled and an uncoupled position relative to said first and third and said second and fourth members, respectively, said first and said second coupling means each having biasing means for constantly urging said respective coupling means toward said uncoupled positions, means for moving said first and second coupling means to said coupled positions against the urging of said biasing means in timed relationship with said transmission means so that said first and second coupling means will both be in said coupled positions only when no rotary power is being transmitted by said transmission means to said first rotatable member, retaining means for holding said first and second coupling means in said coupled positions, said retaining means being selectively operable so that, while one of said coupling means is held in said coupled position, said other coupling means will be free to move under the urging of said biasing means to said uncoupled position, and means for connecting said third and fourth rotatable members for rotation in the same direction so that, when said first coupling means is held in said coupled position, said third rotatable member will be rotated in the same direction as said first rotatable member and, when said second coupling means is held in said coupled position, said third rotatable member will be rotated in the same direction as said second rotatable member.

4,010,701

## SEWING MACHINE ACCESSORY

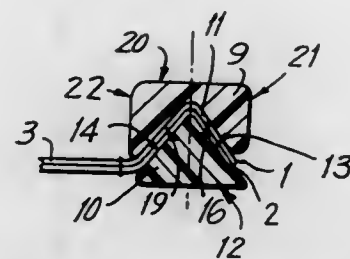
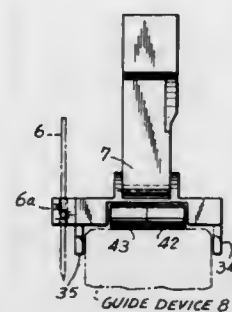
Raymond Helfont, 152-28 Jewel Ave., Flushing, N.Y. 11367

Filed Oct. 30, 1975, Ser. No. 627,143

Int. Cl.<sup>2</sup> D05B 21/00; D05C 9/04

U.S. Cl. 112—121.12

10 Claims



1. A sewing machine accessory for sewing at least two layers of material to each other in an irregular pattern with a sewing machine having a plate with a supporting surface having a hole formed therein, a feeder having a high friction surface positioned in the hole and having an intermittent motion relative to the surface of the plate, a needle and a foot device for pressing material to be sewn onto the supporting surface of the plate and guiding the needle through such material in a selected pattern, said sewing machine accessory comprising independent guide means positionable on the supporting surface of the plate and in intermittent contact with the feeder of a sewing machine for guiding the sewn material through an irregular pattern, said guide means comprising

a pair of complementary jig devices shaped to fit in substantial juxtaposition with layers of material to be sewn to each other positioned between said jig devices, said jig devices having substantially the same irregular configuration and complementary cross-sectional areas, one of the pair of complementary jig devices comprising a frame of substantially rigid material having a cross-sectional area of predetermined geometric configuration and being utilized as the bottom one of said jig devices and the other of said pair of complementary jig devices comprising substantially rigid material having a cross-sectional area of predetermined configuration with a channel formed therein of substantially the same configuration and dimensions as the cross-sectional area of said one of said pair of complementary jig devices and being utilized as the top one of said jig devices, and clamping means for releasably clamping the jig devices in substantial juxtaposition with the material to be sewn positioned therebetween; and

guide member means extending from the foot device of a sewing machine for maintaining the guide means in a predetermined position relative to the needle of the machine while said guide means is moved between the foot device and the supporting surface of the feeder of the machine through the entire duration of said guide means.

4,010,702

## AUTOMATIC THREADING DEVICE FOR SEWING MACHINES

Toshio Miyamoto, 17-27, 2-chome Himezato, Nishiyodogawa, Osaka, Japan

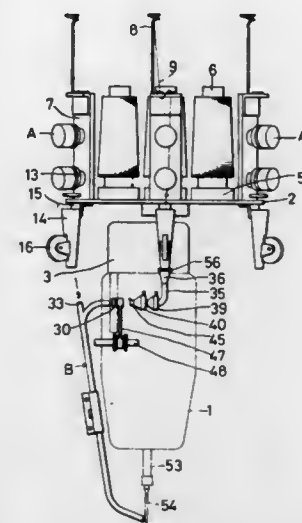
Filed Sept. 3, 1975, Ser. No. 610,058

Claims priority, application Japan, Oct. 8, 1974, 49-116654; Feb. 6, 1975, 50-17055; Sept. 3, 1974, 49-102192; Sept. 3, 1974, 49-102193

Int. Cl.<sup>2</sup> D05B 87/02

U.S. Cl. 112—225

5 Claims



1. A threading device for a sewing machine to selectively feed a thread from one of several bobbins through the eye (55) of a sewing needle (54) in a needle holder (53) at the working end of an arm (1) comprising in combination:

- a moveable table (2) disposed above said arm (1) having a plurality of bobbin holders (5) for supporting bobbins with thread (9) thereon for selectively moving said bobbins to a feeding station;
- guide means (14, 16) below each bobbin to guide and feed thread from the bobbin downwards;
- a suction pipe (35) at said feeding station with an aperture disposed under said guide means (14), an elongated guide pipe fed by said suction pipe (35) and blast and suction means coupled to said guide pipe to propel a thread therethrough, said guide pipe having an outlet (34) disposed in the adjacent said eye (55);
- a slidable rod (50) juxtaposed opposite said eye (35)

having wire means and grasp means at the outer end thereof so adapted and disposed that said grasp means can penetrate said eye, grasp said thread and pull it through the needle eye; and, e. means for actuating said slidable rod.

4,010,703

## END LINING WITH HOT MELT

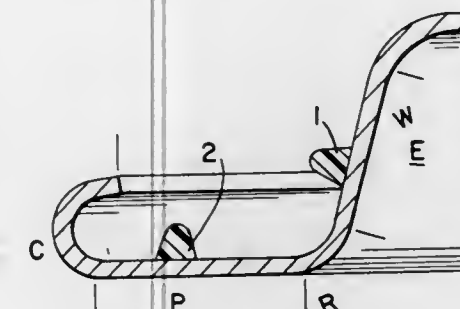
John Clements Spiekermann, III, Justice; David J. Rosbe, Hickory Hills; Edmund M. Kulesa, South Holland; James Kullk, Chicago, and David F. Brasel, Worth, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,417

Int. Cl.<sup>2</sup> B21D 51/30

U.S. Cl. 113—120 Y

11 Claims



1. In a container having an end panel joined to a body by a double lapped seam, an improved method of providing a sealant in said seam comprising the steps of: providing an end panel having a peripheral channel portion, depositing a quantity of hot melt material in said channel portion in a first position, heating said deposited material causing the same to reflow, to a second preferred position, and double seaming said end panel with the reflowed material to said body.

4,010,704

## BUOYANT SPHERE

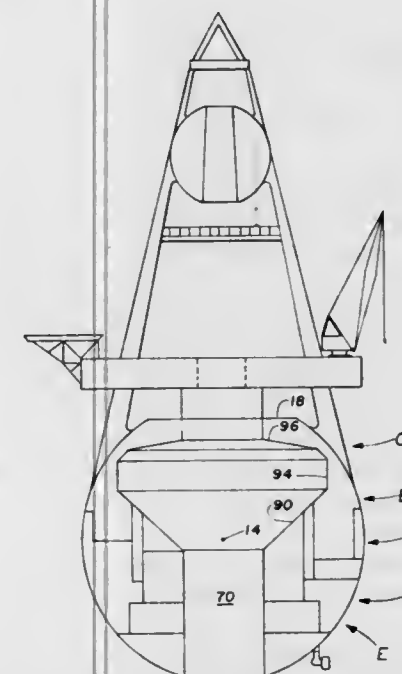
Kenneth E. Mayo, and Charles R. Fink, both of Nashua, N.H., assignors to Energy Systems Corporation, Nashua, N.H.

Filed Aug. 10, 1973, Ser. No. 387,335

Int. Cl.<sup>2</sup> B63B 39/00

U.S. Cl. 114—267

11 Claims



1. A vessel comprising a hull containing structural means, ballasting members, compartments, appurtenances, power means and the like having a generally spherical outer surface

adapted to be partially submerged in an upright position along a vertical diametric axis in a body of water undergoing continuous wave action, the mean water line of said wave action defining a water plane intercept in a horizontal cross section of the hull, said hull having a center of gravity below the geometric center and at least one elongated well within the interior of the hull forming an internal well extending symmetrically about said diametric vertical axis, an opening at the top of said well communicating with the atmosphere and an opening at the bottom of said well communicating with said water to permit free flow of water in said well, said well being sufficiently enlarged in the horizontal cross section substantially along the mean water line so that in combination with the surface of the hull the water plane intercept is reduced such that the period of the vertical oscillation of said vessel is greater than the period of vertical oscillation of any waves reasonably expected to be encountered at any level of submergence.

4. A buoyant body comprising a hull containing structural means, ballasting members, compartments, appurtenances, power means and the like having a generally spherical outer surface adapted to be partially submerged in an upright position along a vertical diametric axis in a body of water undergoing wave action, the mean water line of said wave action defining a water plane intercept in a horizontal cross section of the hull, the weight of said body and that of its contents being selected in accordance with the following relation to obtain a body having a natural period of vertical oscillation according to the following formula:

$$T_h = 2\pi \sqrt{W/g K_s}$$

where

$T_h$  equals the natural period of vertical oscillation (heave);

$W$  equals the total displacement of the body;

$g$  equals the gravitational constant; and

$K_s$  equals the change in buoyancy per foot of change in water line,

said hull having a center of gravity below the geometric center and at least one elongated well within the interior of the hull extending along the vertical diametric axis of said hull, said well being open at both ends and communicating with the water and atmosphere, said well being sufficiently enlarged in the horizontal cross section substantially along the mean water line to significantly reduce the water plane intercept of the hull at any level of submergence so that the period of its vertical oscillation is increased to a desired value greater than the period of natural vertical oscillation.

5. A buoyant body comprising a hull containing structural means, ballasting members, compartments, appurtenances, power means and the like adapted to be partially submerged in a body of water undergoing constant wave action, the mean water line of said wave action defining a water plane intercept in a horizontal cross section of the hull, the outer surface of said hull being formed in the general shape of a spherical surface, said ballasting members structural members, and appurtenances or the like being so distributed so that the center of gravity is below the geometric center as to provide a righting moment making the body float with a predetermined portion up in an upright position along a vertical diametric axis, said hull having an elongated well extending symmetrically along said vertical diametric axis open at both ends to atmosphere and the flow of water therein and of such dimension as to receive therein a column of water the height of which is responsive to the pressure of said body of water at the lower opening of such well, said well being sufficiently enlarged in the horizontal cross section at least above the mean water line integrating with that of the outer surface of said hull to reduce the intercept plane of said hull to make the period of its vertical oscillation greater than the period of vertical oscillation of any waves of significant height reasonably expected to be encountered by the body.



4,010,705

**ROTATIONAL ENERGY ABSORBER APPARATUS FOR HYDROFOIL CRAFT STRUT**

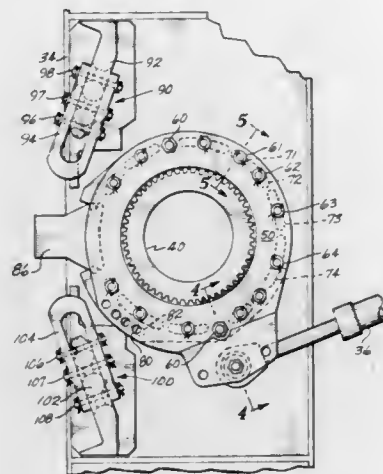
John Bradford Connell, 641 - 212th Ave. SE., Redmond, Wash. 98052, and John Weaver Williams, 16721 SE. 12th, Bellevue, Wash. 98008

Filed Oct. 6, 1975, Ser. No. 620,076

Int. Cl.<sup>2</sup> B63B 1/28

U.S. Cl. 114-279

11 Claims



1. Rotational energy absorbing apparatus for the protection of a hydrofoil craft strut/foil means against impact energy damage causing strut axis rotation, comprising in combination:

- a. a strut plate means rigidly mounted to said strut;
- b. an outer plate disposed on said strut plate and rigidly mounted to said craft structure;
- c. a plurality of yieldable means connected to said strut plate and to said outer plate and adapted for sequential shearing when said strut plate rotates about a substantially common perpendicular axis between said strut and said outer plate which axis is substantially parallel with said strut rotation axis and whereby each shearing action of each said plurality of yieldable means is adapted to take a part of said associated impact energy;
- d. stop means mounted adjacent said strut plate;
- e. said stop means including a rigidly mounted first portion and a second portion yieldably mounted by at least one yieldable restraining means to said first portion, and
- f. a strut plate portion adapted to contact said second portion when said strut plate rotates and has sheared off said yieldable means and whereby said strut plate portion is adapted to dislocate said second portion in respect to said first portion, thereby shearing said yieldable restraining means.

4,010,706

**TOWED DEVICE FOR MEASURING MAGNETIC FIELD AND THE VERTICAL GRADIENT THEREOF AT SEA**

Georges Jean-Marie Pretet, St. Renan, France, assignor to Etat Français representé par le Délégué Ministériel pour l'Armement, France

Filed Dec. 13, 1974, Ser. No. 532,679

Claims priority, application France, Dec. 13, 1973, 73.44465

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

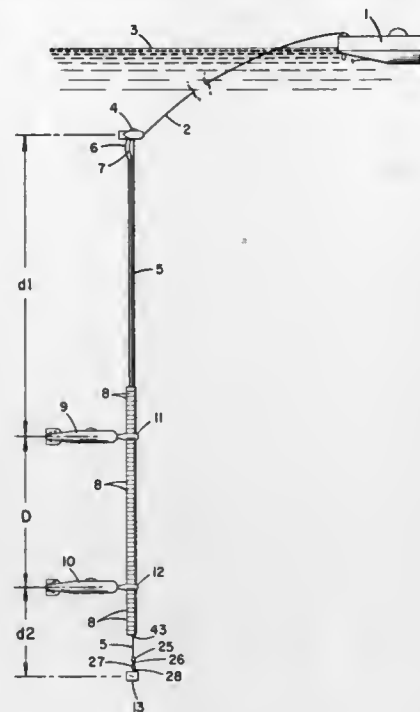
Int. Cl.<sup>2</sup> B63B 21/56

U.S. Cl. 114-245

6 Claims

1. A towed device for measuring at sea variable magnitudes, comprising: a flexible carrying cable including a material having a low coefficient of elongation, a first and a second fish attached to said carrying cable, said first and second fish bearing measuring apparatus, said carrying cable being suspended from the end of a tow cable, a vertically downward pulling member connected to the bottom end of said carrying

cable, said pulling member including a diving wing having a weighted fuselage provided on both sides with ailerons at a negative angle of incidence, said first and said second fish



4,010,707

**MARINE PROPULSION UNIT**

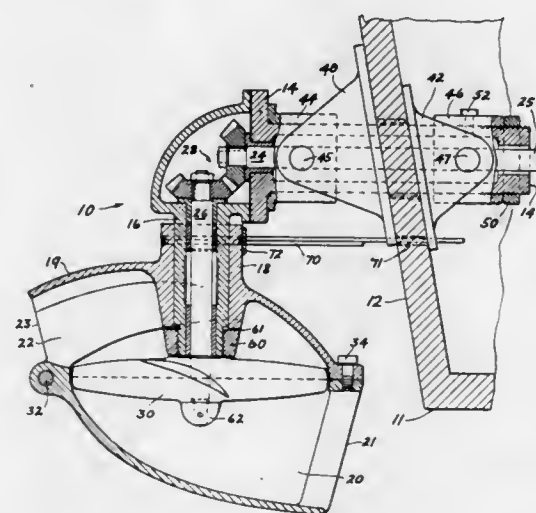
Wilfrid H. Bendall, Castle Hill Road, Pawcatuck, Conn. 06379

Filed June 11, 1976, Ser. No. 695,146

Int. Cl.<sup>2</sup> B63H 11/02, 21/24

U.S. Cl. 115-12 R

8 Claims



1. A propulsion unit for marine vessels comprising a housing having an upper portion extending longitudinally through the hull and a lower portion extending normal thereto external to the hull, said housing being rotatable about its horizontal axis, said lower portion having a concentric outer housing rotatable thereon, drive shafts in the upper and lower housing portions, said drive shafts having bevel gears interconnecting the shaft inner end portions, the outer end of the drive shaft in the upper housing being extended for connection to a power plant and the outer end of the drive shaft in the lower housing being extended for connection to a screw propeller, said unit being arranged for attachment to the vessel with the propeller rotating in a horizontal plane substantially above and closely adjacent to the surface of a working fluid wake leaving the bottom surface of the vessel when under way, said outer housing comprising a fluid inlet duct on one side of the propeller plane

and an outlet duct on the opposite side, said inlet and outlet ducts, respectively, providing a rammed intake and directed discharge of the working fluid inducted when the vessel is under way, said outer housing being rotatable about its vertical axis for directional control of the vessel and said upper housing having adjustable mounting means for attachment of the unit to the vessel.

4,010,708

**DIFFERENTIAL PRESSURE INDICATOR INCLUDING REMOTE SENSING MEANS**

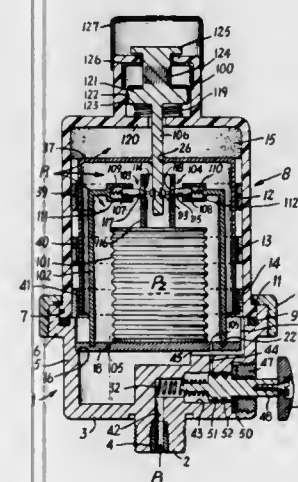
Francis C. Keledy, Butler, and Laszlo Nemes, West New York, both of N.J., assignors to Trodyne Corporation, Teterboro, N.J.

Filed Dec. 2, 1975, Ser. No. 637,031

Int. Cl.<sup>2</sup> G08B 1/00

U.S. Cl. 116-65

5 Claims



1. A pressure responsive indicator comprising a pressure tight casing including means for connecting the interior of said casing in fluid pressure communication with a closed system to be monitored;

the improvement comprising

- closed bellows means mounted within said casing under predetermined pressure;
- a shaft reciprocally mounted in said casing for rectilinear motion between exposed and retracted positions;
- means for biasing said shaft to the exposed position;
- releasable means for maintaining said shaft in said retracted position;
- means for coupling said shaft and bellows and responsive to a predetermined pressure differential between the pressure in said bellows and said closed system for releasing said shaft to said exposed position;
- wherein said shaft in assuming said exposed position exposes one portion thereof to ambient;
- a source of radiation located at the exposed portion of said shaft;
- and
- said casing further comprising radiation shield means surrounding said source of radiation when said shaft is in the retracted position.

4,010,709

**APPARATUS FOR RANDOMLY COLORING CARPET OR OTHER PILE FABRIC**

Robert W. Sayman; John S. Quarles, and Howard J. Hamilton, all of Dalton, Ga., assignors to Shaw Industries, Inc., Dalton, Ga.

Filed Jan. 28, 1976, Ser. No. 653,211

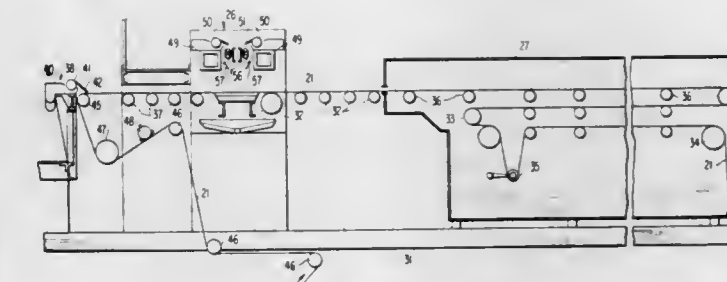
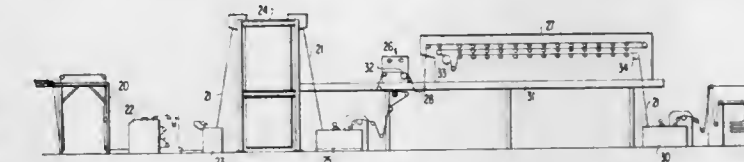
Int. Cl.<sup>2</sup> B05C 11/00; D06B 1/04

U.S. Cl. 118-33

11 Claims

1. An apparatus for randomly coloring a pile carpet web or the like comprising means for supporting and conveying a carpet web on a substantially horizontal path of movement with the pile face of the carpet web upwardly, means substantially aligned horizontally with said supporting and conveying

means and near the upstream end of the horizontal path of movement of the carpet web for applying a relatively thick viscous coating layer to the pile face of the carpet web during movement thereof, means downstream from the applicator means for said viscous coating for delivering liquid dye drippings randomly on top of said viscous coating layer from an overhead dye source whereby said dye drippings may pool and run in irregular rivulets on said viscous coating layer without



immediately penetrating into the carpet pile face, and elevated temperature means downstream from said dye delivery means and being substantially aligned horizontally with said supporting and conveying means and receiving the moving carpet web with the viscous coating layer and the dye drippings thereon and causing the viscous coating layer to disintegrate and settle into the carpet pile face with said dye drippings to thereby form a permanent random color pattern in the carpet pile face and to fix the dye.

4,010,710

**APPARATUS FOR COATING SUBSTRATES**

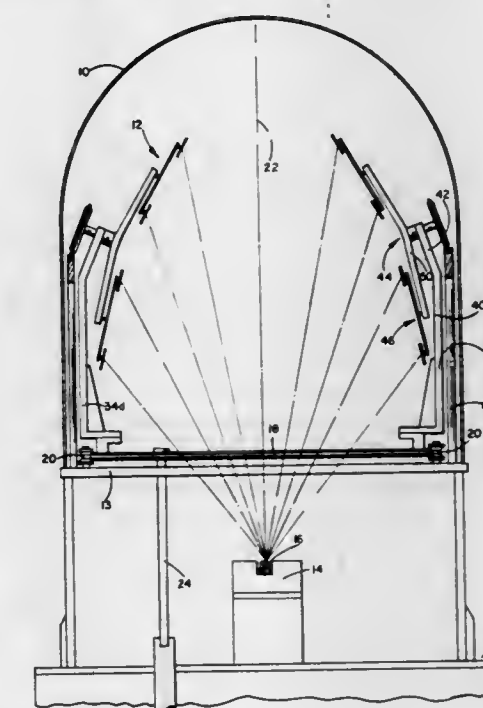
Ernest E. Williams, Fullerton, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 20, 1974, Ser. No. 508,007

Int. Cl.<sup>2</sup> C23C 13/12

U.S. Cl. 118-49

20 Claims



1. Apparatus for holding workpieces comprising a base support, an annular base mounted to said base support for rotation about a base axis,



means for driving said annular base about said axis, a plurality of cluster standards fixed to and upstanding from said annular base at points spaced about the periphery thereof, and

a plurality of cluster assemblies each respectively mounted on a respective one of said cluster standards, each said cluster assembly comprising

a primary multi-armed spider mounted on an associated cluster standard for rotation about a primary axis, a plurality of secondary multi-armed spiders each respectively mounted on a respective one of the arms of said primary spiders for rotation about respective ones of a plurality of secondary axes, holding means carried on each arm of said secondary spiders for

holding a workpiece, means for rotating said primary spiders relative to the associated cluster standard, and means for rotating each of said secondary spiders relative to the arm on which it is rotatably mounted.

4,010,711

# APPARATUS FOR APPLYING A SOLDERING PASTE TO DISCRETE SPOTS ON COMPONENTS PRIOR TO SOLDERING

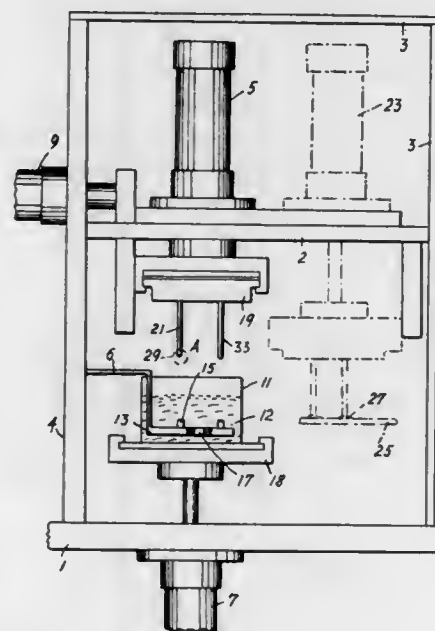
Manfred Bodewig, No. 75, Eselsweg, 405 Monchen-Gladbach, Germany

Filed Nov. 4, 1975, Ser. No. 628,724

Int. Cl.<sup>2</sup> B05C 1/00

U.S. Cl. 118—211

12 Claims



1. Apparatus for applying soldering paste from a bath of soldering paste to discrete spots on electrical communication components to be soldered, said apparatus comprising

- a. at least one metering cup,
- b. means supporting said metering cup,
- c. means for supporting at least one component at a position spaced from said metering cup,
- d. at least one metering plunger,
- e. means for moving said metering plunger between a first position in alignment with said metering cup and a second position in alignment with said means for supporting said component and for raising and lowering said metering plunger at said first position to dip the end of said plunger in soldering paste contained in said metering cup and entrain soldering paste thereon and at said second position to transfer the entrained soldering paste to a predetermined spot on a component,
- f. container means for containing soldering paste, and
- g. means for raising and lowering said container means in synchronism with the ascent and descent of said metering plunger to immerse said metering cup in said soldering paste and fill said cup and to lower said container means to expose said metering cup above the level of said solder-

ing paste in such a manner that said metering cup is immersed in said soldering paste when said container means and said metering plunger are in their respective raised positions and the end of the metering plunger dips into the full metering cup above the level of the soldering paste when said plunger and said container means are in their respective lower positions.

4,010,712

# COATING APPLICATOR TOOL FOR WELL CASING

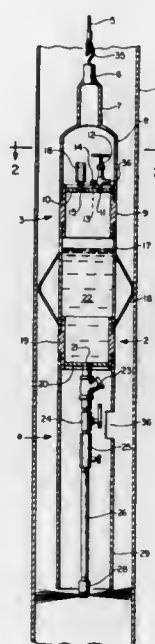
Michael G. Dugas, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 12, 1975, Ser. No. 631,034

Int. Cl.<sup>2</sup> B05C 7/02

U.S. Cl. 118—306

10 Claims



1. An apparatus for the application of a relatively uniform interior protective coating to well casing in-place which comprises, in combination, a spray section and a container section, said container section including means for releasable attachment to said apparatus of a lowering line, a container head having an end wall defining the upper portion of the container, said container head end wall having filling and pressurizing means, vent means and pressure relief means and a container bottom having an end wall defining the lower portion of the container, said container bottom end wall having an outlet communicating with said spray section, said spray section having at least one spray nozzle connected through a conduit, said conduit containing a pressure regulated flow control valve means, to the container bottom end wall and communicating with the container section through said outlet in said container bottom end wall.

4,010,713

# ELECTROSTATIC POWDER SPRAY COATING APPARATUS

Hermann Wirth, Gundelfingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 28, 1975, Ser. No. 563,075

Claims priority, application Germany, Mar. 29, 1974, 2415296

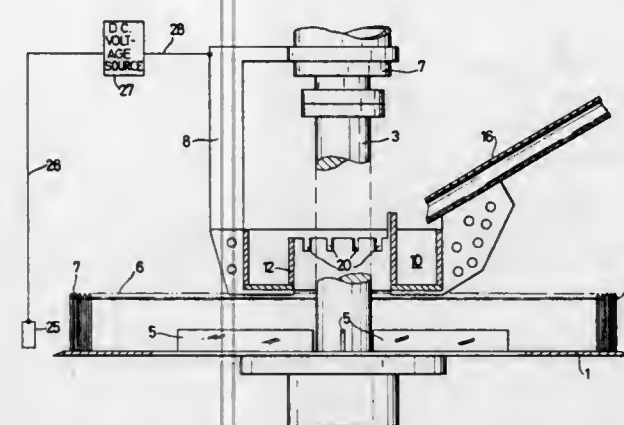
Int. Cl.<sup>2</sup> B05C 5/02

U.S. Cl. 118—621

4 Claims

1. Electrostatic powder spray coating apparatus having a rotary spray-distributing disk, means for feeding coating powder to the central portion of said disk, means for applying an electric field between articles to be coated and, on the other hand said disk and said feed means, whereby particles of said coating powder are launched mechanically field under the influence of which the powder is applied to articles said to be coated, and means for breaking up agglomerates of the coat-

ing material in its path towards the articles to be coated in the form of a regularly spaced cylindrical grid of a plurality of



elongated impact elements (6) located on the upper side of said rotary disk, at or near the periphery of the disk.

4,010,714

# SYSTEM FOR MANAGING MILKING-COWS IN STANCHION STOOL

Iwao Notsuki, Narashino, and Katsumi Ueno, Chiba, both of Japan, assignors to Director, National Institute of Animal Industry, Aobacho, Japan

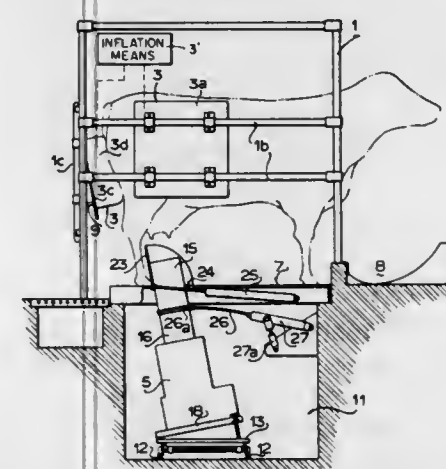
Filed Feb. 27, 1975, Ser. No. 553,894

Claims priority, application Japan, Mar. 8, 1974, 49-26844; Mar. 8, 1974, 49-26845

Int. Cl.<sup>2</sup> A01J 3/00

U.S. Cl. 119—14.03

8 Claims



1. A system for managing milking-cows in stanchion stool comprising

- a stool frame,
- a stanchion member means for projecting the head of the cow therethrough,
- a plurality of support member means secured to the stool frame for setting the body of the cow in a standing position,
- stopper means for restricting the vertical movement of the neck of the cow, and
- a milking unit set under the floor and capable of rising through a trap door disposed on the floor, said milking unit having a plurality of teatcups and means for raising the teatcups and means for stopping the raising of the teatcups so that the teatcups are fitted to the respective teats.

4,010,715

# FLUID CONDUCTIVITY DETECTING MEANS

James D. J. Robar, and David G. Glass, both of Saskatoon, Canada, assignors to Seds Systems Ltd., Canada

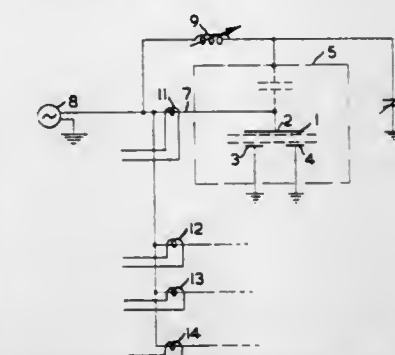
Filed June 5, 1975, Ser. No. 584,069

Claims priority, application Canada, Oct. 18, 1974, 211755

Int. Cl.<sup>2</sup> A01J 7/00

U.S. Cl. 119—14.14

15 Claims



1. Apparatus used in determining the conductivity of a fluid, comprising

- a. an insulating tube for passing of fluid therethrough;
- b. current generating means including a radio frequency alternating current source and a pair of laterally spaced conducting plates, each separated by a dielectric from the fluid, for capacitively coupling a radio frequency alternating current signal to the fluid to produce a conductivity current varying with the ionic conductivity of the fluid;
- c. detection means connected to the conductive plates for detecting an alternating current passing through said fluid.

4,010,716

# ROTARY ENGINE

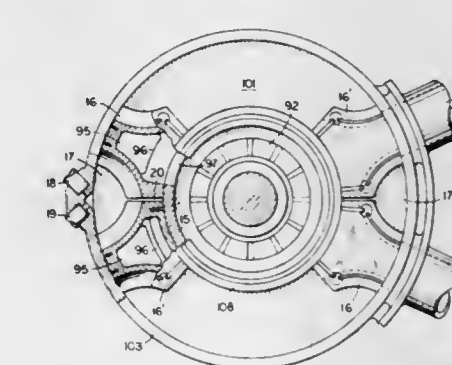
Karlis Minka, 204 E. Joppa Road, Towson, Md. 21204

Filed July 12, 1974, Ser. No. 487,968

Int. Cl.<sup>2</sup> F02B 53/04

U.S. Cl. 123—8.47

16 Claims



1. An internal combustion rotary engine comprising: a circular housing having axially spaced end walls, a peripheral casing interconnecting said end walls, and at least one intake port and at least one exhaust port, said ports being arranged on the peripheral casing; a pair of rotor halves disposed coaxially within said circular housing, each rotor half having N vanes, N being an even number and the vanes of one rotor half being interposed between the vanes of the other; oscillator means interconnected with said rotor halves for superimposing rotatory oscillations thereon whereby the rotor halves oscillate with respect to each other while rotating in the same direction; a pair of said vanes, the vanes being from alternate rotor halves, periodically defining together with said peripheral casing a hemispherical combustion chamber and a squish area, and another pair of said vanes, the vanes being from alternate rotor halves, periodically defining together with said peripheral casing a hemispherical scavenging chamber, the scavenging chamber communicating with said intake port and said exhaust port.



4,010,717

# FUEL CONTROL SYSTEM HAVING AN AUXILIARY CIRCUIT FOR CORRECTING THE SIGNALS GENERATED BY THE PRESSURE SENSOR DURING TRANSIENT OPERATING CONDITIONS

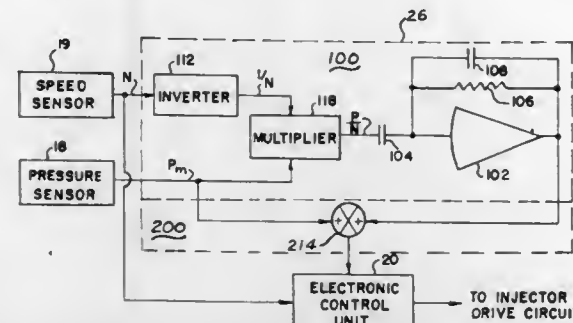
Lael Brent Taplin, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 3, 1975, Ser. No. 546,239

Int. Cl.<sup>2</sup> F02B 3/00

U.S. Cl. 123—32 EH

23 Claims



1. An electronic fuel injection system for an internal combustion engine comprising:  
engine sensor means for generating signals indicative of engine operating conditions, said sensor means including pressure sensor means for generating a pressure signal indicative of engine air intake manifold pressure, and speed sensor means for generating a speed signal indicative of engine operating speed;  
pressure signal correction circuit means for generating a corrected pressure signal having a value equal to the sum of said pressure signal and a correction signal generated in response to said pressure signal and said speed signal, when the pressure signal is changing and indicative of a transient condition;  
electronic control unit means for generating electrical signals indicative of engine fuel requirements in response to signals generated by said engine sensors, including said speed signal and said corrected pressure signal; and  
fuel delivery means for delivering fuel in response to the signals generated by said electronic control unit means.

4,010,718

# RECIPROCATING PISTON ENGINES HAVING PISTON OIL COOLING

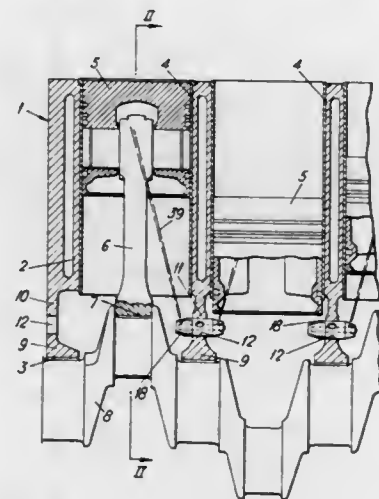
William Findlay Stewart, Peterborough, England, assignor to Perkins Engines Limited, Peterborough, England

Filed Jan. 27, 1975, Ser. No. 544,530

Claims priority, application United Kingdom, Feb. 6, 1974, 5374/74

Int. Cl.<sup>2</sup> F01P 3/06

U.S. Cl. 123—41.35



1. A reciprocating piston engine comprising a cylinder

block having a cylinder therein, a piston reciprocable in the cylinder, a crankcase, a crank rotatable on a bearing in the crankcase, a connecting rod connecting the crank to the piston, a lubricating oil passage in said crankcase, a bore formed in said crankcase between the bearing and said cylinder and meeting said oil passage, a tubular jet assembly, locating means on said jet assembly for accurately positioning said jet assembly within the engine and said jet assembly having an interference fit with said bore to retain said jet assembly's position in said bore in said crankcase, said jet assembly having a hollow interior connected to said oil passage and a jet passage accurately formed and positioned prior to assembly in said bore.

4,010,719

# ROTARY INTERNAL COMBUSTION ENGINE

Cleto L. Lappa, 541 Torwood Lane, Pittsburgh, Pa. 15236

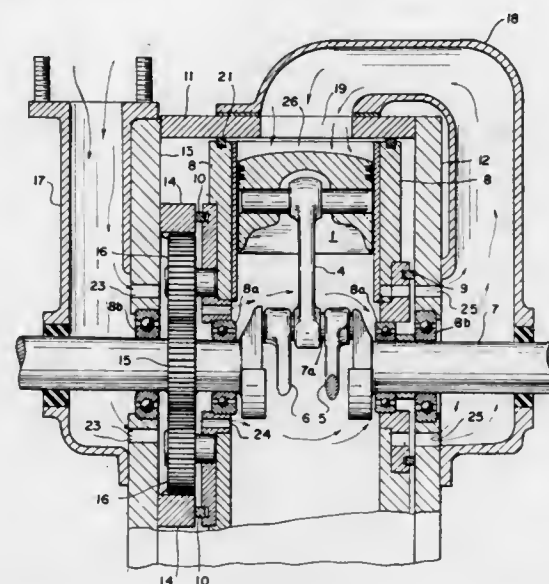
Continuation of Ser. No. 357,195, May 4, 1973, abandoned.

This application Jan. 22, 1975, Ser. No. 543,135

Int. Cl.<sup>2</sup> F02B 57/04, 57/08

U.S. Cl. 123—44 C

2 Claims



1. A rotary internal combustion engine including a housing, together with a gaseous inlet port extending through a sidewall of said housing, a one-way reed valve in said port, a second port extending through the other sidewall of said housing, a gas intake port and an exhaust port in said housing cylindrical portion, said gas intake port connected to a conduit to said second port, said rotary block having a pair of radially extending cylinders 180° apart, a pair of pistons, each slidably mounted on one of said cylinders, a crank shaft including a double throw provided by a pair of crank pins, a pair of connecting rods, each having one end connected to one of said pistons and the other end connected to one of said crank pins, a spark plug mounted on said housing to ignite the gaseous mixture introduced in said gas intake port at the moment when said pistons are outermost to effect power impulse movements of said block, whereby when both pistons move radially outwardly whereupon said reed valve is drawn open, the fuel mixture drawn in will fill both cylinders, and when said reed valve is forced closed by movement of said pistons radially inwardly, said drawn in fuel mixture will be fed through said conduit and said gas intake port to a single piston to effect supercharging.

4,010,720

# ACCELERATOR PRESSURE CONTROL MECHANISM

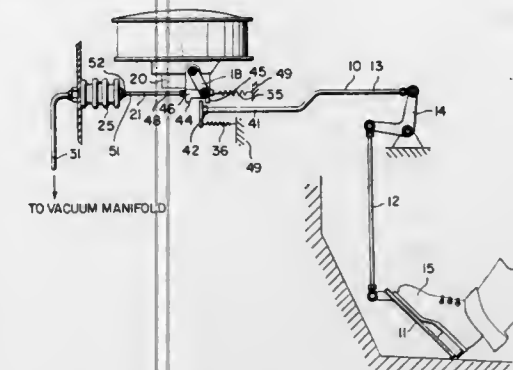
Reginald H. Gram, West Hill, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 14, 1975, Ser. No. 564,096

Int. Cl.<sup>2</sup> F02D 11/08

U.S. Cl. 123—103 R

3 Claims



1. A throttle linkage for the carburetor of an internal combustion engine that encourages the operation of the engine at a high vacuum condition in the engine intake manifold, said linkage comprising  
a carburetor, the throttle valve linkage of which is biased by first spring means to the idle position of the throttle valve, an accelerator pedal linkage biased by second spring means to the idle position of the accelerator pedal, and a bellows unit powered by the suction furnished from a tube joined to the intake manifold of said carburetor, said pedal linkage and said bellows unit each fitted with means to engage the throttle valve linkage in parallel configuration,  
said first spring means and said second spring means being of a magnitude to generate a total force together that is greater than the force generated by the bellows unit with said bellows unit linked to the said throttle valve so as to apply a force to the throttle valve in the direction opposed to the force applied by each of said spring means and in the direction of the force applied to the throttle linkage by the pedal linkage when the accelerator pedal is moved away from the idle position, such that an increase of suction in the bellows unit and in the intake manifold reduces the force required to hold the accelerator pedal linkage away from the idle position.

4,010,721

# VACUUM DELAY/RELIEF VALVE

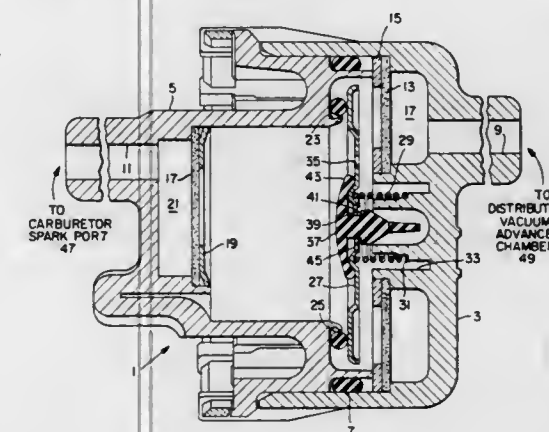
George Ludwig, Troy, Mich., assignor to The Bendix Corporation, South Bend, Ind.

Filed Apr. 24, 1975, Ser. No. 571,163

Int. Cl.<sup>2</sup> F02P 5/10; F16K 21/02

U.S. Cl. 123—117 A

5 Claims



1. In an internal combustion engine having a vacuum source

responsive to engine acceleration and a distributor vacuum advance chamber, a device for controlling communication between said vacuum source and said vacuum advance chamber to delay spark retard on moderate engine acceleration and to provide normal spark retard during substantially full throttle acceleration, said device comprising a housing having a first port communicated to said vacuum source and a second port communicated to said vacuum advance chamber, normally closed valve means responsive to the pressure differential between said ports to permit substantially uninhibited communication therebetween when the pressure level at said first port exceeds the pressure level at the second port by a predetermined amount, and flow restricting means permitting limited communication from said first port to said second port when said valve means is closed, said valve means including mechanism permitting substantially uninhibited communication from said second port to said first port when the pressure level at the second port is greater than the pressure level at the first port to thereby permit normal spark advance at all times.

4,010,722

# METERING CONTROL FOR THE AIR-FUEL MIXTURE IN INTERNAL COMBUSTION ENGINES

Bernard R. Laprade; Xavier J. Laprade, both of 64260 Arudy, and Pierre J. Gele, Route de Lourdes, 65000 Tarbes, all of France

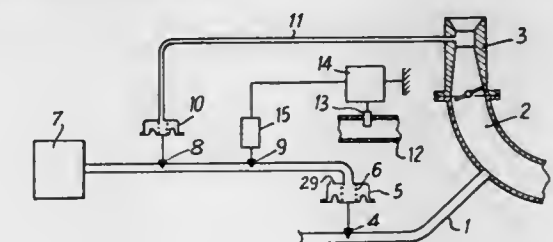
Filed Dec. 15, 1975, Ser. No. 640,934

Claims priority, application France, Dec. 20, 1974, 74.42191

Int. Cl.<sup>2</sup> F02M 23/04

U.S. Cl. 123—119 D

16 Claims



1. A metering-correction control apparatus for the air-fuel mixture in an internal combustion engine including an intake pipe, a device for metering the air-fuel mixture, and an exhaust manifold, said control apparatus comprising:  
at least one auxiliary air supply branched at the engine intake pipe downstream of the metering device;  
at least one valve for controlling the introduction of secondary air in said auxiliary air supply;  
a spring-biased membrane capsule for controlling said valve;  
a source coupled to said capsule for supplying a constant partial vacuum of predetermined magnitude; and  
variable throttle means for modulating the partial vacuum applied to said capsule, said throttle means including first control means responsive to the rate of air-flow in the metering device of the air-fuel mixture to control the partial vacuum proportionally to said air-flow rate and second control means responsive to the composition of burnt gases in the exhaust manifold to control the partial vacuum as a function of the composition of the burnt gases.



4,010,723

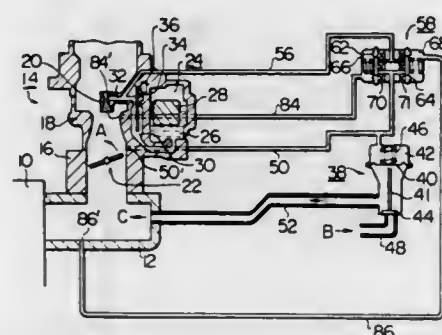
**EXHAUST GAS CLEANING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE FOR A VEHICLE**  
Katsumi Suzuki; Katsunori Kawatake; Hiroshi Sawada, and Hiroki Matsuoka, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan  
Filed Dec. 30, 1975, Ser. No. 645,392

Claims priority, application Japan, Oct. 15, 1975, 50-124132

Int. Cl.<sup>2</sup> F02M 25/06

U.S. Cl. 123—119 A

4 Claims



1. An exhaust gas cleaning apparatus for an internal combustion engine for a vehicle having a carburetor including an air bleed system to bleed air to a fuel line of said carburetor, and having an exhaust gas recirculation valve including a diaphragm mechanism which is controlled by negative pressure in said carburetor so as to recirculate a part of said exhaust gas from the exhaust manifold in the intake manifold, said apparatus comprising: a second air bleed system to bleed air to the fuel line of said carburetor; and valve means for communicating said second air bleed system and said diaphragm mechanism of the exhaust gas recirculation valve with the atmosphere, in response to negative pressure in the venturi of said carburetor and intake manifold, thereby both the recirculating operation of a part of the exhaust gas and the supplying operation of a rich air-fuel mixture to the engine can be attained during the accelerating operation of the vehicle.

4,010,724

**APPARATUS FOR HEATING AN INTAKE MANIFOLD IN AN INTERNAL COMBUSTION ENGINE**

Hiroshi Sami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

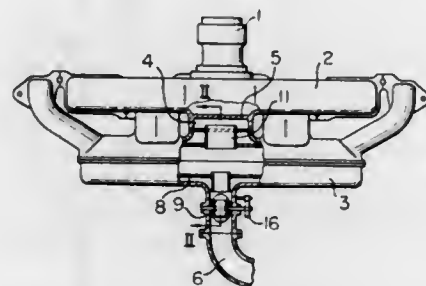
Filed Oct. 3, 1974, Ser. No. 511,522

Claims priority, application Japan, July 17, 1974, 49-81840

Int. Cl.<sup>2</sup> F02M 31/00

U.S. Cl. 123—122 AC

7 Claims



1. In an internal combustion engine comprising an intake manifold having a riser portion, an exhaust gas reactor, and an exhaust pipe, the improvement comprising:

- a heating chamber for heating the intake manifold, said chamber being arranged directly and immediately below the riser portion of the intake manifold,
- a first passage connecting the interior of the reactor to the exhaust pipe,
- a straight vertical conduit fluidly communicating the interior of the reactor and said heating chamber, said one end of said conduit opening directly into said heating cham-

ber in a direction toward said riser portion so that exhaust gas passing through said conduit can directly strike the riser portion the other end of said conduit opening directly into the reactor,

- a by-pass passage, for exhaust gas, in the reactor, the upstream end of said by-pass passage opening into said heating chamber and the downstream end of said by-pass passage opening into the first passage,
- a control valve, in said first passage adjacent the downstream end of the by-pass passage, for controlling the flow route of exhaust gas from the exhaust reactor, said control valve being pivotable in said first passage between a first position in which the downstream end of the by-pass passage is closed by the valve so that the exhaust gas from the reactor is discharged directly therefrom through said first passage into the exhaust pipe and a second position in which the first passage is closed by the valve so that the exhaust gas from the reactor is discharged therefrom through the heating chamber and the by-pass passage into the exhaust pipe.

4,010,725

**SELF-CONTAINED ENGINE WARMER**

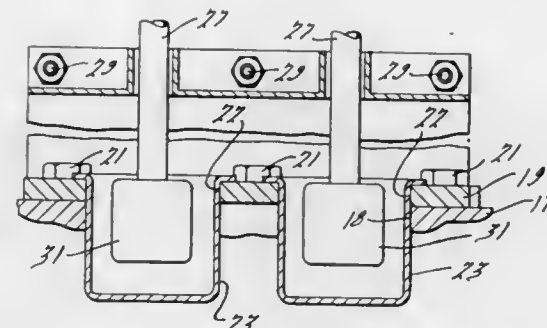
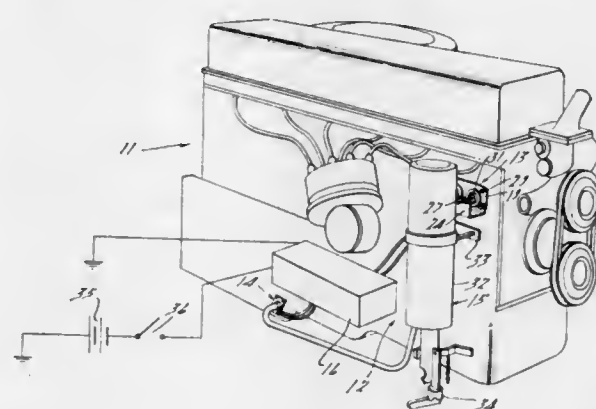
Cygnal G. White, 4835 Read Blvd., New Orleans, La. 70127

Filed Nov. 14, 1974, Ser. No. 523,679

Int. Cl.<sup>2</sup> F02N 17/02

U.S. Cl. 123—142.5 R

2 Claims



1. A self-contained heating system for a liquid cooled internal combustion engine having a cooling jacket with an opening formed in an outer wall thereof, said heating system comprising a mounting portion having a flange adapted to engage the cooling jacket outer wall around the opening and a cup-shaped portion extending into the cooling jacket and having a substantial heat radiating area exposed to the coolant therein, a flameless infra-red burner supported by said mounting portion and extending into the interior of said cup-shaped portion for establishing a heat exchange relationship with the coolant, a fuel source for supplying fuel to said flameless infra-red burner, and an electrical ignition system for said burner fired by the battery of the associated engine independent of the vehicle ignition system.

4,010,726

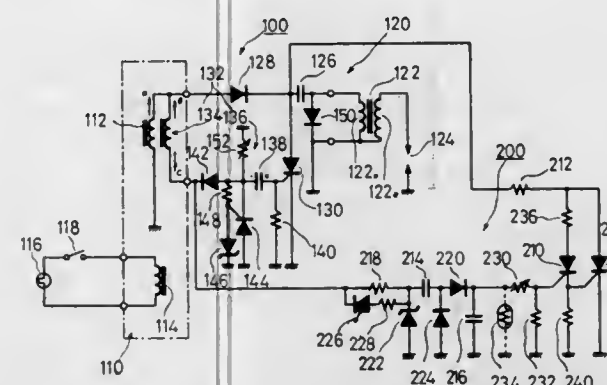
**DEVICE FOR PREVENTING AN OVERRUNNING OPERATION OF AN INTERNAL COMBUSTION ENGINE**  
Tetsuya Kondo, Susono, and Katumasa Miyazaki, Numazu, both of Japan, assignors to Kokusan Denki Co., Ltd., Numazu, Japan

Filed July 23, 1975, Ser. No. 598,214

Int. Cl.<sup>2</sup> F02P 1/00

U.S. Cl. 123—148 CC

7 Claims



1. A device for preventing an overrunning operation of an internal combustion engine, provided in a capacitor discharge type breakerless ignition system comprising a magneto generator including an ignition power coil and at least one loading coil and an ignition circuit including a capacitor charged from said ignition power coil of said magneto generator, an ignition coil and a discharging thyristor, energy from said capacitor being discharged through the primary side of said ignition coil when said discharging thyristor is triggered in time with said engine, said device comprising an ignition failing thyristor shunting said discharging thyristor whereby a discharge current from said capacitor is prevented from being supplied to said ignition coil; means to trigger said ignition failing thyristor when said engine revolves at more than a predetermined revolution number per minute, including a revolution number detecting generator providing a voltage indicative of the revolution number per minute of said engine, a first capacitor charged by said revolution number detecting generator, and a second capacitor having a greater electrostatic capacity than said first capacitor and also charged by said revolution number detecting generator, a Zener diode connected across said first and second capacitors, said ignition failing thyristor being connected to said second capacitor whereby said ignition failing thyristor is triggered when the voltage across said second capacitor reaches a predetermined value corresponding to the maximum allowable revolution number per minute of said engine, and an auxiliary thyristor connected in parallel to said ignition failing thyristor and an impedance connected in series with said ignition failing thyristor to limit current flow therethrough, said auxiliary thyristor having the gate thereof connected to the cathode of said ignition failing thyristor whereby a potential at the cathode of said ignition failing thyristor causes said auxiliary thyristor to be triggered.

4,010,727

**INTERNAL COMBUSTION ENGINE**

Michael Ellison Cross, 52 Bloomfield Avenue, and Albert Edward Coles, 366 Bloomfield Road, both of Bath, England

Filed Sept. 6, 1974, Ser. No. 504,689

Claims priority, application United Kingdom, Sept. 7, 1973, 42104/73

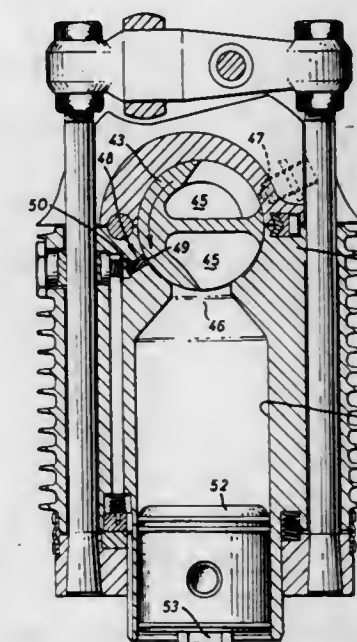
Int. Cl.<sup>2</sup> F01L 7/00

U.S. Cl. 123—190 DL

3 Claims

1. A method of enhancing the performance of an internal combustion engine which includes a rotary valve for controlling the inlet of combustible mixture to and the exhaust of combustion products from the combustion chamber of an engine, which rotary valve comprises a valve housing, an opening in the valve housing communicating with the combus-

tion chamber, a valve member rotatably mounted within the housing, a port within the valve member which comes into and out of registration with the said opening as the valve member rotates, said method comprising the steps of rotating the valve member in a timed relationship to the engine, supplying a copious amount of lubricant to the interface between the valve member and the valve housing at a location after rotation of the valve member past the opening to lubricate and cool the valve, removing excess lubricant from the valve member before said member passes over the opening to an extent that leaves on the valve member a film of lubricant of from 40 to 50μ inches by rotating the valve member past a rigid scraper blade held in the valve housing, said scraper blade



4,010,728

**CIRCULATING FIREPLACE SYSTEM**

Rod A. Hempel, Huntington; Walter P. Tittman, Fort Wayne, and Santosh D. Sbeth, Huntington, all of Ind., assignors to American Standard, Inc., New York, N.Y.

Filed June 2, 1975, Ser. No. 582,589

Int. Cl.<sup>2</sup> F24B 1/18

U.S. Cl. 126—120

19 Claims

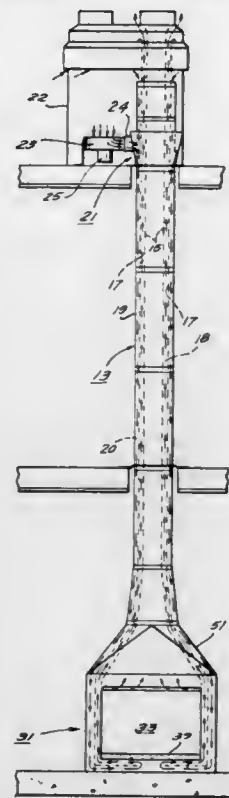
1. A Thermal system comprising:

- a. a thermosiphonic chimney having a flue, an intermediate chimney pipe and an outer chimney pipe concentric therewith and spaced successively outward therefrom whereby to define between said flue and said intermediate chimney pipe an intermediate chimney duct and whereby to define between said intermediate chimney pipe and said outer chimney pipe an outer chimney duct;
- b. a heat source having an inner chamber and spaced successively outward therefrom an intermediate casing and an outer casing, said inner chamber being coupled to the flue of said thermosiphonic chimney, said intermediate casing being coupled to the intermediate chimney pipe of said thermosiphonic chimney, said outer casing being coupled to the outer chimney pipe of said thermosiphonic chimney, and the zone between said inner chamber and



said intermediate casing being in communication with the zone between said intermediate casing and said outer casing;

- c. air-intake assembly having a tapered structure mounted around the outer chimney pipe of said thermosiphonic chimney and
- d. means for impelling gas through said tapered structure into said outer chimney duct from a source external to



said thermosiphonic chimney and for directing said gas through said outer chimney duct to the zone between said intermediate casing and said outer casing of said heat source; and

- e. outlet means associated with said heat source for delivering to a zone external to said heat source at least a portion of the gas impelled into said outer chimney duct and directed therethrough to said heat source.

4,010,729

## FIREPLACE FURNACE

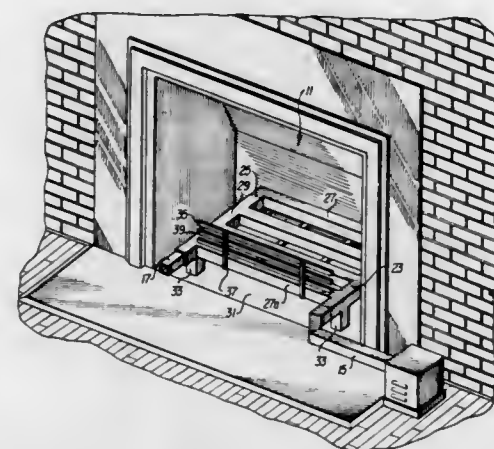
Glen H. Egli, Stuart Draft, Va., assignor to Joglex Corporation, Palmyra, Va.

Filed Apr. 2, 1975, Ser. No. 564,273

Int. Cl.<sup>2</sup> F24B 7/00

U.S. Cl. 126—121

20 Claims



1. A forced-air heating fireplace grate for supporting burning materials in a fireplace, said grate comprising:
- a single, inlet-manifold duct to extend from front to rear of said fireplace for receiving cool air introduced into said fireplace grate, said single, inlet-manifold duct having an inlet opening for receiving said cool air, and at least three exit openings positioned along the length thereof for releasing air laterally thereof;

a single, exhaust-manifold duct to extend from front to rear of said fireplace for receiving all warm air in said fireplace grate prior to its expulsion from said fireplace grate, said single, exhaust-manifold duct having an exhaust opening positioned at the end thereof so as to be at the front of said fireplace when said grate is positioned in said fireplace and a number of inlet openings corresponding to said exit openings of said inlet-manifold duct positioned along the length thereof for receiving said warm air laterally thereof;

a separate cross duct interconnecting each of said exit openings of said inlet-manifold duct with a respective one of said inlet openings of said exhaust-manifold duct, said cross ducts being approximately equally spaced, one from the other, and extending from side-to-side of said fireplace when said fireplace grate is positioned in said fireplace, said inlet-and exhaust-manifold ducts and said cross ducts thereby defining elongated hot-ash retaining spaces therebetween surrounded by ducts;

legs attached to some of said ducts and extending downwardly from said ducts to support said ducts a substantial distance from the floor of said fireplace;

a single, individual hot-ash retaining cross-grille bar attached directly to said manifold ducts and extending longitudinally of, and across the bottom of each of said hot-ash retaining spaces so as to retain large amounts of hot ashes falling from said burning materials in said hot ash retaining spaces prior to its falling to the floor of said fireplace while allowing efficient fire-supporting ventilation.

4,010,730

## FIREPLACE SHIELD

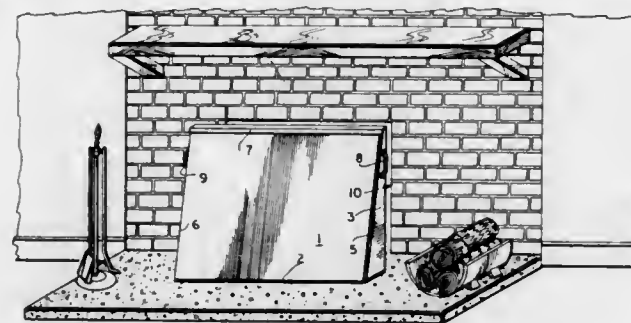
Terry L. Mitchell, Rte. 3, Loganville, Ga. 30249

Filed June 11, 1975, Ser. No. 585,790

Int. Cl.<sup>2</sup> F24C 15/10

U.S. Cl. 126—140

2 Claims



1. A shield for use in combination with a fireplace having a front opening, said shield comprising a front panel, a pair of side panels disposed respectively at the ends of said front panel and extending generally transverse to said front panel, the side edges of said front panel interconnected respectively with the edges of said pair of side panels remote from said opening by means of a gastight reinforcing seam, each of said reinforcing seams having a strip integral with a side edge of said front panel and another face contacting strip integral with the adjacent edge of the corresponding side panel, a base interconnected with the lower edges of said front panel and said pair of side panels, a top piece interconnected with the upper edges of said front panel and said pair of side panels, and the lower portion of said front panel being spaced from said opening a greater distance than the upper portion of said front panel when said shield is disposed adjacent said opening, said shield being effective to eliminate discharge of heated room air through said opening.

4,010,731

## HEAT STORAGE TANK

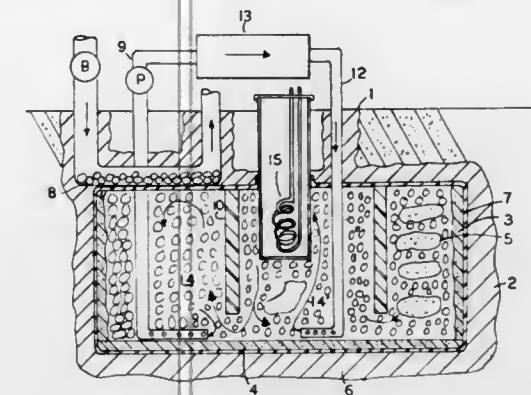
Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,061

Int. Cl.<sup>2</sup> F24J 3/02; F24H 7/00

U.S. Cl. 126—271

8 Claims



1. A heat storage tank mounted in a pit in the ground, said pit having a continuous side portion and a bottom, a lining of incompressible insulating material mounted against said continuous side portion of said pit, a liquid-impervious flexible liner tank having a continuous side portion and a bottom mounted against said incompressible insulating material and a top portion resting on the contents of said tank, at least one insulating barrier extending down from said top to a point adjacent the bottom of said tank, said barrier dividing said tank into at least a first and a second portion, heat storage material substantially filling said tank, said heat storage material having sufficient voids to permit circulation of heat transfer liquid, a hot liquid intake pipe extending adjacent to the bottom of said tank in said first portion thereof, a cool liquid out-take pipe extending adjacent to the bottom of said tank in said second portion thereof, and means for withdrawing heat from the upper part of said first portion of said tank.

4,010,732

## MULTI-STAGE SYSTEM FOR ACCUMULATION OF HEAT FROM SOLAR RADIANT ENERGY

Shinji Sawata, Higashi-Murayama; Tatsuo Tani, Koganei, and Takashi Horigome, Tanashi, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

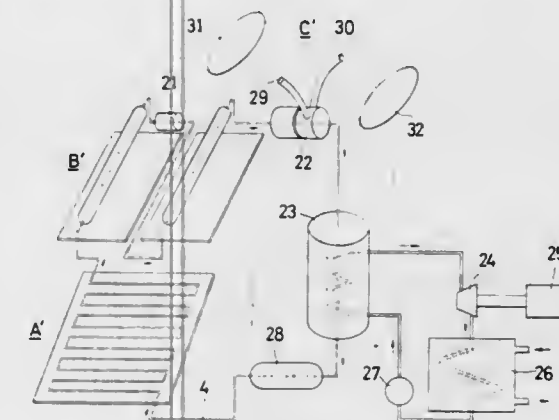
Filed Mar. 26, 1975, Ser. No. 562,196

Claims priority, application Japan, June 15, 1974, 49-67646; June 21, 1974, 49-70298

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—271

3 Claims



1. In a system for the accumulation of the solar radiant

energy adapted to have the solar radiant energy absorbed by heat-absorption means and transferred therefrom to a heat-transfer medium for thereby heating said heat-transfer medium, a multi-stage system for the accumulation of the solar radiant energy which comprises:

a plurality of heat-absorption apparatuses arranged in a series connection and having different selectively penetrating membranes disposed respectively on said heat-absorption apparatuses and possessed of properties suitable for reflecting electromagnetic wave energies of different magnitudes corresponding to ascending degrees of temperature respectively rated for the heat-transfer medium at said plurality of stages.

4,010,733

## STRUCTURALLY INTEGRATED STEEL SOLAR COLLECTOR

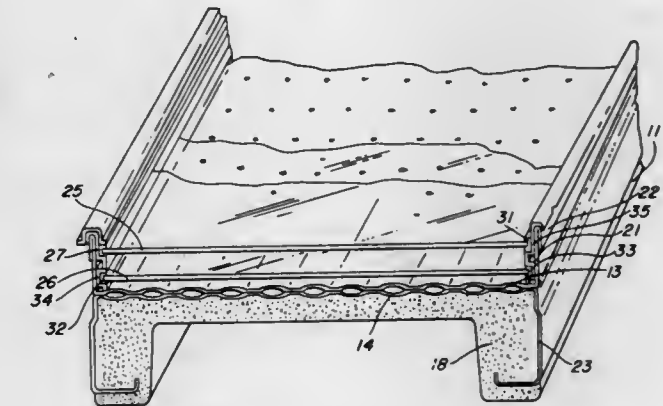
Stanley W. Moore, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 3, 1975, Ser. No. 583,374

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—271

7 Claims



1. A solar energy collector unit comprising:
- an expanded metal energy collector panel including an upper sheet and a lower sheet;
- a substantially I-shaped upstanding portion at either side of said collector panel unitary with said upper sheet;
- a substantially C-shaped downwardly extending portion at either side of said collector panel unitary with said lower sheet;
- glazing support means adjacent each of said upstanding portion;
- a transparent panel covering said upper sheet secured by said glazing support means and,
- insulation covering the bottom of said lower sheet between said downwardly extending portions.

4,010,734

## CLOSED SYSTEM SOLAR HEATER

Emil L. Chayet, Largo, Fla., assignor to Solar Energy Dynamics Corporation, Tampa, Fla.

Filed Mar. 10, 1976, Ser. No. 665,648

Int. Cl.<sup>2</sup> F24J 3/02

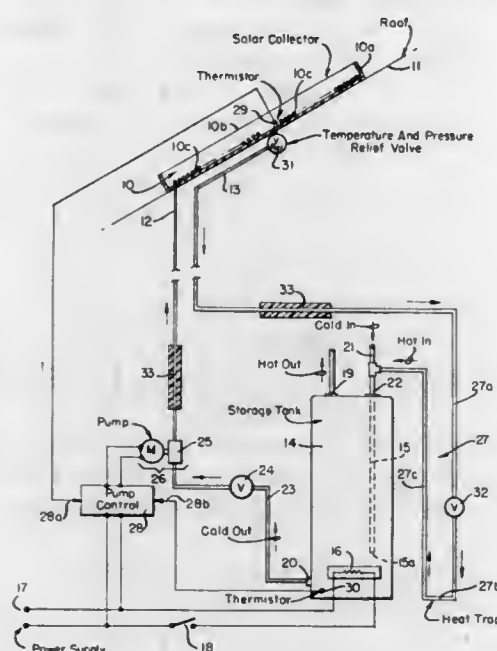
U.S. Cl. 126—271

10 Claims

1. A solar heating system comprising a solar collector constructed to receive solar radiation and having a water inlet for admitting water to said collector to be heated by said solar radiation, said solar collector including a hot water outlet for the egress of heated water from said collector, a water storage tank, supply means for supplying comparatively cold water to said tank at a cold water inlet adjacent the top of said tank, a cold water outlet from said tank located adjacent the bottom of said tank, a first water line connecting said cold water outlet of said tank to said water inlet of said solar collector, a second water line connecting said hot water outlet of said solar collec-



tor to said cold water inlet of said tank, said second water line including a heat trap comprising a substantially U-shaped water line section external of said tank extending from said solar collector hot water outlet vertically downward past the



top of said tank to a position adjacent the bottom of said tank and then vertically upward to said cold water inlet of said tank adjacent the top of said tank, and a hot water outlet adjacent the top of said tank for extracting heated water from said tank for utilization.

4,010,735

## WATER HEATER AIR INLET CONTROL

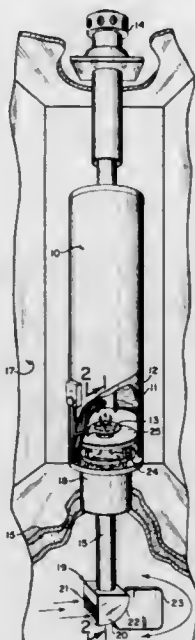
Robert F. Stanley, Glendale, and Henry Jack Moore, Jr., Los Angeles, both of Calif., assignors to Mor-Flo Industries, Inc., Cleveland, Ohio

Filed Jan. 21, 1976, Ser. No. 650,935

Int. Cl.<sup>2</sup> F24H 1/18

U.S. Cl. 126—350 R

5 Claims



1. An air inlet control means for a hot water heater having an air inlet opening in its lower end, including:

- an air tube communicating at its upper end with said air inlet opening and extending vertically downwardly and,
- an air-cup assembly mounted to the lower end of said air tube for rotation about a vertical axis and including a front opening facing horizontally and a rearwardly extending rudder and having an air scoop portion defined by an upwardly curved rear wall opposite said front wall for guiding incoming air into the lower end of said air tube, said upwardly curved rear wall including an upper

rear opening displaced in a vertical direction from said front opening and facing rearwardly for permitting an excess of air scooped in through said front opening to bypass said air tube so that a controlled air flow passes up said air tube, whereby said air tube can extend downwardly through the floor of a trailer home or camper to expose the air cup assembly to wind blowing under the trailer home or camper, said rudder orienting the air cup assembly so that the front opening faces the wind.

4,010,736

## FOOD WARMER AND HUMIDIFIER

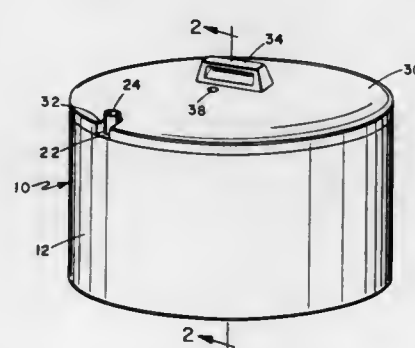
Norma Rose Sacomani, and Louis Paul Sacomani, both of 1426 San Lucas Court, Solana Beach, Calif. 92075

Filed Dec. 8, 1975, Ser. No. 638,700

Int. Cl.<sup>2</sup> F24D 1/00

U.S. Cl. 126—369

9 Claims



1. A food warmer and humidifier comprising: a double walled container with an outer wall and an inner wall enclosing a water jacket, and having an inner food holding chamber; said container having an upper peripheral rim at which said outer and inner walls are connected; said container having a closed bottom portion and said chamber having a closed bottom panel spaced from said closed bottom portion; said water jacket having a primary vent extending through said rim; at least one steam port in said inner wall communicating from said water jacket into said chamber, said port being circumferentially spaced from said primary vent at a distance related to a predetermined steam flow through the port; and a lid adapted to seat on said rim.

4,010,737

## BONE BIOPSY INSTRUMENT KIT

Miklos I. Vilaghy, and Gabor Zellerman, both of Apt. 1508, 830 Ontario St., Toronto 282, Canada

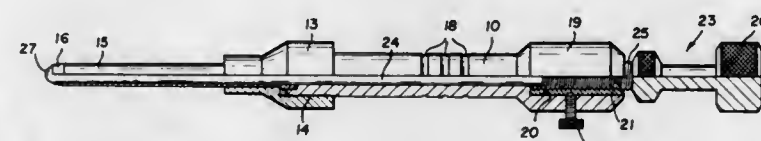
Continuation of Ser. No. 152,896, June 14, 1971, abandoned.

This application July 18, 1973, Ser. No. 380,131

Int. Cl.<sup>2</sup> A61B 10/00

U.S. Cl. 128—2 B

12 Claims



1. A bone biopsy instrument kit having a plurality of parts shaped for selective interconnection to form a bone biopsy tool, said kit comprising:

- a body having an axial bore and shaped to serve as a handle;
- a forward region of said body having a socket radially larger than said axial bore and formed around said axial bore;

- a selected one of a plurality of interchangeable needles being seated in said socket, and each of said needles being generally cylindrical, hollow and strong enough to be driven axially into a bone, the hollow interior of said selected one of said needles being aligned with said axial bore of said body;
- each of said needles having a rear region with a substantially identical radial enlargement shaped to fit removably into said socket around said axial bore of said body;
- a forward end of each of said needles terminating in a plane perpendicular to the cylindrical axis of each of said needles;
- an external bevel sharpening said forward end of each of said needles to a circular knife edge suitable for driving straight into bone;
- a hollow chuck having a bore snugly receiving the cylindrical portion of said selected one of said needles to engage said radial enlargement in said rear region of said selected one of said needles;
- means fastening said chuck to said forward region of said body so said chuck holds said rear region of said selected one of said needles firmly in said socket;
- a stylet having a shaft extending through said body and shaped for moving axially in a snug, sliding fit through said bore of said body and through said selected one of said needles held in said socket by said chuck; and
- screw thread means connecting said stylet to said body for moving and positioning a forward end of said stylet axially relative to said forward end of said selected one of said needles as a function of the threading together of the parts of said screw thread connecting means, said body, said selected one of said needles, said chuck, said stylet, and said screw thread connecting means forming said bone biopsy tool when assembled as defined.

4,010,738

## METHOD OF PREDICTING AND DETECTING OVULATION

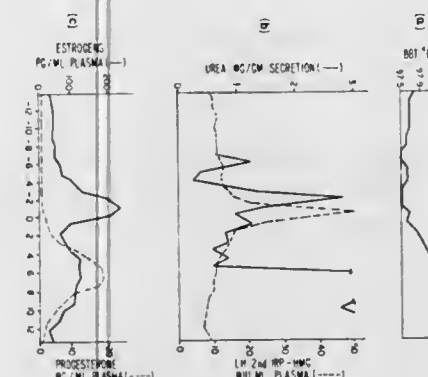
George Preti, Philadelphia, and George Richardson Huggins, Wallingford, both of Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 519,220, Oct. 30, 1974. This application Apr. 2, 1975, Ser. No. 564,348

Int. Cl.<sup>2</sup> A61B 10/00

U.S. Cl. 128—2 R

20 Claims



1. A method of diagnosing the onset of the fertile period or ovulation in female mammals comprising the steps of:

- monitoring the variation in concentration of the vaginal secretions of one of said mammals for urea, said variation corresponding to the onset of the fertile period or ovulation of said mammal; and
- providing an indicator means for qualitatively and quantitatively responding to the concentration of said urea in said vaginal secretions; whereby the response of said

means is diagnostic of the onset of the fertile period or ovulation in said female mammal.

4,010,739

## SPHYGMOMANOMETER

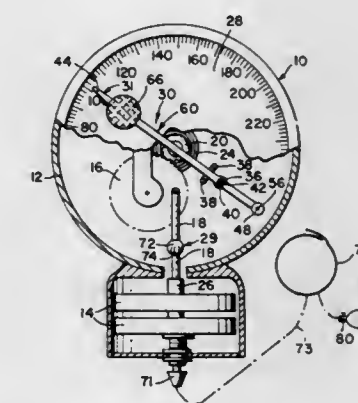
John Meredith Leach, Box 341, Port Jefferson, N.Y. 11777

Filed Nov. 3, 1975, Ser. No. 628,227

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128—2.05 G

2 Claims



1. In a gauge of the type used in blood pressure determinations, a main shaft for said gauge mounted for rotation therein, means for rotating said shaft in accordance with variations in the blood pressure of a given subject, a first hand mounted on said shaft for rotation therewith, a calibrated dial over which said first hand moves, a pivot mounted on said first hand at a point removed from said mounting of said first hand on said main shaft for movement with said first hand, a second hand mounted for rotation on said pivot, a second pivotal mounting for said second hand carried thereby at a point removed from said pivot and in contact with said dial, stop arms carried by said first hand in position to permit limited movement of said second hand separate from movement of said first hand at which time said second hand pivots on said pivot carried by said second hand which is at that time in stationary contact with said dial, said stop arms being in position to contact said second hand at the end of its limited movement and move said second hand with said first hand at which time said pivot carried by said second hand slides over said dial in contact therewith.

4,010,740

## SPECULUM

Ove Gustav Littorin, Stockholm, Sweden, assignor to ABM-Mavello AB, Stockholm, Sweden

Filed Apr. 21, 1976, Ser. No. 678,759

Claims priority, application Sweden, Apr. 21, 1975, 7504607

Int. Cl.<sup>2</sup> A61B 1/32; A61M 29/00

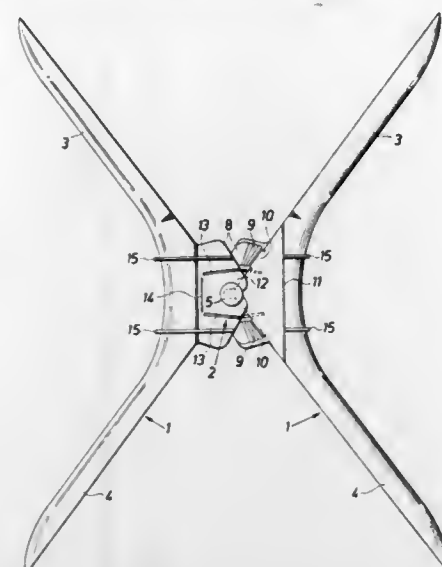
U.S. Cl. 128—17

8 Claims

1. A speculum arranged for examining body cavities and consisting of two angle pieces (1) each having a generally U-shaped cross-section along substantially the whole of its length, and consequently having trough-like legs (3, 4) of which one leg (3) is preferably narrower than the other (4), both angle pieces (1) with their troughs facing each other being removably connectable to each other with side portions of the angle pieces on either side of the speculum overlapping each other to form a pivot portion (2), from which the four legs (3, 4) extend, being movable together or apart by means of one pair of legs (3, 4), one from each angle piece (1), serving as handles for operating the other pair (4, 3), characterized in that both angle pieces (1) are made identically alike and that in the area of the pivot portion (2) each has on one



side a pin (5) and on the opposite side a hole (6), the hole in each angle piece (1) being made to accommodate the pin (5)



of the opposing angle piece (1) for creating the pivoting function of the pivot portion (2).

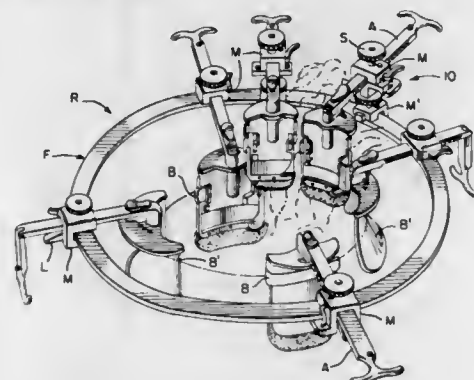
#### 4,010,741 SURGICAL RETRACTOR

William Kohlmann Gauthier, 310 Codifer Blvd., Metairie, La. 70005

Filed Jan. 22, 1976, Ser. No. 651,267  
Int. Cl.<sup>2</sup> A61B 17/02

U.S. Cl. 128—20

7 Claims



1. A surgical retractor for use in surgery to hold an incision open and to retain intestines out of the way to provide working area for performing a surgical procedure, comprising: a frame means; a plurality of retractor arm means releasably carried by the frame means for movement along the frame means and for movement transversely of the frame means, and including retractor blade means carried by the arm means in a position to be disposed in an incision to engage the flesh at the edge of the incision to hold the incision open; extension bottom mounting member releasably carried by the frame means for movement along the frame means; upstanding extension means carried by the extension mounting member for movement therewith and extending above the plane of the frame means and including an upper mounting member connecting said arm means to said extension means, said mounting member being substantially similar to said extension mounting member, whereby said mounting member can connect said arm means to either said frame means or said upstanding extension means; further retractor arm means carried by the extension means in an elevated position above the plane of the frame means, thus providing a space between the further retractor arm means and the frame means, in which intestines removed from the abdominal cavity through the incision may be placed; and blade means carried by the further retractor arm means in a position to engage the intestines and retain them out of the abdominal cavity to provide working area for a surgical procedure.

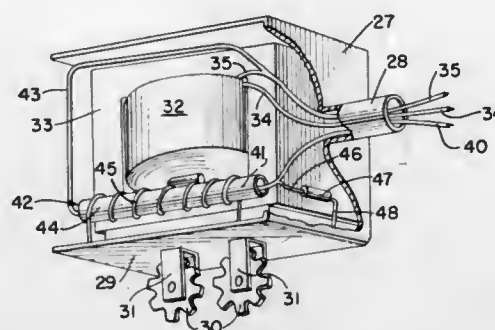
#### 4,010,742 ELECTRON THERAPY DEVICE

In Su Kim, 54-1, 2-ka, Myeong-dong, Junk, Seoul, South Korea

Filed July 15, 1975, Ser. No. 596,164  
Claims priority, application South Korea, July 29, 1974, 743200

Int. Cl.<sup>2</sup> A61H 29/00  
U.S. Cl. 128—24.4

6 Claims



1. An electron therapy device for the treatment of ailments of the human body comprising a vibrator including a casing having a vibratory panel of conductive material, electrically energized means housed in said casing for imparting vibration to said panel, applicator means of conductive material mounted on said panel for contact with the human body, and means for supplying negative electrons only to said panel and applicator means whereby, when said applicator means are brought into contact with the human body, negative electrons are introduced into the body.

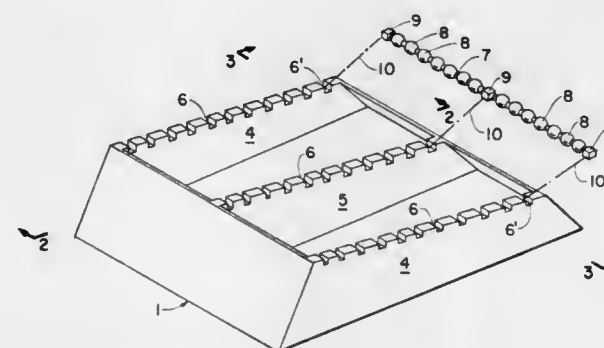
#### 4,010,743 FOOT MASSAGER

Ron Fitzsimons, 5557 Fleming St., Vancouver, British Columbia, Canada

Filed Mar. 30, 1976, Ser. No. 672,043  
Int. Cl.<sup>2</sup> A61H 15/00

U.S. Cl. 128—57

6 Claims



1. A foot massager comprising a supporting frame adapted to be located upon a floor or other horizontal supporting surface, spacing means adapted to provide a first and second row of uniformly spaced rod locating points located on two opposed uppermost marginal edges of said supporting frame, rods locating means adapted at the free ends of each of said rods providing removable engagement with said two opposed uppermost marginal edges and said locating points, a plurality of uniform diameter spherical balls each in touching engagement along each of said rods intermediate said rods locating means adapted to rotate about cylindrical holes whose longitudinal axes pass through the origins of said balls, said rods passing through said cylindrical holes, a plurality of individual rods fitted with said balls thereupon having parallel longitudinal axes the free ends thereof aligned along said two marginal edges, one of said rods fitted with said balls selectively adapted to be located parallel to another of said rods having a distance between dissimilar to the distance between another pair of adjacent parallel rods.

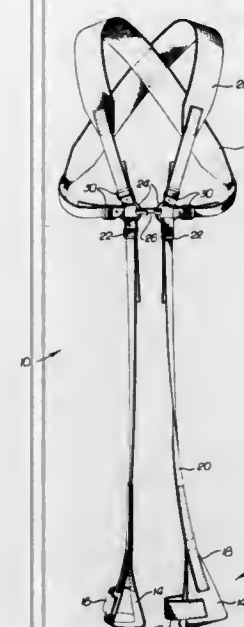
#### 4,010,744 FOOT-NECK HARNESS DEVICE

Steven G. Boyen, 3875 Wilshire Blvd., Los Angeles, Calif. 90005

Filed Mar. 11, 1976, Ser. No. 665,880  
Int. Cl.<sup>2</sup> A61H 1/02

U.S. Cl. 128—75

2 Claims



1. A harness device for maintaining flexion of a person's hips and knees while reclining in a horizontal lateral position, comprising:  
sling means for securing a person's feet and including heel strap means,  
shoulder-chest strap members having adjustable lengths and attached to ring members, said ring members being connected to each other in close proximity and located in a position corresponding to the approximate center of said person's chest,  
strap members with adjustable lengths, said strap members connecting said sling means to said ring members, and formed to extend in close proximity to each other and longitudinally between said person's legs from said sling means to said ring members while said person is reclining in a horizontal lateral position, whereby traction is produced and maintained on said person's low neck-upper back area when said harness device is pulled taut on said person.

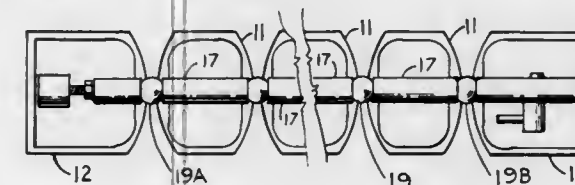
#### 4,010,745 FLEXIBLE SPLINT

Jack L. Height, 3900 St. Johns Road, Lima, Ohio 45806

Filed Mar. 4, 1976, Ser. No. 663,964  
Int. Cl.<sup>2</sup> A61F 5/04

U.S. Cl. 128—87 R

12 Claims



1. A flexible splint comprising:  
a plurality of similar pads, positioned in a line in a single series;  
connecting means comprising a cable connecting all said pads with each other;  
friction means comprising tubes and balls separating each said pad from its adjacent pads; and

adjusting means for adjusting the tension of said cable, whereby said adjusting means controls the degree of friction of said friction means.

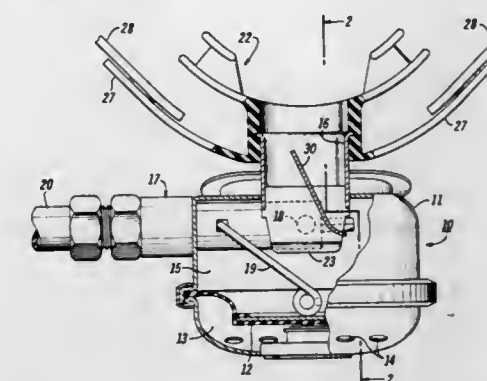
#### 4,010,746 REGULATOR WITH WATER FILL MECHANISM TO PREVENT FREE FLOW

Vernon G. Pedersen, Chicago, Ill., assignor to Dacor Corporation, Northfield, Ill.

Filed Aug. 25, 1971, Ser. No. 174,618  
Int. Cl.<sup>2</sup> A62B 7/04

U.S. Cl. 128—147

5 Claims



1. A pressure regulator for use in underwater breathing apparatus, said regulator including a housing; a diaphragm dividing the housing into a first compartment open to the ambient and a second compartment from which extends a mouthpiece tube through which the user breathes; an air inlet orifice opening into said second compartment; a valve for controlling the flow of air to said orifice; and means connecting said valve to said diaphragm for opening the valve when a pressure differential of at least a predetermined amount is provided between said first and second compartments, the invention being characterized by means for channeling water into said second compartment through a portion of said mouthpiece tube when said valve is open and said regulator is immersed in water with said tube open to the water to cause said valve to close, said means for channeling comprising a partition disposed in said mouthpiece tube and extending a substantial distance from within said second compartment into said tube and dividing said tube into two adjacent passageways respectively opening into said second compartment, and the inner end of said partition being offset away from said orifice over one of said passageways to reduce the air flow from said orifice through said one of said passageways to permit water to flow therethrough into said second compartment while said valve is open.

#### 4,010,747 METHOD OF STORING AN AMPOULE FOR A NEEDLELESS HYPODERMIC INJECTOR

Wesley D. Clark, 26870 Taaffe Road, Los Altos Hills, Calif. 94022, and Keith E. Hollenbeck, 847 Tulane Court, Mountain View, Calif. 94040

Division of Ser. No. 518,039, Oct. 25, 1974, Pat. No. 3,948,266, which is a continuation-in-part of Ser. No. 342,508, March 19, 1973, Pat. No. 3,853,125. This application Nov. 24, 1975, Ser. No. 634,369  
Int. Cl.<sup>2</sup> A61M 5/30

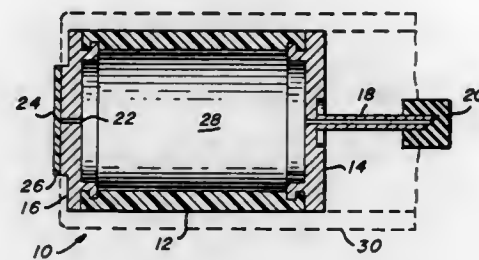
U.S. Cl. 128—173 H

2 Claims

1. A method of needleless medicant injection with an after use disposable ampule having a medicant chamber and a bore extending therefrom which is dimensioned for needleless injection, comprising the steps of:  
evacuating the medicant chamber in the disposable ampule to less than ambient pressure;  
sealing the evacuated chamber to maintain the same at less



than ambient pressure without a medicant for shelf storage; just prior to an injection, exposing said evacuated and sealed chamber to a contained medicant which is approx-



imately at ambient pressure to transfer such medicant into said chamber; and just after transferring the medicant into said chamber, exposing the medicant to a higher than ambient pressure to force it through said bore for needleless injection.

4,010,748

### BREATHING AIR HUMIDIFIER FOR RESPIRATION DEVICES

Gunter Dobritz, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

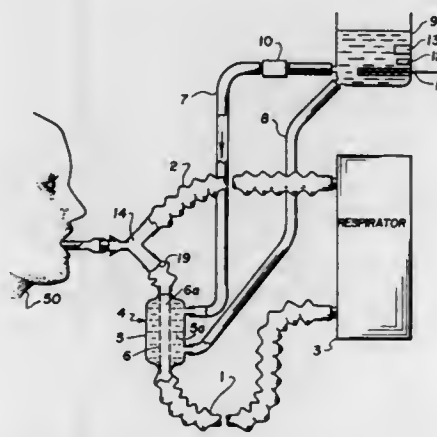
Filed June 26, 1975, Ser. No. 590,632

Claims priority, application Germany, June 27, 1975, 2430875

Int. Cl.<sup>2</sup> A61M 16/00

U.S. Cl. 128—192

10 Claims



1. A breathing air humidifier, comprising a respirator air supply conduit having a flexible tubular foil portion of a material impervious to water but pervious to water vapor, a receptacle surrounding said foil portion and defining an annular water chamber therearound, water reservoir means above said receptacle for circulating water to said water chamber, and a Y-piece having three interconnected tubular portions comprising a first tubular portion connectable to the mouth of the user, a second tubular portion connected to the said respirator air supply conduit downstream of said receptacle, and a third tubular portion having a respirator air return connection.

4,010,749

### METHOD OF DETECTING INFILTRATION OF INFUSED LIQUID BY COMPARING ALTERED SKIN TEMPERATURE WITH SKIN TEMPERATURE IN AREA OF INFILTRATED LIQUID

Robert F. Shaw, 135 Willowbrook Drive, Portola Valley, Calif. 94025

Filed May 9, 1975, Ser. No. 576,035

Int. Cl.<sup>2</sup> A61M 5/00

U.S. Cl. 128—214 E

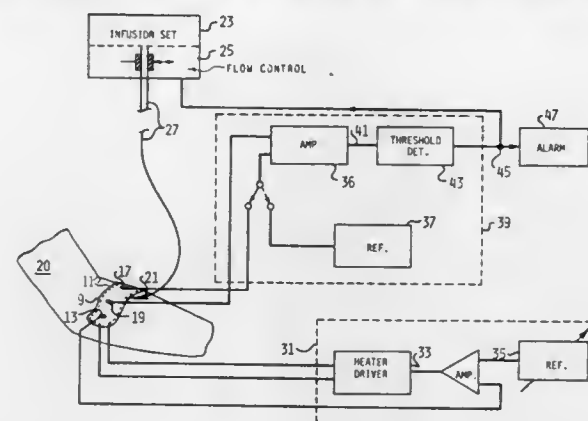
3 Claims

1. The method of detecting liquid-infusion infiltration into the skin of a patient which is at a temperature not sufficiently

different from the temperature of the liquid being infused, the method comprising the steps of:

placing a liquid-delivery conduit into a blood vessel of a patient for delivering an infusion liquid into a blood vessel of the patient;

altering the patient's skin surface temperature relative to the temperature of the liquid in a region of the skin over-



lying the tip of the intravascular portion of the liquid conduit means; and sensing the difference between the skin surface temperature due to the accumulation of the infused liquid in the perivascular region and the altered skin temperature for providing an output indicative of the difference between the two temperatures.

4,010,750

### PARENTERAL FLUID ADMINISTRATION SETS

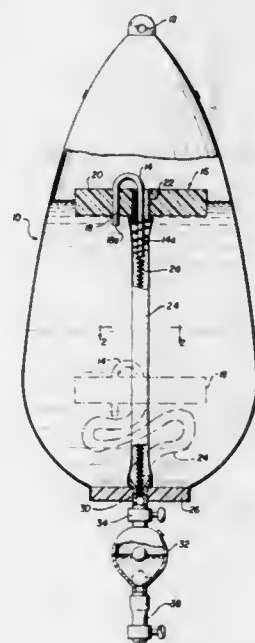
William L. Howell, 3615 Macomb St., Washington, D.C. 20016

Filed Feb. 6, 1976, Ser. No. 656,009

Int. Cl.<sup>2</sup> A61M 5/16

U.S. Cl. 128—214 C

11 Claims



1. A parenteral fluid administration set comprising: a container having a bottom outlet and providing a supply of the parenteral fluid to be administered, a floating siphon adapted to follow the level of the fluid in said container and including a float and at least one siphon U-tube having a shorter and a longer leg, the shorter leg being affixed to and extending through the float body with its fluid-inlet end opening into the fluid in said container, the longer leg of the siphon U-tube extending through an aperture in the float, said longer siphon leg terminating a substantial distance above the container bottom, the fluid outlet end of said longer leg extending into

and flowing fluid at a controlled rate to a flow tube affixed at its upper end to said float and at its lower end to said bottom outlet and which extends through the body of fluid in said container and is adapted to dispense said fluid flowing into same through the container bottom to an intravenous tubing line terminating in an infusion needle, said flow tube being fashioned from a material which renders it both non-rigid axially with lowering of the float and collapsible radially under the pressure of the fluid in the container acting thereon along its immersed length, and means disposed within and extending substantially the length of the tube for preventing its complete radial collapse as would block fluid flow through the tube.

4,010,751

### INSERTER FOR DELIVERING SOFT, DEFORMABLE TAMPONS INTO BODY CAVITIES AND THE COMBINATION OF A TAMPON THEREWITH

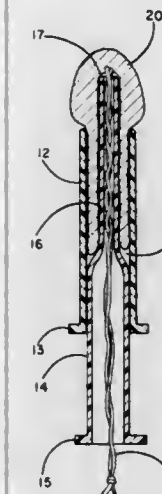
David F. Ring, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sept. 11, 1975, Ser. No. 612,487

Int. Cl.<sup>2</sup> A61F 13/20

U.S. Cl. 128—263

14 Claims



1. An inserter device particularly adapted for delivering and depositing a structurally unattached soft, easily deformable catamenial tampon of the type equipped with a withdrawal string into body cavities with the entire inserter being adapted for removal from the cavity after such deposition, said inserter being comprised of an elongate outer element and a unitary elongate inner element in telescoping association, said outer element being in the form of a tube, said inner element having a main portion circumferentially dimensioned for slidable engagement with the inside of said tube, said main portion having on its forward end an integral axially disposed elongate extension, said extension being of smaller diameter than said main portion and said extension being of a length which extends through substantially the full length of said tube when said main portion is in slidable engagement with said tube.

4,010,752

### DISPOSABLE DIAPER HAVING A PUFF BONDED FACING LAYER

Thomas Albert Denny, Edison, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 7, 1976, Ser. No. 647,290

Int. Cl.<sup>2</sup> A61F 13/16; B32B 5/16

U.S. Cl. 128—284

10 Claims

1. A disposable diaper comprising: a moisture-impervious backing sheet, an absorbent batt having a first face positioned on one face of said backing sheet, and a facing layer having one face in juxtaposition with the other face of the absorbent batt and adhered to said one face of said facing layer, said facing layer comprising:

an integral nonwoven fibrous web having a median portion flanked by side portions, said side portions having an overall density substantially lower than that of at least a portion of said median portion and no greater than about



0.02 grams per cubic centimeter, said side portions comprising haphazardly arranged fibers secured together at their junctions by a binder and formed into a cellular structure comprising chambers substantially free of fibers and surrounded by fiber strata.

4,010,753

### DISPOSABLE DIAPER HAVING ADHESIVE TAB FASTENERS WITH BUILT-IN RELEASE SYSTEM

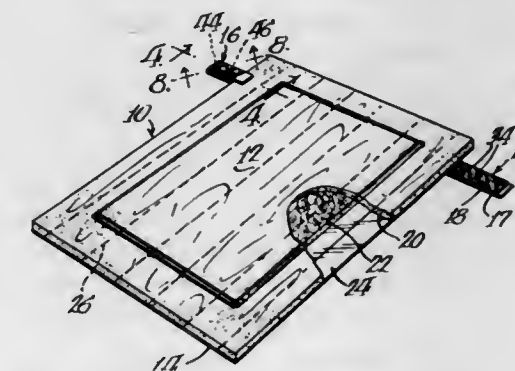
Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 19, 1976, Ser. No. 659,314

Int. Cl.<sup>2</sup> A16F 13/16

U.S. Cl. 128—284

15 Claims



1. A disposable diaper which comprises: a moisture-impervious backing sheet forming a diaper outside surface for direction away from an infant when the diaper is worn by that infant; a moisture-permeable facing sheet which forms a diaper inside surface for direction toward the infant; an absorbent layer positioned between the backing sheet and the facing sheet; tab fastener means having side edges, a fixed end secured to said diaper backing sheet, and a free work end, said tab fastener means being provided with a layer of pressure-sensitive adhesive presenting a tacky surface facing in the same direction as the diaper inside surface; a plurality of elongated spacer means positioned on said tacky surface in a spaced relationship to one another and adhered thereto, and defining a plurality of exposed adhesive regions between said spacer means; said free working end having a distal end portion which is folded over onto an adjacent central portion of said free working end and releasably secured thereto in a storage position, and juxtaposed spacer means bridging one another and being in limited contact with a juxtaposed region of said tacky surface at a plurality of attachment points when said free working end is folded over.



4,010,754

**TAB FASTENER HAVING SUBSTANTIALLY COPLANAR DIVERGING ANCHORING LEGS**

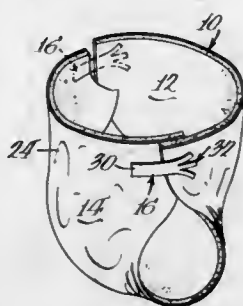
Heinz A. Pieniak, Chicago, Ill., assignor to Johnson &amp; Johnson, New Brunswick, N.J.

Filed Feb. 4, 1976, Ser. No. 655,047

Int. Cl.<sup>2</sup> A41B 13/02

U.S. Cl. 128—287

12 Claims



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

- an integral elongated tape segment having a free working end which extends longitudinally to one transverse edge of said tape segment and a fixed end which extends longitudinally from said free working end to an opposite transverse edge of said tape segment, said fixed end having an adhesive coating on one face thereof for permanently attaching said tape segment to said backing sheet at a marginal location thereof, and including at least two substantially coplanar anchoring legs;
  - a pressure-sensitive adhesive coating on one face of said free working end; and
  - release means releasably attached to said adhesive coating on said free working end;
- said anchoring legs being contiguous at a location spaced from said transverse edge of said fixed end and diverging with respect to one another to a spaced-apart position at said transverse edge of said fixed end for facilitating distribution of stresses imposed on said tape segment; and said free end being separable from said release means to make said adhesive-coated free end of said tape segment available for use in securing said diaper about an infant.

4,010,755

**UNIPOLAR PACING CATHETER WITH PLURAL DISTAL ELECTRODES**

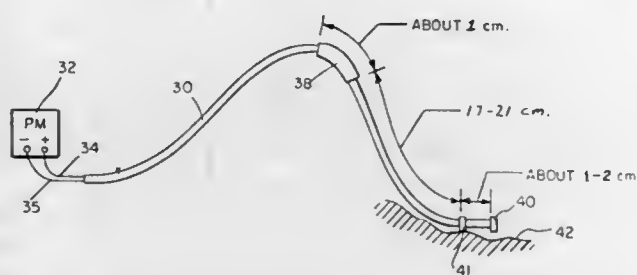
Thomas A. Preston, 820 37th Ave., Seattle, Wash. 98122

Continuation-in-part of Ser. No. 309,996, Nov. 28, 1972, Pat. No. 3,893,461. This application May 27, 1975, Ser. No. 580,876

Int. Cl.<sup>2</sup> A61N 1/04

U.S. Cl. 128—404

8 Claims



1. Catheter apparatus adapted to be positioned in a patient for use in cardiac pacing of the patient, with a predetermined distal end extending into the patient's heart, comprising:

- a. an elongated flexible catheter tube having two conducting leads extending through respective lengths thereof;
- b. a proximal electrode of predetermined surface size connected electrically to a first one of said leads;
- c. a distal electrode, positioned at about said distal end, having at least two conducting bands surrounding said catheter tube and of respective predetermined surface areas, said bands being positioned within 2 cm of said distal end, each of said conducting bands electrically connected to the second one of said leads, said conducting bands being separated, such that said distal electrode comprises a plurality of electrically connected bands having only non-conducting surfaces therebetween; and
- d. said proximal electrode being positioned on said catheter at least 17 cm proximal to said distal electrode.

4,010,756

**HEART PACER LEAD WIRE WITH BREAK-AWAY NEEDLE**

Jacques DuMont, Asnieres, and Jacques Romagne, Les Essarts le Roi, both of France, assignors to Ethicon, Inc., Somerville, N.J.

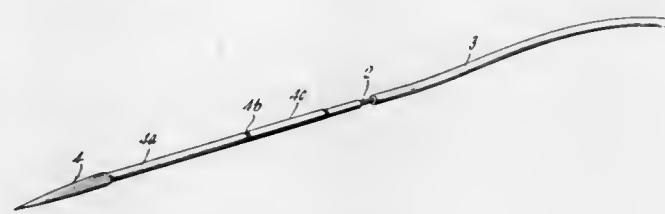
Filed Feb. 13, 1976, Ser. No. 657,897

Claims priority, application France, Feb. 14, 1975, 75.04710

Int. Cl.<sup>2</sup> A61N 1/04

U.S. Cl. 128—404

10 Claims



1. In a surgical electrode comprising
- a. an electrically conductive wire,
  - b. a needle attached to and in electrical contact with said wire and having a substantially straight shank portion adjacent the point of attachment to said wire, and
  - c. a non-conductive coating over the exterior surface of the wire electrically insulating said wire over a major portion of the length thereof,
- the improvement comprising providing a weakened zone in the needle adjacent the straight shank portion of said needle whereby said needle may be readily broken at said weakened zone.

4,010,757

**AUXILIARY TOOL FOR REMOVING ELECTRODE FROM HOLDER**

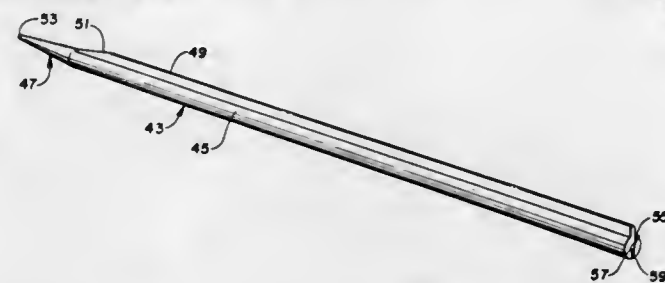
James L. Jula, 3880 Oak Terrace, White Bear Lake, Minn. 55110, and Dennis E. Zeidler, 1835 134th Lane NE., Anoka, Minn. 55303

Division of Ser. No. 443,802, Feb. 19, 1974, Pat. No. 3,875,947. This application Jan. 24, 1975, Ser. No. 543,810

Int. Cl.<sup>2</sup> A61N 1/02

U.S. Cl. 128—418

1 Claim



1. An article for removing a body implantable electrode assembly from a device for holding said assembly, said assembly being of the type having an electrically conductive uninsulated distal end portion, a flexible insulated electrical conduc-

tor, and a proximal end thereof adaptable for connection to a power supply, said device including a first means for firmly holding a portion of said electrode assembly near said uninsulated distal end portion thereof, second means adapted to contact an insulated portion of said insulated conductor for releasably holding said conductor to facilitate the screwing of said distal end portion into body tissue and for preventing the transmission of torque to said proximal end of said conductor when said distal end portion is being screwed into body tissue, and third means communicating with said first and second means for allowing said electrode and said conductor to be released from said first and second means by said article, said article comprising a first portion comprising an elongated, substantially cylindrical member dimensioned to be moveable in said third means, a second portion dimensioned to be moveable in said second means, said second portion comprising a ridge member extending substantially entirely along the length of said first portion and parallel to the longitudinal axis of said first portion, and a third portion dimensioned to be moveable in said first means comprising a cone-shaped member attached to one end of and in axis alignment with said first portion, said second portion having an upwardly inclining, leading edge commencing proximate the junction of said first and third portions, whereby movement of said article into operative position removes said assembly from said first and second means, and said cylindrical member of said first portion further having aperture means located in the end remote from said third portion, said aperture means being dimensioned to receive said proximal end of said assembly.

4,010,758

**BIPOLAR BODY TISSUE ELECTRODE**

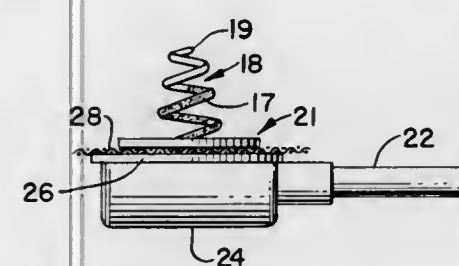
Ronald H. Rockland, Wayzata, and David H. Gobel, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sept. 3, 1975, Ser. No. 610,063

Int. Cl.<sup>2</sup> A61N 1/04

U.S. Cl. 128—418

14 Claims



1. A heart tissue implantable bipolar electrode assembly for disposition within a living animal comprising:
- a. first and second insulated, flexible conductors, each having a proximal end adapted to be connected to an energizing source and a distal end;
  - b. a first conductive, rigid, helically-shaped electrode adapted to be rotatively inserted within the tissue and having a proximal end electrically connected to said distal end of said first conductor;
  - c. an inert insulating covering disposed about said first electrode leaving a limited portion thereof exposed;
  - d. a second conductive, annularly-shaped electrode disposed about said first electrode and being electrically connected to said distal end of said second conductor, said second electrode having a substantially flat surface adapted for intimate contact with the tissue; and
  - e. insulating housing means for mounting said second electrode in a spaced, insulated manner with respect to said first electrode and to dispose said limited portion of said first electrode in a spaced relationship from said flat surface so that said first electrode may be fully inserted within the tissue and said second electrode be in electrical contact with the surface of the tissue, whereby a relatively intense electrical field is established through the tissue

between said exposed portion of said first electrode and said second electrode.

4,010,759

**INSULATED, CORROSION RESISTANT MEDICAL ELECTRONIC DEVICES AND METHOD FOR PRODUCING SAME**

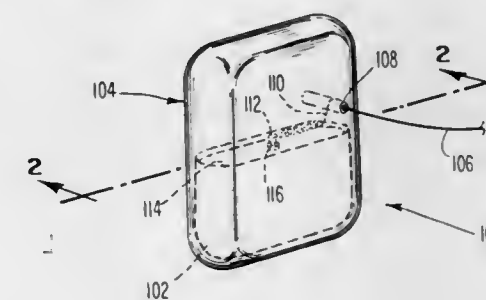
Gerard B. M. Boer, Dieren, Netherlands, assignor to Vitatron Medical B.V., Dieren, Netherlands

Filed Aug. 29, 1975, Ser. No. 608,894

Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—419 P

34 Claims



1. An insulated, corrosion-resistant pacer for rhythmically stimulating heart muscle, comprised of:
- a. a hermetically sealed case;
  - b. electronic circuit means for producing a rhythmic heart muscle stimulating negative output pulse, said electronic circuit means being disposed within said case and including a power source providing an operating voltage;
  - c. output means for conducting said output pulse from said electronic circuit means to outside of said case, said output means extending from within said case to a terminal outside of said case and comprising a tantalum centerpin disposed through said case and a tantalum feed wire welded to said centerpin, and having an anodically formed substantially continuous Ta<sub>2</sub>O<sub>3</sub> insulating layer covering said feed wire, the portion of said centerpin which is outside of said case, and the surface where said feed wire is welded to said centerpin; and
  - d. epoxy capsule means for surrounding said output means; whereby said insulating layer reduces electrical leakage from said conductor to said case, and whereby said insulating layer further protects said pacer from corrosive and electrolytic attack.

4,010,760

**COUPLING ASSEMBLY FOR IMPLANTABLE ELECTROMEDICAL DEVICES**

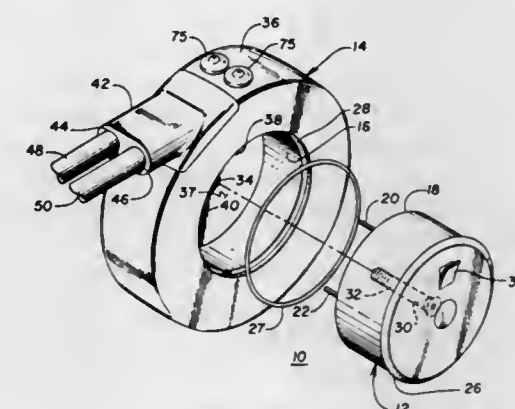
Robert E. Kraska, Minneapolis, and Pieter M. J. Muller, St. Paul, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 23, 1975, Ser. No. 580,042

Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—419 PS

14 Claims



1. A body implantable electromedical device of the type



having electrical potential source means for developing a predetermined potential and an electrical current, generating means adapted to receive and responsive to the current from said potential source means for generating a tissue stimulating signal, lead means adapted to be coupled with said generating means for transmitting said signal to a remote situs, and at least one coupling assembly for detachably coupling said electrical potential source means to said generating means comprising at least first and second electrically coupleable units each comprising first and second members, said first unit being adapted to be at a higher electrical potential than said second unit, at least said first and second members of said first unit being composed of a material having an electrochemical breakdown potential in excess of the electrical potential provided by said electrical potential source means and further having a passive current density such that the leakage current between said first and second electrically coupleable units is substantially less than the current demand of said generating means.

4,010,761

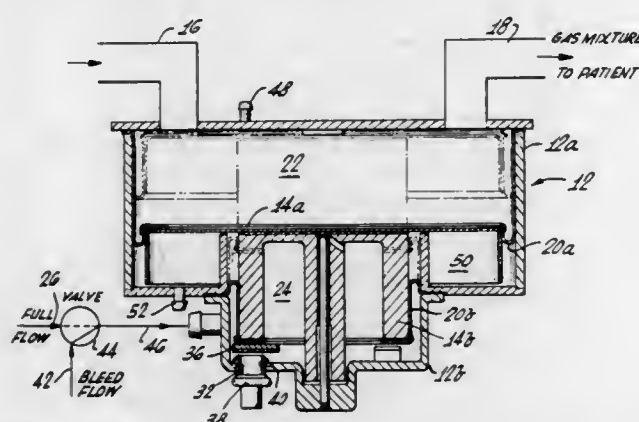
**DELIVERY MEANS FOR USE IN  
VOLUME-CONTROLLED RESPIRATION APPARATUS**  
Neil A. Tipple, Redondo Beach, Calif., assignor to Puritan-Bennett Corporation, Santa Monica, Calif.

Filed Nov. 10, 1975, Ser. No. 630,083

Int. Cl.<sup>2</sup> A61M 16/00

U.S. Cl. 128—145.6

13 Claims



1. Gas delivery apparatus for use with a respirator system, said apparatus comprising:  
a cylinder;  
a piston slidably mounted in said cylinder;  
sealing means affixed to said cylinder and to said piston, effectively dividing said cylinder into first and second chambers, said first chamber having connected thereto an input line for admitting a gas mixture to be delivered to a patient and an output line for delivering a desired volume of the gas mixture to the patient on movement of said piston, and said second chamber having an exit port therein;  
means for admitting an initial flow and a subsequent flow of actuating gas into said second chamber;  
valve means for venting gas from said second chamber, through said exit port when said initial flow is admitted into said second chamber, including a valve seal attached to said piston and a valve seat located about said exit port and engageable with said valve seal; and  
means for completely sealing said exit port when said subsequent flow of actuating gas is admitted into said second chamber to displace said piston and drive the desired volume of gas from said first chamber;  
whereby the initial flow of actuating gas exits said second chamber through said valve means and said exit port, and establishes a pressure in said second chamber sufficient to hold said piston in an equilibrium position, with said sealing means being prestressed by the pressure in said second chamber, to minimize volume errors, and said piston being movable in rapid response to further in-

crease in the actuating pressure when said exit port is completely sealed by said sealing means.

4,010,762

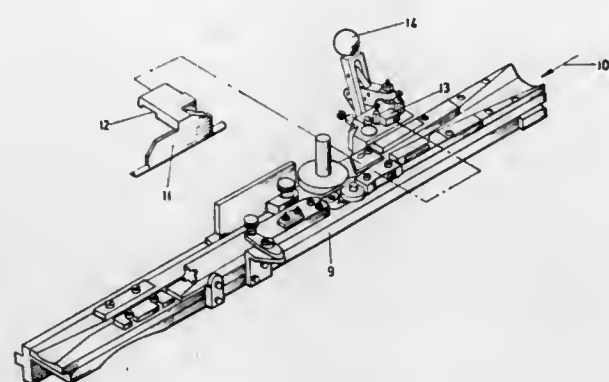
**CIGARETTE ROD CONDITION DETERMINING**  
Mauritz Leon Strydom, Stellenbosch, South Africa, assignor to Tobacco Research and Development Institute Limited, Zug, Switzerland

Continuation-in-part of Ser. No. 529,869, Dec. 4, 1974, abandoned. This application May 13, 1976, Ser. No. 685,957  
Claims priority, application South Africa, Dec. 11, 1973, 73/9394; Aug. 21, 1974, 74/5369

Int. Cl.<sup>2</sup> A24B 7/14; A24C 5/32

U.S. Cl. 131—21 B

6 Claims



1. In a rod making machine comprising means to forward material such as tobacco from which a rod is to be made in the form of a stream along a predetermined path, and a throat along the path in which material is compressed to rod-shape as it is forwarded along the path, the improvement that the throat comprises at least one curved elongated segment free on all sides from the other throat components, a cantilever arm fixed at one end to the machine and at the other end to the segment, a strain gauge mounted on the cantilever arm between the machine and the segment, and means to detect the output of the strain gauge.

4,010,763

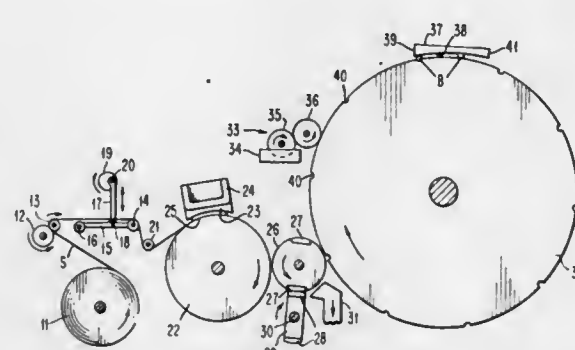
**ADJUSTABLE APPARATUS FOR CUTTING WRAPPERS  
FOR DOUBLE CIGAR BUNCHES OF DIFFERENT SIZES**  
Hans C. Dreher, Dallas, Pa., assignor to Culbro Corporation, New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 641,732

Int. Cl.<sup>2</sup> A24C 1/26; B23D 25/12

U.S. Cl. 131—33

30 Claims



1. Apparatus for dispensing a continuous sheet in the form of V-shaped segments of predetermined width measured along the length of said sheet which comprises adjustable means for feeding said sheet at a predetermined rate, a rotatable suction drum for holding the leading end of said sheet thereon, at least one V-shaped knife blade projecting slightly from the cylindrical surface of said suction drum into contact with said leading end of said sheet, a V-shaped narrow cutting anvil projecting slightly from the concave face of a block fixed relative to said suction drum so that all of said V-shaped knife blade passes in

substantially instantaneous rubbing contact with said V-shaped anvil during the rotation of said suction drum, and means for removing from said suction drum each V-shaped segment cut from said sheet by the passage of said V-shaped knife blade covered with said leading end of said sheet in rubbing contact with said V-shaped anvil.

4,010,764

**SIDE BURN TRIMMING GUIDE**

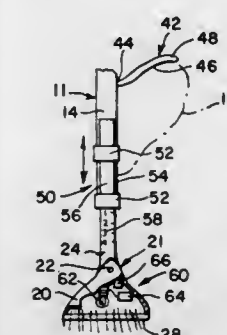
Stan Wagner, 880 Van St., London, Ontario, Canada

Filed May 10, 1976, Ser. No. 684,584

Int. Cl.<sup>2</sup> A45D 24/36

U.S. Cl. 132—45 R

7 Claims



1. A sideburn trimming guide comprising:  
a flexible arcuate band element for placement on the top portion of the user's head, the free ends of said band element biased inwardly and resting in front of and adjacent to the user's ears;  
first adjusting means for adjusting the length of said band element;  
a pair of guide means for providing a pair of guide lines for guiding a cutting implement in cutting the user's sideburns, said guide lines spaced a variable distance from the location of said band;  
second adjusting means for adjusting the position of said guide lines said variable distance from said band element;  
a pair of positioning elements each affixed on one end thereof to said band element adjacent each of said user's ears, the portion adjacent the other ends of said positioning element for resting on said ears positioning said free ends of said band element at a fixed distance relative to said ears; and  
illumination means attached to said guide means adapted to illuminate said sideburns adjacent said guide lines.

4,010,765

**COIN CHANGER WITH SPRING-BIASED SLIDES**

Howard W. Clay, Rockford, Ill., assignor to Reed Industries, Inc., Rockford, Ill.

Filed Mar. 1, 1976, Ser. No. 662,322

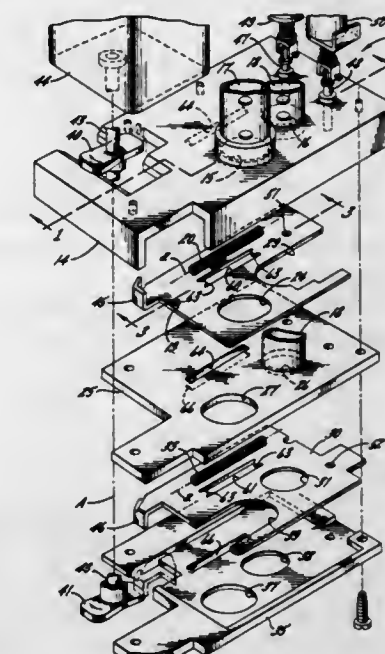
Int. Cl.<sup>2</sup> G07D 1/02

U.S. Cl. 133—4 A

8 Claims

1. A coin changer having a coin payout mechanism, said mechanism comprising a base, first and second coin storage tubes supported on said base, a first slide underlying said base and reciprocable horizontally back and forth in a linear path beneath said base from a home position to a payout position, a stationary divider plate underlying said first slide, a second slide underlying said divider plate and reciprocable horizontally back and forth in a linear path beneath said divider plate from a home position to a payout position, a stationary bottom plate underlying said second slide, each of said slides being operable when moved from its home position to its payout position to discharge a coin from its respective coin tube and through said bottom plate, a power operated cam means rotatable about a vertical axis and operable when actuated through one payout cycle to release said slides for movement to said payout positions and then to return to said home position any slide which has been moved to said payout position, the improvement in said coin changer comprising, first and

second coiled compression springs for moving said first and second slides, respectively, to said payout positions, each of said springs having an axis substantially intersecting the rotational axis of said cam means and extending parallel to the linear path followed by the respective slide, said first spring being disposed within an opening in said first slide and having



4,010,766

**CHANGE DISPENSING APPARATUS**

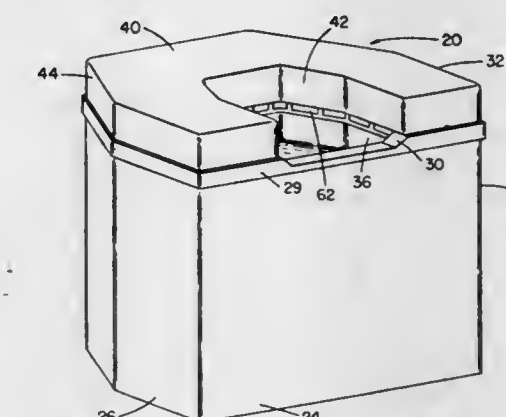
Ralph F. Bowles, Ithaca, and Arthur Hartvig, Spencer, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 8, 1975, Ser. No. 638,877

Int. Cl.<sup>2</sup> G07D 1/00

U.S. Cl. 133—4 A

20 Claims



1. A change dispensing apparatus comprising:  
a. a coin channel mounted in a generally vertical direction and adapted to receive coins to be dispensed, said coin channel having a top orientated discharge end;  
b. means for moving coins in the coin channel to a coin dispensing position at said discharge end;  
c. a coin retaining means disposing adjacent the discharge end;  
d. means extending in a generally horizontal direction from the discharged end of said coin channel to said coin retaining means to guide coins dispensed from said coin channel to said coin retaining means;  
e. coin delivery means selectively positioned adjacent the top of the discharge end of the coin channel to dispense a coin from said discharge end through said guide means to said coin retaining means when operated;



- f. and means operatively associated with said delivery means to selectively operate said delivery means.

4,010,767

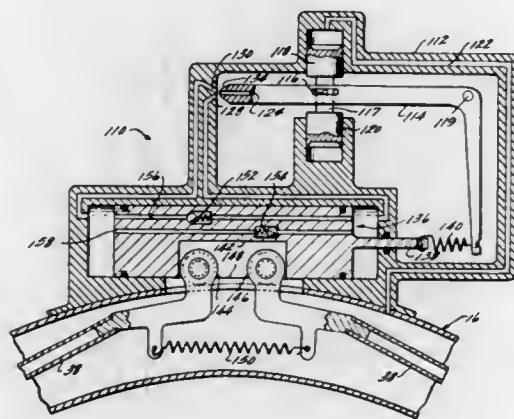
## FUEL SUPPLY AND DISTRIBUTION SYSTEM

Richard Henry Cornell, Marblehead, Mass., assignor to General Electric Company, Lynn, Mass.

Division of Ser. No. 487,888, July 12, 1974, Pat. No. 3,949,775. This application Oct. 31, 1975, Ser. No. 627,728 Int. Cl.<sup>2</sup> G05D 11/00

U.S. Cl. 137—118

2 Claims



1. A fuel supply and distribution system comprising: an annular manifold tube for receiving a flow of pressurized fuel, an actuator having a piston slidably disposed therein wherein the piston is actuated in response to changes in the pressure of the fuel in the manifold tube, a plurality of flow dividing valves disposed about the circumference of the manifold tube each including a metering piston translatablely disposed therein for regulating the flow of fuel from the manifold tube, linkage means extending through the manifold tube interconnecting the actuator with the flow dividing valves such that movement of the actuator piston is simultaneously imparted to the flow dividing valve pistons, wherein the actuator includes servo means controlled by the pressure of the manifold fuel in a manner which unbalances the pressure of a servo fluid at opposing ends of the actuator piston and thus translates the actuator piston as a function of changes in the manifold fuel pressure, and feedback means for returning the servo means to the balanced condition in order to stop translation of the actuator piston, wherein the servo means includes a bell crank type jet pipe servo rotatably disposed with respect to the actuator for discharging a jet of pressurized servo fluid wherein rotation of the jet pipe is controlled by rotatable and sliding engagement to a rod interconnecting two spaced apart pistons both of which are disposed for translation relative to the actuator with the head side of one piston pressurized by fuel received from the manifold and the head side of the other piston pressurized by the gaseous mixture from the combustor, and further includes spaced apart receiver passages for receiving the servo fluid from the jet pipe and directing it to pressurize opposing sides of the actuator piston, and wherein the feedback means includes a resilient connection between the actuator piston and jet pipe so as to impart a torque to the jet pipe servo counter to that imposed by a change in fuel manifold pressure.

4,010,768

## TWO-STAGE JET PUMP PROPORTIONER

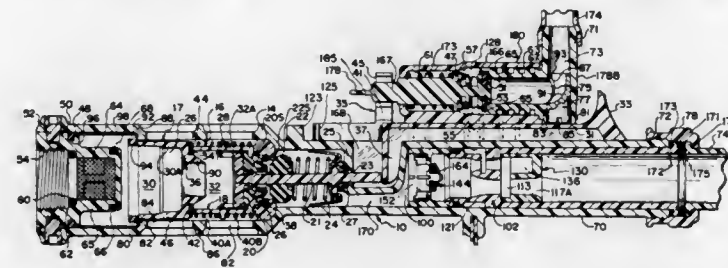
Valentine Hechler, IV, 26 Meadow View Road, Northfield, Ill. 60093

Division of Ser. No. 520,676, Nov. 4, 1974, which is a continuation-in-part of Ser. No. 443,831, Feb. 27, 1974, Pat. No. 3,933,179. This application Dec. 10, 1975, Ser. No. 639,310

Int. Cl.<sup>2</sup> F16K 19/00

U.S. Cl. 137—218

16 Claims



1. In a mixture dispensing device having a housing defining a mixing compartment; normally open valve means for conducting solvent to said compartment above a comparatively low positive gauge pressure including a vent valve and flow control valve closed by solvent present having a pressure above said low positive gauge pressure; manual means for actuating the solvent valve means above said low pressure and the solute valve means simultaneously therewith; and, jet pump mixing means in said compartment inducing said lower pressure by confluent flow of said solvent and solute for mixing said solvent and solute in a solution of predetermined portions.

4,010,769

## LEAK DETECTION ARRANGEMENT FOR VALVE HAVING SEALING MEANS

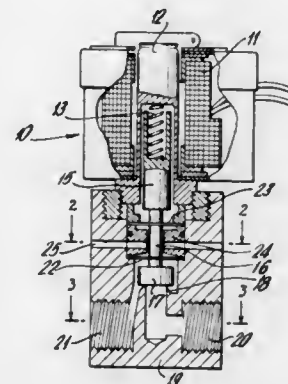
Bruce L. De Lorenzo, and Daniel J. McCarthy, both of Clifton, N.J., assignors to Plast-O-Matic Valves, Inc., Totowa, N.J. Continuation of Ser. No. 309,903, Nov. 27, 1972, abandoned.

This application Nov. 25, 1974, Ser. No. 526,991

Int. Cl.<sup>2</sup> F16K 31/06, 41/12

U.S. Cl. 137—312

3 Claims



1. Valve construction comprising: actuating means, a valve body having a fluid inlet passage and a fluid outlet passage, a valve seat between said inlet and outlet passages and a cavity above the valve seat, a valve flow control plunger operatively arranged between the actuating means and the valve seat and extending through the cavity in the valve body and responsive to the actuating means for movement relative to the valve seat for correspondingly controlling fluid flow through the valve seat from the inlet passage to the outlet passage, spaced apart first and second diaphragms correspondingly secured between the plunger and the valve body for sealing against fluid flow to the actuating means, the

- second diaphragm sealing against fluid flow along the plunger beyond the first diaphragm, a leak detection passage extending from the interior of the valve body outwardly to the exterior thereof and located between the first and second diaphragms for the flow of any fluid leaking past the first diaphragm to a visible location outside of the valve body, and a spacer in the cavity surrounding the plunger and located between the first and second diaphragms and having an opening therethrough defining a portion of the detection passage.

4,010,770

## VELOCITY FLOW CONTROL VALVE FOR FLUID LINE

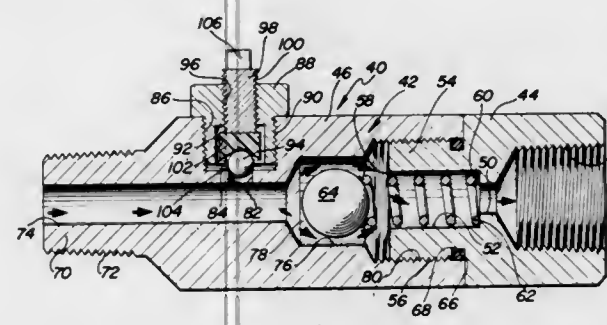
Clifford M. Peters, Longview, Tex., assignor to W-K-M Well-head Systems, Inc., Shreveport, La.

Filed Mar. 1, 1976, Ser. No. 662,312

Int. Cl.<sup>2</sup> F16K 31/12

U.S. Cl. 137—492.5

5 Claims



1. In a safety system for closing a gate valve in a main flow line having a fluid actuator for closing the gate valve, a pilot valve to control the flow of fluid to the actuator, and a branch line between the main flow line and the pilot valve to supply fluid pressure from the main flow line to the pilot valve, the improvement comprising a velocity flow control valve in the branch line adjacent the main flow line, said flow control valve having a longitudinal extending main body including two body portions threaded together in end-to-end relation to form an upstream female body portion and a downstream male body portion both having a central bore therethrough forming a flow passage, said downstream male body portion having a ball valve seat on its inner end about the central bore and a coil spring within the central bore and extending beyond the valve seat, a ball valve member on the extending end of the spring adapted to seat on the ball valve seat and block the flow of fluid therethrough when urged against the bias of the spring by a predetermined pressure differential, said upstream female body portion having an enlarged inner end forming a valve chamber for receiving the ball valve and permitting a flow of fluid around the ball valve when in an unseated position, said female body portion having a bleed port in fluid communication with the bore upstream of the valve chamber, and a bleed valve closing said bleed port in one position and permitting in another position the bleeding of fluid from the bore.

4,010,771

## CHANGE-OVER VALVE, PREFERABLY FOR A RAILWAY VEHICLE

Gert Artur Persson, Oxie, Sweden, assignor to Svenska Aktebolaget Bromsregulator, Malmö, Sweden

Filed July 8, 1974, Ser. No. 486,580

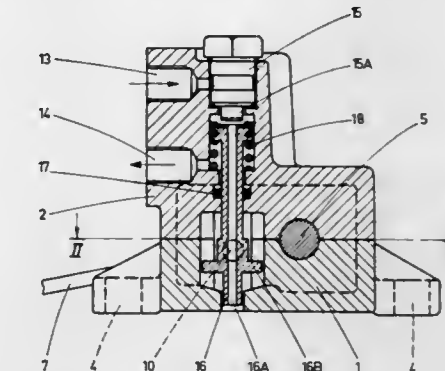
Claims priority, application Sweden, July 11, 1973, 7309716

Int. Cl.<sup>2</sup> B60T 8/18

U.S. Cl. 137—596.1

4 Claims

1. A change-over valve operating mechanism operable by an applied force such as the weight of a vehicle, comprising in combination, means providing a flow path from an input fluid flow coupling to an output fluid flow coupling, a fluid control



- structure coupling said rotary mechanism to said spring so that in response to an applied force of pre-determined magnitude the mechanism overcomes the spring and permits the valve member to move into the second of said two positions, wherein the structure limits the applied pressure on the valve to the force of said spring and having said fluid control valve spring biased by a spring less powerful than said return spring, whereby said less powerful spring urges said fluid control valve into said position permitting flow of fluid through said path when said rotary mechanism overcomes the return spring.

4,010,772

## TWO PART LIP SEALING MIXING VALVE FOR LAVATORIES, SINKS, ETC.

Patsy B. Palmer, Granada Hills, and Julius L. Tolnai, Los Angeles, both of Calif., assignors to Price Pfister Brass Mfg. Co., Pacoima, Calif.

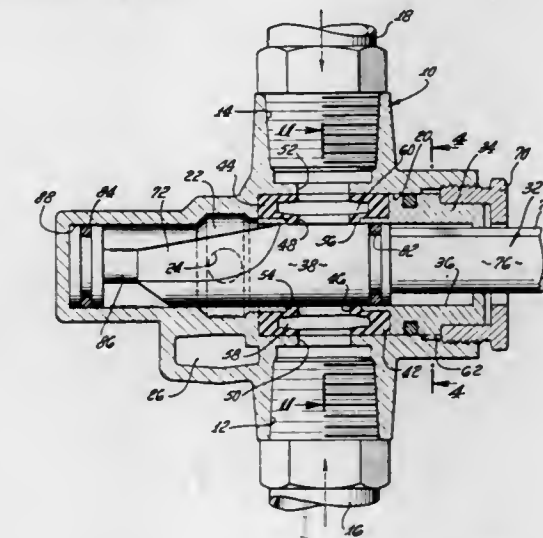
Continuation of Ser. No. 241,653, April 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 95,506, Dec. 7, 1970, Pat. No. 3,661,181. This application Feb. 21, 1975, Ser. No. 551,673

The portion of the term of this patent subsequent to May 9, 1989, has been disclaimed.

Int. Cl.<sup>2</sup> F16K 19/00

U.S. Cl. 137—625.17

2 Claims

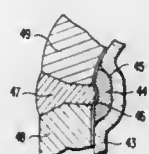
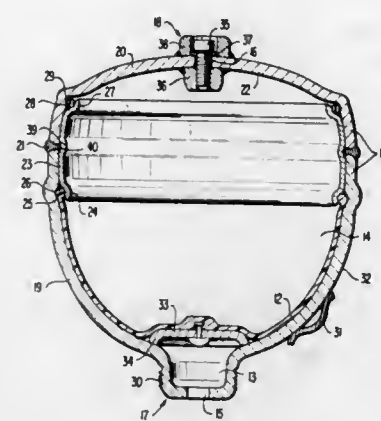


1. In a mixing valve structure: a. a valve body having means forming a substantially cylindrical valve chamber; b. means forming hot and cold water inlet openings into the chamber at angularly spaced locations thereof;

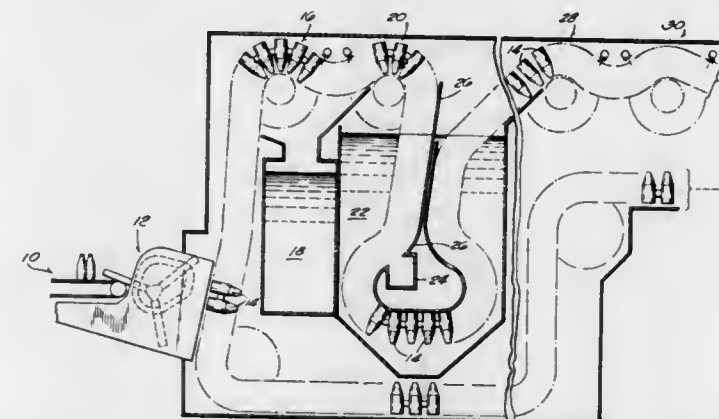


- c. a valve stem extending into said chamber and having a substantially cylindrical exterior surface portion movable to oppose said inlet openings;
- d. a cage-like support attached to said body and having a hollow, substantially cylindrical portion interposed between said inlets and said valve stem, said cylindrical portion having a pair of angularly spaced, outwardly facing recesses respectively facing the hot and cold water inlets respectively, said recesses having inner walls provided with openings to the interior of said hollow portion for communication with said valve stem;
- e. a pair of sealing members made of flexible material fitted in said support recesses respectively, said sealing members each having a port establishing communication between its inlet, through the support recess opening to the stem;
- f. each sealing member having a bead protruding through the corresponding recess opening for cooperation with said valve stem on the inside of said hollow portion;
- g. said sealing members respectively extending entirely about the inward axial projection of the corresponding inlet opening to form operative static seals around the insides of the corresponding inlet openings;
- h. each of said ports having an intermediate recessed enlargement forming an atrium subjected to supply inlet pressure to expand the sealing member into sealing engagement with the edges about the corresponding inlet opening and to urge the corresponding bead into sealing engagement with said cylindrical surface portion of said stem when the stem is in closed position;
- i. said valve stem having flow channel means adjoining the cylindrical surface portion to control flow into said valve chamber from the inlet openings in accordance with the angular and axial positions of said valve stem;
- j. said sealing members forming the only operable static and dynamic seals between said inlet openings and the exterior surface of said valve stem.

welding material of said welding seam, said layer being disposed at least at a portion of said retaining ring means adjacent



**4,010,774**  
**ROTARY SPRAY STATION FOR BOTTLE WASHERS**  
 Otto H. Fischer, Milwaukee, Wis., assignor to Stowell Industries Inc., Milwaukee, Wis.  
 Filed Mar. 3, 1975, Ser. No. 554,905  
 Int. Cl.<sup>2</sup> B08B 3/02, 9/08  
 U.S. Cl. 134—104 **2 Claims**



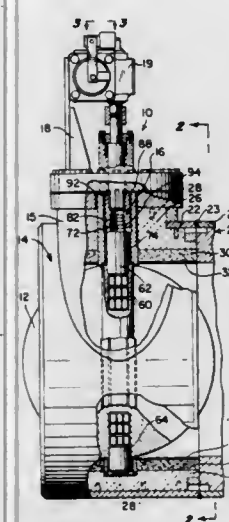
1. A bottle washing machine of the type having a conveyor transporting bottles through the machine in parallel rows, the bottles in each row being spaced and supported to remain normal to the conveyor on straight runs of the conveyor and to be radially disposed where the conveyor follows a curved path, the improvement comprising a spray station located where the conveyor follows a curved path with the necks of the bottles facing the center of curvature, the bottles in each row being angularly spaced at the spray station, a pipe at the spray station rotated in synchronism with the conveyor drive, axially spaced rows of circumferentially disposed nozzles mounted on the pipe in alignment with the rows of bottles on the conveyor, the angular spacing of the nozzles in each row corresponding to the angular spacing of the bottles passing over the

**4,010,773**  
**HYDROPNEUMATIC PRESSURE STORAGE DEVICE**  
 Eugen Bihlmaier, Birkmannsweller, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany  
 Filed May 21, 1974, Ser. No. 471,901  
 Claims priority, application Germany, May 22, 1973, 2325844  
 Int. Cl.<sup>2</sup> F16L 55/04  
 U.S. Cl. 138—30 **29 Claims**

1. A hydropneumatic pressure storage device comprising a housing means having two parts welded together by a welding seam, a retaining ring means arranged at the inner wall of said housing means within the area of the welding seam, means for fixing said retaining ring means in said housing means, a bellows means serving as a movable partition wall, said retaining ring means holding said bellows means in said housing means, and a weld rejectable layer of a material for rejecting the

- curved spray station with each nozzle being aligned with a bottle as the bottle passes the spray station so the spray from the nozzle is aligned with the bottle for the angular embrace of the bottle travel over the curved path, pump means delivering liquid under pressure to the interior of the pipe, a stationary header embracing a circumferential portion of said pipe and substantially blocking spray from the nozzles as they travel outside said angular embrace, said header including a normally inoperative flow path which, when operative, permits liquid under pressure to be injected through each nozzle in the reverse direction as the nozzle is aligned with the flow path, and means for rendering the flow path operative and permitting the liquid to be withdrawn from the interior of said pipe.

**4,010,775**  
**HIGH TEMPERATURE VALVE**  
 Richard Albert Roberts, Corona, Calif., assignor to Consolidated Controls Corporation, Bethel, Conn.  
 Filed Jan. 15, 1975, Ser. No. 541,254  
 Int. Cl.<sup>2</sup> F16L 9/14  
 U.S. Cl. 138—142 **29 Claims**

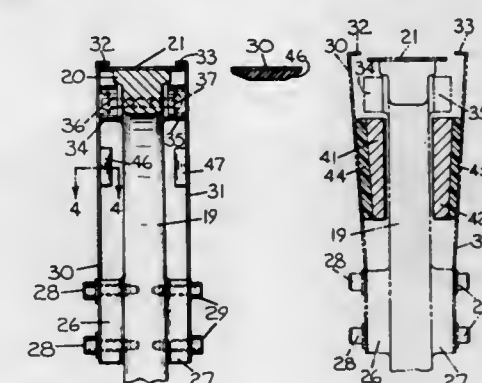


1. An abrasion resistant conduit for conveying high temperature abrasive fluids such as coal gas and the like comprising an outer shell of metal, an outer liner of castable refractory material having a relatively unsmooth surface cast in place in said shell, and a flame sprayed inner liner of ceramic material on an inside surface of said outer liner to provide a smooth inner surface of said outer liner and to provide a smooth surface for contact with said abrasive fluids.

**4,010,776**  
**TAPE WHEEL FOR SHUTTLELESS LOOMS**  
 Maurice Flamand, Cumberland, R.I., assignor to Rockwell International Corporation, Pittsburgh, Pa.  
 Filed Nov. 28, 1975, Ser. No. 635,875  
 Int. Cl.<sup>2</sup> D03D 47/18  
 U.S. Cl. 139—449 **5 Claims**

1. An improved tape wheel for use in a shuttleless loom in which flexible tapes are inserted into and withdrawn from the warp shed by being wrapped about and extended from said tape wheel respectively, said improved tape wheel comprising: a. hub means journaled for effecting oscillation of said tape wheel; b. a plurality of spoke members extending outwardly from said hub means; c. outer rim means supported by said spoke members with attachment means for anchoring one end of a flexible tape thereto; d. means carried by said spoke members for retaining the flexible tape in close proximity with said outer rim means; and

- e. means operatively associated with said retaining means and spoke members for sequentially displacing said retaining means to release the flexible tape while it is being

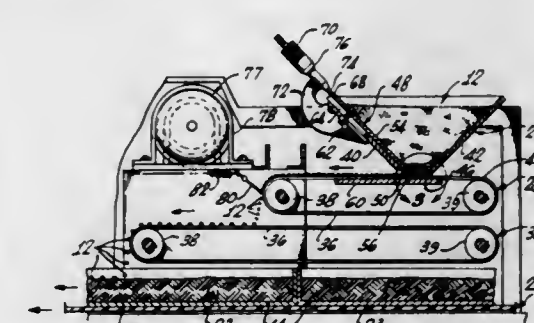


extended from said tape wheel, and sequentially returning them to tape retaining position while the flexible tape is being wrapped about said tape wheel.

**4,010,777**  
**METHOD FOR THE ACHIEVEMENT OF AN ACETYLENE GAS MIXTURE**  
 Sten Mogensen, Djursholm, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden  
 Continuation-in-part of Ser. No. 397,141, Sept. 13, 1973, abandoned. This application June 4, 1975, Ser. No. 583,751  
 Claims priority, application Sweden, Sept. 19, 1972, 12050/72  
 Int. Cl.<sup>2</sup> B65B 31/00 **5 Claims**

1. A method for safely storing increased amounts of acetylene in a gaseous state in closed containers, while reducing the tendency of said acetylene to decompose, which comprises adding a liquid solvent for said acetylene to said container, adding said acetylene to said containers, and adding a sufficient amount of flammable, stable gas selected from the group consisting of the C<sub>1</sub> to C<sub>6</sub> alkanes, alkenes, and mixtures thereof to said container to act as a solvent for said acetylene, whereby the total amount of said acetylene which can be safely stored in said acetylene-filled closed container is increased by about 10 to 15% by the addition of said flammable, stable gas.

**4,010,778**  
**AUTOMATIC SEED PLANTING MACHINE AND METHOD FOR PLANTING SEEDS IN PLANTERS**  
 Alvin F. Aggen, 2750 Sailor Ave., Ventura, Calif. 93003  
 Filed Jan. 10, 1973, Ser. No. 322,391  
 Int. Cl.<sup>2</sup> B65B 3/04 **3 Claims**



1. The method of planting seeds of a predetermined size uniformly in flats comprising the steps of: dispensing seeds from a supply in a hopper in single height, side-by-side, and closely spaced relation onto a first conveyor; dropping said seeds from said first conveyor to a second conveyor positioned therebelow;



moving said second conveyor at a speed faster than that of said first conveyor thereby to space out said seeds dropped onto said second conveyor; and dropping said seeds from the end of said second conveyor into flats moving on a third conveyor below said second conveyor.

4,010,779

## APPARATUS FOR RECOVERY OF VAPOR

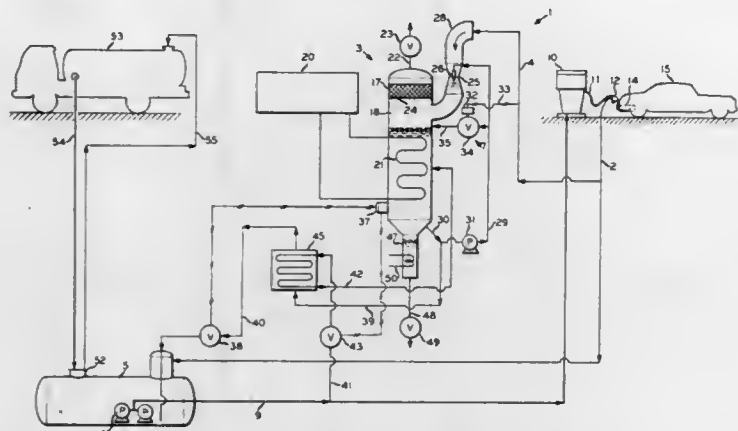
Lyle W. Pollock, and Glenn H. Dale, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 20, 1975, Ser. No. 560,402

Int. Cl.<sup>2</sup> B65B 31/00

U.S. Cl. 141-44

8 Claims



1. An apparatus for recovery of vapor expelled from a tank during filling of same, said apparatus comprising:
  - a. a storage tank;
  - b. a first conduit having a first end adapted to receive vapor from a tank being filled, said first conduit being in continuous flow communication with said storage tank;
  - c. a second conduit in continuous open flow communication with said first conduit;
  - d. liquefaction means communicating with said second conduit and operable to receive vapor from said first conduit through said second conduit for liquefying same; and
  - e. first means operably associated with said liquefaction means and said first means including a pressure sensing means operably associated with at least one of said first conduit and said second conduit and also operably associated with said liquefaction means and being operable in response to a pressure change in one of said first and second conduits for selectively actuating a liquefying portion of said liquefaction means whereby at least a portion of the vapor selectively flows to the liquefaction means.

4,010,780

## ACID FILLING APPARATUS FOR BATTERIES OR THE LIKE

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 423,317, Dec. 10, 1973, Pat. No. 3,934,624. This application July 28, 1975, Ser. No. 600,153

Int. Cl.<sup>2</sup> B65B 3/06

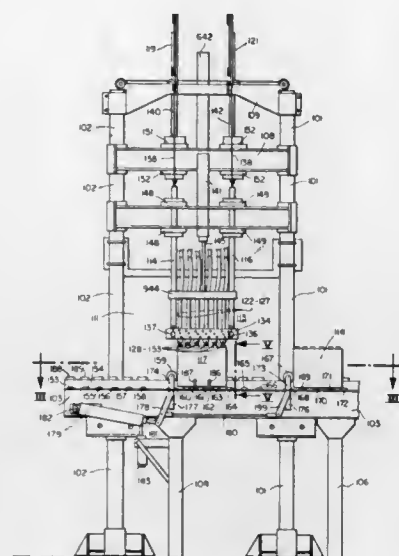
U.S. Cl. 141-168

13 Claims

8. In a system for sequentially processing batteries with battery processing equipment, an apparatus for retaining each of said batteries in at least one stand-by position, for advancing each of said batteries to at least one battery processing position, for aligning each of said batteries with respect to said battery processing equipment during the operation of said equipment, and for allowing the discharge of each of said batteries from said battery processing position, comprising:
  - a. a conveyor surface defined by a plurality of transverse rollers, at least two of which rollers which are spaced apart by a distance at least as great as the longitudinal dimension of said batteries to be processed being adapted for

movement with respect to said surface between first normal positions and second stop positions, whereby longitudinal movement of at least two of said batteries along said surface is halted at said standby and said battery processing positions by said rollers in said stop positions;

- b. actuator means for causing said rollers to move in unison between said normal and said stop positions; and



4,010,781

## GASOLINE DISPENSING NOZZLE GUARD WITH SPOUT ENCLOSURE AND VAPOR RETURN LINE

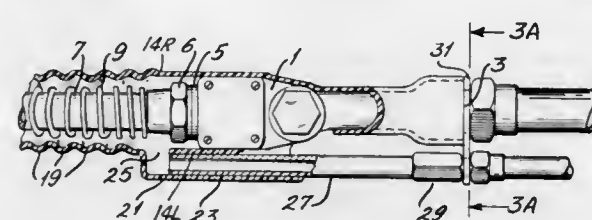
Grenville G. Sutcliffe, Villa Ridge, Mo., assignor to Husky Corporation, Pacific, Mo.

Filed Mar. 31, 1975, Ser. No. 563,808

Int. Cl.<sup>2</sup> B65B 3/04

U.S. Cl. 141-392

8 Claims



1. The combination of a fuel dispensing nozzle having a body with an elongated inlet passage and an outlet mounting an elongated spout insertible into the filler opening of a fuel tank for discharging fuel thereinto, with a guard comprising a body portion having a front wall, spaced side walls, a top wall and a bottom wall and open at its rear, adapted to fit tightly over and substantially enclose the nozzle body, a hollow projection extending forwardly from said front wall and adapted to surround the elongated nozzle spout in spaced relation with the exterior thereof and open at its forward end to engage structure surrounding the fuel tank filler opening, an elongated boss on one side wall extending from the rear portion of said hollow projection to the rear edge of said body portion, said boss being hollow and forming a passageway communicating at its forward end directly with the interior of said hollow projection and open at its rear end, and a vapor return tube alongside the nozzle inlet passage with its forward end telescopically received in said passageway, said nozzle inlet

passage having an opening at its rear end adapted to receive a fuel hose fitting, and a plate transverse of said inlet passage apertured to permit the passage therethrough of said hose fitting and adapted to be gripped between said hose fitting and the abutting rear end of said nozzle body, said plate being formed with a second aperture radially spaced from said first aperture to receive and position said vapor return tube.

4,010,782

## METHOD AND DEVICE FOR FEEDING TREES IN TREE HARVESTING APPARATUS

Jukka Moisander, Tampere, Finland, assignor to Rauma-Repola Oy., Finland

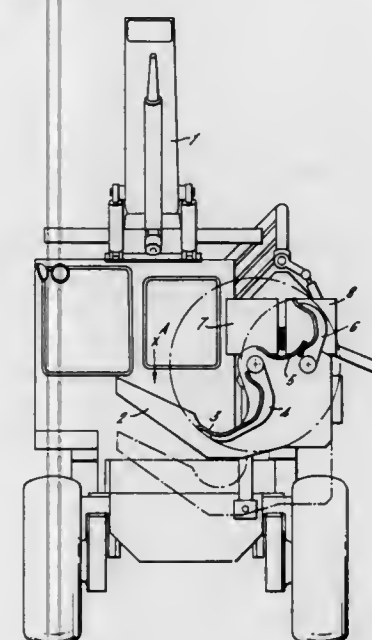
Filed Jan. 5, 1976, Ser. No. 646,552

Claims priority, application Finland, Jan. 16, 1975, 750107

Int. Cl.<sup>2</sup> A01G 23/08

U.S. Cl. 144-309 AC

3 Claims



3. In a multifunctional tree-harvesting apparatus having tree-felling means, means for delivering felled trees to the input end of the apparatus, and a handling line for felled trees including tree-pulling means and lopping knives:
  - a. a tree supporting member mounted on a lower portion of the input end of the apparatus for receiving and supporting the butt end of a felled tree, said support member forming a holding and storing means for said felled tree awaiting handling;

- b. an upwardly-inclined, sideward, beam-like extension on said tree supporting member for receiving and supporting additional felled trees and for permitting said additional felled trees to successively slide onto said tree supporting member;
- c. first delimbing means rigidly mounted at the input end of the apparatus along the handling line, said first delimbing means having a cutting edge and a configuration for encircling a portion of the circumference of the trunk of a tree in the handling line;
- d. second delimbing means adjacent said first delimbing means, said second delimbing means having cutting edges and being pivotably mounted for reciprocating movement through an arc sufficient to contact said trunk and so placed as to encircle a portion of the circumference of the trunk of said tree in the handling line adjacent the portion encircled by said first delimbing means; and
- e. third delimbing means having cutting edges and a scoop-like configuration mounted at the input end of the apparatus for unobstructed, continuous rotation through a full circle about a substantially horizontal axis extending in the longitudinal direction of the apparatus, said axis of rotation being disposed below the handling line and above the tree supporting member, the length of said third delimbing means being sufficient to extend beneath

the butt end of a felled tree on said tree-supporting member, whereby, upon rotation, said third delimbing means raises said butt end of the tree to feed it into the pulling means in the handling line while encircling a third portion of the circumference of the trunk for delimbing, said third delimbing means, upon completion of delimbing, continuing its rotation to engage a second tree on the three supporting member to raise said second tree to the handling line, said continuously rotatable third delimbing means constituting the sole means for raising a felled tree from the tree supporting member to feed said tree to the handling line.

4,010,783

## FLEXIBLE, COLLAPSIBLE CONTAINER FOR LIQUIDS HAVING REINFORCED TAIL PORTION

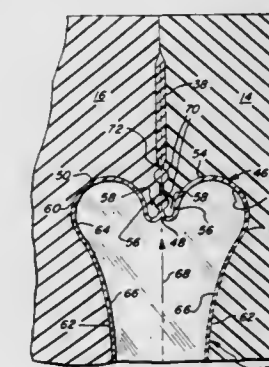
Philip G. Ralston, Woodstock, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed July 21, 1975, Ser. No. 597,426

Int. Cl.<sup>2</sup> B65D 33/02

U.S. Cl. 150-1

8 Claims



1. In a flexible-walled, flat-collapsible container including a sealed head portion with access means to the contents of the container, and a tail portion defining a sealed line joining sides of said container into a sealed end, the improvement comprising:
  - said sealed line occupying a recess defined in said sealed end by said flexible container walls, said sealed line and recess extending essentially the entire width of said container, whereby outwardly-directed shock is absorbed by movement of the walls of said recess to protect said sealed line from rupture, said sealed line being free of extra seal-reinforcing means.

4,010,784

## BULK CONTAINERS

Frank Natrass, "Fallows End", Brearton, Harrogate, Yorkshire, and Peter Johnson Natrass, "Tresco", Chain Lane, Knaresborough, Yorkshire, both of England

Continuation-in-part of Ser. No. 454,870, March 26, 1974, abandoned. This application Oct. 15, 1975, Ser. No. 622,740

Claims priority, application United Kingdom, Mar. 4, 1973, 15798/73

Int. Cl.<sup>2</sup> B65D 33/14

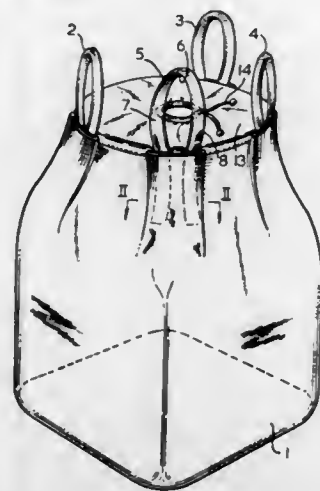
U.S. Cl. 150-1

18 Claims

1. A bag for transporting bulk material, the bag having a top and having four separate lifting loops disposed around the top, each loop having a bight and two spaced legs, and each leg being secured to the fabric of the bag by being disposed along a section of the fabric folded to a substantially S-shaped con-



figuration along fold lines extending from the top towards the bottom of the bag to form three overlying thicknesses of fabric



and stitching through the three thicknesses of fabric and the leg.

4,010,785

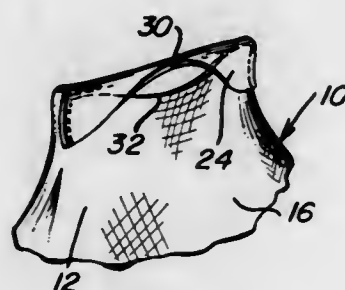
## PERSONAL CLOTHING BAG FOR WASHING MACHINE

Robert M. Patik, 823 Reservoir St., Mt. Pleasant, Pa. 15666  
Filed Feb. 12, 1976, Ser. No. 657,633

Int. Cl.<sup>2</sup> B65D 33/24

U.S. Cl. 150-7

4 Claims



1. A personal clothing bag for washing machines, said bag including front and rear mesh panel portions including pairs of registered corresponding marginal edge portions, all of said pairs of corresponding marginal edge portions, except one pair, being secured together, one of said panel portions including an outward extension flap extending along and projecting outwardly of the marginal edge portion thereof comprising one of said one pair of corresponding edge portions, said extension flap being folded back over the outer side of the other marginal edge portion of said one pair of edge portions and including opposite marginal edges overlying, extending along, and sewn to the end portions of second and third pairs of corresponding marginal edge portions of said panel portions between which said one pair of corresponding marginal edge portions extend, the corresponding opposite end portions of said one pair of corresponding marginal edge portions and the overlying portions of said extension flap being sewn together inwardly therealong from said second and third pairs of edge portions to the opposite ends of central portions of said one pair of edge portions and with said central portions of said one pair of edge portions and the corresponding overlying portion of said flap being free of connections with each other.

4,010,786  
SEALED CONTAINER

Georges Aguetant, l'avenue Jules Carteret, and Louis Doyen,  
79, rue de Bourgogne, both of Lyon, France

Filed Apr. 8, 1974, Ser. No. 459,190

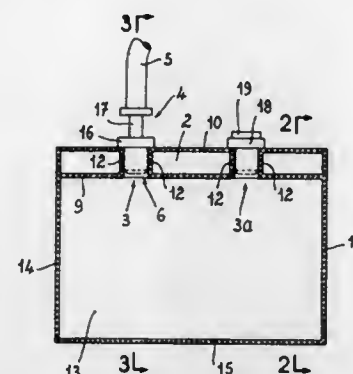
Claims priority, application France, Apr. 10, 1973,  
73.13609

Disclosure was also published under second Trial Voluntary  
Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B65D 33/36

U.S. Cl. 150-8

6 Claims



1. A container comprising a hollow body of sealable sheet material with two integrally interconnected and coextensive rectangular portions marginally sealed to each other along first, second and third edges and infolded along the fourth edge to form an inwardly projecting gore with a ridge spaced from said second edge opposite said fourth edge, the flanks of said gore being sealed to each other over part of the length of said fourth edge with formation of at least one outwardly open pouch closed by said ridge and separated thereby from the interior of said body, and a rigid sleeve inserted into said pouch in fluidtight peripheral contact with the surrounding sheet material of said gore.

4,010,787  
WALLET

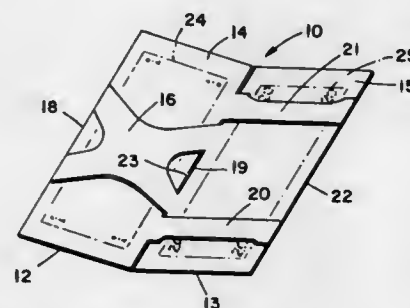
Allan Michael Traugott, 37 Linden Ave., Atherton, Calif.  
94025, and Lony P. Traugott, 91 Flood Circle, Atherton,  
Calif. 94025

Filed Nov. 3, 1975, Ser. No. 628,163

Int. Cl.<sup>2</sup> A45C 1/06

U.S. Cl. 150-35

6 Claims



1. A wallet for carrying currency of various denominations together with a plurality of credit cards, said wallet comprising:

- a pair of at least partially resilient foldable rectangular planar members having relatively larger length and smaller width dimensions greater than the dimensions of said currency, each said planar member having inner and outer faces respectively with the inner faces of said members adapted to normally be maintained in near abutment, the members in combination being foldable lengthwise along central fold lines so that the outer face of one of the planar members is concealed in said folded configuration;
- a plurality of slit pockets arranged in the outer face of said one of the planar members, the openings of said slit pockets

ets being disposed generally parallel to the widthwise dimension of said one rectangular member, said slit pockets being disposed on each side of the fold line with the openings of said slit pockets disposed toward said fold line; and

strap means joining lengthwise lateral edges of the respective planar members disposed oppositely when the inner faces of the planar members are in near abutment so that the currency of high and low denominations respectively can be disposed against the respective inner faces of the members and retained thereagainst by the strap means and a plurality of credit cards can be located in the slit pockets and are concealed when the planar members are maintained in their folded configuration.

4,010,788  
BOLT SEAL

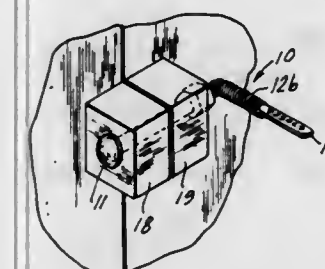
James J. Van Gompel, Fremont, Ind., assignor to Brammall,  
Inc., Angola, Ind.

Filed Sept. 29, 1975, Ser. No. 617,597

Int. Cl.<sup>2</sup> F16B 39/02

U.S. Cl. 151-2 A

4 Claims



1. A bolt seal comprising:  
a bolt with a threaded portion having a head at one end and a flattened area at the other end on which an identification can be printed,  
a nut threadably receivable on said threaded portion, wherein said nut is a spin nut which has a first cup-shaped cylindrical member with sides and a bottom at right angles to the sides and with a central opening through which said bolt is receivable, and a threaded member with a central threaded opening receivable into said cup-shaped member and rotatably attached to said cup-shaped cylindrical member,  
wherein said spin nut further includes a cover second cup-shaped cylindrical member with sides and a flat bottom at right angles to the sides and with a central opening through which said bolt is receivable and said cover member non-rotatably attached to said first cup-shaped cylindrical member and said threaded member rotatably confined between said first and second cup-shaped cylindrical members whereby said threaded member rotates when said spin nut is turned in a first direction but does not turn when said spin nut is turned in the other direction and also includes a second flattened area formed on said bolt near its head upon which an identification can be printed and said identification corresponding to the identification on the flattened area at said other end, and wherein said bolt is made of material that has a characteristic such that said threaded portion of said bolt does not break when bent 90° but which breaks when straightened to its initial position.

4,010,789  
ANCHOR PLATE TIRE

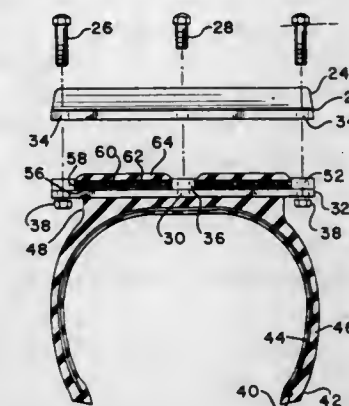
Aleksandar Vidakovic, and Rodney H. Anderson, both of Libertyville, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Sept. 2, 1975, Ser. No. 609,471

Int. Cl.<sup>2</sup> B60C 27/20; B62D 55/28

U.S. Cl. 152-182

10 Claims



1. A pneumatic tire comprising:  
a carcass portion having a partially opened toroidal cross section including bead sections, sidewall sections and a crown portion, said crown portion disposed centrally between said sidewall sections and diametrically opposite said opened portion between said bead sections; and  
a plurality of radially disposed anchor plates positioned on said flat crown portion; and  
an anchor ply circumferentially disposed around said crown portion of said pneumatic tire on top of said anchor plates wherein said pneumatic tire including said carcass portion, said anchor plates and said anchor ply is assembled, formed, and cured into a single unified assembly.

4,010,790

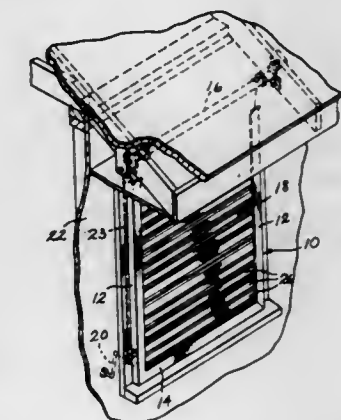
## SLATTED WINDOW ASSEMBLY

John Varga, 51724 Hollyhock Road, South Bend, Ind. 46637  
Filed Sept. 3, 1976, Ser. No. 720,106

Int. Cl.<sup>2</sup> E06B 9/08

U.S. Cl. 160-133

3 Claims



1. In a window assembly having a frame and a flexible slatted curtain carried by said frame between spaced guide means, a winding device, one end of said curtain connected to said winding device, means for rotating said winding device to cause said curtain to be wound about and unwound from the winding device in shifting between raised and lowered positions, the improvement wherein said curtain includes a plurality of slats located side by side, each slat including a channel part and a cover, each channel part including a base having end portions and spaced sides projecting from said base, said sides defining opposed groove means extending between said base end portions, a pin carried by said base at each end portion thereof, each pin projecting outwardly from said base and terminating adjacent the level of said opposed groove



means, a slotted opening formed in each side at each base end portion between said base and the groove means of the side, a plurality of links each having a longitudinal slot formed therein extending from one end portion to the other end portion of the link, a said link located at corresponding base end portions of adjacent channel parts and having one of its end portions fitted through a said slotted opening in one adjacent channel part with the pin thereof extending lockingly through said slot in the link and having its other end portion fitted through a said slotted opening in the other adjacent channel part with the pin thereof extending lockingly through said slot in the link, a said cover fitted between the sides of each channel part within said groove means of the channel part and overlying each pin of the channel part and locked link end portions.

4,010,791

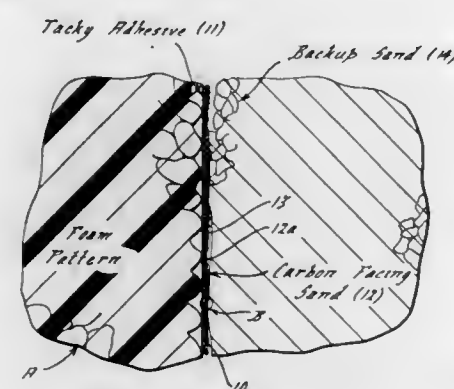
# METHOD FOR CAVITYLESS CASTING EMPLOYING A DUAL LAYER PATTERN COATING

Adolf Hetke, Livonia, and Kip M. Bonds, Union Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.  
Filed Aug. 29, 1975, Ser. No. 608,959

Int. Cl.<sup>2</sup> B22C 9/02

U.S. Cl. 164—34

7 Claims



1. In a process for casting metals by utilization of a mold having embedded therein a destructible pattern of foam thermoplastic resinous material, said mold having refractory particles about said pattern to define a mold cavity and in turn to define a casting upon introduction of molten metal to said pattern and consequent destruction of the pattern, the surface of the resulting casting corresponding to the shape of the mold particles defining the cavity as well as the surface of the foam material, said process including the pouring of molten metal into said mold whereby the foam pattern is destroyed and displaced by metal, the improvement comprising:

depositing a dual layer coating on the surface of said pattern, the first and inner layer of said coating consisting essentially of a highly tacky viscous adhesive substantially devoid of solids or refractory particles, said adhesive filling the pores or crevices inherently defined in the outer surface of said foam pattern, the second and outer layer of said coating consisting essentially of a collection of dry refractory particles in the size range of 100–140 AFS, each of said particles being secured on said pattern by the adhesive quality of said first layer, only those particles of said second layer having a portion thereof in contact with said first layer being so secured, the particles of said second layer being unsecured with respect to each other and thereby constitute a permeable second layer aligned on the surface of said adhesive to present an ultrasmooth surface, said coating having the first layer thereof volatilized along with said pattern upon pouring of molten metal into said mold while the second layer of said coating remains unaffected and thus functions to define the outer surface of the resultant casting.

4,010,792

# METHOD FOR CONTINUOUSLY CASTING STEEL

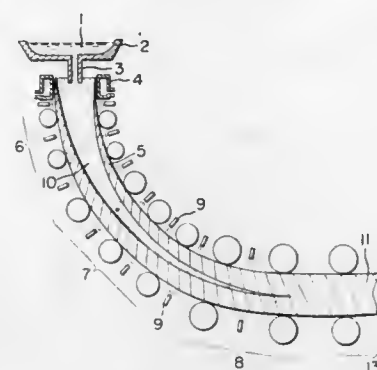
Moriyuki Ishiguro; Shinobu Miyahara; Isao Sugawara; Masayuki Hanmyo; Shigetaka Uchida; Hideo Uchibori, all of Fukuyama, and Shigeki Komori, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan  
Filed Oct. 30, 1975, Ser. No. 627,065

Claims priority, application Japan, Nov. 25, 1974, 49-134404

Int. Cl.<sup>2</sup> B22D 11/12

U.S. Cl. 164—76

1 Claim



1. In a method for continuously casting steel, comprising: arranging a group of at least two pairs of reduction rolls near the crater top of a cast strand such that the solidification of the molten steel in said cast strand is substantially completed in said group of reduction rolls, reducing said cast strand near said crater top by said reduction rolls, setting the roll pitch of said reduction rolls to about 200mm to 420mm, and concurrently setting the draft per pair of said reduction rolls to about 0.1% to 2.0% to produce a cast strand with substantially no center segregations or inner cracks.

4,010,793

# METHOD FOR CHANGING WIDTH OF CAST SLABS DURING CONTINUOUS CASTING

Yozo Takemura, Tokai; Kouich Hirayama, Cita, and Yoshiyuki Kikuchi, Tokai, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

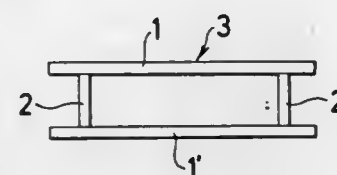
Filed Oct. 29, 1975, Ser. No. 626,639

Claims priority, application Japan, Nov. 8, 1974, 49-128748

Int. Cl.<sup>2</sup> B22D 11/04

U.S. Cl. 164—82

3 Claims



1. A method of changing the width of a steel slab formed in a continuous casting operation in which molten metal is poured into one end of a mold and the slab is withdrawn continuously from the other end of the mold and which mold includes two longer front members and two shorter side members with the front members defining the width surface of the slab being formed and the side surfaces defining the thickness surface of the slab being formed with the side members extending between the front members and defining the opposite ends of the width surface, wherein the improvement comprises moving at least one of the side members relative to the front members at a speed not greater than 2.0 mm/second while continuing to pour the molten metal into the mold and to withdraw the slab from the mold for effecting a significant change in the width of the slab being formed.

4,010,794

# METHOD OF CASTING AN ARTICLE HAVING A BODY CAVITY

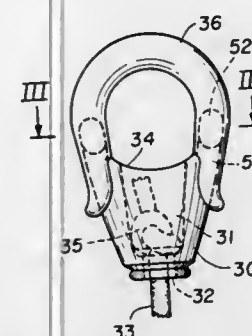
Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.

Filed Jan. 22, 1976, Ser. No. 651,617

Int. Cl.<sup>2</sup> B22D 23/00; B29C 5/08; B29D 9/00; B29F 1/00

U.S. Cl. 164—94

10 Claims



1. A method of forming an article having a body and a fixed loop portion secured to spaced portions of said body and substantially aligned with a cavity extending through said body, said cavity having two ends of different diameters, with the larger of said ends being towards said loop, said method comprising:

casting said body portion of hardenable material in a first mold cavity and about a core member adapted to define said cavity, said mold cavity being adapted to form said body with two spaced structural portions, each of said portions providing means adapted to interlock with after-molded material to form said loop and hardening of said hardenable material to form said body;

removing said body from said first mold cavity and axially withdrawing said core from the larger end of said cavity having two ends of different diameters; inserting said body in a second mold cavity, casting and hardening further hardenable material under suitable conditions between said spaced structural portions and interlocking with said interlocking members, thereby completing said loop and said article.

4,010,795

# COOLING UNIT

Kaj Stenberg, Staffanstorp, Sweden, assignor to Gambro AG, Zug, Switzerland

Continuation of Ser. No. 484,341, June 28, 1974, abandoned.

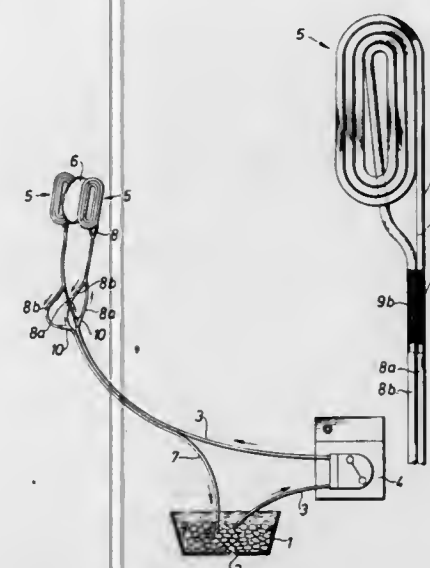
This application Aug. 14, 1975, Ser. No. 604,880

Claims priority, application Sweden, Aug. 2, 1973, 7310636

Int. Cl.<sup>2</sup> F28F 7/00; A61F 7/00

U.S. Cl. 165—46

1 Claim



1. In a cooling unit for use in cooling a live body organ, said

cooling unit including a source of cooling medium; a cooling body; a first tube means for passage of cooling medium from said source to the cooling body, a second tube means for returning cooling medium from said cooling body to said source, and means for circulating cooling medium through said unit, the improvement wherein said cooling body consists essentially of a formable coil of cooling hose and a permanently deformable stiffening member in the form of a metal wire in said coil, said stiffening member being disposed entirely within the bore of the hose and occupying less than all of the cross-sectional space within the bore of the hose, which cooling body can be manually shaped to form an enclosure about such body organ.

4,010,796

# LATTICE, COMPOSED OF STRIPS WITH CONNECTING BRACKETS POSITIONED IN BETWEEN

Christiaan Gustaaf Adolf Scholtus, Alkmaar, Netherlands, assignor to Reactor Centrum Nederland, The Hague, Netherlands

Continuation of Ser. No. 307,215, Nov. 16, 1972, abandoned.

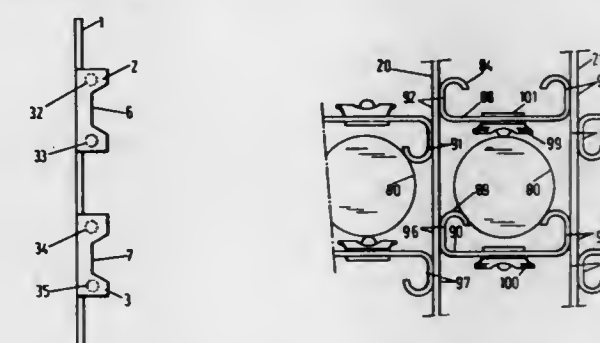
This application Nov. 1, 1974, Ser. No. 520,226

Claims priority, application Netherlands, Nov. 26, 1971, 7116242

Int. Cl.<sup>2</sup> F28F 7/00

U.S. Cl. 165—69

1 Claim



1. A lattice spacer structure for supporting cylindrical heat exchanging elements, said structure comprising: a plurality of elongated parallel flat strips positioned lengthwise and interconnected with brackets thereby forming a plurality of compartments, each of said compartments being defined by a pair of said strips and a pair of said brackets, each of said brackets including a body portion extending the width between said strips having separate bent lip portions on both sides, each lip portion being fastened to one of said strips by spot welds which are spaced-apart along a line parallel to the axis of the compartment and each lip portion having a notch between every two spot welds and an integral curved spacer, said spacers being positioned on one of said brackets to support said cylindrical heat exchanging elements within one of said compartments, and said cylindrical elements also being secured to a second bracket by a plate spring fastened to the back of each of said brackets.

4,010,797

# HEAT EXCHANGER

Fiske O. Parnkopf, and George E. Good, both of Arcadia, Calif., assignors to C F Braun & Co, Alhambra, Calif.

Filed Mar. 4, 1974, Ser. No. 447,912

Int. Cl.<sup>2</sup> F28F 9/22

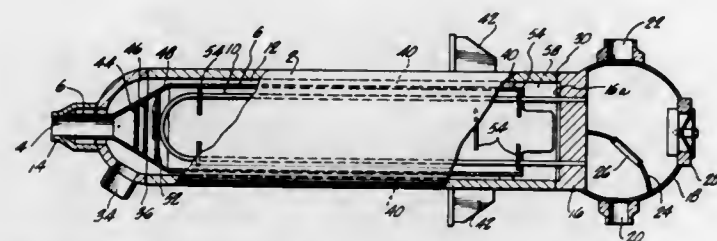
U.S. Cl. 165—159

4 Claims

1. A heat exchanger comprising an outer shell, a bundle of heat exchange tubes extending longitudinally within said shell, a shroud spaced between said outer shell and said heat exchange tubes to provide an annular passageway therebetween, said shroud sealably attached to said shell at one end within an inlet nozzle so the inlet nozzle is in communication with the heat exchange tubes within said shroud but is sealed from the passage defined by said shell and said shroud, said shell and said inlet nozzle at one end permitting admission of fluid into



the shell substantially longitudinally along the heat exchange tubes and the inner surface of the shroud, an outlet nozzle at substantially the same end of the shell as said inlet nozzle for exit of the heat exchanged fluid after passage between the shell and the outer surface of the shroud, and a tube sheet



connected to said shell at the end opposite from said inlet nozzle, whereby the cooled heat exchanged fluid passes along the face of said tube sheet and along the outer surface of the shroud at a temperature that minimizes the thermal gradient across said tube sheet and to maintain a relatively uniform temperature along the inner surface of said shell.

4,010,798

# METHOD AND APPARATUS FOR COMPLETING UNDERWATER WELL HEADS

Jean Louis Corgnet, Boulogne, France, assignor to Compagnie Francaise des Petroles, Paris, France

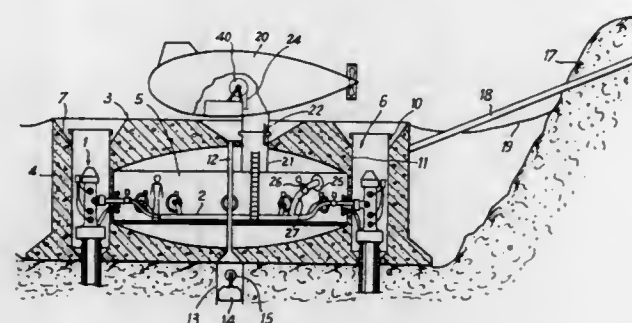
Filed Dec. 10, 1975, Ser. No. 639,491

Claims priority, application France, Dec. 17, 1974, 74.41534

Int. Cl.<sup>2</sup> E21B 43/01, 7/12

U.S. Cl. 166—5

21 Claims



1. A method of completion of at least one undersea oil well comprising the steps of:  
installing a well head in a compartment laterally adjacent to and integral with an enclosure which is in fluid communication with said compartment by way of a separator plate, sealing the enclosure from said compartment by closing said hatch,  
filling said enclosure with air at atmospheric pressure,  
lowering said structure vertically within the sea and onto the sea bed where the oil gathering is to be carried out, to allow drilling to occur by access through the open compartment to the well head carried thereby,  
placing a production head within said compartment, rendering the compartment watertight,  
removing the water from the compartment from inside the integral enclosure,  
filling the compartment with a mixture of gases at the pressure of the enclosure,  
opening said plate between said enclosure and said laterally adjacent compartment,  
connecting the production head within said compartment to the manifold within said enclosure by a connector plate which seals the compartment from the enclosure in a watertight manner after connection, and  
opening the compartment to the sea.

# METHOD FOR REDUCING POWER LOSS ASSOCIATED WITH ELECTRICAL HEATING OF A SUBTERRANEAN FORMATION

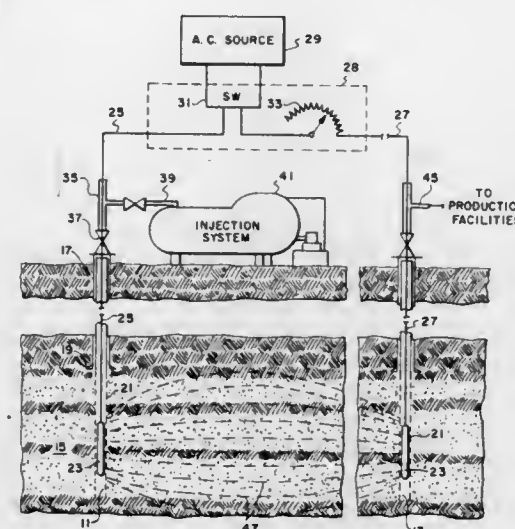
Lloyd R. Kern, Irving, and Thomas K. Perkins, Dallas, both of Tex., assignors to Petro-Canada Exploration Inc., Calgary; Imperial Oil Limited, Toronto and Canada-Cities Service, Ltd., Calgary, all of, Canada

Filed Sept. 15, 1975, Ser. No. 540,434

Int. Cl.<sup>2</sup> E21B 43/24

U.S. Cl. 166—248

1 Claim



1. Method of reducing power losses associated with transmission of electrical energy down a wellbore to heat a subterranean formation via electrical conduction between a plurality of wells completed therein, which comprises, passing an alternating current having a frequency of from about 0.10 to about 5.0 cycles per second through the conductors in said wellbore.

4,010,800

# PRODUCING THIN SEAMS OF COAL IN SITU

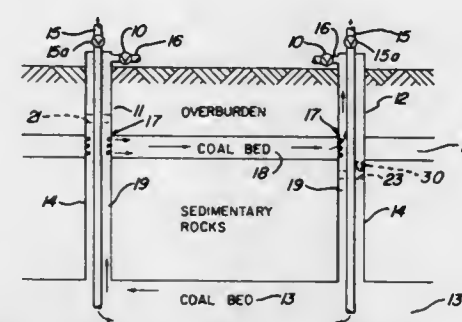
Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed Mar. 8, 1976, Ser. No. 664,570

Int. Cl.<sup>2</sup> E21B 43/24

U.S. Cl. 166—258

5 Claims



4. A method of extracting energy and chemical values from coal in situ wherein there are first and second subsurface coal beds separated by other subsurface material, comprising the steps of,  
establishing passages interconnecting the first and second coal beds and connecting at least said second coal bed to a surface location,  
igniting the second coal bed to establish in situ gasification thereof,  
capturing hot exit gases resulting from the gasification of the second coal bed and directing the hot exit gases to and through the first coal bed to remove volatile material from the first coal bed,  
injecting a sealant material into portions of the first coal bed after volatiles have been removed therefrom whereby the hot gases flowing through the first coal bed will follow alternate paths through the first coal bed,

capturing the hot gases and entrained volatiles emanating from the first coal bed, and  
transferring the hot gases and entrained volatiles to the surface.

4,010,801

# METHOD OF AND APPARATUS FOR IN SITU GASIFICATION OF COAL AND THE CAPTURE OF RESULTANT GENERATED HEAT

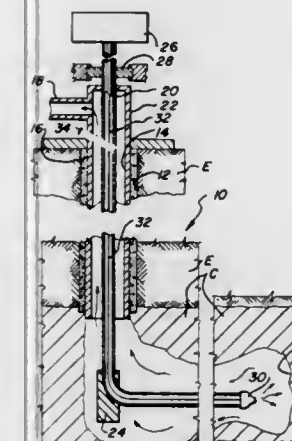
Ruel C. Terry, Denver, Colo., assignor to R. C. Terry, Denver, Colo.

Division of Ser. No. 510,409, Sept. 30, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,562

Int. Cl.<sup>2</sup> E21C 43/04; E21B 43/24

U.S. Cl. 166—261

4 Claims in the fractures near said wellbore, whereby said unconsolidated formation remains essentially unconsolidated.



1. A process for in situ gasification of coal comprising the steps of:  
establishing a passage of fluid communication between a surface location and a sub-surface coal formation,  
inserting a flexible conduit into the passage so that it opens into the coal formation,  
establishing an hermetic seal between the coal formation and the above surface ambient environment,  
igniting the coal formation,  
injecting gasifying agents through the conduit to sustain the burning of the coal formation,  
releasing the gasifying agents at the receding burning face of the coal formation by increasing the extent to which the conduit extends into the formation so that the conduit opens at the burning face, and  
capturing the gaseous products emitted from the burning coal.

4,010,802

# WELL STIMULATION

Leon H. Miles, Plano, and Ferman G. Martin, Irving, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 28, 1975, Ser. No. 626,245

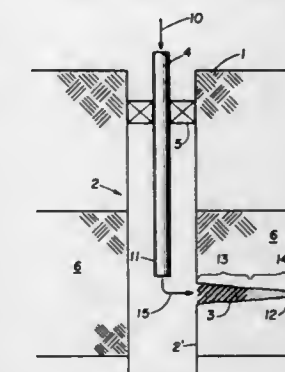
Int. Cl.<sup>2</sup> E21B 43/26, 33/138

U.S. Cl. 166—281

9 Claims

1. A method for stimulating an unconsolidated formation in a well comprising fracturing said formation without any prior consolidation treatment of said formation, the fracturing fluid used in said fracturing step at least initially containing no consolidating agent, at least a portion of said fracturing fluid containing at least one propping agent, and consolidating only a portion of said propping agent in the fractures created by said fracturing step by maintaining the portion of said fracturing fluid which contains propping agent initially devoid of consolidating agent and incorporating at least one consolidating agent into the latter part of the portion of said fracturing fluid which contains propping agent, said consolidating agent

being incorporated in a sufficient portion of said latter part of fracturing fluid essentially to consolidate said propping agent



4,010,803

# METHOD FOR CRYOTHERMAL FRACTURING OF ROCK FORMATIONS

Sigmund L. Ross, Bronx, N.Y., assignor to Rose Shuffman, executrix, Scarsdale, N.Y.

Division of Ser. No. 523,887, Nov. 14, 1974, Pat. No. 3,978,921, which is a continuation-in-part of Ser. No. 148,048, May 28, 1971, Pat. No. 3,759,329, which is a continuation-in-part of Ser. No. 823,306, May 9, 1969, Pat. No. 3,581,821. This application Apr. 29, 1976, Ser. No. 681,764

Int. Cl.<sup>2</sup> E21B 43/24, 43/26

U.S. Cl. 166—303

7 Claims



2. A method of fracturing a rock formation surrounding a downwardly extending hole which comprises lowering into said hole a plugging device to a position spaced substantially from the bottom of the hole, causing said plugging device to expand until it becomes fixed in place and is effective to retain free water in said hole above said plugging device, introducing water into said hole until a body of free water is retained in said hole above said plugging device, and flash freezing said body of free water by bringing a cryogenic liquid into intimate contact therewith.



# 4,010,804 DISTRIBUTED LOAD LINER HANGER AND METHOD OF USE THEREOF

Juan A. Garcia, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Mar. 27, 1975, Ser. No. 562,691

Int. Cl.<sup>2</sup> E21B 23/02, 33/14

U.S. Cl. 166—315

26 Claims



1. A method of suspending a lower well pipe from an upper well pipe in a well bore comprising:

- lowering a hanger assembly having said lower well pipe suspended therefrom into said upper well pipe, said hanger assembly including at least two hanger means;
- securing one of said hanger means to said upper well pipe;
- setting a predetermined share of the weight of said suspended lower well pipe on said secured hanger means and thereafter securing each of the remaining hanger means to said upper well pipe one at a time and resting a predetermined amount of the weight of said suspended lower well pipe on each of said remaining hanger means prior to securing each subsequent hanger means until all of said hanger means are secured and the weight of said suspended lower well pipe is distributed in a predetermined ratio over all of said hanger means.

24. Apparatus for suspending a lower well pipe from an upper well pipe arranged in a well bore comprising a hanger unit connected to said upper well pipe, said hanger unit having bearing means, said bearing means being sealed from well fluids and pressure balanced to equalize internal and ambient external pressures; and

said lower well pipe extending through and supported on said hanger unit to permit rotation of said lower well pipe relative to said upper well pipe.

4,010,805

# FLOW THROUGH BRUSH CUTTER

Leon O. Kelley, 916 Texas St., Stamford, Tex. 79553

Filed Apr. 29, 1974, Ser. No. 464,969

Int. Cl.<sup>2</sup> A01B 13/00, 35/20

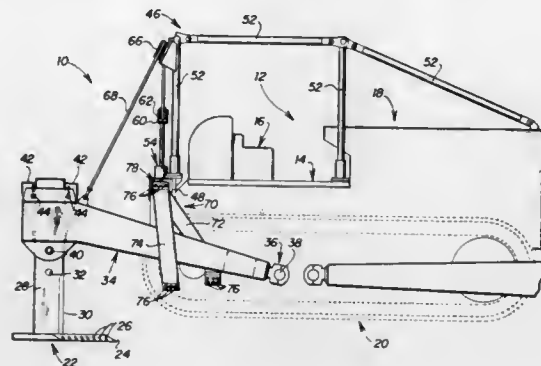
U.S. Cl. 172—698

11 Claims

1. A flow-through brush cutter for attachment to a vehicle comprising:

- a generally thin, flat blade adapted for movement along a generally horizontal plane extending beneath the surface of the earth;
- a pair of legs secured to and extending upwardly from spaced points on the blade, each of said legs having a substantially thin cross-section in the direction extending transversely to the direction of movement of the blade;

a pair of arms detachably secured to the upper ends of the legs and extending forwardly therefrom;  
means pivotally connecting the forward ends of the arms to the vehicle;  
fluid-powered cylinder means;  
a subframe mounted on the vehicle;  
means mounting said fluid-powered cylinder means on said subframe;  
rollers mounted on said subframe at elevated positions;



a beam mounted on said fluid-powered cylinder means for actuation thereby;  
a pair of rollers mounted at spaced points on said beam; and  
a pair of cables each secured at one end to said subframe and extending around one of the rollers of said beam and around at least one roller mounted on said subframe at an elevated location and connected at the opposite end to one of the arms wherein the vertical positioning of the blade may be controlled.

4,010,806

# ROCK BOLTING EQUIPMENT

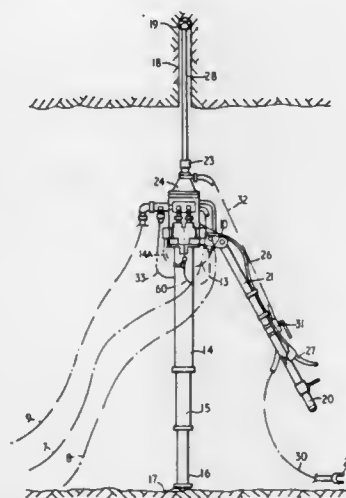
Kenneth Joseph Broadbent, Speers Point, Australia, assignor to The Titan Manufacturing Company Proprietary Limited, Newcastle, Australia

Filed Nov. 16, 1972, Ser. No. 307,228

Int. Cl.<sup>2</sup> E21C 1/10

U.S. Cl. 173—57

7 Claims



1. Drilling equipment for drilling holes in mine roofs for the purpose of rock bolting comprising, an intermediate portion having mounted on and extending from it at one end a telescopic leg, a drill rod mounted on and extending from said intermediate portion at the other end thereof, a hydraulic motor mounted on the intermediate portion and coupled to said drill rod, first valve means adapted to be connected to a pressure fluid source for supplying pressure fluid to said leg for extending it or for releasing fluid from said leg, second valve means adapted to be connected to a pressure source for supplying pressure fluid to said hydraulic motor for driving it or for shutting-off the supply of pressure fluid to the motor for stopping it, an elongated torque and control arm pivotally

connected at one end to the intermediate portion and having at its outer end means for controlling said first and second valve means independently of each other, whereby an operator is permitted to resist the torque produced by the drill when in operation and allowing the operator to control the drill from a distance.

4,010,807

# TOOL FOR FORMING A HOLE FOR A FASTENING ELEMENT

Athur Fischer, Althelmer Strasse 219, D-7241 Tumligen, Germany

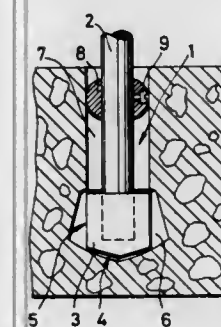
Filed Oct. 2, 1974, Ser. No. 511,256

Claims priority, application Germany, Oct. 5, 1973, 2349998

Int. Cl.<sup>2</sup> E21B 17/10; E21C 9/00

U.S. Cl. 175—325

6 Claims



1. A tool for drilling undercut holes in a stationary support structure comprising, in combination, an elongated drill shaft having an axis of rotation; a drill bit at one end of said drill shaft and having cutting edges located radially outwardly of said drill shaft, said cutting edges being operative for removing material from the stationary support structure to initially form a cylindrical hole therein; and means axially adjustably fixed to said drill shaft for supporting said drill shaft and pivoting the latter out of axial coincidence with the cylindrical hole about a fulcrum located adjacent an inlet end of the hole whereby said cutting edges remove material from the support structure beyond the confines of the cylindrical hole in a region thereof remote from the inlet end to thereby increase the cross-sectional area of the hole in such region at a selected distance from said fulcrum.

4,010,808

# EXPANDABLE RAISE BIT

Thomas Franklin Youngblood, Desoto, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 22, 1975, Ser. No. 615,736

Int. Cl.<sup>2</sup> E21B 9/24

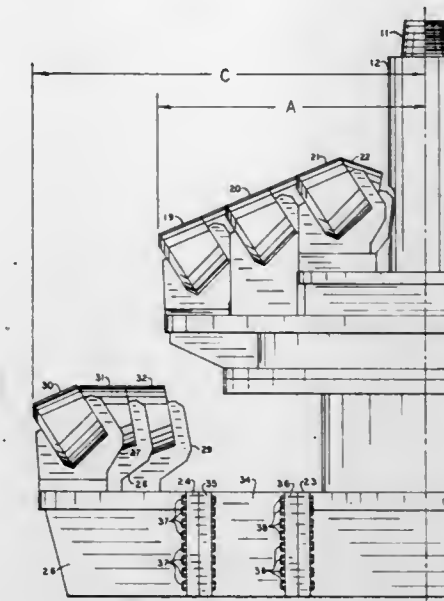
U.S. Cl. 175—334

2 Claims

1. A raise bit for enlarging a first hole into a larger second hole by being drawn through said first hole and disintegrating earth formations surrounding said first hole, comprising:

- a drive stem;
- a raise bit body connected to said drive stem, said drive stem defining a bit axis of rotation;
- primary cutter means positioned on said bit body for disintegrating the formations out to a first radial distance from said bit axis of rotation;
- secondary cutter means adapted to be connected to said bit body selectively located in a first position for disintegrating the formations between said first radial distance and a second radial distance from said bit axis of rotation, said second radial distance being greater than said first radial distance, and selectively located in subsequent positions for disintegrating the formations between said first radial distance and subsequent radial distances from said bit axis of rotation, said subsequent radial distances being greater than said second radial distance; and

expansion means adapted to be located between said second



ary cutter means and said bit body for locating said secondary cutter means in said subsequent positions.

4,010,809

# WEIGHING METHOD

Jack Hobart, Leamington Spa, England, assignor to Hobart Engineering Limited, England

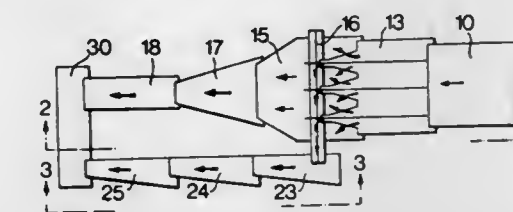
Continuation of Ser. No. 489,833, July 17, 1974, Pat. No. 3,938,601. This application Nov. 25, 1975, Ser. No. 635,105

Claims priority, application United Kingdom, July 17, 1973, 34038/73

Int. Cl.<sup>2</sup> G01G 13/02

U.S. Cl. 177—1

3 Claims



1. A method of weighing a product made up of irregular pieces into a batch of predetermined weight, including grading a flow of the irregular pieces to separate a supply of smaller-sized pieces from the flow which will be more than adequate for making successive batches up to the predetermined weight, conveying the remaining flow of pieces towards a weighing device, delivering pieces from the remaining flow to the weighing device until a batch of the product is accumulated having a weight slightly less than said predetermined weight, separately conveying smaller-sized pieces from said supply towards the weighing device, adding the separately conveyed smaller-sized pieces to the batch until the said predetermined weight is just achieved, and allowing any excess accumulation of said smaller-sized pieces graded from the flow to be deposited in the remaining flow before it reaches the weighing device.

4,010,810

# HEAVY DUTY DENIER TYPE BALANCE

Victor W. Pickett, 205 Wilson Ave., Kinston, N.C. 28501

Filed Mar. 19, 1975, Ser. No. 559,723

Int. Cl.<sup>2</sup> G01G 23/02, 1/24, 19/00, 21/22

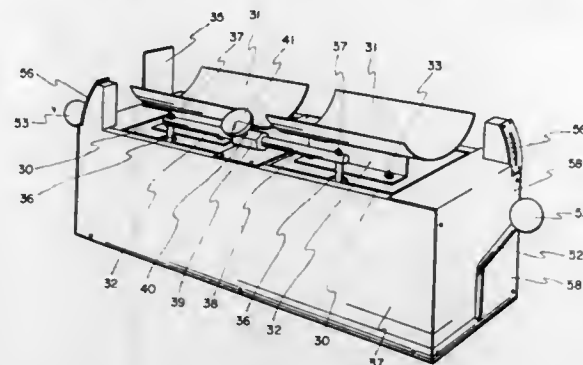
U.S. Cl. 177—157

12 Claims

1. A balance for comparative weighing of denier tubes and other articles comprising: a base; a main support fixedly secured to said base; a pivot means in operative contact with



said support means; at least one elongated rocker arm fixedly secured at its central portion to said pivot means; second and third pivot means fixedly secured one at each end of said rocker arm; a hanger means suspended from each of said second and third pivot means; a lower plate means fixedly secured to each of said hanger means; an upper plate means



fixedly secured in spaced relation to each of said lower plate means whereby, when two separate articles are placed one each on said upper plates, the weight differential, if any, between said articles can be determined; and a toggle actuated locking bar means disposed between said base and said lower plate means for preventing relative movement therebetween when so desired.

4,010,811

## PLATFORM SCALE

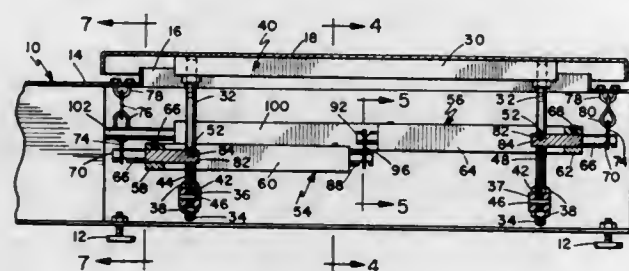
Vincent Joseph Muccillo, Jr., 952 La Jolla Rancho Road, La Jolla, Calif. 92037

Filed Aug. 7, 1975, Ser. No. 602,771

Int. Cl.<sup>2</sup> G01G 21/08

U.S. Cl. 177-257

11 Claims



1. A platform scale, comprising:

- a housing,
- a weighing platform mounted above said housing,
- a suspension frame attached to said platform and extending downwardly into the housing,
- lever means pivotally suspended in said housing and having an output arm for attachment to weight readout means, said suspension frame being pivotally attached to said lever means,
- certain of the pivotal attachments between said lever means and said suspension frame each including a hanger pin longitudinally secured in the lever means and having a V-notch therein,
- a link plate pivotally attached to the suspension frame and having a blade portion engaged in the V-notch fixing the longitudinal position of the blade portion along the length of the hanger pin,
- and means for selectively adjusting the longitudinal fixed position of the hanger pin thereby selectively moving the position of the link.

4,010,812

## MOTORCYCLE FRAME

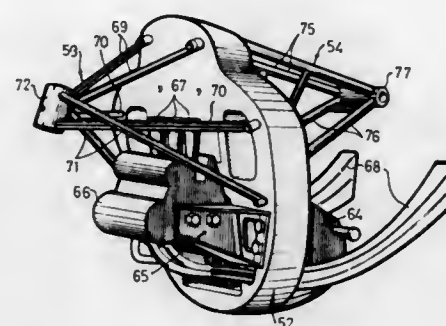
Peter William Bothwell, 114 Shipston Road, Stratford-upon-Avon, Warwickshire, England

Continuation-in-part of Ser. No. 406,914, Oct. 16, 1973, abandoned. This application May 21, 1975, Ser. No. 579,669 Claims priority, application United Kingdom, May 22, 1974, 22857/74

Int. Cl.<sup>2</sup> B62K 11/04

U.S. Cl. 180-33 A

14 Claims



1. A motor cycle frame comprising a fundamental rigid member of unitary form which extends transversely of the frame and constitutes the widest and deepest part thereof, the member being relatively narrow in the longitudinal direction of the frame and comprising mounting means for an engine and a gear box; a front cantilever structure which is secured to the member so as to be supported thereby and to project solely forwardly therefrom; and a rear cantilever structure which is secured to the member so as to be supported thereby and to project solely rearwardly therefrom, the front and rear structures being independent of one another.

4,010,813

## LEADING LINK TYPE INDEPENDENT SYSTEMS

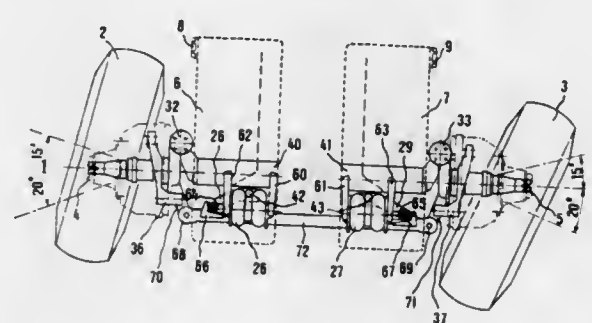
André Quignot, 161, rue de Larmor, 56100 Lorient (Morbihan), France

Filed Mar. 10, 1976, Ser. No. 665,391

Int. Cl.<sup>2</sup> B62D 7/00

U.S. Cl. 180-73 C

6 Claims



1. An independent suspension system of the leading link type for a vehicle, in which a pair of independent leading links are mounted on vehicle frame for oscillating movement, comprising a half axle fixed to each leading link, a stub axle pivotally connected to each half axle by a vertical swivel pin, an assembly mounted between each leading link and its associated half axle including an elastic chamber disposed in parallel with an anti-roll damper, a vertical axis pivot mounting effectively connecting said elastic chamber to its leading link, one of the ends of said anti-roll damper being connected to said vertical axis pivot mounting, and a ball-jointed connecting bar interconnecting both said vertical axis pivot mountings.

4,010,814

## INTERLOCK SYSTEM FOR EMERGENCY VEHICLES

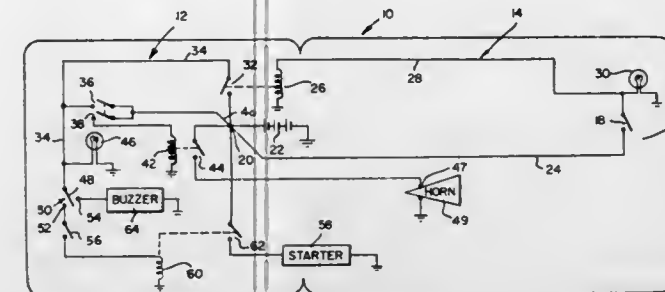
Thomas C. Adams, 7190 W. 2nd Lane, Hialeah, Fla. 33014

Filed Oct. 16, 1975, Ser. No. 623,042

Int. Cl.<sup>2</sup> B60K 26/02

U.S. Cl. 180-82 R

4 Claims



1. An interlock system for an emergency vehicle for preventing the vehicle engine from being started unless a crew member is manning a post at a predetermined location remote from the driver of the vehicle, said system comprising: an electrical starter for said engine; a first switch means at said post for actuation by said crew member; a first indicator lamp at said post for view by said crew member; a second indicator lamp positioned for being viewed by said driver; a second switch means for actuation by said driver for controlling electrical energization of said starter; and means responsive to actuation of said first switch means for electrically energizing said second switch means for enabling said second switch means to control energization of said starter and for electrically energizing said first and second indicator lamps.

4,010,815

## SERVO STEERING GEAR, PARTICULARLY FOR ALLEVIATOR-CONTROLLED CONSTANT PRESSURE SERVO SYSTEMS IN MOTOR VEHICLES

Günther Strauff, Kaarst, Germany, assignor to Langen & Co., Düsseldorf, Germany

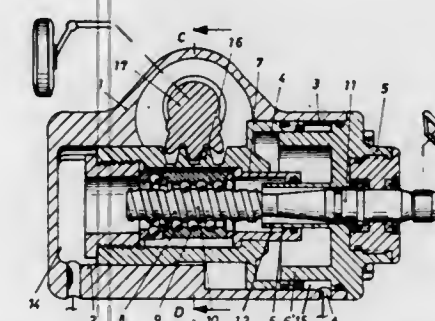
Filed May 29, 1975, Ser. No. 581,929

Claims priority, application Germany, June 1, 1974, 2426712

Int. Cl.<sup>2</sup> B62D 5/08

U.S. Cl. 180-132

7 Claims



1. In a constant pressure blocked-center servo system for motor vehicles, including an input member connected to a steering wheel and an output member connected to steered wheels of a vehicle, a working fluid operated servo motor having first and second working chambers connected to said output member, control means in fluid communication with said motor for controlling the pressure of said work fluid to said servo motor including a housing substantially surrounding said control means, a source of pressurized working fluid in fluid communication with a first opening in said housing for supplying pressurized working fluid to said control means, an exhaust fluid conduit means in fluid communication with a second opening in said housing for receiving an exhaust fluid from said control means, and fluid conduit means connecting said first working chamber of said motor in fluid communication with a third opening in said housing for transmitting working fluid to and

receiving exhaust fluid from said first working chamber of said motor, said third opening normally not in fluid communication with said first and second openings, the improvement comprising fluid flow switching means for completing one of two possible separate fluid conducting connections, said connections including:

- a first fluid conducting connection between said first and third openings in said housing, whereby said first working chamber of said motor is connected in fluid communication with said source of pressurized working fluid by way of said fluid conduit means, and
- a second fluid conducting connection between said second and third openings in said housing, whereby said first working chamber of said servo motor is connected in fluid communication with said exhaust fluid conduit means through said fluid conduit means, said fluid switching means including:

first valve means including an elongated sleeve means substantially surrounded by said housing of said control means and being slidably displaceable within said housing along the longitudinal axis of said sleeve means between first and second limit positions defined by said housing, said first valve sleeve means comprising first and second ends adjacent said first and second limit positions, respectively, and first, second, and third fluid conducting cavities in constant fluid communication with said first, second, and third openings in said housing, respectively; and

second valve means substantially enclosed within said first valve means, including an elongated valve shaft slidably displaceable within a first bore extending along the longitudinal axis of said first valve sleeve means, said elongated valve shaft including:

first and second shaft sections fluid sealingly engaging the surface of said first bore, and

- a third shaft section disposed between and of smaller diameter than said first and second shaft sections, said first shaft section with said first and second shaft sections and said surface of said first bore defining an annular, fluid conducting passageway being in fluid communication with said third fluid conducting cavity and longitudinally shiftable into fluid communication with said first and second fluid conducting cavities, said second valve means also including: fluid pressure change responsive means for longitudinally shifting said elongated valve shaft means and said passageway into communication with one of said first and second fluid conducting cavities, said fluid pressure responsive means including a fluid pressure reaction chamber in fluid communication with said first working chamber of said servo motor and piston means connected to a first end portion of said valve shaft, said piston means longitudinally shiftable between limit positions in said reaction chamber, whereby fluid pressure changes inside said reaction chamber acting on said piston means serve to longitudinally shift said valve shaft and to place said passageway into fluid communication with one of said first and second fluid conducting cavities,

said control means further including actuating means responsive to said input member for causing fluid pressure changes in said reaction chamber, whereby turning of said steering wheel acts upon said input member causing said actuating means to longitudinally displace said first valve sleeve means and to move said first or second fluid conducting cavity into fluid communication with said passageway thereby causing an increase or decrease in fluid pressure in said reaction chamber, said increase or decrease acting on said piston means causing said valve shaft to shift longitudinally to increase or decrease fluid pressure in said first working chamber and thereby to supply motive power to said output member.



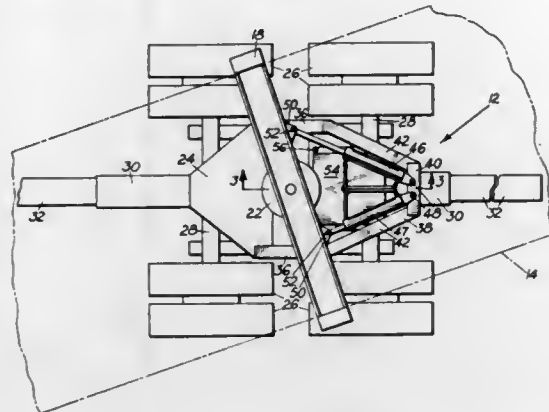
# 4,010,816 STEERABLE TRAILER

Charles R. Powell, 6729 N. Richmond Ave., Portland, Oreg. 97203

Filed Feb. 4, 1976, Ser. No. 655,107  
Int. Cl.<sup>2</sup> B60P 3/40; B62D 5/08

U.S. Cl. 180-144

7 Claims



1. A steerable trailer for hauling elongated loads wherein the load comprises the pulling connection between a pulling tractor and the trailer, comprising

- a wheel supported frame,
- a bunk pivotally supported on said frame for supporting the rear of the long load and forming the pulling connection for the trailer with the load,
- a pair of extendable drive means connected between said bunk and said frame and arranged to pivot said frame relative to said bunk for steering the trailer,
- electrical power operated means on said trailer operating said drive means,
- and electric circuit control means for said electrical power operated means for selectively controlling the latter.

# 4,010,817

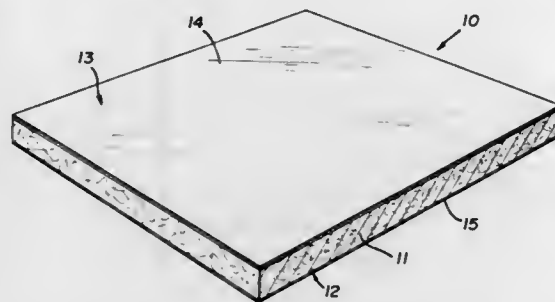
## PAPER-BACKED ACOUSTICAL TILE

Herbert L. Warren, Arlington Heights, and Bruce A. Wittrup, Hoffman Estates, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed May 20, 1974, Ser. No. 471,392  
Int. Cl.<sup>2</sup> E04B 1/99

U.S. Cl. 181-33 G

8 Claims



1. An acoustical tile comprising a relatively thin, flat body of mineral wool and a binder and having a back surface and a face surface and constituting the major proportion of said tile, and a paper sheet-form member uniformly affixed to and substantially coextensive with the entire back surface of said body, said paper sheet-form member being water absorbent, having good sound attenuation properties, and having a non-water-leachable fire-retardant material associated therewith, and a protective coating over said face surface and directly on said mineral wool.

# 4,010,818 FLEXIBLE NOISE BARRIER MATERIAL

Melvin W. Westley, Trumbull, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 10, 1975, Ser. No. 585,589  
Int. Cl.<sup>2</sup> F04B 1/99; G10K 11/04; B32B 19/02

U.S. Cl. 181-33 G

8 Claims

1. A flexible barrier material capable of reducing sound transmission through air; the barrier material comprising:

- a non-woven sheet structure based on continuous filament synthetic organic fiber of polyester and polypropylene,
- a neoprene composition adhesive coat applied to the sheet structure, and
- a mass building coat comprised of, neoprene and dispersed particles of a metal compound, having a density of less than 6 grams per milliliter, selected from the group consisting of iron sulfide, iron oxide, barium oxide, and barium sulfate; wherein the mass building coat is applied upon the adhesive coated sheet structure.

# 4,010,819

## ARRANGEMENT FOR MUFFLING THE EXHAUST OF A PNEUMATIC ROCK DRILLING MACHINE

Gösta Ivar Ekstrom, Nacka, and Karl-Evert Johansson, Ek-torp, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 2, 1974, Ser. No. 528,908  
Claims priority, application Sweden, Dec. 27, 1973, 73174393

Int. Cl.<sup>2</sup> F01N 3/06

U.S. Cl. 181-36 A

18 Claims



1. In a pusher leg arrangement for rock drills, the combination of a pneumatic rock drill (10) and a pressure fluid operated pusher leg (12) for the supporting and feeding of said rock drill, means (11) for providing a hinge connection between said pusher leg and said rock drill, a muffler housing (56) associated with said pusher leg, an exhaust port (55) in said rock drill through which air under pressure is discharged during operation of said rock drill, and means for fluid tight connecting said muffler housing to said exhaust port, said fluid tight connecting means including an inlet mouth, said inlet mouth being arranged substantially in alignment with said hinge connection but spaced axially therefrom.

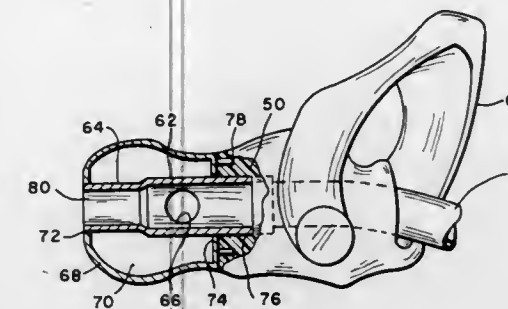
# 4,010,820

## ACOUSTIC EAR MOLD FOR HEARING AID

Rubein V. Johnson, 2432 Court St., Muskogee, Okla. 74401  
Division of Ser. No. 408,943, Oct. 23, 1973, Pat. No. 3,921,756. This application Aug. 1, 1975, Ser. No. 601,167

Int. Cl.<sup>2</sup> A61B 7/02  
U.S. Cl. 181-135

6 Claims



1. In a hearing aid ear mold insertable into the ear canal and having a longitudinal conduit for the passage of sound wave energy from a hearing aid to the tympanic membrane of the ear, the improvement comprising a metal structure having:

- a central thin walled metal tube forming said conduit, connected at one end by tubular means to said hearing aid, the other end inserted into the ear;
- an outer thin walled metal tube coaxial with said central tube, and forming an annular space, closed by annular end walls, sealing the space between the ends of said two tubes;
- an opening in the wall of said central tube, joining said annular space and the space inside said conduit;
- and wherein said outer tube is of a diameter and shape to snugly fit the ear canal whereby vibration of said outer tube is communicated directly to the auditory meatus and to the bony structure of the ear.

# 4,010,821

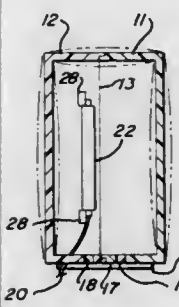
## OMNIDIRECTIONAL SYMPATHETICALLY DRIVEN SOUND REPRODUCTION DEVICE

Leo-Helz Quillmann, 4545 Laguna, No. 220, Boulder, Colo. 80303

Filed May 2, 1975, Ser. No. 574,166  
Int. Cl.<sup>2</sup> H04R 1/02, 1/32

U.S. Cl. 181-148

7 Claims



1. A sound reproduction device comprising substantially closed enclosure formed of pliable walls of expanded polymeric material having vent holes defined therein and a speaker system means suspended within and fully surrounded by the enclosure with the enclosure shielding the speaker system means from the atmosphere, thereby acoustically driving the pliable enclosure walls which in turn radiate sound in an omnidirectional manner to the atmosphere.

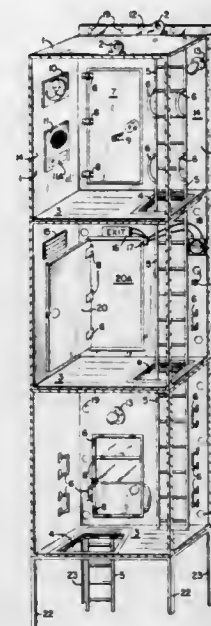
# 4,010,822

## BUILDING EMERGENCY EXIT MEANS

Philip M. Banner, 28 Oxford Road, Massapequa, N.Y. 11758  
Filed Feb. 20, 1974, Ser. No. 444,148

Int. Cl.<sup>2</sup> A62B 1/20  
U.S. Cl. 182-18

11 Claims



1. A building emergency exit means in combination with a building structure having exit means comprising a plurality of modules in stacked relation, and connected to each other, each module comprising a bottom member and top member and having walls to form an enclosure, each module having attachment and locking means for connection to said building and to each other, opening means in said top member and bottom member matching similar openings in adjacent modules, ladder means connected between said top member and bottom member and adjacent said opening means facilitating communications between said modules, opening means in one side of said module and adjacent said exit means in said building for providing access to said modules, each module having alarm means, light means, ventilation means, and electronic communication means.

# 4,010,823

## METHODS AND APPARATUS FOR INSPECTING AND/OR WORKING INSIDE OF A LARGE DRUM

George H. J. Love, Huntington Beach, Calif., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 21, 1975, Ser. No. 634,097  
Int. Cl.<sup>2</sup> E04G 1/36

U.S. Cl. 182-128

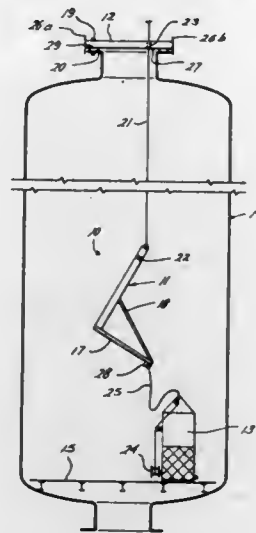
9 Claims

1. A method for inspecting and/or working on the internal wall surface of a large drum having a flange on the top rim thereof comprising the steps of,

- assembling a right angled spider hanging bracket having a vertical support column and a horizontal lift bracket yoke,
- attaching a first hoist cable to the vertical support column,
- attaching an end of a cable from a second hoist on an inspector's/worker's cage to a protruding end of the horizontal lift bracket yoke,
- securing a crosshead support across the top of the drum rim flange,
- lifting the right angled spider hanging bracket with the first hoist to a position immediately under the drum rim flange with the vertical support column adjacent to the crosshead support and the horizontal lift bracket yoke protruding end extending to a position adjacent the wall surface,



- f. rigidly attaching the vertical support column to the cross-head support whereby the protruding end of the horizontal lift bracket yoke is adjacent to the drum wall surface, and
- g. hoisting the inspector's/worker's cage up and down from



the protruding end of the horizontal lift bracket yoke adjacent the drum wall surface to cover one sector at a time of the drum internal wall surface for providing a fast, thorough, safe, economical, and efficient method of inspecting and/or working on the internal wall surface of a large drum.

4,010,824

## CONVEYOR SYSTEM FOR DRIVE-IN BANKS AND THE LIKE

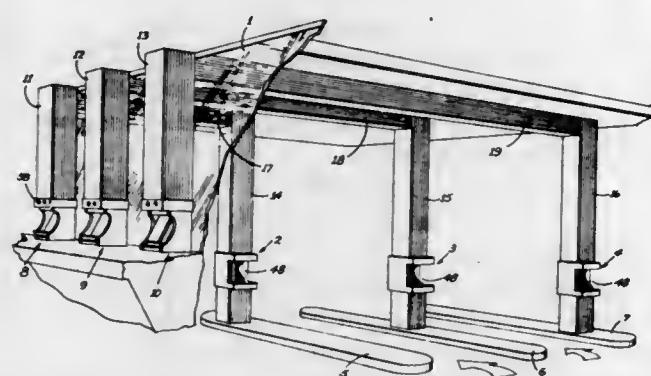
Edward F. Bavis, c/o The E. F. Bavis & Associates, Inc., 200 Jlmson Road, Cincinnati, Ohio 45215

Filed Dec. 24, 1975, Ser. No. 644,112

Int. Cl.<sup>2</sup> E04H 3/04

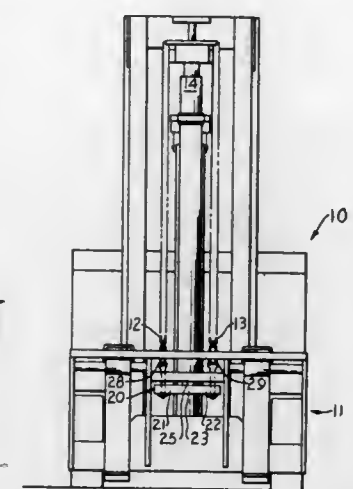
U.S. Cl. 186—1 C

20 Claims



1. In an integrated conveyor system for conveying a container between a spaced apart pair of stations, a first container receiving means at one of said stations, a first vertical module extending upwardly from said first container receiving means, a second container receiving means at the other of said stations, a second vertical module extending upwardly from said second container receiving means, and a horizontal module extending between the upper ends of said first and second vertical modules, reversible containers conveying means contained in each of said modules, means for concurrently driving each of said container conveying means in the same direction, and translation means at the opposite ends of said horizontal module for transferring the container between the vertical and horizontal modules.

4,010,825  
LIFT CHAIN EQUALIZING DEVICE  
Charles R. Chelin, Dallas, Oreg., assignor to Towmotor Corporation, Mentor, Ohio  
Filed Apr. 5, 1976, Ser. No. 674,028  
Int. Cl.<sup>2</sup> B66B 9/20; B66F 9/06  
U.S. Cl. 187—9 R 7 Claims



1. In a material handling apparatus having a generally vertically movable carriage, first and second spaced apart chain assemblies each connected at their first ends to the carriage, and power means associated with the chain assemblies for generally vertically moving the first ends of the chain assemblies and the carriage in response thereto, the improvement comprising:

- a pivot element having first and second end portions and a middle portion and being connected at the first and second end portions to the first ends of respective chain assemblies;
- a fulcrum member having first and second spaced apart pivot areas positioned at locations substantially equally spaced from the first ends of the chain assemblies with said fulcrum member being at a higher elevation than said pivot element; and
- stop means for limiting vertical and pivotal movements of the pivot element to preselected values.

4,010,826

## CARGO LOADING VEHICLES

Rodney Vernon Jones, Rochford, England, assignor to Atel Products Limited, Southend-on-Sea, England

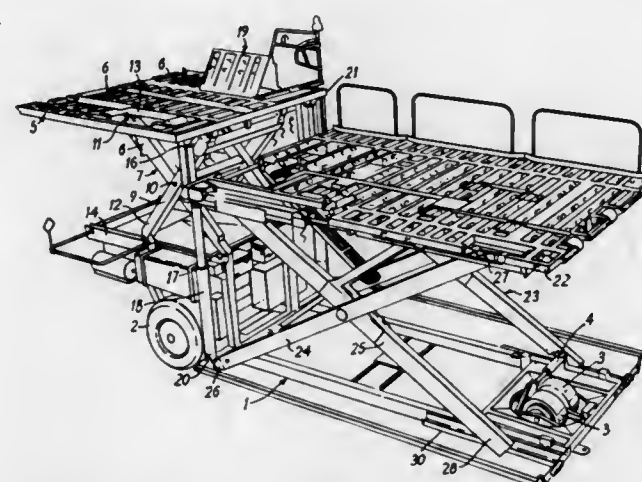
Filed Mar. 20, 1975, Ser. No. 560,195

Claims priority, application United Kingdom, Mar. 22, 1974, 12931/74

Int. Cl.<sup>2</sup> B66B 11/04

U.S. Cl. 187—26

9 Claims



1. A cargo loading vehicle comprising a forward lifting platform, a main lifting platform, said forward lifting platform being movable between a lowered position and a raised position

tion by first lifting means, said main lifting platform being movable between a lowered position and a raised position by second lifting means, said second lifting means comprising two spaced apart cables, each of said spaced apart cables having one end attached to said forward lifting platform, each of said spaced apart cables also having a second end operatively connected to said main lifting platform, hoisting means associated with each of said cables, said hoisting means comprising first and second motor means respectively operatively acting on said cables, said first and second motor means when activated being effective to respectively cause said cables to move in order to make said second ends of said cables more nearly approach said one ends of said cables thereby causing said main lifting platform to be raised to the level of said forward lifting platform, synchronizing means for synchronizing movement of said cables, said synchronizing means comprising first and second pulley means over which said spaced apart cables respectively pass, torque tube means connected to said first and second pulley means and fixedly secured thereto as to fixedly rotate with said first and second pulley means, said torque tube means being effective to transmit power as needed from said first pulley means to said second pulley means and from said second pulley means to said first pulley means, and first and second spaced apart lift stabilizing chain means each of which is operatively connected to both said forward lifting platform and said main lifting platform.

4,010,827

## CLUTCH ENGAGED BRAKE MECHANISM

Christopher R. Ellis, Chinley; Richard H. Gibbon, Chapel-en-le-Frith, and Walter R. Stirling, Buxton, all of England, assignors to Ferodo Limited, Manchester, England

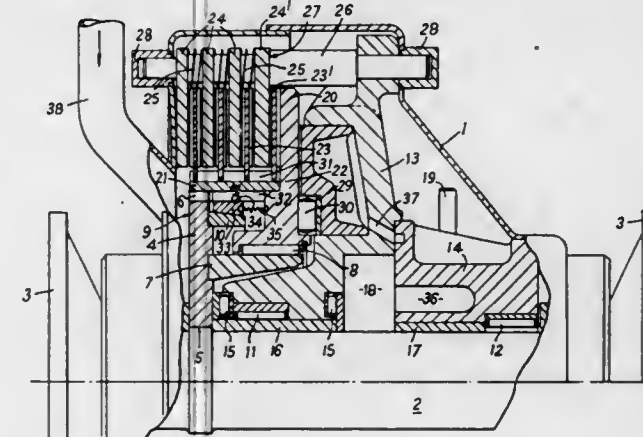
Filed Sept. 4, 1975, Ser. No. 610,268

Claims priority, application United Kingdom, Oct. 1, 1974, 42515/74

Int. Cl.<sup>2</sup> F16D 67/02

U.S. Cl. 188—71.2

9 Claims



1. A friction brake characterised by the combination of
  - a. a casing housing a rotary shaft connectible to or forming part of the propeller shaft or an axle of a vehicle;
  - b. a retarding device comprising (i) friction plates arranged and adapted to rotate with the rotary shaft and to be axially slidable relative thereto and (ii) stator plates interleaved with the friction plates and mounted within the casing to be axially slidable relative to the rotary member;
  - c. a hydraulically operable pressure device arranged and adapted to bring the stator plates and friction plates into functional engagement on actuation of the retarding device;
  - d. a clutch device arranged and adapted in operation to positively connect the friction plates and rotary shaft during periods of actuation of the retarding device whereby the friction plates will rotate with the shaft, and to disconnect the friction plates and rotary shaft during periods of nonactuation of the retarding device said clutch device including an inner hub directly secured to and rotatable with said rotary shaft, and an outer hub

axially movable into engagement with said inner hub under the influence of said pressure device on actuation of said retarding device, the outer hub carrying said friction plates, said inner and outer hubs having cooperable positive engagement means and a synchromesh device between said inner and outer hubs;

e. a pump arranged and adapted to circulate hydraulic liquid through the casing and to supply the liquid under pressure to the pressure device on actuation of the brake; and

f. control means arranged and adapted to actuate the pressure device at will.

4,010,828

## BRAKE ADJUST AND RESET APPARATUS

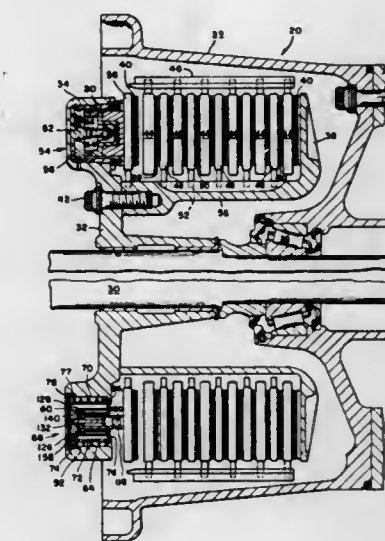
Richard J. Dittlinger, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 22, 1975, Ser. No. 624,621

Int. Cl.<sup>2</sup> F16D 55/02, 65/52

U.S. Cl. 188—71.8

6 Claims



5. Automatic brake adjust and reset apparatus for a disc brake having an axially movable pressure plate for applying the brake comprising:
  - carrier means provided with at least one cavity; an annular housing disposed in said cavity and provided with an end wall;
  - spaced apart first and second stop means adapted to be engaged by said housing to establish limits to axial travel of said housing;
  - tubular means coaxially arranged with said housing and bearing against said end wall; and
  - cutting means secured to said pressure plate and engageable with said tubular means;
- said housing being actuated into engagement with said second stop means in response to actuation of said cutting means by said pressure plate in a brake applying direction whereupon continued movement of said pressure plate results in motion of said cutting means axially through the wall of said tubular means to compensate for frictional wear of said disc brake;
- said housing being actuated into engagement with said first stop means in response to actuation of said pressure plate in a brake release direction to establish a predetermined brake running clearance;
- said tubular means including telescoping coaxial inner and outer tubular members arranged in radially spaced apart relationship;
- said cutting means includes first and second cutting members operatively engaged with said inner and outer tubular members, respectively, an operative to cut axially



therethrough in sequential order in response to movement of said pressure plate.

4,010,829

## HYDRAULIC SHOCK ABSORBER

Masaharu Naito, and Kazuhiko Nomura, both of Hamamatsu, Japan, assignors to Yamaha, Hatsudoki Kabushiki Kaisha, Japan

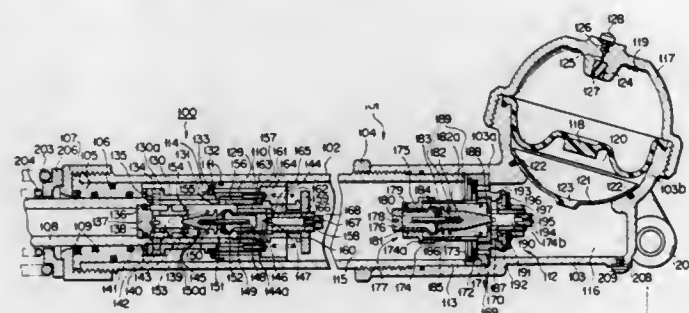
Filed Sept. 24, 1975, Ser. No. 616,415

Claims priority, application Japan, Sept. 30, 1974, 49-112557; Aug. 26, 1975, 50-103177

Int. Cl.<sup>2</sup> F16F 9/52

U.S. Cl. 188—278

8 Claims



1. A hydraulic shock absorber comprising:

- a cylinder assembly;
- a sealing head fixed to one end of the cylinder assembly;
- a piston assembly including a piston reciprocally inserted into the cylinder assembly and a piston rod secured to the piston so as to pass through the sealing head;
- a foot valve assembly housed in the cylinder assembly near the other end thereof;
- a first chamber defined by the cylinder assembly, sealing head and piston;
- a second chamber defined by the cylinder assembly, piston and foot valve assembly;
- a third chamber defined by the foot valve assembly and the other end of the cylinder assembly;
- a damping oil filled in the first, second and third chambers;
- first undamping passage means formed in the piston assembly to establish communication between the first and second chambers;
- first check valve means for allowing the free flow of damping oil from the second chamber into the first chamber through the first undamping passage means when the piston rod enters the first chamber;
- first damping passage means formed in the piston assembly to provide communication between the first and second chambers, said first damping passage means including a first damping passage provided with a first opening-variable orifice and communicating at its one end with the first chamber, a second damping passage communicating at its one end with the other end of said first damping passage and a third damping passage provided with a first opening-fixed orifice, said third damping passage communicating at its one end with the other end of the first damping passage and at its other end with the second chamber;
- a first heat-sensitive valve unit for changing the opening area of the first opening-variable orifice as a function of the temperature of damping oil; said first heat-sensitive valve unit is manually adjustably coupled to the piston assembly so as to change the initial opening area of the first opening-variable orifice;
- second check valve means for allowing restricted flow of damping oil from the first chamber into the second chamber through the first and second damping passages when the first chamber has a higher pressure by a predetermined extent than the second chamber;
- second undamping passage means formed in the foot valve assembly to establish communication between the second and third chambers;
- third check valve means for allowing the free flow of damp-

ing oil from the third chamber into the second chamber through the second undamping passage means when the piston rod is withdrawn from the first chamber;

second damping passage means formed in the foot valve assembly to provide communication between the second and third chambers, said second damping passage means including a fourth damping passage provided with a second opening-variable orifice and communicating at its one end with the second chamber, a fifth damping passage communicating at its one end with the other end of the fourth damping passage and at its other end with the third chamber, and a sixth damping passage provided with a second opening-fixed orifice, said sixth damping passage communicating at its one end with the other end of the fourth damping passage and at its other end with the third chamber;

a second heat-sensitive valve unit for changing the opening area of the second opening-variable orifice as a function of the temperature of the damping oil; said second heat-sensitive valve unit is manually adjustably coupled to the foot valve assembly so as to change the initial opening area of the second opening variable orifice;

fourth check valve means for allowing restricted flow of damping oil from the second chamber into the third chamber through the fourth and fifth damping passages when the second chamber has a higher pressure by a predetermined extent than the third chamber; and

a reservoir filled with damping oil and communicating with the third chamber.

4,010,830

## PLANETARY WHEEL DRIVE WITH ACCESSIBLE LOW-TORQUE DISC BRAKES

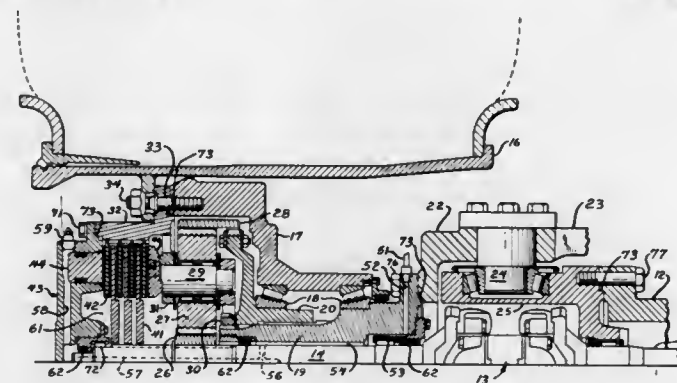
Anthony T. Logus, Chicago, and Ronald W. Barnhart, Elmhurst, both of Ill., assignors to Pettibone Corporation, Chicago, Ill.

Filed Apr. 11, 1975, Ser. No. 567,238

Int. Cl.<sup>2</sup> F16H 57/10; B60K 29/02

U.S. Cl. 192—4 A

4 Claims



1. A readily accessible disc braking system for wheels with planetary wheel-drive, in which an axial drive spindle extending outwardly from its bearing carries a sun gear which drives planetary gears meshing on the inside of a stationary ring gear, the planetary gears rotating on orbiting pins moving with the wheel; said brake system being characterized by:
- outer brake disc means located axially outwardly from said gears and removably locked to rotate with the wheel, inner brake disc means in braking engagement with the outer disc means during braking, and removably locked to rotate with the spindle, a removable cap located outwardly of the brake disc means, mounted to rotate with one of said brake disc means, and carrying hydraulic actuating means for the disc means, the removal of said cap giving access to said disc means and providing an opening adequate for disc-replacement; said brake disc means, when braking secures their respective rotative parts against relative movement, causing a lock-up of the planetary gears with the stationary ring gear.

4,010,831

## TRANSMISSION FRICTION PLATE AND DEVICE

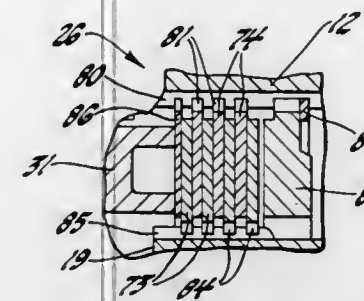
David F. Reuter, Oldham, England, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1975, Ser. No. 634,253

Int. Cl.<sup>2</sup> F16D 13/52, 13/64

U.S. Cl. 192—70.2

10 Claims



1. In a friction torque establishing device; an inner member having external splines; an outer member having internal splines; a plurality of annular flat friction plates having annular friction faces engaged in full surface engagement during engagement of the friction torque establishing device and inner and outer perimeters located radially between said members including a first set of alternate plates having external spline tangs splined to the internal splines of the outer member and a second set of intermediate plates having internal spline tangs splined to the external splines of the inner member; the plates of one of said first and second sets of plates being continuous annular plates and the plates of the other of said first and second sets of plates being open annular plates having a narrow gap extending completely through said open annular plates of said other set from the inner perimeter to the outer perimeter and axially from face to face to provide adjacent free end portions having rounded corner edges with the faces and providing a complete separation between the adjacent free end portions of said open annular plates of said other set.

4,010,832

## RETURN SPRING FOR TEETH CLUTCH — TWO STAGE FORCE

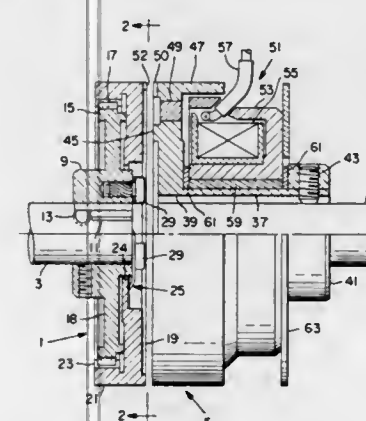
John Frederick Puro, Elmira, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed June 24, 1975, Ser. No. 589,815

Int. Cl.<sup>2</sup> F16D 27/10

U.S. Cl. 192—84 C

1 Claim



1. An electromagnetic clutch comprising:
- a driven clutch member;
- a driving clutch member mounted adjacent to said driven clutch member for communication with said driven member;
- electromagnet actuating means mounted to said driven and driving clutch members for providing a driving engagement between said members when the electromagnet

means is energized, said actuating means further comprising:

armature means;

a pair of magnetic poles mounted adjacent said armature means for drivably engaging said armature means;

mutually engagable driving teeth mounted to said armature means and one of said poles for engagement of said armature means to said one pole when said electromagnet means is energized,

said armature means further including a hub member, an electromagnetic armature mounted adjacent said hub member for communication therewith; a spline connecting said armature to said hub for providing relative movement between said hub and said armature; and

biasing means interposed said driven and driving clutch members for disengaging said actuating means when said electromagnet is deenergized, said biasing means further comprising:

first means for providing a force sufficient to overcome residual magnetism for initial break away, said first means having a plurality of wide spring-like fingers having a small offset;

second means for providing a smaller force sufficient to further separate said armature from said poles, said second means having a plurality of narrow spring-like fingers having a large offset, so that the spring force sufficient for initial breakaway of the armature from the poles is effective only during initial breakaway and the smaller spring force is thereafter effective; and

means for attaching said first and second providing means to said hub member whereby the spring-like fingers engage the armature.

4,010,833

## CLUTCH ASSEMBLY FOR PLANETARY-GEAR TRAINS

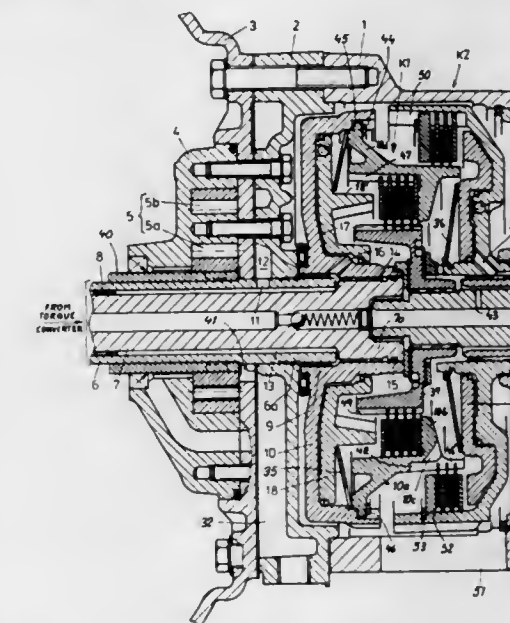
Uwe Brendel, Kressbronn, and Manfred Bucksch, Friedrichshafen, both of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Feb. 19, 1975, Ser. No. 551,053

Int. Cl.<sup>2</sup> F16D 25/10

U.S. Cl. 192—87.11

8 Claims



1. A clutch assembly for selectively coupling an input shaft with either of two nested output shafts coaxial therewith, comprising:
- a first clutch housing on said input shaft open toward said output shafts and centered on the common shaft axis;
- a generally cylindrical sleeve centered on said shaft axis and secured to said first clutch housing, said sleeve having an inner wall surface provided with peripherally spaced first ribs and an outer wall surface provided with peripherally spaced second ribs, said first clutch housing and said sleeve being two separate bodies provided with interfitted



peripheral formations and with retaining means holding said formations in mutual engagement;

- a set of first annular friction foils in said sleeve slidably guided by said first ribs, said sleeve being integrally provided with an inner radial flange forming a backstop for one of said first friction foils, said second ribs extending across said flange and terminating in peripherally spaced-apart prongs overhanging said flange on the side remote from said first clutch housing;
- an annular support on an extremity of the inner one of said output shafts proximal to said input shaft;
- a set of first coacting annular foils interleaved with said first friction foils and slidably mounted on said support;
- a second clutch housing on the outer one of said output shafts open toward said input shaft and centered on said shaft axis, said second clutch housing partly enveloping said sleeve;
- a set of second annular friction foils on said sleeve slidably guided by said second ribs;
- a set of second coacting annular foils interleaved with said second friction foils and slidably mounted in said second clutch housing;
- abutment means on said second clutch housing forming a backstop for said second friction foils;
- a first piston in said first clutch housing fluidically movable toward said support for jointly pressing said first friction foils and coacting foils against said flange; and
- a second piston in said second clutch housing fluidically movable toward said support for jointly pressing said second friction foils and coacting foils against said abutment means.

4,010,834

# PRINTING DEVICE COMPRISING A DISTANCE MEMBER

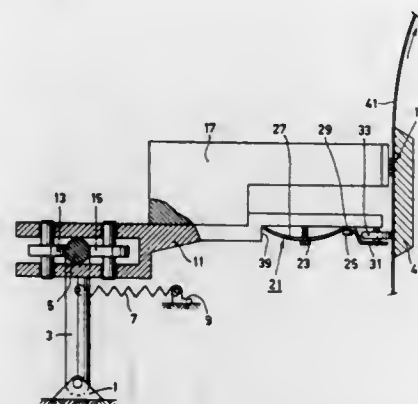
Ebbe Linder, Jarfalla, Sweden, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,697

Claims priority, application Sweden, June 3, 1975, 7502473 Int. Cl.<sup>2</sup> B41J 3/05

U.S. Cl. 197-1 R

3 Claims



1. In a printing device comprising a printing head which is displaceable along a record carrier at a printing distance which is determined by an adjustable distance member, the printing head being displaceable in the direction to or from the record carrier by adjustment of said distance member for adjustment of the printing distance between the printing head and the record carrier, the improvement wherein the distance member comprises a contact member which contacts the record carrier during printing, and a leaf spring which is coupled to said contact member and which comprises an adjustable curvature in its longitudinal direction, the leaf spring being guided along and contacting, near both ends of the curvature, surface areas of the printing head, the connecting line between the two surface contact areas on the printing head being substantially transverse of the plane of the record carrier at the printing area.

4,010,835

# MATRIX PRINT HEAD

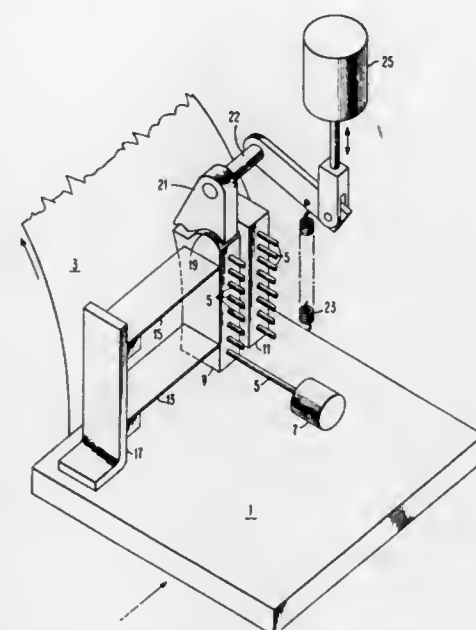
Blair Robertson Martin, Owego, and Johann Hans Meier, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 1, 1975, Ser. No. 600,985

Int. Cl.<sup>2</sup> B41J 3/04

U.S. Cl. 197-1 R

7 Claims



1. In a matrix printer for printing along a print line on a document, a print head mounted to move along said print line, said print head having a plurality of longitudinally movable print wires operable to impact said document for printing thereon, and guide means on said print head adjacent said document receiving said print wires and positioning them in two arrays arranged in spaced relation, said guide means being translatable to change at least the vertical alignment of one of said arrays relative to the other.

4,010,836

# WIRE PRINTING DEVICE

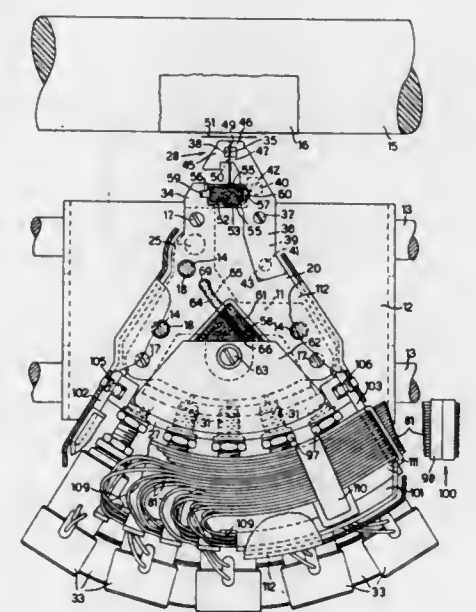
Francesco Bernardis, Ivrea, and Dario Blone, Montalto Dora, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Mar. 14, 1975, Ser. No. 558,292

Claims priority, application Italy, Apr. 10, 1974, 68140/74 Int. Cl.<sup>2</sup> B41J 3/04

U.S. Cl. 197-1 R

8 Claims



1. In a wire printing device comprising a platen, a recording

medium supported by said platen, a carriage movable parallel to said platen, a base member removably mounted on said carriage, and a plurality of printing wires actuatable for striking said recording medium, each one of said wires having a terminal portion located in proximity to said recording medium and a first portion spaced from said terminal portion,

a plurality of electromagnetic actuating means, one of said electromagnetic actuating means being connected to said first portion of each of said printing wires to individually activate said printing wire,

first mounting means for adjustably and removably mounting each one of said actuating means on said base member,

central guide means in slidable contact with said printing wires at a point between said terminal portion and said first portion,

second mounting means for removably mounting said central guide means on said base member,

terminal guide means disposed in the proximity of said platen for guiding said terminal portion of said wires,

third mounting means for removably mounting said terminal guide means on said base member,

lubricating means for lubricating said printing wires during the slidable contact of said printing wires with said central guide means,

fourth mounting means for removably mounting said lubricating means on said base member,

each one of said electromagnetic actuating means including a magnetic circuit comprising a tubular casing of a material of high magnetic permeability having a frontward threaded portion, an annular core of a nonmagnetic material disposed inside said tubular casing substantially coaxial thereto, said core having means defining a central bore, an excitable coil wound around said annular core between said core and said tubular casing, a cylindrically shaped armature disposed in said bore and movable between a rest position and a work position upon excitation of said coil, said armature having a front end connected to said first portion of one corresponding of said printing wires and a front face and a rear end connected through a return spring to said tubular casing, a cylindrical stem of a material of high magnetic permeability having a rearward portion lodged in said central bore with a rear face in opposed relationship to said front face of said armature and defining a gap therebetween, said return spring loading said armature with a predetermined load into said rest position to be overcome upon excitation of said coil moving said armature to said work position, said stem having an axial bore substantially coaxial with said central bore for accommodating said one corresponding printing wire and a central threaded portion coupled with said frontward threaded portion of said tubular casing for axial movement with respect to said tubular casing for varying said gap between said armature and said stem.

4,010,837

# SYLLABIC KEYBOARD CONTROLLED DEVICES

Jean Gremillet, 64 Avenue Felix Faure, Paris 15<sup>e</sup>, France Division of Ser. No. 259,051, June 2, 1972, abandoned. This application Aug. 30, 1974, Ser. No. 502,184

Claims priority, application France, June 21, 1971, 71.22450

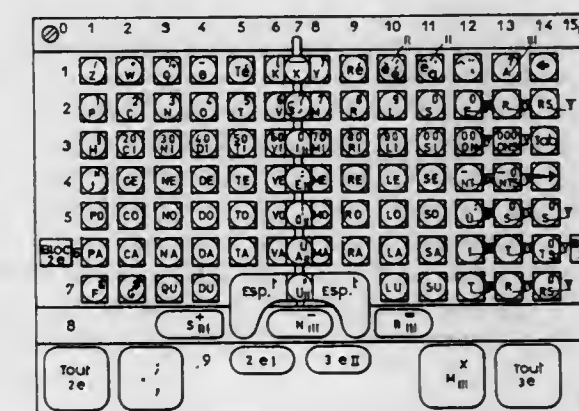
Int. Cl.<sup>2</sup> B41J 3/26, 3/51

U.S. Cl. 197-7

17 Claims

5. A keyboard-controlled device including a syllabic keyboard certain keys of which can be simultaneously depressed, certain of said keys being each provided with means for simultaneously controlling several characters belonging to different character groups each of said groups corresponding to a distinct printing point, one other of said keys at least being provided with means for controlling a spacing and other of said keys being each provided with means for controlling a subsidiary function, all said keys being each provided with an elec-

tronic switch, the device including several coding matrices to which the keyboard is connected, so that said keyboard transmits simultaneously to said matrices pulses corresponding to characters, to spacings, and to subsidiary functions, which are assigned to the simultaneously depressed keys; the device including a buffer storage unit to which the coding matrices are connected, so that said coding matrices send to said buffer storage unit codes corresponding to said characters, spacings, and subsidiary functions respectively the buffer storage unit comprising a tape (FIG. 18) which constitutes a storage medium and means (FIGS. 24 and 18) for recording simultaneously in successive transversal lines of said tape the codes corresponding to the characters, to the spacing and to sub-



ary functions, assigned to the simultaneously depressed keys, and means for advancing the tape by jumps (FIGS. 2 to 6, 10 to 12 and 18, 19), the length of each jump corresponding to the number of transversal lines occupied by said codes; the different lengths of the jump-wise advance of the tape being obtained (FIGS. 18 and 19) by means comprising an escapement wheel having movable cogs which are movable on said wheel, from a stop position to an escapement position, and in which the escapement obtained is proportional to the number of the cogs displaced from a stop position to an escapement position (FIGS. 2-6 and 10-12), the wheel being optionally combined with an escapement anchor (FIGS. 5 and 6) in order to augment the total escapement by a single interval.

4,010,838

# SPACER BAR MECHANISM

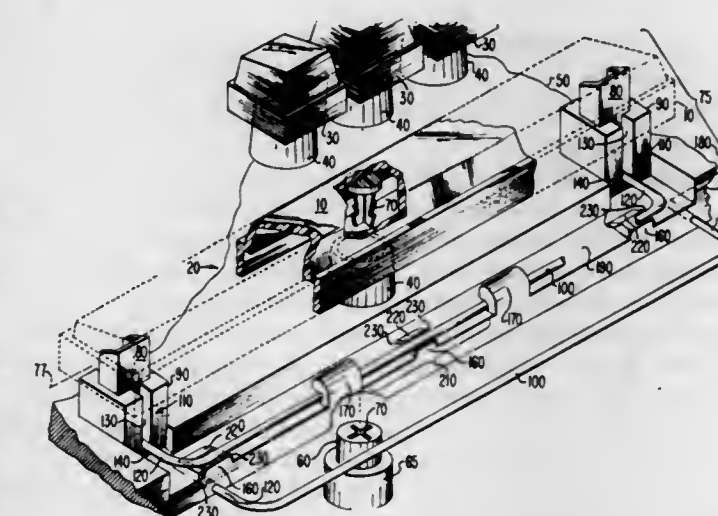
Dewey M. Sims, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 17, 1975, Ser. No. 541,790

Int. Cl.<sup>2</sup> B41J 5/08

U.S. Cl. 197-98

8 Claims



1. A spacer bar assembly for an electronic keyboard having a base member and a plurality of actuatable keys, said assembly comprising:

- a. an elongated spacer bar,



- b. an electronic switch operatively positioned underneath said spacer bar,
- c. a spring loaded actuating shaft centrally fixed to the underside of said spacer bar and disposed in actuating relationship with said electronic switch, the spring loading of said shaft being effective for yieldably supporting said spacer bar in a raised inoperative position relative to said switch,
- d. a U-shaped wire bail having a linear central portion pivotally anchored to said base member and a pair of offset leg extremities operatively coupled to the extremities of said spacer bar, and
- e. wire engaging means formed in said base member for pivotally anchoring said linear central portion of said U-shaped bail and further for applying a constant undulating stress thereto, said wire engaging means including land and overhang projections alternately disposed along the pivotal axis of said central linear portion of said U-shaped bail, each of said land projections being provided with a guide slope and each of said overhang projections being provided with a yieldably restrictive opening, said guide slopes and said yieldably restrictive openings serving to facilitate and to accommodate the installation of said central linear portion of said U-shaped bail between said land and overhang projections upon the application of tactile pressure to said central linear portion of said bail.

4,010,839

# CARTRIDGE FOR A RIBBON OF A TYPEWRITER OR LIKE OFFICE MACHINES

Glampaolo Guerrini, Ivrea (Turin), and Giuseppe Corna, Candia (Turin), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

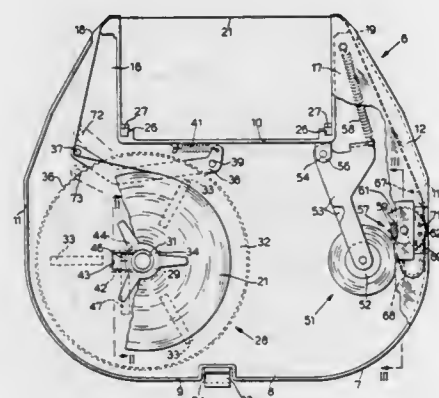
Filed Nov. 25, 1975, Ser. No. 635,223

Claims priority, application Italy, Nov. 25, 1974, 70426/74

Int. Cl.<sup>2</sup> B41J 33/04, 35/36

U.S. Cl. 197—151

12 Claims



1. A carbon coated ribbon cartridge removably mountable in a typewriter or other printing office machine wherein the typewriter includes a driving shaft for driving said ribbon, the cartridge comprising:

- a container having a bottom portion and a top portion;
- a feed spool on which said carbon ribbon is normally wound, said feed spool being rotatably supported in said container between said bottom and said top portion;
- a take-up spool for receiving said carbon ribbon;
- means defining a first and a second aperture in said container adjacent said feed spool and said take-up spool, respectively, said carbon ribbon extending through said first aperture to the exterior of said container and returning to the interior thereof through said second aperture;
- a toothed roller rotatably mounted in said container between said bottom and said top portion adjacent said take-up spool, said toothed roller having a connecting portion engageable with the driving shaft of the machine;
- means defining an opening in the bottom portion of said container, alignment with said toothed roller so as to

enable said driving shaft to engage the connecting portion of said toothed roller for the rotation thereof, during use;

a support member movably mounted in said container between said bottom and top portion and on which said take-up spool is rotatably mounted; and

resilient means acting on said support member for holding an outermost turn of said carbon coated ribbon wound on said take-up spool in engagement with said toothed roller for the winding of said carbon coated ribbon on said take-up spool in response to the rotation of said driving shaft.

4,010,840

# AUTOMATIC AIR LEAK TESTING APPARATUS FOR MULTIPLE CHAMBERED CONTAINERS

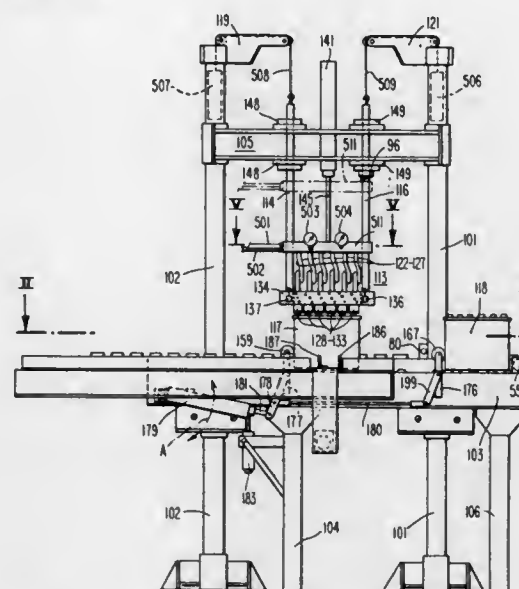
William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 475,273, May 31, 1974, Pat. No. 3,938,368. This application Aug. 18, 1975, Ser. No. 605,271

Int. Cl.<sup>2</sup> B65G 47/24

U.S. Cl. 198—345

6 Claims



1. In a system for processing batteries, apparatus for longitudinally conveying a battery to at least one predetermined position comprising:

- a conveyor surface defined by a plurality of transverse rollers in a roller means, a first one of said rollers being pivotally connected about an adjacent second one of said rollers,
- b. a first actuating means for pivoting said first one of said rollers upwardly and above said adjacent second one of said rollers to a reference position, whereby longitudinal movement of a battery along said rollers is halted by said first one of said rollers,
- c. sensing means for selectively making a determination of the longitudinal dimension of said battery in said halted position, and
- d. a second actuating means coacting with said first actuating means and said sensing means for repositioning said first one of said rollers with respect to said second one of said rollers in response to said determination to thereby reposition said battery with respect to a preselected vertical axis along the longitudinal advancement of said battery.

4,010,841

# FORKED WORK-CARRIER CONVEYOR MECHANISM

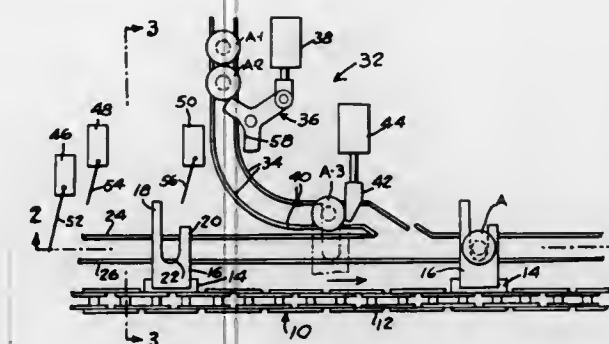
Eugene P. Bonzack, Livonia, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed Mar. 21, 1975, Ser. No. 560,716

Int. Cl.<sup>2</sup> B65G 47/00

U.S. Cl. 198—357

15 Claims



1. A conveyor mechanism for transporting workpieces of the type having a head and a depending stem of narrower cross section than the head comprising, a plurality of workpiece carriers, conveyor means for causing the carriers to move along a desired path, each carrier having a pair of arms spaced apart in the direction of travel of the carrier to receive the stem of a workpiece therebetween, said carrier being adapted to support the workpiece by engaging the underside of the head of the workpiece with the stem extending downwardly between said arms, the trailing arm on each carrier extending outwardly beyond the free end of the leading arm on the carrier a distance at least equal to the dimension of the workpiece stem in a direction transversely of the path of travel of the carrier, a loading station for said carriers comprising means for delivering workpieces to a pick up position adjacent the path of travel of the carriers and wherein the stem of the workpiece at said work pick up position is located in the path of travel of the trailing arm of a carrier and means at said pick up position cooperating with the trailing arm of the carrier for deflecting the workpiece at said pick up position in a generally horizontal plane onto the carrier in response to traversing of the carrier past said pick up position.

4,010,842

# MACHINE FOR ORIENTING PEARS

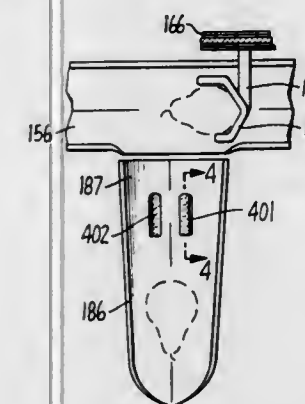
Laurence H. Smith, Lafayette, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Continuation-in-part of Ser. No. 407,468, Oct. 18, 1973, abandoned, which is a division of Ser. No. 267,017, June 28, 1972, Pat. No. 3,797,639. This application Aug. 18, 1975, Ser. No. 605,283

Int. Cl.<sup>2</sup> B65G 47/24

U.S. Cl. 198—394

1 Claim



1. In a pear feeding and orienting apparatus, a chute having an upper end and a lower end and having a cross-section with a curved base portion whose radius of curvature is substan-

tially larger than the radius of curvature of the bulb portion of the largest pear to be handled and with upwardly projecting side portions spaced apart a distance at least as great as the length of the largest pear to be handled, said chute being disposed longitudinally at a predetermined downward inclination, the improvement comprising at least two strips of small size in relation to the size of the chute and secured on the chute adjacent the upper end thereof and extending along the run of the chute spaced apart on either side of the central axis of the chute, said strips extending over a small portion only of the chute and each strip having a continuous surface of a predetermined frictional coefficient greater than that of the chute such that a pear aligned lengthwise with said chute and with its stem end in leading disposition will slide along said chute in such position, but a pear with its blossom end in leading disposition will engage the spaced strips and be caused to roll over into stem end leading disposition, and means for feeding pears in spaced relationship through said chute.

4,010,843

# DEVICE FOR TRANSFERRING A LOAD FROM ONE CONVEYOR TO A SECOND CONVEYOR

Raymond Roger Louis Lucas, Avenue de la Republique, 33 Prechac, France

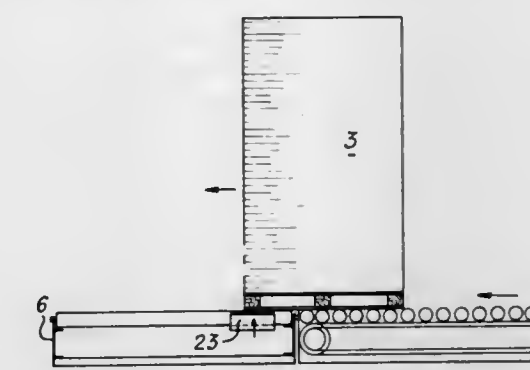
Filed Mar. 13, 1975, Ser. No. 558,013

Claims priority, application France, June 20, 1974, 74.22546

Int. Cl.<sup>2</sup> B65G 47/54

U.S. Cl. 198—487

10 Claims



1. A device for transferring a load between a first roller conveyor and a second roller conveyor perpendicularly-disposed thereto, said first and second roller conveyors including a plurality of rollers parallel to each other in said conveyor, said first roller conveyor comprising a frame supporting said plurality of rollers, said first roller conveyor having an end portion adjacent a side edge of said second roller conveyor, said device comprising:

- a chassis positioned below said rollers of said first roller conveyor;
- a carriage mounted in said chassis for movement along a path parallel to said rollers of said first conveyor;
- a plurality of supporting elements parallelly disposed between rollers of said first roller conveyor, each of said supporting elements being mounted to said carriage;
- a drive means for reciprocally driving said carriage along said path between a first position wherein said supporting elements are spaced from said end portion of said second roller conveyor to a second position wherein said supporting elements are proximate to said end portion of said second roller conveyor; and
- means for vertically lifting said carriage relative to said frame of said first roller conveyor between a first position wherein said support elements lie below the upper horizontal plane of said rollers of said first roller conveyor to a second position wherein said support elements lie above said upper horizontal plane of said rollers of said first roller conveyor.



4,010,844

**MATERIAL HANDLING CONVEYOR LOADER**

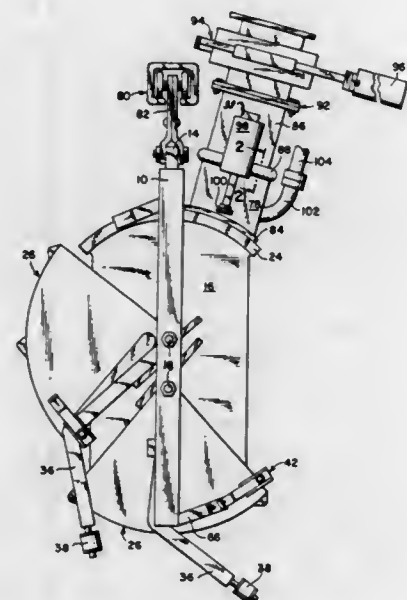
John Meredith Leach, P.O. Box 341, Port Jefferson, N.Y. 11777

Filed Jan. 27, 1975, Ser. No. 544,419

Int. Cl.<sup>2</sup> B65G 47/19

U.S. Cl. 198—562

4 Claims



1. A bulk material handling system comprising a supporting conveyor, material holding magazines supported at intervals by said conveyor and each having a filling opening therein, a gasket carried by each of said magazines and surrounding its said filling opening, a movable closure carried by each of said magazines for its said filling opening, means for moving said closure from a closed position wherein it covers said opening and coacts with said gasket to form a completely dust-free enclosure for said magazine to prevent the escape of any material from or entrance of any substance into said magazine, to an open position wherein said opening is exposed, an extensible filling spout for said magazine comprising a fixed section and a movable section, means for supporting said fixed section, means for moving said movable section from a position where it is out of the way of said closure to a position where it tightly contacts the same said magazine gasket and covers said filling opening to completely prevent any escape of material and dust during the magazine filling operation, and means for driving said conveyor intermittently to move each of said magazines into filling position, stop each of them until filled and then move each filled magazine ahead and at the same time move the next empty magazine into filling position, and repeat this cycle indefinitely.

4,010,845

**COIN HOLDER**

Samuel Bloomfield, P.O. Box 4500, Palm Springs, Calif. 92262

Filed Apr. 28, 1975, Ser. No. 572,129

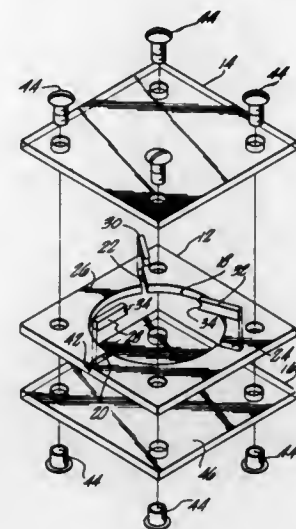
Int. Cl.<sup>2</sup> A45C 11/28

U.S. Cl. 206—82

6 Claims

1. A coin holder comprising a first transparent plate, a second transparent plate, a support plate disposed between said first and second transparent plates, said support plate having a viewing aperture therein and a plurality of slots radially disposed about and communicating with said viewing aperture, a corresponding plurality of elongated coin supporting arms disposed within said slots, at least one of said arms being slidably mounted within one of said slots and each of said arms defining prongs at the innermost extended end thereof for contacting a coin disposed within said viewing aperture at the juncture of the rim and edge portions thereof and having a transverse width substantially less than the longi-

tudinal length thereof for minimizing the visual obstruction of the edge portion of said coin and means for securing said



transparent plate about said support plate and supporting arms.

4,010,846

**SAFETY MATCH BOOK**

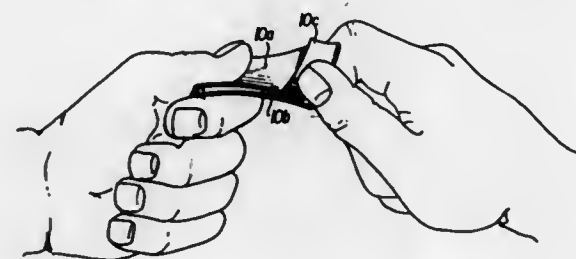
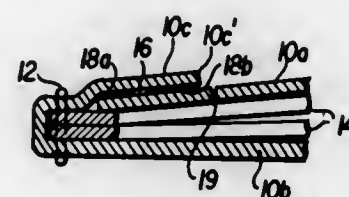
James Henry Parsons, 4715 N. Forest Road, Hixson, Tenn. 37343

Filed Nov. 20, 1975, Ser. No. 633,985

Int. Cl.<sup>2</sup> A24F 27/00

U.S. Cl. 206—108

31 Claims



1. A safety match book comprising:

a match book cover comprising:

an openable and closable front panel closure flap;  
a back panel connected at one end to one end of said front panel closure flap;  
an imperforate retainer flap extending from the other end of the back panel;

matches secured between the back panel and the retaining flap and adapted to be partially enclosed by the closure flap;

a friction strip on the other end of the front panel closure flap, said other end of the front panel closure flap and the friction strip thereon being normally positioned between the retainer flap and the matches so that the friction strip is not sufficiently exposed for striking of the matches thereon; and

means, completely covered by the retainer flap when the front panel closure flap is closed, for releasably interconnecting the other end of the closure flap and the retainer flap whereby the friction strip can only be exposed for striking of the matches thereon by release of the intercon-

necting means so that the other end of the closure flap and the friction strip thereon can be removed from normal position between the retainer flap and the matches.

4,010,847

**ARTICLE CARRIER**

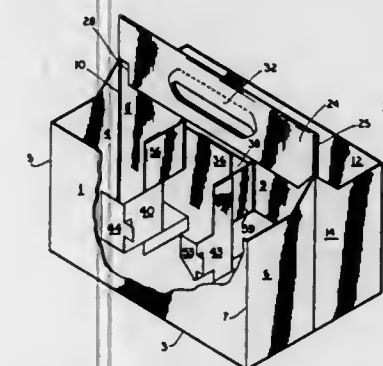
Prentice J. Wood, Jonesboro, and James T. Stout, Acworth, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 19, 1975, Ser. No. 642,370

Int. Cl.<sup>2</sup> B65D 5/48, 85/30

U.S. Cl. 206—187

3 Claims



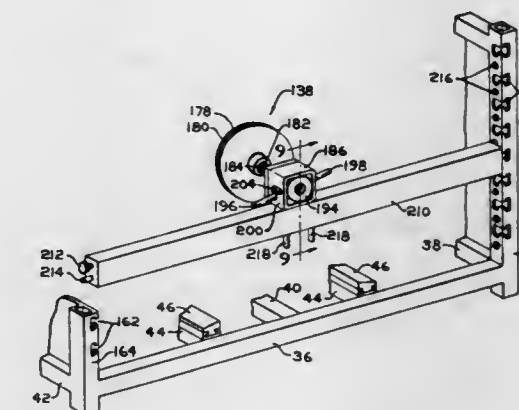
1. An article carrier comprising a bottom wall, side walls foldably joined to the side edges of said bottom wall, end wall panels foldably joined to the end edges of said side walls and extending inwardly therefrom, medial partition structure at one end of the carrier comprising a pair of medial panels foldably joined respectively to said end wall panels at said one end of the carrier along the edges thereof remote from said side walls and extending medially inward of the carrier, medial partition structure at the other end of the carrier comprising a pair of medial panels foldably joined respectively to said end wall panels at said other end of the carrier along the edges thereof remote from said side walls and extending medially inward of the carrier, a multiple ply handle comprising at least one pair of handle panels and secured at its ends respectively to said medial partition structure at each end of the carrier, a first medial partition panel foldably joined to one of said medial panels at said one end of the carrier, a second medial partition panel foldably joined to one of said medial panels at said other end of the carrier, the inner portion of said first medial partition panel being disposed in flat face contacting relation with the inner portion of said second medial partition panel to form a double thickness partition midway between the ends of the carrier, a pair of first transverse partition panels foldably joined respectively to a pair of said medial panels and disposed on each side of said handle, a pair of anchoring tabs secured respectively to said side walls, a pair of second transverse partition panels foldably joined respectively to said pair of anchoring tabs, the adjacent end portions of the associated pairs of said first and second transverse partition panels being foldably joined respectively to each other and being disposed in overlapping face contacting relation to form double thickness partitions midway between the side walls and handle, a portion of each of said anchoring tabs being struck from the associated one of said medial panels to form apertures therein, and portions of said medial partition panels being disposed in substantial coincidence with said apertures.

4,010,848

FRONT RESTRAINT DEVICE FOR SHIPPING BINS  
Walter E. Pater, New Kensington, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.Division of Ser. No. 488,851, July 15, 1974, Pat. No. 3,963,122. This application Dec. 11, 1975, Ser. No. 639,727  
Int. Cl.<sup>2</sup> B65D 85/48

U.S. Cl. 206—448

13 Claims



1. A mechanical restraint device for dampening oscillatory and lateral forces acting on a plurality of automotive backlites during shipment, wherein the articles are supported on a first edge and tilted toward a back support member and wherein the oscillatory forces move the backlites about the first edge toward and away from the support member along a first movement path and the lateral forces move the backlites away from the support member along a second movement path comprising:

a rigid member having a first major surface opposite to a second major surface;  
a resilient pad mounted on the first major surface of said member;  
a threaded shaft having one end pivotally mounted to the second major surface of said rigid member;  
a housing for receiving the second end of said threaded shaft and having a groove in at least one pair of opposed surfaces;  
a nut mounted on the second end of said shaft to detachably secure said shaft in said housing;  
a nest mounted in said housing for receiving said nut and for preventing rotation of said nut;  
a plurality of disc springs mounted on said shaft in said housing;  
a washer mounted in said housing against biasing action of said disc springs to urge said disc springs against said nut in said nest;  
means for mounting said housing in the first and second movement path such that said resilient pad engages the backlites; and  
a finger member passing through each of the grooves of said housing and securably mounted to said washer for maintaining said springs in compression against said nut wherein rotating said shaft out of the housing moves said pad against the outermost backlite against biasing action of said springs to urge the backlites together against the back support member and urging said finger members toward the backlites along the grooves moves said washer against said springs to increase the biasing action of said springs on said shaft by way of said nut such that the backlites respond to the oscillatory and lateral forces as a unitized pack and to dampen oscillatory forces and lateral forces acting on the articles during shipment.

2. In a bin for shipping loose sheets, wherein the bin is of the type having a back support secured to a base for supporting each of the sheets on an edge in a generally vertical position in facing relationship to one another, the improvement comprising:

a rigid member having an engaging surface and a major surface opposite to the engaging surface;



a spring biased shaft having one end mounted to the major surface of said rigid member;  
means mounting said shaft for securing said shaft in spaced relation to the back support and the base with the engaging surface of said member facing the back support; and  
means acting on said shaft for moving the engaging surface of said member toward the back support wherein the engaging surface engages outermost one of the plurality of sheets to be shipped, said spring biased shaft urging said rigid member against the outermost sheet to urge the sheets together against the back support such that the sheets during shipment respond to oscillatory and lateral forces as a unitized pack and said shaft dampens oscillatory and lateral forces acting on the sheets during shipment.

4,010,849

# NESTABLE ARTICLE SHIPPING RACK HAVING PIVOTALLY MOUNTED END RESTRAINTS

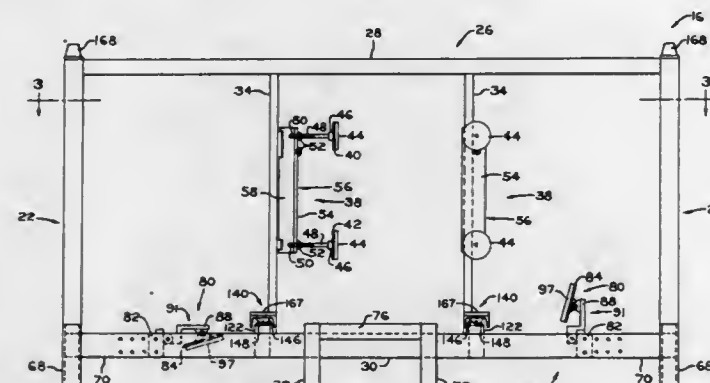
Walter E. Pater, New Kensington, and James R. Rowley, Freeport, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1975, Ser. No. 618,609

Int. Cl.<sup>2</sup> B65D 85/48

U.S. Cl. 206—448

19 Claims



1. In a rack for shipping articles wherein the rack is of the type having a base and a pair of end restraint means mounted in opposed spaced relationship on the base to limit longitudinal motion of the articles to be shipped, the improvement comprising:

each of the end restraint means comprising:

a rigid member pivotally mounted to the base for movement in a first direction toward the plane of the base and in a second opposite direction away from the plane of the base;

a rigid plate mounted on said rigid member; and  
biasing means mounted between the base and said rigid member as it moves in the second direction, said biasing means responsive to the movement of said rigid member as it moves in the second direction to urge said rigid member in the first direction.

4,010,850

# DEVICE FOR SUSPENDING OBJECTS

Curt Hardy Persson, Brannerigatan 5, S-282 00 Tyninge, Sweden

Continuation-in-part of Ser. No. 512,938, Oct. 7, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,948

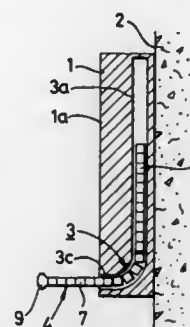
Int. Cl.<sup>2</sup> A47B 53/00

U.S. Cl. 211—1.3

3 Claims

1. A device for suspending objects, comprising:  
a body having at least one inner passage provided with a portion directed longitudinally of the body, a portion directed laterally toward and opening into one of the long sides of said body, and a curved intermediate portion; and  
a suspension arm normally disposed in said inner passage and movable into and out of said passage, said suspension arm comprising:

- a. an elongated, flexible, continuous spring blade presenting an unbroken upper surface and adapted to be bent upwardly when said arm passes said curved intermediate portion in case of a displacement of said arm in said passage; and
- b. a plurality of vertebra-like members attached to said spring blade and arranged in side-to-side abutting relationship to prevent downward bending of said spring blade beyond a condition wherein said blade is straight, each of said members having on one side a projection and on an opposite side a recess, said projections and said recesses on adjacent members being arranged to interengage when said members are brought into abutting relationship and extending along the entire height of said members, the top face of said vertebra-like members being fixed to the undersurface of said spring blade, whereby said spring blade can be bent in the upward direction for moving the arm through said curved portion of said body, but said abutting vertebra-like members prevent bending of said spring blade downwardly from said straight condition, and said interengaged projections and recesses prevent bending of said spring blade in all other directions except upwardly when said spring blade is in said straight condition, so that the portion of said spring blade pulled from the passage presents an unbroken upper surface and maintains a straight shape without yielding when objects are suspended therefrom.



4,010,851

# COLLAPSIBLE PAINTER'S CANVAS FRAME HOLDER RACK

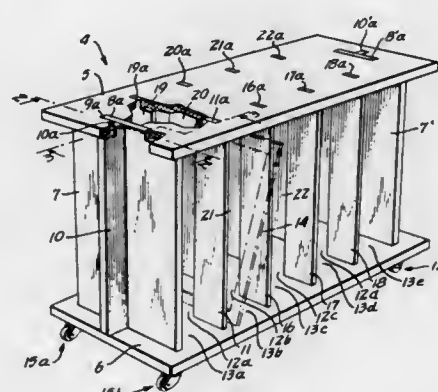
Alma Doris Erikson, 328 W. 17th St., New York, N.Y. 10011

Filed Jan. 15, 1975, Ser. No. 541,159

Int. Cl.<sup>2</sup> A47F 5/10

U.S. Cl. 211—189

5 Claims



1. A collapsible painter's canvas frame holder rack comprising in combination: a lower sheet structure and a separate upper sheet structure, an upper face on the lower sheet structure having female receptacles some of which female receptacles are spaced along the upper surface at first predetermined intervals substantially in linear alignment along an axis extending transversely along a width of the lower sheet structure, and spaced apart at second predetermined intervals along a longitudinal axis of the lower sheet structure, the upper sheet structure having female receptacles on a lower face thereof

positioned substantially as a mirror image of the upper face of the lower sheet structure such that when the upper sheet structure is positioned with its lower face in substantial alignment over the upper face of the lower sheet structure said female receptacles of the upper sheet structure are in substantially opposing relationships to one-another spaced-apart from one-another, and a plurality of at least three upright support sheets extending substantially parallel to one-another and said support sheets including opposite end support sheets and at least one intermediate upright support sheet all having each of opposite upper and lower ends shaped to define male inserts shaped to detachably lock into the female receptacles of the upper sheet structure and the lower sheet structure respectively at least first ones of the other of said female receptacles being located on each of said lower and upper sheet structures and being elongated along other transverse axes thereof and at least second ones of the other of said female receptacles being located on each of said sheet structures and being elongated along another longitudinal axis and intersecting said first ones of said female receptacles at substantially right angles thereto, and at least the two support sheets of the opposite ends each having its male insert at both ends thereof elongated along a linear axis of a width of the respective upper and lower sheet structures and received within said first ones of said female receptacles, a pair of support strips having a male insert at each of the ends thereof mounted within said second ones of said female receptacles, said support strips extending at right angles to and engaging the respective ones of said two support sheets at the opposite ends, whereby said plurality of sheet structures are braced against shifting with the support sheets mounted uprightly with their respective longitudinal axes extending between the upper and lower sheet structures respectively, and whereby a plurality of side-by-side support channels defining through-spaces are formed between the at least three parallel upright support sheets.

4,010,852

# SHEAVING ARRANGEMENT

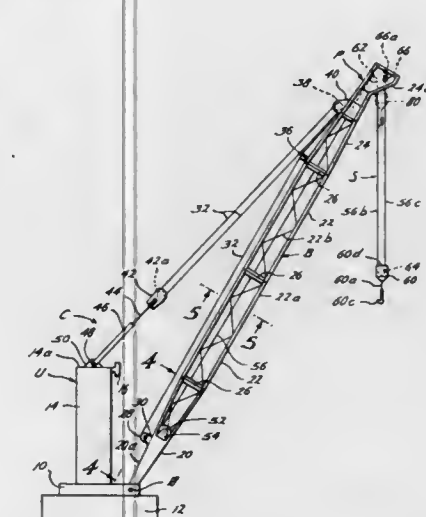
John B. Goss, 7627 Beech Cove Lane; William D. Morrow, 10206 Amblerwood, both of Houston, Tex. 77072, and Jack W. Corbett, 210 E. Vermilion Parkway, Lafayette, La. 70501

Filed May 30, 1975, Ser. No. 582,185

Int. Cl.<sup>2</sup> B66C 23/00

U.S. Cl. 212—8 R

9 Claims



1. A crane having a boom with a boom point at the extremity thereof, a load hoist cable, a load hoist, a traveling block and multiple sheave means for said cable, the improvement residing in said sheave means, comprising:

first fixed sheave means located with the boom point of said boom over which said cable passes from said load hoist; first movable load sheave means mounted with said traveling block about which said cable passes from said first fixed sheave means;

second fixed sheave means located in proximity to said first fixed sheave means with said boom point but outwardly from said first fixed sheave means;  
said first fixed sheave means mounted adjacent the boom point of said boom in a first plane substantially parallel to the longitudinal axis of said boom;  
said second fixed sheave means being in a plane substantially perpendicular to said first plane;  
third fixed sheave means mounted adjacent the boom point substantially in said second plane in substantial radial alignment with and adjacent to said second fixed sheave means and receiving said cable passing from said second fixed sheave means;  
second movable load sheave means mounted with said traveling block in substantial axial alignment with and adjacent to said first movable load sheave means in a third plane substantially parallel to said first plane and spaced apart therefrom at least substantially the diameters of said second and third fixed sheave means, said second movable load sheave means receiving said cable from said third fixed sheave means;  
fourth fixed sheave means mounted adjacent to and in substantial axial alignment with said first fixed sheave means in said third plane and receiving said cable from said second movable load sheave means; and,  
said second and third fixed sheave means, respectively, being laterally spaced from said first and fourth fixed sheave means, respectively, a distance approximately equal to the diameter of said first and second movable load sheave means, respectively, for thereby spacing the cable lengths from said first and second movable load sheave means, respectively, apart such distance to prevent spinning of said traveling block and twisting of said cable when raising and lowering said traveling block.

4,010,853

# DRAFT GEAR CARRIER FOR RAILWAY CARS

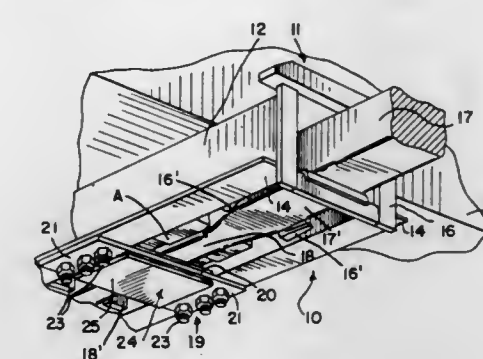
Franklin P. Adler, Michigan City, Ind., assignor to Pullman Transport Leasing Company, Chicago, Ill.

Filed July 24, 1975, Ser. No. 599,238

Int. Cl.<sup>2</sup> B61G 7/10, 9/20

U.S. Cl. 213—61

1 Claim



1. For a railway car having a center sill including a top wall, horizontally spaced vertical side walls and lower connecting means, a draft gear including a yoke reciprocates essentially longitudinally, the improvement comprising:

a draft gear carrier having a substantially flat plate with laterally spaced end connector portions and first and second wear portions offset from opposite sides of the plate,

said wear portions each having a length substantially greater than the width of the yoke and extending substantially the length of the spacing between the vertical side walls of the center sill,

means for initially releasably connecting the end connector portions to the respective connecting means on the side walls of the center sill with its first wear portion beneath and in engagement with said yoke, said wear portion initially having essentially flat wear surfaces,



said yoke at least in the area of engagement with the carrier being narrower than the width of said wear portions, means for restricting movements of the yoke laterally substantially less than the lengths of said wear portions whereby said yoke in operation develops a wear pattern on the first wear portion that forms a transversely arcuate depression essentially centered on the first wear portion and leaving unworn lateral thick edge portions of substantially original thickness on said first wear portion flanking said depression,

said carrier being adapted to be reversed to position the second offset wear portion beneath and in engagement with said yoke upon predetermined wear on said first wear portion and disposing said wear portion on the bottom of the carrier with said arcuate depression facing downwardly and defining an upwardly bowed strength-imparting arch-like structure centered between said unworn thick edge portion of the carrier which serve as buttresses for the arch like structure.

4,010,854

## UNCOUPLING LEVER ASSEMBLY

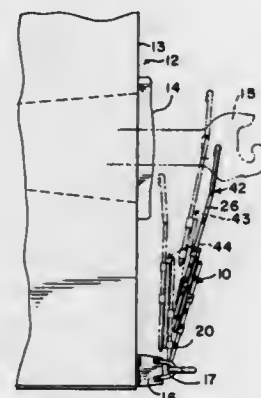
Leonard Francis Manyek, Lansing, Ill., assignor to Stanray Corporation, Chicago, Ill.

Filed June 5, 1975, Ser. No. 583,870

Int. Cl.<sup>2</sup> B61G 3/08

U.S. Cl. 213—166

6 Claims



1. An uncoupling lever assembly particularly adapted for use on a railroad car having a coupler mounted at an end thereof for side to side lateral movement and movement longitudinally of the car in response to buff and draft forces, said coupler having a lock lifter for uncoupling the coupler, said assembly including a handle member having a handle portion at one end thereof, said handle member being pivotally mounted on said end of said car, a lock lifter member having a lock lifter portion near one end thereof, said lock lifter portion formed to engage said lock lifter for support by said coupler, connecting means disposed generally intermediate said handle portion of said handle member and said lock lifter portion of said lock lifter member to connect said handle member to said lock lifter member, near an opposite end of each, in adjacent, generally parallel relationship to allow their axial movement relative to one another while allowing turning torque to be transmitted from said handle member pivoted relative to said car to said lock lifter member to uncouple said coupler, said connecting means including guide means formed to maintain said opposite ends of each of said handle member and said lock lifter member in said parallel relationship, by limiting the vertical and lateral movement of said members, and bearing means, mounted within said guide means to be engaged by said handle member and said lock lifter member to facilitate relative axial movement of said members and to reduce wear, said bearing means including bearing pads formed from a resilient material in a generally U-shaped configuration, having a bottom surface and two side surfaces formed by generally vertical legs, said legs having a slightly outward pitch such that they may be snapped into said guide means to engage an interior side surface of said guide means

with a sufficient force to maintain said bearing pad within said guide means during operation of said uncoupling lever assembly, each of said bearing pads being slightly longer in length than a corresponding one of said guide means and having outwardly extending flanges at opposite ends thereof, said flanges engaging exterior end surfaces of said guide means to prevent longitudinal movement of said bearing pad relative to said guide means.

4,010,855

## WAREHOUSE SYSTEM WITH PAN TRANSFER APPARATUS

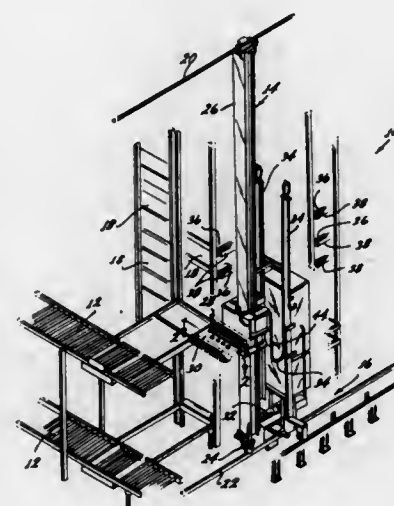
Joseph F. Smith, Freckleton near Preston, England, assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 27, 1975, Ser. No. 553,537

Int. Cl.<sup>2</sup> B65G 47/00

U.S. Cl. 214—16.4 A

5 Claims



1. In a warehouse system an operable shuttle, said shuttle having an elevatable platform and movable along an aisle with horizontal storage racks on each side thereof, said racks including a plurality of vertical storage compartments therealong comprising:

a plurality of storage pans of unitized construction for containing storable material, each of said pans having an integrated base and side walls with an engagable lip formed on each of said side walls adjacent the aisles; means carried by said elevatable platform for engaging said lip for pulling one of said plurality of storage pans from a selected location on one side of said aisle toward and onto said elevatable platform and for engaging one of said side walls at a position below said lip for pushing said one of said plurality of storage pans to the center of said elevatable platform and for pushing said pan from said center of said elevatable platform to a selected location on either side of said aisle; and said means carried by said elevatable platform comprises a pair of side by side counter rotating chains movable in a common horizontal plane each having one lip engaging pin for pulling and two substantially shorter pins for pushing said pans from said elevatable platform, the axes of rotation of said chains being substantially parallel with said pins and vertical storage compartments, said elevatable platform including a pair of angle supports having their aisle ends downward sloping for supporting and guiding said one of said plurality of pans while on said shuttle and said pins movable in an endless horizontal path around said supports.

4,010,856

## STORAGE APPARATUS WITH SLIDE ASSEMBLIES AND A TRANSPORTATION DEVICE WITH PIVOTAL CONVEYOR MEANS

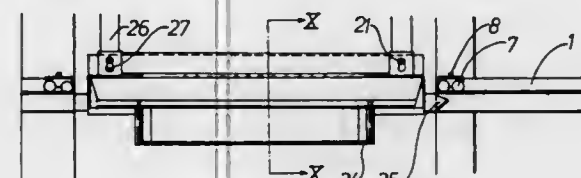
Leif Per Roland Anderson, Bogatan 39 A, 412 72 Goteborg, Sweden

Filed May 27, 1975, Ser. No. 580,699

Int. Cl.<sup>2</sup> E04H 6/06

U.S. Cl. 214—16.4 A

2 Claims



1. Arrangement in connection with storage establishments for unit loads comprising a number of storage compartments for reception of the unit loads and at least one transportation device arranged to service the storage compartments, said transportation device being movable along the storage compartments and having a platform movable between different levels and provided with first supporting means arranged to support the unit loads, said device further having sidewardly pushing means mounted on said platform and arranged to transfer the unit loads respectively into their storage compartments and vice versa, said storage compartments including second supporting means having sliding devices arranged to receive one edge of the unit load respectively at the side of the storage compartment from which the unit load is intended to be introduced by means of the transportation device and carry said edge during the introduction of the unit load into the storage compartment respectively, said transportation device including means to support and displace a second edge of the unit load within a range of the transportation device which substantially occupies a position outside of the storage compartments, said transportation device including further means for the transfer of the last mentioned edge of the unit load from said range within the main part of the transportation device to the outside edge of the storage compartment and vice versa, means on said platform with said supporting means of said transportation device being pivotable around a common axis, substantially horizontally and transversely arranged in relation to the sidewardly pushing means, enabling the unit load to be tilted and one of said edges to be tilted upwardly upon sidewardly displacement of same to and from a position above said sliding devices, and upon lifting from said sliding devices to be brought down onto the sliding devices by tilting downwardly.

4,010,857

## COAL CONDITIONING SYSTEM

Thomas E. Reim, Willowick; Jerry J. Pollack, Brookpark, and Robert A. Kemmerling, Cleveland, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Division of Ser. No. 720,057, April 10, 1968, abandoned. This application Oct. 29, 1970, Ser. No. 85,238

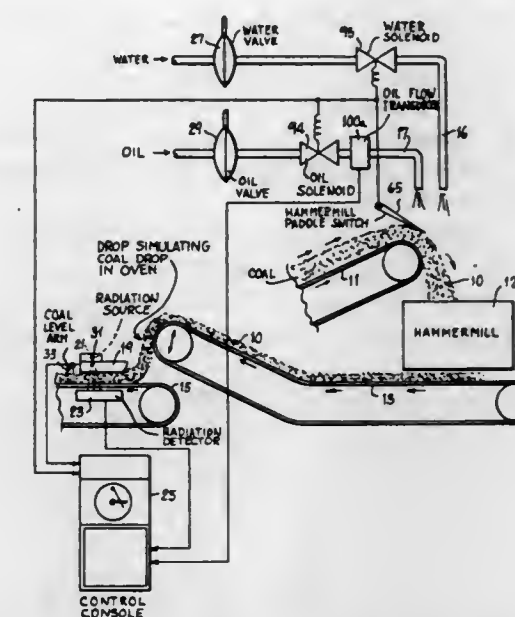
Int. Cl.<sup>2</sup> F23K 3/00

U.S. Cl. 214—18 R

9 Claims

1. A system for detecting the bulk density of coal supplied to an oven, wherein the coal is dropped into the oven, comprising means for providing a moving stream of coal to a detecting station which detects the bulk density of the coal passing through the station and thence to the oven, and means

adjustably positioned before the detecting station for conditioning the coal so that it is in substantially the same bulk



density condition in the detecting station as it is when dropped into the oven.

4,010,858

## METHOD AND MEANS FOR TOWING A VEHICLE

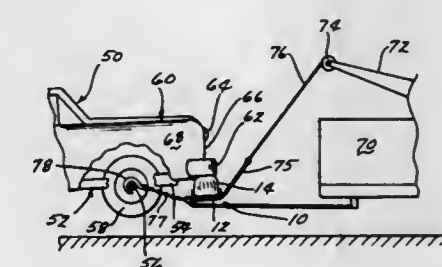
Carl F. Mahnke, Jr., Chicago, Ill., assignor to Vicar Industries Incorporated, Chicago, Ill.

Filed July 14, 1975, Ser. No. 595,523

Int. Cl.<sup>2</sup> B60P 3/06

U.S. Cl. 214—86 A

14 Claims



1. A device of the kind described comprising, a vehicle comprising a chassis and a body structure mounted above said chassis having opposite ends and wheels adjacent said opposite ends, said body structure having opposite end portions extending beyond said ends of said chassis; boom means having one end above and adjacent one end of said body structure; at least one elongated flexible towing member having securing means on one end thereof, said securing means being detachably secured to said chassis adjacent one end thereof and said towing member extending from said point of attachment outwardly below and beyond said end portion of said body structure, and thence upwardly to said boom means; power means associated with said boom means and connected to said towing member for pulling said towing member upwardly to said boom means to cause lifting of said one end of said vehicle; a towing cushion positioned between said towing member and said body structure for preventing said towing member from engaging said body structure, said towing cushion comprising an elongated yieldably compressible cushion member extending transversely of said vehicle; said towing cushion comprising an elongated rigid member secured to said cushion member, said rigid member being below said cushion member and engaging said towing member, said rigid member in cross section having a



horizontal web and a pair of upstanding legs which form a U-shape, said rigid member having handles secured to its opposite ends.

4,010,859

## LIFTING IMPLEMENT

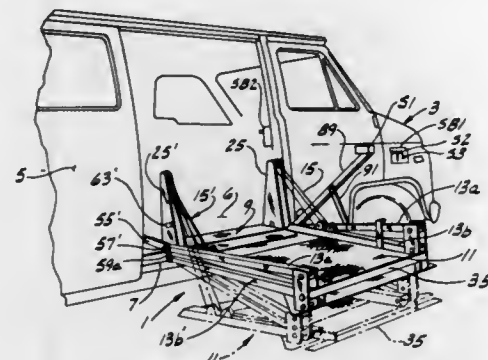
Richard K. Ronian, Rte. No. 1, Box 313, Hazelwood, Mo. 63042, and Robert Dale Moses, 3555 Ridgewood Drive, St. Charles, Mo. 63301

Filed May 12, 1975, Ser. No. 576,693

Int. Cl.<sup>2</sup> B60P 1/48

U.S. Cl. 214—77 R

2 Claims



1. A lift comprising a base adapted to be secured to the floor of a van-type passenger vehicle adjacent the doorsill thereof, to the bed of a pickup truck adjacent the tail gate thereof, or to other suitable structure, a lifting platform, means for connecting said platform to said base, a pair of cable and pulley means, one for each side of the platform, interconnecting said base and said platform, each of said cable and pulley means including a cable having securement means fixedly attached thereto, and a winch secured to the base having a tapered winding drum for moving the platform via said cable and pulley means in a generally vertical plane between a lowered horizontal position in which the platform is below the level of the base, a raised horizontal position in which the platform is substantially at the level of the base so that a load may readily be moved horizontally on and off the platform, and a stowed position in which the platform is disposed vertically generally above the base, means for converting said winch having a tapered winding drum to a winch which simultaneously winds and unwinds said two cables of said cable and pulley means at substantially the same speed, said winch further including power operated means for rotating said winding drum, said conversion means comprising a sleeve having an outer cylindrical surface and an inner tapered bore for reception of said tapered winding drum, said sleeve being split longitudinally to form sleeve halves which are adapted to be placed around the winding drum, means for releasably securing said sleeve halves together surrounding said winding drum, means for securing said sleeve to said winding drum for rotation therewith, and means adjacent each end of said sleeve for securement of a respective cable thereto comprising a recess at each end of one of said sleeve halves for reception of and engagement with said securement means secured to a respective cable, said recesses being so located relative to one another on said one sleeve half for forming a first layer of cable on said cylindric surface as said winding drum is rotated in one direction, said first layer being progressively wound from the ends of the sleeve inwardly toward the center thereof until said cables engage one another, and for further forming a second layer on the first layer, said second layer being progressively wound on said first layer from the center of the sleeve outwardly toward its ends.

2. The method of simultaneously winding first and second cables at substantially the same speed by a single power driven winch having a tapered winding drum comprising the steps of: securing a sleeve over said tapered winding drum, said sleeve having a tapered inner bore for reception of said tapered winding drum and an outer cylindric surface;

securing one end of said first cable to one end of said sleeve and securing one end of said second cable to the opposite end of said sleeve; rotating the winding drum in a cable winding direction whereby both cables are simultaneously wound up onto the outer cylindric surface of said sleeve; progressively forming a first layer of each of said cables on the outer cylindric surface of the sleeve from the outer ends of sleeve in toward the center of the sleeve as the drum continues to rotate in said cable winding direction, said first and second cables engaging one another substantially at the center of said winding drum; and continuing to rotate said winding drum in said cable winding direction for progressively forming a second layer of each of said cables over its respective first layer with each of said second layers extending outwardly toward the ends of said winding drum.

4,010,860

## SHAPED CONTAINER

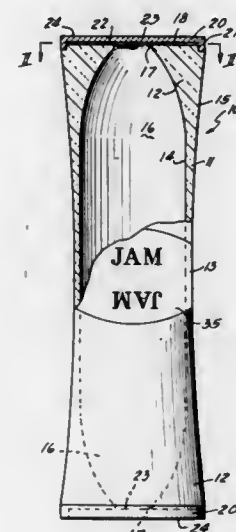
Bernard Garber, 6963 N. Bell, No. 108, Chicago, Ill. 60645

Filed Nov. 3, 1975, Ser. No. 628,416

Int. Cl.<sup>2</sup> B65D 23/00

U.S. Cl. 215—1 R

6 Claims



1. A generally cylindrical, hollow container having a longitudinal axis and being bilaterally symmetric about a median plane normal to said axis, said container comprising:

a solid circumferential wall forming said container with an outer peripheral surface and a hollow therewithin at an inner peripheral surface thereof, said wall being radially thicker near opposite longitudinal extremities of said container and radially thinner near said median plane, thereby to form a weighted end for promoting support stability, said outer peripheral surface being tapered concavely inwardly toward said median plane from said ends, and said inner peripheral surface tapering to reduced cross-section at each of said ends at openings therein, said wall further having a flat axial surface on each said end about said opening;

engagement means forming a coupling adjacent each said flat surface;

a closure member connected to each respective coupling, each of said closure members having a flat closure surface extending radially across said axial opening forming a support surface by means of which the containers may be positioned uprightly on a support surface; and sealing means between said wall and said closure member engaging said axial wall and said closure member about said opening to form a liquid-tight seal.

4,010,861

## NURSING BOTTLE

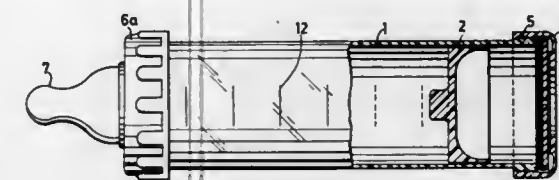
Ottar Torolf Welten, Brandshaug, N-2340 Loten, Norway

Filed Oct. 1, 1975, Ser. No. 612,469

Int. Cl.<sup>2</sup> A61J 9/04

U.S. Cl. 215—11 B

5 Claims



1. A nursing bottle, comprising:

a cylindrical tube having a uniform internal diameter, the opposite ends of said tube having external threads formed thereon;

a suction nipple;

a first cap receivable over said suction nipple, and engageable with the external threads on one end of said cylindrical tube for securing said nipple to said one end;

a piston slidably received within said cylindrical tube, and dividing said tube into a first portion facing toward said one end of said tube and adapted to receive liquid to be dispensed through said suction nipple, and a second portion facing toward the other end of said tube;

a thin foil valve element having a diameter greater than the uniform internal diameter of said cylindrical tube, and engageable with the other end of said cylindrical tube;

a valve plate positioned on the outside of said thin foil valve element, said valve plate and said thin foil valve element having non-aligned flow opening means therein arranged to be closed when said thin foil valve element is in engagement with said valve plate; and

removable means for detachably connecting said valve plate and said thin foil valve element to said other end of said cylindrical tube.

4,010,862

## FLUID CONTAINER HAVING SLIDING HANGER ON T-SHAPED SEALING BEAD

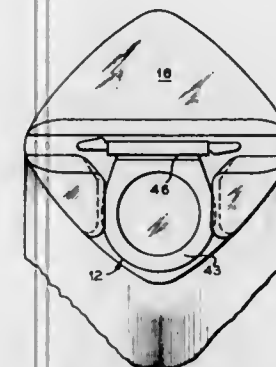
Dixie E. Gilbert, Orangeburg, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 463,545, April 24, 1974, abandoned. This application Nov. 7, 1974, Ser. No. 521,774

Int. Cl.<sup>2</sup> B65D 23/00

U.S. Cl. 215—100 A

11 Claims



1. A hollow article capable of sitting flat in an upright condition or being suspended in an upside-down condition comprising:

a biaxially oriented container portion having a neck, side walls, and a bottom, which bottom has at least three flat portions spaced around said bottom;

a longitudinal recess passing through a center axis of said article, said recess having a longitudinal T-shaped sealing bead therein comprising a longitudinal cross bar having a boss at each end and a longitudinal stem connecting said

cross bar with said bottom wall in said recess, at least one of said flat surfaces being on each side of said longitudinal recess;

said bottom further having a tab receiving recess at right angles to said longitudinal recess, one of said flat surfaces being on each side of said tab receiving recess, said tab receiving recess being so contoured as to form an undercut between said flat surfaces on each side of said tab receiving recess and a portion of said bottom within said tab receiving recess;

and a suspension tab slidably affixed to said T-shaped sealing bead, said tab having downwardly and inwardly projecting members which form a slot, said tab further having a hanger portion having a hole therein and an integral hinge adjacent said downwardly and inwardly projecting members and connecting same with said hanger portion.

4,010,863

## COMBINED CONTAINER FOR NEW AND WASTE CRANKCASE OIL

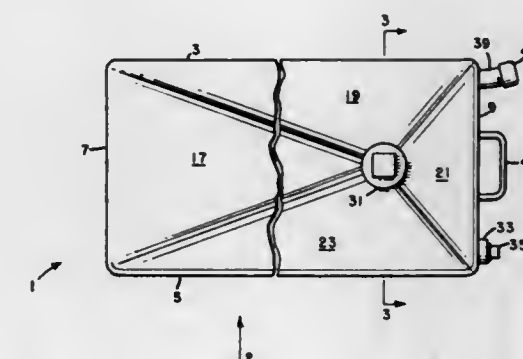
Lawrence G. Ebel, 624 N. Pearl St., Albany, N.Y. 12204

Filed Feb. 9, 1976, Ser. No. 656,380

Int. Cl.<sup>2</sup> B65D 85/00, 25/40

U.S. Cl. 220—1 C

1 Claim



1. A combined double-compartment container and drain funnel for use in changing the crankcase oil for an engine comprising:

a bottom wall;

upstanding end walls and side walls connected to said bottom wall and being relatively short in comparison with the length and width of said bottom wall;

a drain funnel connected to the top of said end walls and side walls;

an internal wall connected to said end walls and side walls in a plane generally parallel to the bottom wall and spaced apart from the bottom wall and from said drain funnel so as to divide said container into a new oil compartment on the bottom and a used oil compartment on the top;

a closable opening in the bottom of said drain funnel communicating with said used oil compartment;

a closable pouring spout formed on an end wall and communicating with the new oil compartment, said spout being adapted for use with the oil filler opening of an engine; and

a closable extension formed on the same end wall in communication with the used oil compartments;

thereby providing a combined double-compartment container and drain funnel having an overall flat and broad configuration enabling it to be placed under an engine having relatively low clearance from the ground.



4,010,864

**MULTILAYER PRESSURE VESSEL**

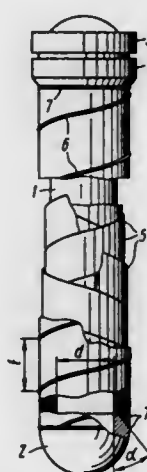
Pavel Gdallevich Pimshtein, ulitsa Kurchatova, 9, kv. 45; Marat Moiseevich Shel, ulitsa Kievskaya, 4, kv. 15; Enver Rakhmatullovich Khismatulin, ulitsa 4 Zheleznodorozhnaya, 46"b", kv. 16; Evgeny Grigorievich Borsuk, ulitsa Kurchatova, 5"v", kv. 10; Alexandr Nikolaevich Novikov, ulitsa Kurchatova, 9, kv. 41, all of Irkutsk; Viktor Matveevich Makarov, ulitsa Sakko i Vantsetti, 58, kv. 35; Boris Grigorievich Ziselman, ulitsa Inzhenernaya, 71, kv. 45, both of Sverdlovsk; Alexandr Valeryanovich Kuramzhin, ulitsa Shvernika, 1, korpus 4, kv. 43, Moscow; Viktor Grigorievich Usenko, ulitsa Kurchatova, 9, kv. 28, Irkutsk; Nikolai Kirillovich Globin, ulitsa Griboedova, 20, kv. 64, Sverdlovsk, and Vladimir Viktorovich Ivantsov, ulitsa Kurchatova, 7" a", kv. 31, Irkutsk, all of U.S.S.R.

Filed Apr. 7, 1976, Ser. No. 674,606

Int. Cl.<sup>2</sup> B65D 7/42; F16L 9/14, 9/16

U.S. Cl. 220—3

5 Claims



1. A multilayer pressure vessel comprising a cylindrical portion formed by a pipe with a flange; the bottom of said vessel adjoining said cylindrical portion; a cover adjoining said cylindrical portion at the side of the flange; roll strips wound on said cylindrical portion in layers along a helical line which is counteropposed in the adjacent layers, the winding pitch ranging from 0.2 to 2.2 of the inside diameter of said pipe; the ends of each of said roll strips forming the layers on said cylindrical portion of the vessel welded, correspondingly, to said bottom and flange of the vessel; a roll strip forming the external layer on said cylindrical portion of the vessel, all the coils of said strip being welded to one another on a helical line; roll strips forming the internal layer on said cylindrical portion of the vessel, the intermediate coils of said strips being not welded to one another.

4,010,865

**COLLAPSIBLE INSULATED BOX**

James L. Wilgus, c/o Reliable Plastics, Inc., 35 Middaugh St., Somerville, N.J. 08876

Filed Nov. 11, 1974, Ser. No. 522,327

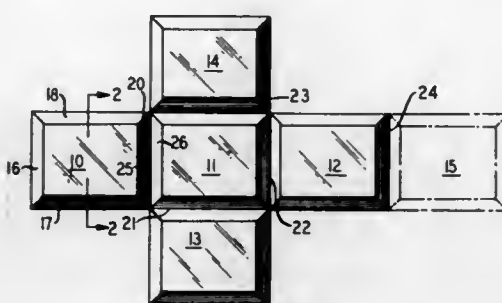
Int. Cl.<sup>2</sup> B65D 7/30, 5/20

U.S. Cl. 220—6

3 Claims

1. A multi-sided collapsible insulated container comprising a liner composed of a semirigid flexible material segmented into a plurality of contiguous rectangular sections, rigid insulating rectangular panels formed adhering to corresponding sections of said liner by expansion of a rigid urethane foam in a mold having truncated pyramidally-shaped sections corresponding to each of said liner sections, said liner sections combined with said molded urethane foam panels being substantially rigid, each of said molded panels having a truncated pyramid-shaped cellular structure exhibiting a low heat transfer function, adjacent mating side surfaces of each panel being initially molded at an angle of at least 46° with respect to the

plane of said liner onto which said panel is formed so as to conform and seal said mating side surfaces by a crushing



4,010,866

**PAINT ROLLER PAN**

Robert A. McClane, Anaheim, Calif., assignor to Impact Manufacturing Co., Inc., Santa Fe Springs, Calif.

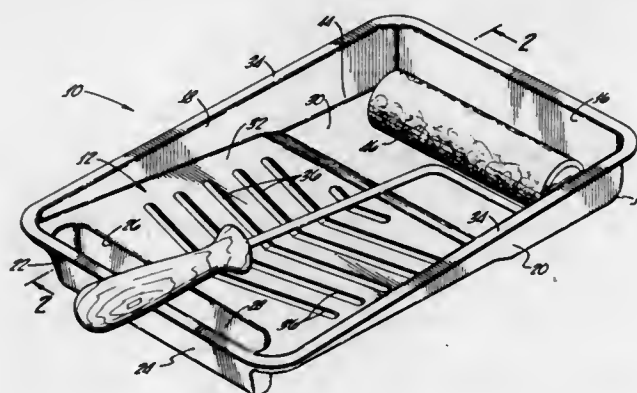
Continuation of Ser. No. 506,741, Sept. 16, 1974, abandoned.

This application June 7, 1976, Ser. No. 693,603

Int. Cl.<sup>2</sup> B65D 1/36; B44D 3/12; B05C 21/00

U.S. Cl. 220—20

3 Claims



1. A paint roller pan comprising: a bottom section having an inclined area; an end wall extending up from the lower end of said bottom section; a pair of side walls extending up from the respective sides of said bottom section, said end wall and said pair of side walls in conjunction with said bottom section forming a paint receptacle which is relatively deep at one end and relatively shallow at the other end and is of sufficient width for receiving a typical paint roller and of sufficient length to permit the roller to be rolled a substantial distance along the inclined area of the bottom section; and a leg integrally connected to said bottom section at the shallow end and extending generally parallel to said end wall, said leg maintaining said bottom section inclined relative to the flat support surface on which the pan rests, said leg being hollow with an opening forming a paint brush reservoir for receiving a typical paint brush used to do touch-up work in conjunction with the use of said paint roller, said paint brush reservoir being substantially smaller than said paint roller reservoir, allowing said inclined surface to extend along substantially the entire length of said pan.

4,010,867

**TWO-PIECE CAN CONSTRUCTION**

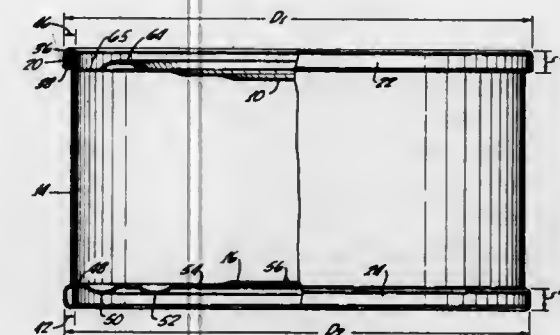
Walter C. Jones, San Pedro, Calif., assignor to United Can Company, Fullerton, Calif.

Filed Feb. 4, 1974, Ser. No. 439,345

Int. Cl.<sup>2</sup> B65D 17/02, 17/08

U.S. Cl. 220—66

10 Claims



1. A two-piece can comprising: a first piece having a cylindrical sidewall portion and an integral bottom panel portion; a plate attached to the end of said cylindrical portion opposite side bottom panel; a first circumferential lip formed along the attachment of said plate to said cylindrical portion; and a second circumferential lip formed along the intersection of said bottom panel and said cylindrical portion, said first and second lips having substantially the same cross sectional shape with two separated flat portions joined at one end by a curved portion, at least one of said flat portions on said first and second lips extending away from said plate and said bottom panel respectively in a direction generally parallel to the longitudinal center of said can.

4,010,868

**APPARATUS FOR THE AUTOMATIC ISSUANCE AND RETURN OF KEYS**

Arkadius Rese, Gossau, St. Gallen, Switzerland, and Hermann Eberhardt, Syrgenstein, Germany, assignors to Eberhardt & Co., Giengen, Germany

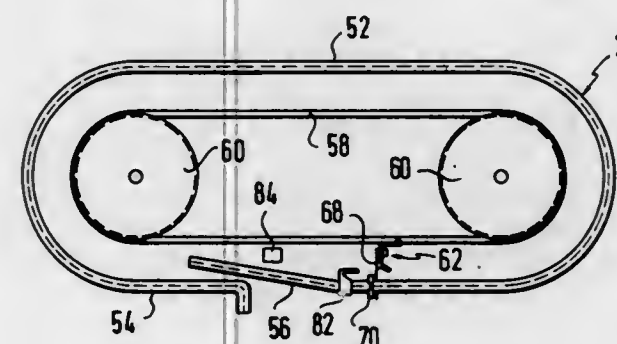
Filed May 12, 1975, Ser. No. 576,895

Claims priority, application Germany, May 27, 1974, 2425487

Int. Cl.<sup>2</sup> B65H 7/02

U.S. Cl. 221—9

41 Claims



1. A system for storing and dispensing keys comprising, a storage rail having an entry terminal at one end and an exit terminal at the other end and a length sufficient to store a plurality of keys successively therealong, said keys having means for slidably suspending each from said rail, said key having predetermined code means indicative of the nature of the keys to be stored on said storage rail, selection means located at the entry terminal to said storage rail operative to permit only keys having the predetermined code means to be introduced onto said storage, dispensing means located adjacent said rail prior to said exit terminal for engaging at least the leading one of said keys, said dispensing means being actuatable to separate the leading key from the succeeding keys

causing it to move toward the exit terminal, for separation therefrom.

4,010,869

**TIME-DELAYED SINGLE CIGARETTE DISPENSER**

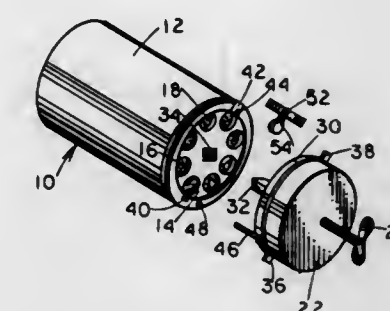
Charles Adamo, Middle Village, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 14, 1976, Ser. No. 649,066

Int. Cl.<sup>2</sup> A45C 11/00

U.S. Cl. 221—15

5 Claims



1. A cigarette dispenser comprising: a cylindrical housing having a dispensing opening, a cylindrical cigarette magazine slideably and rotatably positioned within said housing, said magazine including a plurality of cylindrical chambers radially positioned about the periphery of said magazine each adapted to receive a cigarette and to be sequentially aligned with said dispensing opening, a cover element for said housing, said cover element including motor means operable for a predetermined time interval, a rotatable disc connected to said motor means, and means for operatively connecting said disc to said cigarette magazine when said cover element is attached to said housing, whereby operation of said motor means for a predetermined time interval will cause said disc to rotate said cigarette magazine to align one of said cigarette chambers with the dispensing opening in said housing to enable a single cigarette to be dispensed from said housing during the interval of operation of said motor means.

4,010,870

**TOOTHPASTE DISPENSER AND CONTAINER**

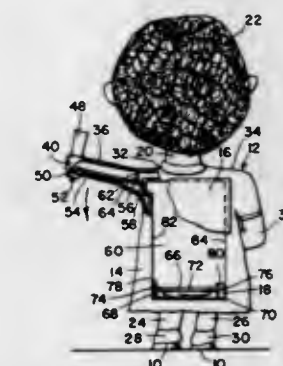
Esther Wilson, Apple Creek, Ohio, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 12, 1975, Ser. No. 557,769

Int. Cl.<sup>2</sup> B65D 35/30

U.S. Cl. 222—78

3 Claims



1. A container for dispensing toothpaste, which comprises: a. a toy figure of a person having a main body with a chamber therein, said main body having a removable rear panel therein, a neck extending upwardly from said body, a head affixed to said neck, a pair of rigid shoulders, a pair of legs with attached feet, said legs extending down-



wardly from said body, a pair of arms with hands, said arms affixed to said rigid shoulders, at least one of said arms of a flexible composition extending horizontally outwardly from said body, and said hand of one said arm having a simulated tube of toothpaste therein, said tube of toothpaste having a neck portion with an externally threaded surface thereon; said tube of toothpaste having an opening therein;

- b. a screw cap member threadably engaging said neck portion;
- c. a tube member contained in one said flexible arm, said tube member extending from said chamber through said one flexible arm, through said hand into said opening of said tube of toothpaste; said tube member having a hole therein;
- d. a rubber gasket member affixed onto said end of said tube member, said rubber gasket positioned within said chamber;
- e. a flexible tube of toothpaste contained in said chamber, said flexible tube of toothpaste having a base, a pair of upwardly extending end walls, an upwardly extending rear wall, an upwardly extending front wall, an upper end, and a side arm having a bore there through, said side arm affixed onto one said end wall, a free end of said side arm communicating with said rubber gasket;
- f. a suction cup member affixed onto each said foot of said toy figure;
- g. a rod member contained in said flexible arm, said rod member affixed to said shoulder, said rod member extending downwardly from said shoulder into said tube through said hole in said tube, said arm flexing downwardly as said tube pulls away from said stationary rod member;
- h. a coil spring affixed onto a base of said chamber;
- i. a horizontally placed platform affixed onto said coil spring, said platform engaging said base of said flexible tube of toothpaste, each end of said platform having notches therein; and
- j. a flange member contained on each vertical end wall of said chamber, one said flange member slidably contained in each said notch of said platform for maintaining said platform in a horizontal plane within said chamber.

4,010,871

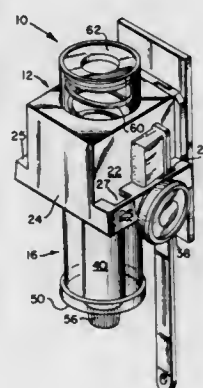
#### DEVICE FOR DISPENSING THE CONTENTS OF A COLLAPSIBLE TUBE

Wilson L. Broadie, 842 Victor Ave., Inglewood, Calif. 90302  
Filed Dec. 19, 1975, Ser. No. 642,619

Int. Cl.<sup>2</sup> B65D 35/24, 35/34

U.S. Cl. 222—93

8 Claims



1. A device for dispensing the contents of a collapsible tube having a dispensing outlet comprising:
  - a housing having sidewalls and an integral support frame;
  - a casing having opposing longitudinal slots extending through the sidewalls thereof and positioned within said support frame and at least partially within said housing, said casing adapted to substantially enclose the collapsible tube and including a spring abutment means at an upper end thereof and a detachable tube mounting means at a lower end thereof;

a shaft extending across the interior of said casing through said casing slots with the opposing end portions thereof mounted for rotation on the housing sidewalls, said shaft including collapsible tube end engagement means; and, a compression spring means positioned within said casing and extending axially between said spring abutment means and said shaft.

4,010,872

#### OXIDATION HAIR DYE IN A PLURAL-FLUIDS DISPENSING PACKAGE

David S. Lozano, and Samuel B. Prussin, both of Los Angeles, Calif., assignors to Dart Industries Inc., Los Angeles, Calif.  
Continuation of Ser. No. 799,941, Feb. 17, 1969, abandoned, which is a continuation-in-part of Ser. No. 755,823, Aug. 28, 1968, abandoned. This application Mar. 13, 1972, Ser. No. 234,357

Int. Cl.<sup>2</sup> B65D 35/22

U.S. Cl. 222—94

1 Claim

1. A dispensing package having two compartments, one compartment containing one part of a two-part oxidative hair dye composition, the other compartment containing the other part of said composition, and means for mixing said parts including a pressure propellant to dispense said parts together, said one part comprising an aqueous solution containing an alkaline material selected from the group consisting of ammonium hydroxide, and short chain alkanolamines, said other part comprising an aqueous solution having a pH of about 3.75 containing from about 5.95 to about 10.5 percent hydrogen peroxide and about 0.1 percent phosphoric acid by weight, the amount of alkaline material in said first part and the amount of phosphoric acid in said other part being such as to provide a pH of about 8.5 to about 10.0 in the two-part composition immediately after mixing.

4,010,873

#### TOOTHPASTE DISPENSER

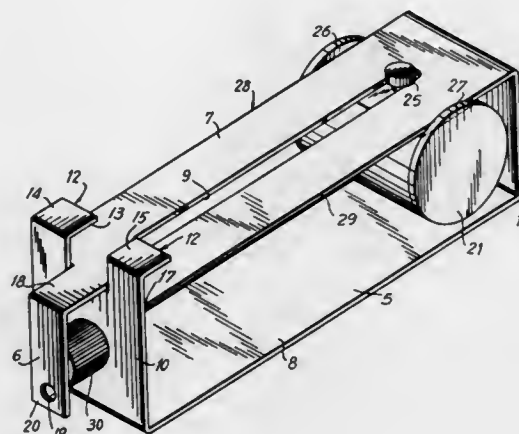
Hovhannes H. Mardirossian, 42-36 81st St., Elmhurst, N.Y. 11373

Filed Aug. 18, 1975, Ser. No. 605,301

Int. Cl.<sup>2</sup> B65D 35/28

U.S. Cl. 222—101

7 Claims



1. A dispenser device for dispensing amorphous material from a tube of amorphous material having a neck, an opening in the neck and an end, said dispenser device comprising a substantially resilient frame for accommodating a tube of amorphous material said frame comprising a unitary member of substantially resilient material having first and second spaced substantially parallel elongated sides maintained by spring bias at slightly less than parallel relation with each other and having a cover part in operative proximity with a tube of amorphous material accommodated in the frame, said cover part extending substantially perpendicularly from the first side of the frame; tube compressing means in the frame and guided by said frame for compressing the tube from the end thereof to

the area of the neck thereof, said tube compressing means abutting both the first and second sides of the frame in an initial position and permitting said sides to remain spaced from each other due to said spring bias, and compressing the end of the tube of amorphous material between itself and the second side of the frame when moved toward the area of the neck of said tube to dispense material from said tube thereby extending the distance between the first and second sides of said frame by the thickness of the flattened tube to move the said sides farther from each other whereby the cover part moves with said first side in a manner whereby said cover part covers the opening of the neck of the tube in the initial position of the tube compressing means when the tube compressing means is a substantially maximum distance from the neck of the tube and said cover part frees the opening of the neck of the tube for the transfer of amorphous material when said tube compressing means is moved toward said neck of said tube and the flattened tube is interposed between the tube compressing means and said second side of said frame.

4,010,874

#### PUMP FOR HAND-HELD DISPENSERS

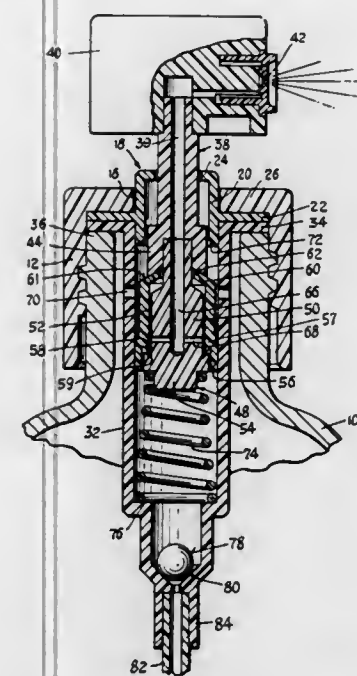
Wolf Steiman, 649 Springer Road, Fairfield, Conn. 06430

Filed June 26, 1975, Ser. No. 590,688

Int. Cl.<sup>2</sup> G01F 11/04

U.S. Cl. 222—321

1 Claim



1. A pump construction for hand-held dispensers and the like, comprising in combination:
  - a. a cylinder having a side vent opening in its upper portion,
  - b. means providing an annular sealing shoulder on the cylinder inner wall at a location above said vent opening,
  - c. a hollow plunger reciprocally mounted at the top of the cylinder and movable in the direction of its axis in the upper portion of the cylinder, said plunger having a discharge passage, carrying a valve head at its lower portion, and having a slide bearing surface above the valve head,
  - d. a hollow tubular piston carried by the plunger and movable in the cylinder between raised and lowered positions, said piston having a cylindrical body portion which is engageable with and slidable longitudinally on the bearing surface of the plunger between high and low positions thereon, and spaced from the walls of the cylinder, said piston having a lower skirt portion engageable with the cylinder walls and provided with a valve seat engageable with the valve head when the piston is in said low position on the plunger, and
  - e. means providing a fluid passage from the lower valve seat of the piston to the discharge passage of the plunger when the valve seat is disengaged from the valve head,

- f. said plunger having an annular valve seat located above its slide bearing surface and engageable with an upper portion of the piston when the latter is in its high position on the plunger,
- g. the upper edge portion of the piston body portion constituting a valve which engages the sealing shoulder in the cylinder when the piston is in its raised position in the cylinder,
- h. the said upper portion of the piston having an inwardly-extending flange located at the upper piston end and extending toward the plunger axis, said plunger having a body portion disposed under said flange, and having means maintaining it spaced from the flange,
- i. the upper surface of said flange constituting a valve face adapted for engagement with the annular valve seat of the plunger,
- j. said annular valve seat of the plunger being conical and snugly receiving the piston flange,
- k. the upper surface of the piston flange and the said upper edge portion of the piston body portion constituting essentially a single continuous conical surface,
- l. the annular sealing shoulder in the cylinder being conical for engagement with said single continuous conical surface of the piston body portion.

4,010,875

#### POURER-STOPPER

Pierre Babiol, Villefranche-sur-Saone, France, assignor to Le Bouchage Mecanique, Paris, France

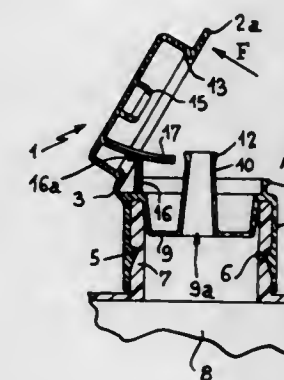
Filed Jan. 13, 1976, Ser. No. 648,707

Claims priority, application France, Jan. 16, 1975, 75.02014

Int. Cl.<sup>2</sup> B67D 3/00

U.S. Cl. 222—517

6 Claims



1. A pourer-stopper comprising a stoppering device adapted for mounting on a container neck, and having a first portion having a discharge spout, a second portion including a cap for shutting off the spout and hinged to the said first portion by a connecting tab, and resilient means acting between said portions and operable to assist movement of said cap from a partially open position to a fully open position and to prevent free return of said cap from said fully open position, said resilient means including a flexible blade integral with one of said stoppering device portions and extending generally axially thereof and including a cooperating tongue integral with the other of said portions and extending generally axially thereof, said blade being adapted to flex in response to engagement with said tongue during opening movement of said cap whereby initially to resist opening and then to straighten resiliently to lever said cap to said fully open position.



4,010,876

# ARRANGEMENT FOR THE DELIVERY OF MEASURED QUANTITIES OF THE MOLTEN CONTENTS OF A STORAGE VESSEL

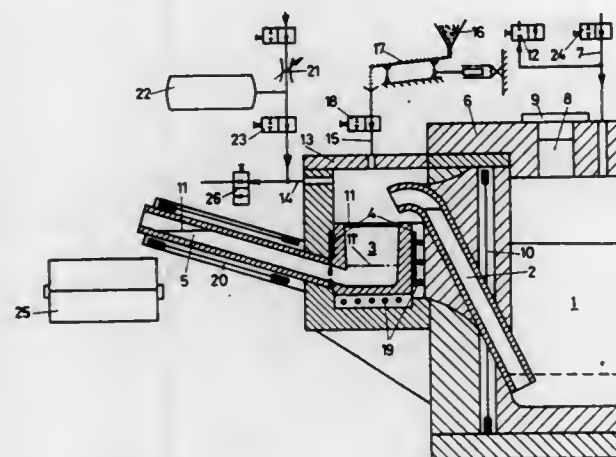
Robert Steinemann, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Germany  
Filed Mar. 25, 1975, Ser. No. 561,687

Claims priority, application Switzerland, Apr. 9, 1974, 4982/74

Int. Cl.<sup>2</sup> B22D 39/00

U.S. Cl. 222—595

3 Claims



3. An arrangement for the delivery of predetermined amounts of the molten contents of a storage vessel, said arrangement comprising:

- a storage vessel having an overflow pipe and a closeable opening to insert a molten charge, said vessel being sealed when said opening is closed;
- an intermediate vessel, said vessel being sealed and into which said overflow pipes opens, the end of said overflow pipe within said intermediate vessel being at a higher level than the end within the storage vessel, said intermediate vessel being provided with a rising delivery pipe;
- measuring means, provided in said intermediate vessel, for providing an electrical parameter which corresponds to the molten charge within said intermediate vessel;
- first gas-pressure lines, said lines having pressure release means, for providing pressurized gas to said storage vessel, said pressurized gas for forcing molten metal from said storage vessel through said overflow pipe into said intermediate vessel, said first gas-pressure lines being individually controllable; and
- second gas-pressure lines, said second lines having pressure release means, said pressurized gas for forcing molten metal from said intermediate vessel through said delivery pipe, said second gas lines being individually controllable, said second gas-pressure lines including means for controlling the slope of the amount of metal delivered by said delivery pipe versus time, said means including a closed, pressurized gas storage chamber and a constant-pressure adjustable gas source, said storage chamber and adjustable gas source being combined in a single gas line to provide a high initial gas pressure followed by a lower gas pressure when said single gas line is opened.

4,010,877

# WORK FIXTURE AND FOLDING METHOD

Robert L. Hayes, and Joseph C. Gould, both of Honea Path, S.C., assignors to Parke, Davis & Company, Detroit, Mich.  
Division of Ser. No. 585,271, June 9, 1975. This application  
Apr. 22, 1976, Ser. No. 679,110

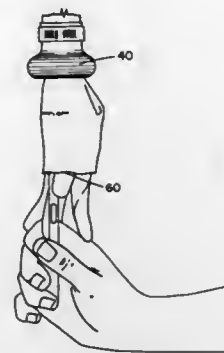
Int. Cl.<sup>2</sup> A41H 33/00

U.S. Cl. 223—37

4 Claims

1. Method of folding an article of wearing apparel comprising: mounting one end of the article on the cuff of a hollow

sleeve fixture so that the article is suspended by gravity from the fixture, grasping the article at a point between said end and its lower end, raising the article and inserting it into the sleeve fixture for



a distance at least sufficient to cause said mounted or trailing end of the article to be demounted from the cuff, and withdrawing the article from the sleeve fixture under gravity thereby accomplishing simultaneous removal of the article from the fixture and folding of the article on a fold line coinciding with the point of grasping.

4,010,878

# DISPLAY FORM FOR BABY BOOTIE

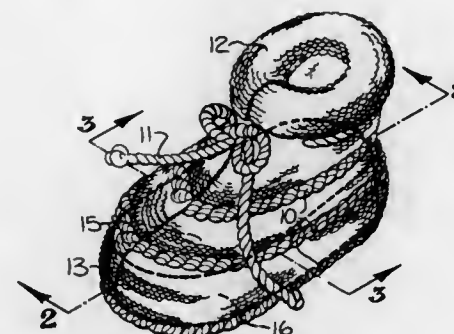
Twain Westmoreland, Rte. 2, Box 168, Hillsville, Va. 24343

Filed May 3, 1976, Ser. No. 682,446

Int. Cl.<sup>2</sup> D06C 5/00

U.S. Cl. 223—75

5 Claims



1. The combination of a display form and a baby bootie including a foot and ankle portion, said display form including an integrally formed elongate member having an overall length of only a few inches and a width of a fraction of its length and wherein the length and width generally correspond to the length and width of the foot portion of the baby bootie, said member including an upper wall spaced above the bottom of the bootie and with side walls extending downwardly therefrom on all sides thereof and being connected to the upper wall along a radius so as to provide rounded corners of connection of the side walls to the upper wall for aiding in inserting the display form within the baby bootie, and wherein the height of the side walls is a fraction of the width of said upper wall and wherein the height of the side walls generally corresponds to the height of the foot portion of the bootie so that the ankle portion of the bootie extends upwardly above the display form and the display form is substantially hidden in use.

4,010,879

# GARMENT HANGER

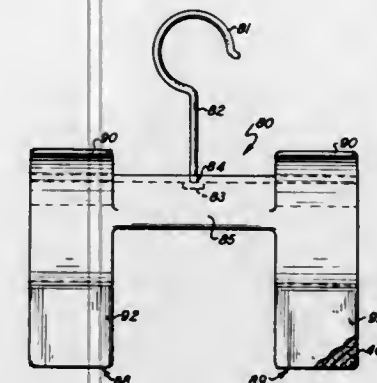
Paul J. George, P.O. Box 86, Brecksville, Ohio 44141, and M. Ted Raptis, 2111 Jefferson Davis Highway, Arlington, Va. 22202

Continuation-in-part of Ser. No. 401,292, Sept. 27, 1973, Pat. No. 3,923,213. This application Dec. 1, 1975, Ser. No. 636,610

Int. Cl.<sup>2</sup> A47J 51/94

U.S. Cl. 223—96

9 Claims



1. A one-piece hanger fabricated from a plastic material for gripping and hanging a garment permitting it to hang freely comprising gripper means, spring-biased yoke means, gripper separating means, and hanger suspending means:

- a. said spring-biasing yoke means having a spring action property and a generally arcuate form extending horizontally;
  - b. gripper means and gripper separating means disposed at opposite ends of said yoke means;
  - c. each of said gripper separating means comprising a pair of arm members angled downwardly towards each other, each arm member connected at an intermediate portion thereof to the side of said yoke means;
  - d. said gripper means comprising horizontally-extending gripper members connected to and coextensive with the lower end of each of said arm members; each of said gripper members having an inwardly disposed vertical gripping surface comprising a planar dimensional area having frictional gripping means; both of said gripping surfaces being normally spring-biased by said yoke means in a parallel, closed, contacting position;
  - e. said suspending means extending upwardly and connected to an upper medial portion of said yoke means for suspending said hanger;
- whereby said gripper means at each end can be easily separated by squeezing respective arm members towards each other to thereby enable a garment to be inserted and frictionally held between said gripper members at each end of said hanger upon release of said arm members.

4,010,880

# APPLIANCE FOR THE SECURE TRANSPORT OF DOMESTIC ANIMALS SUCH AS DOGS AND CATS

Maria Guillot-Munoz, 60 rue Mazarine, Paris, France (75006)

Filed Aug. 4, 1975, Ser. No. 601,285

Claims priority, application France, Aug. 13, 1974, 74.27981

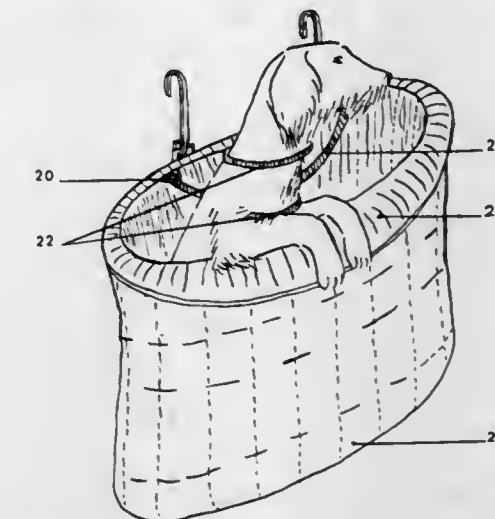
Int. Cl.<sup>2</sup> B60R 7/00

U.S. Cl. 224—42.42 A

10 Claims

1. An animal supporting and restraining device for providing the secure transportation of domestic animals such as dogs and cats on a passenger seat comprising a collapsible basket including first and second frame hoops each of closed configuration, a bag-like member consisting of a cover of flexible material fixed over said rigid hoops and having a side portion and a bottom portion, ring means fixedly connected to said upper hoop, strap means connected to said ring means and connectable to an animal carried within the confines of said bag-like member for retaining an animal therein, a medial

third hoop, brace means connecting said third hoop to said lower hoop for maintaining said third hoop in spaced parallel relationship above said lower hoop and a plurality of pairs of hinged bars connecting said upper hoop to said third hoop, each pair of hinged bars comprising an upper bar and a lower bar, upper pivot means connecting the upper end of each of



4,010,881

# APPARATUS FOR THE TREATMENT OF CHIPS

Klaus von Wietersheim, Heiligenhaus, Germany; Bastiaan Maertzdorf, Schaesberg, and Eduard Hendrik Schiks, Heerlen, both of Netherlands, assignors to Mayfran Incorporated, Cleveland, Ohio

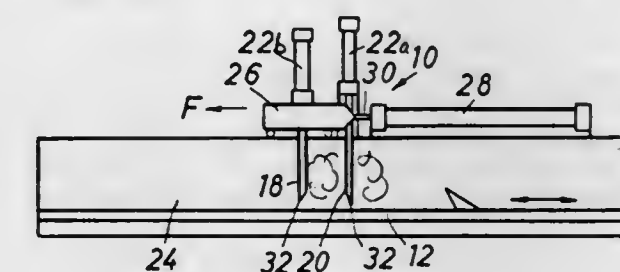
Filed Aug. 11, 1975, Ser. No. 603,751

Claims priority, application Germany, Aug. 14, 1974, 2439129

Int. Cl.<sup>2</sup> B26F 3/02

U.S. Cl. 225—100

20 Claims



1. A device for separating bales of metal cutting chips formed on a chip conveyor having a conveying direction comprising:

- at least one holding tooth positioned along the conveyor and spaced therefrom and selectively movable toward and away from said conveyor; said holding tooth being adapted to penetrate a bale of chips on said conveyor when moved toward said conveyor;
- at least one ripping tooth positioned along said conveyor having a first position adjacent to said holding tooth and movable in said conveying direction; said ripping tooth being selectively movable toward and away from said conveyor; said ripping tooth being adapted to penetrate said bale of chips on said conveyor when moved toward said conveyor;
- first drive means associated with said holding tooth and said ripping tooth to move said teeth toward and away from said conveyor and;
- second drive means independent of said first drive means for moving said ripping tooth laterally away from said conveyor.



holding tooth to a second position when said teeth have been moved toward said conveyor whereby portions of said bale of chips may be torn away.

4,010,882

# SPROCKET DRIVE AND STRIPPER ARRANGEMENT FOR COMPUTER FORM FEEDER APPARATUS

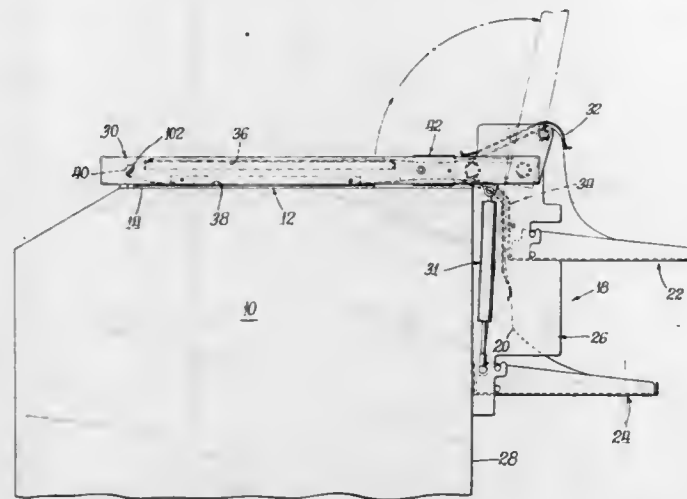
Carl L. Turner, Mount Prospect, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed May 15, 1975, Ser. No. 577,705

Int. Cl.<sup>2</sup> B65H 25/04, 17/40

U.S. Cl. 226—11

6 Claims



1. In a computer form feed apparatus for feeding a web having predetermined spaced apertures along an edge thereof along a copyboard having upper and lower surfaces and a free end, said web moving over said upper surface about the free end of said copyboard and along said lower surface, the upper and lower surfaces of said copyboard being predeterminedly spaced from each other, sprocket drive device means mounted on said copyboard for transporting said web, including in combination;

first and second spaced wheels having diameters less than the distance between said copyboard surfaces and one of which includes a sprocket wheel having a plurality of projections extending radially outwardly about the periphery thereof, endless pin chain means encircling said wheels for movement between said wheels and about the peripheries thereof, said pin chain means including a plurality of pins extending therefrom, said pins being of a predetermined diameter and spaced predeterminedly from each other for receipt in the spaced apertures in said web,

means coupled to said sprocket wheel for driving the latter rotatably thereby to impart movement along said path to said pin chain means, and

stripper means along which said web passes mounted adjacent said pin chain means and including upper and lower central web guide portions extending between said wheels on opposite sides thereof along planes passing generally through the base of said pins as they are moved between said wheels, and upper and lower end guide portions extending from opposite ends of said upper and lower central guide portions, respectively, toward the upper and lower surfaces of said copyboard, respectively, each said end guide portion being inclined from a corresponding central guide portion toward one of a respective upper and lower surface of said copyboard at a relatively shallow angle for lifting the web from said pins as the web is transported from one of said upper and lower copyboard surfaces and to guide said web onto said pins when the web is transported from one of said upper and lower copyboard surfaces to a respective one of said central guide portions, thereby to avoid tearing of said web about said apertures.

4,010,883

# THREAD DELIVERY DEVICE FOR TEXTILE MACHINES

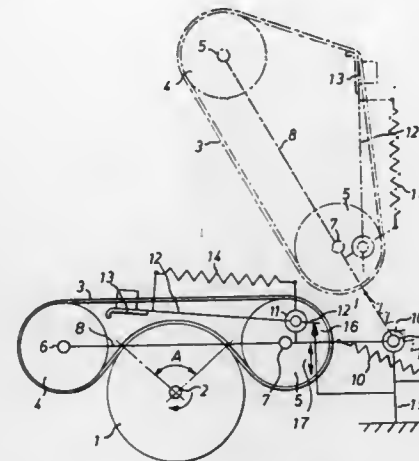
Helmut Ritter, Wattwil, Switzerland, assignor to Herberlein & Co. AG, Wattwil, Switzerland  
Filed Oct. 15, 1975, Ser. No. 622,718

Claims priority, application Switzerland, Oct. 30, 1974, 14519/74

Int. Cl.<sup>2</sup> B65H 51/32

U.S. Cl. 226—171

4 Claims



1. A thread delivery device for a textile machine comprising means providing a first stationary axis, a cylinder mounted coaxially with said axis to be driven thereabout, a pivotable support mounted to swing to and fro about a second stationary axis parallel to said first mentioned axis, spaced rollers mounted for free rotation about spaced parallel axes on said pivotable support, an endless belt embracing said rollers and contacting said cylinder over a predetermined wrap angle when said pivotable support is in an operative position, whereby said cylinder can cause said belt to circulate about said rollers, a pivotally mounted arm, a guide element mounted on said arm to pivot therewith towards and away from a location traversed by said belt when caused to circulate about said rollers, a spring operative on said arm to bias said guide element towards said location, means impeding said guide element from reaching said location when said pivotable support is in said operative position and for freeing said arm to the action of said spring when said pivotable support is moved about said second stationary axis towards an inoperative position wherein said belt is separated from said cylinder, whereupon said guide element engages said belt and removes slack therein.

4,010,884

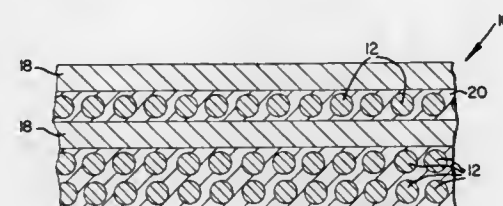
# METHOD OF FABRICATING A FILAMENT-REINFORCED COMPOSITE ARTICLE

Edward A. Rothman, South Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.  
Filed Nov. 20, 1974, Ser. No. 525,573

Int. Cl.<sup>2</sup> B23K 28/00

U.S. Cl. 228—190

6 Claims



1. An improved method of fabricating an impact-resistant filament-reinforced composite article having a plurality of high stiffness, high tensile strength, low density filaments in a lower strength matrix comprising:  
positioning a plurality of filament-reinforced foils compris-

ing parallel boron filaments supported on a foil and attached thereto by a fused binder in a multi-ply layup, said foil and said binder consisting essentially of aluminum or alloys thereof;  
placing at last one laminate of titanium or an alloy thereof between the filament-reinforced foils; and  
subjecting the multi-ply layup to heat and pressure in a diffusion bonding process to join the titanium and the reinforced foils together in a matrix containing the reinforcing filaments.

4,010,885

# APPARATUS FOR ACCURATELY BONDING LEADS TO A SEMI-CONDUCTOR DIE OR THE LIKE

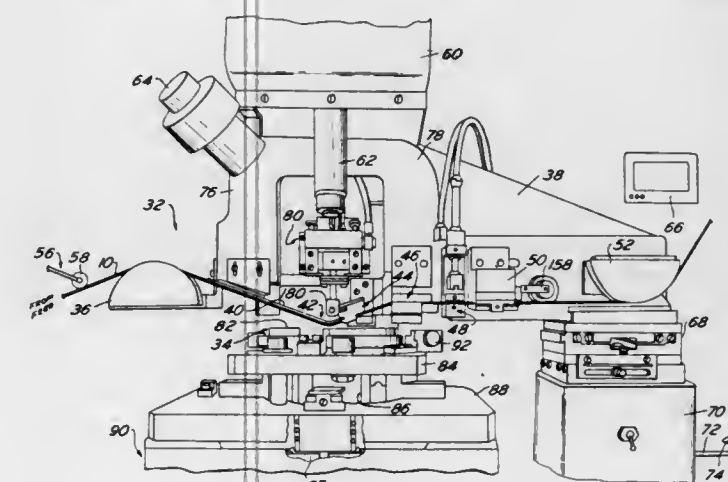
Alan S. Keizer, Huntingdon Valley, and Hugh R. Harris, Levittown, both of Pa., assignors to The Jade Corporation, Huntingdon Valley, Pa.

Filed Sept. 30, 1974, Ser. No. 510,207

Int. Cl.<sup>2</sup> H01L 21/601

U.S. Cl. 228—6 A

7 Claims



1. Apparatus for bonding leads of a lead frame on a film carrier to a die of the type having a plurality of bonding pads, comprising:

means for positioning a die having a plurality of bonding pads adjacent a planar bonding site;

a film carrier track for guiding a film carrier having at least one lead frame thereon to a position adjacent the planar bonding site;

means for adjusting said film carrier track to align a lead frame on the film carrier with the die bonding pads adjacent the bonding site;

a bonding tool disposed above the film carrier track; and  
slide means for automatically moving said bonding tool rectilinearly in a plane substantially parallel to the bonding site from a first rest position at which said bonding tool is spaced apart from a line of view substantially perpendicular to the bonding site to a second position at which said bonding tool is coincident with the line of view, said line of view being unobstructed when said bonding tool is at said first rest position;

means for moving said bonding tool rectilinearly along the line of view from the second position to a third position at which said bonding tool is in operative contact with the lead frame and die adjacent the bonding site; and

means operatively associated with said slide means for inhibiting movement of said bonding tool towards the bonding site until the bonding tool is coincident with the line of view and for permitting uninhibited movement of said bonding tool when it is coincident with the line of view.

4,010,886

# MEANS AND METHODS FOR MAKING A SPIRAL MUFFLER

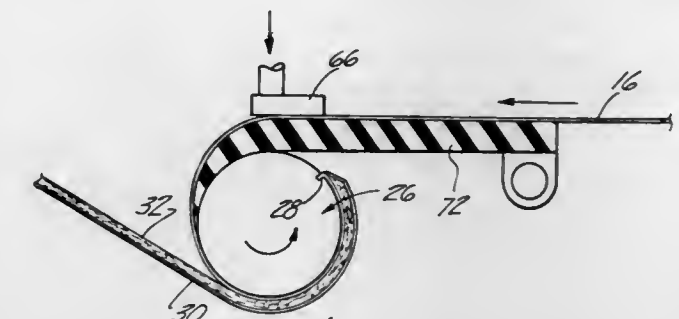
Gerard R. Santos, Levittown, Pa., assignor to The Budd Company, Troy, Mich.

Filed June 23, 1975, Ser. No. 589,274

Int. Cl.<sup>2</sup> B23K 31/00; F01N 7/18

U.S. Cl. 228—173

8 Claims



5. A method of making a spiral muffler having sound absorbing properties comprising the steps of providing a rotatable mandrel and motor means for driving said mandrel, securing together a solid metal strip, sound absorbing material and a perforated screen to provide a composite strip, with said sound absorbing material being disposed between said solid metal strip and said perforated screen, placing a pair of end plates on said mandrel, attaching one end of said composite strip on to said mandrel between said pair of end plates, rotating said mandrel to spirally wind said composite strip, welding the longitudinal edges of said solid metal strip to said pair of end plates as said mandrel is rotated, maintaining a fixed space between adjacent sections of said composite strip as said composite strip is being wound, and varying the speed of rotation of said mandrel to provide a relatively uniform welding operation as said composite strip is wound outwardly away from the axis of said mandrel.

4,010,887

# CARTON FOR EGG-SHAPED CONTAINERS

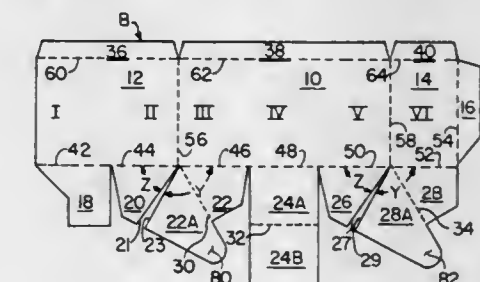
David M. Durham, P.O. Box 408, Mebane, N.C. 27302

Filed Apr. 30, 1975, Ser. No. 573,572

Int. Cl.<sup>2</sup> B65D 85/20, 3/04, 5/36

U.S. Cl. 229—21

1 Claim



1. A collapsible base carton for egg-shaped containers of the type having a circular transverse cross-section, wherein the diameter of said cross-section varies from top to bottom, with the largest effective diameter being slightly nearer the bottom than the top and formed by a plurality of radially extending projections, wherein said base carton comprises:

- a die-cut, pre-folded pre-glued blank means having a first, flattened or knocked down position and a second, unfolded or open position for receiving said containers;
- said blank means including a front wall, rear wall, and a pre-formed, pre-glued bottom wall means;
- said bottom wall means being so connected to the lower edge of said front and rear walls, that when said blank is in said first, flat position, said pre-formed bottom wall means is folded up in between said front and rear walls, and when said blank is opened to said second position,



said bottom wall means is resultingly moved to an extended position forming a double thickness, bottom wall without the necessity of any further securing means;

d. each of said front and rear walls including a retaining means along the top edge thereof, said retaining means comprising at least one downwardly and inwardly foldable flap, and upon folding, the lower free edge of said flap is initially spaced from the corresponding front or rear wall defining a diameter less than the said largest effective diameter of said container with the projections to provide a resiliently biased retaining means; and

e. the distance between the lower edge of said flaps and the bottom wall of said carton is greater than the vertical distance between the bottom of said egg-shaped container and the horizontal plane containing said projections, wherein when said container is emplaced in said carton, the largest effective diameter of said container is below said retaining means.

4,010,888

## SMALL ANIMAL CARRYING CASE

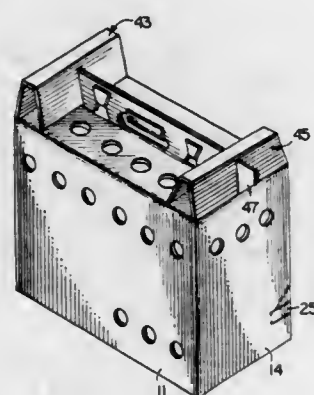
Earl F. Gilbert, Farmington Hills, Mich., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,920

Int. Cl.<sup>2</sup> B65D 5/46

U.S. Cl. 229—52 B

4 Claims



1. A shipping container for small animals prepared from a single blank of paperboard or the like and having an integral handle and an effective top closure locking means comprising:

- opposed pairs of main and side walls foldably connected to define a tube;
- closure panels foldably connected to the lower ends of said main and side walls consisting of a pair of full width panels connected to said main walls and a pair of half width panels connected to said side walls to define a triple wall bottom for said shipping container;
- closure flaps foldably attached to the upper ends of said main and side walls to define a top closure for said shipping container and an integral handle element, said top closure flaps further comprising a pair of substantially identical first flaps attached to the opposed main walls, each of said first flaps including main portions for covering the top of said shipping container and riser portions for forming the integral handle element of said shipping container wherein each of said riser portions each further contain a pair of matching male and female locking tabs and slots, a matching handhole cut out and handhole flap with locking tabs, a pair of hook-like projections at each end thereof which engage matching slots in said symmetrical second top closure flaps and a pair of slots inboard of said hook-like projections which engage matching slots in the ends of said second symmetrical second top closure flaps, and a pair of symmetrical second flaps attached to the opposed side walls, each of said second flaps including three separate panels that are folded over and engage the riser portions of said first flaps; and
- means cut from two adjacent main and side walls of said shipping container near the bottom of said shipping con-

tainer for retaining a feeding/watering receptacle in the finally assembled container, said means further including a removable access panel for said feeding/watering receptacle formed in the adjacent walls of said shipping container.

4,010,889

## ENVELOPE ASSEMBLY

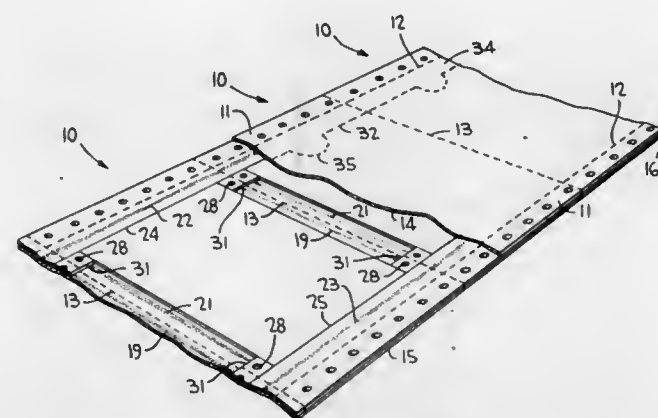
Robert H. Allen, North Tonawanda; Edmund G. Van Malderghem, Lewiston; Victor J. Robertson, Niagara Falls, and William C. Shook, Wilson, all of N.Y., assignors to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Oct. 9, 1975, Ser. No. 621,165

Int. Cl.<sup>2</sup> B65D 27/10

U.S. Cl. 229—69

11 Claims



1. A stuffed sealed envelope assembly comprising superimposed front and back plies, insert material having opposite side and end edges within the sealed envelope, registration means preventing shifting of said insert material relative to said front and back plies, said registration means including chip elements in abutting engagement with and unattached to each of said side and end edges of said insert material for immobilizing said insert material within the envelope, and means including a line of weakening inside one of said side and end edges in said front and back plies providing a tear strip for opening the sealed envelope and exposing said insert material for removal therefrom.

4,010,890

## CENTRIFUGE ROTOR LID

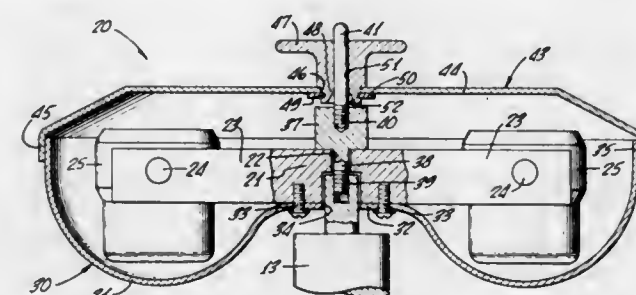
Herschel Eugene Wright, Santa Clara, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 28, 1976, Ser. No. 653,278

Int. Cl.<sup>2</sup> B04B 7/02

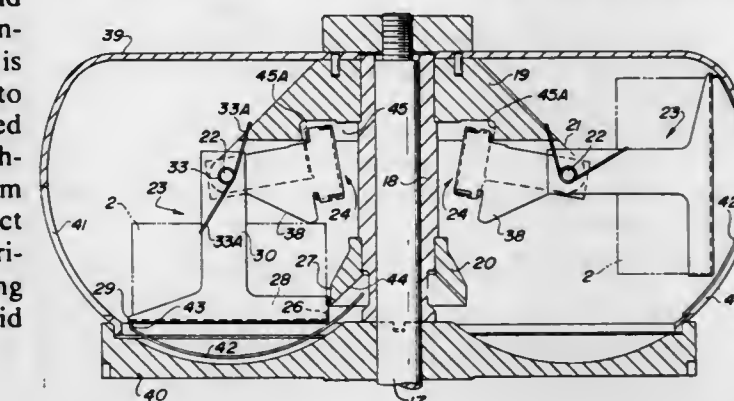
U.S. Cl. 233—1 R

7 Claims



1. A centrifuge rotor comprising:
  - a rotatable yoke having an axis of rotation; and
  - an enclosure for said yoke, said enclosure being operatively connected to said yoke for rotation therewith, said enclosure comprising:
    - shield means physically connected to the bottom of said yoke and extending beneath said yoke and around the sides thereof, said shield means terminating in an upwardly facing circular lip;
    - a pin connected to and extending from said yoke coaxial with the axis of rotation of said yoke; and

lid means positioned over said yoke and terminating in a downwardly facing circular lip which extends in side-by-side, contacting relationship with said shield means lip, said lid means having a central hole for slidably receiving said pin when said lid is placed over said yoke on said shield means, said lid free to move in a vertical and rotational direction relative to said pin when said lid means lip is in said side-by-side contacting relationship with said shield means lip and when said rotor is stationary, said lid means being free of attachment to said enclosure whereby said lid means can be removed from said enclosure when said rotor is stationary without having to physically disconnect said lid means from said enclosure, said lid means being retained in contact with said shield means during operation of said centrifuge by the force created by the naturally-occurring low pressure within said enclosure, beneath said lid means.



4,010,891

## VAPOR REMOVAL APPARATUS FOR OIL/WATER SEPARATOR

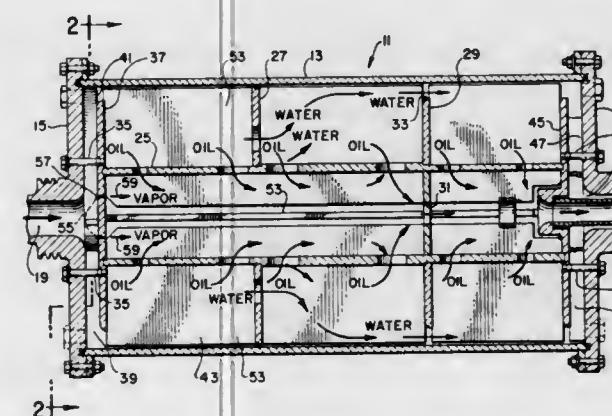
Ernest O. Kartinen, Long Beach, Calif., assignor to Burmah Oil & Gas Company, Long Beach, Calif.

Filed Jan. 8, 1976, Ser. No. 647,472

Int. Cl.<sup>2</sup> B04B 11/02

U.S. Cl. 233—3

4 Claims



1. A centrifugal oil/water separator comprising:
  - an inlet conduit for supplying a mixture of oil and water to said separator, said mixture including vapor bubbles;
  - a main, rotating centrifugal separator chamber;
  - an impeller chamber fluidly connected between said inlet conduit and said main separation chamber;
  - an impeller mounted within said impeller chamber;
  - means comprising plural apertures through said separator plate for permitting flow of said vapor bubbles directly from said inlet conduit to said main chamber at a location adjacent the rotational axis of said chamber; and
  - plural frits mounted in said plural apertures for generating different flow impedances for vapor and liquid flows through said aperture.

4,010,892

## CENTRIFUGE EQUIPMENT AND ANALYTICAL SYSTEM USING IT

Georges Revillet, Onex, and Manuel C. Sanz, Grand-Lancy, both of Switzerland, assignors to Micromedic Systems, Inc., Horsham, Pa.

Filed July 14, 1975, Ser. No. 595,954

Int. Cl.<sup>2</sup> B04B 9/14

U.S. Cl. 233—23 A

7 Claims

1. In equipment comprising a centrifuge for handling and centrifuging liquid material, especially in a carrier or holder for such material, wherein the centrifuge comprises rotor means having an annular axis, a plurality of swing supports on pivotal axes provided in, and spaced equidistantly about, the outer peripheral portion of the annular member, said pivotal

axes lying in a common plane each extending at right angles to a radial line from the rotor axis, the improvement wherein the swing has an open-ended tray adapted to receive a carrier for the liquid material to be centrifuged, the open end of the tray being at the outer end of the tray in respect to the rotor axis when the centrifuge is arrested and the swing is in its position

4,010,893

## TRIAC CENTRIFUGE

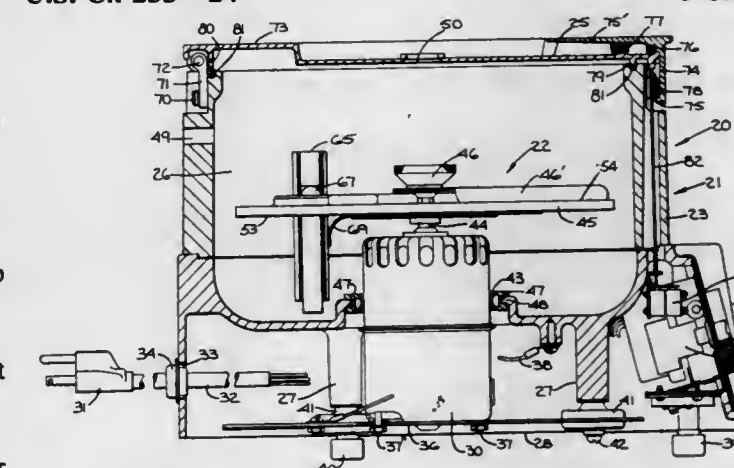
John A. Smith, East Orange; Jack H. Miller, Morristown; Russell C. Schilling, Denville, and Howard L. North, Jr., Newfoundland, all of N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

Filed June 20, 1975, Ser. No. 588,713

Int. Cl.<sup>2</sup> B04B 9/10, 5/02, 7/06

U.S. Cl. 233—24

8 Claims



1. A centrifuge comprising:
  - a stator portion forming a chamber therein and adapted to be positioned on a supporting surface;
  - a rotor portion rotatably mounted in the chamber of the stator;
  - variable drive means on the stator and connected to the rotor to rotate the rotor at desired speeds;
  - sample holding means on the head adapted to hold a number of different types of sample holders;
  - a cover on the stator adapted to be shifted between the open and closed positions;
  - control means connected to the drive means to vary the speed of the rotor to correspond with the speed required for centrifuging the samples being held in the sample holding means and for starting and stopping the centrifuge;
  - the rotor portion including a disc-shaped head of substantially one-piece with appropriate openings and surfaces for receiving the variety of sample holding means thereon;
  - a cruciform flexible sheet forming four extending flaps being mounted on the underside of the head and being



shiftable between one position when there is no sample holder being employed and a second position when there is a sample holder being employed to reduce windage power losses and to facilitate proper air flow in the centrifuge during operation thereof;

the flaps being located opposite openings in the rotor disc by centrifugal force to close the openings in the disc and prevent air flow through the openings in the disc when in the one position and to expose the openings when in the second position; and

the flaps comprising a set of centrifugally operated valves which are held open by sample holders used at lower rotor speeds and allowed to close when the sample holders are removed.

4,010,894

**CENTRIFUGE FLUID CONTAINER**

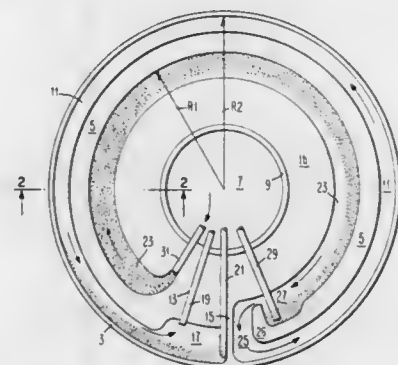
Robert Melroy Kellogg, Endwell, and Victor Robert Kruger, Apalachin, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1975, Ser. No. 634,209

Int. Cl.<sup>2</sup> B04B 5/00

U.S. Cl. 233—27

10 Claims



1. A flexible collapsible centrifuge fluid container comprising two circular pieces of material sealed together at the outer periphery and each having a central opening, the edges of the openings being sealed together,

a plurality of sealed-together annular-like portions of said two pieces of material, forming a plurality of separate concentric-like annular channels, and

inlet/outlet tubes sealed in said material and communicating with said channels.

4,010,895

**SYSTEM FOR PREHEATING A WATER-COOLED VEHICLE ENGINE AND FOR HEATING THE INTERIOR OF THE VEHICLE**

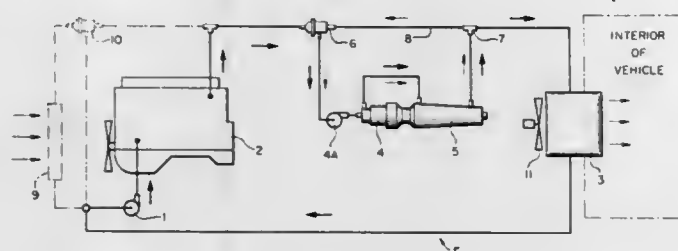
Siegfried Kofink; Wolfgang Rich, both of Esslingen, and Herbert Langen, Altbach, all of Germany, assignors to J. Eberspacher, Esslingen (Neckar), Germany

Filed Nov. 20, 1974, Ser. No. 525,576

Int. Cl.<sup>2</sup> B60H 1/02

U.S. Cl. 237—12.3 C

7 Claims



1. A system, for use in a vehicle propelled by a water cooled engine, for cooling the water cooled engine and for heating the interior of the vehicle, comprising a closed conduit system for circulating a cooling liquid, said water-cooled engine having an inlet and an outlet each connected to said conduit

system so that the cooling liquid can flow through said engine, a first heat exchanger having an inlet and an outlet each connected to said conduit system for flow of the cooling liquid therethrough and said first heat exchanger arranged to transfer heat from the cooling liquid flowing in the cooling system so that the heat can be used subsequently in heating the interior of a vehicle, a thermostat positioned in said conduit system between the outlet from said engine and the inlet into said first heat exchanger with said thermostat arranged for selectively blocking flow through said conduit system, a T-shaped piece connected to said conduit system between said thermostat and the inlet to said first heat exchanger, said thermostat arranged for selectively blocking flow through said conduit system, a heating device including a second heat exchanger, a first branch conduit extending between said thermostat and said heating device and a second branch conduit extending between said second heat exchanger and said T-shaped piece with said thermostat and said T-shaped piece arranged to form a branch conduit including the first branch connection, the heating device including the second heat exchanger, the second branch connection, the portion of said conduit system extending between said thermostat and said T-shaped piece, with said thermostat and T-shaped piece arranged to direct flow through branch conduit separate from the remainder of said conduit system containing said engine and said first heat exchanger so that cooling liquid flowing through said branch conduit can be heated until a selected temperature is reached and then by arranging said thermostat and T-shaped piece flow of the heated cooling liquid can be directed through said conduit system for flow through the first heat exchanger and through said water cooled engine.

4,010,896

**MODULAR LIQUID COLLECTION SYSTEM FOR RAILROAD ROADBEDS**

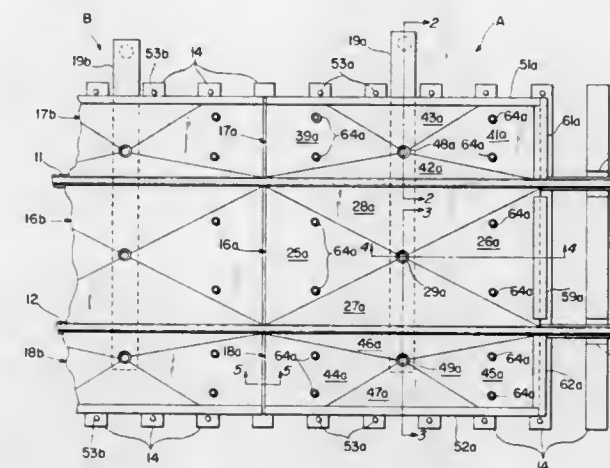
William N. Stockton, 2706 N. 55th St., Omaha, Nebr. 68104

Filed Mar. 25, 1976, Ser. No. 670,145

Int. Cl.<sup>2</sup> E01B 1/00; E01C 9/06

U.S. Cl. 238—2

23 Claims



1. A liquid collection system for the roadbed of a railroad which includes a pair of parallel rails supported by longitudinally spaced ties, the system comprising

- a series of collection modules arranged end-to-end along the roadbed and each of which includes at least one rectangular precast basin which rests on a group of ties and extends alongside at least one of the rails,
- said basin having an upper, liquid-receiving surface defined by four planar faces which slope downward and direct liquid flow toward a centrally located drain opening,
- said basin also having internal locking means arranged to engage oppositely directed tie side faces to limit movement of the basin in the direction of the rails,
- each module also including a precast drain trough located between an adjacent pair of ties beneath said drain opening,

ing and extending transversely of the roadbed to a region beyond one end of the ties, and

e. the drain trough having a discharge opening at said region.

4,010,897

**METHOD AND APPARATUS FOR HOME PRODUCTION AND APPLICATION OF NITROGEN FERTILIZER**

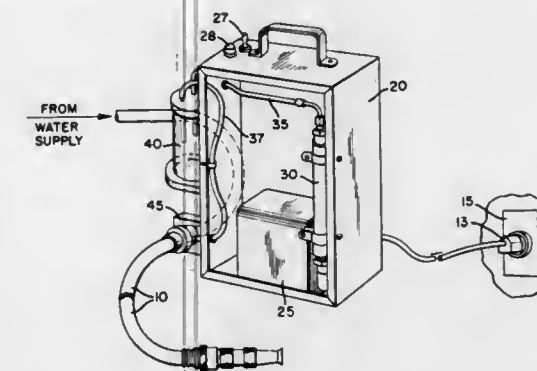
Richard W. Treharne, Xenia, and Charlton K. McKibben, Dayton, both of Ohio, assignors to Charles F. Kettering Foundation, Dayton, Ohio

Filed Mar. 31, 1976, Ser. No. 672,285

Int. Cl.<sup>2</sup> B05B 7/30, 17/04; C05C 11/00; A01C 23/04

U.S. Cl. 239—8

10 Claims



5. A method of home production and application of a fixed nitrogen fertilizer solution to the yard or garden of a home comprising the steps of:

- applying power from an electrical outlet to electrodes mounted in an arc discharge chamber such that a portion of the oxygen and nitrogen in the air in the chamber is ionized and nitrogen oxides are formed,
- transporting the gases in said chamber to a fixture connected between a garden hose and a water faucet and inserting said gases into the water as it flows from the faucet into the hose such that a fixed nitrogen solution is formed, and
- spraying said fixed nitrogen solution on the yard or garden with said garden hose.

4,010,898

**IRRIGATION METHOD AND APPARATUS**

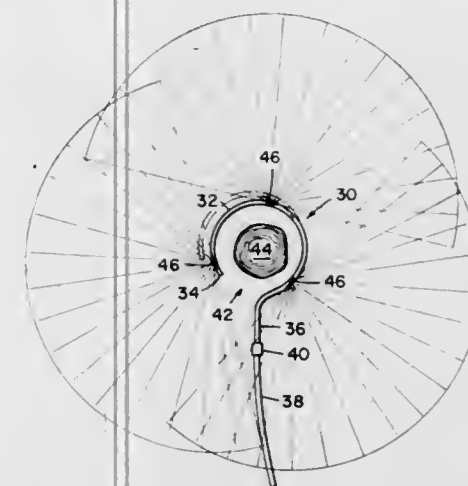
David M. Williams, 165 Riker Terrace, Salinas, Calif. 93901

Filed July 21, 1975, Ser. No. 597,327

Int. Cl.<sup>2</sup> B05B 1/04

U.S. Cl. 239—11

14 Claims



1. A method of distributing a liquid around plant, comprising:

- selecting and forming spring conduit means having an open end and a closed semipermanently shaped, into a semicircular spring loop defining a variable throat having a width less than the diameter of said loop,

mounting a plurality of sprinkler heads having a fan shaped spray pattern in the upper wall thereof, said upper wall being defined as the upper surface of the conduit when the loop lies in a substantially horizontal plane;

hooking said loop around the trunk of a plant, connecting said open end of said conduit means to a supply of liquid under pressure;

arranging said spray patterns to extend solely away from said plant; and

arranging said spray patterns to partially overlap for thereby forming an annular spray pattern about said plant.

4,010,899

**PULSATING FLUID SPRAY DEVICE**

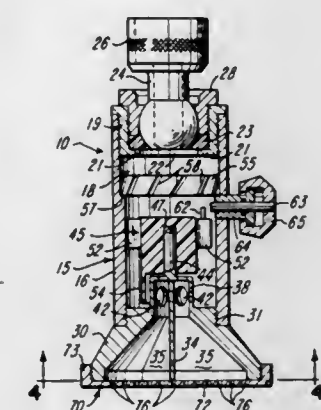
Charles J. Heitzman, 1200 College Walk, Honolulu, Hawaii 96817

Filed Nov. 19, 1975, Ser. No. 633,227

Int. Cl.<sup>2</sup> B05B 1/08

U.S. Cl. 239—101

11 Claims



1. A pulsating fluid spray device adapted for use as a shower head, comprising a housing defining a fluid passage having an inlet adapted to be connected to a fluid supply, said housing including a discharge end portion having a plurality of angularly disposed partitions defining a corresponding plurality of fluid chambers therebetween, a discharge end wall connected to said housing and having means defining a plurality of nozzle discharge orifices for each of said fluid chambers, a cup-shaped stator wall projecting axially from said fluid chambers and connected to said housing, said partitions extending from said discharge end wall into said cup-shaped stator wall and forming extensions of said chambers into said stator wall, means defining a plurality of peripherally spaced ports within said stator wall between said partitions and providing for an inward flow of fluid from said fluid passage directly into said extensions of said fluid chambers and against said partitions, a turbine valve rotor supported for rotation within said fluid passage, said valve rotor including a projecting closure portion having a rotational path surrounding said ports for successively closing said ports and momentarily restricting the inward flow of fluid from said fluid passage into said extensions of fluid chambers in response to rotation of said valve rotor, and means within said housing for directing the fluid along a path to produce rotation of said valve rotor for pulsating the fluid discharged from said orifices.

11. A pulsating fluid spray device adapted for use as a shower head, comprising a housing defining a fluid passage having an inlet adapted to be connected to a fluid supply, said housing including a discharge end portion having a plurality of angularly disposed partitions forming a corresponding plurality of angularly disposed fluid chambers, a discharge end wall connected to said housing and said partitions and defining a plurality of nozzle discharge orifices for each of said fluid chambers, a stator wall connected to said housing and defining a corresponding plurality of angularly disposed ports connecting said fluid chambers directly to said fluid passage, a turbine valve rotor having means defining an axially extending blind bore with an inner end surface, a stationary shaft projecting axially upstream from said stator wall into said bore and en-



gaging said end surface to support said valve rotor for rotation within said fluid passage, said valve rotor including a closure portion having a rotational path adjacent said ports for successively closing said ports and momentarily restricting the flow of fluid from said fluid passage into the corresponding said fluid chambers in response to rotation of said valve rotor, and means within said housing for directing the fluid along a path to produce rotation of said valve rotor to provide for pulsating the fluid discharged from said orifices.

4,010,900

## MOBILE AGRICULTURAL SPRAY MACHINE

Jean-Marie Flix, 10600 LaChapelle Saint Luc, Mergey, and Guy Payen, 10170 Mery sur Seine, Chauchigny, both of France

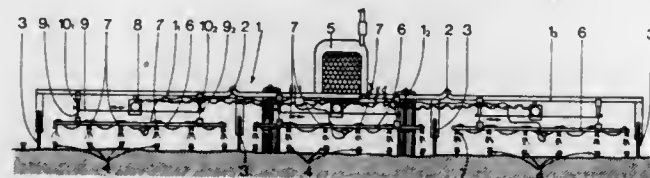
Filed Dec. 24, 1975, Ser. No. 644,078

Claims priority, application France, Dec. 31, 1974, 74.43377; Sept. 10, 1975, 75.27678

Int. Cl.<sup>2</sup> B05B 1/20; E01H 3/02; A01B 49/02

U.S. Cl. 239—168

13 Claims



1. In a powder spraying machine for agricultural use, a tractor vehicle having a powder hopper, a frame assembly with wheels including means to affix said powder hopper to said tractor vehicle, said frame assembly having at least two movable sections mounted on wheels; at least two spraying conduits with spray nozzles wherein said conduits are suspended from said assembly moveable sections, motorized adjusting means to permit individual lateral adjustment of each of said conduits, perpendicular to the direction of advance of the tractor vehicle wherein each of said conduits can be individually and laterally moved by said motorized adjusting means during the advance of said tractor and, further adjusting means for adjusting the height and separation of the spray nozzles of each said conduit.

4,010,901

## PROJECTABLE LAWN SPRINKLER

Kerney T. Sheets, P.O. Box 637, Duplessis, La. 70728

Filed Mar. 1, 1976, Ser. No. 662,827

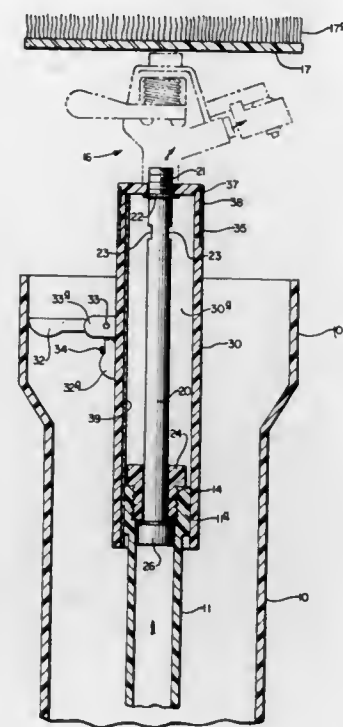
Int. Cl.<sup>2</sup> B05B 15/10

U.S. Cl. 239—204

22 Claims

1. A projectable lawn sprinkler comprising:  
a. housing means;  
b. pipe means rigidly connected to said housing means;  
c. projectable conduit means connected to said pipe means;

d. projectable damper means covering a portion of said pipe means, said projectable damper means being rigidly connected to said projectable conduit means; and,



e. means connected to said projectable conduit means for spraying water.

4,010,902

## BLOW GUNS

Geoffrey Edward Speyer, Worcester, England, assignor to Taylor & Osborne Limited, Birmingham, England

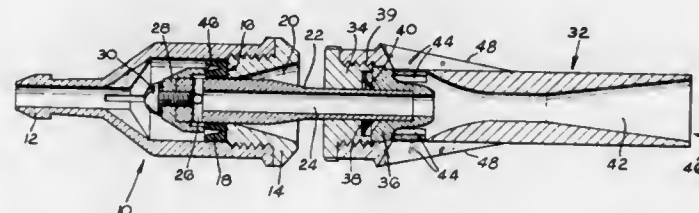
Filed Nov. 3, 1975, Ser. No. 629,091

Claims priority, application United Kingdom, Oct. 9, 1975, 41459/75

Int. Cl.<sup>2</sup> B05B 1/28, 1/30

U.S. Cl. 239—428.5

6 Claims



1. A blow gun comprising a hollow body having an inlet for compressed air at one end of the body, a tube extending from the other end of the body, said tube having a closed end mounted to swivel in the body, and further having radial port leading from the interior to the exterior of the tube adjacent to the closed end of the tube, a cap carried by the closed end of the tube which is radially spaced from the periphery of the tube and shrouds said port, a seal in the body, surrounding the tube, on which the cap normally seats to prevent air from entering said port, but from which one side of the cap can be separated by swinging the tube out of axial alignment with the body to admit air to said port, wherein the improvement comprises a nozzle fixed on the outer end of the tube, said nozzle having a Venturi passage extending outward from the tube, the inner end of such passage being radially spaced from the tube and having ports arranged laterally of the tube which act as inlets when air is discharged through the nozzle and as outlets when the nozzle is obstructed, and a plurality of radial vanes on the periphery of the nozzle which extend from the inner ends of the lateral ports substantially beyond the outer ends thereof.

4,010,903

## NOZZLE FOR INJECTION MOLDING OF THERMOPLASTICS

Osamu Sakuri; Toshio Saito, and Masanori Kato, all of Tokyo, Japan, assignors to Torazo Saito, Tokyo, Japan

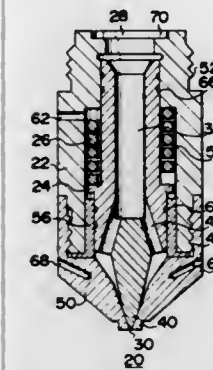
Filed Apr. 21, 1975, Ser. No. 569,928

Claims priority, application Japan, June 27, 1974, 49-72764

Int. Cl.<sup>2</sup> B05B 1/30

U.S. Cl. 239—533.1

11 Claims



1. An improved plug-in type small nozzle adapted to be inserted into a mold cavity for injecting molten resin of thermoplastic into a cavity and for use in sprueless and runnerless types of multi-cavity molding processes comprising:

a cylindrical body having a cylindrical piston chamber therein open at the forward end and having an inlet at the rear end for introducing molten resin to said piston chamber;

a ring with a flange on the circumference of the front end disposed in said piston chamber, the outer surface of said ring except said flange in contact with the interior surface of the front end of the piston chamber, the rear surface of said flange in contact with the front surface of said cylinder;

a cone shape cylinder cap attached to the front end of said cylinder so that the ring is captured between the front surface of said cylinder and a transverse flat rear surface of said cylinder cap;

a gate at the front end of said cylinder cap opening along the axis of said cylinder for injecting molten resin in said piston chamber into the mold cavity;

a differential moving piston disposed in said piston chamber slidable along the axis of said cylinder for dividing said piston chamber into a front portion and a rear portion, the outer surface of the rear portion of the differential moving piston in axial slidable contact with the interior surface of the rear end of the piston chamber, the outer surface of the front end of the differential moving piston in axial slidable contact with the interior surface of said ring;

a front surface of said differential moving piston defining said front portion of the piston chamber;

a rear surface of said differential moving piston defining said rear portion of the piston chamber, the area of the rear surface being slightly smaller in the effective area functioning as a piston head than that of said front surface;

a needle protruding forward along the axis of said cylinder from said front surface of the differential moving piston, mating with said gate when said differential moving piston is located in the front position of the sliding movement and being apart from said gate when said differential moving piston is located in the rear portion of the sliding movement;

a plurality of annularly spaced passages through said differential moving piston substantially parallel to the axis of said cylinder interconnecting said front portion and said rear portion of the piston chamber for facilitating the application of the same pressure of molten resin on said front surface as on the rear surface to cause backward differential force between the total pressure applied on

said front surface and the total pressure applied on said rear surface;

a spring disposed in the piston chamber to apply force to the differential moving piston for holding the differential moving piston in the front position of the sliding movement against said backward differential force until the pressure of molten resin becomes a predetermined value; means on the rear end of said cylinder for attaching the cylinder to a molding machine;

the forward end of the cone shaped tip having a configuration adapted to permit direct connection to a mold cavity with the downward end forming part of the inner wall of the mold cavity.

4,010,904

## GRINDING MILL TRUNNION DISCHARGER TO OPPOSITE FACING SCREENS

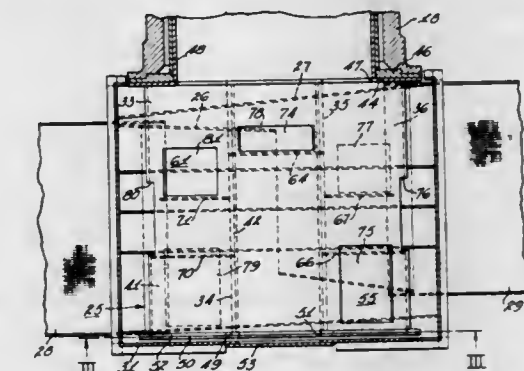
David M. Kjos, Wauwatosa; Raymond C. Jenness, Milwaukee; Richard E. Sabaski, Hales Corners, and Carl A. Roloff, Nashotah, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 19, 1976, Ser. No. 678,166

Int. Cl.<sup>2</sup> B02C 23/10

U.S. Cl. 241—79.3

7 Claims



1. In a material discharger for a rotatable grinding mill having a discharger end;

a frame having an axis of rotation carried by the grinding mill for rotation with it;

a plurality of compartments carried by said frame for rotation with the frame and around the axis of rotation of said frame

material inlet openings in one end of each of said compartments adjacent the discharge end of the grinding mill; a plurality of vibrating screens disposed below said discharger in position to receive material from the discharger; and,

port means in each compartment in position to effect a discharge of material from its associated compartment to said screens as said compartments rotate with said frame about its axis of rotation.

4,010,905

## LINER SEGMENT FOR USE IN CONE CRUSHERS AND THE LIKE

Jerome C. Motz, Milwaukee, and Robert J. Pokora, Cudahy, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Mar. 25, 1975, Ser. No. 561,793

Int. Cl.<sup>2</sup> B02C 2/04

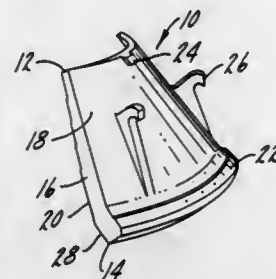
U.S. Cl. 241—295

2 Claims

1. A liner segment for use as a part of a composite liner assembly for lining the bowl in a cone crusher, the segment including a generally upright body portion in the form of a circumferential section of a frustoconical liner, the segment being of limited horizontal peripheral extent with a substantially greater horizontal dimension at the bottom than at the top, the side edges being defined by generally vertical surfaces adapted to oppose like surfaces on adjacent liner segments when mounted in the bowl of a crusher, the body being cir-



cumferentially curvilinear between the generally vertical side edge surfaces defining a somewhat convex outer surface to be positioned against the bowl of the crusher and a somewhat concave inner surface shaped and arranged to define a portion of the crushing cavity in the cone crusher, the segment having a maximum thickness at the bottom and diminishing in thickness toward the top, a peripherally continuous unitary lower bowl-engaging surface adjacent to and limited to the bottom



edge of the segment projecting outwardly from the convex outer surface, and a unitary upper bowl-engaging projection adjacent the upper edge of the segment extending outwardly from the convex outer surface a distance generally equal to the distance of extension of the peripheral continuous lower surface, the upper projection extending a peripheral distance between the vertical surfaces which is substantially less than the peripheral extent of the upper edge between the vertical surface.

4,010,906

# MACHINE FOR WINDING THREAD INTO TUBULAR SHELLS WITH CONVEX ENDS

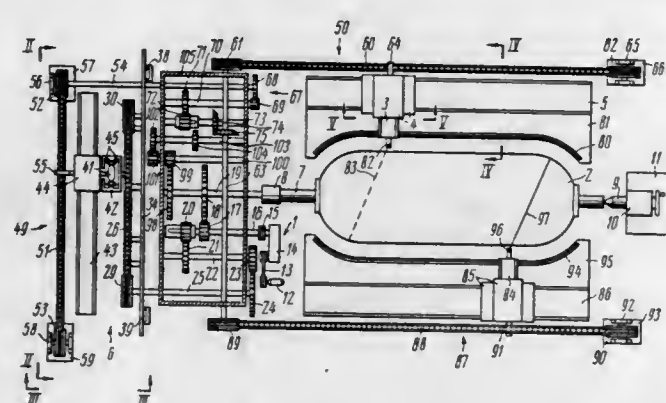
Igor Vasilievich Kaminsky, ulitsa Lenina, 51, kv. 12, Severodonetsk Voroshilovgradskoi oblasti; Viktor Dmitrievich Protasov, 9 Sokolnicheskaya ulitsa, 4, korpus 2, kv. 32, Moscow; Viktor Alexeevich Pimenov, ulitsa Donetskaya, 35, kv. 57, Severodonetsk Voroshilovgradskoi oblasti; Vyacheslav Alexandrovich Barynin, ulitsa Chernyakhovskogo, 4, kv. 81, Khotkovo Moskovskoi oblasti; Vladimir Vladimirovich Sheshtakov, ulitsa Lisichanskaya, 41, kv. 30, Severodonetsk Voroshilovgradskoi oblasti; Vladimir Larionovich Polyakov, ulitsa Chernyakhovskogo, 4, kv. 69, Khotkovo Moskovskoi oblasti; Genrikh Fedorovich Severov, ulitsa Pervomaiskaya, 29, kv. 41, Severodonetsk Voroshilovgradskoi oblasti; Aron Iosifovich Zaitsev, ulitsa Donetskaya, 53, kv. 40, Severodonetsk Voroshilovgradskoi oblasti, and Stanislav Vasilievich Stepanov, ulitsa Mayakovskogo, 11b, kv. 58, Severodonetsk Voroshilovgradskoi oblasti, all of U.S.S.R.

Filed May 12, 1975, Ser. No. 576,442

Int. Cl.<sup>2</sup> B21F 17/00

U.S. Cl. 242-7.21

11 Claims



1. A machine for winding on a mandrel a thread, such as a resin-impregnated fibreglass thread, to form from the thread a tubular shell with convex ends, comprising:  
a mechanism for rotating a mandrel which has a central horizontal axis around its axis;

a first horizontal guide arranged parallel to the axis of said mandrel;  
a traverse carriage installed on said horizontal guide for movement therealong;  
a thread guide installed on said carriage for movement therewith along said first horizontal guide and for movement with respect thereto in a direction perpendicular to the axis of said mandrel;  
an endless flexible linkage connected with said mandrel-rotating mechanism to be driven thereby;  
master guides engaging said endless flexible linkage for guiding and setting the position and configuration in space of said endless flexible linkage; the shape of said master guides including a curve which in the rectangular system of coordinates  $x, y$  is determined by the relation:

$$y = \int \sqrt{A^2 \left( \frac{d\psi}{dx} \right)^2 - 1} dx + C,$$

wherein  $x$  is travel of said carriage with said thread guide, an abscissa of a point on said curve determining the shape of the master guides;

$\psi = f(x)$  is the relation between the turning angle  $\psi$  of said mandrel and the travel of said carriage with said thread guide;

$A$  is a constant determining the ratio of speed of the endless flexible linkage to the rotation speed of said mandrel;

$C$  is an integration constant assumed to be zero;

$y$  is an ordinate of the point on the curve determining the shape of the master guides;

a vertical guide;

a vertical-guide carriage for transmitting motion to said vertical guide from said endless flexible linkage, said vertical-guide carriage being mounted on said vertical guide for movement therealong and being articulated to said endless flexible linkage;

a second horizontal guide;

a motion-transmitting carriage installed on said second horizontal guide for movement therealong and rigidly connected with said vertical guide, and means linking said motion-transmitting carriage kinematically with said traverse carriage for transmitting movement of said motion-transmitting carriage to said traverse carriage.

4,010,907

# APPARATUS FOR AUTOMATICALLY SUPPLYING COPS TO A THREAD WINDER

Shigeyuki Nishiyama; Yoshio Orii, both of Amagasaki; Kotaro Tsurumi, Takatsuki, and Kunio Nishimura, Amagasaki, all of Japan, assignors to Nihon Spindle Seizo Kabushiki Kaisha, Amagasaki, Japan

Filed Aug. 23, 1974, Ser. No. 500,211

Claims priority, application Japan, Aug. 24, 1973, 48-94938

Int. Cl.<sup>2</sup> B65H 54/20, 54/26

U.S. Cl. 242-35.5 A

6 Claims

1. An apparatus for automatically supplying cops to a winder having plural winding units and a rotary cop magazine for each winding unit for holding a plurality of supply cops, said apparatus comprising a cop feeder travelling along the winder, said cop feeder including

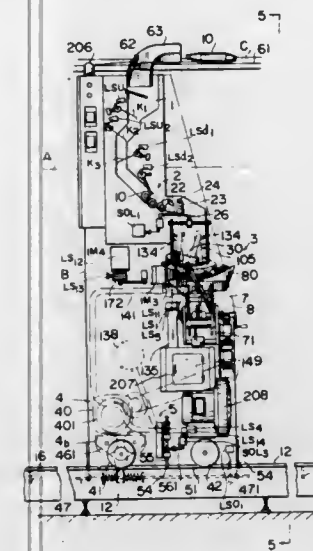
A. a halting means for stopping said cop feeder in registry with any one of said magazines of the winder;

B. a containing unit for storing in a line a number of cops;

C. a feed-out section for successively feeding out cops from said containing unit;

D. a charging section waiting at the cop-receiving position below said feed-out section and receiving and holding cops supplied from said feed-out section, said charging section being movable from a position adjacent said feed-out section to a position adjacent said magazine, means

for shifting said charging section after receipt of cops to the position adjacent said magazine for charging cops to the magazine, said position being close to the cop supply point of the magazine;  
E. a yarn end-treating section comprising a yarn take-out means for taking out the end of yarn wound on the cop present in said charging section;



a yarn-gathering means for gathering the yarn spread between said yarn take-out means and the cop charged in the magazine toward a yarn-sucking opening of a yarn clamp of the magazine to catch the yarn by suction and

a yarn-cutting means for cutting said yarn spread between said yarn take-out means and yarn clamp of the magazine.

4,010,908

# METHOD AND APPARATUS FOR HANDLING LINEAR ELEMENTS

John L. Patterson, Granville, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

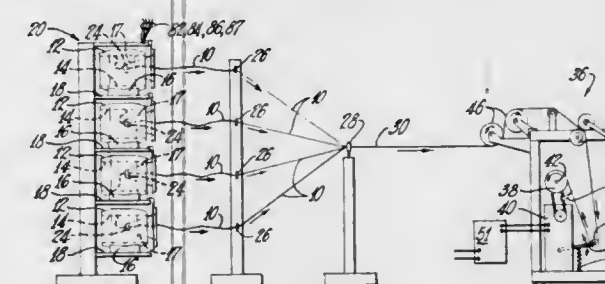
Filed July 29, 1974, Ser. No. 492,373

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B65H 63/00

U.S. Cl. 242-36

15 Claims



1. A method for handling a linear element comprising:

- linearly advancing a linear element along a given path such that a beam of light directed to the element is reflected therefrom with varying intensity with regard to the speed of advancement of the element;
- directing a beam of light to the element for reflection therefrom;
- sensing changes in the intensity of the light reflected from the element as an indication of changes in the speed of its advancement;
- supplying a signal which varies in response to changes in intensity of the reflected light; and
- controlling advancement of the linear element in response to the signal.

4,010,909

# DISPENSING CABINET FOR SHEET MATERIAL

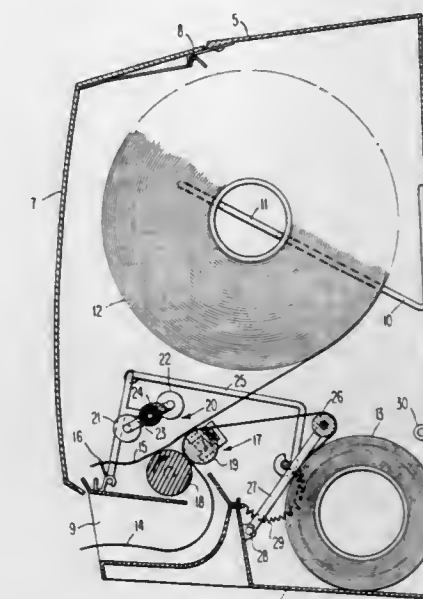
Lehyman John Bastian, Media, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Sept. 15, 1975, Ser. No. 613,070

Int. Cl.<sup>2</sup> A47K 10/38, 10/22; B65H 19/04

U.S. Cl. 242-55.3

5 Claims



1. In a dispensing cabinet for sequentially dispensing sheet material from a primary roll and a reserve roll, comprising first and second feed rollers rotatably mounted to form a nip through which sheet material is passed to dispense it from the cabinet, drive means for rotating the first feed roller, transfer means for feeding sheet material from the reserve roll into the nip upon engagement of the transfer means with the feed rollers, and transfer actuation means for causing the transfer means to engage the feed rollers in response to substantial depletion of the sheet material in the primary roll, the improvement wherein:

the transfer means comprises first and second rotatably mounted transfer rollers, each being mounted for movement into engagement with a different feed roller for pressing the reserve roll sheet material into contact with both feed rollers at spaced-apart locations on the sheet material and on the inwardly rotating side of the nip when the transfer rollers engage the feed rollers; and

the feed rollers and the transfer rollers being adapted to drive the reserve roll sheet material towards the nip by the cooperation of the first transfer roller with the first feed roller and being adapted to block the reserve roll sheet material from being driven past the transfer means by the cooperation of the second transfer roller with the second feed roller, whereby the reserve roll sheet material is crowded into the nip upon engagement of the transfer rollers with the feed rollers and rotation of the first feed roll.

4,010,910

# FILM SUPPLY AND TAKE-UP SYSTEM FOR MOTION PICTURE PROJECTOR

Angelo Boudouris, Sylvania; William D. Petty, Perrysburg, and Clarence S. Simonds, Sylvania, all of Ohio, assignors to Eprad Incorporated, Toledo, Ohio

Filed Sept. 29, 1975, Ser. No. 617,520

Int. Cl.<sup>2</sup> B65H 17/48; G03B 21/00

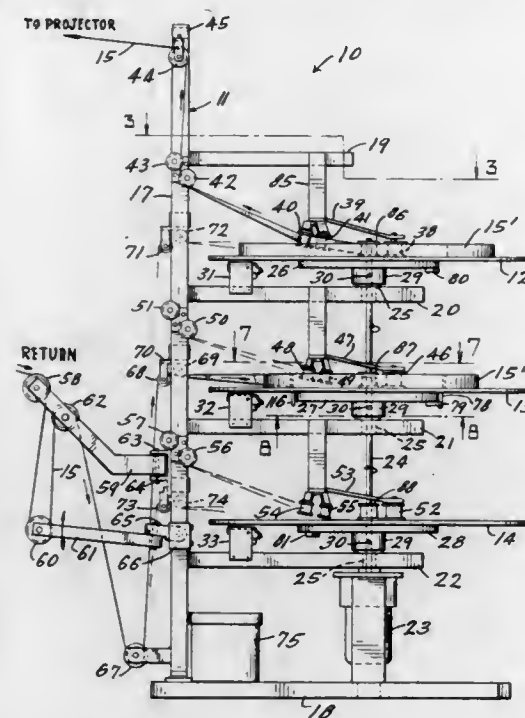
U.S. Cl. 242-55.18

13 Claims

1. In a motion picture projection system, an improved film transport for supplying film to a projector through which the film is advanced and for taking up film from the projector comprising, in combination, a drive shaft, motor means for rotating said drive shaft at a controlled speed, at least two platter means for carrying coils of film, means for rotationally driving each of said platter means simultaneously from said



drive shaft, one of said platter means functioning as a film take-up platter means for winding a coil of film from the projector and the other of said platter means functioning as film supply platter means for supplying film to the projector, means for controlling the rotational speed of said drive shaft for driving said take-up platter means to wind film at the same



average rate that such film is advanced through the projector, and means for decreasing the rotational speed of said film supplying platter means below the rotational speed of said film take-up platter means for supplying film from a film coil on said film supplying platter means at the same average rate that such film is advanced through the projector.

4,010,911

# SPLICING APPARATUS FOR WEBS OF METALLIC FOIL OR THE LIKE

Bob Heltmann, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

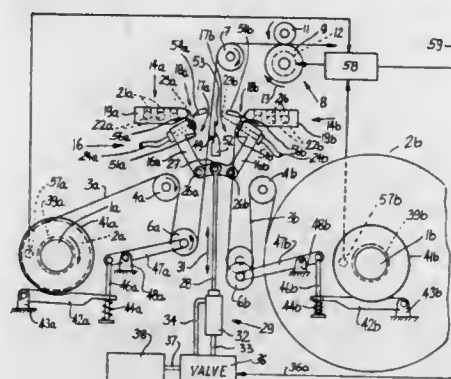
Filed Nov. 13, 1975, Ser. No. 631,850

Claims priority, application Germany, Dec. 6, 1974, 2457714

Int. Cl.<sup>2</sup> B65H 19/16

U.S. Cl. 242—58.4

11 Claims



1. Apparatus for attaching a running web which is withdrawn from a first source of supply to the leader of a fresh web which is stored in a second source of supply by means of a uniting band both sides of which are adhesive, comprising means for advancing the running web along a predetermined path; first and second positioning means disposed at the opposite sides of said path, the leader of the fresh web being held by said second positioning means; first and second severing means disposed at the opposite sides of said path and being actuatable to sever the respective webs intermediate the corresponding sources and said advancing means; a splicer having

first and second sections actuatable to move toward and away from each other intermediate said positioning means and said sources, said path and the leader of the fresh web being located between said sections; means for holding a uniting band so that the band is located between said sections and between the running and fresh webs; first and second trimming means disposed at the opposite sides of said path and being operable to trim the leaders of webs which are respectively held by said first and second positioning means; and means for actuating said sections and said first severing means whereby said sections attach the running and fresh webs to the opposite sides of the band and said first severing means severs the running web intermediate the uniting band and said first source, said actuating means comprising means for operating said trimming means whereby said second trimming means trims the leader of the fresh web intermediate said holding means and said second positioning means.

4,010,912

# APPARATUS FOR COLLECTING WEBS OF PHOTOGRAPHIC PAPER OR THE LIKE

Karl Dreher, Munich; Adolf Fleck, Unterhaching; Christian Götz; Ernst Ismann, both of Munich, and Mathias Pflugbeil, Baldham, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

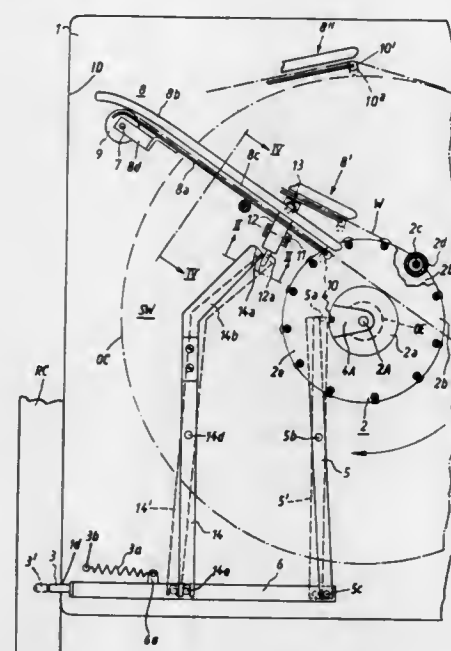
Filed Sept. 24, 1975, Ser. No. 616,418

Claims priority, application Germany, Sept. 26, 1974, 2445998

Int. Cl.<sup>2</sup> B65H 17/02, 75/28

U.S. Cl. 242—67.1 R

18 Claims



1. Apparatus for collecting webs of flexible material, particularly webs of photographic paper issuing from a copying machine, comprising a rotary collecting member having a slotted periphery for introduction of the leader of a web; means for rotating said member in a direction to convolute the web about said periphery once the leader of such web has entered said member whereby the convolutions of the web form a growing roll surrounding said member; guide means defining an elongated channel through which the web passes on its way toward said member, said guide means being movable between a first position in which said channel extends substantially radially of said member so as to introduce the leader into the interior of said member and a second position in which said channel is substantially tangential to said periphery; means for propelling said guide means from said first to said second position in response to actuation of said rotating means; and intercepting means movable between operative and inoperative positions in which said intercepting means respectively prevents and permits the movement of said guide means from said second to said first position.

4,010,913

# RETRIEVER REEL

Rene L. Guerster, Maple Glen, and Leigh David Leiter, Willow Grove, both of Pa., assignors to Ametek, Inc., New York, N.Y.

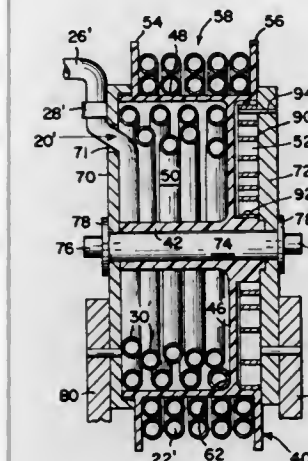
Continuation of Ser. No. 185,506, Oct. 1, 1971, abandoned.

This application Oct. 9, 1973, Ser. No. 404,433

Int. Cl.<sup>2</sup> B65H 75/48

U.S. Cl. 242—107

8 Claims



1. A retriever reel comprising a stationary base means, a drum means mounted for rotational movement relative to said base means, a continuous line means having a first portion arranged for unreeling movement from said drum means, a second portion arranged for stationary mounting on the base means and an intermediate portion extending between said first and second portions and arranged in a random-lay spiral coil having a variable diameter and multiple layers extending around the axis of said drum means and remote therefrom to accommodate said relative movement, means attaching said first line portion to said drum means, and means for attaching said second line portion to said base means, said random-lay spiral coil decreasing in coil diameter as the drum means rotates in one direction relative to the base means as the first portion of the line means is unreeling and increasing in coil diameter when the drum means rotates in the other direction relative to the base means to rewind the first portion of the line means onto the drum means.

4,010,914

# PRIMER CORD DISPENSER

Leon Kowalski, Box 213, Snow Lake, Manitoba, Canada

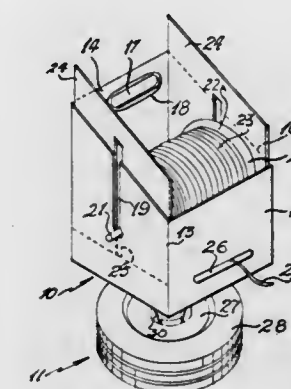
Filed May 28, 1975, Ser. No. 581,488

Claims priority, application Canada, June 17, 1974, 202642

Int. Cl.<sup>2</sup> B65H 49/00

U.S. Cl. 242—129.62

8 Claims



1. A dispenser for explosive primer cord and the like which is wound upon a reel having a transversely extending central bore; comprising in combination a container and a base, means mounting said container upon said base for free rotation in a plane parallel to said base, detachable spindle means in said container to receive the associated reel and to mount same for free rotation upon said spindle and a cord dispensing

aperture in one wall of said container, said container including a rear wall, a front wall, a base plate and a pair of side walls forming a substantially cubicle container and at least one selectively detachable spacer plate engaging within said enclosure between one side of the associated reel and one of said side walls of said container, said spacer plate having a substantially vertical slot extending upwardly from the lower edge of said spacer plate and terminating spaced from the upper edge of said spacer plate, said slot engaging said spacer plate over said detachable spindle means, said spacer plate having a configuration similar to one of said side walls but with the upper edge of said spacer plate extending above the upper edge of said side wall when said spacer plate is engaged within said container, said spacer plate being removed by grasping said extending upper edge.

4,010,915

# PROCESS FOR THE CONTROL OF YARN TENSION

Hans-Jürgen Strutz, and Ingolf Jacob, both of Bobingen, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

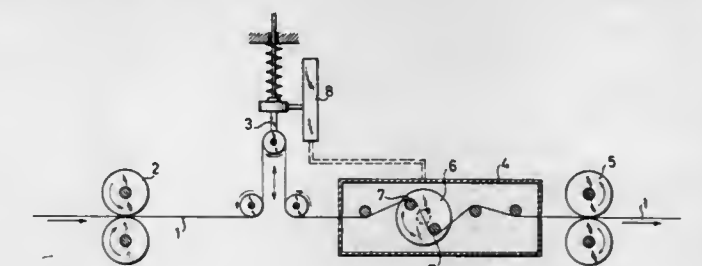
Filed May 13, 1975, Ser. No. 577,042

Claims priority, application Germany, May 18, 1974, 2424302

Int. Cl.<sup>2</sup> B65H 59/26

U.S. Cl. 242—147 R

3 Claims



1. A process for the control of the tension of a travelling yarn or thread over a determined distance, which comprises supplying the yarn to travel over the predetermined distance at a substantially constant linear speed, obtaining of the yarn tension by using a yarn brake after the above distance working in direction of the travelling yarn and being connected with a yarn tension feeler measuring the yarn tension before the brake, drawing off the yarn from the brake at a substantially constant linear speed, measuring the yarn tension by the yarn tension feeler and, upon rising tension of the yarn in the controlled section, increasing the braking effect of the yarn brake, or upon decreasing tension of the yarn in the controlled section, decreasing the braking effect of the yarn brake.

4,010,916

# DEVICE FOR PROVIDING PROPER LAYING OF CABLE ON THE DRUM OF A CRANE

Fabian F. Swain, Kingsley, Iowa 51028

Filed Sept. 24, 1975, Ser. No. 616,507

Int. Cl.<sup>2</sup> B65H 57/28

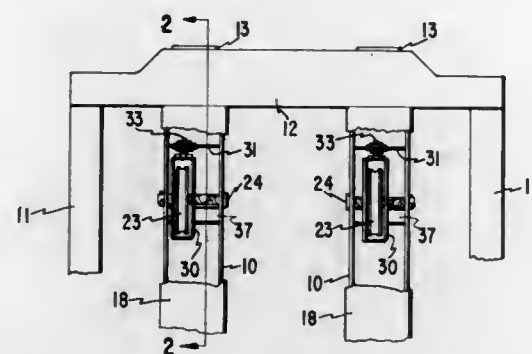
U.S. Cl. 242—157.1

3 Claims

1. In combination with a hoist including a platform, power-driven drum means rotatably mounted on said platform, a hoist cable attached to said drum means and adapted to be wound onto said drum means, and upright means on said platform through which said cable is adapted to run; means for guiding said cable onto and off from said drum comprising: a cross-threaded axle fixed in said upright means having an axis substantially parallel to that of said drum means and adjacent to said drum means, a sheave wheel rotatably mounted on said axle and laterally movable thereon, said sheave wheel having a part engaged in the threads on said axle so that rotation of the wheel causes a back and forth axial movement across said axle, framework means surrounding said sheave wheel and having parts adjacent the sides of said sheave wheel near said



axle, said framework means including a guide rod extending therefrom, said guide rod being engaged with part of said upright means to guide said framework means, said sheave wheel being engageable with said framework means to that



movement of said wheel is effective to move said framework means, said framework means also including lip means extending therefrom, said lip means extending adjacent to and being slidable along a part of said upright means.

4,010,917

# AUTOMATIC STOP DEVICE FOR A MAGNETIC TAPE RECORDING AND/OR PLAYBACK APPARATUS

Theophil Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

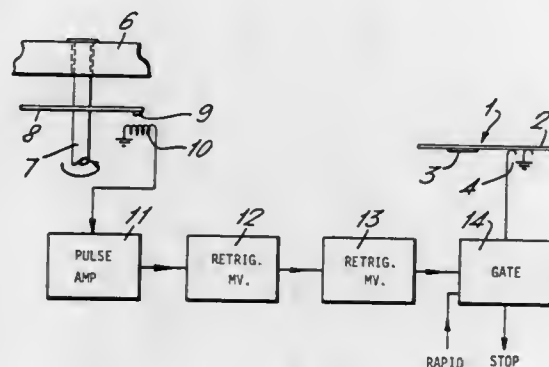
Filed July 29, 1975, Ser. No. 600,089

Claims priority, application France, July 30, 1974, 74.26453

Int. Cl.<sup>2</sup> G11B 15/06, 15/54; B65H 25/32

U.S. Cl. 242—188

12 Claims



1. In an automatic stop device for a magnetic tape recording and/or playback apparatus, said apparatus including a drive mechanism for transferring magnetic tape between a supply reel and a take up reel, and an end of tape detector sensitive to reference marks positioned on the magnetic tape near the ends thereof and adapted to stop the tape drive mechanism in response to the passage of said reference marks, the improvement comprising, means for sensing the rotational speed of one of said reels, means for establishing a threshold speed, and means responsive to the relationship between said sensed speed and said threshold speed for disabling said end of tape detector at the start of the tape when said take up reel is empty, thereby to prevent premature operation of said stop device.

4,010,918

# AUTOMATIC REVERSAL MECHANISM

Saburo Kato, Yokohama, Japan, assignor to Ricoh Co., Ltd., Japan

Filed Nov. 3, 1975, Ser. No. 628,320

Claims priority, application Japan, Nov. 6, 1974, 49-127668

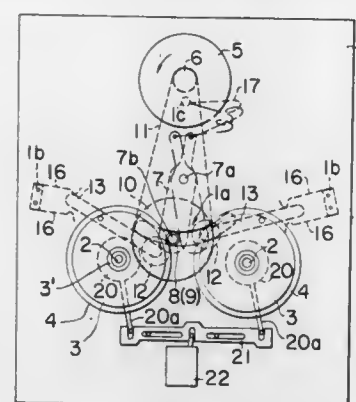
Int. Cl.<sup>2</sup> G03B 1/04; G11B 15/32

U.S. Cl. 242—191

5 Claims

1. An automatic reversal mechanism comprising:  
a. a pair of driven wheels,

a drive roller supported for rotation in either direction and movable along a path between said wheels for peripheral engagement with selected one of said wheels,  
c. drive source means applying drive to said roller,  
d. means for moving said roller beyond a neutral position within said path in either direction in accordance with the direction of rotation of said roller,  
e. toggle means pressing said roller against one of said wheels to cause the peripheral engagement therewith upon the actuation of said moving means,



4,010,919

# AUTOGYRO HAVING BLADE TIP JETS

Gerald L. Breuner, 124 Leford Road, Piedmont, Calif. 94611

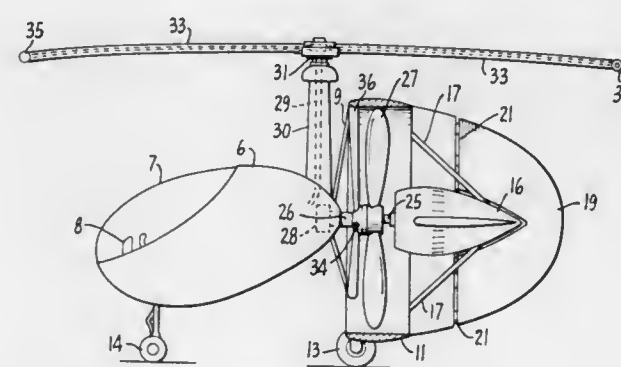
Filed Dec. 5, 1975, Ser. No. 637,878

The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> B64C 27/02

U.S. Cl. 244—17.21

4 Claims



4. An autogyro having a rotor comprising:  
a cabin;  
duct defining means defining an essentially circular duct connected to said cabin;  
an autogyro engine connected to said duct defining means;  
a propeller mounted in said duct defining means;  
propeller driving means connecting said propeller to said engine and including a first shaft connected at one end to said engine, a bearing block support connected to the other end of said first shaft for supporting said first shaft, a hollow shaft surrounding said first shaft to be essentially coaxial therewith and connected at one end thereof to said first shaft for rotation therewith, and a propeller

mounting means connected to said hollow shaft for rotation therewith so that said propeller is driven by said engine via said shafts and propeller mounting means; and rotor blade tip jets on the rotor for causing rotation thereof so that the rotor is rotated by said tip jets.

4,010,920

# APPARATUS AND METHOD TO CONTROL FORWARD CONTROL SURFACE TYPE AIRCRAFT IN FLIGHT

Hans U. Farner, Mythenstrasse 9, Hinwil, Switzerland

Continuation of Ser. No. 289,281, Sept. 15, 1972, abandoned.

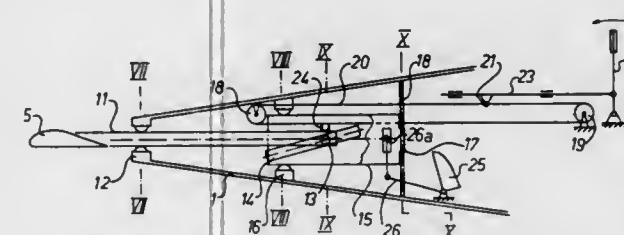
This application Nov. 19, 1974, Ser. No. 525,120

Claims priority, application Switzerland, Sept. 17, 1971, 13630/71

Int. Cl.<sup>2</sup> B64C 5/10

U.S. Cl. 244—89

20 Claims



5. Aircraft control system to control a heavier-than-air, forward-control airfoil aircraft having a first lifting wing (4) to provide lift,  
a forward lifting-and-control wing (5) located forwardly of the center of gravity (3) to provide a controlled lift vector;  
said first lifting wing (4) being located behind the center of gravity (3) of the aircraft (1) and providing only part of the lift;  
a support means (6,8,9,11) supporting said forward lifting-and-control wing (5) on the aircraft (1);  
and means (7,7'; 10, 10'; 12, 13) movably securing said support means (6,8,9,11) supporting said forward lifting and control wing (5) in the aircraft for movement of said entire forward lifting and control wing (5) and the support means (6,8,9,11) therefor in a direction parallel to the longitudinal axis of the aircraft to thereby move the entire forward lifting-and-control wing (5) and its support means (6,8,9,11) longitudinally with respect to the center of gravity (3) of the aircraft.

4,010,921

# SPACECRAFT CLOSED LOOP THREE-AXIS MOMENTUM UNLOADING SYSTEM

Josef Siegfried Pistiner, Lafayette Hill, Pa., and Ludwig Muhlfelder, Livingston, N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1975, Ser. No. 606,273

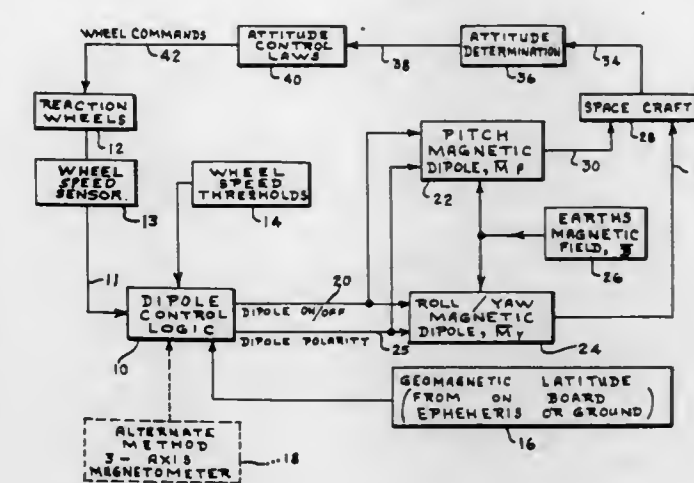
Int. Cl.<sup>2</sup> B64G 1/10

U.S. Cl. 244—166

5 Claims

1. A closed loop three-axis automatic momentum unloading system for a spacecraft attitude control system comprising:  
a spacecraft vehicle having an attitude control system including, a plurality of reaction wheels and magnetic dipoles; logic processing means; wheel speed sensor means connected to the logic processing means; wheel speed threshold input means connected to the logic processing means; geomagnetic latitude input means connected to the logic processing means; means connecting said magnetic dipoles and the logic processing means whereby excessive momentum in the reaction wheels will cause a signal to be generated in the logic means and sent to the

dipoles of such polarity and magnitude as to cause dipole interaction with the earth magnetic field and cause said



attitude control system to react in a manner that will unload momentum stored in said system.

4,010,922

# PORTABLE POST SUPPORT

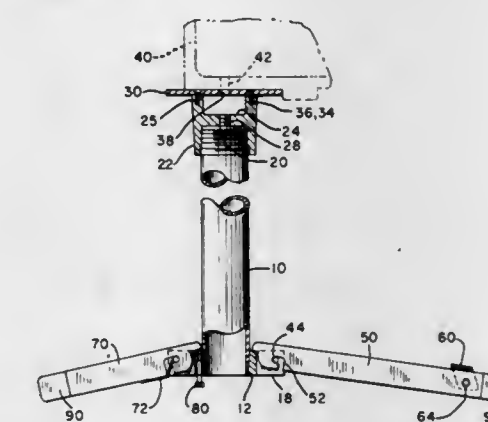
Thomas L. Heller, 12 Wootton Road, Essex Fells, N.J. 07021, and Leonard C. Heller, 40 Oak Lane, Randolph, N.J. 07801

Filed Jan. 2, 1976, Ser. No. 645,943

Int. Cl.<sup>2</sup> F16M 11/32

U.S. Cl. 248—165

9 Claims



1. A post support stand for cartridge rebuilding, reconditioning and like bench-type tool apparatus, this stand having folding legs for selected collapse, storage, transport and the like, said stand having legs which are retained at one end by a common base member, said support stand including: (a) a support column; (b) a base member adapted to engage and retain the lower end of said column in an attitude substantially normal to the plane of the base member; (c) an apparatus tool holder rotatably mounted on the upper end of the support column; (d) means for locking the apparatus tool holder in a selected orientation on the column including a threaded end on the support column with the tool holder carried on this threaded end and a thrust plate positioned between the end of the column and the tool holder, and there is a jam screw carried in a threaded aperture in the tool holder, this jam screw turned into engagement with the thrust plate to cause the tool holder to be locked in the desired orientation on the column; (e) four legs retaining slots having a selected size and orientation formed in the base member; (f) two front legs and two rear legs slidably and pivotally and removably mounted in the retaining slots in the base member and in mounted and extended condition the legs form an X-type configuration, said front legs being the longer pair of legs; (g) a retaining pivot pin carried in each slot and extending at least substantially therethrough, this pin providing a means for pivotally retaining one end of a leg when mounted in the leg retaining slot; (h) a mounting end formed on one end of each leg, this mounting end slidable in an appropriately sized slot in the base



member and in this end is formed a pin engaging slot, this slot sized for an easy sliding fit on the retaining pivot pin, said engaging slot extending inwardly from one longitudinal edge and terminating intermediate the longitudinal edges whereat the slot turns for a short distance substantially parallel to the longitudinal axis of the leg and toward the end of the leg to be retained in the slot, this extension of the slot providing a pivot retention portion when and as it engages the pivot pin, and (i) cooperative means provided on the leg and base member to limit the rotative motion of each leg around the pivot pin when and after the leg has been slidably mounted on the pin, this limiting movement causing the outer ends of each of the legs to engage the support surface before the support column and the base member engage the support surface when in an erected condition.

4,010,923

## SUPPORTS FOR CAMERAS

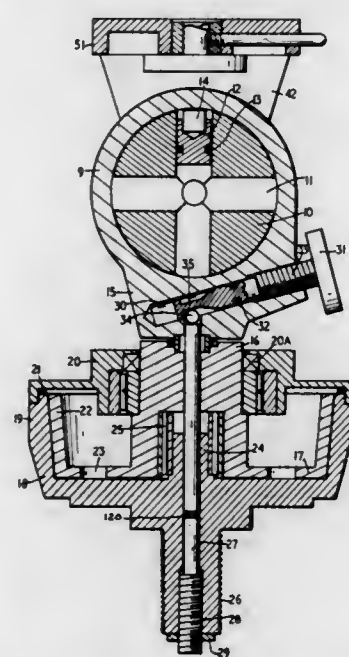
Jeanette Mary Miller, and Robert Eric Miller, both of Rose Bay, Australia, assignors to Timothy Robert Miller and Victoria Alice Miller, both of Rose Bay, Australia, part interest to each

Division of Ser. No. 407,687, Oct. 18, 1973. This application Oct. 30, 1974, Ser. No. 519,370

Claims priority, application Australia, Oct. 25, 1972, 967/72

Int. Cl.<sup>2</sup> F16M 11/12

U.S. Cl. 248—183



1. A fluid head support for rotating an apparatus supported thereon, said support comprising a casing having a tapered bore therein, a corresponding tapered block, which is rotatable within said tapered bore, means permitting attachment of apparatus to said fluid head support, sealing means to maintain a hydraulic fluid between the corresponding tapered surfaces of the block and casing, means permitting axial movement of the block with respect to the casing, wherein said means permitting axial movement comprises a rod, which is attached to and protrudes from the casing and extends into a coaxial passage within the block, means for axially moving of the rod relative to the block and thereby causing axial displacement of the block with respect to the casing.

4,010,924

## ATTACHMENT FOR BRICKWORK

David Charles Parsons; Wendy Anne Parsons, both of Much Hadham; Norman Brian Pigott, Bishops Stortford, and Alan Ernest Foster, Sawbridgeworth, all of England, assignors to S.S.B. (Aerial Fixings) Limited, England

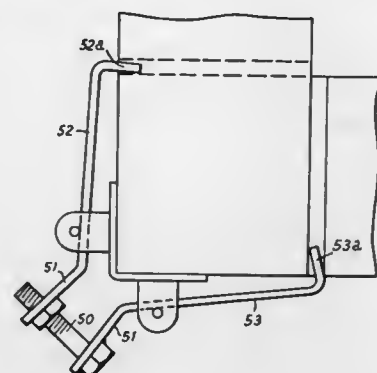
Filed Sept. 4, 1975, Ser. No. 610,288

Claims priority, application United Kingdom, Sept. 9, 1974, 39318/74; June 5, 1975, 24315/75

Int. Cl.<sup>2</sup> E04H 17/14; H02B 1/04; F16M 1/00

U.S. Cl. 248—225.3

12 Claims



1. An attachment for a building structure comprising securing means shaped to locate on a corner of a structure, two arms supported by the securing means so as to extend divergently to permit location of the arms along adjacent faces of the structure to opposite sides of the corner, engagement portions at remote ends of the arms for engagement into a respective one of said adjacent faces of the structure and a single adjustment means operatively coupled with the arms and operable to effect sliding of the arms along said adjacent faces towards the corner to urge said engagement portion into clamping engagement with the structure.

4,010,925

## ADJUSTABLE TRAFFIC SIGNAL MOUNTING ASSEMBLY

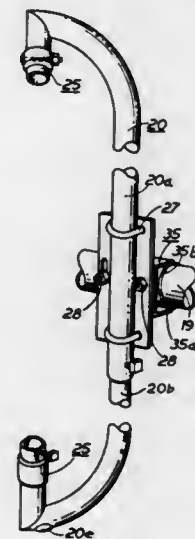
John S. Garchinsky, Aldan, Pa., assignor to Gar Design Research, Inc., Media, Pa.

Filed Apr. 4, 1975, Ser. No. 565,120

Int. Cl.<sup>2</sup> A47F 5/00

U.S. Cl. 248—295

11 Claims



1. An assembly for mounting traffic signals or the like comprising:

- a first rigid, generally J-shaped tubular means having a generally curved end portion permanently and rigidly joined to a straight portion, said curved end portion being adapted to engage one end of said signals,
- a second rigid, generally J-shaped tubular means having a generally curved end portion for engaging the other end of said signal joined to a straight portion into which the straight portion of said (a) means is adapted to be slid,

and also having adjustable means disposed transverse thereto which protrudes interiorly thereof a selected distance thereby to engage said (a) means, said adjustable means being constructed to fix the relative position of said (a) and (b) means when assembled together so that a fixed desired distance exists between the curved ends thereof, the terminal parts of said curved ends being arranged to be substantially aligned with one another along an axis substantially parallel to the axis of said straight portions said (b) means having a cross-section which is slightly larger than the cross-section of said (a) means.

4,010,926

## ADJUSTABLE PEDESTAL

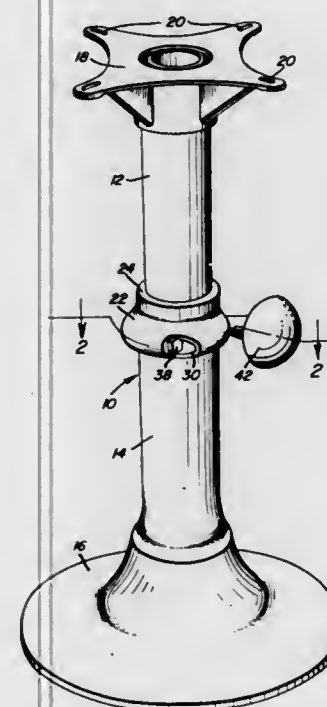
Garnett H. Carnahan, Box J, Nixa, Mo. 65714

Filed May 26, 1976, Ser. No. 690,097

Int. Cl.<sup>2</sup> F16M 11/00

U.S. Cl. 248—411

10 Claims



10. In combination with a pair of elongated sections, one of said sections being tubular and telescopically receiving the other section in one end portion thereof, said one end portion of said other section including means defining an inwardly opening peripherally extending groove segment of at least 90° in angular extent and openings through said one end portion aligned with the ends of said groove segment and provided with outwardly facing seating surfaces, and an elongated tension member of a configuration conforming to and received in said groove and provided with opposite end portions projecting outwardly through said openings, one of said tension member end portions including a first enlargement thereon seated against the corresponding seating surface and the other tension member end portion including a second enlargement thereon shiftable therealong and engageable with the corresponding seating surface for placing said tension member in tension and shifting the tension member into clamping engagement with said other support section.

4,010,927

## SEAT ADJUSTING MECHANISM

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Dec. 3, 1975, Ser. No. 637,160

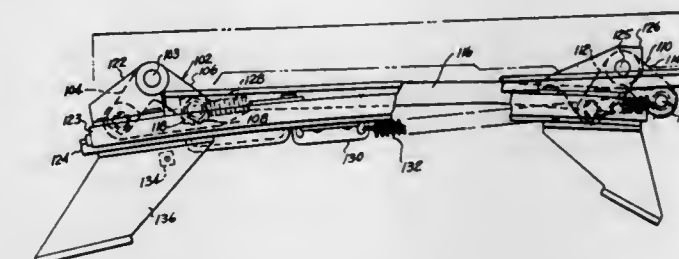
Int. Cl.<sup>2</sup> F16M 13/00

U.S. Cl. 248—420

3 Claims

1. An adjustable vehicle seat, comprising stationary rail means adapted to extend generally horizontally of a vehicle, a carriage assembly slidable longitudinally on said rail means,

seat elevating means on said carriage assembly including bell cranks pivoted to the front and rear edges of said carriage assembly rotatable about axes adapted to extend transversely of the vehicle, a seat connected to said bell cranks, said bell cranks each having a lift arm extending forwardly and downwardly from its pivot axis when the seat is in lowered position and swingable upwardly to raise said seat, and an actuating arm extending downwardly and rearwardly from its pivotal axis and swingable forwardly to raise said seat, a rigid link



connecting longitudinally aligned actuating arms of said bell cranks, resilient counterbalance means extending generally parallel to said rail means, said counterbalance means comprising a tension spring having its forward end fixed with respect to the vehicle and its rear end attached to the actuating arm of a bell crank at the rear of said carriage assembly to apply simultaneously a forward bias to said carriage assembly and a torque to said bell cranks in a direction to rotate said bell cranks in a direction to elevate said seat.

4,010,928

## PISTON-OPERATED PARALLEL-SLIDE GATE VALVE

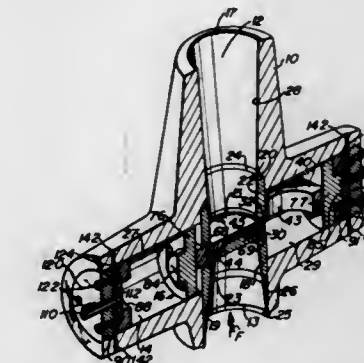
Russell G. Smith, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Dec. 27, 1974, Ser. No. 536,868

Int. Cl.<sup>2</sup> F16K 31/122

U.S. Cl. 251—31

7 Claims



1. A gate valve comprising a one-piece valve body having axially aligned inlet, valving and outlet ports, and a pair of axially aligned cylinders normal to a common axis passing through each of said ports, wherein said cylinders are disposed on opposite sides of said valving port; a gate slidably mounted for movement between open and closed positions relative to said valving port; gate actuating pistons in each of said cylinders; means in open communication with each of said cylinders through which pressure media is selectively introduced and/or exhausted incident to movement of the gate to one or the other of its positions; a gate carrier having opposite side edges and a pair of through openings intermediate said edges wherein the said gate is securely though releasably mounted in one of said openings and wherein the other opening defines a through-port corresponding to the cross-sectional area of the valving port; means securing the opposite side edges of said carrier relative to and between said pistons whereby said carrier is supported and mounted for sliding movement in a plane normal to the said common axis through the inlet, valving and outlet ports; each said piston having an inner face adjacent the valving port and an outer face remote therefrom,



and wherein each cylinder has an inner end in open communication with the valving port and an outer end remote therefrom and defined by a cylinder head; the outer face of each piston and the inner face of each cylinder head having complementary plug and socket portions which are disposed in nested, interengaging relationship as a piston reaches the outer end of its exhaust stroke, a dual inlet-outlet port for pressure media in the said complementary means of each of said cylinder heads; the nested, interengaging relationship of said plug and socket means positively closing off the exhaust of pressure media through the dual inlet-outlet port of the cylinder head of the cylinder, cushioning the end of the stroke of the piston as the plug and socket engage; and said complementary plug and socket portions being hardened to provide wear-resistant surfaces.

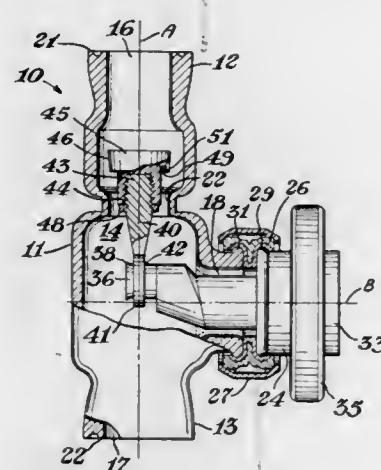
#### 4,010,929 VALVE

James J. Pollock, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 271,375, July 13, 1972, abandoned. This application May 31, 1973, Ser. No. 365,651  
Int. Cl.<sup>2</sup> F16K 31/52

U.S. Cl. 251—260

6 Claims



1. A valve comprising
  - a hollow body defining
  - a cavity therein, the body defining at least three openings, three of the openings being
  - an inlet opening,
  - a first exit opening and
  - a valving opening between the inlet opening and the first exit opening,
  - a seating region within the cavity having a generally circular configuration and
  - an axis disposed generally perpendicular to the axis of the valving opening,
  - a crank member rotatably and sealably supported within the valving opening, the crank member having
  - an exterior end exterior to the cavity and
  - an interior end in at least close proximity to the seating region, the crank member having
  - an axis of rotation generally normal to and generally intersecting the axis of the inlet opening, the interior end of the crank member being eccentrically disposed relative to the axis of the crank member,
  - a valving member connected to the interior end of the crank member, the valving member adapted to be selectively positioned in sealing engagement with the seating region by rotation of the crank member, and means to resiliently support the interior end and the valving member within the valve body with the further limitation that the crank member and the valving member are plastic.

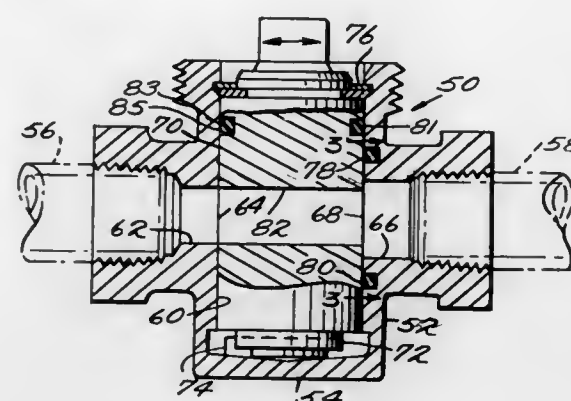
#### 4,010,930 TWO-WAY ROTARY PLUG VALVE

Robert E. Sands, Shelbyville, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Aug. 11, 1975, Ser. No. 603,282  
Int. Cl.<sup>2</sup> F16K 5/04

U.S. Cl. 251—314

14 Claims



1. A rotary plug valve capable of having fluid flow there-through in either direction, said plug valve comprising:
  - a housing member having a valve seat therein, a first passage having a port opening to said valve seat and a second passage having a port opening to said valve seat;
  - a plug member having a flow passageway therethrough with ports at its ends, said plug member being rotatable on an axis in said valve seat between a fully opened position wherein the ports of the flow passageway therethrough axially align respectively with said port openings of said first and second passages in said housing member and a closed position where said flow passageway in said plug member is out of alignment with said port openings in said housing member, the ports of said flow passageway having the same shape as each other and each of said ports having the same width in a plane bisecting said flow passageway perpendicular to said axis of rotation of said plug member and each of said ports having the same height in a plane bisecting said flow passageway parallel to said axis of rotation of said plug member;
  - sealing means in said valve seat encircling only one of said port openings of said first and second passages in said housing member when said plug member is in the closed position, said sealing means being defined by an endless groove in said valve seat encircling the one of said port openings of said first and second passages in said housing member and an endless sealing ring positioned in said endless groove; and,
  - the said passage of said housing member which has said sealing means encircling its port opening having a maximum width parallel to a plane transverse to the axis of rotation of said plug member greater than a maximum width of the other passage parallel to the same plane so that when said plug member is rotated towards the said closed position, the one of said ports of said passageway in said plug member which was cooperating with the port opening of said other passage will have passed beyond the same and be covered by said valve seat prior to the trailing side of the other of said ports of said passageway passing the edge of the port opening of said passage having said sealing means surrounding the same and prior to passing an unsupported portion of said sealing ring.

#### 4,010,931 DOOR LIFTING AND HOLDING TOOL

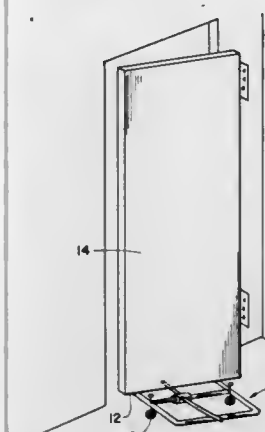
Lawrence Wheeler, 1500 Clevenger, Modesto, Calif. 95350  
Filed Mar. 26, 1976, Ser. No. 670,962  
Int. Cl.<sup>2</sup> B66F 15/00

U.S. Cl. 254—131

9 Claims

1. A door lifting and holding tool comprising:
  - a. a hollow frame member for resting on a supporting sur-

- face, a portion of said frame member dimensioned for insertion under and for engaging a portion of the lowermost edge of a door resting on said supporting surface;
- b. elongated fulcrum means fixedly secured on the ends thereof to said frame member, whose the longitudinal axis of said elongated fulcrum means being substantially parallel to said lowermost edge;
- c. a lever element being pivotally affixed to said fulcrum



- means and slidable along said longitudinal axis of said elongated fulcrum means, a first end of said lever element dimensioned to engage said lowermost edge of said door, a second end of said lever element for receiving a human foot thereupon;
- d. elevation means affixed to said frame member adjacent to said ends of said fulcrum means, said elevation means enabling manual changes in the elevation of said frame member in relation to said supporting surface.

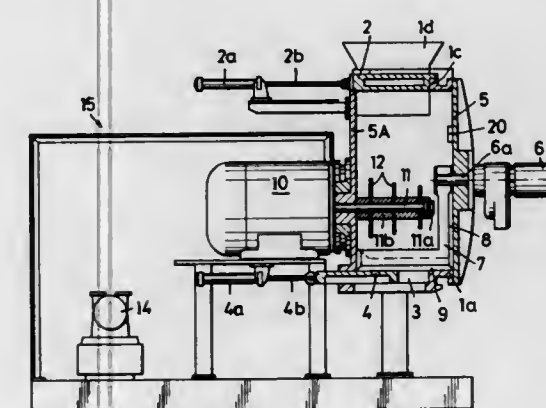
#### 4,010,932 MACHINE FOR MAKING AND KNEADING DOUGH

Friedrich Otto, Hameln, Germany, assignor to A. Stephan U. Sohne GmbH & Co., Hameln, Weser, Germany  
Filed July 15, 1975, Ser. No. 596,081  
Claims priority, application Germany, July 17, 1974, 2434330

U.S. Cl. 259—6

Int. Cl.<sup>2</sup> B01F 7/00

21 Claims



1. In a machine for making and treating dough or similar substances, a combination comprising a receptacle including a substantially horizontal main section having a substantially cylindrical internal surface and two end walls at the respective axial ends of said main section, one of said end walls being movable to and from an open position to respectively afford and prevent access to the interior of said receptacle, an upper portion having a first opening for admission of the ingredients of said substances and a lower portion having a second opening for evacuation of said substances; means for sealing and exposing said openings; first and second tool means mounted in said receptacle for rotation about discrete first and second axes, one of said tool means being mounted on said one end wall and its axis coinciding with the axis of said main section

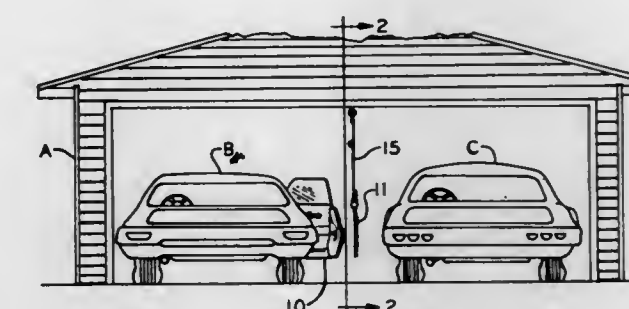
in the closed position of said one end wall; and means for rotating said tool means about the respective axes.

#### 4,010,933 GARAGE WITH IMPROVEMENT TO PROTECT AGAINST DAMAGE TO PARKED CARS

Thomas Hebda, 235 Vance, Lombard, Ill. 60148  
Filed Jan. 12, 1976, Ser. No. 648,276  
Int. Cl.<sup>2</sup> A47H 23/00

U.S. Cl. 256—23

6 Claims



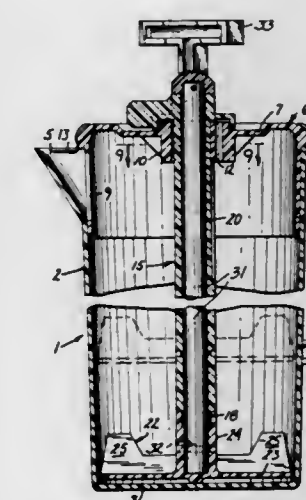
1. In a garage having a ceiling structure and providing parking space for two or more cars in which two cars are parked in spaced parallel relationship at least one of said cars having a door which opens into the space between cars, the improvement comprising a flexible resilient sheet, and means for suspending said sheet from said ceiling structure in a vertical plane between said cars and spaced from each of said cars, whereby when said door is opened said sheet prevents the door from striking the other of said cars.

#### 4,010,934 LIQUID MIXING AND DISPENSING DEVICE

King S. McCord, and Irene W. McCord, both of 5617 Code Ave. South, Edina, Minn. 55436  
Filed Mar. 17, 1976, Ser. No. 667,967  
Int. Cl.<sup>2</sup> B01F 7/20

U.S. Cl. 259—116

10 Claims



1. A liquid mixing and dispensing device comprising:
  - a. an open-topped, generally cylindrical container;
  - b. a closure member for the open top of said container;
  - c. a tubular housing mounted in said closure member and extending axially of said container for rotary and axial movement relative to said container and closure member;
  - d. a shaft coaxial with said tubular housing and mounted therein for axial movements therewith and for rotation relative to said housing and container, said shaft having opposite upper and lower ends;
  - e. a disk-like impeller mounted fast on the lower end of said shaft below said housing;
  - f. handle means on the upper end of said shaft above said housing and closure member;



g. and cooperating stop elements on said closure member and said tubular housing for limiting upward movement of said impeller, shaft and housing, relative to said container and closure member, between the bottom of said container and a plurality of predetermined levels above said bottom of the container.

4,010,935

# **HIGH EFFICIENCY ALUMINUM SCRAP MELTER AND PROCESS THEREFOR**

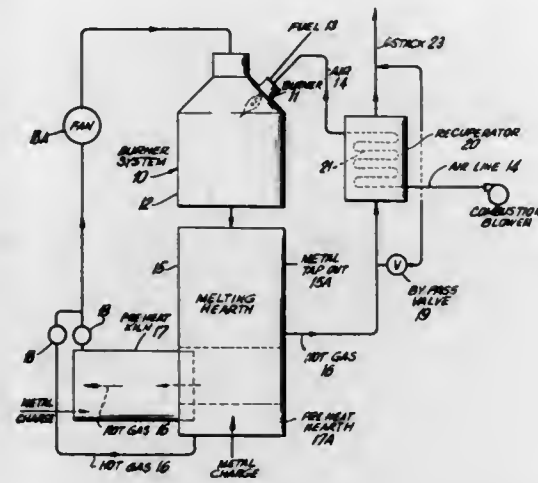
Wilbur E. Stephens, Redwood City, Calif., assignor to Aluma Inc., San Mateo, Calif.

Filed Dec. 22, 1975, Ser. No. 643,360

Int. Cl.<sup>2</sup> C21B 11/00

U.S. Cl. 266—44

13 Claims



1. A process for improving the efficiency of melting scrap aluminum in a melting furnace which comprises, providing a furnace having a melting hearth therein communicating with a combustion chamber having a burner for combusting hydrocarbon fuel and air fed thereto and an after-burner section by means of which said hearth is heated to a temperature to melt aluminum by hot gases formed by combustion and continuously circulated from said after-burner section to said hearth, heating said hearth to an aluminum-melting temperature, charging scrap containing hydrocarbon contaminants through a rotatable scrap-receiving preheat kiln for preheating said scrap while rotating said kiln, circulating a portion of effluent hot gases from said hearth through said rotating kiln in countercurrent flow to the scrap fed through the kiln to preheat said scrap prior to the charging thereof to said hearth and to remove said hydrocarbon contaminants contained in said scrap, charging said preheated scrap to said heated hearth to melt the same, recycling said hot gases containing hydrocarbons from said rotating kiln to the after-burner section of said combustion chamber to burn the hydrocarbons removed from said scrap and thereby provide additional heat for melting said aluminum, circulating the remainder portion of effluent hot gases from said hearth to a recuperator cooperatively associated with said combustion chamber to preheat air passing through tubes in said recuperator in heat exchange relationship with said effluent hot gases passing through said recuperator, conducting said preheated air to the burner of said combustion chamber, and conducting said effluent hot gases from said recuperator to an exhaust stack, whereby a marked improvement in thermal efficiency is effected per pound of aluminum melted.

4. An integrated aluminum scrap-melting system comprising in combination, a hearth for receiving and melting a charge of scrap aluminum,

a combustion chamber having an after-burner section communicating with said hearth, said combustion chamber having a fuel burner system for burning hydrocarbon fuel with air to produce effluent hot gases in said after-burner section for circulation through said hearth for melting scrap aluminum, a rotatable scrap-receiving preheat kiln in communication with said hearth for charging aluminum scrap there-through into said hearth, means for conducting a portion of said effluent hot gases from said hearth through said rotatable kiln in countercurrent flow to scrap fed through said kiln, a return duct communicating with said rotatable kiln and said after-burner section of said combustion chamber for conducting said effluent hot gases from said rotatable kiln to said after-burner section, and means for conducting the remainder of said effluent hot gases as hot exhaust gases from said hearth through a heat exchanger to an exhaust stack.

4,010,936

# **PROCESS FOR TAPPING A STEEL-MAKING CONVERTER**

Masaru Takashima, Tokyo, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 476,496, June 5, 1974, abandoned.

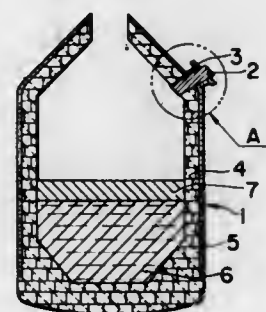
This application Mar. 15, 1976, Ser. No. 667,009

Claims priority, application Japan, June 5, 1973, 48-62582

Int. Cl.<sup>2</sup> C21C 5/46

U.S. Cl. 266—45

7 Claims



1. A process for tapping a converter of a steel-making furnace which converter has a tap hole, which comprises (1) placing a stopper plug in the tap hole located at the upper part of a wall of the converter when said converter is in an upright position, said stopper plug comprising a refractory material, a fibrous substance and a binder and being elastic and capable of shrinking and deformation, said stopper plug being larger in diameter than the diameter of the tap hole; and (2) tilting the converter such that the molten steel therein contacts the stopper plug and exerts an increasing pressure on the stopper plug as the tilting proceeds, said stopper plug not being forced out of said tap hole until said stopper plug is completely covered with molten steel.

4,010,937

# **METHOD AND APPARATUS OF REFINING CRUDE CADMIUM**

Hans Wilhelm Wiekling, and Karl Ehlers, both of Goslar, Germany, assignors to Preussag Aktiengesellschaft Metall, Goslar, Germany

Division of Ser. No. 521,886, Nov. 7, 1974. This application

June 4, 1975, Ser. No. 583,558

Claims priority, application Germany, Apr. 13, 1974, 2418170

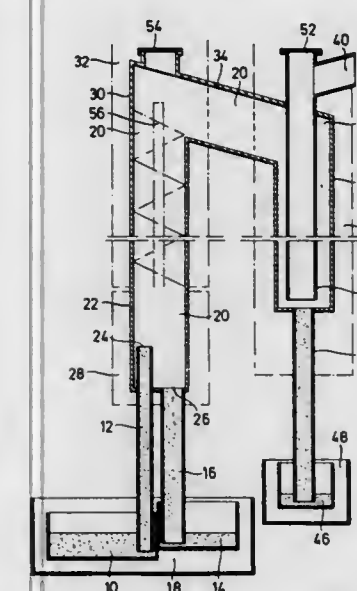
Int. Cl.<sup>2</sup> C22B 9/04

U.S. Cl. 266—149

11 Claims

1. An apparatus for continuously refining crude cadmium by a vacuum evaporation process, the apparatus comprising an inverted U-shaped vacuum chamber having a first leg, a

second leg, a transition portion joining said first leg and said second leg, an evaporator and a reflux condenser in said first leg, a feed pipe for feeding said crude cadmium issuing from a crude cadmium bath into said first leg adjacent said evaporator, and a rejection pipe for distillation residue leading from said first leg into a distillation residue bath, said second leg including a further condenser, said feed pipe and said rejection pipe cooperating to prevent back-flow from said rejection pipe to said feed pipe, said transition portion operatively connecting said reflux condenser to said further condenser in said second leg, and an outlet pipe for refined cadmium leading from said second leg to a refined cadmium receiver, whereby liquid crude cadmium introduced by said feed pipe is evaporated in said evaporator and vaporized crude cadmium is passed through said reflux condenser wherein impurities having a higher boiling point than cadmium are condensed together with a portion of pure cadmium vapor, the condensate in said reflux condenser moving in counter-flow with said



crude cadmium vapor, the remaining portion of said pure cadmium vapor being condensed in said further condenser, said feed pipe being immersed in the crude cadmium bath, said outlet pipe being immersed in the refined cadmium receiver, and said rejection pipe being immersed in the distillation residue bath, and having their open ends, which extend into said vacuum chamber at a height above the surface of the levels of said respective baths which corresponds at least to the barometric height of the levels of said baths at the operating temperatures of said baths, said open end of said feed pipe being higher than said open end of said rejection pipe, and further comprising a vacuum pipe, means on said vacuum pipe for connection to a source of vacuum, said vacuum pipe extending downwards along said second leg of said chamber to a point just above the lowermost point of said further condenser, said vacuum pipe forming condensation surfaces in said further condenser, and said feed pipe, said outlet pipe and said rejection pipe being connected to the lowermost free ends of said two legs of said vacuum chamber.

4,010,938

# **METAL TREATMENT GUN AND METHOD**

Edward W. Crudup, P.O. Box 669, Bryson City, N.C. 28713

Filed Mar. 24, 1975, Ser. No. 561,226

Int. Cl.<sup>2</sup> C21C 7/00

U.S. Cl. 266—216

5 Claims

1. A metal treatment gun for selectively introducing particulate metal treating material into a metallic melt below its surface comprising:

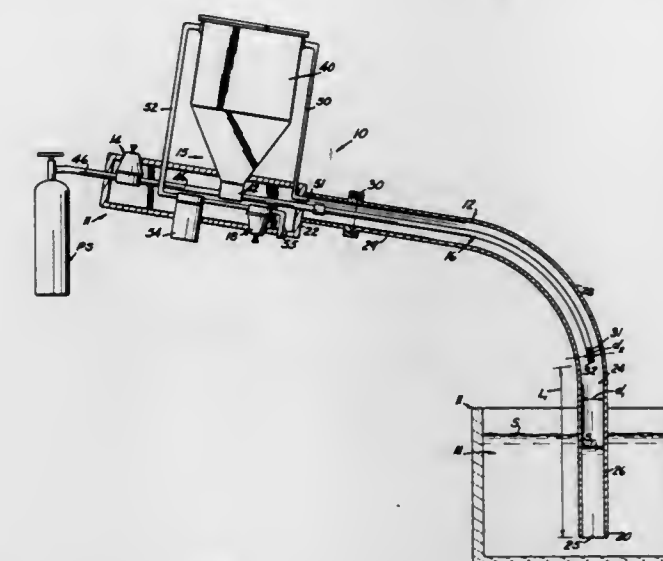
a discharge tube defining a discharge chamber therethrough with a first cross-sectional area, the upstream end of said discharge tube being closed and the downstream end of said discharge tube being open so that the metallic melt will be in communication with said discharge member when the downstream end is inserted below the surface of the metallic melt;

an injection tube defining an injection passage therethrough having an outlet end communicating with said first chamber intermediate its ends above the metallic melt;

fluid drive means operatively connected to said injection passage through said injection tube for selectively forcing a fluid propellant through said injection passage under a first pressure so that said fluid propellant is discharged into said discharge chamber toward the downstream end thereof;

feed means for introducing the particulate metal treating material into said fluid propellant flowing through said injection passage in said injection tube for entrainment of the particulate metal treating material in the fluid propellant so that the entrained particulate metal treating material will be discharged into said discharge chamber with said fluid propellant; and,

pressure relief means operatively communicating with said discharge chamber upstream of the outlet end of said injection tube for selectively controlling the pressure in said discharge chamber when its downstream end is in communication with the metallic melt independently of the pressure within said injection passage of said injection tube so that a second pressure is maintained in said first chamber lower than said first pressure in said injection passage by allowing a prescribed portion of said fluid propellant to escape from said first chamber without passing into said metallic melt.



4,010,939

# **MELTING POT APPARATUS FOR USE IN A CONTINUOUS CASTING PROCESS**

Jerome B. Allyn, Graytown; Richard D. Wileman, and John Kozak, both of Toledo, all of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 26, 1974, Ser. No. 536,485

Int. Cl.<sup>2</sup> C22B 7/00

U.S. Cl. 266—242

2 Claims

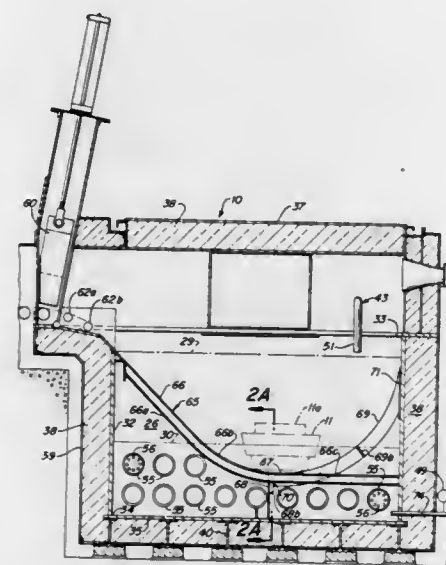
1. Melting pot apparatus containing a liquid metal bath and adapted to be charged with metal hogs, said apparatus comprising:

an enclosure for treating metal in a liquid state defined by a closed steel plate sidewall, said sidewall having a flanged upper end and a lower end, and a bottom plate welded to said lower end of said sidewall; superstructure means secured to said bottom plate to support said enclosure; vestibule means for charging metal hogs into said enclosure positioned adjacent and above said flanged upper end of said enclosure, said vestibule means including inner and outer charging doors and roller supports for conveying metal hogs through said inner charging door; and ramp means continuous with said rollers and disposed within the interior of said enclosure for conveying said



hogs down an incline into said bath in a nondestructive manner while supporting said hogs at a fixed elevation within said enclosure during melting thereof, said ramp means including

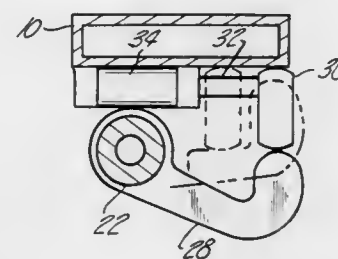
- a. a plurality of transversely-spaced runners extending downwardly into said enclosure to a predetermined point spaced from said bottom plate,



**4,010,941**  
**VARIABLE RATE VEHICLE SUSPENSION**  
Arthur C. Kirkland, 4015 Sturtevant, Detroit, Mich. 48204  
Filed Oct. 30, 1975, Ser. No. 627,374  
Int. Cl.<sup>2</sup> F16F 1/14

U.S. Cl. 267—57

8 Claims

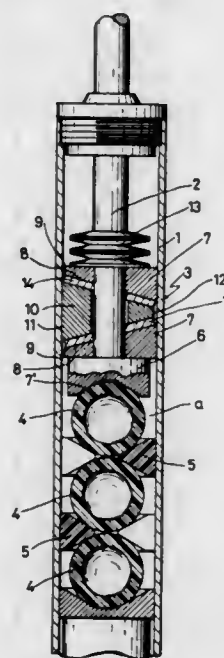


- b. a plurality of pairs of curvilinear side runners extending upwardly in said enclosure, each side runner in each pair disposed on opposite leg portions of said runner and each side runner having an upper edge aligned with the base portion of each runner at said predetermined point, and
- c. support means extending from said bottom plate to support said runners and said curvilinear runners in a resilient manner at approximately said predetermined point.

**4,010,940**  
**TELESCOPIC SHOCK ABSORBER**  
Adalbert Freyler, Tulpenstrasse 17, 56 Wuppertal, Germany  
Filed Aug. 5, 1975, Ser. No. 602,101  
Claims priority, application Germany, Aug. 14, 1974, 2438978

Int. Cl.<sup>2</sup> F16F 11/00  
U.S. Cl. 267—9 B

14 Claims



1. A telescopic shock absorber comprising:
  - a. a cylindrical tube,
  - b. a piston rod extending into said tube, said piston rod having a piston thereon received within said tube and

comprising: an endpiece secured to the end of said piston rod; a pair of brake discs slidably received on said rod inwardly of said endpiece and mounted to have no radial movement with respect to said rod, said brake discs having oppositely directed, confronting slanted surfaces thereon; a wedge received between said brake discs and mounted for radial shifting relative to said rod, said wedge having oppositely directed slanting surfaces on the opposite sides thereof extending generally parallel to the confronting slanted surfaces on said brake discs; and resilient means inwardly of said brake discs for urging said brake discs toward said endpiece; and

- c. means in the slide path of the rod engageable by said endpiece for producing resistance to sliding movement of the rod, including compressible members having a circular cross-section.

1. In a road vehicle having a sprung mass, road wheel means deflectable toward and away from the sprung mass in accordance with terrain irregularities, resilient torsion bar means for suspending the sprung mass from the road wheel means, first means anchoring one end of each torsion bar to the road wheel means, and second means anchoring the other end of each torsion bar to the sprung mass; said first and second anchoring means exerting a wind-up effect on the bar as the road wheel moves from its minimum load condition upwardly toward the sprung mass, and a relaxation effect on the bar as the road wheel moves downwardly away from the sprung mass toward the minimum load condition, whereby the suspension system has a positive spring rate related to the torsional deflection characteristic of the bar: the improvement comprising at least one auxiliary anchoring means stationed between the two previously mentioned anchoring means to anchor an intermediate section of the bar against rotational deflection when the vehicle is in the maximum load condition; each auxiliary anchoring means comprising a thrust absorption element operatively engageable with the intermediate section of the bar, and power means for retracting the thrustabsorption element to a position completely disengaged from the bar.

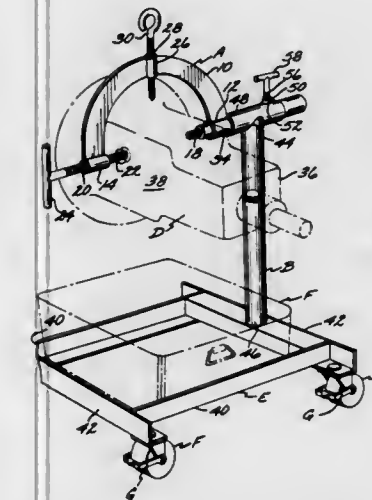
**4,010,942**  
**REPAIR SUPPORT ASSEMBLY FOR AUTOMOTIVE TRANSMISSIONS**  
Gary Lee Ward, 4304 W. 182nd St., Torrance, Calif. 90504  
Filed Mar. 4, 1974, Ser. No. 447,688  
Int. Cl.<sup>2</sup> B25B 1/22

U.S. Cl. 269—15

3 Claims

1. A device for removably supporting an automatic, fluid containing, automotive transmission of either the type that has flat opposed side walls or side walls in which transversely aligned cavities are formed, during the time repair work is being performed on said transmission, said device including:
  - a. a rigid horizontal base that has a plurality of sides;
  - b. a plurality of spaced casters that depend from said base

- and are capable of movably supporting said base above a flat floor surface;
- c. an open top fluid receiving receptacle removably supported on said base;
  - d. a vertical upright that has first and second ends, with said first end rigidly secured to one of said sides of said base;
  - e. a horizontal tube secured to said second end of said upright, said tube including a transversely positioned outwardly extending boss in which a tapped bore is formed;
  - f. a threaded rod that engages said tapped bore;
  - g. a first handle secured to said rod for rotating the latter;
  - h. a transmission supporting assembly that includes a rigid generally U-shaped member having first and second ends, first means extending inwardly from said first and second ends to removably support one of said transmissions therebetween, said first means including
    1. a first externally threaded pin that is secured to said first end of said U-shaped member;
    2. a second threaded pin rotatably supported in a tapped bore formed in said second end of said U-shaped member, said second pin transversely aligned with said first pin;
    3. A second handle secured to said second pin for rotating the same relative to said tapped bore in which said second pin is supported to move said second pin towards or away from said first pin when said second pin is rotated by said handle in an appropriate direction;



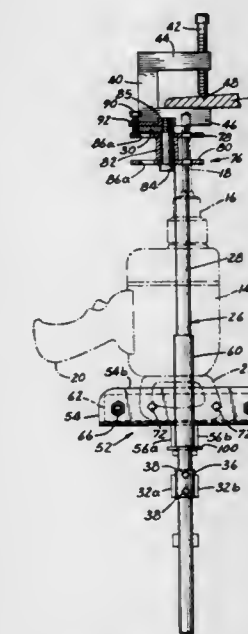
4. first and second bodies having first and second recesses therein that are engaged by said first and second pins;
5. first and second pressure plates pivotally supported on the most adjacently disposed ends of said first and second bodies when the latter are supported from said pins, said first and second pressure plates including first and second corrugated surfaces defined by a material that is of greater hardness than that of the portion of said transmission that said plates will contact, with said pressure plates having said corrugated surfaces thereof forced into frictional supporting contact with the sides of said transmission when said second handle is rotated in an appropriate direction to lessen the distance between said first and second bodies, second means secured to said U-shaped member that may be secured to the hook of a hoist to permit said assembly and a transmission supported thereby to be moved from an automotive vehicle to a position adjacent said device, and a bar extending outwardly from said first end of said U-shaped member, said bar capable of being slidably inserted in said tube and held in a non-rotatable position therein when said first handle is rotated in a direction to move said threaded rod into pressure frictional contact with said bar, when said bar is so engaged supporting said U-shaped member and transmission supported thereby over said receptacle in a first position to permit fluid in said transmission to drain downwardly therefrom by gravity into said receptacle,

and said threaded rod when subsequently loosened and again tightened permitting said assembly and transmission supported thereby to be pivoted to and supported in a second position where repair work may be conveniently carried out on said transmission.

**4,010,943**  
**POWER DRILL SUPPORT AND GUIDE APPARATUS**  
Sheldon E. Eft, 1014 E. Taylor St., Bloomington, Ill. 61701  
Filed July 3, 1975, Ser. No. 593,174  
Int. Cl.<sup>2</sup> B23B 45/14

U.S. Cl. 269—87.1

15 Claims



1. Apparatus for supporting a power driven drill in cooperative relation with a workpiece located overhead and for drilling a hole in the overhead workpiece, comprising, in combination, a depending frame means having first and second ends and defining a rectilinear vertically extending guide track, clamping means mounted on the upper end of said depending frame means and adapted to suspend said frame means to the overhead workpiece, a support carriage mounted on the lower end of said frame means and movable upwardly along said rectilinear guide track, said support carriage being adapted to support a power driven drill for movement therewith, drill guide means mounted on the upper end of said frame means generally adjacent said clamping means and the underside of said workpiece and being adapted to receive a drill bit of the power drill therethrough with sliding of said frame means upwardly along said guide track and for guiding said drill bit along its longitudinal axis during a drilling operation, and actuator means supported by said frame means and cooperative with said support carriage to facilitate selective movement of said carriage along said guide track so that a drill supported by said carriage may be caused to drill a hole in said workpiece and thereafter be removed from said workpiece.

**4,010,944**  
**BLANK FEEDING DEVICE HAVING AN ADJUSTABLE AND AUTOMATIC POSITIONING BACKSTOP MEANS**  
Donald Warren Young, Jarrettsville, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.  
Filed June 16, 1975, Ser. No. 587,288  
Int. Cl.<sup>2</sup> B65H 1/06, 3/08

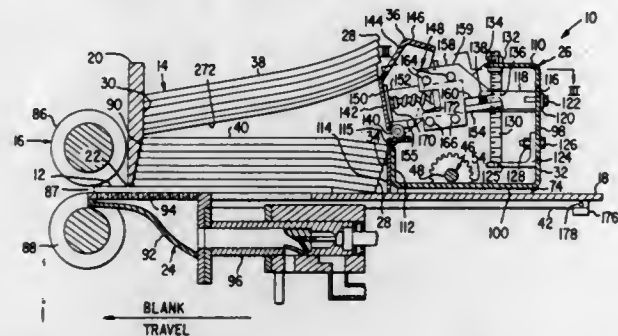
U.S. Cl. 271—99

11 Claims

1. A remotely operable backstop means selectively positionable along the length of a feed table of a blank feeding device for accommodating different size stacks of blanks thereon, comprising:
  - a pair of laterally spaced rack means secured to said feed



table and extending along the length thereof parallel to the direction of feed of said blanks;  
 an enclosure means extending across and spaced above said rack means transverse to the direction of feed;  
 a shaft means housed within said enclosure means and rotatably secured to transverse ends of said enclosure means;  
 a pair of pinion gear means secured to said shaft means, each of said pinion gear means in meshing engagement with one of said rack means; and



a remotely operable electrical drive means housed within said enclosure means and connected to said shaft means for rotation thereof upon energization of said drive means for moving said backstop means along said rack means on said feed table, said enclosure means further including a manually adjustable, pivotably movable, stack support means along the lateral center thereof for resiliently-biased engagement with a bottom blank of an upper portion of said stack.

4,010,945

## CONTINUOUS FEEDER

Hermann Kistner, Tamm, Germany, assignor to Maschinenbau Oppenweiler GmbH, Oppenweiler, Germany

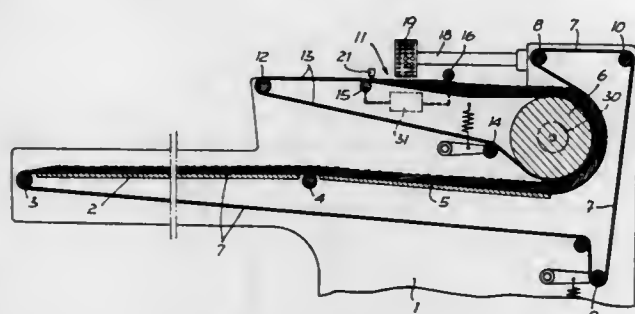
Filed Feb. 6, 1976, Ser. No. 656,077

Claims priority, application Germany, Feb. 7, 1975, 2505164; May 16, 1975, 2521849

Int. Cl.<sup>2</sup> B65H 1/22, 3/10, 7/02

U.S. Cl. 271-151

14 Claims



1. A circular stack sheet feeder comprising a lower loading tray upon which stacks of sheets having a sheet-by-sheet arrangement can be loaded, a conveying and reversing device for transporting the sheets from said loading tray onto a discharge tray in an inverted disposition, said device including a rotatable reversing cylinder having upper and lower sides, means for conveying sheets in a first direction toward the lower side of said cylinder, around said cylinder to the upper side thereof and then in a second direction onto said discharge tray, said means for conveying in said second direction including at least one flexibly stretched conveyor belt which extends over said discharge tray and which is adapted to assume an inclination, at least in the region of said discharge tray, which deviates from the horizontal as a function of the size and weight of the stack of sheets disposed thereon, separating means for drawing off the upper sheet of the stack disposed on said discharge tray, means for automatically adjusting the inclination of said conveyor belt so that the upper sheet of the stack disposed on said discharge tray will always be maintained in substantially horizontal plane thereby facilitating

withdrawal by said separating means, first and second rollers extending transversely to said conveyor belt and defining a sheet removal zone therebetween in said discharge tray, said first roller being disposed above said belt and adapted to bear upon the upper sheet in said stack and said second roller being supportingly disposed below said belt, and wherein said means for automatically adjusting the inclination of said conveyor belt includes means for varying the distance between said first and second rollers.

4,010,946

## LUNG EXERCISE DEVICE

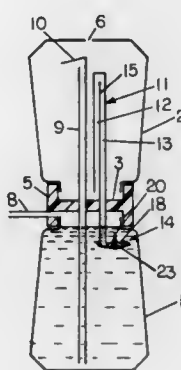
James Granville Miller, Northwood, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 24, 1975, Ser. No. 634,111

Int. Cl.<sup>2</sup> A63B 23/00

U.S. Cl. 272-99

7 Claims



1. In a device for forced expiration exercise wherein liquid is blown from a lower container to an upper container communicating with each other through an interconnecting liquid transfer tube, having means for accommodating the blowing of air pressure into the lower container and forcing liquid through the transfer tube to the upper container, the combination of

- a siphon in the upper container having a discharge tube communicating with the lower container,
- a downwardly disposed valve seat connected to and surrounding the lower end of the discharge tube and having an aperture therethrough communicating with the discharge tube, and
- a flexible coacting dish-shaped valve member located beneath the valve seat in juxtaposed relationship therewith and supported from said valve slot for limited movement toward and away from said valve seat, the outer periphery of said dish-shaped valve member forming a continuous seal surrounding said aperture to limit the upward movement of fluid through said aperture into the discharge tube when blowing pressure is introduced into said lower container and adapted to unseat by the aid of gravity with substantially no back cracking pressure and permit the downward flow of liquid through said aperture when the blowing pressure is relieved and sufficient liquid has been forced into the upper container to prime said siphon, and said dish-shaped valve member adapted to retain liquid when said valve is unseated to be available to seal against the passage of air through said aperture when blowing pressure is commenced and then to form a head of liquid in the lower end of said discharge tube to assist in the priming of said siphon.

4,010,947

## VARIABLE WEIGHT EXERCISE MACHINE

Lloyd J. Lambert, Sr., 1538 College Ave., Houston, Tex. 77034

Filed Apr. 18, 1975, Ser. No. 569,206

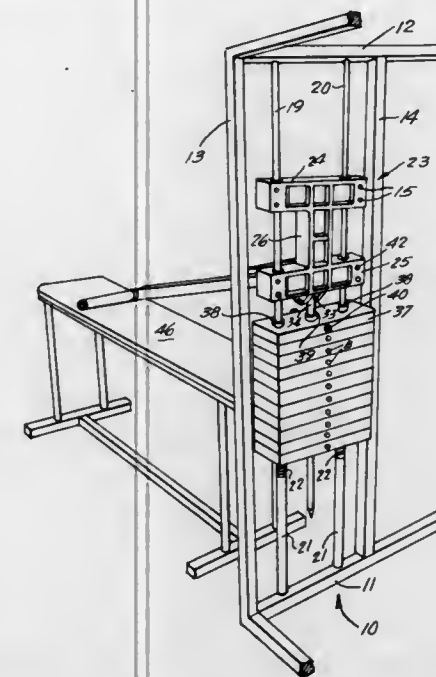
Int. Cl.<sup>2</sup> A63B 21/06

U.S. Cl. 272-118

6 Claims

1. An exercise machine comprising a pair of vertical frame

members arranged in spaced parallel relation, a pair of spaced parallel vertical guide members positioned between said frame members, a carriage arranged for vertical reciprocation between said frame members, anti-friction means on said carriage engaging about said guide members for guiding said carriage for vertical reciprocation, said carriage being spaced from said frame members and guided only by said guide mem-



bers, a plurality of weights mounted for vertical sliding movement on said guide members beneath said carriage and rigid means depending from said carriage for selective connection to said weights for moving the connected weights with said carriage on vertical sliding movement of said carriage, a pair of arms detachably connected to opposite sides of said carriage and a pair of handles secured to said arms for moving said carriage vertically between said frames.

4,010,948

## PULL TYPE FRICTION EXERCISING DEVICE

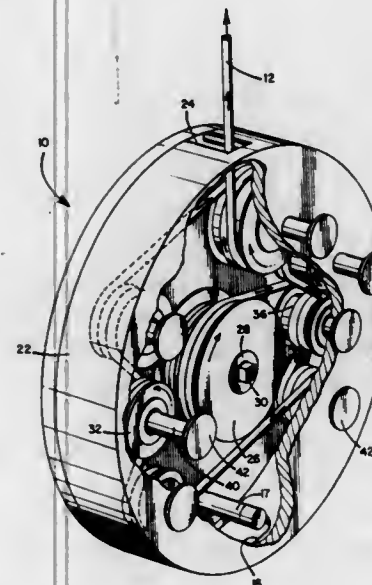
Michael E. Deluty, 37 Addington Road, Brookline, Mass. 02146

Continuation-in-part of Ser. No. 579,704, May 21, 1975, which is a continuation-in-part of Ser. No. 481,907, June 21, 1974, Pat. No. 3,885,789. This application Sept. 18, 1975, Ser. No. 614,610

Int. Cl.<sup>2</sup> A63B 21/00

U.S. Cl. 272-133

8 Claims



- 1. An exercising device comprising:
  - a. a housing having a hollow interior and a cord opening;
  - b. a cord retractor reel mounted for rotation within said housing;

- c. rewind means for continuously urging said retractor reel in the rewind direction;
- d. a plurality of capstans all mounted in fixed locations within said housing, the axis of each said capstan being spaced from the axis of said cord retractor reel and from the other said capstans, said capstans all freewheeling in the rewind direction;
- e. manually operated locking means associated with said plurality of capstans for selectively locking one or more of said capstans against rotation in the unwind direction in the operating mode, and for selectively unlocking one or more of said capstans to permit freewheeling in the unwind direction in the inoperative mode;
- f. a flexible cord fixed to and wrapped around said retractor reel, said cord running from said reel sequentially to and being wrapped at least partially around each said capstan, said cord running from the sequentially last of said capstans out of said housing through said cord opening; and
- g. said rewind means and said locked capstans cooperating to apply a retarding force to said cord to oppose an exteriorly applied manual force pulling said cord in the unwind direction, and said rewind means applying a rotational force on said retractor reel to pull said cord in the rewind direction in the absence of an exteriorly applied manual force on said cord.

4,010,949

## PLUGS FOR POCKET BILLIARD TABLES

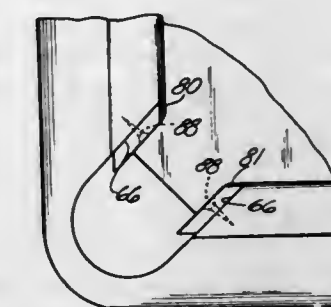
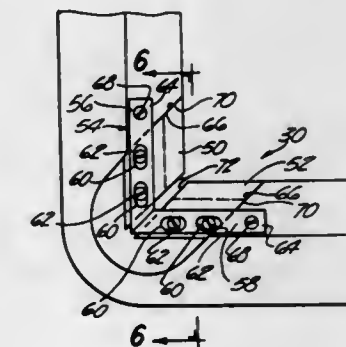
A. George Lee, 4103 Elmhurst, Royal Oak, Mich. 48073

Filed June 30, 1975, Ser. No. 591,454

Int. Cl.<sup>2</sup> A63D 15/00

U.S. Cl. 273-4 A

4 Claims



1. A pocket plug for use with a pocket billiard table having permanent rail assemblies with a solid support portion and a resilient cushion portion at the perimeter and above the top of the table interrupted by ball receiving pockets, said pocket plug comprising, a rail subassembly having a solid support portion and a resilient cushion portion mounted on said solid support portion, said plug being adapted to be disposed in a pocket of said table with an end in abutment with the permanent rail assembly adjacent to the pocket, and means including a bracket member mounted on said solid support portion of said pocket plug and having parts projecting beyond the end thereof and being adapted for detachable connection to said permanent rail assembly to maintain said pocket plug in alignment with the resilient cushion portion of said permanent



rail assembly, and fastening means associated with said bracket parts and adapted to releasably connect said bracket parts to said permanent rail assembly.

4. A pocket plug for use with a pocket billiard table having permanent rail assemblies with a solid support portion and a resilient cushion portion at the perimeter and above the top of the table interrupted by ball receiving pockets, said pocket plug comprising, a rail subassembly having a solid support portion and a resilient cushion portion mounted on said solid support portion, said plug having a vertical dimension less than the vertical dimension of said permanent rail assemblies and being adapted to be disposed in a pocket of said table with an end in abutment with the permanent rail assembly adjacent to the pocket, means operatively associated with said solid support portion of said pocket plug and a solid support of said permanent rail assembly to maintain said pocket plug in said pocket with said resilient cushion portion thereof in alignment with the resilient cushion of said permanent rail assembly, said means including a screw fastener releasably connecting said solid support portions of said permanent rail assemblies and said plug to each other with the latter in elevated relationship to the top of said table.

4,010,950

## BASEBALL BATTING PRACTICE APPARATUS

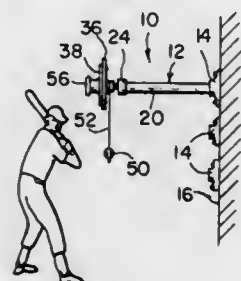
Joseph N. Visockis, 5204 S. Lorel, Chicago, Ill. 60638

Filed Jan. 26, 1976, Ser. No. 652,542

Int. Cl.<sup>2</sup> A63B 69/00

U.S. Cl. 273-26 E

5 Claims



1. Baseball batting practice apparatus comprising:  
a shaft adapted to be fixedly secured at one end thereof to a vertically extending surface;  
an internal gear carried rotatably by said shaft and having an axial hub integral therewith;  
an external gear carried rotatably by said shaft spring-biased into meshing engagement with said internal gear, said external gear having a lesser number of teeth than said internal gear and being mounted eccentrically relative to said internal gear so as to be in meshing engagement therewith through an arc located at one diametral region and in spaced relation to said internal gear at an opposite diametral region;  
spring means for resiliently biasing said external gear axially of said shaft into engagement with said internal gear;  
indicia on said external and internal gears for indicating the degree of rotation of said gears relative to each other;  
and a ball element suspended from said hub of said internal gear.

4,010,951

## PORTABLE SUPPORT FRAME FOR A TENNIS NET

Thomas Richard Gronlund, 1835 Baldwin Drive, McLean, Va. 22101

Filed Nov. 25, 1975, Ser. No. 635,163

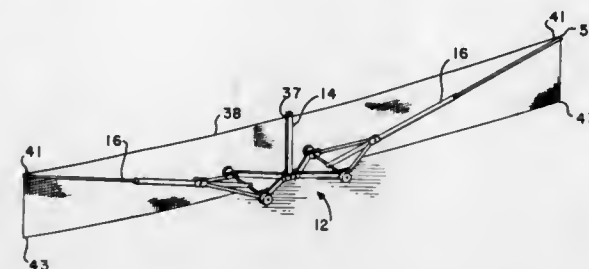
Int. Cl.<sup>2</sup> A63B 69/00

U.S. Cl. 273-29 BC

17 Claims

1. A portable support frame for a tennis net having its longitudinal axis extending horizontally, comprising:  
a. a stable, horizontally disposed base;  
b. a vertical support member rigidly attached at one of its ends to said base;

c. means for attaching the top of said tennis net to the remote end of said vertical support member providing support substantially at the center of said net;  
d. a pair of beam support members, each of said pair being pivotally attached at one of its ends to said base, said pair of beam support members extending upwardly and out-



wardly from said base on opposite sides of said vertical support member, said beam and vertical support members being substantially in the same vertical plane; and  
e. means for attaching the outer, top ends of said tennis net to the remote ends of said beam support members, said beam support members forming cantilever beams when said tennis net is attached thereto.

4,010,952

## TABLE GAME

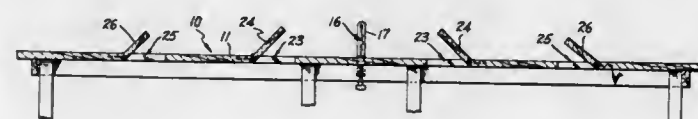
Robert J. Young, 5111 Virginia Ave., SE., Charleston, W. Va. 25304

Filed July 25, 1975, Ser. No. 599,021

Int. Cl.<sup>2</sup> A63B 39/00

U.S. Cl. 273-30

11 Claims



1. A table game played with paddle and ball and including:  
a. a playing surface;  
b. a plurality of apertures formed in said playing surface for catching the ball, each aperture being larger than the diameter of the ball;  
c. a plurality of platforms set at an angle to the playing surface, each platform projecting over an associated aperture to partially inhibit the aperture catching ball; and  
d. means on said table dividing said playing surface into equal courts, each court containing the same number of said plurality of apertures and platforms, each platform being set along one edge of its associated aperture, the opposite edge of the aperture being toward the opposite court, one of the platforms in each court being set at a first angle and another one of the platforms in each court being set at a second angle.

4,010,953

## CATAPULT BASKETBALL GAME

Angelo Russo, 24-25 Kings Highway, Brooklyn, N.Y. 11229

Filed Aug. 4, 1975, Ser. No. 601,719

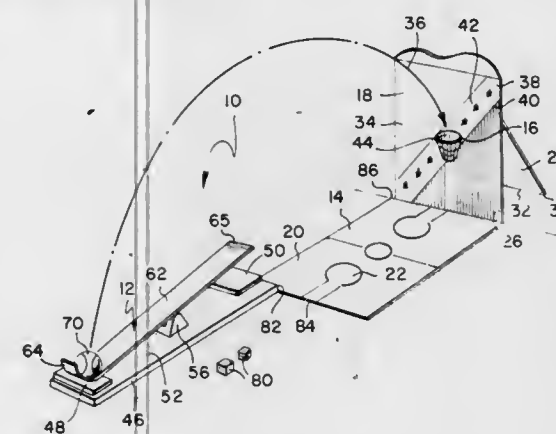
Int. Cl.<sup>2</sup> A63F 7/06, 7/10

U.S. Cl. 273-85 C

4 Claims

1. A catapult basketball game, which comprises:  
a. a vertically aligned backboard;  
b. a rectangularly shaped frame affixed to a rear surface of said backboard, said frame extending downwardly from said backboard at an acute angle;  
c. a plurality of rubberized foot members affixed onto a base of said frame, said rubberized foot members adapted to engage the ground;  
d. a basket with net affixed to a front surface of said backboard;

e. a rectangularly shaped member having a basketball court printed on a top surface thereof, one end of said member abutted against said backboard;  
f. an elongated, rectangularly shaped foot member, said foot member abutted against another end of said rectangularly shaped member, and extending longitudinally outwardly therefrom;  
g. a base of a triangularly shaped member affixed centrally to a top surface of said elongated foot member, said triangularly shaped member having a lateral aperture therethrough, said aperture towards an apex of said triangularly shaped member;



h. an elongated J-shaped ramp member having a curved end, said apex of said triangularly shaped member pivotally engaging a bottom center surface of said ramp member;  
i. a C-shaped bracket extending through said lateral aperture, the ends of said C-shaped bracket affixed to said bottom surface of said ramp member;  
j. a ball member resting in said curved end of said ramp member, another end of said ramp member adapted to be pushed downwardly by a player causing said curved end to move upwardly to propel said ball forwardly in a curved arc towards said basket; and  
k. means for determining point value for said ball member passing through said basket.

4,010,954

## BOARD GAME APPARATUS

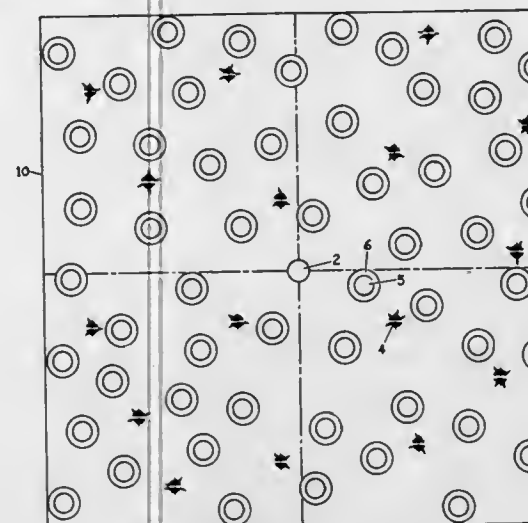
Donald N. Uding, 5022 N. Springfield, Chicago, Ill. 60625

Filed Sept. 5, 1975, Ser. No. 610,622

Int. Cl.<sup>2</sup> A63F 3/04

U.S. Cl. 273-131 BB

9 Claims



1. A monetary acquisition board game played by at least two players comprising:  
a. a board with property sites and paths for random multidirectional movement toward any of a plurality of said property sites;  
b. at least one marker for each player for representation of said movement;

c. first indicia having rates of movement for the markers of each player; and  
d. second indicia displaying the acquisition status obtained by each player, with said acquisition status governing the type of property rights which may be purchased by each player.

4,010,955  
CELL GAME

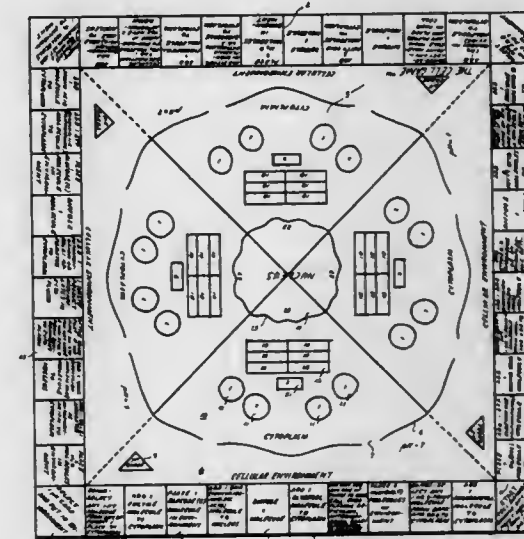
Richard Clay Nelson, P.O. Box 217, Glenwood, N. Mex. 88039

Filed June 18, 1975, Ser. No. 588,029

Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273-134 C

1 Claim



1. Game apparatus comprising a game board having a continuous playing path therearound and a central area; means in said central area defining representation of a living plant/animal cell including cell nucleus and nuclear membrane, cell cytoplasm, cell membrane; the area between the delineated playing path and cell membrane representing cellular environment; means in said area dividing the cytoplasm, nucleus and cellular environment into four equal playing segments; delineated areas within the cytoplasm and the entire area delineated by a segment of the nucleus with spaces to be filled during the course of play with playing components; said delineated areas on said game board having numerals matching those on the playing components; a delineated area within the cellular environment for pH cards; an area within the delineated cellular environment for placement of playing components; delineated cell membrane with spaces to permit movement of playing components from the cellular environment area of the playing board into the cytoplasm area of the playing board and from the cytoplasm area of the playing board into the cellular environment area of the playing board; a plurality of playing components dimensioned to fit within delineated spaces within the cell cytoplasm and cell nucleus; said components being marked with names and numerical values, the names being those of cell molecules and structures; said continuous playing path divided into sequential areas, each having directions for a player in regard to placement of playing components onto or off of the playing board; a plurality of additional playing pieces known as pH cards which are marked to designate various values of pH and which may be taken from a single source outside the playing board and placed in delineated areas provided for said cards in the cellular environment; means of determining the extent of movement of playing pieces along said playing path.



4,010,956

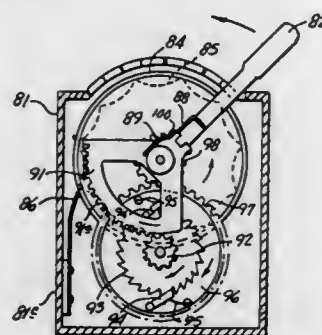
## DRAG RACING GAME APPARATUS

Gregory J. Zyla, P.O. Box 185, Pillow, Pa. 17080, and Michael T. Platt, Bethesda, Md., assignors to said Gregory J. Zyla, Pillow, Pa., by said Michael T. Platt

Division of Ser. No. 532,734, Dec. 13, 1974, Pat. No. 3,954,268. This application Jan. 16, 1976, Ser. No. 649,844 Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273—134 CA

4 Claims



1. In an automobile racing game:
  - a. a playing board divided into a plurality of parallel paths;
  - b. each of said paths being divided into a plurality of zones and bearing spaced distance indicia;
  - c. a plurality of playing pieces equal in number to the number of said paths for advancing along each of said paths in discrete steps through each of said zones;
  - d. a plurality of control means each bearing indicia including numbers simulating the racing performance characteristics of a different automobile, for controlling the advance of each of said playing pieces through each of said zones in accordance with said racing performance characteristics; and
  - e. means for randomly selecting one of the numbers on said control means, the means for randomly selecting numbers comprising number display means for displaying one of a plurality of numbers; handle means movable into a selected one of a plurality of positions equal in number to the number of said zones; and means responsive to the movement of said handle between selected ones of said positions for causing said numbered display means to randomly display one of said numbers.

4,010,957

## SPORTS GAME BOARD

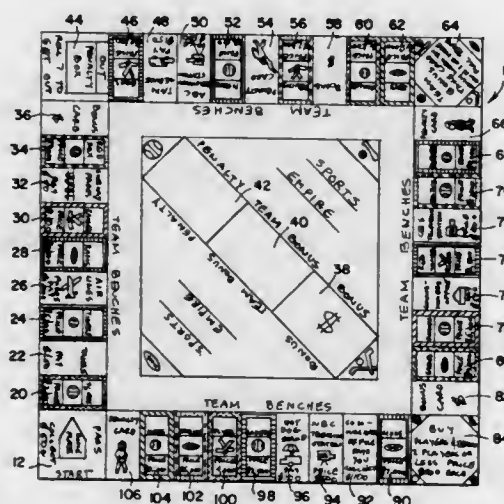
Russell Tricoli, 729 Humboldt St., Secaucus, N.J. 07094

Filed Mar. 29, 1976, Ser. No. 671,321

Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273—134 AD

10 Claims



1. A game apparatus comprising:
  - a. a playing board including a continuous path of successive delineated spaces, a plurality of said spaces having indicia thereon related to sports teams and purchase prices for

said teams, groups of said teams being related to the same sport;

- b. a plurality of player pieces to indicate individual players;
- c. a means of chance to indicate the movement of each player piece in turn a number of spaces along said path;
- d. a plurality of stacks of cards having indicia thereon the terms of which relate respectively to awards and penalties, designated spaces in said path being associated with particular stacks;
- e. a plurality of team player markers, groups of said markers being related to particular sports; and
- f. a supply of play money for payment of various purchases, awards and penalties.

4,010,958

## GOLF PUTTER

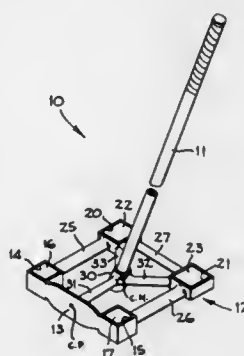
Steven K. Long, 17151 Almaden Road, San Jose, Calif. 95120

Filed Nov. 19, 1973, Ser. No. 416,969

Int. Cl.<sup>2</sup> A63B 53/04

U.S. Cl. 273—169

16 Claims



1. A golf club comprising:
  - A. a club shaft;
  - B. a club head carried by the lower end of said club shaft, said club head having a substantially right-angled polygonal configuration in the plan view, said club head comprising:
    - a. a first weighting means located at the front heel corner of the club head,
    - b. a second weighting means spaced from said first weighting means in the toe-heel direction of said club head and located at the front toe corner of said club head,
    - c. a club face extending in the toe-heel direction,
    - d. a third weighting means spaced from said first weighting means in the aft direction of said club head and located at the rear heel corner of said club head,
    - e. a fourth weighting means spaced from said second weighting means in the aft direction of said club head and spaced from said third weighting means in the toe-heel direction of said club head and located at the rear toe corner of said club head,
    - f. shaft support means, to connect said shaft to said club head,
    - g. means connecting the weighting means to each other,
    - h. said weighting means having a greater mass than said shaft support means and said connecting means.

4,010,959

## SOUND REPRODUCING UNIT

Jay Smith, III, 504 Marquette Ave., Pacific Palisades, Calif. 90272, and Richard F. M. Conroy, 22707 Burbank Blvd., Woodland Hills, Calif. 91364

Filed May 20, 1974, Ser. No. 471,351

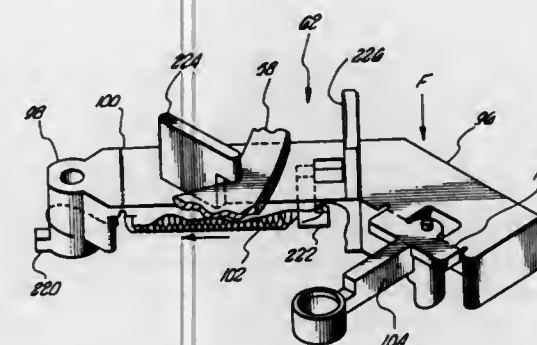
Int. Cl.<sup>2</sup> G11B 3/10

U.S. Cl. 274—23 R

8 Claims

1. A sound unit speaker system for producing sound sequences from a recording medium having sound indicia, comprising a speaker member having a generally cone configuration

to the apex of which a coupling element is joined, a vertically positioned link, one end of which is interconnected to said coupling element, a sound pick-up assembly connected to said link including a tone arm body member mounted for lateral and pivotal movement relative to said recording medium, a stylus mounting arm interconnected to said body member, flexure means hingedly interconnecting the stylus mounting arm to the body member along a hinge axis so as to provide for



relative movement therebetween, a stylus mounted on said mounting arm adjacent to the hinge axis of said flexure means, said stylus mounting arm having a receiving portion located in spaced relation from said hinge axis of said stylus mounting arm for receiving an end of said link for engagement therewith, so that said link is responsive to movement of said stylus for transmitting sound indicia motion from said stylus through said link to said speaker member.

4,010,960

## ROTATING SEAL

Jean Martin, Chatillon, France, assignor to Groupement pour les Activités Atomiques et Avancées "GAAA", Le Plessis-Robinson, France

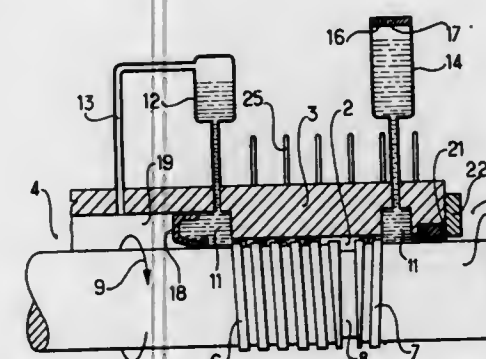
Filed Oct. 7, 1975, Ser. No. 620,456

Claims priority, application France, Oct. 21, 1974, 74.35285

Int. Cl.<sup>2</sup> F16J 15/40

U.S. Cl. 277—3

18 Claims



1. In a seal assembly for a rotating shaft effecting sealing by viscous effect, and having a rotating shaft extending through a bore formed in a wall separating, from the outside medium, an enclosure containing a fluid kept under high pressure, said assembly comprising, at the level of the bore, a sleeve mounted within said bore and surrounding said shaft and defining with said shaft opposed continuous cylindrical faces, first and second threads within one of said faces separated at their center by a groove and limited at their periphery by first and second lip seals for said rotating shaft, of the conventional type, two tanks of viscous liquid, cooling means, means for balancing the pressures between said viscous liquid and said high pressure fluid, the improvement wherein said threads have unequal lengths and are cut on one of the continuous cylindrical faces in opposite pitches such that each of said threads tend to drive said viscous liquid towards its periphery in the direction of the lip seals.

4,010,961

## SKI TIE

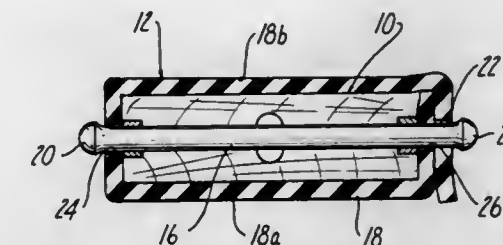
David Paul Goode, 2015 Long Lk. Shores, Orchard Lake, Mich. 48033

Filed May 17, 1976, Ser. No. 687,170

Int. Cl.<sup>2</sup> A63C 11/02

U.S. Cl. 280—11.37 A

8 Claims



1. A device for binding a pair of skis together in spaced bottom-to-bottom relationship comprising: an elongate spacer rod of relatively pliable polymeric material having moderately enlarged integral heads on the opposite ends thereof, the length of said rod between said heads being about the width of a ski whereby the rod may be placed between a pair of skis with the heads extending beyond the lateral extremities thereof; and a strip of elastically elongatable material including a first aperture located approximately at its center, said strip in the configuration binding said skis being disposed on the rod adjacent one of the heads with said first aperture encircling said rod and having portions extending in opposite directions from said first aperture; second and third apertures in the strip near respective opposite ends thereof with one strip portion stretched over one ski in said pair and hooked over the opposite head via the second aperture and the other strip portion stretched over the other ski in said pair and hooked over said opposite head via the third aperture.

4,010,962

## BOAT LOADING STRUCTURE

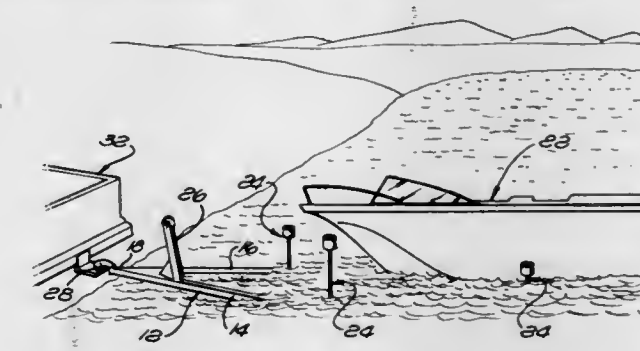
John T. Groblebe, 467 W. 8th St., Perris, Calif. 92370

Filed May 22, 1975, Ser. No. 579,841

Int. Cl.<sup>2</sup> B60P 3/10

U.S. Cl. 280—414 R

4 Claims



1. A boat loading structure comprising:
  - a. a boat trailer including a pair of longitudinally extending side rails;
  - b. at least one pair of bar assemblies, each of said bar assemblies of each pair being mounted on respective side rails, said pair being mounted in a plane generally perpendicular to said side rails;
  - c. each of said bar assemblies comprising:
    - a. a base secured to said side rails;
    - b. a vertical rod extending upwardly from said rail;
    - c. a spring interconnecting said base and one end of said vertically extending rod;
    - d. a roller member rotatably mounted on the other end of said spring rod; and
    - e. means for varying the spacing between the springs of each bar assembly pair for providing a continuous variable adjustment of the amount of pressure exerted by said roller members.



4,010,963

**SKIRT FOR MOBILE HOMES**

John E. Prentice, 1212 N. 950 West, Orem, Utah 84057  
Filed Feb. 10, 1975, Ser. No. 548,850  
Int. Cl.<sup>2</sup> B60R 27/00

U.S. Cl. 280—768

2 Claims



1. A skirt section for mobile homes and the like of substantially rigid sheet material, the skirt section comprising:
  - top panel means spanning between the side limits of the skirt section and defining at least two vertically extending lip means;
  - bottom panel means at least partially vertically overlapping the top panel means and spanning between the side limits of the skirt section, the bottom panel means comprising at least two lip means respectively contiguous with the lip means of the top panel means;
  - the respective pairs of contiguous lip means defining a track whereby the vertical span of the skirt section may be selectively adjusted and alignment preserved by relatively displacing the top panel means in respect to the bottom panel means along said track;
  - means for mounting the top edge of the top panel in suspended relation to a mobile home or the like;
  - each panel means comprising three separate pieces in series, the two end pieces in a common plane and the third in a second plane offset from but essentially parallel to the first plane and said mounting means comprising a bridge physically tying said three separate pieces of the top panel means together for unitary displacement and an additional bridge physically tying said three separate pieces of said bottom panel means together for unitary displacement.
2. A skirt section for mobile homes and the like, the skirt comprising:
  - at least three pairs of generally U-shaped telescopically related loosely partially vertically superimposed top and bottom sheets, each pair of sheets being vertically slidably interlocking with at least one other of said pairs of sheets, the vertically slidably interlocking feature between pairs of sheets comprising flange extending from the edge of each sheet and defining one leg of an included acute angle substantially less than 90° the remainder of each sheet comprising the other leg of said acute angle, two of the flanges of each pair of sheets projecting essentially in one direction and two in the opposite direction each two being loosely contiguously superimposed in said telescopic relation;
  - top bridge means rigidly connected to the top sheet of each of said pairs of sheets to secure said top sheets together so that said top sheets are manually relatively vertically displaced as a unit, said top bridge means comprising means for attaching the top bridge means to a mobile home or the like so that the skirt section is suspended at the periphery of the mobile home into the space between the ground and the floor of the mobile home;
  - bottom bridge means rigidly connected to the bottom sheet of said pairs of sheets to secure said bottom sheets together so that said bottom sheets are manually relatively vertically displaced as a unit in respect to the top sheets, to allow the bottom bridge means to engage the ground upon manual telescopic adjustment of the vertical height for the skirt and the skirt section to thereby span the full distance between the ground and the floor of the mobile home at said periphery.

4,010,964

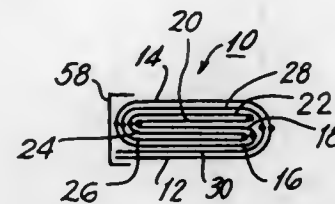
**PRINTED COUPON FOLDER**

Sheldon Schechter, 34 Bush Parkway, East Brunswick, N.J. 08816

Filed Oct. 29, 1975, Ser. No. 626,629  
Int. Cl.<sup>2</sup> B42D 15/04

U.S. Cl. 283—56

8 Claims



1. A printed coupon direct mail folder comprising an even numbered plurality of individual panels that are oblong in plan and equal in size and are attached edge to edge seriatim with their narrow sides in alignment to form a unitary element that is oblong in plan, the long axis of each individual panel being perpendicular to the long axis of said element, each of said individual panels bearing printed promotional material related to an associated saleable item, at least one of said individual panels bearing a printed redemption coupon, said printed coupon providing for the purchase of the associated saleable item at a predetermined reduction in price, each of said individual panels being connected across said element to an adjacent individual panel by a rectilinear weakened zone, said weakened zones being perpendicular to the long axis of said element, said element being folded by a plurality of parallel over-and-over folds to a member that has the plan size of a single individual panel and a thickness of all of said individual panels combined, said parallel over-and-over folds including a first fold whereby the oblong element is folded in half with the endmost individual panels being registered in planar parallelism and the weakened zones in each half being superimposed, and succeeding parallel over-and-over folding of said element at said superimposed weakened zones exclusive of said endmost panels, terminating with a final parallel over-fold of the element exclusive of said endmost individual panels onto said registered endmost individual panels, and means to secure said folder in folded condition against premature opening.

4,010,965

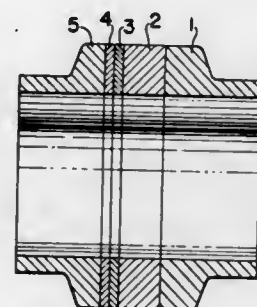
**PIPE JOINT FOR CONNECTING DIFFERENT KINDS OF METALLIC PIPES**

Takeshi Izuma; Chiyoshi Fukumoto, and Kazuhiko Yamaura, all of Takashimagun, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1975, Ser. No. 566,534  
Claims priority, application Japan, Apr. 15, 1974, 49-40941  
Int. Cl.<sup>2</sup> F16L 55/00

U.S. Cl. 285—173

2 Claims



1. A pipe joint for connecting an aluminum pipe to a stainless steel pipe, which comprises washer layers of aluminum, titanium, nickel and stainless steel in this order, each washer layer being welded to the adjacent layers in the axial direction of the pipe joint by explosive bonding.

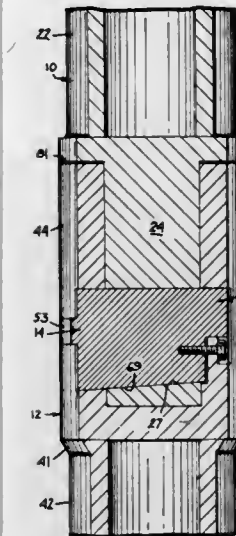
4,010,966

**PIPE COUPLER**

Paul G. Vanden Bosch, Box 222, Gregory, S. Dak. 57533  
Filed Mar. 18, 1976, Ser. No. 668,205  
Int. Cl.<sup>2</sup> F16L 21/00, 25/00

U.S. Cl. 285—403

5 Claims



1. A pipe coupler comprising:
  - a. a male coupler element having a rearward end adapted for attachment to a pipe and a fluid passageway through said element generally along the longitudinal axis thereof, said element having a non-circular cross sectional configuration and a pair of recesses formed in the outer surface of said element on opposite sides thereof, said recesses having forward walls transverse to said longitudinal axis;
  - b. a female coupler element having a rearward end adapted for attachment to a pipe, the forward portion of said element having a non-circular bore configured to conform to the outside shape of said male coupler element for telescopic non-rotational engagement therewith, said female coupler element having an internal narrowing step adjacent said forward portion for abutment with the forward end of said male coupler element when telescopically engaged therewith, said step having a fluid passageway therethrough in alignment with the fluid passageway of said male coupler element, said female coupling element having a pair of slots formed therein extending parallel to each other on opposite sides thereof in alignment with said recesses of said male coupler element when telescoped in said female coupler element;
  - c. key means including a pair of key blocks each sized to fit within one of said slots in position within said recess, each key block having a first edge for engagement with a surface of the slot of said female coupler element and having a second edge at an acute angle to said first edge for wedging engagement with said forward wall of said recess; and
  - d. means for securing said key blocks within said slots so as to wedge said male coupling element into place with its forward end in fluid sealing abutment with said internal step of said female coupling element.

4,010,967

**GASOLINE TANK CLOSURE FOR A MOTOR VEHICLE**

Isaac Renteria, Jr., Houston, Tex., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 21, 1976, Ser. No. 650,850

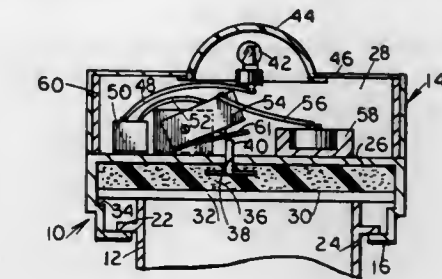
Int. Cl.<sup>2</sup> E05B 19/18

U.S. Cl. 292—251.5

8 Claims

1. A closure for an automobile gas tank or radiator comprising:
  - a cylindrical body having a top and a bottom wall adapted to be attached to an automobile gas tank or radiator, a light secured to said top wall, and

electrical circuit means within said cylindrical body between said top and bottom walls for activating said light in



response to removal of said closure from said automobile gas tank or radiator.

4,010,968

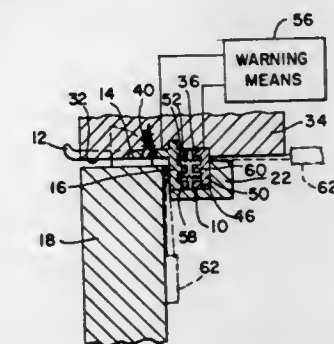
**LATCH GUARD**

Arthur W. Rehfeld, Arleta, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest  
Filed Mar. 10, 1976, Ser. No. 665,525

Int. Cl.<sup>2</sup> E05C 1/12

U.S. Cl. 292—346

1 Claim



1. In a latch guard having a mounting flange mountable in overlying relation to the inner face of a jamb in the vicinity of keeper means located on the jamb, and a blocking flange integrally fixed along one edge of the mounting flange substantially at right angles thereto so as to lie in a first plane paralleling, and adapted to overlie the abutment face of a jam-mounted stop, the blocking flange projecting laterally on a side of the mounting flange facing the door, the mounting flange having an enlarged recess defined centrally therein, the improvement wherein a portion of the blocking flange projecting along and beyond the full length of the recess in a direction away from the door has a plurality of toothed segments formed therein, and further comprising a conductive plate lying in a second plane paralleling the first plane and normally spaced therefrom in a direction away from the door, and at least one non-conductive compression spring being interposed between said plate and said blocking flange for urging said plate in a direction away from said blocking flange, and wherein the stop and the jamb are formed with first and second recesses, respectively to receive said blocking flange, said spring, and said plate, and wherein the blocking flange and said plate are formed with projections facing one another, respectively, the blocking flange is conductive, and the latter and said plate are adapted to be electrically coupled to an intruder-actuated warning means, respectively, whereby, upon an intruder attempting to selectively jam a prying tool between the jamb and the stop, and between the door and the stop, said projections make electrical contact with one another and actuate said warning means.



4,010,969

**IMPACT RESISTANT LIGHTWEIGHT, LOW COST  
AUTOMOBILE BUMPERS AND METHOD OF MAKING  
SAME**

Ronald G. Cantrell, Birmingham, and Barron L. Katchka, Pontiac, both of Mich., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Filed May 17, 1973, Ser. No. 361,245

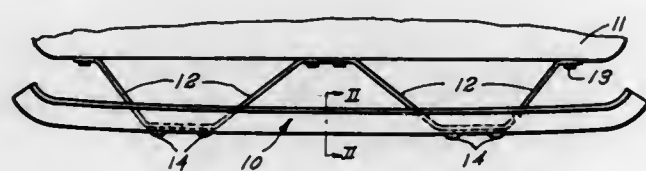
Int. Cl.<sup>2</sup> B60R 19/02

U.S. Cl. 293-98

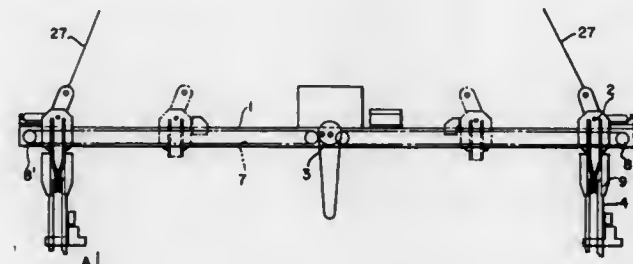
16 Claims

U.S. Cl. 294-81 R

3 Claims



16. A bumper bar adapted to be mounted protectively across an end of an automotive vehicle; the bar being formed from easily workable sheet or strip steel and having an elongated body portion and spaced apart integral portions extending angularly away from the body portion; said body portion being heat and quench hardened throughout its major extent to provide it with yield strength to withstand repeated impact of a high order of magnitude without significant damage; said spaced apart portions being at least in part free from heat and quench hardening adjacent to said body portion and comprising flanges along upper and lower sides of said body portion; and areas lying at or near the vertical neutral axis between said body portion and said flanges being unhardened.



1. A lifting device comprising a lifting beam, a pair of shackle suspending devices slidably mounted upon said lifting beam, means including a sprocket and driving chain for moving said suspending devices toward or away from each other, a shackle device including a shackle pin, means for attaching a shackle device to each of said suspending devices including a rotary pin, means for adjusting the angular position of each of said shackle devices, and means for advancing each shackle pin into an attaching hole of a block or retracting each shackle pin from said attaching hole.

4,010,972

**AXLES RESILIENTLY MOUNTING WHEELS**

Manfred Schindehutte, Calden; Erwin Raquet, Sprockhovel, and Helmut Licht, Bochum, all of Germany, assignors to Fried. Krupp Huttenwerke AG, Bochum, Germany

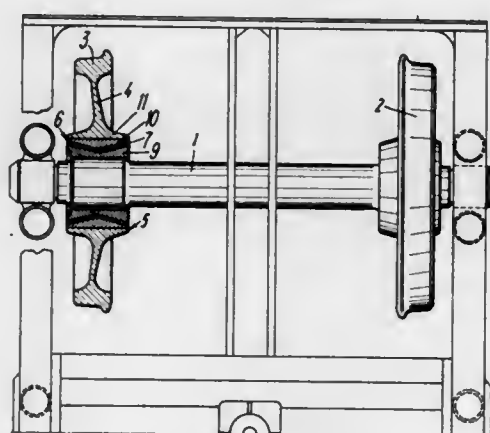
Filed Jan. 24, 1975, Ser. No. 543,907

Claims priority, application Germany, Feb. 13, 1974, 2406880

Int. Cl.<sup>2</sup> B60B 9/12, 17/00, 27/00, 37/00

U.S. Cl. 295-11

5 Claims



1. Wheel set for a bogie of a track vehicle, comprising an axle rotatably mounted in bearings of a bogie, wheels mounted fixed to the axle, a substantially wide rubber elastic insert for springing each said wheels, said rubber elastic insert having an arched axial-radial cross-section, the height of the arch in radial direction being substantially small relative to the width of the arch, said insert being arranged between the wheel hub and wheel rim in the proximity of the hub boring and extending substantially over the whole width of the wheel hub, the apex of the arched insert facing the hub boring, and an outer part comprised of individual circular segments surrounding substantially said rubber elastic insert.

4,010,970

**WASTE RECEIVER FOR DOGS**

John R. Campbell, 776 Holly St., New Milford, N.J. 07646

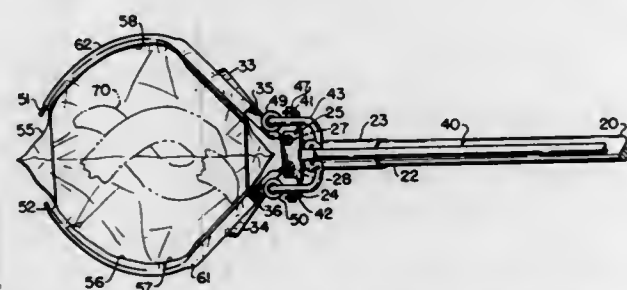
Continuation-in-part of Ser. No. 540,841, Jan. 14, 1975,

abandoned. This application Apr. 21, 1976, Ser. No. 678,990

Int. Cl.<sup>2</sup> A01K 29/00

U.S. Cl. 294-19 R

20 Claims



14. A waste receptacle for pet toilet use adapted to be supported by curved cooperating arms having free ends which touch each other, said receptacle having a top opening with two sides of said opening, tubular portions of said receptacle extending at least partially along the outside of said top opening, pressure sensitive fastening means extending within and along at least one side of said opening and in a parallel position to said tubular portions in a plane parallel to the plane of said opening, whereby said receptacle may be supported along said tubular portions by said arms and said fastening means are closed when engaged by said arms during withdrawal of said receptacle over the touching free ends of said arms.

4,010,973

**MOTOR CAMPER ACCESSORY**

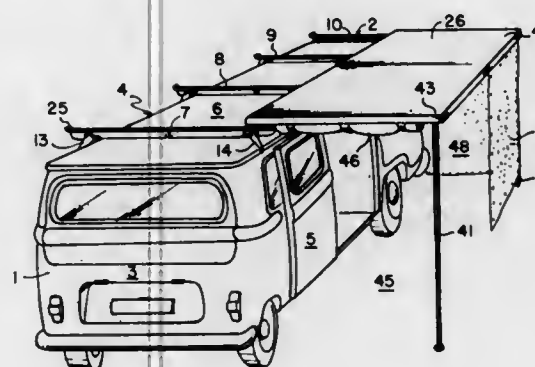
Manfred G. Heinrich, Richmond, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Sept. 8, 1975, Ser. No. 611,569

Int. Cl.<sup>2</sup> B60P 3/32

U.S. Cl. 296-23 R

3 Claims



1. A motor camper accessory for a motor camper vehicle having a front, a rear, a pair of sides and a roof extending from front to rear and side to side, said motor camper accessory comprising

a plurality of spaced tracks affixed to the roof of a vehicle and extending from side to side of the vehicle in substantially parallel relation with each other, each of the tracks being of T-shaped cross-section and being bent upward at the driver's side of the roof;  
a platform having approximately the same dimensions as the roof of the vehicle and having roller means affixed to an underside thereof rollably mounting the platform on the tracks for movement to a position covering the roof and to an extended position extending beyond the roof from a side of the roof in approximately the plane of the roof; and  
support posts for supporting two corners of the platform farthest from the vehicle when the platform is in its extended position for maintaining said platform at approximately the level of the roof above the ground whereby said platform in its extended position covers an area of ground alongside the vehicle.

4,010,974

**MULTIPLE COMPARTMENT STRUCTURE**

Donald F. Day, 9213 Tamarind, Fontana, Calif. 92335

Continuation of Ser. No. 350,515, April 12, 1973, abandoned.

This application Oct. 4, 1974, Ser. No. 511,993

Int. Cl.<sup>2</sup> B60P 3/04

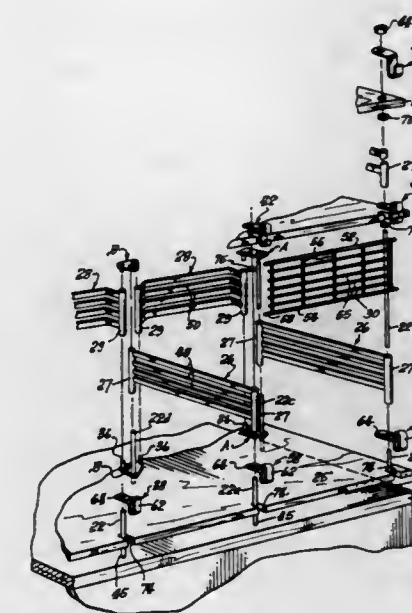
U.S. Cl. 296-24 C

6 Claims

1. A structure forming a plurality of layers of compartments arranged in vertical tiers and supported on an underlying base, comprising:

a first wall member and a second wall member for each compartment of a tier cooperative to form at least the two opposite side walls and the rear wall of the compartment, at least one of said wall members forming an angle in plan configuration, one leg of the angle forming one side wall of the compartment, the other leg of the angle forming at least part of the rear wall of the compartment, each of said wall members having two horizontally spaced upright passages therethrough;  
a plurality of horizontal panels forming floors and ceilings of the compartments; and  
a group of four rods in each tier extending upward from said base through the horizontal panels, said four rods including two rods extending through the two

upright passages of the first wall members of the tier and two rods extending through the upright passages of the



second wall members of the tier to hold the wall members in their assembled positions.

4,010,975

**AUXILIARY FOOTREST FOR AUTOMOBILES**

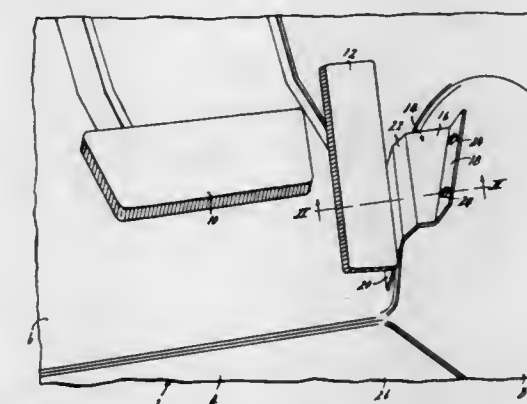
Frank Horton, 302 Broadway, Lamar, Mo. 64759

Filed Nov. 21, 1975, Ser. No. 634,265

Int. Cl.<sup>2</sup> B60N 3/06

U.S. Cl. 296-75

6 Claims



1. In combination with an automobile equipped with the usual accelerator pedal and the usual brake pedal disposed to the left of said accelerator pedal, both pedals being operable by the right foot of the driver, said automobile being equipped with an automatic speed regulating system commonly known as a cruise control system operable when activated to maintain the automobile at a pre-set speed, said cruise control system when activated requiring that the driver's right foot be removed from both of said pedals, an auxiliary footrest for the right foot of the driver, said footrest comprising:

a. a generally planar rigid step,  
b. means at the right edge of the step connecting said step rigidly to the body of said automobile and positioning said step with its plane generally parallel to and above the plane of said accelerator pedal when said pedal is in its normal raised position, and immediately to the right of said accelerator pedal, and  
c. a generally planar apron secured along its upper edge to the left edge of said step and extending generally vertically downwardly therefrom past and below the right edge of said accelerator pedal to a point at least as low as the upper surface of said pedal when said pedal is in its fully depressed position, the apron being secured only to the left edge of the generally planar step.



4,010,976

## MOTORCYCLE FAIRING

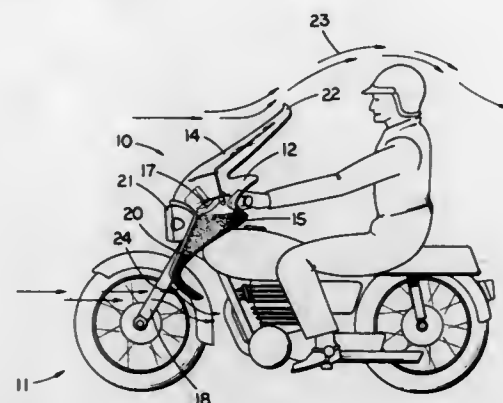
William D. Shields, R.R. 6 Lake Edgewood, Martinsville, Ind. 46151

Filed Feb. 13, 1976, Ser. No. 658,036

Int. Cl.<sup>2</sup> B62J 17/02

U.S. Cl. 296—78.1

10 Claims



## 1. A motorcycle fairing which comprises:

a formed sheet of transparent material, the formed sheet including first portions extending across and spaced apart from the front of the motorcycle handlebars, a second portion extending above the handlebars to shield the motorcycle rider's face, and third portions extending downwardly along opposite sides of the front fork of the motorcycle; and

connecting means for attaching the third portions to the front fork of a motorcycle, said connecting means comprising a gasket extending along the third portions, the gasket comprising a flexible, resilient material, the third portions being spaced apart a distance sufficient to cause the gasket to be deformed against the front fork of the motorcycle and to frictionally engage the front fork.

4,010,977

## TWO POSITION SEAT AND LOCK

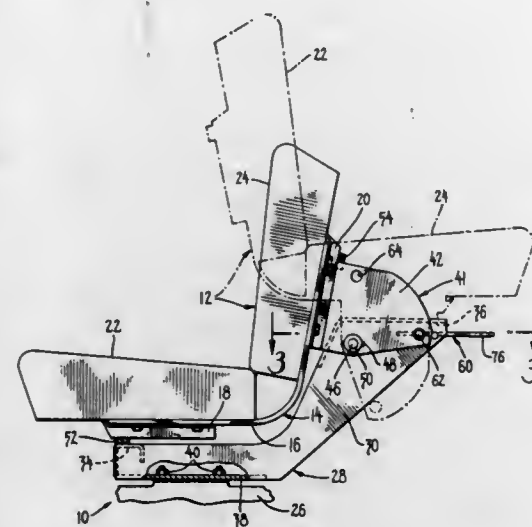
Habibur Rahman, Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Aug. 25, 1975, Ser. No. 607,313

Int. Cl.<sup>2</sup> B60N 1/02

U.S. Cl. 297—92

6 Claims



1. A two position vehicle seat supported on a vehicle portion comprising: a pair of parallel plate members extending longitudinally of a vehicle and vertically upward, a seat assembly having a pair of body supporting portions disposed at an angle to each other, a pivot member pivotally connecting said seat assembly to said plate members for movement about a transverse axis spaced from the vehicle portion, a bracket member mounted on one of said body supporting portions, said bracket member forming a pair of apertures spaced from each other and equally spaced from said transverse axis, one of said plate members forming an aperture also equally spaced

from said transverse axis and coincidental alternately with the apertures of said bracket member, lock means for maintaining one of said body supporting portions in a position below said transverse axis to form a seat and for maintaining both said supporting portions above said transverse axis in a second position where said one supporting portion forms a backrest and the other supporting portion a seat, said lock means including a lock assembly movably supported on one of said plate members for engagement with the apertures of one of said plate members and one of the apertures of said bracket member simultaneously when said seat assembly is in one of its positions.

4,010,978

## TAKE DOWN BLOOD DONOR SEATING APPARATUS

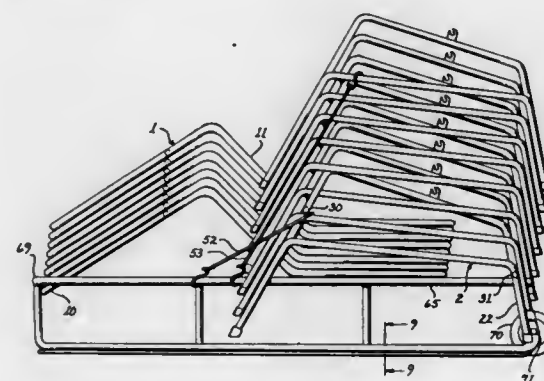
Evan W. Rosen, 110 S. Cuesta, Tucson, Ariz. 85705

Filed Dec. 15, 1975, Ser. No. 640,870

Int. Cl.<sup>2</sup> A47C 3/04

U.S. Cl. 297—239

4 Claims



1. An easily transported integrally nested take down chair ensemble for erecting reclinable chairs at a facility, said ensemble comprising in combination:

- a stretcher-like dolly for receiving and transporting said reclinable chairs to and from the facility, said dolly including a framework having webbing extending thereacross and defining a platform, a pair of wheels disposed at one longitudinal end of said dolly, and a U-shaped handle extending from another longitudinal end of said framework for defining a circumscribed area adjacent said other end;
- a body support structure having a backrest, a seat and a leg rest for supporting a person upon said reclinable chair, said body support structure being of a width less than the lateral dimension of said dolly to prevent lateral overhang of said body support structure upon placement of said body support structure upon said platform and having a part of the backrest extending into the circumscribed area of said dolly;
- a base for supporting said body support structure, said base including a pair of mirror image inverted U-shaped members interconnected by rods, each said U-shaped member including a vertically oriented lower part and an inwardly canted upper part, said lower parts of said U-shaped members being spaced apart from one another by said rods by a distance equivalent to the width of said dolly such that on placement of said base upon said dolly subsequent to placement of said body support structure upon said dolly, said platform supports one of said rods, said body support structure supports another of said rods and said lower part depends downwardly adjacent the sides of said dolly to prevent lateral movement of both said body support structure and said base with respect to said dolly;
- a pivot bracket extending upwardly from said upper part of each said U-shaped member for pivotally mounting said body structure;
- a pair of pivot pins attached to the seat for disengageably engaging respective ones of said pivot brackets; and
- manually releaseable latch means disposed upon said upper part of each said U-shaped member for selectively

inhibiting rearward pivotal movement of said body support structure mounted upon said base; whereby, said dolly transports said base without danger of lateral displacement of said body support structure and said reclinable chair is readily erectable by engaging said pivot pin of said body support structure with said pivot bracket of said base.

4,010,979

## LATCH STRUCTURE FOR VEHICLE SEATS

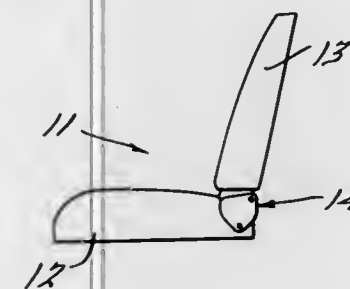
Alfred J. Fisher, III, 9 Stratford Place, Grosse Point, Mich. 48230, and Cecil A. Collins, 1355 Edgeorge Drive, Pontiac, Mich. 48054

Filed May 24, 1976, Ser. No. 689,033

Int. Cl.<sup>2</sup> B60M 1/02

U.S. Cl. 297—379

5 Claims



1. A latch structure for preventing movement of a vehicle seat back relative to the vehicle seat during deceleration of the vehicle, said latch comprising a bracket on said seat having a first latching recess therein, a latching member on said seat back having a second latching recess therein, a primary inertia member having a latch pin thereon engageable in said first and second latching recesses to preclude relative movement of said bracket and latching member, said primary inertia member being movable due to inertia forces from an unlatched position to a latched position upon the occurrence of said deceleration, said primary inertia member having a track therein, and a secondary inertia member movable along said track from a normal position to an inertia induced position, said secondary inertia member being operable to maintain said primary inertia member in a latched position after movement of said secondary inertia member from its normal position along said track toward the inertia induced position.

4,010,980

## COVERS FOR OUTDOOR CHAIRS

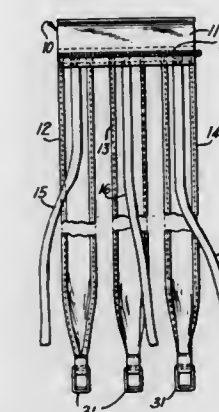
Emanuel Dubinsky, 99 Kingston Ave., Yonkers, N.Y. 10701

Filed Jan. 3, 1975, Ser. No. 538,455

Int. Cl.<sup>2</sup> A47C 7/00

U.S. Cl. 297—441

3 Claims



1. In a horizontal vinyl-like tubular covered chair having a frame having a seat portion and a back portion and having a plurality of originally installed vinyl-like horizontal tubular straps extending around said frame across said back and seat portions thereof and fixed to said frame, said originally installed horizontal tubular straps extending parallel to each other with spaces between adjacent originally installed horizontal tubular straps; the improvement comprising a removable cover for reinforcing and enhancing the effective duration of said originally installed horizontal vinyl-like tubular covering for said chair, said removable cover comprising a

tubular top piece removably mountable over the top of said frame back portion, said removable cover top piece comprising a pair of opposed front and rear separable portions removably connectable together to fix said top piece about said frame back portion top and a zipper means thereon for removably connecting said top piece separable portions together about said frame back portion top, said removable cover further comprising a first plurality of spaced apart parallel straps having a width greater than the width of said originally installed horizontal tubular straps and vertically extending from said removable cover top piece front portion and a second plurality of spaced apart parallel straps having a width narrower than said straps of said first plurality and vertically extending from said removable cover top piece rear portion, said first and second plurality of vertically extending straps being equal in number and being disposed on said respective front and rear portions with a respective corresponding strap of said second plurality substantially coaxial with a respective strap of said first plurality, each of said straps of said first plurality having an adjustable self-tightening tension means at the free end thereof in which the free end of said corresponding respective strap of said second plurality is removably interlockable, each of said first plurality of vertically extending straps being weavably threadable through selected ones of said originally installed horizontal tubular straps and lockable in place by interlocking with said corresponding strap of said second plurality behind said frame seat portion for reinforcing said originally installed horizontal tubular straps.

4,010,981

## AIR CONVEYOR WITH TUNNEL GUIDE

Trevor A. Hodge, Maple Down, Crown Road, Buxton, Norwich NOR 61Y, England

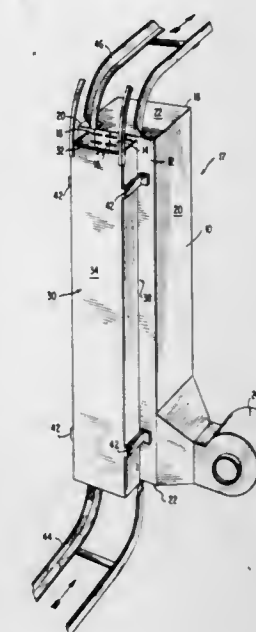
Continuation of Ser. No. 399,356, Sept. 20, 1973, abandoned.

This application July 21, 1975, Ser. No. 597,623

Int. Cl.<sup>2</sup> B65G 51/02

U.S. Cl. 302—2 R

9 Claims



1. An air conveyor for vertically lifting articles having a generally uniform exterior configuration comprising a plenum chamber, means for supplying pressurized air to the plenum chamber, a deck plate covering said plenum chamber and having a plurality of slots therein configured to issue pressurized air from the plenum in the form of directional air jets having a predominant flow component along the surface of the deck plate, an imperforate wall member mounted in spaced relation to the deck plate and being in confronting relation to the deck plate slots, said wall member extending along said deck plate and together with said deck plate defining a conveying zone to trap and conserve the conveying air, said wall member having an interior surface conforming to the exterior surface of the articles conveyed and defining a small air space between the interior surface of said wall member and each of said articles, said wall member having at least one



edge extending substantially the full length of the wall member, air gap means extending substantially the full length of said wall member along said edge providing for limited escape of air from within the conveying zone to prevent the buildup of air back pressure within said zone, means supporting said air conveyor in a direction having a substantial vertical component for moving articles from a lower to a higher elevation, and said imperforate wall member and said deck plate together provide a cross-section substantially similar to the cross-section of the articles being conveyed.

4,010,982

## VEHICLE-TRAILER BRAKING SYSTEM

Stuart James Cameron Grossart, Coventry, England, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

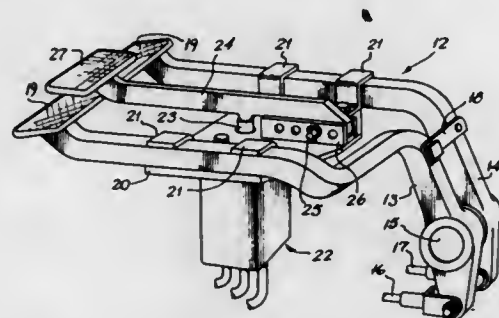
Filed Sept. 30, 1975, Ser. No. 618,198

Claims priority, application United Kingdom, Oct. 2, 1974, 42839/74; Oct. 4, 1974, 43263/74

Int. Cl.<sup>2</sup> B60T 13/14

U.S. Cl. 303—10

6 Claims



1. A braking system having a source of pressurized fluid, a reservoir, a hydraulic actuator, a brake, said actuator operable to cause engagement of said brake, a return and a supply line connecting said actuator with said reservoir and source of pressurized fluid, respectively, valve means for controlling flow through said supply and return lines including a body, a spool, said body having first and second ports therein, said first port connected to said supply line, said second port connected to said return line, said spool closing said first port when said second port is open and vice versa, a chamber formed between said spool and said body and means for biasing said spool including a first conduit connecting said chamber to said actuator for biasing said spool on said chamber side, and a second conduit between said actuator and said chamber to provide an unrestricted fluid path with said spool in said first position, a manual control device and a resilient connecting means between said manual control device and said spool to permit said manual control device to move said spool to a position opening said first port and then said conduit for biasing said spool, and said means for biasing said spool to then return said spool to a second position opening said second port and closing said first port to maintain a force on the brake system proportional to the force applied on said manual control device.

4,010,983

## DUAL BRAKE CIRCUIT VALVE ASSEMBLY

Ralph Coupland, Lincoln, England, assignor to Clayton Dewandre Company Limited, Lincoln, England

Filed May 29, 1975, Ser. No. 581,846

Claims priority, application United Kingdom, June 13, 1974, 26285/74

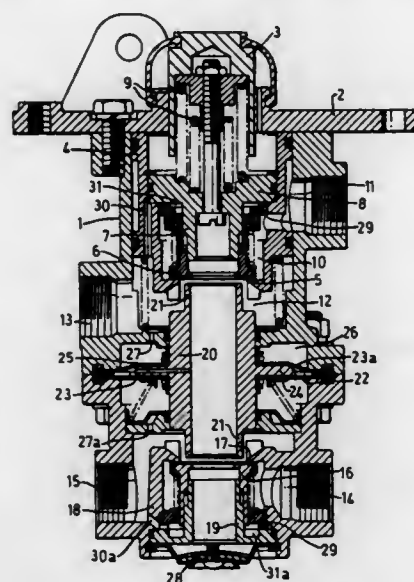
Int. Cl.<sup>2</sup> B60T 15/12

U.S. Cl. 303—40

2 Claims

1. A dual brake system valve assembly comprising a housing provided with respective sets of fluid pressure inlet and delivery ports connected into respective braking circuits, means defining passages within the housing between the inlet and delivery ports on each set, a poppet type valve member in

each passage, said valve members being slidably mounted in coaxial relation within said housing and having adjacent one ends, means biasing said valve members to close pressure transmitting communication between the ports of each set through their respective associated passages, operating means for substantially simultaneously displacing said valve members to interconnect the related inlet and delivery ports in pressure transmitting communication through their respective passages for actuating brakes in the respective circuits, said operating means including a thrust member disposed between said adja-



cent one ends of said valve members, and means whereby during brake actuation the delivery pressure in each passage is applied in force balancing relation to non-adjacent end areas of the associated valve member, said thrust member comprising a tubular exhaust valve structure disposed coaxially between said two valve members and mounted by a diaphragm assembly, and spaced at opposite sides of the diaphragm assembly being connected respectively to the two delivery ports so that effective delivery pressures across the exhaust valve structure are balanced.

4,010,984

## INTERNAL HYDRAULIC SEALING FOR A VEHICLE LOCKING DEVICE

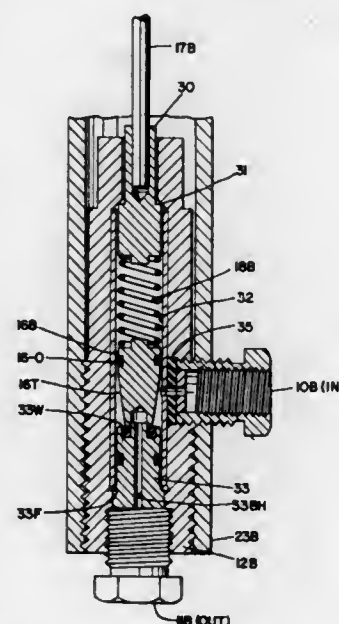
James A. Coleman, 2250 E. 105th St., Cleveland, Ohio 44106

Filed Nov. 3, 1975, Ser. No. 628,333

Int. Cl.<sup>2</sup> B60T 17/16

U.S. Cl. 303—89

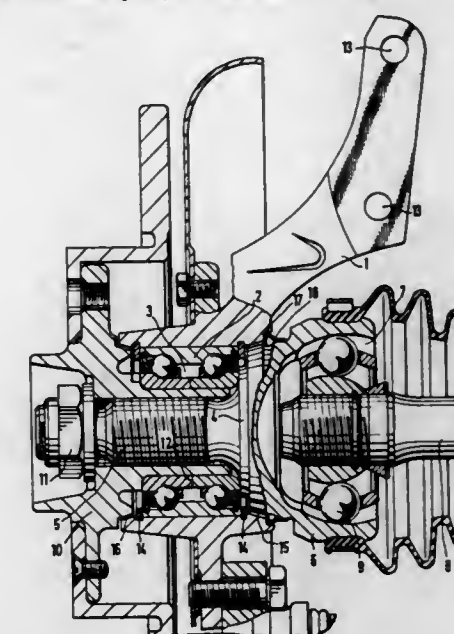
3 Claims



1. In a locking device, a ported cylinder, a soft metal liner which is coaxially arranged within the cylinder, a piston valve located coaxially within the liner,

a valve seat co-operable for mating said piston valve, said valve seat incorporating a relatively hard metal which has a flared portion for mating with an end of said soft metal liner, and a cylinder port fitting having wrench accommodating flats and arranged for threaded engagement advance within the ported cylinder whereby advancement of the valve seat flared portion against the soft metal liner forms an internal seal.

component in the vicinity of the bore, said annular ring cooperating with and projecting into the groove so as to substantially prevent foreign elements from entering the gap and contaminating the bearing in the bore.



4,010,985

## ROTARY DRILL BIT

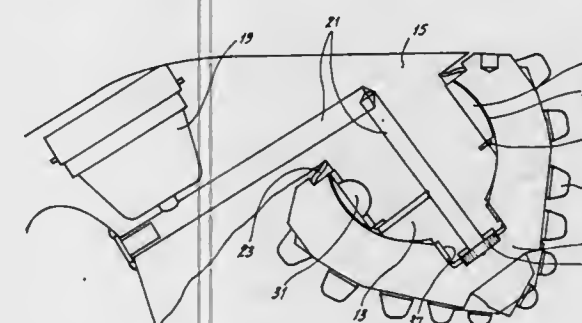
Ian Graeme Rear, 53 Louise St., Nedlands, Western Australia, Australia (6009)

Filed Dec. 23, 1975, Ser. No. 643,939

Int. Cl.<sup>2</sup> F16C 19/00

U.S. Cl. 308—8.2

10 Claims



1. A rotary drill bit comprising a bit head and roller cutters mounted on said head, a shaft fixed at one end to the bit head, each roller cutter being rotatably mounted on said shaft, said shaft being provided with an annular formation having a substantially spherical outer surface thereon, any one point on the surface having a center of curvature on the diametric axis of the annular formation which intersects that point, said spherical outer surface forming a bearing surface of said shaft, each said roller cutter being provided with a correspondingly formed bearing surface to surround the spherical outer surface of the annular formation and bearingly engage said surface.

4,010,986

## BEARING ARRANGEMENT FOR A VEHICLE WHEEL

Heinz Otto, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Dec. 31, 1975, Ser. No. 645,796

Claims priority, application Germany, Feb. 7, 1975, 2505081

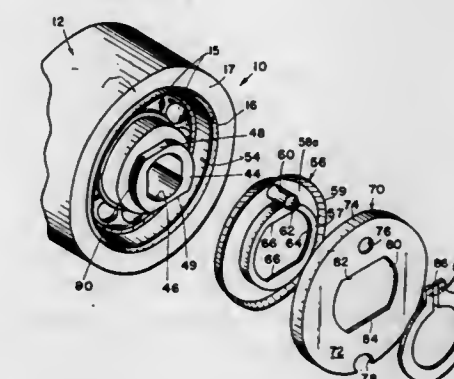
Int. Cl.<sup>2</sup> F16C 13/00

U.S. Cl. 308—16

3 Claims

1. An improved bearing arrangement for a vehicle wheel, particularly of an automobile, having in combination an outer component provided with a bore and an inner axle component journaled in the bore and supported therein by means of a bearing, whereby one of the components is connected to a wheel for the vehicle and the other component is connected to wheel guiding elements articulated on the vehicle body, the surfaces of said components in the vicinity of the bore defining a gap between them extending in toward the bearing, wherein the improvement comprises a bearing-protecting packing arrangement at an entrance of the gap which includes an annular groove, concentric with the bore, defined on the surface of the outer component in the vicinity of the bore and leading widthwise in toward the bore and a complementary annular slinger ring fixed on the surface of the inner axle

1. A bearing assembly comprising inner and outer annular bearing races spaced apart from one another, anti-friction bearing means interposed between said races for rotatably supporting one race with respect to the other; means for axially positioning said anti-friction bearing means; said assembly adapted to be supported on a support extending through said assembly; an extension extending laterally to one side of said inner race; shield means mounted on said extension for covering the opening between said races at the side of said assembly, said shield means including an aperture there-through for receiving said extension; removable securing means for retaining said shield means including resilient retaining means for constantly maintaining engagement with said extension to hold said shield means on said extension and means allowing removal of said resilient retaining means and shield means without removing or disassembling said bearing assembly from any support for the assembly when the assembly is mounted thereon such that the shield means and retaining means are removable without disassembly of any other portion of the assembly or removal of the assembly from its support.



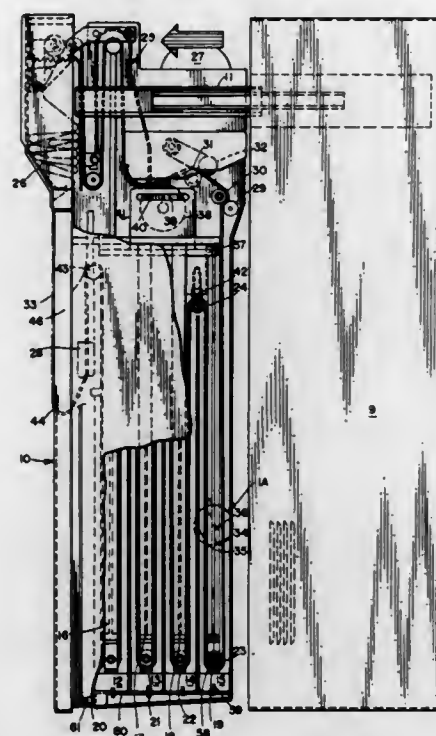


4,010,988

## TOWEL APPARATUS

James W. Schwartz, 782 Shag Bark Lane, Deerfield, Ill. 60015  
Continuation of Ser. No. 755,013, Aug. 23, 1968, Pat. No. 3,884,630. This application Mar. 7, 1975, Ser. No. 556,104  
Int. Cl.<sup>2</sup> B65H 19/00; D061 1/00  
U.S. Cl. 312—38

7 Claims



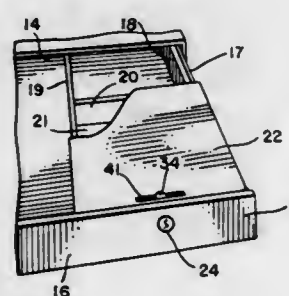
1. Apparatus for dispensing rolled fabric toweling including a cabinet and a clean toweling storage compartment, means for allowing manual withdrawal of lengths of clean toweling from said clean toweling storage compartment and said cabinet, and electric motor driven means for retracting lengths of use toweling to within said cabinet, a slot located in the surface of said cabinet through which said toweling is caused to pass upon retraction of said lengths of use toweling to within said cabinet, the dimension of the opening of said slot in a direction transverse to the surface of toweling sections lying within said slot being no larger than 0.070 inches, and the external surfaces of said slot adjacent said opening being abruptly joined to the surfaces of said slot generally parallel to said towel sections lying within said slot.

4,010,989

## LOCKABLE DRAWER COMPARTMENT

Joseph R. Klug, Manitowoc, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.  
Filed Oct. 14, 1975, Ser. No. 622,146  
Int. Cl.<sup>2</sup> A47B 88/00  
U.S. Cl. 312—204

6 Claims



1. A drawer for use with a supporting frame in which the drawer is movable between open and closed positions and is provided with a compartment therewithin, a cover for the compartment movably mounted on the drawer, the cover being movable between a closed position in which access to the compartment is prevented and an open position in which the compartment is substantially uncovered, and locking means on the drawer movable between a first position in

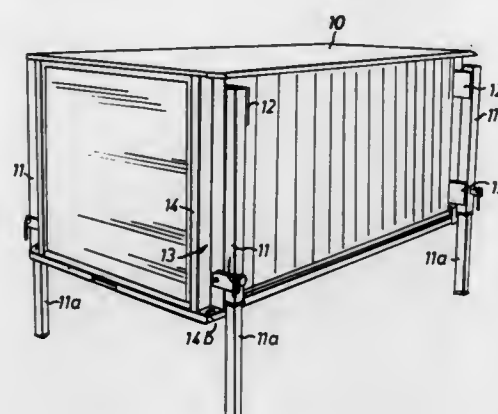
which both the drawer and the cover of the drawer compartment are locked in their closed positions, a second position in which the drawer is unlocked and the cover is locked, and a third position in which both the drawer and the cover are unlocked and are freely movable between their open and closed positions.

4,010,990

GOODS CONTAINER FOR TRANSPORT PURPOSES  
Robert John Rowley, Peterborough, and David Allen, Kettering, both of England, assignors to Modular Distribution Systems Limited, Kettering, England  
Filed Oct. 20, 1975, Ser. No. 624,244  
Claims priority, application United Kingdom, Oct. 21, 1974, 45387/74

Int. Cl.<sup>2</sup> A47B 91/00, 95/00; F16M 11/16  
U.S. Cl. 312—255

8 Claims



1. A goods container for use in containerised goods transport systems, comprising a container body which is provided at each vertical corner with a retractable leg structure, said structure comprising a fixed pillar having a vertically-extending recess which is open laterally of the container, a tubular post hinged to said pillar to swing about a vertical axis between a stowed position within the recess and an operative position extending laterally outboard of the container, a hollow ground-engaging leg slidably engaged in the tubular post to move vertically, each of said post and leg being of corresponding rectangular cross-sections, a ram accommodated within and connected between the post and the leg to effect sliding of the leg, and locking means for retaining the post in its stowed and operative positions, the locking means including a part which is mounted on the pillar to move into and out from the recess and which engages the post in its operative position to prevent the post moving to its stowed position and which is retained in the recess by the post when the latter is stowed.

4,010,991

METHOD FOR DEVACUATING A VACUUM TUBE  
George Ernest Eiwen, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,561

Int. Cl.<sup>2</sup> H01J 9/50

U.S. Cl. 316—2

1 Claim

1. In a method for devacuating an evacuated electron tube to atmospheric pressure, said tube comprising an envelope having a glass neck portion and, housed in said neck portion, a mount assembly including a surface structure opposite and closely spaced from an area of said neck portion, said method including the step of directing a pulsed beam of radiant energy incident upon an external surface area of said glass neck portion until a crater is formed in said neck portion and the glass material at the bottom of said crater volatilizes and is swept into said envelope and condenses therein; the improvement comprising applying said beam to an area of said neck portion that is opposite and closely spaced from said surface structure

4,010,993

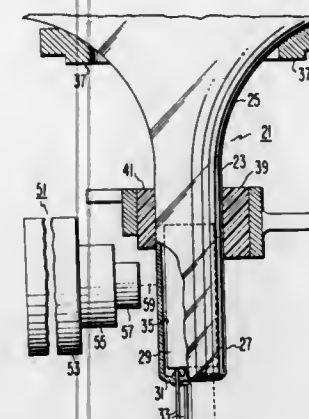
## ELECTRICAL CONNECTOR DEVICE

Reiner Mathias Hohenberger, Brackenheim, and Gerd Johann Emil Holst, Loewenstein, both of Germany, assignors to Bunker Ramo Corporation, Oak Brook, Ill.  
Continuation of Ser. No. 410,059, Oct. 26, 1973, abandoned, which is a continuation of Ser. No. 333,553, Feb. 20, 1973, abandoned, which is a continuation of Ser. No. 142,876, May 13, 1971, abandoned. This application Feb. 28, 1975, Ser. No. 554,331

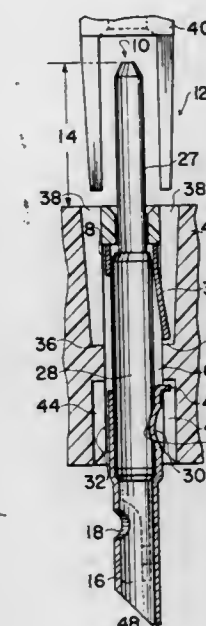
Int. Cl.<sup>2</sup> H01R 27/00

U.S. Cl. 339—31 R

5 Claims



said surface structure of said mount assembly, said surface structure being spaced no further than 250 mils from the inner surface of said glass neck portion.



4,010,992

## LOW PROFILE SOCKET HAVING TERMINAL PINS SEALINGLY MOUNTED IN SOCKET HOUSING

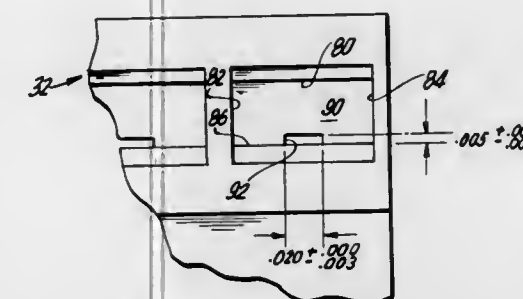
David J. Crimmins, Stockton, and William Y. Sinclair, Frenchtown, both of N.J., assignors to Aries Electronics, Inc., Frenchtown, N.J.

Filed Jan. 8, 1976, Ser. No. 647,425

Int. Cl.<sup>2</sup> H01R 13/12

U.S. Cl. 339—17 CF

12 Claims



1. A socket for receiving an electronic multi-pin package comprising an elongated housing having the plurality of channels extending therethrough and a plurality of terminals; each terminal including (1) a post portion received within a respective one of said channels and extending from one side of the housing, and (2) a receptacle portion disposed within said respective channel for engaging a pin of said multi-pin package; each said channel in said housing defined by (1) rigid upstanding wall portions for engaging the sides of said receptacle portion of the terminal, and (2) a flexible membrane base having an aperture therein, with the cross-section of said aperture being less than the cross-section of said terminal post portion whereby, when the terminal post portion is fully assembled in said channel, the membrane base thereof deforms downwardly to sealingly engage the terminal.

1. An electrical connector device which may be used either as a female connector device or as a male connector device, said electrical connector device comprising:

a body of insulating material having a passageway extending from a front end to a rear end and including an outwardly formed stop means between said ends; and a one-piece metallic sleeve located at least partially within said passageway and having outwardly extending resilient means cooperating with said stop means for positioning said sleeve in said passageway, the sleeve having front and rear end portions and contact means interconnecting said end portions, said contact means bowed inwardly to resiliently contact a projecting end portion of a first male contact element of a mating connector when such element is inserted into said sleeve in a direction from the front end of said passageway toward the rear end thereof with said contact means then acting as a female connector device, and said contact means also being outwardly expandable to alternatively engage and support an enlarged rear portion of a second male contact element constituting an adapter converting said sleeve from a female contact to a male contact when the combination of said sleeve and said second male contact element is inserted in said passageway in the opposite direction from the rear end thereof toward the front end thereof, said contact means receiving the second male contact element in a position where the smaller front portion of said second male contact element then extends outwardly from said body beyond the front end of said passageway, the sleeve including attachment means on said rear end portion for making electrical connection to an external conductor.



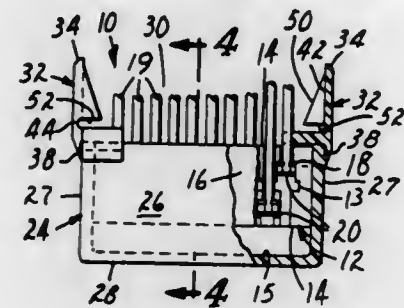
4,010,994

## CONNECTOR ENCAPSULATING HOUSING

James E. Aysta, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Division of Ser. No. 400,950, Sept. 26, 1973. This application  
June 12, 1975, Ser. No. 586,502  
Int. Cl.<sup>2</sup> H01R 13/44

U.S. Cl. 339—36

7 Claims



1. A housing for encapsulating an electrical connector having upstanding side walls extending between opposite ends and internal passageways through the connector between said opposite ends, said housing having walls defining a socket with an unrestricted open end and smooth inner side surfaces having dimensions adapted to conform to the side walls of a said connector entirely around the connector and receive the connector endways with a sliding fit sufficiently close that the passageways in the connector will offer less resistance to movement of the encapsulating material than the space between the inner side surfaces of the socket and the connector walls, a pair of levers, and means for hingedly mounting said levers at the open end of the socket in opposing relationship, each lever having an end spaced a first distance from said hinge means and adapted for manual engagement and a driving surface adjacent the open end of the socket spaced a distance less than said first distance from said hinge means and adapted to engage the exposed end of a said connector received in the socket, and being manually pivotable via said hinge means from a first position at which the open end of the socket is unrestricted toward a second position to engage its driving surface with the exposed end of a said connector received in the socket and drive the connector fully within the socket.

4,010,995

## ELECTRICAL OUTLET GUARD

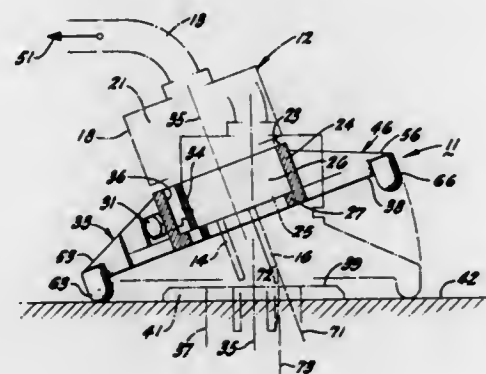
Robert H. Britschgi, 4515 Sierra View Way, Fair Oaks, Calif. 95826, and Jerry C. Frinzel, 5324 Tiburon Way, Sacramento, Calif. 95841

Filed Nov. 14, 1975, Ser. No. 631,888

Int. Cl.<sup>2</sup> H01R 13/62

U.S. Cl. 339—45 R

2 Claims



1. Electrical outlet guard comprising:  
a. a central hub shaped to receive an electrical plug and orient the prongs of the plug into alignment with the slots of an electrical wall outlet when said guard is located

against the wall in register with the outlet, said central hub being of hollow right circular cylindrical configuration, and means on said hub for releasably clamping said guard to the electrical plug;

b. at least three circumferentially spaced limbs each mounted at one end on said hub said limbs being arrayed in radial fashion relative to the axis of said hub, at least one of said limbs being provided with a radial slot extending through the adjacent portion of said hub, said clamping means including means for urging the slot walls into closed position with the plug disposed within said hub for clamping engagement thereby as the slot is closed; and,  
c. a leg mounted on the other end of each of said limbs, the ends of said legs normally contacting the wall surface externally of a cover plate of the wall outlet, said legs being spaced at a distance from said hub such that the prongs of the plug remain substantially in alignment with the wall outlet slots as said guard is tilted away from the wall in any direction with at least one of said legs serving as a fulcrum as the plug is withdrawn and the tips of the prongs are moved from a first engaged position in the outlet to a second position in which the prong tips disengage the outlet.

4,010,996

## INTRINSIC CERTIFICATION ASSEMBLY TECHNIQUE FOR WIRING COMPONENTS INTO AN ELECTRICAL APPARATUS

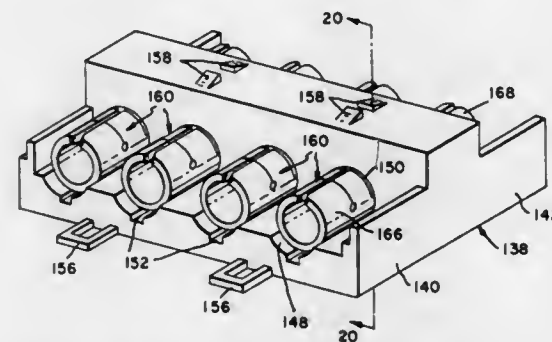
John Root Hopkins, Belleair, Fla.; Robert Maurice Renn, and Robert Keith Southard, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 649,009, Jan. 14, 1976, which is a division of Ser. No. 520,399, Nov. 4, 1974, Pat. No. 3,970,354. This application Aug. 17, 1976, Ser. No. 715,096

Int. Cl.<sup>2</sup> H01R 25/00

U.S. Cl. 339—47 R

5 Claims



1. An improved hermaphroditic electrical connector assembly comprising:  
a connector housing having a main body portion with integral contact supporting portions extending from two opposite sides thereof, a plurality of contact receiving channels extending through said housing from one contact supporting portion to the other, each channel including a profiled groove in each of said contact supporting portions and a profile aperture in said main body portion,  
a plurality of tubular contacts each having at least one longitudinal slot defining matable contact engagement areas and each said contact adapted to be received in a respective one of each of said contact passages of said connector housing, each said contact further including first means adapted to be received in said profiled groove to limit the axial movement of said contact and second means engageable with the profiled aperture in said main body portion preventing rotational movement of said contact about its longitudinal axis.

4,010,997

## PLUG-IN JACK FOR ELECTRICAL BUSWAYS

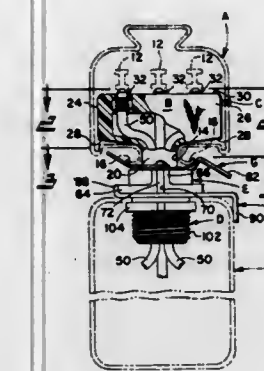
William J. Bulanchuk, Pelham, N.Y., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 28, 1975, Ser. No. 636,040

Int. Cl.<sup>2</sup> H01R 7/28, 13/54

U.S. Cl. 339—75 R

17 Claims



1. A plug-in jack for electrical busways or the like comprising: a generally T-shaped hollow housing of electrical insulating material including an enlarged hollow head portion having end walls and sidewalls and a substantially closed top end, said head portion having a width across said end walls substantially greater than its thickness across said sidewalls, a plurality of spaced-apart electrical contact buttons extending outwardly from said top end of said head portion, a hollow base portion opposite from said head portion and having attaching means thereon for attaching said base portion to a junction box or the like, said base portion being integrally formed and connected with a relatively narrow hollow neck portion which is integrally formed and connected with said head portion, said head portion, neck portion and base portion having hollow interiors communicating with one another for passage of wires there-through for connection with said buttons, and releasable locking means carried by said housing intermediate said head and base portions for releasably locking said head portion in an opening.

4,010,998

## MATABLE ELECTRICAL CONNECTOR MEANS WITH INERTIA LOCK

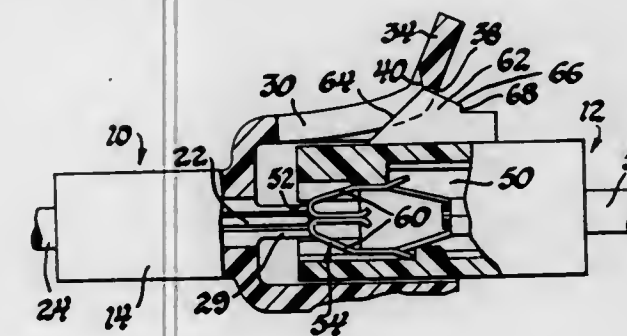
Emil J. Tolnar, Jr., Warren; Robert G. Plyler, Vienna, and David R. Heilman, Warren, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1976, Ser. No. 652,387

Int. Cl.<sup>2</sup> H01R 13/54

U.S. Cl. 339—91 R

5 Claims



1. Matable electrical connector means having lock means comprising  
a first connector body of moldable insulating material having a given number of first longitudinal open ended terminal receiving cavities, each of which has a first terminal retained therein having a forward female portion,  
a second connector body of moldable insulating material having a corresponding number of second longitudinal open ended terminal receiving cavities, each of which has

a second terminal retained therein having a forward male portion,  
one of said first and second connector bodies having a forward portion engaging a forward portion of the other of said connector bodies when said connector bodies are in a mated position whereat said first and second cavities are longitudinally aligned and said male portion(s) is received by said female portion(s) and biasingly engaged by resilient portions thereof,  
said first and second terminals having a predetermined terminal engagement force resisting connection of said connector bodies produced by insertion of said male portion(s) in said female portion(s) during assembly,  
one of said first and second connector bodies having integral cantilevered latch arm means and the other of said first and second connector bodies having protruding generally triangular locking ramp means which cooperate to lock said connector bodies in said mated position,  
said latch arm means having free end portion means engaging said ramp means and being deflected outwardly thereby during assembly producing a maximum predetermined force resisting assembly of said connector bodies into said mated position, and  
said ramp means being profiled and located on said other connector body such that during assembly said maximum predetermined force occurs prior to biased engagement of said male portion(s) by said female portion(s) and is about twice as great as said predetermined terminal engagement force.

4,010,999

## DEAD-FRONT ELECTRICAL PLUG

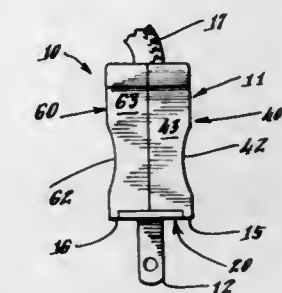
Ernest Gerhard Hoffman, Middlefield, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Sept. 2, 1975, Ser. No. 609,797

Int. Cl.<sup>2</sup> H01R 13/58

U.S. Cl. 339—107

21 Claims



1. A dead-front electrical plug comprising:  
A. a dead-front member comprising the front of the dead-front electrical plug;  
B. at least two conductive blades mounted through and supported by said dead-front member, said blades including means for connecting wire conductors thereto;  
C. a first side cover comprising one side and substantially one-half of the ends and top of the dead-front electrical plug in its assembled condition, said first side cover pivotally connected to said dead-front member by a web hinge integral with both said first side cover and said dead-front member, wherein said first side cover is pivotable between an open position affording access to said means for connecting wire conductors to said blades and a closed position partially enclosing said means for connecting wire conductors to said blades;  
D. a second side cover comprising another side and substantially the other half of the ends and top of the dead-front electrical plug in its assembled condition, said second side cover pivotally connected to said dead-front member opposite to said first side cover by a web hinge integral with both said second side cover and said dead-front member, wherein said second side cover is pivotable between an open position affording access to said means



for connecting wire conductors to said blades and a closed position fully enclosing, together with said first side cover, said means for connecting wire conductors to said blades;

E. means for securing said side covers together to maintain the dead-front plug in its assembled condition fully enclosing said means for connecting wire conductors to said blades;

F. at least one first member laterally protruding from one of said dead-front member or said first side cover near the web hinge connecting them, and at least one opening defined in the other of said dead-front member or said first side cover near the web hinge connecting them for receiving said first laterally protruding member in mating interengagement when the electrical dead-front plug is in its assembled condition, whereby said first laterally protruding member bears longitudinal stress between said first side cover and said dead-front member in at least one longitudinal direction and protects said web hinge from such longitudinal stress; and

G. at least one second member laterally protruding from one of said dead-front member or said second side cover near the web hinge connecting them, and at least one opening defined in the other of said dead-front member or said second side cover near the web hinge connecting them for receiving said second laterally protruding member in mating interengagement when said dead-front electrical plug is in its assembled condition, whereby said second laterally protruding member bears longitudinal stress between said second side cover and said dead-front member in at least one longitudinal direction and protects said web hinge from such longitudinal stress.

4,011,000

## ELECTRICAL RECEPTACLE

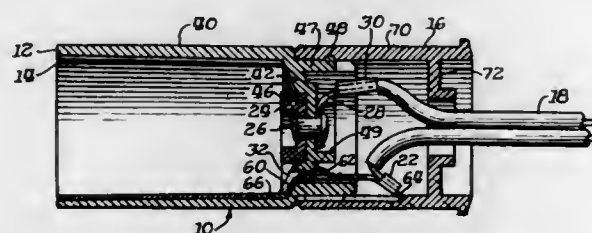
Richard F. Wharton, Chicago, Ill., assignor to Marquis Industries, Inc., Chicago, Ill.

Filed June 30, 1975, Ser. No. 591,773

Int. Cl.<sup>2</sup> H01R 17/18

U.S. Cl. 339—130 C

3 Claims



1. An electrical receptacle for use with a plug of the type having a first spring-loaded contact member at the center of one end, and a second spring-loaded contact member on one side;

said electrical receptacle comprising a housing, a sleeve within said housing, a center contact member, and first and second terminal members affixed respectively to said center contact member and to said sleeve;

said housing being of insulating material with an opening forming a well and having a bottom portion at one end of said well, said well having a generally cylindrical side wall which is tapered with the diameter at the bottom slightly smaller than the diameter at the top open end, said bottom portion having a center opening surrounded by a short cylindrical depression which in turn is surrounded by a surface sloping upward from the depression to the bottom of the side wall, and a side opening through which said second terminal member extends;

said first terminal member having a ring at one end; said center contact member being a cup-shaped metal member which fits in said depression, having a hole in its center, and shaped to receive said first spring-loaded contact member of said plug; fastening means extending

in order through said hole in the center contact member, said center opening of said housing, and said ring of the first terminal member to thereby affix both the center contact member and the first terminal member to the housing;

said sleeve being of relatively thin, smooth metallic material formed into only a cylinder with an open seam parallel to the axis, and inserted with a close fit within said well adjacent said side wall;

the shape and dimensions within said well being such that said plug may be inserted with a straight motion with said first spring-loaded contact member entering said cup-shape of said center contact member and being compressed against said fastening means, and said second spring-loaded contact member sliding along and being compressed against said sleeve.

4,011,001

## LIQUID CRYSTAL DEVICE

Tokio Moriya, Chiba, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Mar. 14, 1975, Ser. No. 558,461

Claims priority, application Japan, Mar. 15, 1974, 49-29744

Int. Cl.<sup>2</sup> G02F 1/01; G04B 19/30

U.S. Cl. 350—160 LC

6 Claims



1. A liquid crystal device for use in watches and the like comprising: first and second transparent base plates disposed in superposed spaced-apart relationship; a liquid crystal element sandwiched between said first and second base plates; means defining a recess in the peripheral side edge of said second base plate and said liquid crystal element; a light source disposed within said recess for illuminating said liquid crystal element; and means for directing light emitted from said light source toward said liquid crystal element.

4,011,002

## ELECTRONIC DEVICE FOR DETECTING THE ENERGIZED STATE OF A LIQUID CRYSTAL DISPLAY CELL

Heihachiro Ebihara, and Fukuo Sekiya, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

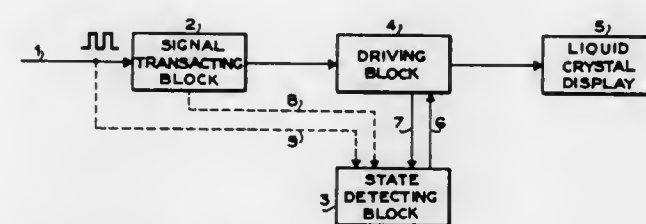
Filed May 6, 1975, Ser. No. 574,969

Claims priority, application Japan, May 16, 1974, 49-53881

Int. Cl.<sup>2</sup> G02F 1/18; G08B 5/36; G02F 1/13; G08B 5/22

U.S. Cl. 350—160 LC

7 Claims



1. An electronic device comprising: a logic circuit for producing an alternating current signal, a liquid crystal display cell,

a driving circuit for supplying a driving signal to said display cell in accordance with the output signal from said logic circuit,

a detecting circuit for monitoring the energized state of said display cell, said detecting circuit producing an output when the display cell is energized by direct current, and means for changing the energized state of said display cell to a deenergized state of said display cell in accordance with the output signal from said detecting circuit.

4,011,003

## ELECTROMAGNETICALLY CONTROLLABLE PIVOTING MIRROR DEVICE

Jan Cornelis Willem Dragt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

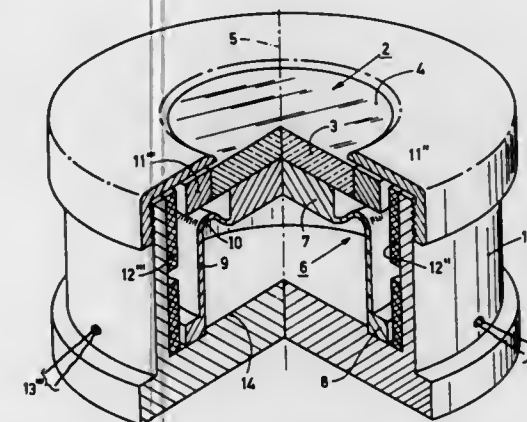
Filed Jan. 26, 1976, Ser. No. 652,535

Claims priority, application Netherlands, Mar. 10, 1975, 7511634

Int. Cl.<sup>2</sup> G02B 27/17; G05D 25/00

U.S. Cl. 350—6

2 Claims



1. An electromagnetically controllable pivoting mirror device for causing a reflecting surface to pivot about pivotal axes parallel to the reflecting surface under the influence of electrical control signals, more particularly destined for both radially and tangentially following the information track of a rotating optically readable video disc with the aid of a light spot produced by a light source, and comprising:

a frame, a mirror which relative to the frame is pivotable about the said pivotal axes, which mirror comprises a base with a reflecting surface on one side thereof, supporting means for pivotally supporting the mirror on the frame and comprising a first portion which is connected to the mirror and a second portion which is connected to the frame as well as a third elastically deformable intermediate portion of an elastic plastic, and electromagnetic control means comprising permanent magnets and/or electrical coils, characterized in that said third portion of the supporting means comprises a substantially rotation-symmetrical bellows body, which comprises at least one fold which is concentric with the optical center of the reflecting surface.

4,011,004

## PIVOTABLE STAGE FOR MICROSCOPE SYSTEM

Marshall S. Levine, Wayne, Pa., and Ralph Z. Jorden, Pennsauken, N.J., assignors to Geometric Data Corporation, Wayne, Pa.

Filed Feb. 6, 1975, Ser. No. 547,685

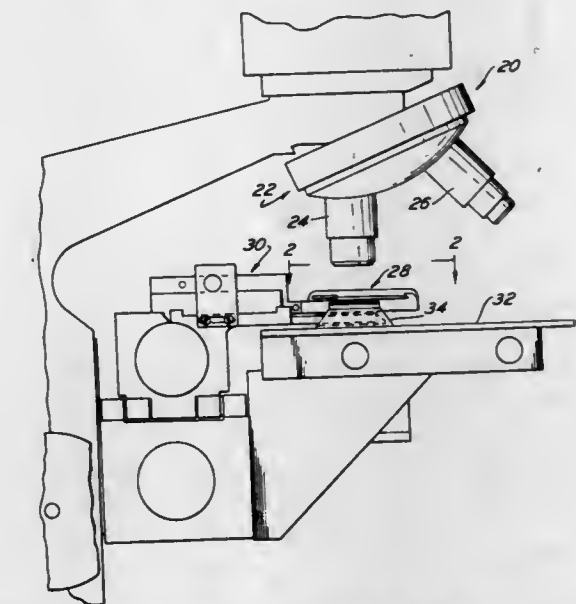
Int. Cl.<sup>2</sup> G02B 21/24

U.S. Cl. 350—90

1 Claim

1. In a microscope system, a stage for holding a slide under a microscope, said stage including a movable support member, a slide holder for engaging a slide, said slide holder secured to said movable support member by a pivotable member which is rotatable about a horizontal axis, means for moving said movable member in at least two rectilinear directions,

said slide holder being movable with said movable support member so that a slide held thereby is movable in two rectilinear directions in a plane substantially transverse to the optical axis of said system, a condenser disposed in the optical axis of said system, said condenser including a point-like projection which extends upwardly from the top of the condenser, said slide holder including a slidable member and fixed projection, means on said slide holder for resiliently urging said slidable



member against said slide so that said slide is held by said slide holder between said slidable member and said projection, said slide holder and slide being disposed with respect to said condenser so that said slide rests on said point-like projection and is slidably supported thereon so that the bottom surface of said slide in the optical axis of said microscope system remains substantially fixed longitudinally of said optical axis as said slide is moved transversely with respect thereto.

4,011,005

## COUPLER FOR OPTICAL COMMUNICATION SYSTEM

Thaddeus Hawkes, and Jean-Claude Reymond, both of Paris, France, assignors to Thomson-CSF, Paris, France

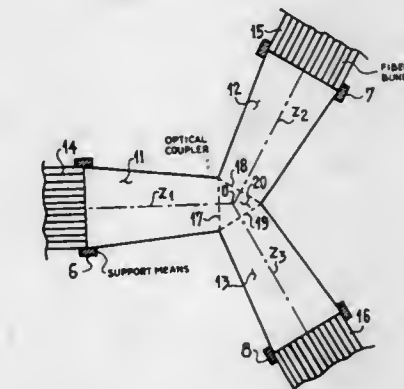
Filed Jan. 19, 1976, Ser. No. 650,263

Claims priority, application France, Jan. 22, 1975, 75.01971

Int. Cl.<sup>2</sup> G02B 5/16

U.S. Cl. 350—96 C

11 Claims



1. An optical coupler for interconnecting transmission lines in an optical communication system having at least three optical signal transmission lines each comprising at least one optical waveguide having a core of transparent material having a refractive index N1 surrounded by a layer of transparent cladding material having a refractive index N2 that is lower than N1, said coupler coupling the signal in any one of said optical transmission lines to all of the remaining optical signal transmission lines and comprising:

a propagation medium of transparent material of refractive index N3, formed by at least three elongated frusto-conical shaped arms, each having an outer side surface and



two planar end faces namely a major base and a minor base which are substantially perpendicular to the longitudinal axis thereof and a connecting medium for mutual optical interconnection of the said minor bases and for mechanical holding of said arms, said longitudinal axes meeting at a common point situated in the said connecting medium which is comprised between said minor bases, said arms being symmetrically disposed with respect to the said common point so that the angle between any pair of said axes is the same, said minor bases having diameters determined such that their respective light radiation pattern in the said connecting medium is substantially hemispherical for the numerical aperture  $A$  of the associated transmission line, the value  $A$  being equal to  $N_1^2 - N_2^2$ ,

layer means surrounding said propagation medium except said major bases for reflecting light that impinges upon the side surfaces thereof, and

support means for connecting said transmission lines to said major bases respectively such that the optical waveguide of which a said transmission line is comprised terminate parallel to the corresponding longitudinal arm axis with waveguide end faces disposed in a plane substantially adjacent to the corresponding major base.

4,011,006

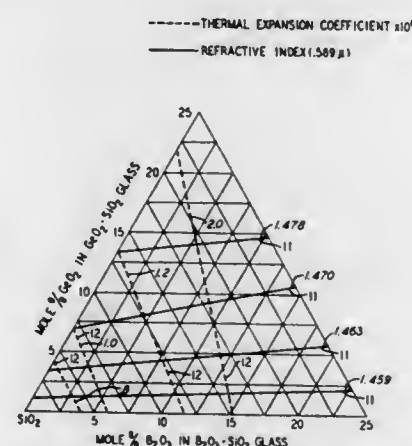
**GeO<sub>2</sub>-B<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> OPTICAL GLASS AND LIGHTGUIDES**  
James William Fleming, Jr., Piscataway; Raymond Edward Jaeger, Basking Ridge, and Thomas John Miller, Green Brook, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 509,652, Sept. 26, 1974, Pat. No. 3,954,431. This application Dec. 17, 1975, Ser. No. 641,651. The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> C03C 3/08; G02B 5/14

U.S. Cl. 350-96 M

3 Claims



2. A light guide for transmitting light along a transmission path comprising a first glass which is the core in contact with a second glass which is the cladding along the transmission path CHARACTERIZED IN THAT the first glass is composed of from 8 mole percent to 40 mole percent GeO<sub>2</sub>, remainder SiO<sub>2</sub>, and the second glass is composed of from 5 mole percent to 40 mole percent B<sub>2</sub>O<sub>3</sub>, from 0.1 to 5 mole percent GeO<sub>2</sub>, remainder SiO<sub>2</sub>, so that the first glass and the second glass differ in index of refraction by more than one half percent and differ in coefficient of linear expansion by less than 20 percent.

4,011,007  
**OPTICAL FIBER BUNDLE IMAGE CONDUIT**  
Roland A. Phaneuf, Sturbridge, and Richard R. Strack, Southbridge, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

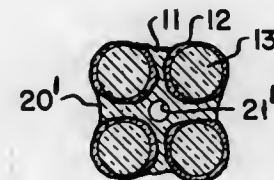
Continuation of Ser. No. 157,217, June 28, 1971, abandoned.

This application Dec. 27, 1973, Ser. No. 428,967

Int. Cl.<sup>2</sup> G02B 5/16

U.S. Cl. 350-96 BC

4 Claims



1. A drawn bundle of optical fibers comprising:  
a plurality of cores of selected material and dimension;  
a first core cladding having a refractive index providing substantially total internal reflection within said cores;  
a second core cladding disposed on said first core cladding having a viscosity lower than the viscosity of said core and first core cladding and having a cross-sectional area selected to provide at least a minimum free space of cross-sectional area unoccupied by said core and said first and second cladding within said drawn bundle for substantially eliminating optical fiber blemishes and preventing fiber distortion while providing channeling between the optical fibers;

said bundle being fused by the second core cladding deformed by said drawing to an extent to provide said minimum free space in said cross-sectional area unoccupied by said core and said first and second cladding.

4,011,008

**DISPLAY DEVICE COMPRISING A LAYER OF LIQUID CRYSTAL CRYSTAL**

Cornelis Jan Gerritsma, and Wilhelmus Hendrikus de Jeu, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

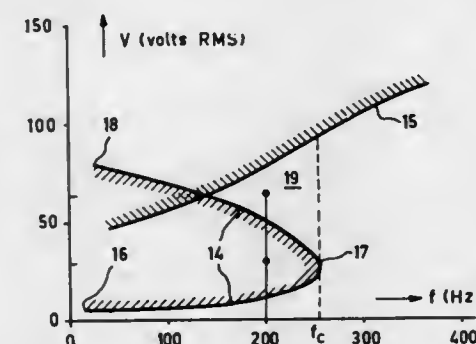
Filed Apr. 12, 1974, Ser. No. 460,355

Claims priority, application Netherlands, Apr. 18, 1973, 7305413

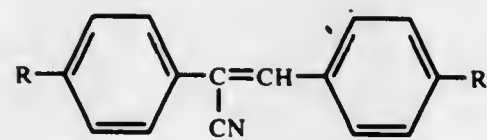
Int. Cl.<sup>2</sup> G02F 1/13

U.S. Cl. 350-160 LC

4 Claims



1. A display device comprising a mixture of a nematic liquid crystal having a negative dielectric anisotropy  $\Delta\epsilon < -1$  ( $\Delta\epsilon = \epsilon_{||} - \epsilon_{\perp}$ ) and being a stilbene of the formula:



where R and R' are each alkyl, alkoxy or acyloxy of up to 8 carbon atoms with the proviso that R and R' do not both

represent methyl or methoxy and an optically active material between two supporting plates provided with electrodes, said nematic liquid crystal exhibiting light scattering properties below a critical frequency when a voltage is supplied to at least two of said electrodes in a first range of voltages between a first frequency dependent minimum and a frequency dependent maximum of said voltage as well as in a second range of voltages above a second frequency dependent minimum of said voltage, said nematic crystal being transparent when subjected to a voltage between said frequency dependent maximum and said second frequency dependent minimum in a range of frequencies said second frequency dependent minimum being higher than said frequency dependent maximum, means for supplying recording and erasing voltages having the same frequency in said range of frequencies to at least two of said electrodes, said recording voltage being between said first minimum and said maximum of said voltage and said erasing voltage being between said maximum and said second minimum of said voltage.

4,011,009

**REFLECTION DIFFRACTION GRATING HAVING A CONTROLLABLE BLAZE ANGLE**

William L. Lama, Webster; Ned J. Seachman, Penfield, both of N.Y., and Clark I. Bright, Arcadia, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 27, 1975, Ser. No. 580,654

Int. Cl.<sup>2</sup> G02B 5/18; G02F 1/19

U.S. Cl. 350-162 R

11 Claims



1. A blazed reflection diffraction grating comprising:  
a first electrode coupled to a substrate material;  
an elastomeric material coupled to said first electrode, said elastomeric material deformable upon application of an electric field thereto; and  
a second electrode coupled to said elastomeric material, said second electrode coupled to a surface of said material positioned oppositely to said first electrode, said second electrode comprising an optically reflecting material, at least a part of said second electrode becoming a multiplicity of generally uniform planar regions upon application of a periodic electric field having a repeating sawtooth profile between said first and said second electrode, wherein said planar regions are substantially parallel and inclined at substantially a constant angle to said first electrode after said application of a periodic electric field.

4,011,010

**VISUAL FIELD TESTER WHICH IS ENTITLED MULTISCALE PERIMETER**

Allen L. Cohen, 9677 Basket Ring Road, Columbia, Md. 21045

Filed Feb. 18, 1976, Ser. No. 659,092

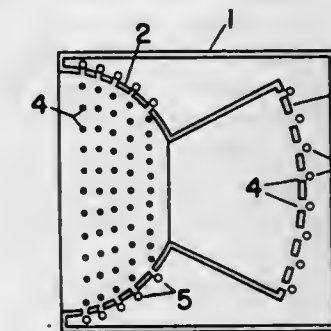
Int. Cl.<sup>2</sup> A61B 3/02

U.S. Cl. 351-24

2 Claims

1. Apparatus for testing both the peripheral and central

fields of vision of the human eye, which includes a hemispherically shaped testing surface for peripheral field testing, and at least one more testing surface substantially spaced from said hemispherical surface, said testing surfaces being spaced from each other by flared-shaped spacing means, said surfaces being joined in such a manner such that for  $n$  testing surfaces,



where  $n$  is an integer, there exists  $n-1$  surfaces whose central area is open so as to expose all of said surfaces to view, with the more central surface portions always at a greater distance from view, and with means for presenting visual targets upon the testing surfaces in a predetermined manner and location according to the discretion of the examiner.

4,011,011

**OPTICAL PROJECTION APPARATUS**

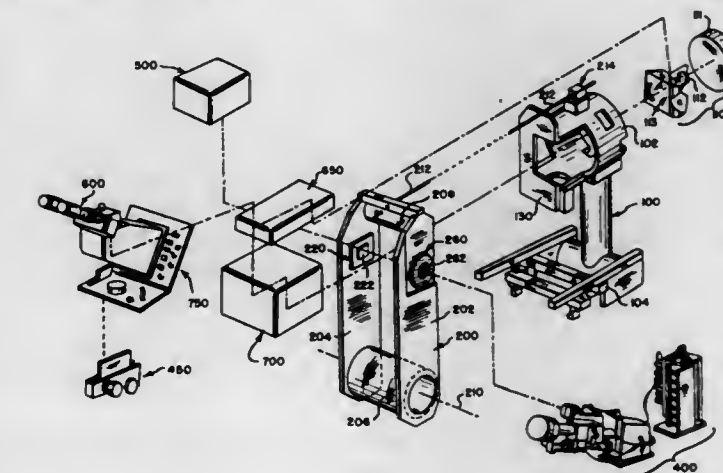
Harold S. Hemstreet, Wilton; David A. Markle, Norwalk, both of Conn.; William H. Newell, Mount Vernon, N.Y., and Abe Offner, Darien, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 339,860, March 9, 1973, abandoned. This application Dec. 19, 1974, Ser. No. 534,465

Int. Cl.<sup>2</sup> G03B 27/32

U.S. Cl. 355-18

8 Claims



1. Apparatus for photographically exposing an image-receiving surface to a light image of an object, said apparatus comprising:

a concave mirror,  
a convex mirror of smaller radius of curvature with its center of curvature substantially at the center of curvature of the concave mirror,  
means for supporting an object surface and an image-receiving surface with respect to each other and with respect to said mirrors so as to optically define a common image and optical plane,  
said optically defined common image and optical plane being located a distance from the concave mirror substantially equal to the radius of curvature thereof,  
said optically defined common image and optical plane containing the centers of curvature of said mirrors, and the perpendicular to the optically defined common image and optical plane through said centers of curvature constituting an axis of said mirrors,  
means for illuminating an arcuate area at the site of the



object surface which forms an arcuate light image area at the site of the imagereceiving surface, said arcuate area at the site of the object surface and said arcuate light image area at the site of the image-receiving surface optically defining, on the optically defined common image and optical plane, arcuate images respectively having arcuate areas exterior of and substantially centered on said axis of the mirrors, and means to advance said support means and the sites of the object and image-receiving surfaces to be supported thereon in their planes transversely of the means for illuminating the arcuate area on the object surface, said advancing means comprising a carriage rotatable about an axis fixed with respect to said concave and convex mirrors.

#### 4,011,012 OPERATION CONTROL DEVICE FOR COPYING APPARATUS

Yoshihisa Kawai, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

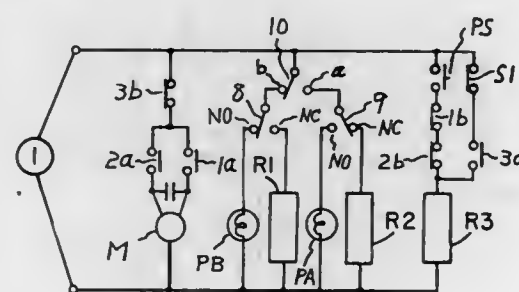
Filed May 19, 1975, Ser. No. 579,111

Claims priority, application Japan, May 31, 1974, 49-63340[U]

Int. Cl.<sup>2</sup> G03B 27/52

U.S. Cl. 355-55

10 Claims



1. An operation control device for use in a reproducing apparatus having a reproduction-projection mechanism together with drive means therefor, said mechanism being operable to form an image of a document, and including projectionmagnification changing means operable to vary the size of the image to be formed by the reproduction-projection mechanism, wherein the improvement comprises:

- means for producing a first signal in response to completion of a projection-magnification changing operation,
- a first circuit for actuating the drive means, said first circuit being closed in response to a signal from the signal-producing means,
- a second signal-producing means indicating completion of an operation of the mechanism,
- a second circuit for actuating the projection-magnification changing means, said second circuit being closed in response to completion of an operation by the reproduction-projection mechanism, and
- a manual control and memory means associated with said first circuit, said memory means being settable to a discrete state indicative of an operation of the manual control and said changing means being actuated in response jointly to the discrete state of the memory means and the signal from said second signal-producing means,

#### 4,011,013 MULTIFREQUENCY EXCITATION OF GAS ROTATIONAL SPECTRA

Joseph John Barrett, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Apr. 21, 1975, Ser. No. 569,894

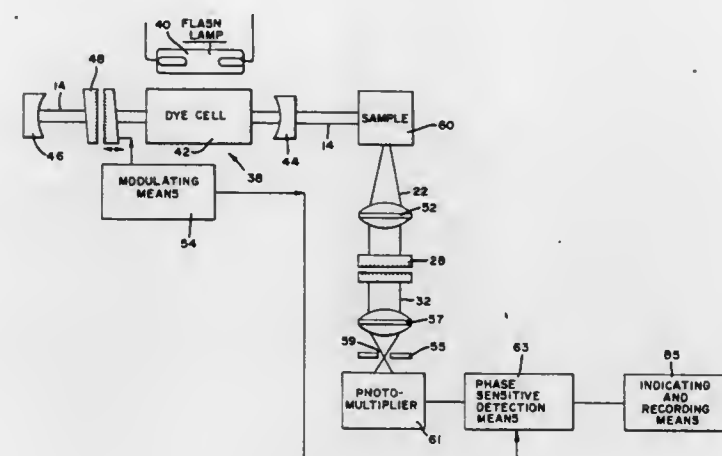
Int. Cl.<sup>2</sup> G01J 3/44; G01B 9/02

U.S. Cl. 356-75

20 Claims

1. An apparatus for spectroscopically analyzing gas comprising:

- a. radiation source means for generating a plurality of spatially superimposed beams of monochromatic radiation;
- b. tuning means for adjusting the frequency difference between radiation beams of adjacent frequency to equal substantially an odd integral submultiple of the frequency difference between adjacent spectral components of the periodic spectrum for a preselected constituent of gaseous material;
- c. projecting means for directing said radiation beams through said gaseous material to produce scattered radiation, the scattered radiation produced by each of said radiation beams having spectral components periodic in frequency and the spectral components for said preselected constituent being superimposed to form, within the spectrum produced by combined scattering of said radiation beams, the periodic spectrum for said preselected constituent;



- d. primary interferometric means adapted to receive said scattered radiation for selectively separating said periodic spectrum therefrom and transmitting said periodic spectrum in the form of a detectable signal, said primary interferometric means having interference-producing means for providing a plurality of transmission windows regularly spaced in frequency, the frequency spacing between adjacent windows being adjusted to equal substantially the frequency differences between radiation beams of adjacent frequency; and
- e. frequency shifting means associated with said tuning means for displacing the frequencies of said radiation beams relative to the frequencies of said transmission windows so that the frequency of a given radiation beam is located substantially half-way between adjacent transmission windows of said primary interferometric means, whereby said detectable signal is a fringe derived from the superimposed spectral lines of said periodic spectrum and having an intensity substantially equal to their sum.

#### 4,011,014 POLARIZATION ROTATION ANALYZER

George A. Tanton, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 8, 1974, Ser. No. 449,407

Int. Cl.<sup>2</sup> G01J 4/04

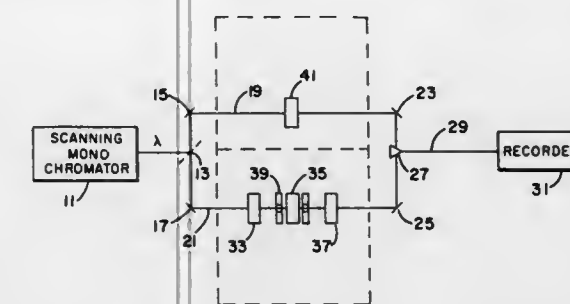
U.S. Cl. 356-116

3 Claims

1. An analyzer of polarization rotation by translucent specimens, comprising:

- a spectrometer with a selective frequency monochromator and a recorder with optical means therebetween for establishing and converging parallel light beams from said monochromator; and,
- a comparator including a polarizer, a supported specimen position, and an analyzer sequentially disposed in the path of one of said beams, said analyzer being adjustable to equal and opposite settings for modification of the

intensity of the beam passing through a rotary power translucent specimen to compensate for specimen absorption and reflection and said recorder being disposed



to provide outputs in logarithmic proportion to the ratios of light intensity of said parallel beams to determine the polarization rotation by the specimen.

#### 4,011,015 REFRACTOMETRIC DENSITOMETER

Nobuyuki Baba, Shin-nanyo, Japan, assignor to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

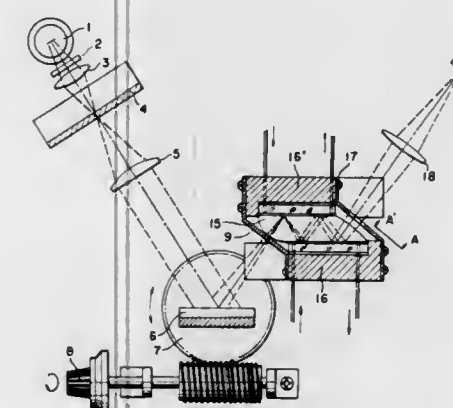
Filed Sept. 29, 1975, Ser. No. 617,509

Claims priority, application Japan, Mar. 25, 1975, 50-35806

Int. Cl.<sup>2</sup> G01N 21/46

U.S. Cl. 356-136

6 Claims



- 1. A refractometric densitometer comprising: a first packing element and a first gasket disposed at one side of a glass element, a second packing element and a second gasket disposed at the other side of the glass element, a groove for passage of a reference material and a groove for passage of a sample respectively formed in the first and second packing elements, an inlet pipe and an outlet pipe formed in the first and second gaskets for passing the reference material or the sample to the grooves, means for connecting the outlet pipe of the first gasket to the inlet pipe of the second gasket, and means for imparting multiple reflection to an incident light from the part of the glass element between the faced surfaces of the glass element contacting the first and second packing elements.

#### 4,011,016 SEMICONDUCTOR RADIATION WAVELENGTH DETECTOR

Charles R. Layne, Orlando, and M. William Ford, Maitland, both of Fla., assignors to Martin Marietta Corporation, New York, N.Y.

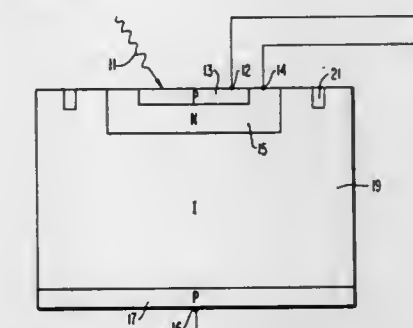
Continuation of Ser. No. 465,652, April 30, 1974, abandoned.

This application Sept. 23, 1975, Ser. No. 616,115

Int. Cl.<sup>2</sup> G01J 3/46; H01J 39/12; H01L 27/14

U.S. Cl. 356-195

10 Claims



1. A semiconductor wavelength detector for determining the wavelength of incident monochromatic electromagnetic radiation whose wavelength is variable within a specified range comprising:

- a first semiconductor photodiode having an active region with a thickness and absorption coefficient such that it absorbs substantially all the photon energy of the shortest wavelength in said range, but which transmits an increasing amount of photon energy as the wavelength increases until substantially all of the longest wavelength in said range is transmitted;
- a second semiconductor photodiode monolithically formed with said first diode and having an active region which is thicker than that of said first photodiode and which absorbs substantially all of the photon energy transmitted by said first diode, the proportion of photon energy absorbed by said first and second diodes varying in accordance with the wavelength of the incident radiation throughout said specified range; said incident radiation being directed only onto said first diode, and said diodes being formed in the same semiconductor material; and
- means for continuously measuring the wavelength of the incident radiation throughout said specified range by comparing the changes in photoconductivity of both said photodiodes as the wavelength varies.

#### 4,011,017 BORESCOPE SUPPORT APPARATUS

Roger F. Feuerstein, Schenectady; Maurice A. Freeman, Burnt Hills, and Leonardo B. Spinelli, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 523,431, Nov. 13, 1974, Pat. No.

3,917,432. This application July 16, 1975, Ser. No. 596,377

Int. Cl.<sup>2</sup> G01N 21/16, 21/32

U.S. Cl. 356-241

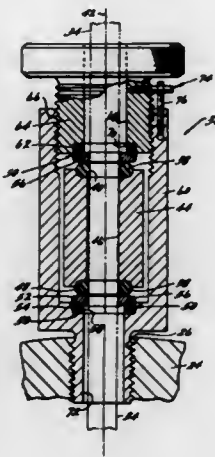
5 Claims

1. An apparatus for supporting a borescope probe, said borescope probe being of the type having an elongated, generally cylindrical stem portion which projects through an opening in an outer casing, said apparatus comprising:

- a housing;
- at least one resiliently deformable washer formed with an annular opening therethrough sized, in a non-deformable condition, to slideably receive said stem portion in close fitting relationship therewith;
- spherical bearing means abutting said resilient washer for providing swivelling movement of said resilient washer, said bearing means formed with an opening therethrough which is generally axially aligned with the resilient washer opening and is sized to permit the borescope stem portion to freely pass therethrough; and;
- a locking collar carried by said housing, said locking collar



being movable between a first position wherein said bore-scope stem portion is free to slide along and rotate about its axis and said bearing means are free to swivel and a



second position wherein said resilient washer is resiliently deformed into gripping engagement with said bore-scope stem portion and said bearings are frictionally locked against further swivelling motion.

4,011,018

## LOOSE LEAF BINDER

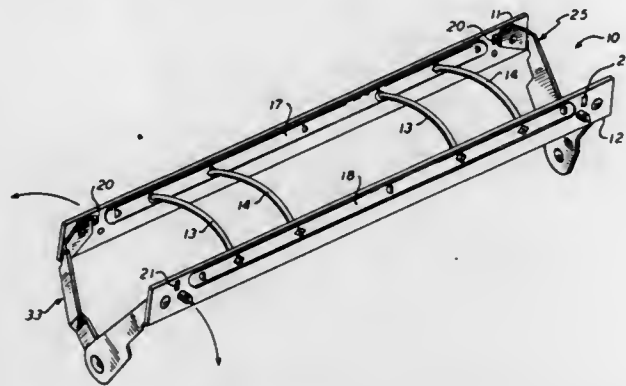
Billy J. Doolittle, Springfield, Mo., assignor to Royal Business Machines, Inc., Springfield, Mo.

Filed Sept. 10, 1975, Ser. No. 612,199

Int. Cl.<sup>2</sup> B42F 13/12, 13/20

U.S. Cl. 402-44

1 Claim



1. A linking arms mechanism for a prong type binder comprising:

first and second elongated, longitudinally extending, substantially flat and planar spacer bars, said spacer bars being disposed in spaced apart, parallel relationship; each of said spacer bars being provided intermediate the side edges thereof with an elongated recess extending longitudinally over a major portion of the length of each bar, said recesses each terminating short of the respective opposite ends of the related bar; each of said recesses being defined by a portion of the related spacer bar being laterally offset toward the other spacer bar to thereby provide the base of said recess; a first set of spaced, curved binding prongs each having one end thereof connected to and within the recess of said first spacer bar; a second set of spaced, curved binding prongs each having one end thereof connected to and within the recess of said second spacer bar; a pair of hinge assemblies each respectively provided at the respective opposite ends of said spacer bars, and interconnecting said spacer bars for movement toward and away from each other; the base of each recess being provided with holes arranged to receive the free ends of the prongs of the other spacer bar when the linking arms mechanism is closed; each of said hinge assemblies comprising:

two leaves pivotally interconnected to each other at one of their ends for pivotal movement in the plane of said leaves; a flange connected to the terminal end of each of said leaves; and means pivotally connecting the flanges of each of said pair of hinge assemblies one to each of said spacer bars, at the portion of the latter between the extreme end of said bar and the adjacent end of the recess in said bar; each of first and second spacer bars being provided with a pair of stops respectively disposed at the opposite ends of each bar, each stop being located between the pivotal connection of a hinge assembly flange to said spacer bar and the adjacent end of the recess in said spacer bar; said stops being shear formed within said spacer bars and being cooperable with the terminal end of each of said flanges to limit pivotal movement of the latter relative to said spacer bar in the open position of said mechanism; and

means for releasably and latchably coupling one of said spacer bars to a loose leaf binder cover; whereby said recesses shield the connections of said prongs to the spacer bars and the free ends of said prongs, and also provide more easily manually graspable structure for opening and closing operation of said linking arms mechanism.

4,011,019

## ADJUSTABLE AND DISENGAGABLE EARTH RAISE BORER STEM

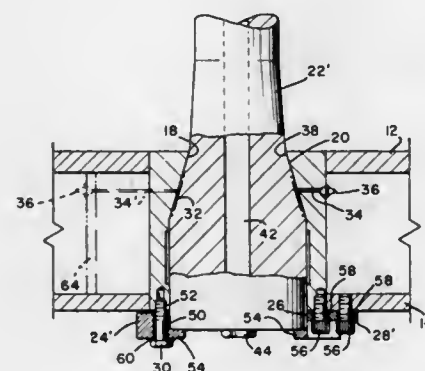
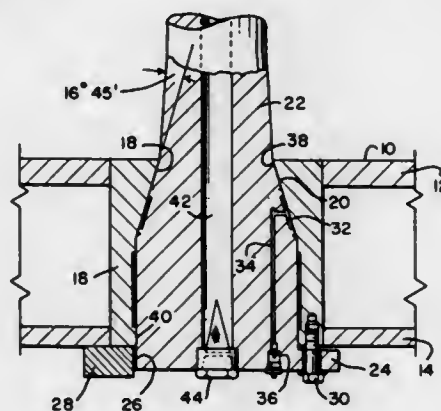
Michael C. McDonald, Auburn, and Charles R. Dively, Seattle, both of Wash., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 16, 1976, Ser. No. 649,850

Int. Cl.<sup>2</sup> F16D 1/00; F16L 17/00, 29/00

U.S. Cl. 403-15

12 Claims



1. An arrangement replaceably coupling the stem of an earth raise borer to the cutterhead thereof, comprising: first and second surfaces formed on a stem and cutterhead, respectively, which cooperate to define a slidingly-engageable interference fit therebetween, to effect a mutual, coupling engagement of said stem and cutterhead; and

means for engaging both said stem and cutterhead for fastening said stem and cutterhead together, retentively, in such an interference-fit coupling arrangement; further including rotary torque-receiving means carried by one of said stem and cutterhead; and rotary torque-transmitting means also carried by one of said stem and cutterhead for contacting engagement with said torque-receiving means for transmitting stem rotary torque to said cutterhead; wherein said torque-receiving means comprises a plurality of lugs, each thereof having a lateral, radially disposed surface; said torque-transmitting means comprises a like plurality of wall elements, each thereof arranged for contacting engagement with said lateral, radially disposed surface of one of said lugs; and said lugs are adjustably displaceable relative to said cutterhead for movement of said lateral, radially disposed surfaces thereof into and out of proximity to said wall elements.

4,011,021

## COMPENSATORY JOINT

Helmut Hartz, Hedwigstrasse 24, Wanne-Eickel, Germany (4680)

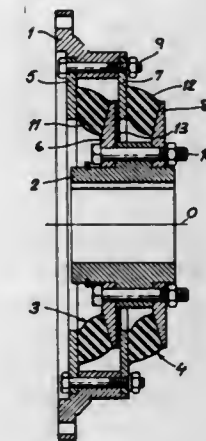
Filed Sept. 12, 1975, Ser. No. 612,809

Claims priority, application Germany, Sept. 13, 1974, 2443804

Int. Cl.<sup>2</sup> F16G 11/00

U.S. Cl. 403-220

9 Claims



1. A joint for interconnecting a driving member and a driven member with limited relative peripheral and radial mobility, comprising: rigidly interconnected, axially spaced first and second coaxial annular plates securable to one of said members; a third annular plate bracketed by said first and second annular plates and securable to the other of said members; a friction coupling separating said second and third annular plates from each other; and an elastic ring interposed between said first and third annular plates and positively connected therewith for transmitting torques therebetween and for axially pressing said friction coupling into contact with said second annular plate.

4,011,020

## TRANSFER JOINT FOR RIGID FRAMES

Erich Frantl, Gablenzgasse 24, A-1160 Vienna; Peter Hofstätter, Kollergerngasse 6, A-1060 Vienna, and Willibald Zemler, Ospelgasse 34, A-1200 Vienna, all of Austria

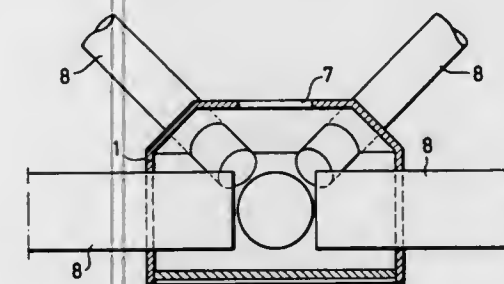
Filed Feb. 13, 1975, Ser. No. 549,797

Claims priority, application Austria, Feb. 20, 1974, 1398/74

Int. Cl.<sup>2</sup> F16B 7/00

U.S. Cl. 403-172

17 Claims



1. A transfer joint for rigid frames comprising: a solid joint member including a hollow metal casing having a wall with an outer surface which is substantially convex and an inner surface which is substantially concave, said casing being filled with a hardened grout material, said casing having a rigid connection with said hardened grout material, said casing having a plurality of substantially two-dimensional openings extending through said wall thereof; at least three longitudinal bars extending into said casing, one each through a respective one of said openings, toward a common point of intersection within said casing, each of said bars having a portion within said casing embedded in said hardened grout material, the cross-sectional area of each of said bars at the area thereof passing through said wall of said casing being substantially undiminished from the cross-sectional area thereof exterior said casing, and each of said bars having an end portion within the interior of said casing which has at least some surface areas diverging from the longitudinal direction of said bar; and a grout addition hole, extending through said wall of said casing, said grout addition hole being located to provide a free and unrestricted path to the ends of said longitudinal bars.

4,011,022

## SELF-DRAINING VEHICULAR SUPPORTING PANEL AND STRUCTURE

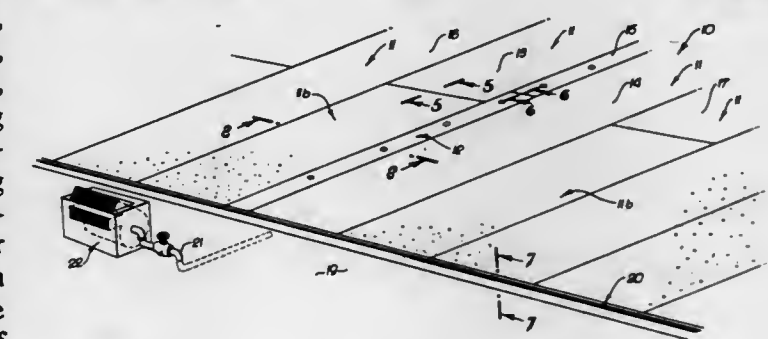
Lloyd G. Welty, 410 S. Beverly Drive, Beverly Hills, Calif. 90212

Filed Dec. 3, 1975, Ser. No. 637,201

Int. Cl.<sup>2</sup> E01C 5/22

U.S. Cl. 404-40

9 Claims



5. A panel as defined in claim 4, in which said body portion includes a plurality of longitudinal ribs between and parallel to said side plates and spaced therefrom and from each other to form a plurality of said longitudinal channels.



4,011,023

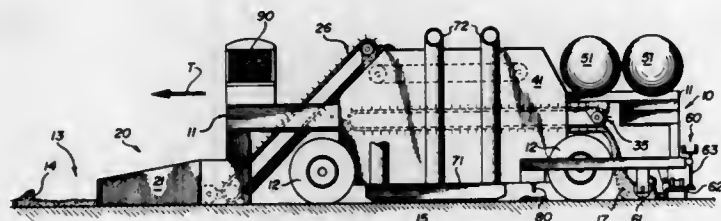
## ASPHALT PAVEMENT RECYCLING APPARATUS

Earl F. Cutler, Lawrence, Kans., assignor to Cutler Repaving, Inc., Lawrence, Kans.

Filed Dec. 15, 1975, Ser. No. 640,444  
Int. Cl.<sup>2</sup> E01C 23/12

U.S. Cl. 404-91

21 Claims



1. Equipment for recycling macadam pavement, comprising pickup means for removing crumbled macadam pavement material from a roadbed site, first and second heater means for heating the removed and crumbled pavement material, transport conveyor means including a first conveyor reach for conveying crumbled pavement material in a first direction past the first heater means, drop area means for dropping the crumbled pavement material from the first conveyor reach, thereby tumbling and agitating the crumbled pavement material, and a second conveyor reach for conveying the crumbled, agitated pavement material in a second direction of travel opposite the first direction of travel in an extended serpentine path past the second heater means for further heating, applicator means located in the drop area means for applying liquid asphalt to the heated, tumbling crumbled pavement material in the drop area means, and spreader means for applying the crumbled pavement and asphalt mix to the original roadbed site.

4,011,024

## DRILLING MACHINE

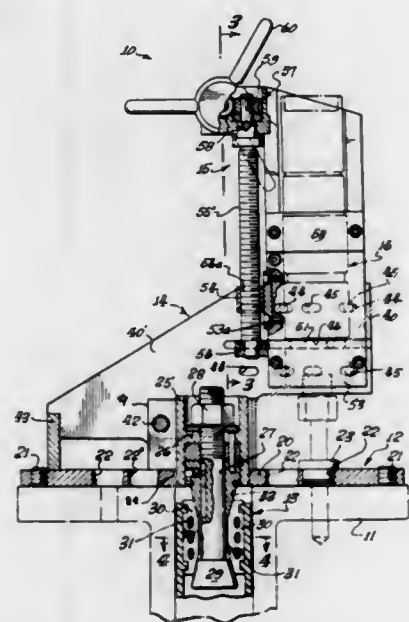
Gregory Nakano, Pearl City; Stephen Orillo, Jr., Wahiawa; Tadao Uyetake, Pearl City, and Teikichi Higa, Honolulu, all of Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 4, 1976, Ser. No. 655,182

Int. Cl.<sup>2</sup> B23B 45/14

U.S. Cl. 408-79

5 Claims



1. An apparatus for drilling holes in a pipe boss flange comprising:  
a disk shaped mounting plate provided with a concentric projection having an axial bore and shaped for abutting

the surface of the pipe boss flange having a plurality of openings therethrough;

means including a plurality of blades arranged in a cylinder with their longitudinal axis being mutually parallel, a resilient element bonding the blades together in their cylindrical configuration and a drawbolt-expander mechanism disposed to radially displace the blades against the inner surface of the pipe to secure the abutting mounting plate thereon and being and reaching through the axial bore of the mounting plate and sized to fit within the pipe for expanding when inserted therein to be secured on one side of the mounting plate;

means including a split clamp that clamps onto the concentric projection to arrest further rotational motion when the boring means is aligned with an opening on the mounting plate and an extension is provided with an elongate foot held on the surface of the mounting plate near its periphery for further assuring the perpendicular attitude therefrom and being carried on the concentric projection on the other side of the mounting plate having the extension for rotatably engaging the mounting plate to maintain a perpendicular attitude therefrom;

means mounted on the engaging means for effecting parallel and perpendicular displacements with respect to the surface of the pipe boss flange;

means mounted on the effecting means for boring aligned holes in the pipe boss flange after the engaging means and the effecting means have aligned the boring means with the openings in the mounting plate;

means carried about the periphery of the mounting plate for aligning it with the surface of the pipe boss flange; and means disposed in each of the openings of the mounting plate for guiding the boring means into the surface of the pipe boss flange.

4,011,025

## EXPANDING REAMER

Dieter Kress, Aalen, Germany, assignor to MAPAL Dr. Kress KG, Aalen, Germany

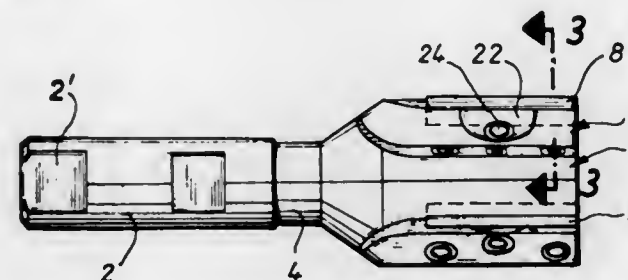
Filed June 10, 1975, Ser. No. 585,464

Claims priority, application Germany, July 16, 1974, 2434041

Int. Cl.<sup>2</sup> B23B 29/02

U.S. Cl. 408-153

9 Claims



1. A reamer comprising:  
a. an elongated shank having an axis;  
b. a cutter head fixedly secured on an axially terminal portion of said shank,  
1. said cutter head having a core portion and a plurality of rib portions radially projecting from said core portion in circumferentially spaced relationship,  
2. each rib portion having a first axially elongated flank and a second, axially elongated flank,  
3. the first flank of each rib portion and the second flank of a circumferentially adjacent rib portion bounding a flute therebetween,  
4. each rib portion being formed with a plurality of bores elongated in a direction transversely intersecting said first and second flanks thereof;  
c. a cutting blade associated with each rib portion and having two spaced edge portions elongated in a common direction, one of said edge portions being formed with a cutting edge;

4,011,027

## STAIN REMOVAL APPARATUS

Harald Selder, Dachau, Switzerland, assignor to Escher Wyss G.m.b.H., Ravensburg, Wurttemberg, Germany

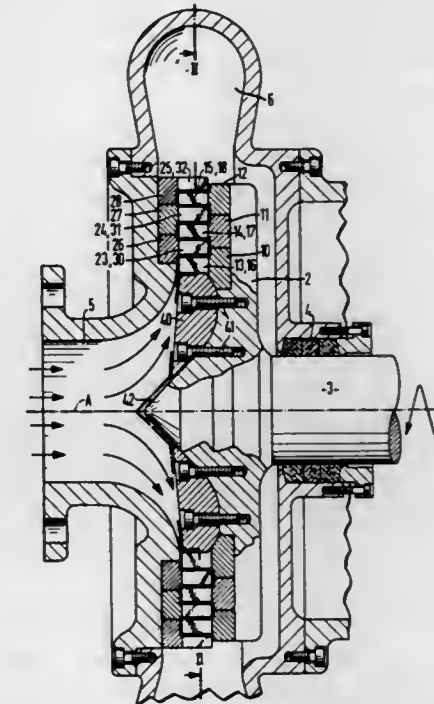
Filed Sept. 22, 1975, Ser. No. 615,527

Claims priority, application Switzerland, Sept. 23, 1974, 12842/74

Int. Cl.<sup>2</sup> F01D 1/06

U.S. Cl. 415-121 B

5 Claims



1. A stain removal apparatus for paper pulp comprising a housing;  
a rotor rotatably mounted in said housing on a longitudinal axis;  
a plurality of concentric rows of spaced apart teeth mounted on said rotor;  
a plurality of concentric rows of spaced apart teeth mounted on said housing and disposed in alternating manner with said rows of teeth on said rotor; and  
a plurality of check members secured to said rotor, each said check member being disposed adjacent a respective one of said teeth of the innermost row of said rows of teeth, each said check member having a thickness in a plane radial to said axis and at each respective tooth equal to the thickness of said tooth thereat in a plane radial to said axis and merging at a point remote from said tooth into said rotor.

4,011,028

## AXIAL-FLOW TRANSSONIC COMPRESSOR

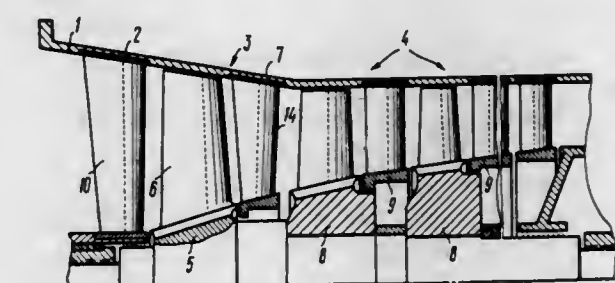
Anatoly Nikolaevich Borsuk, ulitsa Metallurgov, 40, kv. 7, Moscow, U.S.S.R.

Filed Oct. 16, 1975, Ser. No. 623,012

Int. Cl.<sup>2</sup> F01D 1/02

U.S. Cl. 415-192

2 Claims



1. An axial flow transsonic compressor comprising: a compressor housing; an inlet bladed stator structure; at least one transsonic compression stage and at least one subsonic compression stage; said inlet bladed stator structure, said tran-

d. clamping means releasably clamping the associated blade to the first flank of said rib portion in a position in which said one edge portion is axially elongated and projects radially beyond said rib portion, said clamping means including

1. a clamping screw received in a first one of said bores, and
  2. a clamping shoe retained by said screw and engaging a face of said blade intermediate said edge portions;
- e. an abutment member movable in at least one other bore of each rib portion and having a cam face obliquely inclined relative to the direction of elongation of said at least one other bore, said cam face radially engaging the other edge portion of said blade remote from said cutting edge; and
- f. a backing screw threadably movable in said at least one other bore and limiting movement of said abutment member under radial pressure exerted by the engaged blade.

4,011,026

## INTERLOCK CUTTING TOOL HOLDER

Gene Lee Bennett, North Madison, Ohio, assignor to Genio Tools, Inc., Mentor, Ohio

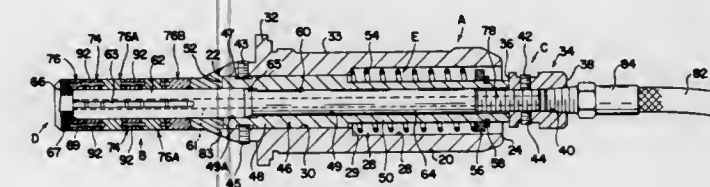
Continuation-in-part of Ser. No. 277,636, Aug. 3, 1972, Pat. No. 3,907,453. This application Mar. 21, 1974, Ser. No.

453,218

Int. Cl.<sup>2</sup> B23B 29/03

U.S. Cl. 408-199

4 Claims



1. A cutting tool holder for securing at least one apertured cutting tool in a desired spaced relationship to a metal removal machine as said cutting tool is selectively engaged with a workpiece for performing a cutting operation, said holder comprising:

- an elongated holder body having a longitudinal axis and a first end face,
- a bore extending longitudinally through said first end face and said body;
- an elongated shaft axially displaceable relative to said body and having a tool mounting portion and a shaft mounting portion, said tool mounting portion extending outwardly of said body from said first end face and slidably and rotatably receiving said apertured cutting tool, and said shaft mounting portion being received in said bore and extending substantially longitudinally through said holder body from said first end face,
- stop collar means fixed on said tool mounting portion of said shaft and spaced from said holder body, said cutting tool being axially positioned on said tool mounting portion between said collar means and said first end face,
- means interengaging said cutting tool and stop collar means to prevent rotation of said cutting tool relative to said shaft and including axially opposed cooperably interengaged means, and
- means releasably interconnecting said shaft and said body to axially position said stop collar means relative to said first end face to axially capture said cutting tool and retain said opposed means in interengagement, said means releasably interconnecting said shaft and said body including spring means received in said bore and biasing said shaft in the direction to displace said stop collar means toward said first end face.



sonic compression stage and said subsonic compression stage being arranged within said compressor housing, in succession along the flow path of the compressed fluid through said compressor and defining the flow section thereof, said transonic stage comprising a transonic rotor and a bladed stator structure, said bladed stator structure being mounted downstream along the path of the compressed fluid from said transonic rotor, said subsonic stage comprising a subsonic rotor and a stator structure; said inlet bladed stator structure comprising blades each having a peripheral section perpendicular to the blade axis, a radially innermost section perpendicular to the blade axis and a middle section perpendicular to the blade axis, the angle of setting of a profile of said peripheral section, determined with respect to a vector of the circumferential speed of said transonic rotor being in excess of 90°, the angle of setting of a profile of said radially innermost section determined with respect to the vector of the circumferential speed of said transonic rotor being less than 90°, and the angle of setting of a profile of said middle section, determined with respect to the vector of the circumferential speed of said transonic rotor substantially equalling 90°, said profile of said middle section having a middle line with a curvature equalling zero, said stator structure of said transonic stage comprising blades each having a radially innermost section and a peripheral section, and having a chord increasing in value from a profile of said radially innermost section toward a profile of said peripheral section.

4,011,029

## FLUID SUCTION AND DISCHARGE APPARATUS

Shigemi Shimizu, Sakai, Japan, assignor to Sankyo Electric Company Limited, Ise, Japan

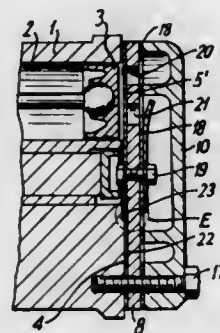
Filed May 16, 1975, Ser. No. 578,311

Claims priority, application Japan, May 17, 1974, 49-56031; May 17, 1974, 49-56032

Int. Cl.<sup>2</sup> F04B 1/12

U.S. Cl. 417-269

2 Claims



1. In a fluid suction and discharge apparatus including a cylinder block formed with a plurality of cylinders in parallel with one another, pistons slidably reciprocated in the cylinders for fluid suction and discharge, a valve plate secured to the cylinder block at one end thereof with inlet and outlet openings in registry with each of said cylinders, discharge valve means, a sheet of suction reed valve means formed of a metal sheet and formed with a plurality of suction reeds corresponding to respective ones of said cylinders, the suction reed valve means being held between the cylinder block and the valve plate, and a gasket of similar extent as the valve plate being held between the suction reed valve means and the cylinder block, the improvement which comprises: said suction reed valve means being formed of a metal sheet of an extent less than said valve plate, said valve plate being secured to said cylinder block by means of bolts extending through said valve plate and said gasket, a spot faced recess being formed in one end surface of said cylinder block facing said gasket, said recess having an extent and a thickness corresponding to said suction reed valve means so as to contain said suction reed valve means therein, said gasket being placed between, and being in contact with, said cylinder block and said valve plate at the peripheral portion thereof, and said cylinder block and said suction valve at the central portion thereof.

4,011,030  
ENGINE SEAL ASSEMBLY

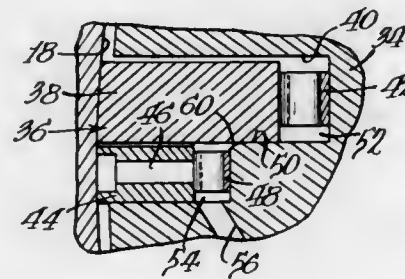
Paul J. Staebler, Dunlap; Ziedonis I. Krauja, and Alexander Goloff, both of East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 31, 1975, Ser. No. 627,569

Int. Cl.<sup>2</sup> F01C 19/00, 1/02; F16J 9/16, 15/00

U.S. Cl. 418-51

4 Claims



1. In an internal combustion engine, the combination comprising:  
a housing defining an operating chamber having a wall;  
an output shaft journaled in said housing;  
a piston operatively associated with said shaft and movable within said housing;  
a seal receiving groove on said piston, said groove including a step to define a relatively deep compression seal receiving portion and a relatively shallow oil seal receiving portion, said step being slightly crowned;  
a compression seal received in said groove and sealingly engaging said wall; and  
an oil seal received in said groove in side-by-side, substantially abutting relation within said compression seal, the width of the oil seal being slightly less than the height of the oil seal receiving portion of the groove to permit cocking of the compression seal, the crowned step preventing jamming of the compression seal when cocked.

4,011,031

## ROTOR CONSTRUCTIONS FOR SLANT AXIS ROTARY MECHANISMS

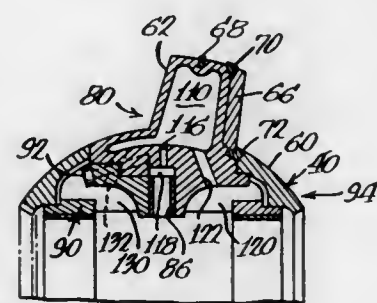
David E. Hackett, Washington, and Paul J. Staebler, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 9, 1976, Ser. No. 675,359

Int. Cl.<sup>2</sup> F01C 1/02, 21/06

U.S. Cl. 418-53

10 Claims



1. In a slant axis rotary mechanism, the combination of  
a housing defining a chamber,  
a shaft journaled in said housing and having an angular eccentric within said chamber,  
a radially outwardly extending thrust collar on said eccentric between the ends thereof, and  
a rotor within said chamber and journaled on said eccentric, said rotor having a hub and a peripheral flange and being defined by a centerpiece including said flange and part of said hub and having a bearing pad embracing one side of said thrust collar, an intermediate piece secured to said centerpiece on one side thereof and having a bearing pad embracing the other side of said thrust collar, and a pair of covers, each defining part of said hub, one secured

to said centerpiece and the other secured to and covering said intermediate piece.

4. The slant axis rotary mechanism of claim 1 wherein said centerpiece includes plural, angularly spaced coolant receiving cavities, and means for directing coolant to said cavities.

4,011,032

## SYSTEM FOR LIQUID COOLING OF A ROTOR OR A ROTARY MECHANISM

Johannes Steinwart, Obersulm-Willsbach; Armin Bauder, Neckarsulm, and Wulf Leiternmann, Bad Wimpfen, all of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Germany

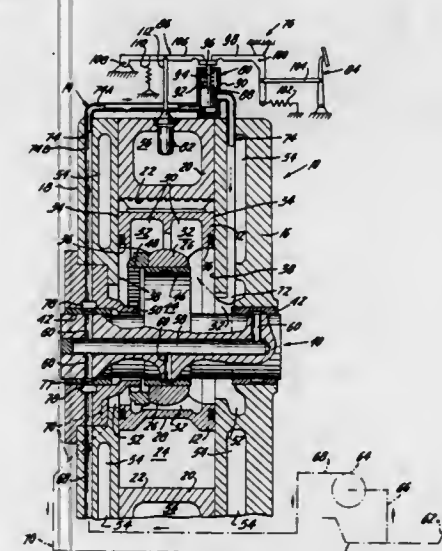
Filed Feb. 4, 1976, Ser. No. 655,013

Claims priority, application Germany, Mar. 21, 1975, 2512425

Int. Cl.<sup>2</sup> F01C 21/06

U.S. Cl. 418-84

7 Claims



1. In a rotary piston mechanism having a housing comprising two housing walls spaced apart by a peripheral wall to define a multi-lobe, trochoidal-shaped cavity and a rotor eccentrically supported for planetary movement within said cavity and which rotor has a hub portion and peripheral wall portions defining cooling spaces therebetween which communicate with the area exteriorly of the rotor through an opening adjacent each end of the hub portion, an improved rotor cooling system comprising:

- a pressurized source of cooling fluid;
- at least one discharge nozzle communicating through a supply passage means with said source of pressurized cooling fluid;
- said nozzle being disposed in one of said housing walls and positioned so as to emit a stream of cooling fluid toward and into said opening in the rotor and the cooling spaces therein; and
- means for controlling flow of cooling fluid through the supply passage means and to the discharge nozzle in accordance with the pressure conditions of the cooling fluid, and the temperature and load operating conditions of the mechanism.

4,011,033

## POSITIVE DISPLACEMENT VANE TYPE ROTARY PUMP

Charles A. Christy, 201 Airport Drive, No. 34, Farmington, N. Mex. 87401

Filed Apr. 2, 1975, Ser. No. 564,288

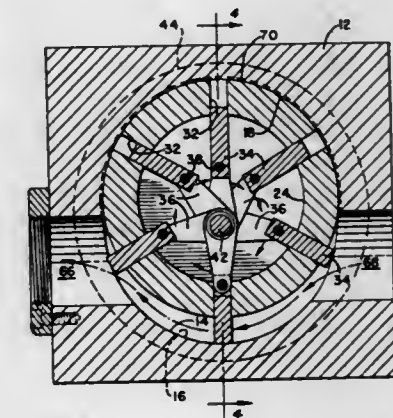
Int. Cl.<sup>2</sup> F01C 1/00

U.S. Cl. 418-253

6 Claims

1. A vane rotary device comprising a housing member having a cavity extending therethrough, said cavity including two cylindrical portions having spaced-apart centers but having substantially equal radii of curvature, first and second end closure members, a rotor disposed in said cavity and rotatably supported in said housing member for rotation about an axis

coaxial with the center of a first one of said two cylindrical portions, said rotor having a plurality of radial openings therein, vane means disposed in each of said radial openings for sliding movement therein and rotary movement along with said rotor, an inlet passage and an outlet passage in said housing member communicating with said cavity, said inlet passage being separated from said outlet passage by said first and second cylindrical portions, a second cylindrical portion of said cavity forming a circumferential channel extending from said inlet passage to said outlet passage, said channel in operation of said pump serving as a fluid pumping chamber, said vane means extending radially outwardly of said rotor and in substantial pressure sealing relationship with said channel but maintaining a slight clearance therebetween while being rotated through said channel by said rotor thereby pumping fluid



from said inlet passage to said outlet passage, said first cylindrical portion of said cavity constituting a non-pumping circumferential portion between said outlet passage and said inlet passage over which said rotor passes with said vane means retracted within said rotor and a circumferential groove extending in said first cylindrical portion to provide communication only between radial openings simultaneously passing said first cylindrical portion to relieve pressure therein and thereby to facilitate radial movement of said vane means, and said vane means comprise a plurality of sliding blade members each of which is supported on a fixed journal element for pivotal movement about an axis parallel to but eccentric to the axis of rotation of said rotor by at least one radially inwardly extending connecting link pivotally connected to said journal element and to said blade member.

4,011,034

## PRODUCTION OF FIBROUS SHEET MATERIAL

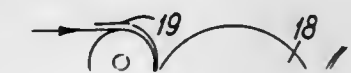
Harold George Curry, Hambrook near Bristol; Brian William Attwood, Hanham near Bristol; Derek Graham Walter White, Bristol, all of England; John Mosgaard Christensen, Risskov, and Karl Kristian Kobs Kroyer, Viby J, both of Denmark, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Continuation of Ser. No. 533,627, Dec. 19, 1974, abandoned, which is a division of Ser. No. 375,094, June 29, 1973, abandoned. This application Apr. 9, 1976, Ser. No. 675,319  
Claims priority, application United Kingdom, July 8, 1972, 32098/72

Int. Cl.<sup>2</sup> D21F 3/00

U.S. Cl. 425-80

6 Claims



1. Apparatus for forming a sheet of paper or paperboard comprising:  
means for dry-laying a web including essentially cellulosic



fibers by depositing dry fibers in an air stream onto a movable band and means for moistening the fibrous web to permit consolidation thereof, and consolidating means for consolidating the moistened, dry-laid fibers of the web to increase its strength, said consolidating means comprising, a consolidating surface, and means for heating said surface, a backing means for holding a newly formed web in contact with an area of the heated surface, the backing means exerting at least a limited pressure urging the web against the surface, and at least two pressure means spaced apart along said surface for pressing against said backing means and hence acting therethrough to press the said web against the heated surface at the nip formed between the pressure means and the said surface with a pressure which is substantially uniform over the width of the web, which is between 150 to 500 p.l.i., and which is greater than the pressure exerted by the backing means along said surface between the nips, said backing means being operable to maintain the web against the surface between said nips of the pressure means with at least some pressure and to maintain a level of transfer of heat from the heated surface to the web above that level which would occur in the absence of a backing means, such that pressure and heat transfer are maintained along said surface at least at and between the pressure means, wherein said pressure and hence also said heat transfer are greater at the pressure means than in the space between them.

4,011,035

# APPARATUS FOR MOLDING CHARACTERS ON A BLANK

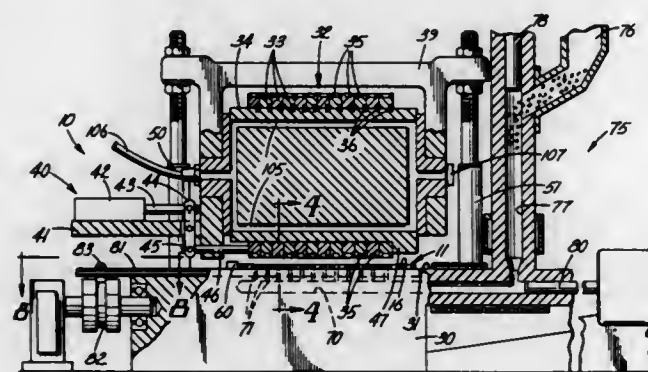
Russell L. Root, Cleveland, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Mar. 12, 1973, Ser. No. 340,174

Int. Cl.<sup>2</sup> B29C 27/00

U.S. Cl. 425—121

8 Claims



1. Apparatus for molding a plurality of plastic characters on the face of a plastic blank having passage means extending therethrough, said apparatus comprising: support means engageable with the reverse surface of the blank for supporting the blank in molding position, die means having gate-free cavities corresponding to the shape of the characters to be molded, said die means comprising a plurality of die members in side-by-side relation, each having a plurality of said cavities therein, means supporting said die members for movement relative to each other so that a plurality of cavities defining selected characters can be aligned adjacent the passage means in the blank, means for effecting relative movement of said plurality of die members and said blank to position an area on the die members surrounding said aligned cavities in abutting engagement with the face of said blank, means for forcing plastic material first through the passage means in said blank and thence into said aligned die

cavities after said die members and the face of the blank have been positioned in abutting engagement to simultaneously mold the characters defined by said aligned cavities in adhering relationship to the face of said blank, said means including passageways in said support means communicating with said passage means in said blank, and said support means including as a portion thereof a valve member providing a surface on which the reverse surface of the blank rests, and means for moving said valve member to sever material in the passageways from said blank.

4,011,036

# MOLDING APPARATUS WITH MATERIAL SMOOTHING MEANS AND RECYCLING MEANS

Lucien Bichet, Draveil, France, assignor to Societe Immobiliere et Financiere Suchet Alfort S.I.F.S.A., Paris, France

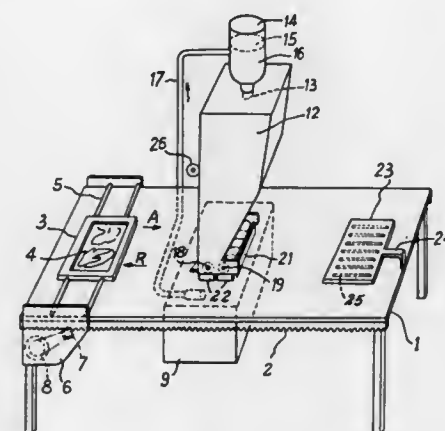
Filed Aug. 28, 1974, Ser. No. 501,031

Claims priority, application France, Sept. 7, 1973, 73.32297

Int. Cl.<sup>2</sup> B29C 29/00

U.S. Cl. 425—217

8 Claims



1. Apparatus for filling one or more cavities of a synthetic elastomeric mold with powdered plastic material and for preliminary gelation of said material, comprising: a distributor means for depositing powdered material in the mold; leveling means for leveling with the top of the mold the powdered material deposited in the mold by said distributor means; a heat generator for effecting preliminary gelation of the leveled powdered material deposited in the mold, said heat generator comprising a horizontal plate, equipped on its lower surface with high intensity heating means; a horizontally supported frame along which are disposed in series said distributor means, said leveling means and said heat generator; carriage means, horizontally reciprocally movable along said frame, for reciprocally moving the mold from an initial position to said distributor means, from thence past said leveling means to said heat generator, and then back to the initial position, said carriage means comprising a perforated plate or grill on which the mold can be carried so as to be level, said perforated plate or grill having a surface area greater than that of the mold in contact therewith, whereby the mold does not totally cover said perforated plate or grill; and return means for returning the excess powder after said leveling means to said distributor means, said return means including a holding bin below the level of said carriage means and substantially disposed beneath said distributor means and said leveling means, said holding bin having a sifting means at the entrance thereto, below the level of said carriage means, for separating non-powder masses from the powder.

4,011,037

# CONVEYOR BOAT FOR HIGH-TEMPERATURE CONTINUOUS FURNACE

Viktor Mathieu, Neuberg II, and Reinhard Schäfer, Rodenbach I, both of Germany, assignors to Reaktor-Brennelement Union GmbH, Hanau, Germany

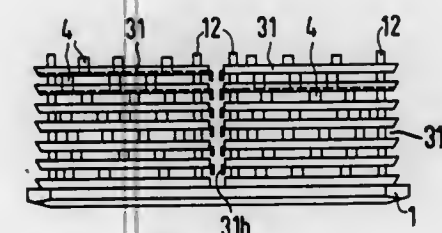
Filed May 15, 1975, Ser. No. 577,852

Claims priority, application Germany, May 27, 1974, 2425526

Int. Cl.<sup>2</sup> F27D 5/00

U.S. Cl. 432—258

3 Claims



1. A boat for carrying a load of stacked layers of interspaced pellets through a high-temperature continuous furnace, the boat comprising a horizontal base for carrying the load, a plurality of upstanding posts mounted on the base, and a plurality of sheets having holes through which the posts are passed to hold the sheets against horizontal shifting, the sheets being adapted to be individually interposed between each two of said layers and having edge shapes leaving the periphery of each of the layers horizontally free for a substantial portion of each layer's height, said edge shapes comprising angularly bent-edge portions of the sheets, said portions being adapted to have less vertical extent than the layer's height but the extent being adequate to prevent the pellets from falling side-wise over the peripheries of the sheets, said posts and said sheets forming two side-by-side groups and the adjacent bent edge portions of each two side-by-side sheets, comprising bent-down edge portions, the balance of the sheets bent-edge portions being bent-up edge portions.

4,011,038

# PLATE PROVIDED WITH APERTURES SEPARATED FROM EACH OTHER BY SEPARATING RIBS FOR AN INSTALLATION FOR THE MANUFACTURE OF STICKS FROM DOUGH MATERIAL

Willem Hendrik Willemsen, 83, Westervalle, Warffum, Netherlands

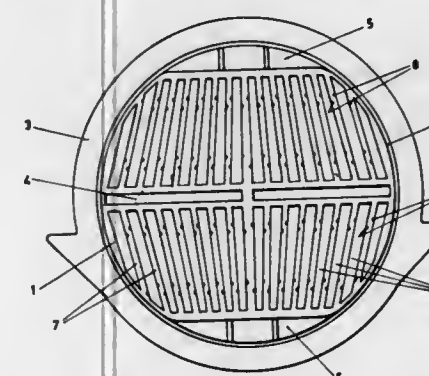
Filed Apr. 15, 1976, Ser. No. 677,483

Claims priority, application Netherlands, Feb. 2, 1976, 7601006

Int. Cl.<sup>2</sup> B29C 23/00; B29F 3/00

U.S. Cl. 425—302 R

6 Claims



1. A plate provided with apertures separated from each other by separating ribs for a device for the manufacture of so-called sticks from dough material, said plate being destined to be provided at the end of a tank, in said tank, means being provided for pressing the dough material intermittently through the apertures of the plate, means for cutting of the

dough material pressed through said plate being provided under said plate, at least two opposite walls of said separating ribs of the apertures having slot-like recesses extending over at least a part of the height of said opposite walls until the under surface of said plate.

4,011,039

# PARISON TRANSFER DEVICE

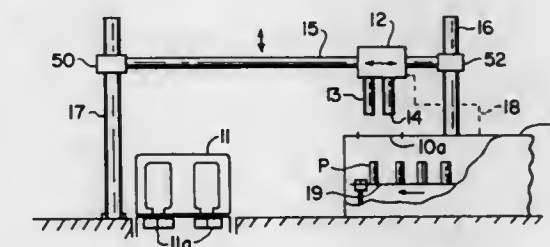
David C. Oas, Downingtown, Pa., and Waldemar E. Kmentt, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Apr. 7, 1975, Ser. No. 565,361

Int. Cl.<sup>2</sup> B29C 17/07

U.S. Cl. 425—397

18 Claims



1. In combination with a parison heating oven and a mold for forming the parison into a finished article, a transfer means for transferring heated parisons from the oven to the mold, said transfer means comprising:

a carriage, picker means mounted on the carriage operative to grasp a heated tubular parison at an upper portion thereof and remove said parison from the oven while holding the same in a substantially vertical plane during transfer to the mold, means moving the carriage along a given path between the oven and the mold, said path being straight and horizontal, said carriage being mounted on a horizontally extending structure for horizontal movement therealong between the oven and the mold, and said horizontally extending structure including gear means mounted to engage a toothed rack on a frame means, said gear means and the toothed rack cooperating to provide guidance for vertical movement of the horizontally extending structure therealong, whereby the picker means is movable simultaneously both horizontally and vertically by movement of the carriage on the horizontally extending structure and by vertical movement of the horizontally extending structure on the frame means, respectively, power actuating means including a movable actuated element operatively connected to the carriage and having at least a component of movement substantially parallel to said given path to cause movement of the carriage along said path, and including a displacement multiplication means operatively interconnecting the actuated element with the carriage such that the carriage and hence also the picker means and the parison carried thereby are moved a greater distance along said path than the said component of movement of the actuated element is moved parallel to said path during any, given movement of said actuated element.

4,011,040

# LIGHTER COVER

Harold G. Lacks, 2100 S. Ocean Lane, Apt. 2407, Fort Lauderdale, Fla. 33316

Filed Dec. 8, 1975, Ser. No. 638,699

Int. Cl.<sup>2</sup> F23D 2/36

U.S. Cl. 431—344

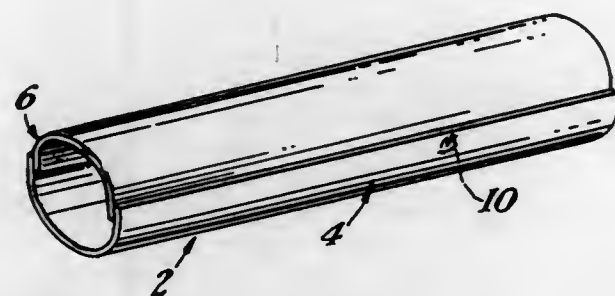
3 Claims

1. In a lighter and lighter cover device with the lighter including a lighter body having two end portions larger than a narrower central portion, the improvement of which comprises:

a lighter cover including,



a main member including a portion of a mating hinge means, and  
a secondary member including the other portion of a mating hinge means, said secondary member connected to said



main member by the mating hinge portions to provide a scissor-like action to open one end to receive the lighter body and to close over the central portion after one end portion of the lighter body moves past the hinge means.

4,011,041

## TOBACCO CURING AND DRYING APPARATUS

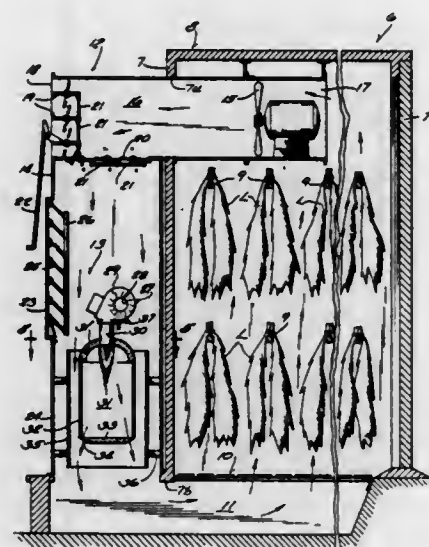
John S. Taylor, Jacksonville, Fla., assignor to Tifcon Company, Lenox, Ga.

Filed June 16, 1975, Ser. No. 587,158

Int. Cl.<sup>2</sup> F26B 3/02; A24B 1/02

U.S. Cl. 432-21

15 Claims



1. A method of processing products such as tobacco, wherein the products to be processed are placed in an enclosure which has an inlet and an outlet and through which heated air is circulated from said inlet to said outlet, which method comprises:

A. communicating the outlet of the enclosure with the inlet

of a duct that has its outlet communicated with the inlet of the enclosure;

B. effecting a positive circulation of air through the enclosure by drawing air from its outlet and forcing it into the duct to thereby create a zone of positive pressure in the duct near its inlet to force the air through the duct towards its outlet;

C. combusting fuel in the duct at a combustion zone located downstream of said zone of positive pressure;

D. supplying air for such combustion from a location in the duct between said zone of positive pressure and said combustion zone; and

E. creating a pressure differential through the combustion zone in the direction to establish a lower pressure downstream of the combustion zone than that which obtains at the location in the duct from which the air for combustion is taken, whereby heat and gases resulting from the combustion are constrained to flow through the combustion zone in the direction of air flow through the duct, to thereby minimize the possibility of any substantial back draft through the combustion zone.

3. Apparatus for processing products such as tobacco, by circulating heated air through an enclosure having an air inlet and an air outlet and in which the product being processed is so placed that the air being circulated through the enclosure from its inlet to its outlet can reach substantially all parts of the product, said apparatus comprising:

A. means defining a duct having an outlet connected with the air inlet of the enclosure;

B. air inlet means for said duct;

C. means for communicating said air inlet means with the air outlet of the enclosure, so that air leaving the enclosure can enter the duct;

D. air moving means having a suction side and a pressure side, located near said inlet means for effecting movement of air through the duct towards its outlet, and for concomitantly effecting circulation of air through the enclosure from its air inlet to its air outlet;

E. a forced draft fuel burner having a fan with a definitely defined air intake, to force air entering said intake through the burner, the burner also having a mouth from which flame and hot gases issue when the burner is in operation;

F. means mounting the fuel burner with its air intake communicating with the interior of the duct at a first zone thereof that is downstream of the pressure side of the air moving means and with its mouth debouching into the duct at a second zone thereof that is downstream of said first zone; and

G. means forming a constriction in the duct between said first and second zones to cause air passing through the duct to have a substantially higher pressure at said first zone than at said second zone, and operable to constrain heat and hot gases issuing from the mouth of the fuel burner to flow therefrom only in the direction towards the outlet of the duct, and thereby eliminate the possibility of any substantial back draft through the burner whether it is in operation or not.

## CHEMICAL

4,011,042

## OXIDATION OF VAT AND SULFUR DYES

Harry Stitzel, Heath Springs, S.C., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 3, 1971, Ser. No. 168,734

Int. Cl.<sup>2</sup> C09B 9/00, 49/00

U.S. Cl. 8-34

9 Claims

1. In a method for dyeing cotton or cellulose-polyester blended textiles with vat or sulfur dyes, comprising the steps of applying a vat or sulfur dye to said textile and subsequently oxidizing said dye by contacting it with an aqueous solution of an oxidizing agent the improvement wherein said aqueous solution comprises 0.005-5 percent by weight sodium bromite and has a pH of at least 6.

8. In a method for dyeing cotton or cotton-polyester textile fibers, comprising the steps of applying at least one vat or sulfur dye in reduced form to said fibers and subsequently oxidizing said dye by contacting it with an aqueous solution of an oxidizing agent, the improvement wherein said aqueous solution of an oxidizing agent comprises, by weight 0.01 to 2% sodium bromite, 0.048 to 0.099% alkali and 95 to 99.99% water, and has pH of at least 8.

4,011,043

## LIQUID AMMONIA DYEING PROCESS

Jean-Paul Dalle, and Maryvonne Vaesken, both of Saint Quentin, France, assignors to Opldrychimie, Grugles; Alain Declercq and Philippe Declercq, both of Hem, all of, France

Filed May 29, 1975, Ser. No. 581,795

Claims priority, application France, June 6, 1974, 74.19661

Int. Cl.<sup>2</sup> D06P 3/14, 1/673

U.S. Cl. 8-54

9 Claims

1. A process of dyeing textile material formed of natural or synthetic polyamides, polyacrylics, polyesters or chlorinated hydrocarbons, wherein the material is first impregnated with liquid ammonia in an impregnation zone, the ammonia in said zone is removed and the material, still impregnated with ammonia, is dyed.

4,011,044

## USE OF LASER SPECKLE PATTERNS FOR MEASUREMENT OF ELECTROPHORETIC MOBILITIES

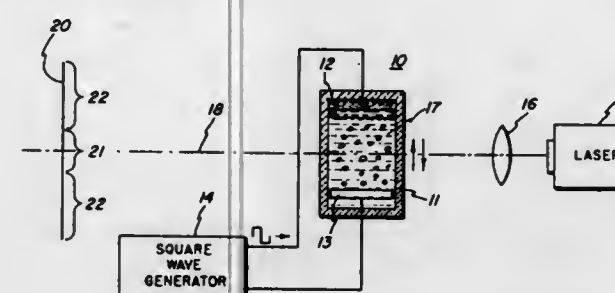
Egdiijus E. Uzgis, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 6, 1976, Ser. No. 702,941

Int. Cl.<sup>2</sup> G01N 27/26, 33/16

U.S. Cl. 23-230 B

6 Claims



1. A method of testing for a change in electrophoretic mobility of particles suspended in a solution, comprising:

directing coherent light onto said solution such that light scattered from said solution impinges on a display screen in a speckle pattern configuration;

applying a square wave voltage across said solution; and observing movement of said speckle pattern on said screen along the direction of the applied electric field across said solution.

4,011,045

## TURBIDITY REDUCTION IN TRIGLYCERIDE STANDARDS

Dean P. Bonderman, 586 W. 77th North Drive, Indianapolis, Ind. 46260

Filed Feb. 14, 1975, Ser. No. 549,940

Int. Cl.<sup>2</sup> G01N 31/02, 31/14

U.S. Cl. 23-230 B

17 Claims

1. A method of preparing serum which is suitable for use as a triglyceride standard comprising:

a. reducing the triglyceride level normally present in the serum,

b. after said reducing, adding to the serum glycerides of fatty acids having from 5 to 10 carbon atoms to achieve a concentration of at least 0.03% and an effective amount of an alkyl-phenoxy polyethoxyethanol surfactant for solubilizing said added glycerides, said surfactant containing an average of from 6 to 10 ethoxy groups, and the alkyl group of said surfactant containing from about 5 to about 14 carbon atoms, and

c. preserving the serum by lyophilizing or freezing the serum to which said added glyceride has been added.

4,011,046

## LIQUID CRYSTAL QUANTITATIVE ANALYSIS METHOD FOR OPTICALLY ACTIVE COMPOUNDS

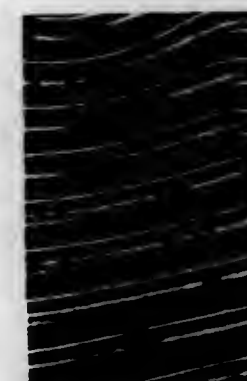
Mortimer M. Labes, Philadelphia, Pa., assignor to Temple University, Philadelphia, Pa.

Filed Nov. 12, 1975, Ser. No. 631,100

Int. Cl.<sup>2</sup> G01N 21/46, 23/201, 23/207

U.S. Cl. 23-230 LC

31 Claims



1. Method for quantitatively analyzing a sample, for a specific optically active compound contained therein, by first determining the relationship between line spacing of differentially refracted light and concentration of said optically active compound in a nematic liquid crystalline material oriented in a first standardized cell consisting of a thin layer of said liquid crystalline material disposed between transparent cell face members, and subsequently injecting a preselected amount of said sample into the nematic liquid crystalline layer of a second standardized cell identical with said first cell, observing the line spacing of refracted light in said second cell and comparing it to the relationship determined in said first cell and, on the basis of said comparison, determining the quantity of said optically active compound in said second cell.

4,011,047

## SMELT SPOUT FOR RECOVERY BOILER

Ronaldo Joseph Tremblay, Windsor, Canada, assignor to Domtar Limited, Montreal, Canada

Filed Dec. 5, 1975, Ser. No. 638,197

Int. Cl.<sup>2</sup> B01J 1/00; D21C 11/00

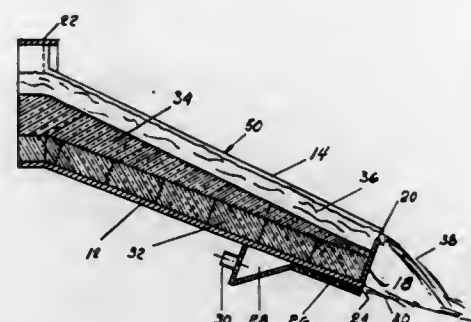
U.S. Cl. 23-252 R

2 Claims

1. A smelt spout for a paper pulp mill chemical recovery furnace, said spout comprising a metal trough having a bottom wall, a refractory lining in said trough, means for connecting said trough to said furnace at one end of said trough, said trough at the end opposite said one end terminating in a free end from which a smelt stream flows, nozzle means immediately adjacent to the bottom of said trough and said free end



of said trough means for directing steam to said nozzle means, said nozzle means forming a steam jet intersecting the trajectory of said stream of smelt flowing from said spout thereby to disintegrate said stream, said nozzle means being positioned



relative to said trough means so that said jet passes immediately adjacent said bottom wall at said free end and impairs the build up of slag formed by solidification of said smelt onto said bottom wall adjacent said free end.

4,011,048

## INCUBATION APPARATUS

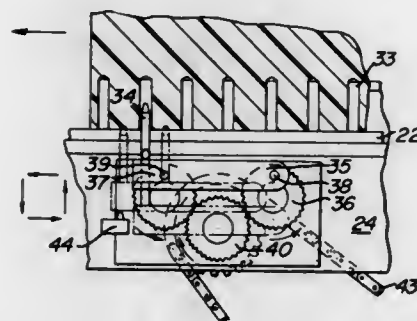
Edgar G. Johnson, Jr., and Howard L. McGill, both of Huntsville, Ala., assignors to Micromedic Systems, Inc., Horsham, Pa.

Filed June 17, 1976, Ser. No. 697,172

Int. Cl.<sup>2</sup> G01N 33/16; B01L 7/00

U.S. Cl. 23—259

8 Claims



1. An incubation apparatus for use in automated biochemical analyzer systems, which comprises  
a block of thermoconductive material having means for temperature control attached thereto and a plurality of rows of regularly spaced wells, said wells extending into the block from a bottom surface of the block and having openings facing downward;  
a pair of flat plates of insulating material, said plates lying in the same plane, each with an edge in mutual abutment, one plate being fixed and the other longitudinally slidable a given incremental distance in a direction away from the point of abutment, with the block with well openings facing downward being slidably carried upon said pair of insulating plates; and  
means for lifting into a row of wells a set of sample carriers from a carrier holder disposed directly beneath the block and insulating plates and in alignment with a row of wells in the block exposed to the carrier holder by a transverse space created by incrementally sliding the slidable plate, and for lowering a set of sample carriers from a row of wells into a carrier holder disposed directly beneath and in alignment with the row of wells.

4,011,049  
METHOD OF AND DEVICE FOR HOLDING A CUTTING  
INSERT IN THE POCKET OF A TOOL HOLDER

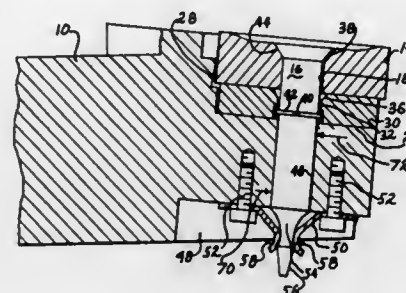
James F. McCreery, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Sept. 19, 1975, Ser. No. 614,975

Int. Cl.<sup>2</sup> B26D 1/00

U.S. Cl. 29—96

6 Claims



1. In a holder for supporting a cutting insert wherein the holder has an insert receiving pocket with a bottom wall and side wall means and a pin element which extends downwardly through a hole in the insert and a hole in the holder to hold the insert securely against the side wall means of the pocket, the improvement which comprises: one end of said pin element adapted to engage the insert from above, cooperating elements of a press-on, pry-off connection, one of said cooperating elements comprising a spring clip located on the holder and the other element located near the other end of the pin element, the axis of the hole in the holder being offset toward the side wall means of the pocket from the axis of the hole in the insert when said insert is abutted against the bottom and side walls of said pocket, the pin element adapted to engage the lateral surfaces of the holes in the insert and the holder and hold said insert against at least the side wall means when said cooperating elements of a press-on, pry-off connection on said holder and pin element are engaged.

4,011,050

## CUTTING-OFF TOOL

Karl Zinner, Helenenstrasse 18, 8500 Nuremberg, Germany

Continuation of Ser. No. 478,670, June 12, 1974. This

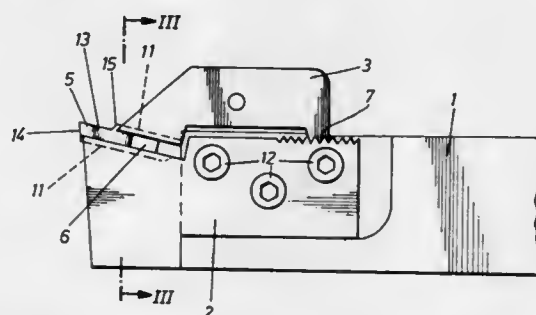
application Nov. 3, 1975, Ser. No. 627,845

Claims priority, application Germany, Jan. 30, 1974, 2404302

Int. Cl.<sup>2</sup> B26D 1/00

U.S. Cl. 29—96

7 Claims



1. A cutting-off tool for cutting a workpiece, comprising a support, a holder detachably mounted on one side of said support, said holder having a V-shaped groove, a cutting bit having a V-shaped bottom part mating with said V-shaped groove in said holder, said cutting bit being made of a single piece of material of sufficient hardness to effect cutting of said workpiece, a clamping plate having one end portion engaging an upper side of said cutting bit and another end portion engaging said holder, securing means detachably holding said clamping plate to said support, said one end portion of said clamping plate having a V-shaped groove, said cutting bit having a front portion and a rear portion, said cutting bit having at its rear portion a V-shaped top part mating with said

V-shaped groove in said clamping plate, said cutting bit having at its front portion a chip-guiding surface having a front longitudinal end coincident with the front longitudinal end of said cutting bit and a rear longitudinal end located at the junction between said front and rear portions, an elongated groove in said chip-guiding surface beginning at said front of said chip-guiding surface and extending toward the rear end portion of said chip-guiding surface, said elongated groove terminating at a position spaced from said juncture of said front and rear portions to provide a generally flat and ungrooved rear chip-guiding surface section disposed between the rear end of said groove and said juncture, the width of said elongated groove being less than the width of said chip-guiding surface, whereby lateral portions of said chip-guiding surface extend on both sides of said elongated groove.

4,011,051

COMPOSITE WEAR-RESISTANT ALLOY, AND TOOLS  
FROM SAME

Eugene L. Helton, Peoria; Preston L. Gale, Chillicothe; Lowell J. Moen, Peoria, all of Ill.; Robert C. Mueller, Mentor, Ohio; Walker L. Pierce, Jr., and Henry J. Vermillion, Jr., both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 2, 1974, Ser. No. 466,142

Int. Cl.<sup>2</sup> B22F 3/00

U.S. Cl. 29—182

9 Claims

1. A composite alloy having high wear-resistance, consisting essentially of cast spheroids of a first alloy consisting essentially of a chromium-iron based alloy of from about 25–70% by weight chromium, from about 6–12% by weight boron, from 0 to about 2% by weight carbon, and iron is the balance, embedded in a matrix of a second tough, ductile alloy in which said first alloy is soluble with difficulty.

4,011,052

## ELECTRICAL CONTACT MATERIAL AND PROCESS

Terrence Ardern Davies, Encino, Calif., assignor to Square D Company, Park Ridge, Ill.

Continuation-in-part of Ser. No. 340,440, March 12, 1973, abandoned, and a continuation-in-part of Ser. No. 387,884, Aug. 13, 1973, abandoned. This application Oct. 8, 1975, Ser. No. 620,909

Claims priority, application United Kingdom, Mar. 15, 1972, 12189/72; Aug. 18, 1972, 38568/72; Aug. 25, 1972, 39667/72

Int. Cl.<sup>2</sup> B22F 1/00, 3/00

U.S. Cl. 29—182.5

57 Claims

1. A process of improving material used in manufacturing electrical contacts for electrical power applications and made with a first starting material selected from a group essentially consisting of a first metal in powder form and reducible compounds of the first metal in powder form both having a selected maximum particle size, and with a second starting material selected from a group essentially consisting of a second metal in powder form, reducible compounds of the second metal in powder form, and mixtures of the second metal in powder form all having a selected maximum particle size with said second metal selected to be more readily oxidizable than the first metal under similar environmental conditions and added in an amount from a minimum effective amount up to the maximum limit of solubility of the second metal in the first metal by mixing the first and second starting materials together to obtain a mixture having a substantially even dispersion of the first and second starting materials; heating the mixture in a reducing atmosphere at a temperature below the melting temperature of the alloy of the alloy of the first and second metals in the proportions present to alloy the first and second metals in a powder form; sieving the alloyed mixture to produce a selected maximum particle size; heating the sieved mixture in an oxidizing atmosphere at a temperature and under conditions selected to substantially completely oxidize the second metal and with said temperature below the

melting temperature of the alloy of the first and second metals in the proportions present to thereby maintain the mixture in a powder form; and sieving the oxidized mixture to produce a selected maximum particle size, said process comprising:  
adding at a selected time during the process an oxide of a third metal selected from a group consisting of the metals in group IA and IIA of a periodic table.

4,011,053

## ELECTRICAL CONTACT MATERIAL AND PROCESS

Terrence Ardern Davies, Encino, Calif., assignor to Square D Company, Park Ridge, Ill.

Continuation-in-part of Ser. No. 340,440, March 12, 1973, abandoned, and a continuation-in-part of Ser. No. 387,884, Aug. 13, 1973, abandoned. This application Oct. 15, 1975, Ser. No. 622,786

Claims priority, application United Kingdom, Mar. 15, 1972, 12189/72; Aug. 18, 1972, 38568/72; Aug. 25, 1972, 39667/72

Int. Cl.<sup>2</sup> B22F 3/00

U.S. Cl. 29—182.5

66 Claims

1. A material for use in making electrical contacts for power level applications consisting essentially of a first metal selected from a group consisting of silver and copper, an oxide of a second metal selected from a group consisting of cadmium, tin, and zinc added in an amount from a minimum effective amount up to a maximum equal to the limit of solubility of the second metal in the first metal, and an oxide of a third metal selected from a group consisting of metals in group IA and IIA of a periodic table.

33. An electrical contact for electrical power applications comprising a first metal selected from a group consisting of silver and copper, an oxide of a second metal selected from a group consisting of cadmium, tin and zinc added in an amount from a minimum effective amount up to a maximum equal to the limit of solubility of the second metal in the first metal, and an oxide of a third metal selected from a group consisting of the metals in groups IA and IIA of a periodic table.

4,011,054

SINTER MATERIAL FOR SEALING STRIPS IN ROTARY  
PISTON ENGINES

Horst Beyer, Burscheid; Ulrich Buran, Opladen-Quettingen; Norbert Dautzenberg, Meerbusch, and Joseph Hewing, Monchengladbach, all of Germany, assignors to Goetzwerke-Friedrich Goetze AG, Burscheid, Germany

Continuation of Ser. No. 424,802, Dec. 14, 1973, abandoned.

This application Sept. 9, 1976, Ser. No. 721,716

Claims priority, application Germany, Dec. 16, 1972, 2261794

Int. Cl.<sup>2</sup> C22C 1/10

U.S. Cl. 29—182.7

15 Claims

1. In a sintered material for a sealing strip of a rotary piston engine and produced from a powder mixture of 15 to 45 weight percent of vanadium carbide or a mixture of vanadium carbide with at least one other metal carbide and balance essentially iron or an iron alloy, the improvement wherein the powder mixture further comprises at least one additive selected from the group consisting of (1) the compound Cu<sub>3</sub>P, (2) an alloy of the system Fe—B, (3) an alloy of the system Cu—Mn, and (4) an alloy of the system Ni—Mn—B, the amount of said additives (1), (2) and (3) when present being 4 weight percent and the amount of said additive (4) when present being 3 to 5 weight percent, said additive being liquid at the material sintering temperature and being effective to wet and partially dissolve the vanadium carbide during the sintering process and prevent the vanadium carbide from breaking out of the sintered material.



4,011,055

## ANTI-OXIDATION COATINGS

James Hill, Pamber Heath, and Leslie Boyne, Newbury, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sept. 8, 1975, Ser. No. 611,246

Claims priority, application United Kingdom, Sept. 9, 1974, 39333/74

Int. Cl.<sup>2</sup> B32B 15/04

U.S. Cl. 29—195

7 Claims

1. A carbon artefact including an anti-oxidation coating over at least part of its surface, said coating comprising:
  - a layer of silicon on the surface of the artefact;
  - a layer of nickel overlying the silicon layer;
  - and a layer of chromium overlying the nickel layer.
7. A carbon artefact as claimed in claim 1 wherein said artefact is a carbon brake disc having peripheral parts of its surface provided with said coating.

4,011,056

## QUINARY SILVER ALLOY

Hans T. Steine, Crissier; Rene Wasserman, Echichens, and Wolfgang Simm, Lausanne, all of Switzerland, assignors to Eutectic Corporation, Flushing, N.Y.

Filed June 6, 1975, Ser. No. 584,406

Claims priority, application Switzerland, June 12, 1974, 8010/74

Int. Cl.<sup>2</sup> C22C 30/02

U.S. Cl. 29—199

10 Claims

8. A brazed joint comprising metal parts joined together with a braze alloy consisting essentially by weight of about 35 to 48% Ag, about 25 to 35% Zn, about 0.5 to 3.5% Sn, about 0.01 to 0.4% Si, 0 to about 1% Ni, 0 to 1% Pd, 0 to 0.5% P and the balance essentially copper.

4,011,057

## HINDERED PHENOL ANTIOXIDANT COMPOSITION CONTAINING AN AMINO COMPOUND

George Alvin Sayers, Penns Grove, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

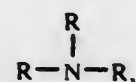
Filed Apr. 16, 1974, Ser. No. 461,391

Int. Cl.<sup>2</sup> C10L 1/22

U.S. Cl. 44—52

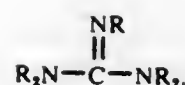
12 Claims

1. In an antioxidant composition comprising hindered phenol antioxidant, the improvement comprising, in combination with the hindered phenol, from 1% to 10%, based on the combined weight, of at least one amino compound having a  $pK_a$  of from 0.3 to 8.0, the amino compound being selected from the group consisting of
  - i. hydrocarbylamines of the formula,



wherein each R represents hydrogen or a hydrocarbyl group which has 1 to 24 carbon atoms, the R being joined to the nitrogen atom through a saturated carbon, at least one of the R groups being a hydrocarbyl group,

- ii. hydroxyalkyl- and hydroxy(alkyleneoxy) alkylamines of the formula,  $R_2N(R'O)_xH$ , where R is hydrogen, hydrocarbyl, or  $(R'O)_xH$ , wherein R' is alkylene of 2 to 3 carbon atoms and x is from 1 to 5,
- iii. cyclic amines of the formula,  $R-NY$ , where R is hydrogen or hydrocarbyl, Y is the divalent connecting group  $-(CH_2)_m-$ , where  $m = 4$  to 6,  $-CH_2CH_2-NHCH_2CH_2-$ , or  $-CH_2CH_2-O-CH_2CH_2-$ ,
- iv. amino compounds of the formula,



- wherein R represents hydrogen or hydrocarbyl,
- v. polyamines of the formula,  $R_2N-(R'NR)_xR$ , where R is hydrogen or hydrocarbyl, R' is alkylene of 2 to 8 carbon atoms and x is 1 to 5, and
  - vi. ammonia.

4,011,058

## PRODUCTION OF SUBSTITUTE NATURAL GAS FROM GASIFICATION OF COAL CHAR

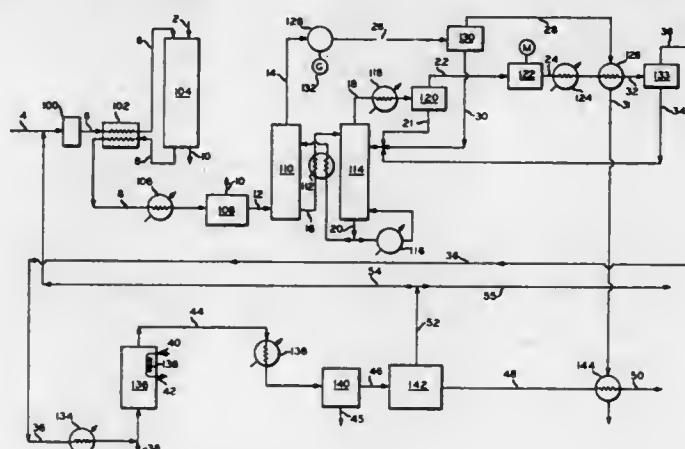
Marvin M. Johnson; Donald C. Tabler, and Gerhard P. Nowack, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 1, 1975, Ser. No. 618,719

Int. Cl.<sup>2</sup> C10J 3/00; C10K 3/00

U.S. Cl. 48—197 R

21 Claims



1. A process for the production of a gas comprising methane which comprises, in combination, the steps of

- a. gasifying a solid carbonaceous material at an elevated temperature in the presence of air and carbon dioxide to produce a raw process stream comprising carbon monoxide, carbon dioxide and nitrogen;
- b. cooling, cleaning and purifying said raw process stream to obtain a stream consisting essentially of carbon monoxide and nitrogen;
- c. separating carbon monoxide from said stream consisting essentially of carbon monoxide and nitrogen by contacting said stream in an absorption zone with an absorbent consisting essentially of an inert hydrocarbon diluent and at least one copper sulfonate, wherein said carbon monoxide is taken up in said absorbent, withdrawing from said absorption zone a stream consisting essentially of nitrogen and a stream consisting essentially of said absorbent and said carbon monoxide, passing said stream consisting essentially of absorbent and carbon monoxide to a desorption zone, separating in said desorption zone said carbon monoxide from said absorbent and withdrawing said carbon monoxide from said desorption zone;
- d. combining stream with said separated carbon monoxide and reacting the resulting CO/steam mixture in a catalytic methanation zone to produce an effluent gas stream consisting essentially of carbon dioxide, methane and hydrogen; and
- e. cooling said effluent gas stream and separating impurities therefrom to produce a product stream comprising methane.
6. A process for the production of a gas comprising methane which comprises, in combination, the steps of
  - a. gasifying a solid carbonaceous material at an elevated temperature in the presence of air and carbon dioxide to produce a raw process stream comprising carbon monoxide, carbon dioxide and nitrogen;

- b. cooling, cleaning and purifying said raw process stream to obtain a stream consisting essentially of carbon monoxide and nitrogen;
- c. separating carbon monoxide from said stream consisting essentially of carbon monoxide and nitrogen;
- d. combining steam with the separated carbon monoxide and reacting the resulting CO/steam mixture in a catalytic methanation zone by contacting said mixture with a methanation catalyst consisting essentially of nickel, a promoter selected from the group consisting of barium and uranium, and a calcium phosphate support having a Ca:P atomic ratio in the range of 1.4:1 to 2.3:1, wherein the components are present in approximate amounts as follows:

Calcium	5 to 35,	
Phosphorus	2 to 20,	
Nickel	10 to 50	and either
Barium	1 to 20,	or
Uranium	2 to 40,	

all said amounts expressed in terms of weight percent, based upon the weight of the total catalyst, thereby producing an effluent gas stream consisting essentially of carbon dioxide, methane and hydrogen; and

- e. cooling said effluent gas stream and separating impurities therefrom to produce a product stream comprising methane.

4,011,059

## SELF-CENTERING TRAVERSING STIRRER SHAFT FOR FIXED BED GASIFIER

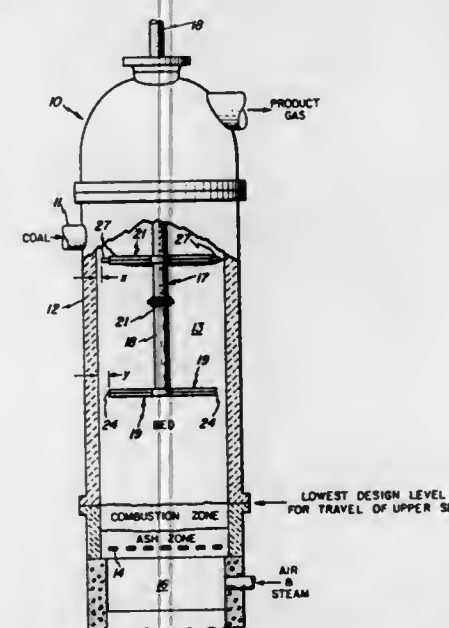
John W. Daly, Quaker Street, and Kenneth A. Darrow, Sprakers, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,917

Int. Cl.<sup>2</sup> C01J 3/32

U.S. Cl. 48—85.2

6 Claims



1. In apparatus for generating a gas mixture containing combustible components wherein a closed vertically extending vessel is provided with means mounted in the lower region of the interior of said vessel for supporting a bed of solid fuel thereon, first conduit means in flow communication with said interior of said vessel below said supporting means for introducing gas flow into said vessel, second conduit means in flow communication with the upper region of said interior of said vessel for removing product gas therefrom, means in flow communication through the exterior of said vessel with said upper region for introducing solid fuel bodies therein and liquid-cooled means for stirring said bed of solid fuel, said stirring means being adapted for vertical and rotational mo-

4,011,060

## METHOD OF CONTROLLING THE SOFTENING POINT OF SOLDER GLASS

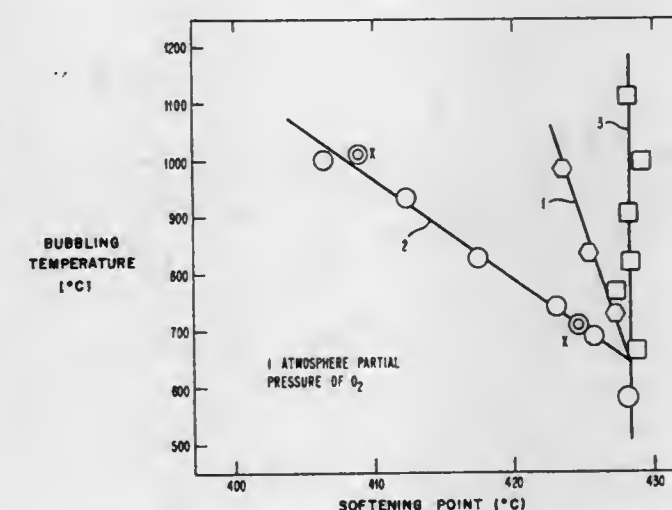
Melvin Berkenblit, Yorktown Heights; See Ark Chan, Bronx; Joan B. Landermann, Fishkill; Arnold Reisman, Yorktown Heights, and Takeshi Takamori, Croton-on-Hudson, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1975, Ser. No. 619,110

Int. Cl.<sup>2</sup> C03B 5/00

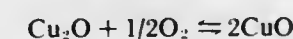
U.S. Cl. 65—134

22 Claims



1. A process for controlling the softening point, for minimizing lot by lot scattering of the softening point, and for providing preselected softening point of a solder glass containing copper oxide by controlling the  $Cu^+$  concentration, comprising

- A. heating solder glass batch composition containing at least about 0.5% by weight of copper oxide calculated as cupric oxide to a temperature above the softening point of the composition to provide a homogeneous melt;
- B. bubbling oxygen-containing gas through said homogeneous melt for a time at least sufficient to achieve equilibrium of the reaction



and at a temperature and oxygen partial pressure predetermined to provide the desired  $Cu^+$  concentration and preselected softening point of the solder glass; and thereby

- C. obtaining said solder glass containing copper oxide and having said preselected softening point.



4,011,061

## ARTICLES PROVIDING SUSTAINED RELEASE AND METHOD OF MAKING

Roger K. Forseen, Mahtomedi, and David A. Hofacker, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 20, 1975, Ser. No. 560,540

Int. Cl.<sup>2</sup> C05C 9/00; C05G 3/00

U.S. Cl. 71—29

20 Claims

14. A tablet for providing sustained release of plant fertilizer in a moist environment, said article comprising a plurality of agglomerate particles, each comprising a nucleus of organophobic, totally water-soluble fertilizer 100 to 600 micrometers in size and surrounded by talc particles clinging thereto, said talc particles having a median particle size of about 5 micrometers or less and comprising about 5 to 15 percent of the total weight of the article, said agglomerate particles being bound into a solid coherent tablet by a water-permeable matrix comprising 60 to 100% by weight polyethylene and up to 40% by weight paraffin wax.

4,011,062

## NOVEL COMPOSITIONS CONTAINING ACETYLENIC GLYCOL SAFENERS FOR SPRING WHEAT

Richard Joseph Demchak, and David Lasilla Whitehead, both of Trenton, N.J., assignors to American Cyanamid Company, Stamford, Conn.

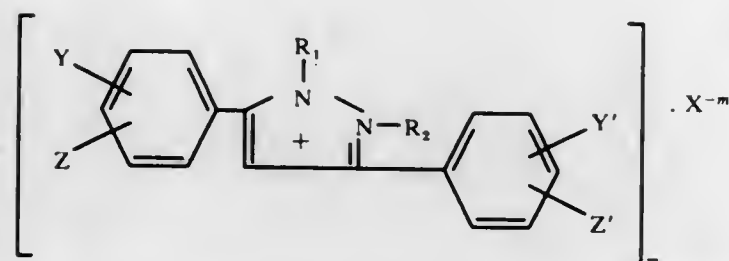
Filed Sept. 9, 1975, Ser. No. 611,748

Int. Cl.<sup>2</sup> A01N 9/22

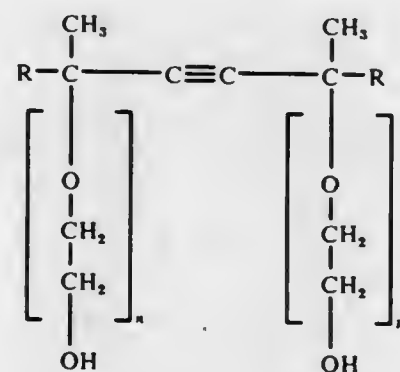
U.S. Cl. 71—92

12 Claims

1. A composition of matter comprising: a mixture of from about 90% to about 99%, by weight, of a compound having the formula (1):



wherein R<sub>1</sub> and R<sub>2</sub> are each lower alkyl C<sub>1</sub>—C<sub>4</sub>; Y, Y', Z and Z' are members selected from the group consisting of hydrogen, halogen, nitro, alkyl C<sub>1</sub>—C<sub>4</sub>, haloalkyl C<sub>1</sub>—C<sub>4</sub>, alkoxy C<sub>1</sub>—C<sub>4</sub>, m is an integer from 1 to 3; X is an anion selected from the group consisting of acetate, sulfate, hydroxide, hydrogen sulfate, methyl sulfate, benzene sulfonate, p-toluenesulfonate, nitrate, phosphate, carbonate and alkane sulfonate C<sub>1</sub>—C<sub>4</sub>; and from about 1% to about 10%, by weight, of a compound having the formula:



wherein R is selected from the group consisting of ethyl and 2-methylpropyl; and n+p represents the number 0, 3.5, 10 or 30.

4,011,063

## LOW DENSITY ABRASIVE UTILIZING ISOCYANURATE RESIN

Manley R. Johnston, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1972, Ser. No. 241,449

Int. Cl.<sup>2</sup> B21B 21/00; B24D 3/32

U.S. Cl. 51—295

13 Claims

1. In a low-density abrasive product wherein abrasive granules are bonded throughout a lofty, porous, compressible, nonwoven fibrous structure having interconnected three-dimensionally extending voids which constitute the majority of the volume thereof, the fibers of said product being bonded to each other and the abrasive granules bonded to said fibers by resinous binder, the improvement which comprises using for said binder the hard, tough, organically substituted polyisocyanurate resin of a cured isocyanate-terminated polyol, said resin having at least 0.5 gram equivalent of isocyanurate and at least 1.3 gram equivalents of urethane and isocyanurate combined, whereby the resulting low-density abrasive has extended wear life and reduced tendency to smear compared to similar products bonded with phenolic resins.

4,011,064

## MODIFYING THE SURFACE OF CUBIC BORON NITRIDE PARTICLES

Minyoung Lee, Schenectady; Lawrence E. Szala, Scotia, and Louis E. Hibbs, Jr., Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 28, 1975, Ser. No. 599,942

Int. Cl.<sup>2</sup> B24D 3/34; C23C 17/02

U.S. Cl. 51—295

6 Claims



5. An abrasive particle consisting essentially of cubic boron nitride particle having a rough adherent flaky granular covering, said covering consisting essentially of an outside surface coating ranging in composition from metal to a mixture of boride and nitride of said metal with all mixtures of said metal and metal boride and nitride falling within said range, and a layer of a mixture of boride and nitride of said metal intermediate said surface coating and said cubic boron nitride particle bonding said surface coating to said cubic boron nitride particle, said metal being selected from the group consisting of molybdenum, tungsten, titanium, niobium, tantalum, chromium, zirconium and alloys thereof, said covering ranging in structure from non-uniform to substantially uniform and from discontinuous to continuous and covering from at least 50 percent to about 100 percent of the surface area of said cubic boron nitride particle.

4,011,065

## PROCESS FOR THE ENRICHMENT OF GASES

Heinrich Münzner, Essen-Kray; Heinrich Heimbach, Bochum; Werner Körbächer, Essen-Borbeck; Werner Peters, Wattenscheid; Harald Juntgen, Essen-Heisingen; Karl Knoblauch, Essen, and Dieter Zündorf, Essen-Heisingen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Continuation-in-part of Ser. No. 445,319, Feb. 22, 1974, which is a continuation-in-part of Ser. No. 245,460, April 19, 1972, abandoned, and a continuation-in-part of Ser. No. 161,211, July 9, 1971, Pat. No. 3,801,513. This application Nov. 14, 1974, Ser. No. 523,687

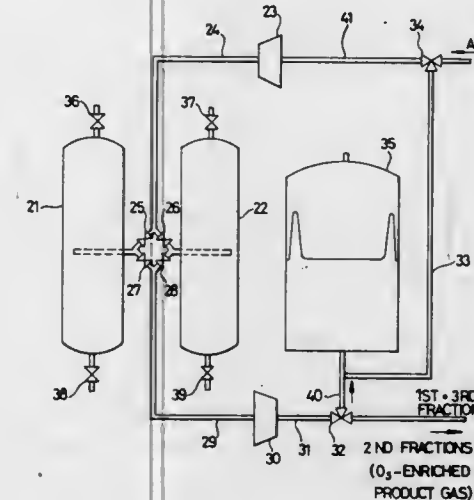
Claims priority, application Germany, Jan. 9, 1974, 2400860

The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> B01D 15/06

U.S. Cl. 55—25

28 Claims



1. A process for the oxygen-enrichment of air, comprising initially loading at least one adsorber with oxygen by conveying a stream of air into said one adsorber while evacuating an initial effluent gas from said one adsorber, said one adsorber adsorbing oxygen preferentially to nitrogen, and said initial effluent gas initially having a proportion of oxygen which is less than the proportion of oxygen in said air stream; terminating said initial loading when the proportion of oxygen in said initial effluent gas approximates the proportion of oxygen in said air stream; thereafter additionally loading said one adsorber with oxygen by conveying a nitrogen-containing gas stream having substantially 25 to 70 percent by volume of oxygen into said one adsorber while evacuating another effluent gas from said one adsorber, said other effluent gas initially having a proportion of oxygen which at most approximately equals the proportion of oxygen in said air stream; terminating said additional loading before the proportion of oxygen in said other effluent gas substantially exceeds the proportion of oxygen in said air stream; thereafter initially unloading said one adsorber by creating an underpressure therein so as to obtain a first fraction which has substantially 25 to 70 percent by volume of oxygen; subsequently further unloading said one adsorber at an underpressure so as to obtain a second fraction which has substantially 70 to 95 percent by volume of oxygen; thereafter additionally unloading said one adsorber at an underpressure so as to obtain a third fraction which has substantially 25 to 70 percent by volume of oxygen; recovering said second fraction as product gas; and using at least a portion of the total of said first and third fractions in a step similar to said additional loading step.

4,011,066

## PROCESS OF PURIFYING GASES PRODUCED BY THE GASIFICATION OF SOLID OR LIQUID FOSSIL FUELS

Karl Bratzler, Bad Homburg; Alexander Doerges, and Manfred Kriebel, both of Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

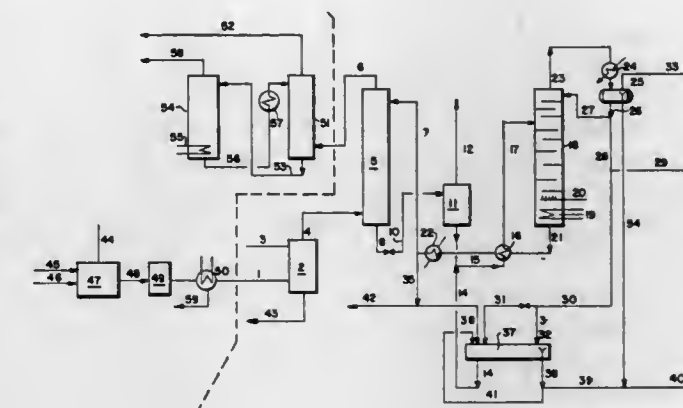
Filed July 7, 1975, Ser. No. 593,915

Claims priority, application Germany, Jan. 29, 1975, 2503507

Int. Cl.<sup>2</sup> B01D 19/00

U.S. Cl. 55—44

7 Claims



1. In a process of purifying gases produced by a gasification of fossil fuels by treatment with water vapor and oxygen under superatmospheric pressures to remove catalyst-deteriorating impurities, such as mono- and polyunsaturated hydrocarbons, mercaptans, HCN, HCl, H<sub>2</sub>S, CS<sub>2</sub>, COS, and NH<sub>3</sub>, and to desulfurize the gas, to produce an exhaust gas which is rich in H<sub>2</sub>O, wherein the gas is cooled and scrubbed under superatmospheric pressures at normal temperatures while the raw gas, at a temperature of 150°–170° C, is indirectly cooled to ambient temperatures, the condensable hydrocarbons are separated and removed, the gas is scrubbed with water to remove ammonia in a first scrubbing stage in which the rate of water addition is controlled to be just sufficient to remove the ammonia, the gas is then scrubbed with a highboiling organic solvent which is miscible with water and to which sulfur is added, in a second scrubbing stage in which the rate of solvent addition is controlled in dependence on the solubility of the methylmercaptan, which is to be removed, in the solvent, the gas is subsequently scrubbed with the same solvent in a third scrubbing stage in which the water content of the solvent is kept at 5–30 mole percent H<sub>2</sub>O and in which H<sub>2</sub>S and COS are entirely and selectively removed from the gas, and the scrubbing agents from the second and third scrubbing stages are separately regenerated and recycled to the second and third scrubbing stages for re-use, the improvement which comprises flashing the scrubbing agent used in the second scrubbing stage approximately to atmospheric pressures, adding water, if desired, heating the scrubbing agent to the boiling temperature but not in excess of 170° C, treating the scrubbing agent in a stripping column with water vapor or stripping gas to remove liquid impurities, condensing the mixed vapors, isolating the condensates by phase separation, and feeding part of the aqueous phase as a reflux to the upper portion of the stripping column while the stripped scrubbing agent is cooled and is fed back to the top of the second scrubbing stage.



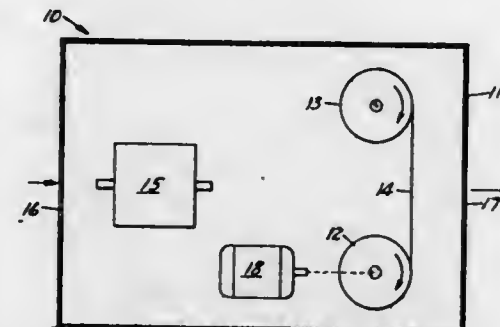
4,011,067

**FILTER MEDIUM LAYERED BETWEEN SUPPORTING LAYERS**

Patrick H. Carey, Jr., Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Continuation of Ser. No. 437,880, Jan. 30, 1974, abandoned.  
This application Sept. 11, 1975, Ser. No. 612,460  
Int. Cl.<sup>2</sup> B01D 46/18

U.S. Cl. 55—354

21 Claims



1. A multilayer filter medium exhibiting a low pressure drop at a desired particle penetration comprising a preformed handleable self-supporting porous fibrous base layer; at least one thin lightweight non-self-supporting filtration layer of randomly arranged microfibers having an average diameter less than about 0.5 micrometer collected on said base layer by interposing the base layer in a stream of the microfibers, said layer of microfibers weighing less than about 0.01 pound per square yard; and a porous top layer laminated over the layer of microfibers so as to unify the filter medium into a single handleable self-supporting sheet material; said base and top layers contributing less than 20 percent of the pressure drop through the filter medium at a face velocity of 100 feet per minute; and said layer of microfibers having a relationship of initial particle penetration to pressure drop when tested at a face velocity of 100 feet per minute within the range defined by curves C and D shown in FIG. 3.

4,011,068

**PARTICLE SEPARATOR**

Richard Penderell Llewellyn, Cheltenham, Australia, and John Austin Hart, Lymm, England, assignors to State Electricity Commission of Victoria Commonwealth of Australia, Melbourne, Australia

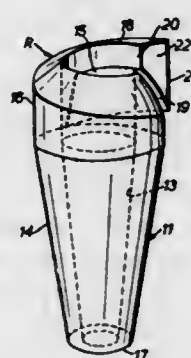
Continuation-in-part of Ser. No. 314,165, Dec. 11, 1972, Pat. No. 3,883,332. This application Feb. 28, 1975, Ser. No. 553,973

The portion of the term of this patent subsequent to May 3, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> B01D 45/12

U.S. Cl. 55—459 D

8 Claims



1. Apparatus for separating particles from a stream of gas and entrained particles comprising, an elongate annular duct having an outer tubular wall and an inner tubular wall both extending from an inlet end of the duct through to an outlet end of the duct; an annular duct roof on the inlet end of the duct; an inlet to the duct to direct said stream into the inlet end of

the duct so that it flows with swirling motion through to the outlet end of the duct; and outlet means to divide an inner part of the flow at the outlet end of the duct from particles in the outer region of the flow; wherein said inlet has a roof, a floor and inner and outer walls connecting the roof and floor so as to define a single inlet passage separate from the annular duct; and wherein the inner and outer walls of the inlet converge in the direction of flow and smoothly join the inner and outer walls of the duct respectively; the roof of the inlet joins smoothly on to the roof of the duct; the floor of the inlet and the smoothly continuous inlet and duct roofs become continuously less transverse to the axis of the duct in the direction of flow; the roof of the duct, after one revolution around the duct, joins smoothly with the floor of the inlet at the entrance to the annular duct; and the inlet is of contracting cross-section in the direction of flow.

4,011,069

**APPARATUS FOR MAKING FIBER OPTIC DEVICES**

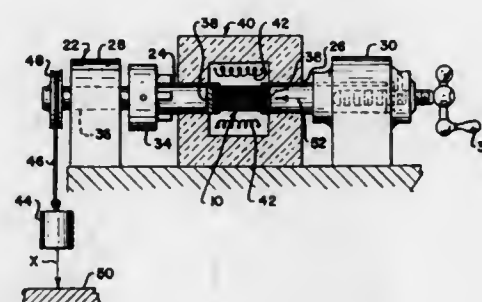
Henry B. Cole, East Woodstock, Conn., and Colin K. Yates, Sturbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed June 11, 1971, Ser. No. 155,665

Int. Cl.<sup>2</sup> C03B 37/02

U.S. Cl. 65—11 R

6 Claims



1. Apparatus for making shortened fiber optic image inverters comprising:

- a furnace having thermostatically controlled heating means for heating the intermediate section and opposite ends respectively of a bundle of optical fibers to controlled different temperatures suitable for twisting said bundle, said opposite ends of said bundle being heated to lower temperatures than said intermediate section;
- a pair of high heat-resistant endpieces attachable to said opposite ends of said bundle of fibers, said endpieces being adapted to extend into said furnace with said bundle of fibers held thereby;
- a headstock for supporting one endpiece and a tailstock for supporting the other endpiece;
- means for rotating one of said endpieces relative to the other for twisting said bundle of fibers held thereby when said bundle is heated in said furnace; and
- means for moving one endpiece toward the other for compressing said heated bundle of fibers to effect axial shortening thereof.

4,011,070

**METHOD AND APPARATUS FOR REGULATING MOLTEN GLASS FLOW INTO A CONDITIONING CHAMBER**

William Christie Hynd, Lymm, England, assignor to Pilkington Brothers Limited, St. Helens, England

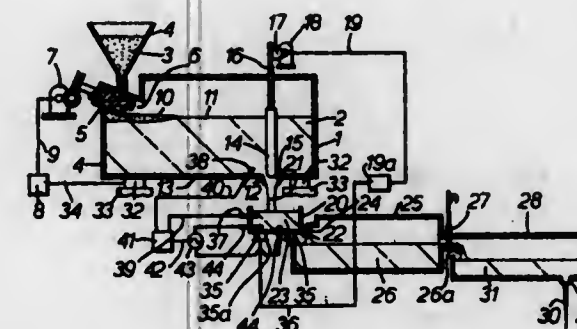
Filed Oct. 3, 1975, Ser. No. 619,160

Claims priority, application United Kingdom, Oct. 22, 1974, 45701/74

Int. Cl.<sup>2</sup> C03B 5/24

U.S. Cl. 65—29

24 Claims



1. A method of controlling the rate of continuous flow of molten glass from a reservoir, comprising a glass melting furnace, to a forming process, which method comprises feeding glass forming material into the furnace, discharging molten glass through an adjustable outlet from the furnace to an intermediate vessel, and discharging molten glass from an outlet in the intermediate vessel into a third vessel from which molten glass is removed for use in the forming process, said method further comprising sensing the temperature of the glass discharged from the outlet of the furnace, sensing the temperature of glass in the intermediate vessel and maintaining the temperature of the glass in the intermediate vessel at a value which is fixed in relation to the temperature of the glass discharging from the furnace, continuously determining the quantity of glass in the intermediate vessel, generating a control signal representing any change in said quantity of glass in the intermediate vessel, and employing that control signal to adjust the rate of flow of molten glass through the outlet from the furnace so as to maintain a predetermined rate of flow from the furnace to the intermediate vessel and thereby from the intermediate vessel to the third vessel.

15. Apparatus for controlling the rate of flow of molten glass to a glass forming process, which apparatus comprises a glass melting furnace having adjustable feeding means for feeding material to the furnace, flow control means for regulating the rate of flow of molten glass through an outlet from the furnace, means for determining the quantity of glass in the furnace and first temperature sensing means for sensing the temperature of the molten glass discharged from the outlet of the furnace, and an intermediate vessel positioned to receive molten glass discharged from the outlet of the furnace, said intermediate vessel having an outlet for discharging molten glass, second temperature sensing means for sensing the temperature of molten glass in the intermediate vessel and heating means for maintaining the temperature of glass in the intermediate vessel at a value which is fixed in relation to the temperature of the glass discharged from the furnace, and a third vessel arranged to receive molten glass from the outlet in the intermediate vessel, monitoring means being provided and arranged to continuously determine the quantity of glass in the intermediate vessel and generate a signal representing any change in that quantity, the monitoring means being connected to said adjustable feeding means thereby to adjust the flow of molten glass from the furnace.

4,011,071

**METHOD OF MAKING GLASS SHAVING INSTRUMENT**

Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed July 10, 1975, Ser. No. 594,826

Int. Cl.<sup>2</sup> C03C 15/00, 23/20

U.S. Cl. 65—31

1 Claim



1. The method of making a cutting instrument of glass having at least one sharp edge comprising the steps of: grinding and polishing a first flat surface on a slab of soluble glass; grinding and polishing a second flat surface on a slab of insoluble glass; assembling said slabs with one of said first and second flat surfaces placed against the other; heating the assembly of said slabs to a temperature sufficient to interfacially fuse said first and second surfaces together; cutting from said assembly at an acute angle across the fused interface of said first and second surfaces a preform, the plane of one side of said preform intersecting said second flat surface of said interface at an acute angle and producing a sharp edge therealong; grinding and polishing said plane of one side of said preform to an optical flat to render said edge of maximum acuteness; fusing a second slab of soluble glass to said ground and polished side of said preform to protectively encase said acute edge of said preform; heating and drawing at least a portion of the fused unit of said preform and second slab of soluble glass in a direction substantially parallel to the direction of extension of said encased edge thereof and into a section of reduced cross-sectional size; removing said section; leaching away from said section all remaining soluble glass; and at any preselected stage of the method following said step of heating and drawing, cutting said section transversally to a length desired of said instrument.

4,011,072

**FLOTATION OF OXIDIZED COPPER ORES**

James B. Holman; John A. Cronin, both of Inspiration, Ariz., and Bernhard Lamby, Moers, Germany, assignors to Inspiration Consolidated Copper Company, Inspiration, Ariz.

Filed May 27, 1975, Ser. No. 581,267

Int. Cl.<sup>2</sup> B03D 1/08; C22B 15/00

U.S. Cl. 75—2

4 Claims

1. The method of recovering copper by froth flotation from an aqueous pulp of an ore containing both sulfide and oxidized minerals of copper which comprises subjecting an aqueous pulp of the ore to a first froth flotation operation in the presence of a collector for sulfide copper minerals, thereby producing a concentrate containing a large proportion of the sulfide copper minerals, then subjecting the residual ore pulp to a further operation which comprises continuously monitoring the EMF of the pulp, adding a water-soluble sulfide to the pulp in an amount from 0.05 to 7 pounds contained sulfur per ton of ore whenever and for so long as the pulp EMF rises above about -30 millivolts with reference to a silver-silver chloride standard electrode and discontinuing such addition



whenever such EMF becomes less than about -30 millivolts, and thereafter subjecting the pulp to a second froth flotation operation in the presence of a collector for copper sulfide minerals, thereby producing a concentrate containing much of the remaining sulfide copper minerals and a substantial part of the oxidized copper minerals of the ore.

4,011,073

# FLAME SPRAY POWDER OF COBALT-MOLYBDENUM MIXED METAL AGGLOMERATES USING A MOLYBDENUM SALT BINDER AND PROCESS FOR PRODUCING SAME

John Allen Powers, New Albany; Martin Benedict MacInnis, Towanda, and David John Port, Athens, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.  
Filed July 2, 1975, Ser. No. 592,476

Int. Cl.<sup>2</sup> C22F 9/00

U.S. Cl. 75—.5 BB

5 Claims

1. A flame spray powder consisting essentially of particle agglomerates of finely divided particulates of a metal selected from the group consisting of molybdenum and its alloys, and a compound of cobalt selected from the group consisting of cobalt oxides, cobalt hydroxides and cobalt oxalates, the agglomerates held together by at least one binder consisting essentially of spray dried ammonium molybdate, the spray dried ammonium molybdate being present in an amount equivalent to at least 5 weight percent of molybdenum trioxide based on total weight of powder, whereby upon heating in a reducing atmosphere the spray dried ammonium molybdate and the cobalt compound are reduced to base metal.

3. Process for producing a flame spray powder comprising (a) spary drying a slurry of finely divided particulates of a metal selected from the group consisting of molybdenum and its alloys, and a compound of cobalt selected from the group consisting of cobalt oxides, cobalt hydroxides and cobalt oxalates, in an aqueous solution of a least one binder consisting essentially of ammonium molybdate in an amount equivalent to at least 5 weight percent of molybdenum trioxide based on the total weight of the powder, whereby particle agglomerates of the particulates are formed, held together by the spray dried ammonium molybdate; (b) classifying the agglomerates to obtain agglomerates within a desired particle size distribution; and (c) subjecting agglomerates outside the desired particle size distribution to at least one recycling operation, said recycling comprising reslurrying out-sized agglomerates, spray drying the reslurry to reform agglomerates, and classifying the reformed agglomerates.

4,011,074

# PROCESS FOR PREPARING A HOMOGENEOUS ALLOY

Josef Dietl, and Josef Jarosch, both of Munich, Germany, assignors to Consortium für Elektrochemische Industrie GmbH, Munich, Germany

Continuation-in-part of Ser. No. 454,517, March 25, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,273

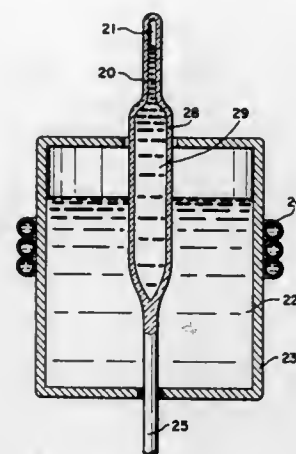
Int. Cl.<sup>2</sup> C22C 1/00

U.S. Cl. 75—135

4 Claims

1. In a process for making a homogeneous solidified alloy having at least one component with a comparatively high vapor pressure, in which the alloy components are enclosed in the form of a homogeneous melt in a sealed ampoule and cooled therein, the improvement that the volume free of melt

in said ampoule is during the entire cooling step of the melt between 0.001 and 1 cc, and the ratio of the volume of the



ampoule free of melt and that of the ampoule filled with melt is not larger than 1:5.

4,011,075

# MATERIALS FOR TAMPING BATTERY MIX

Misao Watanabe, Nikko; Yasuji Fujii, Yokohama, and Kiyoshi Takayanagi, Tokyo, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 271,517, July 13, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,616

Claims priority, application Japan, July 16, 1971, 46-52862

Int. Cl.<sup>2</sup> C22C 19/05, 19/07, 14/00

U.S. Cl. 75—171

6 Claims

1. A tamping device for use in the tamping of dry battery mix of the Leclanche-type and manganese alkaline type consisting of an alloy of CoTi composed of 60 - 40 atomic % of titanium, about 0.5 to 5 atomic % of molybdenum, the balance being Co, and having good corrosion resistance against Leclanche-type or manganese-alkaline dry battery mix.

4,011,076

# METHOD FOR FABRICATING BERYLLIUM STRUCTURES

Victor M. Hovis, Jr., Kingston, and Walter G. Northcutt, Jr., Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 18, 1976, Ser. No. 668,023

Int. Cl.<sup>2</sup> B22F 3/00

U.S. Cl. 75—211

5 Claims

1. A method for fabricating a thin-walled beryllium structure, comprising the steps of preparing a mixture of beryllium powder and elemental silicon powder with a concentration of silicon in a range of about 2500 to 4000 ppm, plasma spraying the mixture onto a substrate, removing the sprayed body from the substrate, exposing the plasma-sprayed body to a moist atmosphere for a duration sufficient to effect absorption of liquid water therein, confining the sprayed body within a sizing die having coefficient of thermal expansion substantially similar to that of beryllium, out-gassing the plasmasprayed body in vacuum at an elevated temperature, and thereafter sintering the plasma-sprayed body in an inert atmosphere.

4,011,077

# COPPER COATED, IRON-CARBON EUTECTIC ALLOY POWDERS

Sydney M. Kaufman, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 6, 1975, Ser. No. 584,562

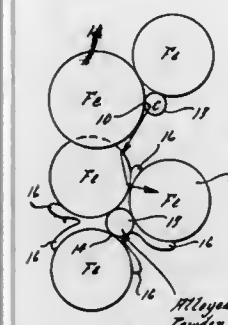
Int. Cl.<sup>2</sup> B22F 3/16; C22C 1/04

U.S. Cl. 75—212

16 Claims

1. A method for preventing solid state carbon diffusion in powder metallurgy techniques at elevated temperatures, comprising:

- prepare at least a first hypoeutectic carbon iron based powder collection and a second hypereutectic carbon metal powder collection, each containing dissolved carbon with said first collection having a carbon content exceeding the carbon content of said second powder collection by at least 0.5% by weight,
- impart a thin envelope about substantially all particles of one of said powder collections, said envelope being comprised of a metal having a melting point lower than but substantially close to the melting point of said one powder collection, said metal being characterized by having a diffusivity for carbon therethrough in the solid state and being completely soluble in said one powder collection when the latter is in the molten state, said diffusivity being such that the carbon content of said second powder collection will not recede to below the eutectic point for said second collection during substantially the time involved in heating said second collection to the liquidus temperature, said envelope metal constituting from .1-1.5% by weight of said one powder collection,
- intimately and homogeneously mix said powder collection to form an admixture, and
- heat said admixture to provide an increase in temperature of the collections up to substantially the initial liquidus temperature for said first powder collection, said envelope preventing a carbon diffusion from one collection to the other during said temperature increase below the liquidus temperature, and hold said heated condition at about the liquidus temperature for said one powder col-



lection to dissolve said envelope metal and to permit diffusion alloying and carbon exchange between said powder collections.

## 5. A method making iron alloys, comprising:

- providing a low carbon iron base powder and an iron alloy powder containing essentially a eutectic amount of carbon,
  - thinly coat the surfaces of each particle of at least said alloy powder with a metal effective to act as a substantial barrier against carbon diffusion when said alloy powder is in the solid state, said barrier metal having a melting point lower than said iron alloy powder,
  - intimately and homogeneously blend said base and coated alloy powders,
  - compact said blended powders to a self-supporting green strength, and
  - heat said compact to the liquidus temperature of said alloy powder and maintain said liquidus temperature for a period of time to permit carbon and alloy diffusion to take place between the powders to a stabilized value.
- A method of making powdered parts, comprising:
    - providing an iron-carbon-alloy powder in a particle size range of -100 +325 having a hypereutectic amount of carbon,
    - coating said iron-carbon-alloy powder with copper by subjection to abrasive action of copper elements impacted with the particles of said iron-carbon-alloy powder,
    - mixing said coated iron-carbon-alloy powder with a base iron powder having a hypoeutectic amount of carbon and having a lower carbon content than said iron-carbon-alloy powder,

- compacting said mechanically mixed powders under ambient temperature conditions and under a pressure of 30 tsi to a density of 6.6 g/cc, rendering a compact having a green strength of at least 1200 psi,
- subjecting said compact to liquid phase sintering under a protective atmosphere at a temperature in the range of 2060-2100 °F for a period of 20 minutes,
- allowing said sintered product to cool, and
- reheating said cooled sintered shape and hot working said shape at a temperature of about 1800° to a desired configuration and to a density of substantially 100%.

4,011,078

# PHOTOSENSITIVE MEMBER AND METHOD OF IMAGING

Satoru Honjo, Tokyo, Japan, and Masamichi Sato, Urbana, Ill., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 14, 1972, Ser. No. 217,845

Int. Cl.<sup>2</sup> G03G 13/22

U.S. Cl. 96—1 R

5 Claims



1. A xerographic photosensitive member which comprises an opaque substrate with an adhesive backing on one side and a light sensitive photoconductive insulating layer suitable for use in electrophotography on the other side, said photoconductive layer, in turn, having an opaque overlayer removably attached with an intermediate adhesive layer disposed at the edges between the opaque overlayer and the photoconductive layer resulting in the formation of a narrow opening between said opaque overlayer and said photoconductive layer.

4,011,079

# METHOD FOR PRODUCING AN ELECTROPHOTOGRAPHIC RECORDING MATERIAL

Johannes Berle, Ruthen; Hartmut Dülken, Beleck; Gottfried Guder, Beleck, and Karl-Heinz Kassel, Beleck, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Aug. 1, 1974, Ser. No. 493,889

Claims priority, application Germany, Aug. 2, 1973, 2339115

Int. Cl.<sup>2</sup> G03G 5/04

U.S. Cl. 96—1.5

12 Claims

1. A method for producing an amorphous electrophotographic recording material of selenium, selenium compounds, or alloys with selenium, wherein the selenium, selenium compounds, or alloys with selenium are present only in amorphous form, by depositing the recording material on a conductive carrier, comprising the steps of applying, by vapor depositing, a photoconductive layer on the conductive carrier at a first temperature range below the glass transformation temperature, and then heating the photoconductive layer on the conductive carrier at a higher second temperature range the lower limit of which is the glass transformation temperature of the photoconductive layer and the upper limit of which is the temperature just below that at which the electrophotographic properties begin to change.



4,011,080

**ELECTROPHOTOGRAPHIC ELEMENTS COMPRISING POLYSILICIC ACID-CROSSLINKED CONDUCTIVE POLYMERS**

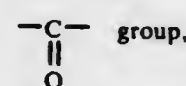
John Murray McCabe, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 447,421, March 1, 1974, abandoned. This application Aug. 30, 1974, Ser. No. 502,259  
Int. Cl.<sup>2</sup> G03G 5/04

U.S. Cl. 96—1.5

24 Claims

1. A photographic element comprising a conductive layer comprising a conductive polymer having an electrical resistivity of  $1 \times 10^{10}$  ohm/sq. or lower crosslinked with hydrolyzed tetraethyl orthosilicate through an



and having on the conductive layer a silver halide emulsion layer.

4,011,081

**DIRECT-POSITIVE DOUBLE EXPOSURE PROCESS UTILIZING A PRIMITIVE, UNFOGGED SILVER HALIDE EMULSION CONTAINING AN ELECTRON ACCEPTOR**

Paul B. Gilman, Rochester, N.Y., and John V. Morgan, Burnsville, N.C., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 398,906, Sept. 19, 1973, abandoned, which is a continuation of Ser. No. 154,155, June 17, 1971, abandoned. This application Mar. 3, 1975, Ser. No. 554,932

Int. Cl.<sup>2</sup> G03C 5/32, 5/24

U.S. Cl. 96—45.2

4 Claims

1. A process for producing a direct-positive image in a silver halide photographic element comprising

1. imagewise exposing for at least 0.01 second at an intensity of at least  $1 \times 10^{-12}$  watt/cm<sup>2</sup> a photographic element comprising a support and coated thereon at least one layer of a primitive, silver halide emulsion which contains 1 mg to 2 grams per mole of silver of an electron-accepting compound having a cathode halfwave potential more positive than -1.0 volt and an anodic halfwave potential more positive than +0.4 volt, said emulsion being derived from precipitation of an alkali metal halide and a water soluble silver salt in contact with a peptizer and in the absence of chemical or physical sensitizing conditions, the silver halide emulsion in the absence of exposure exhibiting a density of less than 0.3 when processed for 5 minutes at 27° C in a photographic developer having the following composition:

water	500.0 cc
N-methyl-p-amino-phenol sulfate	2.0 g
sodium sulfite	90.0 g
hydroquinone	8.0 g
sodium carbonate, monohydrated	52.5 g
potassium bromide	5.0 g
water to make	1.0 liter

2. exposing said imagewise-exposed silver halide emulsion to an overall flash for less than 0.05 second at an intensity at least 10 times greater than the imagewise exposure and  
3. developing said photographic element in silver halide surface-image developer which is substantially free of silver halide solvent.

4,011,082

**SILVER HALIDE PHOTOGRAPHIC MATERIAL**

Takeo Sakai; Masakazu Yoneyama, and Nobuo Yamamoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

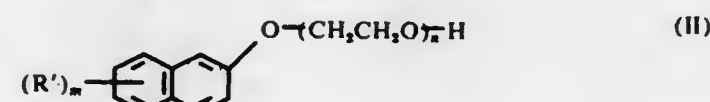
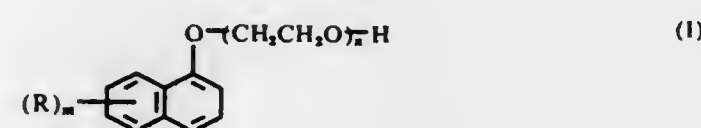
Filed June 6, 1975, Ser. No. 584,674

Claims priority, application Japan, June 6, 1974, 49-64437  
Int. Cl.<sup>2</sup> G03C 1/06, 5/30, 1/28, 1/38

U.S. Cl. 96—95

12 Claims

1. A silver halide photographic material comprising a support having thereon at least one hydrophilic colloid containing silver halide emulsion and including at least one polyethylene oxide naphthyl ether represented by the following general formulae (I) and (II)



wherein R and R' each represents a hydrogen atom or an alkyl group containing 1 to 18 carbon atoms, m is an integer of 1 or 2, and n is an integer of from 10 to 150, and at least one anionic surface active agent, wherein said anionic surface active agent is a compound containing a hydrophobic group having 8 to 30 carbon atoms and a sulfonic acid group of the formula  $-\text{SO}_3\text{M}$  or  $-\text{OSO}_3\text{M}$ , wherein M represents a hydrogen atom, an alkali metal atom or an ammonium group.

4,011,083

**SURFACE SENSITIVE SILVER HALIDE EMULSION CONTAINING A SILVER COMPLEXING AZAINDENE TO REDUCE DESENSITIZATION OF OPTICAL SENSITIZING DYE INCORPORATED THEREIN**

Maurice Francis Durning, Rochester, and John Edward Starr, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 531,277, Dec. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 293,963, Oct. 2, 1972, abandoned. This application July 26, 1976, Ser. No. 708,818

Int. Cl.<sup>2</sup> G03C 1/34, 1/20

U.S. Cl. 96—109

14 Claims

1. A surface-sensitive photographic silver halide emulsion having a pAg of about 6.0 to 8.5, said emulsion containing  
a. at least one photographic infrared spectral sensitizing dye capable of sensitizing said silver halide emulsion to radiation longer than about 700 nm, said dye being a methine dye having a polarographic cathodic halfwave potential more positive than about -1.20 volts and a polarographic anodic halfwave potential more negative than about +0.6 volts, said dye being employed in said emulsion at a concentration which results in at least about 0.3 log E desensitization of a test portion of said emulsion, when said test portion of said emulsion is coated on a support and sensitometrically exposed to light to which said silver halide emulsion is intrinsically sensitive and developed for 6 minutes at 20° C in Kodak D-19 developer; and

4,011,085

**LITHOGRAPHIC PRINTING PROCESS**

Sidney L. Rapoport, Lagrangeville, and Douglas F. Mitchell, Brooklyn, both of N.Y., assignors to Rapoport Printing Corporation, New York, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,293

Int. Cl.<sup>2</sup> B41M 1/18

U.S. Cl. 96—116

19 Claims

b. a silver complexing axaindene which forms a silver salt with a solubility product between that of silver chloride ( $1.6 \times 10^{-10}$  at 25° C) and silver bromide ( $7.7 \times 10^{-13}$  at 25° C) in an amount effective to reduce the desensitization caused by said dye.

4,011,084

**FLUID PHOTO-CROSSLINKABLE COMPOSITIONS FOR THE MANUFACTURE OF RELIEF PRINTING PLATES**

Heinrich Hartmann, Limburgerhof; Gerhard Hoffmann, Speyer; Helmut Barzynski, Bad Dürkheim; August Lehner, Roedersheim-Gronau; Werner Lenz, Ludwigshafen; Herbert Stutz, Karlsruhe, and Heinz-Ulrich Werther, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 10, 1975, Ser. No. 612,010

Claims priority, application Germany, Sept. 13, 1974, 2443786

Int. Cl.<sup>2</sup> G03C 1/68

U.S. Cl. 96—115 P

8 Claims

1. A fluid, photo-crosslinkable composition for use in the manufacture of a laminate and comprising a photoinitiator and a mixture of the following materials in the following proportions:

- A. from 40 to 80 percent by weight of a soluble, olefinically unsaturated isocyanate group-free polyurethane which has a molecular weight of from 400 to 10,000, and which has been manufactured by reaction of
  - A1. one or more soluble olefinically saturated polyesters having a hydroxyl number of from 100 to 300 and derived from a saturated polyhydric aliphatic alcohol of 2 to 8 carbon atoms and a saturated dicarboxylic acid of 4 to 8 carbon atoms or from a mixture thereof containing corresponding unsaturated alcohol and/or acid components in an amount such that the mixture contains at least 50 mole percent saturated aliphatic compounds with (A2) a polyisocyanate of 6 to 36 carbon atoms and (A3) a monoacrylate and/or monomethacrylate of an aliphatic diol of 2 to 10 carbon atoms, and
  - B. from 20 to 60 percent by weight of at least one photopolymerizable  $\text{C}_6$  to  $\text{C}_{18}$  N-vinylactam monomer or a mixture of at least 20% by weight thereof with at least one other photopolymerizable monomer.
8. A process for the production of relief printing plates by image-wise exposing to actinic light the photocrosslinkable layer of a laminate comprising a substrate and a photo-crosslinkable layer of a composition consisting essentially of a photoinitiator and a mixture of the following materials in the following proportions:

- A. from 40 to 80 percent by weight of a soluble, olefinically unsaturated isocyanate group-free polyurethane which has a molecular weight of from 400 to 10,000, and which has been manufactured by reaction of
- A1. one or more soluble olefinically saturated polyesters having a hydroxyl number of from 100 to 300 and derived from a saturated polyhydric aliphatic alcohol of 2 to 8 carbon atoms and a saturated dicarboxylic acid of 4 to 8 carbon atoms or from a mixture thereof containing corresponding unsaturated alcohol and/or acid components in an amount such that the mixture contains at least 50 mole percent saturated aliphatic compounds with (A2) a polyisocyanate of 6 to 36 carbon atoms and (A3) a monoacrylate and/or monomethacrylate of an aliphatic diol of 2 to 10 carbon atoms, and
- B. from 20 to 60 percent by weight of at least one photopolymerizable  $\text{C}_6$  to  $\text{C}_{18}$  N-vinylactam monomer or a mixture of at least 20% by weight thereof with at least one other photopolymerizable monomer, and thereafter removing the material from the unexposed areas of said layer.



1/2000"

1. A method for producing a photolithographic screen comprising,
  - a. interposing a transparent plate between a light source and a photographically sensitive surface,
  - b. said transparent plate having a large plurality of light disruptive projections on at least one of its surfaces,
  - c. exposing said photographically sensitive surface to said light source for a first predetermined time interval,
  - d. developing said exposed photographically sensitive surface to produce a negative photographic transparency,
  - e. interposing said negative transparency between a second photographically sensitive surface and a light source,
  - f. exposing said second photographically sensitive surface to said light source for a second predetermined time interval,
  - g. developing said exposed second photographically sensitive surface to produce a positive transparency,
  - h. said second predetermined time interval being chosen to result in a positive transparency having a transparency factor from about 0.25 to about 0.60 when said second photographically sensitive surface is developed to an optical density of from about 0.17 to about 1.6.

4,011,086

**PHOTOGRAPHIC EMULSIONS AND ELEMENTS CONTAINING RIGIDIZED CARBOCYANINE DYES**

Joseph Michael Simson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,903

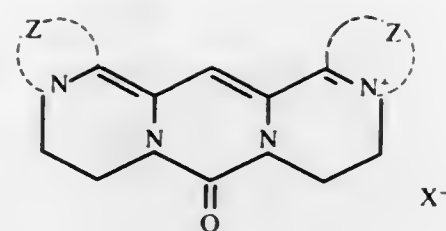
Int. Cl.<sup>2</sup> G03C 1/18

U.S. Cl. 96—136

6 Claims

1. A photographic silver halide emulsion containing a completely rigidized dye having the formula:





wherein:

- a. Z represents the atoms necessary to complete a heterocyclic nucleus selected from the group consisting of an imidazole nucleus, an oxazole nucleus, a thiazole nucleus, a selenazole nucleus and a quinoline nucleus, and  
b. X<sup>-</sup> represents an anion.

4,011,087

## SILVER COMPOSITIONS

Oliver Alton Short, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 2, 1974, Ser. No. 466,419

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> H01B 1/02

U.S. Cl. 106—1

4 Claims

1. In silver metallizing compositions useful for producing silver patterns on glass substrates, said compositions comprising finely divided silver particles and a particulate glass binder dispersed in an inert liquid vehicle, the improvement comprising, as said silver particles, silver-halide coated silver.

4,011,088

## ANTI-CORROSIVE COATING COMPOSITIONS

Hiroshi Makishima, Tokohama; Minoru Hoshino, Yokohama; Toshio Shinohara, Fujisawa; Hiroshi Nii, Kamakura; Minoru Hosoda, and Toshiharu Hayashi, both of Yokohama, all of Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 16, 1974, Ser. No. 533,359

Claims priority, application Japan, July 30, 1974, 49-86644

Int. Cl.<sup>2</sup> C09D 5/10

U.S. Cl. 106—1

5 Claims

1. A water-soluble anti-corrosive coating composition having improved weldability, which comprises (1) 5 to 80% by weight (as calculated as solids) of a binder composed of at least one member selected from potassium silicate of K<sub>2</sub>O·n·SiO<sub>2</sub> wherein n is from 2.5 to 4.0 and organic ammonium silicate and (2) 20 to 95% by weight (as calculated as solids) of a mixture of zinc powder with at least one member selected from iron phosphide and nickel phosphide in which the weight ratio of zinc powder to phosphide is within a range of from 8:2 to 2:8.

4,011,089

## PHOSPHAZENE COMPOSITION

James T. F. Kao, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 480,734, June 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 339,902, March 9, 1973, abandoned, and a continuation-in-part of Ser. No. 369,221, June 12, 1973, which is a continuation-in-part of Ser. No. 339,902. This application June 16, 1975, Ser. No. 586,987

Int. Cl.<sup>2</sup> C09D 5/18; C08L 1/24

U.S. Cl. 106—15 FP

2 Claims

1. Regenerated cellulose filaments and filamentary articles having dispersed therein a flame retardant amount of a phosphonitrilic polymer prepared by an improved process including the steps of (a) heating a phosphonitrilic halide with at least a stoichiometric amount of an alkali metal compound of the formula MOR, wherein M is an alkali metal and R is an

organic radical having up to about 8 carbon atoms to produce a phosphonitrilic polymer, (b) reacting a phosphonitrilic halide with less than the stoichiometric amount of said alkali metal compound producing a phosphonitrilic polymer containing a substantial amount of residual halide groups, and (c) heating the phosphonitrilic polymer of (a) with the phosphonitrilic polymer containing a substantial amount of residual halide groups of (b) under conditions sufficient to drive off an organic halide, the improvement comprising preparing at least one of the polymers of (a) and (b) by a process of adding said alkali metal compound to said phosphonitrilic halide so that from about 0.1 to about 5 weight percent of alkali metal is retained in the resultant phosphonitrilic polymer as a P—O—M group, said phosphonitrilic halide being contained in an inert solvent such that during the reaction a substantial excess of said phosphonitrilic halide is maintained, whereby the viscosity of the resultant phosphonitrilic polymer and its average molecular weight are increased.

4,011,090

## AQUEOUS AMMONIACAL ZINC OXIDE COMPOSITIONS FOR LUMBER TREATMENT

Michael R. Clarke, and Raman L. Desai, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 356,355, May 2, 1973, Pat. No. 3,945,834. This application Apr. 14, 1975, Ser. No. 567,886

Claims priority, application Canada, Sept. 1, 1972, 150792 Int. Cl.<sup>2</sup> B27K 3/32, 3/52; C09D 5/14

U.S. Cl. 106—15 R

10 Claims

1. A wood treating composition comprising an aqueous solution containing:  
a. zinc ion, in a total amount, in the solution, of from about 0.5 to about 10% by weight, as zinc;  
b. ammonium thiocyanate, in an amount of from about 1 to about 28% by weight, with the mole ratio calculated as NH<sub>4</sub>CNS/Zn being from about 2 to about 3;  
and  
c. ammonia, in an amount of from about 0.1 to about 28%, sufficient to provide a ratio of ammonia to zinc of at least about 0.1 to about 1, the composition having a pH of about 9 or more.

4,011,091

## CERAMIC MATERIALS CONTAINING KEATITE

Howard L. McCollister, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 13, 1975, Ser. No. 604,509

Int. Cl.<sup>2</sup> C03C 3/22, 15/00

U.S. Cl. 106—39.7

23 Claims

17. The low expansion, thermally stable, ceramic article consisting essentially of keatite as the predominant crystalline phase together with about 15% by weight to about 32% by weight of mullite on the basis of SiO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub>, which article has been formed by the acid leaching of a lithium aluminosilicate crystalline article consisting essentially of:

Component	Weight %
SiO <sub>2</sub>	72-83
Al <sub>2</sub> O <sub>3</sub>	11-21
Li <sub>2</sub> O	3.0-5.0

When the SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> molar ratio is from about 6 to 7.5, the Li<sub>2</sub>O/Al<sub>2</sub>O<sub>3</sub> molar ratio is from about 0.65 to 0.85;  
When the SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> molar ratio is from about 7.5 to 9, the Li<sub>2</sub>O/Al<sub>2</sub>O<sub>3</sub> molar ratio is from about 0.85 to 0.97; and  
When the SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> molar ratio is from 9 to 12, the LiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> molar ratio is from about 0.87 to about 0.97; and containing keatite solid solution as the predominant crys-

talline phase to produce an hydroxy aluminosilicate structure, and dehydrating said hydroxy aluminosilicate structure to form said ceramic article.

4,011,092

STANNOUS SULFATE AND GYPSUM MIXTURE AS A RETARDER IN GRINDING PORTLAND CEMENT AND BLENDED HYDRAULIC CEMENT FOR IMPROVING THE QUALITY OF THE CEMENT, MORTAR AND CONCRETE  
Sing Tsze Yue, 129 Wanda Court, Santa Cruz, Calif. 95065  
Filed Feb. 11, 1976, Ser. No. 657,160

Int. Cl.<sup>2</sup> C04B 7/02, 7/35

U.S. Cl. 106—89

11 Claims

1. A process for producing a cement mixture comprising:  
1. a base of cement clinker;  
2. mixing a retarder of not more than 3% of gypsum and from about 0.5 to 5.0% stannous sulfate based on the dry weight of the cement clinker, with the latter and;  
3. grinding the mixture to form a fine homogeneous cement.

4,011,093

## SEALANT FOR GLASS-CERAMIC SURFACES

Frank Veres, Sylvania Township, Lucas County, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 317,558, Dec. 22, 1972, Pat. No. 3,929,494. This application Jan. 24, 1975, Ser. No. 543,856

Int. Cl.<sup>2</sup> C03C 3/04, 3/22

U.S. Cl. 106—52

3 Claims

1. A glass consisting essentially of, in weight percent,  
SiO<sub>2</sub> — 54-80  
Al<sub>2</sub>O<sub>3</sub> — 14-32  
Li<sub>2</sub>O — 3-8  
CeO<sub>2</sub> — 1-7  
ZnO — 0-9  
and not more than about 1 weight percent of other alkali metal oxides, wherein the mole ratio of (LiO<sub>2</sub> + ZnO) : Al<sub>2</sub>O<sub>3</sub> is from 0.7 to 1.2 and the mole ratio of Li<sub>2</sub>O : ZnO is at least 2.

4,011,094

## CEMENTITIOUS COMPOSITIONS CONTAINING MAGNESIUM COMPOUNDS TO PROVIDE SAG RESISTANCE

David R. Burley, Cranbury, N.J., assignor to Tile Council of America, Inc., Princeton, N.J.

Filed Jan. 14, 1976, Ser. No. 649,085

Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 106—93

13 Claims

1. A dry-set mortar composition having improved sag resistance, said composition being capable of admixture with water, which comprises a Portland cement, a water retentive cellulosic material and as an additive to provide improved sag resistance, at least 0.5% by weight, based on the weight of said composition, of a reactive magnesium oxide having an iodine number of greater than twenty.

4,011,095

## VISCOSITY STABILIZED SOLUTION OF ETHYL CELLULOSE

Abraham Mertwoy, Dresher, and Henry Gisser, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 31, 1975, Ser. No. 563,767

Int. Cl.<sup>2</sup> C08L 1/26

U.S. Cl. 106—183

3 Claims

1. Process for forming a viscosity stabilized solution of ethyl cellulose in n-butyl acetate and ethyl lactate for use with propellant strips of propellant actuated devices, said ethyl cellulose having a viscosity of 70 centipoise before its addition to said n-butyl acetate and said ethyl lactate, comprising heating a solution of said ethyl cellulose in said n-butyl

acetate and said ethyl lactate at about 80°–110° C for at least one hour.

4,011,096

## VESICULATED SILICA MICROSPHERES

Lionel Samuel Sandell, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 10, 1975, Ser. No. 585,590

Int. Cl.<sup>2</sup> C04B 31/00

U.S. Cl. 106—288 B

12 Claims

1. Vesiculated silica microspheres consisting essentially of from 0 to 90% by weight of pigment, based on the total weight of the microspheres, and from 10 to 100% by weight of silica, based on the total weight of the microspheres, the microspheres, having an average diameter from 0.5μ to 50μ, the average diameter of the vesicles being 0.1μ to less than 50μ and the volume of the vesicles being from 5 to 95% of the total volume of the microspheres, wherein the vesicles are substantially discrete and spheroidal.

7. Process for preparing vesiculated silica microspheres by the steps of

i. forming an oil-in-water emulsion by contacting a siliceous aqueous phase with a first oil phase, said siliceous aqueous phase composed of water and at least one silicon compound selected from the group consisting of colloidal silica and alkali metal silicates, said first oil phase composed of at least one water-immiscible hydrocarbon selected from the group consisting of liquid and low melting aliphatic and aromatic hydrocarbons, distributed in at least one of said phases is at least one oil-in-water emulsifying agent,  
ii. forming an oil-in-water-in-oil emulsion by contacting the oil-in-water emulsion formed in Step (i) with a second oil phase, said second oil phase composed of a nonionic water-in-oil emulsifying agent and at least one waterimmiscible hydrocarbon selected from the group consisting of aliphatic, aromatic and chlorinated hydrocarbons,  
iii. adding acid to the oil-in-water-in-oil emulsion formed in Step (ii), said acid being added in an amount from 0.5 to 2.0 times the amount of said acid needed to react stoichiometrically with the total amount of base present in the siliceous aqueous phase of Step (i) to gel the siliceous aqueous phase and form a slurry of vesiculated silica microspheres, and  
iv. separating the vesiculated silica microspheres from the slurry formed in Step (iii).

4,011,097

## METHOD OF REMOVING IRON SULFIDE AND SLUDGE FROM METAL SURFACES

Thomas L. Sharp, 715 Nenana St., Houston, Tex. 77035

Division of Ser. No. 508,655, Sept. 23, 1974, Pat. No. 3,969,281. This application Dec. 22, 1975, Ser. No. 643,500

Int. Cl.<sup>2</sup> C23G 1/02

U.S. Cl. 134—3

2 Claims

1. A method of removing iron sulfide and sludge from interior metal surfaces in a glycol system which comprises introducing, onstream, into said glycol system an effective iron sulfide and sludge removing amount of a water and glycol soluble composition comprising:

a. from about 2 to about 15% by weight of a high molecular weight diamine;  
b. from about 2.5 to about 18% by weight of acetic acid;  
c. from about 1 to about 10% by weight of an organic nitrogen substituted imidazoline of the formula;







by unremoved fields of oxide and underlying fields of P<sup>+</sup>-type material;  
forming a uniform thin oxide layer over the active substrate areas and forming a substantially thicker oxide layer over said fields;  
ion-implanting a P-type dopant through the thin oxide layer into the active substrate areas to form at said active areas layers of P-type semiconductor material whose resistivity is lower than that of the P<sup>-</sup>-type substrate and higher than that of the P<sup>+</sup>-type fields; and  
forming N-channel MOS devices at least at selected ones of said layers of P-type material.

4,011,106

# HOT-ROLLED STEEL SHEET OF HIGH COLD FORMABILITY AND METHOD OF PRODUCING SUCH STEEL SHEET

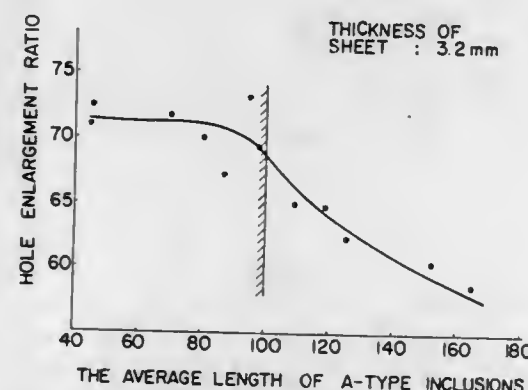
Hiroshi Takechi, Kisarazu; Hiroaki Masui, Kimitsu; Chikara Fujii; Tsuyoshi Kawano, both of Kisarazu, and Kazuo Koyama, Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed June 18, 1975, Ser. No. 588,021

Int. Cl.<sup>2</sup> C21D 7/13, 9/48

U.S. Cl. 148—2

4 Claims



1. A method of producing a hot-rolled steel sheet having high cold formability which comprises producing a steel slab from sheet consisting essentially of 0.03–0.30%C and 0.15–2.0%Mn as the main additive ingredients by an ingot making or continuous casting method, said steel being free from sulfide shape-controlling agents, followed by hot-rolling said slab at a finishing temperature in the range of 800°–1000° C and at a finishing rolling speed of more than or equal to 1100 m/min. so as to make the average length of the sulfide and/or silicate inclusions of stringer form in the steel less than 100  $\mu$ .

4,011,107

# BORON DIFFUSION COATING PROCESS

William J. Hayes, Shelby, Mich., assignor to Howmet Corporation, Greenwich, Conn.

Continuation of Ser. No. 479,775, June 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 220,477, Jan. 24, 1972, abandoned. This application Oct. 8, 1975, Ser. No. 620,634

Int. Cl.<sup>2</sup> C23F 7/00; C23C 9/02

U.S. Cl. 148—6

6 Claims

1. A process for the diffusion coating of metals with boron, comprising the steps of packing a solid metal substrate in which the metal is free from titanium and is capable of forming a compound or solid solution with boron, said metal being selected from the group consisting of iron alloys, nickel alloys, cobalt alloys, molybdenum, tungsten and alloys thereof having a melting point at a temperature above 1350° F, with a composition consisting essentially of a refractory oxide or refractory salt and boron in an amount within the range of 0.2 to 15% by weight based upon the metal of the oxide or salt and the boron, and heating the pack to a temperature above 1350° F under non-oxidizing conditions to diffusion coat the substrate.

# CUTTING TOOLS AND A PROCESS FOR THE MANUFACTURE OF SUCH TOOLS

Per Ingvar Hellman, Soderfors, and Bo Gunnar Klang, Oxelosund, both of Sweden, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed Jan. 19, 1976, Ser. No. 650,002

Int. Cl.<sup>2</sup> B22F 3/16, 5/00

U.S. Cl. 148—11.5 P

4 Claims

1. Cutting tool containing

Co	25 – 33	percent by weight
W	0 – 30	percent by weight
Mo	0 – 20	percent by weight
C	0 – 0.20	percent by weight
Si	0 – 1.0	percent by weight
Mn	0 – 0.4	percent by weight
Cr	0 – 0.4	percent by weight
Ni	0 – 0.4	percent by weight

and the balance Fe containing normal contaminants and where W + 2Mo being equal to 20 – 40% by weight, characterized by also containing 0.005 – 0.01% B or 0.005 – 0.03% by weight Zr or a mixture of both not exceeding 0.03% by weight, the structure of the tool consisting of a martensitic matrix having a grain size of 5 – 70  $\mu$ m determined as austenite grain size, containing 5 – 15 percent by volume of an intracrystalline, very homogeneously distributed fine-disperse phase consisting of an intermetallic compound of Fe, Co, W and Mo and, between the grains of the base mass, 20 – 30 percent by volume of a primarily precipitated phase mainly consisting of the same intermetallic compound having a predominant grain size of 1 – 2  $\mu$ m.

4,011,109

# METHOD FOR PRODUCING STEEL FILAMENTS

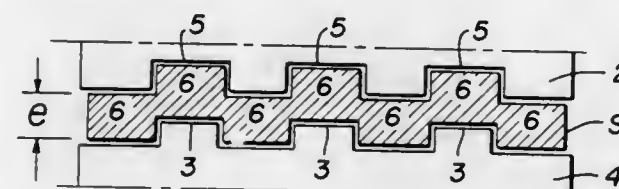
David I. Golland, Cary, N.C.; Charles J. Runkle, Guntersville, Ala.; Milan F. Kozak, Raleigh, N.C., and John A. Schey, Waterloo, Canada, assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 10, 1975, Ser. No. 630,595

Int. Cl.<sup>2</sup> C21D 9/52

U.S. Cl. 148—12 B

13 Claims



1. A method for producing continuous lengths of high strength steel filaments, comprising the steps of:  
a. providing a steel coil having a carbon content from about 0.30 to about 0.95, percent by weight;  
b. scoring the surface of said steel to form a plurality of grooves that delineate continuous longitudinal segments;  
c. heat treating said steel to develop an appropriate metallurgical structure;  
d. separating said segments into individual filaments by causing said steel to fracture at said grooves; and  
e. passing said filaments through a mechanical straightener.

4,011,110

# METHOD AND APPARATUS FOR FORMING AND TREATING BUNDLES OF STEEL RODS

Hermann-Josef Böckenhoff, Blecher; Walter Schaeffer, Cologne, and Berthold Kranz, Duren, all of Germany, assignors to Arbed-F & G Drahtwerke Köln GmbH, Cologne, Germany

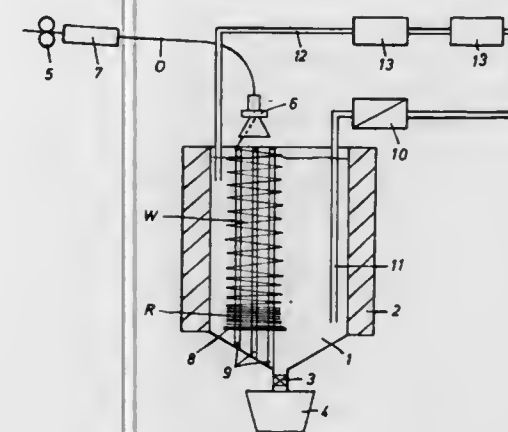
Filed July 24, 1975, Ser. No. 598,667

Claims priority, application Germany, July 25, 1974, 2435830

Int. Cl.<sup>2</sup> C21D 1/64, 9/58

U.S. Cl. 148—12 B

17 Claims



1. In a manufacturing method wherein metallic rod issues hot from a mill, the improvement comprising the steps of: heating a salt bath above a lower predetermined temperature below that of said rod; withdrawing liquid from the bottom of said bath, cooling the withdrawn liquid to below a higher predetermined temperature below that of said rod and above said lower temperature, and reintroducing the cooled and withdrawn liquid into the top of said bath; forming said rod substantially directly as it issues from said mill and before substantial cooling of said rod into a succession of turns; lowering said turns as they are formed by gravity into said bath one after another through the bath while maintaining said turns out of contact with each other as they are lowered for a period of time sufficient to effect a predetermined structural change in the metal of said turns as a result of differences between the temperatures of said turns and of said bath; and accumulating said turns after lowering same into said bath into a bundle with said turns lying on one another.

4,011,111

# HIGH STRENGTH, DEEP DRAWING QUALITY, LOW CARBON STEEL, ARTICLE FORMED THEREFROM, AND METHOD FOR PRODUCTION THEREOF

Rollin E. Hook, Dayton, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Aug. 25, 1975, Ser. No. 607,624

Int. Cl.<sup>2</sup> C21D 1/48

U.S. Cl. 148—16.6

11 Claims

1. A method of increasing the yield strength of a low carbon steel sheet stock, which comprises:  
providing a deoxidized, deep drawing quality steel containing, by weight percent, from about 0.002% to about 0.015% carbon, up to about 0.012% nitrogen, up to about 0.08% aluminum, about 0.05% to about 0.6% manganese, up to about 0.035% sulfur, up to about 0.01% oxygen, up to about 0.01% phosphorus, up to about 0.015% silicon, a nitride-forming element chosen from the group consisting of titanium, columbium, zirconium, and mixtures thereof, in amounts such that titanium in solution is from about 0.02% to about 0.2%, columbium in solution is from about 0.025% to about 0.3%, and zirconium in solution is from about 0.025% to about 0.3%, the sum total of said nitride-forming elements not exceeding about 0.3% in solution, and balance iron except for incidental impurities;

reducing said steel to a final thickness of about 0.02 to about 0.09 inch;  
annealing said steel at about 705° to about 760° C in an atmosphere consisting essentially of about 6% to 20% by volume hydrogen and remainder essentially nitrogen for a period of time sufficient to produce complete recrystallization;  
annealing the resulting sheet stock in an atmosphere consisting essentially of about 1% to about 20% by volume ammonia and remainder a carrier gas of nitrogen and hydrogen in which hydrogen is 6% to 20% by volume and remainder essentially nitrogen at a temperature between 593° and 705° C for a period of time of at least 3 hours and sufficient to cause reaction of said nitrideforming elements with the nitrogen of said ammonia to form small, uniformly dispersed nitrides and to cause formation of a surface layer of iron nitride; and  
denitriding said sheet stock in an atmosphere consisting essentially of about 6% to about 50% by volume hydrogen and balance essentially nitrogen within the temperature range of 649° to 760° C for a period of time equal to or less than that of the nitriding annealing step whereby to remove the iron nitride surface layer.

4,011,112

# MULTI-SECTIONED COOLING METHOD FOR HEATED STEEL MATERIAL

Koji Sakasegawa, Fukuyama; Kazuo Kunioka, Yokohama, and Atushi Ohsumi, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

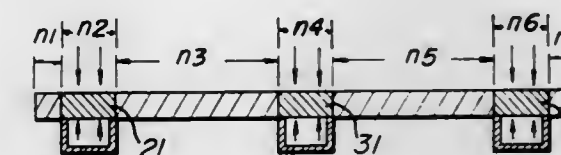
Filed May 28, 1974, Ser. No. 473,825

Claims priority, application Japan, June 8, 1973, 48-63921

Int. Cl.<sup>2</sup> C21D 1/18

U.S. Cl. 148—134

13 Claims



1. A method for forcibly cooling an elongated heated steel material of predetermined length by cooling means, the heated steel material being maintained stationary relative to said cooling means at least in the longitudinal direction of said heated steel material, comprising:

multi-sectioning said elongated steel material in the longitudinal direction thereof into a plurality of zones;  
cooling only a plurality of zones in said steel material which are spaced apart from each other by uncooled zones in the longitudinal direction of said steel material while maintaining said steel material stationary relative to said cooling means; and  
thereafter cooling said steel material as a whole.

4,011,113

# METHOD OF MAKING INJECTION LASERS BY EPITAXIAL DEPOSITION AND SELECTIVE ETCHING

George H. B. Thompson, and David F. Lovelace, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,115

Claims priority, application United Kingdom, Jan. 9, 1975, 928/75

Int. Cl.<sup>2</sup> H01L 21/225, 21/205, 33/00

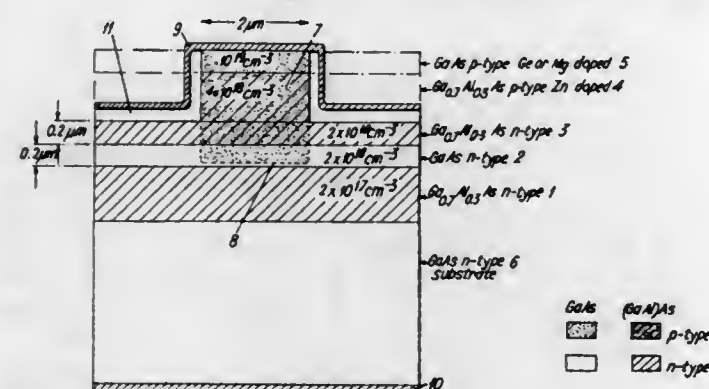
U.S. Cl. 148—175

4 Claims

1. A method of making a double heterostructure injection laser including the steps of forming a double heterostructure with a layer bounded on both sides by layers of the same conductivity type but larger band gap, the upper of said larger bandgap layers having a thickness not large compared with the



wavelength of the laser radiation in said upper layer, of growing an epitaxial layer of opposite conductivity type on said upper layer using a conductivity type determining dopant of greater mobility and in greater concentration than used in the provision of the underlying layers of the double heterostructure.



ture, of selectively removing all of said epitaxial layer with the exception of a stripe extending in a direction normal to a cleavage plane, and of heating the structure so as to promote diffusion of the greater mobility dopant until the p-n junction beneath the stripe is translated into the smaller band gap layer of the double heterostructure.

4,011,114

#### CROSS-LINKED NITROCELLULOSE PROPELLANT FORMULATION

John C. Allabashi, Cumberland, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1964, Ser. No. 358,981  
Int. Cl.<sup>2</sup> C06B 45/10

U.S. Cl. 149—19.4

8 Claims

1. A propellant formulation comprising the following ingredients:

- Nitrocellulose
- Prepolymer of polyglycoladipate and 2,4-tolylene diisocyanate
- Nitroglycerin
- Cyclotetramethylenetetranitramine
- Aluminum
- 2-Nitrodiphenylamine.

4,011,115

#### EXPLOSIVE COMPOSITIONS WITH THERMALLY CONDUCTIVE INGREDIENT

Roy Clifford Harris, Oxford, and John William Martin, Wilmington, both of England, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 13, 1966, Ser. No. 557,869

Claims priority, application United Kingdom, June 11, 1965, 24878/65

Int. Cl.<sup>2</sup> C06B 43/00, 41/02

U.S. Cl. 149—22

3 Claims

1. In an explosive composition having an electrical conductive ingredient incorporated therein selected from the group consisting of graphite, lead styphnate and manganese dioxide; the improvement comprising the incorporation therein of a thermally conductive, electrically insulating substance selected from the group consisting of boron nitride, silicon nitride and beryllium oxide.

4,011,116

#### CARBON DIOXIDE LASER FUELS

Lester A. Lee, 405 River Wood Drive, Oxon Hill, Md. 20022, and Edward E. Baroody, 189 Bucknell Road, Bryans Rd., Md. 20616

Filed Dec. 6, 1974, Ser. No. 530,260

Int. Cl.<sup>2</sup> C06B 31/28

U.S. Cl. 149—46

13 Claims

1. A composition capable of generating a laser beam when subjected to combustion in a gas dynamic-chemical transfer laser, said composition comprising a halogenated or deuterated compound selected from the group consisting of

- a. a 5-substituted tetrazole;
- b. a 1,5-disubstituted tetrazole;
- c. a 2,5-disubstituted tetrazole;
- d. a 1-monosubstituted bitetrazole;
- e. a 2-monosubstituted bitetrazole;
- f. a 1,5-dinitromethyl substituted tetrazole; and
- g. a 2,5-dinitromethyl substituted tetrazole, and an oxidizer selected from the group consisting of air, N<sub>2</sub>O, KClO<sub>4</sub>, NH<sub>4</sub>ClO<sub>4</sub>, NH<sub>4</sub>NO<sub>3</sub>, ND<sub>4</sub>ClO<sub>4</sub>, ND<sub>4</sub>NO<sub>3</sub> and mixtures thereof.

4,011,117

#### METHOD FOR CURING POLY(GLYCIDYL 2,2-DINITRO-2-ETHOXIDE)

George A. Lo, Canoga Park, and Milton B. Frankel, Tarzana, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 23, 1974, Ser. No. 472,795

Int. Cl.<sup>2</sup> C06B 25/00

U.S. Cl. 149—88

1 Claim

1. A method for curing a poly(glycidyl 2,2-dinitro-2-fluoroethoxide) prepolymer which comprises the step of adding tris (β-isocyanatoethyl) nitromethane to said prepolymer in an amount sufficient to effect the cure thereof.

4,011,118

#### METHOD OF MANUFACTURING A COAXIAL CABLE, AND COAXIAL CABLE MADE BY THIS METHOD

Louis Joseph Henri Geominy, Venlo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

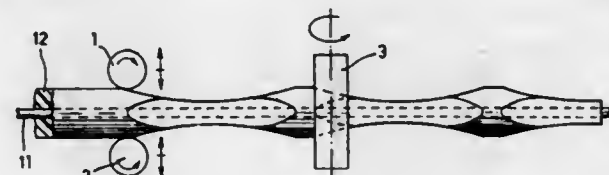
Filed May 21, 1975, Ser. No. 579,321

Claims priority, application Netherlands, May 21, 1974, 74-06784

Int. Cl.<sup>2</sup> H01B 13/06

U.S. Cl. 156—51

7 Claims



1. A method of continuously manufacturing a coaxial cable having a dielectric which consists partly of a gas, comprising a central conducting wire, dielectric spacers surrounding said wire, and an envelope comprising a cylindrical outer conductor and an outer sheath, comprising the steps of continuously extruding a cylinder of synthetic dielectric material having a first diameter concentrically about a wire made of a conductive material, then cooling the synthetic material, then mechanically removing parts of the cylinder at longitudinally evenly distributed intervals along the cylinder by members which reciprocate with respect to the longitudinal direction of the cylinder of dielectric material such that said central conducting wire remains enveloped by directly adjacent dielectric material, while continuously advancing said cylinder in its longitudinal direction, the parts so removed being separated by circular cylindrical portions extending to said first diameter.

ter, and then applying a cylindrical sheathing about said dielectric so as to enclose gasfilled spaces, extending longitudinally along the cable without communication with one another, interiorly of said sheathing where the parts were removed.

4,011,119

#### METHOD FOR COLD LIDDING CONTAINERS WITH ELASTOMERIC FILM

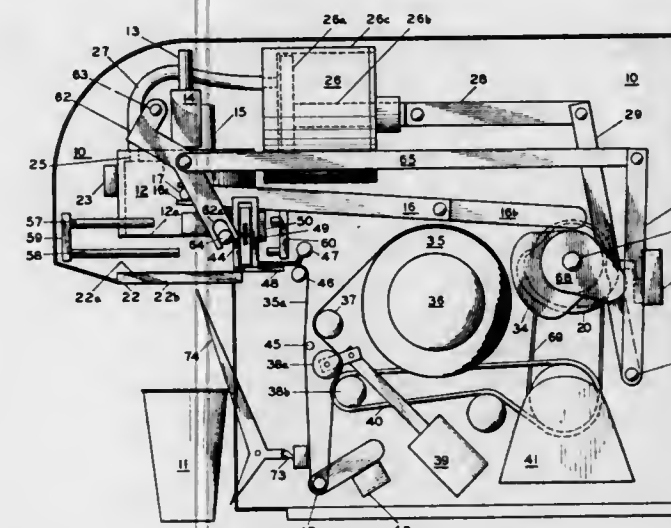
Richard Patrick Mitchell, and Thomas Mathew Gorshe, both of Neenah, Wis., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 19, 1975, Ser. No. 642,367

Int. Cl.<sup>2</sup> B65B 7/16; B67B 3/04

U.S. Cl. 156—69

3 Claims



1. A method for cold lidding an open-top container with roll-stock elastomeric film, comprising the steps of:

- a. presenting a web of the elastomeric roll-stock, film below the open-ended bottom of a lidding chamber,
- b. severing said web from said roll-stock,
- c. holding said web in air-tight relationship across the open-ended bottom of the lidding chamber,
- d. evacuating said lidding chamber above said web while maintaining said air-tight relationship to stretch said web, within its elastic limit, upwardly into said lidding chamber,
- e. inserting the top of the container to be lidded into said lidding chamber so that said stretched web extends below the top of said container and about the periphery thereof, and
- f. releasing said stretched web over the top of said container, allowing the web to contract onto a periphery of said container, thereby applying a lid to said container.

4,011,120

#### METHOD FOR FASTENING CERAMIC MAGNETS TO A FLYWHEEL USING CENTRIFUGAL FORCE

Glenroy Newcomb Aggen, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

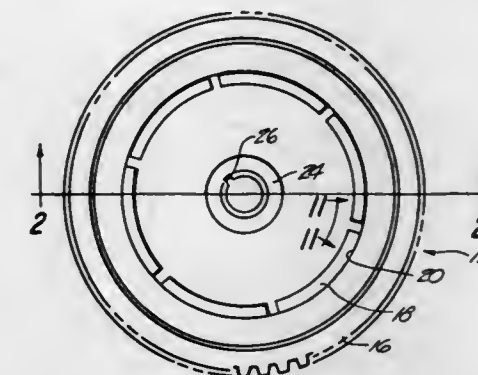
Filed May 2, 1975, Ser. No. 573,929

Int. Cl.<sup>2</sup> B32B 31/16; H02K 15/02

U.S. Cl. 156—74

24 Claims

1. The method of attaching a magnet on a radially inner surface of a rotor for use in a dynamoelectric system and the like wherein magnet is to be located at a predetermined angular position on said rotor, the steps of applying an adhesive to either said magnet or said rotor at a proposed interface therebetween, positioning said magnet within said rotor, spinning said rotor and said magnet about a rotational axis of said rotor while aligning said magnet at said predetermined angular



position on said rotor as said magnet is pressed against said rotor by centrifugal force and continuing to spin said rotor and

said magnet to maintain said magnet pressed against said rotor while said adhesive sets.

4,011,121

#### ADHESIVE BONDING OF POLY(ARYLENE SULFIDE) SURFACES

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1975, Ser. No. 573,182

Int. Cl.<sup>2</sup> B32B 31/12; B29C 17/12; B32B 7/12, 31/26

U.S. Cl. 156—82

11 Claims

1. A method to bond a first solid surface to a second solid metal surface comprising

- a. coating said first solid surface with a material selected from the group consisting of unfilled poly(arylene sulfide) and fiberglass-filled poly(arylene sulfide) to produce a first poly(arylene sulfide) surface,
  - b. submitting said first poly(arylene sulfide) surface to a pre-treatment selected from the group consisting of flame-treating the unfilled poly(arylene sulfide) surface for a period of time sufficient to dull the luster of the unfilled poly(arylene sulfide) surface but insufficient to substantially alter said surface by melting, pyrolyzing or burning thereof, mechanically roughening the unfilled poly(arylene sulfide) surface, and mechanically roughening the fiberglass-filled poly(arylene sulfide) surface,
  - c. adhesive-bonding said first poly(arylene sulfide) surface to said second solid metal surface.
6. A method to bond a first solid surface to a second solid surface wherein
- a. a first solid surface consisting of unfilled poly(arylene sulfide) is flame-treated for a period of time sufficient to dull the luster of the unfilled poly(arylene sulfide) surface but insufficient to substantially alter said surface by melting, pyrolyzing or burning thereof, and
  - b. said flame-treated first solid surface of unfilled poly(arylene sulfide) is adhesively bonded to said second solid surface.

4,011,122

#### METHOD FOR PRODUCING PLASTIC-COVERED CONTAINERS

Richard I. Ashcroft, Alameda, Calif., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 464,224, April 25, 1974, Pat. No.

3,959,065. This application Sept. 29, 1975, Ser. No. 617,884

Int. Cl.<sup>2</sup> B29C 27/00

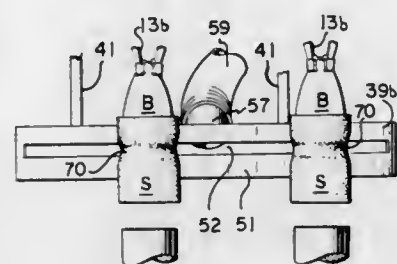
U.S. Cl. 156—86

8 Claims

1. The method of forming an encircling plastic covering on elongated base articles comprising: conveying base articles in a first path with their longitudinal axes perpendicular to the direction of movement, moving hollow body sleeves of a heat shrinkable plastic material in a separate, second path spaced from the articles, a portion of said second path being parallel with said first path so that the central longitudinal axes of said



sleeves are substantially in a coaxial relationship with said articles, the sleeves having an interior cross dimension slightly larger than the exterior cross dimension of said articles, during said movements, telescopically transferring the sleeve over each article by movement in said coaxial direction to a position whereat the sleeve is placed over at least a portion of the article for movement with the latter in said first path,

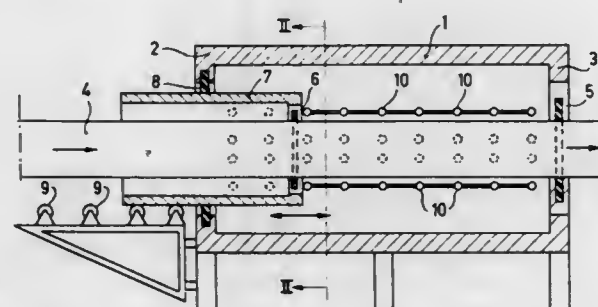


conveying the transferred sleeve and article together in said first path through a subsequent portion thereof past a zonal heating device for applying tacking heat to an annular exterior band region of the sleeve adjacent said article, thereby shrinking said annular band of the sleeve onto the article holding the sleeve in place on the article, conveying the sleeve and article further in said first path into and through a heat applying device, and applying heat to said sleeve sufficient to completely shrink it into a snug, conforming, encircling relationship on the surface of said article.

**4,011,123**  
**APPARATUS FOR ETCHING A CONTINUOUSLY MOVING THIN METAL STRIP**  
Petrus Johannes Buysman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
Filed Oct. 30, 1975, Ser. No. 627,105  
Claims priority, application Netherlands, Jan. 9, 1975, 7500246

Int. Cl.<sup>2</sup> C23F 1/02  
U.S. Cl. 156—345

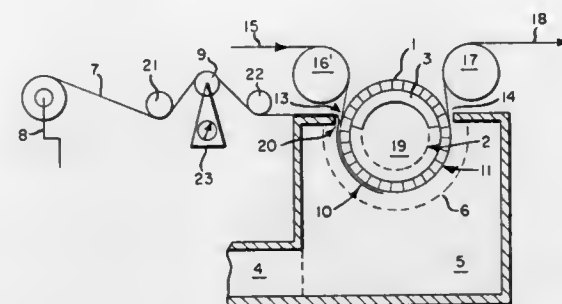
3 Claims



1. An apparatus for etching a continuously moving thin metal strip, comprising an etching compartment in which spraying heads for etching liquid are arranged along the length of the etching compartment, said compartment being closed on the inlet end and on the outlet end by means of closure means pressing against both main surfaces of the strip, said closure means on at least one of the two ends being arranged in a housing which is movable in the etching compartment along the path of movement of the metal strip, and the housing being sealed on the outside relative to the etching compartment.

**4,011,124**  
**APPARATUS FOR CONTINUOUS HOT AIR BONDING A NONWOVEN WEB**  
James Fletcher Baxter, Hendersonville, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Filed July 9, 1975, Ser. No. 594,283  
Int. Cl.<sup>2</sup> F26B 11/18; D04H 3/12  
U.S. Cl. 156—358

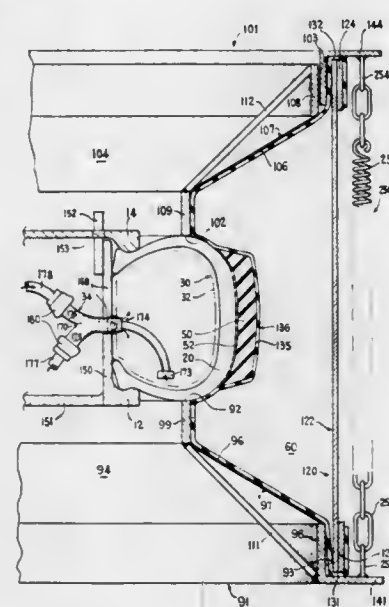
1 Claim



1. In an apparatus which includes a rotating hollow cylindrical roll having a pervious surface for conveying a web and means for passing hot air through the web and into the roll over the distance the web is conveyed on the roll; the improvement for thermally bonding a web of thermoplastic filaments which comprises a stationary porous fabric for restraining the web against the roll surface for a distance of about 35 inches under pressure developed by flow of the hot air through the fabric, the fabric having one end free and being held stationary by tension means which includes fabric supply means for adjusting the length of fabric in contact with the web on the roll, a pressure sensing roll located between the supply means and contact of the fabric with the web on the roll, and means for measuring tension on the fabric.

**4,011,125**  
**TIRE RETREADING**  
Guy Pelletier, Melbourne, Canada, assignor to Bombardier Limitee, Canada  
Filed May 31, 1974, Ser. No. 475,309  
Int. Cl.<sup>2</sup> B29H 5/04  
U.S. Cl. 156—394

6 Claims

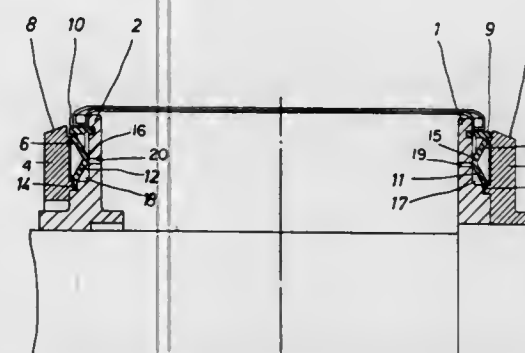


1. Apparatus for retreading a worn pneumatic tire with a fully pre-cured tread band to be bonded to the tread surface of said tire by means of a layer of cushion gum, said apparatus comprising a rim assembly for mounting centrally of said tire and having first and second flange means for preventing outward displacement of the beads of said tire, an inner tube assembly disposed within said tire and including a steam impervious rubber tube and a first steam supply and drain assembly attached to said rubber tube and projecting inside said rubber tube, a cage assembly for receiving therein the tire

assembly, which consists of said rim assembly with said inner tube assembly and said tire in position thereon, and for defining an annular steam chamber circumscribing said tire assembly, a second steam supply and drain assembly in communication with the inside of said annular steam chamber, a housing for said cage assembly, and first and second steam control means respectively for said first and second steam supply and drain assemblies, characterized in that said cage assembly consists of a first and second cone member, means for retaining said cone members on either sides of said tire for centering said cone members and said rim assembly on a common axis and for preventing outward displacement of one cone member relative to the other cone member throughout the cushion gum curing process, each cone member having an inner peripheral edge of a predetermined common diameter for contacting the corresponding side wall region of said tire radially outwardly of said rim assembly flange means but radially inwardly of said tread band, a main ring assembly for circumscribing the outer peripheral edges of said cone members, and a steam impervious bladder in sealing engagement with the opposite edges of said main ring assembly, said bladder being an endless belt made of heat-resistant, flexible rubber-like material, the inwardly facing surface of said main ring assembly and the outwardly facing surface of said bladder defining said steam chamber.

**4,011,126**  
**DRUM FOR PRODUCING BLANKS FOR CAR TIRES**  
Werner Eichholz, and Gerd Krebs, both of Hamburg, Germany, assignors to Phoenix Gummiwerke A.G., Hamburg, Germany  
Filed Feb. 28, 1975, Ser. No. 553,880  
Claims priority, application Germany, Mar. 1, 1974, 2409737  
Int. Cl.<sup>2</sup> B29H 17/26  
U.S. Cl. 156—416

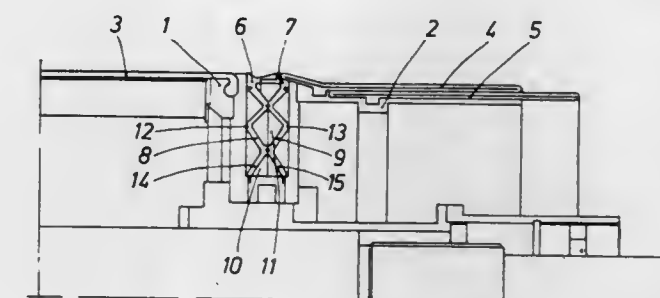
1 Claim



1. A device for producing blanks for car tires of rubber with braker strips, said device comprising a drum consisting of coaxial rings movable axially relative to each other, said rings having outer spaced flanges forming an annular groove in each ring, and a ring insert located in each groove and consisting of an elastomeric material, said ring insert comprising a top cylindrical supporting part and a bottom disc part connected by an integral joint with said supporting part at the axial outer edge of each supporting part and extending radially inward into said groove, said disc part having a joint therein forming a toggle-like bend in cross-section, said supporting parts being fixed to the axially outer face of the axially inner flange of each ring, said disc part extending to the bottom of said groove, means for applying fluid pressure into said groove to cause the radial expansion of said supporting parts at locations not fastened to said flanges by the air pressure causing the strengthening of the toggle-like bends in said disc parts.

**4,011,127**  
**TIRE BUILDING DRUM**  
Werner Eichholz, and Gerd Krebs, both of Hamburg, Germany, assignors to Phoenix Gummiwerke Aktiengesellschaft, Hamburg, Germany  
Filed Apr. 8, 1975, Ser. No. 566,102  
Claims priority, application Germany, Apr. 17, 1974, 2418410  
Int. Cl.<sup>2</sup> B29H 17/22  
U.S. Cl. 156—416

5 Claims



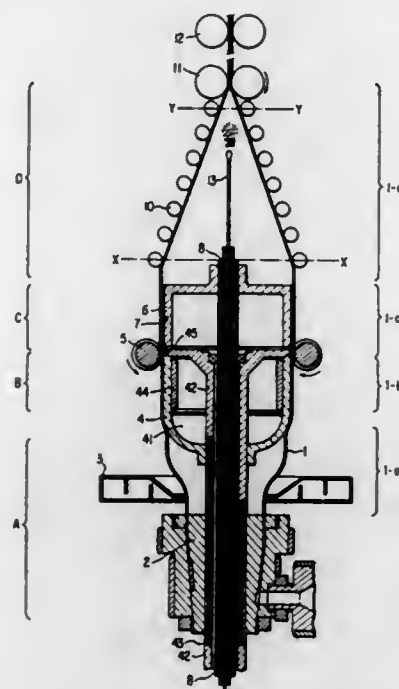
1. A tire building drum for assembling and shaping tire carcasses toroidal, comprising a central drum, and two side drums, an inflatable membrane carried by said central drum, inflatable membranes carried by said side drums, means forming radial grooves located between the central drum and each side drum, a core supporting ring and membrane supporting ring both of elastomeric material having a shore hardness A of about 90°, said membrane supporting ring located axially outwardly of, adjacent to, and in overlapping contact with the core supporting ring to form a composite cylindrical ring structure axially spanning said groove, and flanges located in said groove, one of said flanges being connected to the axially inward end of each core supporting ring and extending to the bottom of said groove at the axially inward edge and one of said flanges being connected to the axially outward end of each membrane supporting ring and extending to the bottom of said groove at its axially outward edge, said flanges consisting of annular discs with bent interconnected movable portions with the bends of the core and membranes supporting rings flanges being in mirror image so that when radially collapsed alternate bends in each pair of core and membrane supporting rings flanges contact each other and contact the side walls of the groove and when radially expanded the bends are substantially removed from the flanges and they are pressed out of contact with each other and against the side walls of said grooves, and means to introduce air pressure between said flanges to radially expand the flanges and thus the core and membrane support rings attached thereto and supported by said flanges.

**4,011,128**  
**APPARATUS FOR FORMING A CROSS-ORIENTED FILM**  
Shigemasa Suzuki, Toda, Japan, assignor to Nippon Ekika Seikei Kabushiki Kaisha, Tokyo, Japan  
Continuation-in-part of Ser. No. 553,274, Feb. 26, 1975, which is a continuation of Ser. No. 287,855, Sept. 11, 1972, abandoned. This application July 17, 1975, Ser. No. 596,670  
Claims priority, application Japan, Sept. 9, 1971, 46-69233  
Int. Cl.<sup>2</sup> B29D 23/04

U.S. Cl. 156—500  
1. An apparatus for forming a seamless cross-oriented film comprising:  
tubular-film-producing means for forming a thermoplastic synthetic resin tubular film;  
means for maintaining the temperature of said tubular film below the melting point yet above the secondary transition temperature thereof, disposed downstream of said producing means;  
twist-preventing means, in contact with said film for pressing and feeding said tubular film in the film-forming



direction, disposed at an axial position of said apparatus substantially coincident with said temperature maintaining means and which includes a fixed mandrel adapted to be disposed within said tubular film and in contact therewith and at least three feed rolls provided, within at least one plane disposed at an axial position corresponding to that of said fixed mandrel, externally of said tubular film and in contact therewith so that said tubular film may not undergo slip with respect to any cross-orientation force created by means of drawing and lateral rotation operations;



cross-orientation means, disposed immediately downstream of said twist-preventing means, for continuously rotating said tubular film, relative to the film-forming direction or laterally thereof while said film is moving in said film-forming direction, at a peripheral speed of at least twice as fast as the feed speed of said twist-preventing means; and

a take-up device, disposed downstream of said cross-orientation means, for imparting a drawing speed, of at least twice as fast as the feeding speed of said twist-preventing means, to said cross-orientation means so as to thereby successively flatten said tubular film into two layers, said take-up device including guide rolls and nip rolls.

4,011,129

## PULP MILL RECOVERY SYSTEM

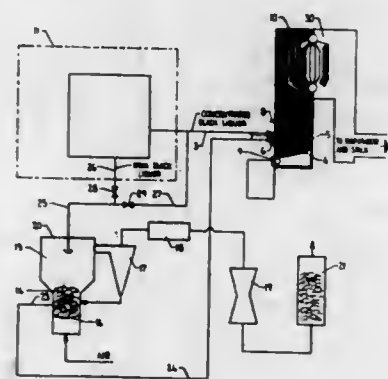
George Herbert Tomlinson, II, Ile Perrot, Canada, assignor to Domtar Limited, Montreal, Canada

Filed Apr. 11, 1975, Ser. No. 567,473

Int. Cl.<sup>2</sup> D21C 11/04, 11/12

U.S. Cl. 162—30 K

4 Claims



1. A method of increasing recovery capacity of a kraft pulp mill without substantially increasing the emissions from a smelting kraft recovery furnace having a boiler section, com-

prising, cooking cellulosic material thereby to produce a kraft pulp, separating spent black liquor from said pulp, concentrating said black liquor, injecting a portion of said concentrated black liquor to an oxidation zone in said kraft recovery furnace whereby a char is formed and collected as a char bed on a hearth at the bottom of said kraft recovery furnace, maintaining a reducing atmosphere in said char bed, thereby to transform sodium sulfate contained in said spent black liquor to sodium sulfide, injecting a further portion of said spent black liquor to an oxidation zone external of said Kraft recovery furnace thereby to form pellets containing sodium carbonate and sodium sulfate from said further portion of said black liquor, injecting said pellets free from entraining liquid into said kraft recovery furnace and onto said char bed, said pellets being substantially spherical and sufficiently large so that there is no significant entrainment of the pellets by the furnace gases and yet small enough so that operation of the furnace is not disrupted to render the process inoperative, and maintaining a temperature and reducing conditions in said bed thereby to convert sodium sulfate in said pellets to sodium sulfide, and withdrawing a smelt of sodium sulfide and sodium carbonate from said kraft furnace.

4,011,130

## LEATHER-LIKE WATERLAID SHEETS CONTAINING PARTICULATE FILLERS

Robert A. Worden, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 9, 1974, Ser. No. 504,237

Int. Cl.<sup>2</sup> D21H 3/48, 5/12

U.S. Cl. 162—151

26 Claims

1. A leather-like, waterlaid sheet comprising a major amount of essential solids consisting of elastomeric binder and nonelastomeric solids comprising particulate filler and reinforcing fiber, said particulate filler comprising about 10 to 60% by weight of said essential solids, the particles of said particulate filler being inflexible, non-fibrous, rounded particles having an average particle size in the range of about 1 to 160 microns, the length of any major axis of the particles being no more than twice the length of any of the other axes, said reinforcing fiber comprising at least 5% by weight of said essential solids and said elastomeric binder being present in an amount sufficient to provide an integral, cohesive sheet.

4,011,131

## LUBRICATED SUCTION BOX COVER

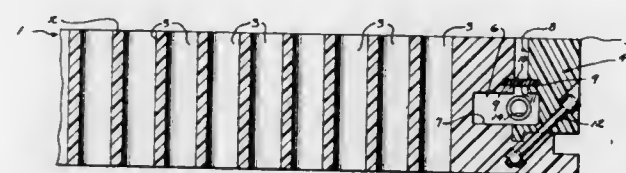
Charles B. Nicholson, Glens Falls, N.Y., assignor to Albany International Corporation, Albany, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,357

Int. Cl.<sup>2</sup> D21F 1/52

U.S. Cl. 162—279

8 Claims



1. A fabric lubricating structure for a suction box comprising:

a cover having a leading portion with a fabric supporting surface, and including a channel in the interior thereof; means for introducing a fabric lubricating liquid into said channel;

said channel having a lower manifold region for receiving fabric lubricating liquid, and a throat region extending upward from the manifold region which opens upon said fabric supporting surface; and

a metering member mounted in said channel and located intermediate said manifold region and the opening of said throat region, which metering member has a series of

orifices to control the flow of lubricating liquid from said manifold region to said throat region to maintain the surface of the lubricating liquid in said throat region flush with said fabric supporting surface.

4,011,132

## NUCLEAR REACTOR PRESSURE VESSEL FOR NUCLEAR REACTORS WITH PLASTICALLY DEFORMABLE SPACERS

Hermann Kumpf, Wendelstein, and Gottfried Molz, Erlangen, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

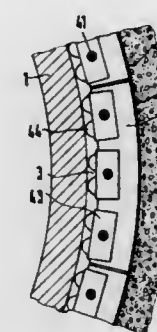
Filed Jan. 22, 1975, Ser. No. 543,136

Claims priority, application Germany, Jan. 29, 1974, 2404171

U.S. Cl. 176—38

Int. Cl.<sup>2</sup> G21C 9/00

6 Claims



1. Cylindrical pressure vessel structure for nuclear reactors comprising a steel pressure vessel adapted to receive therein a pressurizing medium, said steel pressure vessel, during operating condition thereof wherein said steel pressure vessel is heated and pressurized, being expandable, an outer concrete enclosure, said steel pressure vessel being mounted within said outer concrete enclosure in unheated and unpressurized condition and being radially and axially spaced from said outer concrete enclosure, and a supporting and insulating layer secured in the radially extending space between said steel pressure vessel and said outer concrete enclosure in radially spaced-apart relationship to both said steel pressure vessel and said outer concrete enclosure, a layer of concrete interposed in the radial spacing between said supporting and insulating layer and said outer concrete layer, said layer of concrete being produced in situ by solidification of a matrix thereof poured into the radial spacing between said supporting and insulating layer and said outer concrete enclosure, said supporting and insulating layer having support plates on the side thereof adjacent said steel pressure vessel, spacer members connected with said support plates and having projections extending beyond the surface of said support plates in direction toward said steel pressure vessel, said spacer members defining a given radial spacing of said support plates from said pressure vessel, said spacer members being unyieldable against radial forces produced during solidification of said layer of concrete interposed in the radial space between said supporting and insulating layer and said outer concrete enclosure, so as to maintain said given radial spacing of said support plates from said pressure vessel, said spacer members being yieldable, however, to radial forces applicable thereto by said expansion of said pressure vessel during said heated and pressurized condition thereof, so that said projections of said spacer members plastically deformed to permit the expanding pressure vessel to expand into the radial spacing between said pressure vessel and said supporting and insulating layer and bear against said outer concrete enclosure through the intermediary of said deformed spacer members, said supporting and insulating layer and said layer of concrete.

4,011,133

## AUSTENITIC STAINLESS STEEL ALLOYS HAVING IMPROVED RESISTANCE TO FAST NEUTRON-INDUCED SWELLING

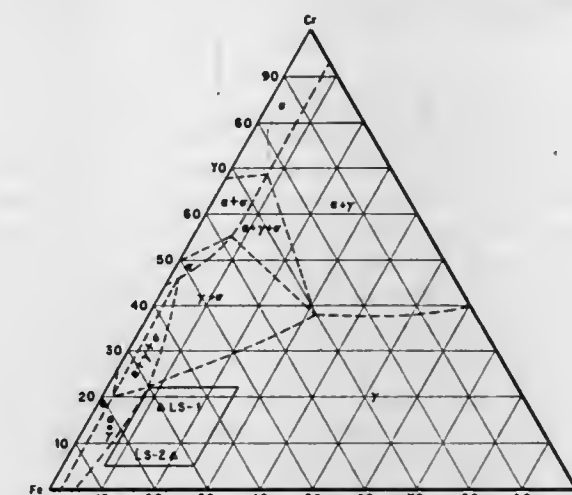
Everett E. Bloom; James O. Stiegler; Arthur F. Rowcliffe, all of Oak Ridge, and James M. Leitnaker, Kingston, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 16, 1975, Ser. No. 596,546

Int. Cl.<sup>2</sup> G21C 3/02

U.S. Cl. 176—68

5 Claims



1. A nuclear fuel element comprising a core selected from the group consisting of an oxide nitride or carbide of uranium and an austenitic stainless steel alloy cladding consisting essentially of Fe, Cr, and Ni as prescribed within the area ABCD in the ternary diagram of FIG. 3, and a void depressing concentration of Si and Ti.

4,011,134

## PRESSURIZED-COOLANT REACTOR FUEL ROD

Heinz Stehle, Marloffstein, and Hans-Jürgen Romeiser, Grossgrundlach, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Nov. 7, 1974, Ser. No. 521,849

Claims priority, application Germany, Nov. 9, 1973, 2356182

Int. Cl.<sup>2</sup> G21C 3/02

U.S. Cl. 176—68

3 Claims



1. A pressurized-coolant reactor fuel rod comprising a cladding tube having ends closed gas-tightly, said tube internally defining a fuel-containing space, nuclear fuel in said space, said tube containing a fission gas plenum chamber formed by a capsule having a flow choke connecting the chamber with said space and said fuel, said capsule being positioned between said fuel and one of said ends closed gas-tightly, and said capsule being elastically expandable



lengthwise with respect to said tube and engaging and restraining said fuel against displacement lengthwise with respect to said tube, by pressing said fuel elastically away from said one of said tube's closed ends.

4,011,135

# PRODUCTION OF L(+)-TARTARIC ACID

Yoshio Kamatani, Osaka; Hisayoshi Okazaki, Kyoto; Ko Imai, Osaka; Noriaki Fujita, Suita; Yoshio Yamazaki, Toyonaka, and Katsuhiko Ogino, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Jan. 19, 1976, Ser. No. 650,025

Claims priority, application Japan, Jan. 17, 1975, 50-8149 Int. Cl.<sup>2</sup> C12D 1/02

U.S. Cl. 195—30

13 Claims

1. A method for producing L(+)-tartaric acid or salts thereof by hydrolysis of cis-epoxysuccinic acid which comprises (1) bringing a culture or processed matter containing an enzyme system thereof, obtained from a microorganism which belongs to the genus *Pseudomonas*, *Agrobacterium* or *Rhizobium* and said culture or enzyme system being capable of hydrolyzing cis-epoxysuccinic acid or salts thereof, thereby forming L(+)-tartaric acid, into contact with cis-epoxysuccinic acid or salts thereof in an aqueous medium at 5° to 50° C for a time sufficient to produce L(+)-tartaric acid and (2) recovering the so-formed L(+)-tartaric acid.

4,011,136

# BIOCHEMICAL PROCESS

Eunice Jean Napier, Mattingley, England, assignor to Glaxo Laboratories Limited, Greenford, England

Filed July 22, 1974, Ser. No. 490,844

Claims priority, application United Kingdom, July 23, 1973, 35057/73

Int. Cl.<sup>2</sup> C07G 7/02, 7/028

U.S. Cl. 195—31 R

13 Claims

1. A process for the production of maltose, wherein starch in an aqueous medium is treated with a  $\beta$ -amylase derived from a strain NCIB 11,033 of *Bacillus circulans* having the following characteristics:

- at 37° C the pH for its optimal activity on glycogen substrate is 6.5 to 7.5;
- the enzyme is stable at 60° C for at least 30 minutes without substrate (pH 6.0, 0.05M tris/maleate buffer);
- the enzyme is not significantly inhibited by the sulphhydryl-inhibitor, sodium p-chloromercuriphenylsulphonate at levels up to 2 mM;
- gel filtration on a porous polyacrylamide gel possessing a MW exclusion limit of 100,000, shows a single peak of  $\beta$ -amylase activity corresponding to a molecular weight of 53,000 to 63,000;
- the isoelectric point determined by thin layer gel electrophoresis is pH 4.6;
- neither activity nor thermostability is affected by calcium chloride in the range 0.001 to 0.1 M.

4,011,137

# PROCESS FOR PRODUCING DEXTROSE USING MIXED IMMOBILIZED ENZYMES

Kenneth N. Thompson; Richard A. Johnson, and Norman E. Lloyd, all of Clinton, Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,975

Int. Cl.<sup>2</sup> C12D 13/02

U.S. Cl. 195—31 R

17 Claims

1. A process for converting starch to dextrose comprising treating starch with alpha-amylase to obtain a partially hydrolyzed starch solution containing at least 10 percent hydrolyzed starch and then treating the partially hydrolyzed starch solution with an enzyme system comprising immobilized glucoamylase selected from the group consisting of glucoamylase covalently bonded to an insoluble carrier and glucoamylase

adsorbed on an insoluble carrier and immobilized alpha-amylase selected from the group consisting of alpha-amylase covalently bonded to an insoluble carrier and alpha-amylase adsorbed on an insoluble carrier under conditions whereby a hydrolysate containing at least about 92 percent dextrose on an ash free, dry basis is produced.

4,011,138

# PROCESS FOR THE PREPARATION OF CHOLESTEROL ESTERASE

Osamu Terada, and Takayuki Uwajima, both of Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed June 17, 1975, Ser. No. 587,699

Claims priority, application Japan, June 17, 1974, 49-68160 Int. Cl.<sup>2</sup> C12D 13/10

U.S. Cl. 195—65

13 Claims

1. A process for preparing cholesterol esterase which comprises culturing a microorganism belonging to the species *Pseudomonas fluorescens* and capable of producing cholesterol esterase in a nutrient medium, producing and accumulating cholesterol esterase extracellularly and intracellularly, and recovering said cholesterol esterase.

4,011,139

# PROCESS FOR PRODUCING $\alpha$ -1,6 GLUCOSIDASES USING THERMOPHILIC MICROORGANISMS

R. Otto Horwath, Westport; John A. Lally, and Philip Rotheim, both of Stamford, all of Conn., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Nov. 26, 1974, Ser. No. 527,405

Int. Cl.<sup>2</sup> C12D 13/10

U.S. Cl. 195—65

15 Claims

1. A process for producing  $\alpha$ -1,6 glucosidases comprising growing thermophilic microorganisms selected from the group consisting of the *Bacillus* genus, the *Antinomycetales* order and gram negative rod shaped microorganisms which produce  $\alpha$ -1,6 glucosidases under aerobic conditions in an aqueous nutrient medium having present a carbohydrate selected from the group consisting of glucose, isomers of glucose, oligomers and polymers containing a glucose moiety or isomers of a glucose moiety and mixtures thereof and maintaining the medium at a suitable pH and a temperature of from about 45° to about 70° C to provide substantial growth of the microorganisms and production of  $\alpha$ -1,6 glucosidase enzymes.

4,011,140

# PROCESS FOR PRODUCING ANTITUMOR COMPOUND

Nobuhiko Komatsu, Tokyo, Japan, assignor to The Green Cross Corporation, Osaka, Japan

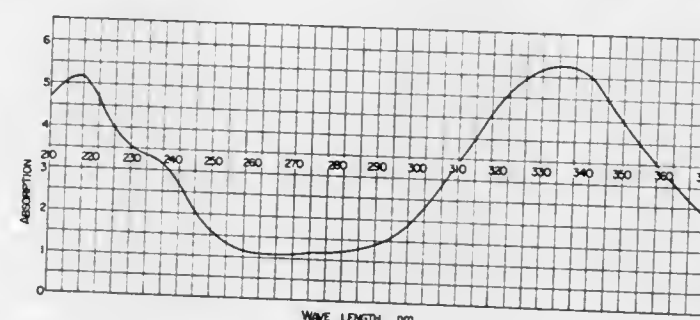
Filed Apr. 2, 1976, Ser. No. 673,056

Claims priority, application Japan, Dec. 25, 1975, 50-155500

Int. Cl.<sup>2</sup> C12D 9/00

U.S. Cl. 195—80 R

16 Claims



1. A process for producing 5,10,11,11a-tetrahydro-9,11-dihydroxy-8-methyl-5-oxo-1H-pyrrolo-[2,1-c][1,4]benzodiazepin-2-acrylamide (PBA), which comprises aerobically culturing *Streptomyces spadicogriseus* KOMATSU, FERM

p-3275, ATCC 31179, to produce said compound in the medium, and recovering said compound from the medium.

4,011,141

# PROCESS FOR MAXIMIZING THE GROWTH AND NICOTINE DEGRADING ACTIVITY OF MICROORGANISMS

Lawrence E. Gravely, Louisville, Ky.; Vernon L. Geiss, Floyd Knobs, Ind., and Richard P. Newton, Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Nov. 17, 1975, Ser. No. 632,857

Int. Cl.<sup>2</sup> C12B 1/20

U.S. Cl. 195—96

13 Claims

1. The process of maximizing the growth and nicotine degrading activity of microorganisms effective to degrade nicotine through a biochemical mechanism in which 3-succinoylpyridine is formed, which microorganisms are selected from the group consisting of *Cellulomonas* sp. and *Pseudomonas putida*, comprising:

- inoculating nicotine containing broth with said microorganisms, and
- subjecting said broth to aeration and agitation, said broth:
  - being maintained at a pH of between about 6 and about 7.8;
  - having an initial nicotine concentration of at least 0.5 mg. per ml. up to an amount which is toxic to said microorganisms; and
  - being maintained at a temperature between about 10° C and about 45° C.

4,011,142

# PROCESS FOR MEASURING THE PLASMINOGEN CONTENT OF A SAMPLE

Eckart Jacobi, Erkrath, Germany, assignor to Behring-Werke AG, Marburg, Germany

Filed Jan. 15, 1975, Ser. No. 541,335

Claims priority, application Germany, Jan. 27, 1973, 2338254; June 29, 1974, 2431342

Int. Cl.<sup>2</sup> G01N 31/14

U.S. Cl. 195—103.5 R

8 Claims

1. The process of measuring the plasminogen content of a plasma sample comprising the steps of:

- eliminating any antiplasmin from the plasma sample,
- adding a predetermined amount of fibrinogen to the sample,
- adding an amount of plasminogen activator sufficient to activate all possible plasminogen present in the sample, and
- incubating the sample a sufficient period of time to form a solution of fibrinogen and antiplasmin-free, plasminogen-activated plasma,
- adding thrombin to the solution, and
- timing the reaction until the moment of fibrin coagulation is observed in the solution, the plasminogen content to be established by comparing the observed time to fibrin coagulation with an established normal standard.

4,011,143

# MATERIAL DEPOSITION MASKING FOR MICROCIRCUIT STRUCTURES

Louis A. Del Monte, Minnetonka, and Robert H. Grangroth, Buffalo, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 373,526, June 25, 1973, Pat. No. 3,897,324. This application July 28, 1975, Ser. No. 599,796

Int. Cl.<sup>2</sup> C25D 5/02, 7/12

U.S. Cl. 204—15

13 Claims

1. A method for providing deposition materials on a microcircuit structure through a separate mask provided as a sheet of a mask material having deposition openings therein, said method comprising:

flexing said mask toward a substantially protrudent shape while forcing a major surface thereof, which tends toward being substantially convex as a result of said flexing, against a first surface of said structure sufficiently to provide sealing around said deposition openings, and depositing said deposition materials.

4,011,144

# METHODS OF FORMING METALLIZATION PATTERNS ON BEAM LEAD SEMICONDUCTOR DEVICES

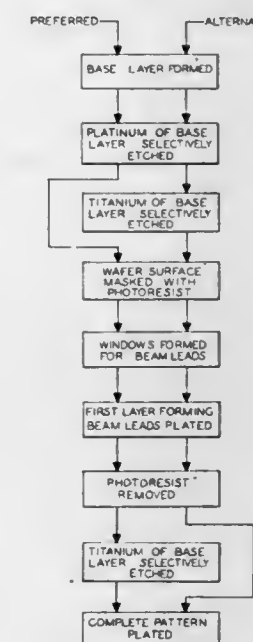
Albert K. Bachman, Allentown, Pa., assignor to Western Electric Company, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,201

Int. Cl.<sup>2</sup> C25D 5/02, 7/12

U.S. Cl. 204—15

9 Claims



1. A method of forming conducting paths including supporting elements on a surface of a semiconductor wafer, which comprises:

- depositing a conductive film on the surface of the wafer;
- defining a pattern of the paths including the supporting elements on the film;
- selectively electroplating a first layer of metal on portions of the pattern to form the supporting elements;
- removing the film except for the portions of the defined pattern;
- coupling the pattern into an electrical metal deposition circuit;

and electroplating a second layer of metal over the elements and over portions of the pattern not covered by the elements.

4,011,145

# ELECTROCHEMICAL MANUFACTURE OF AROMATIC ESTERS

Juergen Haufe, Ludwigshafen; Costin Rentzea, Heidelberg, and Dieter Degner, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 18, 1975, Ser. No. 587,919

Claims priority, application Germany, July 19, 1974, 2434845

Int. Cl.<sup>2</sup> C25B 3/00

U.S. Cl. 204—59 R

4 Claims

1. Electrochemical manufacture of aromatic or heterocyclic esters of the formula











charge, whereby said second trigger means are operative to trigger said other thyristor in such a manner as to eliminate such unbalance

4,011,153

# LIQUEFACTION AND DESULFURIZATION OF COAL USING SYNTHESIS GAS

Yuan C. Fu, Bethel Park, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.  
Filed Apr. 1, 1975, Ser. No. 564,182  
Int. Cl.<sup>2</sup> C10G 1/08

U.S. Cl. 208—10

4 Claims

1. A process for desulfurizing and liquifying coal while increasing the hydrogen to carbon monoxide ratio of the treat off-gas comprising:

heating at 425° to 450° C. under a pressure of 1500 to 5000 psig, a slurry of coal in a slurry liquid selected from the group consisting of tar, anthracene oil, heavy petroleum oils and fuel oil product, and a treat gas of hydrogen, carbon monoxide and steam, said steam being present in the ratio of liquid water to feed stock of about 5:100 to 15:100, in a reactor in the presence of a desulfurizing catalyst selected from the group consisting of cobalt molybdate supported on alumina, silica-stabilized cobalt molybdate supported on alumina, and nickel molybdate supported on alumina, and an alkali metal catalyst selected from the group consisting of sodium carbonate, potassium carbonate and sodium formate, whereby the coal is desulfurized and liquified to a fuel oil product and the ratio of hydrogen to carbon monoxide in the treat off-gas is increased.

4,011,154

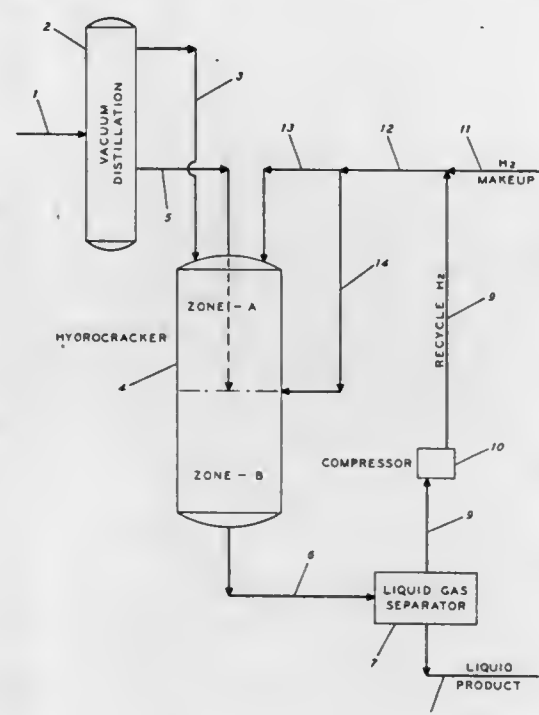
# PRODUCTION OF LUBRICATING OILS

Bruce E. Stangeland, Berkeley, and Harold F. Mason, Moraga, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 345,150, March 26, 1973, abandoned. This application June 18, 1976, Ser. No. 697,670  
Int. Cl.<sup>2</sup> C10G 13/00, 37/02

U.S. Cl. 208—59

5 Claims



1. A process for producing a lubricating oil base stock comprising:

1. fractionating a hydrocarbon feedstock boiling above 650° F into a plurality of fractions including at least a lower-boiling fraction and a higher-boiling fraction;

2. contacting said lower-boiling fraction and hydrogen in a

first hydrocracking zone, at hydrocracking conditions, with a hydrocracking catalyst to obtain an effluent comprising:

a. hydrocarbons boiling in the range of said feedstock, and

b. hydrocarbons boiling below the boiling range of said feedstock;

3. contacting (a) said hydrocarbons formed in step (2) boiling in the range of said feedstock, (b) said higher-boiling fraction, formed in step (1) without intermediate deasphalting thereof, and (c) hydrogen in a second hydrocracking zone, at hydrocracking conditions, with a hydrocracking catalyst to obtain a lubricating oil base stock comprising a plurality of lube oil fractions of reduced viscosity index spread over the range of said lube oil fractions; and

4. recovering said lubricating oil base stock.

4,011,155

# WRAPPED PACKAGE INSPECTION AND REJECTION APPARATUS

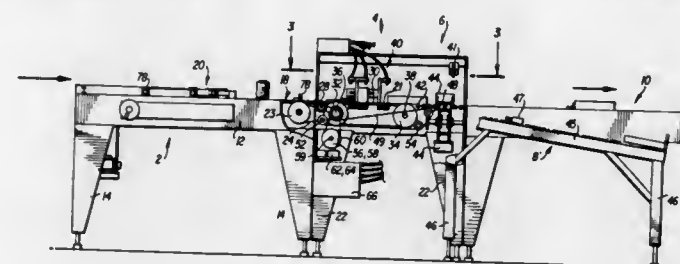
Ludwig J. Feurstein, Sheboygan; Otis E. Meives, Cleveland; Roger E. Schelk, and Larry L. Verhyen, both of Sheboygan, all of Wis., assignors to Pemco, Inc., Sheboygan, Wis.

Filed Mar. 31, 1975, Ser. No. 563,430

Int. Cl.<sup>2</sup> B07C 5/342

U.S. Cl. 209—74 R

34 Claims



1. An improved inspecting and sorting apparatus for essentially rectangular wrapped packages of the type wherein the wrapping covers all surfaces of the wrapped product, comprising:

means for continuously conveying said packages along a path without reorienting said packages during inspection; means for monitoring a plurality of different package wrap parameters of a continuously moving package without contacting said package, to determine whether one or more of a plurality of predetermined standards for the package wrap have been exceeded on one or more of said plurality of different, separate surfaces of said packages; and

means responsive to said parameter monitoring means for rejecting defectively wrapped packages from said conveying means.

4,011,156

# METHOD FOR ELIMINATING ORGANIC AND INORGANIC BOUND NITROGEN FROM DOMESTIC AND INDUSTRIAL WASTE WATER

Max Dubach, and Alfred Scherler, both of Riedholz, Switzerland, assignors to Cellulose Attisholz, AG, Luterbach, Switzerland

Continuation of Ser. No. 308,130, Nov. 20, 1972, abandoned.

This application July 12, 1974, Ser. No. 488,064

Claims priority, application Switzerland, Nov. 23, 1971, 17030/71

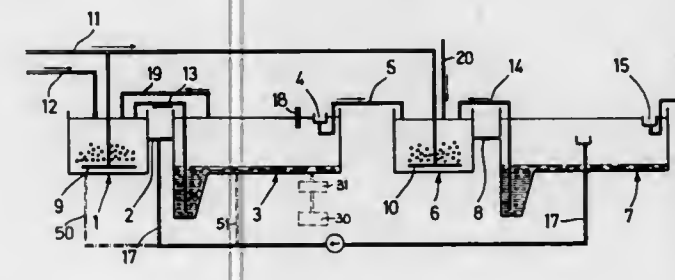
Int. Cl.<sup>2</sup> C02C 1/06

U.S. Cl. 210—8

31 Claims

1. A method of eliminating organic and inorganic bound nitrogen from domestic and industrial waste water in a biological activated sludge waste water purification installation capable of directly processing unclarified waste water comprising two stages connected in series for producing biologically

treated waste water containing sludge in each stage, each stage containing an aeration tank and a subsequently connected settling basin, wherein the waste water is aerated in the first stage and is subsequently introduced into the settling basin of the first stage where a clarified effluent is transferred into the second stage aeration tank where it is again aerated and subsequently introduced into the settling basin of the second stage, the improvement comprising the steps of: aerating influent waste water containing organic and inorganic bound nitrogen in the aerating tank of the first stage and ammonifying the organic bound nitrogen, transferring the ammonified waste water which also contains nitrates therein



to the settling basin of the first stage where denitrification of the nitrate occurs, said aeration step being controlled to maintain a substantially zero oxygen level in the clarified effluent leaving the first stage settling basin, transferring the clarified effluent from the settling basin of the first stage which is substantially free of oxygen and containing ammonia to the aeration tank of the second stage and aerating to an oxygen level of at least about 2mg/l to provide an aerobic condition in the second stage for nitrification of the ammonia to nitrates, continuously recirculating a portion of the clarified effluent from the settling basin of the second stage and which contains nitrates back into the first stage, and denitrifying the recirculated portion of the waste water in the first stage.

4,011,157

# ULTRASONIC REMOVAL OF SOLID IMPURITIES FROM RECIRCULATING INK

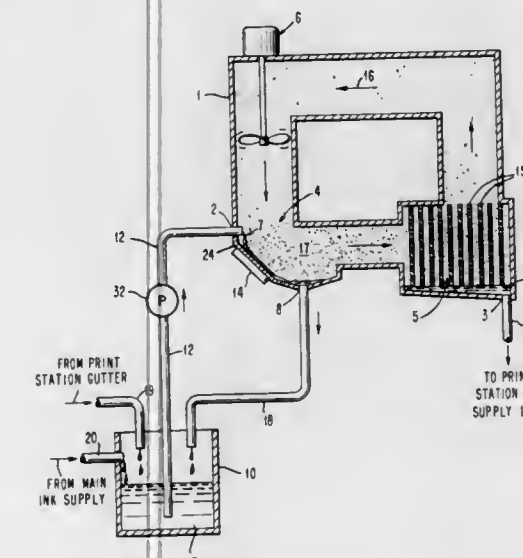
William Boone Pennebaker, Jr., Carmel; Keith Samuel Pennington, Somers; Hugo Karl Seitz, Putnam Valley, all of N.Y., and Frederick Hochberg, deceased, late of Yorktown, N.Y., by Lee Hochberg, administratrix, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,813

Int. Cl.<sup>2</sup> B01D 43/00

U.S. Cl. 210—19

5 Claims





[2.2.1]heptene-2) and poly(methyl-5 bicyclo [2.2.1]heptene-2) mainly obtained by opening the cycle of bicyclo [2.2.1]heptene-2 and its methyl derivative; and removing said strong, solid, rubbery self-supporting film from the solid or liquid surface.

4,011,160

# PROCESS OF USING OXAZOLINE AND/OR OXAZINE-MODIFIED POLYMERS

Thomas A. Chamberlin, and Norman L. Madison, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

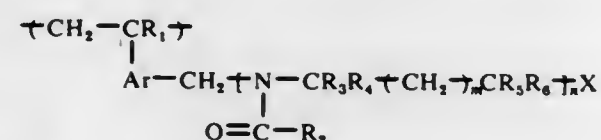
Division of Ser. No. 554,380, March 3, 1975. This application Dec. 9, 1975, Ser. No. 639,152

Int. Cl.<sup>2</sup> B01D 15/00

U.S. Cl. 210-40

5 Claims

1. A process for removing phenolics from a phenol solution comprising contacting said solution with a liquid-permeable, water-insoluble, synthetic resinous body, capable of removing a phenol from a phenol solution in contact therewith, comprising a cross-linked vinyl-addition polymer whose backbone contains a plurality of units corresponding to the formula



wherein:

R<sub>1</sub> is hydrogen or methyl;

R<sub>2</sub> is hydrogen, phenyl or alkyl of from 1 to about 24 carbon atoms;

R<sub>3</sub>-R<sub>6</sub> are each independently hydrogen, lower alkyl or hydroxy-substituted lower alkyl, with the proviso that at least two of R<sub>3</sub>-R<sub>6</sub> are hydrogen;

Ar is a carbocyclic aromatic nucleus;

m is 0 or 1;

n is an integer of at least 1; and

X is Cl, Br, I, or OH.

4,011,161

# TREATMENT OF WASTE WATER PRODUCED IN THE MANUFACTURE OF EXPANDABLE POLYSTYRENE

Karl Hugo Popp, Frankenthal; Klaus Hess, Bad Dürkheim; Werner Simmler, Ludwigshafen; Richard Stickel, and Ludwig Zuern, both of Bad Dürkheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 337,658, March 2, 1973, abandoned.

This application Jan. 23, 1975, Ser. No. 543,522

Claims priority, application Germany, Mar. 2, 1972, 2209986

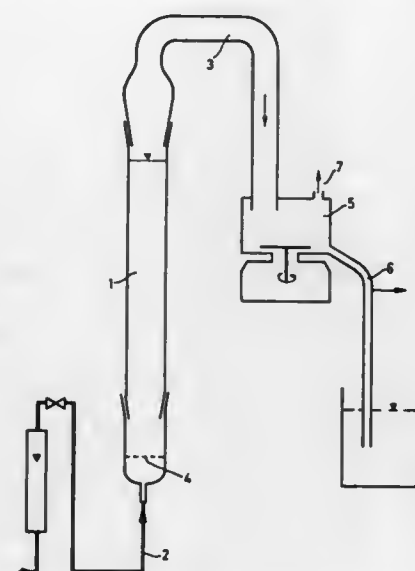
Int. Cl.<sup>2</sup> C02C 5/00

U.S. Cl. 210-44

7 Claims

1. A process for the purification of waste water produced in the manufacture of expandable polystyrene in aqueous suspension and in the presence of protective colloids based on polyvinyl pyrrolidone, said waste water containing unfoamed polystyrene beads, styrene emulsion polymers and portions of the protective colloids which consists essentially of removing

suspended solids by mechanical means, diluting with water, passing a stream of small diameter gas bubbles through the



4,011,162

# PIVOTABLE FLUID DIVERTER FOR RECIRCULATION SYSTEM

Robert R. Oldham; John H. Wooddell, both of Sidney, and Arthur L. Cain, Strongsville, all of Ohio, assignors to Robert R. Oldham, Inc., Sidney, Ohio

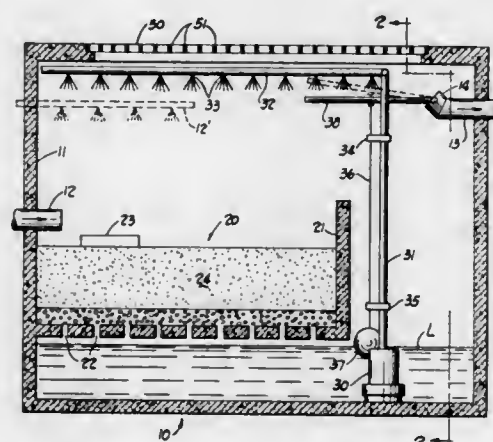
Filed Oct. 29, 1973, Ser. No. 410,612

The portion of the term of this patent subsequent to Feb. 5, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> B01D 23/16

U.S. Cl. 210-121

10 Claims



1. In a reservoir having liquid outlet means wherein a predetermined liquid level is to be maintained and liquid is to be recirculated by pumping through spraying means disposed above said liquid level, the improvement of a fluid diverter for selective diversion of a predetermined portion of pumped liquid through said outlet means, said fluid diverter comprising float means disposed in said liquid, fluid diverter means pivotally supported above said predetermined liquid level in vertically spaced relation with said float means, and flexible interconnecting means transmitting motion in tension but not in compression interconnecting said float means with said fluid diverter means to selectively place a portion of said liquid being recirculated through said spraying means in open communication with said outlet means.

4,011,163

# WATER WASTE TREATMENT

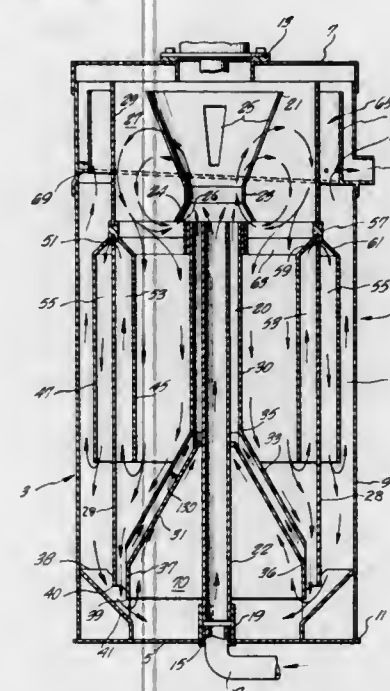
Fred A. Fairbanks, 36-957 Melrose Ave., Palm Springs, Calif. 92262

Filed June 19, 1975, Ser. No. 588,244

Int. Cl.<sup>2</sup> B01D 21/08

U.S. Cl. 210-208

6 Claims



1. A sewage treatment apparatus comprising: an outer tank defining an enclosure therewithin; a mixing chamber positioned inside said outer tank; a draft tube adapted for transporting sewage to be treated to said mixing chamber and an outer draft tube positioned annularly about said draft tube, an inner tank positioned annularly about said outer draft tube, said inner tank being located below, and open to, and in communication with said mixing chamber and defining a primary settling circuit between said draft tube and said inner tank;

first and second annular walls forming first and second annular passageways, said first annular wall being positioned between said inner tank and said outer draft tube, said second annular wall being positioned between said inner tank and said outer tank, said inner tank having an aperture therein, whereby said first and second annular passageways are open to and in communication with each other, and thereby defining a secondary settling circuit; said primary settling circuit being defined by said annular first wall of said inner tank and said outer draft tube, said outer draft tube being open to and connecting said primary and secondary circuits to said mixing chamber, whereby a portion of sewage solids removed in said primary and secondary circuits may be returned to said mixing chamber;

a pumping means positioned within said mixing chamber and adapted to introduce air into said sewage to be treated, said pumping means being further defined as comprising:

a shaft, having a passageway therein;

a hollow propeller section mounted on said shaft, said propeller section having a cavity therein, said propeller cavity being in communication with said shaft passageway, said propeller section being adapted to be submerged and rotated in a first fluid, said propeller section further comprising at least one blade having a forward and rearward face, the forward face being disposed at an angle relative to the centerline of said shaft such that the lower portion of said forward face leads the upper portion of said forward face as said shaft and propeller are rotated, the rearward face of said propeller blades being provided with a plurality of holes in communication with said propeller cavity;

a digester compartment in communication with said primary and secondary settling circuits; and a sewage treatment outlet positioned in said outer tank and in communication with said secondary settling circuit.

4,011,164

# SKIMMER APPARATUS FOR SEWAGE SETTLING TANKS AND THE LIKE

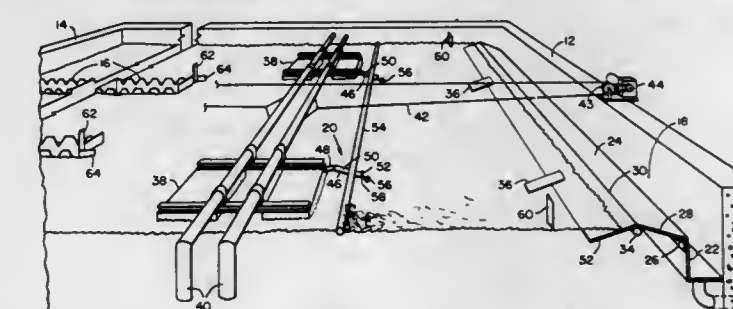
Robert F. McGivern, Columbus, Ohio, assignor to Sybron Corporation, Rochester, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,559

Int. Cl.<sup>2</sup> B01D 23/02, 35/00

U.S. Cl. 210-242 R

13 Claims



1. A skimmer used in sewage settling tanks and the like for moving floating materials from one end of the tank to a scum trough located at an opposite end of the tank, said skimmer comprising:

a. a ramp having a first end disposed below the level of liquid in the tank and a second end including support means extending above the liquid level;

b. means for moving said ramp back and forth across said tank in a path of travel extending towards and away from the scum trough;

c. a boom extending transverse the ramp path of travel and being movable along said ramp from one end of said ramp to the other;

d. said boom when at said first ramp end being free floating and urged along by said ramp toward the scum trough;

e. said boom when at said second ramp end being supported by said support means above the level of liquid in the tank for movement away from the scum trough;

f. means adjacent the scum trough end of said ramp path of travel for moving said boom from said first ramp end to said second ramp end; and

g. means adjacent the end of said ramp path of travel remote from the scum trough for repositioning said boom for ultimate relocation of said boom to said first ramp end.

4,011,165

# HIGH FREQUENCY OZONIZER

Jury Vasilievich Filippov, Leninsk gory, MGU, korpus M, kv. 159; Vsevolod Petrovich Vendillo, ulitsa Panferova, 11, kv. 99, and Nikolai Alexandrovich Ox, Michurinsky prospekt, 54, korpus 2, kv. 85, all of Moscow, U.S.S.R.

Filed July 31, 1975, Ser. No. 600,862

Int. Cl.<sup>2</sup> C01B 13/11

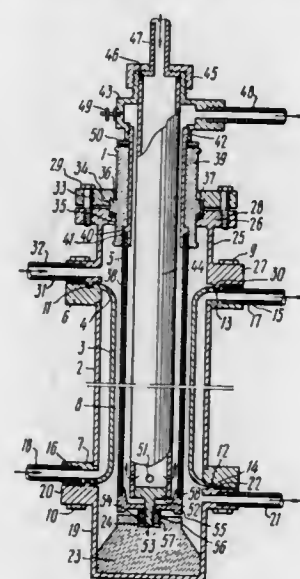
U.S. Cl. 250-540

3 Claims

1. A high frequency tubular ozonizer having a metal cylindrical housing with coupling flanges on both sides thereof, said flanges having branch pipes for supplying and discharging a coolant, at least one ozonizing element in said housing and comprising a low voltage tubular electrode cooled with a flow of coolant, a high voltage electrode coaxially disposed in said low voltage electrode and comprising a pipe of two parts, one of said parts being metal and being coated with a dielectric, the other of said parts comprising a metal flow outlet, said tubular parts being arranged to abutt each other; the opposing surfaces of the pipes of the low voltage and the high voltage electrodes forming a discharge gap wherein the ozone-



generating chemical reaction takes place at the moment of electric discharge; a metal pipe inside the high voltage electrode and along the axis thereof, said pipe having openings at each end thereof for admitting cooling liquid into the zone of the high voltage electrode and having an end cap with a positioning stop and a clamp at the same end for fastening the high voltage electrode; a hollow cylinder-shaped high voltage insulator for insulation of the high voltage electrode from the low voltage electrode, said insulator having a ring-shaped bead in the middle portion thereof; a metal tubular t-piece for fastening said flow outlet of said high voltage electrode in the zone of said high voltage electrode, said pipe being rigidly fastened to a free opposite end of the t-piece, a branch pipe for supplying the cooling liquid and being rigidly secured to abut said pipe, in a zone of the pipe of the t-piece there is



provided a branch pipe through which the liquid cooling the high voltage electrode is discharged; a cylinder-shaped cup having flanges on both sides thereof for attaching flanges of said cup to said flange of the housing, a cavity in the butt end of said flange of the cup for fastening a branch pipe to supply ozonized gas, the other flange having an opening arranged along the axis of said cup, said opening and said cavity having the shape and dimensions of said bead of the high voltage insulator; a metal cap having an opening along the axis thereof, the shape and dimensions of said opening being those of the bead of said high voltage insulator; the cylindrical metal base rigidly fastened to the free end of said housing having the bottom from one side thereof and a flange from another side thereof, the butt end of said flange having an opening for fastening a branch pipe to discharge the ozonized gas.

4,011,166

## SYNTHETIC LUBRICANT COMPOSITIONS

Thomas A. Schenach, Huntington Beach, Calif., assignor to Bray Oil Company, Los Angeles, Calif.

Filed Mar. 10, 1975, Ser. No. 556,947

Int. Cl.<sup>2</sup> C10M 1/16, 1/18

U.S. Cl. 252—32.7 E

7 Claims

1. A synthetic hydrocarbon lubricating oil composition possessing a minimum viscosity of about 8 centistokes at 210° F. (98.9° C.), a maximum pour point of about -60° F. (-51.1° C.), a maximum bromine number of about 1.0, a viscosity index of between 120, and 135, and a flash point of at least 400° F. (204.4° C.), said lubricant composition being prepared by the following process:

- forming an admixture of benzene and anhydrous aluminum chloride in a ratio of one mole of benzene to about 0.08 to 0.15 mole of aluminum chloride;
- adding thereto a linear alpha-olefin containing from 8 to 12 carbon atoms at a temperature sufficient to cause polymerization of the olefin and alkylation of the benzene by the olefin and polymers thereof, the ratio of olefin to benzene being between about 0.6 to 1.5 moles of olefin

per mole of benzene and the ratio of aluminum chloride to olefin being between about 0.06 and 0.15 moles of aluminum chloride to one mole of olefin.

- removing the aluminum chloride and distilling the reaction mixture to remove therefrom unreacted starting materials and simple monoalkyl benzenes, thereby obtaining the desired synthetic hydrocarbon lubricant composition.
- A crankcase motor oil with a viscosity range of SAE 20 to SAE 30, said motor oil containing a major amount of the lubricant composition of claim 1 in admixture with 1-4% zinc dithiophosphate antiwear additives.

4,011,167

## LUBRICANT COMPOSITIONS CONTAINING METAL COMPLEXES AS DETERGENTS

Sheldon Chibnik, Cherry Hill, and Ferdinand P. Otto, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 9, 1975, Ser. No. 594,410

Int. Cl.<sup>2</sup> C10M 1/54

U.S. Cl. 252—42.7

12 Claims

1. A lubricant composition comprising a major proportion of a base oil selected from the group consisting of oils lubricating viscosity and grease thereof and a minor amount sufficient to improve detergency properties thereof of a metal complex prepared by (a) reacting a metal compound capable of forming a Werner complex selected from the group consisting essentially of zinc oxide, zinc carbonate, zinc acetate, zinc nitrate, nickel acetate, and nickel carbonate, at a temperature of from about 40° to about 150° C with a phenolic compound selected from the group consisting essentially of alkyl phenols containing from about 4 to about 30 carbon atoms, the reaction product of said alkyl phenols and a sulfur halide, dimers of said alkyl phenols, and said alkyl phenols which have been crosslinked with an aldehyde, to yield the metal salt of said phenolic compound; (b) reacting the resulting metal salt at a temperature of from about 25° to about 250° C with a polyamine having the formula  $H_2N(C_2H_4NH)_xH$  where  $x$  is 1 to 5; and (c) reacting the resulting product at a temperature of from about 70° to about 250° C with an alkenylsuccinic anhydride characterized by a molecular weight between about 400 and about 3,000.

11. A metal complex of an alkylsuccinimide prepared by (a) reacting a metal compound capable of forming a Werner complex selected from the group consisting essentially of zinc oxide, zinc carbonate, zinc acetate, zinc nitrate, nickel acetate, and nickel carbonate, at a temperature of from about 40° to about 150° C, with a phenolic compound selected from the group consisting essentially of alkyl phenols containing from about 4 to about 30 carbon atoms, the reaction product of said alkyl phenols and a sulfur halide, dimers of said alkyl phenols, and said alkyl phenols which have been crosslinked with an aldehyde, to yield the metal salt of said phenolic compound; (b) reacting the resulting metal salt at a temperature of from about 25° to about 250° C with a polyamine having the formula  $H_2N(C_2H_4NH)_xH$  where  $x$  is 1 to 5; and (c) reacting the resulting product at a temperature of from about 70° to about 250° C with said alkenylsuccinic anhydride further characterized by a molecular weight between about 400 and about 3,000.

4,011,168

## ARC TRACK RESISTANT COMPOSITION

John G. Uhlmann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 6, 1974, Ser. No. 466,927

Int. Cl.<sup>2</sup> H01B 3/18

U.S. Cl. 252—63.7

8 Claims

1. A composition consisting essentially of 20 to 50 percent by weight of a siloxane fluid having a viscosity in the range of 100 to 5000 centistokes at 25° C., the substituents on the

silicon atoms in the siloxane fluid being hydrocarbon radicals containing 1 to 18 carbon atoms, 50 to 80 percent by weight of a mineral filler selected from the group consisting of clays, ground quartz, gypsum, silica and aluminum, and which also contains up to 6 percent by weight of a siloxane resin composed of  $SiO_2$  and  $(CH_3)_3SiO_{1/2}$  units, the ratio of the  $SiO_2$  units to the  $(CH_3)_3SiO_{1/2}$  units being in the range of 1:0.6 to 1:1.2.

4,011,169

## STABILIZATION AND ENHANCEMENT OF ENZYMATIC ACTIVITY

Francis Louvaine Diehl, Wyoming; Eugene Zeffren, Montgomery, and Edward John Milbrada, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 375,251, June 29, 1973, Pat. No. 3,944,470. This application Jan. 28, 1976, Ser. No. 653,170 Int. Cl.<sup>2</sup> C11D 3/395

U.S. Cl. 252—95

10 Claims

1. A detergent composition consisting essentially of:
- from about 5% to about 99.9% by weight of an organic surface-active agent selected from the group consisting of anionic, nonionic, zwitterionic and ampholytic detergents and mixtures thereof; and
  - from about 50% to about 0.1% by weight of a mixture comprising
    - an enzyme suitable for use in detergent compositions; and
    - an aminated polysaccharide selected from the group consisting of aminated starch and aminated cellulose having from about 0.01% to about 2% by weight of nitrogen in its elemental composition;

wherein the weight ratio of said enzyme to said aminated polysaccharide is in the range from about 1:500 to 1:1.

4,011,170

## MARBLED DETERGENT BARS

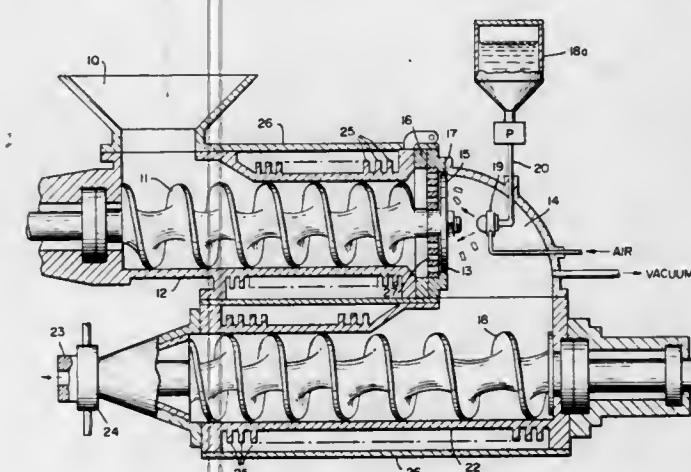
John Harlan Pickin, 1 Woodside Road, Madison, Morris County, N.J. 07940; Russell Edward Compa, 24 McClellan Terrace, West Orange, Essex County, N.J. 07052, and Har Govind H. Joshi, 1214 Brookside Road, Piscataway, Middlesex County, N.J. 08854

Filed July 10, 1974, Ser. No. 487,199

Int. Cl.<sup>2</sup> B29F 3/12; B29B 1/04; C11D 17/00, 13/18

U.S. Cl. 252—134

9 Claims



1. A method for producing marbled detergent bars comprising the steps of supplying a base detergent material to the inlet of the upper barrel of a double-barrel plodder apparatus having a vacuum chamber between the upper and lower barrels, subjecting the base detergent material to plodding in said upper barrel, extruding said base detergent material through a pressure plate disposed on the downstream side of said upper barrel and into said vacuum chamber in the form of strands, cutting said strands into segments, said segments having a geometric ratio from about 2 to about 12, supplying a liquid

coloring agent to said vacuum chamber, spraying said liquid coloring agent in atomized form onto said segments falling into the vacuum chamber from the upper barrel pressure plate, plodding said base detergent material and said liquid coloring agent in the bottom barrel of said plodder apparatus to form a marbled detergent mass, extruding said marbled detergent mass as a billet, cutting said billet into bars and pressing said bars into a predetermined shape.

4,011,171

## BOILER TREATMENT USING AMINES AND ORGANOPHOSPHONATE MATERIALS

Walter F. Lorenc, Harvey, and Dean H. Joneson, Oak Lawn, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jan. 29, 1976, Ser. No. 653,681

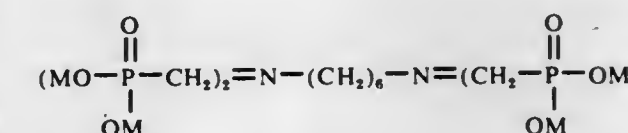
Int. Cl.<sup>2</sup> C02B 5/06

U.S. Cl. 252—180

2 Claims

1. A method of inhibiting the precipitation of scale deposits in a water system comprising adding to said system a scale preventive composition consisting essentially of a combination of:

A. An organophosphonate material having the formula:



where M is selected from the group consisting of H,  $NH_4$ , alkali metal and combinations thereof; and

B. An amine selected from the group consisting of dihydroxyethylethylenediamine, trihydroxyethylethylenediamine, tetrahydroxyethylethylenediamine and aminoethylethanolamine and combinations thereof; in which the scale preventive composition is added to the system in a range of from 5:1 to 1:100, based on the hardness of said system.

4,011,172

## BLEACHING ARTICLES

Mario Stephen Marsan, Cincinnati; Francis Louvaine Diehl, Wyoming, and James Byrd Edwards, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 27, 1975, Ser. No. 562,529

Int. Cl.<sup>2</sup> C11D 3/395, 7/54; D06L 3/06

U.S. Cl. 252—187 R

4 Claims

1. An article especially adapted for bleaching fabrics in an automatic clothes dryer, comprising:

- a thickened chlorine bleaching composition characterized by a viscosity in the range from 200 cps to 100,000 cps wherein the composition has an available chlorine content of from about 0.5% to about 15% by weight and a pH of from 8 to 11 and wherein the composition is thickened with a thickener selected from the group consisting of colloidal silicas, water-swellaable and water-soluble polyacrylamides, cellulose derivatives, clays, and mixtures thereof; and
- a water-insoluble dispensing means holding the bleaching composition characterized by being in the form of a pouch having perforations of a diameter from about 0.05 mm to about 3 mm or embossed in such a manner that upon rupture perforations are formed having a diameter of from about 0.05 mm to about 3 mm.



4,011,173

**MODIFIED NEMATIC MIXTURES WITH POSITIVE DIELECTRIC ANISOTROPY**

Ralf Steinstrasser, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Germany

Continuation-in-part of Ser. No. 277,502, Aug. 3, 1972. This application Apr. 17, 1974, Ser. No. 461,653

Claims priority, application Germany, Apr. 28, 1973, 2321632

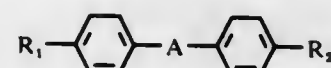
Int. Cl.<sup>2</sup> C09K 3/34; G02F 1/13

U.S. Cl. 252-299

33 Claims

1. A modified liquid crystal nematic mixture having positive dielectric anisotropy and an enantiotropic nematic mesophase of about 20° to 80° C. extending over temperatures from 0° to 30° C., comprising an admixture of:

a. at least one nematic compound of the formula

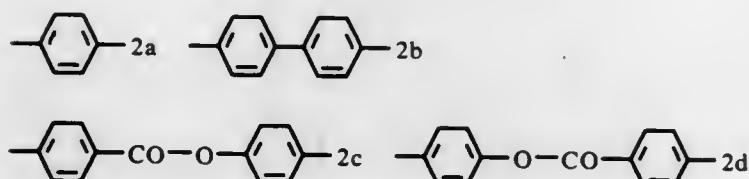


wherein A is azoxy or carbonyloxy and R<sub>1</sub> and R<sub>2</sub> are each straight-chain alkyl or alkoxy of 1-8 carbon atoms; and

b. at least one compound of the formula



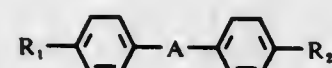
wherein X is dialkylamino of 2-4 carbon atoms; Y is cyano, nitro or trifluoromethyl; and R is selected from the group consisting of divalent radicals of the formulae



characterized in that component (b) is present in an amount sufficient to increase the dielectric anisotropy of the admixture to a value of at least +2.

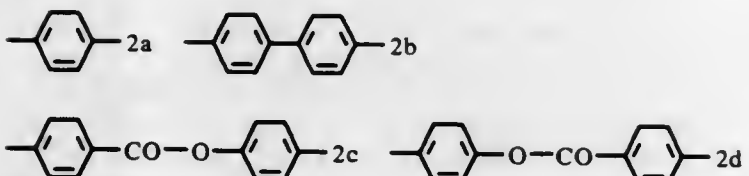
11. A modified liquid crystal nematic mixture having positive dielectric anisotropy and an enantiotropic nematic mesophase of about 20° to 80° C. extending over temperatures from 0° to 30° C., comprising an admixture of:

a. 20-95% by weight of at least one nematic compound of the formula



wherein A is azoxy or carbonyloxy and R<sub>1</sub> and R<sub>2</sub> are each straight-chain alkyl or alkoxy of 1-8 carbon atoms;

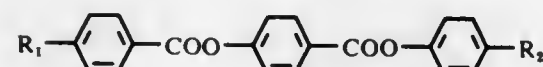
b. 3-65% by weight of at least one compound of the formula X-R-Y wherein X is straight-chain alkyl of 4-9 carbon atoms or dialkylamino of 2-4 carbon atoms; Y is cyano, nitro or trifluoromethyl when X is dialkylamino, and Y is nitro or trifluoromethyl when X is straight-chain alkyl; and R is selected from the group consisting of divalent radicals of the formulae



characterized in that component (b) is present in an amount

sufficient to increase the dielectric anisotropy of the admixture to a value of at least +2; and

c. 2-27% by weight based on the total composition of at least one compound of the formula



wherein R<sub>1</sub> and R<sub>2</sub> are each alkyl or alkoxy of 1-8 carbon atoms, said component (c) being present in an amount sufficient to compensate the clearing-point-lowering effect of the addition of component (b) to the nematic component (a).

4,011,174

**WATER WASHABLE DYE PENETRANT COMPOSITION AND METHOD OF APPLICATION**

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 444,433, Feb. 21, 1974, Pat. No. 3,915,886, and a continuation-in-part of Ser. No. 521,730, Nov. 7, 1974, Pat. No. 3,939,092. This application May 23, 1975, Ser. No. 580,258

Int. Cl.<sup>2</sup> C09K 11/06; G01N 19/08, 21/16

U.S. Cl. 252-301.19

16 Claims

1. A water washable biodegradable liquid dye penetrant composition for use in non-destructive testing for detecting cracks and flaws in the surface of an object, which consists essentially of (1) a single biodegradable nonionic surfactant which consists essentially of ethoxylates of linear secondary aliphatic alcohols, with the hydroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being a mixture of alkyl chains containing in the range from 10 to 17 carbon atoms, and containing an average of from 3 to 12 moles of ethylene oxide, (2) a dye soluble in said surfactant and (3) glycol monobutyl ether as extender.

4,011,175

**COMPOSITION FOR SEPARATING HYDROCARBONS FROM WATER**

Paul Preus, 21 Smith Road, Toms River, N.J. 08753

Continuation of Ser. No. 292,886, Sept. 28, 1973, Pat. No. 3,855,152, which is a division of Ser. No. 83,640, Oct. 24, 1970, abandoned. This application Aug. 15, 1974, Ser. No. 497,712

Int. Cl.<sup>2</sup> B01J 31/02; B01D 15/00

U.S. Cl. 252-427

6 Claims

1. oleophilic-hydrophobic composition for separating water immiscible organic liquids from water comprising a lighter than water demulsified comminuted mass of a mixture of expanded perlite, asphalt and a fibrous filler, said loose mass having an average particle size with one dimension of at least about 1/8 inch in length, and said loose mass when introduced in a water-organic material system selectively absorbing the organic material therein for subsequent mechanical separation thereof with said composition.

4,011,176

**ELECTROCONDUCTIVE COATING COMPOSITION CONTAINING CATIONIC LATEXES**

Frank L. Saunders; Donald A. Kangas, and Ralph E. Friedrich, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 31, 1975, Ser. No. 546,044

Int. Cl.<sup>2</sup> H01B 1/04

U.S. Cl. 252-500

10 Claims

1. An aqueous coating composition comprising (1) a water-dispersible cationic electroconductive polymer having chemically bound to its backbone a number of pendant cationic moieties such that the polymer has a volume resistivity less than 10<sup>7</sup> ohm centimeters at 17% relative humidity and (2) a

latex of a normally solid thermoplastic organic addition polymer containing an amount of a cationic surface active agent sufficient to stabilize the latex, said electroconductive polymer being present in an amount from about 15 to about 85 dry weight parts per 100 dry weight parts of the composition provided that said amount is such that the surface electrical resistivity of a non-conductive substrate having its surface coated with said composition is a value no greater than 10<sup>12</sup> ohms at 10% relative humidity and said latex being present in an amount from about 15 to about 85 dry weight parts of per 100 dry weight parts of the composition provided said amount is sufficient to improve the solvent holdout properties of a coating of the composition in accordance with the solvent holdout method of A. S. Diamond, TAPPI, 48, 94a (10/65).

4,011,177

**CHEMICALS AND THEIR USE IN PERFUMERY**

Hifzur Rahman Ansari, Rayleigh; Paul Edgar Fido, London, and Horst Richard Wagner, Woodford Green, all of England, assignors to Bush Boake Allen Limited, London, England

Filed June 5, 1975, Ser. No. 584,082

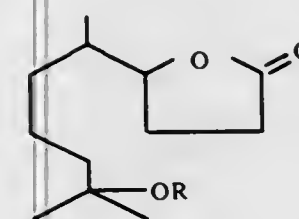
Claims priority, application United Kingdom, June 5, 1974, 24971/74

Int. Cl.<sup>2</sup> C07D 307/32

U.S. Cl. 252-522

12 Claims

1. A compound of the formula



wherein R is an alkyl group having from 1 to 4 carbon atoms.

4,011,178

**RESINS AND POLYMER MIXTURES THEREOF**

Joel Muse, Medina, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 535,609, Dec. 23, 1974, abandoned. This application May 21, 1976, Ser. No. 688,812

Int. Cl.<sup>2</sup> C08K 5/01, 5/06, 5/07; C08L 7/00

U.S. Cl. 260-4 AR

13 Claims

1. A resinous composition, suitable as a solubilizing and/or plasticizing aid for paint-type resins, characterized by enabling a fluid coating mixture with a paint-type resin comprised of at least one of styrene/2-ethylhexyl acrylate, vinyl toluene/2-ethylhexyl acrylate, styrene/1,3-butadiene and chlorinated natural rubber with a solvent, or solvent mixture, having a KB value in the range of about 30 to about 40 selected from aromatic hydrocarbons, aliphatic hydrocarbons, liquid ketones, and ethylene glycol ethers prepared by the method which comprises (A) polymerizing a monomer mixture comprising about 10 to about 90 weight percent of at least one methyl branched α-olefin selected from 3-methyl-1-butene and 4-methyl-1-pentene and, correspondingly, about 90 to about 10 weight percent aromatic monomers selected from at least one of styrene and α-methyl styrene in the presence of a catalyst selected from aluminum chloride, ethyl aluminum dichloride, boron trifluoride and boron trifluoride etherate, and in the presence of a solvent selected from aliphatic hydrocarbons containing 4 to 7 carbon atoms, aromatic hydrocarbons containing 6 to 8 carbon atoms and liquid chloro-substituted hydrocarbons containing 1 to 6 carbon atoms and (B) removing said solvent therefrom.

4,011,179

**CONTINUOUS SULFUR FOAM PREPARATION USING POLYISOCYANATES**

Gar Lok Woo, Tiburon, Calif.; John M. Dale, and Allen C. Ludwig, both of San Antonio, Tex., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 382,598, July 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 281,587, Aug. 17, 1972, abandoned. This application Feb. 7, 1975, Ser. No. 548,061

Int. Cl.<sup>2</sup> C08J 9/00

U.S. Cl. 260-2.5 A

15 Claims

1. A process for the production of sulfur foam containing at least 50 weight percent sulfur, which consists essentially of:

a. heating sulfur in a first zone to a temperature above about 100° C to obtain molten sulfur and reacting the molten sulfur with an organic protonic acid which is reactive with molten sulfur so as to incorporate the organic acid with sulfur to form a sulfur-organic acid adduct containing unreacted protonic acid groups;

b. passing said sulfur adduct in liquid state out of said first zone and into a separate mixer; and

c. mixing and reacting in said mixer a polyisocyanate with the unreacted acid groups of said sulfur adduct to thereby, upon removal of the polyisocyanate-acid group reaction product from the mixer, release gas and generate a foam.

4,011,180

**NOVEL COCATALYST SYSTEM FOR TRIMERIZING POLYISOCYANATES**

Robert J. Lockwood, East Haven; Harold E. Reymore, Jr., Wallingford, and Edward J. Thompson, Watertown, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 437,780, Jan. 30, 1974, Pat. No. 3,896,052. This application May 2, 1975, Ser. No. 573,908

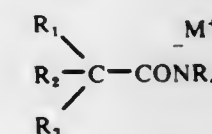
Int. Cl.<sup>2</sup> B32B 5/20; C08G 18/18

U.S. Cl. 260-2.5 AW

26 Claims

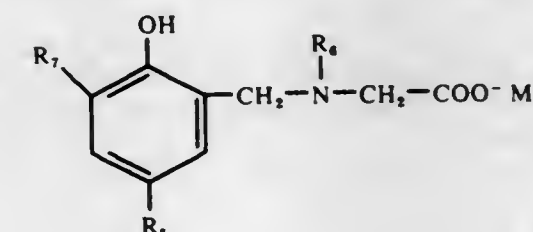
1. In a process for the preparation of a cellular polymer in which the major recurring polymer unit is isocyanurate which process comprises bringing together in the presence of a blowing agent, a polyisocyanate, a trimerization catalyst, and from about 0.01 equivalent to about 0.3 equivalent of a polyol per equivalent of isocyanate, the improvement which consists essentially of employing as the catalyst, a combination of the following ingredients:

a. from 0.00075 to 0.03 equivalent per equivalent of said polyisocyanate of an amide salt having the formula



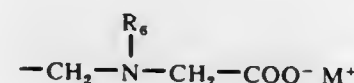
wherein M is an alkali metal, R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> can be the same or different and are selected from the group consisting of H, lower alkyl, aryl, aralkyl, and cycloalkyl, and R<sub>4</sub> is selected from the group consisting of lower alkyl and aryl; and

b. from 0.0015 to 0.025 equivalent per equivalent of said polyisocyanate of a glycine salt having the formula





wherein M is an alkali metal,  $R_5$  is selected from the class consisting of hydrogen and alkyl having from 1 to 12 carbon atoms, inclusive,  $R_6$  is selected from the class consisting of hydrogen, alkyl having from 1 to 12 carbon atoms, inclusive and  $-\text{CH}_2-\text{COO}^- \text{M}^+$ , and  $R_7$  is selected from the class consisting of hydrogen and the group



4,011,181

# POLYURETHANE FOAMS CONTAINING STANNOUS CATECHOL DERIVATIVES

Bruce G. van Leuwen, Trumbull, and James J. Pitts, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

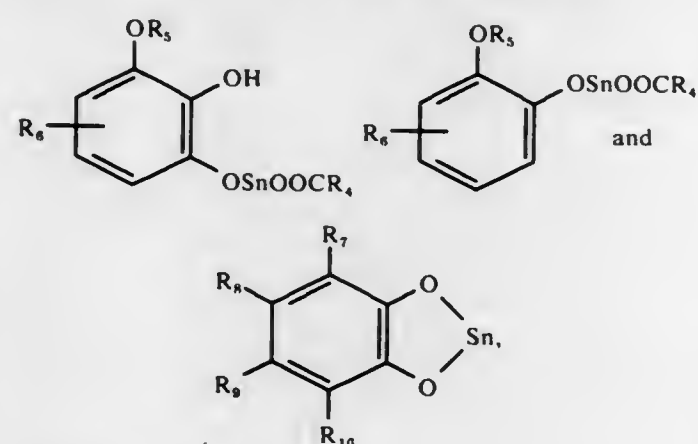
Continuation-in-part of Ser. No. 375,396, July 2, 1973, Pat. No. 3,899,520. This application July 30, 1975, Ser. No. 600,244

Int. Cl.<sup>2</sup> C08G 18/24, 18/14

U.S. Cl. 260—2.5 AB

17 Claims

1. In a process for preparing a polyurethane foam from a reaction mixture comprising an organic polyisocyanate, a polyol, a blowing agent, and a gel catalyst, the improvement wherein said gel catalyst is a stannous catechol derivative of the formula selected from the group consisting of:



and mixtures thereof, wherein,

$R_4$  represents an alkyl group having from 1 to about 9 carbon atoms or an alkenyl group having from 1 to about 9 carbon atoms,

$R_5$  represents an alkyl group having from 1 to about 10 carbon atoms,

$R_6$  represents a substituent selected from the group consisting of hydrogen, halogen, nitro and alkyl having 1 to about 10 carbon atoms, and

$R_7$ ,  $R_8$ ,  $R_9$  and  $R_{10}$  represent substituents independently selected from the group consisting of hydrogen, halogen amine, nitro, nitroso, sulfonyl and alkyl having 1 to about 10 carbon atoms.

4,011,182

# CYCLIC UNDECAPEPTIDE ANALOGS OF SOMATOSTATIN AND INTERMEDIATES

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 560,671, March 21, 1975, abandoned. This application Dec. 10, 1975, Ser. No. 639,550

Int. Cl.<sup>2</sup> C07C 103/52; A61K 37/00; C08L 25/06

U.S. Cl. 260—8

15 Claims

9. A compound of the formula

R-Lys( $R^1$ )-Asn-Phe-Phe-Trp-Lys( $R^2$ )-Thr( $R^3$ )-Phe-Thr( $R^4$ )-Ser( $R^5$ )- $R^6$

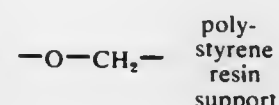
wherein Trp represents either D- or L-tryptophyl and all other chiral amino acids are of the L-configuration;

$R$  is an  $\alpha$ -amino protecting group that is cleavable under conditions that will not cleave the  $R^1$  and  $R^2$  protecting group;

$R^1$  and  $R^2$  is a protecting group for the side chain amino substituent of lysine selected from the class consisting of benzyloxycarbonyl, tosyl, t-amylloxycarbonyl, t-butyloxycarbonyl, diisopropylmethoxycarbonyl and substituted benzyloxycarbonyl, said substituent selected from halo and nitro and said  $R^1$  and  $R^2$  group not being the same as said  $R$  group;

$R^3$ ,  $R^4$  and  $R^5$  are selected from the class consisting of hydrogen and a protecting group for the alcoholic hydroxyl group of threonine and serine selected from acetyl, benzoyl, tert-butyl, trityl, benzyl, 2,6 dichlorobenzyl and benzyloxycarbonyl; and

$R^6$  is selected from the class consisting of OH,  $\text{NHNH}_2$ ,  $\text{N}_3$ ,  $\text{OCH}_3$  and



4,011,183

# BUILDING BOARD PRODUCTS AND PROCESS FOR PRODUCING SAME

David Lee Ruff, Torrance, Calif., assignor to Grefco Inc., Bala Cynwyd, Pa.

Filed July 22, 1976, Ser. No. 707,668

Int. Cl.<sup>2</sup> C08L 5/00, 1/00

U.S. Cl. 260—9

29 Claims

1. A method of producing water repellent shaped articles for construction and insulation which comprises applying to expanded perlite particles a solution of a synthetic organic binder in an organic solvent which is liquid at ambient temperatures and has a boiling point below about 150° F., said binder being capable of curing upon standing at ambient temperatures and of reacting with hydroxyl groups present in said expanded perlite, forming a mass of said particles into the desired shape, removing said solvent and curing said binder.

16. A shaped article for construction and insulation which is water repellent comprising expanded perlite particles bonded together by a synthetic organic binder, said binder being bonded to said perlite by reaction with hydroxyl groups present in said expanded perlite, said shaped article having a density of from about 10 to about 20 pounds per cubic foot.

4,011,184

# BITUMEN-POLYMER COMPOSITION

Jan W. van Reijndam, and Jan van Schooten, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 17, 1975, Ser. No. 559,095

Claims priority, application United Kingdom, Mar. 28, 1974, 13746/74

Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 260—28.5 R

21 Claims

1. A process for preparing bituminous products which comprises chemically coupling a modified bitumen and a modified elastomer in the presence of ions of a metal selected from the group consisting of iron, chromium, manganese and a metal of Groups I to IV of the Periodic Table wherein said modified bitumen is a bitumen having carboxyl group substituents and wherein said modified elastomer is an elastomer having carboxyl group substituents.

4,011,185

# AQUEOUS INSULATING VARNISHES

Etsuo Hosokawa, Yokohama; Misao Waki, Chiba, and Katsumi Asada, Yokohama, all of Japan, assignors to Showa Densen Denran Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 440,212, Feb. 6, 1974, abandoned. This application Jan. 20, 1976, Ser. No. 650,599 Claims priority, application Japan, Apr. 13, 1973, 48-42013; May 25, 1973, 48-59150; Oct. 18, 1973, 48-117177; Nov. 30, 1973, 48-135152

Int. Cl.<sup>2</sup> C08G 63/76, 63/68; C08J 3/06

U.S. Cl. 260—29.2 N

22 Claims

1. An aqueous insulating varnish prepared by STAGE 1: reacting to a substantially complete degree (1) a compound selected from the group consisting of an aromatic dicarboxylic acid and a lower alkyl ester thereof, (2) an aliphatic primary diol and (3) an aliphatic alcohol having at least three hydroxyl groups in quantities satisfying the requirements:

$$\frac{a}{b+c} \left( 1 + \frac{c}{b+c} \right) \leq 1 \text{ and } \frac{a}{b+c} \geq 0.4,$$

wherein  $a$ ,  $b$  and  $c$  each represent equivalent quantities greater than zero of the compounds of (1), (2) and (3), respectively;

STAGE 2: reacting the thus produced reaction product with (4) a compound selected from the group consisting of an aromatic tetracarboxylic acid and an anhydride thereof in a quantity satisfying the requirement:

$$0.5 (b+c) - a \leq d \leq 2 (b+c) - a,$$

wherein  $d$  represents an equivalent quantity greater than zero of the compound of (4), at a temperature at which no gelation occurs and which is above the melting point of said reaction product but below the sublimation temperature of the compound of (4), and for a time during which no gelation occurs; and

STAGE 3: subsequently dispersing the resulting product in an aqueous solution containing ammonia or an organic amine.

4,011,186

# AQUEOUS RESOLE RESIN SOLUTIONS HAVING DISPERSED INERT SALTS

Harold P. Higginbottom, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 18, 1976, Ser. No. 658,945

Int. Cl.<sup>2</sup> C08G 51/24

U.S. Cl. 260—29.3

20 Claims

1. An aqueous solution of a resole resin having a pH of 3 to 8.5 comprising:

a. said resole resin having a number average molecular weight is less than about 300, a water tolerance greater than 50 percent, a combined formaldehyde to phenol ratio in the range of from about 1.0:1 to 2.9:1 and,

b. a dispersion of insoluble oxalate salt particles, wherein, said resole being prepared with a catalyst comprising alkaline earth metal hydroxides selected from the group consisting of magnesium, calcium, barium, strontium and mixtures thereof, said pH being adjusted with a compound selected from the group consisting of oxalic acid, ammonium oxalate and mixtures thereof providing a stable dispersion of insoluble oxalate salt particles of said alkaline earth metal ions in said solution, wherein said solution is stable to salt flocculation at a resole resin content of from about 40 to 95 percent by weight.

4,011,187

# COATING COMPOSITIONS COMPRISING TETRAFLUOROETHYLENE POLYMERS AND ALUMINUM HYDROXYCHLORIDE

John Wilmar Edwards, Welwyn Garden City, and Barry William Farrant, St. Neots, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 367,004, June 4, 1973, Pat. No. 3,900,684. This application Apr. 11, 1975, Ser. No. 567,076

Claims priority, application United Kingdom, June 9, 1972, 27011/72

U.S. Cl. 260—29.6 F

9 Claims

1. A liquid composition comprising polytetrafluoroethylene polymer or copolymer and an aluminum hydroxychloride wherein the weight of aluminum provided by the aluminum hydroxychloride is at least 3 g per 100 g of polymer or copolymer.

4,011,188

# POWDERY COATING COMPOSITION

Jörn Rüter, Marl, and Heinz Scholten, Lippramsdorf, both of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Nov. 14, 1975, Ser. No. 632,016

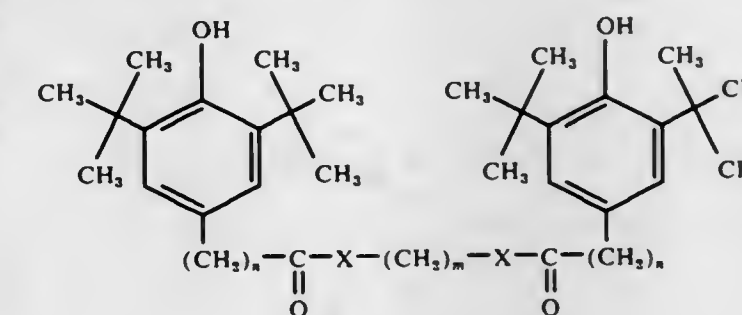
Claims priority, application Germany, Nov. 20, 1974, 2454880

Int. Cl.<sup>2</sup> C08L 67/02

U.S. Cl. 260—31.6

9 Claims

1. A powdery coating composition suitable for coating metallic surfaces at high temperatures, comprising powdery particles of a saturated, high-molecular weight thermoplastic polyester having an RSV value of about 0.4–1.2 dl./g. having homogeneously dispersed throughout said particles about 0.1–5% by weight, based on the weight of the polyester, of a flow agent of the formula



wherein

$n$  is an integer of 0–6;

$m$  is an integer of 2–12; and

$X$  is oxygen or an  $-\text{NH}-$  group.

4,011,189

# URETHANES MODIFIED WITH SILOXANES

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Aug. 8, 1975, Ser. No. 602,933

Int. Cl.<sup>2</sup> C08J 3/08; C08K 5/01, 5/54

U.S. Cl. 260—33.6 UB

12 Claims

1. A homogeneous polymeric dispersion comprising a. 55 to 99 parts by weight of a curable urethane composition; b. 1 to 45 parts by weight of a fluid which is incompatible with the urethane composition, said fluid having a viscosity not exceeding 20,000,000 cs. at 25° C., wherein (a) + (b) is equal to 100 parts, c. 1 to 20 weight percent based on the weight of (b) of a dispersing agent capable of maintaining (b) dispersed in (a), said dispersing agent being a siloxane-organic copolymer selected from the group consisting of



1. siloxane-organic copolymers consisting essentially of  $\text{SiO}_2$  units,  $(\text{CH}_3)_2\text{SiO}_{1/2}$  units and  $\text{D}(\text{CH}_3)_2\text{SiO}_{1/2}$  units in which D is a polyoxyethylene polymer having a molecular weight of at least 500, or a polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 2,500 and the polyoxypropylene portion constitutes up to 50 mole percent of the organic portion of the copolymer, said D being attached to the silicon atom via a silicon-carbon bond, the ratio of the  $\text{SiO}_2$  units to the total  $(\text{CH}_3)_2\text{SiO}_{1/2}$  and  $\text{D}(\text{CH}_3)_2\text{SiO}_{1/2}$  units being in the range of 1.0:0.4 to 1.0:1.2,
2. copolymers which are reaction products derived from heating a mixture of a siloxane consisting essentially of  $\text{SiO}_2$  units and  $(\text{CH}_3)_2\text{SiO}_{1/2}$  units in which the ratio of  $\text{SiO}_2$  units to  $(\text{CH}_3)_2\text{SiO}_{1/2}$  units is in the range of 1.0:0.4 to 1.0:1.2, and a hydroxylated polyoxyethylene polymer having a molecular weight of at least 500 or a hydroxylated polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 2,500 and the polyoxypropylene constitutes up to 50 moles percent of the organic portion of the copolymer,
3. polydimethylsiloxane-organic copolymers in which the polydimethylsiloxane portion has a molecular weight of at least 1400 and the organic portion consists essentially of a polyoxyethylene polymer having a molecular weight of at least 500, or a polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 1,000 and the polyoxypropylene constitutes up to 50 mole percent of the organic portion of the copolymer, said organic portion being attached to silicon atoms via silicon-carbon bonds, and
4. polydimethylsiloxane-organic copolymers which are reaction products produced by heating a mixture of hydroxylated polydimethylsiloxanes having a molecular weight of at least 1400, and a hydroxylated polyoxyethylene polymer having a molecular weight of at least 500, or a hydroxylated polyoxyethylene-polyoxypropylene copolymer having a molecular weight of at least 1,000 and the polyoxypropylene constitutes up to 50 mole percent of the organic portion of the copolymer.

4,011,190

## SELECTIVE BLACK FOR ABSORPTION OF SOLAR ENERGY

Maria Telkes, Newark, Del., assignor to Ses, Incorporated, Newark, Del.

Filed Nov. 24, 1975, Ser. No. 634,953

Int. Cl.<sup>2</sup> C08K 3/08, 5/01; F24J 3/02

U.S. Cl. 260—33.65 B

17 Claims

9. A black surface for absorption of solar energy comprising a substrate coated with black particles in a binder transparent to wavelengths longer than about three microns, said black particle being a reflective metal particle having an emissivity less than about 0.1 covered with a thin film of a semiconductor material which transmits wavelengths longer than 2 microns and which has an absorptivity of at least about 0.90 and a reflectivity of less than about 0.1.

4,011,191

## HEAT-CURABLE SILICONE ELASTOMER COMPOSITIONS CONTAINING ALKENYLTRIACETOXSILANES

Harold V. Lefler, III, Sanford, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jan. 15, 1976, Ser. No. 649,290

Int. Cl.<sup>2</sup> C08L 83/04

U.S. Cl. 260—37 SB

10 Claims

1. An anhydrous composition, heat-curable in the presence of moisture to form an elastomeric material having a dry, non-tacky surface, said composition consisting essentially of  
A. 100 parts by weight of a vinyl-enclosed polydiorganosilo-

loxane having a viscosity of from 1 pascal-second to less than 100 pascal-seconds at 25° C. wherein the organic radicals are selected from the group consisting of monovalent hydrocarbon radicals and fluorinated monovalent hydrocarbon radicals, at least 50 percent of all organic radicals being methyl,

B. from 3 to 10 parts by weight of an alkenyltriacetoxysilane,

C. from 0.1 to 10 parts of an organic peroxide and

D. from 10 to 300 parts by weight of a filler.

4,011,192

## COLORED YARNS

Gerard Lees, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 13, 1971, Ser. No. 207,229

Int. Cl.<sup>2</sup> C08J 3/20

U.S. Cl. 260—37 P

13 Claims

1. In a process for the manufacture of a yarn comprising a thermoplastic polymer and a coloring material, wherein the thermoplastic polymer in the molten state is mixed with a feed of coloring material and forwarded at a metered rate to means for forming at least one filament, the improvement whereby periodical changes are made in the rate of addition, or composition, of the coloring material feed, the successive changes being effected at a time interval greater than 0.03 T, and no greater than 10 T where T is the half-decay time for instantaneous injection of color.

4,011,193

## REINFORCED THERMOPLASTIC POLYESTER COMPOSITIONS

Allen D. Wambach, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 13, 1972, Ser. No. 314,544

Int. Cl.<sup>2</sup> C08K 3/22, 7/08

U.S. Cl. 260—40 R

7 Claims

1. A reinforced thermoplastic composition comprising:  
a. a high molecular weight poly(1,4-butylene terephthalate) resin, and  
b. potassium titanate, substantially in the form of single crystal filaments, in a minor proportion based on said composition, in an amount at least sufficient to reinforce the composition but in an amount not in excess of that which embrittles the composition.

4,011,194

## SMOKE RETARDANTS FOR POLYVINYL HALIDES AND POLYSTYRENES

Stanley Robert Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

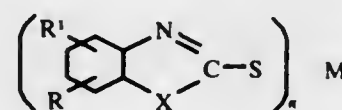
Filed Oct. 16, 1975, Ser. No. 623,152

Int. Cl.<sup>2</sup> C08K 5/59, 5/47, 5/36

U.S. Cl. 260—45.75 C

16 Claims

1. A smoke-retardant polymer composition comprising a resin selected from the group consisting of polyvinyl halide and polystyrene admixed with a sufficient amount to reduce smoking of a metal-2-mercaptobenzothiazole, metal-2-mercaptobenzoxazole, or metal-2-mercaptobenzimidazole having the general structure:



where

- a. R, R<sup>1</sup> and R<sup>2</sup> are independently selected from the class consisting of hydrogen, alkyl of 1 to 4 carbons, aryl of 6 to 12 carbons, and alkylaryl of 7 to 12 carbons, in addition R and R<sup>1</sup> can be selected from a halogen;
- b. X is selected from oxygen, sulfur or an NR<sup>2</sup> group;

4,011,197

## METHOD OF CURING ORGANOSILOXANE COMPOSITIONS USING MICROWAVES

Chi-Long Lee, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sept. 18, 1975, Ser. No. 614,466

Int. Cl.<sup>2</sup> C08G 77/04

U.S. Cl. 260—46.5 R

7 Claims

1. A method of curing a siloxane composition comprising exposing an organosiloxane composition to a microwave source having frequencies of from 900 to 5,000 mega Hertz until the organosiloxane has cured to a three dimensional network, said organosiloxane composition comprising an organosiloxane polymer and a heat accelerated curing mechanism, the organosiloxane composition having at least five weight percent of the silicon-bonded organic radicals selected from the group consisting of aryl radicals, chlorinated aliphatic hydrocarbon radicals, fluorinated aliphatic hydrocarbon radicals, hydrocarbon radicals having at least one carbon-bonded mercapto group, hydrocarbon radicals having at least one carbinol group and aliphatic hydrocarbon ether radicals, wherein all the organic radicals are bonded to silicon atoms through silicon-carbon bonds and any atom other than carbon or hydrogen being separated from the silicon atom by at least three carbon atoms, any remaining silicon-bonded organic radicals bonded to the silicon atom through silicon-carbon bonds in the organosiloxane composition being aliphatic hydrocarbon radicals.

4,011,198

## METHOD FOR MAKING POLYETHERIMIDES

Tohru Takekoshi, Scotia, N.Y., and John E. Kochanowski, Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 459,073, April 8, 1974, and a continuation-in-part of Ser. No. 319,372, Dec. 29, 1972, Pat. No. 3,803,085. This application Feb. 13, 1975, Ser. No. 549,469

The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> C08G 73/10

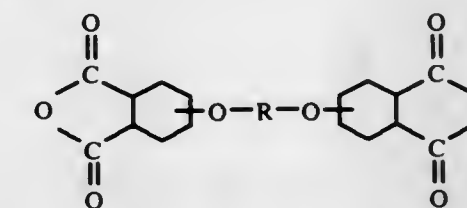
U.S. Cl. 260—47 CP

3 Claims

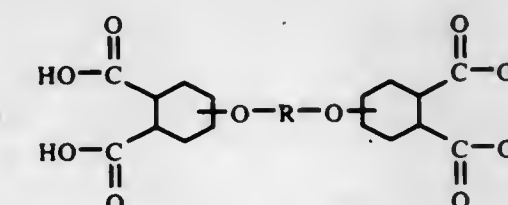
1. A continuous method for making polyetherimide which comprises, continuously feeding into an extruder maintained at melt polymerization temperatures, a mixture containing as essential ingredients an organic diamine of the formula,



and an aromatic bis(etherdicarbonyl) compound selected from the class consisting of dianhydride of the formula,



and tetra-carboxylic acid of the formula,



and continuously venting water of reaction therefrom at temperatures up to 350° C, where R is a divalent aromatic organic

- c. M is a metal selected from the class consisting of beryllium, magnesium, calcium, strontium, barium, titanium, zirconium, antimony, bismuth, chromium, molybdenum, tungsten, manganese, iron, ruthenium, osmium, cobalt, rhodium, iridium, nickel, palladium, platinum, copper, silver, mercury, aluminum, germanium, and lead; and
- d. n is an integer equal to the valence of the metal M.

4,011,195

## POLYMERIZABLE COMPOSITIONS CONTAINING UNSATURATED POLYESTER RESINS AND AQUEOUS ALKALI METAL SILICATE, METHOD OF PREPARING SHAPED ARTICLES FROM SUCH COMPOSITIONS AND THERMOSET PRODUCTS THEREOF

James M. Self, Taylor, S.C., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 460,489, April 12, 1974, abandoned. This application Jan. 29, 1975, Ser. No. 544,966

Int. Cl.<sup>2</sup> C08K 3/34

U.S. Cl. 260—40 R

28 Claims

1. A polymerizable composition consisting essentially of the alkaline reaction product of (a) one part by weight of unsaturated polyester resin syrup; and (b) 0.3 to 10 parts by weight of aqueous sodium silicate; said composition including a polymerization initiator for unsaturated polyester resin syrup, wherein the said aqueous sodium silicate contains 45 to 85 parts by weight water and 55 to 15 parts by weight of sodium silicate solids having a weight ratio of  $\text{SiO}_2\text{Na}_2\text{O}$  of 1.5 to 3.75.

4,011,196

## STABILIZED POLYESTER RESIN AND PROCESSES FOR MAKING THEM

Frank E. Carevic, West Chester, Pa., and Anthony Labriola, Pennsville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

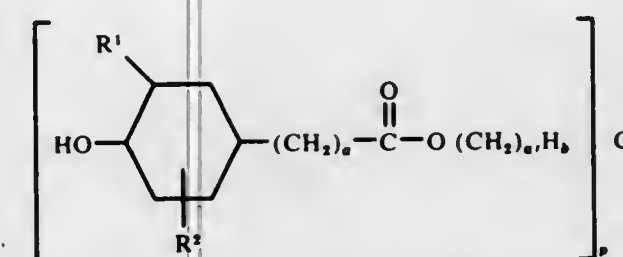
Continuation-in-part of Ser. No. 173,284, Aug. 19, 1971, abandoned. This application Nov. 16, 1972, Ser. No. 307,017

Int. Cl.<sup>2</sup> C08K 5/52, 5/13, 5/12

U.S. Cl. 260—45.85 B

4 Claims

1. A process for producing a fiber or film-forming polyester having improved resistance to deterioration by heat and moisture comprising polycondensing bis 2-hydroxy ethyl terephthalate formed by transesterification, or intermediate condensation products thereof, in the presence of a zinc organic acid salt transesterification catalyst, a phosphorus acid or ester thereof, and a stabilizing amount of a hindered phenol represented by the formula:



in which R<sup>1</sup> and R<sup>2</sup> are lower alkyls of the group consisting of isopropyl, tertiary butyl and neopentyl, with R<sup>1</sup> in a position ortho to the hydroxyl group and R<sup>2</sup> in the other position ortho to the hydroxyl group or in the other position meta to the hydroxyl group and para to R<sup>1</sup> and in which a and a' each has a value of from 0 to 18 inclusive, b has a value of 0 or 1, d has a value of 0 or 1 and p has a value of 1 or 4, and in which when p has a value of 1, b has a value of 1 and d has a value of 0, and when p has a value of 4, b has a value of 0 and d has a value of 1.



radical having from 6-30 carbon atoms, R<sup>1</sup> is a divalent organic radical selected from R radicals, alkylene radicals having from 2-20 carbon atoms, cycloalkylene radicals, and C<sub>(2-8)</sub> alkylene terminated polydiorganosiloxane radicals.

#### 4,011,199 ACIDOLYSIS PROCESS

Finley E. McFarlane, and Thomas G. Davis, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

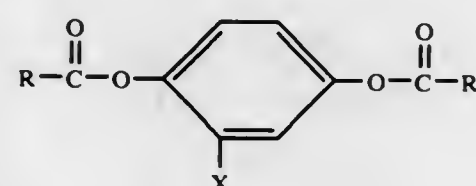
Filed Nov. 28, 1975, Ser. No. 636,186  
Int. Cl.<sup>2</sup> C08G 63/22

U.S. Cl. 260—47 C

3 Claims

1. A process for preparation of a polyester having an inherent viscosity of at least 0.5 comprising contacting within a temperature range of 275° C. to 375° C., under polyester forming conditions,

- A. a dicarboxylic acid component comprised of
  1. from 60 to 35 mole percent terephthalic acid,
  2. from 40 to 65 mole percent isophthalic acid, and
- B. a diol component corresponding to the structure



wherein

R is a monovalent alkyl, aromatic or alicyclic radical, and X is —Cl, —Br or a monovalent alkyl radical having 1 to 4 carbon atoms.

#### 4,011,200 NOVEL POLYPHENYLENE ETHER AND PROCESS FOR PREPARING THE SAME

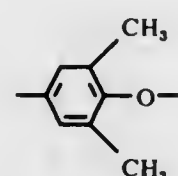
Eiichi Yonemitsu, Kashiwa; Akitoshi Sugio, Omiya, and Takao Kawaki, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Japan

Filed Mar. 4, 1975, Ser. No. 555,129  
Claims priority, application Japan, May 25, 1974, 49-59197  
Int. Cl.<sup>2</sup> C08G 65/44

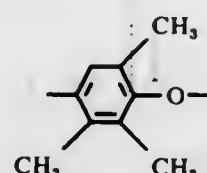
U.S. Cl. 260—47 ET

12 Claims

1. A polyphenylene ether random copolymer excelling in heat resistance and resistance to solvents, said copolymer being composed of 50-98 mol% of a structural unit of the formula



derived from 2,6-dimethyl phenol and 50-2 mol% of a structural unit of the formula



derived from 2,3,6-trimethylphenol, each of said structural units being randomly arranged in the polymeric structure, said copolymer having an intrinsic viscosity, as measured in chloroform at 25° C., of at least 0.3 dl/g.

#### 4,011,201 POLYMERS OF MONOMERS CONTAINING ACTIVE METHYLENE GROUPS AND OTHER ETHYLENICALLY UNSATURATED MONOMERS

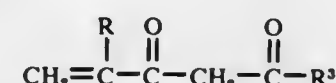
Ignazio S. Ponticello, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 497,803, Aug. 15, 1974, Pat. No. 3,939,130. This application Nov. 13, 1975, Ser. No. 631,801  
Int. Cl.<sup>2</sup> C08F 28/00; C08G 75/00

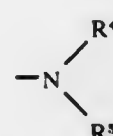
U.S. Cl. 260—65

11 Claims

1. A polymer comprising  
A. from about 1 to 100% by weight of a polymerized monomer containing at least one active methylene group and having the formula



wherein R is hydrogen or methyl, and R<sup>3</sup> is alkoxy containing from 1 to 10 carbon atoms or amino having the structure atoms;



wherein R<sub>4</sub> and R<sub>5</sub> are independently selected from the group consisting of hydrogen, alkyl having 1 to 10 carbon atoms and aryl containing from 6 to 12 carbon atoms and B. from 0 to about 99% by weight of at least one additional polymerized ethylenically unsaturated monomer.

#### 4,011,202 SEPARATING VAPOROUS REACTION PRODUCT IN THE PRODUCTION OF POLYESTERS

Karl Ebner, Oberursel; Franz Ettinger, Kassel; Rudolf Fuchs, Fuldabruck, and Helmut Schnorr, Kassel, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.

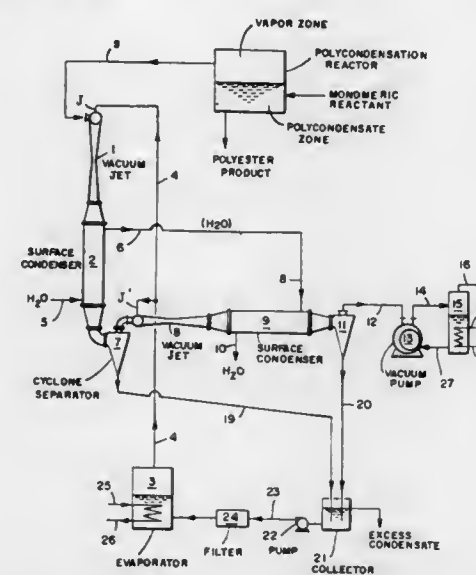
Filed Feb. 27, 1975, Ser. No. 553,681

Claims priority, application Germany, Feb. 27, 1974, 2409343

Int. Cl.<sup>2</sup> C08G 63/22

U.S. Cl. 260—75 M

10 Claims



1. In a process for the separation of vaporous reaction products from the vapor zone of a polycondensation reactor in which a polyester is produced, said vaporous reaction products being drawn off by the suction of a fluid vacuum jet, the improvement which comprises:

supplying glycol vapor as the jet medium to suction off said vaporous reaction products through at least a first stage vacuum jet;

condensing at least part of the glycol vapor emerging from the vacuum jet; and subsequently separating non-condensable gases and residual condensable vapors from each other by suction withdrawal through a liquid circulating vacuum pump operated by liquid glycol in a closed liquid circuit.

#### 4,011,203 AROMATIC POLYAMIDE FROM PIPERAZINE, p-PHENYLENE DIAMINE AND TEREPHTHALOYL HALIDE

Tuyoshi Konomi; Keiji Yukimatsu; Kenichi Katsuo, and Masayasu Yamaguchi, all of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Filed Dec. 19, 1974, Ser. No. 534,475

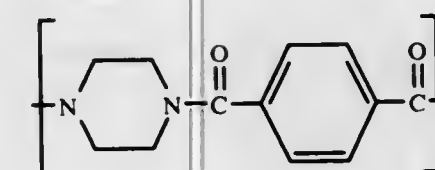
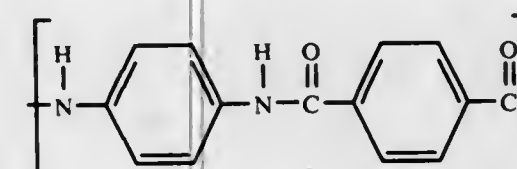
Claims priority, application Japan, Dec. 19, 1973, 48-143099

Int. Cl.<sup>2</sup> C08G 69/32

U.S. Cl. 260—78 R

10 Claims

1. A fiber-forming or film-forming aromatic polyamide consisting essentially of repeating units of the following formulae [I] and [II]:



wherein the repeating units of the formula [II] are contained in said polyamide in the ratio of 10 to 35 molar % of the whole polymer, said polyamide being produced by polycondensing a mixed diamine consisting of piperazine and p-phenylenediamine with a substantially equimolar amount of terephthaloyl dihalide in at least one amide type polar solvent, said piperazine being employed in the ratio of 10 to 35 molar % on the basis of the whole diamine component.

#### 4,011,204 QUATERNARY SALTS OF METHACRYLIC OR ACRYLIC ESTERS AND CATIONIC QUATERNARY POLYELECTROLYTES AND ION EXCHANGE RESINS THEREOF

Milan Beneš, and Jan Peška, both of Prague, Czechoslovakia, assignors to Československá akademie věd, Prague, Czechoslovakia

Filed Nov. 1, 1972, Ser. No. 302,897

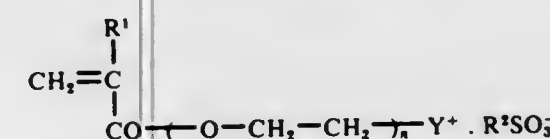
Claims priority, application Czechoslovakia, Nov. 2, 1971, 7687/71; Nov. 2, 1971, 7688/71

Int. Cl.<sup>2</sup> C08F 3/84, 7/12, 15/02

U.S. Cl. 260—79.3 MU

13 Claims

1. Homopolymers comprising the monomer of the general formula I

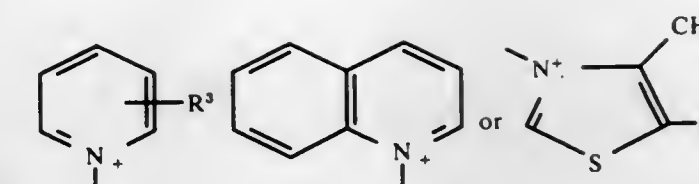


wherein

R<sup>1</sup> is H or CH<sub>3</sub>

R<sup>2</sup> is CH<sub>3</sub>, C<sub>6</sub>H<sub>5</sub> or p-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>

n is 1 or 2 and Y<sup>+</sup> is



where

R<sup>3</sup> is H, CH<sub>3</sub>, CONH<sub>2</sub>, CHO, COCH<sub>3</sub> and R<sup>4</sup> is H or CH<sub>2</sub>CH<sub>2</sub>OH.

#### 4,011,205 ENZYMES SEPARATION

Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England  
Division of Ser. No. 469,221, May 13, 1974, abandoned, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.

This application Sept. 2, 1975, Ser. No. 609,418

Claims priority, application United Kingdom, Feb. 11, 1971, 3469/71

Int. Cl.<sup>2</sup> C07G 7/00

U.S. Cl. 260—112 R

9 Claims

1. A reactive matrix consisting essentially of a reduced form of nicotinamide adenine dinucleotide chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said reduced form of nicotinamide adenine dinucleotide attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said reduced form of nicotinamide adenine dinucleotide, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

#### 4,011,206 EXTRACTION OF A SWEET SUBSTANCE FROM THAUMATOCOCCLUS DANIELLII FRUIT

John Douglas Higginbotham, near Reading, England, assignor to Tate & Lyle Limited, London, England

Filed Apr. 28, 1976, Ser. No. 681,258

Claims priority, application United Kingdom, Apr. 29, 1975, 17831/75; Feb. 13, 1976, 5719/76

Int. Cl.<sup>2</sup> A23J 1/00; A23L 1/22; C07G 7/00

U.S. Cl. 260—112 R

22 Claims

1. A process for the extraction of a sweet substance from the fruit of *Thaumatococcus daniellii* which comprises extracting at least a portion of the fruit with a dilute aqueous solution of an aluminum salt.

#### 4,011,207 DES-(ALA<sup>1</sup>, GLY<sup>2</sup>, LYS<sup>4</sup>, SRIF, DES-(ALA<sup>1</sup>, GLY<sup>2</sup>, LYS<sup>4</sup>)-D-TRP<sup>8</sup>, SRIF AND INTERMEDIATES

Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

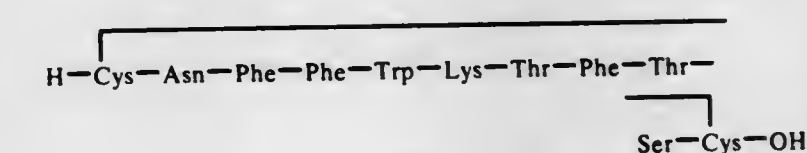
Continuation-in-part of Ser. No. 537,037, Dec. 27, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,608

Int. Cl.<sup>2</sup> C07C 103/52; A61K 37/00

U.S. Cl. 260—112.5 S

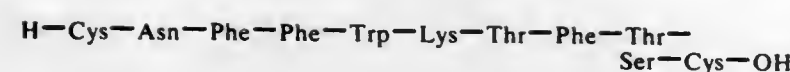
8 Claims

1. A undecapeptide selected from those of the formula





-continued



and the non-toxic acid addition salts thereof, in which Trp is L-tryptophyl or D-tryptophyl and all other amino acid residues in said undecapeptide having an asymmetric  $\alpha$ -carbon atom being of the L-configuration.

#### 4,011,208 3-CYANO OR

#### ACYL-4-ARYL-5-ARYLAZO-6-HYDROXYPYRIDONE-2 DYES

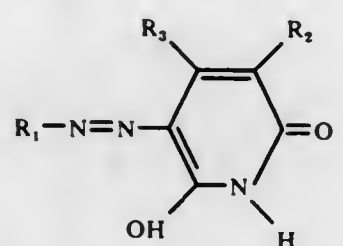
Hermann Burkhard, Neu-Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 148,162, May 28, 1971, abandoned, which is a continuation of Ser. No. 787,585, Dec. 27, 1968, abandoned. This application Sept. 11, 1974, Ser. No. 504,876

Claims priority, application Switzerland, Jan. 18, 1968, 787/68

Int. Cl.<sup>2</sup> C09B 29/36; D06P 3/26, 3/36, 3/54  
U.S. Cl. 260—156 15 Claims

1. A compound of the formula



wherein

$R_1$  is phenyl, substituted phenyl, naphthyl or substituted naphthyl, wherein each substituent of substituted phenyl and substituted naphthyl is independently chloro, bromo, hydroxy, cyano, nitro, trifluoromethyl, alkyl, substituted alkyl, alkoxy, substituted alkoxy, acyl, acyloxy, acylamino, formyl, morpholinosulfonyl, piperidinosulfonyl, morpholinosulfonyloxy, aziridinosulfonyloxy, peripidinosulfonyloxy, alkylsulfamoylamino, phenylsulfamoylamino, dinitroanilino, alkylcarbonylamino, dinitrophenyl, phenylazo, nitrophenylazo, dichlorophenylazo, bromophenylazo, cyanophenylazo, methoxyphenylazo, ethoxyphenylazo, tolylazo or acylphenylazo, wherein each substituent of substituted alkyl and substituted alkoxy is independently chloro, bromo, alkoxy, phenyl, cyano, hydroxy or acyloxy,

$R_2$  is cyano, acyl, thienylcarbonyl or pyridylcarbonyl, and  $R_3$  is phenyl, naphthyl, thiazolyl, benzothiazolyl, thienyl, pyrrolyl, furyl, pyridyl, imidazolyl or benzimidazolyl, or a substituted derivative thereof, wherein each substituent is independently chloro, bromo, alkyl, substituted alkyl, alkoxy, substituted alkoxy, hydroxy, trifluoromethyl, cyano, thiocarbonyl, nitro, alkylamino, dialkylamino, acyl, acyloxy or acylamino,

wherein each substituent of substituted alkyl and substituted alkoxy is independently chloro, bromo, alkoxy, phenyl, cyano, hydroxy or acyloxy,

wherein each acyl and acyl radical of each acyloxy, acylamino and acylphenylazo is independently  $R-X$  or  $R'-Y$ ,

wherein  $R$  is lower alkyl, substituted lower alkyl, cyclohexyl, phenyl or substituted phenyl, wherein each substituent of substituted lower alkyl is independently chloro, bromo, alkoxy, phenyl, cyano, hydroxy or acyloxy, and each substituent of substituted phenyl is independently chloro, bromo, hydroxy, cyano, nitro, trifluoromethyl, alkyl or alkoxy,

$X$  is  $-\text{CO}-$ ,  $-\text{O}-\text{CO}-$  or  $-\text{SO}_2-$ ,

$R'$  is hydrogen or  $R$ , and  $Y$  is  $-\text{NR}'-\text{CO}-$  or  $-\text{NR}'-\text{SO}_2-$ , and each alkyl, alkoxy and alkyl and alkoxy radical of each substituted alkyl, substituted alkoxy, alkylsulfamoylamino, alkylcarbonylamino, alkylamino and dialkylamino independently has 1 to 10 carbon atoms.

#### 4,011,209

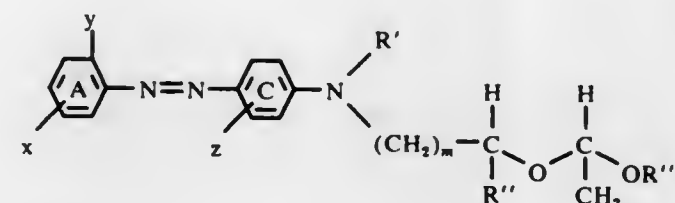
#### ORGANIC SOLVENT-SOLUBLE AZO DYES

Francesco De Feo; Sisto Papa, both of Milan, and Enrico Traverso, Monza (Milan), all of Italy, assignors to Aziende Colori Nazionali Affini ACNA S.p.A., Milan, Italy

Continuation of Ser. No. 153,868, June 16, 1971, abandoned. This application Mar. 5, 1973, Ser. No. 337,821

Int. Cl.<sup>2</sup> C09B 43/00

U.S. Cl. 260—207.5 6 Claims  
1. An organic solvent-soluble azo dye having the formula



in which

A and C each represents the phenyl ring;

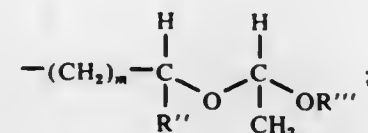
$m$  is an integer from 1 to 3;

$x$  represents H or a  $\text{NO}_2$  group;

$y$  represents H, Cl,  $\text{NO}_2$  or alkyl or alkoxy containing from 1 to 3 carbon atoms;

$z$  represents H, Cl, or alkyl or alkoxy containing from 1 to 3 carbon atoms;

$R'$  represents alkyl containing from 1 to 3 carbon atoms; or  $R'$  represents the group



$R''$  represents H or alkyl containing from 1 to 3 carbon atoms; and

$R'''$  represents alkyl containing from 1 to 18 carbon atoms.

#### 4,011,210

#### 4-SULFANILAMIDOTHIAZOLE

Gregory Gallagher, Jr., Collegeville, and William D. Kingsbury, West Chester, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 521,707, Nov. 7, 1974, Pat. No. 3,939,172. This application Nov. 7, 1975, Ser. No. 629,837

Int. Cl.<sup>2</sup> C07D 277/52

U.S. Cl. 260—239.95 1 Claim  
1. 4-Sulfanilamidothiazole.

#### 4,011,211

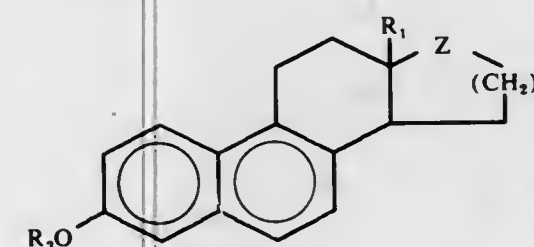
#### STEROID TOTAL SYNTHESIS PROCESS UTILIZING ASYMMETRIC INDUCTION

Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 406,980, Oct. 16, 1973, Pat. No. 3,932,519, which is a division of Ser. No. 100,372, Dec. 21, 1970, abandoned. This application Sept. 24, 1975, Ser. No. 616,239

Int. Cl.<sup>2</sup> C07J 17/00

U.S. Cl. 260—239.55 R 1 Claim  
1. A process for the preparation of compounds of the formula



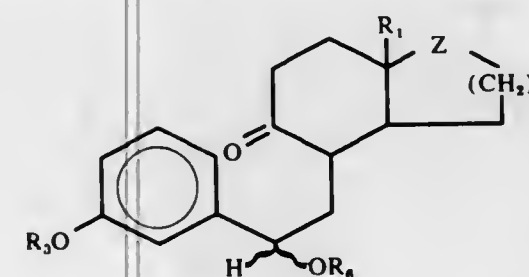
where

$R_1$  is a primary alkyl group of from 1 to 5 carbon atoms;  $R_2$  is a cycloalkyl group, or a primary alkyl group from 1 to 8 carbon atoms;  $Z$  is carbonyl or a group of the formula



where  $R_7$  is hydrogen, a group consisting of the residue of a hydrocarbyl monocarboxylic acid having from 1 to 18 carbon atoms formed by removal of the hydroxyl portion of the carboxyl group, lower alkyl, aryl lower alkyl or tetrahydropyran-2-yl and  $R_8$  is hydrogen or lower aliphatic hydrocarbyl; and  $m$  is 1 or 2;

which comprises reacting a compound of the formula



where

$R_1$ ,  $R_3$ ,  $Z$  and  $m$  are as above; and  $R_8$  is hydrogen, lower acyl or aroyl; with a strong acid.

#### 4,011,212

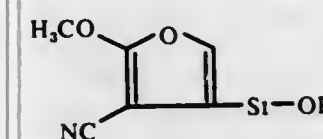
#### 22-CYANO-24-NORCHOLANES

Nedumparambil A. Abraham, Dollard des Ormeaux, and Yvon Lefebvre, Pierrefonds, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 469,269, May 13, 1974, Pat. No. 3,944,541. This application Dec. 15, 1975, Ser. No. 641,128

Int. Cl.<sup>2</sup> C07J 17/00

U.S. Cl. 260—239.55 R 4 Claims  
1. A compound of general formula



in which St represents rings A, B, C and D of naturally occurring  $3\beta$ -oxygenated aglycones with their respective substituents attached thereto selected from the group consisting of digitoxigenin, periplogenin, digoxigenin and gitoxigenin, R represents a substituent on the  $3\beta$ -oxygen of the aglycone selected from the group consisting of hydrogen, a lower aliphatic acyl group containing 2 to 4 carbon atoms and in which the 2-methoxy-3-cyanofuryl group is attached to the steroid moiety St at position 17 $\beta$ .

#### 4,011,213

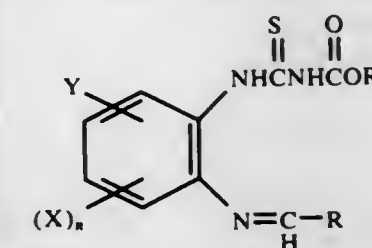
#### ALKYL 4-[O-(SUBSTITUTED METHYLENEMINO)PHENYL]-3-THIOALLOPHA- NATES

Joel Benjamin Wommack, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 865,947, Oct. 13, 1969, Pat. No. 3,836,569. This application May 24, 1974, Ser. No. 473,157

Int. Cl.<sup>2</sup> C07C 149/40

U.S. Cl. 260—240 G 8 Claims  
1. A compound of the formula



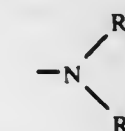
wherein

X is hydrogen, fluorine, chlorine, or bromine;

Y is hydrogen or alkyl of 1 to 4 carbon atoms;

$R_1$  is alkyl of 1 to 12 carbon atoms;

R is thienyl; furyl; naphthyl; pyridyl; quinolyl; alkyl of 1 to 12 carbon atoms; alkoxy of 1 to 3 carbon atoms or



$R_2$  is hydrogen or alkyl of 1 to 4 carbon atoms;

$R_3$  is alkyl of 1 to 4 carbon atoms, provided that  $R_2$  and  $R_3$  can be taken together to be  $-\text{CH}_2\text{CH}_2\text{OCH}_2\text{CH}_2-$  or  $-(\text{CH}_2)_m-$ ;

when Y is alkyl  $n$  is 0;

when Y is hydrogen  $n$  is 1, 2 or 3;

$m$  is 4, 5 or 6;

and the sodium, potassium, lithium, calcium, barium, copper, zinc and manganese salts of these compounds.

#### 4,011,214

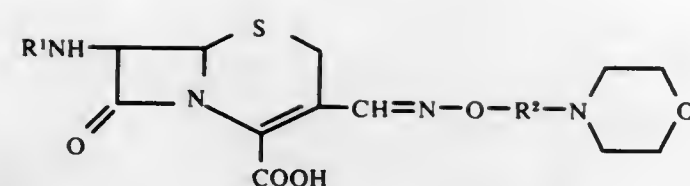
#### 3-(MORPHOLINOALKOXYIMINOMETHYL)CEPHEM COMPOUNDS

Shinji Terao; Mitsuru Shirakishi, both of Osaka; Toshio Miyawaki, Hyogo; Isao Minamida, Kyoto; Masayoshi Yamaoka, and Mitsuo Numata, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

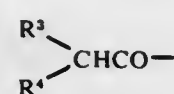
Filed Dec. 20, 1974, Ser. No. 534,787  
Claims priority, application Japan, Dec. 20, 1973, 48-143175

Int. Cl.<sup>2</sup> C07D 501/50, 501/52, 501/54  
U.S. Cl. 260—240 G 23 Claims  
1. A compound of the formula:





wherein  $R^1$  is formyl, benzoyl or a group having the formula:



wherein  $R^3$  is hydrogen, phenyl, phenoxy, thienyl, tetrazolyl, furyl, pyrazolyl, pyridyloxy, cyclohexenyl, acetyl, cyano, 3-amino-3-carboxypropyl or 3-amino-3-carboxypropyl in which the 3-amino group is protected with isobornyloxycarbonyl,  $\beta$ -methylsulfonylthioethoxycarbonyl, benzoyl, phthalyl, *p*-*t*-butylbenzoyl, phenylacetyl, phenylthiocarbonyl, benzyloxycarbonyl, *p*-toluenesulfonyl, or *p*-*t*-butylbenzenesulfonyl, and  $R^4$  is hydrogen, hydroxyl, sulfo, carboxyl or  $C_{1-2}$  alkyl, and  $R^2$  is unsubstituted  $C_{1-4}$  alkylene or substituted  $C_{1-4}$  alkylene substituted with methoxy or ethoxy, or a pharmaceutically acceptable salt thereof.

4,011,215

### 3-CHLOROALKYLCARBAMOYLOXYMETHYL-7-[2-(FUR-2-YL)-2-METHOXYIMINOACETAMIDO]CEPH-3-EM-4-CARBOXYLIC ACIDS AND PHYSIOLOGICALLY ACCEPTABLE SALTS OR OXIDES THEREOF

Martin C. Cook, Liverpool; Gordon I. Gregory, Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Aug. 1, 1975, Ser. No. 601,397

Claims priority, application United Kingdom, Aug. 15, 1974, 36012/74

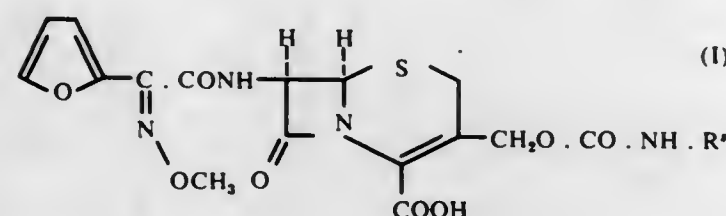
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 501/20

U.S. Cl. 260—243 C

6 Claims

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula



wherein  $R^*$  represents a  $C_1$ - $C_4$  alkyl group substituted by chlorine, and a physiologically acceptable salt or oxide thereof.

4,011,216

### $\Delta^{2,3}$ -0-2-ISOCEPH-4-CARBOXYLIC ACID AND DERIVATIVES THEREOF AS ANTIBACTERIAL AGENTS

Marcel Menard; Gary M. F. Lim, both of Candiac, and Terry T. Conway, Brossard, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

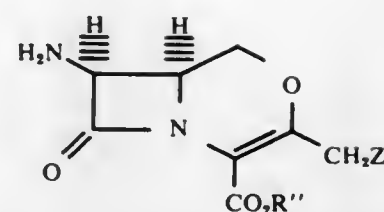
Filed Apr. 11, 1975, Ser. No. 567,323

Int. Cl.<sup>2</sup> C07D 265/00, 273/00, 295/00; A01N 9/00

U.S. Cl. 260—244 R

13 Claims

1. A compound of the formula



—OCOR<sub>2</sub>

wherein  $R_2$  is hydrogen, amino or (lower)alkyl and  $R''$  is hydrogen or an easily cleavable ester carboxyl-protecting group, or carboxylic acid or acid addition salts thereof.

4,011,217

### 4-(3-AMINO-2-ACYLOXYPROPOXY)-1,2,5-THIADIAZOLE COMPOUNDS

Burton Kendall Wasson, Valois, Canada, assignor to Merck Sharp & Dohme (I.A.) Corporation, Rahway, N.J.

Division of Ser. No. 352,765, April 19, 1973, Pat. No.

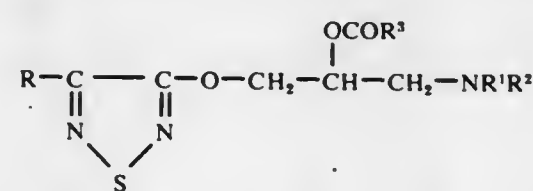
3,891,639. This application Feb. 26, 1975, Ser. No. 553,186

Int. Cl.<sup>2</sup> C07D 285/10, 295/12

U.S. Cl. 260—247.1 H

2 Claims

1. A racemic product or an optically active isomer thereof having the structure



or an acid addition salt thereof wherein R represents hydrogen, chloro, lower alkyl, lower alkoxy, phenyl, benzyl, N-lower alkylcarbamoyl, piperazinyl, N-lower alkylpiperazinyl;  $R^1$  represents hydrogen and  $C_{1-5}$  alkyl;  $R^2$  represents  $C_{1-10}$  alkyl, hydroxy  $C_{1-10}$  alkyl, lower alkenyl, lower alkynyl; the radical  $NR^1R^2$  can represent morpholino; and  $R^3$  represents a mono- or polysubstituted lower alkyl wherein the alkyl group contains from 2 to 6 carbons and the substituent groups are selected from halogen, a phenyl, phenoxy or carboxy.

4,011,218

### 1,2,4-TRIAZOLES

John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 269,684, July 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 75,785, Sept. 25, 1970, abandoned. This application Dec. 3, 1974, Ser. No.

529,151

Int. Cl.<sup>2</sup> C07D 249/08

U.S. Cl. 260—250 AH

9 Claims

1. A compound of the formula:



and non-toxic salts thereof, wherein

$R_1$  is hydrogen,  $C_{1-5}$  alkyl,  $C_{2-5}$  alkanoyl, phenyl- $C_{1-5}$  alkyl, carbamoyl  $C_{1-5}$  alkylcarbamoyl or di- $C_{1-5}$  alkylcarbamoyl;  $R_2$  is pyridylmethyl, N-oxide pyridylmethyl, pyrazinyl, pyrazinyl-N-oxide, pyridazinyl or pyridazinyl-N-oxide; and

$R_3$  is pyridyl, pyridyl-N-oxide, pyrazinyl or pyrazinyl-N-oxide such that when  $R_3$  is a pyridyl,  $R_3$  is other than a pyridyl.

4,011,219

### PHthalazine DERIVATIVES AND SALTS THEREOF

Yasuho Nishii; Shun-ichi Hata; Kiyoshige Wakabayashi; Koji Mizuno, Tokyo; Akio Yoshida, and Minoru Shindo, all of Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

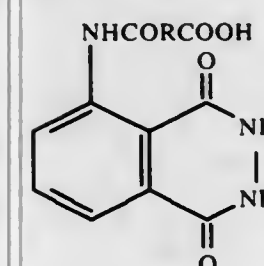
Filed Mar. 28, 1975, Ser. No. 562,920

Int. Cl.<sup>2</sup> C07D 237/32

U.S. Cl. 260—250 P

3 Claims

1. A compound represented by the formula



wherein R represents an alkylene having 1-6 carbon atoms, or a salt thereof.

4,011,220

### PYRIDAZINIUM COMPOUNDS AND A PROCESS FOR THEIR PRODUCTION

Rudolf Kropp, Limburgerhof; Franz Reicheneder; August Amann, both of Ludwigshafen, and Hubert Giertz, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 396,615, Sept. 12, 1973, Pat. No.

3,980,633. This application Mar. 8, 1976, Ser. No. 664,645

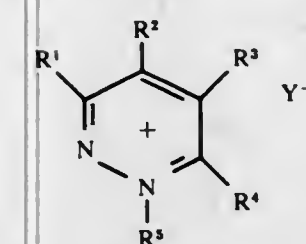
Claims priority, application Germany, Sept. 15, 1972, 2245248

Int. Cl.<sup>2</sup> C07D 237/20

U.S. Cl. 260—250 A

3 Claims

1. A pyridazinium compound of the formula:



in which

$R^1$  is hydrogen;

$R^2$  is amino;

$R^3$  is hydrogen;

$R^4$  is hydrogen or —SR<sup>6</sup> in which  $R^6$  is an alkyl of one to 12 carbon atoms;

$R^5$  is phenyl; and

$Y^{\ominus}$  is a pharmaceutically acceptable anion of an inorganic or organic acid selected from the group consisting of perchloric acid, hydrochloric acid, hydrobromic acid, hydroiodic acid, phosphoric acid, carbonic acid, sulfuric acid, methylsulfuric acid, ethylsulfuric acid, trifluoromethylsulfonic acid, nitric acid or fluoboric acid, formic acid, acetic acid, trifluoroacetic acid, propionic acid, glycolic acid, lactic acid, pyruvic acid, oxalic acid, malonic acid, succinic acid, maleic acid, fumaric acid, malic acid, tartaric acid, citric acid, ascorbic acid, benzoic acid, phenylacetic acid, 4-amino-benzoic acid, 4-hydroxybenzoic acid, anthranilic acid, cinnamic acid, mandelic acid, salicylic acid, 4-aminosalicylic acid, 2-

acetoxysalicylic acid, *p*-toluenesulfonic acid, isonicotinic acid, nicotinic acid, methionine, tryptophan, lysine and arginine.

4,011,221

### S-INOSYLCYSTEINE AND A PROCESS FOR PRODUCING THE SAME

Eiichi Sakakibara, Takarazuka; Iwao Hashimoto, Osaka, and Mitsuru Hirohashi, Katano, all of Japan, assignors to Funai Pharmaceutical Industries, Ltd., Japan

Filed Aug. 21, 1975, Ser. No. 606,478

Claims priority, application Japan, Aug. 22, 1974, 49-95527

Int. Cl.<sup>2</sup> C07D 473/30

U.S. Cl. 260—252

1 Claim

1. S-inosylcysteine.

4,011,222

### FLUORO-SUBSTITUTED DIBENZO[b,f]THIEPINS

Max Gerecke, Reinach; Jean-Pierre Kaplan, Le Plessis Robinson, and Emilio Kyburz, Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 471,101, May 17, 1974, Pat. No.

3,966,737, which is a continuation-in-part of Ser. No. 378,733, July 12, 1973, abandoned. This application Jan. 12, 1976, Ser. No. 648,345

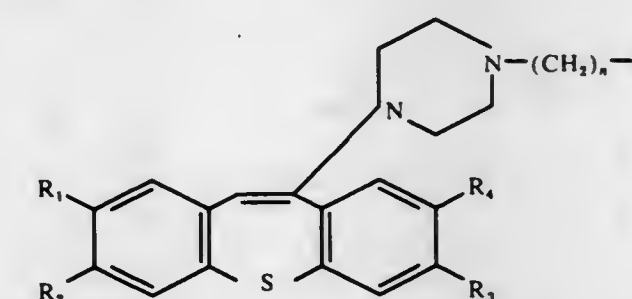
Claims priority, application Switzerland, Mar. 30, 1973, 4606/73; Jan. 16, 1974, 568/74

Int. Cl.<sup>2</sup> C07D 409/04

U.S. Cl. 260—268 TR

5 Claims

1. A compound of the formula



wherein  $n$  is an integer from 1 to 3; R is hydrogen or, when  $n$  is 2 or 3, is hydroxy or an alkanoyloxy group of 2-18 carbon atoms; one of  $R_1$  and  $R_2$  is hydrogen and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, fluoro, chloro or trifluoromethyl; and one of  $R_3$  and  $R_4$  is hydrogen, and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, fluoro, chloro or trifluoromethyl, provided that at least one of  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$  is fluoro, or a pharmaceutically acceptable acid addition salt thereof.

4,011,223

### BIS-(1,4-BETA-AMINO

### CARBONYL-ETHYL)-PIPERAZINES

David Charles Priest, Charlotte, N.C.; Michael Ray Sandner, Charleston, and David John Trecker, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 463,247, April 23, 1974, Pat. No.

3,954,749, which is a division of Ser. No. 309,906, Nov. 27, 1972, Pat. No. 3,821,131. This application Feb. 23, 1976, Ser. No. 660,000

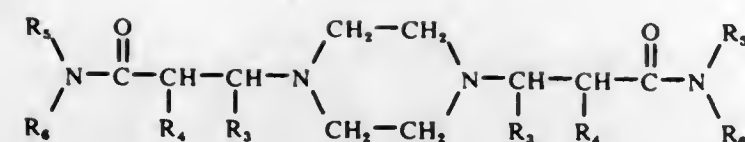
Int. Cl.<sup>2</sup> C07D 295/12

U.S. Cl. 260—268 R

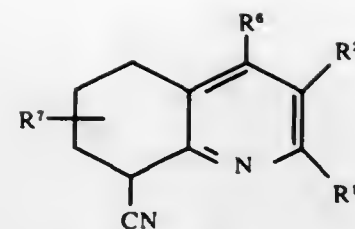
3 Claims

2. N,N'-piperazino-bis[3-(N'',N''-dialkylamides)] having the formula,





wherein  $R_3$  and  $R_4$  are hydrogen or alkyl having from 1 to 4 carbon atoms, and  $R_5$  and  $R_6$  are alkyl having from 1 to 4 carbon atoms.



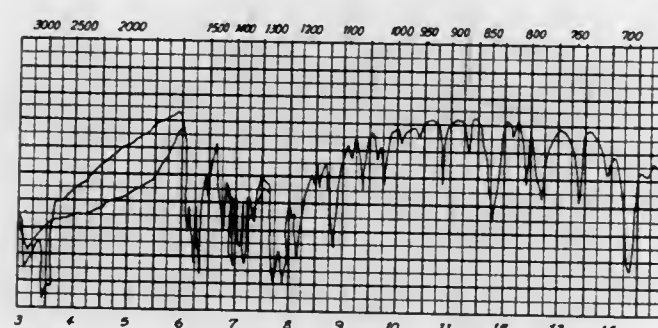
and acid addition salts thereof with pharmaceutically acceptable acids, wherein  $R^1$ ,  $R^2$  and  $R^6$  are the same or different and are selected from hydrogen, trifluoromethyl, alkyl having from 1 to 6 carbon atoms, phenylalkyl wherein the alkyl group has 1 - 6 carbon atoms, or phenyl groups or  $R^1$  and  $R^2$  taken together represent a polymethylene chain of 3 to 5 carbon atoms,  $R^7$  represents hydrogen or from 1 to 3 groups selected from alkyl of 1 to 6 carbon atoms (which may be substituted by alkoxy of 1 to 6 carbon atoms or trifluoromethyl), phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms and phenyl groups, and any of the phenyl or the phenyl portion of any phenylalkyl groups  $R^1$ ,  $R^2$ ,  $R^6$  and  $R^7$  may be substituted by alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halogen, nitro or trifluoromethyl with the provisos that (1) when  $R^1$  and  $R^2$  or  $R^2$  and  $R^6$  are both alkyl they are selected from normal and secondary alkyl groups and (2) when two alkyl  $R^7$  groups are present on the same carbon atom then they are both n-alkyl groups and when two  $R^7$  alkyl groups are present on adjacent carbon atoms they are selected from normal and secondary alkyl groups.

**4,011,224**  
PROCESS FOR THE PREPARATION OF  
7-OXO-7H-DIBENZO-[d,e,h]-QUINOLIN-2-OL  
Francesco De Feo, Milan; Franco Gonzati, Saronno (Varese),  
and Alberto Osti, Milan, all of Italy, assignors to Aziende  
Colori Nazionali Affini ACNA S.p.A., Milan, Italy  
Filed Dec. 26, 1974, Ser. No. 536,591  
Claims priority, application Italy, Jan. 21, 1974, 19614/74;  
July 16, 1974, 25196/74

Int. Cl.<sup>2</sup> C09B 5/14

U.S. Cl. 260—278

16 Claims



1. A process for preparing 7-oxo-7H-dibenzo-[d,e,h]-quinolin-2-ol, said process comprising cycloisomerizing N-phenyl-acetyl-phthalimide in an inert aliphatic or aromatic solvent, optionally substituted by chlorine or an  $\text{NO}_2$  group and at a temperature of  $50^\circ$ - $200^\circ$  C. in the presence of  $\text{AlCl}_3$  as a Friedel-Craft catalyst, the molar ratio of catalyst to N-phenyl-acetyl-phthalimide being 2-5:1 to form an intermediate which is o-(3-hydroxy-1-isoquinolinyl)-benzoic acid and thereafter subjecting the intermediate to dehydrating condensation to cyclize same and form 7-oxo-7H-dibenzo-[d,e,h]-quinolin-2-ol.

**4,011,225**  
8-CYANO-5,6,7,8-TETRAHYDROQUINOLINE  
DERIVATIVES  
Adrian Charles Ward Curran, South Cave; Roger Crossley,  
Reading, and David George Hill, Cookham, all of England,  
assignors to John Wyeth & Brother Limited, Maidenhead,  
England

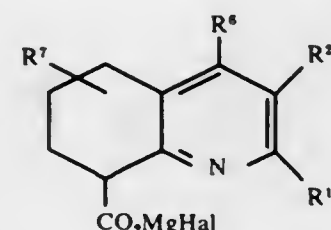
Continuation-in-part of Ser. No. 600,257, July 30, 1975,  
abandoned, which is a continuation-in-part of Ser. No.  
460,265, April 11, 1974, abandoned, which is a  
continuation-in-part of Ser. No. 403,289, Oct. 3, 1973,  
abandoned. This application Oct. 20, 1975, Ser. No. 624,081  
Claims priority, application United Kingdom, Oct. 21, 1972,  
48595/72; Oct. 15, 1973, 7424/73; July 21, 1973, 34866/73;  
Aug. 16, 1973, 38701/73; Oct. 17, 1973, 48595/72

Int. Cl.<sup>2</sup> C07D 215/48

U.S. Cl. 260—283 CN

1. A compound of formula IA

8 Claims



wherein

$R^1$ ,  $R^2$  and  $R^6$  are independently hydrogen or alkyl or 1 to 6 carbon atoms or one of  $R^1$ ,  $R^2$  and  $R^6$  is trifluoromethyl, phenylalkyl or 7 to 12 carbon atoms, phenyl, alkylphenyl of 7 to 12 carbon atoms, alkoxyphenyl of 7 to 12 carbon atoms, halophenyl, nitrophenyl or trifluoromethylphenyl;  $R^7$  is hydrogen, alkyl or 1 to 6 carbon atoms, gem dimethyl (at the 5, 6 or 7 position), phenylalkyl of 7 to 12 carbon atoms;

and

Hal represents chlorine, bromine or iodine; with the proviso that when  $R^1$  and  $R^2$  or  $R^2$  and  $R^6$  are both alkyl, they are selected from normal and secondary alkyl groups.

**4,011,226**  
8-CARBOXYL-TETRAHYDROQUINOLINE  
DERIVATIVES

Adrian Charles Ward Curran, Newcastle-upon-Tyne, England,  
assignor to John Wyeth & Brother Limited, Maidenhead,  
England

Division of Ser. No. 526,353, Nov. 22, 1974, Pat. No.  
3,963,722. This application Dec. 8, 1975, Ser. No. 638,383  
Int. Cl.<sup>2</sup> C07D 215/48

U.S. Cl. 260—287 T

1. A compound of formula (II)

5 Claims

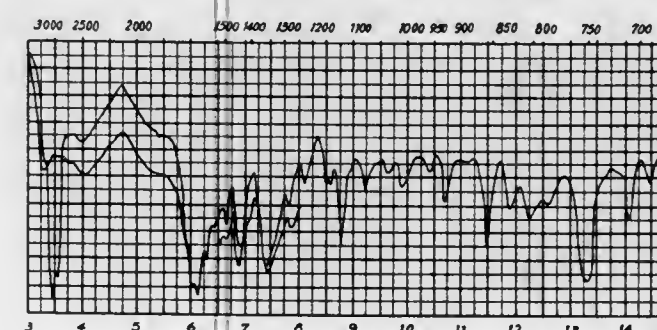
**4,011,227**  
o-(3-HYDROXY-1-ISOQUINOLINYL)-BENZOIC ACID  
Francesco De Feo, Milan; Franco Gonzati, Saronno (Varese),  
and Alberto Osti, Milan, all of Italy, assignors to Aziende  
Colori Nazionali Affini ACNA S.p.A., Milan, Italy  
Division of Ser. No. 536,591, Dec. 26, 1974. This application  
Apr. 23, 1976, Ser. No. 679,559

Claims priority, application Italy, Jan. 21, 1974, 19614/74;  
July 16, 1974, 25196/74

Int. Cl.<sup>2</sup> C07D 217/24

U.S. Cl. 260—287 D

1 Claim



1. o-(3-hydroxy-1-isoquinolinyl)-benzoic acid.

**4,011,228**  
CARBOXYLIC ACID SALTS OF  
TETRAHYDROQUINOLINES AND PYRIDINE  
DERIVATIVES

Adrian Charles Ward Curran, Newcastle-upon-Tyne, England,  
assignor to John Wyeth & Brother Limited, Maidenhead,  
England

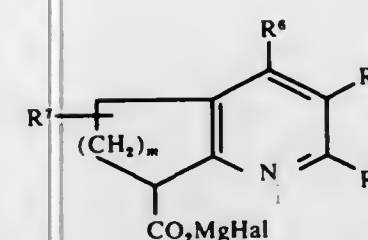
Division of Ser. No. 526,353, Nov. 22, 1974, Pat. No.  
3,963,722. This application Dec. 8, 1975, Ser. No. 638,739  
Claims priority, application United Kingdom, Nov. 26, 1973,  
54728/73; Mar. 27, 1974, 13516/74

Int. Cl.<sup>2</sup> C07D 215/48, 221/04

U.S. Cl. 260—287 T

1. A compound of formula (II):

9 Claims



wherein

$R^1$ ,  $R^2$  and  $R^6$  are independently hydrogen or alkyl of 1 to 6 carbon atoms, or one of  $R^1$ ,  $R^2$  and  $R^6$  is trifluoromethyl, phenylalkyl of 7 to 12 carbon atoms, phenyl, alkylphenyl of 7 to 12 carbon atoms, alkoxyphenyl of 7 to 12 carbon atoms, halophenyl, nitrophenyl or trifluoromethylphenyl; or  $R^1$  and  $R^2$ , taken together, are trimethylene, tetramethylene or pentamethylene or an  $R^7$  substituted derivative thereof;

$R^7$  is hydrogen, alkyl of 1 to 6 carbon atoms, gem-dimethyl, phenylalkyl of 7 to 12 carbon atoms, phenyl, alkylphenyl of 7 to 12 carbon atoms, alkoxyphenyl of 7 to 12 carbon atoms, halophenyl, nitrophenyl and trifluoromethylphenyl;  
 $m$  is 1 or 3;

and

Hal represents chlorine, bromine or iodine, with the proviso that when  $R^1$  and  $R^2$  or  $R^2$  and  $R^6$  are both alkyl, they are selected from normal and secondary alkyl groups.

**4,011,229**  
8-AMINO-5,6,7,8-TETRAHYDROQUINOLINE  
DERIVATIVES

Adrian Charles Ward Curran, South Cave; Roger Crossley,  
Reading, and David George Hill, Cookham, all of England,  
assignors to John Wyeth & Brother Limited, Maidenhead,  
England

Continuation-in-part of Ser. No. 554,259, Feb. 28, 1975, Pat.  
No. 3,991,065. This application Apr. 2, 1976, Ser. No.  
673,016

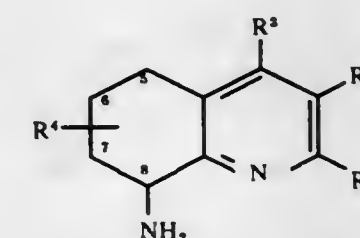
Claims priority, application United Kingdom, Mar. 5, 1974,  
9763/74

Int. Cl.<sup>2</sup> C07D 215/40

U.S. Cl. 260—288 R

1. A compound of formula I

4 Claims



and pharmaceutically acceptable acid addition salts thereof, wherein  $R^1$ ,  $R^2$  and  $R^3$  are the same or different and represent hydrogen, or lower alkyl of 1-6 carbon atoms,  $R^4$  represents hydrogen or substitution at the 5,6 or 7-position by lower alkyl of 1-6 carbon atoms, with the proviso that when any two of  $R^1$ ,  $R^2$  and  $R^3$  are lower alkyl and are on adjacent carbon atoms then they are selected from normal and secondary alkyl groups.

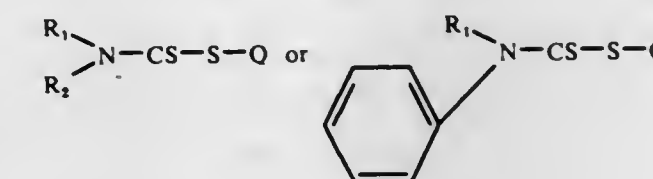
**4,011,230**  
DITHIOCARBAMATE ESTER BACTERICIDES AND  
FUNGICIDES

Thomas Andrew Lies, Montgomery Township, and James  
Wellington Clapp, Princeton, both of N.J., assignors to  
American Cyanamid Company, Stamford, Conn.  
Division of Ser. No. 323,169, Jan. 12, 1973, abandoned, which  
is a division of Ser. No. 127,825, March 24, 1971, Pat. No.  
3,723,494. This application Apr. 14, 1975, Ser. No. 567,664  
Int. Cl.<sup>2</sup> C07D 401/12, 403/12

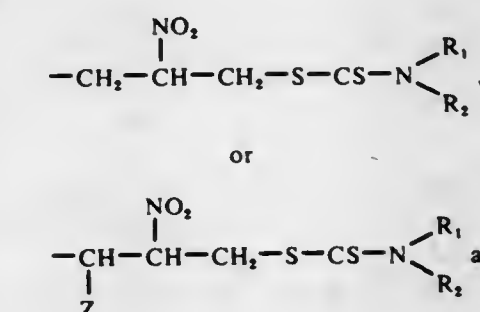
U.S. Cl. 260—293.85

1. A compound having the structure:

7 Claims

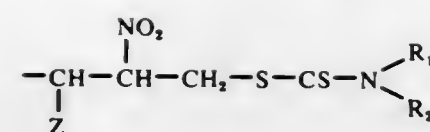


wherein Q represents

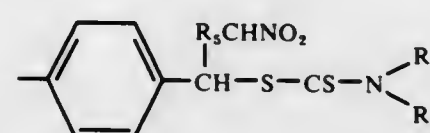


wherein Q' represents



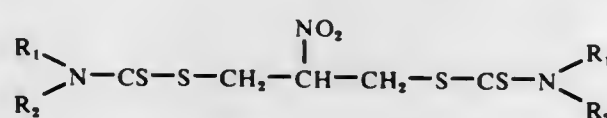


and where  $R_1$  and  $R_2$  are each loweralkyl  $C_1$ - $C_4$ , or when  $R_1$  and  $R_2$  are taken together with N represent a piperidine or pyrrolidine nucleus; and Z is phenyl,



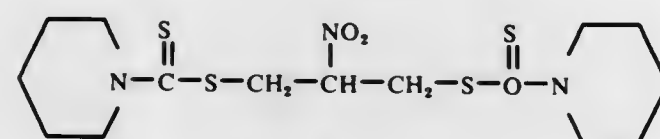
1-naphthyl, 2-furyl, 2-thienyl, 5-chloro-2-thienyl or substituted phenyl and  $R_3$  is hydrogen or lower alkyl  $C_1$ - $C_4$ .

2. A compound according to claim 1 having the formula:



where  $R_1$  and  $R_2$  are each loweralkyl  $C_1$ - $C_4$ , or when  $R_1$  and  $R_2$  are taken together with N form piperidine or pyrrolidine.

5. A compound according to claim 2:



4,011,231

**2-PHENYL-6-(1-HYDROXY-2-T-BUTYLAMINOETHYL)-4H-PYRIDO[3,2-d]-1,3-DIOXIN MALEATE AND ITS USE AS AN INTERMEDIATE**

Ronnie D. Carroll, East Lyme; Bernard S. Moore, Waterford, and James R. Tretter, Niantic, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 3, 1975, Ser. No. 619,302

Int. Cl.<sup>2</sup> C07D 213/69

U.S. Cl. 260-296 R

1 Claim

1. A process for producing 2-hydroxymethyl-3-hydroxy-6-(1-hydroxy-2-t-butylaminoethyl)-pyridine dihydrochloride which comprises the steps of

1. heating 2-phenyl-4H-pyrido-[3,2-d]-1,3-dioxin-6-epoxyethane with at least a molar amount of t-butylamine to obtain 2-phenyl-6-(1-hydroxy-2-t-butylaminoethyl)-4H-pyrido[3,2-d]-1,3-dioxin as product,
2. reacting maleic acid with the product of step (1) in a molar ratio of at least 1:1 in ethyl acetate at a temperature of from 30° to 50° C. to obtain 2-phenyl-6-(1-hydroxy-2-t-butylaminoethyl)-4H-pyrido[3,2-d]-1,3-dioxin maleate as product and
3. treating the product of step (2) with excess hydrochloride in methanol to obtain the desired product.

4,011,232

**PHENOXYPHENYL PYRIDYL COMPOUNDS**

Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

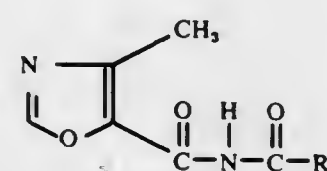
Filed Dec. 18, 1975, Ser. No. 635,681

Int. Cl.<sup>2</sup> C07D 213/44, 213/50

U.S. Cl. 260-297 R

18 Claims

1. A compound which is a free base of the formula:



wherein R is lower alkyl.

**4,011,233  
2-METHYL-2-(4-METHYL-3-PENTENE-1-YL)  
THIAZOLIDINE**

Paul Dubs, Zug; Heiner Kuntzel, Oberengstringen; Mario Pesaro, Zurich, and Harald Schmidt, Wallisellen, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 374,714, June 28, 1973, Pat. No.

3,944,561. This application Aug. 22, 1975, Ser. No. 606,808

Int. Cl.<sup>2</sup> C07D 277/04

U.S. Cl. 260-306.7 R

1 Claim

1. 2-Methyl-2-(4-methyl-3-penten-1-yl)-thiazolidine.

4,011,234

**N-ALKANOYL OXAZOLE-CARBOXAMIDE COMPOUNDS**

Hans Hoffmann-Paquotte, Inzlingen, Germany, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 25, 1976, Ser. No. 699,907

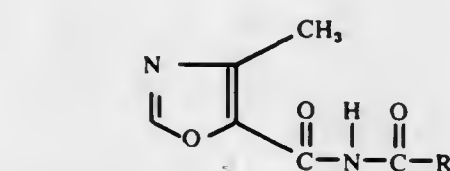
Claims priority, application Switzerland, July 11, 1975, 9102/75

Int. Cl.<sup>2</sup> C07D 263/34

U.S. Cl. 260-307 R

4 Claims

1. A compound of the formula:



wherein R is lower alkyl.

**4,011,235  
POLYGLYCIDYL COMPOUNDS CONTAINING  
N-HETEROCYCLIC STRUCTURE**

Jürgen Habermeier, Pfaffingen; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 371,449, June 19, 1973, Pat. No. 3,900,493. This application July 7, 1975, Ser. No. 593,801

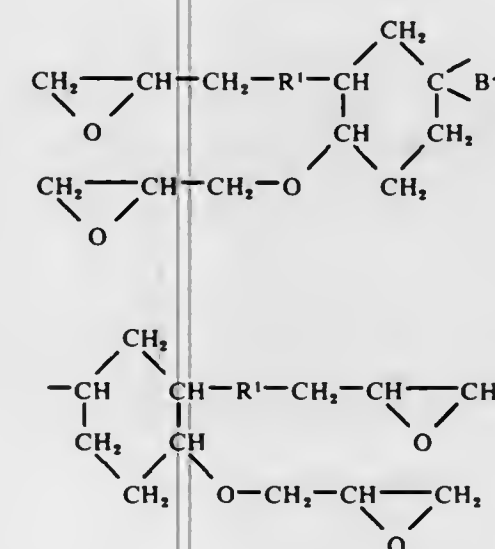
Claims priority, application Switzerland, June 23, 1972, 9528/72

Int. Cl.<sup>2</sup> C07D 233/72

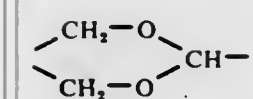
U.S. Cl. 260-309.5

1 Claim

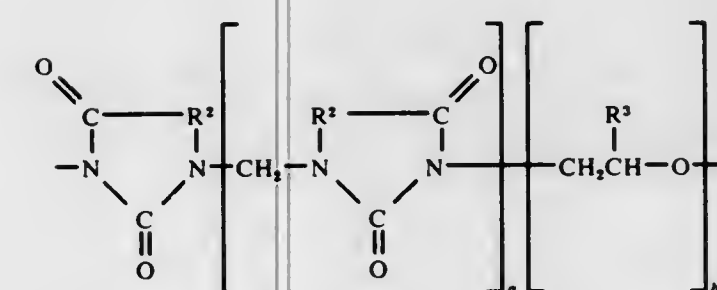
1. A polyglycidyl compound of the formula



wherein B denotes the radical

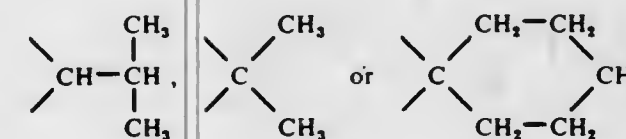


$R^1$  denotes a divalent radical of the formula



wherein

a and b are identical or different and denote either 0 or 1;  
 $R^3$  is hydrogen or methyl;  
and  $R^2$  denotes one of the radicals



**4,011,236  
N-(BENZIMIDAZOL-2-YL)ARYLCARBOXAMIDES AS  
ULTRAVIOLET (UV) LIGHT ABSORBERS**

Nathaniel Grier, Englewood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 320,231, Jan. 2, 1973, Pat. No. 3,907,700, which is a continuation-in-part of Ser. No. 758,601, Sept. 9, 1968, abandoned. This application May 27, 1975, Ser. No.

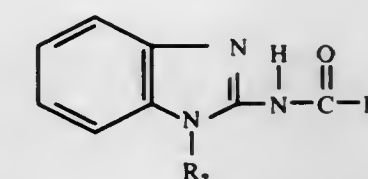
580,847

Int. Cl.<sup>2</sup> C07D 235/30

U.S. Cl. 260-309.2

1 Claim

1. A N-(benzimidazol-2-yl)arylcarboxamide having the formula:



wherein  $R_1$  is a phenyl group substituted at the 2-, 3- or 4-position by a member selected from the group consisting of methoxycarbonyl, ethoxycarbonyl, butoxycarbonyl, propoxycarbonyl, dodecyloxycarbonyl, carboxy, phenyl, nitro, and carboxamide and  $R_2$  is a member selected from the group consisting of hydrogen, methyl, acetyl, methoxycarbonyl, butyryl, pivaloyl, stearoyl, acryl, tolyl, mesityl, butyl, octyl, benzoyl, halobenzoyl, and phenyl.

**4,011,237  
HETEROCYCLIC SUBSTITUTED  
CHROMENOPYRAZOLES**

Jean Claude Petitpierre, Kaiseraugst, Switzerland, and Robert Garner, Bury, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,731

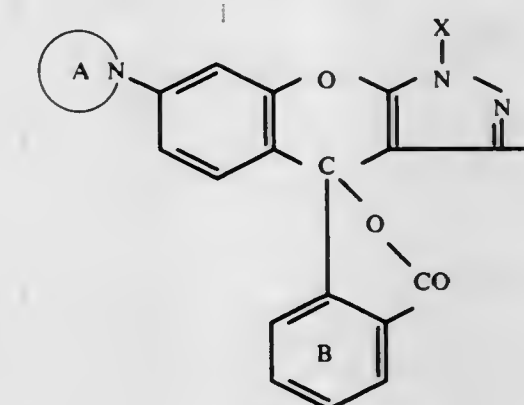
Claims priority, application Switzerland, Nov. 13, 1974, 15130/74

Int. Cl.<sup>2</sup> C07D 491/02

U.S. Cl. 260-310 R

7 Claims

1. A chromenopyrazole of the formula



wherein

the ring A represents pyrrolidinyl,  
X and Y, independently of the other, represent alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 12 carbon atoms, phenyl or phenyl which is substituted by alkyl of 1 to 4 carbon atoms, nitro, halogen, amino or by an amino group which is mono- or disubstituted by alkyl of 1 to 12 carbon atoms acyl of 2 to 12 carbon atoms or by benzyl, and  
wherein the benzene ring B is unsubstituted or is substituted by a nitro group or by 1 to 4 halogen atoms.



4,011,238

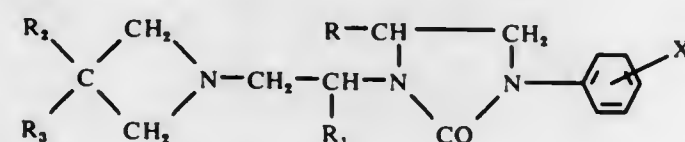
## 2-IMIDAZOLIDIONE DERIVATIVES

Luigi Fontanella, and Guilio Maffii, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy  
Continuation of Ser. No. 367,675, June 6, 1973, abandoned.  
This application July 7, 1975, Ser. No. 593,358  
Claims priority, application Italy, July 26, 1972, 27404/72  
Int. Cl.<sup>2</sup> C07D 403/06

U.S. Cl. 260—309.7

3 Claims

1. A compound represented by the formula



wherein R and R<sub>1</sub> independently represent H or lower alkyl, and R<sub>2</sub> and R<sub>3</sub> independently represent lower alkyl, X represents one or two substituents selected from lower alkyl, halo, lower alkoxy or trifluoromethyl, or a salt thereof with a pharmaceutically-acceptable acid.

4,011,239

## SELECTIVE REACTIONS OF FREE RADICALS WITH OLEFINS IN THE PRESENCE OF AN ION OF Mn, V, OR Ce

El Ahmadi I. Heiba, Princeton, and Ralph M. Dessau, Highland Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

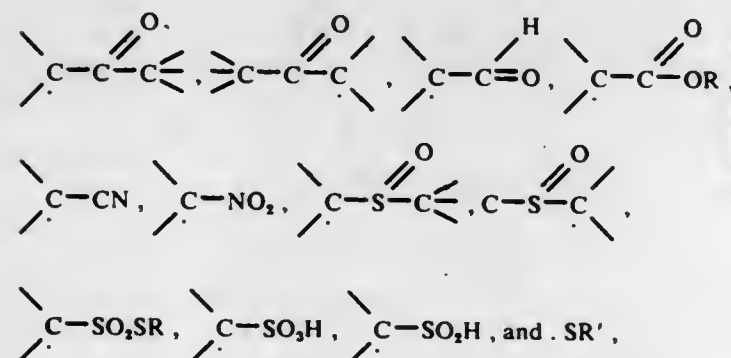
Continuation-in-part of Ser. No. 755,732, Aug. 27, 1968, abandoned, and a continuation-in-part of Ser. No. 714,447, March 20, 1968, abandoned. This application Sept. 24, 1973, Ser. No. 400,484

Int. Cl.<sup>2</sup> C07D 327/04; C07C 69/52, 45/02

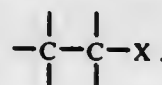
U.S. Cl. 260—327 S

58 Claims

1. Method of selectively reacting a free radical X with an olefin, said free radical X being selected from the group consisting of



Where R is an alkyl group and R' is a hydrocarbyl or substituted hydrocarbyl group, and said free radical being derived respectively from a ketone, a ketone, an aldehyde, an ester, a nitrile, a nitroparaffin, a sulfoxide, a sulfone, a thiosulfonic acid ester, an alkanesulfonic acid, an alkanesulfonic acid, and a thiol, comprising reacting said olefin, a compound selected from the group consisting of ketones, aldehydes, esters, nitriles, sulfoxides, nitroparaffins, thiosulfonic acid esters, alkanesulfonic acids, alkanesulfonic acids, and thiols, and a stoichiometric quantity of an ion of manganese, vanadium, or cerium having a valence higher than the lowest valence above the zero valent form of the metal to form a product containing the structure



4,011,240

## SUBSTITUTED CYSTEINES

Roland-Yves Mauvernay, Riom; Andre Monteil, Gerzat; Jacques Simond, Chamallieres; Jacques Moleyre, Mozac, and Norbert Busch, Loubeyrat, all of France, assignors to Centre Europeen de Recherches Mauvernay (CERM), Riom, France

Filed Oct. 12, 1972, Ser. No. 296,902

Claims priority, application France, Oct. 13, 1971, 71.36840

Int. Cl.<sup>2</sup> C07D 333/16

U.S. Cl. 260—332.2 A

3 Claims

1. N-acetyl-S-(3-paramethoxyphenyl-3-oxo) propylcysteine.
2. N-acetyl-S-(3-thien-2-yl-3-oxo) propylcysteine.
3. N-acetyl-S-(3-paramethoxyphenyl-3-oxo-2-methyl) propylcysteine.

4,011,241

## AN INTERMEDIATE IN THE PREPARATION OF 2-(5H-DIBENZO[a,d]CYCLOHEPTEN-5-ON-2-YL)ACETIC, PROPIONIC AND BUTYRIC ACIDS

Peter H. Nelson, and Karl G. Untch, Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

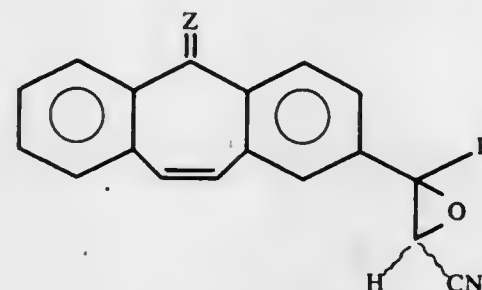
Filed Sept. 8, 1975, Ser. No. 611,053

Int. Cl.<sup>2</sup> C07D 303/02

U.S. Cl. 260—348 R

2 Claims

1. A compound represented by the formula



wherein R is hydrogen, methyl or ethyl and Z is oxo.

4,011,242

## PROSTAGLANDIN INTERMEDIATES AND PROCESSES FOR PREPARATION OF PROSTAGLANDIN INTERMEDIATES

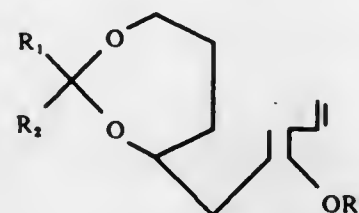
Lawrence Libit, 240 E. O'Keefe St., Palo Alto, Calif.

Division of Ser. No. 230,939, March 1, 1972, Pat. No. 3,859,188. This application Jan. 6, 1975, Ser. No. 539,027  
Int. Cl.<sup>2</sup> C07D 319/08

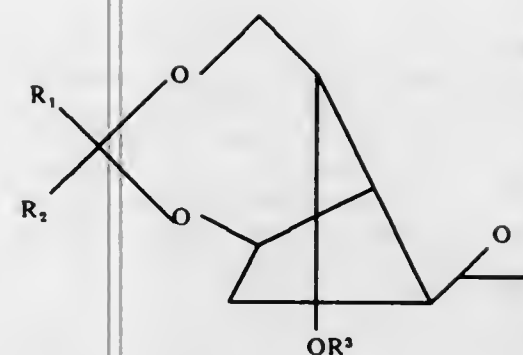
U.S. Cl. 260—340.3

6 Claims

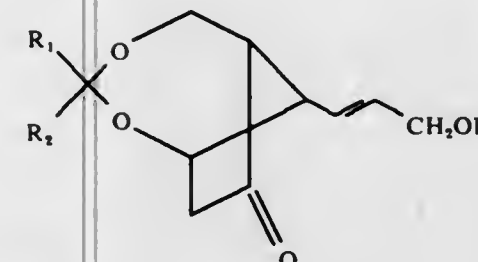
1. The process for the preparation of intermediates useful in the production of prostaglandins, the steps which comprise subjecting a compound corresponding to the formula



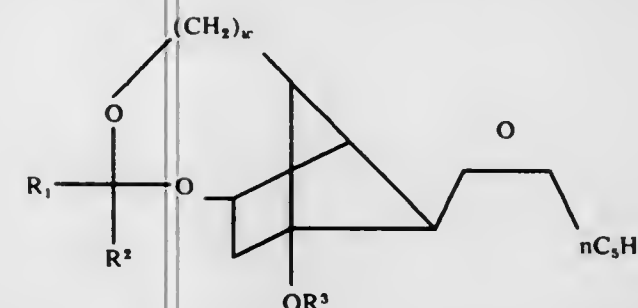
where R<sub>1</sub> and R<sub>2</sub> are the same or different alkyl, cycloalkyl or aralkyl groups containing up to 8 carbon atoms, and R<sub>3</sub> is acyl, selected from the group consisting of acetyl, propionyl, butyryl, benzoyl and cyclohexylacetyl, to irradiation in the presence of a photosensitizing agent to effect photocyclization of said compound, and then epoxidizing said photocyclized compound to produce a compound corresponding to the formula



2. The process of claim 1, in which the epoxidized compound is then cleaved to produce a keto-alcohol corresponding to the formula



3. A chemical compound corresponding to the formula



where R<sub>1</sub> and R<sub>2</sub> are the same or different alkyl or cycloalkyl or aralkyl groups containing up to 8 carbon atoms, R<sub>3</sub> is a member selected from the group consisting of acetyl, propionyl, butyryl, benzoyl and cyclohexylacetyl and w is an integer from 1 to 10.

4,011,243

## INTERMEDIATE IN THE OXIDATIVE PROCESS FOR THE PREPARATION OF 2-(5H-DIBENZO[a,d]CYCLOHEPTEN-5-ON-2-YL)ACETIC, PROPIONIC AND BUTYRIC ACIDS

Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

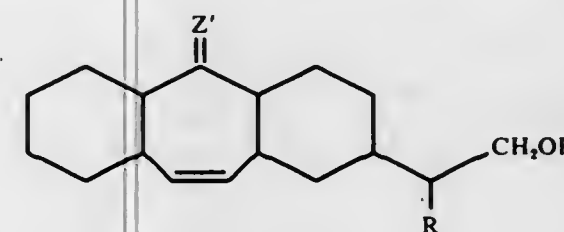
Filed Sept. 8, 1975, Ser. No. 611,054

Int. Cl.<sup>2</sup> C07D 317/72

U.S. Cl. 260—340.9

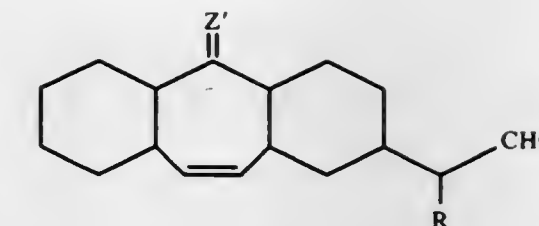
4 Claims

1. A compound represented by the formula



wherein R is hydrogen, methyl or ethyl and Z' is a conventional ketal protecting group selected from the group consisting of ethylene, 1,3-propylene, 2,2-dimethyl-1,3-propylene and 2,3-butylene.

3. A compound represented by the formula



wherein R is hydrogen, methyl or ethyl and Z' is a conventional ketal protecting group selected from the group consisting of ethylene, 1,3-propylene, 2,2-dimethyl-1,3-propylene and 2,3-butylene.

4,011,244

## PROCESS FOR PREPARING TETRAHYDROFURAN William Edward Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 420,851, Dec. 3, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 623,904  
Int. Cl.<sup>2</sup> C07D 307/08

U.S. Cl. 260—346.1 R

2 Claims

1. A process for preparing tetrahydrofuran which comprises heating a carboxylic acid monoester of 1,4-butanediol in the vapor phase in the presence of a dehydroacyloxylation catalyst selected from the group consisting of alumina, silica, silica-alumina, and silica-magnesia under substantially anhydrous conditions at a temperature in the range of from 200° C to about 325° C.

4,011,245

## METHOD FOR THE MANUFACTURE OF 2,6,10,10-TETRAMETHYL-1-OXASPIRO 4,5-DEC-6-ENE Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Mar. 5, 1976, Ser. No. 664,212  
Claims priority, application Switzerland, Mar. 11, 1975, 3053/75; Dec. 30, 1975, 16871/75

Int. Cl.<sup>2</sup> C07D 307/94

U.S. Cl. 260—346.1 R

5 Claims

1. A process for the manufacture of theaspiran, which process comprises treating 4-(2,6,6-trimethyl-2-cyclohexen-1-ylidene)-butan-2-ol with an acid.

4,011,246

## 2-[4-(3,4-DICARBOXYPHENOXY)PHENYL]-2-(4-HYDROXYPHENYL)PROPANE AND THE ANHYDRIDES THEREOF

Ronald L. Markezich, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

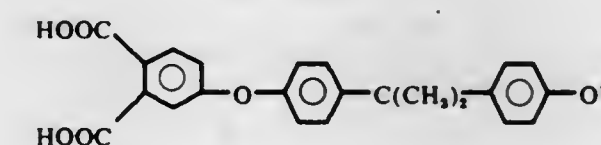
Filed Apr. 14, 1976, Ser. No. 676,855

Int. Cl.<sup>2</sup> C07D 307/89

U.S. Cl. 260—346.3

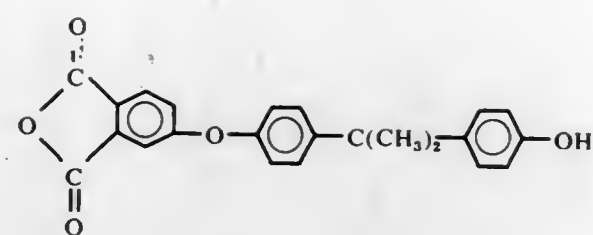
3 Claims

1. A bisphenol-A compound selected from the class consisting of a compound having the formula



and a compound having the formula





4,011,247

# METHOD FOR THE PREPARATION OF AN ORGANOHYDROGENPOLYSILOXANE AS A PRODUCT OF A PARTIAL ADDITION REACTION

Yasuhiko Sato; Hiroshi Inomata, and Toshio Shiobara, all of Annaka, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed Oct. 4, 1974, Ser. No. 512,369

Claims priority, application Japan, Oct. 8, 1973, 48-113047 Int. Cl.<sup>2</sup> C07D 301/00

U.S. Cl. 260—348 SC

6 Claims

1. A method for the preparation of an organohydrogenpolysiloxane comprising the steps of:

- A. partial addition reaction between
  - a. a cyclic or non-cyclic organic unsaturated compound with an aliphatic double bond in the molecule selected from the group consisting of ethylene, propylene, cyclohexene, styrene,  $\alpha$ -methylstyrene, methyl acrylate, ethyl acrylate, methyl methacrylate, ethyl methacrylate, allyl acetate, allyl acrylate, allyl methacrylate, allyl glycidyl ether, vinyl cyclohexene monoepoxide and 4-vinyl styrene oxide, and
  - b. starting organohydrogenpolysiloxane represented by the average formula



where R is methyl or phenyl, a and b are each positive numbers expressed as  $1 \leq a \leq 2$  and  $b \leq 1$ , respectively, with the proviso that  $2 \leq (a + b) \leq 3$ , and having at least two hydrogen atoms directly bonded to the silicon atoms through Si—H linkages in one molecule, in an amount such that the amount of said hydrogen atoms in said starting organohydrogenpolysiloxane is in excess over equimolar to said aliphatic double bond, in the presence of a platinum catalyst, by which part of said Si—H linkages are subjected to addition reaction with said aliphatic double bonds and the remaining of said Si—H linkages are left unreacted,

- B. addition of a compound selected from the group consisting of benzothiazole, 2,2'-dithiobenzothiazole, 2-(morpholiniothio)benzothiazole, and 2-(morpholinodithio)benzothiazole to the reaction mixture obtained by said partial addition reaction in an amount larger than equimolar to said platinum catalyst, and
- C. recovery of an organohydrogenpolysiloxane as the finished product by distillation.

4,011,248

# ORGANIC COMPOUNDS

Istvan Toth, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Dec. 1, 1975, Ser. No. 636,816

Claims priority, application Switzerland, Dec. 5, 1974, 16158/74

Int. Cl.<sup>2</sup> C09B 1/00

U.S. Cl. 260—369

11 Claims

1. A process of purifying 1-nitroanthraquinone in admixture with dinitroanthraquinone as impurity which comprises selectively converting the dinitroanthraquinone to an amino derivative by treatment of the mixture with ammonia, converting the resulting amino derivative to acid addition salt form, and separating the acid addition salt form of the amino derivative from the 1-nitroanthraquinone on the basis of their different polarities.

4,011,249

# SUBSTITUTED KETO AND ALKOXY CARBONYL ESTERS OF 16-SUBSTITUTED PGE<sub>2</sub> TYPE COMPOUNDS

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 523,568, Nov. 14, 1974. This application

Nov. 21, 1975, Ser. No. 634,124

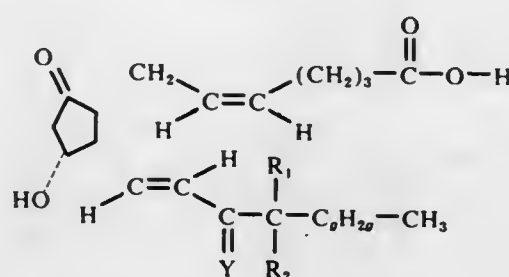
The portion of the term of this patent subsequent to July 8, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C07C 177/00

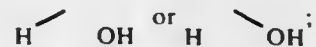
U.S. Cl. 260—390

11 Claims

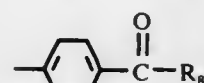
1. An optically active compound of the formula



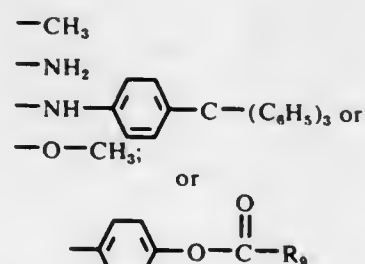
or a racemic mixture of that compound and the enantiomer thereof. Wherein  $C_6H_{12}$  is alkylene of one to 6 carbon atoms inclusive, with one to 5 carbon atoms inclusive, in the chain between  $-CR_1R_2-$  and (terminal methyl:  $R_1$  and  $R_2$  are hydrogen, methyl, ethyl, or fluoro, being the same or different, with the proviso that at least one of  $R_1$  and  $R_2$  is other than hydrogen, and with the further proviso that  $R_2$  is fluoro only when  $R_1$  is hydrogen or fluoro; Y is



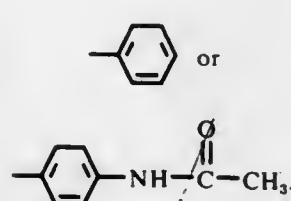
and E is



(1)

wherein  $R_8$  is

(2)

wherein  $R_9$  is

4,011,250

# 1 $\alpha$ , 2 $\alpha$ -DIHYDROXYCHOLECALCIFEROL AND PROCESS FOR PREPARING THE SAME

Masayuki Ishikawa; Chikara Kaneko, both of Tokyo; Satoshi Sasaki, Higashiyama; Tatsuo Suda, Tachikawa; Sachiko Yamada, Kawagoe, and Akiko Sugimoto, Hino, all of Japan, assignors to Masayuki Ishikawa; Chikara Kaneko; Satoshi Sasaki and Tatsuo Suda, all of Tokyo, Japan

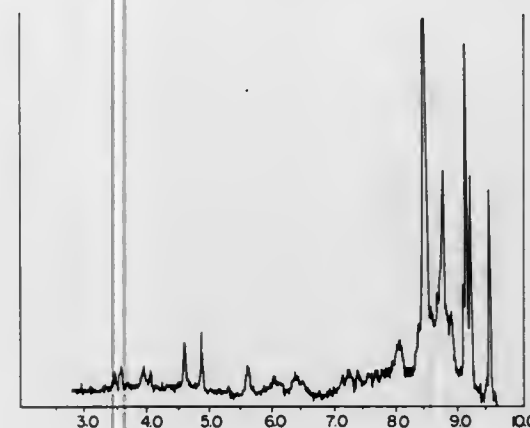
Filed Aug. 6, 1975, Ser. No. 602,363

Claims priority, application Japan, Aug. 7, 1974, 49-89835

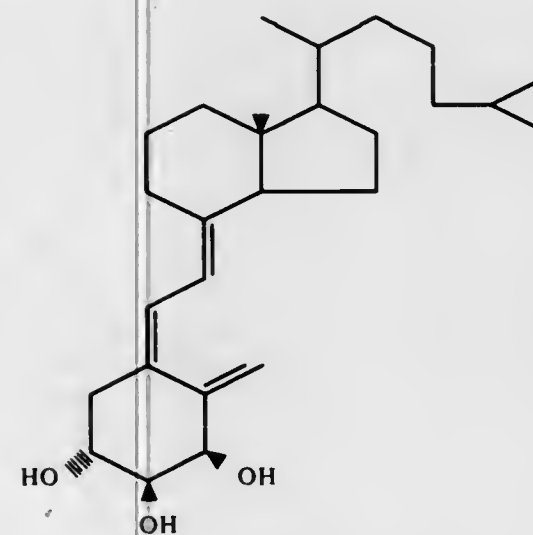
Int. Cl.<sup>2</sup> C07J 71/00, 9/00

U.S. Cl. 260—397.2

1 Claim



1. 1 $\alpha$ , 2 $\alpha$ -dihydroxycholecalciferol represented by the formula



4,011,251

# METHOD OF PREPARING ESTERS OF GLYCEROL AND POLYGLYCEROLS AND C5-C9 MONOCARBOXYLIC FATTY ACIDS

Boris Konstantinovich Tjurin, prospekt Oktyabrya, 71, kv. 116; Appolon Lukich Momot, prospekt Lenina, 26, kv. 2; Nikolai Lvovich Volodin, ulitsa Revoljutsionnaya, 7, kv. 12; Valentina Trofimovna Peremitina, prospekt Oktyabrya, 27, kv. 53; Anna Vasilievna Evdokimova, ulitsa Druzhby, 68, kv. 109; Vyacheslav Petrovich Churov, ulitsa Zheleznodorozhnaya, 14, kv. 9, all of Sterlitamak, Bashkirskaya ASSR; Samuil Markovich Krugly, ulitsa Khlobystova, 6, kv. 14, Moscow, and Gabbulbar Garifzyanovich Garifzyanov, ulitsa Revoljutsionnaya, 7, kv. 25, Sterlitamak, Bashkirskaya ASSR, all of U.S.S.R.

Filed Mar. 13, 1975, Ser. No. 557,948

Int. Cl.<sup>2</sup> C09F 5/08; C11C 3/00

U.S. Cl. 260—410.6

3 Claims

1. Method of producing esters of glycerol and polyglycerols with  $C_5-C_9$  monocarboxylic fatty acids which comprises reacting the still residue resulting from the distillation of synthetic glycerol produced by a chlorine method and containing in said

residue glycerol, polyglycerols, sodium hydroxide and sodium chloride with  $C_5-C_9$  monocarboxylic fatty acids at a temperature of  $140^\circ - 210^\circ C$  with continuous distillation of water present in the reaction zone, thus forming a reaction mixture containing the corresponding esters, and isolating said esters from the reaction mixture.

4,011,252

# PRODUCTION OF FATTY ACIDS FROM ALKANES BY OXIDATION

Harold Robert Gerberich, Jr., and Edward F. Dougherty, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,280

Int. Cl.<sup>2</sup> C07C 51/20, 51/24, 51/26, 51/28

U.S. Cl. 260—413

9 Claims

1. A process for the production of fatty acids which comprises:

- a. oxidation of  $C_{20}$  to  $C_{30}$  normal alkanes with molecular oxygen at elevated temperatures and at pressures sufficient to maintain a liquid phase of said alkanes so as to produce an alkane oxidation product containing fatty acids, unreacted alkanes, and oxygenated hydrocarbon intermediates, said alkane oxidation product being comprised of an aqueous phase containing most of the  $C_1$  to  $C_6$  fatty acids and a hydrocarbon phase containing most of the  $C_7$  and higher fatty acids;
- b. hydrogenation of at least the said hydrocarbon phase of said alkane oxidation product by reacting same with molecular hydrogen under hydrogenation conditions utilizing a catalytic amount of a hydrogenation catalyst, the hydrogenation being carried to an extent sufficient to reduce the degree of unsaturation by at least 50% as measured by the iodine number in the material being hydrogenated but insufficient to substantially affect the fatty acids contained therein;
- c. oxidation by nitric acid oxidation of the product obtained in such hydrogenation so as to oxidize oxygenated hydrocarbon intermediates therein to fatty acids and produce a nitric acid oxidation product comprised of an aqueous phase containing most of the  $C_1$  to  $C_6$  fatty acids and a hydrocarbon phase containing most of the  $C_7$  and higher fatty acids, said nitric acid oxidation being conducted at elevated temperatures and pressures sufficient to maintain a liquid phase and in the presence of a catalytic amount of a nitric acid oxidation catalyst; and
- d. recovery of a fatty acid product from said nitric acid oxidation product.

4,011,253

# PROCESS FOR THE PRODUCTION OF SILICIC ACRYLATE COMPOUNDS AND RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 589,626, June 23, 1975,

abandoned, and Ser. No. 551,534, Feb. 21, 1975, Pat. No.

3,956,466. This application July 9, 1976, Ser. No. 703,925

Int. Cl.<sup>2</sup> C07F 7/08, 7/18

U.S. Cl. 260—448.2 E

9 Claims

1. The process for the production of silicic acrylate compounds and resinous products by the following steps:

- (a) adding about 100 parts by weight of dry granular alkali metal metasilicate slowly to 50 parts by weight of concentrated sulfuric acid (60–98% acid)
- (b) agitating said mixture to keep the temperature below  $100^\circ C$  and oxygen evolves from the mixture, thereby
- (c) producing a white granular mixture of a silicic acid compound and alkali metal sulfate;
- (d) washing said mixture with water, then filtering the mixture to remove the alkali metal sulfate and then air drying at  $25^\circ$  to  $75^\circ C$ , leaving a fine white granular silicic acid compound;
- (e) mixing about 50 parts by weight of said silicic acid



- compound with about 30 to 95 parts by weight of an acrylic acid compound;
- (f) adding an alkali catalyst in the ratio of 1% to 10% by weight of the silicic acid compound and acrylic acid compound;
- (g) heating the said mixture to just below the boiling point of the acrylic acid compound while agitating for about 20 to 60 minutes, thereby
- (h) producing a tan granular silicic acrylate compound.

4,011,254

## PROCESS FOR THE PURIFICATION OF DIAMINOMALEONITRILE

Tatsumi Kobayashi; Yutaka Takakura; Sadafumi Yoshino, and Yoshiaki Fukuda, all of Kurashiki, Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan  
Filed Aug. 19, 1975, Ser. No. 605,865

Claims priority, application Japan, Sept. 3, 1974, 49-101228

Int. Cl.<sup>2</sup> C07C 120/00, 121/45

U.S. Cl. 260—465.5 R

7 Claims

1. A process for the recovery of diaminomaleonitrile, in essentially pure form, from a crude mixture produced by the tetramerization of hydrogen cyanide and containing (a) diaminomaleonitrile, (b) a higher hydrogen cyanide polymer than the tetrameric diaminomaleonitrile which is soluble in a solvent for diaminomaleonitrile, and (c) a higher hydrogen cyanide polymer than tetrameric diaminomaleonitrile which is insoluble in a solvent for diaminomaleonitrile, comprising heating said crude mixture in a gaseous medium which is inert towards diaminomaleonitrile and is selected from the group consisting of air and nitrogen, at a temperature of about from 90° C to 140° C for about from 0.5 to 5 hours whereby said higher hydrogen cyanide polymer which is soluble in a diaminomaleonitrile solvent is converted to additional higher hydrogen cyanide polymer which is insoluble in a diaminomaleonitrile solvent, separating the diaminomaleonitrile from the insoluble higher polymer by extraction with a diaminomaleonitrile solvent, and removing the solvent from the resulting diaminomaleonitrile solution to obtain diaminomaleonitrile in a purity of about 99%.

4,011,255

## FLUOROALKYLENEETHER DIFUNCTIONAL COMPOUNDS

Christ Tamborski, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

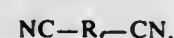
Filed Sept. 4, 1975, Ser. No. 610,520

Int. Cl.<sup>2</sup> C07C 121/28

U.S. Cl. 260—465.6

3 Claims

1. A fluoroalkyleneether difunctional compound having the following formula:



wherein  $\text{R}_f$  is  $\text{Y}[\text{CF}(\text{CF}_3)\text{CF}_2\text{O}]_n(\text{CF}_2)_m[\text{OCF}_2\text{CF}(\text{CF}_3)]_n\text{Y}$ , wherein each Y is  $(\text{CF}_3)_2\text{O}$  or  $\text{CF}(\text{CF}_3)\text{OCF}_2\text{CF}_2\text{O}$  and the carbon atom of each CN radical is bonded to a carbon atom, and wherein n is an integer from 1 to 5, inclusive.

4,011,256

## CYCLOHEXANE DERIVATIVES

Mikio Sawaki, Odawara; Isao Iwataki, Odawara; Yoshihiko Hirono, Hiratsuka, and Hisao Ishikawa, Odawara, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

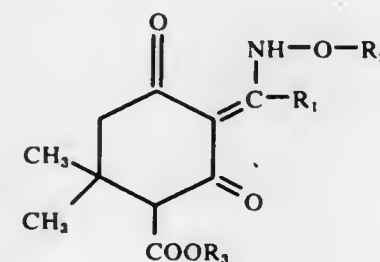
Division of Ser. No. 490,349, July 22, 1974, Pat. No. 3,950,420. This application Oct. 9, 1975, Ser. No. 620,862  
Claims priority, application Japan, Aug. 15, 1973, 48-91425; Mar. 7, 1974, 49-25714

Int. Cl.<sup>2</sup> C07C 101/42

U.S. Cl. 260—468 J

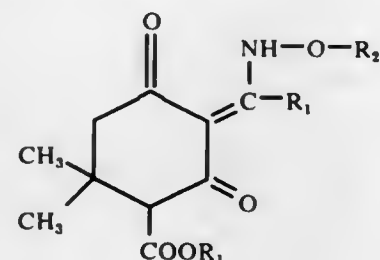
4 Claims

1. A compound of the formula



wherein

- $\text{R}_1$  is selected from the group consisting of ethyl and propyl,  
 $\text{R}_2$  is selected from the group consisting of ethyl and allyl,  
 $\text{R}_3$  is selected from the group consisting of methyl and ethyl.  
 3. The sodium, potassium, barium and calcium salts of a compound of the formula



wherein

- $\text{R}_1$  is selected from the group consisting of ethyl and propyl,  
 $\text{R}_2$  is selected from the group consisting of ethyl and allyl,  
 $\text{R}_3$  is selected from the group consisting of methyl and ethyl.

4,011,257

## PROCESS FOR PREPARING 5-OXA PROSTAGLANDIN ANALOGS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

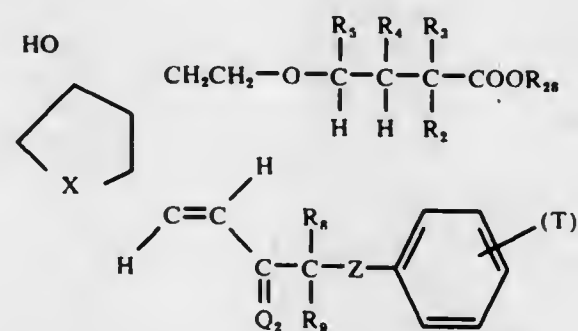
Continuation of Ser. No. 524,481, Nov. 18, 1974, abandoned, which is a division of Ser. No. 361,990, May 21, 1973, Pat. No. 3,864,387. This application Feb. 26, 1976, Ser. No. 661,573

Int. Cl.<sup>2</sup> C07C 69/76

U.S. Cl. 260—473 G

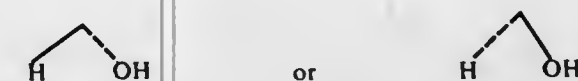
12 Claims

1. A process for preparing an optically active compound of the formula

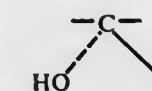


or a racemic compound of that formula and the mirror image thereof, wherein Z represents an oxo atom ( $-\text{O}-$ ) or  $\text{C}_2\text{H}_5$ ,

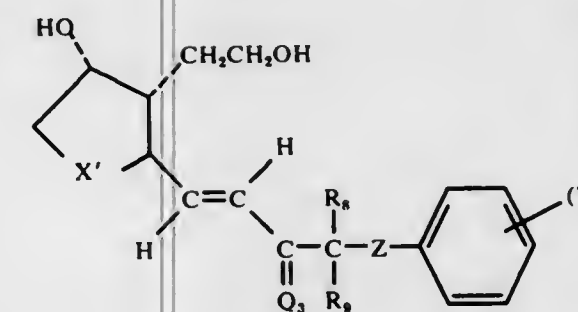
wherein  $\text{C}_2\text{H}_5$  is a valence bond or alkylene of one to 9 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 6 carbon atoms, inclusive between  $-\text{CR}_2\text{R}_3-$  and the ring; wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or  $-\text{OR}_{10}$ , wherein  $\text{R}_{10}$  is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; wherein  $\text{Q}_2$  is



wherein, when Z is oxo ( $-\text{O}-$ ),  $\text{R}_4$  and  $\text{R}_5$  are hydrogen or alkyl of 1 to 4 carbon atoms, being the same or different, and, when Z is  $\text{C}_2\text{H}_5$ ,  $\text{R}_4$  and  $\text{R}_5$  are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that  $\text{R}_6$  is fluoro only when  $\text{R}_8$  is hydrogen or fluoro; wherein  $\text{R}_3$  is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro; wherein  $\text{R}_2$  is hydrogen or fluoro, with the proviso that  $\text{R}_2$  is fluoro only when  $\text{R}_3$  is hydrogen or fluoro; wherein  $\text{R}_4$  and  $\text{R}_5$  are hydrogen or alkyl of one to 4 carbon atoms, inclusive, being the same or different, with the proviso that no more than one of  $\text{R}_3$ ,  $\text{R}_4$ , and  $\text{R}_5$  is alkyl; and wherein  $\text{R}_{26}$  is alkyl of one to 3 carbon atoms, inclusive; and wherein X is

or  $-\text{CH}_2-$ ;

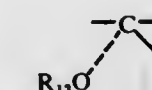
which comprises starting with an optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein  $\text{Q}_3$  is

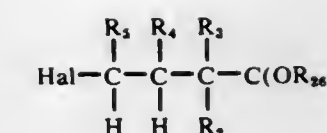


wherein  $\text{R}_{13}$  is a blocking group, wherein X' is

or  $-\text{CH}_2-$ ,

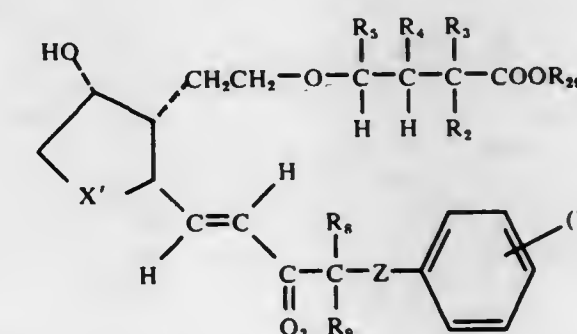
and wherein  $\text{R}_4$ ,  $\text{R}_5$ , Z, T, and s are as defined above; and subjecting said compound successively to the following reactions:

a. alkylation with an omega-halo ortho ester of the formula



wherein Hal is chloro, bromo, or iodo, and wherein  $\text{R}_2$ ,  $\text{R}_3$ ,  $\text{R}_4$ ,  $\text{R}_5$  and  $\text{R}_{26}$  are as defined above, in the presence of a base, with the proviso that, when the base is an organolithium compound, there is present either hexamethylphosphoramide or dimethyl formamide;

b. transformation of the product of step a) to an optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein  $\text{Q}_3$ ,  $\text{R}_2$ ,  $\text{R}_3$ ,  $\text{R}_4$ ,  $\text{R}_5$ ,  $\text{R}_6$ ,  $\text{R}_9$ ,  $\text{R}_{13}$ ,  $\text{R}_{26}$ , S, T, X', and Z are as defined above, by hydrolysis; and

c. replacement of the blocking groups with hydrogen, by hydrolysis.

4,011,258

## ORALLY ACTIVE BRONCHOSPASMOLYTIC COMPOUNDS

Kjell Ingvar Leopold Wetterlin, Sandby, and Lelf Ake Svensson, Lund, both of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

Division of Ser. No. 372,497, June 21, 1973, Pat. No. 3,937,838, which is a continuation-in-part of Ser. No. 55,791, July 17, 1970, and Ser. No. 55,676, July 17, 1970, said Ser. No. 55,791, said Ser. No. 55,676, each is a continuation-in-part of Ser. No. 676,288, Oct. 18, 1967, abandoned. This application July 7, 1975, Ser. No. 593,424

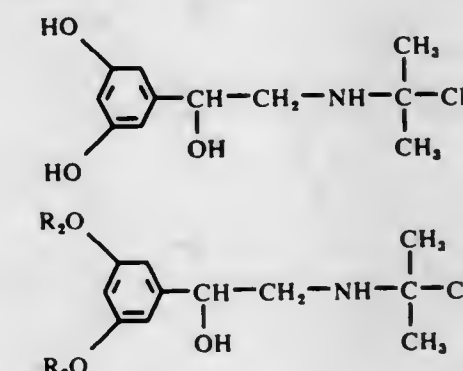
Int. Cl.<sup>2</sup> C07C 93/26, 91/34

U.S. Cl. 260—479 R

3 Claims

1. A compound effective for producing bronchial dilation in animals, including humans, selected from the group consisting of

i. ethanol amines having the formulas



and

wherein  $\text{R}_2$  is the acyl radical of a 2-5 carbon fatty acid and ii. pharmaceutically acceptable salts thereof.



4,011,259

## MONOMERIC EMULSION STABILIZERS

Carlos M. Samour, Wellesley Hills, and Mildred C. Richards, Wakefield, both of Mass., assignors to The Kendall Company, Walpole, Mass.

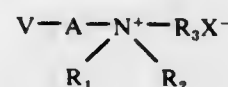
Division of Ser. No. 496,321, Aug. 9, 1974, Pat. No. 3,928,423, which is a division of Ser. No. 272,282, July 17, 1972, abandoned, which is a division of Ser. No. 867,899, Oct. 20, 1969, Pat. No. 3,780,092. This application July 11, 1975, Ser. No. 595,296

Int. Cl.<sup>2</sup> C07C 93/00, 103/70

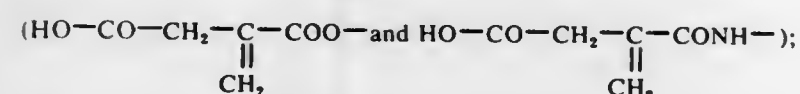
U.S. Cl. 260—485 H

2 Claims

1. Compound corresponding to the formula

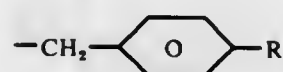


wherein V is selected from the class consisting of acid ester groups and acid amido groups derived from maleic, (HO—CO—CH=CH—COO— and HO—CO—CH=CH—CONH—), citraconic, (HO—CO—CH=C(CH<sub>3</sub>)—COO— and HO—CO—CH=C(CH<sub>3</sub>)CONH—), and itaconic acids

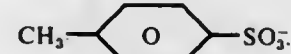


A is selected from the class consisting of ethylene (—CH<sub>2</sub>—CH<sub>2</sub>—); propylene (—CH<sub>2</sub>—CH<sub>2</sub>—CH<sub>2</sub>—); isopropylene (—CH<sub>2</sub>—CH(CH<sub>3</sub>)—); hydroxypropylene (—CH<sub>2</sub>—CHOH—CH<sub>2</sub>—); and acetoxypolypropylene (—CH<sub>2</sub>—CH(OCOCH<sub>3</sub>)—CH<sub>2</sub>—) groups;

R<sub>1</sub> and R<sub>2</sub> are selected from the class consisting of benzyl groups and alkyl groups of from 1 to 7 carbon atoms; R<sub>3</sub> is a



group wherein R is a saturated aliphatic hydrocarbon group of 7 to 28 carbon atoms; and X is a radical selected from the class consisting of F<sup>-</sup>, Cl<sup>-</sup>, Br<sup>-</sup>, I<sup>-</sup>, CH<sub>3</sub>SO<sub>4</sub><sup>-</sup>, C<sub>2</sub>H<sub>5</sub>SO<sub>4</sub><sup>-</sup>, and



4,011,260

## 3-AMINO-N-SUBSTITUTED SUCCINAMIC ACIDS AND INTERMEDIATES THEREOF

Arthur H. Goldkamp, Bellevue, Wash.; Robert H. Mazur, Deerfield, and James M. Schlatter, Glenview, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 56,753, July 20, 1970, Pat. No. 3,803,223, which is a continuation-in-part of Ser. No. 704,229, Feb. 9, 1968, abandoned. This application Feb. 14, 1974, Ser. No. 442,431

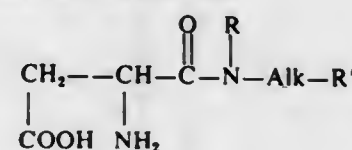
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07C 103/50

U.S. Cl. 260—514 J

5 Claims

1. A compound of the formula



wherein R is hydrogen or a methyl radical, Alk is a lower alkylene radical and R' is a cyclohexyl radical.

4,011,261

## PROCESS FOR THE MANUFACTURE OF 1,4-DISUBSTITUTED BICYCLIC OR TRICYCLIC COMPOUNDS AND NEW 1,4-DISUBSTITUTED BICYCLIC COMPOUNDS

Leonardo Guglielmetti, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1975, Ser. No. 629,180

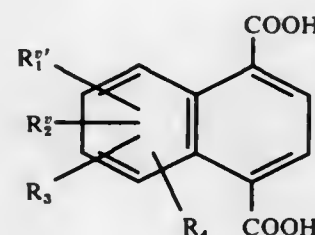
Claims priority, application Switzerland, Nov. 14, 1974, 15190/74

Int. Cl.<sup>2</sup> C07C 51/08, 63/38

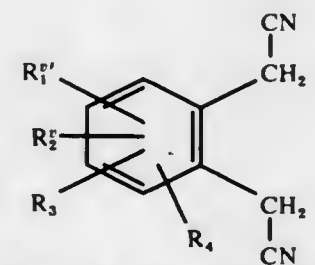
U.S. Cl. 260—515 P

7 Claims

1. A process for the manufacture of bicyclic or tricyclic compounds of formula



wherein R<sub>1</sub><sup>v</sup> represents hydrogen, halogen, alkyl, alkoxy, carboxy, sulfo, —SO<sub>2</sub>NR<sub>5</sub>R<sub>6</sub>, wherein each of R<sub>5</sub> and R<sub>6</sub> independently represents hydrogen or alkyl, or together they complete a 5- or 6-membered heterocyclic ring, alkylsulphonyl, arylsulphonyl, nitro, or together with R<sub>2</sub><sup>v</sup> completes a 6-membered aromatic ring or represents the methylenedioxy radical, R<sub>2</sub><sup>v</sup> represents hydrogen, halogen, alkyl, alkoxy, carboxy, alkylsulphonyl, nitro, or together with R<sub>1</sub><sup>v</sup> completes a 6-membered aromatic ring or represents the methylenedioxy radical, R<sub>3</sub> represents hydrogen, halogen or alkyl, and R<sub>4</sub> represents hydrogen, halogen or alkyl, which process comprises reacting at a temperature below 50° C an o-xylylene dicyanide of formula



wherein R<sub>1</sub><sup>v</sup>, R<sub>2</sub><sup>v</sup>, R<sub>3</sub> and R<sub>4</sub> are as defined hereinbefore, with glyoxal in the presence of a base and a solvent, and saponifying the resultant reaction product, without isolating it, with an acid or a base, at temperatures above 50° C.

4,011,262

## 13,14-DIHYDRO-15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS OF THE TWO SERIES

Hans-Jurgen E. Hess, Old Lyme; Michael R. Johnson, Gales Ferry; Jasjit S. Bindra, Groton, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. Nos. 271,220, July 13, 1972, abandoned, and Ser. No. 425,519, Dec. 17, 1973, abandoned.

This application July 3, 1974, Ser. No. 485,431

Int. Cl.<sup>2</sup> C07C 61/06

U.S. Cl. 260—520 B

13 Claims

1. 13,14 dihydro-ω-pentanorprostaglandins of the A<sub>2</sub>, F<sub>2</sub> and E<sub>2</sub> series having at the 15-position one hydrogen or lower alkyl substituent and one substituent of the formula:

Ar—CH<sub>2</sub>—

wherein Ar is α- or β-naphthyl; phenyl; 3,4-dimethoxyphenyl; 3,4-methylenedioxyphenyl; 3,4,5-trimethoxyphenyl; or monosubstituted phenyl wherein said substituent is halo, trifluoromethyl, phenyl, lower alkyl or lower alkoxy.

4,011,263

## PROCESS FOR THE PRODUCTION OF N-ACETYL-L-METHIONINE

Hans Wagner, Constance, and Alfred Maierhofer, Allensbach, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed May 11, 1976, Ser. No. 685,420

Claims priority, application Germany, July 4, 1975, 2529854

Int. Cl.<sup>2</sup> C07C 101/04

U.S. Cl. 260—534 S

10 Claims

1. A process for the production of N-acetyl-L-methionine comprising reacting L-methionine with acetic anhydride in the presence of aqueous alkali at a temperature between about 20° and 60° C., while maintaining the pH between about 6.5 and 10.0.

4,011,264

## CARBOXYMETHYLOXYSUCCINATES

Ralph House, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

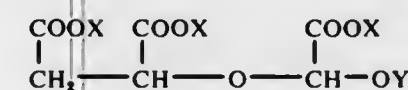
Filed Dec. 20, 1974, Ser. No. 534,999

Int. Cl.<sup>2</sup> C07C 59/12

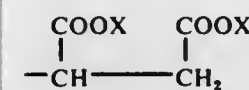
U.S. Cl. 260—535 P

5 Claims

1. Detergent-active materials of the formula



wherein Y is H or



and X is H or a water-soluble salt-forming cation.

4,011,265

## 3,3''-DIAMINO- OR

3,3''-DIMETHOXY-OCTANITRO-M-TERPHENYL Joseph C. Dacons, Washington, D.C., and Richard R. Minesinger, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

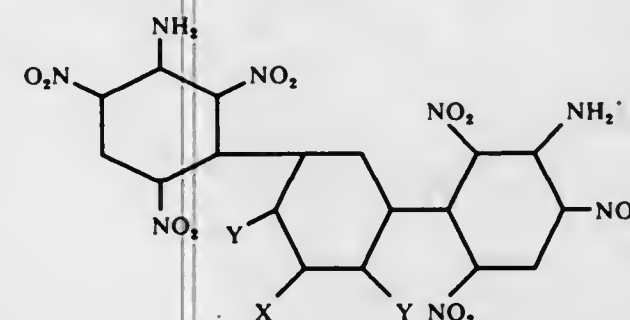
Filed Mar. 19, 1970, Ser. No. 24,914

Int. Cl.<sup>2</sup> C07C 87/60

U.S. Cl. 260—578

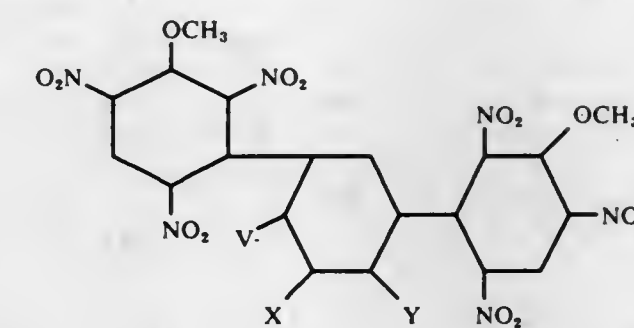
6 Claims

1. A compound according to the formula



wherein X and Y are selected from the group consisting of H and NO<sub>2</sub> provided that when X is H, Y is NO<sub>2</sub> and when Y is H, X is NO<sub>2</sub>.

4. A compound according to the formula



wherein X and Y are selected from the group consisting of H and NO<sub>2</sub> provided that when X is H, Y is NO<sub>2</sub> and when Y is H, X is NO<sub>2</sub>.

4,011,266

## 2-VINYL-FLUORENONE AND DERIVATIVES THEREOF James M. Pearson, Webster, and John F. Yanus, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

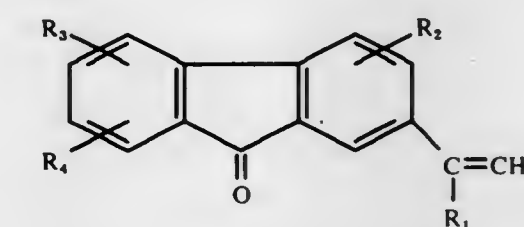
Filed Oct. 31, 1973, Ser. No. 411,577

Int. Cl.<sup>2</sup> C07C 49/76, 49/84

U.S. Cl. 260—590 FB

8 Claims

1. A composition of matter characterized by the structural formula:



wherein R<sub>1</sub> is hydrogen or methyl and R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are hydrogen, halogen, substituted or unsubstituted alkyl groups containing 1 to 4 carbon atoms or alkoxy groups containing 1 to 4 carbon atoms.

4,011,267

## PERFLUOROALKYLETHETHER SUBSTITUTED ARYL PHOSPHINES AND THEIR SYNTHESIS

Christ Tamborski, Dayton, and Carl E. Snyder, Jr., Trotwood, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

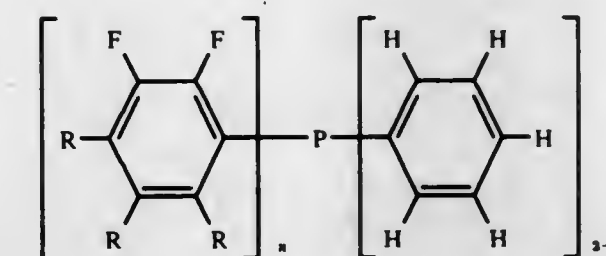
Filed Nov. 6, 1975, Ser. No. 629,469

Int. Cl.<sup>2</sup> C07F 9/50

U.S. Cl. 260—606.5 P

8 Claims

1. A fluorinated phosphine having the following formula:



where one of the R's is a perfluoroalkylether group, two of the R's are fluorine, and n is 1, 2 or 3.



4,011,268

METHOD OF PREPARING MONOETHERS OF  
ALKYLENE GLYCOLS

Suzanne V. McKinley, Wellesley, Mass., and Joseph W. Rakshys, Jr., Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

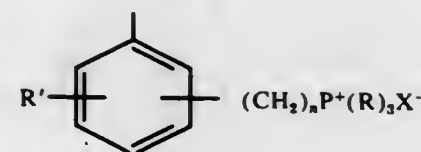
Continuation of Ser. No. 390,453, Aug. 22, 1973, abandoned. This application Sept. 25, 1975, Ser. No. 616,727

Int. Cl.<sup>2</sup> C07C 41/02

U.S. Cl. 260—613 D

14 Claims

1. A method of preparing monomers of alkylene glycols comprising commingling a 1,2- or 1,3-epoxide having from 2 to about 8 C atoms with an unsubstituted monohydroxy compound having from 1 to 10 C atoms, at a temperature of from about 50° to about 150° C., in the presence of a catalytically active amount of a catalyst which is a polymer, insoluble in the reaction mixture, having a carbon to carbon backbone, cross-linked with carbon to carbon atoms, said polymer having a plurality of



or  $\text{CO}_2(\text{CH}_2)_m\text{P}^+(\text{R})_3\text{X}^-$  pendant groups wherein n is an integer from 1 to 3, m is an integer from 1-6, R is an alkyl group of from 1 to about 6 C atoms, R' is H, CN or one or more alkyl groups having a total of up to 6 C atoms, and X is hydroxyl, an alkoxy group of 1-10 C atoms, a cycloalkoxy group of 5-10 C atoms or an aryloxy group of 6-10 C atoms.

4,011,269

PROCESS FOR THE PREPARATION OF  
SESQUITERPENIC DERIVATIVES

Ferdinand Näf, Geneva, and Gunther Ohloff, Bernex, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Filed Aug. 20, 1975, Ser. No. 606,054

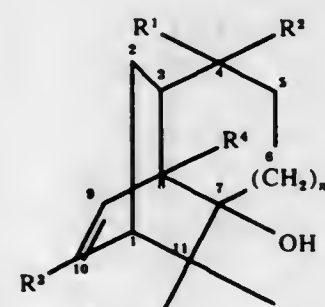
Claims priority, application Switzerland, Aug. 23, 1974, 11503/74

Int. Cl.<sup>2</sup> C07C 29/00

U.S. Cl. 260—617 R

9 Claims

1. A process for the preparation of a compound of formula (I)

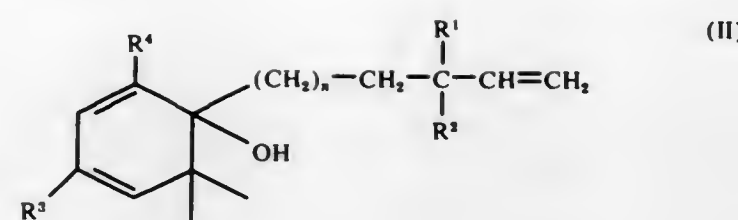


and wherein:

each of symbols  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$  and  $\text{R}^4$ , identical or different, represents a hydrogen atom or an alkyl radical containing from 1 to 6 carbon atoms, and the index n stands for zero or 1

which comprises reacting

A hydroxyl compound of formula (II)



wherein the index n and the symbols  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^3$  and  $\text{R}^4$  have the aforementioned meaning, at a temperature from about 200° to about 400° C and a pressure of from about 1 to 20 atmospheres, with a strongly basic agent, to yield the compound of formula (I).

4,011,270

RECRYSTALLIZED MENTHOL PRODUCT AND  
METHOD OF MAKING

Richard Gardner Carrington, Chehalis, Wash., assignor to I. P. Callison & Sons, Inc., Seattle, Wash.

Filed May 28, 1974, Ser. No. 473,733

Int. Cl.<sup>2</sup> C07C 35/12

U.S. Cl. 260—631 R

6 Claims

1. A method of obtaining a menthol product from crude natural menthol, comprising the steps of:

dissolving the crude natural menthol in an alcohol-water solution containing 20-40% by volume ethyl alcohol, with the remainder water, to form an emulsion thereof at a temperature ranging from 18°-25° C.,

allowing phase separation of the emulsion in a clear glass vessel into an upper phase and a lower phase, the upper phase containing liquid menthol and ethyl alcohol and the lower phase containing primarily water, some alcohol and residual liquid menthol, and in the presence of light

suspending a glass rod or synthetic plastic-coated glass rod in the upper phase with the lower end of the rod touching the interface between the upper and lower phases but not entering the lower phase, the menthol contained in the upper phase recrystallizing on the rod above the liquid level of the upper phase.

6. A crystalline menthol product obtained from crude menthol crystals by:

(1) dissolving crude natural menthol in an alcohol-water solution containing 20-40% by volume ethyl alcohol and the remainder water; in a glass vessel at a temperature ranging from 18°-25° C. to form an emulsion thereof,

allowing phase separation of the emulsion in a clear glass vessel into upper and lower phases, the upper phase being clear and containing liquid menthol and alcohol and the lower phase being milky in appearance and containing primarily water, along with some alcohol and residual liquid menthol, and in the presence of light

suspending a glass rod or a synthetic plastic-coated glass rod in the upper phase with the lower end of the rod touching the interface between the upper and lower phases but not entering the lower phase, the crystalline menthol product recrystallizing on the rod above the liquid level of the upper phase, the rod having an outer exposed surface of a material selected from the group consisting of glass, polyethylene or polypropylene.

4,011,271

PREPARATION AND USE OF MAGNESIUM ACETYLENE  
COMPLEX

John Nicholson Gardner, Garrison, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

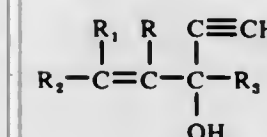
Division of Ser. No. 460,846, April 15, 1974, Pat. No. 3,985,817, which is a continuation-in-part of Ser. No. 402,544, Oct. 1, 1973, abandoned. This application May 3, 1976, Ser. No. 682,247

Int. Cl.<sup>2</sup> C07C 29/00

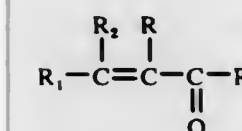
U.S. Cl. 260—638 Y

6 Claims

1. A process for the producing an ethynyl carbinol of the formula:



wherein  $\text{R}_1$  is lower alkyl, lower alkenyl or hydrogen;  $\text{R}_2$  is hydrogen or a hydrocarbon having from 1 to 18 carbon atoms;  $\text{R}_1$  and  $\text{R}_2$  taken together with their attached carbon atom form a cyclic member selected from the group consisting of cyclo lower alkyl or cyclo lower alkenyl; and  $\text{R}$  and  $\text{R}_3$  are lower alkyl, lower alkenyl or hydrogen; comprising reacting a mixture of sodium acetylide and a magnesium acetylene complex with an oxo compound of the formula:



wherein  $\text{R}$ ,  $\text{R}_1$ ,  $\text{R}_2$  and  $\text{R}_3$  are as above; in a liquid ammonia reaction medium wherein the mixture contains at least 5% by weight of the magnesium acetylene complex said magnesium acetylene complex being prepared by a process comprising reacting in liquid ammonia, magnesium and acetylene gas wherein the reaction medium contains from about 5 to 97% by weight of sodium, as metal or as sodamide, based on the weight of sodium and magnesium.

4,011,272

PROCESS FOR PRODUCING TERTIARY BUTYL  
ALCOHOL

Hideo Matsuzawa; Minoru Ikeda; Yukinobu Sugimoto, and Shuji Uchida, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 479,037, June 13, 1974, abandoned. This application July 9, 1975, Ser. No. 594,354 Claims priority, application Japan, July 25, 1973, 48-83719; Mar. 7, 1974, 49-26491

Int. Cl.<sup>2</sup> C07C 29/04

U.S. Cl. 260—641

5 Claims

1. A process for continuously producing t-butyl alcohol, which comprises reacting isobutylene with water at 20° to 80° C in the presence of an acidic ion-exchanger and from 30 to 500 moles per 100 moles of water of a saturated aliphatic carboxylic acid having from 1-6 carbon atoms under conditions such that the liquid product obtained is a homogeneous solution.

4,011,273

METHOD FOR THE PRODUCTION OF GUERBET  
ALCOHOLS UTILIZING INSOLUBLE LEAD CATALYSTS

Phillip Gary Abend, Teaneck, and Peter Leenders, Allendale, both of N.J., assignors to Henkel Inc., Teaneck, N.J.

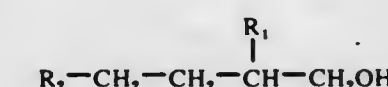
Filed Aug. 4, 1975, Ser. No. 601,371

Int. Cl.<sup>2</sup> C07C 29/00

U.S. Cl. 260—642 C

6 Claims

1. In the process for the condensation of alcohols by the Guerbet process for the production of branched alcohols having the formula



wherein  $\text{R}_2$  and  $\text{R}_1$  are members having from 2 to 20 carbon atoms selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl alkyl, phenylalkyl and alkylphenylalkyl comprising condensing an alcohol having the formula



with an alcohol having the formula



wherein  $\text{R}_2$  and  $\text{R}_1$  have the above-assigned values in the presence of an alkali under conditions whereby the water of reaction is removed substantially as fast as it is formed in the presence of a catalyst at temperatures above 100° C to the reflux temperature, and recovering said branched alcohols, the improvement consisting of conducting said condensation in the presence of from 0.05 to 3.0 gm per mol of total alcohol, of an insoluble lead salt of an oxyacid of a group IV element of the Periodic Table having a molecular weight greater than 27 selected from the group consisting of lead silicates, lead titanates, lead zirconates, lead germanates and lead hafnates, as said sole catalyst.

4,011,274

## 1,1-DIPHENYL ETHANE PROCESS

Masaaki Watanabe; Masao Hasegawa; Jiroye Yamada, and Kouichi Kobayashi, all of Tokyo, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Division of Ser. No. 423,986, Dec. 12, 1973, abandoned. This application May 19, 1976, Ser. No. 687,768

Claims priority, application Japan, Jan. 13, 1973, 48-6735

Int. Cl.<sup>2</sup> C07C 15/10

U.S. Cl. 260—668 C

4 Claims

1. A process for obtaining 1,1-diphenyl ethane, which comprises reacting ethylene and benzene to form ethyl benzene and high boiling by-products, and fractionally distilling said higher boiling by-products and recovering a fraction consisting essentially of 1,1-diphenyl ethane.

4,011,275

CONVERSION OF MODIFIED SYNTHESIS GAS TO  
OXYGENATED ORGANIC CHEMICALS

John C. Zahner, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 499,869

Int. Cl.<sup>2</sup> C07C 15/02

U.S. Cl. 260—668 R

9 Claims

1. In the process of converting synthesis gas to gasoline boiling range hydrocarbons by the sequential steps of converting said synthesis gas to a product comprising predominantly methanol and then converting at least the methanol portion of this product to gasoline boiling range hydrocarbons by contact thereof with a crystalline aluminosilicate zeolite having a silica



to alumina ratio of at least about 12, a constraint index of 1 to 12 and a crystal density of not substantially below about 1.6 grams per cubic centimeter, at a temperature of at least about 500° F; the improvement, whereby increasing the proportion of synthesis gas converted to said product comprising predominantly methanol and dimethyl ether available for conversion to gasoline boiling range hydrocarbons by contact with said zeolite, which comprises adjusting the hydrogen-carbon monoxide mole ratio in said synthesis gas to about 0.8 to 1.7, which is a hydrogen deficiency with respect to methanol stoichiometry; converting said hydrogen deficient synthesis gas, at elevated pressures of about 500 to 4000 psig, space velocity of about 10,000 hv<sup>-1</sup> to 40,000 hv<sup>-1</sup> and temperatures of about 400 to 570° F in contact with a solid metallic methanol synthesis catalyst having a solid acid component incorporated therewith, to a product comprising a high ratio of dimethyl ether to methanol and representing a high conversion of synthesis gas thereto; and converting at least said dimethyl ether and methanol to gasoline boiling range hydrocarbons as aforesaid.

4,011,276

## DISPROPORTIONATION OF TOLUENE

Chin-Chiun Chu, South Plainfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 28, 1976, Ser. No. 680,998

Int. Cl.<sup>2</sup> C07C 3/62

U.S. Cl. 260—672 T

13 Claims

1. A process for effecting disproportionation of toluene to produce benzene and xylenes in which the proportion of para-xylene isomer is in excess of its normal equilibrium concentration which comprises contacting toluene under conditions effective for accomplishing said disproportionation in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12, said catalyst having been modified by the addition thereto of phosphorus oxide and magnesium oxide, each in an amount of at least about 0.25 percent by weight.

4,011,277

## PREPARATION OF SQUALANE BY HYDROGENOLYSIS

Takashi Nishida; Yoichi Ninagawa; Kazuo Itoi, all of Kurashiki; Yutaka Omura, and Haruo Nagai, both of Niigata, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki and Kyowa Gas Chemical Industry Co., Ltd., Tokyo, both of Japan

Filed Mar. 25, 1974, Ser. No. 454,694

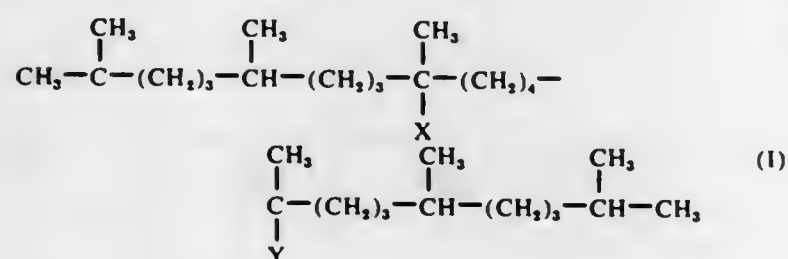
Claims priority, application Japan, Apr. 7, 1973, 48-39667; Apr. 26, 1973, 48-48193; Sept. 7, 1973, 48-101416

Int. Cl.<sup>2</sup> C07C 9/14

U.S. Cl. 260—676 R

12 Claims

1. A process for preparing squalane which comprises submitting, i. a compound having the formula (I):



wherein X and Y represent hydroxy radicals or one of X and Y represents a hydroxy radical and the other represents a hydrogen atom,

ii. a mixture of compounds of the formula (I), or a mixture of (iii) with squalane, to hydrogenolysis in the presence of a metal catalyst selected from the group consisting of nickel, cobalt, palladium, platinum, rhodium, iridium,

ruthenium, osmium and rhenium and a compound thereof unsupported or supported on a carrier and in the presence of an acidic substance selected from the group consisting of organic carboxylic acids, Bronsted acids, Lewis acids, solid acids, and hydrogen salts of a strong acid and a weak base at a temperature of from about 100° to 300° C. under a hydrogen pressure of from about 20 to about 150 kg/cm<sup>2</sup>.

4,011,278

## CONVERSION OF POLAR COMPOUNDS USING A ZSM-5 ZEOLITE CATALYST

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, and George T. Kerr, Trenton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 296,370, Oct. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 821,980, May 5, 1969, abandoned, which is a continuation-in-part of Ser. No. 494,846, Oct. 11, 1965, Pat. No. 3,442,795, which is a continuation-in-part of Ser. No. 261,494, Feb. 27, 1963, abandoned. This application Feb. 3, 1975, Ser. No. 546,863

Int. Cl.<sup>2</sup> C07C 1/24

U.S. Cl. 260—682

2 Claims

1. In the process of dehydrating an alcohol, by contacting it at a temperature of about 70° to 1400° F with a solid crystalline aluminosilicate zeolite acidic catalyst having a pore size sufficient to permit the diffusion of said alcohol thereinto and to permit dehydration therein, the improvement whereby carrying out said dehydration with exceptional catalyst stability, which comprises utilizing said zeolite having a silica to alumina ratio substantially greater than 10 to 1.

4,011,279

## PROCESS FOR MAKING POLYIMIDE-POLYDIORGANOSILOXANE BLOCK POLYMERS

Abe Berger, Schenectady, and Peter C. Juliano, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 23, 1975, Ser. No. 615,991

Int. Cl.<sup>2</sup> C08L 83/10

U.S. Cl. 260—824 R

5 Claims

1. A method for making polyimide-polydiorganosiloxane block copolymer which comprises:

1. effecting azeotropic water removal from a refluxing mixture of an organic dianhydride and organic diamine in the presence of an organic solvent and an effective amount of an organic acid catalyst where the ratio of the organic dianhydride to the organic diamine utilized in the mixture has a value greater than 1,
2. allowing the reaction mixture of 1 to cool to a temperature of at least 20° C and adding to the resulting mixture an amount of amino alkyl terminated polydiorganosiloxane which is substantially the stoichiometric equivalent to the excess of organic dianhydride utilized in the mixture of 1, and agitating the resulting mixture for a time sufficient to effect polyimide-polydiorganosiloxane block copolymer formation,
3. recovering the polyimide-polydiorganosiloxane block copolymer from (2).

4,011,280

## PROCESS FOR THE PRODUCTION OF BINDERS FOR WEATHER-PROOF WOOD MATERIALS AND PRODUCT

Friedrich Josten, Rheinkamp-Uffort, and Martin Cherubim, Rheinkamp-Eick, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Dec. 6, 1974, Ser. No. 530,477

Claims priority, application Germany, Dec. 21, 1973, 2363797

Int. Cl.<sup>2</sup> C08L 61/00, 61/34; C08G 8/26

U.S. Cl. 260—828

14 Claims

1. A process for the production of binders derived from phenol-acetone-formaldehyde co-condensates, for use in weather-proof wood materials consisting essentially of as a first step condensing phenol and formaldehyde in a mole ratio of between 1:1.5 and 1:5 in the presence of from 0.1 to 1 mole of alkali hydroxide, based on phenol, at a temperature of from 40° to 100° C. to obtain a precondensate of a viscosity of from about 10 to 20 seconds measured at 20° C. in the 4 mm DIN Standards flow cup and subsequently, in the second step, adding to this precondensate from 0.1 to 1 mole, based on phenol, of acetone, 2 to 6 moles based on acetone, of formaldehyde and 0 to 1 mole of alkali metal hydroxide, based on phenol plus acetone, and continuing the condensation reaction at 40° to 100° C. until having obtained, for a solids content of from 40 to 50 percent, a viscosity of from 20 to 200 seconds measured at 20° C. in the 4 mm DIN Standards flow cup.

4,011,281

## POLYETHER THIOUREA EPOXY CURING AGENTS

Harold George Waddill, and Heinz Schulze, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Mar. 6, 1975, Ser. No. 555,843

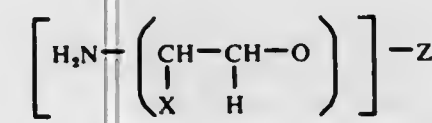
Int. Cl.<sup>2</sup> C08G 45/06

U.S. Cl. 260—830 S

4 Claims

1. A curable epoxy resin composition consisting essentially of:

- a vicinal polyepoxide; and
- an effective amount of a polyether thiourea curing agent having terminal primary amino groups and being formed by the reaction of a compound selected from a group consisting of thiourea, thiourea forming compounds and carbon disulfide with a polyoxyalkylenepolyamine of the formula



wherein X is a hydrogen or methyl radical, Z is a hydrocarbon radical having 2 to 5 carbon atoms forming from 2 to 4 external ether linkages, n is a number from 1 to about 15 and r is a number from 2 to 4 wherein the molar ratio of said compound to said polyoxyalkylenepolyamine is from 0.20 to 0.83, wherein X is a hydrogen the molecular weight is approximately 650 and wherein X is a methyl radical the molecular weight is from about 200 to 2,000.

4,011,282

## MALEIC ANHYDRIDE/2,5-DIHYDROFURAN COPOLYMERS

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 10, 1975, Ser. No. 612,058

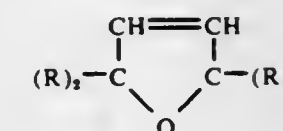
Int. Cl.<sup>2</sup> C08F 220/08, 63/00, 63/02

U.S. Cl. 260—836

4 Claims

3. A heat-curable composition, which comprises from about 5% to about 50% by weight of a curing agent comprising the

water-soluble addition copolymer of a dihydrofuran compound having the formula:



wherein each R is independently hydrogen of lower alkyl, and maleic anhydride wherein the average mol ratio of said dihydrofuran to anhydride is from about 1:2 to about 1:3, said copolymer having a melting point of from about 40° C to about 60° C and an epoxy resin.

4,011,283

## POLYMERIZATION PROCESS

Alan Charles Sturt, Guildford, England, assignor to BP Chemicals Limited, London, England

Continuation of Ser. No. 107,855, Jan. 19, 1971, abandoned.

This application Mar. 19, 1973, Ser. No. 342,370

Claims priority, application United Kingdom, Feb. 6, 1970, 5798/70

Int. Cl.<sup>2</sup> C08L 9/08

U.S. Cl. 260—880 R

5 Claims

1. A process which comprises polymerising under emulsion polymerisation conditions a first monomeric material other than vinyl chloride that gives rise to a non-film forming polymer having a glass transition temperature above 10° C in aqueous emulsion, said first monomeric material being selected from the group consisting of ethylene, propylene, styrene, acrylonitrile, methyl methacrylate, a vinyl ester, butadiene, isoprene, chloroprene, ethyl acrylate and mixtures thereof, allowing the emulsion polymer to absorb an amount of a second monomeric material selected from the group consisting of ethylene, propylene, styrene, acrylonitrile, methyl methacrylate, a vinyl ester, butadiene, isoprene, chloroprene, ethyl acrylate, vinyl chloride, and mixtures thereof not greater than the weight of the emulsion polymer, destroying the emulsion by adding an acid or a multivalent ion in the presence of a suspension stabilising system, and polymerising the absorbed second monomeric material under suspension polymerising conditions.

4,011,284

## PROCESS FOR THE MANUFACTURE OF IMPACT-RESISTANT POLYVINYL AROMATIC COMPOUND

George Gawne, Amsterdam, and Cornelis Ouwerkerk, The Hague, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed June 25, 1975, Ser. No. 590,178

Claims priority, application United Kingdom, June 25, 1974, 28128/74

Int. Cl.<sup>2</sup> C08L 9/06

U.S. Cl. 260—880 R

7 Claims

1. In the continuous process for the manufacture of an impact-resistant polyvinyl-aromatic compound by the bulk polymerization of a solution of a vinyl-aromatic monomer in admixture with an elastomeric polymer and in the optional presence of up to 20% by weight of hydrocarbon diluent, calculated on the starting vinyl-aromatic monomer, where said solution is successively passed through an agitated pre-polymerization zone, a backmixed intermediate polymerization zone and an unstirred final polymerization zone, the improvement which comprises reacting said solution in an intermediate zone having from 2 to 4 reactors, inclusive, wherein the reaction mixture is maintained in each reactor in substantially homogeneous condition by agitation, and heat of polymerization is removed from each reactor by evaporation of vaporizable components of the mixture, and wherein the monomer conversion in said intermediate zone is advanced



from a range of about 20% to about 35% entering the first intermediate reactor to a range of about 65% to about 85% leaving the last intermediate reactor, and controlling the conversion in said intermediate zone so that the difference in the percent of conversion in successive reactors in said zone does not exceed 25%.

C. from 2 to 15 weight percent of a radial teleblock copolymer prepared by a method which comprises polymerizing monomers selected from the group consisting of conjugated dienes and vinyl-substituted aromatic compounds in the presence of an organomonolithium initiator and reacting the resulting mono-lithium-terminated polymer with from 0.1 to about 1 equivalent based on the lithium in the polymer of a compound having at least three reactive sites capable of reacting with the carbon-lithium bond of the polymer, exclusive of organic reactant materials having halogen atoms that are attached to a carbon atom which is alpha to an activating group selected from the group consisting of an ether linkage, a carbonyl and a carbon-to-carbon double bond, thereby coupling said polymer with said compound.

4,011,285

# **MOLDING COMPOSITION COMPRISING A BLEND OF POLY(TETRAMETHYLENE TEREPHTHALATE), A POLYETHERESTER AND A RADIAL TELEBLOCK COPOLYMER**

Robert W. Seymour, and Willis C. Wooten, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 14, 1976, Ser. No. 687,114  
Int. Cl.<sup>2</sup> C08L 67/06

U.S. Cl. 260—873

7 Claims

1. A composition comprised of, based on the weight of the composition, an admixture of

A. from 96 to 70 weight percent poly(tetramethylene terephthalate) having an inherent viscosity of at least 0.5,

B. from 2 to 15 weight percent of a polyetherester having an inherent viscosity of at least 0.4 selected from the group consisting of

1. a first polyetherester comprised of

A. a dicarboxylic acid component comprised of

a. 100–60 mole percent terephthalic acid, and

b. 0–40 mole percent of an aliphatic or aromatic dicarboxylic acid having a molecular weight of less than 300, and

B. a diol component comprised of

a. a glycol comprised of 100–60 mole percent tetramethylene glycol and 0–40 mole percent of an aliphatic or aromatic glycol having a molecular weight of less than 300, and

b. 10–60 weight percent, based on the weight of the polyetherester, of a poly(alkylene oxide) glycol having 2, 3 or 4 carbon atoms in the repeating unit and having a molecular weight in the range of 400 to 5,000,

wherein the sum of the total mole percent amount of aliphatic or aromatic dicarboxylic acid having a molecular weight of less than 300 in part 1.B.(1)(A)(b), the mole percent amount of aliphatic or aromatic glycol having a molecular weight of less than 300 in part 1.B.(1)(B)(a), and the weight percent, based on the weight of the polyetherester, of the poly(alkylene oxide) glycol in part 1.B.(1)(B)(b) equals at least 35 but does not exceed 80,

2. a second polyetherester comprised of

A. a dicarboxylic acid component comprised of terephthalic acid, and

B. a diol component comprised of

a. a glycol comprised of 90–60 mole percent 1,4-cyclohexanedimethanol and 10–40 mole percent ethylene glycol or tetramethylene glycol, and

b. 10–50 weight percent, based on the weight of the polyetherester, of a poly(alkylene oxide) glycol having 2 to 4 carbon atoms in the repeating unit and having a molecular weight in the range of 400 to 2,000,

# **POLYETHERESTER-RADIAL TELEBLOCK COPOLYMER BLEND MOLDING COMPOSITION**

Robert W. Seymour; Freddie A. Shepherd, and Theodore F. Gray, Jr., all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 16, 1976, Ser. No. 705,964  
Int. Cl.<sup>2</sup> C08L 67/06

U.S. Cl. 260—873

7 Claims

1. A composition comprised of, based on the weight of the composition, an admixture of

A. from 95 to 50 weight percent of a polyetherester having an inherent viscosity of at least 0.4 selected from the group consisting of

1. a first polyetherester comprised of

A. a dicarboxylic acid component comprised of

a. 100–60 mole percent terephthalic acid, and

b. 0–40 mole percent of an aliphatic or aromatic dicarboxylic acid having a molecular weight of less than 300, and

B. a diol component comprised of

a. a glycol comprised of 100–60 mole percent tetramethylene glycol and 0–40 mole percent of an aliphatic or aromatic glycol having a molecular weight of less than 300, and

b. 10–60 weight percent, based on the weight of the polyetherester, of a poly(alkylene oxide) glycol having 2, 3, or 4 carbon atoms in the repeating unit and having a molecular weight in the range of 400 to 5,000,

wherein the sum of the total mole percent amount of aliphatic or aromatic dicarboxylic acid having a molecular weight of less than 300 in part 1.A.(1)(A)(b), the mole percent amount of aliphatic or aromatic glycol having a molecular weight of less than 300 in part 1.A.(1)(B)(a), and the weight percent, based on the weight of the polyetherester, of the poly(alkylene oxide) glycol in part 1.A.(1)(B)(b) equals at least 35 but does not exceed 80,

2. a second polyetherester comprised of

A. a dicarboxylic acid component comprised of

a. 100–60 mole percent terephthalic acid, and

b. 0–40 mole percent of an aliphatic or aromatic dicarboxylic acid having a molecular weight of less than 300, and

B. a diol component comprised of

a. a glycol comprised of 90–60 mole percent 1,4-cyclohexanedimethanol and 10–40 mole percent ethylene glycol or tetramethylene glycol, and

b. 10–50 weight percent, based on the weight of the polyetherester, of a poly(alkylene oxide) glycol having 2 to 4 carbon atoms in the repeating unit and having a molecular weight in the range of 400 to 2,000,

B. from 5 to 50 weight percent of a radial teleblock copolymer prepared by a method which comprises polymerizing monomers selected from the group consisting of conjugated dienes and vinyl-substituted aromatic compounds in the presence of an organomonolithium initiator and

reacting the resulting monolithium-terminated polymer with from 0.1 to about 1 equivalent based on the lithium in the polymer of a compound having at least three reactive sites capable of reacting with the carbon-lithium bond of the polymer, exclusive of organic reactant materials having halogen atoms that are attached to a carbon atom which is alpha to an activating group selected from the group consisting of an ether linkage, a carbonyl and a carbon-to-carbon double bond, thereby coupling said polymer with said compound.

4,011,287

# **STEAM CONDITIONING VALVE**

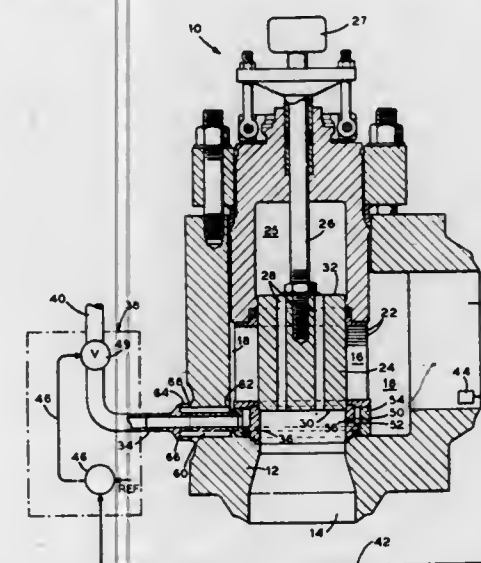
David John Marley, Santa Ana, Calif., assignor to Control Components, Inc., Irvine, California

Filed July 11, 1975, Ser. No. 594,992

Int. Cl.<sup>2</sup> B01F 3/04

U.S. Cl. 261—64 R

12 Claims



1. A steam conditioning valve for reducing high temperature high pressure steam at the inlet of the valve to low temperature low pressure steam at the outlet of the valve comprising:

a valve housing having a steam inlet area and a steam outlet area;

a series of members forming a multi-turn labyrinth mounted in said valve housing between the inlet area and the outlet area to require the steam to flow through the multi-turn labyrinth before reaching the outlet area;

an orifice member spacedly mounted in the inlet area of said valve housing to prevent substantial physical contact with said valve housing, said orifice member also being mounted proximate to said series of members for spraying cooling fluid into the inlet area side of said series of members; and

a cooling fluid line spacedly extending through said valve housing to prevent substantial physical contact with said valve housing and being connected to said orifice member to supply cooling fluid to said orifice member.

4,011,288

# **DISPOSABLE HUMIDIFIER ASSEMBLY**

Robert Assenheimer, Boonton, N.J., and Michael O. Pekkarinen, Lincolnshire, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 14, 1975, Ser. No. 558,601

Int. Cl.<sup>2</sup> A61M 15/00

U.S. Cl. 261—121 R

10 Claims

1. A gas humidifier set comprising:

a solution bottle;

a cap-seal member overlying and sealing the mouth of said bottle, said cap-seal member defining spaced first and second pierceable seal portions;

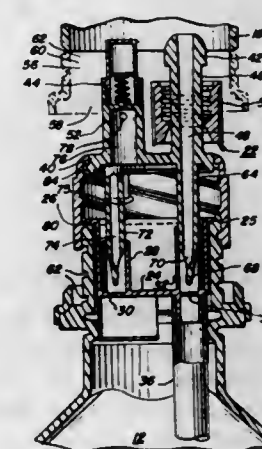
first and second guide means extending upwardly from said cap-seal member, respectively adjacent to said first and second seal portions;

a connector assembly enclosing a space between said cap-seal member, said connector assembly comprising:

a gas inlet and outlet member defining a first conduit portion extending transversely through a base portion, an outer end of said first conduit portion being adapted for connection to a gas supply, and an inner end of said first conduit portion defining spike means and extending into said first cap-seal guide means in a position spaced from said cap-seal but adapted to puncture said first seal portion when moved into engagement therewith;

a second conduit portion extending outwardly from and through said base portion of said gas inlet and outlet member, to define a gas passage through said base portion, the outer end of said second conduit portion being adapted for connection to a gas administration device;

a third conduit portion extending downwardly from said base portion of said gas inlet and outlet member, said third conduit portion defining a gas passage communicat-



ing with the passage defined by said second conduit portion, the inner end of said third conduit portion defining spike means and extending into said second cap-seal guide means in a position spaced from said cap-seal but adapted to puncture said second cap-seal when moved into engagement therewith;

an annular member overlying said inlet and outlet member in sliding engagement therewith and engaging the neck of said solution bottle;

means associated with said connector assembly causing said first and second conduit portions to move in a direction to puncture said cap-seal when said annular member is moved in a selected direction;

said second and third conduit portions being axially spaced from each other, said space enclosed by said cap-seal member and base portion of the gas inlet member defining an expansion chamber for the passage of gas from said third conduit portion to said second conduit portion.

4,011,289

# **MANUFACTURE OF MICROGLOBULES**

Arend Jaman Noothout, Oosterbeek, and Otakar Votocek, Arnhem, both of Netherlands, assignors to Reactor Centrum Nederland, The Hague, Netherlands

Continuation-in-part of Ser. No. 284,061, Aug. 28, 1972, abandoned. This application Jan. 22, 1974, Ser. No. 435,506 Claims priority, application Netherlands, Aug. 26, 1971, 7111738

Int. Cl.<sup>2</sup> G21C 21/00; C09K 3/00; G21C 19/46

U.S. Cl. 264—.5

5 Claims

1. In a process for preparing microspheres which includes dispersing into an organic phase droplets of an inorganic aqueous phase having a viscosity  $\geq 12$  centipoise at 0° C which inorganic aqueous phase comprises an hydrated metal oxide selected from the group consisting of metal oxides of actinide metals, lanthanide metals, yttrium and scandium, into a water-immiscible organic phase having a temperature of from 50° to 150° C and having a viscosity at said temperature of between about 0.5 and about 8.5 centipoise, whereby the



surface tension maintains said droplets in a spherical shape as they solidify, then removing the thus formed microspheres, the improvement of making small microglobules substantially devoid of internal voids and surface dents thereon, comprising, in combination:

- incorporating in said organic phase a surface active agent in an amount of between about 0.04 and 2.0 percent by volume based on the volume of said organic phase, said amount selected such that forming and solidifying microspheres just fail to adhere to each other while at the same time said microspheres retain their spherical shape during formation, and
- spraying the inorganic aqueous phase into an atmosphere above the organic phase so to disperse the formed droplets over and onto the surface of said organic phase, thereby producing said small microglobules having a diameter ranging from about 5 to about 250 microns.

4,011,290

# METHOD AND DEVICE FOR DISPERSING A MELT WITH A FLUID JET

Seppo Ilmari Blomqvist, Haukilahti; Launo Leo Lilja, Pori; Valto Johannes Mäkitalo, Pori; John Henrik Relander, Pori; Matti Elias Honkanen, and Frans Heikki Tuovinen, both of Tornio, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

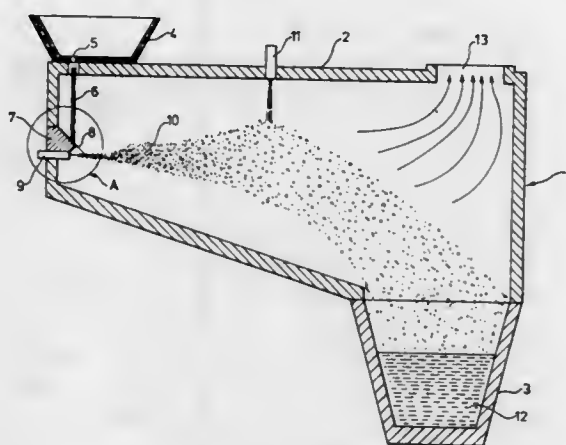
Filed Dec. 5, 1974, Ser. No. 529,807

Claims priority, application Finland, Dec. 19, 1973, 733922

Int. Cl.<sup>2</sup> B22D 23/08

U.S. Cl. 264-12

15 Claims



1. A method for dispersing a melt by means of a jet of at least one medium selected from the group of gaseous and liquid media, by causing the melt flow to impinge against a continuous laterally open deflecting surface in the dispersion space to form a thin, widening, laterally unconfined, film of the melt before it meets the jet of the dispersing medium.

6. An improved device for dispersing a melt by means of a jet of at least one medium selected from the group of gaseous and liquid media having a reactor, means for feeding a melt to be dispersed into the reactor; and means for spraying at least one substance selected from the group of gaseous and liquid dispersing media into the reactor towards the melt flow to disperse this flow; the improvement comprising feeding means for dispersing medium fitted in the reactor between the intersection point of the melt and the dispersing medium and the feeding point of the melt; and a continuous laterally open surface slanted in relation to the melt flow and directed away from the feeding means for the dispersing medium to spread this flow into an even and widening, laterally unconfined thin film before it meets the jet of the dispersing medium.

4,011,291

# APPARATUS AND METHOD OF MANUFACTURE OF ARTICLES CONTAINING CONTROLLED AMOUNTS OF BINDER

James D. Curry, St. Joseph, Mich., assignor to Leco Corporation, St. Joseph, Mich.

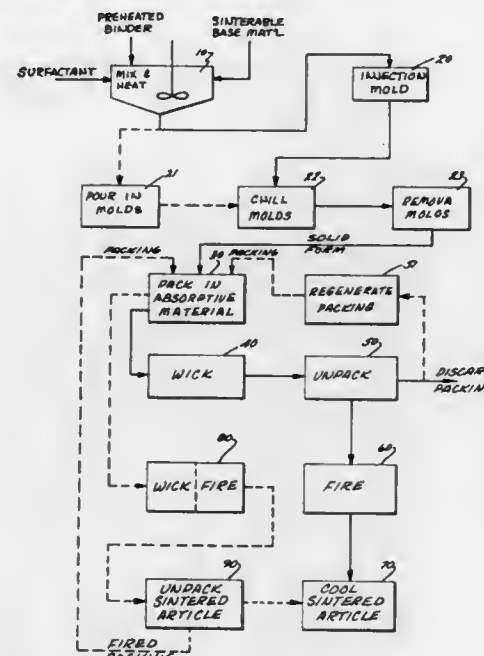
Continuation of Ser. No. 408,821, Oct. 23, 1973, abandoned.

This application Sept. 2, 1975, Ser. No. 609,493

Int. Cl.<sup>2</sup> B29D 27/04

U.S. Cl. 264-43

13 Claims



1. In a method of forming ceramic products containing a controlled amount of meltable binder comprising forming a mixture of a melted meltable wax binder which is solid at room temperature and ceramic forming base materials into a solid article of desired configuration by allowing said mixture to solidify in a mold, the improvement in said method comprising the steps of:

packing said article into a binder-absorptive material for absorbing said binder when it is converted to a liquid state wherein said binder has a melting point less than the temperature at which said base material is undesirably heat altered and wherein said binder absorptive material has a melting point greater than the melting point of the binder, is non-reactive with said binder, and has a sufficiently small particle size so as to not yield imperfections when contacting the solidified mixture and elevating and maintaining the temperature of said article above the melting point of the meltable binder but below the vaporization temperature of said binder causing said binder to become liquid and allowing said binder to be drawn from said article into said binder-absorptive material by a wicking action until at least 45% of said binder is wicked out of said article and into said binder absorptive material; and thereafter firing said article in a kiln to produce a ceramic product.

4,011,292

# METHOD FOR PRODUCING SHEET MATERIAL WITH MULTICOLOR STRIATED PATTERN AND SHEET MATERIAL PRODUCED THEREBY

Robert E. Randall, Kensington, Conn., assignor to Rowland, Incorporated, Kensington, Conn.

Division of Ser. No. 457,770, April 4, 1974, Pat. No. 3,920,366. This application July 7, 1975, Ser. No. 593,882

Int. Cl.<sup>2</sup> B29F 1/12, 3/12

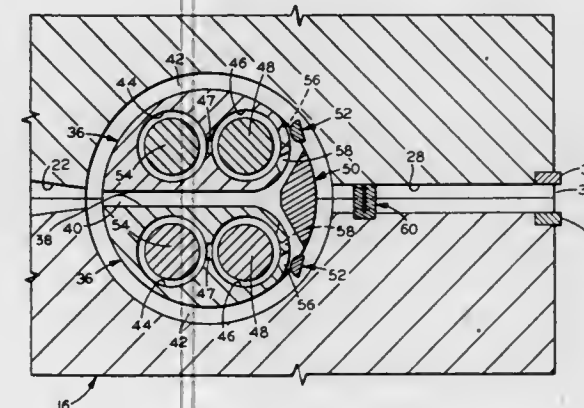
U.S. Cl. 264-75

6 Claims

1. In a method for fabricating synthetic thermoplastic sheet material having differentially colored bands and striations of said bands therein extending along the length thereof, the steps comprising:

- providing a die having a die chamber, a main inlet to said

- chamber, an extrusion orifice and a discharge passage communicating between said die chamber and extrusion orifice, said die chamber being elongated relative to its depth in the direction perpendicular to the imaginary line drawn between said inlet and said discharge passage;
- continuously supplying fluid synthetic thermoplastic resin to said inlet of said die chamber and causing said resin to flow through said die chamber to said discharge passage;
- intermittently supplying a differentially colored fluid synthetic thermoplastic resin at a multiplicity of points in said die chamber spaced along the length thereof transversely of and within the flow of said first mentioned resin and between said inlet for said first mentioned fluid synthetic plastic resin and said discharge passage to produce a plurality of bands of said differentially colored resin at said spaced points within a matrix of said first mentioned resin flowing about said spaced points;



- causing the composite stream of said bands within said matrix in said discharge passage to flow through the perforations of a perforated member and thereby provide fine striations in the bands of said differentially colored resin, said striations extending in the direction of flow of said composite stream towards said extrusion orifice; and
- extruding a composite stream into a sheet-like structure wherein said differentially colored synthetic thermoplastic resin is encapsulated within a matrix of said first mentioned synthetic thermoplastic resin, said differentially colored synthetic plastic resin providing a plurality of striated bands of differential color along the length of the extruded composite stream with fine striations of said differential color extending longitudinally of the extruded composite stream.

4,011,293

# TOUGHENED LINEAR AROMATIC POLYMERS

David M. Gale, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 21, 1973, Ser. No. 389,989

Int. Cl.<sup>2</sup> B27J 5/00; D04H 1/54

U.S. Cl. 264-126

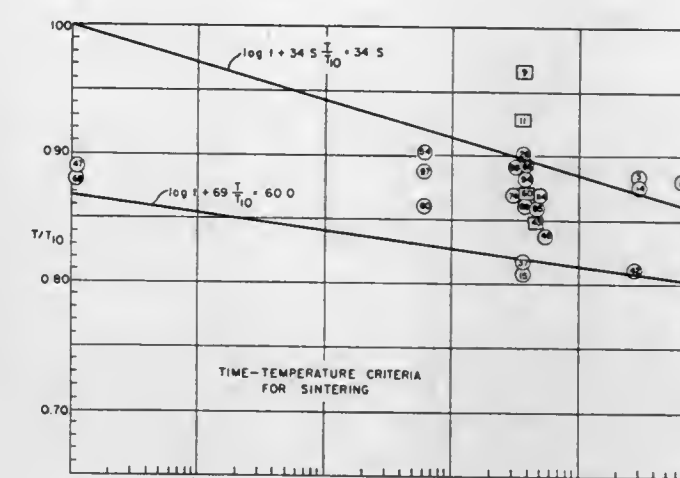
8 Claims

1. A method of preparing a toughened shaped article composed of polymer which comprises substantially linear, aromatic polymer selected from the group consisting of aromatic hydrocarbon polymers, aromatic halocarbon polymers and aromatic haloaromatic polymers, consists essentially of substantially heteroatomfree aromatic linkage along the polymer backbone, is thermally stable at 400° C as evidenced by a decomposition temperature above 400° C, is infusible at the decomposition temperature, and is insoluble in conventional solvents, said toughening method comprising compacting particles of said polymer into a shaped article, and sintering said shaped article under a time-temperature cycle such that, when  $T/T_{10}$  is plotted against  $t$  in the graph of the drawing, that point falls between the line representing the equation

$$\log t + 34.5 T/T_{10} = 34.5$$

and the line representing the equation

$\log t + 69 T/T_{10} = 60$   
where  $t$  is the sintering time in seconds,  $T$  is the sintering



temperature in degrees Kelvin, and  $T_{10}$  is the decomposition temperature of the polymer in degrees Kelvin.

4,011,294

# PROCESS FOR MAKING HIGH SHRINKAGE ACRYLIC FIBERS

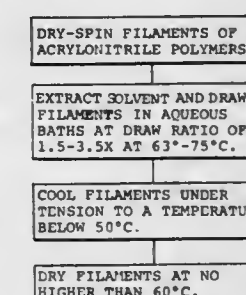
Merton L. Davis, Camden, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 481,374, June 18, 1974, abandoned. This application June 20, 1975, Ser. No. 588,610

Int. Cl.<sup>2</sup> D01F 6/18

U.S. Cl. 264-206

3 Claims



1. In the process of preparing acrylic fibers wherein as-spun, dry-spun filaments of acrylonitrile polymers are extracted to remove solvent by passing the filaments continuously through aqueous baths, drawn between 1.5X and 3.5X during passage through the baths and thereafter dried; the improvement for preparing high shrinkage fibers having high shrinkage force which comprises passing the as-spun filaments through the aqueous baths in which they are drawn at bath temperatures of 63° to 75° C and then cooling the filaments while they are held under tension to a temperature of below 50° C and then drying the filaments at a temperature no higher than 60° C.

4,011,295

# CERAMIC ROTOR FOR GAS TURBINE ENGINE

Dennis Jack Tree, Scottsdale, and F. Michael Tovey, Tempe, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 7, 1974, Ser. No. 512,817

Int. Cl.<sup>2</sup> F01D 5/28

U.S. Cl. 264-275

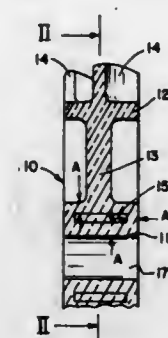
8 Claims

1. A method of forming a ceramic rotor for a gas turbine engine, comprising the steps of:

- hot pressing a quantity of refractory material to form a reinforcing element of predetermined shape;
- supporting said reinforcing element in a mold cavity conforming to the shape of the rotor desired;
- filling the cavity with pulverized refractory material to



mold the rotor body with the reinforcing element embedded therein; and



(d) exposing the molded body to high temperature in a reducing atmosphere to reaction bond the refractory material of the body and reinforcing element into a unitary article.

4,011,296

## IRRADIATED FUEL REPROCESSING

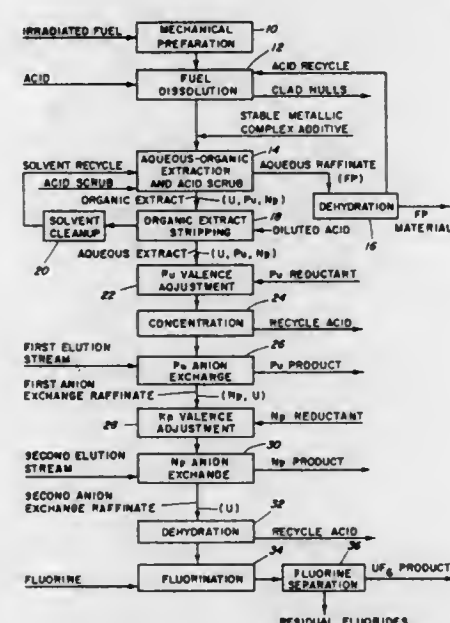
Carl Phillip Ruiz, Fremont, and John Paul Peterson, Jr., Livermore, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed May 27, 1975, Ser. No. 581,138

Int. Cl.<sup>2</sup> C01G 43/00

U.S. Cl. 423—4

24 Claims



1. In a process for treating irradiated nuclear fuel to recover uranium and at least one transuranic isotope selected from the group consisting of neptunium and plutonium so that said uranium and said at least one transuranic isotope are substantially free of fission products which comprises dissolving said fuel in a strong mineral acid and forming an aqueous dissolved nuclear fuel solution and subsequently treating said dissolved solution to separate said uranium and said at least one transuranic isotope therefrom substantially free of said fission products, the improvement comprising adding to said solution prior to treatment for separation of said uranium and said transuranic isotope a sufficient amount of an additive of a non-radioactive [stable] metallic complex in which the metallic component is selected from the group consisting of niobium, tantalum and combinations thereof and said amount is sufficient to alter the decontamination factor exhibited by radioactive niobium in said solution.

13. A process for treating irradiated nuclear fuel contained in clad rods to recover separately uranium, neptunium, and plutonium therefrom substantially free of fission products, said process comprising the steps of

- perforating the clad of the rods,
- contacting the perforated rods with a strong mineral acid

to dissolve the nuclear fuel and form an acid dissolver solution,

- adding to said dissolver solution an additive of a nonradioactive metallic complex in an amount sufficient to alter the decontamination factor of radioactive niobium in said dissolver solution, said complex having the metallic component selected from the group consisting of niobium, tantalum and combinations thereof,
- contacting said dissolver solution with an organic solvent to separate uranium, plutonium and neptunium into the organic solvent from said dissolver solution and leave an aqueous solvent extraction raffinate containing fission products,
- contacting the organic solvent with a dilute mineral acid to strip the uranium, plutonium and neptunium from the organic solvent and from an aqueous extraction product,
- adjusting the valence of plutonium and neptunium by contacting said aqueous solvent extraction product with a reductant,
- concentrating said aqueous extraction product,
- cooling said concentrated aqueous solvent extraction product,
- contacting said concentrated aqueous solvent extraction product with an anion exchange resin so that plutonium in the +4 valence is extracted by the resin, leaving a first aqueous anion exchange raffinate containing neptunium and uranium,
- adjusting the valence of the neptunium in said first aqueous anion exchange raffinate with a reductant,
- contacting said first aqueous anion exchange raffinate with an anion exchange resin to extract the neptunium therefrom, and giving a second aqueous anion exchange raffinate,
- dehydrating said second aqueous anion exchange raffinate to an anhydrous solid of uranium oxide, and
- fluorinating the anhydrous solid to give uranium hexafluoride.

4,011,297

## IN-SITU pH MEASUREMENT OF ORGANIC-CONTINUOUS SOLVENT EXTRACTION PROCESSES

Bror Göran Nyman, Pori; Raimo Juhani Leimola, Harjavalta, and Erik Gustav Bäck, Kokkola, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 362,731, May 22, 1973, abandoned. This application Apr. 1, 1975, Ser. No. 564,044

Claims priority, application Finland, June 2, 1972, 721565

Int. Cl.<sup>2</sup> C01G 3/00, 9/00, 53/00; G01N 27/43

U.S. Cl. 423—24

11 Claims

- In an improved liquid-liquid extraction process for separating metals from each other, the steps of:
  - providing an organic solution of at least one extraction agent which releases hydrogen ions with a hydrocarbon or a mixture of hydrocarbons as a diluent;
  - mixing with said organic solution an aqueous solution containing metals to form a mixture consisting of an organic continuous phase and an aqueous dispersed phase;
  - measuring the pH by means of pH electrodes immersed in said mixture to determine the rate at which hydrogen ions are being released by said extraction agent;
  - controlling the pH of the aqueous dispersed phase by adding to said mixture a neutralizing agent, the rate of addition of said neutralizing agent being controlled in accordance with said pH measurement to maintain the pH of said aqueous dispersed phase substantially constant;
  - permitting the transfer of metals from said aqueous phase to said organic phase;
  - separating the said phases after the transfer of metals to said organic phase;
  - recovering metal values from said organic phase; and
  - regenerating said extraction agent.
- The process of claim 5 wherein the metals to be separated

are two or more of zinc, cadmium, cobalt, nickel and copper and wherein the diluent is kerosene.

4,011,298

METHOD FOR SIMULTANEOUS REMOVAL OF SO<sub>2</sub> AND NO<sub>x</sub>

Suguru Fukui, Tokyo; Haruo Nishino, Kawasaki; Yohji Kameoka, Tokyo; Junichi Miyazaki, Fujisawa; Toshio Kuroda, Kawasaki, and Shinichi Konishi, Tokyo, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co. Ltd., Yokohama, Japan

Filed Dec. 16, 1974, Ser. No. 533,294

Claims priority, application Japan, Dec. 18, 1973, 48-140363

Int. Cl.<sup>2</sup> C01B 21/00

U.S. Cl. 423—235

4 Claims

- A method for simultaneous removal of SO<sub>2</sub> and NO<sub>x</sub> from the waste gas containing said oxides, which method comprises the steps of:
  - adding an ozone-containing gas to said waste gas at temperatures between about 15° C and about 100° C to oxidize the NO<sub>x</sub> so that the value x in NO<sub>x</sub> in the waste gas is in the range of 1.2 to 2.5.
  - bringing said waste gas which has undergone treatment in step (A) into contact in a first zone with a solution containing sulfuric acid, nitric acid and ferric ion as a catalyst to remove SO<sub>2</sub> and NO<sub>x</sub> from said waste gas, said ferric ion content being in the range of from about 50 to 6,000 ppm by weight, and said nitric acid and sulfuric acid content being in the range of from about 0.05 to about 4% and from about 0.5 to about 10% respectively,
  - passing said solution resulting from step (B) from said first zone to a second zone,
  - introducing air or oxygen into the solution passed to said second zone in step (C) to effect oxidation of said SO<sub>2</sub> and NO<sub>x</sub> and activate the catalyst in said solution,
  - recycling the solution of the second zone into contact with waste gas in the first zone thereby establishing a circulation system between the first zone and second zone,
  - removing part of the solution from the circulation system, and
  - supplying make up water and make up catalyst to said circulation system.

4,011,299

## PROCESS FOR REMOVING SULFUR DIOXIDE AND NITROGEN OXIDES FROM GASES

Jay M. Henis, and Mary K. Tripodi, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 1, 1975, Ser. No. 618,729

Int. Cl.<sup>2</sup> B01D 53/00

U.S. Cl. 423—239

11 Claims

- A process for removing sulfur dioxide and nitrogen oxides from stack gases containing the same which process comprises contacting such gases at a convenient space velocity and at temperatures in excess of about 700° C with a solid reagent consisting essentially of calcium oxide, magnesium oxide or compounds convertible thereto under the reaction conditions, or mixtures thereof in the presence of an excess of reducing gas comprising carbon monoxide, hydrogen, or mixtures thereof, with the solid reagent, by replenishing as necessary, being maintained in sufficient stoichiometric excess of the sulfur dioxide and other oxidants in the gases being treated to induce the formation of the corresponding sulfide of the alkaline earth metal component of the solid reagent.

4,011,300

## METHOD OF PRODUCING AMMONIUM POLYPHOSPHATE

Bruce A. Harbolt, Northridge, and Donald C. Young, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed June 27, 1975, Ser. No. 591,056

Int. Cl.<sup>2</sup> C01B 15/16, 25/26

U.S. Cl. 423—313

11 Claims

- The method of producing aqueous solutions of mixed ammonium phosphates, of which at least 40 percent of the equivalent P<sub>2</sub>O<sub>5</sub> is present as polyphosphates, from a phosphoric acid feed of which less than 40 percent of the total P<sub>2</sub>O<sub>5</sub> is in the form of a member selected from the group consisting of polymerized phosphoric acid, ammonium polyphosphates and combinations thereof, which feed has an H<sub>2</sub>O/P<sub>2</sub>O<sub>5</sub> mole ratio of about 4.5 or less, by spraying said acid from an acid spray means downwardly through an unconfined reaction zone having a minimum internal diameter of about at least 2 feet and a height of at least about 2 feet determined as the distance between said acid spray means and the upper surface of said aqueous quench and into a liquid phase, aqueous quench under conditions sufficient to produce a dispersed liquid acid spray, jetting ammonia radially inwardly into said acid spray in said unconfined reaction zone around the full periphery of said acid spray in a direction and at a velocity having an inward radial vector of at least about 200 feet per second and a mass flow rate of at least about 0.12 weight parts ammonia per weight part acid determined as P<sub>2</sub>O<sub>5</sub> and further dispersing said acid phase into discontinuous small liquid droplets, surrounding said acid droplets with said ammonia, and reacting said ammonia with said acid to adiabatically heat the unconfined acid droplets to a temperature within the range of about 500° to about 750° F. by the autogenous heat of reaction, increase the polymeric P<sub>2</sub>O<sub>5</sub> content by an amount corresponding to at least about 10 percent of the total P<sub>2</sub>O<sub>5</sub> present, and convert said acid to an ammoniated, polymerized melt, of which at least about 40 percent of the phosphate determined as P<sub>2</sub>O<sub>5</sub> is present as ammonium polyphosphates, within less than about 5 feet of said acid spray means and before said acid spray contents said aqueous quench, and quenching said melt to a temperature of less than about 200° F. by immersion in said aqueous quench.

4,011,301

## AMMONIUM PHOSPHATE PRODUCTION AND THE REDUCTION OF FLUORINE AND SILICON EMISSIONS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Oct. 23, 1975, Ser. No. 625,166

Int. Cl.<sup>2</sup> C01B 15/16, 25/26; B01D 19/00

U.S. Cl. 423—313

9 Claims

- The method of converting wet-process phosphoric acid containing silicon and fluorine as soluble compounds thereof to ammonium phosphates and reducing the emission of said compounds to the atmosphere, including the steps of (a) heating said wet-process acid feed to a temperature of at least about 120° C. sufficient to vaporize a portion of the water from said acid, concentrate said acid and form a vapor phase containing vaporized water and a portion of said silicon and fluorine; (b) separating said vapor phase from the concentrated acid, (c) maintaining said vapor phase at a temperature of at least about 50° C. until said vapor phase is contacted with the ammonium phosphate solution hereinafter defined; (d) at least partially neutralizing at least 5 percent of said concentrated acid with ammonia to form said ammonium phosphates; and (e) contacting said vapor phase with said ammonium phosphates in the liquid phase at a liquid phase temperature below about 110° C., a vapor phase temperature of at least about 50° C., and a pH of at least 5.5, and absorbing said vapor phase in said ammonium phosphate solution.



4,011,302

**PROCESS FOR PREPARING HIGHLY ABSORBENT, LOW BULK DENSITY SODIUM SILICATE**

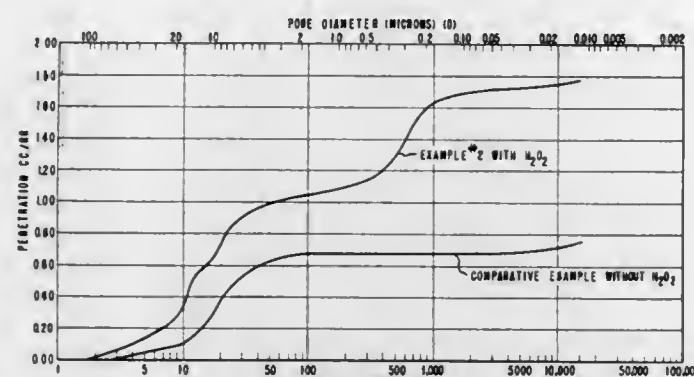
Mohamed Defrawi, Memphis, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 26, 1975, Ser. No. 590,494

Int. Cl.<sup>2</sup> C01B 33/32

U.S. Cl. 423—332

7 Claims



1. A process for the preparation of a water-soluble, highly absorbent, sodium or potassium silicate comprising mixing an aqueous alkali metal silicate selected from sodium silicate and potassium silicate having a mole ratio of silica to sodium or potassium oxide of from 2:1 to 3.5:1 with a 20 to 100% by weight hydrogen peroxide aqueous solution to form a mixture with a viscosity sufficiently low to pass through the spray dryer nozzle without preheating and spray drying the mixture having a 5 to 20% by weight hydrogen peroxide content based on the weight of alkali metal silicate at a temperature of from about 450° to about 800° F and collecting a sodium or potassium silicate product having a water content of from 12 to 22% by weight, a bulk density of 0.1 g/cc to 0.3 g/cc and an absorbency of 50 to 200% based on the OSB test.

4,011,303

**PROCESS FOR DESULFURIZING SULFUR-BEARING COKE**

Douglas MacGregor, Salt Lake City, Utah, assignor to William H. Sayler, Salt Lake City, Utah, a part interest

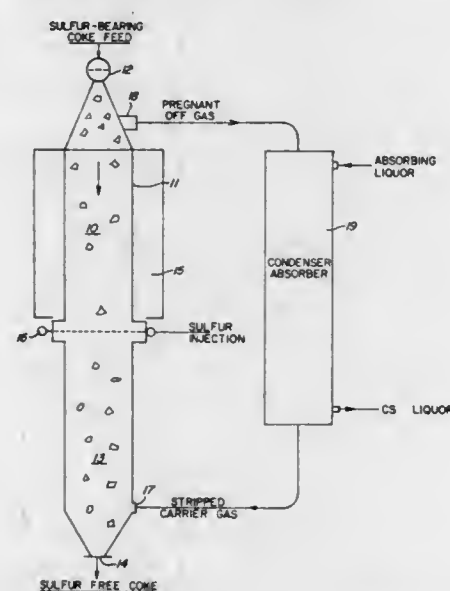
Continuation of Ser. No. 541,001, Jan. 14, 1975, abandoned.

This application Nov. 12, 1975, Ser. No. 630,960

Int. Cl.<sup>2</sup> C01B 31/02, 31/26

U.S. Cl. 423—461

6 Claims



1. A process of desulfurizing sulfur-bearing coke, comprising the steps of heating a sulfur-bearing coke; passing a diluted elemental sulfur vapor through the heated coke, the temperature of the coke being such that said sulfur vapor will react with the sulfur compounds and complexes in the combustible portion of the coke to form carbon disulfide, which reaction thereby removes sulfur values originally carried by the com-

combustible portion of said coke; controlling the reaction time so that the reaction will not continue substantially beyond the time that sulfur values originally carried by the combustible portion of said coke have been consumed; controlling the reaction environment so that the sulfur vapor is the only active element present and recovering the desulfurized coke.

4,011,304

**METHOD FOR CONTROLLING REMOVAL OF HYDROGEN SULFIDE FROM GASES**

Robert A. Mancini, Elk Grove Village, and David M. Cyr, Lombard, both of Ill., assignors to Air Resources, Inc., Palatine, Ill.

Filed Mar. 5, 1975, Ser. No. 555,570

Int. Cl.<sup>2</sup> C01B 17/04

U.S. Cl. 423—573 G

9 Claims

1. In a process for the removal of hydrogen sulfide from a gas in an oxidation-reduction system by contacting the gas with a chelated iron solution comprising an aqueous solution of iron complexed with at least one chelating agent, whereby iron in the ferric state oxidizes the hydrogen sulfide to elemental sulfur and is reduced to the ferrous state, separating sulfur from said solution, and regenerating said solution by aeration to oxidize the iron to the ferric state; the improved method of regulating the redox potential of the solution in the system to obtain a hydrogen sulfide removal efficiency of at least about 85%, which comprises:

- effecting addition for fresh chelated iron solution to the system and withdrawal of used solution from the system so as to increase the ratio of ferric ions to ferrous ions and thereby increase the redox potential of the solution in the system;
- maintaining a substantially constant volume of solution in the system;
- maintaining substantially the maximum rate of aeration of the solution;
- measuring the redox potential of the solution in the system by means of a redox electrode; and
- controlling said addition of fresh solution and said withdrawal of used solution to maintain said redox potential of the solution in the system at not less than a predetermined minimum required to maintain the activity of the solution.

4,011,305

**PROCESS FOR OBTAINING HYDROGEN AND OXYGEN FROM WATER**

Rudolf Schulten, Richterich, and Karl Friedrich Knoche, Aachen, both of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne, Germany

Filed Oct. 4, 1974, Ser. No. 512,797

Int. Cl.<sup>2</sup> C01B 13/02

U.S. Cl. 423—579

5 Claims

1. A process for the dissociation of water into hydrogen and oxygen in a multi-stage closed cycle process using an iron/chlorine system, characterized in that a first material bed containing iron(II)chloride is subjected to a mixture of steam and hydrogen converting the iron(II)chloride to a mixture of iron(II)oxide and iron, said latter mixture is subjected in said first bed to steam to produce iron(II,III)oxide accompanied by the liberation of hydrogen, and said iron(II,III)oxide is then subjected in said first bed to hydrogen chloride to convert it back to iron(II)chloride with the liberation of oxygen.

4,011,306

**OXYGEN GENERATION METHOD**

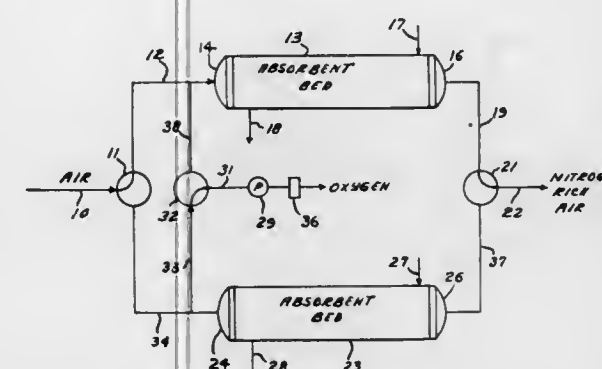
William B. Fox, Jr., West Carrollton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 26, 1976, Ser. No. 661,581

Int. Cl.<sup>2</sup> C01B 13/02

U.S. Cl. 423—579

9 Claims



1. In a method of generating oxygen wherein bis(3-fluorosalicyl)ethylenediamine cobalt (II) is used as the oxygen absorbent and during absorption and desorption of oxygen volatilizable inert materials form in the absorbent and occupy oxygen sites, the improvement which comprises heating the oxygen absorbent containing volatilizable inert materials in a heating zone at a temperature ranging from about 340° to 390° F for a period of about 15 to 30 minutes, thereby volatilizing the inert materials; and continuously removing volatilized inert materials from the heating zone during the heating period.

4,011,307

**PRODUCTION OF <sup>203</sup>Pb-TRIS-HYDROXYMETHYL AMINO METHANE**

Richard M. Lambrecht, East Quogue; Samuel Packer, Manhasset, both of N.Y.; Jerald C. Merrill, Salt Lake City, Utah; Harold L. Atkins; Alfred P. Wolf, both of Setauket, N.Y., and Patrick R. Bradley-Moore, New York, N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 3, 1976, Ser. No. 692,625

Int. Cl.<sup>2</sup> A61K 29/00, 43/00; G01T 1/161; G21H 5/02

U.S. Cl. 424—1

5 Claims

1. The method of preparing carrier-free <sup>203</sup>Pb-lead tris-hydroxymethyl amino methane comprising the steps of:

- exposing a target consisting of naturally occurring thallium to a beam of deuterons of at least about 11 MeV but not in excess of 22.7 MeV energy, said target being of sufficient thickness along the path of said beam so as to cause said beam to be degraded down to about 11 MeV in the thallium, for a sufficient length of time to produce lead-203 by the reaction <sup>203</sup>Tl (d, 2n) <sup>203</sup>Pb;
- dissolving said target;
- chemically separating said <sup>203</sup>Pb in the form of <sup>203</sup>Pb-nitrate from the dissolved target; and
- dissolving the <sup>203</sup>Pb-nitrate in an aqueous solution of tris-hydroxymethyl amino methane, the latter being supplied in sufficient amount to adjust the solution to a pH in the range of about 6.8 to 7.2.

4,011,308

**METHOD FOR SURFACE IMMUNOLOGICAL DETECTION OF BIOLOGICAL PARTICLES BY THE USE OF TAGGED ANTIBODIES**

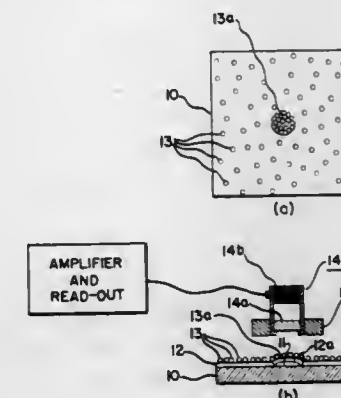
Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 430,884, Jan. 4, 1974, abandoned. This application Mar. 24, 1976, Ser. No. 670,043

Int. Cl.<sup>2</sup> G01N 23/00, 33/16

U.S. Cl. 424—1.5

29 Claims



1. A method for determining the presence or absence of select biological particles in a liquid sample comprising the steps of:

- contacting a portion of the surface area of a substrate with first biological particles specific to the select biological particles, said first biological particles being dispersed as a first single layer coating said portion of said surface area in the form of a preselected pattern;
- contacting at least the coated surface area of said substrate with the sample liquid for a preselected period of time;
- applying a liquid medium to the coated surface area resulting from the preceding step;
- said liquid medium containing tagged biological particles specific to the select biological particles, the tags for said tagged biological particles being detectable by determining the presence of emanations therefrom and monitoring the level of tag emanations over said surface area to determine whether said level is significantly greater over said preselected pattern than over the balance of said surface area.

4,011,309

**DENTIFRICE COMPOSITION AND METHOD FOR DESENSITIZING SENSITIVE TEETH**

Herman J. Lutz, Hatboro, Pa., assignor to Marion Laboratories, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 542,520, Jan. 20, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 648,977

Int. Cl.<sup>2</sup> A61K 7/16

U.S. Cl. 424—49

4 Claims

1. A tooth desensitizing dentifrice composition in the form of an aqueous gel comprising from about 0.1 to about 3 percent by weight of citric acid, from about 0.3 to about 9 percent of sodium citrate, from about 19 to about 25 percent of a normally-solid, water-soluble condensation product of ethylene oxide and polypropylene glycol, said condensation product having a molecular weight of about 8,000 to about 14,000, and a polyoxyethylene content of from about 65 to about 80 percent by weight, and water.



4,011,310

## DENTAL PROPHYLAXIS CONTAINING ALKYLAMINE FLUOROPHOSPHATES

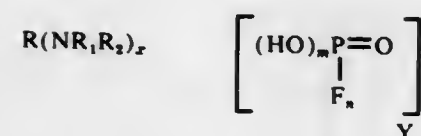
Gianluigi Soldati, Mercerville; Ralph G. Eilberg, Cranbury; Helga Melger, Willingboro, all of N.J., and David A. Schlichting, Pound Ridge, N.Y., assignors to Carter-Wallace, Inc., New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 624,775

Int. Cl.<sup>2</sup> A61K 7/18

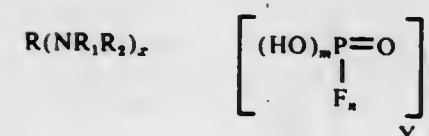
U.S. Cl. 424—52

1. Alkylamine fluorophosphates of the formula:



wherein R is a linear or branched alkyl group containing 1-20 carbon atoms, R<sub>1</sub> is hydrogen or lower alkyl containing 1-6 carbon atoms, R<sub>2</sub> is hydrogen or lower alkyl, x is 1 or 2, m and n are whole integers whose sum is 3 and Y is 1 when x=1 and 1 or 2 when x=2; when R, R<sub>1</sub> and R<sub>2</sub> are lower alkyl they can be substituted with an hydroxy group.

6. A dental prophylaxis comprising a vehicle and an alkylamine fluorophosphate of the formula:



wherein R is a linear or branched alkyl group containing 1-20 carbon atoms, R<sub>1</sub> is a lower alkyl of 1-6 carbon atoms or hydrogen, R<sub>2</sub> is hydrogen or lower alkyl, x is 1 or 2, Y is 1 when x is 1, Y is 1 or 2 when x=2, and m and n are whole positive integers whose sum is 3. When R, R<sub>1</sub> and R<sub>2</sub> represent a lower alkyl they can be substituted with an hydroxy group.

4,011,311

## APPLICATOR STICK

Arie Noomen, Voorhout, and Pieter H. J. Schuurink, Noordwijk, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Apr. 18, 1974, Ser. No. 461,966

Claims priority, application Netherlands, Apr. 24, 1973, 7305664

Int. Cl.<sup>2</sup> A61K 7/32

U.S. Cl. 424—65

18 Claims

1. A shaped gel applicator containing a water dispersible material to be applied to a surface by rubbing the gel over the surface which comprises

- 5% to 40% by weight of a gel which is the reaction product of an aromatic diisocyanate having 8 to 30 carbon atoms, the isocyanate groups of the diisocyanate being bonded directly to an aromatic ring, with a mono-alkanolamine or dialkanolamine having 2 to 16 carbon atoms;
- 10% to 90% by weight of water or a water and water miscible organic solvent mixture; and
- 0.01% to 45% by weight of said material to be applied to the surface, all percentages by weight being calculated on the sum of the three aforementioned components.

4,011,312

## PROLONGED RELEASE DRUG FORM FOR THE TREATMENT OF BOVINE MASTITIS

Gerald L. Reuter, and Andrew G. Tsuk, both of Plattsburgh, N.Y., assignors to American Home Products Corporation, New York, N.Y.

Filed June 25, 1975, Ser. No. 590,358

Int. Cl.<sup>2</sup> A61K 31/765, 35/66

U.S. Cl. 424—78

3 Claims

1. A bioerodable solid dosage form for the treatment of mastitis comprising from about 30 to 70% by weight of a dosage form of at least one antimicrobial agent intimately dispersed in a polyester of glycolic and lactic acid, prepared by heating the polyester to a temperature of about 60°-80° C, dispersing therein the antimicrobial agent and thereafter rapidly cooling the admixture, the polyester having a molecular weight less than 2,000, a glycolic acid content of about 60 to 80 mole percent, and a lactic acid content of about 20 to 40 mole percent.

4,011,313

## MEDICAMENT PREPARATIONS

Geoffrey F. Thompson, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

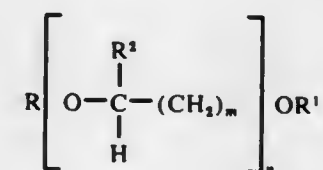
Continuation of Ser. No. 477,227, June 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 313,431, Dec. 8, 1972, Pat. No. 3,833,725, and Ser. No. 413,965, Nov. 8, 1973, abandoned. This application Oct. 17, 1975, Ser. No. 623,871 The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 31/08, 31/65

U.S. Cl. 424—227

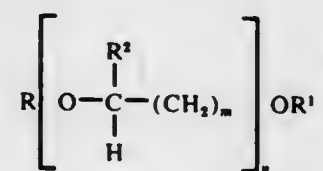
23 Claims

1. A stabilized, antibiotic composition comprising a major amount of at least one dialkylated mono- or poly-alkylene glycol having the formula:



where R and R<sup>1</sup> are independently lower alkyl having 1 to 6 carbon atoms, R<sup>2</sup> is hydrogen or lower alkyl having 1 to 6 carbon atoms, m is an integer from 1 to 6, and n is an integer from 1 to a very large number such that the molecular weight of said dialkylated glycol is up to about 20,000 and a pharmaceutically effective amount of a tetracycline or a pharmaceutically acceptable salt thereof, said composition containing a minimum amount of water, up to about 5%, and being substantially devoid of peroxides and other oxidation products in quantities which interfere with the carrier or stabilizing properties of said composition.

20. The method of controlling acne which comprises topically applying to an acne affected skin area a composition comprising a major amount of a dialkylated mono- or poly-alkylene glycol, having the formula:



where R and R<sup>1</sup> are independently lower alkyl having 1 to 6 carbon atoms, R<sup>2</sup> is a hydrogen or lower alkyl having 1 to 6 carbon atoms, m is an integer from 1 to 6, and n is an integer from 1 to a very large number such that the molecular weight of said dialkylated glycol is up to about 20,000; an acne controlling amount of a tetracycline; and a minor amount of at

least one antioxidant for said dialkylated glycol material, said composition containing a minimum amount of water, up to about 5%, and being substantially devoid of peroxides and other oxidation products in the quantities which interfere with the carrier or stabilizing properties of said glycol material.

4,011,314

## 7-HYDROXYESTRADIOLS

Karl Petzoldt; Hans-Jörg Vidic; Klaus Prezewowsky; Yukishige Nishino; Rudolf Wiechert, and Henry Laurent, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Oct. 9, 1975, Ser. No. 621,136

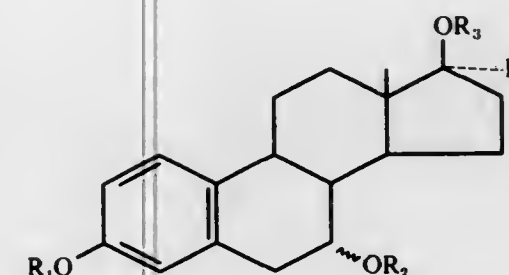
Claims priority, application Germany, Oct. 14, 1974, 2449327; Aug. 8, 1975, 2535997

Int. Cl.<sup>2</sup> A61K 31/58; C07J 1/00

U.S. Cl. 424—241

28 Claims

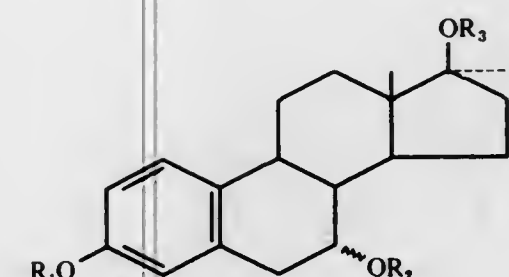
1. A hydroxyestradiol of the formula



wherein R<sub>1</sub> is a hydrogen atom, the acyl radical of a hydrocarbon carboxylic or sulfonic acid of 1-15 carbon atoms, alkyl of 1-8 carbon atoms, cycloalkyl of 3-7 carbon atoms, tetrahydrofuran or tetrahydropyran;

R<sub>2</sub> and R<sub>3</sub> each are a hydrogen atom, the acyl radical of a hydrocarbon carboxylic or sulfonic acid of 1-15 carbon atoms, tetrahydrofuran or tetrahydropyran; and R<sub>4</sub> is alkenyl, chloroalkenyl, alkynyl or chloroalkynyl, each of up to 5 carbon atoms.

28. A method of treating estrogen deficiency syndromes in a female mammal which comprises the enteral or parenteral administration of an amount effective to ameliorate symptoms of estrogen deficiency in the female mammal of a hydroxyestradiol of the formula.



wherein R<sub>1</sub> is a hydrogen atom, the acyl radical of a hydrocarbon carboxylic or sulfonic acid of 1-15 carbon atoms, alkyl of 1-8 carbon atoms, cycloalkyl of 3-7 carbon atoms, tetrahydrofuran or tetrahydropyran; R<sub>2</sub> and R<sub>3</sub> each are a hydrogen atom, the acyl radical of a hydrocarbon carboxylic or sulfonic acid of 1-15 carbon atoms, tetrahydrofuran or tetrahydropyran; and R<sub>4</sub> is alkyl, alkenyl, chloroalkenyl, alkynyl or chloroalkynyl, each of up to 5 carbon atoms.

4,011,315

## 21-ACETALS AND MIXED ACETALS OF STEROIDAL 21-ALDEHYDES, INTERMEDIATES AND METHODS OF PREPARATION

Michael Marx, Sunnyvale, and Denis John Kertesz, Menlo Park, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

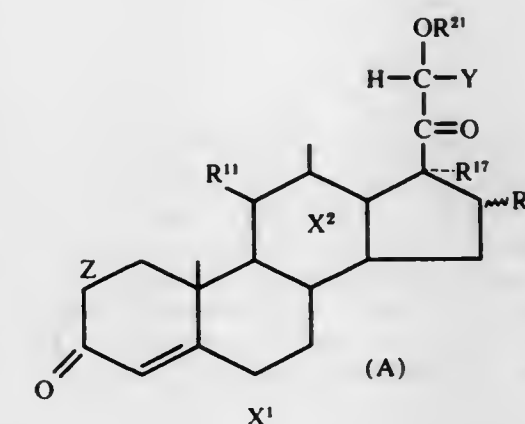
Filed July 7, 1975, Ser. No. 593,903

Int. Cl.<sup>2</sup> C07J 5/00

U.S. Cl. 424—241

29 Claims

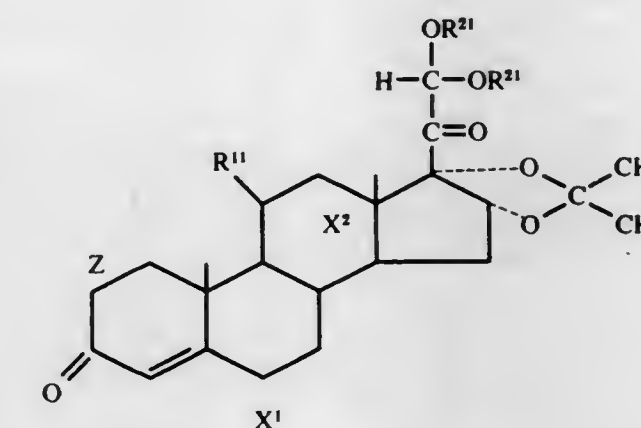
1. A compound having the formula:



wherein:

- R<sup>11</sup> is chloro or hydroxy;  
 R<sup>16</sup> independently is methyl;  
 R<sup>17</sup> independently is hydroxy or acyloxy having 2 to 8 carbon atoms or R<sup>16</sup> and R<sup>17</sup> taken together are 16α,17α-isopropylidenedioxy;  
 R<sup>21</sup> is lower alkyl having 1 to 8 carbon atoms;  
 X<sup>1</sup> and X<sup>2</sup> are independently hydrogen, chloro or fluoro, with the proviso that when R<sup>11</sup> is chloro, X<sup>2</sup> is chloro;  
 Y is OR<sup>21</sup>, Sr<sup>21</sup>, bromo, chloro, cyano, thiocyno or azido in which R<sup>21</sup> is lower alkyl having 1 to 8 carbon atoms or phenyl and R<sup>21</sup> is as defined above but independent thereof with the proviso that when Y is OR<sup>21</sup>, R<sup>16</sup> and R<sup>17</sup> are 16α,17α-isopropylidenedioxy; and  
 Z is a single or double bond.

29. A method for relieving symptoms associated with inflammatory disorders comprising administering an effective amount of a compound having the formula



wherein:

- R<sup>11</sup> is chloro or hydroxy;  
 both R<sup>21</sup> groups are identical lower alkyls containing 1 to 8 carbon atoms;  
 X<sup>1</sup> and X<sup>2</sup> are independently hydrogen, chloro or fluoro with the proviso that when R<sup>11</sup> is chloro, X<sup>2</sup> is chloro; and  
 Z is a single or double bond; or a pharmaceutical composition containing same.



4,011,316

## CYCLOHEXA-2,5-DIENE-1-THIONES

Derek Harold Richard Barton, London, England, assignor to Research Institute for Medicine and Chemistry Inc., Cambridge, Mass.

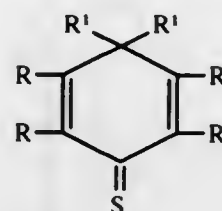
Filed Feb. 24, 1975, Ser. No. 552,345

Int. Cl.<sup>2</sup> A61K 31/58

U.S. Cl. 424-241

22 Claims

1. A compound of the general formula



wherein the substituents R, which may be the same or different, represent hydrogen atoms or alkyl groups of 1-6 carbon atoms and the groups R' represent alkyl groups of 1-6 carbon atoms or an adjacent pair of substituents R and R' together with the carbon atoms to which they are attached form part of the ring structure of a steroid 1,4-diene-3-thione of the cholesterol, androstane, oestrane or pregnane series or of santonin 3-thione; or an S-oxide of said compound.

4,011,317

## STEROID DERIVATIVES

Aldo Bertelli, Milan, Italy, assignor to Rorer Italiana S.p.A., Milan, Italy

Filed Aug. 22, 1975, Ser. No. 607,042

Int. Cl.<sup>2</sup> A61K 31/56

U.S. Cl. 424-243

5 Claims

1. 11 $\beta$ ,17,21-trihydroypregna-1,4-diene-3,20-dione 21-(4-N-acetyl-aminomethylcyclohexanecarboxylate).

4,011,318

METAL SALTS OF 1,1,5,5-TETRASUBSTITUTED DITHIOBIURETS AS POPULATION CONTROL AGENTS

William R. Diveley, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

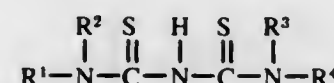
Division of Ser. No. 359,164, May 10, 1973, Pat. No. 3,950,366. This application Oct. 28, 1975, Ser. No. 626,525

Int. Cl.<sup>2</sup> A61K 31/04, 31/095

U.S. Cl. 424-244

5 Claims

1. A method of inhibiting ovulation in a female mammal, which comprises orally administering to that mammal at least for a period of time prior to ovulation an effective nontoxic ovulation inhibiting amount of a metal salt of a 1,1,5,5-tetrasubstituted dithiobiuret of the formula:



in which R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup>, when taken independently of each other, are selected from the group consisting of C<sub>1</sub>-C<sub>18</sub> alkyl, C<sub>6</sub>-C<sub>12</sub> aryl, C<sub>3</sub>-C<sub>12</sub> cycloalkyl and these radicals substituted by at least one member of the group consisting of hydroxyl, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>8</sub> acyl, halo and nitro, and R<sup>1</sup> and R<sup>2</sup> when taken together with the nitrogen to which they are bonded, and R<sup>3</sup> and R<sup>4</sup> when taken together with the nitrogen to which they are bonded are selected from the group consisting of N-morpholinyl, N-piperidyl, N-pyrrolidyl, and N-aziridinyl.

4,011,319

## PHARMACEUTICAL COMPOSITIONS AND METHODS INVOLVING BENZAZEPINE DERIVATIVES

Carl Kaiser, Haddon Heights, N.J., and Robert G. Pendleton, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

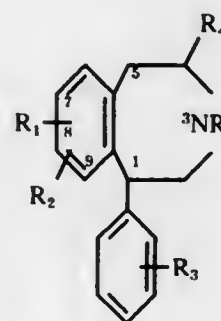
Filed July 2, 1975, Ser. No. 592,708

Int. Cl.<sup>2</sup> A61K 31/33

U.S. Cl. 424-244

13 Claims

1. A method of stimulating peripheral dopamine receptors in an animal requiring stimulation of said peripheral dopamine receptors which comprises administering internally to said animal a nontoxic amount sufficient to stimulate said peripheral dopamine receptors of a compound of the formula:



in which:

R is hydrogen, methyl, hydroxyethyl or n-butyl;

R<sub>1</sub> is hydrogen, hydroxy, methoxy, ethoxy or alkanoyloxy, in the 7-, 8- or 9-position;

R<sub>2</sub> is hydroxy, methoxy, ethoxy or alkanoyloxy, in the 8- or 9-position;

R<sub>3</sub> is hydrogen, chloro, bromo, fluoro, methyl, hydroxy or methoxy;

R<sub>4</sub> is hydrogen or methyl; and said alkanoyl moieties have from 2 to 5 carbon atoms, or a pharmaceutically acceptable acid addition or quaternary salt of said compound.

4,011,320

## 7(8)-SUBSTITUTED TRIAZINOBENZIMIDAZOLES AND ANTHELMINTIC COMPOSITIONS AND METHOD

Colin C. Beard, Palo Alto; John A. Edwards, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

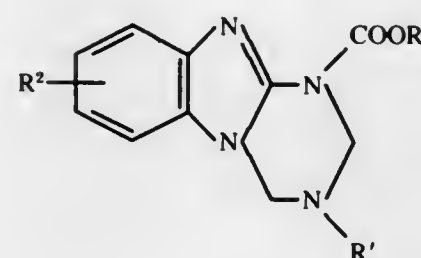
Continuation-in-part of Ser. No. 589,237, June 23, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,454

Int. Cl.<sup>2</sup> C07D 251/72

U.S. Cl. 424-249

31 Claims

1. A compound selected from the group of compounds represented by the formula:



where R is a lower alkyl group having 1 to 4 carbon atoms; R' is di(lower)alkylaminoalkyl (C<sub>2-6</sub>) or alkyl having 1 to 18 carbon atoms; R<sup>2</sup> is phenylsulfinyl, phenoxyethoxy, benzyloxyethoxy, methoxyethylsulfinyl, or 3-chloroprop-1-ylsulfinyl; the R<sup>2</sup>-substitution being at the 7(8)-position; or a pharmaceutically acceptable salt thereof.

4,011,321

PHARMACEUTICAL COMPOSITIONS AND METHODS OF INHIBITING  $\beta$ -ADRENERGIC RECEPTORS

William John Coates, Welwyn Garden City; Anthony Maitland Roe, Hatfield, and Robert Antony Slater, Letchworth, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 531,957, Dec. 12, 1974, Pat. No.

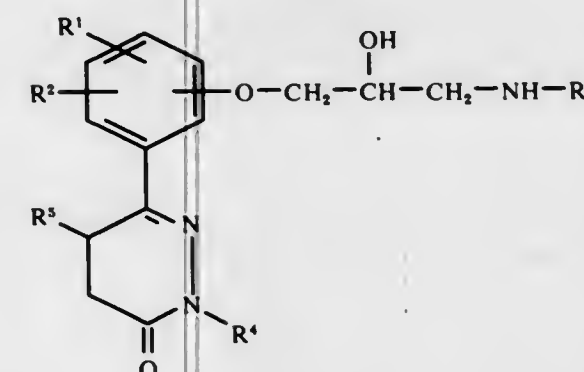
3,931,177. This application Sept. 15, 1975, Ser. No. 613,601

Int. Cl.<sup>2</sup> A61K 31/495

U.S. Cl. 424-250

11 Claims

1. A pharmaceutical composition having  $\beta$ -adrenergic blocking activity comprising in an effective amount to produce said activity a pyridazinone compound of the formula:



wherein

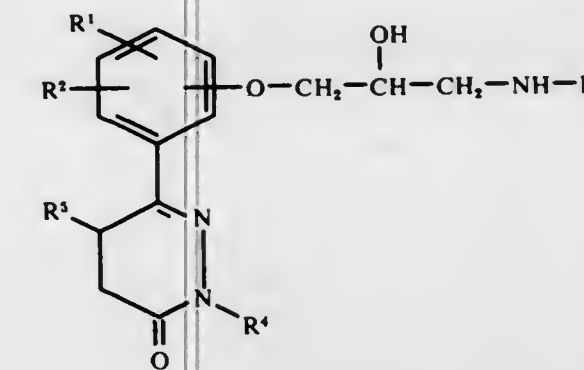
R<sup>1</sup> is hydrogen, lower alkyl, lower alkenyl, -CF<sub>3</sub>, halogen, cyano, nitro, hydroxy, lower alkoxy, lower alkenyloxy, amino, lower alkanoylamino, lower alkylamino, di lower alkylamino or morpholino;

R<sup>2</sup> is hydrogen, methyl, or together with R<sup>1</sup> forms a benzene ring fused to the benzene ring shown to form a naphthyl group;

R<sup>3</sup> is isopropyl or tertiary butyl; and

R<sup>4</sup> and R<sup>5</sup>, which may be the same or different, are hydrogen or methyl; or a pharmaceutically acceptable acid addition salt thereof in combination with a pharmaceutically acceptable diluent or carrier.

2. A method of inhibiting  $\beta$ -adrenergic receptors which comprises administering internally to an animal in need thereof in an amount sufficient to block said receptors a pyridazinone compound of the formula:



wherein

R<sup>1</sup> is hydrogen, lower alkyl, lower alkenyl, -CF<sub>3</sub>, halogen, cyano, nitro, hydroxy, lower alkoxy, lower alkenyloxy, amino, lower alkanoylamino, lower alkylamino, di lower alkylamino or morpholino;

R<sup>2</sup> is hydrogen, methyl, or together with R<sup>1</sup> forms a benzene ring fused to the benzene ring shown to form a naphthyl group;

R<sup>3</sup> is isopropyl or tertiary butyl; and

R<sup>4</sup> and R<sup>5</sup>, which may be the same or different, are hydrogen or methyl; or a pharmaceutically acceptable acid addition salt thereof.

4,011,322

## BENZIMIDAZOLE DERIVATIVES AND PROCESS FOR THE PRODUCTION THEREOF

Dieter Rahtz, Hans Wendt, and Henning Koch, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed July 28, 1975, Ser. No. 599,398

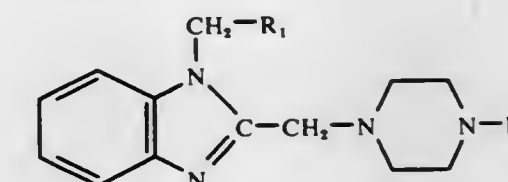
Claims priority, application Germany, July 29, 1974, 2436883

Int. Cl.<sup>2</sup> C07D 403/06

U.S. Cl. 424-250

8 Claims

1. A benzimidazole derivative of the formula



wherein R<sub>1</sub> is o-hydroxyphenyl, p-chlorophenyl, or p-fluorophenyl, and R<sub>2</sub> is an alkyl of 2-4 carbon atoms, or a physiologically acceptable acid addition salt thereof.

4,011,323

## BI-4-[1-(QUINAZOLINYL-4)PIPERIDYLS] AND BIS 4-[1-(QUINAZOLINYL-4)PIPERIDYL]ALKANES

William R. J. Simpson, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 451,977, March 18, 1974, abandoned, which is a continuation-in-part of Ser. No.

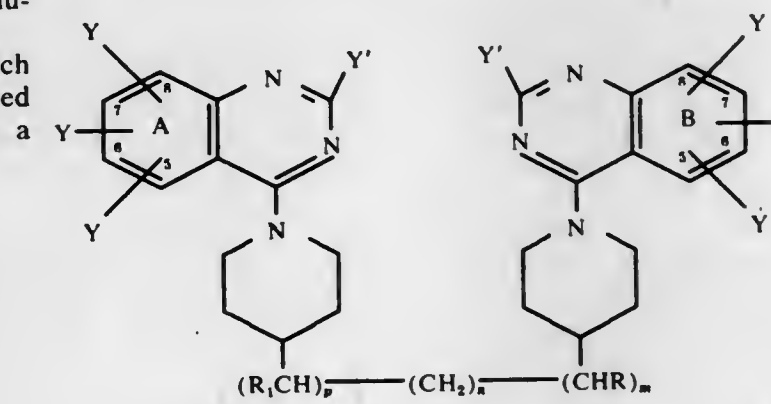
291,652, Sept. 25, 1972, abandoned. This application June 18, 1975, Ser. No. 588,003

Int. Cl.<sup>2</sup> C07D 401/14

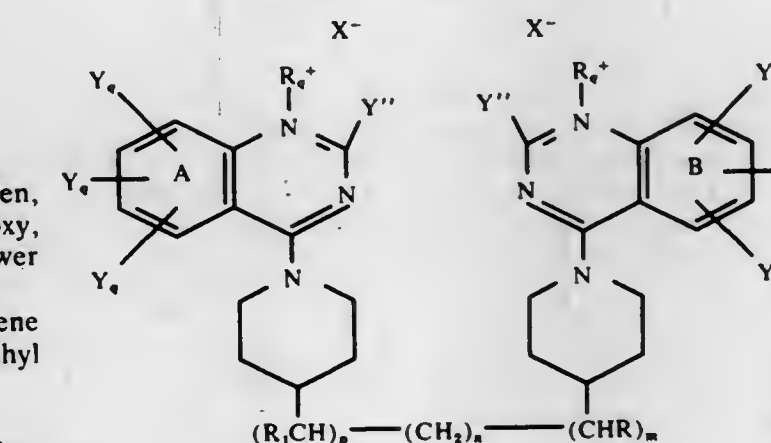
U.S. Cl. 424-251

52 Claims

1. A compound selected from the group consisting of: a. compounds of the formula I:



b. compounds of the formula Iq:

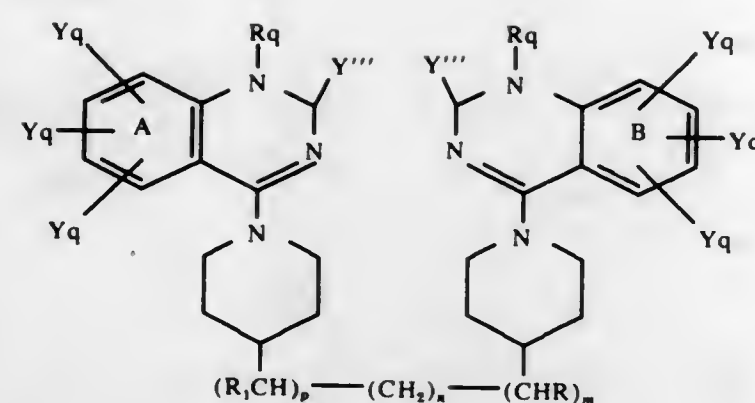


and c. compounds of the formula Ir:



4,011,324  
ESTERS AND AMIDES OF  
PYRIMIDO[4,5-b]QUINOLIN-4(3H)-ONE-2-CARBOXY-  
LIC ACIDS AS ANTIULCER AGENTS  
Thomas H. Althuis, Groton, Conn., assignor to Pfizer Inc., New  
York, N.Y.

Filed Jan. 20, 1976, Ser. No. 650,714  
Int. Cl.<sup>2</sup> C07D 471/04; 260 256.4 F; 256.5 R  
U.S. Cl. 424—251 27 Claims  
1. A compound of the formula

I<sub>r</sub>

wherein

R and R<sub>1</sub> are independently hydrogen or alkyl of 1 to 4 carbon atoms,  
n is 0 to 4,  
m is 0 to 1,  
p is 0 or 1,

each Y is independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, alkylthio of 1 to 3 carbon atoms, hydroxy, formamido, trifluoromethyl, nitro, cyano, amino, hydroxylamino, N-monoalkylamino of 1 to 4 carbon atoms, N,N-dialkylamino in which each alkyl is of 1 to 3 carbon atoms, alkanoylamino of 2 to 4 carbon atoms, N-alkyl (of 1 to 3 carbon atoms), N-alkanoyl (of 2 to 4 carbon atoms) amino or N-alkyl (of 1 to 3 carbon atoms), N-formylamino or two adjacent Y together form 6,7-methylenedioxy or 6,7-ethylenedioxy (with the other Y on each A and B ring so substituted being hydrogen), subject to the proviso that: (1) adjacent Ys are not both tert-butyl; (2) no more than 2 Ys in each A and B ring are substituents selected from the group consisting of trifluoromethyl, nitro, cyano, hydroxy, formamido, alkylthio, amino, N-alkylamino, N,N-dialkylamino, hydroxylamino, alkanoylamino, N-alkyl, N-alkanoylamino and N-alkyl, N-formylamino; (3) when any Y in an A or B ring is amino, cyano, hydroxylamino, N-alkylamino, N,N-dialkylamino, alkanoylamino, formamido, N-alkyl, N-alkanoylamino or N-alkyl, N-formylamino, then any dissimilar Y is selected from the group consisting of hydrogen, fluoro, chloro, bromo, alkyl and alkoxy; and (4) when any Y is hydroxy, then no other Y is a dissimilar substituent selected from the group consisting of alkoxy and alkylthio,

each Y' is independently hydrogen, chloro, bromo or alkyl of 1 to 4 carbon atoms,

each Y'' is independently hydrogen, chloro, bromo or straight chain alkyl of 1 to 4 carbon atoms,

each Y''' is independently hydrogen or straight chain alkyl of 1 to 4 carbon atoms,

each Y<sub>q</sub> is independently hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 3 carbon atoms, trifluoromethyl or nitro or two adjacent Y<sub>q</sub> together form 6,7-methylenedioxy or 6,7-ethylenedioxy with the other Y on each A and B ring so substituted being hydrogen, subject to the provisos that: (1) adjacent Y<sub>q</sub>'s are not both tert-butyl; and (2) no more than two Y<sub>q</sub>'s in each A and B ring are substituents selected from the group consisting of trifluoromethyl and nitro,

R<sub>q</sub> is alkyl of 1 to 4 carbon atoms which is unbranched on the α-carbon atom, and

X is a pharmaceutically acceptable inorganic anion, or a pharmaceutically acceptable acid addition salt of a compound of the formula I and I<sub>r</sub>.

51. A pharmaceutical composition comprising an inert pharmaceutically acceptable carrier and 3 to 500 milligrams of a compound of claim 1.

wherein

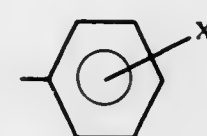
Z is selected from the group consisting of hydroxyalkyl having from two to four carbon atoms, aminoalkyl having from two to four carbon atoms; and

—(alk)<sub>m</sub>—(O)<sub>n</sub>—W

wherein

each of m and n is 0 or 1, provided that when n is 1, m is 1; (alk) is alkylene having from one to four carbon atoms, provided that when n is 1, (alk) is alkylene having from two to four carbon atoms;

W is selected from the group consisting of pyridyl, imidazolyl and



wherein X is selected from the group consisting of hydrogen, amino, carboxy, hydroxy, alkyl having from one to four carbon atoms and alkoxy having from one to four carbon atoms;

Y is selected from the group consisting of hydrogen, methyl, carboxyalkyl having from one to four carbon atoms in the alkyl group and carbalkoxyalkyl having from one to four carbon atoms in each of the alkyl and alkoxy groups;

R<sub>1</sub> is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms and phenyl;

each of R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> when taken separately is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, halo, hydroxy, benzyloxy, benzoyloxy, alkanoyloxy having from one to four carbon atoms, thiol, methylthio, methylsulfinyl, benzylthio and benzylsulfinyl; with the proviso that no more than two of R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are branched alkyl or alkoxy, and when two of R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are branched chain alkyl or alkoxy, said groups are located on non-adjacent carbon atoms;

R<sub>2</sub> and R<sub>3</sub> or R<sub>3</sub> and R<sub>4</sub> when taken together are alkylenedioxy and are selected from the group consisting of methylenedioxy and ethylenedioxy;

with the proviso that only one of said pairs is alkylenedioxy; and

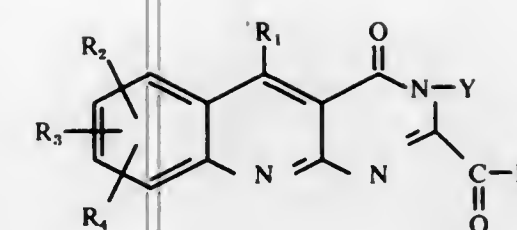
the pharmaceutically acceptable acid addition salts thereof, and the pharmaceutically acceptable cationic salts of those compounds wherein W is carboxyphenyl or Y is carboxyalkyl.

16. A method for the control of peptic ulcers in animals in need of said treatment which comprises administering, by either the intraperitoneal or oral route to the animals an anti-peptic ulcer amount of a compound having the formula

4,011,325  
IMIDAZOPYRIMIDINES USEFUL AS AGRICULTURAL  
AND HORTICULTURAL FUNGICIDES  
Ian Trevor Kay, Wokingham, England, assignor to Imperial  
Chemical Industries Limited, London, England  
Filed Mar. 27, 1975, Ser. No. 562,423

Claims priority, application United Kingdom, Mar. 27, 1974, 13563/74

Int. Cl.<sup>2</sup> C07D 487/04 8 Claims  
U.S. Cl. 424—251  
1. A compound of formula:



wherein

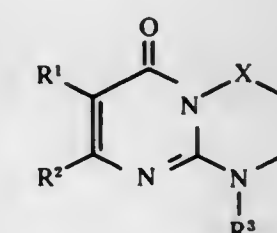
R<sub>0</sub> is selected from the group consisting of alkoxy having from one to four carbon atoms, and NHZ wherein Z is selected from the group consisting of hydrogen, hydroxyalkyl having from two to four carbon atoms, aminoalkyl having from two to four carbon atoms; alkyl having from one to four carbon atoms and:

—(alk)<sub>m</sub>—(O)<sub>n</sub>—W

wherein

each of m and n is 0 or 1, provided that when n is 1, m is 1; (alk) is alkylene having from one to four carbon atoms, with the proviso that when n is 1, (alk) is alkylene having from two to four carbon atoms;

W is selected from the group consisting of pyridyl, imidazolyl and



wherein R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are alkyl groups of up to six carbon atoms, and X and Y are independently selected from the group consisting of carbonyl, hydroxymethylene, ethoxymethylene and acetoxymethylene.

7. A fungicidal compositions for use against fungal plant pests which comprises a fungicidally effective amount of a compound according to claim 1 in association with an agriculturally and horticulturally acceptable diluent.

4,011,326  
2-SUBSTITUTED OXAZOLO[4,5-b]PYRIDINE  
ANTI-INFLAMMATORY AGENTS  
Norman P. Jensen, New Providence, N.J., assignor to Merck &  
Co., Inc., Rahway, N.J.

Filed July 29, 1975, Ser. No. 600,169  
Int. Cl.<sup>2</sup> C07D 498/04

U.S. Cl. 424—256 5 Claims  
1. A compound of structural formula:

wherein X is selected from the group consisting of hydrogen, amino, carboxy, hydroxy, alkyl having from one to four carbon atoms and alkoxy having from one to four carbon atoms;

Y is selected from the group consisting of hydrogen, methyl, carboxyalkyl having from one to four carbon atoms in the alkyl group and carbalkoxyalkyl having from one to four carbon atoms in each of the alkyl and alkoxy groups;

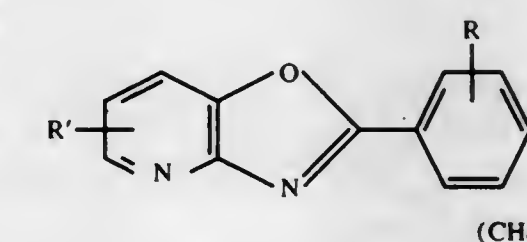
R<sub>1</sub> is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms and phenyl;

each of R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> when taken separately is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, halo, hydroxy, benzyloxy, benzoyloxy, alkanoyloxy having from one to four carbon atoms, thiol, methylthio, methylsulfinyl, benzylthio and benzylsulfinyl; with the proviso that no more than two of R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are branched alkyl or alkoxy, and when two of R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are branched chain alkyl or alkoxy, said groups are located on non-adjacent carbon atoms;

R<sub>2</sub> and R<sub>3</sub> or R<sub>3</sub> and R<sub>4</sub> when taken together are alkylenedioxy and are selected from the group consisting of methylenedioxy and ethylenedioxy;

with the proviso that only one of said pairs is alkylenedioxy; and

the pharmaceutically acceptable acid addition salts thereof, and the pharmaceutically acceptable cationic salts of those compounds wherein W is carboxyphenyl or Y is carboxyalkyl.



wherein

R is  
1. hydrogen,  
2. halo,  
3. lower alkyl, or  
4. lower alkoxy;

R' is  
1. hydrogen, or  
2. lower alkyl;

n is 3, 4, or 5; and  
—(CH<sub>2</sub>)<sub>n</sub> is linked to adjacent carbon atoms of the benzo group.



4,011,327

## COMPOSITIONS CONTAINING

7 $\beta$ -ALKYLTHIOEoxynupharidin-6 $\alpha$ -OLS

Robert Thomas La Londe; Amy Inn-Mei Tsai, both of Syracuse; Chun Juan Wang, Jamesville, and Chunfook Wong, Syracuse, all of N.Y., assignors to Research Corporation, New York, N.Y.

Filed Jan. 31, 1975, Ser. No. 546,191

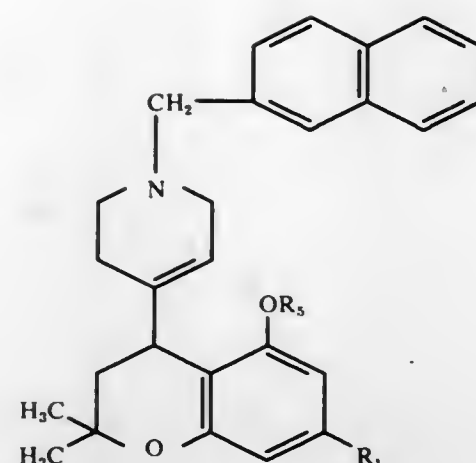
Int. Cl.<sup>2</sup> A01N 9/00, 9/22

U.S. Cl. 424—256

8 Claims

1. A fungicidal composition containing a fungistatically effective amount of a compound selected from the group consisting of:

7 $\beta$ -Methylthioeoxynupharidin-6 $\alpha$ -ol,  
7 $\beta$ -Isobutylthioeoxynupharidin-6 $\alpha$ -ol,  
7 $\beta$ -(2-Hexenyl)-thioeoxynupharidin-6 $\alpha$ -ol,  
7 $\beta$ -(1-Propenyl)-thioeoxynupharidin-6 $\alpha$ -ol, and  
7 $\beta$ -(1-Cyclohexyl)-thioeoxynupharidin-6 $\alpha$ -ol,  
and a pharmaceutically acceptable carrier.



or a pharmaceutically acceptable non-toxic salt thereof, wherein R<sub>1</sub> is alkyl of 5 to 8 carbon atoms which is straight chained or  $\alpha$ -substituted by a methyl group or  $\alpha,\alpha$ -disubstituted by methyl groups and R<sub>5</sub> is hydrogen, R<sub>6</sub> or CO.R<sub>6</sub> wherein R<sub>6</sub> is alkyl of 1 to 4 carbon atoms or alkyl of 1 to 6 carbon atoms substituted by NR<sub>7</sub>R<sub>8</sub> wherein R<sub>7</sub> and R<sub>8</sub> are each hydrogen or alkyl of 1 to 4 carbon atoms or NR<sub>7</sub>R<sub>8</sub> is a pyrrolidino, piperidino or morpholino.

4,011,328

## DERIVATIVES OF PYRIDINE-3-ACETIC ACID, PROCESS FOR THEIR PREPARATION AND APPLICATIONS THEREOF

Henri Pinhas, Paris, and Serge Beranger, Bretigny, both of France, assignors to SERDEX - Societe d'Etudes, de Recherches, de Diffusion et d'Exploitation, Puteaux, France

Filed Oct. 15, 1974, Ser. No. 514,778

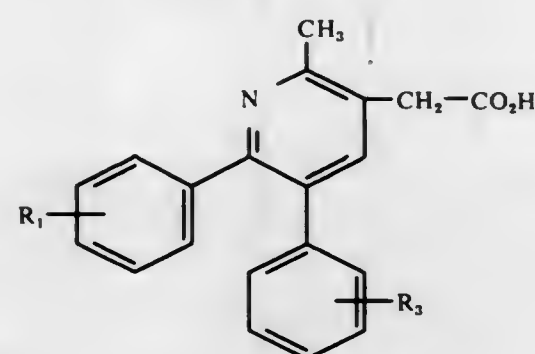
Claims priority, application France, Oct. 18, 1973, 73.37178

Int. Cl.<sup>2</sup> A61K 31/44; C07D 213/16

U.S. Cl. 424—263

10 Claims

1. A compound selected from the group consisting of compounds of the formula:



in which R<sub>1</sub> is selected from the group consisting of hydrogen, methoxy, methylthio and halogen and R<sub>2</sub> is selected from the group consisting of hydrogen, methoxy and halogen, and a pharmacologically acceptable salt thereof.

4,011,329

## TETRAHYDROPYRID-4-YL-CHROMAN-5-OL DERIVATIVES IN THE TREATMENT OF HYPERTENSION

Charles Sylvester Fake, Harlow, England, assignor to Beecham Group Limited, England

Division of Ser. No. 504,087, Sept. 9, 1974, Pat. No.

3,960,880, which is a continuation-in-part of Ser. No. 324,222, Jan. 16, 1973, Pat. No. 3,853,899. This application Aug. 20, 1975, Ser. No. 606,251

Claims priority, application United Kingdom, Jan. 26, 1972, 3654/72

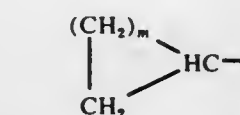
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 31/40, 31/44, 31/44S, 31/535

U.S. Cl. 424—263

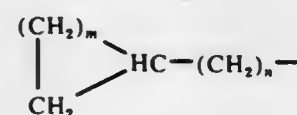
32 Claims

15. A method of treating hypertension in humans and animals which comprises administering to a human or animal in need thereof an antihypertensively effective amount of a compound of the formula



wherein A and B are both hydrogen atoms and R is a hydrogen atom or a

group, or A and B together represent an additional bond and R is a



radical, m being 1, 2, 3 or 4 and n being 0, 1, 2 or 3, or a pharmaceutically acceptable acid addition salt thereof.

4,011,331

## PIPERIDINE DERIVATIVES

Adrian Charles Ward Curran, Newcastle-upon-Tyne, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed Feb. 28, 1975, Ser. No. 554,258

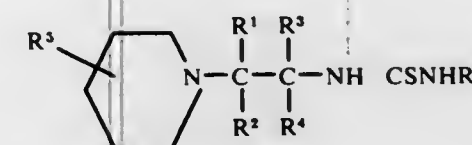
Claims priority, application United Kingdom, Mar. 5, 1974, 9766/74

Int. Cl.<sup>2</sup> C07D 295/14

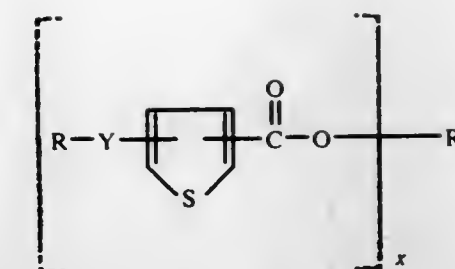
U.S. Cl. 424—267

5 Claims

1. A compound of formula I



or pharmaceutically acceptable acid addition salts thereof, wherein R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are the same or different and represent hydrogen, or lower alkyl, and R<sup>6</sup> represents hydrogen, alkyl of 1 to 3 carbon atoms, which may be substituted by diloweralkylamino; lower alkanoyl, benzoyl or halobenzoyl.



wherein Y is selected from the group consisting of oxygen and divalent sulfur; R is selected from the group consisting of a straight or branched saturated hydrocarbon chain containing from 10 to 20 carbon atoms and a straight or branched unsaturated hydrocarbon chain containing from 10 to 20 carbon atoms and from 1 to 4 double bonds; R<sub>1</sub> is selected from the group consisting of hydrogen, a straight or branched lower alkyl group of from 1 to 6 carbon atoms, benzyl, phenethyl, alkane-poly-yl containing from 3 to 6 carbon atoms and from 2 to 6 univalent bonds, and 1,2,3,4,5,6-cyclohexanehexyl; X is an integer of from 1 to 6 with the proviso that when R<sub>1</sub> is alkane-poly-yl or 1,2,3,4,5,6-cyclohexanehexyl, X is equal to from 2 to 6, and when R<sub>1</sub> is other than alkane-poly-yl or 1,2,3,4,5,6-cyclohexanehexyl, X is equal to 1; or pharmaceutically acceptable salts thereof.

4,011,332

## HEMORRHAGIC-LESION PRODUCING AND ANTICOAGULANT-CONTAINING COMPOSITIONS AND THEIR USE

Wolfgang Schoetensack, Hegne, and Richard Riedel, Constance, both of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Germany

Filed Feb. 3, 1975, Ser. No. 546,765

Claims priority, application Luxembourg, Feb. 20, 1974, 69428

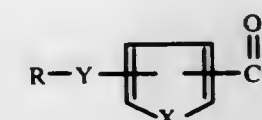
Int. Cl.<sup>2</sup> A61K 31/415, 31/37, 31/33

U.S. Cl. 424—273

22 Claims

1. A composition which comprises (a) component means to inhibit mammalian blood clotting and (b) component means to produce hemorrhagic alimentary canal lesions when administered in a single oral dose of less than 50 mg/kg of body weight to a Sprague-Dawley rat with an empty stomach, the composition containing component means (a) and component means (b) in a combined concentration of more than 10<sup>-3</sup> percent by weight based on the total weight of the composition.

19. A composition according to claim 1 wherein component means a is 4-hydroxy-2-oxo-3-(3-oxo-1-phenyl-butyl)-2H-chromene and component means b is 1,5-diphenyl-3-(p-chlorophenyl)-4-pyrazole acetic acid.



wherein Y is selected from the group consisting of oxygen and divalent sulfur, R is selected from the group consisting of a straight or branched saturated hydrocarbon chain having from 10 to 20 carbon atoms and a straight or branched unsaturated hydrocarbon chain having from 10 to 20 carbon atoms and from 1 to 4 double bonds, and X is selected from the group consisting of oxygen and divalent sulfur.

4,011,333

## SUBSTITUTED THIOPHENECARBOXYLIC ACID AND ESTERS AS HYPOLIPIDEMIC AGENTS

Roger Alan Parker, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed June 16, 1975, Ser. No. 587,045

Int. Cl.<sup>2</sup> A61K 31/38

U.S. Cl. 424—275

20 Claims

1. A method of reducing the lipid concentration in the blood of a patient in need thereof which comprises orally or parenterally administering to said patient a blood lipid lowering effective amount of a compound of the formula:

4,011,335

## METHYLENE DIOXYPHENYL ETHERS

Walter Hangartner, Schofflisdorf, and René Zurfluh, Pfaffhausen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 5, 1975, Ser. No. 584,246

Claims priority, application Switzerland, June 17, 1974, 8250/74

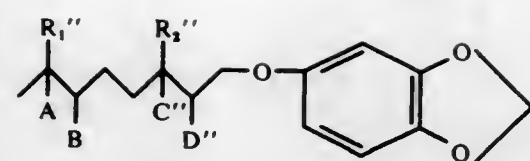
Int. Cl.<sup>2</sup> A61K 31/36

U.S. Cl. 424—282

17 Claims

1. A phenyl derivative having the formula:

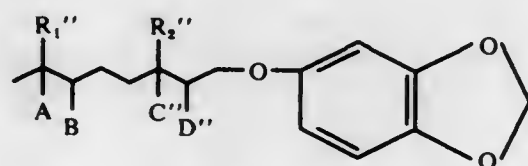




wherein

R<sub>1</sub>'' is propyl, butyl or isobutyl;  
R<sub>2</sub>'' is methyl, A and B taken together form an oxygen and C'' and D'' are individually hydrogen or taken together form a carbon to carbon bond; with the provision that when R<sub>1</sub>'' is isobutyl and R<sub>2</sub>'' is methyl, C'' and D'' both are hydrogen.

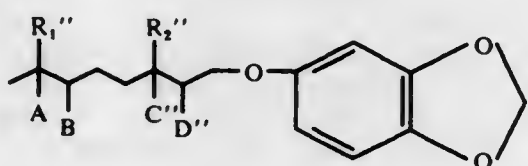
11. A pesticidal composition for the control of Lepidoptera and Coleoptera which contains as an essential active ingredient or essential active ingredients one or more of the phenyl derivatives of the formula:



wherein

R<sub>1</sub>'' is propyl, butyl or isobutyl;  
R<sub>2</sub>'' is methyl; A and B taken together form an oxygen bridge and C'' and D'' are individually hydrogen or taken together form a carbon to carbon bond.

16. A process for protecting materials from Lepidoptera and Coleoptera comprising applying to said material an effective amount of a composition containing as an active ingredient a compound of the formula:



wherein

R<sub>1</sub>'' is propyl, butyl or isobutyl;  
R<sub>2</sub>'' is methyl, A and B taken together form an oxygen bridge and C'' and D'' are individually hydrogen or taken together form a carbon to carbon bond; or mixtures thereof and an inert carrier.

4,011,336

### 3-(p-BIPHENYL)-BUTYRONITRILE AND THERAPEUTIC COMPOSITIONS CONTAINING THE SAME

August Amann, Ludwigshafen; Heinz Georg Vilhuber, Speyer; Johannes Kunze, Carlsberg; Hubert Glertz, Limburgerhof, and Albrecht Franke, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 28, 1975, Ser. No. 636,167  
Claims priority, application Germany, Dec. 3, 1974, 2456958

Int. Cl.<sup>2</sup> A61K 31/275; C07C 121/66

U.S. Cl. 424—304

4 Claims

1. 3-(p-Biphenyl)-butyronitrile.  
2. A therapeutic composition comprising in addition to a suitable carrier, excipient or diluent, an effective amount of 3-(p-biphenyl)-butyronitrile as an active ingredient.

### 4,011,337 OXAMIDE-OXAMIC COMPOUNDS, COMPOSITIONS AND METHODS OF USE

Charles M. Hall; Richard S. P. Hsi, and John B. Wright, all of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

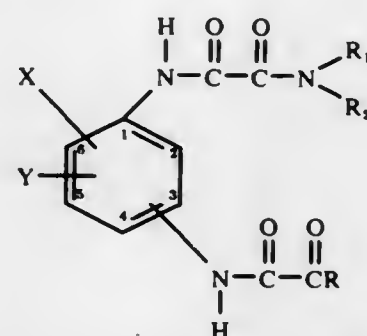
Filed July 7, 1975, Ser. No. 593,632

Int. Cl.<sup>2</sup> A61K 31/24; C07C 103/28

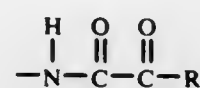
U.S. Cl. 424—309

12 Claims

1. Compounds of the formula:

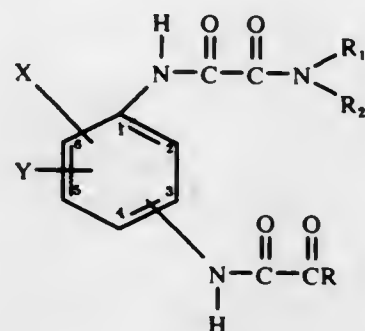


wherein X and Y are the same or different and are selected from the group consisting of hydrogen, fluorine, chlorine, bromine, trifluoromethyl, acetyl, phenyl, alkyl of one to six carbon atoms, inclusive, alkoxy of one to six carbon atoms, inclusive, and nitro;

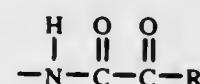


is at the 3 or 4 position; R<sub>1</sub> and R<sub>2</sub> are the same or different and are selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, monohydroxyalkyl wherein alkyl is from two to six carbon atoms, inclusive, and the hydroxy is not on the alpha carbon atom, and tris(hydroxymethyl)methyl with the proviso that when R<sub>1</sub> has a tertiary carbon atom adjacent to the nitrogen atom, then R<sub>2</sub> does not have a tertiary carbon atom adjacent to the nitrogen atom; R is OM wherein M is selected from the group consisting of hydrogen, a physiologically acceptable metal or amine cation, and alkyl of one to six carbon atoms, inclusive.

11. A method for the prophylactic treatment of allergy of a reagent or non-reagent mediated nature which comprises administering to a mammal in need of said treatment an anti-allergy effective amount of a compound of the formula



wherein X and Y are the same or different and are selected from the group consisting of hydrogen, fluorine, chlorine, bromine, trifluoromethyl, acetyl, phenyl, alkyl of one to six carbon atoms, inclusive, alkoxy of one to six carbon atoms, inclusive, and nitro;



is at the 3 or 4 position; R<sub>1</sub> and R<sub>2</sub> are the same or different and are selected from the group consisting of hydrogen, alkyl

of one to six carbon atoms, inclusive, monohydroxyalkyl wherein alkyl is from two to six carbon atoms, inclusive, and the hydroxy is not on the alpha carbon atom, and tris(hydroxymethyl)methyl with the proviso that when R<sub>1</sub> has a tertiary carbon atom adjacent to the nitrogen atom, the R<sub>2</sub> does not have a tertiary carbon atom adjacent to the nitrogen atom; R is OM wherein M is selected from the group consisting of hydrogen, a physiologically acceptable metal or amine cation, and alkyl of one to six carbon atoms, inclusive.

4,011,338

### 15-METHYL PROSTAGLANDIN COMPOUNDS HAVING BRONCHODILATING ACTIVITY

Donald P. Strike, Philadelphia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 473,604, May 28, 1974, Pat. No.

3,972,917. This application Mar. 5, 1976, Ser. No. 664,117

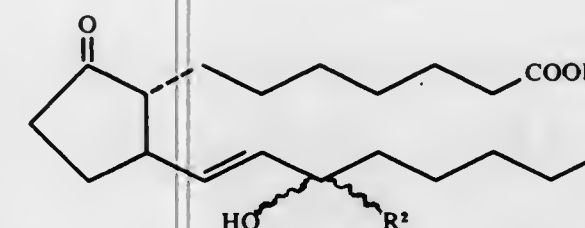
Int. Cl.<sup>2</sup> A61K 31/19, 31/215

U.S. Cl. 424—317

3 Claims

1. A process for relieving bronchial spasm and facilitating breathing in warm-blooded animals which comprises administering to a warm-blooded animal in need thereof an amount sufficient to relieve bronchial spasm and facilitate breathing in said warm-blooded animal of a composition comprising:

a. a compound of the formula



wherein R<sup>1</sup> is hydrogen, alkyl of from 1 to about 6 carbon atoms, alkali metal, or a pharmacologically-acceptable cation derived from ammonia or a basic amine, and R<sup>2</sup> is alkyl of from 1 to about 6 carbon atoms; and

b. a pharmacologically-acceptable carrier.

4,011,339

### HYPOLIPIDEMIC ALLENE CARBOXYLIC ACIDS

Eugene E. Galantay, Liestal, Switzerland, and Faizulla G. Kathawala, West Orange, N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

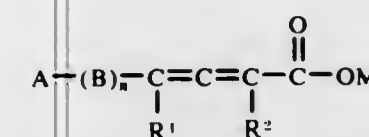
Filed Aug. 15, 1975, Ser. No. 605,040

Int. Cl.<sup>2</sup> A61K 31/19

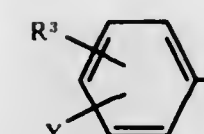
U.S. Cl. 424—317

32 Claims

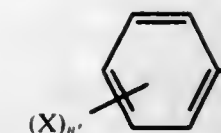
1. A compound of the formula



wherein n is 0 or 1;



wherein Y is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 24 carbon atoms, alkylthio having from 1 to 24 carbon atoms, halo having an atomic weight of from about 19 to 36, cyclohexyl, phenoxy or substituted or unsubstituted phenyl of the formula



wherein X is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkoxy having from 1 to 4 carbon atoms or alkyl having from 1 to 4 carbon atoms;

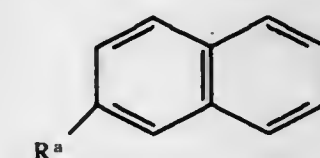
n' is 1 or 2;

each of R<sub>1</sub> and R<sub>2</sub>, independently, is a hydrogen atom or alkyl having from 1 to 4 carbon atoms;

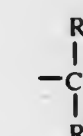
R<sub>3</sub> is a hydrogen atom, halo having an atomic weight of from about 19 to 36, or alkyl having from 1 to 4 carbon atoms; and

when n is 0,

then A may also be

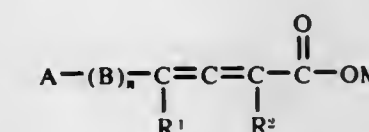


wherein R<sup>a</sup> is hydrogen, halo having an atomic weight of from about 19 to 36, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, alkylthio having from 1 to 4 carbon atoms, or difluoromethoxy; B is

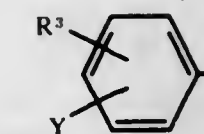


wherein each of R<sup>4</sup> and R<sup>5</sup> is, independently, alkyl having from 1 to 3 carbon atoms, and M is a hydrogen atom, or a cation forming a non-toxic pharmaceutically acceptable salt, provided that when n is 0, then Y and R<sup>3</sup> are not both hydrogen atoms.

30. A method of lowering the level of lipids in the blood of a mammal comprising administering to said mammal an amount effective in lowering the level of lipids in the blood of said mammal of a compound of the formula:

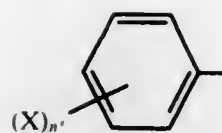


wherein n is 0 or 1;  
wherein A is

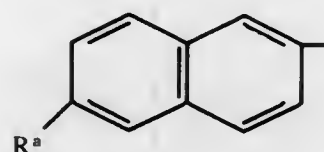


wherein Y is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 24 carbon atoms, alkylthio having from 1 to 24 carbon atoms, halo having an atomic weight of from about 19 to 36, cyclohexyl, phenoxy or substituted or unsubstituted phenyl of the formula

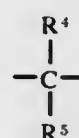




wherein X is a hydrogen atom, halo having an atomic weight of from about 19 to 36, alkoxy having from 1 to 4 carbon atoms or alkyl having from 1 to 4 carbon atoms;  $n'$  is 1 or 2; each of  $R^1$  and  $R^2$ , independently, is a hydrogen atom or alkyl having from 1 to 4 carbon atoms;  $R^3$  is a hydrogen atom, halo having an atomic weight of from about 19 to 36, or alkyl having from 1 to 4 carbon atoms, and where  $n$  is 0 then A may also be



wherein  $R^a$  is hydrogen, halo having an atomic weight of from about 19 to 36, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, alkylthio having from 1 to 4 carbon atoms, or difluoromethoxy; B is



wherein each of  $R^4$  and  $R^5$  is, independently, alkyl having from 1 to 3 carbon atoms, and M is a hydrogen atom, or a cation forming a non-toxic pharmaceutically acceptable salt.

## 4,011,340

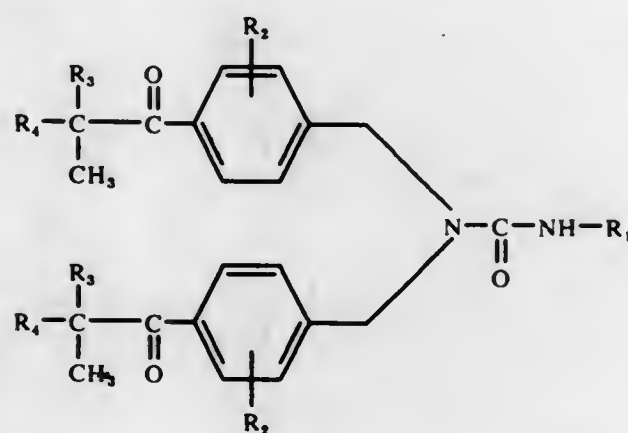
**HYPOLIPIDEMIC BIS(PIVALOYL BENZYL) UREAS**  
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 575,726, May 8, 1975, abandoned. This application Oct. 28, 1975, Ser. No. 625,816  
Int. Cl.<sup>2</sup> A61K 31/17; C07C 127/17

U.S. Cl. 424—322

6 Claims

1. A compound of the formula



where

$R_1$  represents lower alkyl having 1 to 4 carbon atoms, and  $R_2$  each independently represents hydrogen, halo having an atomic weight of about 19 to 36, and  $R_3$  and  $R_4$  each independently represent lower alkyl having 1 to 2 carbon atoms.

4,011,341  
**RING-SUBSTITUTED  
N-(2,2-DIFLUOROALKANOYL)-O-PHENYLENEDIAMINE INSECTICIDES**

George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

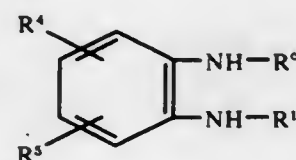
Division of Ser. No. 479,073, June 13, 1974, Pat. No. 3,907,892, which is a continuation-in-part of Ser. No. 277,452, Aug. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 47,857, June 19, 1970, abandoned, and a continuation-in-part of Ser. No. 17,865, March 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 803,998, March 3, 1969, abandoned. This application June 25, 1975, Ser. No. 590,226

Int. Cl.<sup>2</sup> A01N 9/20, 9/24

U.S. Cl. 424—324

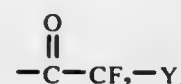
3 Claims

1. The method for the control of insect and arachnid pests which comprises contacting an insect or arachnid with an inactivating amount of an active agent, said active agent being a compound of the formula

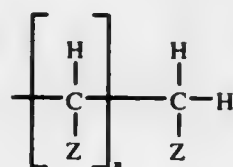


wherein

$R^0$  represents a 2,2-difluoroalkanoyl radical of the formula

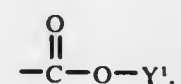


wherein Y represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of  $C_1-C_6$ , or radical of the formula

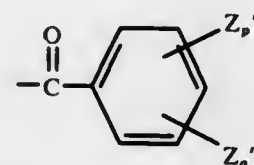


wherein each Z independently represents hydrogen or halogen and  $n$  represents 0 or 1;

$R^1$  represents hydrogen, radical of the formula



wherein  $Y^1$  represents loweralkyl of  $C_1-C_4$  or phenyl, benzoyl, furoyl, naphthoyl, or substituted benzoyl of the formula



wherein each  $Z'$  independently represents halo or nitro,  $Z''$  represents loweralkyl of  $C_1-C_4$  or loweralkoxy of  $C_1-C_4$ ,  $p$

represents 0, 1, or 2,  $q$  represents 0 or 1, and the sum of  $p$  and  $q$  is 1-3;

$R^4$  represents nitro; and

$R^5$  represents trifluoromethyl, difluoromethyl, or difluorochloromethyl, subject to the limitations (1) that  $R^4$  and  $R^5$  are meta to one another, and (2) that where  $R^1$  represents hydrogen, the ring position ortho to the  $-NH-R^1$  bears one of the designated  $R^4$  or  $R^5$  moieties.

## 4,011,342

**METHOD AND COMPOSITION FOR THE TREATMENT OF HYPERTENSION WITH ORTHO-DISUBSTITUTED ARYL GUANIDINES**

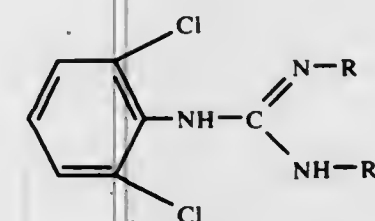
Jean Schwartz, and Camille Georges Wermuth, both of Strasbourg, France, assignors to Seperic, Morat, Switzerland  
Division of Ser. No. 461,128, April 15, 1974, abandoned, which is a continuation of Ser. No. 258,050, May 30, 1972, abandoned. This application Feb. 26, 1975, Ser. No. 553,155  
Claims priority, application United Kingdom, June 2, 1971, 18510/71

Int. Cl.<sup>2</sup> A61K 31/155

U.S. Cl. 424—326

2 Claims

1. An orally administrable therapeutical composition having a hypotensive activity containing from 5 to 20 mg of a compound selected from the group consisting of a guanidine of the formula:



(I)

in which R and  $R'$  are each selected from the group consisting of hydrogen and methyl, and a pharmaceutically acceptable acid addition salt thereof, in a pharmaceutically acceptable carrier.

## 4,011,343

**TRIAZAPENTADIENES AS ACARICIDES AND INSECTICIDES**

Michael Raymond Graves Leeming, Canterbury, and Alexander Ballingall Penrose, Eastray near Sandwich, both of England, assignors to Pfizer Inc., New York, N.Y.

Filed Aug. 5, 1975, Ser. No. 601,988

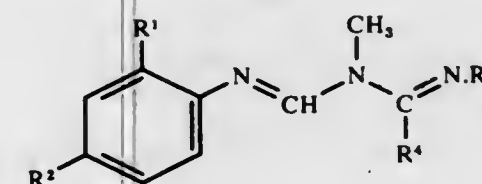
Claims priority, application United Kingdom, Aug. 23, 1974, 37232/74

Int. Cl.<sup>2</sup> C07C 123/00

U.S. Cl. 424—326

16 Claims

1. A compound of the formula:



wherein

$R^1$  is alkyl of 1 to 4 carbon atoms;  $R^2$  is hydrogen, halogen or alkyl of 1 to 4 carbon atoms;  $R^3$  is cycloalkyl of 4 to 10 carbon atoms, or cycloalkyl substituted by halogen or alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by phenyl or phenyl substituted by one or two  $C_1-C_4$  alkyl or  $C_1-C_4$  alkoxy groups; or alkyl of 1 to 4 carbon atoms substituted by cycloalkyl of 4 to 10 carbon atoms or cycloalkyl substituted by halogen or alkyl of 1 to 4 carbon atoms; and  $R^4$  is hydrogen or alkyl of 1 to 4 carbon atoms; and the pesticidally acceptable acid addition salts thereof.

## 4,011,344

**IMINODIMETHYLENE DI-TERT-ALKYLOPHENONES AND PHENOLS**

Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

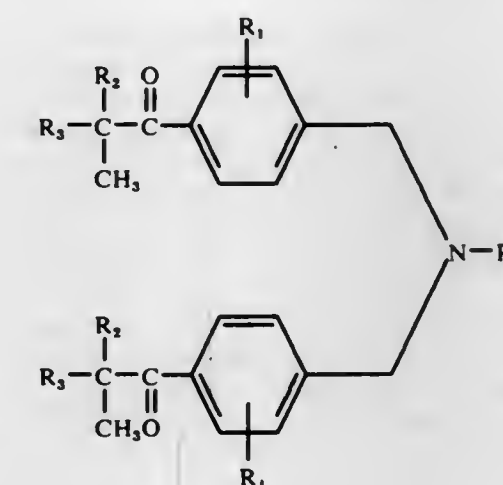
Continuation-in-part of Ser. No. 558,180, March 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 460,891, April 15, 1974, abandoned. This application June 20, 1975, Ser. No. 588,789

Int. Cl.<sup>2</sup> A01N 9/20; C07C 87/28

U.S. Cl. 424—330

13 Claims

1. A compound of the formula:



wherein

$R_1$  represents hydrogen, halo having an atomic weight of about 19 to 36 or straight chain lower alkoxy, and

$R_2$  and  $R_3$  each independently represent lower alkyl having 1 to 2 carbon atoms, and

$R_4$  represents lower alkyl having 1 to 4 carbon atoms, or a pharmaceutically acceptable salt thereof.

13. A method of treating lipidemia which comprises administering to a mammal in need of said treatment a hypolipidemic effective amount of a compound of claim 1.

## 4,011,345

**EXPANDED SEMI-MOIST PET FOOD**

Arthur G. Bartsch, Lake Zurich, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Nov. 26, 1975, Ser. No. 635,293

Int. Cl.<sup>2</sup> A23K 1/16

U.S. Cl. 426—72

15 Claims

1. An expanded, semi-moist, sugarless pet food having a moisture content of 20 percent to 40 percent comprising:

- 0 percent to 30 percent animal protein source;
- 5 to 30 percent oilseed vegetable protein source;
- 15 percent to 50 percent of at least one cereal grain derivative — wherein (b), and (c) combine to comprise 40 percent to 65 percent;
- 3 percent to 9 percent of at least one polyhydric alcohol;
- 0 percent to 20 percent of at least one fat;
- up to about 3 percent of at least one edible food grade acid or acid salt sufficient to adjust the pH to 4.0 to 6.0;
- up to 5 percent of at least one additive selected from the group consisting of salt, vitamins, minerals, coloring and flavoring; and
- 0.01 percent to 0.5 percent of at least one antimicrobial;
- all percentages being based on the weight of the pet food.



4,011,346

**PROCESS FOR THE PRODUCTION OF A FORMED HIGH MOISTURE PET FOOD PRODUCT**

Thomas J. Ernst, St. Louis, Mo., assignor to Raiston Purina Company, St. Louis, Mo.

Filed Sept. 18, 1974, Ser. No. 504,795

Int. Cl.<sup>2</sup> A23B 4/12; A24B 4/14

U.S. Cl. 426—104

15 Claims

1. A process for the production of a formed pet food product having a moisture content exceeding about 40% with a shear value of at least about .080 ft. lb./gram and stabilized against bacterial and mycotic penetration comprising:

- grinding raw animal meat into particles of a substantially uniform size;
- heating the ground raw meat to a temperature sufficient to pasteurize the meat and reduce the bacterial contamination thereof;
- impregnating the heated meat particles with a preservative composition in an amount effective to inhibit bacterial and mycotic penetration in the pet food product, said preservative composition comprising a mixture of a material selected from the group consisting of succinic acid, pyruvic acid, fumaric acid, adipic acid, glucono- $\Delta$ -lactone, tartaric acid, lactic acid, citric acid, malic acid, and mixtures thereof, together with an edible antimycotic;
- mixing the impregnated meat particles with hydrated acid stabilized expanded protein pieces, said expanded pieces being added in an amount of between about 25% to 90% by volume of the pet food product; and
- forming the mixture into a pet food product having a shear value of at least about 0.080 ft. lb./gram which is stabilized against subsequent bacterial and mycotic growth.

4,011,347

**FOOD PRODUCT CONTAINING CUSHIONING MEANS**

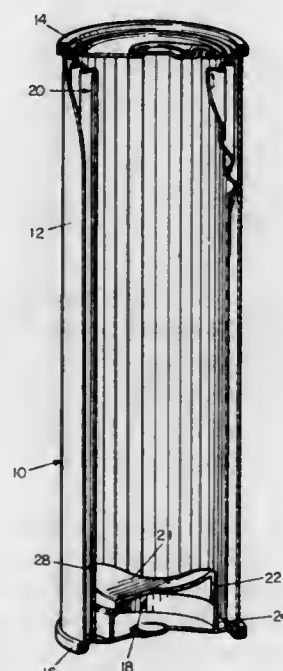
Edwin D. Griffith, Pemberville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 12, 1975, Ser. No. 576,525

Int. Cl.<sup>2</sup> B65D 85/30

U.S. Cl. 426—124

3 Claims



1. A package containing a stack of uniformly-shaped individual units of food product and a food product cushioning means, said package comprising, in combination:

- a substantially rigid tubular container surrounding said stack of uniformly-shaped individual units of food product, said container having a sidewall formed from a substantially oxygen-imperious material having ends secured thereto; and
- a resilient cushioning means positioned within said con-

tainer supporting the bottom of said stack of uniformly-shaped individual units of food product, said resilient cushioning means being adapted to prevent breakage of said individual food units and including a circular top wall having a contour approximating the contour of the uniformly-shaped units of food product in said stack, a first annular sidewall depending downwardly from the outer extremities of said circular top wall, a flexible connecting ledge extending outwardly from the bottom edge of said first annular sidewall, and a second annular sidewall of greater diameter than said first annular sidewall depending downwardly from the outer extremity of said flexible connecting ledge.

4,011,348

**PROCESS FOR INHIBITING BROWNING OF FRUIT**

Ray W. Farrier, and Roland B. Leavens, both of Hood River, Oreg., assignors to Diamond Fruit Growers, Inc., Hood River, Oreg.

Continuation-in-part of Ser. No. 256,895, May 25, 1972,

abandoned. This application Nov. 6, 1974, Ser. No. 521,206

Int. Cl.<sup>2</sup> A23B 7/10

U.S. Cl. 426—268

9 Claims

1. A process for preservation of plant material subject to browning which comprises:

- applying to the surface of said plant material an aqueous solution having a pH of between 4 and 7.5 and consisting essentially of a material selected from the class consisting of sodium ascorbate and a mixture of sodium ascorbate and ascorbic acid so as to provide ascorbate ion in a concentration of from about 3.5 to about 10 weight percent of the solution,

removing said plant material from said solution and storing said plant material under aerobic conditions at a temperature between about 32° F. and 40° F.

4,011,349

**DIETETIC CHOCOLATE COMPOSITION**

Alfred Riesen, 6405 Immensee, Switzerland

Filed Sept. 24, 1975, Ser. No. 616,138

Int. Cl.<sup>2</sup> A23G 1/00

U.S. Cl. 426—548

4 Claims

1. A dietetic chocolate composition comprising as major constituents about 9% cocoa beans, about 15% powdered whole milk, about 7% powdered skim milk, about 31% sorbitol and 38% added cocoa butter, and as minor constituents about an effective amount of a synthetic sweetener selected from the group consisting of cyclamate and saccharin about 0.6% lecithin and about 0.01% vanilla, the weight of said minor constituents being based on the total weight of the major constituents.

4,011,350

**METHOD OF MAKING MICROSCOPE SLIDE SYSTEM**

Arthur L. Markovits, Millburn, N.J. and Stanley W. Wolfson, West Orange, both of N.J., assignors to Chemical Sciences, Inc., Whippany, N.J.

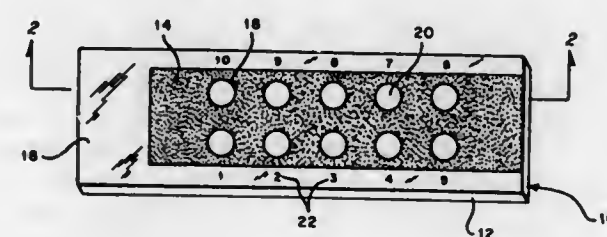
Division of Ser. No. 140,497, May 5, 1971, Pat. No. 3,736,042.

This application May 29, 1973, Ser. No. 364,240

Int. Cl.<sup>2</sup> G02B 21/34

U.S. Cl. 427—2

9 Claims



1. A method of preparing a microscope slide system including the steps of:

- spraying a layer of fluorocarbon on one surface of a microscope slide, said layer having an approximate thickness range between  $7.5 \times 10^{-5}$  and  $1.5 \times 10^{-4}$  inch, said fluorocarbon layer having a plurality of openings passing therethrough for forming reactant regions on said surface of said microscope slide; and,
- applying a layer of 0.02% agarose solution to said surface of said microscope slide only within and completely covering said reactant region.

4,011,351

**PREPARATION OF RESIST IMAGE WITH METHACRYLATE POLYMERS**

Edward Gipstein, Saratoga, Calif.; Wayne M. Moreau, Wappingers Falls, N.Y., and Omar U. Need, III, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 29, 1975, Ser. No. 545,063

Int. Cl.<sup>2</sup> B05D 3/06; G03C 5/00

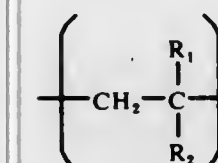
U.S. Cl. 427—43

15 Claims

1. A method for the production of a positive resist image comprising the steps of:

- exposing a film consisting essentially of a non-crosslinked polymeric material to electron beam radiation from  $10^{-5}$  to about  $10^{-6}$  coulombs/cm<sup>2</sup> in a predetermined pattern, wherein the non-crosslinked polymeric material has a number average molecular weight (Mn) in the range of about  $5 \times 10^3$  to about  $1,500 \times 10^3$  and a weight average molecular weight (Mw) in the range of about  $10 \times 10^3$  to about  $300 \times 10^3$ ; and is selected from the group consisting of:

- non-crosslinked polymeric material containing:
  - polymerized alkyl methacrylate units wherein the alkyl group contains from 1 to 4 carbon atoms; and
  - polymerized units of at least one other ethylenically unsaturated monomer selected from the group consisting of an acrylic acid derivative containing at least one  $\alpha$ -halogen or  $\alpha$ -cyano substituent, an acrylate derivative containing at least one  $\alpha$ -halogen or  $\alpha$ -cyano substituent; acrylonitrile derivative containing at least one  $\alpha$ -halogen substituent; vinyl chloride; vinylidene chloride and mixtures thereof and having the formula:



wherein R<sub>1</sub> is selected from the group consisting of H, CH<sub>3</sub>, CN, Cl, CH<sub>2</sub>Cl, CH<sub>2</sub>CN, Br, CH<sub>2</sub>Br, I, CH<sub>2</sub>I, F and wherein R<sub>2</sub> is selected from the group of COOCH<sub>3</sub>, COOH, CN, CH<sub>2</sub>CN, Cl, CH<sub>2</sub>Cl, Br, CH<sub>2</sub>Br, I, CH<sub>2</sub>I, F, provided that when R<sub>2</sub> is COOCH<sub>3</sub> or COOH then R<sub>1</sub> is other than CH<sub>3</sub> and H; wherein the amount of the polymerized alkyl methacrylate units (a) is from about 50 to about 99 mole % and the amount of the polymerized units of the at least one other ethylenically unsaturated monomer (b) is from about 50 to about 1 mole % based upon the total moles of (a) and (b) in the polymeric material;

- posthalogenated polymer of the above polymeric material (1) wherein the halogen content due to the posthalogenation is from about 1 to about 10 mole %, and wherein the total halogen content and cyano content is from about 2 to about 50 mole %;
- posthalogenated polyalkyl methacrylate wherein the alkyl group contains from 1 to 4 carbon atoms and wherein the halogen content is between about 1 and about 10 mole %; and
- mixtures of any of (1), (2), or (3) with each other;

4,011,352

**THERMOGRAPHIC PROCESS OF PRODUCING AN IMAGE**

Wilhelmus Janssens, Aarschot; Raymond Gerard Lemahieu, Mortsel; Jozef Aimé Dierckx, Hove, and Daniël Alois Claeys, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 428,805, Dec. 27, 1973, abandoned.

This application Nov. 28, 1975, Ser. No. 635,904

Claims priority, application United Kingdom, Sept. 14, 1973, 43337/73

Int. Cl.<sup>2</sup> B41M 5/12

U.S. Cl. 427—145

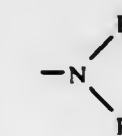
12 Claims

1. In a thermographic recording process in which a dye is produced by bringing image-wise into reactive contact with the aid of heat an organic acid-reacting compound with a dye precursor compound, the improvement of producing a light stable yellow image by bringing said compound into contact with a dye precursor corresponding to the following general formula:



wherein:

Ar represents a phenylene nucleus,  
R<sub>1</sub> represents a phenyl group and  
X represents a



group wherein each of R<sub>2</sub> and R<sub>3</sub> (same or different) represents an alkyl group, a cyanoalkyl group, a chloroalkyl group, and an alkoxy carbonylalkyl group.

4,011,353

**APPARATUS FOR FORMING A UNIFORM LIQUID FILM ON A ROLLER**

Toyoo Okamoto; Takashi Suzuki, and Kelichi Maruta, all of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

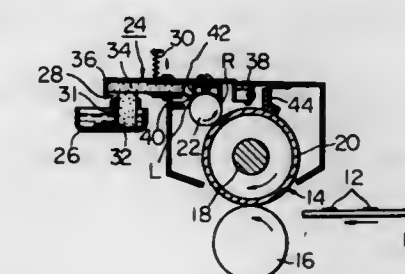
Filed May 1, 1974, Ser. No. 465,792

Claims priority, application Japan, May 9, 1973, 48-50634

Int. Cl.<sup>2</sup> B05C 11/00; G03G 13/20

U.S. Cl. 427—194

10 Claims



10. A method of applying a liquid of substantially constant thickness onto the circumference of a driven roller utilizing a transfer roller disposed parallel to the driven roller, and wherein the transfer roller receives liquid from an applicator which comprises a reservoir containing the liquid, a porous member partially immersed in the liquid, a porous cloth contacting the porous member and the circumference of the



transfer roller, and biasing means to urge the porous cloth against the circumference of the transfer roller, the method comprising the steps of transferring liquid from said transfer roller to said driven roller when the thickness of the liquid on said driven roller is below a predetermined value by causing said driven roller to drive and rotate said transfer roller so that the latter picks up liquid from said porous cloth and transfers the same liquid to said transfer roller, and interrupting transfer of liquid from said transfer roller to said driven roller when the thickness of the liquid on said driven roller is above a predetermined value by halting the rotation of said transfer roller as said driven roller continues to rotate, whereby a uniform film of liquid of substantially constant thickness is applied onto the circumference of said driven roller.

4,011,354

# METHOD AND APPARATUS FOR MAKING TUBULAR RESIN ELEMENTS SUCH AS PIPES

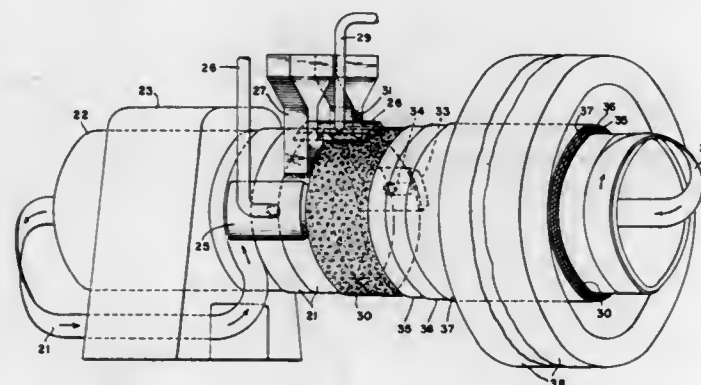
Frede Hilmar Drostholm, Vedbaek, Denmark, and Leonard S. Meyer, Columbia, S.C., assignors to Frede Hilmar Drostholm, Vedbaek, Denmark

Filed Mar. 22, 1972, Ser. No. 236,892

Int. Cl.<sup>2</sup> B29C 13/04; B65H 81/04

U.S. Cl. 427-195

11 Claims



1. In the manufacture of tubular fiber reinforced resin elements, the method which comprises applying a tube lining to an axially moving mandrel surface to be advanced axially of the mandrel by said moving surface, applying at least one layer of liquid fiber reinforced thermosetting resin material superimposed upon the tube lining to be advanced axially with the lining, the lining layer being applied by depositing solid particulate thermoplastic resin material on the mandrel surface, heating the particulate resin material to soften and fuse it in situ on the mandrel surface, and heating the thermosetting resin material to effect solidification thereof during axial advancement of the superimposed layers with the moving mandrel surface.

4,011,355

# EMULSION COATING FOR LIGHTWEIGHT AGGREGATE

Theodore O. Mandish, and Doneath M. Mandish, both of Rte. No. 2, Box 184, Titusville, Fla. 32780

Continuation-in-part of Ser. No. 488,318, July 15, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,153

Int. Cl.<sup>2</sup> B05D 7/02; B32B 13/02, 5/18

U.S. Cl. 427-214

2 Claims

1. A method of making a lightweight, coated aggregate for use in forming a lightweight concrete material, comprising the steps of:

- forming a mixture of approximately equal parts by volume of dehydrated lime and hydrated alumina in combination with water having a wetting agent therein to form a suitable consistency when thoroughly mixed in a mixer;
- coating lightweight expanded polymer beads with said mixture; and
- mixing cement with said coated expanded beads;

said aqueous mixture of dehydrated lime and hydrated alumina, polymer beads and cement being employed in a ratio such that approximately 1 to 2 quarts of said aqueous mixture of dehydrated lime and hydrated alumina are employed for each approximately 6 cubic feet of polymer beads and approximately 2 quarts of cement.

4,011,356

# LAMINATED GLAZING PANE

Emmanuel Lambert, Jumet, and Lucien Leger, Montigny-le-Tilleul, both of Belgium, assignors to Glaverbel-Mecaniver S.A., Watermael-Boitsfort, Belgium

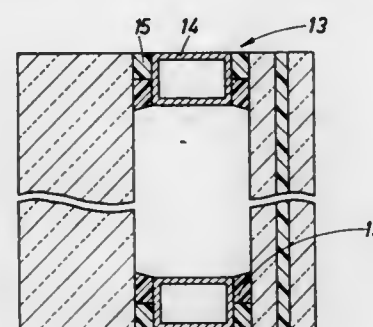
Filed Dec. 19, 1974, Ser. No. 534,218

Claims priority, application United Kingdom, Jan. 29, 1974, 4109/74; Jan. 29, 1974, 4111/74

Int. Cl.<sup>2</sup> E06B 3/24; E04B 1/82; B32B 17/10

U.S. Cl. 428-34

19 Claims



1. In a laminated glazing pane comprising at least two sheets of vitreous material and an intervening layer of adhesive material bonding said sheets together, the improvement wherein said intervening layer is of a predetermined thickness and comprises polyvinyl chloride and an added plasticizer, said plasticizer being present in a proportion of 30.5% to 35%, by weight, of said intervening layer, for causing the numerical value of the base frequency ( $f$ ) of said laminated pane to lie in the range  $0.70f_0 \leq f \leq 0.97f_0$  where  $f_0$  is the theoretical base frequency of the pane, whereby the pane has improved sound damping properties.

4,011,357

# LAMINATE OF BIAXIALLY ORIENTED POLYSTYRENE FILM AND POLYSTYRENE FOAM

Donald A. Haase, Penfield, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 448,851, March 7, 1974, abandoned, which is a continuation of Ser. No. 211,088, Dec. 22, 1971, abandoned, which is a division of Ser. No. 876,814, Nov. 14, 1969, Pat. No. 3,682,730. This application Sept. 23, 1975, Ser. No. 615,947

Int. Cl.<sup>2</sup> B32B 3/26

U.S. Cl. 428-215

8 Claims

1. A laminate of a flat extruded sheet of pentane blown polystyrene foam directly heat sealed to a preformed film of biaxially oriented film of polystyrene in which laminate the preformed film of polystyrene has not undergone disorientation as a result of being directly heat sealed to the foam sheet.

8. A laminate, as defined in claim 1, consisting of a layer of the foam sheet heat sealed to the film of polystyrene and having an overall thickness of about 48 mils.

4,011,358

# ARTICLE HAVING A COEXTRUDED POLYESTER SUPPORT FILM

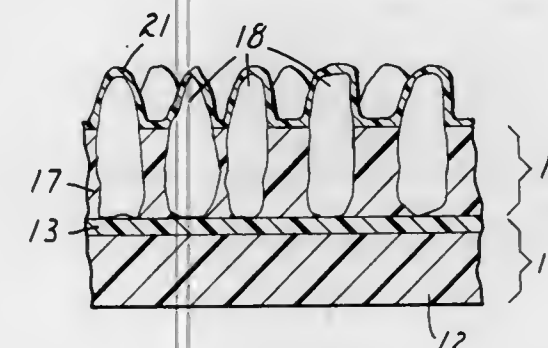
Glenn E. Roelofs, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed July 23, 1974, Ser. No. 491,131

Int. Cl.<sup>2</sup> B32B 27/36, 27/06

U.S. Cl. 428-287

12 Claims



1. Composite coated sheet material comprising, in combination:

- a biaxially oriented and heat-set coextruded support film consisting essentially of (A) a base layer of dimensionally stable crystalline first polyester selected from the group consisting of polyethylene terephthalate, polycyclohexane dimethyl terephthalate and polyethylene naphthalate (B) an adhesion-promoting layer having a thickness from about one-fourth of the total thickness of said support layer to about 1 mil thick of a second polyester having a minor degree of crystallinity between about 20° C and 230° C and melting at a temperature less than about 230° C wherein said adhesion-promoting layer is a polyester produced by the condensation reaction of a dicarboxylic acid component consisting of from about 10 to about 100 mole percent of a dicarboxylic acid selected from the group consisting of isophthalic acid, hexahydroterephthalic acid, sebaic acid, succinic acid, adipic acid, azelaic acid, suberic acid, pimelic acid, glutaric acid or mixtures thereof, or the diesters of such acids and correspondingly from 90 to zero mole percent of terephthalic acid, and a glycol component, in substantially equimolar proportions with the dicarboxylic acid component, wherein the glycol component is selected from the group consisting of polymethylene glycol of the formula  $\text{HO}(\text{CH}_2)_n\text{OH}$ , wherein  $n$  is an integer of 2-10, neopentyl glycol, 1,4-cyclohexane dimethanol and bisphenol A; and
- a coating of polymeric material firmly adherently bonded to the face of said (B) layer.

4,011,359

# INTERLEAVING MATERIALS COMPRISING PARTICULATE SEPARATOR AND ACIDIC MATERIALS, FOR SEPARATING GLASS SHEETS

Gordon Thomas Simpkin, Ormskirk, and Kenneth Ashcroft, Liverpool, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed Apr. 22, 1975, Ser. No. 570,314

Claims priority, application United Kingdom, Apr. 25, 1974, 18169/74

Int. Cl.<sup>2</sup> B32B 17/08; C08L 1/02

U.S. Cl. 428-326

25 Claims

1. An interleaving material for separating glass sheets and protecting them from staining, comprising a porous finely divided support material, impregnated with a weak organic acid selected from the group consisting of dibasic aliphatic acids, aromatic acids and mixtures thereof, and fine particles of a chemically inert plastics material selected from the group consisting of a thermoplastic homopolymer of an ethylenically unsaturated monomer, a thermoplastic copolymer of ethylenically unsaturated monomers and mixtures thereof, the particle size of said plastics material being larger than that of said

acid-impregnated porous support material and the particle sizes of both said plastics material and said support material being such that the particles will pass through a 10 mesh British Standard sieve but will be retained on a 300 mesh British Standard sieve, said plastics material and said acid-impregnated porous support material being present in relative proportions between 90:10 and 10:90 parts by weight.

4,011,360

# ELECTRICALLY CONDUCTIVE SILICONE RUBBER STOCK

Thomas William Walsh, North Andover, Mass., assignor to Chomerics, Inc., Woburn, Mass.

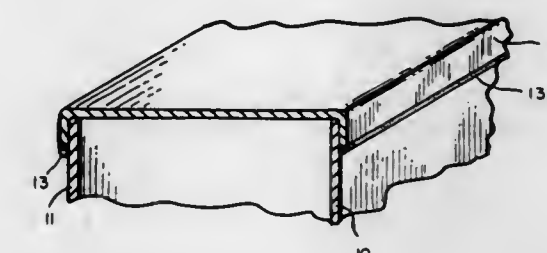
Continuation of Ser. No. 459,486, April 10, 1974, abandoned.

This application Jan. 23, 1976, Ser. No. 651,806

Int. Cl.<sup>2</sup> B32B 5/16

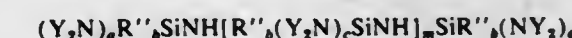
U.S. Cl. 428-402

11 Claims



1. An uncured one component room temperature moisture curing electrically conductive RTV silicone rubber stock stored under anhydrous conditions and which will remain essentially uncured when so stored at room temperature and which comprises the mixture of essentially:

- 75 to 98 parts by weight (PBW) of electrically conductive particles each comprising glass cores having an outer surface of silver;
- 2 to 25 PBW of a linear siloxane polymer of the average molecular formula  $\text{R}'_2\text{SiO}[\text{R}_2\text{SiO}]_n\text{SiR}'_2$  wherein each  $\text{R}$  is a monovalent hydrocarbon radical or a halogenated monovalent hydrocarbon radical, each  $\text{R}'$  is a hydrogen atom, alkoxy radical, aryloxy radical, hydroxy radical or acyloxy group and  $x$  has an average value of from 50 to 10,000; and
- 0.0005 to 0.020 parts by weight, based on each part by weight of the siloxane polymer, of a curing agent which is an aminosilane of the formula  $\text{R}''_n\text{Si}(\text{NY}_2)_{4-n}$  or an aminosilazane of the formula



wherein each  $\text{R}''$  is an alkyl radical, aryl radical, or aralkyl radical, each  $\text{Y}$  is a hydrogen atom, alkyl radical, aryl radical or aralkyl radical,  $n$  is 0 or 1,  $m$  is at least 1,  $a$  is 2 or 3,  $b$  is 0 or 1, and  $c$  is 1 or 2.

4,011,361

# FLUOROPOLYMER COATING COMPOSITIONS HAVING IMPROVED ADHESION

Eustathios Vassiliou, Newark, Del., and Thomas P. Concannon, Newtown Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 18, 1975, Ser. No. 588,005

Int. Cl.<sup>2</sup> B32B 27/00; C08G 51/24; C08J 1/48

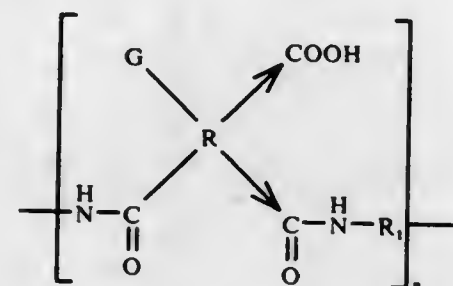
U.S. Cl. 428-422

21 Claims

- A coating composition comprising
  - about 10%-90%, by weight of the total of (a) and (b) solids, of a particulate polymer of monoethylenically unsaturated hydrocarbon monomers completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms, the polymer having a number average molecular weight of at least 20,000;



- b. about 10%–90%, by weight of the total of (a) and (b) solids, of a binder which comprises
- about 5–95%, by weight of the total of (1) and (2) solids, of a colloidal silica which air-dries to form a continuous film when laid down by itself,
- and
- about 5–95%, by weight of the total of (1) and (2) solids, of a salt of a polyamide acid represented by the structure



where

- G is hydrogen or a carboxyl group; → denotes isomerism; R is a tetravalent organic radical containing at least two carbon atoms, no more than two carbonyl groups of each polyamide acid unit being attached to any one carbon atom of each tetravalent radical; R<sub>1</sub> is a divalent radical containing at least two carbon atoms, the amide groups of adjacent polyamide acid units each being attached to separate atoms of said divalent radical; and
- n is a number large enough to give the polyamide acid an inherent viscosity of at least 0.1, measured as a 0.5% solution in N,N-dimethylacetamide at 30° C.;
- c. about 10–90%, by weight of the polyamide acid amide salt, of N-methyl pyrrolidone, dimethyl formamide, dimethylacetamide, dimethylsulfoxide, cresylic acid, sulfolane or formamide;
- and
- d. a liquid carrier.
11. An article bearing a primer coat of the composition of claim 1, topcoated with a fused fluoropolymer enamel.

4,011,362

#### METAL SUBSTRATES WITH CARBOXYFUNCTIONAL SILOXANE RELEASE COATINGS

Howard Franklin Stewart, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.  
Division of Ser. No. 457,007, April 1, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,066  
Int. Cl.<sup>2</sup> B32B 15/08; C07F 7/08; C08G 77/14, 77/22  
U.S. Cl. 428–447

3 Claims

1. A metal substrate having on the surface thereof, in an amount sufficient to improve the release characteristics of said substrate, a composition consisting essentially of (1) from 1 to 99 percent by weight of a siloxane fluid having the general formula  $(CH_3)_xSiO[(CH_3)_2SiO]_xSi(CH_3)_3$  wherein x is an integer, and (2) from 1 to 99 percent by weight of a siloxane composed essentially of from 0.1 to 50 mole percent of  $R_aR'_bSiO_{(4-a-b)/2}$  units and from 50 to 99.9 mole percent of  $R''_cSiO_{(4-c)/2}$  units wherein

R is a carboxyfunctional radical,  
a has an average value from 1 to 3,  
R' is a hydrocarbon or halogenated hydrocarbon radical,  
b has an average value from 0 to 2,  
the sum of a + b is from 1 to 3,  
R'' is a hydrocarbon or halogenated hydrocarbon radical,  
and c has an average value from 0 to 3.

3. In a process of treating a metal substrate to improve the release characteristics thereof, said process including the step of applying a substance to the metal substrate which substance enhances the release characteristics of said substrate, the

improvement comprising applying to the metal substrate as the substance which enhances the release characteristics a composition consisting essentially of (1) from 1 to 99 percent by weight of a siloxane fluid having the general formula  $(CH_3)_xSiO[(CH_3)_2SiO]_xSi(CH_3)_3$  wherein x is an integer, and (2) from 1 to 99 percent by weight of a siloxane composed essentially of from 0.1 to 50 mole percent of  $R_aR'_bSiO_{(4-a-b)/2}$  units and from 50 to 99.9 mole percent of  $R''_cSiO_{(4-c)/2}$  units wherein

R is a carboxyfunctional radical,  
a has an average value from 1 to 3,  
R' is a hydrocarbon or halogenated hydrocarbon radical,  
b has an average value from 0 to 2,  
the sum of a + b is from 1 to 3,  
R'' is a hydrocarbon or halogenated hydrocarbon radical,  
and  
c has an average value from 0 to 3.

4,011,363

#### CURABLE AMINO RESINS

Richard D. Sundie, Montvale, and Walter L. Pennie, Morris-town, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 530,313, Dec. 6, 1974, Pat. No. 3,979,492, which is a division of Ser. No. 431,535, Jan. 7, 1974, Pat. No. 3,891,590, which is a continuation of Ser. No. 210,160, Dec. 20, 1971, abandoned. This application May 18, 1976, Ser. No. 687,572

Int. Cl.<sup>2</sup> B32B 27/42

U.S. Cl. 428–524

16 Claims

1. A fiberboard comprising fibrous material impregnated with a curable amino resin, said resin being prepared by a process comprising the steps of:

- mixing the following ingredients to form component I:
  - from about 15 to about 25 weight percent urea;
  - from about 30 to about 70 weight percent formaldehyde;
  - from about 4.5 to about 10 weight percent melamine;
  - from about 10 to about 30 weight percent water;
  - from about 0.05 to about 4.0 weight percent stabilizer, said stabilizer comprising a buffering agent which maintains the pH of the composition within the range from about 4.0 to about 7.5;
- mixing the following ingredients to form component II:
  - from about 35 to about 50 weight percent urea;
  - from about 45 to about 65 weight percent water; and
  - from about 0.5 to about 3.0 weight percent catalyst which promotes the reaction of urea, melamine and formaldehyde; and
- mixing together from about 40 to about 60 parts of component I with correspondingly from about 60 to about 40 parts of component II to form the curable amino resin.

4,011,364

#### NON-REVERSIBLE BATTERY COVER

Raymond L. Schenk, Jr., Doylestown, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Oct. 1, 1975, Ser. No. 618,500

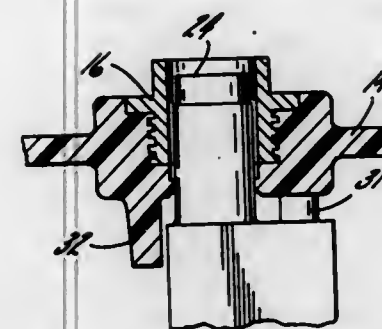
Int. Cl.<sup>2</sup> H01M 2/04

U.S. Cl. 429–1

5 Claims

1. A non-reversible cover arrangement for a battery having a casing and at least two symmetrically disposed terminal posts of opposite polarity comprising, in combination, a cover adapted to fit and close said casing and having polarity designating indicia on one side of the center line thereof, said cover having apertures therethrough disposed symmetrically for receiving said terminal posts when said cover is properly oriented so that said indicia is located adjacent said posts of like polarity, and means including eccentric abutments adjacent at least said posts of one polarity and opposing eccentric projections on the underside of said cover adjacent at least the

apertures on one side of said center line for preventing said posts of said one polarity from extending fully through said electric current carried by the cell and being arranged to



apertures when said cover is mis-oriented with said indicia located adjacent said posts of unlike polarity.

4,011,365

#### ELECTRIC ACCUMULATOR

Olle Birger Lindstrom, Taby, Sweden, assignor to AB Olle Lindstrom, Taby, Sweden

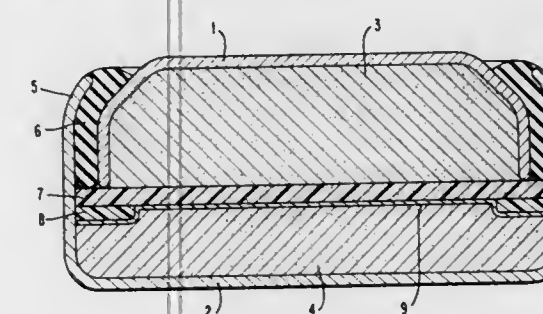
Filed Sept. 26, 1975, Ser. No. 617,153

Claims priority, application Sweden, Oct. 3, 1974, 7412505

Int. Cl.<sup>2</sup> H01M 10/34

U.S. Cl. 429–60

10 Claims



1. Rechargeable electrochemical cell or electric accumulator comprising such cells containing a positive electrode in which the active material in its fully charged condition comprises silver oxides and in its fully discharged condition comprises silver, an electrolyte comprising a water solution of an alkali hydroxide and a negative electrode in which the active material in its charged condition comprises metallic iron, said cell being sealed so that the gases being developed within the cell are brought in contact with the negative as well as the positive electrode.

4,011,366

#### ELECTRIC CELLS

Roger John Bones, Abingdon, and John Richard Harbar, Wantage, both of England, assignors to United Kingdom Atomic Energy Authority, England

Filed May 11, 1976, Ser. No. 685,424

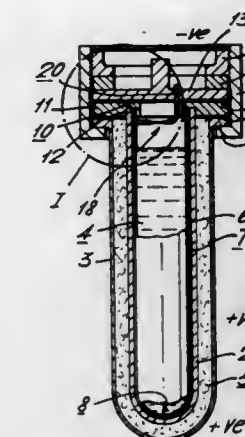
Claims priority, application United Kingdom, May 22, 1975, 22389/75

Int. Cl.<sup>2</sup> H01M 2/00

U.S. Cl. 429–61

9 Claims

1. An electric cell comprising a solid electrolyte which partially bounds on one side a compartment containing liquid sodium and on the other side a compartment containing liquid sulphur impregnated in a graphite felt, and a circuit breaking means connected inside the cell in series in the internal electric circuit of the cell, said circuit breaking means being re-



interrupt the internal electric circuit upon either the temperature or the current reaching a predetermined value.

4,011,367

#### SODIUM-SULPHUR ELECTRIC CELLS

Leslie Samuel Evans, Reading; Trevor Leslie Markin, Goring-on-Thames, and Roger John Bones, Abingdon, all of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, England

Filed June 17, 1976, Ser. No. 696,895

Claims priority, application United Kingdom, June 23, 1975, 26628/75

Int. Cl.<sup>2</sup> H01M 10/00

U.S. Cl. 429–104

7 Claims



1. A sodium-sulphur electric cell having a compartment containing liquid sulphur bounded at least in part by one side of a solid electrolyte, a compartment containing liquid sodium on the other side of the solid electrolyte, and a current collecting means extending into the liquid sulphur compartment, wherein the improvement comprises a current collecting means of hollow form, the current collecting means containing an expansion space therewithin for products arising from reaction of sodium and sulphur, and port means provided in the current collecting means and connected between the liquid sulphur compartment and the expansion space to provide for flow of said products into and out of the expansion space.



4,011,368

**WATERTIGHT BATTERY CAP**

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co. Ltd., Tokyo, Japan

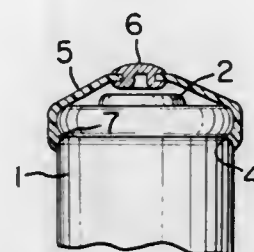
Continuation of Ser. No. 438,581, Jan. 31, 1974, abandoned.

This application July 10, 1975, Ser. No. 594,798

Int. Cl.<sup>2</sup> H01M 6/02

U.S. Cl. 429—121

4 Claims



1. An improved watertight battery and cap combination comprising:

a first battery having a first terminal at the center of one end face thereof, a second terminal at the opposed end thereof and a peripheral groove formed on the outside surface proximate the end thereof adjacent the first terminal,

a movable cap having a first cylindrical portion that surrounds a portion of the periphery of said battery, an inwardly directed lip at one end of said cylindrical portion, said lip engaging the peripheral groove in said battery and a resilient, substantially convex end wall integral with said cylindrical portion at a location axially spaced from the plane of said lip and capable of being moved inwardly towards said first battery terminal upon the application of a force; and

a conductive terminal integral with and extending through said end wall of said battery cap and in opposition to one of said battery terminals, said terminal being normally spaced from and capable of contacting said first battery terminal when the force is applied to said end wall but being insulated from said second battery terminal.

4,011,369

**ELECTRIC STORAGE BATTERY ELECTRODE, AND METHOD FOR ITS MANUFACTURE**

Erik G. Sundberg, Nol, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

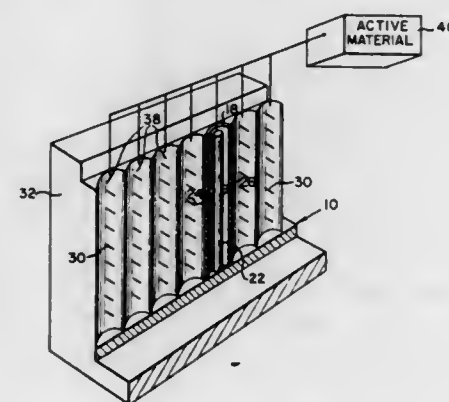
Filed Feb. 20, 1975, Ser. No. 551,327

Claims priority, application Sweden, Feb. 22, 1974, 7402348

Int. Cl.<sup>2</sup> H01M 2/16

U.S. Cl. 429—140

10 Claims



1. A plate electrode for a storage battery containing a plurality of tubes connected together to define a plane for said electrode with each of said tubes comprising an outer sheath of electrical insulating, electrolyte-permeable material filled with active material and a rod of electrically conducting material disposed in the center thereof and characterized in that for

centering the conductive rod, said rod is provided solely with centering fins formed integrally with the rod which project radially from the center of the rod, with all of said centering fins lying solely in a direction substantially parallel to the plane of said electrode.

4,011,370

**METHODS AND APPARATUS FOR CLOSING THE BOTTOM ENDS OF ELECTRODE TUBES**

Gunnar Eckerbom, Kungälv, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

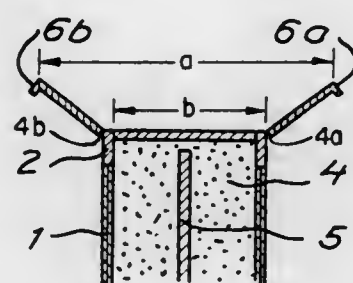
Filed June 2, 1976, Ser. No. 692,119

Claims priority, application Sweden, Feb. 6, 1975, 7506254

Int. Cl.<sup>2</sup> H01M 35/12

U.S. Cl. 429—140

7 Claims



1. A closure strip for covering the bottom ends of battery electrode tubes, said bottom strip comprising:

a base mounted on the bottom ends of the electrode tubes joining said electrode tubes together, and

at least one movable closure section joined to said base, said movable closure section being movable from an open position allowing the tubes to be filled with active material to a closed position closing the bottom ends of said electrode tubes.

4,011,371

**MEANS FOR DETECTING AND NEUTRALIZING LEAKS IN ELECTROCHEMICAL CELLS**

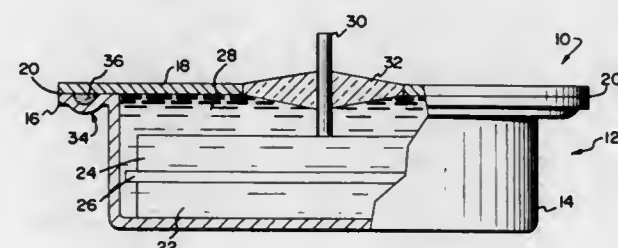
Joseph L. Hallett, Seneca Falls; Peter H. Rollason, Cayuga, and Thaddeus V. Rychlewski, Seneca Falls, all of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 17, 1975, Ser. No. 641,487

Int. Cl.<sup>2</sup> H01M 2/08

U.S. Cl. 429—174

7 Claims



1. An electrochemical cell comprising: a container having a substantially cup-shaped portion and a lid therefor peripherally sealed to said cup-shaped portion; a positive and a negative electrode within said sealed container; a corrosive electrolyte within said sealed container and encompassing said electrodes; and means associated with said seal and forming an integral part with said container including a neutralizing agent for said corrosive electrolyte in the event of a leak, said integral part comprising a depression formed in a flange of said cup-shaped portion.

4,011,372

**METHOD OF PREPARING A NEGATIVE ELECTRODE INCLUDING LITHIUM ALLOY FOR USE WITHIN A SECONDARY ELECTROCHEMICAL CELL**

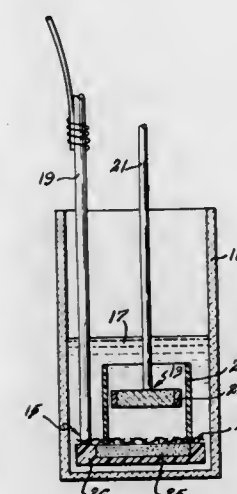
Zygmunt Tomczuk, Palos Hills; Theodore W. Olszanski, Roselle, and James E. Battles, Oak Forest, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 9, 1975, Ser. No. 639,133

Int. Cl.<sup>2</sup> H01M 4/40

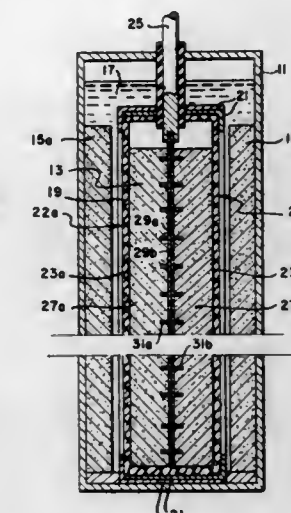
U.S. Cl. 429—218

10 Claims



1. A method of preparing an electrode including a lithium alloy as active material for use as a negative electrode within a secondary electrochemical cell, said cell also including a positive electrode and a molten salt electrolyte, said method comprising preparing a melt of lithium alloy selected from the group of lithium-aluminum, lithium-silicon and lithium-magnesium; immersing a porous substrate of electrically conducting metal within said melt; removing said substrate from said melt to completely solidify adherent lithium alloy within at least a portion of the void volume of said substrate; and assembling said substrating with completely solidified lithium alloy within said electrochemical cell.

ternary alloys, said positive electrode composition comprising a transition metal, lithium sulfide, and a compound selected



from alkali metal and alkaline earth metal compounds consisting of the nitrides and carbides.

4,011,374

**POROUS CARBONACEOUS ELECTRODE STRUCTURE AND METHOD FOR SECONDARY ELECTROCHEMICAL CELL**

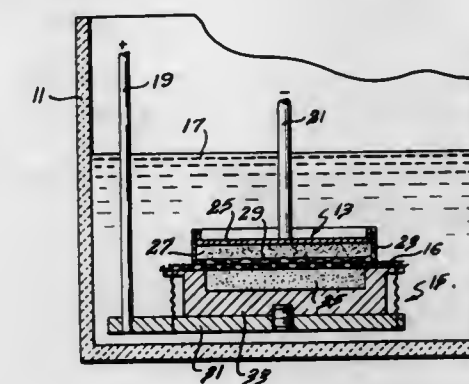
Thomas D. Kaun, Lisle, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 2, 1975, Ser. No. 636,882

Int. Cl.<sup>2</sup> H01M 4/36

U.S. Cl. 429—220

16 Claims



1. An improved electrode for use in a high-temperature, secondary electrochemical cell including a molten salt electrolyte, said electrode comprises a solid, porous matrix of thermosetting, carbonaceous material of about 50–65% porosity having solid particles of metal sulfide selected from the group consisting of sulfides of iron, cobalt, nickel and copper, fixedly embedded therein in a generally uniform distribution and exposed to interstitial volume within said porous matrix.

4. A paste composition for forming an electrode for use in a high-temperature, secondary electrochemical cell, said paste composition comprising a thermosetting material in liquid form, particulate active material and solid volatile in a generally uniform mixture, said particulate active material being selected from the group consisting of sulfides of iron, cobalt, nickel and copper and said solid volatile being about 50–65% of the total volume of paste constituents.

11. A method of preparing an electrode including a particulate active material selected from the group consisting of sulfides of iron, cobalt, nickel and copper for use in a high-temperature, secondary electrochemical cell, said method comprising blending thermosetting carbonaceous material in liquid form with the particulate active material and solid volatile to form a generally uniform paste, said solid volatile being provided in sufficient amount to be about 50–65% of the

4,011,373

**UNCHARGED POSITIVE ELECTRODE COMPOSITION**

Thomas D. Kaun, Lisle; Donald R. Vissers, Naperville, and Hiroshi Shimotake, Hinsdale, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 29, 1976, Ser. No. 681,649

Int. Cl.<sup>2</sup> H01M 35/02

U.S. Cl. 429—218

7 Claims

1. An uncharged electrode composition for use in a positive electrode within a secondary electrochemical cell opposite to a negative electrode containing a material capable of alloying with lithium to produce an alloy of higher melting point than that of lithium metal, said negative electrode material being selected from the group of aluminum and silicon or their



total volume of paste constituents; and heating said paste to transform said volatile to vapor and to cure said thermosetting, carbonaceous material into a rigid, porous matrix containing said active material.

4,011,375

# PHOTODEGRADABLE PLASTICS CONTAINING HALOGENATED DIPHENYL ETHANES

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

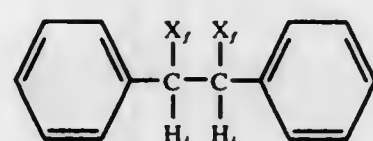
Filed Nov. 26, 1974, Ser. No. 527,400

Int. Cl.<sup>2</sup> C08J 3/20

U.S. Cl. 526—1

2 Claims

1. A photodegradable composition comprising a polyolefin and about from 0.1 to 10% of an additive of the structure



wherein:

Each X is chlorine, bromine, or iodine,  
j is 1 or 2, and  
j is 2—f.

4,011,376

# NOVEL REACTION PRODUCTS OF ALLYL HALIDES OR VINYL BENZYL HALIDES WITH OXAZOLINES (OR OXAZINES)

Donald A. Tomalia, and Elizabeth A. Zubritsky, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

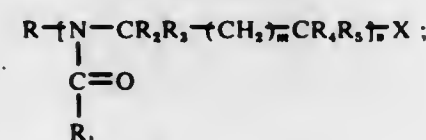
Filed Mar. 3, 1975, Ser. No. 554,381

Int. Cl.<sup>2</sup> C08G 33/06; C07D 85/36; C08G 33/02, 45/00

U.S. Cl. 526—11.1

10 Claims

1. A methylene chloride-soluble composition of matter corresponding to the formula



wherein

R is allyl or m- and/or p-vinylbenzyl  
R<sub>1</sub> is hydrogen, alkyl of 1 to 24 carbon atoms or phenyl;  
R<sub>2</sub>-R<sub>5</sub> are hydrogen, lower alkyl or lower-hydroxyalkyl with the proviso that at least two of R<sub>2</sub>-R<sub>5</sub> are hydrogen;  
m is 0 or 1;  
n is an integer of at least 1; and  
X Chloro bromo iodo or hydroxy.

4,011,377

# ENZYME SEPARATION

Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England  
Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.

This application Sept. 4, 1975, Ser. No. 610,152

Int. Cl.<sup>2</sup> C08F 120/052, 8/40; C08C 19/24

U.S. Cl. 526—13

9 Claims

1. A reactive matrix consisting essentially of adenosine triphosphate chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble

organic polymeric support material containing said adenosine triphosphate attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said adenosine triphosphate, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,011,378

# AROMATIZED POLYACETYLENES

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

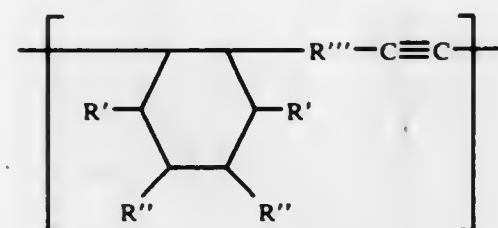
Filed June 29, 1972, Ser. No. 267,389

Int. Cl.<sup>2</sup> C08F 9/00; C08G 25/00

U.S. Cl. 526—19

8 Claims

1. A polymer all of whose repeating units have the formula



wherein each R''' is the residue other than an ethynylene group of a solvent-soluble polyacetylene, each R', independently, is lower alkyl, lower alkoxy, carbonyl, phenyl or halophenyl and each R'', independently, is phenyl or halophenyl.

4,011,379

# ELECTRICAL INSULATION FROM LIGHTLY CHLORINATED, HIGH BULK DENSITY OLEFIN POLYMER

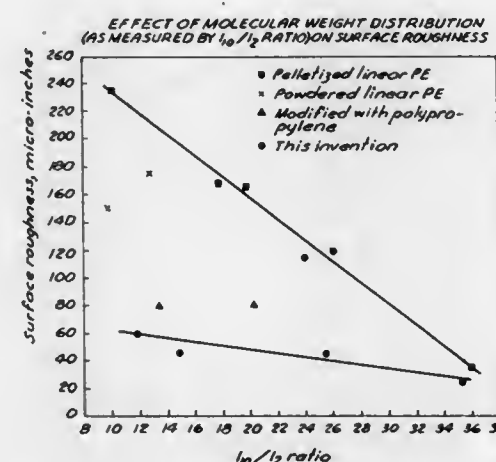
Kenneth E. Bow, and James D. MacRae, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 22, 1975, Ser. No. 580,095

Int. Cl.<sup>2</sup> C08F 8/22, 10/02, 11/02

U.S. Cl. 526—22

4 Claims



1. Electrical insulation formed from a normally solid, linear polyethylene containing from about 1 to about 20 percent by weight chlorine chemically combined therewith said polyethylene having a bulk density of from about 22 to about 36 pounds per cubic foot and wherein the individual particles of said polymer are predominantly in the range of from about 300 to about 800 microns in size, said polyethylene additionally being characterized by a melt index of from about 0.05 to about 2 as determined by ASTM Test No. D-1238, Procedure A and a tensile yield strength of greater than about 1000 p.s.i. wherein said polyethylene is chlorinated by reacting said polyethylene while in substantially dry, powdered form with gaseous chlorine in the substantial absence of oxygen at tem-

peratures not substantially exceeding 90° C, while holding said polyethylene in a fluidized bed state.

4,011,380

# OXIDATION OF POLYMERS IN PRESENCE OF BENZENE SULFONIC ACID OR SALT THEREOF

Charles T. West, Naperville, and George S. Culbertson, Downers Grove, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 5, 1975, Ser. No. 637,886

Int. Cl.<sup>2</sup> C08F 8/06, 8/32

U.S. Cl. 526—30

21 Claims

1. The process of oxidizing copolymers of ethylene and olefinically unsaturated monomers in the temperature range of from about -40° F. to about 800° F. in the presence of from about 0.01 weight percent to about 5.0 weight percent based on copolymer/oil solution, of an oil soluble benzene sulfonic acid or salt thereof.

4,011,381

# PROCESS FOR PREPARING THERMOSETTING POWDER COATING COMPOSITION

Naozumi Iwasawa; Nobuo Sugiyama; Ichiro Yoshihara; Tadashi Watanabe, and Taizo Kondo, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Amagasaki, Japan  
Filed May 28, 1975, Ser. No. 581,430

Claims priority, application Japan, June 4, 1974, 49-63218

Int. Cl.<sup>2</sup> C08F 220/14

U.S. Cl. 526—56

15 Claims

1. A process for preparing a thermosetting powder coating composition comprising the steps of copolymerizing 5 to 25 wt.% of at least one member selected from the group consisting of glycidyl acrylate and glycidyl methacrylate with 95 to 75 wt.% of an ethylenically unsaturated compound in a solvent having a boiling point of up to 170° C to obtain a solution of copolymer, the copolymer having a number average molecular weight of 2,000 to 30,000 and a melt viscosity of 100 to 500 poises at 160° C, uniformly dispersing a pigment into the copolymer solution, removing the solvent from the resulting mixture at a temperature of 170° to 220° C and reduced pressure not to exceed 0.5 wt.% of residual solvent, thereafter admixing a di- or tri-carboxylic acid cross-linking agent with the mixture with heating at a temperature of up to 120° C, and pulverizing the solid mixture obtained.

4,011,382

# PREPARATION OF LOW AND MEDIUM DENSITY ETHYLENE POLYMER IN FLUID BED REACTOR

Isaac J. Levine, Somerville, and Frederick J. Karol, Bellemead, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,122

Int. Cl.<sup>2</sup> C08F 2/34, 4/16, 4/24, 10/00

U.S. Cl. 526—96

10 Claims

1. A process for producing solid ethylene polymers having a density of less than 0.941 and a melt index of >0.0 to at least about 2.0 under relatively low pressure conditions which comprises

copolymerizing ethylene with sufficient quantities of C<sub>3</sub> to C<sub>8</sub> α-olefin monomer to provide the desired density in the copolymer product

in a fluid bed process at a temperature of about 30° to 105° C., under a pressure of less than about 1000 psi, and under a mass gas flow rate of about 1.5 to 10 times G<sub>mf</sub> by contacting the monomers with fluidized particles of a supported catalyst wherein said particles have an average diameter of about 50 to 200 microns

said supported catalyst having been activated in air or oxygen at a temperature of about 300° to 900° C., and comprising, based on the total weight of the support and the catalyst,

about 0.05 to 3.0 weight percent of chromium, about 1.5 to 9.0 weight percent of titanium, and

>0.0 to about 2.5 weight percent of fluorine, said chromium and said titanium being in the form of oxides after said activation.

4,011,383

# TETRA(NEOPHYL) ZIRCONIUM AND ITS USE IN PROCESS FOR THE POLYMERIZATION OF OLEFINS

Robert Alton Setterquist, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 471,813, May 20, 1974, Pat. No.

3,932,307. This application July 30, 1975, Ser. No. 600,297

Int. Cl.<sup>2</sup> C08F 2/06, 4/64, 10/02, 10/06

U.S. Cl. 526—154

11 Claims

1. A process for the polymerization or copolymerization of at least one olefinic monomer, selected from the group consisting of ethylene, higher 1-olefins and conjugated diolefins, to produce solid, linear polyolefins which comprises contacting at least one olefinic monomer in an inert hydrocarbon medium, at a temperature in the range of 10° to 300° C. and at a pressure high enough to keep the monomer in solution at the temperature employed, with a catalyst consisting essentially of neophyl zirconium aluminate bonded onto the surfaces of activated, fumed alumina.

4,011,384

# PROCESS FOR THE PRODUCTION OF CRYSTALLINE TERPOLYMERS OF ETHENE, BUTENE-1 AND BUTENE-2

Fritz Baxmann; Johann Dietrich; Walter Dittmann, and Albert Frese, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed June 10, 1975, Ser. No. 585,698

Claims priority, application Germany, June 29, 1974, 2431353

Int. Cl.<sup>2</sup> C08F 210/08

U.S. Cl. 526—158

5 Claims

1. A process for preparing crystalline, thermoplastic, low-pressure terpolymers of ethene with 0.1-5 mol % butene-1 and 0.1-3 mol % butene-2 having a density of 0.94-0.96 g./cm<sup>3</sup>, which comprises:

polymerizing a liquid phase monomer mixture consisting essentially of ethene, 0.05-10 mol % butene-1 and 20-98.9 mol % butene-2 with a catalytic amount of a particulate mixed polymerization catalyst comprising

a. TiCl<sub>3</sub> · nAlCl<sub>3</sub> wherein n is 0.2-0.6, and  
b. isoprenylaluminum in a molar ratio Al:Ti of about 2-20 to form said terpolymer.

4,011,385

# POLYMERIZATION OF OLEFINS

Long Shyong Wang, Stamford, and Erwin Richard Ruckel, Darien, both of Conn., assignors to Arizona Chemical Company, Wayne, N.J.

Filed May 12, 1975, Ser. No. 576,936

Int. Cl.<sup>2</sup> C08F 36/08

U.S. Cl. 526—190

13 Claims

1. A process for polymerizing an olefin selected from the group consisting of isobutylene, isoprene, piperylene, alpha-pinene, beta-pinene, camphene, dipentene, limonene, and mixtures thereof, which comprises the steps of: establishing a catalyst system consisting essentially of a mixture of an alkyl germanium halide or an aryl germanium halide, or an alkyl germanium alkoxide and aluminum chloride or aluminum bromide or mixtures of the latter in an inert solvent, adding at a temperature between about minus 30° and about plus 30° C an olefin selected from the group consisting of isobutylene, isoprene, piperylene, alpha-pinene, beta-pinene, camphene, dipentene, limonene, and mixtures thereof incrementally with agitation, adjusting and maintaining the temperature of the mixture at about minus 30° to about plus 30° C for from about 1 to about 4 hours, quenching the latter mixture with an aqueous solution, separating aqueous phase from the hydrocarbon phase, and recovering a solid polymer therefrom.



4,011,386

## PROCESS FOR PRODUCING POLYMERS OR COPOLYMERS OF NORBORNENE-CARBOXYLIC ACID AMIDES

Shuichi Matsumoto, Yokohama; Ryuichi Nakamura, Tokyo; Seiji Fukuhara, Kawasaki; Kazuo Suzuki, Yokohama, and Koei Komatsu, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Sept. 4, 1974, Ser. No. 503,209

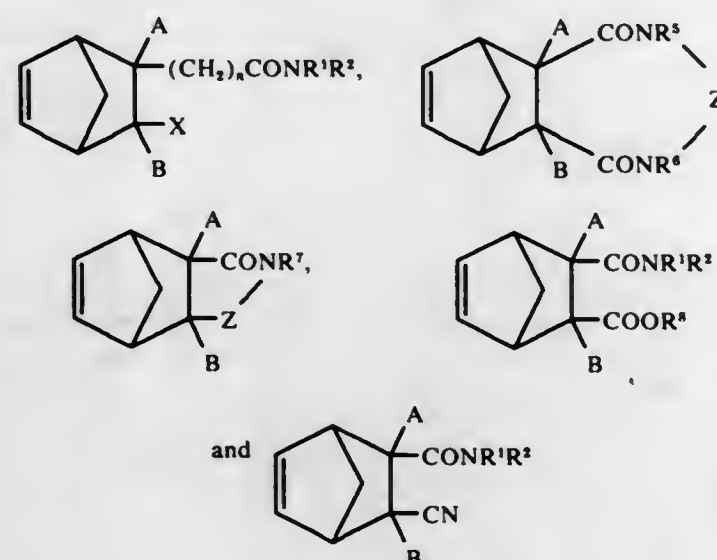
Claims priority, application Japan, Sept. 5, 1973, 48-99966

Int. Cl.<sup>2</sup> C08F 26/06

U.S. Cl. 526—259

6 Claims

1. A polymer obtained by ring-opening polymerization of (I) at least one compound selected from the group consisting of monomers represented by the formula,



wherein R<sup>1</sup> and R<sup>2</sup> are independently a hydrogen atom or a saturated or unsaturated hydrocarbon group having 1 to 10 carbon atoms; X is a hydrogen atom, an alkyl group having 1 to 10 carbon atoms or a group of the formula;



wherein R<sup>3</sup> and R<sup>4</sup> are independently a hydrogen atom or a saturated or unsaturated hydrocarbon group having 1 to 10 carbon atoms; R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> may be the same or different; R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> are independently a hydrogen atom or a saturated or unsaturated hydrocarbon group having 1 to 10 carbon atoms; A and B are independently an alkyl group having 1 to 10 carbon atoms or a cycloalkyl, aralkyl or aryl group having up to 20 carbon atoms, and may be the same or different; Z is an alkylene group having 1 to 10 carbon atoms; and n and m are independently an integer of 0 to 10.

4,011,387

## ADHESIVE RESINS AND METHOD OF PRODUCTION THEREOF

Jullus Curts, and Hanns Pietsch, both of Hamburg, Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

Filed July 23, 1975, Ser. No. 598,533

Claims priority, application Germany, Aug. 8, 1974, 2438125

Int. Cl.<sup>2</sup> C08F 32/06

U.S. Cl. 526—281

8 Claims

1. A resin comprising a polymer of the monomer dimethyl-di-(cyclohexen-3-yl)-methane having a softening point in the range of about 70° to 150° C. and a number average molecular weight of about 800 to about 1200.

4,011,388

## PROCESS FOR PREPARING EMULSIONS BY POLYMERIZATION OF AQUEOUS MONOMER-POLYMER DISPERSIONS

Charles Vincent Murphy, and David William Zunker, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 485,271, May 2, 1974, Pat. No. 3,953,386.

This application Oct. 28, 1975, Ser. No. 626,028

Int. Cl.<sup>2</sup> C08L 1/10, 1/18

U.S. Cl. 526—320

19 Claims

1. Process for the preparation of an aqueous polymer emulsion which comprises mixing water, surfactant, at least one polymer and at least one monomer, the polymer being soluble in said monomer, to form a dispersion of polymer-monomer particles in water; then subjecting said dispersion to conditions such that the monomer within the particles becomes polymerized by free radical polymerization thereby forming a substantially homogeneous blend of at least two polymers within the particles of the emulsion.

4,011,389

## GLYCOSIDE POLYETHERS

William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 21, 1975, Ser. No. 560,728

Int. Cl.<sup>2</sup> C07H 15/04

U.S. Cl. 536—4

7 Claims

1. A material having the formula



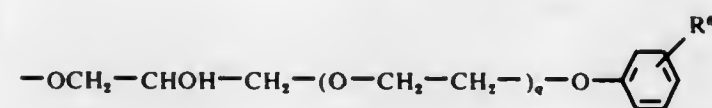
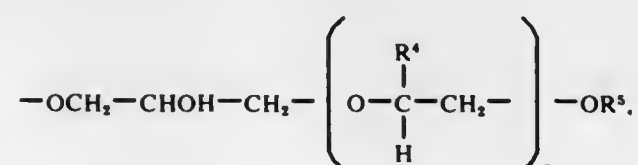
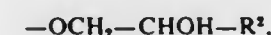
in which

(C<sub>6</sub>H<sub>10</sub>O<sub>5</sub>) represents a glycosyl unit;

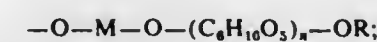
n is an integer from 1 to 20;

R is selected from the group consisting of 2-hydroxypropyl, 2-hydroxyethyl, glyceryl, methyl, ethyl, n-propyl, isopropyl, n-butyl, sec-butyl, methoxyethyl, and ethoxyethyl, said R being joined to a glycosyl unit through an acetal linkage;

R<sup>1</sup> is selected from the group consisting of



and



R<sup>2</sup> is an alkyl group containing 6 to 18 carbon atoms;

R<sup>3</sup> is an alkyl group containing 6 to 18 carbon atoms;

R<sup>4</sup> is selected from the group consisting of methyl and ethyl;

R<sup>5</sup> is an alkyl group containing 1 to 6 carbon atoms;

R<sup>6</sup> is an alkyl group containing 4 to 20 carbon atoms;

p is an integer of from 3 to 20;

q is an integer of from 0 to 20;

M is a hydrophobic chain of 6 to 40 units selected from the group consisting of oxypropylene and oxypropylene-oxyethylene units wherein the oxypropylene content of said hydrophobic chain is from about 75 to 100 weight percent and the oxyethylene content is from 0 to 25 weight percent; and

R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, M, p and q are so selected as to provide that the molecular weight attributable to R<sup>1</sup> equals 10 to 80 percent of the molecular weight attributable to the entire molecule.

4,011,390

## SEMI-SYNTHETIC AMINOCYCLITOL AMINOGLYCOSIDE ANTIBIOTICS AND METHODS FOR THE PREPARATION THEREOF

Marvin J. Weinstein, East Brunswick; Peter J. L. Daniels, Cedar Grove; Gerald H. Wagman, East Brunswick, and Raymond Testa, Verona, all of N.J., assignors to Schering-Plough Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 443,052, Feb. 15, 1974,

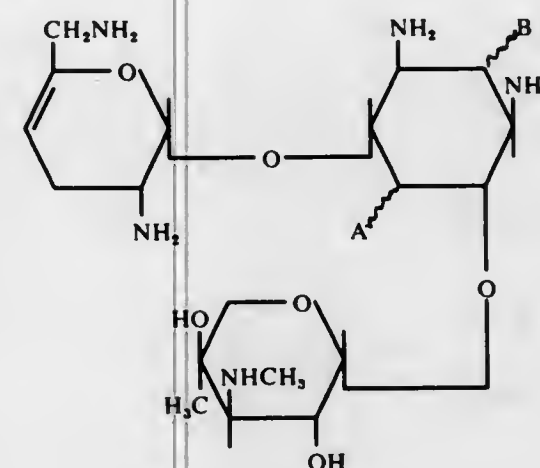
abandoned. This application June 5, 1974, Ser. No. 476,638

Int. Cl.<sup>2</sup> C07H 15/22

U.S. Cl. 536—17

6 Claims

1. A compound selected from the group consisting of compounds of the formula:



and the non-toxic acid addition salts thereof wherein A is a member selected from the group consisting of hydrogen, amino, hydroxy and (C<sub>1</sub>-C<sub>4</sub>) alkoxy, B is a member selected from the group consisting of hydrogen, and hydroxy, wherein the wavy lines connecting A and B to the ring nucleus denotes that such groups may be in any of the possible, stereoisomeric forms, with the proviso that when B is hydrogen and A is hydroxyl, A must be cis to the glycosyl groups adjacent thereto and the further proviso that when A is amino, it must be trans to the glycosyl groups adjacent thereto.

4,011,391

## VALIDAMYCIN C, D, E AND F ANTIBIOTICS

Satoshi Horii; Yukihiko Kameda, both of Osaka; Takashi Iwasa, Kyoto, and Hiroichi Yamamoto, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 18, 1972, Ser. No. 245,135

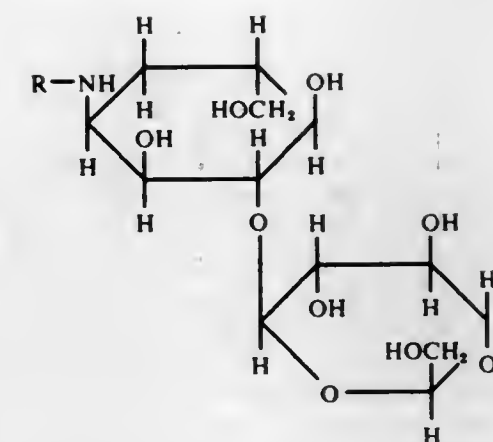
Claims priority, application Japan, Aug. 20, 1971, 46-25419; Aug. 27, 1971, 46-27758

Int. Cl.<sup>2</sup> C07H 15/00

U.S. Cl. 536—17

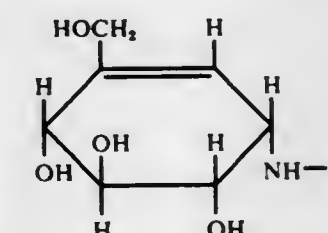
5 Claims

1. A pure antibiotic selected from the group consisting of a. pure validamycin C of the formula



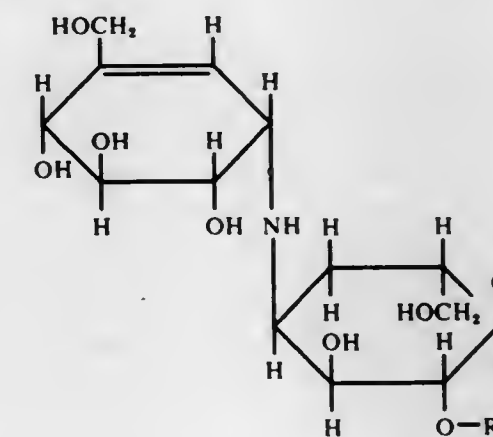
wherein R is O-α-D-glucopyranosyl-3-hydroxymethyl-4,5,6-trihydroxy-2-cyclohexenyl, and decomposing at 142° to 160° C,

b. pure validamycin D of the formula



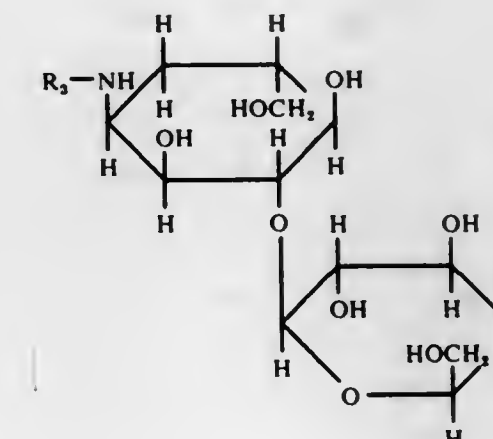
wherein R<sub>1</sub> is O-α-D-glucopyranosyl-2,3,4-trihydroxy-5-hydroxy-methyl-cyclohexyl, and having the optical rotation [α]<sub>D</sub>(H<sub>2</sub>O) = +169.3°,

c. pure validamycin E of the formula



wherein R<sub>2</sub> is O-α-D-glucopyranosyl-O-β-D-glucopyranosyl, and having the optical rotation of [α]<sub>D</sub>(H<sub>2</sub>O) = +148.2°,

d. pure validamycin F of the formula



wherein R<sub>3</sub> is O-α-D-glucopyranosyl-3-hydroxymethyl-4,5,6-trihydroxy-2-cyclohexenyl, and having the optical



rotation  $[\alpha]_D(H_2O) = +130.7^\circ$  and decomposing at  $165^\circ$  to  $173^\circ$  C,  
and acid salts of each of validamycin C, D, E and F.

4,011,392

**MIXED STARCH ESTERS AND THE USE THEREOF**  
Stephen Edward Rudolph, Glenwood, and Raymond Charles Glowaky, Matteson, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio  
Filed Sept. 2, 1975, Ser. No. 609,327  
Int. Cl.<sup>2</sup> C08B 31/06

U.S. Cl. 536—108

43 Claims

1. Mixed esters of starch characterized as having an average molecular weight ranging up to about 100,000 and an average degree of substitution ranging from about 0.5 to 3.0 wherein at least about 0.1 of the total degree of substitution consists of ester groups having pendant carboxyl groups; said esters of starch derived from

- a. low molecular weight hydrolyzed starch and the derivatives thereof having a plurality of anhydroglucose units and
- b. at least about 0.5 mole of acylating agent for each anhydroglucose unit of the hydrolyzed starch and the derivatives thereof;

said acylating agent consisting of (i) from about 0.1 to 2.9 moles of at least one anhydride of a polycarboxylic acid and (ii) from about 0.1 to 2.9 moles of at least one agent selected from the class consisting of anhydrides of monocarboxylic acids and the acyl halides of monocarboxylic acids.

4,011,393

**POLYGALACTOMANNAN GUM FORMATE ESTERS**  
Louis E. Trapasso, Watchung, N.J., assignor to Celanese Corporation, New York, N.Y.  
Filed Apr. 28, 1975, Ser. No. 572,049  
Int. Cl.<sup>2</sup> C08B 37/00

U.S. Cl. 536—114

4 Claims

1. A process for producing polygalactomannan gum formate esters which consists essentially of contacting solid polygalactomannan gum with concentrated formic acid solution, and a fluid organic medium which is a solvent for formic acid and essentially a non-solvent for solid polygalactomannan gum at a temperature between  $0^\circ$  and  $60^\circ$  C., and wherein the contact time is for a period sufficient to provide a predetermined degree of substitution by formate groups in the polygalactomannan gum.

## ELECTRICAL

4,011,394  
KILNS

Donald Percy Shelley, Oulton Grange, Oulton near Stone, England

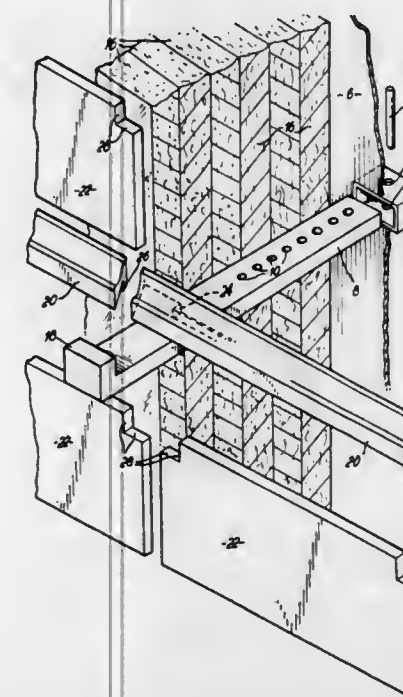
Filed July 9, 1975, Ser. No. 594,524

Claims priority, application United Kingdom, July 16, 1974, 31533/74

U.S. Cl. 13—20

Int. Cl.<sup>2</sup> H05B 3/16

4 Claims



1. A kiln in which inwardly extending cantilevered support ties are located and secured in position in holding devices on the outside of the kiln, the support ties being arranged so as to carry ceramic fibre or like lightweight lining material on the inside of the kiln and being in the form of bars of refractory material.

4,011,395

**ELECTRIC FURNACE HEATER**

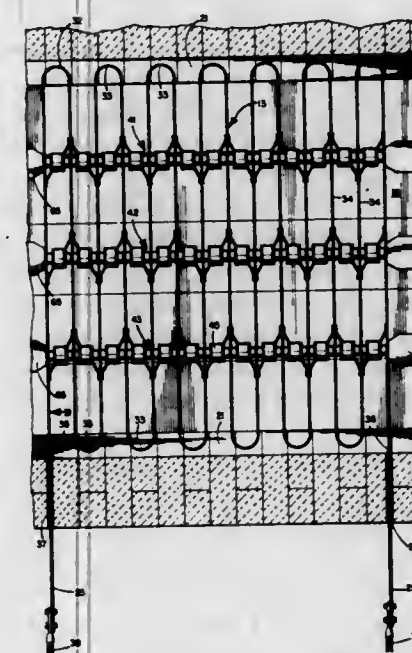
Jacob Howard Beck, Waban, Mass., assignor to BTU Engineering Company, North Billerica, Mass.

Filed Sept. 15, 1975, Ser. No. 613,416

Int. Cl.<sup>2</sup> H05B 3/06

U.S. Cl. 13—25

10 Claims



1. A generally rectangular, grate-like high temperature, self-supporting electrical resistance heater adapted for generally horizontal suspension within a high temperature furnace comprising:  
an elongated flat continuous resistor ribbon folded to pro-

vide a sinuous planar arrangement of a plurality of spaced longitudinal beam-like heater segments having substantially parallel flat vertical confronting surfaces;  
a plurality of physically distinct refractory insulators at least one of each disposed between confronting parallel surfaces of a respective pair of adjacent beam-like heater segments and supported solely on said resistor ribbon for spacing said respective confronting surfaces one from the other, said refractory insulators maintaining said beam-like heater segments in said parallel relationship throughout the operating temperature range of said high temperature heater;  
means on said beam-like heater segments for supporting said refractory insulators between confronting parallel surfaces of adjacent heater segments; and  
electrical connecting means for connection of the respective outer ends of said continuous resistor ribbon to an external electrical power source.

4,011,396

**GAS-FILLED HIGH-VOLTAGE CABLE BUILT UP OF RIGID SEGMENTS**

Gljsbrecht Coenraad Van Deventer, Delft, and Gerard Adriaan Visser, Beemster, both of Netherlands, assignors to N.K.F. Kabel B.V., Delft, Netherlands

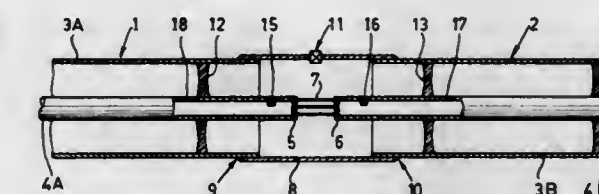
Filed Dec. 6, 1974, Ser. No. 530,282

Claims priority, application Netherlands, Dec. 12, 1973, 7316991

Int. Cl.<sup>2</sup> H02G 5/06

U.S. Cl. 174—11 R

1 Claim



1. A high voltage cable filled with an insulation gas under an operating pressure of more than 1 Bar, comprising a plurality of segments and means for rigidly interconnecting said segments, each segment comprising one or more conductors supported by insulators within a tubular housing, an insulating gas under pressure within said housing, and a blocking device comprising a valve arranged to prevent escape of gas prior to assembly of said segments into a cable, and when pressure in the segment exceeds that in an adjacent segment by more than a predetermined amount; said valve comprising means for biasing the valve toward an open condition such that the valve opens when pressure on each side of the valve is equal, and a stem arranged to reclose when pressure in the segment exceeds that in an adjacent segment by more than a predetermined amount.

4,011,397

**VIBRATION DAMPER FOR HIGH VOLTAGE CABLES**

Raymond R. Bouche, 9419 Cordero Ave., Tujunga, Calif. 91402

Continuation-in-part of Ser. No. 454,421, March 25, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,622

Int. Cl.<sup>2</sup> H02G 7/14

U.S. Cl. 174—42

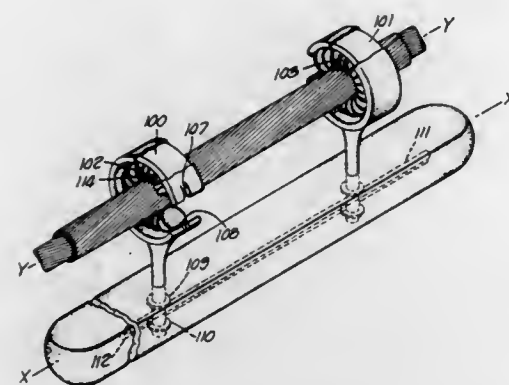
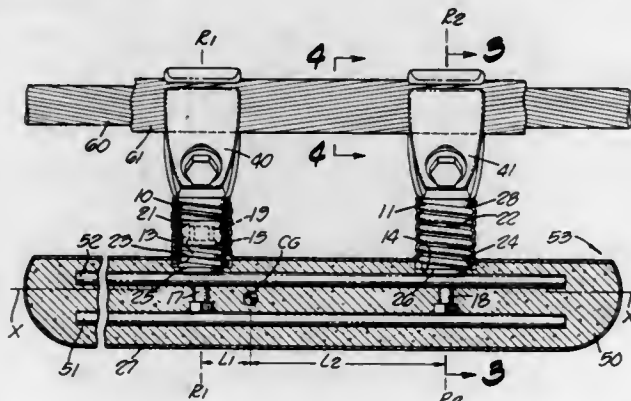
41 Claims

1. In a system for damping Aeolian vibrations in a cable suspended between two points wherein damping is attained by means of a damper connected to said cable at a position near one point of suspension and remote from the other point of suspension, the improvement wherein said damper comprises: an inertial member, and two resilient support members connected to asymmetrically located points on said inertial member and connecting said inertial member to separate points of said cable.

16. In a device for damping Aeolian vibrations of a suspended cable, the improvement comprising:



a damper having a free vibratory inertial member and having two and only two resilient support members external to said inertial member, said resilient support members having lower ends connected to points of said inertial member between the ends thereof, said resilient support members comprising separate means at the ends thereof remote from said inertial member for separate connection of said resilient support members to separate points of such suspended cable by externally gripping said cable at points distributed over more than half the perimeter of said cable and without forming a passage through said cable, whereby said damper may hang from said cable when connected thereto by said resilient support members with said inertial member at the lower end thereof.



30. A resilient support member adapted for connecting an inertial member to a cable suspended between two points to form a damper for dampening Aeolian vibrations of the cable, the resilient support member comprising:

- a clamp portion adapted to partially surround said suspended cable about its top, bottom, and at least one side thereof,
- a resilient portion having at least one tubular spring member adapted for connection at a first end to said clamp portion and connected at a second end to said inertial member, and
- a rubber-like tubular member compressively nested inside said tubular spring member.

4,011,398

**ELECTRICAL CONNECTION TO A CIRCUIT POTTED WITHIN A HOUSING AND METHOD OF SAME**  
Douglas B. Munz, Glenwood, and William G. Skoda, Oak Park, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1975, Ser. No. 554,387

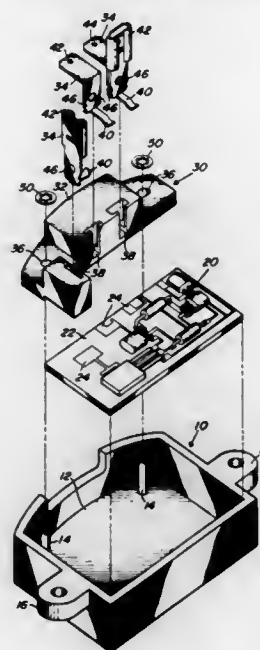
Int. Cl.<sup>2</sup> H05K 1/08

U.S. Cl. 174-52 PE

16 Claims

1. A circuit potted within a housing unit wherein the improvement comprises
  - a subassembly having a terminal and a terminal assembly, the terminal of electrically conductive material and having a connecting end and a mating end,
  - the terminal affixed to the terminal assembly,

the subassembly located in the housing via aligning means for positioning the connecting end within the potting material in electrical contacting engagement with a se-



lected portion of the circuit and a mating end external to the potting material, whereby electrical connection to the mating end effects electrical contact to the circuit.

4,011,399

**PHOTOGRAPHIC IMAGE PICK-UP AND CODING SYSTEM OF RUN-LENGTH TYPE**

Hiroyoshi Tsuchiya; Yukifumi Tsuda; Heijiro Hayami, and Hiroaki Kotera, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jan. 30, 1974, Ser. No. 437,986

Claims priority, application Japan, Feb. 1, 1973, 48-13264

Disclosure was also published under second Trial Voluntary

Protest Program on Apr. 20, 1976

Int. Cl.<sup>2</sup> H04N 7/12

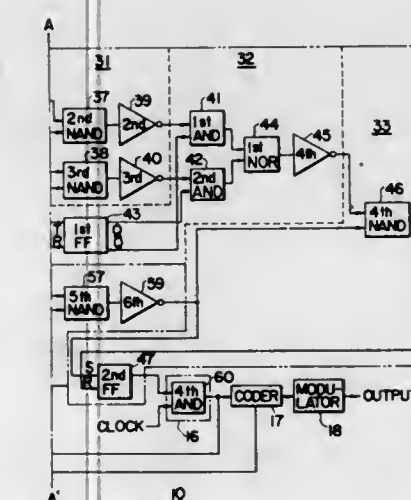
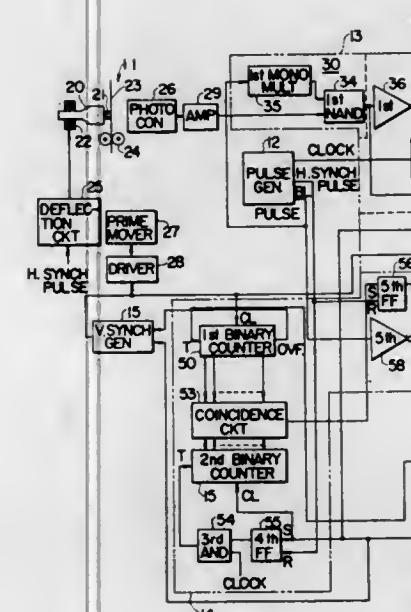
U.S. Cl. 358-261

2 Claims

1. A photographic image information pick-up and coding system for picking up and coding photographic image information carried on a recording medium, which comprises:

- a record medium having photographic image information thereon;
- a facsimile signal generator (11) including scanning means for repeatedly producing facsimile signals representing a part of said image information lying on a horizontal scanning line, each of said facsimile signals including at least one space signal;
- a pulse generator (12) for producing a clock pulse signal consisting of clock pulses consecutively appearing at a constant rate and a blanking pulse signal consisting of blanking pulses appearing during the blanking period between two consecutive facsimile signals;
- a run-length gate (16) for passing therethrough said clock pulse signal during a time period that a run-length gate trigger pulse lasts;
- a start signal generator (14) for producing a start signal;
- a run-length gate controller (13) for producing said run-length gate trigger pulse in accordance with said facsimile signals, clock pulse signal and blanking pulse signal, said run-length gate controller including a space signal superposer for superposing a space signal on a leading edge of each of said facsimile signals, a sampling circuit for sampling said mark and space signals with said clock pulse signal, a mark-space selector (32) triggered by said start signal for selectively passing therethrough one of the sampled mark and space signals, and run-length trigger pulse generating means for producing said run-length trigger pulse generating means for producing said run-

length gate trigger pulse, said run-length gate trigger pulse rising at the rise of said start signal and decaying at the rise of the first pulse of the sampled one signal passed through said mark-space selector, said run-length gate trigger pulse generating means including a first gate (46) for passing therethrough said one of the sampled mark and space signals from said mark-space selector when triggered by said start signal, an error eliminating pulse generator (72, 73, 74) connected to the output of said first gate for producing an error eliminating pulse lasting from the rise of said start signal for a predetermined



duration slightly longer than the repetition rate of said clock pulse train, a second gate (75) connected to the output of said first gate for allowing pulses from said first gate to pass therethrough while preventing said pulses from passing therethrough when energized by an error eliminating pulse, and a flip-flop circuit for producing said run-length gate trigger pulse rising at the rise of said start signal and decaying at the rise of the leading pulse of the pulses from said second gate; and  
a coder (17) for coding the clock pulse passed through said run-length gate.

4,011,400

**APPARATUS FOR READING AN OPTICALLY READABLE REFLECTING INFORMATION STRUCTURE**

Carel Arthur Jan Simons, and Hendrik T. Lam, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

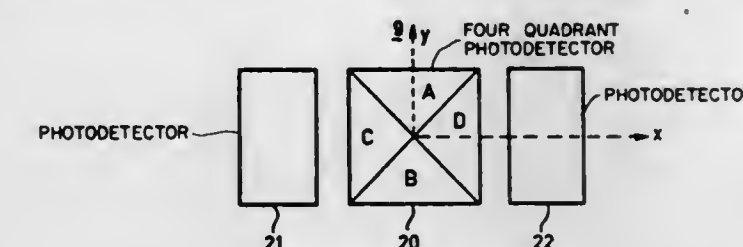
Filed Sept. 4, 1975, Ser. No. 610,329

Claims priority, application Netherlands, July 7, 1975, 7508052

Int. Cl.<sup>2</sup> G11B 7/00

U.S. Cl. 358-127

1 Claim



1. An apparatus for reading a radiation-reflecting record carrier which is provided with information in an optical readable track-shaped information structure, which apparatus is of the type including a radiation source and an objective system for passing radiation from the radiation source to a radiation-sensitive detection system via the record carrier, the improvement wherein the detection system comprises a composite detector consisting of four sub-detectors, and two further detectors which, viewed in a direction transverse to the effective track direction, are disposed at different sides of the composite detector, and that the detection system is disposed near an image of the exit pupil of the objective system, and a cylindrical lens whose cylinder axis is parallel to the effective track direction for forming said image of said exit pupil.

4,011,401

**SPECIAL EFFECTS GENERATOR CAPABLE OF REPOSITIONING IMAGE SEGMENTS**

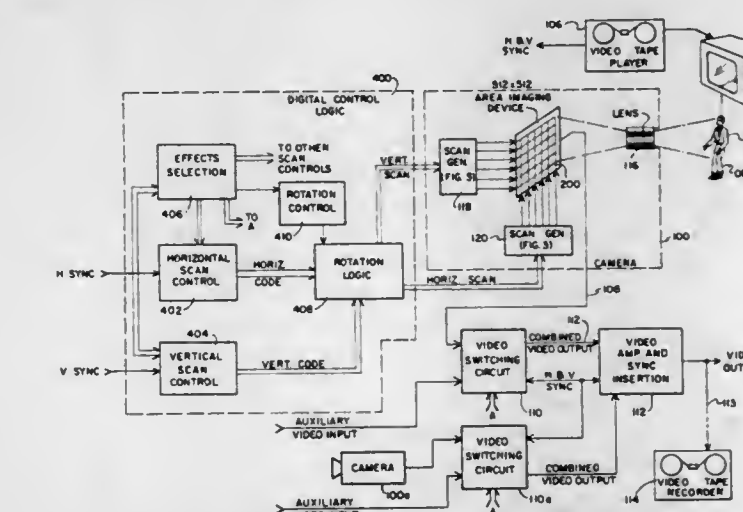
Biagio Presti, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Apr. 25, 1975, Ser. No. 571,521

Int. Cl.<sup>2</sup> H04N 5/22

U.S. Cl. 358-212

17 Claims



1. A video special effects generator comprising:  
a plurality of light sensitive elements arranged in an array for receiving light illumination, each of said elements being responsive to light illumination for providing an electrical signal representative of the quantity of light illumination received thereby;  
means for individually addressing each one of said elements;  
sequencing means coupled to said addressing means for rendering said addressing means operative to address said elements in a predetermined sequence; and  
means operatively coupled to said sequencing means for altering said predetermined sequence.



4,011,402

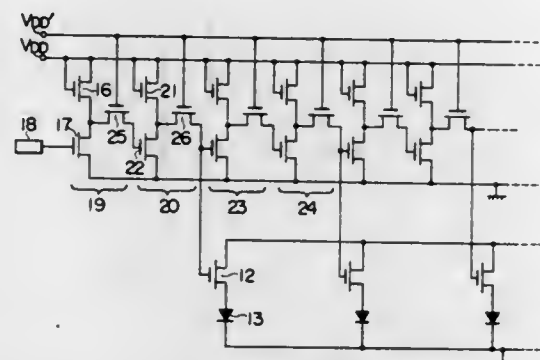
# SCANNING CIRCUIT TO DELIVER TRAIN OF PULSES SHIFTED BY A CONSTANT DELAY ONE AFTER ANOTHER

Norio Koike, Musashino; Takamitsu Kamiyama, Kodaira, and Miki Ashikawa, Koganei, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 19, 1974, Ser. No. 498,656

Claims priority, application Japan, Aug. 24, 1973, 48-94438  
Int. Cl.<sup>2</sup> H04N 3/14; H03K 17/56, 17/60  
U.S. Cl. 358-213

5 Claims



## 3. A scanning circuit comprising:

- a circuit means consisting of a plurality of cascade-connected unit circuits, each unit circuit having a first and a second polarity inverting circuits and the output of said first polarity inverting circuit being fed as an input to said second polarity inverting circuit;
  - a first and a second power source means to supply DC power for each of said unit circuits;
  - an input means to apply an input signal to the first stage of said circuit means; and
  - an output means to take out the output of said second polarity inverting circuit of each of said unit circuits;
- wherein said first polarity inverting circuit consists of a first and a second transistor and said second polarity inverting circuit consists of a third and a fourth transistors, each said first, second, third and fourth transistors having an input terminal and first and second output terminals and said first output terminal of each of said first and third transistors being commonly connected with one end of said first power source means, said second output terminals of said first and third transistors being connected respectively with said first output terminals of said second and fourth transistors, said second output terminals of said second and fourth transistors being connected with the other end of said first power source means; each unit circuit further including a fifth transistor having an input terminal connected with said second power source means, a first output terminal connected with one of said first output terminals of said second and fourth transistors and a second output terminal connected with one of said input terminals of said fourth transistor and said output means.

4,011,403

# FIBER OPTIC LASER ILLUMINATORS

Max Epstein, Highland Park, and Michel E. Marhic, Evanston, both of Ill., assignors to Northwestern University, Evanston, Ill.

Filed Mar. 30, 1976, Ser. No. 671,750

Int. Cl.<sup>2</sup> H04N 5/26

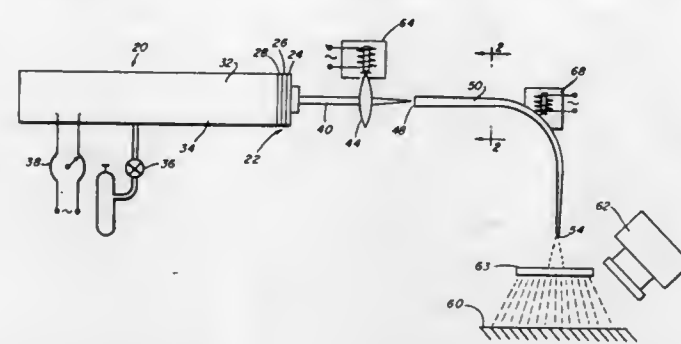
U.S. Cl. 358-209

21 Claims

- Apparatus for providing laser illumination transmitting through an optical fiber for direct visualization of illuminated objects and for photographic recordation, said apparatus comprising

- a highly concentrated light source including a laser beam having coherent light characteristics,
- an optical fiber

focusing means for directing said laser beam to impinge on said fiber for transmission therealong, and



sensing means for visually reproducing objects illuminated by said laser beam.

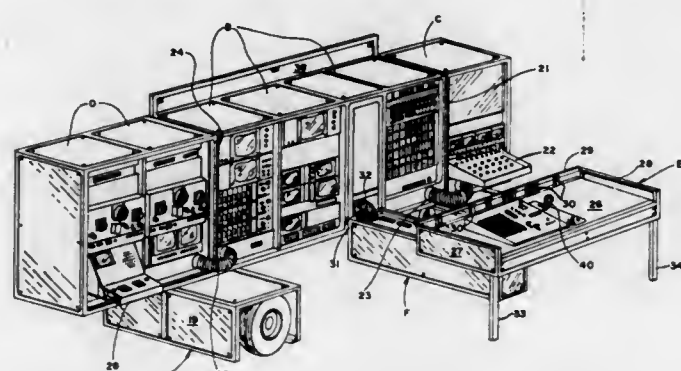
4,011,404

# VIDEO PRODUCTION MODULE

William G. Graham, Las Vegas, Nev., assignor to Las Vegas Convention Service Company, Las Vegas, Nev.  
Filed Jan. 5, 1976, Ser. No. 646,854  
Int. Cl.<sup>2</sup> H04N 5/28

U.S. Cl. 358-185

16 Claims



- In a video production module for housing and transporting video equipment, a supporting frame, a rack frame on said supporting frame containing at least a part of said equipment, a desk in front of and spaced from said rack frame, and a production arm pivotally connected at its one end to said supporting frame and connected with said desk at its other end, said arm being movable about its pivotal connection from a horizontal position to a vertical position adjacent said rack frame.

4,011,405

# DIGITAL DATA TRANSMISSION SYSTEMS

Philip Neale Ridout, Elstree, and Ian Bruce Ridout, Thornton Heath, both of England, assignors to The Post Office, London, England

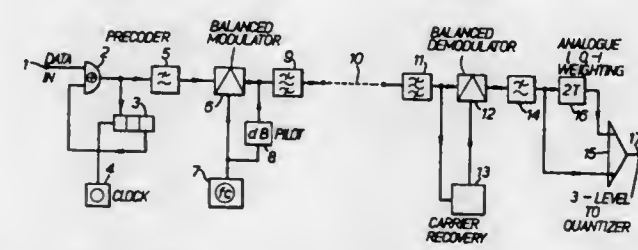
Filed Mar. 5, 1975, Ser. No. 555,571

Claims priority, application United Kingdom, May 17, 1974, 22038/74

U.S. Cl. 178-68

Int. Cl.<sup>2</sup> H04L 27/02

11 Claims



- A receiver for digital data including a network through which incoming signal elements are passed, which network includes additive combining means with a plurality of inputs

for signal elements, a plurality of signal paths having gains related by small integers and connected from a common point to the additive combining means, each path transmitting to the additive combining means all signal elements appearing at the common point, at least one signal path including delay means so that the different signal paths respectively imposed fixed delays on signals transmitted through them which differ by integral numbers of the time intervals between the instants of adjacent signal elements, and means for applying received signal elements to the common point and thence to the additive combining means through the plurality of signal paths in parallel, thereby to produce from the additive combining means an output signal having a greater number of levels than the received signal elements.

4,011,406

# PCM REGENERATOR

Reginhard Pospischil, Lochham, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany  
Filed Mar. 19, 1975, Ser. No. 559,631

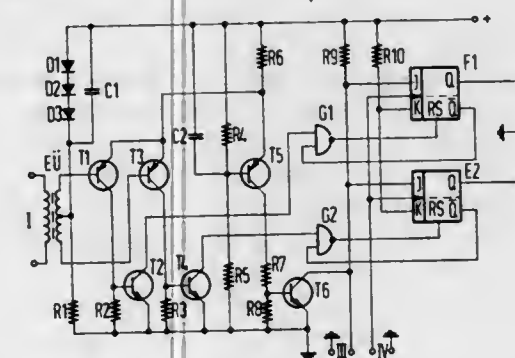
Claims priority, application Germany, Apr. 10, 1974, 2417644

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> H03K 5/01; H04L 25/20

U.S. Cl. 178-70 R

4 Claims



- A PCM regenerator for pseudoternary-coded signal pulses having an amplitude decision device, a time decision device,

- a pair of input terminals receiving the input pulses which have been corrected for cable attenuation and output terminals where the regenerated pulses which have been regenerated in amplitude and time may be obtained, comprising an input transformer which has a center tapped secondary winding and a primary winding which is connected to said input terminals of the regenerator,
- a first pair of npn transistors which form a push-pull circuit and with their bases, respectively, connected to opposite ends of said secondary winding,
- a base voltage divider for the push-pull circuit connected to the center tap of said secondary winding,
- a first capacitor connected in parallel with said voltage divider,
- a second voltage divider formed of two resistors,
- a third npn-transistor with its base connected to said second voltage divider,
- a second capacitor connected in parallel with one of said resistors, the emitter of said third transistor connected to the emitters of said first pair of transistors,
- a third resistor connecting said emitters to a positive operating voltage,
- a first npn transistor,
- the collector of said third transistor connected to the base terminal of said first npn transistor through a fourth resistor,
- the emitter of said first npn transistor connected to ground, the base of said first npn transistor connected to ground through a fifth resistor,
- the collector of said first npn transistor connected through a sixth resistor to said operating voltage,

second and third npn transistors with the base of each, respectively, connected to the collectors of said pair of npn transistors, the emitters of said second and third npn transistors connected to ground, and their bases connected through seventh and eighth resistors to ground, first and second NAND gates, the collector of said second npn transistor connected to the first input terminal of said first NAND gate, the collector of said third npn transistor connected to the first input terminal of said second NAND gate, first and second JK flip-flops, the output of the first NAND gate connected to the resetting input of said first JK flip-flop, the output of the second NAND gate connected to the resetting input of said second JK flip-flop, the inverting output of said first JK flip-flop connected to a second input of said first NAND gate, the inverting output of said second JK flip-flop connected to the second input of said second NAND gate, the K inputs of the first and second JK flip-flops connected together and through a ninth resistor to the operating voltage, the pulse train inputs of the first and second JK flip-flops connected together and to the pulse train supply, the J inputs of said first and second JK flip-flops connected together and to the collector of said first npn transistor and to a pulse train synchronization terminal, and the Q output of the first JK flip-flop connected to an output terminal, the Q output of the second JK flip-flop connected to the second output terminal of the regenerator.

4,011,407

# NARROW-BAND EIGHT-PHASE MODEM

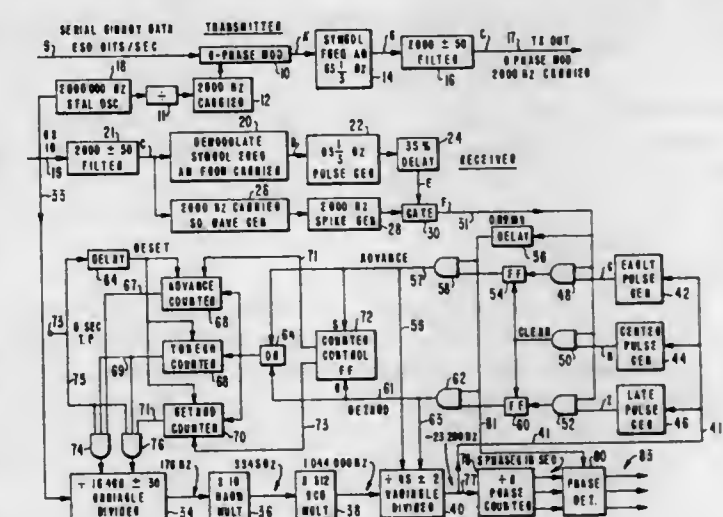
Nicholas DiSanti, Staten Island, and Frank Oster, Brooklyn, both of N.Y., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 26, 1976, Ser. No. 661,522

Int. Cl.<sup>2</sup> H04L 27/22

U.S. Cl. 178-88

8 Claims



- A receiver for a transmitted eight-phase carrier wave in which each phase represents a tri-bit symbol, and the carrier wave is amplitude modulated at the symbol frequency, comprising
- means to derive a symbol frequency pulse wave from said received carrier wave,
  - means timed by said symbol frequency pulse wave to generate symbol spikes each having the phase of one cycle of the received carrier wave during a respective symbol period,
  - local means to generate a reference wave, an early pulse wave, and a late pulse wave, all having a frequency equal to eight times the frequency of the carrier wave.
- phase lock means to compare each symbol spike with said early and late pulse waves, and for each coincidence cause an advancing or retarding of the phase of said waves,



frequency synchronizing means to count and compare the number of coincidences of said symbol spikes with said early and late pulses, and in cases of imbalance to increase or decrease the frequency of said waves, and demodulator means to compare each symbol spike with said reference wave to determine the corresponding symbol phase and the corresponding three information bits.

4,011,408

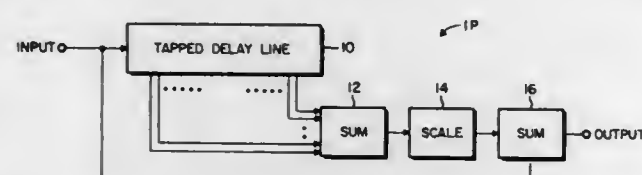
**AUDIO TRANSMISSION PROTECTION APPARATUS**  
Chauncey S. Miller, III, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 17, 1975, Ser. No. 641,471

Int. Cl.<sup>2</sup> H04K 1/02

U.S. Cl. 179—1.5 R

14 Claims



1. Signal transmission protection apparatus comprising:  
a first module, comprising:

delay means to separate an electrical signal, input thereto, into a selected number of primary subsignals, each of said primary subsignals being substantially identical to said electrical signal, each of said primary subsignals further being temporally spaced from said electrical signal and from the remaining primary subsignals; and

arithmetic means to change instantaneous values of said electrical signal by the sum of first fractional parts of the contemporaneous values of each of said primary subsignals, to generate an output from said first module;

transmission means to transmit a resultant signal, derived from said output from said first module, to a remote location;

receiver means, at said remote location, for receiving said resultant signal;

a second module, comprising:

delay means, to separate an electrical signal, introduced thereto, said introduced signal derived from said resultant signal, into a desired number of secondary subsignals, each of said secondary subsignals being substantially identical to said introduced signal, each of said secondary subsignals further being temporally spaced from said introduced signal and from the remaining primary subsignals, said desired number being identical to said selected number, and the temporal spacing between each of said secondary subsignals and said introduced signal being substantially identical to that between the corresponding ones of said primary subsignals and said input signal; and

second arithmetic means to change instantaneous values of said introduced signal by the sum of second fractional parts of the contemporaneous values of said secondary subsignals; wherein:

the arithmetic sign of the activity of said second arithmetic means is opposite to the arithmetic sign of the activity of said first arithmetic means, and said first fractional parts are equal to said corresponding second fractional parts; and

the one of said two modules in which said arithmetic sign is negative further includes means to input said changed values into said delay means thereof.

4,011,409

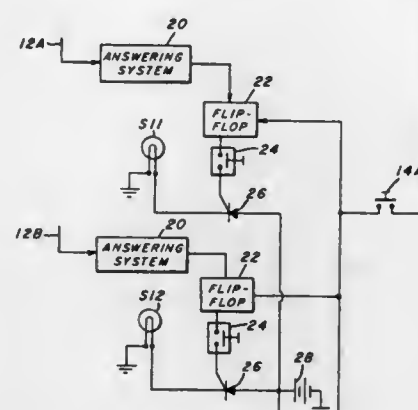
**COMMUNICATION SYSTEM TO MONITOR INDIVIDUAL SUBSCRIBERS**

Robert K. Conrad, 432 Morewood Ave., Pittsburgh, Pa. 15213  
Filed Apr. 2, 1976, Ser. No. 669,801

Int. Cl.<sup>2</sup> H04M 11/00

U.S. Cl. 179—2 A

5 Claims



1. In a communication system to monitor individual subscribers belonging to a class including superannuated, disabled, sick and medically unstable, a method including the steps of:

establishing time-based periods for telephone link responses between each subscriber belonging to said class and a monitor station,

producing separate electrical signals at the monitor station corresponding to said telephone link responses, using said separate electrical signals to energize indicator means at said monitor station,

detecting from said indicator means the failure of a subscriber to respond according to the established time-based period for a telephone link response, providing an alert on behalf of a subscriber based on the detected failure to respond according to the established period for a telephone link response, and

resetting said indicator means at preselected intervals of time corresponding essentially to said time-based periods for a telephone link response.

4,011,410

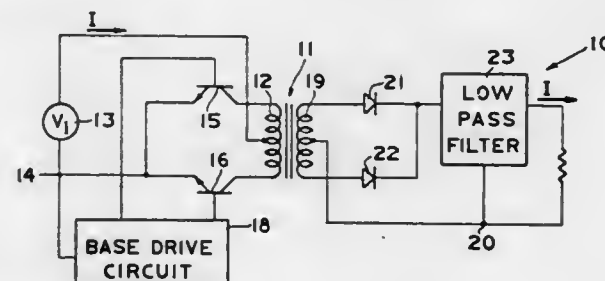
**COMMUNICATION SYSTEM INTERFACE CIRCUITS**  
Robert M. Thomas, 116 Windsor Drive, Brockville, Ontario, Canada

Filed Nov. 13, 1973, Ser. No. 415,481

Int. Cl.<sup>2</sup> H04M 3/18

U.S. Cl. 179—2.5 R

13 Claims



1. In a communications system, an interface circuit for bi-directional transmission of signals between a pair of terminal sets and including transformer means having a pair of winding means, one of said winding means having a center tap, a pair of coupling means coupling said pair of winding means to said pair of terminal sets, said coupling means for said one of said winding means including impedance means coupled between said center tap and a neutral circuit point, and high frequency pulse means coupled to said transformer means to develop high frequency pulses in said winding means, said

high frequency pulse means being arranged to alternately conduct current between opposite ends of said one of said winding means and said neutral circuit point, and comprising a transformer including a primary winding and a secondary winding having a center tap, means connecting said center tap to said neutral circuit point, a pair of unidirectional conduction means connecting opposite ends of said secondary winding to said opposite ends of said one of said winding means, and means for developing a high frequency square wave voltage across said primary winding, each of said coupling means being operative to develop a signal at the corresponding terminal set corresponding to the magnitude of pulses in the corresponding winding means, and each of said coupling means being responsive to a signal applied to the corresponding terminal set to control the magnitude of the pulses in the corresponding winding means and thereby the magnitude of the pulses in the other of said winding means so as to develop a corresponding signal at the other terminal set.

4,011,411

**AUTOMATIC TELEPHONE ANSWERING AND RECORDING DEVICE**

Yuichi Nishimura, Mitaka, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

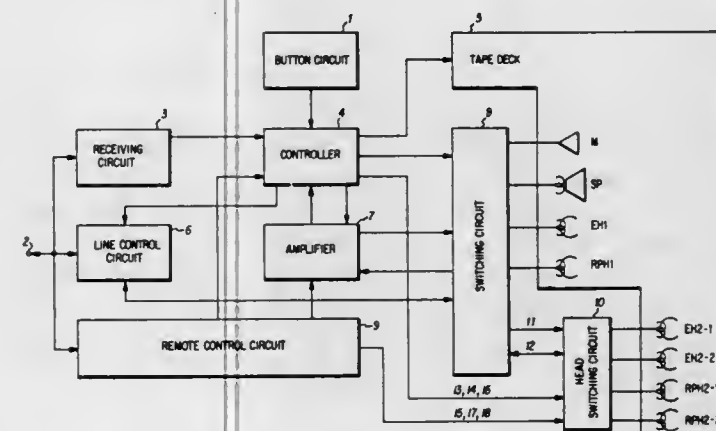
Continuation-in-part of Ser. No. 431,223, Jan. 7, 1974, abandoned. This application June 13, 1975, Ser. No. 586,584

Claims priority, application Japan, Jan. 12, 1973, 48-5888

Int. Cl.<sup>2</sup> H04M 1/64

U.S. Cl. 179—6 E

10 Claims



1. An automatic telephone answering and recording device adapted to be associated with a telephone set which is connected to a telephone line comprising:

a sound recording tape provided with a plurality of sound tracks,

a plurality of sound recording and reproducing heads corresponding to the plurality of sound tracks of the sound recording tape,

a receiving means for receiving a call signal transmitted from a remote calling party,

head switching means for selecting one of the sound recording and reproducing heads associated with one of the sound tracks of the sound recording tape,

control means responsive to an output of the receiving means for controlling the head switching means to record a message transmitted from the remote calling party on a first sound track of the sound recording tape through the head switching means and through a first sound recording and reproducing head selected by the head switching means,

remote control means responsive to a request signal transmitted from another remote calling party for causing the control means to reproduce the message recorded in the first sound track of the sound recording tape by the first sound recording and reproducing head, and

line control means for transmitting the message from the first sound track of the sound recording tape to the another remote calling party,

the remote control means responding to a next request

signal from the another remote calling party for causing the head switching means to select the second sound recording and reproducing head associated with the second sound track of the sound recording tape to record a subsequent message on the second sound track.

4,011,412

**METHOD OF OPERATING A PCM TIME-DIVISION MULTIPLEX TELECOMMUNICATION NETWORK**

Alfred Mattern, Grobenzell, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 14, 1974, Ser. No. 497,293

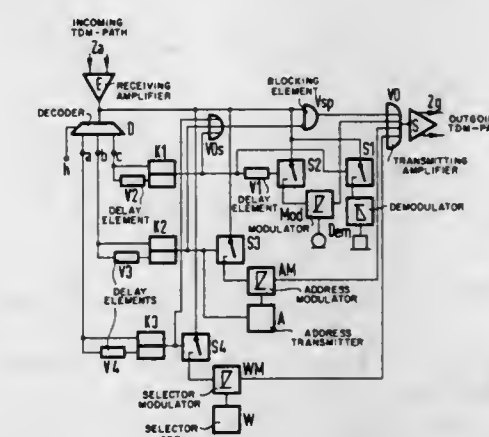
Claims priority, application Germany, Aug. 14, 1973, 2341115

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> H04Q 11/04

U.S. Cl. 179—15 BA

4 Claims



1. A method for operating a PCM time division multiplex telecommunications network utilizing terminal exchanges in the system wherein subscriber stations forming a connection receive the PCM information intended for them responsive to interpretation of their respective addresses which are transmitted from an exchange at the sending end in conjunction with message signals, comprising the steps of:

transmitting addresses of subscriber stations from which message signals are to be sent, from terminal exchange in said network in the time slot allocated for a given connection,

producing message signals from each subscriber station responsive to that subscriber station receiving its address in the time slot allocated to said connection, and

modulating in said subscriber stations an unmodulated byte sent following said addresses in accordance with the message signal to be sent and relaying the modulated result in the desired direction of transmission.

4,011,413

**HOLD CIRCUIT FOR TELEPHONE**

Robert C. Phillips, Chicago, Ill., assignor to Gmlx, Inc., Chicago, Ill.

Filed Jan. 12, 1976, Ser. No. 648,473

Int. Cl.<sup>2</sup> H04M 1/00

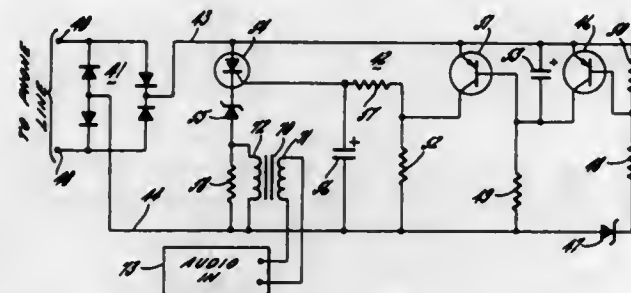
U.S. Cl. 179—81 R

10 Claims

1. A hold circuit for use with a telephone, said telephone being connected to a telephone line, said hold circuit comprising in combination, sensing and latching circuit means coupled to said telephone line, said sensing and latching circuit means including means for establishing a high threshold and sensing a voltage on said telephone line exceeding said high threshold indicating an on-hook telephone condition, means for establishing a low threshold and sensing a voltage on said telephone line below said low threshold indicating an off-hook telephone condition; hold signaling means connected to said telephone line and including a hold switch for establishing a voltage on said telephone line intermediate said low and high



thresholds, and latching circuit means in the sensing and latching circuit responsive to said intermediate voltage level



on said telephone line for latching said telephone line into a hold condition.

4,011,414

# AUTOMATIC DIAL SYSTEM FOR A SUBSCRIBER TELEPHONE

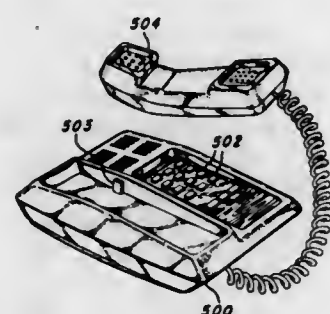
Walter D. Warren, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1975, Ser. No. 565,161

Int. Cl.<sup>2</sup> H04M 1/45, 1/51

U.S. Cl. 179—90 B

16 Claims



1. An automatic dial system for a telephone set comprising:
  - a. an integrated circuit digit processor having at least one set of input terminals and at least one set of output terminals and including:
    - i. a programmed ROM containing a stored instruction set for controlling the operation of the dial system,
    - ii. an arithmetic/logic unit for performing arithmetic and logic operations on data according to said stored instruction set, and
    - iii. a first RAM means for storing data as such data is being processed by said digit processor;
  - b. a keyboard array having a plurality of keys selectively coupled to at least one of said input terminals for entering coded information into said digit processor in dependence upon the state of said keys;
  - c. a second RAM means having data input terminal means coupled to at least one of the output terminals of said digit processor, data output terminal means coupled to at least one of the input terminals of said digit processor and address means coupled to a plurality of data output terminals of said digit processor for storing a plurality of digit sequences corresponding to a repertoire of telephone numbers; and
  - d. signal generator means coupled to at least one output terminal of said digit processor for generating dial signals corresponding to said stored number sequences.

## 4,011,415 CALL CIRCUIT FOR KEY TELEPHONE SYSTEM FOR GIVING DIRECT STATION SELECTION CALL PRIORITY OVER STATION CALL

Hikaru Takematsu, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

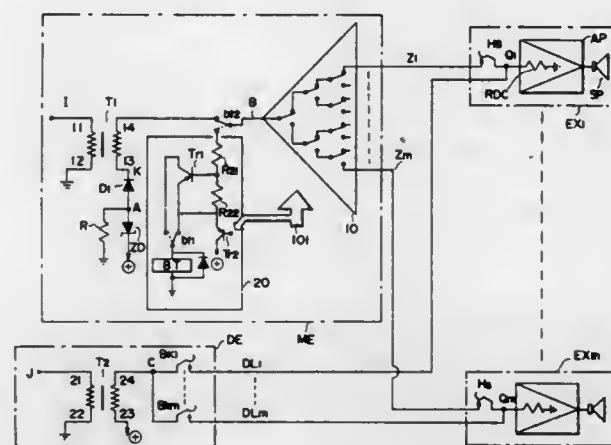
Filed Mar. 3, 1976, Ser. No. 663,502

Claims priority, application Japan, Mar. 5, 1975, 50-26734

Int. Cl.<sup>2</sup> H04M 1/00

U.S. Cl. 179—99

3 Claims



1. A call circuit for a key telephone system comprising:
    - a direct station selection call circuit,
    - a station call circuit,
    - a first power source provided in the station call circuit for applying a direct current to a station call line,
    - a second power source provided in the direct station selection call circuit for applying a direct current to a direct station selection call line;
- the first and second power sources having an output potential difference therebetween,
- a non-linear element disposed between the first power source and a point at which the station call line and the direct station selection call line are connected to each other so that the voltage difference permits the non-linear element to be cut off when a direct station selection call is established so that the direct station selection call is given priority over the station call.

4,011,416

## MULTIPLE COLOR LIGHT FREQUENCIES SWITCHED AUDIO MODULATION

Frank Pontius, Van Nuys, Calif., assignor to Western Geophysical Company of America, Houston, Tex.

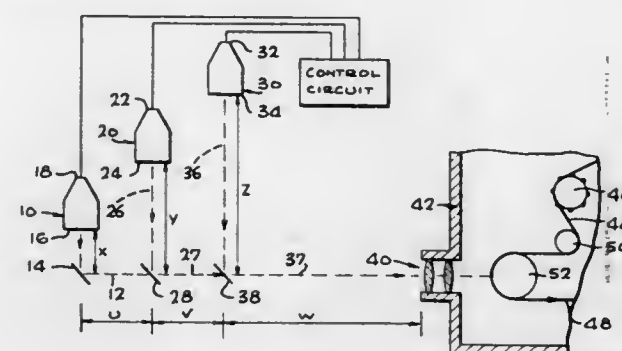
Continuation-in-part of Ser. No. 500,968, Aug. 26, 1974,

abandoned. This application Nov. 6, 1975, Ser. No. 629,241

Int. Cl.<sup>2</sup> G11B 7/20

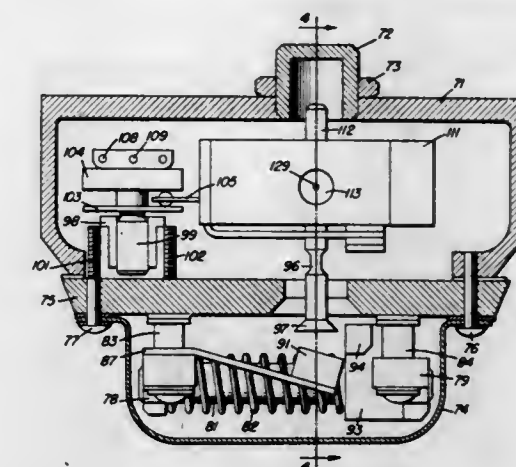
U.S. Cl. 179—100.3 K

4 Claims



1. A photographic film exposure apparatus including means for exposing a plurality of light frequencies on a photographic film, comprising:
  - a. means for emitting a distinct light beam having a differing color light frequency from each of a plurality of charged

- particle beams emitted by respective sources, said means including at least one cathode-ray tube source;
- b. a plurality of independently variable signals simultaneously received by said apparatus;
- c. means for sequentially modulating each one of said plurality of signals onto a first said particle beam and the light beam emitted therefrom;
- d. means for synchronously modulating the same said each one of said plurality of signals on a second said particle beam and the light beam emitted therefrom, in the opposite electrical phase relative to the first said light beam modulated by the same said signal;
- e. means for exposing photographic film including a plurality of distinct light sensitive tracks to said at least two differing colors light frequencies beams for each said signal superposed as a light frequencies beam, whereby each said light sensitive track is exposed to said superposed beam at the instant it has a corresponding selected one of said signals simultaneously received modulated thereon.



said mass, a switch armature mounted on said mass, and a fixed contact located in physical proximity to said armature.

4,011,417

## DYNAMIC TYPE PICKUP

Tomo Kageyama, Sakai, and Yakichi Yoshinuma, Numazu, both of Japan, assignors to Messrs. Kabushiki Kaisha Mitachi Onkyo Selsakusho, Japan

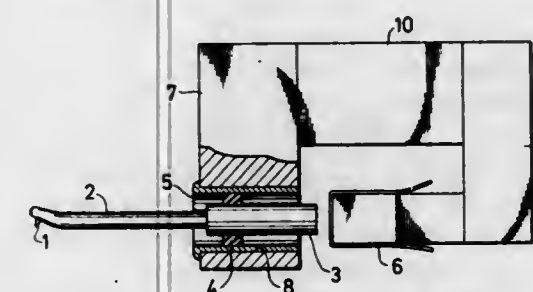
Filed Mar. 17, 1975, Ser. No. 558,656

Claims priority, application Japan, Mar. 19, 1974, 49-3058

Int. Cl.<sup>2</sup> H04R 1/12

U.S. Cl. 179—100.41 K

3 Claims



1. A record pick-up, comprising a pole piece having spaced magnetic leg portions, a coil wound around one of said leg portions, the other of said leg portions having a bore through extending in a direction away from said coil, a resilient annular member disposed in said bore, a pick-up needle assembly including a needle holder having a needle, adjacent one end of said holder, which is adapted to engage in a record groove and a conductor piece, carried at the opposite end of said holder, having an opposite end face disposed adjacent said coil, said annular member resiliently supporting said conductor piece in said bore, said conductor piece being movable upon movement of the needle in the groove of a record to vary the magnetic field around said coil and introduce an acoustic current flow therein.

4,011,418

## VIBRATION RESPONSIVE SWITCH

Jack H. Watson, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 78,189, Dec. 23, 1960. This application

Oct. 18, 1963, Ser. No. 326,649

Int. Cl.<sup>2</sup> H01H 35/14

U.S. Cl. 200—61.45 R

5 Claims

1. A vibration responsive switch comprising a mass, a pair of

1. A switch blade for a snap-action switch having a pivotal mounting for one end of the blade and an overcentering mechanism including a coil spring for yieldably holding the blade on the mounting and for pivoting the blade between stationary contacts, wherein the improvement comprises

- a. a substantially flat rectangularly shaped switch blade body,
- b. a first slot cut inwardly of one end of said body dividing said end of said body into a pair of pivotal legs,
- c. a tongue formed in said body by a pair of slots extending in opposite diverging directions from the inner end of said first slot, with said diverging slots terminating adjacent the opposite longitudinal edges of said body and short of the other end thereof,
- d. a contact carried on the line of junction between said tongue and said other end of said body and in normal engagement with one of the stationary contacts,
- e. said tongue providing means for connection to one end of the coil spring so as to pivotally connect said legs onto the pivotal mounting, and
- f. means formed by said pair of slots providing a connection between said legs and said other end of said body about which said tongue is flexed out of its normal plane by the coil spring, with said contact moving with said tongue in a shearing and rocking action off the stationary contact it normally engages.



4,011,420

**MOLDED CASE CIRCUIT BREAKER WITH IMPROVED INTERRUPTING CAPACITY**

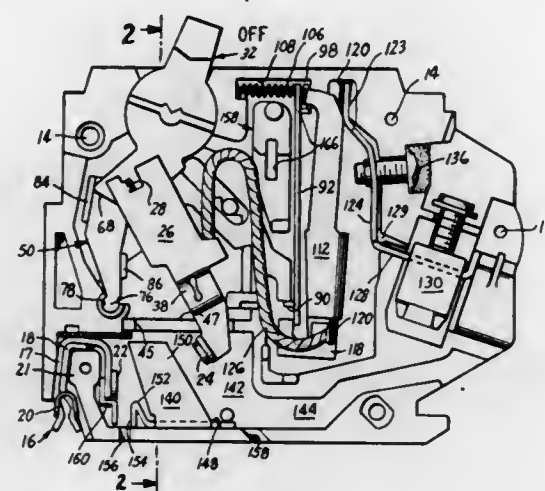
Eldon Bertel Heft, West Hartford, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jan. 22, 1975, Ser. No. 543,134

Int. Cl.<sup>2</sup> H01H 9/34

U.S. Cl. 200-147 R

3 Claims



1. An electric circuit breaker comprising, in combination:
  - A. a molded insulative case having top and bottom walls and opposed end and sidewalls;
  - B. an arc chamber formed in said case adjacent said bottom wall;
  - C. an operating mechanism including
    1. an operating handle pivotally mounted by said case and having an externally accessible handle portion extending through an opening in said case top wall, and
    2. an elongated contact arm within said case pivotally connected adjacent its upper end to said handle and extending downwardly to a termination located within said arc chamber, an elongated portion of said arm above said arc chamber disposed in intimately spaced relation to one of said case sidewalls;
  - D. a first contact affixed to said contact arm adjacent said termination thereof;
  - E. a second contact fixedly positioned in said arc chamber for engagement by said first contact when said arm is pivoted to a closed circuit position;
  - F. a magnetic conductive arc chute disposed in said arc chamber, said arc chute having
    1. a base lying adjacent said case bottom wall,
    2. sideplates extending upwardly along each case sidewall to substantially the full height of said arc chamber with upper terminations located well-above the level of said first contact while in its position of engagement with said second contact, said sideplates shielding the terminal current carrying portion of said contact arm from external magnetic fields penetrating the case of sidewalls, and
    3. a raised, conductive frontal portion extending upwardly from said base toward said second contact and into proximity with the path of movement of said first contact away from said second contact;
  - G. a first arc runner extending downwardly from said chute raised frontal position to a termination adjacent said case bottom wall;
  - H. a second arc runner electrically connected to said second contact and extending downwardly therefrom in spaced relation to said first arc runner to a termination adjacent said case bottom wall; and
  - I. means forming a vent opening in said case bottom wall at a location intermediate said first and second arc runner terminations.

4,011,421

**GAS-BLAST SWITCH**

Richard Thaler, Unterentfelden, Switzerland, assignor to Sprecher &amp; Schuh AG, Aarau, Switzerland

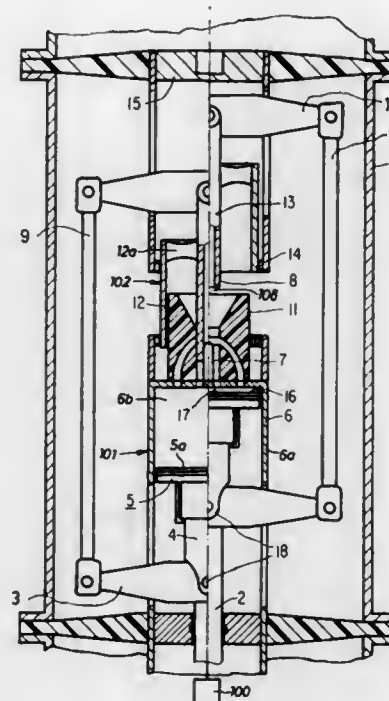
Filed Aug. 11, 1975, Ser. No. 603,864

Claims priority, application Switzerland, Aug. 14, 1974, 11121/74

Int. Cl.<sup>2</sup> H01H 33/88

U.S. Cl. 200-148 A

7 Claims



1. A gas-blast switch comprising two contact elements which can be brought into and out of engagement with one another, drive means for actuating at least one of the contact elements, a pump device actuatable during the switching movements of the gas-blast switch, said pump device comprising a piston and cylinder, said cylinder including a pump compartment, a nozzle, an exhaust compartment flow communicating with said nozzle, said pump device during cut-off movements of the gas-blast switch delivering an extinguishing agent out of the pump compartment through the nozzle into the exhaust compartment, said nozzle being constructed to take-up a switching arc which is formed between the separating contact elements, said piston comprising a number of piston portions which are guided in a gastight manner for relative movement within one another and dividing a piston surface of the piston which confronts the pump compartment, one of the piston portions defining a first piston portion which is positively connected with the drive means and a second piston portion and between such second piston portion and the pump cylinder, said coupling mechanisms upon cut-off of the gas-blast switch and as a function of the pressure difference between the pump compartment and the exhaust compartment selectively positively connecting the second piston portion either with the first piston portion below a pre-selected excess pressure limit prevailing in the pump compartment or the second piston portion with the pump cylinder when there prevail pressure values which are above the pre-selected limit.

4,011,422

**PUSH-BUTTON SWITCH**

Carlton E. Sanford, East Providence, R.I., and Laurence P. Kleven, South Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 3, 1975, Ser. No. 554,385

Int. Cl.<sup>2</sup> H01H 3/12

U.S. Cl. 200-159 B

4 Claims

1. A push-button switch comprising an electrically conduc-

4,011,424

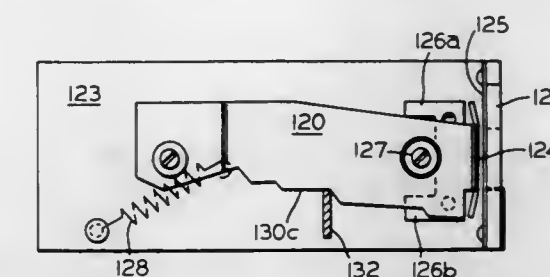
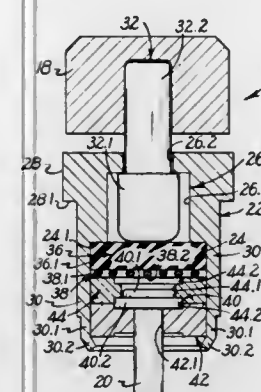
**POSITION INDICATOR FOR DRAWOUT APPARATUS**  
Eric Axel Ericson, Plainville, and Frederick Daniel Kaufhold, Forestville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,619

Int. Cl.<sup>2</sup> H01H 9/00

U.S. Cl. 200-308

10 Claims



1. In a drawout assembly including a carriage mounting an electrical device and, in turn, supported on rails for accommodating racking movement of the device into and out of an electrical enclosure, indicator apparatus comprising, in combination:
  - A. an elongated arm movably mounted to one of the carriage and enclosure;
  - B. a step cam elongated generally in the directions of movement of the device carriage relative to the enclosure and consisting of a series of differentially elevated, essentially straight cam segments interconnected by relatively sharply angled cam segments;
  - C. an actuator, said actuator mounted by one of said carriage and enclosure and said step cam mounted by the other of said carriage and enclosure for relative movement proportional to the movement of the carriage relative to the enclosure, said arm mechanically interconnected with one of said actuator and step cam, and said actuator engaging said angled and straight cam segments to abruptly variously elevate said arm in correlation with the position of the carriage relative to the enclosure; and
  - D. means carried by said arm to indicate, in accordance with the arm elevation, the various positions of the carriage as it is moved on the rails relative to the enclosure.

4,011,423

**COMMON RESET EXTENSION FOR PLURALITY OF OVERLOAD RELAYS**

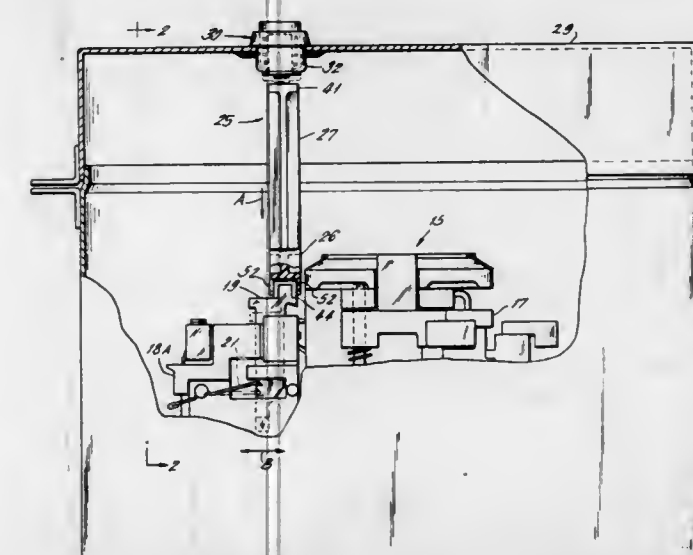
Robert Glenn Zepp, Finksburg, Md., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 12, 1975, Ser. No. 612,943

Int. Cl.<sup>2</sup> H01H 3/20

U.S. Cl. 200-330

7 Claims



1. Electrical switching apparatus including housing means having an openable front cover, a plurality of switches mounted within said enclosure with each having a rearwardly depressible reset handle, a control mounted on said cover so as to be movable therewith and operable from outside of said housing means said switches being disposed with their handles remote from said cover and said control, a common reset extension means operatively mounted to said switches extending forward thereof for operative engagement by said control to transmit rearward movement of the latter to said handles for resetting said switches, with said cover open, said control being remote from said extension means and the latter remaining mounted to said switches.

4,011,425

**ARC CHUTE EXTENSION FOR INCREASED INTERRUPTION RATING**

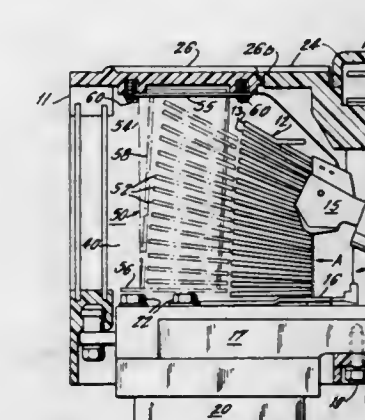
Carl E. Gryetko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Jan. 3, 1975, Ser. No. 538,342

Int. Cl.<sup>2</sup> H01H 9/36

U.S. Cl. 200-144 R

9 Claims



1. A circuit breaker including an insulating case having removable cover means; a terminal bus; a pole unit within said case including separable cooperating movable and stationary contacts, said stationary contact being mounted to said bus at one end and in front thereof; a main spaced-plate arc chute having an entrance end operatively positioned at said one end



of said bus to receive electric current arcs drawn between said contacts during separation thereof; a chamber within said case positioned forward of said bus at the other end thereof; securing means for maintaining said circuit breaker in electrical connection with an external circuit, said securing means being accessible for operation within said chamber; and a spaced-plate arc chute extension disposed within said chamber to receive portions of electric current arcs extending through said main arc chute, said arc chute extension being removably mounted within said chamber in front of said securing means for access to said securing means without the necessity of moving said main arc chute.

4,011,426

**DEVICE WITH ARC-EXTINGUISHING SYSTEM**  
Emil Lange, 97, rue de Versailles, 92 Ville D'Avray (Hauts-de-Seine), France

Continuation of Ser. No. 289,256, Sept. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 67,666, Sept. 26, 1967.

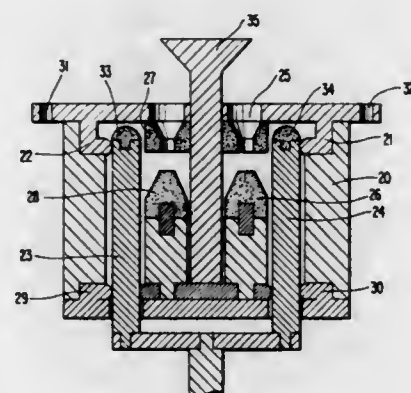
This application July 7, 1975, Ser. No. 593,313

Claims priority, application Germany, Sept. 26, 1966, 54644

Int. Cl.<sup>2</sup> H01H 33/02, 9/30

U.S. Cl. 200-144 C

21 Claims



1. A device for extinguishing electric arcs comprising: a first electrode, and a second electrode wherein . an electric arc burns between said first and second electrodes, said first electrode is composed of a metallic substance providing said first electrode with electrical conductivity, and a non-metallic substance having the property of giving off a volatile, arc extinguishing gas due to the heat of the electric arc, and said second electrode is composed of a metallic substance providing said second electrode with electrical conductivity, and a non-metallic inorganic substance having a melting point higher than the melting point of the non-metallic substance of which said first electrode is composed, said non-metallic inorganic substance having the property of reducing current flow while itself giving off no volatile arc-extinguishing gases.

4,011,427

**ELECTRIC SUPPLY CIRCUITS FOR A MICROWAVE OVEN**

Per Olov G. Risman, Huskvarna, Sweden, assignor to Huskvarna Vapenfabriks AB, Huskvarna, Sweden

Continuation of Ser. No. 401,558, Sept. 27, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 549,739

Claims priority, application Sweden, Sept. 27, 1972, 12448/72

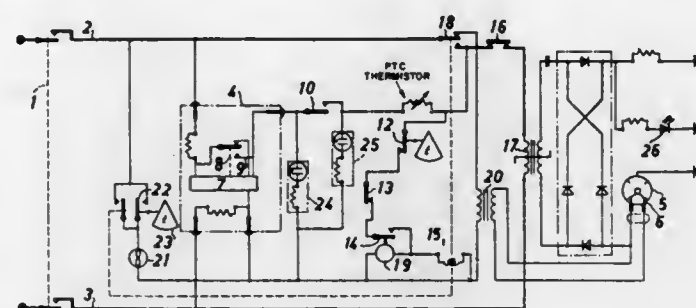
Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219-10.55 B

1 Claim

1. An electric supply circuit for a microwave oven provided

with a magnetron tube in which an anode circuit is supplied with high voltage, said circuit comprising in combination; a main power supply; a leakage reactance transformer having a primary winding and a secondary winding; said secondary winding supplying said anode circuit; two parallel circuits connecting said primary winding of said transformer to said main power supply, a first one of said two circuits including a switch and a protective resistor serially connected, said protective resistor comprising a thermistor having a positive



temperature constant; a second one of said two circuits including a relay contact; and a relay coil connected in series to said protective resistor and forming an additional circuit which is connected in parallel to said primary winding of said transformer, said relay coil controlling said relay contact, said first one of said circuits being energized upon actuation of said switch supplying said relay coil and said primary winding through said protective resistor, said second one of said circuits being energized upon actuation of said relay coil to close said relay contact.

4,011,428

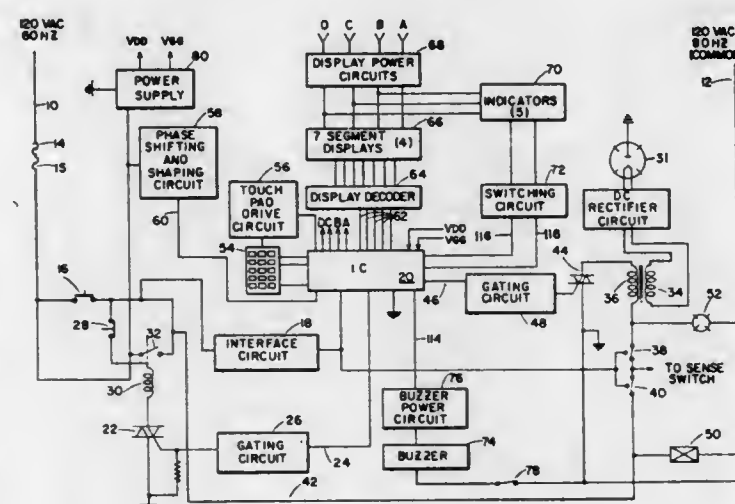
**MICROWAVE OVEN TIMER AND CONTROL CIRCUIT**  
Robert D. Fosnough, and David F. Bennett, both of Logansport, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Mar. 24, 1975, Ser. No. 561,277

Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219-10.55 B

4 Claims



1. A user programmable control system for a microwave oven having a source of microwave energy, which comprises: a keyboard including a plurality of user actuatable number switches and a plurality of user actuatable function switches; control logic circuit means for detecting the actuation of ones of said number and function switches; memory means for storing first and second groups information therein; means responsive to the detection of the actuation of ones of said number switches for loading information into said first group which is representative of the duration of a first time interval; means responsive to the detection of the actuation of a certain one of said function switches for allowing information to be entered into said second group of information;

means responsive to the detection of the actuation of ones of said number switches subsequent to the detection of the actuation of said certain one of said function switch for loading information into said second group which is representative of the duration of a second time interval; means for periodically updating said first group of information so that the first group of information is representative, at any given time, of the time remaining in said first time interval; means responsive to said first group of information for energizing said source of microwave energy during said first time interval; means for periodically updating said second group of information subsequent to the end of said first time interval so that the second group of information is representative at any given time, of the time remaining in a second time interval; and means responsive to said second group of information for energizing said source of microwave energy during said second time interval;

4,011,429

**HOT STRETCH-WRAP FORMING WITH RESISTANCE HEATING**

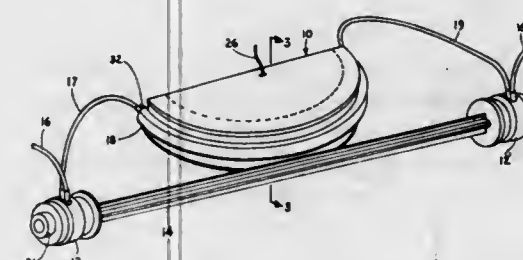
Carl M. Morris, Manhattan Beach; William E. Manchester, Lomita; John L. Hill, Redondo Beach; Robert A. Bridwell, Buena Park, and Douglas B. Hugill, Hermosa Beach, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Oct. 20, 1975, Ser. No. 624,117

Int. Cl.<sup>2</sup> B21J 13/08; H05B 3/26

U.S. Cl. 219-153

6 Claims



1. The process of stretch-wrap forming an elongated metal part or the like, particularly a part having an irregular cross section, on a stretch press having a pair of opposing jaws, comprising:
  - a. positioning a die assembly on said stretch press, said die having a heat-resistant electrical insulating insert in which an elongated forming element is mounted, the cross section of said forming element being capable of maintaining uniform electrical resistance heating when said process is in operation.
  - b. positioning a part in the jaws of said stretch press, said jaw as being electrically isolated from said stretch press,
  - c. passing a heating current in parallel through said forming element and said part,
  - d. bringing said part in contact with said element when said element is uniformly heated to the forming temperature of said part,
  - e. stretch-wrap forming said part around said element of said die,
  - f. stopping said current and holding the formed part in mating relationship with said element until said part has dropped to a desired temperature below said forming temperature, and
  - g. removing said formed part from said jaws.

4,011,430

**MULTIZONE ELECTRICAL FURNACE METHODS AND APPARATUS**

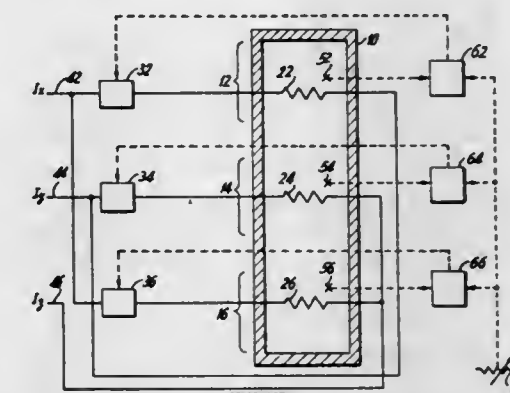
Donald Eli Witkin, and Andrew Stephenson Dalgleish Crum, both of Warren, Pa., assignors to National Forge Company, Irvine, Pa.

Filed May 6, 1975, Ser. No. 574,961

Int. Cl.<sup>2</sup> H05B 1/02

U.S. Cl. 219-486

8 Claims



1. In an electrical furnace including a plurality of thermal zones, said furnace being supplied with polyphase electrical power, the improvement comprising: a plurality of heater circuits associated with each thermal zone, each of said heater circuits including a heating element and a thyristor device for controlling the amount of power supplied to said heating element; means for connecting the heater circuits associated with each thermal zone in parallel in circuit relation with a respective one of the phases of the polyphase power; and means for controlling the thyristor devices in the heater circuits associated with each thermal zone so that only one of said thyristor devices is operating to produce a substantial phase shift in the power supplied to the associated heating element at any time.

4,011,431

**ELECTRIC COOKING APPLIANCE WITH REVERSIBLE GRILL**

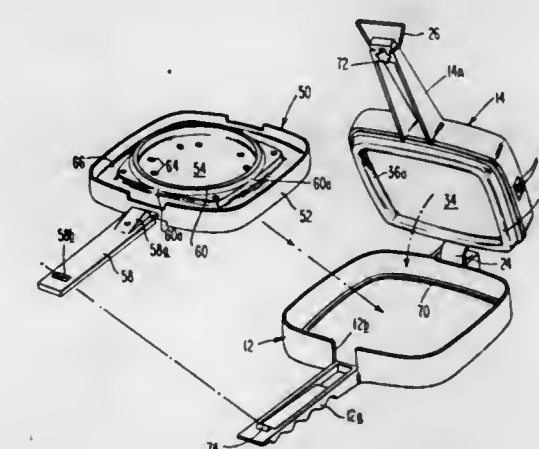
Monte L. Levin, 19 Sutton Place, New York, N.Y. 10022

Filed Apr. 5, 1976, Ser. No. 673,629

Int. Cl.<sup>2</sup> H05B 1/00; A47J 37/00; B29C 3/00

U.S. Cl. 219-524

7 Claims



1. A versatile efficient electric fast cooker for hamburgers, sandwiches and the like comprising
  - a. a rectangular cover having on the bottom thereof a flat downwardly-facing cooking surface surrounded by a substantially rectangular downwardly projecting heat-conducting continuous rib containing an electric heating element;
  - b. a drip-receiving box-like rectangular base pan having an



open top, sidewalls, and a floor, said base pan adapted to mate with and support the cover;

c. hinge means connecting the cover and base pan;

d. a perforated, substantially flat two-sided invertible rectangular metal grill adapted to be received by the base pan, one of the sides constituting the hamburger-cooking side of the grill and presenting an inwardly facing, relatively circular wall surrounding a portion thereof, and the other side constituting the sandwich-grilling side of the grill and presenting an inwardly facing substantially rectangular wall surrounding a portion thereof, the grill having a continuous rectangular mating zone adjacent the periphery of each side and outward of said square and round walls respectively and adapted to align with and engage the rectangular downwardly projecting rib on the cover when the cooker is assembled, the outer surface of the rectangular wall being a smooth upward extension of the mating zone conforming closely to the shape of the inwardly facing upward portion of the rectangular rib, and a plurality of spaced portions of the outer surface of the circular wall also being smooth upward extensions of the mating zone conforming closely to the shape of the inwardly facing upward portion of the rectangular rib; and

e. support means in the base pan for engaging at least a portion of the underside of the grill to support the grill in the base pan, the support means and the grill being so shaped that irrespective of which surface is upward, the support means holds the grill up with the upward mating zone engaging the rib;

whereby when the cooker is assembled with the sandwich grilling side upward, the grill is adapted to support for cooking a square sandwich or the like, and when the cooker is assembled with the hamburger-cooking side upward, the grill is adapted to support for cooking a round hamburger or the like, in the respective instances the upwardly facing mating zone as well as the outer surface of the rectangular wall and at least some of said portions of the circular wall being in engagement with or very proximate the rib to provide effective heat exchange from the heating-element-containing rib to the grill.

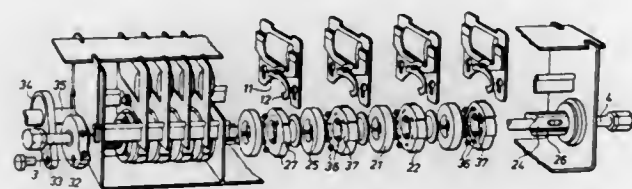
#### 4,011,432 CONVERTER

Kenneth Oscar Emanuel Skogward, Huskvarna, Sweden, assignor to Huskvarna AB, Huskvarna, Sweden  
Filed June 10, 1975, Ser. No. 585,563  
Claims priority, application Sweden, June 13, 1974, 7407801

Int. Cl.<sup>2</sup> G06K 1/00

U.S. Cl. 235—61 PE

6 Claims



1. A converter for converting binary codes into mechanically controlled movements, comprising adjustment means for receiving code signals from an outside signal source, a plurality of sets of cam discs, a common shaft upon which said sets are mounted and axially displaceable thereon, each of said sets comprising pairs of cam discs having axial cams facing one another, wherein said adjusting means further comprises control elements equipped with locking devices cooperating with locking teeth on the periphery of one cam disc in each said pair of cam discs, said control elements operable between a locking position and a free position in response to said signals from the signal source, said converter further comprising a converter drive system comprised of an axial arrangement of the cam disc sets on said common shaft in cooperation

with an indexing mechanism, driven by a rotating means, for rotatably driving the other cam disc in said pairs of cam discs in an oscillating movement said converter for producing an axial stroke in the respective cam disc sets in which said locking devices assume the locking position, which axial strokes are added in the row of cam disc sets into an output movement relative to a zero position.

#### 4,011,433 VALUE DISPENSING SYSTEM

Kazuma Tateisi, Kyoto; Sizuka Horii, Nagaokakyo, and Yasuo Uchida, Takatsuki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

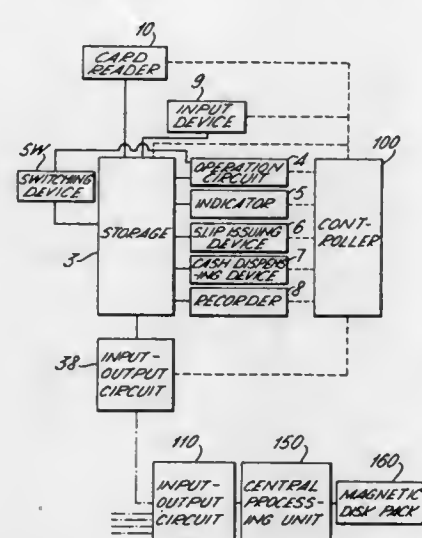
Filed Jan. 27, 1975, Ser. No. 544,215

Claims priority, application Japan, Feb. 1, 1974, 49-13793

Int. Cl.<sup>2</sup> G06K 7/01

U.S. Cl. 235—61.7 B

15 Claims



1. A system for automatically dispensing value, wherein a card for actuating said system is previously issued to each customer having an account in the system, the current status of said account being characterized by a current on-line balance and a current off-line balance, one of said current on-line balance and said current off-line balance being changed each time said system dispenses value to supply a new current off-line balance and a new current on-line balance representative of the status of said account after said value is dispensed, each said card having recorded thereon necessary data including at least the identification number and said current off-line balance of said account, said system comprising: means for reading said data recorded on said card; value setting means for setting an amount of value to be dispensed; means for storing said current on-line balance of the account of each said customer; first comparison means for determining whether said amount is to be dispensed by comparing said amount with said current on-line balance to which access is made by said identification number of said card read by said reading means; second comparison means for determining whether said amount is to be dispensed by comparing said amount with said current off-line balance, said second comparison means being operable in response to a control signal; first control means responsive to said first comparison means for supplying said control signal to render said second comparison means operative whenever said first comparison means determines said amount is not to be dispensed on the basis of said comparison of said amount with said current on-line balance; and dispensing means for dispensing value equivalent to said amount of value established by said value setting means, said dispensing means responsive to said first comparison means to dispense said value when said first comparison means determines said amount does not exceed said current on-line balance, said dispensing means responsive to said second comparison means to dispense said value when said second comparison means determines said amount does not exceed said current off-line balance.

#### 4,011,434 STAND-ALONE CUMULATIVE ELAPSED-TIME CALCULATING SYSTEM

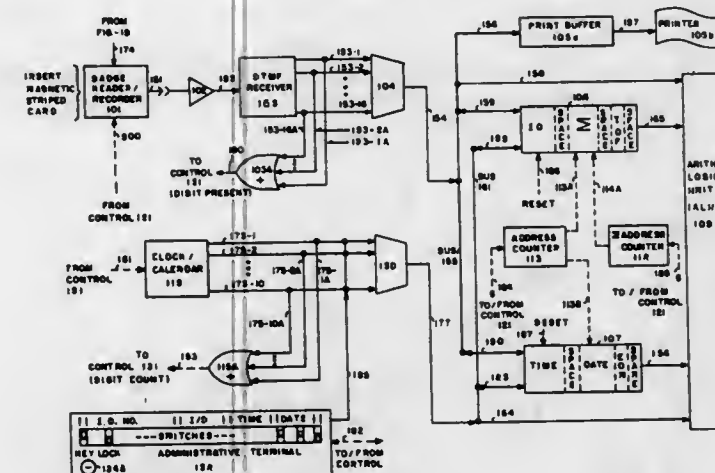
Norman N. Hockler, Galion, Ohio, assignor to North Electric Company, Galion, Ohio

Filed Aug. 25, 1975, Ser. No. 607,495

Int. Cl.<sup>2</sup> G06K 1/00, 7/10

U.S. Cl. 235—61.9 R

18 Claims



1. In a time recordation system for recording data related to successive uses of said system, a portable recording medium having data recording areas permitting recording of data related to the last use of the system, switchable means operative in a first mode to extract data from said recording medium, logic means responsive to first data extracted from said recording medium by said switchable means for calculating the time difference between first and second uses of said system to thereby generate elapsed time data representing a measure of the elapsed time between said first and second uses, and to use said elapsed time data and second data extracted from said recording medium to generate modified data representing current cumulative elapsed time, said switchable means being operative in a second mode to record said modified data upon said recording medium and visual display means for displaying said cumulative elapsed data at the time of each use of the system.

#### 4,011,435 OPTICAL INDICIA MARKING AND DETECTION SYSTEM

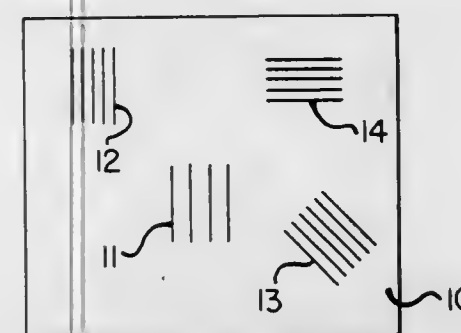
Robert A. Phelps, Kettering, and William R. Horst, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 1, 1974, Ser. No. 438,886

Int. Cl.<sup>2</sup> G06K 7/14, 9/04; G11C 1/14

U.S. Cl. 235—61.11 E

4 Claims



1. An optical identification system comprising: optical indicia members each including a plurality of singularly distinguishable diffraction grating elements overlaying a retroreflective element in a multiple layer structure with each of said diffraction grating elements having a selected line spacing and angular orientation, which spacing and orientation corresponds to a selected code;

indicia classifying apparatus including a source of coherent light capable of illuminating a viewed indicia member, and light sensing means responsive to a plurality of light images produced by said diffraction grating elements of said viewed indicia member for converting said images into usable code signals.

#### 4,011,436 MULTIPLE LEVEL PREDETERMINING SYSTEM

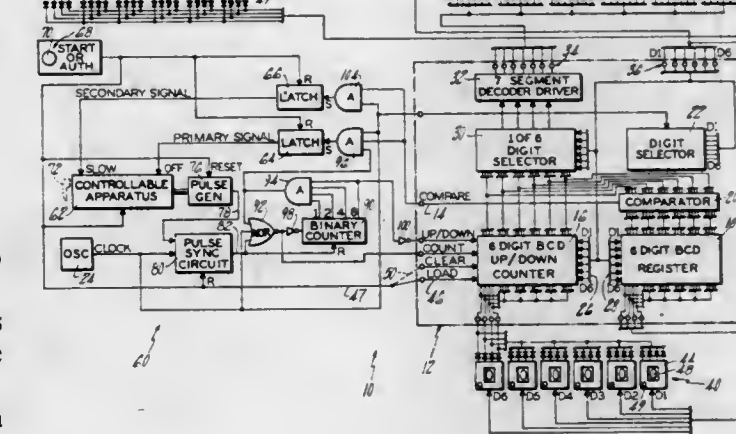
Robert J. Schiller, Simsbury, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed Feb. 13, 1976, Ser. No. 657,854

Int. Cl.<sup>2</sup> G06M 3/02; H03K 21/36

U.S. Cl. 235—92 PE

12 Claims



1. A multiple level predetermining system having a bidirectional predetermining counter operable for being indexed for accumulating a primary count and for generating a primary predetermining control signal when the primary accumulated count reaches a first predetermined accumulated count, and a predetermining control system for automatically generating at least one additional secondary predetermining control signal when the primary count reaches an accumulated count which differs from said first count by a predetermined count differential, the predetermining control system comprising indexing means for indexing the bidirectional counter in a first direction and then the opposite direction through a secondary counting cycle having a plurality of N-1 counts in each direction at least equal to said count differential, and predetermining signal control means for generating a secondary predetermining control signal if the accumulated count equals said first count when the counter is indexed said count differential during a secondary counting cycle.

#### 4,011,437 METHOD AND APPARATUS FOR COMPENSATING FOR UNPROGRAMMED CHANGES IN RELATIVE POSITION BETWEEN A MACHINE AND WORKPIECE

Richard Edward Hohn, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Sept. 12, 1975, Ser. No. 612,764

Int. Cl.<sup>2</sup> B25J 9/00; G06F 15/46

U.S. Cl. 235—151.11

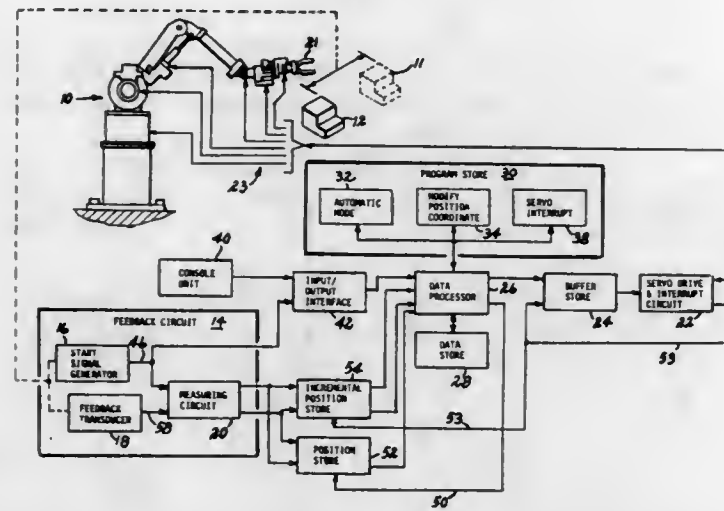
32 Claims

1. An apparatus for modifying command signals representing predetermined positions of a machine element relative to a workpiece to compensate for measurable unprogrammed changes in the relative position between said machine element and workpiece, said machine element being controlled by a servomechanism circuit generating interrupt signals defining fixed time intervals and causing command signals to be transferred to the servomechanism circuit, the apparatus comprising:

a. means for producing feedback signals representing the sign and magnitude of an unprogrammed change in the relative position between the machine element and the workpiece;



- b. means responsive to command signals and the feedback signals for initializing the command signal as a function of the unprogrammed change in the relative position occurring up to the time of a first interrupt signal defined by the most recent occurrence of an interrupt; and
- c. means responsive to the feedback signals and the inter-



rupt signals for producing a modified command signal by modifying the initialized command signal as a function of the unprogrammed change in the relative position occurring from the time of the first interrupt signal until the occurrence of a second interrupt signal causing the modified command signal to be transferred to a servomechanism circuit.

4,011,438

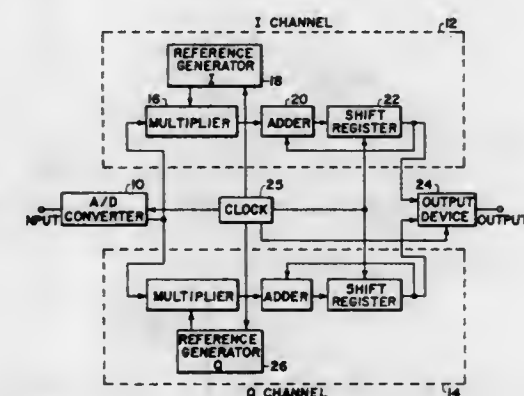
## SIMPLIFIED DIGITAL MOVING TARGET INDICATOR FILTER

Maurice Bernard Aufderheide, and Guy Vernon Morris, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.  
Filed Dec. 17, 1975, Ser. No. 641,392

Int. Cl.<sup>2</sup> G01S 9/42; G06F 15/34

U.S. Cl. 235-152

9 Claims



1. A digital filter for generating a frequency domain output signal from an incoming signal arriving in successive receiving cycles when the incoming signal has any frequency component lying within the pass-band of said digital filter, comprising:

- means for generating a timing signal;
- analog-to-digital converter means responsive to said timing signal for converting the incoming signal into digital input pulses, wherein each digital input pulse corresponds to a range gate interval;
- reference generator means responsive to the timing signal for providing a train of digital reference pulses for each of the successive receiving cycles, wherein a predetermined number of the successive receiving cycles form a frame and wherein the amplitude of each train of digital reference pulses is determined by a correlation function;
- means for multiplying each digital reference pulse with each digital input pulse to generate a train of discrete digital outputs for each receiving cycle; and
- means responsive to the timing signal for accumulating

the discrete digital outputs from said multiplying means and generating the frequency domain output signal for each frame of digital reference pulses.

4,011,439

## MODULAR APPARATUS FOR ACCELERATED GENERATION OF A QUOTIENT OF TWO BINARY NUMBERS

Walter Scott Bennett, Loveland, Colo., assignor to Burroughs Corporation, Detroit, Mich.

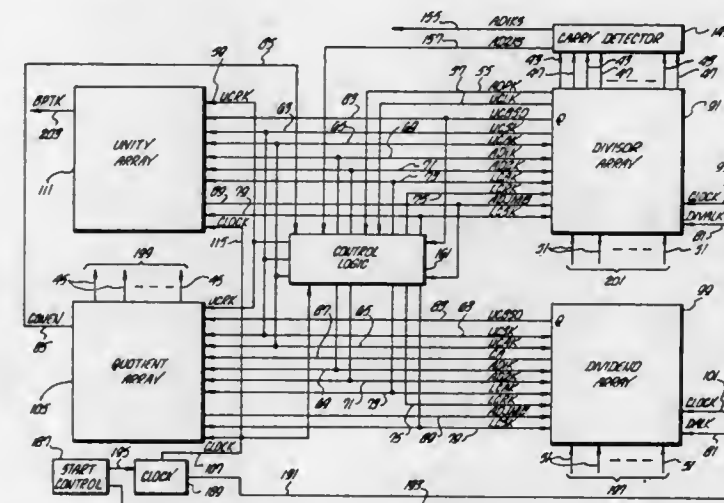
Continuation of Ser. No. 489,885, July 19, 1974, abandoned.

This application Dec. 15, 1975, Ser. No. 639,514

Int. Cl.<sup>2</sup> G06F 7/52

U.S. Cl. 235-164

5 Claims



1. A divider for dividing a dividend bit pattern by a divisor bit pattern to form a quotient bit pattern, comprising: first means for receiving a divisor bit pattern; said first means including means for manipulating a received divisor bit pattern so as to produce control signals representative of the multiplication of the received divisor bit pattern by its reciprocal; second means for receiving a dividend bit pattern; means for applying said control signals produced by said first means to said second means; said second means including means responsive to said control signals for manipulating a received dividend bit pattern in accordance with said control signals so as to generate output signals representative of said quotient bit pattern; and third means for detecting if said quotient has been generated to a bit precision equal to the bit length of a period of the reciprocal of said divisor, and, in response to such detection, doubling the precision of the generated quotient.

4,011,440

## SYSTEM FOR GENERATING AN ANGULAR RATE SIGNAL FROM AN ANGULAR POSITION SIGNAL UTILIZING A CONSTANT AMPLITUDE-VARIABLE CARRIER PHASE SIGNAL

Helmar Rudolf Steglich, Marblehead, Mass., assignor to General Electric Company, Wilmington, Mass.

Filed Apr. 29, 1975, Ser. No. 572,933

Int. Cl.<sup>2</sup> G06G 7/18, 7/22

U.S. Cl. 235-183

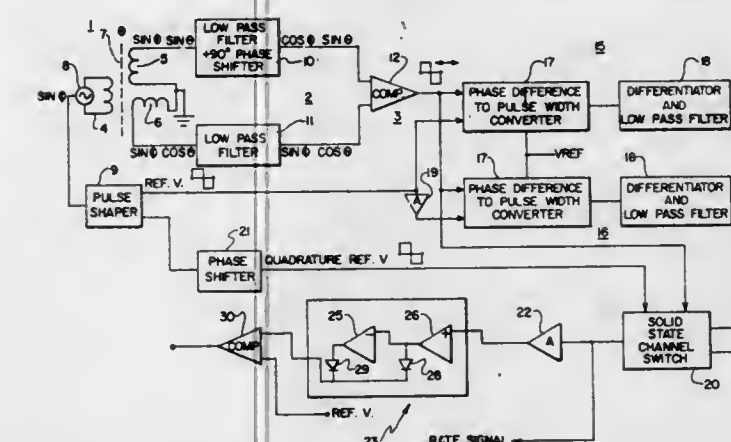
8 Claims

1. In a circuit for deriving an angular rate of change signal from an angular position signal, the combination comprising:
  - angular position signal generating means for providing two fixed phase carrier signals which are respectively amplitude modulated proportionately to the sine and cosine of the angle;
  - means for converting the two fixed phase carrier signals which are amplitude modulated proportionately to the sine and cosine of the angle to a constant amplitude carrier signal, the phase of said constant amplitude carrier signal varying with respect to the phase of said two

amplitude modulated fixed phase carrier signals with variations of angular position so that the phase of said constant amplitude carrier signal is proportional to said angular position,

- signal conversion means for converting the constant amplitude signal the phase of which varies with angular position to a unidirectional signal proportional to the angular rate of change including:

1. first means to convert the constant amplitude signal the



phase of which varies with angular position to a unidirectional signal which is proportional to the carrier phase and thus to the angular position,

2. second means to convert said unidirectional voltage signal proportional to angular position to a unidirectional signal proportional to angular rate of change including means to differentiate the unidirectional signal proportional to angular position to derive a unidirectional signal proportional to angular rate of change.

4,011,441

## SOLID STATE IMAGING APPARATUS

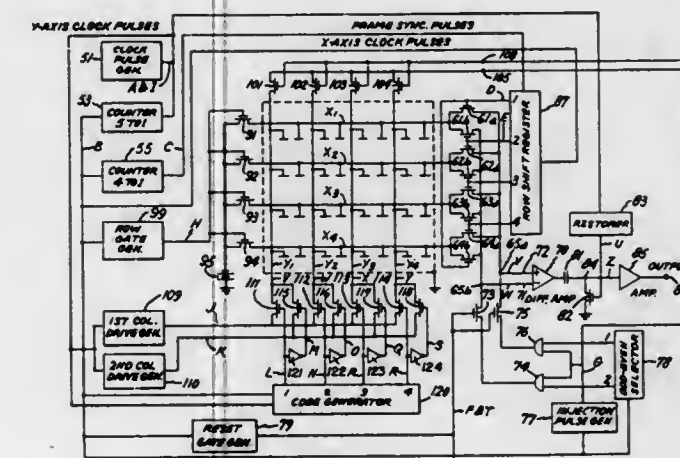
Gerald J. Michon, Waterford, and Hubert K. Burke, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,560

Int. Cl.<sup>2</sup> G06G 7/12; H04N 3/14

U.S. Cl. 235-193

5 Claims



1. In combination, a substrate of semiconductor material of one type conductivity having a major surface, first means forming a first plurality of charge storage sites for opposite type carriers adjacent said major surface of said substrate, second means forming a second plurality of charge storage sites for opposite type carriers adjacent said major surface of said substrate, each coupled to a respective charge storage site of said first plurality to form a plurality of coupled pairs of charge storage sites, said coupled pairs of charge storage sites being arranged in an array of rows and columns,

a plurality of row conductor lines and a plurality of column conductor lines, said first means including a first plurality of electrodes each insulatingly overlying a respective one of said storage sites of said first plurality, each of the electrodes of said first plurality in a respective row of sites being connected to a respective row line, said second means including a second plurality of electrodes, each insulatingly overlying a respective one said storage sites of said second plurality, each of the electrodes of said second plurality in a respective column of sites being connected to a respective column line, means for exposing said substrate to radiation to generate and store charge in said storage sites of said substrate, means for obtaining signals proportional to algebraic sums of charge in a row of charge storage sites including: means for storing charge to be sensed with one sign in the column line coupled sites of said row, means for storing charge to be sensed with the opposite sign in the row line coupled sites of said row, means for transferring the charge stored in the column sites of said row to the row sites thereof and for transferring the charge stored in the row sites of said row to the column sites thereof, means for sensing the signal induced on said first plurality of electrodes of said row in response to the transfer of charge in the storage sites of said row.

4,011,442

## APPARATUS FOR SENSING OPTICAL SIGNALS

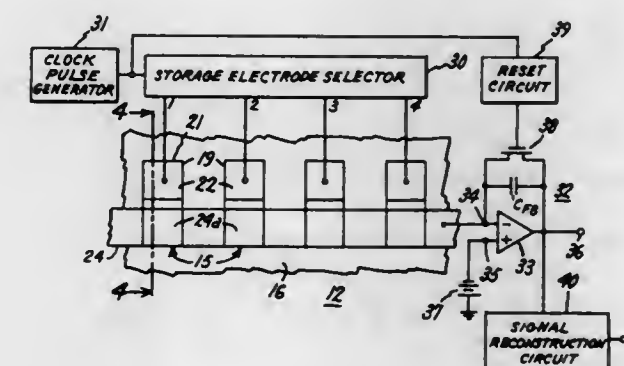
William E. Engeler, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,539

Int. Cl.<sup>2</sup> G06G 7/12; H04N 3/14

U.S. Cl. 235-193

12 Claims



1. Imaging apparatus comprising a substrate of semiconductor material of one type conductivity having a major surface, means forming a first plurality of charge storage sites for opposite type carriers adjacent said major surface of said substrate, means for exposing said substrate to a spatial pattern of radiation to produce a pattern of opposite type carriers of variable quantity in said plurality of storage sites, the quantity of opposite type carriers in each storage site being proportional to a respective sample of said spatial pattern of radiation, output means for deriving an output comprising signals proportional to the algebraic sums of selected combinations of the charge in said first plurality of charge storage sites, said signals being formed by repeatedly sensing the charge in said first plurality of charge storage sites in different combinations.



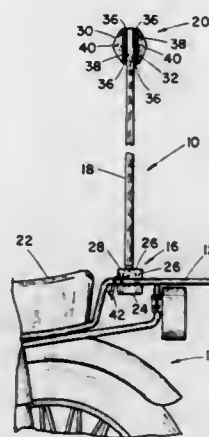
4,011,443

MOTORCYCLE INDICATING SAFETY LIGHT  
ASSEMBLY

Merle F. Smith, 443 W. Main St., Dallastown, Pa. 17313, and  
Harold H. Wagman, 370 Lakeview Drive, York, Pa. 17402  
Continuation-in-part of Ser. No. 506,397, Sept. 16, 1974,  
abandoned. This application Apr. 7, 1975, Ser. No. 565,775  
Int. Cl.<sup>2</sup> B62J 5/00

U.S. Cl. 240—7.55

7 Claims



1. An indicating safety light assembly comprising in combination, a clamp-type subassembly attaching means comprised of a pair of complementary members each having clamping surfaces opposing each other and provided in said surface centrally positioned V-shaped recesses wherein one of said recesses is larger than the other in cross-section thereby adapting said members to effectively receive and be clampably affixed to and firmly grip at least one of a plurality of different sized generally horizontal rod-like structural frame members of a motorcycle vehicle rearwardly of the front wheel base and handle bar said attaching means having at least one threaded socket radially provided in one of said complementary members thereof, a tubular rod threaded at one end into said socket and extending upwardly therefrom, said tubular rod being supported by said attaching means in vertically aligned position relative to said frame member, a geometrically shaped elongated block-like light subassembly threadably connected co-axially to the upper end of said tubular rod and having an opening to receive conductor means, said block-like light subassembly comprising a support base having opposite sides provided with socket means respectively receiving and supporting a pair of electric light bulbs, different colored elongated cup-shaped light-transmitting lenses, means removably connecting said lenses respectively to the opposite sides of said support base in back-to-back relation, an electric circuit conductor connectable at one end to a source of current on said vehicle and extending upwardly through said tubular rod and said opening in said block-like light subassembly for connection to contacts connected to said light bulb sockets and providing electrical current connection for said bulbs, and a circuit control means in said electric circuit.

4,011,444

## LAMP ASSEMBLY

George D. Levy, Wellesley Hills, Mass., assignor to ACLA, Inc., Boston, Mass.

Filed Oct. 31, 1975, Ser. No. 627,545

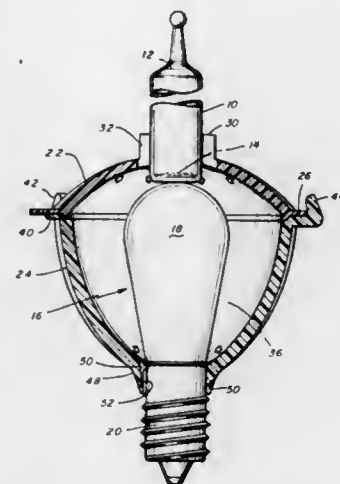
Int. Cl.<sup>2</sup> A47G 33/16; F21P 1/02

U.S. Cl. 240—10 A

1 Claim

1. A lamp assembly comprising, in combination:  
a transparent tube in the form of a candle completely enclosed and for holding a quantity of liquid filling less than the total space in the tube and which generates bubbles in the tube when heat is applied at one end of the tube,  
an incandescent bulb having an illuminating end and a threaded connecting end,  
a housing for holding both the tube and bulb including two separable housing parts defining a chamber joining along

a circular locus and having a passage in one part defined by a slotted collar for accommodating the tube with the tube extending partially into the chamber and a passage in the other part defined by a collar integral with the other part and in line with the passage in the one part when the parts are assembled for accommodating the bulb with the illuminating end disposed in the chamber in juxtaposition to the one end of the tube and the connecting end extending outwardly from the housing for connection to an electrical socket,  
said collar of said other part having at least one slot for receiving a solder spot on the connecting end of the bulb



to prevent rotation of the bulb relative to the other housing part,  
means associated with the housing for separably holding the two parts together in an unpermanent manner so that the parts can be separated for the purpose of replacing the bulb comprising three equally spaced ears extending from an annular flange of the other housing and a like annular flange of said one housing fitting within the ears to hold the parts together, said annular flanges having flat mutual contacting surfaces,  
and means for separating the housing parts including a tab integral with and extending from the annular flange of the one part and disposed between a pair of the three ears.

4,011,445

OPTICAL ARRAY ACTIVE RADAR IMAGING  
TECHNIQUE

Thomas R. O'Meara, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 16, 1975, Ser. No. 641,330

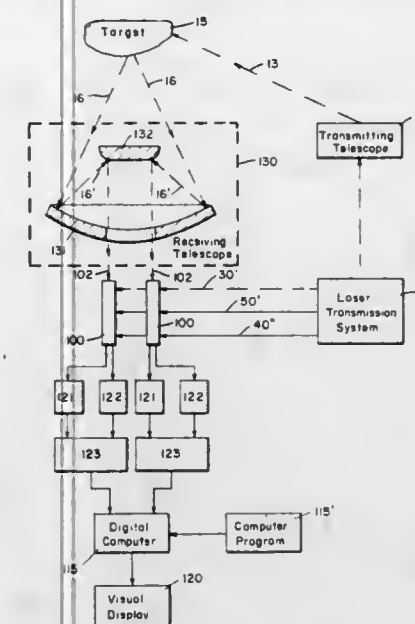
Int. Cl.<sup>2</sup> H04B 9/00

U.S. Cl. 250—199

23 Claims

1. An optical target imaging system, comprising in combination:  
a laser transmitter providing a two pulse sequence target illuminating field, one pulse of the two pulse sequence being substantially polarized in one direction and the other of the two pulse sequence being substantially polarized in a direction orthogonal to said one pulse; and

a plural number of receivers, electromagnetically coupled to the transmitter, for receiving the illuminating field



portion reflected from the target, said field portion being of a predetermined polarization state.

4,011,446

DEVICE FOR PRODUCING A SIGNAL INDICATING THE  
DIRECTIONAL MOVEMENT REQUIRED TO ACHIEVE  
FOCUS

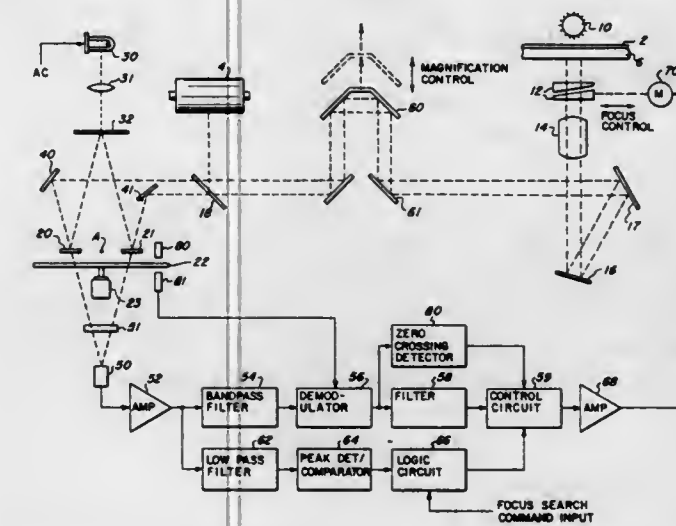
Melvin E. Swanberg, Claremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1975, Ser. No. 569,425

Int. Cl.<sup>2</sup> G01J 1/20; G01B 3/00

U.S. Cl. 250—201

9 Claims



1. A device for producing a signal for controlling the focus of a lens in an optical projection system comprising:  
a first stationary member having a plurality of light reflecting surfaces distributed thereon with light transparent portions between said light reflecting surfaces of said first member,  
a second stationary member having a plurality of light reflecting surfaces distributed thereon with light transparent portions between said light reflecting surfaces of said second member,  
means for illuminating said first and second stationary members,  
means for forming an image of the light reflecting surfaces on said first and second stationary members through said lens at a remote location, the image formed at said remote location being reimaged through said lens on said light reflecting surfaces, the reimaged light being reflected back to said illuminating means if the reimaged light is in focus at said light reflecting surfaces,

a rotating optical modulator comprised of a plurality of alternate light opaque and light transparent portions, said rotating optical modulator being positioned adjacent both said first and second stationary members, the plane of said optical modulator being equidistant from the plane of said light reflecting surfaces of said first and second stationary members,  
means for rotating said modulator at a substantially constant speed, and  
detector means positioned adjacent said optical modulator for detecting that portion of the reimaged light transmitted through the light transparent portions of said first and second stationary members and the light transparent portions of said optical modulator when said reimaged light is not in focus at said light reflecting surfaces.

4,011,447

SYSTEM FOR DETECTING THE EDGES OF A MOVING  
OBJECT EMPLOYING A PHOTOCELL AND AN  
AMPLIFIER IN THE SATURATION MODE

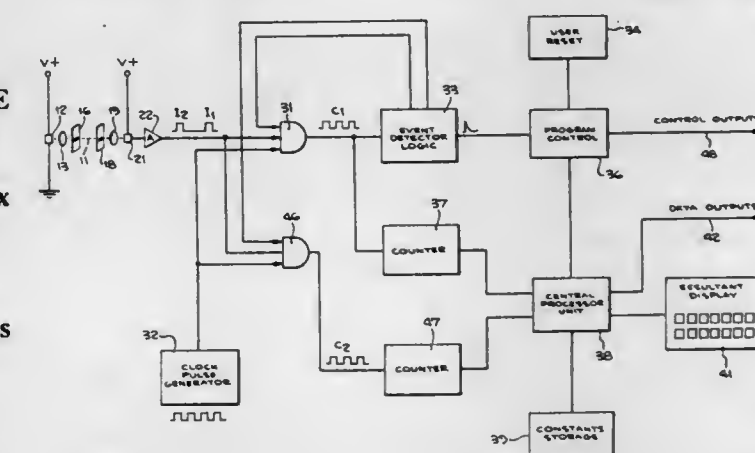
George R. Henderson, 6217 Picardie Road, Rancho Palos Verdes, Calif. 90274

Filed Feb. 9, 1976, Ser. No. 656,328

Int. Cl.<sup>2</sup> G01D 21/04

U.S. Cl. 250—222 R

14 Claims



1. A device for detecting the leading and trailing edges of a moving object comprising:  
means for providing a high flux density light source,  
first aperture plate means positioned in close proximity to said means for providing a high flux density light source and including an aperture for forming a high flux density light beam having a predetermined geometrical relationship to provide a uniform flux density in at least one dimension,  
second aperture plate means spaced apart from said first aperture plate means to enable the moving object to pass therebetween and including a second aperture,  
photo detector means positioned in close proximity to said second aperture and operated in saturation mode for providing an output signal for measuring the time interval from the point of time at which the leading edge of the moving object intersects a first predetermined location within said light beam and the point of time at which the trailing edge of the moving object intersects a second predetermined location within said light beam.

4,011,448

## LINEAR SHAFT ENCODER

Michael F. Hordeski, 14831 Kitterman Drive, Silverado, Calif. 92676

Filed Aug. 8, 1975, Ser. No. 602,990

Int. Cl.<sup>2</sup> H01J 3/14

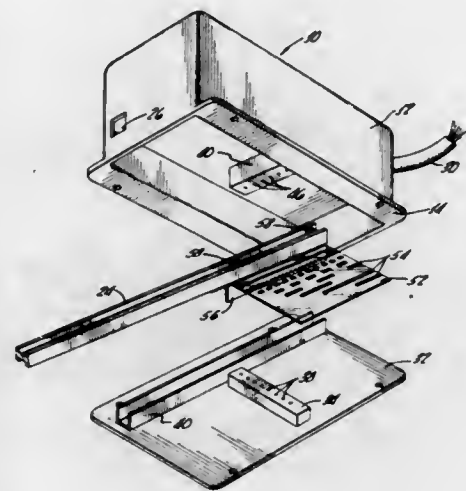
U.S. Cl. 250—237 R

18 Claims

1. A self-contained linear digital encoder for measuring the relative linear dimension between a stationary machine element and a movable machine element, comprising:  
a housing for mounting on one of said stationary and movable machine elements;



a photooptical system having plural photooptical sensors rigidly mounted within said housing;  
a multiple track coded mask cooperating with said photooptical system, each track thereof cooperating with one of said plural photooptical sensors for generating output digital signals indicative of the relative positions of said photooptical system and said mask;  
means mounted within said housing for guiding said coded



mask for movement along a straight line path aligned relative said photooptical system; and  
a flexible rod connecting said coded mask to the other of said stationary and movable machine elements;  
said rod being sufficiently flexible to permit said guiding means to maintain alignment of said coded mask and said photooptical system regardless of small misalignment of said straight line path of said guiding means and the direction of motion of said moveable element.

4,011,449

# APPARATUS FOR MEASURING THE BEAM CURRENT OF CHARGED PARTICLE BEAM

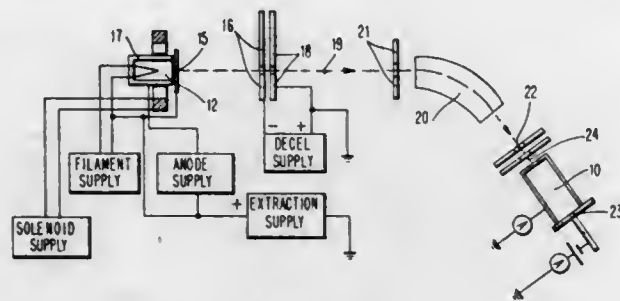
Wen-Chuang Ko, Wappingers Falls, N.Y., and Erich Sawatzky, San Jose, Calif., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 5, 1975, Ser. No. 629,181

Int. Cl.<sup>2</sup> H01J 37/00; G01N 23/00

U.S. Cl. 250—309

18 Claims



1. In apparatus for bombarding a target with a beam of charged particles, a structure for measuring the beam current at said target; comprising:

walls adjacent to and electrically insulated from said target and surrounding said beam whereby said walls and target provide a Faraday Cage,  
means for biasing said target at a potential opposite the polarity of the primary particles in said beam,  
means for biasing said walls at substantially ground potential,  
means connected to said target for measuring said target current, and  
means connected to said wall for measuring the wall current.

4,011,450

# SCANNING ELECTRON DEVICE

Takashi Tagawa, Nara, and Jun-Ichi Mori, Uji, both of Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo and Unitika Ltd., Hyogo, both of, Japan

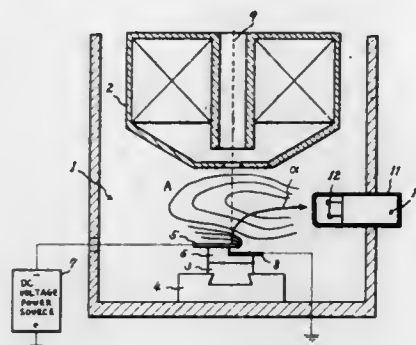
Filed May 16, 1975, Ser. No. 577,989

Claims priority, application Japan, July 17, 1974, 49-81952

Int. Cl.<sup>2</sup> G21K 7/00; G01N 23/00; H01K 37/26

U.S. Cl. 250—311

4 Claims



1. In a device for forming a scanning image by detecting the secondary electrons emanated from a specimen irradiated by a scanning primary electron beam, the improvement comprising

detecting means comprising an electron detector and a collector electrode maintained at a positive potential, at least first and second auxiliary electrodes not including the collector electrode, and

a d.c. power supply for maintaining said first auxiliary electrode at a lower potential than said second auxiliary electrode, said specimen arranged nearest the first auxiliary electrode

such that an electric field is created between the specimen and the detector, said electric field directing the secondary electrons emanated from the specimen toward the detector, thereby increasing the output signal intensity thereof.

4,011,451

# NOVEL PHOTOMETRIC SYSTEM

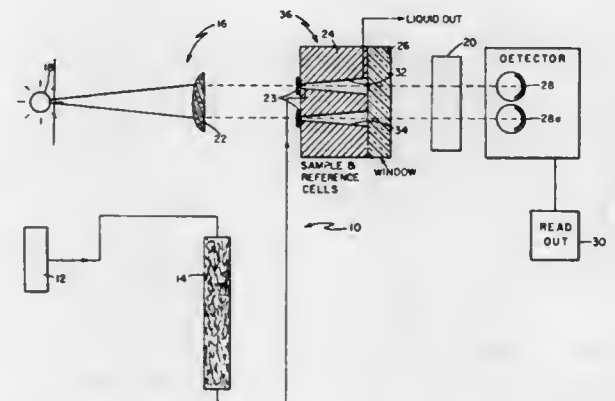
Kenneth E. Nelson, North Attleboro, Mass., assignor to Waters Associates, Incorporated, Milford, Mass.

Continuation-in-part of Ser. No. 592,941, July 3, 1975, abandoned, which is a continuation of Ser. No. 470,076, May 15, 1974, abandoned. This application Oct. 24, 1975, Ser. No. 625,590

Int. Cl.<sup>2</sup> G01M 21/26

U.S. Cl. 250—343

23 Claims



1. In a photometer of the type utilizing a light source, a sample cell adapted to transmit a continuously-flowing liquid to be analyzed from an inlet port near one end thereof through a flowpath to an outlet port near the other end thereof, and a means for measuring the absorption of light in said sample cell, the improvement wherein said photometer comprises a

light detector forming means to receive substantially all non-absorbed light transmitted from said sample cell, means for eliminating liquid lens effects said means comprising a generally conical sample cell, a smaller end of said sample cell being nearer said light source, such that there is substantially reduced loss of light refracted by said lenses on walls of said sample cell.

4,011,452

# ANTINARCISUS REFLECTOR ASSEMBLY FOR INFRARED DETECTOR

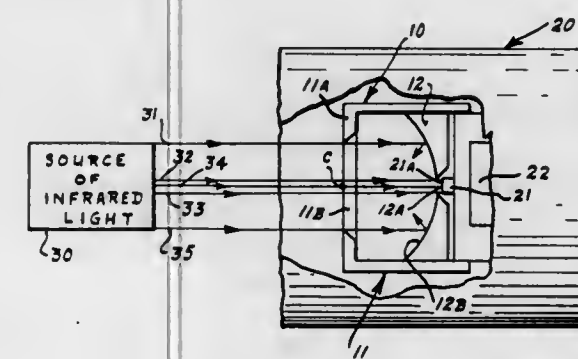
Franklin J. Meyers, Canoga Park, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,467

Int. Cl.<sup>2</sup> G01J 1/04

U.S. Cl. 250—352

1 Claim



1. An antinarcissus reflector assembly for use with a source of infrared light and with an infrared light detector which is a constituent component of an imaging infrared light scanner, comprising:

a. cold stop subassembly comprising a plate of suitable material, with said plate having an aperture therein, and with said plate interposed between said source of infrared light and said infrared light detector;

b. and, a concave spherical mirror having an opening therein, and also having a center of curvature at the geometric center of said aperture of said cold stop plate, with said concave spherical mirror interposed between said cold stop subassembly and said infrared light detector, and with said concave surface of said spherical mirror facing toward said cold stop aperture, and also with said mirror opening in alignment with said cold stop aperture and exposing said infrared light detector.

4,011,453

# DEVICE FOR SCANNING A SURFACE FOR USE IN APPARATUS FOR DIAGNOSTIC EXAMINATION BY THE RECORDING OF SCINTILLATIONS

Wilfrid Delaby, Epinay-sur-Orge, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 5, 1975, Ser. No. 584,153

Claims priority, application France, June 6, 1974, 74.19484

Int. Cl.<sup>2</sup> G01M 21/34

U.S. Cl. 250—363 S

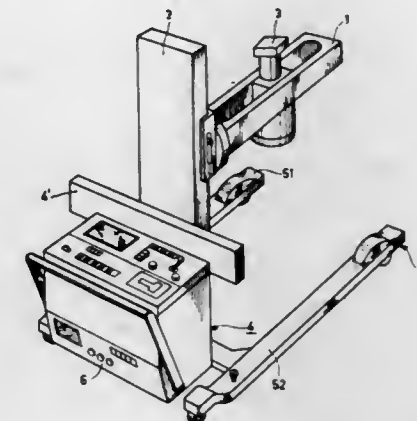
2 Claims

1. Apparatus for scanning a body for scintillations along a surface having any one of a plurality of different orientations which are parallel to a first horizontal direction, said apparatus comprising:

a scintillation detector;

a detector carrier arm assembly along which said detector is movable in a first horizontal direction, said detector being oriented perpendicular to said first horizontal direction and said detector carrier arm assembly being axially rotatable about said first horizontal direction, so that said detector may be oriented in any one of a plurality of different directions which are perpendicular to said first horizontal direction;

an intermediate arm assembly along which said detector carrier arm assembly is movable in the vertical direction;  
a carrier arm assembly along which said intermediate arm assembly is movable in a second horizontal direction perpendicular to said first horizontal direction;  
a first drive motor mounted on said carrier arm assembly and coupled to said intermediate arm assembly for moving said intermediate arm assembly in said second horizontal direction;



a second drive motor mounted on said intermediate arm assembly and coupled to said detector carrier arm assembly for moving said detector carrier arm assembly in the vertical direction; and

a third drive motor mounted on said detector carrier arm assembly and coupled to said detector for moving said detector in said first horizontal direction.

4,011,454

# STRUCTURED X-RAY PHOSPHOR SCREEN

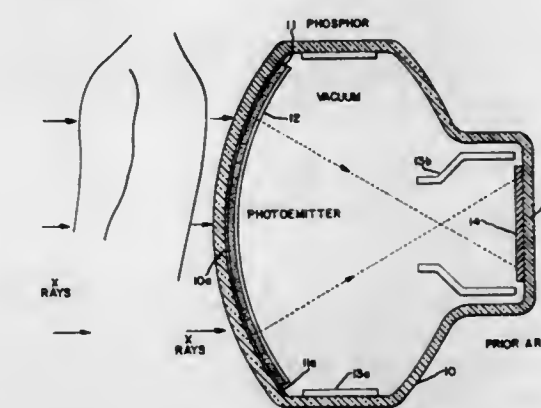
Stanley J. Lubowski, Scotia, and Robert K. Swank, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 28, 1975, Ser. No. 571,950

Int. Cl.<sup>2</sup> G01J 1/58

U.S. Cl. 250—483

7 Claims



1. An improved x-ray phosphor screen comprising:

a supporting substrate having a surface including a large plurality of small raised portions, adjacent ones of said raised portions being separated by relatively depressed portions therebetween;

a large plurality of columns of an x-ray phosphor material, each column having opposed first and second end surfaces, only said first end surface being positioned on and in contact with one of said plurality of raised portions, said plurality of columns being spaced from each other by an appreciable gap of dimension corresponding generally to the width of said depressed portions of said substrate, said phosphor columns being substantially transparent to the radiation emitted by said phosphor material; and

a reflecting substance positioned essentially completely throughout said gaps, and surrounding each of said phos-



phor columns only along substantially the entire height and not upon said end surfaces thereof to substantially inhibit radiation emitted by the phosphor material in each column from leaving the side walls of said column and entering a different column, the radiation being reflected back into the columns so as to ultimately leave said second end surface of substantially only that column in which said radiation is initially emitted.

4,011,455

## PHOSPHOR SCREEN

Alan Hugh Waller, Rayleigh, and Peter Charles Sangway, Upminster, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 22, 1976, Ser. No. 669,353

Claims priority, application United Kingdom, Apr. 4, 1975, 13885/75

Int. Cl.<sup>2</sup> G01J 1/58

U.S. Cl. 250—486

10 Claims

1. An X-ray intensifying screen which comprises in a fluorescent layer a phosphor mixture which consists of an alkaline earth fluorohalide activated with divalent europium having the empirical formula



where

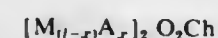
$$y \leq 0.20$$

$$x + y + z \leq 1$$

$$a + b \leq 1$$

$$0.001 \leq p \leq 0.20$$

together with at least one phosphor which is either calcium tungstate or which is a rare earth oxychalcogenide having the formula



wherein M is at least one rare earth host element, A is an activator which is a rare earth element different from M and which has an atomic number from 59 to 71, Ch is sulphur, selenium or tellurium and  $0.001 \leq x \leq 0.2$ .

4,011,456

## ULTRAVIOLET IRRADIATING APPARATUS

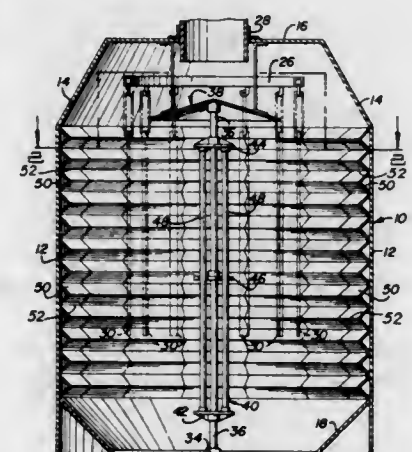
John R. Bredewater, and Mario F. Thumudo, Jr., both of Ada, Okla., assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Oct. 20, 1975, Ser. No. 624,072

Int. Cl.<sup>2</sup> H01J 37/20

U.S. Cl. 250—492 R

18 Claims



1. An improved ultraviolet irradiating apparatus comprising:

- a generally enclosed upright cylindrical housing defining an entry opening and an exit opening;
- a linear ultraviolet radiation source vertically mounted generally along the central axis of the housing;

- multiple sections of reflectors formed to be shaped as zig-zag reflectors disposed around the cylindrical interior of said housing with the corners of the angles between said zig-zag reflectors being disposed generally transversely to the length of said radiation source;
- said zig-zag reflectors presenting specular surfaces to said radiation source, said surfaces being adapted to reflect about 80% of the direct ultraviolet rays from said radiation source;
- said reflectors being formed from specular aluminum sheet;
- a parts conveyor mounted to convey parts into said entry opening, then through a path between said radiation source and said reflectors and then out through said exit opening; and
- said zig-zag reflectors causing said parts carried by said conveyor to be subjected to a greater and more concentrated exposure to ultraviolet radiation which is more evenly distributed to all external surfaces of said parts.

4,011,457

## WEB DEFECT MONITOR FOR ABRUPT CHANGES IN WEB DENSITY

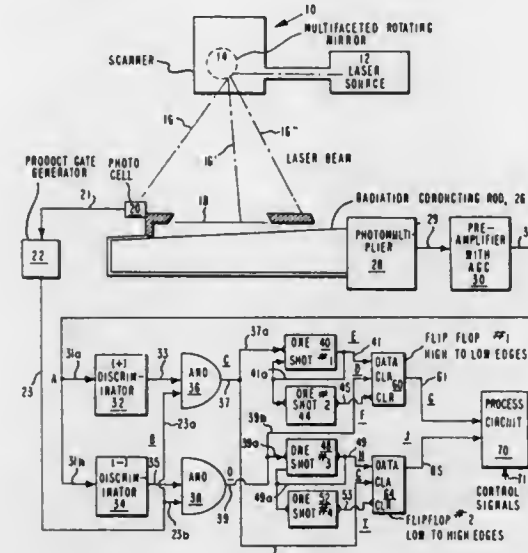
William Edward Wolf, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 6, 1975, Ser. No. 602,465

Int. Cl.<sup>2</sup> G01N 21/32

U.S. Cl. 250—563

5 Claims



1. In a method of inspecting a web that includes detecting density variations in the web by electrooptically scanning the web and generating output signals representative of said variations, the improvement comprising: generating signals when the amplitudes of said output signals exceed predetermined positive and negative threshold levels in either order of occurrence; and indicating when an output signal exceeding one of said threshold levels changes in level and exceeds the other threshold level within a predetermined period of time.

4,011,458

## PHOTOELECTRIC DETECTOR WITH LIGHT SOURCE INTENSITY REGULATION

William J. Malinowski, Pembroke, Mass., assignor to Pyrotec, Incorporated, Hingham, Mass.

Filed Oct. 9, 1975, Ser. No. 621,085

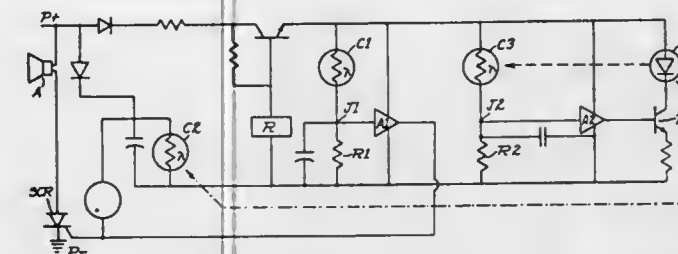
Int. Cl.<sup>2</sup> G01N 21/28

U.S. Cl. 250—564

11 Claims

1. A detector, comprising a light source, a first photo-resistive device positioned to receive only light reflected from a medium to be detected, a second photo-resistive device positioned to receive light directly from the light source, means responsive to the decrease in resistance of the first photo-resistive device to a predetermined resistance to actuate a

signalling device, means for regulating the intensity of the light source, means responsive to increases and decreases in resistance of the second photo-resistive device to cause the light source regulating means to decrease and increase, respectively the intensity of the light source said regulating means maintaining the intensity of the light source at a predetermined



intensity such that the second photo-resistive device is continuously exposed to the light level at which its thermal co-efficient of resistance is substantially the same as the thermal coefficient of resistance of the first photo-resistive device when said first photo-resistive device is exposed to the amount of light that causes it to drop to the predetermined resistance that actuates the signalling device.

4,011,459

## METHOD AND APPARATUS FOR DETERMINING VALID SAMPLE VOLUME

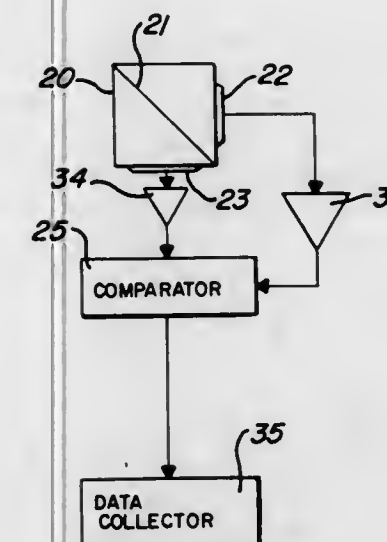
Robert George Knollenberg, and Robert E. Luehr, both of Boulder, Colo., assignors to Particle Measuring Systems, Inc., Boulder, Colo.

Filed Dec. 5, 1975, Ser. No. 638,015

Int. Cl.<sup>2</sup> G01N 21/26; H01J 39/12

U.S. Cl. 250—576

15 Claims



1. Apparatus for defining a valid sample volume comprising: means for providing a beam of radiation, imaging system means having an object plane and an image plane positioned to receive the beam of radiation, a beam splitter positioned between the object plane and the image plane to provide multiple image planes, a plurality of photosensors positioned one each in the image planes produced by the beam splitter with at least one of the photosensors being partially masked, comparator means connected to the outputs from the photosensors, and means for providing samples in the radiation beam, whereby samples within a predetermined defined sample volume are focused primarily on the masked section of the photosensor and produce a signal of less magnitude than that from the other photosensor thereby indicating acceptable data, and samples positioned outside of the predetermined sample volume fall primarily outside of the masked area and produce a signal greater than that from the other photosensor indicating invalid data.

4,011,460

## CONTROL FOR ACTIVATING MOTOR VEHICLE ELECTRICAL LOAD

Richard A. Kniesly, 1734 St. Louis Drive, Kokomo, Ind. 46901; Larry L. Colville, 2718 Dakota, Anderson, Ind. 46012, and Jerrold L. Mullen, 5311 Beth Drive, Anderson, Ind. 46011

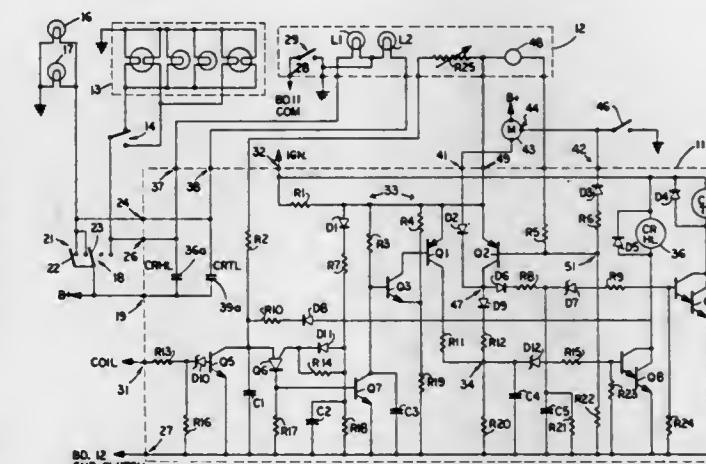
Division of Ser. No. 470,971, May 17, 1974, Pat. No.

3,909,619. This application Apr. 14, 1975, Ser. No. 568,013

Int. Cl.<sup>2</sup> H02G 3/00

U.S. Cl. 307—10 LS

1 Claim



1. A control for activating a lighting circuit in a motor vehicle comprising:

- a motor vehicle lighting circuit;
- control means for coupling electrical power to the lighting circuit when the control means is energized;
- ignition circuit means, having a first electrical signal output;
- reference circuit means for producing a reference electrical signal;
- comparison circuit means, coupled to the ignition circuit means and to the reference circuit means, for energizing the control means when the first electrical signal output differs from the reference electrical signal by a predetermined amount;
- a windshield wiper motor having a first terminal which is energized by a motor vehicle power source when the windshield wiper motor is in operation; and
- said control means includes a first relay circuit means, having an input coupled to the first terminal of the windshield wiper motor, for coupling electrical power to the lighting circuit when the input of the first relay means is energized.

4,011,461

## PIPELINED UNIVERSAL BUBBLE LOGIC ARRAY

Hsu Chang, Yorktown Heights, N.Y.; Tien C. Chen, San Jose, Calif., and Share-Young Lee, Lake Mohogan, N.Y., assignors to International Business Machines Corporation, Yorktown Heights, N.Y.

Continuation of Ser. No. 488,876, July 15, 1974, abandoned.

This application July 17, 1975, Ser. No. 596,932

Int. Cl.<sup>2</sup> G11C 11/14; H03K 19/168

U.S. Cl. 307—88 LC

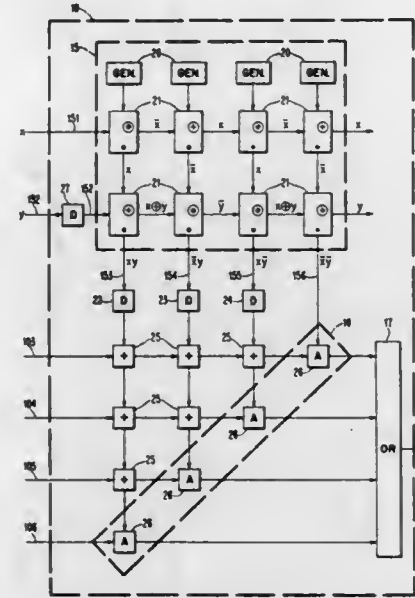
24 Claims

1. A bubble logic array for performing a logic function on a set of input data in the form of a bubble domain pattern and producing a logical output responsive thereto, also in the form of a bubble domain pattern, said logic array comprising:

- a data input bubble propagation path including n input paths for accepting n bubble inputs comprising data;
- a bubble decoder means with an input and an output, means connecting said data input to said decoder means input, said decoder means output including 2<sup>n</sup> decoder output paths, each of said decoder output paths providing one of the possible 2<sup>n</sup> combinations of said input data in the form of said bubble domain pattern;



bubble logic means connected to each of said decoder output paths including a plurality of AND gates, each with at least two inputs and an output, one AND gate input receiving data from each of said decoder output paths,



an OR gate with 2<sup>n</sup> inputs, one input connected to each of said AND gate outputs, a plurality of 2<sup>n</sup> bubble control inputs, each connected to a different one of said other inputs of said AND gates, said plurality of control inputs defining the logic function performed by said array by said bubble domain pattern.

4,011,462

### PULSED INFRARED DIFFERENCE FREQUENCY GENERATION IN CdGeAs<sub>2</sub>

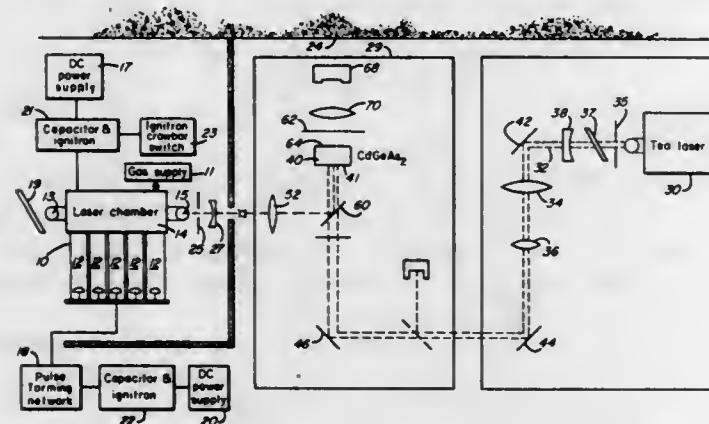
Martin S. Piltch, John P. Rink, and Charles R. Tallman, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 26, 1975, Ser. No. 635,457

Int. Cl.<sup>2</sup> H02M 5/04

U.S. Cl. 307—88.3

3 Claims



1. A laser apparatus for generating a pulsed difference frequency comprising:

an electron beam, pre-ionized CO laser having a single line output wavelength substantially between 5.0 microns and 6.5 microns;

a CO<sub>2</sub> TEA laser having a single line output; mixing means for mixing the output of said CO laser and said CO<sub>2</sub> laser including a Ge dielectric coated beam splitter and a single crystal of chalcopyrite CdGeAs<sub>2</sub> providing a line-tunable difference frequency output; and filter means for removing unwanted wavelengths from the output of said mixing means, producing an output wave-

length discretely line-tunable between substantially 3.5 microns to substantially 18 microns spaced less than 0.1 cm<sup>-1</sup> apart.

4,011,463

### HIGH VOLTAGE PULSE GENERATOR

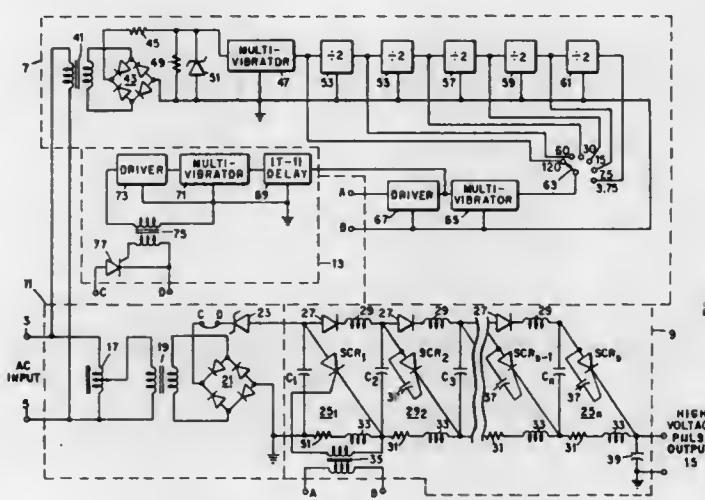
George E. Fasching, Morgantown, W. Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 12, 1975, Ser. No. 586,460

Int. Cl.<sup>2</sup> H02M 7/12; H03K 3/72

U.S. Cl. 307—110

3 Claims



1. In a high-voltage pulse generator wherein a plurality of charge-storing capacitors are connected, respectively, in a corresponding plurality of cascaded charging networks so that each capacitor is charged in parallel and subsequently discharged in series to produce a high-voltage pulse, the improvement comprising:

a plurality of SCR's equal in number to said plurality of charge-storing capacitors, each of said SCR's having an anode, cathode, and gate electrode, all but at least one of said SCR's having their anodes connected to the positive charged side of a corresponding one of said plurality of charge-storing capacitors and their cathodes connected to the negative charged sides of the charge-storing capacitor of the succeeding cascaded network, said last SCR having its anode connected to the positive charged side of the charged-storing capacitor of the last cascaded network and having its cathode connected to an output terminal of said pulse generator;

a charging circuit means responsive to a fixed frequency alternating reference voltage for applying a pulsating d.c. charging voltage to said charge-storing capacitors of said cascaded network;

a triggering circuit for providing triggering signals to the gate electrode of a first one of said plurality of SCR's at selected intervals when no charging voltage is being applied to said charge-storing capacitors including a first full wave rectifier connected to receive said alternating voltage signal at an input thereof and producing full wave rectifier pulses at an output thereof, a plurality of cascaded pulse dividers connected to the output of said first rectifier, each divider reducing the pulse rate applied to the input thereof by a factor of two, a selector switch having a plurality of contacts one greater in number than said plurality of dividers, each contact connected to a separate divider output and said one contact connected to receive the output pulses from said first rectifier, and output circuit means for connecting the common terminal of said selector switch to the gate of said first SCR so that the high-voltage pulse rate may be selected through said selector switch; and

a plurality of triggering capacitors connected between the anode and gate electrode, respectively, of the remaining

plurality of SCR's so that when a triggering signal is applied to the gate electrode of said first SCR the remaining plurality of SCR's are triggered sequentially to switch said charge-storing capacitors into a series discharge mode, generating a high-voltage pulse at said output terminal.

4,011,464

### LOW ENERGY SWITCHING CIRCUIT

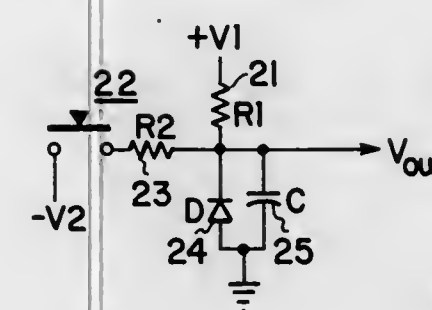
Anthony Drea Robbi, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 6, 1975, Ser. No. 584,379

Int. Cl.<sup>2</sup> H01H 1/50, 1/60

U.S. Cl. 307—137

3 Claims



1. The combination comprising: switch means selectively operable to couple first and second terminals electrically; first, second, and third voltage level means for providing three voltage levels such that said first voltage level is highest, said second voltage level is lowest, and said third voltage is intermediate between said first and second voltage levels; output terminal means; resistance for coupling said first voltage level means to said output terminal means; means for coupling said second voltage level means to said first terminal of the switch means; impedance means for coupling said second terminal of the switch means to the output terminal means; and diode means for coupling said third voltage level means to said output terminal means in a direction whereby the voltage at said output terminal means is not less than said third voltage level.

4,011,465

### MOSFET DETECTING AND SYNCHRONIZING CIRCUIT FOR ASYNCHRONOUS DIGITAL DATA

Cesar E. Alvarez, Jr., Griffith, Ind., assignor to Teletype Corporation, Skokie, Ill.

Filed Sept. 2, 1975, Ser. No. 609,265

Int. Cl.<sup>2</sup> H03K 19/08, 1/17, 5/13, 3/26

U.S. Cl. 307—208

5 Claims

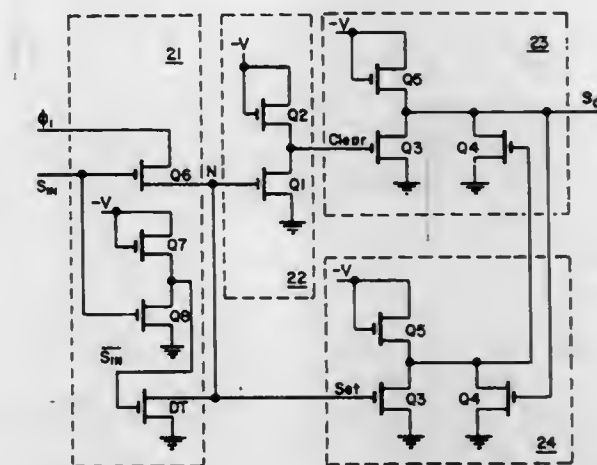
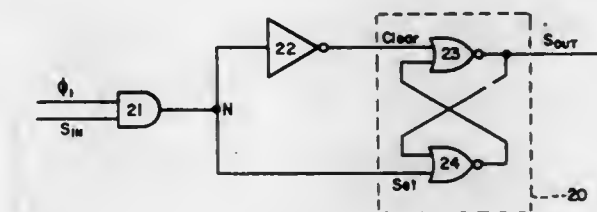
1. A circuit for detecting changes of state in an asynchronous input pulse train and forming an output pulse train synchronized to a local clock, said output pulse train being representative of the detected state changes comprising:

a single pass transistor of the metal-oxide-semiconductor input having two controlled electrodes and a control electrode, the control electrode and one of the controlled electrodes serving as input electrodes and the local clock being applied to one input electrode and the asynchronous input pulse train being applied to the other input electrode, a coincident output being produced at the other controlled electrode;

latching means having two inputs for forming an output signal having alternatively a first and second state; means for coupling the coincident output of said other controlled electrodes to each of the two inputs of the latching means; and

a capacitor, said capacitor being a transistor of the metal-

oxide-semiconductor type having two controlled electrodes and a control electrode, the controlled electrodes



being connected in common to the one input electrode of the pass transistor and the control electrode being connected to the other input electrode of the pass transistor.

4,011,466

### DYNAMIC FILTER

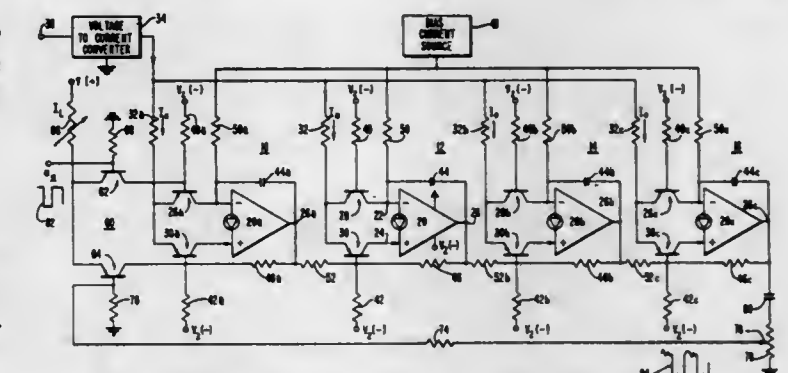
Alan R. Pearlman, Newton, and Timothy C. Gillette, Brookline, both of Mass., assignors to ARP Instruments, Inc., Newton, Mass.

Filed May 10, 1976, Ser. No. 684,788

Int. Cl.<sup>2</sup> H03K 17/02; H03B 1/00; H03F 1/36

U.S. Cl. 307—229

14 Claims



1. A dynamic filter comprising

A. a plurality of cascaded filter stages, each including

1. a current amplifier having an inverting input terminal, a non-inverting input terminal, and an output terminal

2. an integrating capacitor connected between the inverting terminal and the output terminal thereof,

3. first and second matched bipolar transistors having their collectors connected to the inverting and non-inverting input terminals, respectively, and their emitters connected in common to a current source for supplying emitter current thereto, said transistors being connected to operate at substantially constant transconductance,

4. first and second resistors coupling the bases of said first and second transistors, respectively, to a common potential,

5. a feedback resistor connected between the output terminal and the base of one of said transistors,

6. means applying a signal to be filtered to the base of one of said transistors.



4,011,467

## GATE INPUT CIRCUIT FOR INSULATED GATE FIELD EFFECT TRANSISTORS

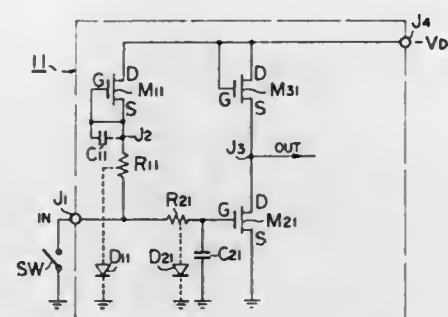
Shunji Shimada, Kodaira; Kenichi Ohba, Fuchu, and Shigeo Ishii, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan  
Filed Feb. 18, 1976, Ser. No. 658,922

Claims priority, application Japan, Mar. 26, 1975, 50-35604

Int. Cl.<sup>2</sup> H03K 17/60, 17/16; H02H 9/04

U.S. Cl. 307—251

6 Claims



1. A gate input circuit to an insulated gate field effect transistor in an integrated circuit comprising:

- a first and second power source lines to which a power source is connected;
- first and second insulated gate field effect transistors connected in series between the first and second power source lines for constituting an inverter circuit, said first insulated gate field effect transistor acting as a driver transistor and said second insulated gate field effect transistor acting as a load transistor;
- an input terminal;
- a third insulated gate field effect transistor of depletion type with a control electrode and first and second output electrodes, said control electrode being connected to the first output electrode and said second output electrode being connected to one line of the first and second power source lines;
- a resistor connected between the input terminal and the first output electrode of the third insulated gate field effect transistor;
- means for connecting the input terminal to the gate electrode of the first insulated gate field effect transistor; and
- switching means connected between the other line of the first and second power source lines and the input terminal.

4,011,468

## LOW POWER CLOCK DRIVER

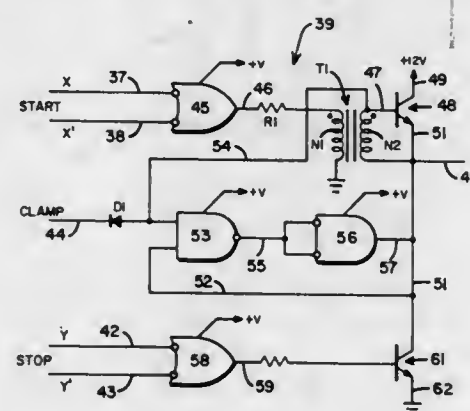
Dick E. Fosler, Jr., and Thomas L. Krocheski, both of Burnsville, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,596

Int. Cl.<sup>2</sup> H03K 1/00, 3/26, 4/00, 5/01

U.S. Cl. 307—270

12 Claims



1. A low power dissipation clock circuit comprising:

a normally off set side input driver for receiving clock pulse starting signals,  
a normally off set side output driver having an input coupled to said set side input driver and an output connected to an output of clock pulses,  
a normally off reset side input driver for receiving clock stopping signals,  
a normally off reset side output driver having an input coupled to said reset side input driver and an output connected to said output of clock pulses, and  
normally off bistable clamping means comprising at least two inputs and at least one output, one of said inputs and said output being connected to said output of clock pulses, and one of said inputs being connected to the input of said normally off set side output driver.

4,011,469

## HALL EFFECT-SWITCHING DEVICE

Claude Chapron, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 485,227, July 2, 1974, abandoned.

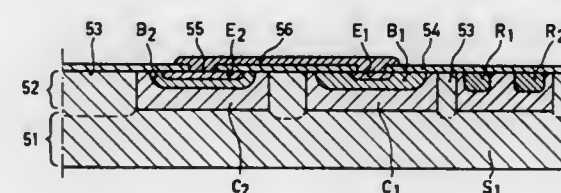
This application Jan. 12, 1976, Ser. No. 648,397

Claims priority, application France, July 9, 1973, 73.25035

Int. Cl.<sup>2</sup> H01L 43/06; H03K 17/90

U.S. Cl. 307—278

4 Claims



1. In an integrated semiconductor device of the type having a Hall element responsive to a magnetic field for producing between two Hall electrodes of the Hall element a Hall voltage having two different values corresponding to two different states of the magnetic field and a differential switching unit responsive to the Hall voltage and having two different stable states, an improved prebiasing means for aligning the switching region of the differential switching unit with the range of Hall voltage values so that the two different stable states of the differential switching unit correspond to the two different states of the magnetic field, the improved prebiasing means comprising an improved input differential stage for the differential switching unit, which comprises:

- two transistors each having a base zone of the same conductivity type and an emitter zone forming a base-emitter junction therewith,
- said emitter zones being held at the same voltage potential with respect to each other,
- said base zones being electrically connected to said Hall electrodes,
- and said base-emitter junctions in said integrated semiconductor device formed with unequal areas so as to effect said prebiasing of the switching unit.

4,011,470

## CIRCUIT UTILIZING OPEN-BASE TRANSISTOR AS LEAKAGE BYPASS DEVICE

William Folsom Davis, Tempe, Ariz., and Thomas Marinus Frederiksen, San Jose, Calif., assignors to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 502,258, Aug. 30, 1974, abandoned, which is a continuation of Ser. No. 317,972, Dec. 26, 1972, abandoned. This application Mar. 25, 1976, Ser. No. 670,497

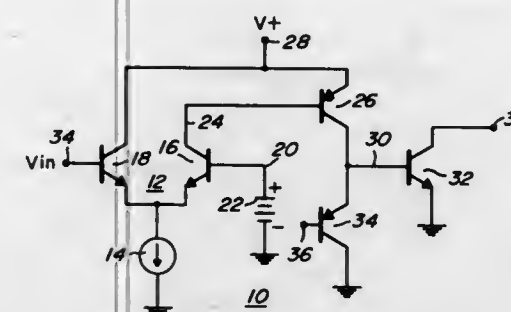
Int. Cl.<sup>2</sup> H03K 1/12

U.S. Cl. 307—297

9 Claims

1. An integrated circuit including first and second power conductors coupled thereto, a first transistor, and a second transistor having a base electrode coupled to input circuit

means of said integrated circuit and having its emitter coupled to said first power conductor, and having its base connected to a collector of said first transistor, said first transistor having its emitter coupled to said second power conductor, said integrated circuit comprising open-base transistor means bypass-



ing reverse leakage current flowing in said collector of said first transistor connected directly between said base of said second transistor and said first power conductor for holding said second transistor in an "off" condition over a wide temperature range when said first transistor is in an "off" condition.

4,011,471

## SURFACE POTENTIAL STABILIZING CIRCUIT FOR CHARGE-COUPLED DEVICES RADIATION HARDENING

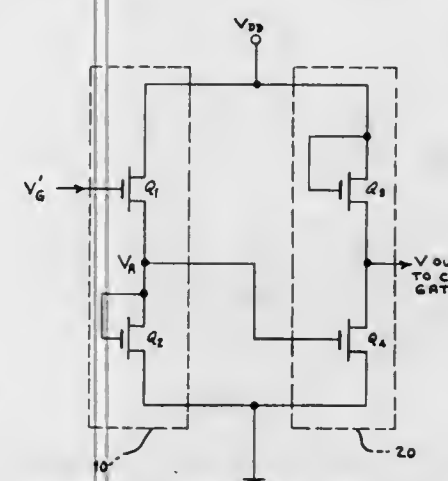
Leonard R. Rockett, Jr., New York, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 18, 1975, Ser. No. 633,131

Int. Cl.<sup>2</sup> H03K 1/02, 1/10; H01L 27/14

U.S. Cl. 307—308

3 Claims



1. A surface potential stabilizing circuit for charge-coupled device radiation hardening comprising first and second MOSFET devices, in combination, forming a source follower stage, said first MOSFET device having a first predetermined threshold voltage and operating as an input device to receive an applied voltage,  $V_G$ , said source follower stage modifying said applied voltage,  $V_G$ , by an amount equal to said first predetermined threshold voltage, said second MOSFET device being a saturated MOS load for said source follower stage, third and fourth MOSFET devices, in combination, forming an inverter stage, said fourth MOSFET device having a second predetermined threshold voltage, the modified applied voltage from said source follower stage being received by said fourth MOSFET device to offset any threshold voltage error to appear at the stabilized circuit output with the stabilized circuit output voltage being the sum of  $V_G$  and said second predetermined threshold voltage, said third MOSFET device operating as a saturated MOS load for said inverter stage.

4,011,472

## ACOUSTIC EMISSION TRANSDUCER

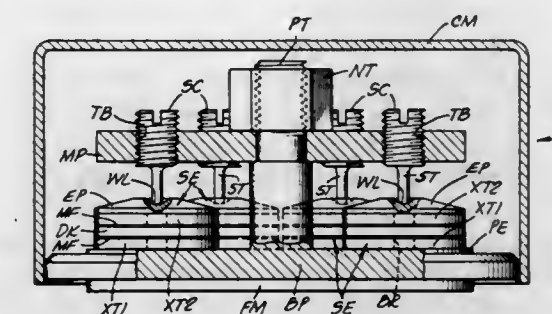
Ching C. Feng, San Clemente, Calif., assignor to Becton, Dickinson Electronics Company, San Juan Capistrano, Calif.

Filed May 13, 1975, Ser. No. 577,035

Int. Cl.<sup>2</sup> H01L 41/04

U.S. Cl. 310—8.1

15 Claims



1. In an acoustic emission transducer for detecting high frequency transverse components of vibrations traveling along the surface of an object that emits acoustic emission signals from parts thereof, the combination of:

- a base plate attachable to said surface;
- a plurality of electromechanical sensor elements mounted on said base plate and selectively responsive to vibrations normal to said base plate, each said sensor comprising at least one piezoelectric member and being adapted to produce electrical signals at its output corresponding to forces acting on said sensors in a direction normal to said base plate;
- a plurality of adjustable means secured relative to said base plate for adjustably compressing said sensor elements against said plate; and
- means for interconnecting the electrical outputs of said sensors to combine the electrical signals produced by them.

4,011,473

## ULTRASONIC TRANSDUCER WITH IMPROVED TRANSIENT RESPONSE AND METHOD FOR UTILIZING TRANSDUCER TO INCREASE ACCURACY OF MEASUREMENT OF AN ULTRASONIC FLOW METER

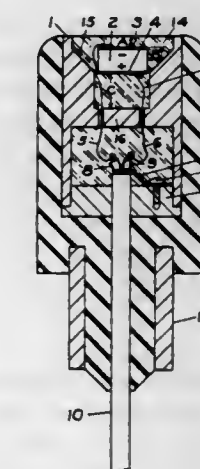
Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. & Donald P. Massa, Trustees of the Stoneleigh Trust, Cohasset, Mass.

Continuation-in-part of Ser. No. 500,391, Aug. 26, 1974. This application Nov. 28, 1975, Ser. No. 636,054

Int. Cl.<sup>2</sup> H01L 41/08

U.S. Cl. 310—8.2

11 Claims



1. An electroacoustic transducer comprising a housing structure having an opening, a piezoelectric disc having a first and second parallel plane surface and third peripheral edge surface, said disc characterized in that it may be set into vibration at a frequency in the vicinity of its planar resonant



vibrational mode, means for locating side disc within said opening in said housing structure so that the first of said parallel plane surfaces is located opposite said opening and the peripheral edge surface of said disc is circumferentially spaced from the wall surface of said housing structure, an annular sound reflecting surface located within said housing and uniformly spaced about a peripheral edge surface of said piezoelectric disc, said annular reflecting surface characterized in that it is symmetrically inclined with respect to the first plane surface of said disc which is opposite said opening in said housing structure, said annular reflecting surface further characterized in that its inclined surface faces said opening in said housing structure whereby the radiation of acoustic energy from the peripheral edge surface of said disc is reflected from said annular reflecting surface and is propagated from said opening along an axial direction at right angles to said first parallel plane surface of said piezoelectric disc, a sound conducting material contained in said opening in said housing, said sound conducting material makes intimate contact with said first plane surface of said disc and with said peripheral edge surface of said disc and also with said inclined annular reflecting surface which surrounds said disc.

4,011,474

## PIEZOELECTRIC STACK INSULATION

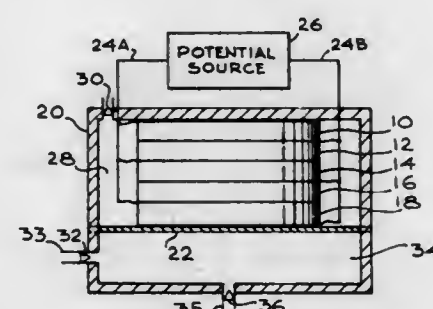
Cormac G. O'Neill, Lafayette, Calif., assignor to PZ Technology, Inc., San Leandro, Calif.

Continuation-in-part of Ser. No. 511,787, Oct. 3, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,309

Int. Cl.<sup>2</sup> H01L 41/08

U.S. Cl. 310—8.7

14 Claims



1. In apparatus of the type employing a plurality of piezoelectric discs having flat surfaces which are stacked serially, which have a dielectric medium applied to their radial surfaces, and which have a voltage applied to the opposing surfaces of said discs for the purpose of causing them to change their radial dimension in response thereto, said voltage having a rise time or fall time such that the particle velocity of the piezoelectric material exceeds the particle velocity of said dielectric medium when said voltage is applied resulting in a separation therebetween, the improvement comprising

applying pressure continuously to said dielectric medium to increase its particle velocity to a value at which it will compensate for separation caused by the difference between its particle velocity and the particle velocity of said piezoelectric material to maintain said dielectric medium in contact with said piezoelectric material during the application of said voltage.

4,011,475

## TORQUE EQUALIZED BRUSHLESS PERMANENT MAGNET ROTOR MOTOR

Fritz Schmider, Hornberg, Germany, assignor to Papst-Motoren KG, Schwarzwald, Germany

Filed June 20, 1974, Ser. No. 481,563

Claims priority, application Germany, June 23, 1975, 2332012; Nov. 21, 1973, 2358030

Int. Cl.<sup>2</sup> H02K 11/00

U.S. Cl. 310—68 R

38 Claims

1. In a brushless, permanent magnet rotor motor having a

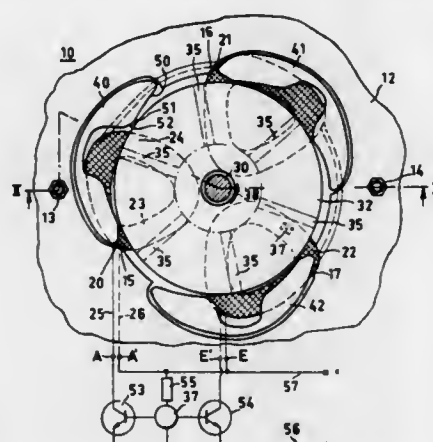
stator structure (12) including winding means (20, 21, 22; 220, 221) which, when energized, generate an electromagnetic field;

a permanent magnet rotor (34, 130, 234);

means (32, 33) forming a direct magnetic circuit including the winding means, the rotor, and an air gap, the rotor being journaled and located such that the magnetic field from the rotor in the magnetic circuit interacts with the electromagnetic field from the stator winding means;

means (37, 53, 54) periodically energizing the winding means as a function of rotor position to provide the electromagnetic field and cause an electrodynamic driving torque ( $M_{rel}$ ) to be applied to the rotor, said driving torque being interrupted during gaps of energization of the stator;

and ferromagnetic means (40, 41, 42; 61; 76; 101; 133, 134; 142; 241, 242; 260) having soft-iron characteristics,



stationary with respect to the rotor, said ferromagnetic means generating, during operation, an additional torque ( $M_{rel}$ ) effective as a positive driving torque during the gaps of generation of the electrodynamic driving torque ( $M_{rel}$ ) due to the gaps of energization of the said winding means, said soft-iron ferromagnetic means being shaped, and located with respect to the location of the winding means such that additional torque ( $M_{rel}$ ) produced thereby during operation is substantially in phase opposition to the alternating component of the torque ( $M_{rel}$ ) caused by energization of the winding means;

the improvement wherein

said ferromagnetic means are positioned to have at least a portion of its volume located outside of the direct magnetic circuit, outside the air gap and within the range of the stray, or leakage flux field from the permanent magnet rotor (34, 130, 234).

4,011,476

## SIGNAL GENERATING MECHANISM

Garry E. Beard, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1975, Ser. No. 643,417

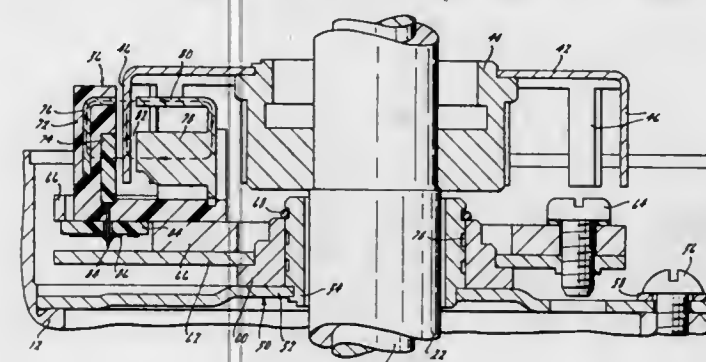
Int. Cl.<sup>2</sup> F02P 1/00; H02K 11/00

U.S. Cl. 310—70 R

3 Claims

1. A signal generating mechanism for producing a pulsating DC electrical signal having a frequency proportional to the angular velocity of a rotating shaft, said signal generating mechanism comprising, in combination: a baseplate fixed relative to said rotating shaft, said baseplate having an opening therein; an annular bushing affixed in said baseplate opening, said bushing extending above said baseplate, said shaft passing through said bushing; a stator assembly, said stator assembly including an annular hub positioned around the portion of said bushing extending above said baseplate, said hub being rotatable about said bushing, a lower plate parallel to said baseplate and affixed to said hub, an upper plate formed from a nonmagnetic material and attached to said lower plate, a support structure attached to said upper plate, a permanent magnet mounted in said support structure, said permanent

magnet having its poles oriented to produce a magnetic flux in a direction radial with respect to said shaft, a Hall effect sensor and integrated circuit package mounted in said support structure and positioned in radial alignment with magnetic flux emanating from said permanent magnet, said Hall effect sensor and integrated circuit package being separated from said permanent magnet by an air gap, a printed circuit board having conductive elements positioned between said support structure and said lower plate, said Hall effect sensor and integrated circuit package having lead wires electrically con-



nected to said conductive elements of said printed circuit board, and pole-pieces associated with said support structure and permanent magnet to provide a flux path; and a rotor attached to said shaft for rotation therewith, said rotor having cup-shaped and depending vanes extending in the axial direction of said shaft and positioned to come into and go out of said air gap as said rotor rotates with said shaft, said vanes short-circuiting magnetic flux emanating from said permanent magnet when said vanes are within said air gap between said permanent magnet and said Hall effect sensor and integrated circuit package.

4,011,477

## APPARATUS USING VARIATIONS IN MAGNETIC FORCE TO RECIPROCATE A LINEAR ACTUATOR

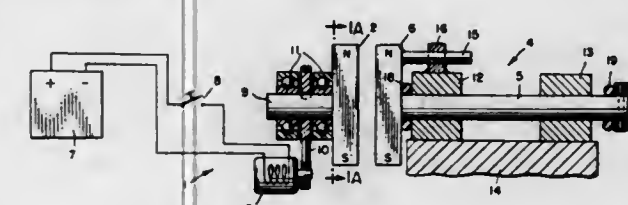
Harold W. Scholin, 1125 N. Northwest Highway, Park Ridge, Ill. 60068

Filed July 19, 1974, Ser. No. 489,999

Int. Cl.<sup>2</sup> H02K 7/06

U.S. Cl. 310—80

4 Claims



1. An apparatus for converting variations in magnetic force into linear motion of an associated device, the combination comprising:

- a first shaft mounted for rotation,
- a first elongated permanent bar magnet having the ends thereof of opposite polarity and mounted at substantially the longitudinal center thereof on one end of said first shaft and rotatable therewith,
- motor drive means for rotating said first shaft and the magnet mounted thereon,
- a second, shaft spaced from said first shaft in axial alignment therewith mounted for linear reciprocating movement in the axial direction thereof and adapted to be associated with a mechanism to be operated thereby,
- mounting means for guiding said second shaft in the linear reciprocating movement thereof,
- a second elongated permanent bar magnet having the ends thereof of opposite polarity and mounted at substantially the longitudinal center thereof on the end of said second shaft adjacent said first magnet,

- means for restraining said second magnet against rotational movement, thereby requiring said second shaft and its magnet to reciprocate only in a linear direction,
- said first magnet, when rotated, being effective to alternately repel and attract said second magnet in response to changes in magnetic forces between said magnets, and thereby reciprocate said second shaft.

4,011,478

## MAGNETIC SPEED SENSING MECHANISM

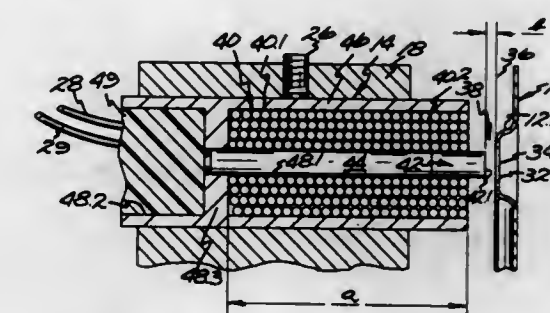
Arthur L. Reenstra, Hopkinton, N.H., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 2, 1975, Ser. No. 583,009

Int. Cl.<sup>2</sup> H02K 21/38

U.S. Cl. 310—155

15 Claims



1. A variable reluctance speed sensing mechanism for use in a skid control system comprising an exciter wheel having a plurality of ferromagnetic portions of selected width disposed in equally spaced relation to each other around the periphery of said exciter wheel, said exciter wheel being adapted to be mounted for rotation with a motor vehicle wheel whose speed is to be monitored for moving said ferromagnetic portions in a plane through a station at a rate corresponding to the speed of rotation of the vehicle wheel, and a magnetic sensor adapted to be mounted at said station, said sensor comprising a wire sensing coil having a selected number of coil turns and having a tubular configuration of a selected length, and a permanent magnet of a rare earth-cobalt material, said magnet having a rod configuration of a relatively much shorter length than said coil disposed within the coil at a first end thereof and having one magnet pole face disposed in selected closely spaced relation to the plane of movement of said ferromagnetic portions of said exciter wheel, whereby the reluctance of a magnetic circuit established by said permanent magnet is varied by movement of said ferromagnetic portions through said station to induce an electrical signal in said coil having a frequency corresponding to the speed of movement of said motor vehicle wheel.

4,011,479

## STATOR CONSTRUCTION FOR A PERMANENT MAGNET-EXCITED D-C MACHINE

Wolfgang Volkrodt, Bad Neustadt, Saale, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 15, 1975, Ser. No. 640,960

Claims priority, application Germany, Dec. 20, 1974, 2460630

Int. Cl.<sup>2</sup> H02K 1/10

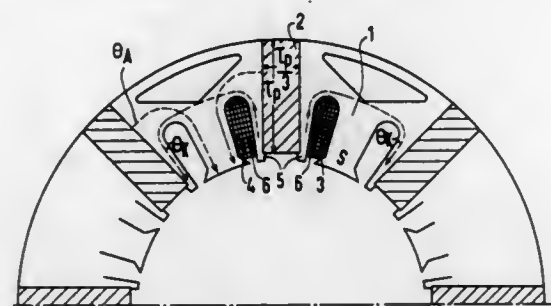
U.S. Cl. 310—186

1 Claim

1. In a permanent magnet-excited d-c machine including a stator, a plurality of flux-conducting pieces disposed in said stator, and a plurality of tangentially magnetized permanent magnets disposed in said stator between each of said flux-conducting pieces, the improvement comprising compensation slots disposed in said flux-conducting pieces on both sides of each of said permanent magnets, said slots each forming a compensation tooth on said flux-conducting pieces between each of said slots and said permanent magnets, and a winding disposed in said slots adjacent each magnet and looped around each said magnet and each compensation tooth disposed



between said slots, so as to form counter-ampere-turns in said pieces for compensating armature-ampere-turns in said pieces



thereby providing a reversing zone for commutation in said machine.

4,011,480

#### ELECTRIC DISCHARGE LAMP

Cornelis Adrianus Joannes Jacobs, and Bart van der Leeuw, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

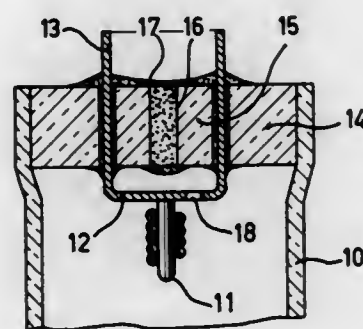
Filed Oct. 29, 1975, Ser. No. 626,611

Claims priority, application Netherlands, Nov. 14, 1974, 7414846

Int. Cl.<sup>2</sup> H01J 61/06

U.S. Cl. 313-217

9 Claims



1. An electric discharge lamp having a tubular discharge vessel of ceramic which is sealed by means of an annular and a cylindrical ceramic moulding between which a tubular metal current leadthrough member is accommodated, characterized in that the current leadthrough member consists of a metal chosen from the group consisting of tungsten, molybdenum, rhenium and alloys thereof, and that said member is connected in a vacuum-tight manner to the two ceramic mouldings by means of sealing ceramic.

4,011,481

#### MODULAR ELECTRON DISCHARGE DEVICE

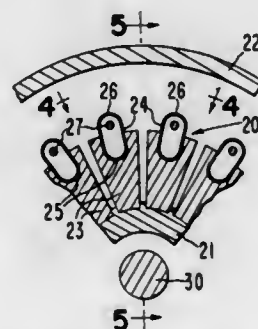
Donald H. Preist, San Mateo, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Oct. 28, 1975, Ser. No. 625,962

Int. Cl.<sup>2</sup> H01J 1/46, 21/10

U.S. Cl. 313-302

12 Claims



1. A grid controlled electron discharge device comprising an anode and a plurality of electron source modules, each module comprising,

an elongated support member, an electron emissive cathode in the form of an elongated cylinder, mechanically mounted on said support member, and an electron permeable grid mechanically mounted on said support member, at least a portion of said grid positioned between said cathode and said anode, at least one of said cathode and said grid being electrically insulated from said support member, said source modules being mounted with said cylindrical cathodes parallel and spaced apart in a direction perpendicular to said cylinders.

4,011,482

#### ELECTRIC CIRCUIT CONTROL SYSTEM USING EXCLUSIVE "OR" GATE

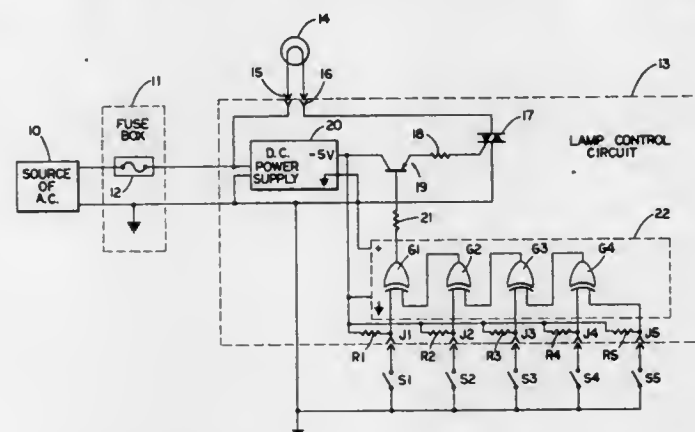
James N. Seib, R.R. 1, Williams, Ind. 47470

Filed Aug. 28, 1975, Ser. No. 608,509

Int. Cl.<sup>2</sup> H05B 37/02, 39/06

U.S. Cl. 315-361

15 Claims



1. An electrical load control circuit for remotely selectively energizing or de-energizing an electrical load which comprises:

- an AC supply source;
- an electrical load;
- a DC operated AC control means for controlling the power applied to said electrical load from said AC supply source;
- a first exclusive OR gate circuit means having a first and second input and for producing a first DC signal in its one output state and a second DC signal in its other output state;
- the output of said first exclusive OR gate circuit means being connected to operate said AC control means;
- a first manually operable switch electrically connected to control the first input of said first exclusive OR gate circuit means so that operation of said switch will change the state of energization of said electrical load; and
- means for readily connecting a second manually operable switch in a manner such that any operation of the second switch would change the state of said second input of said first exclusive OR gate circuit means.

4,011,483

#### GROUND WIRE MONITORING SYSTEM

Samuel K. Meadows, Piney View, W. Va., assignor to The Ohio Brass Company, Mansfield, Ohio

Filed Nov. 7, 1974, Ser. No. 521,682

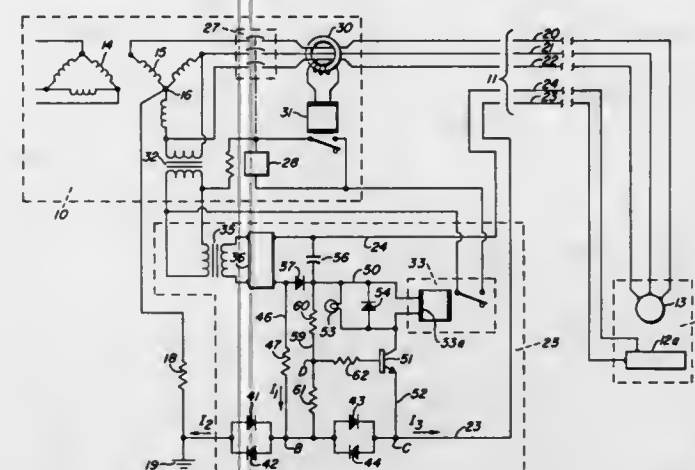
Int. Cl.<sup>2</sup> H02H 3/16, 1/02

U.S. Cl. 361-47

5 Claims

1. A ground wire monitoring circuit for a polyphase current power system comprising a power source having a transformer providing a system neutral point, a ground for the system to which said neutral point is connected, a ground fault current limiting resistor interposed between the neutral point and the system ground, phase conductors to transmit power to an electric power consuming apparatus having a frame, a ground

wire extending from the frame of the apparatus to the power source and connected to the system ground, and a main circuit breaker for said phase conductors, said monitoring circuit comprising a pilot wire extending from the frame of the apparatus, a low voltage D.C. source at the power source for supplying a circulating current to said ground and pilot wires, one terminal of said D.C. source being connected to said pilot wire, circuit means for dividing said circulating current into a first part flowing through the ground wire to the machine



frame and returning to the D.C. source through the pilot wire and a second part flowing through a segment of the ground wire to the system ground, then through any stray parallel ground paths that may be present to the machine frame and through the pilot wire to the D.C. source, and switching means responsive only to the first part of said circulating current and independent of any current that may flow through said stray paths for opening the system circuit breaker upon cessation of flow of said first part of said current.

4,011,484

#### UNDERVOLTAGE RELEASE WITH ELECTRICAL RESET FOR CIRCUIT BREAKER

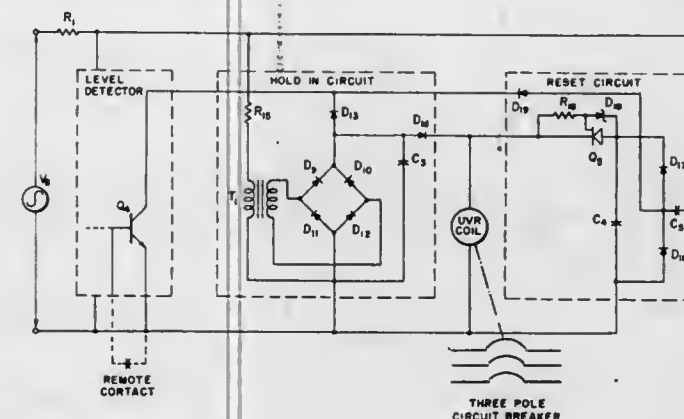
Derek A. Paice, Murrysville, and Alan B. Shimp, Monroeville, both of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,192

Int. Cl.<sup>2</sup> H02H 3/06, 3/24

U.S. Cl. 361-59

7 Claims



1. An undervoltage reset and hold-in circuit for an alternating current power supply comprising in combination: circuit detecting means for sensing when the alternating current voltage supply level falls below a preset level; undervoltage coil circuit means operatively connected to said detector means to trip a circuit breaker when said detecting means is activated by the supply voltage dropping below the preset level; a reset circuit connected to said coil and supply voltage to reset said undervoltage coil means and its associated circuit breaker by applying a repetitive pulse thereto when above the preset level;

a hold-in circuit operatively connected to said coil and circuits to insure that said coil means is held in an operative condition after being reset by applying a continuous signal thereto.

4,011,485

#### VALVE TYPE SURGE ARRESTER

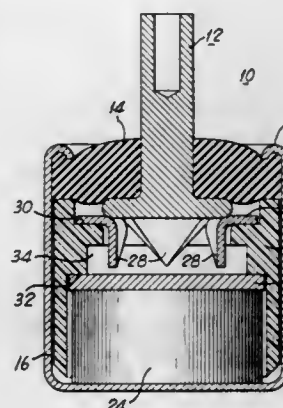
Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed May 30, 1975, Ser. No. 582,136

Int. Cl.<sup>2</sup> H02H 9/06

U.S. Cl. 361-127

6 Claims



1. A surge arrester comprising, a conductive arrester outer housing, a power follow current limiting valve block disposed entirely within said housing and conductively connected to said housing through a low electrical resistance path, first spark gap electrode means disposed within said housing, means for electrically connecting said first electrode means to an electrical power source, second spark gap electrode means electrically disposed within said housing, spaced from said first electrode means to form a spark gap and connected through a low electrical resistance path to said valve block and an insulating spacer disposed entirely within said housing including first integrally formed means for positioning said first electrode means within and spaced from said housing to thereby electrically insulate said first electrode means from an adjacent portion of the inner surface of said housing, second integrally formed means for positioning said second electrode means within and spaced from said housing to thereby electrically insulate said second electrode means from an adjacent portion of the inner surface of said housing, third integrally formed means for forming a relatively long electrical creep path between said first and second electrode means and fourth integrally formed means for electrically insulating a portion of the outer periphery of said valve block from adjacent portions of the inner surface of said housing.

4,011,486

#### TONE OPERATED SWITCHING ARRANGEMENT

David B. Oulton, Dollard des Ormeaux, Canada, assignor to Pylon Electronic Development Company Ltd., Lachine, Canada

Filed Mar. 27, 1975, Ser. No. 562,804

Int. Cl.<sup>2</sup> H01H 47/20

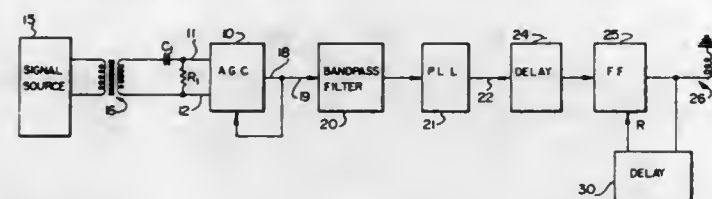
U.S. Cl. 361-182

6 Claims

1. A switching arrangement operable by a tone of a predetermined frequency comprising an automatic gain control amplifier having a signal input, a control input and an output, the signal input being connectable to a source of signals and the output being connected to an input of a bandpass filter which rejects all frequencies except those of a narrow band centered on said predetermined frequency, said output also being connected to said control input whereby the sensitivity



of the automatic gain control amplifier is adjusted to be a maximum for the largest amplitude frequency appearing at said signal input, said bandpass filter being connected to an input of a phase locked loop which produces a change in voltage from a first level to a second level at its output only in



response to a narrow band of frequencies centered on said predetermined frequency, the output of said phase locked loop being connected to a timer which only produces a pulse at its output upon receipt of said second level of voltage for a predetermined time, a pulse from said timer being fed to a flip-flop which changes state and operates a relay.

4,011,487

### SOLID STATE COMMUTATOR MOTOR WITH INTERNALLY POWERED ARMATURE

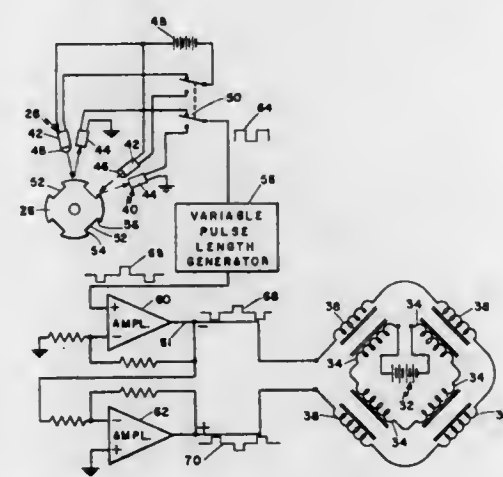
Donald D. Loomis, 5402 Gilbert Drive, San Diego, Calif. 92115

Filed Oct. 7, 1974, Ser. No. 512,469

Int. Cl.<sup>2</sup> H02K 29/00

U.S. Cl. 318—138

8 Claims



1. An electric motor comprising: a rotor body mounted for rotation on a shaft, at least one armature electro-magnet carried by said rotor body, at least one DC battery mounted within said rotor body and connected to power said armature electro-magnet to produce a fixed magnetic pole for each of said armature electro-magnets, at least one field electro-magnet mounted in juxtaposition to the circular path of said armature electro-magnet, a source of DC power for said electro-magnet, an encoding disc on said shaft, said encoding disc having a number of encoding segments equal to twice the number of said armature electro-magnets, sensor means in association with said encoding disc for detecting the passage of alternate segments of said disc and producing a signal output corresponding to a detection of said alternate segments, said sensor means comprising a first sensor for detecting the passage of alternate segments of said encoding disc and mounted to fixed structure at a first position with respect to said encoding disc, a second sensor for detecting the passage of alternate segments of said disc mounted to fixed structure at a second position rotationally displaced around said encoding disc with respect to said first position, amplifier means connected between said sensor means and

said field electro-magnet for increasing the power of pulses corresponding to signals produced by said sensor means in detecting said segments, a forward-reverse switch for selectively connecting said first sensor or said second sensor to said power delivery means.

4,011,488

### LINEAR FIELD CONTROL MOTOR

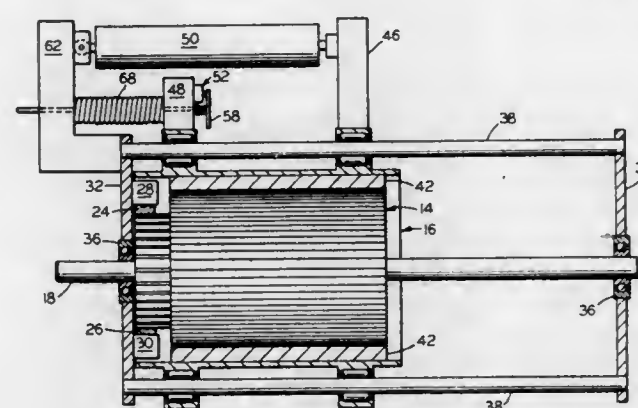
Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry Inc., Somersville, Conn.

Filed Mar. 19, 1975, Ser. No. 560,176

Int. Cl.<sup>2</sup> H02P 7/00

U.S. Cl. 318—139

10 Claims



1. In combination with a motor vehicle having a frame, a seat for a driver and a plurality of wheels, the combination therewith of

#### A. a linear field control motor comprising:

1. an output shaft operatively connected to at least one of said wheels of said motor vehicle for imparting drive thereto;
2. support means operable for supporting the ends of said output shaft for rotation relative thereto;
3. a revolving field segment including a revolvable member mounted on said output shaft intermediate the ends thereof for rotation therewith;
4. electrical conductor means supported in the linear field control motor in operative engagement with said revolvable member, said electrical conductor means being operable to connect the linear field control motor in electrical circuit relation in an external electrical circuit;

5. a linear field segment cooperatively associated with said revolving field segment, said linear field segment including a housing having an internal configuration complementary to the external configuration of said revolvable member and magnetic means mounted on the inner surface of said housing operable for producing a magnetic field capable of encompassing said revolvable member therewithin;

6. slide means supporting said linear field segment for linear movement relative to said revolvable member;

- B. means mounting said motor on said frame;

- C. a self-contained source of power on said frame providing direct current;

- D. circuit means between said power source and said motor; and

- E. actuator means operatively connected to said linear field segment for imparting movement thereto, said actuator means having at least a portion thereof accessible externally of said motor adjacent said driver seat, said actuator means being operable when actuated to cause said linear field segment to move relative to said revolvable member between a first position wherein said linear field segment is located in nonsurrounding relation to said revolvable member corresponding to the operating condition of the linear field control motor wherein the minimum horsepower is produced thereby and a second position wherein

said linear field control motor encircles said revolvable member corresponding to the operating condition of the linear field control motor wherein the maximum horsepower is produced thereby, said actuator means including throttle means comprising in part said externally accessible portion and support means on said frame for said throttle means.

4,011,489

### APPARATUS FOR REGULATING MAGNETIC FLUX IN AN AC MOTOR

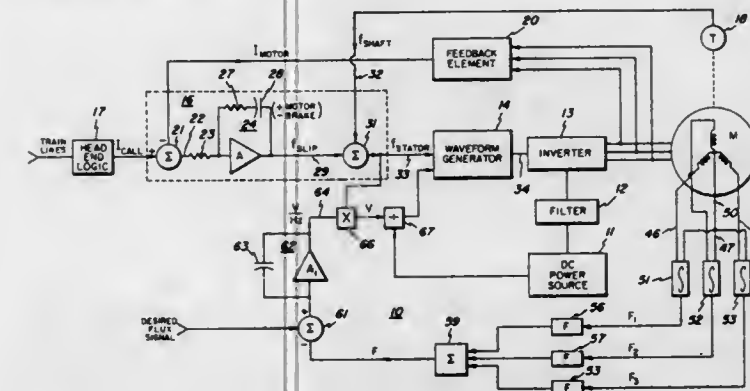
Joseph Phillip Franz, and Allan Barr Plunkett, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Nov. 20, 1974, Ser. No. 525,613

Int. Cl.<sup>2</sup> H02D 5/40

U.S. Cl. 318—227

29 Claims



1. An improved flux regulation system for an a-c motor having a stator and a rotor spaced from one another by an air gap, said stator including a plurality of teeth defined by slots in a surface of the stator adjacent to said air gap and a winding comprising a plurality of main coils embedded in said slots, the stator winding being adapted to be excited by a controllable source of electric power so as to produce electromagnetic flux across the air gap between the stator and the rotor, wherein the improvement comprises:

- a. a sensing coil placed around at least one of said teeth of the motor stator so as to have induced therein a voltage signal substantially proportional to the rate of change of flux across the air gap;
- b. means for integrating said voltage signal to obtain a signal representative of said flux; and
- c. means responsive to said representative flux signal for controlling the power source so as to vary a parameter of stator excitation in a manner that maintains a substantially controlled motor air gap flux level.

4,011,490

### APPARATUS FOR IMMOBILIZING A WORKING SHAFT AT A PREDETERMINED ANGULAR POSITION

Heinz Daab, Heppelstrasse 46, Darmstadt-Arheilgen, and Bernd Scheider, Ostpreussenstrasse 25, Darmstadt-Eberstadt, both of Germany (6100)

Filed Mar. 26, 1975, Ser. No. 562,104

Claims priority, application Germany, Mar. 29, 1974, 2415359

Int. Cl.<sup>2</sup> G05B 5/01

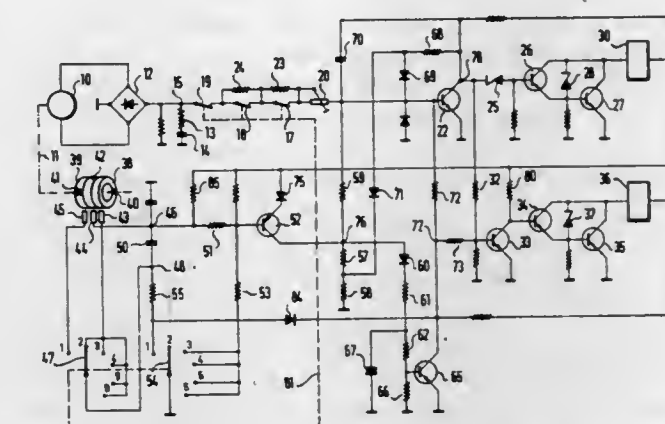
U.S. Cl. 318—269

13 Claims

1. Apparatus for immobilizing a shaft at a predetermined angular position, comprising an electric clutch motor whereof the clutch element transmissively coupled to the working shaft may be connected to a continuously driven main driving spindle of the clutch motor and/or to a braking member by the action of regulator operatively controlled by the difference between the actual speed of revolution and a predetermined nominal speed of revolution, to drive the working shaft substantially at a predetermined working speed of revolution, wherein the improvement comprises:

said regulator having a regeneratively coupled control am-

plifier having means connected between the input and output thereof for generating a variable degree of nega-



tive feedback, and means for adjusting said feedback to a minimum value for the final braking action.

4,011,491

### MOTOR SPEED CONTROL CIRCUIT

Lawrence L. Grover, Saint Joseph, and David L. Plangger, Buchanan, both of Mich., assignors to Heath Company, Benton Harbor, Mich.

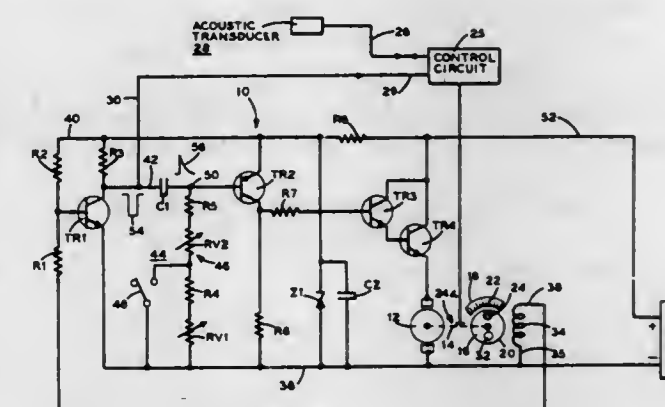
Continuation of Ser. No. 452,691, March 19, 1974, which is a continuation of Ser. No. 288,216, Sept. 11, 1972, abandoned.

This application Mar. 21, 1975, Ser. No. 560,944

Int. Cl.<sup>2</sup> H02P 5/00

U.S. Cl. 318—327

5 Claims



1. A speed-controlling circuit for controlling the rotational speed of a D.C. motor by selectively connecting the motor to a power supply circuit and disconnecting the motor from the power supply circuit, said speed-controlling circuit comprising:

switching circuit means for controlling the supply of electric current to the motor, said switching circuit means being connected to the power supply and to the motor and having an ON state causing the motor to be connected across the power supply circuit and an OFF state causing the motor to be disconnected from the power supply circuit;

transducer means coupled with the motor and responsive to the rotational speed thereof to produce an electric pulse for each motor revolution, the magnitude of said electric pulses increasing with increased motor speed;

threshold circuit means connected to the transducer means to receive therefrom said electric pulses and including means for providing a threshold electric level, means for comparing the magnitude of each received electric pulse with said threshold electric level and means for providing a control pulse in response to each electric pulse whose magnitude exceeds the threshold electric level; and

timing circuit means connected to the threshold means to receive said control pulses therefrom and responsive to each received control pulse to place the switching circuit means in the OFF state thereof for a time interval of



constant, fixed duration which is less than the duration of a motor revolution, said timing circuit maintaining the switching circuit means in the ON state except during said time intervals of constant, fixed duration, wherein said timing circuit means further comprises a capacitor, means connected to the capacitor and to the threshold circuit means for charging the capacitor to a selected constant potential in response to each control pulse provided by the threshold means, means for discharging the capacitor at a selected constant rate; and means connected to the capacitor and to the switching circuit means for placing and maintaining the switching circuit means in the OFF state thereof while the potential on the capacitor exceeds a selected potential level and for placing and maintaining the switching circuit means in the ON state thereof while the potential on the capacitor is below said selected potential level;

whereby current is at first supplied to the motor without interruption until the motor attains a selected speed at which the electric pulses from the transducer means exceed the selected threshold level, and then the supply of current to the motor is shut off for a constant, fixed time interval during each revolution of the motor, but said constant, fixed intervals occur at a rate proportional to the motor speed, to thereby quickly reach and then maintain a selected operational revolution speed.

4,011,492

#### CHOPPER MOTOR CONTROLLER HAVING PULSE-BY-PULSE SENSING OF PLUGGING

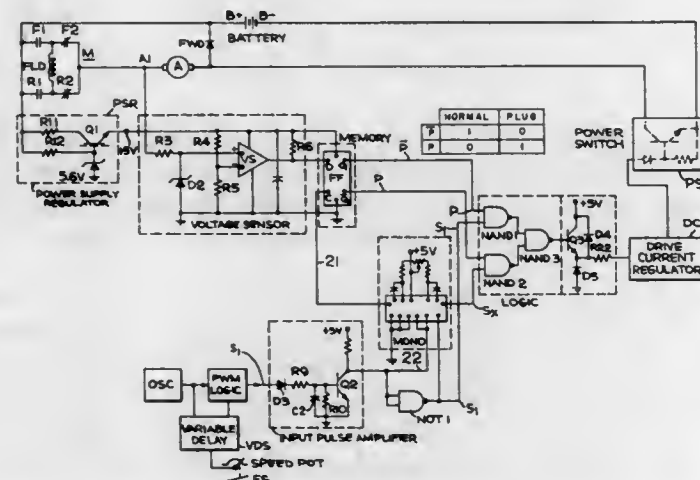
Howard G. Murphy, Greendale, Wis.; Harvey E. Schmidt, Chicago Heights, Ill., and Thomas P. Gilmore, Wauwatosa, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 29, 1975, Ser. No. 644,880

Int. Cl.<sup>2</sup> H02P 3/10

U.S. Cl. 318—373

13 Claims



1. In combination with a reversible D.C. traction motor connected in series with a semiconductor power switch and having means for generating a train of enabling pulses for turning said power switch on and off to regulate the speed of said motor, motor plugging means comprising

voltage sensor means for monitoring the voltage across the armature of said motor and when actuated, deriving a plugging signal if said voltage is below a predetermined value,

means responsive to each said enabling pulse to actuate said voltage sensor means and to also generate a short time duration pulse, and

logic means for respectively coupling said enabling pulses and said short time duration pulses to said power switch when said plugging signal is absent and when it is present.

4,011,493

#### SERVO-CONTROLLER

Hisahiko Fukase, and Minoru Yoneda, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki-Kaisha and Kayabakogyo Kabushiki-Kaisha, both of Tokyo, Japan

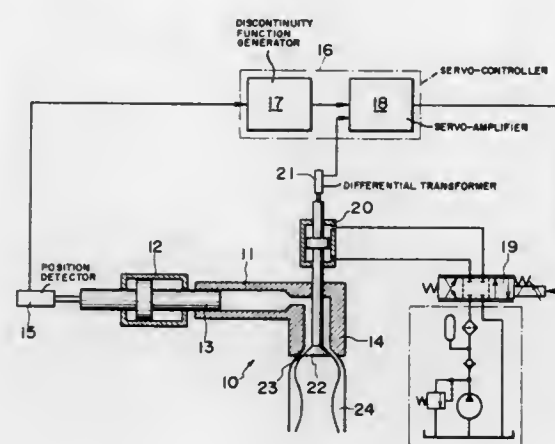
Filed Dec. 2, 1974, Ser. No. 528,950

Claims priority, application Japan, Dec. 3, 1973, 48-135858

Int. Cl.<sup>2</sup> B29D 23/04

U.S. Cl. 318—568

5 Claims



1. A servo-controller, particularly for controlling the wall thickness of an extruded parison, comprising sequence circuit means for comparing an input analog signal with each of a number of stepwise-sorted level signals and for producing one or more comparison signals in dependence upon the state of said analog signal;

a number of relay circuits arranged in correspondence with each of said level signals so as to respond to said comparison signals produced by said sequence circuit means;

a pin board connection panel having first and second switch group means operative for affecting the output and responsive to successive operations of said relay circuits, said first switch group means producing a set signal and said second switch group means including a plurality of switches each serving to operate switches which always operate the next step to each corresponding switch of said first switch group means; and settable discontinuity function generating circuit means comprising logic circuit means for subtracting said set signal obtained through said first switch group means from the signal obtained through said second switch group means, thereupon subtracting said analog input signal from the respective level signal, multiplying the thus obtained subtraction results and adding said set signal through said first switch group means to the multiplicand, so that the output of said discontinuity function generating circuit means forms a signal which serves as the input for a servo-amplifier.

4,011,494

#### INVERTER WITH SYMMETRY CORRECTION CIRCUITS

Mehmet Saka, Stevenage, England, assignor to International Computers Limited, London, England

Filed Sept. 4, 1975, Ser. No. 610,451

Claims priority, application United Kingdom, Sept. 21, 1974, 41200/74

Int. Cl.<sup>2</sup> H02M 3/335

U.S. Cl. 321—12

8 Claims

1. An inverter switching circuit comprising:

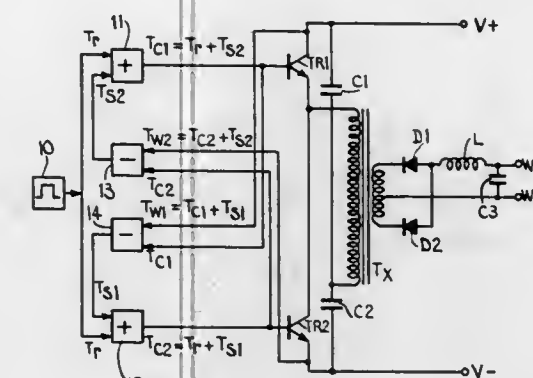
a. output transformer means;

b. first and second switching means connected in push-pull configuration to said output transformer means each switching means being switchable, in response to an input pulse, from a non-conducting state to a conducting state for the duration of an output pulse;

c. means for sensing the difference between the durations of the input and output pulses for each switching means;

d. means responsive to the sensing means, for generating

first and second trains of pulses, the pulses of the first train being timed to occur between the pulses of the second train, the pulses of the first train having a duration equal to a reference duration plus the difference between the durations of the input and output pulses for the first switching means, and the pulses of the second train



having a duration equal to said reference duration plus the difference between the durations of the input and output pulses for the first switching means; and  
e. means for applying said first and second trains of pulses as input pulses to the first and second switching means respectively.

4,011,495

#### HIGH VOLTAGE GENERATOR ARRANGEMENT

Frits Rooij, Rozenburg, Netherlands, assignor to N. V. Optische Industrie "De Oude Delft", Netherlands

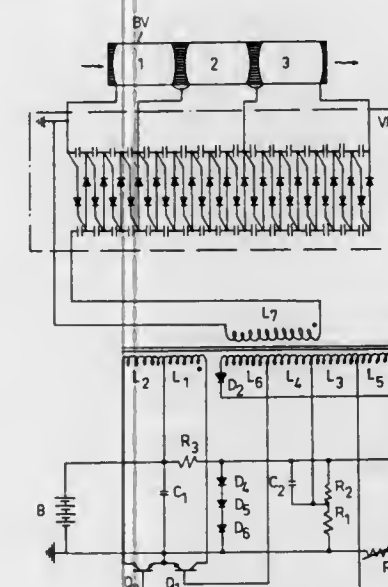
Filed July 2, 1975, Ser. No. 592,467

Claims priority, application Netherlands, July 9, 1974, 7409242

Int. Cl.<sup>2</sup> H02M 7/537

U.S. Cl. 321—18

2 Claims



1. In a high voltage generator arrangement particularly adapted for use with an image intensifier, the arrangement including transistor oscillator means which includes a transformer for supplying A.C. voltage and having a feedback winding for applying base current to said transistor oscillator means and an output winding, a voltage multiplier connected to said output winding, and circuit means responsive to the load on said arrangement for controlling power supplied by said arrangement, the improvement in said control circuit means comprising:

auxiliary winding means on said transformer connected in series with said feedback winding;

a control transistor connected as a current source within said circuit means;

diode means for connecting the collector-emitter circuit of said control transistor to said auxiliary winding means; and

means including said auxiliary winding means for establishing a base potential for said control transistor to cause portions of the direct base current applied from said feedback winding to said transistor oscillator means to be discharged through said control transistor whenever the magnitude of the AC voltage across said feedback and auxiliary winding means exceeds said base potential.

4,011,496

#### METHOD FOR REGULATING WORK CURRENT OF HALF CIRCUITS OF BIPOLAR D.C. TRANSMISSION LINE AND SYSTEM FOR EFFECTING SAME

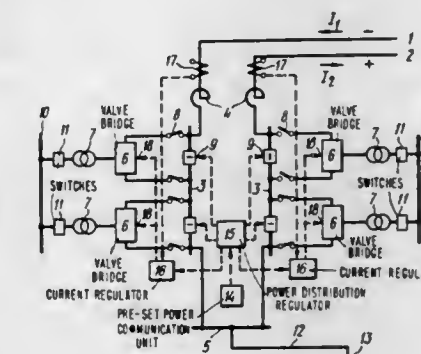
Khaim Shlemovich Grois, Lesnoi prospekt, 15, kv. 38; Vladislav Alexandrovich Kapustin, Grazhdansky prospekt, 85, kv. 141; Vladislav Alexeevich Merzheevsky, ulitsa Nekrasova, 60, kv. 125, all of Leningrad; Anatoly Mikhailovich Monastyrsky, ulitsa Pushkina, 14, kv. 53, Volgograd; Igor Nikolaevich Shaposhnikov, Chongarsky bulvar, 13, kv. 53, Moscow, and German Vasilievich Karasev, prospekt Engelsa, 40, kv. 20, Leningrad, all of U.S.S.R.

Filed July 24, 1975, Ser. No. 598,985

Int. Cl.<sup>2</sup> H02P 13/16

U.S. Cl. 321—27 R

2 Claims



2. A semi-automatic system for regulating the work current in half circuits of a bipolar d.c. transmission line having a plurality of interconnected electric valve bridges with control electrodes, said system comprising a transmitted power setting unit having first and second outputs, means for calculating half circuit current regulator settings having a first input connected to a first output of said transmitted power setting unit, means for converting half circuit current regulator settings having an input connected to an output of said means for calculating half circuit current regulator settings, means for setting an operating connection pattern of the electric valve bridges, a power zone finder for finding a zone wherein there is a definite and constant connection sequence of said electric valve bridges for minimizing the sum of transmitted power loss components, an optimum detector for determining the connection pattern codes of said electric valve bridges, beginning with the optimum connection pattern in the given power zone, a selecting matrix for selecting an operating connection pattern of said electric valve bridges, and a limitation setting unit for generating signals for limiting the number of said electric valve bridges put into operation and the current magnitude in each said half circuit, the second output of said power setting unit being connected to an input of said power zone finder whose output is connected to an input of said optimum detector whose output is connected to a first input of said selecting matrix a first output of which is connected to an input of said means for setting the operating connection pattern of said electric valve bridges, a second input of said selecting matrix being connected to an output of said limitation setting means, whereas a second output of said selecting matrix is connected to a second input of said means for calculating half circuit current regulator settings.







4,011,503

# **APPARATUS FOR MEASURING THE PHASE RELATION OF TWO ALTERNATING CURRENT SIGNALS**

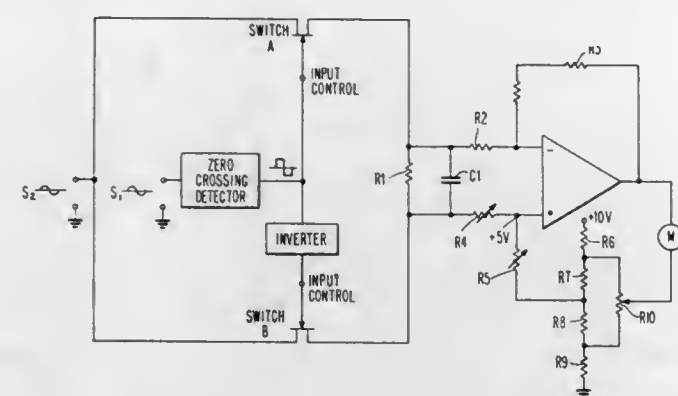
John M. Ferrara, Yardley, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Oct. 16, 1975, Ser. No. 622,842

Int. Cl.<sup>2</sup> H03D 13/00; G01R 25/00

U.S. Cl. 324—83 R

1 Claim



1. A circuit for measuring the difference in phase between first and second alternating signals of the same frequency comprising:

- first and second bilateral switches each having an input control terminal, an input terminal, and an output terminal;
- an input terminal for the first signal connected to a zero crossing detector;
- an inverter connecting the output of the zero crossing detector to the input control terminal of the first bilateral switch;
- a connection between the output of the zero crossing detector and the input control terminal of the second bilateral switch;
- an input terminal for receiving the second signal connected to each input terminal of the first and second bilateral switches;
- charge storage means comprising a resistance and a capacitance connected in parallel between the two output terminals of the bilateral switches whereby the net average charge resulting from the application of said first and second signals to the circuit is stored as an indication of the phase relationship of said first and second signals;
- an operational amplifier connected to said charge storage means adapted to provide an output signal proportional to the charge contained in said storage means, wherein variable resistances ( $R_1$  and  $R_2$ ) are connected to an input terminal of the operational amplifier to allow the circuit to be adjusted so that a bias level DC voltage in the measured signal will not produce a phase measurement error;
- meter means operatively connected to the output of the operational amplifier to provide an indication of the phase relationship of the two signals.

4,011,504

# **SOLID STATE SCALE EXPANDING CIRCUIT FOR ELECTRICAL INDICATOR DEVICES**

Lawrence V. DePillo, 11 Steuben St., Waterbury, Conn. 06708

Filed June 12, 1975, Ser. No. 586,507

Int. Cl.<sup>2</sup> G01R 15/08, 15/10

U.S. Cl. 324—115

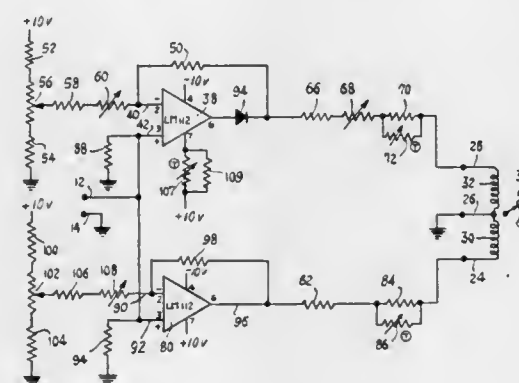
15 Claims

1. A circuit for use with an electrical indicating device to provide a scale-expanding or scale-compressing drive therefor, comprising in combination:

- a pair of input terminals adapted to be connected to a source of input voltage which is to be measured and which varies over a predetermined input range,
- output terminals for connection to the indicating device,
- an electrical voltage responsive network interposed between one of said input terminals and one of said output

terminals, said network normally providing, for the entire predetermined range of said input voltage, an incremental voltage contribution to said one output terminal in response to incremental input voltage excursions at the input terminals, and

- amplifying means including biasing means therefor, said amplifying means being connected with said input terminals and responding to voltages impressed thereon to provide to one of said output terminals a voltage contribution having a given characteristic incremental value for incremental voltages over one portion of the predetermined input range and a different characteristic incre-



mental value for incremental voltages over another portion of the predetermined input range whereby a complete voltage excursion at the output terminals will manifest zones of different incremental characteristics when an input voltage having an excursion of monotonous incremental characteristic is applied at the input terminals,

- said amplifying means comprises a driving amplifier and a driven amplifier, connected in cascade,
- said driven amplifier having a feedback network connected between its output and its input, and
- an indicator having a field coil,
- said field coil constituting part of said feedback network.

4,011,505

# **CURRENT MEASURING DEVICE**

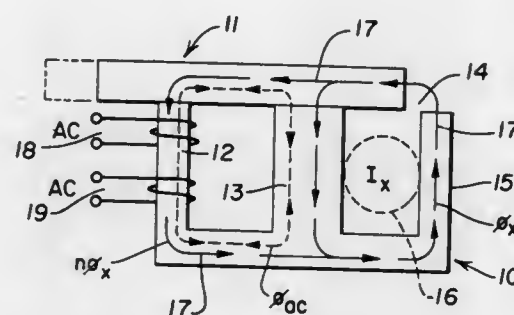
David I. Spalding, Epping, Australia, assignor to Applied Power Australia Limited, Canberra City, Australia

Filed Sept. 22, 1975, Ser. No. 616,166

Int. Cl.<sup>2</sup> G01R 15/02, 33/00

U.S. Cl. 324—117 R

8 Claims



1. A current measuring device for measuring a current flowing in a conductor by inductive coupling to the conductor, said device comprising

- an E-shaped core of magnetic material having first and second outer legs and a center leg spaced from said second outer leg sufficiently to provide a space therebetween for the reception of a conductor carrying the current to be measured,
- a bar movably associated with said E-shaped core and movable between a first position in which the bar is displaced from the end of said second outer leg sufficiently to provide for the insertion of a conductor therein to a normal

position in which it is in engagement with said first outer leg and said center leg but is displaced from said second outer leg by an air gap, a pair of windings disposed on said first outer leg, means for alternately energizing said windings to cause flux flow in opposite directions, and means for measuring any difference in voltage across said windings resulting from the effect of flux flowing in said center leg because of current flow in said conductor.

4,011,506

# **TV SERVICE TRIGGERED OSCILLOSCOPE**

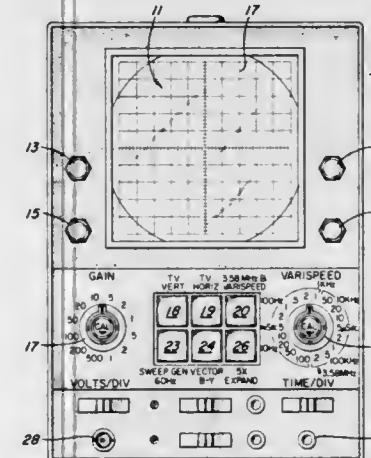
Ralph H. Bowden, 1800 Edgewood Road, Sioux Falls, S. Dak. 57107

Filed Feb. 12, 1975, Ser. No. 549,348

Int. Cl.<sup>2</sup> G01R 13/22; H04N 9/02

U.S. Cl. 324—121 R

8 Claims



1. An oscilloscope for use in television servicing, comprising an amplifier for amplifying a television signal, sync separator means coupled to the output of said amplifier for separating the horizontal and vertical sync pulses therefrom,

said separator means having a first output at which said horizontal sync pulses appear and a second output at which said vertical sync pulses appear,

trigger pulse shaping means, switch means for coupling the separated horizontal or vertical sync pulses to said trigger pulse shaping means or for coupling the output of said amplifier to said trigger pulse shaping means,

a ramp wave generator, means coupling the output from said shaping means to said ramp generator to synchronize the ramp wave with the shaped pulses,

means operative only when the output of said amplifier is connected to said trigger pulse shaping means for adjustably varying the speed of the ramp wave generated by said ramp wave generator, and means for driving one set of deflection plates in a cathode ray tube with said ramp wave.

4,011,507

# **FULL CYCLE CURRENT DETECTOR**

Allen J. Rossell, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 10, 1975, Ser. No. 630,621

Int. Cl.<sup>2</sup> G01R 19/16, 31/02

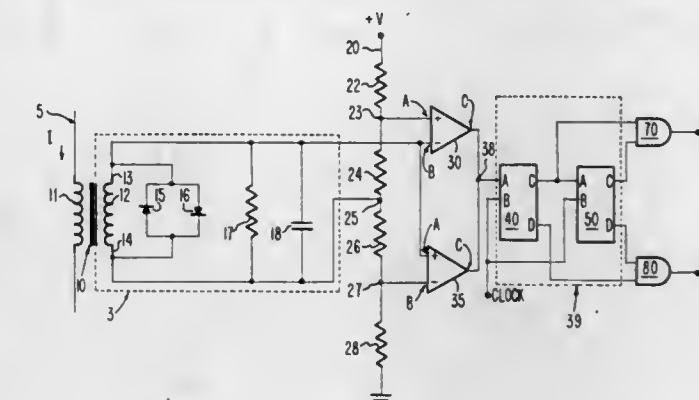
U.S. Cl. 324—127

11 Claims

1. A circuit for detecting current flowing in an external circuit and for generating discrete outputs responsive thereto the outputs respectively identifying current in the external circuit which is either (1) constant zero or constant direct current or (2) both non-zero and varying, said circuit comprising:

means for sensing current flowing in the external circuit and

for generating a voltage in accordance with the magnitude of the current; means for establishing a preselected threshold voltage range; comparing means for generating first signals when said voltage is within said preselected voltage range and sec-



ond signals when said voltage is outside said preselected voltage range; and means associated with said comparing means for triggering a first output means in response to successive first signals and for triggering a second output means in response to successive second signals.

4,011,508

# **LOGIC SIGNAL TEST DEVICE FOR INDICATING LOW, INTERMEDIATE AND HIGH LEVEL SIGNALS**

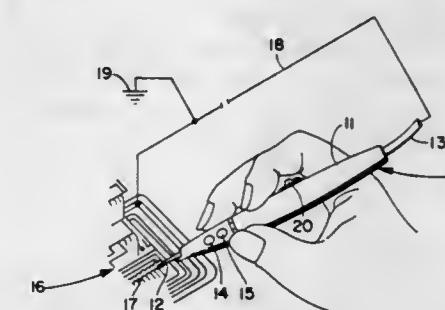
Robert J. Gabor, Mentor, Ohio, assignor to A & P Products Incorporated, Painesville, Ohio

Filed Mar. 24, 1975, Ser. No. 561,111

Int. Cl.<sup>2</sup> G01R 31/02, 19/16

U.S. Cl. 324—133

14 Claims



1. An electric signal testing device for indicating whether an electrical signal in a circuit being tested is at low, intermediate or high level comprising:

means for receiving such electrical signal; first and second indicator portions connected in parallel with each other and in series with said means for receiving and a relative ground connection, said first indicator portion comprising a first threshold indicator and an electric energy source having positive and negative sides and connected in electrical circuit relation with said first threshold indicator, and said second indicator portion comprising a second threshold indicator; said first and second threshold indicators having respective energized and de-energized states with a change of state occurring at respective threshold levels; whereby energization of said first threshold indicator indicates such electrical signal being at one of such low or high levels, energization of said second threshold indicator indicates such electrical signal being at the other one of such low or high levels, and such intermediate level being indicated by said first and second threshold indicators being in respective de-energized states.



# 4,011,509 APPARATUS FOR RELATIVE POWER MEASUREMENTS IN A POWER METER

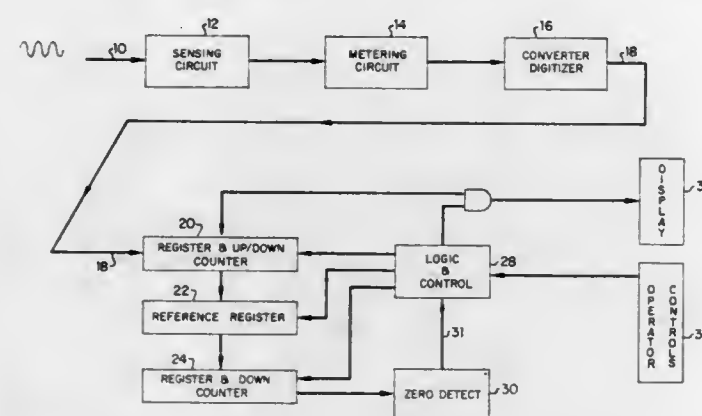
Allen P. Edwards, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 14, 1975, Ser. No. 567,587

Int. Cl.<sup>2</sup> G01R 11/16

U.S. Cl. 324-142

9 Claims



1. In combination with a power meter of the type wherein an input sensing circuit, a metering circuit, and a digitizer are provided for producing a digital signal representing the power value of an input signal, the improvement which comprises: register means for storing a reference digital signal representing a reference power value; and a digital circuit coupled to the register means and coupled to the digitizer for processing the digital signal with respect to the reference digital signal to provide an output signal representing the relative value of the digital signal with respect to the reference digital signal.

# 4,011,510

## SIGNAL-RESPONSIVE APPARATUS HAVING MAGNETIC-PARTICLE-FRICTION MEMORY

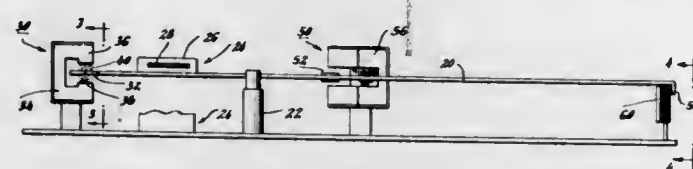
Everett O. Olsen, Wrentham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 543,443, Jan. 23, 1975, abandoned, which is a continuation of Ser. No. 333,997, Feb. 20, 1973, abandoned. This application Apr. 26, 1976, Ser. No. 680,134

Int. Cl.<sup>2</sup> G01R 1/14; F16D 37/02; G05B 5/01

U.S. Cl. 324-157

26 Claims



25. Signal-handling apparatus comprising, in combination: a movable member mounted for movement in one direction or the reverse in response to a positioning force applied thereto in said one direction or the reverse; magnetically-operated friction means coupled to said movable member and including means to develop a friction restraining force having a magnitude sufficient to hold said member firmly in place in the absence of the positioning force applied to said member but insufficient to prevent movement of said member in response to application of the positioning force, said friction means including a mass of magnetized particles engaging an element coupled to said movable member for continuously corresponding movement therewith to develop said friction force by said contact between said element and the particles, said particles being supported to provide for movement relative to one another and also to accommodate movement of said element relative to said particles as said element moves with said member, said particles and said movable member cooperatively providing a non-drift

memory to hold and maintain the position of said member wherever it may be when said positioning force ceases, whichever direction the member had previously been moved by said force;

a transducer effectively coupled to said movable member and responsive to the position thereof for producing an output signal having a characteristic the magnitude of which represents the position of said movable member; and

means to transmit said output signal to a remote location.

# 4,011,511

## FREQUENCY-SHIFT DIGITAL LINK AND DIGITAL FREQUENCY DETECTION SYSTEM

Robert Wu-Lin Chang, Huntington, N.Y., assignor to The Singer Company, Binghamton, N.Y.

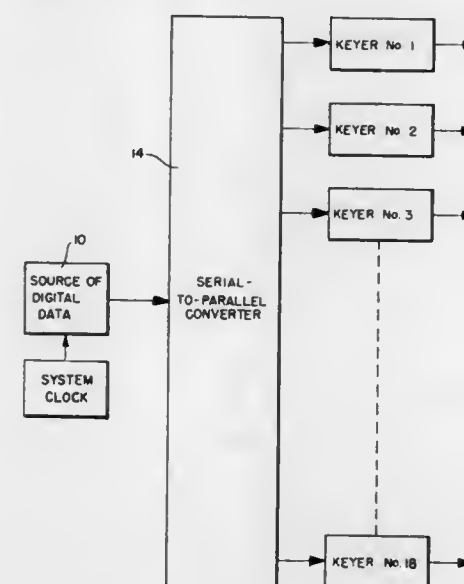
Continuation of Ser. No. 491,272, July 24, 1974, abandoned.

This application Feb. 13, 1976, Ser. No. 657,785

Int. Cl.<sup>2</sup> H04J 1/00; H04L 7/00, 27/10

U.S. Cl. 325-40

15 Claims



14. In a frequency-shift digital data link in which mark/space digital data are transmitted over a plurality of different mark/space frequency channels to a receiver, a method for synchronizing the overall data link system, comprising the steps of:

transmitting synchronization signals over a plurality of frequency channels; receiving said signals and evaluating them to determine which of said signals was least degraded during said transmission; and selecting said synchronization signal least degraded during transmission and passing it on as a clock signal to be used throughout the receiver to synchronize the receiver with the transmitter in said data link system.

# 4,011,512

## ELECTRICAL COMPONENT FAILURE DETECTION APPARATUS

David Michael Drury, Mundelein, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 21, 1975, Ser. No. 579,528

Int. Cl.<sup>2</sup> H03G 3/18

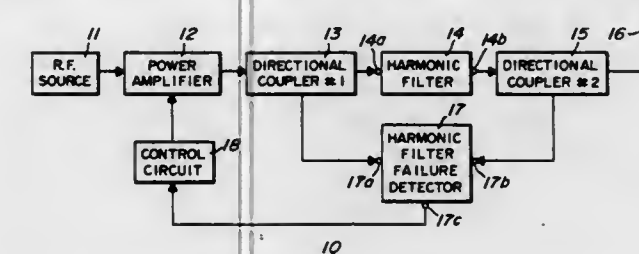
U.S. Cl. 325-150

11 Claims

1. An electrical component failure detection apparatus for use with radio frequency power generating equipment, comprising:

power means for generating power signals; component means having an input terminal coupled to said power means and an output terminal, said component means receiving said power signals at said input terminal and developing corresponding output signals at said output terminal;

load means coupled to said component output terminal for receiving said output signals; first means, including a first directional coupler coupled between said power means and said component means, for producing a first DC signal indicating the forward power delivered to said component means; second means, including a second directional coupler coupled between said load means and said component



means, for producing a second DC signal indicating forward power delivered to said load means; comparator means coupled to said first and second means for producing a failure detecting control signal in response to said first and second signals; and control means coupled to said power means and said comparator means for reducing said power signals generated by said power means in response to said control signal.

# 4,011,513

## TUNING DEVICE FOR A RADIO RECEIVER

Manabu Kawachi, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

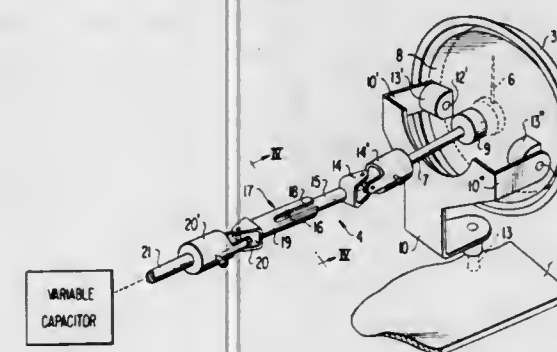
Filed Mar. 19, 1976, Ser. No. 668,382

Claims priority, application Japan, Mar. 20, 1975, 50-36646[U]; July 21, 1975, 50-100179[U]

Int. Cl.<sup>2</sup> H04B 1/06

U.S. Cl. 325-312

7 Claims



1. In a radio receiver having a body, a tuning element with a tuning shaft coupled thereto, and a manually controlled tuning dial having tuning indicating means associated therewith, the improvement comprising, means for pivotally attaching said tuning dial and tuning scale to said body to permit said dial and scale to be pivoted to face various selected directions, and rotational coupling means, including at least one universal coupling, connecting said dial to said tuning shaft to permit rotation of said dial to be transferred to said shaft regardless of the facing direction of said dial and scale.

# 4,011,514

## MEMORY CIRCUIT FOR TUNING OF AN ELECTRONICALLY TUNED RECEIVER TO A PRESELECTED STATION

Jerzy Wróblewski, Warsaw, Poland, assignor to UNITECH Przedsiębiorstwo Techniczno-Hand-Lowe, Warsaw, Poland

Filed Apr. 28, 1975, Ser. No. 572,443

Claims priority, application Poland, May 6, 1974, 170845

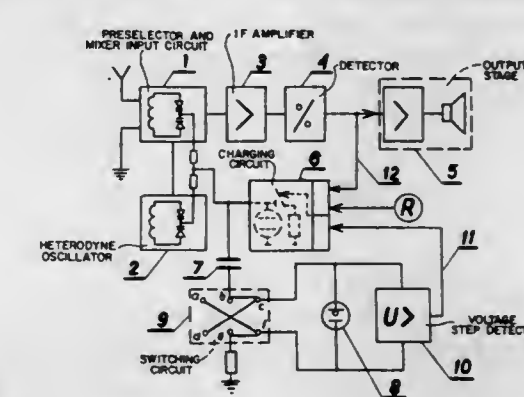
Int. Cl.<sup>2</sup> H04B 1/16

U.S. Cl. 325-464

5 Claims

1. An arrangement for storing a tuning voltage of pre-

lected stations for receivers having electronic tuning with elements of variable reactance having elements comprising capacitance diodes and being dependent on the applied bias voltage, comprising in combination, input circuit means having elements comprising capacitance diodes, said input circuit means being tuned for reception of electrical signals at predetermined frequency by means of said capacitance diodes, said input circuit means comprising tuned resonant circuit means, a superheterodyne oscillator having elements comprising capacitance diodes and being connected to said input circuit means, said oscillator being also tuned by the capacitance diodes in said oscillator, a detector connected to the output of



said input circuit means, capacitor means connected to said input circuit means and said oscillator for storing the tuning voltage applied to said elements in said input circuit means and said oscillator, a charging circuit connected to said capacitor means and controlled from the output of said detector means, at least one electrochemical integrator connected in series with said capacitor means, switching means connected between said integrator and said capacitor means for reversing interconnections between said integrator and said capacitor means, a voltage step detector connected in parallel with said integrator, said charging circuit being controllable from said voltage step detector or from the output of said detector means after actuating said switching means.

# 4,011,515

## TUNABLE SCANNING RADIO RECEIVER

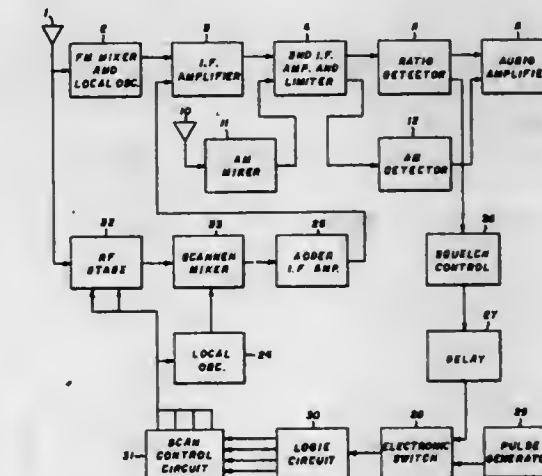
Raymond F. Hanson, Whitesboro, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed May 23, 1975, Ser. No. 580,269

Int. Cl.<sup>2</sup> H04B 1/32

U.S. Cl. 325-470

7 Claims



1. A scanning radio receiver for automatically scanning a number of selected station frequencies within a given frequency band, comprising:

a. at least one voltage sensitive tunable element connected in the receiver circuit for tuning the receiver to said station frequencies as a function of a control voltage applied thereto, b. scan control means for generating a plurality of discrete control voltages,



- c. said scan control means including adjustable means for providing manual adjustment of said discrete control voltages over a range of values;
- d. digital means for sequentially actuating said scan control means so as to provide at the output thereof an ordered sequence of said discrete control voltages;
- e. first means for applying the output of said scan control means to said tunable element, and
- f. second means for controlling said digital means as a function of the received signal so as to operate said digital means for providing scan tuning of said selected station frequencies when the received signal does not exceed a minimum signal strength and to inhibit operation of said digital means for interrupting said scan tuning when the received signal does exceed said minimum signal strength.

4,011,516

## FREQUENCY CORRECTION ARRANGEMENT

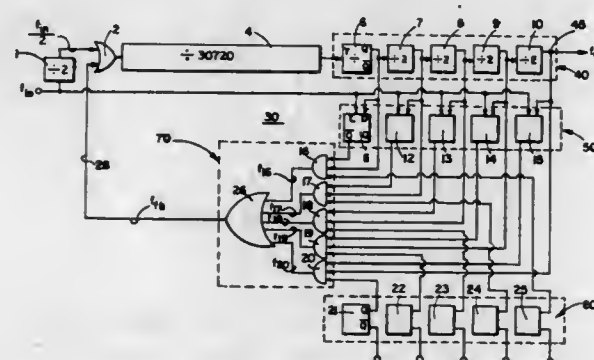
Gary L. Heimbigner, Anaheim, and Robert G. Carlson, Costa Mesa, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 3, 1975, Ser. No. 628,294

Int. Cl.<sup>2</sup> H03B 19/00

U.S. Cl. 328—14

13 Claims



## 1. In combination:

- first and second signal gating means having input and output terminal means, said first signal gating means output terminal means connected to a counter means,
- said counter means providing a plurality of output pulse trains, each of said pulse trains applied to respective first terminals comprising said second signal gating means input terminal means,
- clock terminal means for supplying a sequence of clock pulses, said clock terminal means connected to said first signal gating means input terminal means and to a buffer means,
- said buffer means connected between said counter means and second terminals comprising said second signal gating means input terminal means,
- means to selectively connect a source of enabling signals to third terminals comprising said second signal gating means input terminal means to control the gating of output signals from said buffer means with selected ones of said counter means pulse trains so as to thereby provide a correction signal,
- output signals from said buffer means controlling the pulse duration of said gated correction signal with respect to the pulse duration of said sequence of clock pulses so that there is no pulse overlap therebetween, and
- feedback means connected between said second signal gating means output terminal means and said first signal gating means input terminal means so that said correction signal is fed back and gated with said sequence of clock pulses.

4,011,517  
TIMER APPARATUS FOR INCREMENTING TIMING CODE AT VARIABLE CLOCK RATES

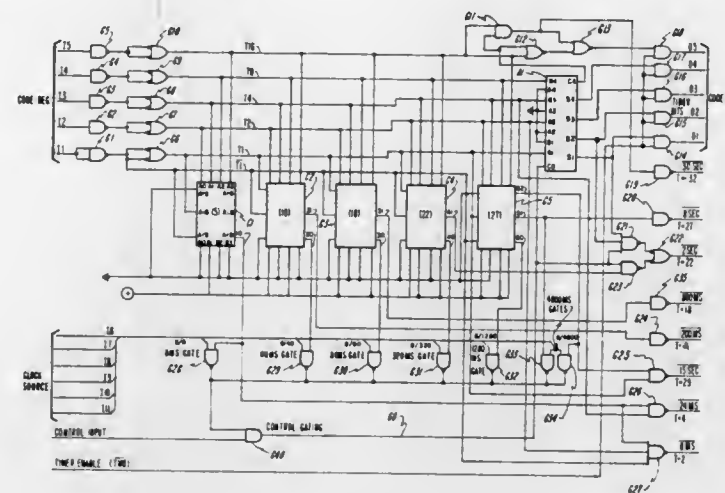
Uwe A. Pommerening, Webster, and Glenn L. Richards, California, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Jan. 22, 1975, Ser. No. 542,947

Int. Cl.<sup>2</sup> H03K 11/17, 13/00; G01R 29/02; H03K 5/00

U.S. Cl. 328—130

9 Claims



1. A timer apparatus comprising:
- first means for receiving a first signal representative of a prescribed timing code; and
- second means, coupled to said first means, for incrementing said timing code to produce a second signal representative thereof in accordance with a predetermined clock rate, the instantaneous frequency of which clock rate is determined by the time code value represented by said first signal.

4,011,518

## MICROWAVE GaAs FET AMPLIFIER CIRCUIT

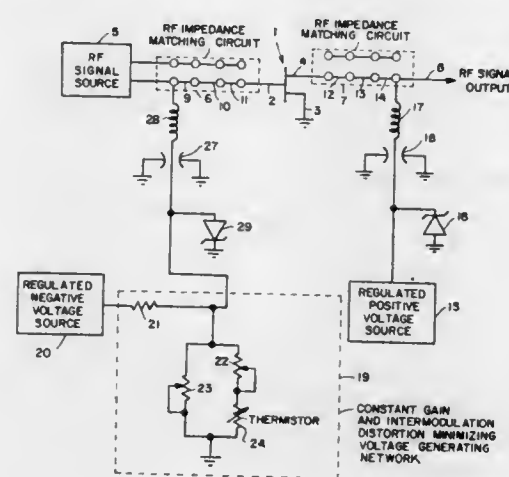
James A. Irvine, Clifton, N.J., and Peter Torriano, Astoria, N.Y., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 626,162

Int. Cl.<sup>2</sup> H03F 3/16

U.S. Cl. 330—23

11 Claims



1. A microwave field effect transistor (FET) amplifier circuit to provide a constant gain for said FET with varying temperature and to minimize intermodulation distortion of said FET comprising:

- a first source of radio frequency (RF) signal;
- a RF signal output;
- a second source of positive drain electrode operating voltage;
- a microwave FET having a gate electrode coupled to said first source, a drain electrode coupled to said output and said second source and a source electrode directly coupled to ground; and

a network coupled to said gate electrode, said network generating a negative gate electrode voltage having a selected nominal value to minimize said intermodulation distortion and a value varying with respect to said nominal value directly proportional to temperature changes to provide said constant gain.

4,011,519

## TRANSISTOR AMPLIFIER CIRCUIT

Masami Kawamura, Kodaira, and Yukio Suzuki, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

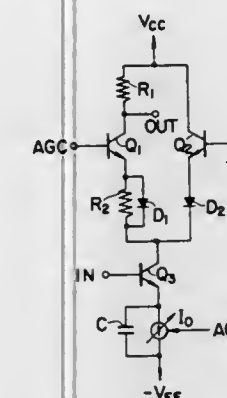
Filed July 30, 1975, Ser. No. 600,431

Claims priority, application Japan, Aug. 2, 1974, 49-88082

Int. Cl.<sup>2</sup> H03G 3/30

U.S. Cl. 330—29

4 Claims



1. A transistor amplifier circuit comprising a grounded-emitter amplifying transistor, first and second differential transistors, the emitter of said first differential transistor being coupled to the collector of said grounded-emitter amplifying transistor, a parallel circuit which consists of a resistance of comparatively large value and a diode connected between the emitter of said second differential transistor and the collector of said grounded-emitter amplifying transistor, means for applying an input signal to the base of said grounded-emitter amplifying transistor, means for applying an AGC voltage which varies inversely with said input signal to the base of said second differential transistor, and variable absorption current control means connected to the emitter of said grounded-emitter amplifying transistor for controlling the emitter current of said grounded-emitter amplifying transistor so as to decrease said current with increase in said input signal level.

4,011,520

## METHOD AND APPARATUS FOR REDUCING PHASELOCK LOOP FM'ING

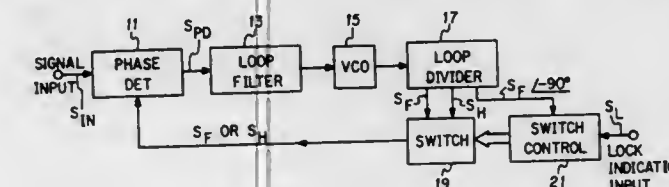
Dietrich H. Schaefer, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 11, 1975, Ser. No. 603,412

Int. Cl.<sup>2</sup> H03B 3/04

U.S. Cl. 331—14

8 Claims



1. Phaselock circuitry having a substantially fixed frequency input signal  $S_{IN}$  to be tracked and an input signal  $S_L$  indicating whether the loop is locked, said phaselock-circuitry comprising:

- first means comprising a loop filter whose filtering characteristic is fixed;
- second means, including controllable oscillator means, for providing two variable frequency signals  $S_F$  and  $S_H$  where

the frequency of  $S_F$  is nominally the same as that of  $S_{IN}$ , and the frequency of  $S_H$  is an odd multiple  $N$  of the frequency of  $S_F$  and thus is nominally an odd multiple  $N$  of the substantially fixed frequency of  $S_{IN}$ ; and

third means, including phase detection means connected for continuously receiving said signal  $S_{IN}$  and switching means, said third means also connected for receiving  $S_F$ ,  $S_H$ , and  $S_L$ , and providing, in accordance with the loop condition as indicated by  $S_L$ , to the loop filter input one of two signals  $S_X$  or  $S_Y$ , where  $S_X$  is a phase detection means output signal produced by the phase comparison in said phase detection means of said signals  $S_{IN}$  and  $S_F$ , and  $S_Y$  is a phase detection means output signal produced by the phase comparison in said phase detection means of said signals  $S_{IN}$  and  $S_H$ , said signal  $S_X$  being provided to said loop filter input after  $S_L$  indicates no-lock and said signal  $S_Y$  being provided to said loop filter input after  $S_L$  indicates lock.

4,011,521

## HIGH POWERED LASER

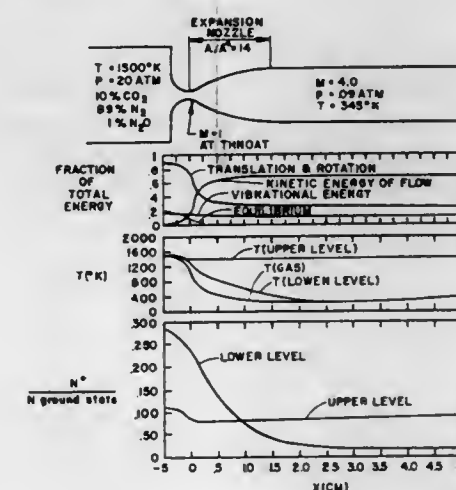
Arthur R. Kantrowitz, Arlington; Edward T. Gerry, Boston; Donald A. Leonard, Stoneham, and Jack Wilson, Reading, all of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed Feb. 16, 1967, Ser. No. 626,357

Int. Cl.<sup>2</sup> H01S 3/09, 3/22

U.S. Cl. 331—94.5 G

10 Claims



1. A high power laser comprising the combination of a chamber formed with an inlet and an exhaust, a nozzle in communication with said chamber, means having an outlet in communication with said inlet for heating a polyatomic gas to provide equilibrium vibrational excitation in said gas, said polyatomic gas having an upper laser level and a lower laser level and a ground state, said upper laser level having an effective relaxation time that is long compared to the effective relaxation time of the lower laser level, the heated gas being expanded into said chamber in a stream to provide a flow time in said nozzle that is short compared to the effective relaxation time of said upper laser level and long compared to the effective relaxation time of said lower laser level, the flow of said gas being through said chamber and out of said exhaust, and an optically resonant cavity coupled to said stream.

4,011,522

## RADIAL FLOW LASER

Theodore John Falk, Clarence, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Feb. 6, 1974, Ser. No. 440,214

Int. Cl.<sup>2</sup> H01S 3/02, 3/09

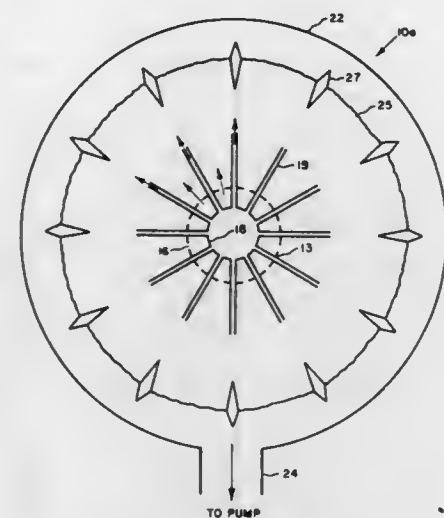
U.S. Cl. 331—94.5 G

28 Claims

1. A method for producing a population inversion in a laser device by the reacting of first and second reactants including the steps of:



supplying the first and second reactants to supply means located in the interior of the laser device; radially delivering the first reactant from the supply means;



radially expanding the first reactant to a desired Mach number; reacting the second reactant with the expanded first reactant whereby a population inversion is achieved.

4,011,523

## AZIMUTHAL MODE CONTROL FOR LASER

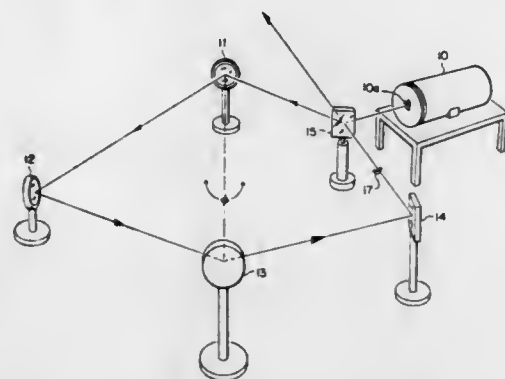
Dennis N. Mansell, Rancho Palos Verdes; Donald L. Bullock, Los Angeles, and Stuart G. Forbes, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 21, 1975, Ser. No. 624,355

Int. Cl.<sup>2</sup> H01S 3/083

U.S. Cl. 331-94.5 C

3 Claims



1. A laser system of the type having a large Fresnel number and an azimuthal mode control for its output beam, said system comprising:

- a laserable medium;
- means for pumping said laserable medium;
- an optical resonant cavity enclosing said medium for generating an output beam;
- means for geometrically rotating and optically mixing the output beam within said cavity;
- means for feeding the output beam back through the laser system; and
- output means for removing the beam from the system.

4,011,524

## OPTICAL ELEMENT FOR A LASER

Arthur Herbert Firester, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 490,401, July 22, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 632,061

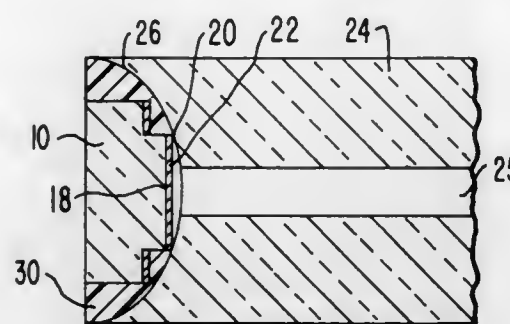
Int. Cl.<sup>2</sup> H01S 3/08

U.S. Cl. 331-94.5 C

3 Claims

1. A laser device comprising a tube having on an outer surface thereof a cavity with a concave surface, an opening

into the tube through a central portion of the concave surface, a glass block secured to said tube and extending within said cavity and across said central concave surface portion, a part of said glass block formed as a projection extending toward



said opening, said projection having an annular edge seated in line contact against the concave surface of said cavity and extending around said opening, said projection including an optical reflector enclosed within said annular edge and extending across said opening.

4,011,525

## GAS LASER GENERATOR

Bruno Godard, Gif sur Yvette, France, assignor to Compagnie Generale d'Electricite, Paris Cedex, France

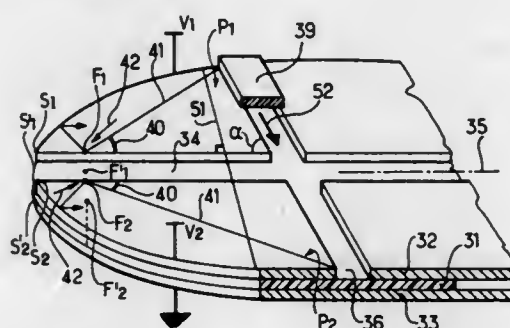
Filed Dec. 31, 1975, Ser. No. 645,775

Claims priority, application France, Jan. 21, 1975, 75.01795

Int. Cl.<sup>2</sup> H01S 3/097, 3/22

U.S. Cl. 331-94.5 PE

7 Claims



1. In a laser generator comprising: a gaseous active medium; at least one electric excitation line formed by an insulating plate inserted between first and second parallel metallic plates, said first metallic plate having at least one slot separating it into two distinct parts; means for maintaining a gaseous active medium in said slot comprising a longitudinal insulating strip closing the slot and fixed to the said two parts of the first metallic plate; and circuit means for setting up a substantially punctual discharge between said metallic plates suitable for generating a progressive current wave in said line, the improvement comprising:

each said metallic plate comprising at least one section in the shape of a half parabola with pseudofocusses as well as the pseudo-apexes of those half parabolas being respectively arranged on the same straight line perpendicular to the plane of the plates, the rectilinear part of said half parabola forming an angle  $\alpha$  which is greater than zero with said slot, and wherein said circuit means sets up said discharge at the level of the pseudo-focusses of said half parabolas generating said progressive current wave.

4,011,526

## TEMPERATURE COMPENSATED SURFACE ACOUSTIC WAVE OSCILLATOR

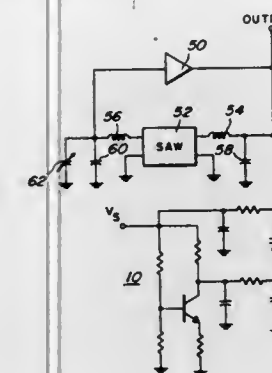
Robert Guy Kinsman, Naperville, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1976, Ser. No. 646,451

Int. Cl.<sup>2</sup> H03B 5/04, 5/32; H03J 3/04

U.S. Cl. 331-107 A

7 Claims



1. Apparatus for temperature stabilizing a tunable circuit, said circuit having a frequency drift characteristic parabolically related to temperature, said circuit further adapted for tuning by a reactance means connected thereto, the apparatus comprising:

- a signal variable reactance means, comprised of two series connected varactor diodes, each diode having a  $\delta > 1$ , where  $\delta$  is a factor relating varactor capacity to applied control voltage, coupled to the tunable circuit, for producing a reactance characteristic predeterminedly related to an applied control signal; and
  - a temperature sensitive signal source means coupled to the signal variable reactance, for generating a control signal predeterminedly dependent on sensed temperature such that the reactance of the signal variable reactance varies predeterminedly as a continuous, true parabolic function of temperature;
- whereby temperature drift of the tunable circuit is substantially compensated by a corresponding temperature dependent change in the signal variable reactance.

4,011,527

## TEMPERATURE COMPENSATED MICROWAVE CAVITY TRANSISTOR OSCILLATOR

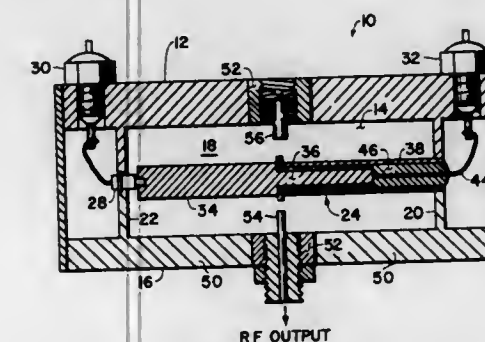
Richard Calvin Havens, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Aug. 28, 1975, Ser. No. 608,422

Int. Cl.<sup>2</sup> H03B 5/18

U.S. Cl. 331-117 D

3 Claims



1. A cavity oscillator, comprising in combination: a resonant chamber having lateral side walls of a predetermined dimension and first and second end walls; a solid state oscillating element for generating energy at a predetermined frequency, said element being disposed through said first end wall and projecting coaxially into said resonant chamber; means for applying a first direct current (dc) bias potential to said oscillating element externally of said resonant chamber;

output means disposed through side walls of said resonant chamber for extracting power therefrom at said predetermined frequency;

an inner conductor coaxially disposed in said resonant chamber which includes a cylindrical rod member attached at one end thereof to said oscillating element and a hollow sleeve member disposed through said second end wall of said resonant chamber, said cylindrical member having a turned down portion of a predetermined length and being terminated in a radio frequency (RF) open circuit with said hollow sleeve member being insulatively disposed thereabout, and;

means for applying a second direct current (dc) bias potential to said oscillating element, said means being disposed within said hollow sleeve member and connected to said turned down portion of said inner conductor; and tuning means disposed through said side wall of said resonant chamber and being capacitively coupled to said inner conductor for varying the frequency of the oscillator.

4,011,528

## SEMI-LUMPED ELEMENT COUPLER

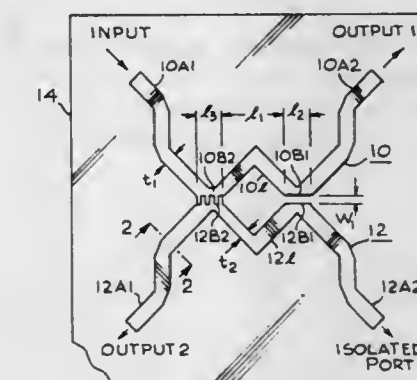
Allen F. Podell, Los Altos, Calif.; Leo Young, Bethesda, Md.; Arthur Karp, Palo Alto, and Donald R. Chambers, Menlo Park, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed July 14, 1975, Ser. No. 595,395

Int. Cl.<sup>2</sup> H01P 5/18

U.S. Cl. 333-10

5 Claims



1. A microwave coupler comprising a dielectric substrate, a first conductor substantially in the form of a W deposited on said substrate, a second conductor substantially in the form of a W which is substantially a mirror image of the first conductor deposited on said substrate with the two base sections of said second conductor W capacitively spaced opposite the two base sections of the W formed by said first conductor, and a conductive coating deposited on the opposite side of said substrate.

4,011,529

## DIRECTIONAL POWER DETECTOR FOR PROPAGATING WAVES

Arthur Garcia, Woodbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,886

Int. Cl.<sup>2</sup> H01P 5/18

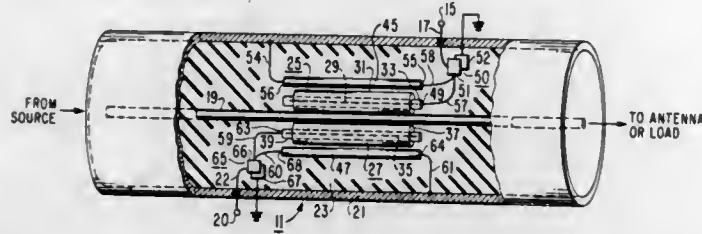
U.S. Cl. 333-10

5 Claims

1. In combination, a distributed capacitive pick-up element coupled in series with a capacitor and positioned along a given length of one of the conductors of a transmission line for providing through said capacitor a first current proportional to the transmission line voltage, a linear lumped element resistor body coupling element



coupled in series with said capacitor and positioned along and closely spaced to said one conductor for providing strong mutual inductance therebetween and through said capacitor a second current in proportion to the transmission line current.



said resistor body coupling element being a linear body of essentially highly resistive material extending substantially said same given length of said one conductor and in the approximate region of said capacitive pick-up element to maintain the phase and magnitude of said second current relative to said line current essentially independent of frequency over a broad band of frequencies.

4,011,530

### TWO-PATH TELEPHONE LINE EQUALIZATION SYSTEM

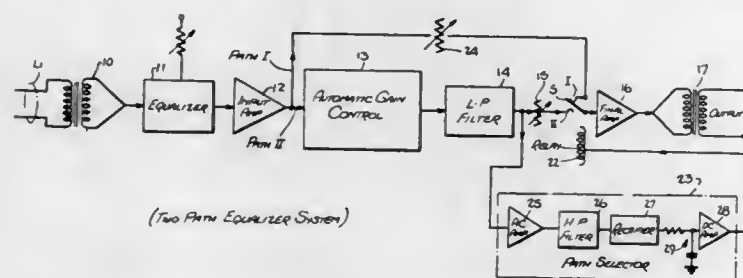
Lawrence M. Carver, Stamford, Conn., assignor to TM Systems, Inc., Bridgeport, Conn.

Filed Mar. 3, 1976, Ser. No. 663,235

Int. Cl.<sup>2</sup> H03H 7/14; H04M 7/00

U.S. Cl. 333—28 R

6 Claims



1. A two-path equalizing system interposable in a telephone line carrying supervisory signals whose frequencies lie below a 3 KHz limit and data signals whose frequencies are primarily above this limit, the system comprising:

- A. an input circuit coupled to said line to receive the incoming signals;
- B. an equalizer to compensate for line losses over the entire range of said frequencies;
- C. an automatic gain control circuit;
- D. a manually-adjustable gain control device;
- E. an output amplifying circuit coupled to said line to return equalized signals thereto;
- F. a first path in which incoming signals from said input circuit are applied through said equalizer to said output circuit via said manually-adjustable gain control circuit;
- G. a second path in which incoming signals from said input circuit are applied through said equalizer to said output circuit via said automatic gain control circuit;
- H. a switch which, when actuated, transfers the system from operation in a first path mode to operation in a second path mode, the switch normally maintaining the system operative in the first path mode; and

I. an automatic mode selector responsive only to signals in the data signal frequency range and coupled to said switch to actuate same whereby only data signals pass through said second path.

### 4,011,531 MICROWAVE ATTENUATOR HAVING COMPENSATING INDUCTIVE ELEMENT

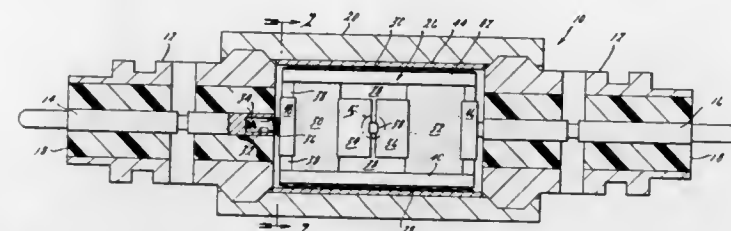
Herbert C. Gaudet, Ann Arbor, Mich., assignor to Midwest Microwave, Inc., Ann Arbor, Mich.

Filed Sept. 29, 1975, Ser. No. 617,789

Int. Cl.<sup>2</sup> H01P 1/22

U.S. Cl. 333—81 A

15 Claims



1. A microwave attenuator comprising:
  - a pair of first conductors, one being adapted to receive microwave energy and the other being adapted to transmit an attenuated portion of said microwave energy received at said one conductor;
  - a ground conductor associated with said first conductors of establishing a microwave transmission path therebetween; and
  - an attenuator element including a dielectric member having disposed thereon at least two resistive members, one electrically connected in series to said one conductor and in shunt to said ground conductor and another electrically connected in series to said other of said first pair of conductors and in shunt to said ground conductor, said attenuator element further including a first center conductor intermediate portion having a predetermined transverse width disposed on said dielectric member between said two resistive members, a second center conductor intermediate portion having a predetermined transverse width disposed on said dielectric member between said two resistive members and connected in series to said another resistive member whereby series connection of the entirety of said transverse width of said center conductor intermediate portions would provide a db value of said microwave attenuator which would tend to decline in value as frequency increases, said center conductor intermediate portions being spaced apart so as to define a gap therebetween, and at least one inductive member disposed on said dielectric member and bridging said gap between said first and second center conductors intermediate portions for providing a series electrical connection therebetween, said at least one inductive member having predetermined dimensions including a transverse width which is substantially less than said transverse widths of said center conductor intermediate portions to provide a value of inductance which compensates for the tendency of the db value of said microwave attenuator to decline as frequency increases so that the overall db value of said attenuator element remains substantially constant over a wide range of microwave frequencies.

4,011,532

### FAST ACTING WAVEGUIDE COUPLER

Norman P. Williams, Linthicum Heights; Roald N. Horton, Ellicott City, and Frank A. Ruff, Annapolis, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 14, 1976, Ser. No. 649,107

Int. Cl.<sup>2</sup> H01P 1/04; F16L 37/00

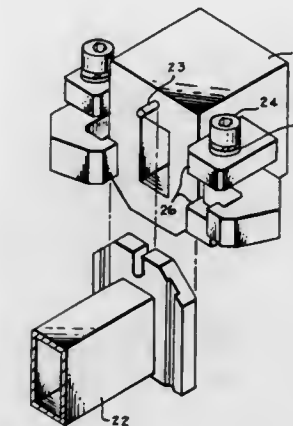
U.S. Cl. 333—98 R

6 Claims

1. Means for coupling first and second structural members comprising
  - flange means extending the coupling surface of said first structural member, and

clamp means connected to lock the coupling surfaces of said structural members together, said clamp means comprising

at least one connector means slideably engaged with said second structural member and adaptable to fixed engagement with the flange of said first structural member, the slideable end of each connector means having a cone-shaped recess therein, and



a threaded member having a cone-shaped end portion associated with each connector means, each said threaded member being threaded through a portion of said second structural member and positioned to matingly engage its cone-shaped end portion in the cone-shaped recess of its associated connector means.

4,011,533

### MAGNETICALLY ACTUATED SWITCH FOR PRECISE RAPID CYCLE OPERATION

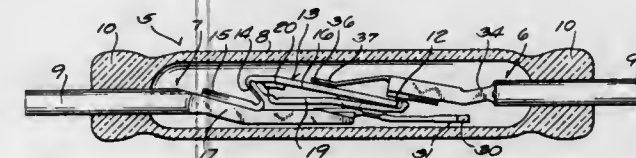
John Dominic Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Jan. 14, 1976, Ser. No. 648,892

Int. Cl.<sup>2</sup> H01H 51/28, 3/60

U.S. Cl. 335—154

13 Claims



1. An electrical switching device wherein a movable contacting element is biased in one direction of its motion and is moved in the opposite direction by an actuating force, and wherein movement of said contacting element in one of said directions brings it into abrupt engagement with a cooperating element, said switching device being characterized by:

- A. said cooperating element being
  1. so supported as to be capable of vibratory motion at one natural frequency and
  2. so located and oriented that energy transferred thereto by abrupt engagement of said contacting element thereagainst tends to produce oscillatory motion of said elements, engaged with one another and acting as a system, in said directions and at another frequency; and
- B. a plurality of elongated vibratile members, each secured at one end in vibration transmitting relationship to said cooperating element and projecting away from the same, and each having its length transverse to said directions so that said vibratile members can vibrate in said directions relative to the cooperating element,
  1. the natural fundamental frequency of such vibration of every vibratile member being substantially resonant with said other frequency so that energy which tends to cause high amplitude of oscillation of the engaged elements can be transferred to and stored by the vibratile members to be manifested in their vibrations, but

2. said vibratile members having different natural fundamental frequencies of such vibration so that their vibrations mutually interfere to delay retransfer of energy back to the cooperating element until such energy has been substantially dissipated in internal friction of the vibratile members.

4,011,534

### MAGNETIC RELAY

Charles D. Flanagan, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

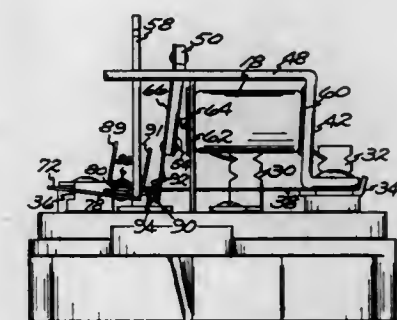
Filed Nov. 25, 1974, Ser. No. 526,654

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> H01H 45/00

U.S. Cl. 335—186

13 Claims



1. A manually set magnetic interlock bypass relay comprising:

- a. a base;
- b. electrical interlock switch means mounted on said base operatively connectable in a load circuit;
- c. electromotive force generating means including an electromagnetic coil operatively connected to the electrical interlock switch means for opening the load circuit upon energization of the coil;
- d. bypass switch means mounted on said base connected in parallel with said electrical interlock switch means including a movable contact arm and a relatively stationary contact arm in overlaying relationship for movement in and out of electrical contact to close and open a circuit through the bypass switch means;
- e. latch means operatively engageable with the movable contact arm of the bypass switch means for holding said movable arm in a first and second latched position in contact with the stationary arm of the bypass switch means;
- f. the electromotive force generating means also being operatively coupled to the latch means of the bypass switch means for moving the latch means from a first latched position to a second and then to an unlatched position; and
- g. manually operable actuator means engageable with the movable contact arm of the bypass switch means for moving the movable arm into the first latch position.

4,011,535

### VAPORIZATION COOLED TRANSFORMER

Philip G. Kosky, Bethlehem, Pa., and Heinz Jaster, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 9, 1976, Ser. No. 703,859

Int. Cl.<sup>2</sup> H01E 27/10

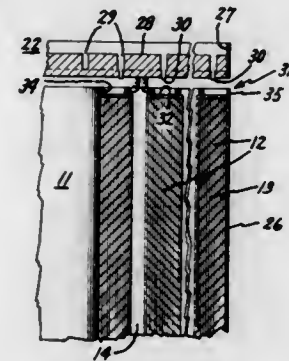
U.S. Cl. 336—57

6 Claims

1. A hermetically sealed vaporization chamber containing heat producing electrical apparatus to be cooled while dielectrically protected and two phase dielectric fluid comprising a liquid and a vapor, said apparatus including a plurality of cooling ducts extending vertically therethrough, said liquid residing at a bottom portion of the chamber and having a liquid level above the bottom of the chamber, said liquid also



being distributed as a film which coats the wall surfaces of the vertical ducts, said vapor being produced by vaporization of said liquid by said heat produced by said apparatus, said vapor occupying space in said chamber above said liquid level, a condenser having one end thereof connected to and communicating with an upper portion of said vaporization chamber occupied by said vapor, a reservoir containing a predetermined mass of non-condensable dielectric gas positioned above said condenser, said condenser having another end connected to and communicating with said reservoir and said gas therein, said gas forming an interfacial contact with said vapor in said condenser at a region therein between said ends of said condenser, said vapor condensing to form liquid con-



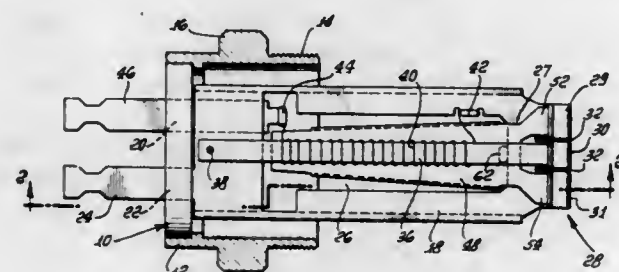
densate in the condenser on one said interfacial contact so that the effective condensation area of said condenser lies between said one end of said condenser and said interfacial contact; distribution means in said chamber positioned above said electrical apparatus for receiving liquid condensate from said condenser, a liquid dam positioned on the upper edges of the apparatus adjacent the associated vertical ducts, the distribution means distributing the liquid condensate uniformly to the liquid dam, the liquid dam distributing the liquid condensate uniformly as a film over the wall surfaces of the adjacent vertical ducts, and a condensate make-up pump for pumping liquid from the bottom portion of the chamber to said distribution means.

#### 4,011,536 LIQUID SENSOR

Lon E. Bell, Altadena, and Robert W. Diller, Pasadena, both of Calif., assignors to Technar Incorporated, Arcadia, Calif.  
Filed Nov. 25, 1974, Ser. No. 526,470  
Int. Cl.<sup>2</sup> H01H 61/02

U.S. Cl. 337-141

6 Claims



1. A liquid sensor comprising a frame, a temperature sensitive expansion element mounted on the frame, an electrical heater element operatively associated with the expansion element for applying heat to the expansion element to raise its temperature above ambient, and means actuated in response to changes in length of the expansion element for indicating change in temperature of the expansion element, the liquid being sensed being brought into heat transfer relation with the expansion element for removing heat from the expansion element to lower its temperature and actuate said indicating means, the expansion element including an elongated strip anchored at both ends to the frame, an elongated flat spring member forming a switching element anchored at one end to the frame, the other end of the spring member moving with

bending of the spring member about the anchored end, and means connecting the spring member to the expansion element so that the spring member is deflected by lateral movement of the expansion element between the anchored ends.

#### 4,011,537 COMPOSITE DROPOUT FUSE DEVICE

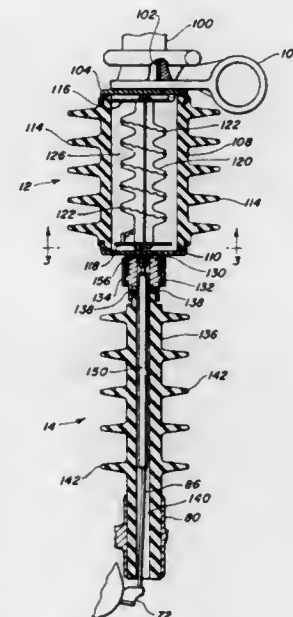
Hiram Solomon Jackson, Jr., Northbrook, and Thomas J. Tobin, Morton Grove, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Nov. 19, 1975, Ser. No. 633,373

Int. Cl.<sup>2</sup> H01H 71/20

U.S. Cl. 337-171

8 Claims



1. A high voltage fuse device for interrupting current between two portions of an electrical circuit comprising:

- a current limiting section comprising:
  - a hollow insulating first housing;
  - a first end wall mounted to and closing one end of said first housing;
  - a second end wall mounted to and closing the other end of said first housing;
  - at least one first fusible member within said first housing electrically connected between said first and second end walls, said first fusible member comprising a current responsive electrically conducting material that is meltable in response to a first current-time characteristic to interrupt current, said first fusible member being formed into a non-linear path within said first housing, the balance of the space within said housing being filled with electrically non-conducting filler material surrounding said first fusible member;
- a fuse section serially connected to said current limiting section comprising:
  - a hollow insulating second housing;
  - a second fusible member within said second housing and electrically connected to said first fusible member, said second fusible member formed of an electrically conducting material that is meltable in response to a second current-time characteristic to interrupt current;
  - said first and second housings each having surface elongating means on the exterior thereof;
  - whereby a broad spectrum of fault currents can be interrupted without external flashover arcing.

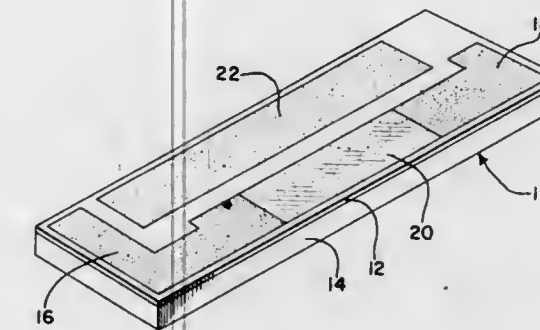
#### 4,011,538 FLUID SENSOR

John G. Froemel, San Diego, Calif., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 30, 1976, Ser. No. 653,161

Int. Cl.<sup>2</sup> H01L 7/00

U.S. Cl. 338-35



1. A fluid sensor comprising a molecular sieve layer, first and second spaced-apart electrodes and a resistance material deposited on said layer so as to make an electrical connection between said first and second electrodes.

#### 4,011,539 SEISMIC DETECTOR ARRAYS

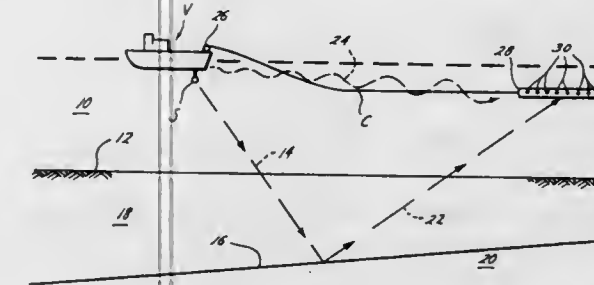
John R. Rogers, Stafford, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,420

Int. Cl.<sup>2</sup> G01V 1/20

U.S. Cl. 340-7 R

18 Claims



1. Seismic survey cable apparatus for producing seismic survey data with reduced noise, comprising: a detector array of a plurality of seismic detectors distributed along the length of a cable, the detectors being located within said array at positions to achieve a detector density conforming to a Gaussian frequency distribution within a frequency band of desired signals to thereby reduce noise in the survey data.

#### 4,011,540 COMBINED ELECTRET HYDROPHONE AND TRANSMISSION LINE

John B. Farr, Houston, Tex., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 22, 1976, Ser. No. 651,668

Int. Cl.<sup>2</sup> G01V 1/38

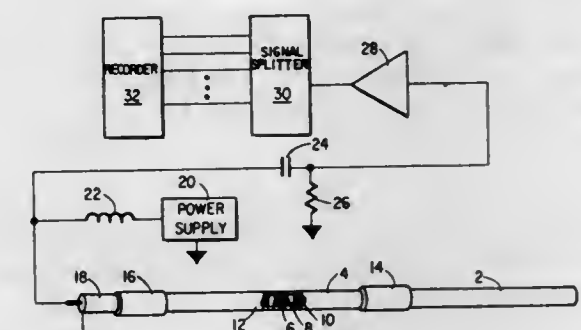
U.S. Cl. 340-7 R

13 Claims

1. A hydrophone streamer comprising: a plurality of transmission line segments, each segment comprising at least two conductors and a dielectric spacer between said conductors, wherein said transmission line has capacitance between said conductors which varies in response to acoustic waves which impinge upon the transmission line, and wherein a voltage change is generated between said conductors proportional to said capacitance change; and electronic circuit means for coupling two or more of said transmission line segments into a linear array of said segments, said circuit means comprising a voltage con-

trolled oscillator coupled to a first of said segments for generating a carrier wave signal having a characteristic modulated by said voltage change and for coupling the modulated carrier signal to a second segment.

12. In a marine streamer, the use of a transmission line segment having at least two conductors and a dielectric separating the conductors wherein said dielectric has a static elec-



trical charge permanently stored therein, said use comprising the simultaneous conversion of seismic energy impinging upon said segment into an electrical signal to be detected on said conductors and transmission of modulated carrier wave signals representative of electrical signals generated by other separate and distinct detectors which form a part of said streamer.

#### 4,011,541 SINGLE WIRE SYSTEM WITH DELAY SWITCHING CIRCUIT FOR SELECTIVE CONTROL OF NAVIGATION AND STROBE LIGHTS

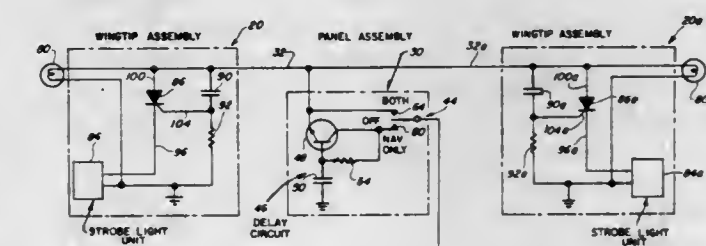
Lloyd W. Fabry, 1120 Manor Drive, Wilmette, Ill. 60091, and Thomas Vinton Brame, 2715 N. 77th Ave., Elmwood Park, Ill. 60635

Filed June 20, 1975, Ser. No. 588,785

Int. Cl.<sup>2</sup> G08E 5/00

U.S. Cl. 340-25

6 Claims



1. In an aircraft lighting system including a D.C. voltage power supply in which the metal air frame is ground, wing tip mounted navigation lights and anti-collision strobe lights, and circuit means for illuminating the navigation lights and for activating the anti-collision strobe light units, the improvement comprising:

- means for selectively turning off and turning on the anti-collision lights while maintaining the navigation lights illuminated, said improvement obviating any need to disassemble airplane wing and fuselage components for the installation of supplemental wiring,
- and constituting electrical power control and first switching means for selectively supplying operating voltage to the navigation lights and strobe light units together, and the navigation lights alone, and operable using a single wire conductor only from said D.C. voltage power supply to the site of said navigation lights and said strobe light units for delivery of lamp-illuminating power thereto, said improvement including:
- second switching means interposed between and interconnecting said circuit means and said strobe light units for controlling the application of voltage from the power supply thereto;
- delay circuit means for controlling actuation of said second switching means,



said first switching means being positionable between a first position in which said delay circuit means is by-passed to establish a circuit flow path directly from the D.C. voltage power supply to both the navigation lights and the strobe light units, thereby to deliver to said aircraft lighting system voltage effective to energize concurrently both said navigation lights and said anti-collision strobe units, and a second position in which said delay circuit means is interposed electrically between said power supply and said second switching means to maintain said second switching means open to preclude the application of voltage to said strobe light units but not interfering with the illumination of said navigation lights.

4,011,542

## REDUNDANT DATA TRANSMISSION SYSTEM

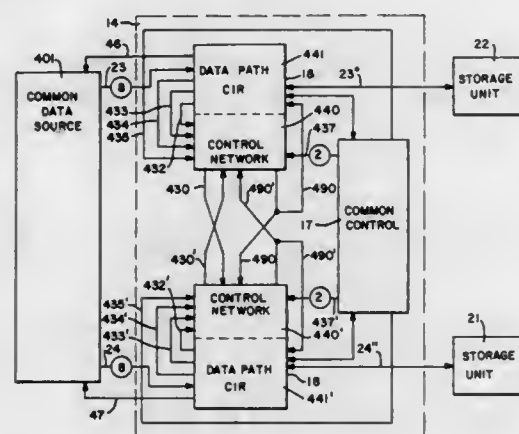
James R. Baichtal, and John C. McDonald, both of Los Altos, Calif., assignors to TRW Inc., Los Angeles, Calif.

Division of Ser. No. 365,045, May 29, 1973. This application Oct. 10, 1974, Ser. No. 513,880

Int. Cl.<sup>2</sup> H04Q 9/00; G08B 19/00

U.S. Cl. 340—147 LP

9 Claims



1. In a system including a plurality of independent and redundant data paths wherein each data path is activated by a different enabling signal and including alarm means for generating alarm signals of different priority classes, an apparatus for controlling the active and inactive states of the data paths as a function of alarm signals comprising,

a plurality of control networks, each one associated with a different data path for controlling the state of the associated data path with an enabling signal, each of said control networks including enabling means responsive to one or more alarm signals for forcing the associated data path inactive provided no other enabling means receives a higher priority alarm and including means for enabling the associated data path active in response to an inactive state of an enabling signal from another enabling means.

4,011,543

## LOW CROSSTALK OPTICAL SWITCH

Richard A. Soref, Newton Centre, and Lloyd R. Schissler, Jamaica Plain, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 20, 1976, Ser. No. 660,196

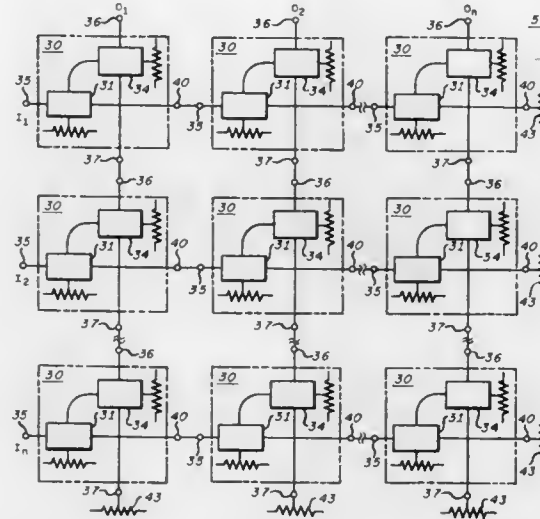
Int. Cl.<sup>2</sup> G02B 5/14; G02F 1/00; H04B 9/00; H04Q 1/00

U.S. Cl. 340—166 R

15 Claims

1. A low crosstalk optical switch comprising: first means selectively operable in a first mode and a second mode having an input port and first and second output ports for switchably coupling said input port to said first and second output ports, said input port being coupled to said first output port during operation in said first mode and to said second output port during operation in said second mode; and second means selectively operable in a first mode and a second mode having a first input port coupled to said first

output port of said first switching means, a second input port and an output port, for switchably coupling said first and second input ports to said output port, said output port being coupled to said first input port during operation in said first mode and to said second input port during operation in said second mode whereby an optical signal at said input port of said first switching means is coupled to said output port of said second switching



means when said first and second switching means are simultaneously operating in said first mode, and an optical signal at said input port of said first switching means is coupled to said second output port of said first switching means and an optical signal at said second input port of said second switching means is coupled to said output of said second switching means when said first and second switching means are simultaneously operating in said second mode.

4,011,544

## CONTROL SYSTEM HAVING A PROGRAMMED LOGIC UNIT

Antoine Cherrey, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

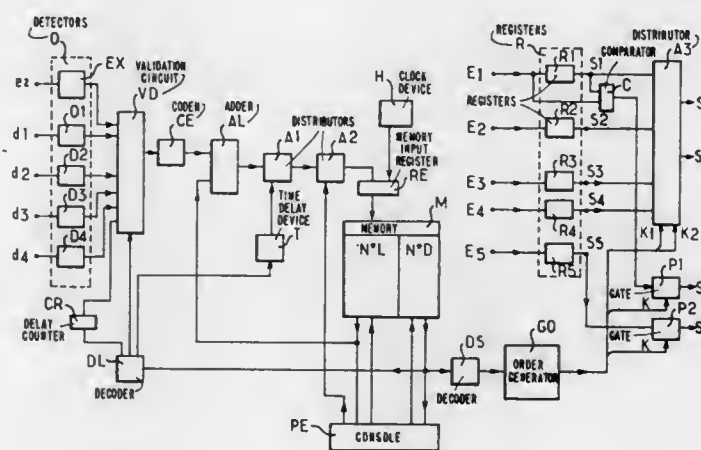
Filed Dec. 13, 1974, Ser. No. 532,575

Claims priority, application France, Dec. 20, 1973, 73.45708

Int. Cl.<sup>2</sup> G05B 11/32; G06F 3/00

U.S. Cl. 340—172.5

5 Claims



1. Logic control system intended for controlling a set of elements by transmitting data and orders to the set of elements, more particularly for use in a telecommunication exchange, comprising:

a directly addressable memory and associated addressing means, a set of input detectors receiving data concerning the state of the said elements, a set of registers for storing said data to be transmitted to said set of elements to be controlled, and

output means connected to said set of registers and receiving as inputs the data stored in said registers for sending to said elements orders and data,

said memory being composed of addressable lines, each containing a line number and a coded instruction word, which is sent to the said addressing means and output means, and the said addressing means comprising: an address register connected to said memory,

an adder having its output connected to said address register and one of its inputs connected to said memory, said adder receiving as one input a line number from said memory,

a validation circuit, whose inputs are connected to the outputs of the said detectors, and controlled by instruction words each allowing the selection of at least one input detector,

a coder, whose inputs are connected to the outputs of the validation circuit and delivering at its output a binary number to said adder to be added to said line number supplied to said adder from said memory in order to obtain the address of the next line to be read in the memory, said binary number from said coder corresponding to the address increment to said address of the next line to be read in the memory.

4,011,545

## COMPUTER AND COMMUNICATIONS SYSTEMS EMPLOYING NEW ARCHITECTURES

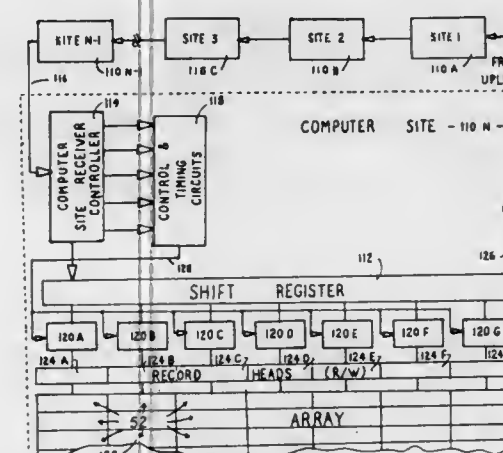
Mark T. Nadir, Warren, N.J., assignor to Ridan Computers, Inc., White Plains, N.Y.

Filed Apr. 28, 1975, Ser. No. 569,651

Int. Cl.<sup>2</sup> G06F 15/16

U.S. Cl. 340—172.5

60 Claims



1. Communication system for transferring data between a large number of sites over transmission line means wherein said sites can each be originating and/or receiving sites, comprising:

sync and counting means, at each site, for detecting a plurality of repetitive time or space oriented matrices on said transmission line means for conveying and/or storing data, each said matrix including a determinator section having a multiplicity of address positions for entry into addresses of those sites seizing an address position in a given matrix, and an array section having a plurality of nests for transmitting and receiving data, whereby the number of said address positions in a given matrix is much smaller than the size of the address set of the sites in the system;

an available address position detector, at each site, connected to said sync and counting means for detecting an available or empty address position in said determinator section;

address entry means, at each originating site, responsive to said available address position detector, for entering the address for an intended receiving site in said detected empty determinator address position to thereby seize said position;

address receiving means, at each receiving site, including an address detector for detecting its own address received in said determinator section;

secondary number generating means, at each originating site, responsive to said address entry means, for providing a secondary number that is used to identify and locate those nests of said array section wherein data from said originating site is entered;

a secondary number receiving means, at each receiving site, responsive to said address receiving means, for determining the same secondary number being used in a given matrix by its originating site so that those nests containing data for said receiving site can be identified and located; array data location means, at the originating and receiving sites, responsive to said sync and counting means and said respective secondary number generating means and secondary number receiving means, for locating those array nests identified by a secondary number;

array data entry means, at the originating sites, responsive to said array data location means, for entering data in those located nests for communication to intended receiving sites;

array data receiving means, at each receiving site, responsive to said array data location means, for receiving said intended data sent by its respective originating site in said located nests; and

address deletion means, at each receiving site, responsive to said array data receiving means, for deleting the address received by said site in said address position in the determinator section after data is received in the nests of the same matrix, thereby making said address position available to other sites desiring entry into said matrix; whereby said data entered and received in said array nests is communicated between an originating and receiving site by means of the secondary number for the duration of the matrix in which an address position has been seized

4,011,546

## DISPLAY APPARATUS

Yoshihiro Kawata, and Kansei Iwata, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

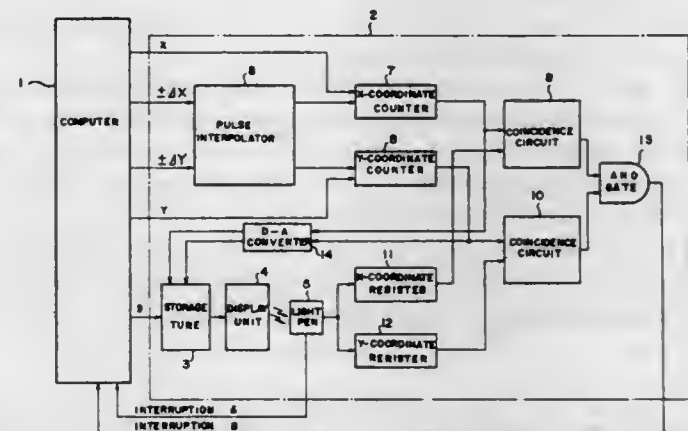
Filed July 22, 1975, Ser. No. 598,018

Claims priority, application Japan, July 27, 1974, 49-86282; July 27, 1974, 49-86284; July 27, 1974, 49-86285

Int. Cl.<sup>2</sup> G06F 3/14

U.S. Cl. 340—172.5

4 Claims



1. In display apparatus of the type wherein a picture image corresponding to an information train given by an electronic computer is written in a storage tube and the content of the storage tube is repeatedly read out of the storage tube to display the picture image on the screen of a cathode ray tube, the improvement which comprises coordinate registers adapted to store the content of the coordinate values of the position of a light pen on said screen of the cathode ray tube when the light pen receives light, coordinate counters connected to receive the information train, directly and through a pulse interpolator, from said electronic computer for changing







E. a quantity of non-toxic material substantially filling the interior of the capsule, said material being one that passes from a solid state to a liquid state at a temperature substantially equal to said predetermined value and upon the addition of latent heat of fusion thereto, so that when said material is in its solid state the temperature of said element cannot rise above said value until a substantial amount of heat has been added to said material.

4,011,553

# REMOTE DETECTOR TO INDICATE LEAKAGE OF LIQUIDS IN TOILET TANKS

Luis Delgado Barri, Benito Juarez y Madero, Tampico, Tamaulipas, Mexico

Continuation of Ser. No. 503,897, Sept. 6, 1974, abandoned.

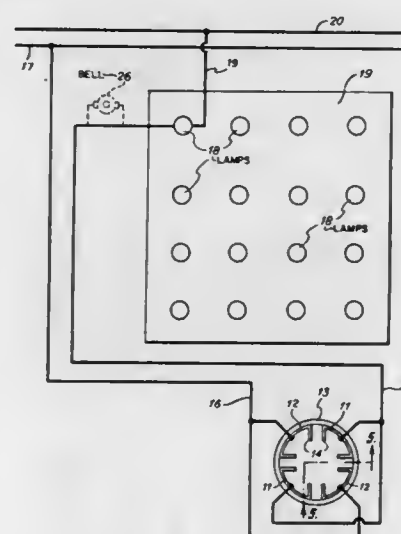
This application Mar. 19, 1976, Ser. No. 669,433

Claims priority, application Mexico, Oct. 24, 1973, 146996

Int. Cl.<sup>2</sup> G08B 21/00

U.S. Cl. 340—242

1 Claim



1. A remote detector to indicate discharge of electrically-conductive liquid from a stationary tank having at least one outlet pipe, comprising:

an annular support member of electrically-insulating material located within said outlet pipe;

a pair of arcuate electrodes constituted by respective curved plates of electrically-conductive material, the curved plates being secured at their convex surfaces to the interior of the annular support member at substantially the same position along the outlet pipe but being spaced apart from one another about the inner periphery of the annular support member; first and second electrical conductor members connected to the electrodes respectively; and

remote indicator means connected to said first electrical conductor,

whereby when said second electrical conductor and said remote indicator means are connected to respective terminals of a source of electrical energy, an electrical circuit through the remote indicator means is completed, thereby to energize the indicator means, when electrically-conductive liquid establishes electrical contact between the electrodes.

4,011,554

# INTRUSION ALARM APPARATUS

George N. Butler, Boca Raton, Fla., assignor to Butler & Law Incorporated, Deerfield Beach, Fla.

Filed June 3, 1976, Ser. No. 692,330

Int. Cl.<sup>2</sup> G08B 13/26

U.S. Cl. 340—274 R

6 Claims

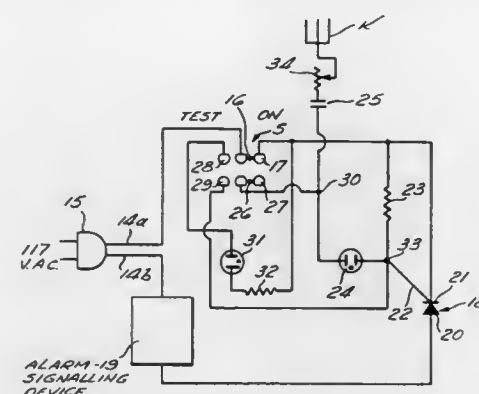
1. In an A.C.-powered alarm apparatus having: an electrical plug for insertion in an A.C. power socket; and an electrical circuit connected to said plug and including: capacitive switch means; and means for signalling an alarm in response to the operation of said capacitive switch means;

the improvement which comprises:

test switch means in said circuit which is operable

a. in a first position to disable said alarm signalling means from being operated by said capacitive switch means, and

b. in a second position to enable said alarm signalling means for operation by said capacitive switch means;



and electrically-energized polarity indicator means connected to said test switch means

a. in said first position of the latter to indicate whether the plug is inserted in the A.C. power socket with the correct polarity for operating said alarm signalling means, and

b. to be disabled in said second position of the test switch.

4,011,555

# RADIO AND TELEVISION ALARM SYSTEM

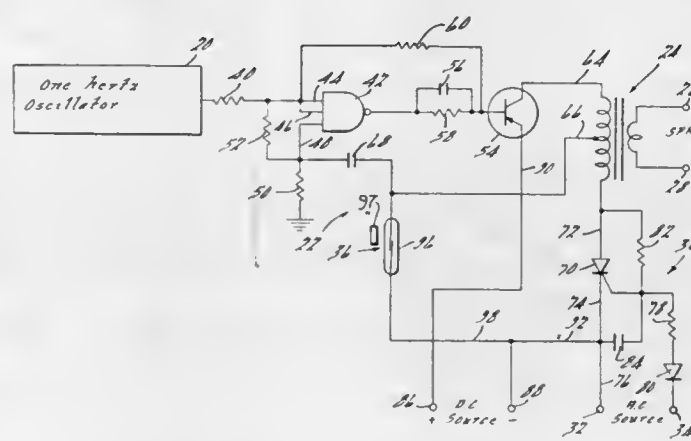
Jack L. Pearce, Roseville, Mich., assignor to Monte Markowitz, Southfield, Mich., a part interest

Filed Aug. 20, 1974, Ser. No. 498,943

Int. Cl.<sup>2</sup> G08B 21/00

U.S. Cl. 340—280

6 Claims



1. An alarm system for a portable appliance which appliance is energized from a fixed source of alternating current potential by an electrical cord having two conductors adapted to conduct the a-c potential from the fixed source to the appliance comprising first oscillator circuit means for providing output gating pulses at a first preselected audio frequency, second oscillator circuit means electrically connected with said first oscillator means for providing an output signal at a second preselected audio frequency higher than said first audio frequency, output means electrically connected with said second oscillator means for providing an audible audio output alarm in response to said second output signal when in an enabled condition and providing no audio output when in a disabled condition, said second oscillator circuit means providing a pair of distinct audio frequency signals to said output means, said output means comprising solid state switching means having a first condition disabling said output means and a second condition enabling said output means, electrical circuit means connecting said solid state switching

means to the two conductors utilized to conduct electrical energy from the fixed source to the appliance, said solid state switching means being operable independently of said first oscillator means and being in said first condition in response to the a-c potential being at the two conductors and being in said second condition in response to the a-c potential being absent at the two conductors whereby said audio output alarm will be sounded when the two conductors are removed from the a-c potential at the fixed source.

4,011,556

# GRAPHIC DISPLAY DEVICE

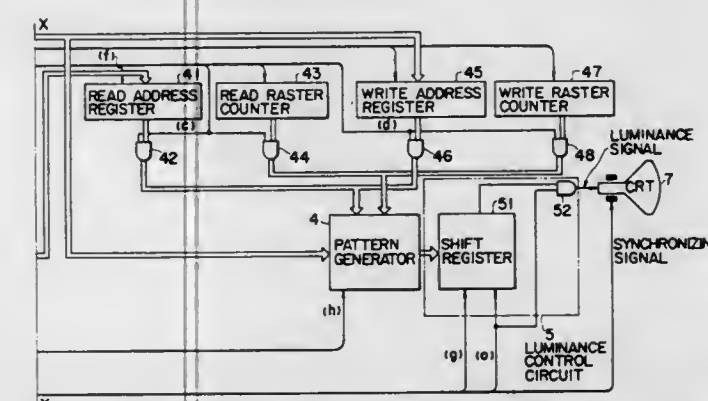
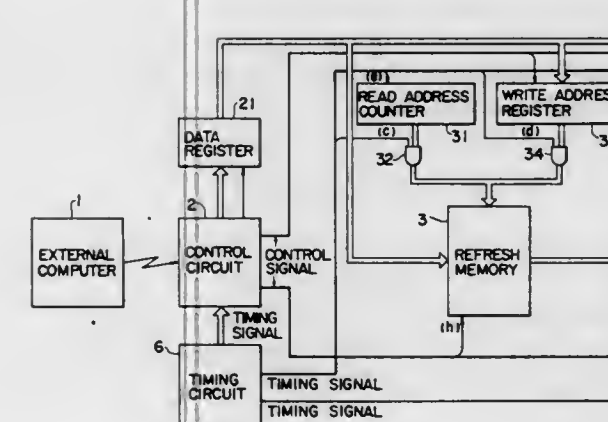
Yutaka Tochitani, Takashi Shinbata, and Yoshitsugu Morioka, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed May 28, 1975, Ser. No. 579,785

Int. Cl.<sup>2</sup> G06K 15/20; G06F 3/14

U.S. Cl. 340—324 AD

9 Claims



1. A graphic display device of the type receiving data and instructions from an external computer and displaying patterns such as alphanumeric characters, symbols, etc. upon a cathode ray tube in accordance therewith, the graphic display device having a pattern generator for storing luminance data to control the formation on the cathode ray tube of predetermined patterns, and a refresh memory for receiving and storing data designating the particular arrangement of patterns to be displayed, the display device being characterized by

a pattern generator formed with a random access memory into which data can be written and from which data can be read;

means for writing luminance data supplied by the external computer into the pattern generator memory; the refresh memory storing the addresses of the luminance data written into the pattern generator memory; and means for thereafter reading the luminance data from the pattern generator memory as designated by the refresh memory to form an arrangement of graphic patterns upon the cathode ray tube;

whereby the pattern generating memory need store formation data only for those characters actually being displayed on the cathode ray tube, and the memory thereby requires only a small storage capacity.

# DEVICE IN A TIME PIECE FOR FEEDING AN ELECTRO-LUMINESCENT DISPLAY

Fernand Chételat, Cortailod, and Pierre Hersberger, Neuchâtel, both of Switzerland, assignors to Ebauches S.A., Neuchâtel, Switzerland

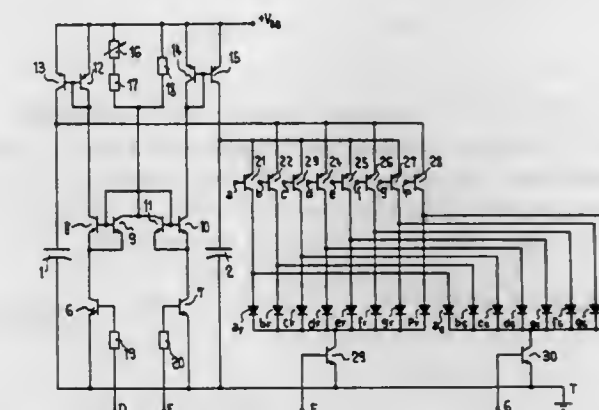
Continuation-in-part of Ser. No. 495,044, Aug. 5, 1974. This application May 13, 1975, Ser. No. 576,976

Claims priority, application Switzerland, Aug. 23, 1973, 12120/73

Int. Cl.<sup>2</sup> H01L 33/00

U.S. Cl. 340—336

11 Claims



1. A device for controlling a luminescent display having plural digits each composed of plural segments, comprising at least one current source, at least one capacitor, first switching means for controlling the charging of said capacitor from said source, and second switching means coupling said capacitor with said segments for controlling the subsequent discharge of said capacitor through a selected segment of a selected digit of said display, said switching action of said second switching means being repeated at a frequency such that the display appears continuous to the eye.

4,011,558

# DC GAS PANEL ELECTRICAL DISPLAY DEVICE

Graham Trevor Sharpless, Hassocks, England, assignor to U.S. Philips Corporation, New York, N.Y.

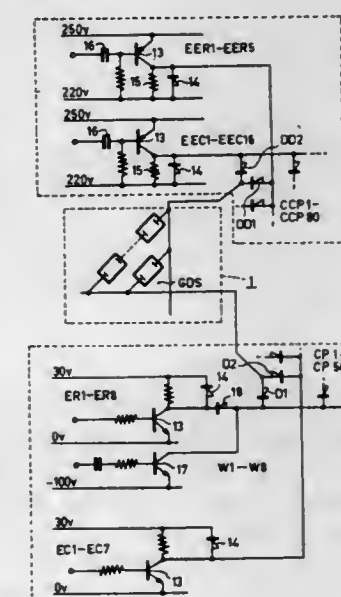
Filed Oct. 22, 1974, Ser. No. 516,985

Claims priority, application United Kingdom, Oct. 22, 1973, 49016/73

Int. Cl.<sup>2</sup> G06F 3/14

U.S. Cl. 340—324 M

6 Claims



1. An electrical display device which comprises a DC gas panel having row conductors and column conductors, an addressing circuit arranged to effect block write/random erase addressing which includes a first sub-matrix of erase driver circuits for supplying erase pulses to the row conductors and







lating oscillator whose variation in amplitude represents the variation in the pointing error of the receiving antenna from the target.

4,011,565

# METHOD OF DETERMINING IONOSPHERIC REFLECTION HEIGHT

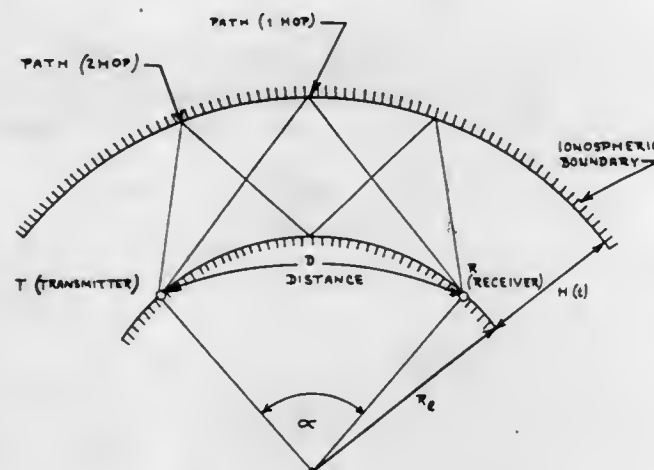
Kurt Toman, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,321

Int. Cl.<sup>2</sup> G01S 3/02

U.S. Cl. 343—112 A

3 Claims



1. The method for determining the ionospheric reflection height from doppler measurements over an oblique CW radio transmission being comprised of transmitting from a first predetermined position first and second identical CW signals obliquely toward a radial moving ionospheric boundary, said first and second signals being single-hop and multi-hop, respectively, receiving at a second predetermined position said first and second signals, the radial motion of said boundary imparting different rate-of-phase-path changes to the one-hop, multi-hop transmissions causing a separate doppler shift for each at the receiver and determining said ionospheric boundary height from the doppler ratio of each of said received one-hop and multi-hop transmissions.

4,011,566

# IN-LINE COAX-TO WAVEGUIDE TRANSITION USING DIPOLE

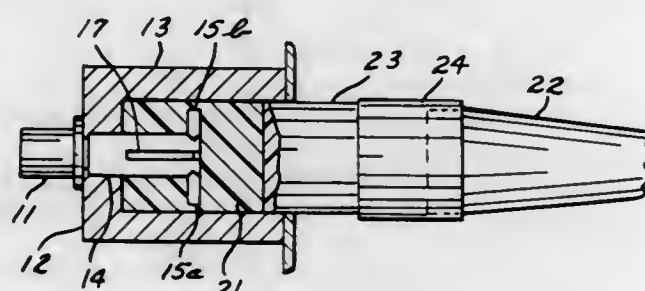
Hajime Honda, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 25, 1975, Ser. No. 599,298

Int. Cl.<sup>2</sup> H01Q 13/24

U.S. Cl. 343—785

4 Claims



1. A transition for coupling the end of a coaxial line, having a center conductor and an outer conductor, to a circular waveguide comprising:

- a dipole positioned on the said outer conductor at the said end of the coaxial line;

- a pair of axial slots positioned in the said outer conductor in a plane normal to the axis of the said dipole, extending to the end of the coaxial line;
- means for short-circuiting the said center conductor of the said coaxial line to the said outer conductor at the said end of the coaxial line;
- a dielectric material filling the said waveguide and positioning the said slotted end of the coaxial line and the said dipole in the said circular waveguide whereby the said slotted end of the coaxial line and the said dipole are imbedded in the said dielectric; and
- a dielectric rod antenna coupled to said circular waveguide.

4,011,567

# CIRCULARLY POLARIZED, BROADSIDE FIRING, MULTIHHELICAL ANTENNA

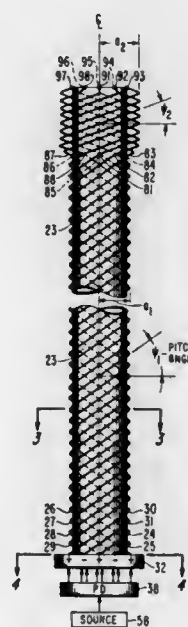
Oded Ben-Dov, Medford, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 28, 1976, Ser. No. 653,035

Int. Cl.<sup>2</sup> H01Q 1/36

U.S. Cl. 343—853

9 Claims



1. An antenna for radiating substantially circularly polarized signals over a given band of frequencies omnidirectionally about and substantially broadside a support mast comprising:

- a number N of conductors helically wound about and spaced from the support mast a given radial distance from the support mast with said conductors equally spaced from each other and wound in the same direction about the mast,
- means for coupling equal power signals at the same frequency within said given band of frequencies to said conductors so that in a plane perpendicular to the axis of the mast the phase of the signals at one conductor is 180° out of phase with the phase of the signals at the two adjacent conductors and is in phase with the signals at the conductor alternate therefrom and so that the number of 360° linear phase changes is equal to one-half the number N of helices, said conductors extending at a pitch angle and in a given radial distance approximating the following relationship:

$$M = \frac{ka}{\cos \psi}$$

where

- $M = \frac{1}{2} N$  the number of helices
- $k = 2\pi/\lambda$

where  $\lambda$  is measured at a frequency within said given band of frequencies,

$a$  = the radius of the helix,  $\psi$  is the pitch angle of the helices, and N is greater than 4 and is an even integer.

4,011,568

# ELECTROPHOTOGRAPHIC CAMERA

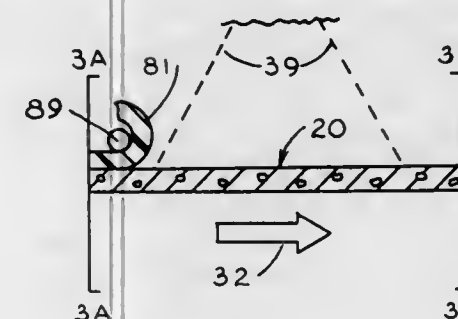
Charles D. Oughton, Interlochen, Mich., and Edward T. Bradley, Caledonia, Wis., assignors to Colorkrome, Inc., Traverse City, Mich.

Filed Nov. 1, 1974, Ser. No. 519,930

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 354—3

6 Claims



1. A camera comprising: a camera housing; lens means at the front of said camera housing for projecting a light image on a field at the rear of said camera housing; electrophotographic print material having an electrically charged electrophotoconductive surface, said charged surface being covered with a sheet of dielectric material; print support means in and at the rear of said camera housing in line with said lens means for holding an electrophotographic base in the field of said lens means such that the lens means projects its image to be photographed thereonto; shutter means mounted in said camera housing between said lens means and said support means for selectively opening and closing said lens means relative to said print support means; advancing means in said camera housing for advancing said electrophotographic print material from one side of the field of vision of said lens means, through said field of vision of said lens means and out of the field of vision of said lens means; sheet removal means in said camera housing upstream from the field of said lens means relative to the direction of advancement by said advancing means whereby said sheet of dielectric material is removed from said print as said print is advanced by said advancing means into the field of said lens means; toner applicator means in said camera housing adjacent said advancing means and out of the field projected by said lens means for applying toner to the exposed print as it is advanced by said advancing means; said housing including means facilitating removal of said print therefrom following its development.

4,011,569

# EXPOSURE CONTROL SYSTEM FOR A CAMERA

Yukio Mashimo, Tokyo, and Tadashi Ito, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 30, 1975, Ser. No. 618,124

Claims priority, application Japan, Oct. 1, 1974, 49-112926; Oct. 1, 1974, 49-112927; Oct. 21, 1974, 49-121142

Int. Cl.<sup>2</sup> G03B 7/08

U.S. Cl. 354—38

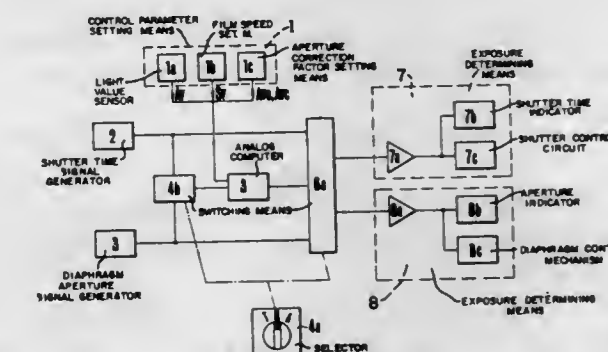
17 Claims

1. An exposure control system for a camera of the type provided with a shutter preselection automatic exposure range and with a diaphragm preselection automatic exposure range, comprising:

- a shutter time information generating means for generating an analog signal corresponding to a preselected shutter time value,
- diaphragm aperture information generating means for

generating an analog signal corresponding to a preselected diaphragm aperture value,

- light value sensor means for generating an analog signal corresponding to the level of brightness of a scene being photographed,
- selecting means having a plurality of switched positions including a first position for said shutter preselection and a second position for said diaphragm preselection automatic exposure range,
- first switching means cooperative with said selecting means and having two input terminals connected to the respective output terminals of said shutter time information generating means and said diaphragm aperture information generating means upon setting of said selecting means to either said first or said second position for causing either said shutter time dependence analog signal or said diaphragm aperture dependence analog signal to exit therefrom,



- computer circuit means responsive to the outputs of a least said light value sensor means and said first switching means for deriving an exposure value,
- second switching means cooperative with said selecting means and having three input terminals connected to the respective output terminals of said shutter time information generating means, said diaphragm aperture information generating means and said computer circuit means, and having first and second output terminals from which shutter control and diaphragm aperture control analog signals exit respectively,
- shutter time control means having an input terminal connected to said first output terminal of said second switching means for controlling the period of actuation of the shutter of said camera, and
- diaphragm control means having an input terminal connected to said second output terminal of said second switching means for controlling the size of aperture of the diaphragm means of said camera.

4,011,570

# PHOTOGRAPHIC CAMERA

Emile Frans Stievenart, Hoboken, and Hugo Frans Deconinck, Deurne-Zuid, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Dec. 2, 1975, Ser. No. 636,842

Claims priority, application United Kingdom, Dec. 4, 1974, 52504/74

Int. Cl.<sup>2</sup> G03B 17/24, 17/50

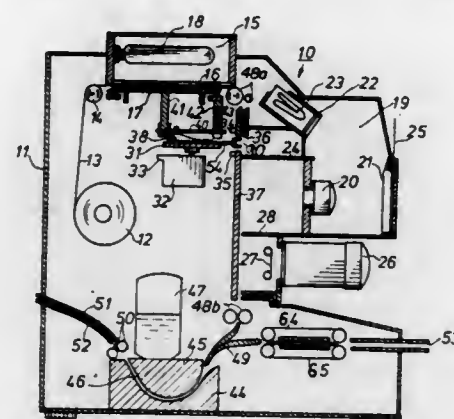
U.S. Cl. 354—89

14 Claims

1. A photographic camera for exposing a photographic light-sensitive material simultaneously to different subjects to form images thereof at different locations on such material, which camera comprises a storage station containing a roll of photographic material, at least two exposure stations arranged in succession, one of said stations incorporating masking means adapted to shield at least two areas of the material while the remainder thereof is being exposed to light at that station, the other station having optical projecting means for projecting an image of one subject onto one of said initially shielded areas and an image of at least one other subject onto another of such areas of the photographic material, transport



means for delivering predetermined lengths of photographic material from said roll to said exposure stations, severing means actuatable to sever said predetermined lengths of photo-



tographic material and web engaging means upstream of said severing means intermittently operable to immobilize the photographic material during the actuation of said severing means.

4,011,571

## VIEW FINDER FOR CAMERAS

Yasutoshi Okuzawa, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa

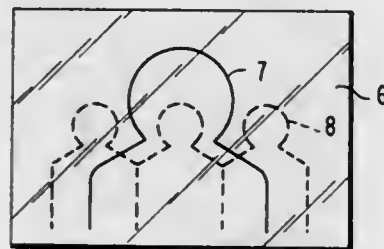
Filed Mar. 17, 1972, Ser. No. 235,696

Claims priority, application Japan, Mar. 18, 1971, 46-18470[U]

Int. Cl.<sup>2</sup> G03B 13/02

U.S. Cl. 354-219

8 Claims



1. In a view finder for a camera comprising a sight field for viewing an object to be photographed, the improvement comprising:

means for positioning within said sight field a plurality of mark means of a different size, position and configuration corresponding to, the size, position, and configuration of the objects being photographed when said objects are properly centered and positioned with respect to the camera lens system as seen through said view finder; whereby, centering of a given object to be photographed and moving the camera relative to the object such that the object within the sight field corresponds in size, position and configuration to a corresponding mark means insures a proper position of the object relative to the camera and at a proper distance therefrom.

4,011,572

## SHUTTER RELEASE MECHANISM FOR CAMERAS WITH AN ELECTRIC SHUTTER

Kunio Mita, Wako, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1975, Ser. No. 566,476

Claims priority, application Japan, Apr. 10, 1974, 49-41527

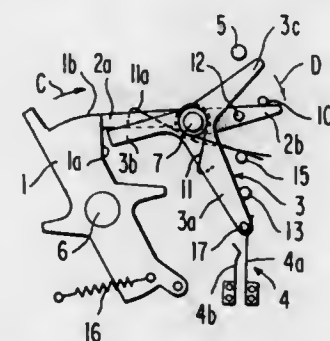
Int. Cl.<sup>2</sup> G03B 17/38

U.S. Cl. 354-266

4 Claims

1. A shutter release mechanism for a camera incorporating an electrically controlled shutter, and including a power switch having normally closed contacts for controlling the supply of electrical power to the electrical circuit controlling the operation of the shutter, said mechanism comprising:

a pivotable shutter operating member, first spring biasing means for biasing said shutter operating member towards shutter operating position, a latching member pivotably mounted adjacent said shutter operating member for movement between a latched position wherein an end portion thereof directly engages the shutter operating member to hold said shutter operating member in a non shutter operating position against the bias of said first spring biasing means and an unlatched position wherein said end portion allows said shutter operating member to rotate under said bias to said shutter operating position, a release member mounted in juxtaposition to said latching member and having a part thereof which operatively engages with said latching member for positively shifting said latching member to said unlatched position as said release member moves from latching member engaging position to a final position, second biasing means for biasing said latching member towards said latching position and said release member towards an initial position where said part thereof is out of engagement with said latching member, means mounting said power switch in operative position with respect to said release member, such that said re-



lease member, when biased to said initial position maintains the normally closed contacts of said switch open; and depressible release button means operatively positioning adjacent said release member for contact therewith, said release button, said release member, said latching member and said switch contacts being positioned relative to one another such that said release button, when depressed, rotates said release member from said initial position to said latching member engaging position and then to said final position against the bias of said second biasing means, said release member moving away from said contacts to permit same to close prior to reaching said latching member engaging position, whereby said latching member remains unmoved during movement of said release member from a position permitting said contacts to close to said latching member engaging position, and means responsive to movement of said latching member to unlatched position to maintain said release member at said final position out of contact with said power switch to maintain the power switch contacts closed; said means for maintaining the power switch contacts closed comprising means carried by said shutter operating member directly engaging said release member to prevent rotation of said release member under the force of said second biasing means.

4,011,573

## APPARATUS FOR DEVELOPING DENTAL X-RAY FILMS

Louis J. Braico, Elgin, Ill., assignor to Rinn Corporation, Elgin, Ill.

Filed Dec. 23, 1974, Ser. No. 535,941

Int. Cl.<sup>2</sup> G03D 3/08, 13/10

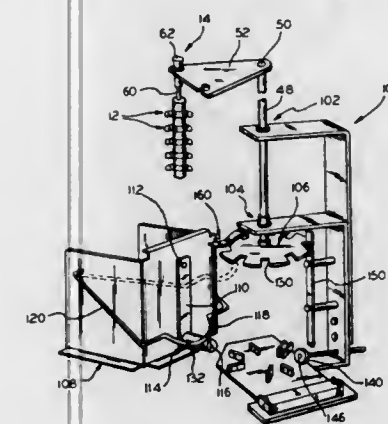
U.S. Cl. 354-322

14 Claims

6. In film developing apparatus having a frame defining processing stations including loading and unloading stations and a plurality of receptacles disposed in an arcuate path

concentric about a vertical axis, a carrier member mounted for rotation about said axis in a substantially horizontal plane over said receptacles, means for dependently supporting from said carrier member one or more film hangers positioned for sequential insertion into said receptacles, means for intermittently rotating said carrier member to move said hangers about said path, means for raising and lowering said carrier member in strokes of predetermined length in timed sequence to said rotating means to dispose said hangers elevationally to be moved from one of said receptacles to another in sequence and lower said hangers for insertion into the respective receptacles, and means for moving said carrier member while in the lowered position thereof for agitating the hangers when disposed within the respective receptacles, the improvement wherein:

said stations include in sequence about said axis said loading station, a developer station, a rinse station, a fix station, a final rinse station, a drying station, and said unloading station,



said developer, rinse, fix and drying stations being defined by said receptacles, said hangers including means for clipping to the hangers the individual films carried thereby, and including means for spinning the individual hangers when disposed at said drying station and within the receptacle thereof for spin drying of the film carried by the individual film hangers, said spinning means including; means for rotatably removably mounting the individual film hangers on said carrier member, a spin driving member journaled in the lower end of said drying station receptacle, means for selectively spin driving said spin driving member, and means for releasably coupling the individual hangers to said spin driving member when the individual hangers are disposed within said drying station receptacle.

4,011,574

## JUNCTION ARRAYS FOR SUPERCONDUCTING AND NONSUPERCONDUCTING APPLICATION

Shyh Wang, El Cerrito, and Won-Tien Tsang, Albany, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 12, 1975, Ser. No. 604,280

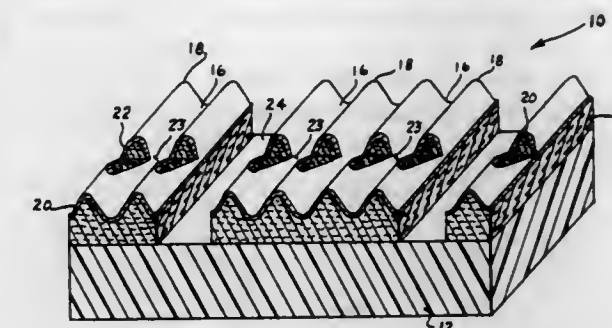
Int. Cl.<sup>2</sup> H01L 49/02, 39/22

U.S. Cl. 357-6

6 Claims

1. A superconduction junction array device comprising: a substrate base; a photoresist material covering one side of said base, said resist having a series of closely spaced, parallel grooves and ridges on its open face; a superconducting metallic

coating covering said photo-resist material, and a first score mark transverse to said ridges and cutting through one ridge



4,011,575

## LIGHT EMITTING DIODE ARRAY HAVING A PLURALITY OF CONDUCTIVE PATHS FOR EACH LIGHT EMITTING DIODE

Henry Tobin Groves, Van Nuys, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

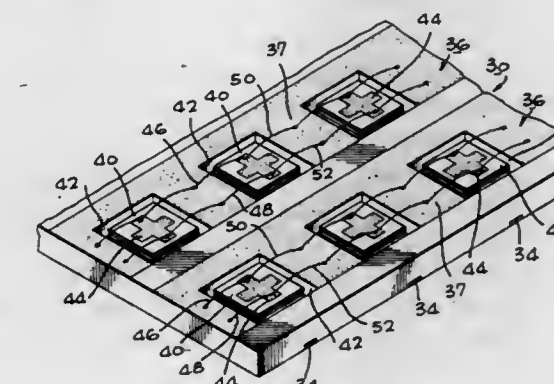
Continuation of Ser. No. 492,195, July 26, 1974, abandoned.

This application June 3, 1976, Ser. No. 692,621

Int. Cl.<sup>2</sup> H01L 33/00, 23/48, 29/44, 29/52

U.S. Cl. 357-17

1 Claim



1. A light emitting diode array, comprising: a substrate; a series of first parallel conductor strips on the substrate; a plurality of LEDs in electrical contact with each of the first conductor strips; a series of second parallel conductor strips on the substrate spaced apart from the first conductor strips and transverse thereto, the second conductor strips including extensions thereof extending between each pair of associated LEDs on adjacent first conductor strips; and wire bond conductors stitched bonded from each LED to the second conductor strip extension adjacent thereto and then to the next adjacent LED.

4,011,576

## NONVOLATILE SEMICONDUCTOR MEMORY DEVICES

Yukimasa Uchida, Yokohama, and Takeshi Matsuo, Yokosuka, both of Japan, assignors to Tokyo Shibaura Electric Company, Ltd., Japan

Filed Aug. 25, 1975, Ser. No. 607,711

Claims priority, application Japan, Aug. 28, 1974, 49-98553

Int. Cl.<sup>2</sup> H01L 29/78, 29/34

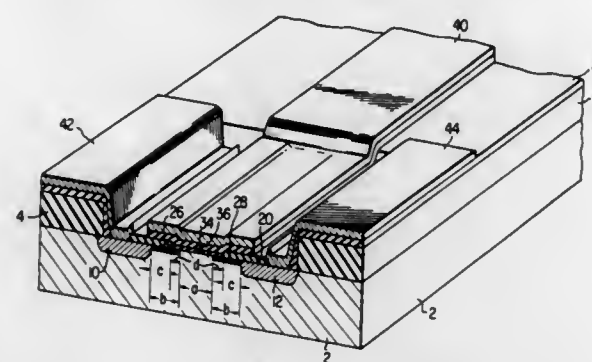
U.S. Cl. 357-23

6 Claims

1. A nonvolatile semiconductor memory device comprising: spaced apart source and drain regions of one conductivity type within a semiconductor substrate of the other conductivity type; first and second spaced apart lightly doped regions of the same conductivity type as said source and drain regions, and formed within the semiconductor substrate in be-



tween said source and drain regions, said first lightly doped region contacting said source region, and said second lightly doped region contacting said drain region; a first insulating layer formed on the semiconductor substrate, said first insulating layer consisting of a thicker part and a very thin part, said thicker part overlying said source and drain regions and part of said lightly doped



regions and said thin part overlying the area between said lightly doped regions and the rest of said lightly doped regions; a second insulating layer applied on said first insulating layer; a gate electrode applied on said second insulating layer; and source and drain electrodes connected to said source and drain regions.

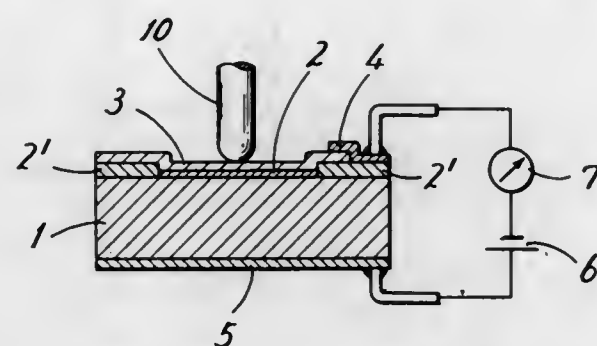
4,011,577

# MECHANICAL-ELECTRICAL FORCE TRANSDUCER WITH SEMICONDUCTOR-INSULATING LAYER-TIN OXIDE COMPOSITE

Shigeru Tanimura, Kyoto; Nobuyuki Yamamura, Takatsuki, and Masanobu Koide, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 342,392, March 19, 1973, abandoned. This application Dec. 10, 1974, Ser. No. 531,447 Claims priority, application Japan, Mar. 21, 1972, 47-28788

Int. Cl.<sup>2</sup> H01L 29/84, 29/96, 29/48, 29/56  
U.S. Cl. 357—26



1. A semiconductor mechanical-electrical transducer comprising:

- a semiconductor composite including a semiconductor substrate having a main surface,
- a first insulating material film of substantial thickness formed on a portion of the main surface of said substrate and defining an exposed portion of said substrate,
- a second insulating material layer deposited on said exposed portion of said main surface of said substrate defined by said first insulating material film, said second insulating material layer consisting essentially of SiO<sub>2</sub> and being approximately 15 to 80 Å in thickness,
- a tin oxide layer deposited on said second insulating material layer,
- said semiconductor composite having a barrier portion defined by said substrate, said second insulating material layer and said tin oxide layer having a rectifying characteristic, and

means for applying mechanical force to said barrier portion of said composite, said composite exhibiting an increased ratio of reverse current therethrough in response to an applied mechanical force relative to the level of reverse current in the absence of an applied mechanical force.

4,011,578  
PHOTODIODE

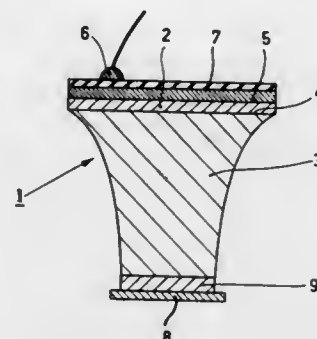
Lambertus Jacobus Maria Bollen, and Cornelius Petrus Theodorus Maria Damen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 5, 1975, Ser. No. 584,156

Claims priority, application Netherlands, June 12, 1974, 7407811

Int. Cl.<sup>2</sup> H01L 27/14, 23/48  
U.S. Cl. 357—30

8 Claims



1. A photodiode, comprising: (a) a semiconductor body having regions of opposite conductivity types which are separated by a p-n junction, (b) an anti-reflective layer at, at least one region said anti-reflective layer consisting essentially of tin-doped indium oxide and forming an ohmic connection with said one region, (c) a metallic contact element disposed over said anti-reflective layer and electrically connected therewith, and, (d) a bismuth oxide layer disposed between said antireflective layer and said metallic contact element.

4,011,579

# SEMICONDUCTOR GATE TURN-OFF DEVICE

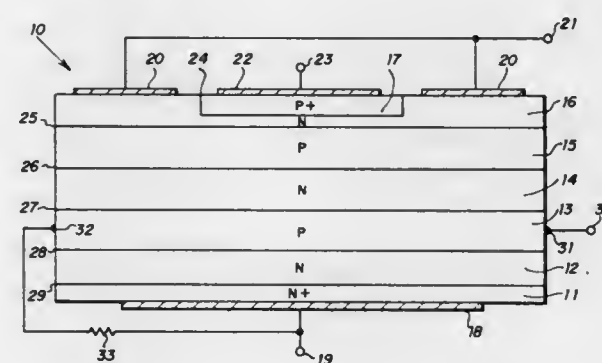
Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Filed Apr. 7, 1975, Ser. No. 565,965

Int. Cl.<sup>2</sup> H01L 29/743

U.S. Cl. 357—38

6 Claims



1. A gate turn-off device comprising:

- a semiconductor body including at least six layers of alternating first and second conductivity types of semiconductor material to form a plurality of interior rectifying junctions,
- a first exterior layer of said body formed from a first conductivity type material more heavily doped than the remaining layers of said first conductivity type in order to provide a low resistivity emitter, said first exterior layer covering only a portion of the exterior surface of said body and disposed in contact with a first intermediate layer of said second conductivity type material having a portion extending to the remaining portion of the exterior surface of said body,

4,011,581

# MOSFET ANTIPARASITIC LAYER

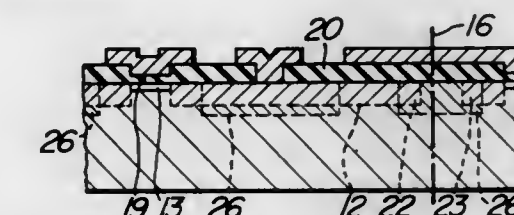
Masaharu Kubo, Hachioji; Minoru Nagata, and Yasunobu Kosa, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 2, 1970, Ser. No. 68,973

Claims priority, application Japan, Sept. 5, 1969, 44-70000  
Int. Cl.<sup>2</sup> H01L 29/78, 27/04

U.S. Cl. 357—52

15 Claims



1. A semiconductor device which comprises  
a. a semiconductor substrate which is of a first conductivity type and has one main surface,  
b. a plurality of semiconductor regions which are of a second conductivity type opposite to said first type and are formed on the main surface of said substrate,  
c. an insulating layer which is provided on said main surface and has openings, and  
d. a wiring metal layer which is provided on said insulating layer, and in which  
a first part of said wiring metal layer is provided through said insulating layer as an intermediary above a gate region formed between at least two neighboring semiconductor regions thereby to form a normal insulating gate type field effect transistor, another semiconductor region is provided adjacent to at least one of said semiconductor regions constituting said insulating gate type field effect transistor, and a second part of said wiring metal layer is provided through said insulating layer as an intermediary above a parasitic gate region formed between said at least one of the semiconductor regions and said other semiconductor region thereby to form a parasitic insulating gate type field effect transistor, characterized in that a high impurity concentration layer having the same conductivity type as that of said substrate and having an impurity concentration higher than that of said substrate is provided in the entire main surface of said semiconductor substrate except the gate region of the normal insulating gate type field effect transistor so as to define PN junctions with said plurality of semiconductor regions, said high impurity concentration layer having a predetermined value of impurity concentration which is low enough to make the breakdown voltage of said PN junctions higher than an operating voltage applied to said wiring metal layer and which is high enough not to induce a parasitic channel layer in said major surface of said substrate under said second part of said wiring metal layer when the operating voltage is applied to said wiring metal layer.

4,011,582

# DEEP POWER DIODE

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 411,011, Oct. 30, 1973, abandoned. This application May 11, 1976, Ser. No. 685,284

Int. Cl.<sup>2</sup> H01L 29/04, 29/161

U.S. Cl. 357—60

16 Claims

1. A semiconductor device comprising  
at least two integral regions of semiconductor material;  
each region having a predetermined level of resistivity, a predetermined type conductivity, and two opposed major surfaces which are, respectively, the top and bottom surfaces thereof;

a second exterior layer of said body formed from said second conductivity type material having a high doping level in contact with a second intermediate layer of said second conductivity type material having a lower doping level, a gate electrode formed in contact with said first intermediate layer, a second electrode formed in contact with said first exterior layer, and a third electrode formed in contact with said second exterior layer, said device operable to be biased into a regenerative process to transition said interior rectifying junctions from blocking conditions into avalanche conditions, means for applying a gating signal to said gate electrode to provide fast turn-off characteristics by terminating said regenerative process, the termination of said regenerative process being facilitated by the effective removal of said first exterior layer emitter during turn-off due to the low resistivity of said emitter which causes reverse current to be injected into said first intermediate layer during switching.

4,011,580

# INTEGRATED CIRCUIT

Wolfdietrich Georg Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

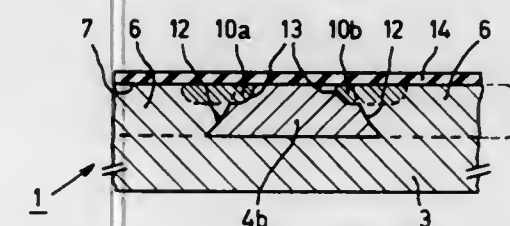
Continuation of Ser. No. 472,412, May 22, 1974, abandoned.

This application Jan. 23, 1976, Ser. No. 651,773

Int. Cl.<sup>2</sup> H01L 27/02

U.S. Cl. 357—51

7 Claims

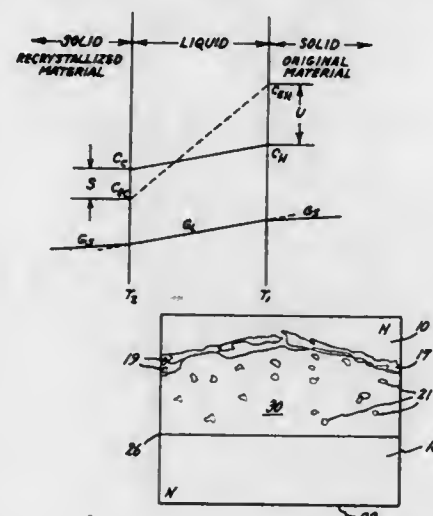


1. An integrated circuit comprising a semiconductor body having an epitaxial semiconductor layer of a first type conductivity and of a given thickness on a semiconductor substrate of a second opposite type conductivity, isolation zones of the second type conductivity extending through the epitaxial layer to define in the epitaxial layer a plurality of first type conductivity isolated islands, plural circuit elements selected from the group consisting of resistors, capacitors, diodes and transistors being located in said islands, at least one of said circuit elements being a resistor formed by the first type epitaxial layer material of one of said islands, means for effecting electrical connection to spaced points of the epitaxial layer material in said one island to form resistor connections for said resistor, the doping near the surface of the epitaxial material in said one island where it remains of the first type being substantially homogenous, and a surface boundary zone of the second type conductivity located in the isolation zone and adjoining a substantial part of the boundary of the said island containing the resistor forming a P-N junction determining the overall resistance of the resistor between its connection points, said boundary zone having a depth of penetration which is smaller than the thickness of the epitaxial layer, the concentration of second type dopants in the isolation zones being greater than the concentration of first type dopants in the isolated islands, and the concentration gradient of second type dopants at the boundary zone-island P-N junction being substantially greater than that at the isolation zone-island P-N junction.



each of the at least two regions being produced from individual wafers, or bodies, of semiconductor material oriented in an abutting surface to surface relationship and joined to each other by a layer of recrystallized semiconductor material of portions of the mutually adjacent surfaces of the wafers formed in situ by thermal gradient zone melting;

the semiconductor material of at least one of the regions being recrystallized semiconductor material of its respective wafer formed in situ by the migration of a melt of metal-rich semiconductor material along a thermal gradient



ent aligned parallel with a first preferred crystal axis of the material of the respective wafer by the same thermal gradient zone melting process practiced at a predetermined elevated temperature which joined the two regions together, and

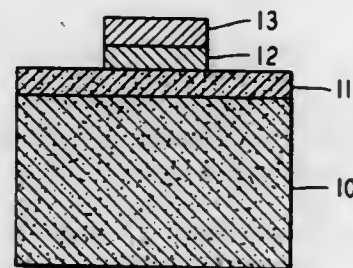
the predetermined level of resistivity and the predetermined type conductivity of the recrystallized semiconductor material being determined by the solid solubility limit of that metal of the melt migrated through the wafer in that semiconductor material at that predetermined elevated temperature to impart the level of resistivity and type conductivity thereto.

4,011,583

#### OHMIC CONTACTS OF GERMANIUM AND PALLADIUM ALLOY FROM GROUP III-V N-TYPE SEMICONDUCTORS

Hyman Joseph Levinstein, Berkeley Heights, and Ashok Kumar Sinha, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Division of Ser. No. 502,451, Sept. 3, 1974, Pat. No. 3,965,279. This application May 27, 1976, Ser. No. 690,400  
Int. Cl.<sup>2</sup> H01L 23/48, 29/46, 29/62, 29/64  
U.S. Cl. 357-67

6 Claims



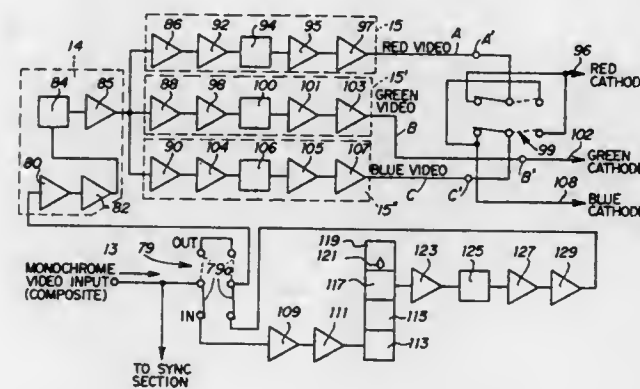
I. A semiconductor device comprising a body of semiconductor material of *n* conductivity type comprising a group III element and group V element and an ohmic contact formed on one surface of said body wherein said contact comprises a combination of Pd-Ge compounds, Pd-group III element compounds and Pd-group V element compounds.

#### 4,011,584 SYSTEM FOR COLOR PRESENTATION OF INFORMATION REPRESENTED BY AMPLITUDE VARYING VIDEO SIGNAL

Lawrence C. Puckett, 4600 Burnett Road, Austin, Tex. 78757  
Continuation-in-part of Ser. No. 198,878, Nov. 15, 1971, abandoned, and a continuation-in-part of Ser. No. 310,460, Nov. 29, 1972, abandoned, and a continuation-in-part of Ser. No. 438,550, Feb. 1, 1974, abandoned. This application Sept. 17, 1974, Ser. No. 506,720  
Int. Cl.<sup>2</sup> H04N 9/02

U.S. Cl. 358-82

6 Claims



1. A system for converting an amplitude varying monochrome video input signal into an output signal representative of a particular amplitude segment of the said input signal, said system being effective to generate a color display indicative of the information represented by the monochrome video signal and comprising in combination:

oscillator means for generating a first signal,  
modulator means responsive to the said input video signal for modulating the said first signal of the oscillator means in accordance with the varying amplitude of the monochrome signal, thereby to provide an output signal from said oscillator means comprising a carrier frequency and a plurality of sidebands having a frequency distribution representative of the amplitude of said video signal,  
RF amplifier means responsive to the modulated output signal from said oscillator means,  
carrier suppression means responsive to the output signal from said RF amplifier means for suppressing the said carrier frequency,  
frequency selective amplifier means coupled to said carrier suppression means for generating an output signal responsive to one of said sidebands being within the response characteristics of said frequency selective amplifier means and varying only within a preselected amplitude increment of the monochrome video input signal,  
detector means responsive to the output signal from said frequency selective amplifier means, and  
a multiple input cathode ray tube having its input terminals coupled to the output of said detector means,  
means for selecting and enhancing the said amplitude increment of said monochrome video input signal furnished to said modulator.

4,011,585

#### MAGNETIC RECORDING REPRODUCING SYSTEM

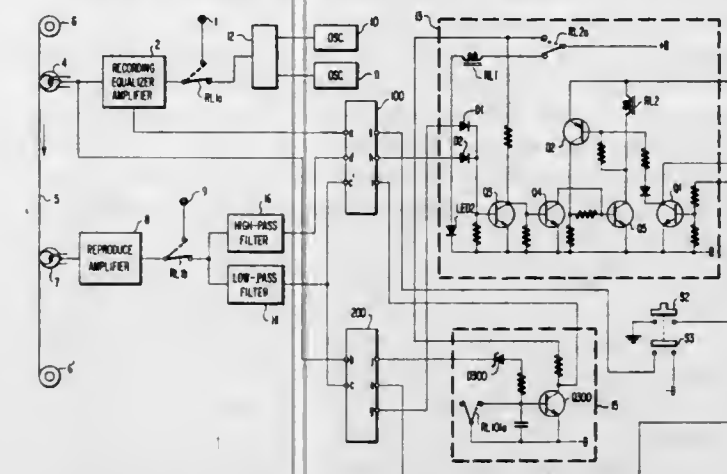
Yoshimitsu Sunaga, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan  
Filed July 11, 1975, Ser. No. 594,973  
Claims priority, application Japan, July 12, 1974, 49-79996; July 12, 1974, 49-79998; Aug. 20, 1974, 49-95378  
Int. Cl.<sup>2</sup> G11B 5/45, 5/008

U.S. Cl. 360-25

8 Claims

1. A magnetic recording-reproducing system comprising: a reference signal recording means for recording the signal on a recording medium, means for reproducing the signal recorded by said recording means, a recording bias oscillator, means

coupled to said oscillator for linearly varying the recording bias from a minimum toward a maximum level, means for rectifying and smoothing said reproduced reference signal to produce a first output signal, means for comparing the first



output signal with a stored second output signal which is an attenuated version of the peak value of the first output signal, and coincidence means coupled to said comparing means for stopping the variation of the recording bias when the levels of said first and second output signals coincide.

4,011,586

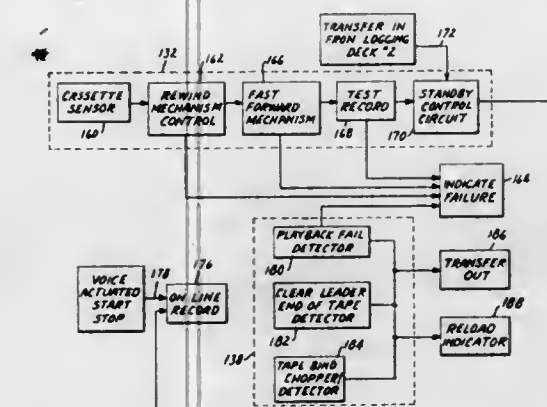
#### VOICE LOGGING RECORDER FOR USE WITH PRELOADED CASSETTES

Sheldon Lee Pastor, St. Paul, Minn., and Dan J. Argento, Thousand Oaks, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 28, 1975, Ser. No. 635,872  
Int. Cl.<sup>2</sup> G11B 5/12, 27/36

U.S. Cl. 360-61

8 Claims



1. A voice logging recorder adapted to utilize magnetic recording tape in preloaded magazines having a logging deck comprising

- transport means having a standby mode position at which a magazine is positioned to enable the tape to be transported at high speed and a run mode position at which the tape is transported at uniform speed,
- means generating an input signal indicative of voice data and enabling switching to the run mode position in response to the input signal, and
- a verification network activated upon insertion of a magazine into the deck including
  - means for rewinding the tape and for producing a tape-advance signal upon completion thereof,
  - means responsive to the tape-advance signal for advancing the rewind tape and for thereupon producing a test-enable signal,
  - means responsive to the test-enable signal for recording and playing back signals and for producing an operate signal in response to said playing back, verifying that the deck and tape thereof are operative,
  - means responsive to said operate signal for switching

the deck into the standby mode position and into the run mode position in response to a said input signal to record said voice data, and

v. means for automatically activating a failure mechanism upon the absence of any of said advance, test-enable and operate signals.

4,011,587

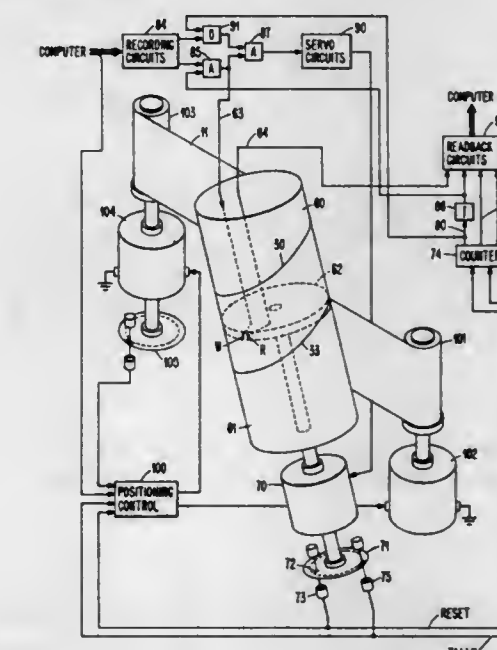
#### ROTARY HEAD MAGNETIC RECORDER FOR USE WITH A SPECIFIC RECORD MEMBER

Nelson K. Arter; Thomas F. Elchhorn, both of Boulder County, and Clement H. Kalthoff, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 451,270, March 14, 1974, Pat. No. 3,932,894. This application Sept. 8, 1975, Ser. No. 611,476  
Int. Cl.<sup>2</sup> G11B 5/09, 15/02, 27/32

U.S. Cl. 360-62

1 Claim



1. For use with a magnetic tape, a rotating head tape recorder having a rotor for rotating in a first sense and with a recording head closely followed by a readback head for use with an elongate record medium having a leading longitudinal edge crossed first by said heads in close succession with one servo track spaced from said leading edge a distance corresponding to said close spacing of said heads with signals recorded on both sides of said servo track transversely to the elongation of the record medium,

the improvement including in combination:

- signal recording circuits;  
servo circuits for exercising control over said recorder to position a tape in said recorder;  
signal readback circuits electrically connected to said readback head for receiving signals therefrom;  
a tachometer means connected to said rotor for indicating rotational position thereof; and  
a double-throw, single-pole, electronic switch means responsive to said rotational position indication to switch said recording head between said servo circuits and said recording circuits such that said recording head alternately senses said servo track and records signals respectively as said readback head senses signals intermediate said leading edge and said servo track and then senses signals recorded by said recording head,  
said tachometer means includes a resettable digital electronic counter generating signal content representing rotor position by a digital count and supplying signals indicative of position including means supplying signals indicating scan of said servo track adjacent said reference edge,  
said electronic switch means consisting of first and second AND circuits having one common connection to said



write head and respective individual connections to said signal recording circuits and said servo circuits and both said AND circuits receiving said servo track signals for alternately switching said write head between said servo circuits and said signal recording circuits, and said signal readback circuits connected to said resettable digital electronic counter for selectively processing signals received from said readback head.

4,011,588

**ROTARY HEAD TYPE MAGNETIC TAPE VIDEO RECORDING-REPRODUCING DEVICE**  
Fujio Yasuda; Teruo Saito, and Mamoru Hiroyasu, all of Saijyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

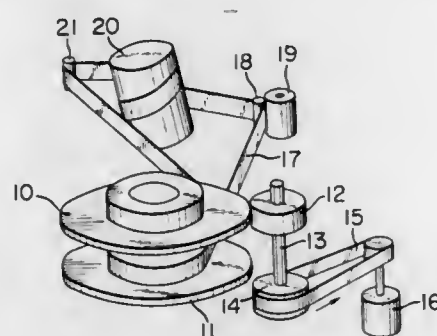
Filed May 22, 1975, Ser. No. 579,859

Claims priority, application Japan, May 30, 1974, 49-61108

Int. Cl.<sup>2</sup> G11B 15/43

U.S. Cl. 360—71

5 Claims



1. A rotary head type magnetic tape video recording-reproducing device of the type wherein a magnetic tape is transported to and from and is wrapped at least one turn around a rotary member carrying at least one rotary magnetic head along a path of revolution thereof at an angle other than 0° relative to the axis of rotation of said rotary member for sequentially recording information upon said magnetic tape or reproducing information therefrom during transport of the tape, and wherein one end of said magnetic tape is wrapped around a supply reel and the other end thereof wrapped around a take-up reel, means including a power supply for selectively driving one of said reels, the improvement wherein means are provided responsive to the interruption of said power supply for reversing the direction of said selected driven reel through a predetermined angle.

4,011,589

**SPINDLE LOCK SHAFT FOR DISK DRIVE MEDIA**  
Louis G. Gitzendanner, Oklahoma City, Okla., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

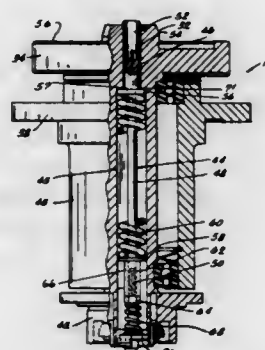
Continuation of Ser. No. 474,575, May 30, 1974, abandoned.

This application Jan. 23, 1976, Ser. No. 651,677

Int. Cl.<sup>2</sup> G11B 5/012; G01D 15/16; F16C 1/02

U.S. Cl. 360—98

4 Claims



1. In a disk drive apparatus having a disk pack with a motor driven spindle for rotating the disk pack, said disk pack in-

cluding a mounting plate located at the bottom thereof and bearing upon the top of said motor driven spindle, said motor driven spindle comprising:

a spindle housing having a hollow interior chamber with an inwardly extending flanged portion at the top thereof; a shaft disposed within the hollow interior chamber of said spindle housing and secured to the mounting plate, said shaft having a top portion, a bottom portion and a mid portion, the mid portion having a diameter smaller than the top portion and the bottom portion; and

means for spring loading said shaft within the hollow interior chamber of said spindle housing, said spring-loading means comprising:

a first spring extending along the length of only the mid portion of said shaft, said first spring being compressibly loaded against the inwardly extending flanged portion at the top of the hollow interior chamber of said spindle housing so as to bias said shaft downwardly,

a second spring extending over only the bottom portion of said shaft, said second spring compressibly loaded against the bottom of the hollow interior of said spindle housing so as to bias said shaft upwardly, and means, located at the bottom of said first spring and the top of said second spring, for compressible loading said first and second springs within the hollow interior chamber of said spindle housing.

4,011,590

**INTERNAL DIVISION ACTUATION OF VENTILATED FLOPPY DISK STACK**

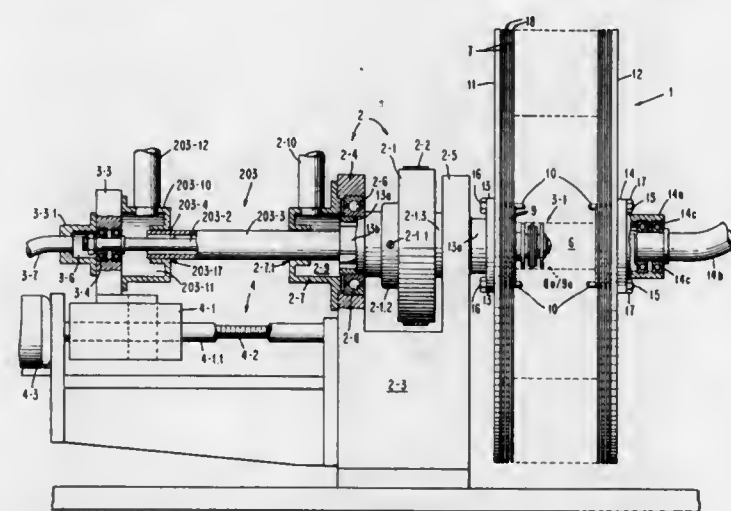
Anthony W. Orlando, Highland, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1975, Ser. No. 628,623

Int. Cl.<sup>2</sup> G11B 5/82, 5/54, 25/04

U.S. Cl. 360—99

10 Claims



1. Access actuation apparatus for sustainably separating normally inaccessible storage surfaces of flexible disks arranged in a rotating stack confined by inflexible end plates, successive said disks being nominally spaced by radially porous spacers, said stack encompassing a partially vacant space extending through all of said disks and spacers, said apparatus comprising:

pressure transmittal means extending slidably into and partially filling said vacant space; and means having an enlarged hub section filling a portion of said space and effectively partitioning said space into at least partially vacant first and second sub-spaces; said means having an enclosed first pressure transmittal channel extending between said hub section and the exterior of said stack; said hub section having a narrow opening connected with said first channel and a cross channel construction isolated from said first channel for connecting vacant portions of said first and second sub-spaces; and means for variably pressuring said first channel and said

vacant portion of at least one of said sub-spaces to cause sustainable split displacement effects relative to said storage surfaces by which said surfaces are rendered selectively accessible for storage transducing operations.

4,011,591

**INTERNAL DIVISION ACTUATION OF VENTILATED FLOPPY DISK STACK**

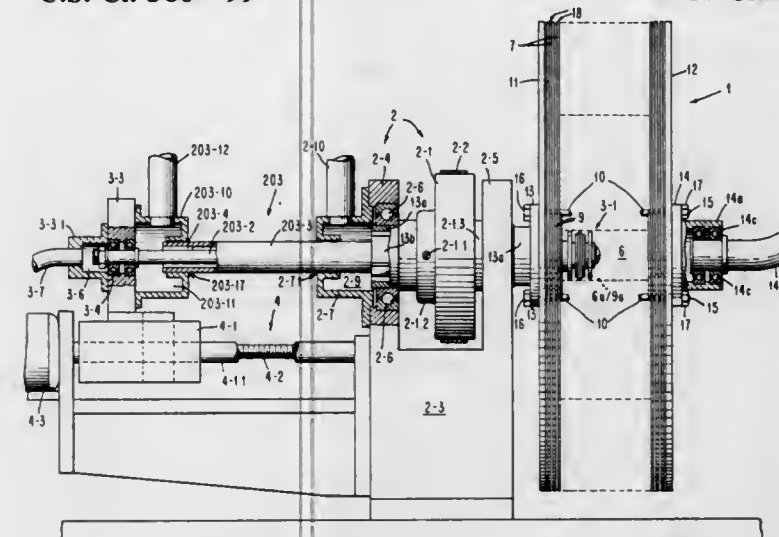
Anthony W. Orlando, Highland, and James A. Weidenhammer, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1975, Ser. No. 628,622

Int. Cl.<sup>2</sup> G11B 5/82, 5/54, 25/04

U.S. Cl. 360—99

17 Claims



1. In a random access disk file data storage system comprised of multiple flexible disks arranged for co-rotation in a stack configuration, said disks having displaceably interfacing storage surfaces which are ordinarily spaced at intervals too narrow for transducing access, a method of providing storage transducing to said surfaces on a random selection basis comprising:

supplying an outward ventilation flow of air under pressure to said intervals between all of said surfaces through a common space encompassed by the rotation of said surfaces;

directing an intermittent increment of outward flow through said of said intervals;

selecting said one interval variably on a said common space to a selected one selection basis; and

controlling the displacements of said surfaces due to said increment of additional air flow to form a stable split opening encompassing said one interval and rendering the surfaces facing said one interval accessible for storage transducing operations.

4,011,592

**CASSETTE TAPE RECORDER WITH TAPE PAD**  
Takehiko Kawada, Yokohama, Japan, assignor to Denki Onkyo Company, Ltd., Tokyo, Japan

Filed Apr. 29, 1975, Ser. No. 572,896

Claims priority, application Japan, Apr. 30, 1974, 49-49184; May 10, 1974, 49-52493; May 25, 1974, 49-58977; May 24, 1974, 49-59533[U]; May 24, 1974, 49-59535[U]; May 24, 1974, 49-59536[U]; May 25, 1974, 49-60152[U]; June 20, 1974, 49-72831[U]; June 21, 1974, 49-72950[U]; June 21, 1974, 49-72951[U]

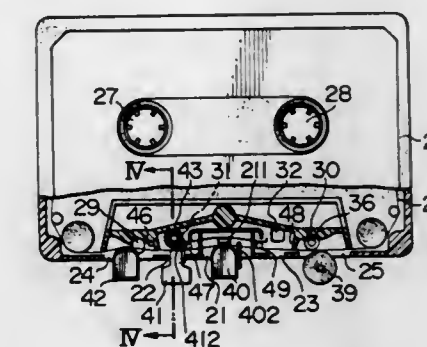
Int. Cl.<sup>2</sup> G11B 23/04, 15/29, 15/60

U.S. Cl. 360—130

15 Claims

1. A cassette tape recorder for use with a tape cassette for containing a magnetic tape, the cassette being formed in its front end face with a central window in which an internal tape pad is provided and with a pair of smaller windows and a pair of larger windows which are disposed symmetrically with respect to the central window, the respective windows exposing a portion of the magnetic tape, the cassette further includ-

ing an upper and a lower wall in which are formed a pair of position control apertures corresponding to the smaller windows, a pair of capstan holes corresponding to the larger windows and a pair of reel openings in which spools for taking up the magnetic tape are disposed therein; the recorder comprising a capstan shaft adapted to be inserted into at least one of the capstan holes in the cassette during use of the cassette, a pinch roller adapted to be inserted into one of the larger windows which corresponds to the capstan hole in which the



capstan shaft is inserted, for cooperating with the capstan shaft to cause the magnetic tape to run, a first magnetic head adapted to be inserted into the central window in the cassette for contact with the magnetic tape, at least second magnetic head adapted to be inserted into one of the remaining windows in the cassette, and a tape pad means mounted in the recorder for insertion into the aperture or hole which corresponds to the window other than the central window into which said second magnetic head is inserted for urging the magnetic tape against the second magnetic head.

4,011,593

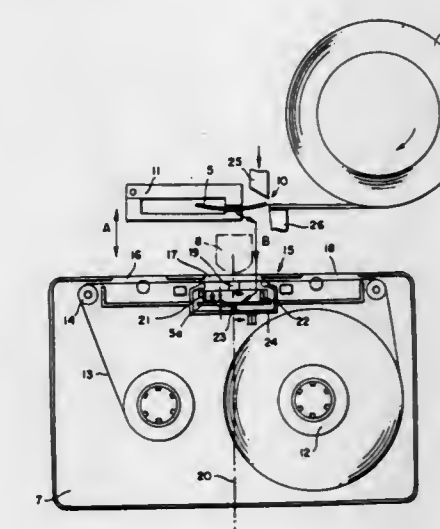
**MAGNETIC TAPE CASSETTE WITH SCREENING SHIELD**

Dieter Gaiser, Diersheim; Eberhard Koester, Frankenthal; Klaus Schoettle, Ludwigshafen, and Friedrich Guenther, Willstaett, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany  
Continuation-in-part of Ser. No. 462,530, April 19, 1974, abandoned. This application Apr. 23, 1975, Ser. No. 570,519  
Claims priority, application Germany, Apr. 21, 1973, 2320439

Int. Cl.<sup>2</sup> G11B 23/04, 15/60

U.S. Cl. 360—132

8 Claims



1. A magnetic tape cassette, especially a compact cassette, comprising lower and upper cassette housing parts having side



walls, the front wall being provided with an entry aperture for a magnetic head associated with a recording/playback apparatus and, facing this aperture, a screening shield secured in the cassette housing by holding means, wherein the screening shield is in the form of an arcuately shaped strip of resiliently deformable "soft" magnetic material, and wherein there are provided means, including said holding means, which incident to the insertion of the strip into the cassette housing flex said strip into a shape of reduced arcuity and after said insertion hold the strip in the last-mentioned shape under flexural stress, said holding means comprising members bearing against two longitudinally spaced portions of said strip from one side and against a portion of said strip intermediate said spaced portions from the other side.

**DESIGN PATENTS****GRANTED MARCH 8, 1977****ERRATA**

For CLASS	See PATENT NO.
015-054 .....	243,574
023-127 .....	243,582
022-019 .....	243,611
022-019 .....	243,612
013-008 .....	243,615
013-008 .....	243,616
013-008 .....	243,617
013-008 .....	243,618
014-053 .....	243,619
014-037 .....	243,620
024-099 .....	243,628
014-075 .....	243,630
028-047 .....	243,638



# DESIGNS

MARCH 8, 1977

243,561

PANTYHOSE

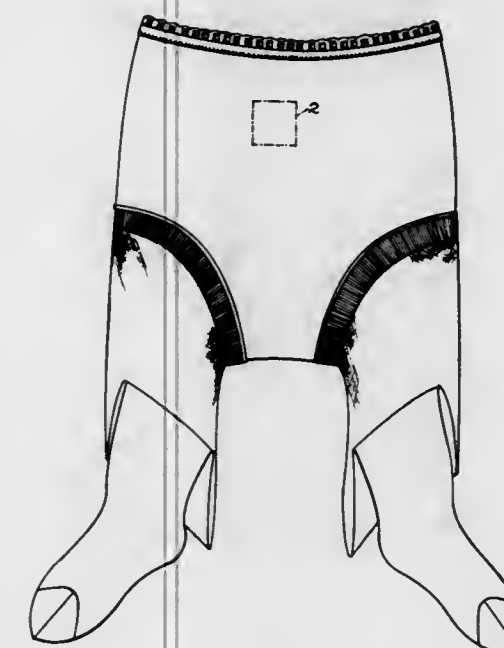
Teresita E. Alvarez, New York, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 7, 1975, Ser. No. 548,173

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-6



243,563

HEAD COVERING

Betty C. Kreisel, 5440 Lindley Ave., Apt. 106, Encino, Calif. 91316

Filed June 11, 1975, Ser. No. 586,047

Term of patent 14 years

Int. Cl. D2-03

U.S. Cl. D2-243



243,562

WOMAN'S TWO-PIECE BATHING SUIT

William H. Kruse, 1430 Kendall St., No. 915, Lakewood, Colo. 80214

Filed Mar. 10, 1975, Ser. No. 556,571

Term of patent 14 years

Int. Cl. D2-02

U.S. Cl. D2-37



243,564

HEAD COVERING

Betty C. Kreisel, 5440 Lindley, Apt. No. 106, Encino, Calif. 91316

Filed Aug. 20, 1975, Ser. No. 606,020

Term of patent 14 years

Int. Cl. D2-03

U.S. Cl. D2-243





243,565

## ORNAMENTAL DESIGN FOR A BOOT

Guy Charles de Massacre, 124, Avenue des Champs-Elysees, Paris (Seine), France

Filed Aug. 26, 1975, Ser. No. 607,872

Claims priority, application France, Feb. 28, 1975, 75.37974

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-272



243,567

## BOOT

Guy de Massacre, 124, avenue des Champs-Elysee, Paris, France

Filed Oct. 20, 1975, Ser. No. 624,164

Claims priority, application France, June 9, 1975, 75.359

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-272



243,566

## BOOT

Guy de Massacre, 124, avenue des Champs-Elysee, Paris, France

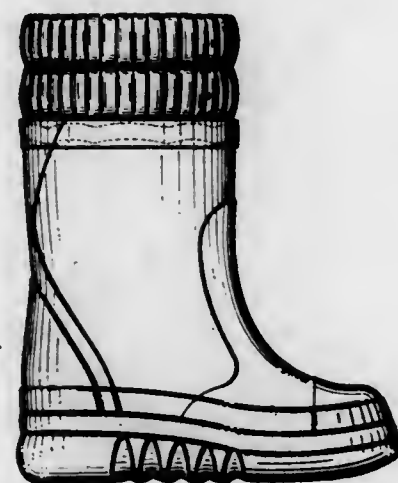
Filed Oct. 20, 1975, Ser. No. 624,163

Claims priority, application France, June 9, 1975, 75.359

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-272



243,568

## TOOTH BRUSH

Per Axel Torbjörn Axelsson, Drottninggatan 27, 652 25 Karlstad, Sweden

Filed Dec. 4, 1974, Ser. No. 529,591

Claims priority, application Sweden, June 12, 1974, 74979

Term of patent 14 years

Int. Cl. D4-02

U.S. Cl. D4-25



243,569

## BABY CARRIER

Robert K. Lieding, 348 Wilson Ave., and Richard E. Cone, 249 Bowman Drive, both of Kent, Ohio 44240

Filed Sept. 17, 1975, Ser. No. 614,139

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-7



243,571

## WICKER CHAIR

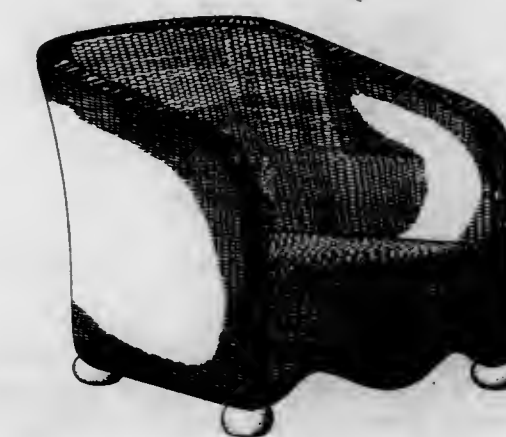
John B. Wisner, New York, N.Y., assignor to Ficks Reed Company, Cincinnati, Ohio

Filed June 16, 1975, Ser. No. 587,078

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-57



243,572

## CHAIR

Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy

Filed Mar. 18, 1975, Ser. No. 559,523

Claims priority, application Italy, Sept. 19, 1974, 60916/74

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-75



243,570

## CHAIR

Richard F. Laurenzi, 620 Vanderbilt Ave., Brooklyn, N.Y. 11238

Filed Oct. 15, 1975, Ser. No. 622,691

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-7





243,573

## MEASURING CUP RACK

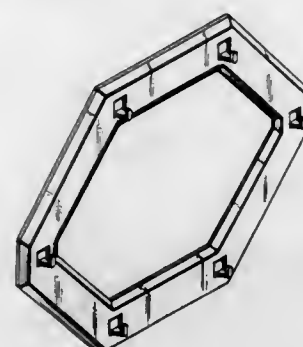
Charles Martin Flaherty, Casselberry, Fla., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Feb. 13, 1976, Ser. No. 657,797

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—114



243,576

## TAPE STORAGE RACK

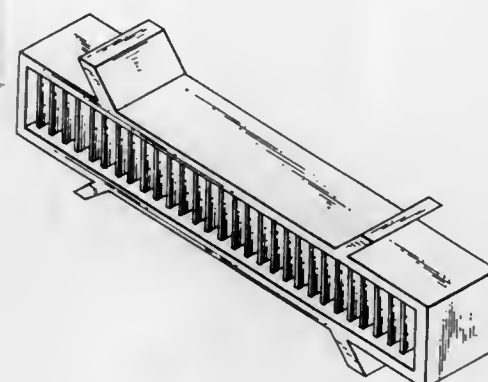
Richard Zinck, 29-24 164th St., Flushing, N.Y. 11358

Filed Dec. 23, 1975, Ser. No. 643,743

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—185



243,574

## HOT WATER EXTRACTION-TYPE CARPET CLEANING APPARATUS AND WHEELED DOLLY THEREFOR

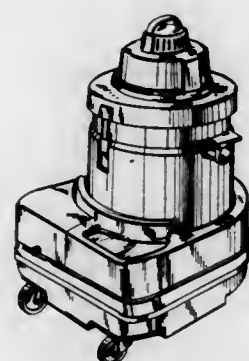
Robert N. Bartlett, Denver, Colo., assignor to Windsor Industries, Inc., Denver, Colo.

Filed July 16, 1975, Ser. No. 596,296

Term of patent 14 years

Int. Cl. D7—05

U.S. Cl. D15—54



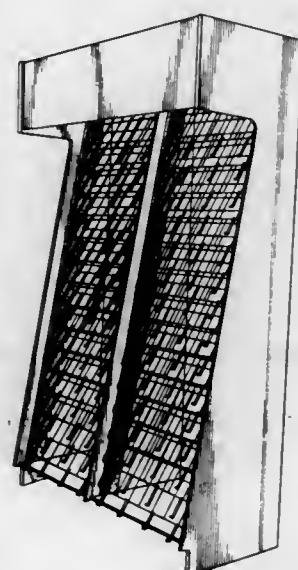
243,577

## DISPLAY RACK FOR CARPET SAMPLES OR THE LIKE

Gerard M. Schouten, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed May 15, 1975, Ser. No. 577,641

U.S. Cl. D6—188



243,575

## STAND FOR A TELEPRINTER

John E. Knox, Eisental, Affental, Germany, assignor to International Standard Electric Corporation

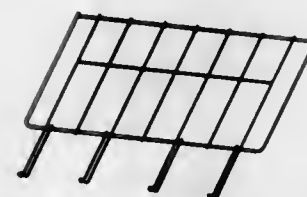
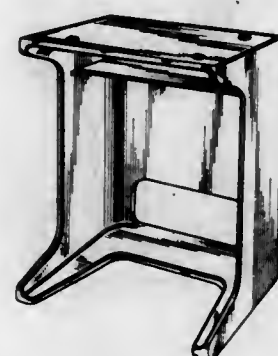
Filed July 10, 1975, Ser. No. 594,816

Claims priority, application Germany, Jan. 17, 1975, 4262

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—181



243,578

## DRINKING MUG

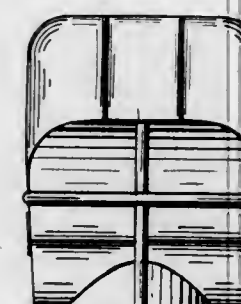
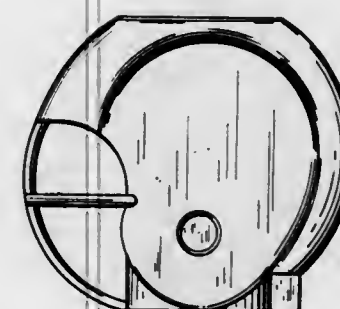
Alfred W. Danat, 2114 Villaret Drive SW., Huntsville, Ala. 35803

Filed Mar. 7, 1975, Ser. No. 556,216

Term of patent 14 years

Int. Cl. D7—01

U.S. Cl. D7—5



243,580

## FASTENER

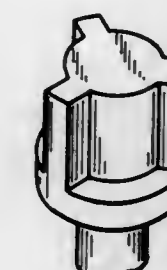
Charles J. DeCaro, Marshfield, Mass., assignor to Textron, Inc.

Filed May 8, 1975, Ser. No. 575,783

Term of patent 14 years

Int. Cl. D8—08

U.S. Cl. D8—388



243,581

## GUIDE SPRING FOR WINDOW SASHES OR SIMILAR ARTICLE

Lorane C. Goss, Jr., Dillsburg; James T. Cribben, Mechanicsburg, and Joseph J. Miller, Plainfield, all of Pa., assignors to Capitol Products Corporation, Mechanicsburg, Pa.

Filed Apr. 15, 1974, Ser. No. 460,694

Term of patent 14 years

Int. Cl. D8—09

U.S. Cl. D8—395



243,579

## PITCHER OR SIMILAR ARTICLE

Frank J. Benes, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 549,529, Feb. 13, 1975, which is a division of Ser. No. 397,069, Sept. 13, 1973, Pat. No. Des. 238,541. This application Apr. 28, 1976, Ser. No. 681,127

U.S. Cl. D7—64



243,582

## SCREW PLUG MOUNTING FOR AN ELECTRIC IMMERSION HEATER

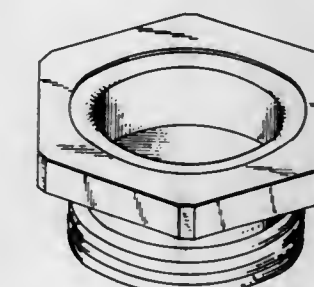
Robert D. Shirey, 207 Ennerdale Drive, Pittsburgh, Pa. 15208

Filed July 10, 1975, Ser. No. 594,851

Term of patent 14 years

Int. Cl. D08—08

U.S. Cl. D23—127





243,583

## PLASTIC SLEEVE-ENCASED BOTTLE

Raymond G. Reynolds, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 566,272, April 9, 1975. This application May 7, 1975, Ser. No. 575,296

The portion of the term of this patent subsequent to Mar. 8, 1992, has been disclaimed.

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-12



243,585

## COMBINED BOTTLE AND CLOSURE

John D. Angleman, Brookside, N.J., and Doris DuCret, New York, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,754

Claims priority, application Australia, Jan. 22, 1974, 6324/74

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-147



243,584

## BOTTLE

Raymond G. Reynolds, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 9, 1975, Ser. No. 566,272

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-119

243,586  
CLOCK

Toshihiro Araki, Osaka, Japan, assignor to Japan Suncrux Co., Ltd., Japan

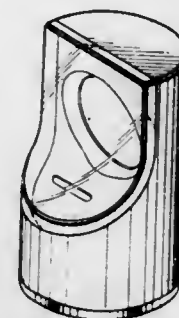
Filed May 12, 1975, Ser. No. 576,261

Claims priority, application Japan, Nov. 12, 1974, 49-39559; Jan. 30, 1975, 50-3988

Term of patent 14 years

Int. Cl. D10-01

U.S. Cl. D10-15



243,587

## PENDANT WATCH

Shelton Shiu-Tong Ho, Hong Kong, assignor to Excelco International Inc., Waverly, Minn.

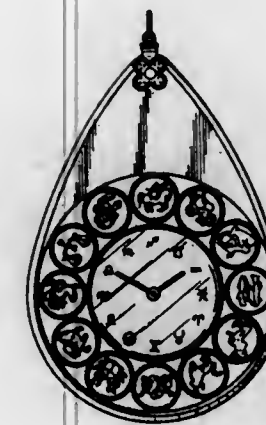
Filed July 28, 1975, Ser. No. 599,543

Claims priority, application United Kingdom, June 5, 1975, 971354/75

Term of patent 14 years

Int. Cl. D10-02

U.S. Cl. D10-30



243,588

## WRIST WATCH

Shelton Shiu-Tong Ho, Hong Kong, assignor to Excelco International Inc., Waverly, Minn.

Filed July 28, 1975, Ser. No. 599,544

Term of patent 14 years

Int. Cl. D10-02

U.S. Cl. D10-33



243,589

## SONAR UNIT FOR FISHERMEN

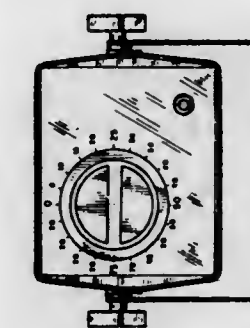
John C. Moore, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Filed June 9, 1975, Ser. No. 584,775

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-46



243,590

## BICYCLE REFLECTOR

Nicholas A. Amoroso, Hillsdale, N.J., assignor to Bright Star Industries, Inc., Clifton, N.J.

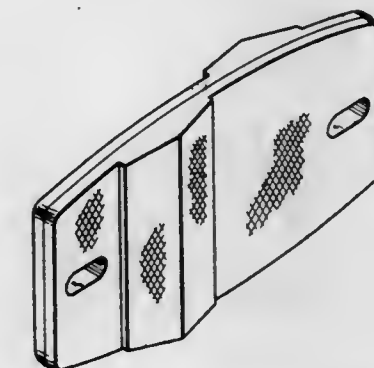
Filed Aug. 8, 1975, Ser. No. 602,970

The portion of the term of this patent subsequent to Oct. 28, 1989, has been disclaimed.

Term of patent 14 years

Int. Cl. D10-06

U.S. Cl. D10-111



243,591

## PANEL FOR DISPLAY OF TIME OR FREQUENCY, OR BOTH

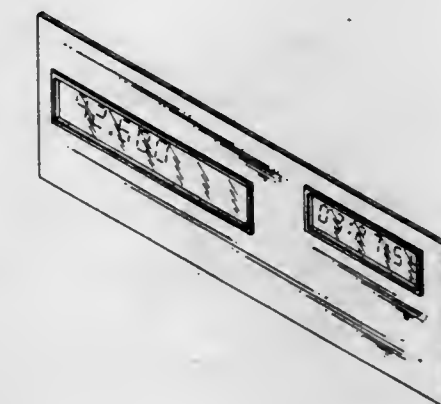
Howard Alan Taishoff, 105 Oxford Blvd., Great Neck, N.Y. 11023

Filed July 28, 1975, Ser. No. 600,103

Term of patent 14 years

Int. Cl. D10-07

U.S. Cl. D10-125





243,592

**CHRISTMAS WALL HANGING**

Helen L. Taber, 63 W. Saddle River Road, Saddle River, N.J. 07458

Filed Nov. 1, 1974, Ser. No. 519,957

Term of patent 14 years

Int. Cl. D11-02

U.S. Cl. D11-121



243,594

**SELF-PROPELLED HANG GLIDER CARRIAGE**

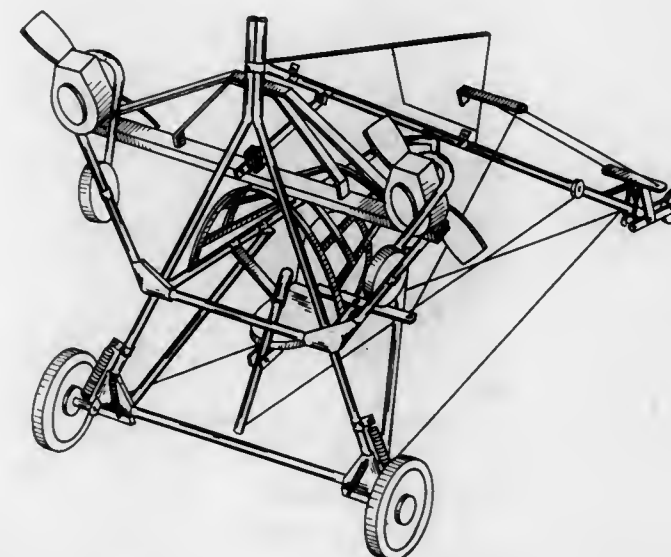
Jeffrey F. Koch, P.O. Box 453, Petaluma, Calif. 94952

Filed Oct. 6, 1975, Ser. No. 619,667

Term of patent 14 years

Int. Cl. D12-07

U.S. Cl. D12-81



243,593

**MULTIPURPOSE KNOCKDOWN HANDCART**

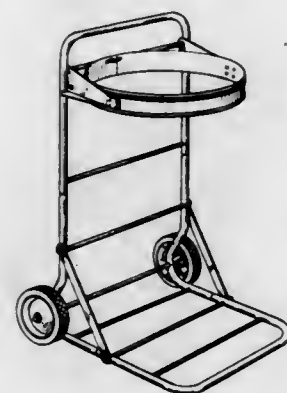
Harvey J. Smith, Sr., 1211 Buckingham Road, and John T. Lipford, 303 Sunset Drive, both of Greensboro, N.C. 27408

Filed Aug. 22, 1975, Ser. No. 606,758

Term of patent 14 years

Int. Cl. D12-02

U.S. Cl. D12-34



243,595

**AUTOMOBILE BODY**

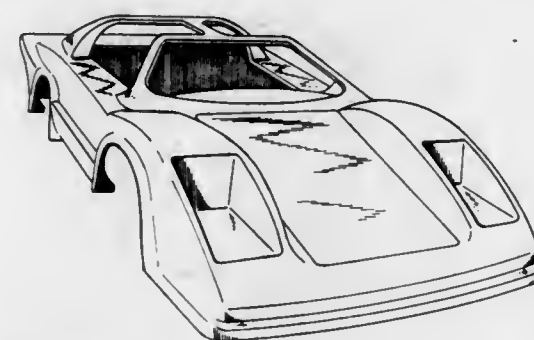
Frederick W. Belz, 3824 Gordon Ave., Fort Worth, Tex. 76110

Filed July 7, 1975, Ser. No. 593,768

Term of patent 14 years

Int. Cl. D12-08

U.S. Cl. D12-92



243,596

**LIVESTOCK TRAILER**

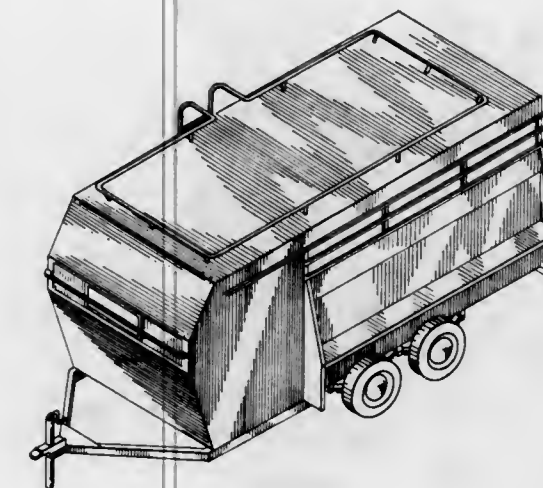
Nick Ksenych, 1130 Skyline Drive, Watertown, S. Dak. 57201

Filed Feb. 20, 1976, Ser. No. 660,040

Term of patent 14 years

Int. Cl. D12-10

U.S. Cl. D12-102



243,599

**VEHICLE TIRE TRACTION DEVICE**

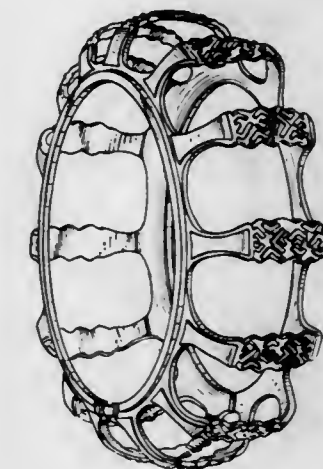
Harry M. Gilmartin, 10460 SE. 22nd, Bellevue, Wash. 98004

Filed July 31, 1975, Ser. No. 600,914

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-154



243,597

**MOTORCYCLE CAMPER HOUSING**

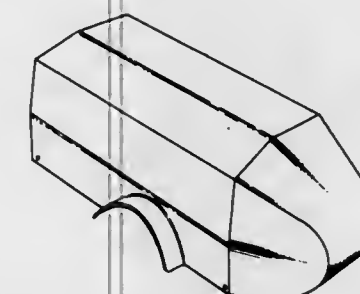
Marion Leon Headington, Jr., 1125 W. Orange Grove, Burbank, Calif. 91502

Filed Feb. 13, 1976, Ser. No. 657,946

Term of patent 14 years

Int. Cl. D12-10

U.S. Cl. D12-103



243,598

**BICYCLE FRAME**

Charles Patrick Duncan Davidson, Droitwich, England, assignor to Joseph Lucas Limited, Birmingham, England

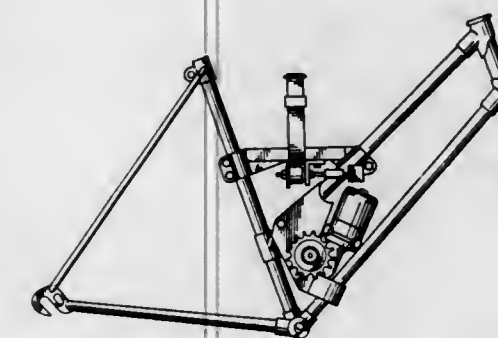
Filed July 22, 1975, Ser. No. 598,021

Claims priority, application United Kingdom, Jan. 28, 1975, 969612/75

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-111



243,600

**TELEVISION CAMERA**

Hans Erich Slany, Esslingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

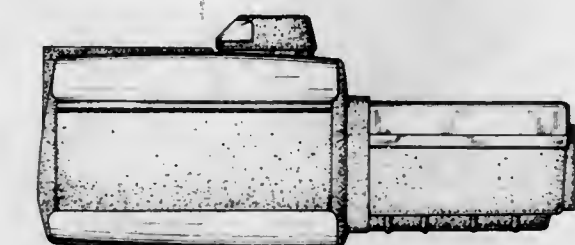
Filed July 25, 1974, Ser. No. 491,866

Claims priority, application Germany, Jan. 26, 1974, 668

Term of patent 14 years

Int. Cl. D16-01

U.S. Cl. D16-1





**243,601  
MICROSCOPE**

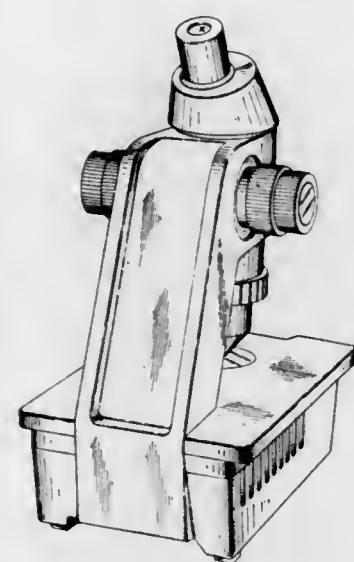
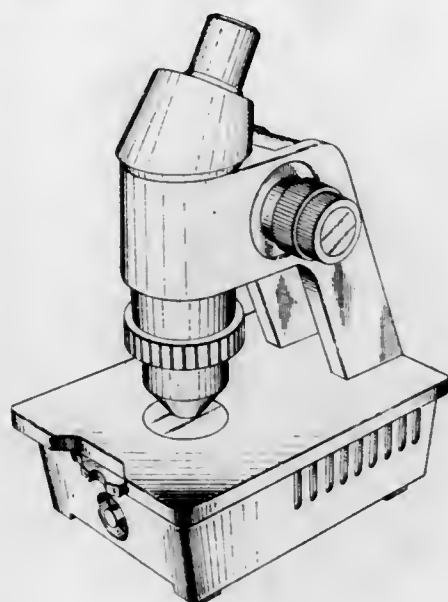
Arthur B. Leeming, Sr., Rochester, and Edwin A. Speaker, Brockport, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,783

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-57



**243,602**

**CONTACT LENS HANDLING DEVICE**

Edward R. Updegraff, 6090 Montgomery Court, San Jose, Calif. 95135

Filed Nov. 6, 1975, Ser. No. 629,252

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-83



**243,603  
EDUCATIONAL CHROMATOGRAPH**

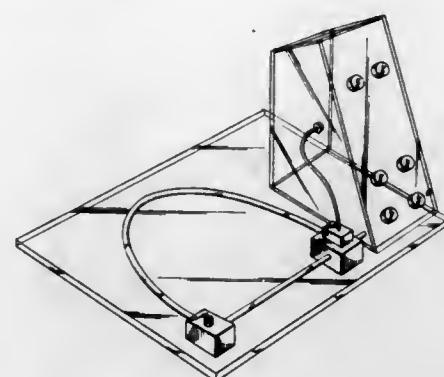
John P. Salsgiver, 29 Ethan Allen Drive, Acton, Mass. 01720

Filed Sept. 13, 1974, Ser. No. 505,856

Term of patent 14 years

Int. Cl. D19-07

U.S. Cl. D19-62



**243,604  
LIST FINDER**

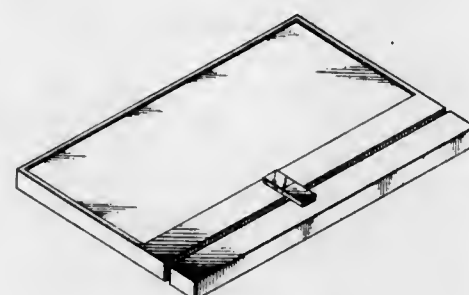
Mel Evenson, Santa Monica, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.

Filed Jan. 16, 1975, Ser. No. 541,425

Term of patent 14 years

Int. Cl. D19-02

U.S. Cl. D19-76



**243,605**

**FISHING LURE**

Frank Howard Shewmake, Rte. 3, Box 878, Plaquemine, La. 70764

Filed Aug. 6, 1975, Ser. No. 602,317

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-27



**243,606  
BOW STRING CABLE FITTING**

John A. Carlson, Wichita, Kans., assignor to Conchemco, Incorporated, Lenexa, Kans.

Filed Dec. 22, 1975, Ser. No. 643,367

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-99



**243,607  
SPOUT**

Rune G. Monö, Nasbyvagen 3, 183 30 Taby, and Michele Morichetto, Mollagatan 36, 502 46 Boras, both of Sweden

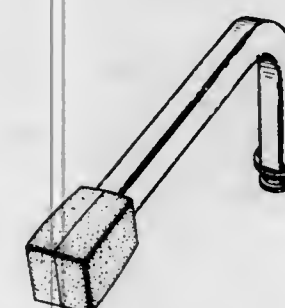
Filed Aug. 25, 1975, Ser. No. 607,597

Claims priority, application Sweden, Feb. 25, 1975, 75417; Feb. 25, 1975, 75418; Feb. 25, 1975, 75419

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-32



**243,608  
FAUCET**

Rune G. Monö, Nasbyvagen 3, 183 30 Taby, and Michele Morichetto, Mollagatan 36, 502 46 Boras, both of Sweden

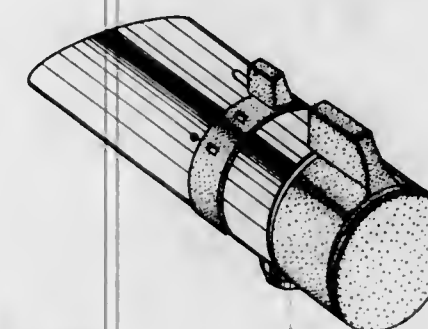
Filed Aug. 25, 1975, Ser. No. 608,506

Claims priority, application Sweden, Feb. 25, 1975, 75421

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-23



**243,609  
HANDSHOWER**

Rune G. Monö, Nasbyvagen 3, 183 30 Taby, and Michele Morichetto, Mollagatan 36, 502 46 Boras, both of Sweden

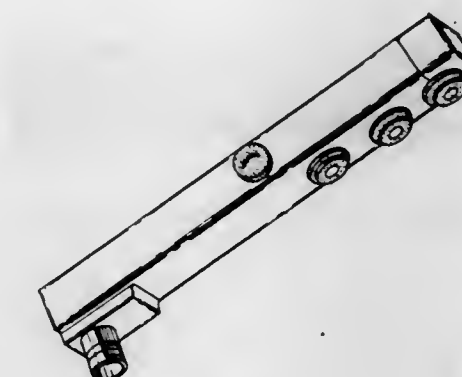
Filed Aug. 25, 1975, Ser. No. 607,598

Claims priority, application Sweden, Feb. 25, 1975, 75420

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-35



**243,610**

**WATER SWEEPER**

Randall T. Craig, 1907 Stonewall Lane, Vista, Calif. 92083

Filed Dec. 12, 1975, Ser. No. 640,060

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-35



**243,611**

**LIGHT ATTRACTING INSECT ELECTROCUTOR**

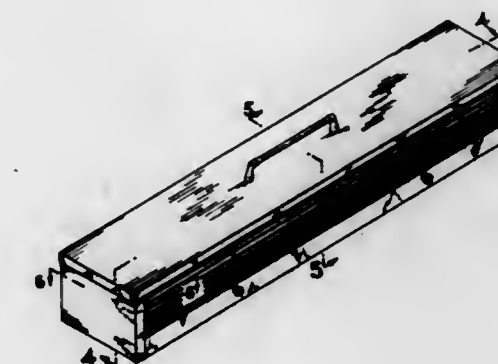
Donald E. Gilbert, Box 2188, Jonesboro, Ark. 72401

Filed Dec. 8, 1975, Ser. No. 638,801

Term of patent 7 years

Int. Cl. D22-06

U.S. Cl. D22-19





243,612

**ELECTRIC CONTROL UNIT FOR FLYING INSECTS**

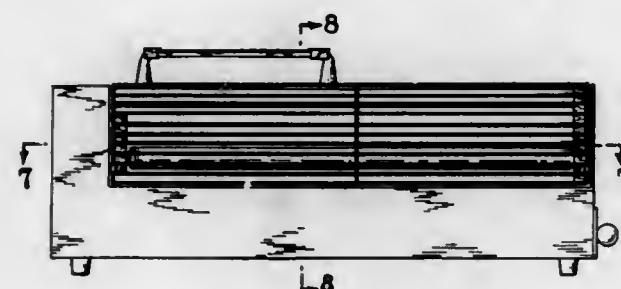
Donald E. Gilbert, Box 2188, Jonesboro, Ark. 72401

Filed Jan. 7, 1976, Ser. No. 647,083

Term of patent 7 years

Int. Cl. D22-06

U.S. Cl. D22-19



243,615

**ELECTRIC BATTERY**

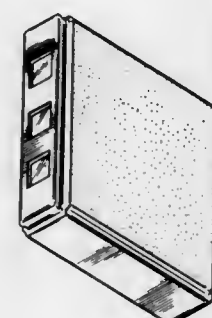
Gordon E. Kaye, Garrison, N.Y., assignor to P. R. Mallory &amp; Co., Inc., Indianapolis, Ind.

Filed Aug. 13, 1975, Ser. No. 604,381

Term of patent 14 years

Int. Cl. D13-02

U.S. Cl. D13-8



243,613

**RETAINING WALL STRINGER**

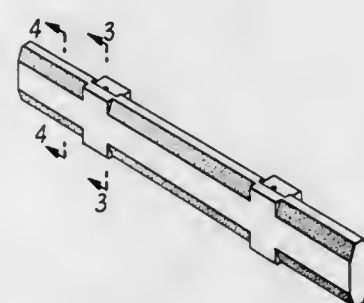
William K. Hilfiker, Eureka, Calif., assignor to Hilfiker Pipe Co., Eureka, Calif.

Filed Feb. 6, 1976, Ser. No. 655,888

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-77



243,616

**ELECTRIC BATTERY**

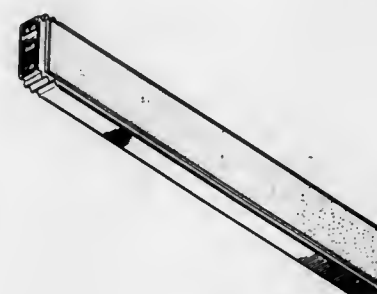
Gordon E. Kaye, Garrison, N.Y., assignor to P. R. Mallory &amp; Co., Inc., Indianapolis, Ind.

Filed Aug. 13, 1975, Ser. No. 604,382

Term of patent 14 years

Int. Cl. D13-02

U.S. Cl. D13-8



243,614

**STAKE**

Michael T. Russo, 1805 Larchwood St., Troy, Mich. 48084

Continuation of Ser. No. 471,404, May 20, 1974, Pat. No. D240,362. This application Nov. 3, 1975, Ser. No. 627,907

Term of patent 14 years

Int. Cl. D25-77

U.S. Cl. D25-77



243,617

**ELECTRIC BATTERY**

Gordon E. Kaye, Garrison, N.Y., assignor to P. R. Mallory &amp; Co., Inc., Indianapolis, Ind.

Filed Aug. 13, 1975, Ser. No. 604,383

Term of patent 14 years

Int. Cl. D13-02

U.S. Cl. D13-8



243,618

**ELECTRIC BATTERY**

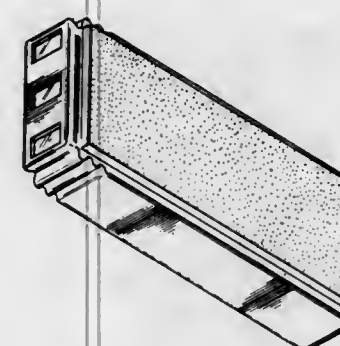
Gordon E. Kaye, Garrison, N.Y., assignor to P. R. Mallory &amp; Co., Inc., Indianapolis, Ind.

Filed Aug. 13, 1975, Ser. No. 604,287

Term of patent 14 years

Int. Cl. D13-02

U.S. Cl. D13-8



243,620

**LISTENING CENTER**

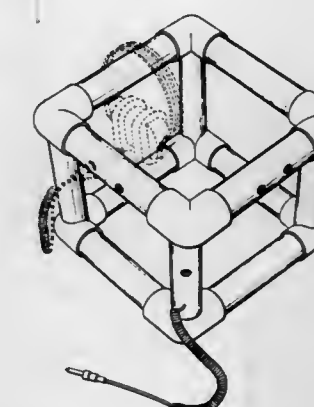
Jack H. Williams, 3229 W. Pioneer Drive, Irving, Tex. 75061

Filed Sept. 17, 1975, Ser. No. 614,331

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-37



243,621

**EAR TAG**

Jay R. Sulik, Carrollton, Tex., assignor to Zoecon Industries, Inc., Dallas, Tex.

Filed June 17, 1974, Ser. No. 480,290

Term of patent 14 years

Int. Cl. D30-08

U.S. Cl. D30-43



243,619

**TELEPHONE INSTRUMENT**

Karl Axel Torbjörn Olsson, Stockholm, Sweden, assignor to Telefonaktiebolaget, Stockholm, Sweden

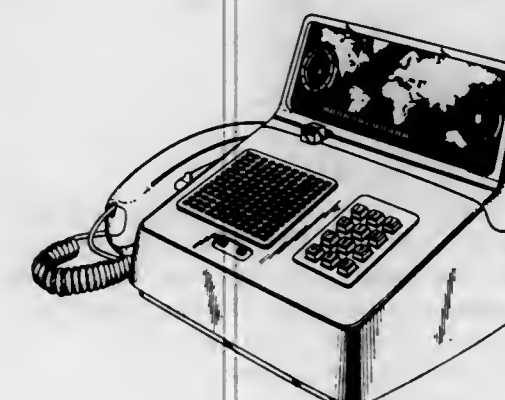
Filed Mar. 12, 1975, Ser. No. 557,684

Claims priority, application Sweden, Oct. 4, 1974, 7400161

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-53



243,622

**EAR TAG**

Ronald L. Burke, Denton, and Jay R. Sulik, Carrollton, both of Tex., assignors to Zoecon Industries, Inc., Dallas, Tex.

Filed Oct. 24, 1974, Ser. No. 517,588

Term of patent 14 years

Int. Cl. D30-08

U.S. Cl. D30-43





243,623  
EAR TAG

Lee-Louise H. Priest, Atherton, Calif., assignor to Zoecon Industries, Inc., Dallas, Tex.

Filed Jan. 9, 1975, Ser. No. 539,796

Term of patent 14 years

Int. Cl. D30-08

U.S. Cl. D30-43



243,624  
GAME CABINET

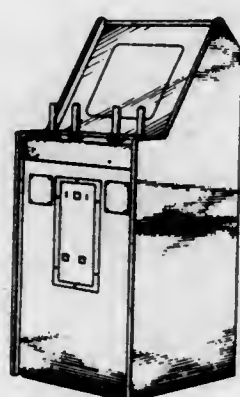
Peter L. Takaichi, San Jose, Calif., assignor to Atari, Inc.

Filed Oct. 20, 1975, Ser. No. 623,804

Term of patent 14 years

Int. Cl. D21-03

U.S. Cl. D34-5 J



243,625  
GAME CABINET

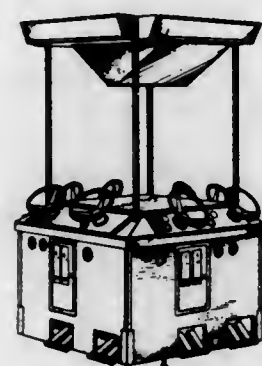
Kenneth W. Sauter, Morgan Hill, Calif., assignor to Atari, Inc.

Filed Oct. 20, 1975, Ser. No. 623,805

Term of patent 14 years

Int. Cl. D21-03

U.S. Cl. D34-5 J



243,626  
GAME CABINET

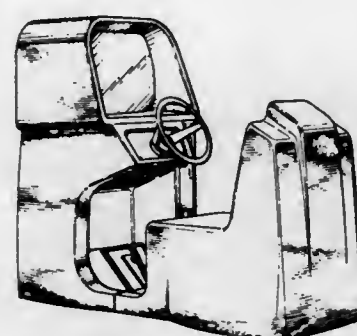
Regan L. Cheng, San Jose, Calif., assignor to Atari, Inc.

Filed Oct. 20, 1975, Ser. No. 623,806

Term of patent 14 years

Int. Cl. D21-03

U.S. Cl. D34-5 J



243,627  
CHILD'S COASTER VEHICLE

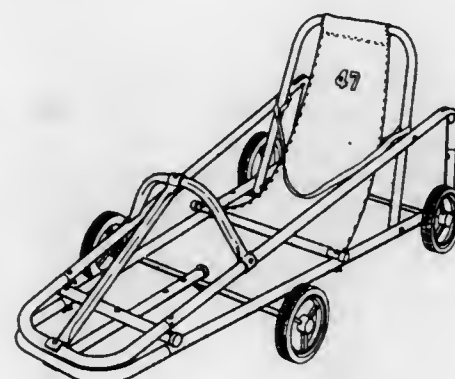
Robert E. Clower, 1036 Elmwood Ave., Evanston, Ill. 60202

Filed Sept. 22, 1975, Ser. No. 615,712

Term of patent 14 years

Int. Cl. D21-01; D12-14

U.S. Cl. D34-15 AJ



243,628  
DISPOSABLE CAPSULE FOR SEPARATELY STORING  
COMPONENTS OF DENTAL AMALGAMS

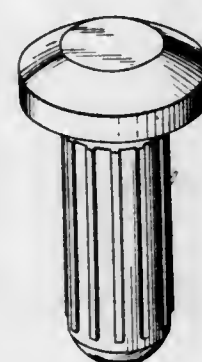
Joseph G. Blondo, Watchung, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.J.

Filed Aug. 1, 1975, Ser. No. 601,220

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D24-99



243,629  
LAMP

Alfred Brych, Romainville, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Paris, France

Division of Ser. No. 356,046, April 30, 1973, abandoned. This application June 12, 1975, Ser. No. 586,268

Term of patent 14 years

Int. Cl. D26-02

U.S. Cl. D48-24 A



243,630  
RADIO RECEIVER

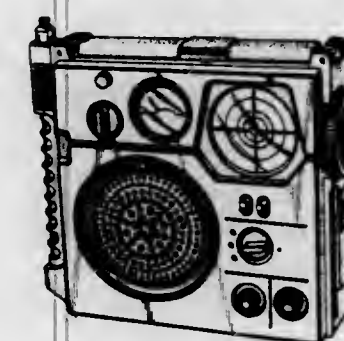
Tsutomu Murakami, Neyagawa; Toshio Igo, Katano; Ken Kawamura, Ibaragi; Katsuhiko Makino, Hirakata; Hironosuke Koda, Kyoto, and Shinzo Murakami, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 7, 1975, Ser. No. 575,547

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-75



243,631  
SOAP BAR

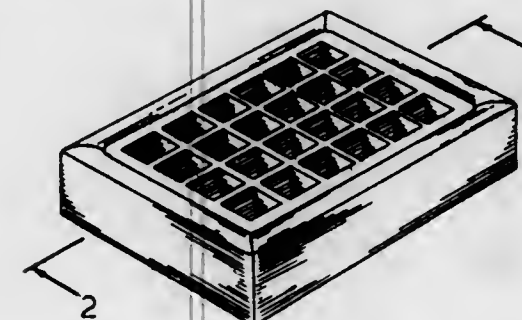
David J. Morrison, 1402 S. 78th St., Omaha, Nebr. 68127

Filed May 19, 1975, Ser. No. 578,375

Term of patent 14 years

Int. Cl. D28-02

U.S. Cl. D73-1 A



243,632  
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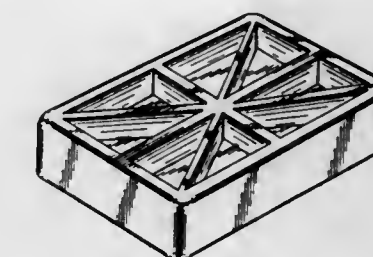
David J. Morrison, 1402 S. 78th St., Omaha, Nebr. 68124

Filed Sept. 2, 1975, Ser. No. 609,409

Term of patent 14 years

Int. Cl. D28-02

U.S. Cl. D73-1 A



243,633  
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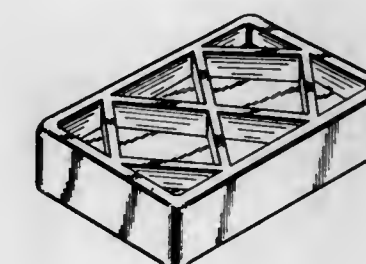
David J. Morrison, 1402 S. 78th St., Omaha, Nebr. 68127

Filed Sept. 22, 1975, Ser. No. 615,341

Term of patent 14 years

Int. Cl. D28-02

U.S. Cl. D73-1 A



243,634  
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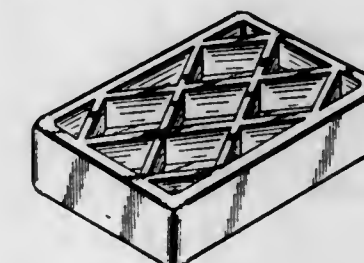
David J. Morrison, 1402 S. 78th St., Omaha, Nebr. 68124

Filed Sept. 22, 1975, Ser. No. 615,399

Term of patent 14 years

Int. Cl. D28-02

U.S. Cl. D73-1 A





243,635

**PRESSURE RELIEF VALVE FOR RESPIRATORY INHALATION SYSTEMS**

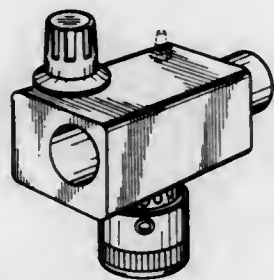
Bruce B. Miller, 714 Ashley Drive, Kalamazoo, Mich. 49001

Filed July 23, 1975, Ser. No. 598,544

Term of patent 14 years

Int. Cl. D29-02

U.S. Cl. D83-1 L



243,636

**MEDICAMENT DISPENSER FOR CHILDREN**

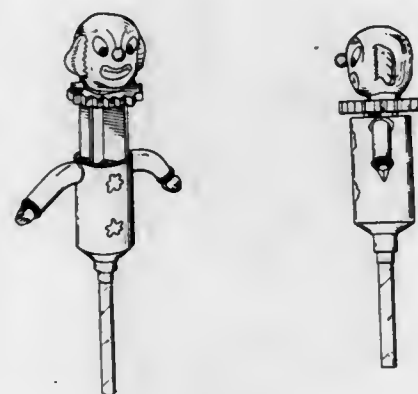
Stuart C. Rubin, 3141 E. Sunset Hill Drive, West Covina, Calif. 91790, and Gilbert I. Martin, 222 Starglen, Covina, Calif. 91722

Filed Feb. 23, 1976, Ser. No. 660,504

Term of patent 14 years

Int. Cl. D24-04

U.S. Cl. D83-12 A



243,637

**VACUUM BOTTLE TOTE BAG**

Harold Rabinowitz, Lakewood, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed July 31, 1975, Ser. No. 600,701

Term of patent 14 years

Int. Cl. D3-02

U.S. Cl. D87-1 R



243,638

**SAFETY RAZOR BLADE ASSEMBLY**

Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 576,251, May 12, 1975, abandoned. This application June 11, 1976, Ser. No. 695,300

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-47



243,639

**BEZEL FLASHING SIGN**

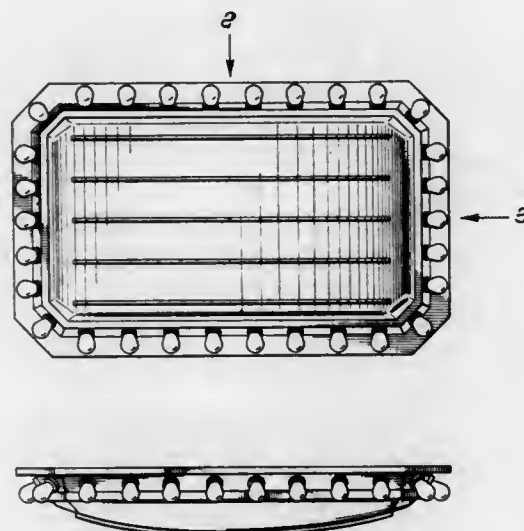
Conrad J. Escalante, 852 E. Ocean Ave., Long Beach, Calif. 90802

Filed Apr. 14, 1975, Ser. No. 567,610

Term of patent 14 years

Int. Cl. D20-03

U.S. Cl. D96-12 R



243,640

**ROTARY ADVERTISING DISPLAY**

John J. Casparro, 23326 Sandalwood St., Canoga Park, Calif. 91304

Filed May 21, 1976, Ser. No. 688,541

Term of patent 14 years

Int. Cl. D20-02

U.S. Cl. D96-12 R

**LIST OF PATENTEEES**

TO WHOM

**PATENTS WERE ISSUED ON THE 8TH DAY OF MARCH, 1977**

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. B. Dick Company: See—  
Turner, Carl L., 4,010,882.  
A & P Products Incorporated: See—  
Gabor, Robert J., 4,011,508.  
A. Stephan U. Sohne GmbH & Co.: See—  
Otto, Friedrich, 4,010,932.  
A-T-O Inc.: See—  
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AB Olle Lindstrom: See—  
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Abend, Phillip Gary; and Leenders, Peter, to Henkel Inc. Method for the production of guerbet alcohols utilizing insoluble lead catalysts. 4,011,273, Cl. 260-642.00C.  
ABM-Mavello AB: See—  
Littorin, Ove Gustav, 4,010,740.  
Abraham, Nedumparambil A.; and Lefebvre, Yvon, to American Home Products Corporation. 22-Cyano-24-norcholanes. 4,011,212, Cl. 260-239.55R.  
ACLA, Inc.: See—  
Levy, George D., 4,011,444.  
Acurex Corporation: See—  
Adler, Alan J., 4,011,551.  
Adamo, Charles, to Lawrence Peska Associates, Inc., a part interest. Time-delayed single cigarette dispenser. 4,010,869, Cl. 221-15.000.  
Adams, Thomas C. Interlock system for emergency vehicles. 4,010,814, Cl. 180-82.00R.  
Addison, F. Clark; and Addison, Lee Silk. Self-contained receptacle type dip stick cleaner. 4,010,512, Cl. 15-210.00B.  
Addison, Lee Silk: See—  
Addison, F. Clark; and Addison, Lee Silk, 4,010,512.  
Addressograph Multigraph Corporation: See—  
Root, Russell L., 4,011,035.  
Adler, Alan J., to Acurex Corporation. Multiple data channel wireless data coupling system for transmitting measured data from a plurality of rotating sources. 4,011,551, Cl. 340-189.00M.  
Adler, Franklin P., to Pullman Transport Leasing Company. Draft gear carrier for railway cars. 4,010,853, Cl. 213-61.000.  
AGA Aktiebolag: See—  
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Agency of Industrial Science & Technology: See—  
Sawata, Shinji; Tani, Tatsuo; and Horigome, Takashi, 4,010,732.  
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AGFA-GEVAERT N.V.: See—  
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Stievenart, Emile Frans; and Deconinck, Hugo Frans, 4,011,570.  
Aggen, Alvin F. Automatic seed planting machine and method for planting seeds in planters. 4,010,778, Cl. 141-9.000.  
Aggen, Glenroy Newcomb, to Tecumseh Products Company. Method for fastening ceramic magnets to a flywheel using centrifugal force. 4,011,120, Cl. 156-74.000.  
Aguettant, Georges; and Doyen, Louis. Sealed container. 4,010,786, Cl. 150-8.000.  
Ahlen, Karl Gustav, to S.R.M. Hydromekanik Aktiebolag. Transmission including a hydrodynamic torque converter. 4,010,660, Cl. 74-688.000.  
Aikoh Co., Ltd.: See—  
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Air Resources, Inc.: See—  
Mancini, Robert A.; and Cyr, David M., 4,011,304.  
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Akzona Incorporated: See—  
Ebner, Karl; Ettinger, Franz; Fuchs, Rudolf; and Schnorr, Helmut, 4,011,202.  
Hense, Karl-Hermann; and Zang, Thomas, 4,010,523.  
Albany International Corporation: See—  
Nicholson, Charles B., 4,011,131.  
Allabashi, John C., to United States of America, Navy. Cross-linked nitrocellulose propellant formulation. 4,011,114, Cl. 149-19.400.  
Allen, David: See—  
Rowley, Robert John; and Allen, David, 4,010,990.  
Allen, Robert H.; Van Malderghem, Edmund G.; Robertson, Victor J.; and Shook, William C., to Moore Business Forms, Inc. Envelope assembly. 4,010,889, Cl. 229-69.000.
- Allied Chemical Corporation: See—  
Barrett, Joseph John, 4,011,013.  
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Allis-Chalmers Corporation: See—  
Kjos, David M.; Jenness, Raymond C.; Sabaski, Richard E.; and Roloff, Carl A., 4,010,904.  
Murphy, Howard G.; Schmidt, Harvey E.; and Gilmore, Thomas P., 4,011,492.  
Allyn, Jerome B.; Wileman, Richard D.; and Kozak, John, to Midland-Ross Corporation. Melting pot apparatus for use in a continuous casting process. 4,010,939, Cl. 266-242.000.  
Althuis, Thomas H., to Pfizer Inc. Esters and amides of pyrimido[4,5-b]quinolin-4(3H)-one-2-carboxylic acids as antiulcer agents. 4,011,324, Cl. 424-251.000.  
Alumax Inc.: See—  
Stephens, Wilbur E., 4,010,935.  
Alvarez, Cesar E., Jr., to Teletype Corporation. MOSFET detecting and synchronizing circuit for asynchronous digital data. 4,011,465, Cl. 307-208.000.  
Amann, August; Vilhuber, Heinz Georg; Kunze, Johannes; Giertz, Hubert; and Franke, Albrecht, to BASF Aktiengesellschaft. 3-(p-Biphenyl)-butyronitrile and therapeutic compositions containing the same. 4,011,336, Cl. 424-304.000.  
Amann, August: See—  
Kropp, Rudolf; Reicheneder, Franz; Amann, August; and Giertz, Hubert, 4,011,220.  
Amdall, John K., to Caterpillar Tractor Co. Butterfly foot pedal control. 4,010,657, Cl. 74-478.000.  
American Can Company: See—  
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American Standard, Inc.: See—  
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Ametek, Inc.: See—  
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Anahara, Meiji; Take, Tsugio; and Kajihara, Yutaka, to Toyo Boseki Kabushiki Kaisha. Method for manufacturing a fancy textured yarn provided with slubs. 4,010,601, Cl. 57-160.000.  
Andersen, Richard H.; Litzinger, William A.; and Corsmeier, Robert J., to General Electric Company. Tip cap apparatus and method of installation. 4,010,531, Cl. 29-156.80H.  
Anderson, Fred N., to Cherry Electrical Products Corporation. Switch blade. 4,011,419, Cl. 200-67.00B.  
Anderson, Leif Per Roland. Storage apparatus with slide assemblies and a transportation device with pivotal conveyor means. 4,010,856, Cl. 214-16.40A.  
Anderson, Rodney H.: See—  
Vidakovic, Aleksandar; and Anderson, Rodney H., 4,010,789.  
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Mayr, Gunter; Leonhardt, Fritz; Andra, Wolfhart; Baur, Willi; Zellner, Wilhelm; and Schlaich, Jorg, 4,010,580.  
Andrzejewski, Heinz, to Drahtex Development AG. Sealing or trimming strip structure. 4,010,573, Cl. 49-479.000.  
Ansari, Hifzur Rahman; Fido, Paul Edgar; and Wagner, Horst Richard,



to Bush Boake Allen Limited. Chemicals and their use in perfumery. 4,011,177, Cl. 252-522.000.

Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. Process for making a deep diode atomic battery. 4,010,534, Cl. 29-572.000.

Anthony, Thomas R.: See—  
Cline, Harvey E.; and Anthony, Thomas R., 4,011,582.

Applied Power Australia Limited: See—  
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Armco Steel Corporation: See—  
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Hook, Rollin E., 4,011,111.

ARP Instruments, Inc.: See—  
Pearlman, Alan R.; and Gillette, Timothy C., 4,011,466.

Arter, Nelson K.; Eichhorn, Thomas F.; and Kalthoff, Clement H., to International Business Machines Corporation. Rotary head magnetic recorder for use with a specific record member. 4,011,587, Cl. 360-62.000.

Arthur, David M. Solar radiation collector and system for converting and storing collected solar energy. 4,010,614, Cl. 60-641.000.

Asada, Katsumi: See—  
Hosokawa, Etsuo; Waki, Misao; and Asada, Katsumi, 4,011,185.

Asahi-Dow Limited: See—  
Watanabe, Masaaki; Hasegawa, Masao; Yamada, Jiro; and Kobayashi, Kouichi, 4,011,274.

Asahi Kasei Kogyo Kabushiki Kaisha: See—  
Izuma, Takeshi; Fukumoto, Chiyoishi; and Yamaura, Kazuhiko, 4,010,965.

Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
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Asano, Koichi: See—  
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Ashcroft, Kenneth: See—  
Simpkin, Gordon Thomas; and Ashcroft, Kenneth, 4,011,359.

Ashcroft, Richard I., to Owens-Illinois, Inc. Method for producing plastic-covered containers. 4,011,122, Cl. 156-86.000.

Ashikawa, Mikio: See—  
Koike, Norio; Kamiyama, Takamitsu; and Ashikawa, Mikio, 4,011,402.

Assenheimer, Robert; and Pekkarinen, Michael O., to Baxter Travenol Laboratories, Inc. Disposable humidifier assembly. 4,011,288, Cl. 261-121.00R.

Associated Engineering Limited: See—  
Noddings, John; and Hunt, Norman, 4,010,674.

Atel Products Limited: See—  
Jones, Rodney Vernon, 4,010,826.

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Lambrecht, Richard M.; Packer, Samuel; Merrill, Jerald C.; Atkins, Harold L.; Wolf, Alfred P.; and Bradley-Moore, Patrick R., 4,011,307.

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Miles, Leon H.; and Martin, Ferman G., 4,010,802.

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Steinwart, Johannes; Bauder, Armin; and Leitermann, Wulf, 4,011,032.

Aufderheide, Maurice Bernard; and Morris, Guy Vernon, to Motorola, Inc. Simplified digital moving target indicator filter. 4,011,438, Cl. 235-152.000.

Australian Atomic Energy Commission: See—  
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Harris, Rano J., Sr.; and Averette, Julius P., Jr., 4,010,648.

Aysta, James E., to Minnesota Mining and Manufacturing Company. Connector encapsulating housing. 4,010,994, Cl. 339-36.000.

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De Feo, Francesco; Papa, Sisto; and Traverso, Enrico, 4,011,209.

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Fischer, Josef; Baarfusser, Johann; and Maier, Helmut, 4,010,514.

Baba, Nobuyuki, to Toyo Soda Manufacturing Co., Ltd. Refractometric densitometer. 4,011,015, Cl. 356-136.000.

Babiol, Pierre, to Le Bouchage Mecanique. Pourer-stopper. 4,010,875, Cl. 222-517.000.

Bachman, Albert K., to Western Electric Company. Methods of forming metallization patterns on beam lead semiconductor devices. 4,011,144, Cl. 204-15.000.

Back, Erik Gustav: See—  
Nyman, Bror Goran; Leimala, Raimo Juhani; and Back, Erik Gustav, 4,011,297.

Bacska, Robert, to Chevron Research Company. Maleic anhydride/2,5-dihydrofuran copolymers. 4,011,282, Cl. 260-836.000.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: See—  
Popp, Karl Hugo; Hess, Klaus; Simmler, Werner; Stickel, Richard; and Zuern, Ludwig, 4,011,161.

Baichtal, James R.; and McDonald, John C., to TRW Inc. Redundant data transmission system. 4,011,542, Cl. 340-147.0LP.

Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 1,2,4-Triazoles. 4,011,218, Cl. 260-250.0AH.

Banner, Philip M. Building emergency exit means. 4,010,822, Cl. 182-18.000.

Barnes, Bennett H., Jr., to Barnes Lumber Corporation. Mobile home foundation. 4,010,584, Cl. 52-299.000.

Barnes Lumber Corporation: See—  
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Blomqvist, Seppo Ilmari; Lilja, Launo Leo; Makitalo, Valto Johannes; Relander, John Henrik; Honkanieni, Matti Elias; and Tuovinen, Frans Heikki, to Outokumpu Oy. Method and device for dispersing a melt with a fluid jet. 4,011,290, Cl. 264-12.000.

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- Bredewater, John R.; and Thumudo, Mario F., Jr., to General Tire & Rubber Company. The Ultraviolet irradiating apparatus. 4,011,456, Cl. 250-492.00R.
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- Cantrell, Ronald G.; and Katchka, Barron L., to Houdaille Industries, Inc. Impact resistant lightweight, low cost automobile bumpers and method of making same. 4,010,969, Cl. 293-98.000.
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- Carey, Patrick H., Jr., to Minnesota Mining and Manufacturing Company. Filter medium layered between supporting layers. 4,011,067, Cl. 55-354.000.
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- Carnahan, Garnett H. Adjustable pedestal. 4,010,926, Cl. 248-411.000.
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- Carroll, Ronnie D.; Moore, Bernard S.; and Tretter, James R., to Pfizer Inc. 2-Phenyl-6-(1-hydroxy-2-t-butylaminoethyl)-4H-pyrido[3,2-d]-1,3-dioxin maleate and its use as an intermediate. 4,011,231, Cl. 260-296.00R.
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- Challenge-Cook Bros., Incorporated: See—  
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- Chamberlin, Thomas A.; and Madison, Norman L., to Dow Chemical Company. The Process of using oxazoline and/or oxazine-modified polymers. 4,011,160, Cl. 210-40.000.
- Chambers, Donald R.: See—  
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- Chang, Robert Wu-Lin, to Singer Company, The. Frequency-shift digital data link and digital frequency detection system. 4,011,511, Cl. 325-40.000.
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- Clarke, Michael R.; and Desai, Raman L., to Canadian Patents and

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Curran, Adrian Charles Ward, to John Wyeth & Brother Limited. 8-Carboxyl-tetrahydroquinoline derivatives. 4,011,226, Cl. 260-287.00T.

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Curry, Harold George; Attwood, Brian William; White, Derek Graham Walter; Christensen, John Mosgaard; and Kroyer, Karl Kristian Kobs, to Karl Kroyer St. Anne's Limited. Production of fibrous sheet material. 4,011,034, Cl. 425-80.000.

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Curtis, Julius; and Pletsch, Hanns, to Beiersdorf Aktiengesellschaft. Adhesive resins and method of production thereof. 4,011,387, Cl. 526-281.000.

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De Lorenzo, Bruce L.; and McCarthy, Daniel J., to Plast-O-Matic Valves, Inc. Leak detection arrangement for valve having sealing means. 4,010,769, Cl. 137-312.000.

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Dunn, Donnell Lynn, to J. I. Case Company. Hydraulic load-sensing system. 4,010,610, Cl. 60-459.000.

Du Pont de Nemours, E. I., and Company: See—  
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Westley, Melvin W., 4,010,818.

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Wommack, Joel Benjamin, Jr., 4,011,213.

Durham, David M. Carton for egg-shaped containers. 4,010,887, Cl. 229-21.000.

Durning, Maurice Francis; and Starr, John Edward, to Eastman Kodak Company. Surface sensitive silver halide emulsion containing a silver complexing azaindene to reduce desensitization of optical sensitizing dye incorporated therein. 4,011,083, Cl. 96-109.000.

Duskin Franchise Co., Ltd.: See—  
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Komatsu, Toshiyoshi, 4,010,511.

Dutmers, Earl S.: See—  
Davis, Alden B.; Dutmers, Earl S.; and Englund, Mariane L., 4,010,499.

Dybel, Frank R., to International Measurement & Control Co. Piezo-electric transducer sensor for use in a press. 4,010,679, Cl. 100-53.000.

Eagle Rubber Co., Inc.: See—  
Cooke, Lawrence G., 4,010,501.

Eastman Kodak Company: See—  
Durning, Maurice Francis; and Starr, John Edward, 4,011,083.

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Chetelat, Fernand; and Hersberger, Pierre, 4,011,557.

Ebel, Lawrence G. Combined container for new and waste crankcase oil. 4,010,863, Cl. 220-1.00C.

Eberhardt & Co.: See—  
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Eberhardt, Hermann: See—  
Rese, Arkadius; and Eberhardt, Hermann, 4,010,868.

Eberle, William J., to General Battery Corporation. Acid filling apparatus for batteries or the like. 4,010,780, Cl. 141-168.000.

Eberle, William J., to General Battery Corporation. Automatic air leak testing apparatus for multiple chambered containers. 4,010,840, Cl. 198-345.000.

Eberspacher, J.: See—  
Kofink, Siegfried; Rich, Wolfgang; and Langen, Herbert, 4,010,895.

Ebihara, Heihachiro; and Sekiya, Fukuo, to Citizen Watch Co., Ltd. Electronic device for detecting the energized state of a liquid crystal display cell. 4,011,002, Cl. 350-160.0LC.

Ebner, Karl; Ettinger, Franz; Fuchs, Rudolf; and Schnorr, Helmut, to Akzona Incorporated. Separating vaporous reaction product in the production of polyesters. 4,011,202, Cl. 260-75.00M.

Eckerbom, Gunnar, to Aktiebolaget Tudor. Methods and apparatus for closing the bottom ends of electrode tubes. 4,011,370, Cl. 429-140.000.



Edwards, Allen P., to Hewlett-Packard Company. Apparatus for relative power measurements in a power meter. 4,011,509, Cl. 324-142.000.

Edwards, James Byrd: See—  
Marsan, Mario Stephen; Diehl, Francis Louvaine; and Edwards, James Byrd, 4,011,172.

Edwards, John A.: See—  
Beard, Colin C.; Edwards, John A.; and Fried, John H., 4,011,320.

Edwards, John Wilmar; and Farrant, Barry William, to Imperial Chemical Industries Limited. Coating compositions comprising tetrafluoroethylene polymers and aluminum hydroxychloride. 4,011,187, Cl. 260-29.60F.

Edwards, Walter William. Thumb trigger and automatic safety. 4,010,566, Cl. 42-69.00R.

Eft, Sheldon E. Power drill support and guide apparatus. 4,010,943, Cl. 269-87.100.

Egli, Glen H., to Joglex Corporation. Fireplace furnace. 4,010,729, Cl. 126-121.000.

Ehlers, Karl: See—  
Wieking, Hans Wilhelm; and Ehlers, Karl, 4,010,937.

Eichholz, Werner; and Krebs, Gerd, to Phoenix Gummiwerke A.G. Drum for producing blanks for car tires. 4,011,126, Cl. 156-416.000.

Eichholz, Werner; and Krebs, Gerd, to Phoenix Gummiwerke Aktiengesellschaft. Tire building drum. 4,011,127, Cl. 156-416.000.

Eichhorn, Thomas F.: See—  
Arter, Nelson K.; Eichhorn, Thomas F.; and Kalthoff, Clement H., 4,011,587.

Eilberg, Ralph G.: See—  
Soldati, Gianluigi; Eilberg, Ralph G.; Melger, Helga; and Schlichting, David A., 4,011,310.

Eilenberg, Jon Arthur; and Naugle, George Henry, to International Paper Company. Apparatus for forming articles such as carton blanks. 4,010,676, Cl. 93-51.00R.

Einhorn, Ruediger, to Coats & Clark, Inc. Shelf bracket assembly and bracket for said assembly. 4,010,697, Cl. 108-93.000.

Einhorn, Ruediger, to Coats & Clark, Inc. Method of casting an article having a body cavity. 4,010,794, Cl. 164-94.000.

Eisenhower, Walter D.: See—  
Paivinen, John O.; and Eisenhower, Walter D., 4,011,105.

Eisert, Gerald A., to Central Research Laboratories, Inc. Sealing device. 4,010,588, Cl. 52-398.000.

Eiwen, George Ernest, to RCA Corporation. Method for devacuating a vacuum tube. 4,010,991, Cl. 316-2.000.

Ekstrom, Gosta Ivar; and Johansson, Karl-Evert, to Atlas Copco Aktiebolag. Arrangement for muffling the exhaust of a pneumatic rock drilling machine. 4,010,819, Cl. 181-36.00A.

Electricite de France (Service National): See—  
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Eli Lilly and Company: See—  
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Ellsworth, Carolyn; and Herring, L. W., to Ellsworth, Carolyn. Electronic mathematics trainer. 4,010,556, Cl. 35-30.000.

Elsters Inc.: See—  
Levenback, George; and Marks, Ronald Aaron, 4,011,101.

Empresa Nacional del Aluminio, S.A.: See—  
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Energy Systems Corporation: See—  
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Englund, Mariane L.: See—  
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Ensign Electronics, Inc.: See—  
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Eprad Incorporated: See—  
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Epstein, Max; and Marhic, Michel E., to Northwestern University. Fiber optic laser illuminators. 4,011,403, Cl. 358-209.000.

Ericson, Eric Axel; and Kaufhold, Frederick Daniel, to General Electric Company. Position indicator for drawout apparatus. 4,011,424, Cl. 200-308.000.

Erikson, Alma Doris. Collapsible painter's canvas frame holder rack. 4,010,851, Cl. 211-189.000.

Ernst, Thomas J., to Ralston Purina Company. Process for the production of a formed high moisture pet food product. 4,011,346, Cl. 426-104.000.

Escher Wyss G.m.b.H.: See—  
Selder, Harald, 4,011,027.

Essex International, Inc.: See—  
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Etat Francais represente par le Delege Ministeriel pour l'Armement: See—  
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Eter, Berwyn E. Method of transporting natural gas. 4,010,622, Cl. 62-48.000.

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Evans, Leslie Samuel; Markin, Trevor Leslie; and Bones, Roger John, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Sodium-sulphur electric cells. 4,011,367, Cl. 429-104.000.

Evdokimova, Anna Vasilievna: See—  
Tjurin, Boris Konstantinovich; Momot, Appolon Lukich; Volodin, Nikolai Lvovich; Peremitina, Valentina Trofimovna; Evdokimova, Anna Vasilievna; Churov, Vyacheslav Petrovich; Krugly, Samuil Markovich; and Garifzyanov, Gabdulbar Garifzyanovich, 4,011,251.

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F. L. Smith Machine Company, Inc.: See—  
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Fabry, Lloyd W.; and Brame, Thomas Vinton. Single wire system with delay switching circuit for selective control of navigation and strobe lights. 4,011,541, Cl. 340-25.000.

Facet Enterprises, Inc.: See—  
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Fairbanks, Fred A. Water waste treatment. 4,011,163, Cl. 210-208.000.

Fake, Charles Sylvester, to Beecham Group Limited. Tetrahydropyrid-4-yl-chroman-5-ol derivatives in the treatment of hypertension. 4,011,329, Cl. 424-263.000.

Falk, Richard A. Molten metal samplers with flow diverter. 4,010,649, Cl. 73-425.40R.

Falk, Theodore John, to Calspan Corporation. Radial flow laser. 4,011,522, Cl. 331-94.50G.

Falkner, Raimund; and Grune, Heinz, to Rapena Patent - und Verwaltungs-AG. Method and device of making a profiled body of at least one band of materials. 4,010,628, Cl. 72-181.000.

Farner, Hans U. Apparatus and method to control forward control surface type aircraft in flight. 4,010,920, Cl. 244-89.000.

Farr, John B., to Standard Oil Company (Indiana). Combined electret hydrophone and transmission line. 4,011,540, Cl. 340-7.00R.

Farrant, Barry William: See—  
Edwards, John Wilmar; and Farrant, Barry William, 4,011,187.

Farrier, Ray W.; and Leavens, Roland B., to Diamond Fruit Growers, Inc. Process for inhibiting browning of fruit. 4,011,348, Cl. 426-268.000.

Fasching, George E., to United States of America, Energy Research and Development Administration. High voltage pulse generator. 4,011,463, Cl. 307-110.000.

Feher, Tibor. Hosiery machine with terry forming apparatus. 4,010,626, Cl. 66-93.000.

Feierabend, Louis B.; and Luhrs, Otto R., to International Business Machines Corporation. Apparatus for contouring magnetic head surfaces and method therefor. 4,010,574, Cl. 51-121.000.

Feng, Ching C., to Becton, Dickinson Electronics Company. Acoustic emission transducer. 4,011,472, Cl. 310-8.100.

Ferodo Limited: See—  
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Ferrara, John M., to Narco Scientific Industries, Inc. Apparatus for measuring the phase relation of two alternating current signals. 4,011,503, Cl. 324-83.00R.

Ferro Manufacturing Corporation: See—  
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Feuerstein, Roger F.; Freeman, Maurice A.; and Spinelli, Leonardo B., to General Electric Company. Borescope support apparatus. 4,011,017, Cl. 356-241.000.

Feurstein, Ludwig J.; Meives, Otis E.; Schelk, Roger E.; and Verhyen, Larry L., to Pemco, Inc. Wrapped package inspection and rejection apparatus. 4,011,155, Cl. 209-74.00R.

Fido, Paul Edgar: See—  
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Filippov, Jury Vasilievich; Vendillo, Vsevolod Petrovich; and Ox, Nikolai Alexandrovich. High frequency ozonizer. 4,011,165, Cl. 250-540.000.

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Cocozella, Robert A.; Dal Pan, Florindo F.; Finelli, Thomas M.; and Patterson, Duane M., 4,010,690.

Fink, Charles R.: See—  
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Finley, Gwendolyn: See—  
Finley, T. J.; and Finley, Gwendolyn, 4,010,569.

Finley, T. J.; and Finley, Gwendolyn. Connector for flexible lines. 4,010,569, Cl. 43-44.830.

Firester, Arthur Herbert, to RCA Corporation. Optical element for a laser. 4,011,524, Cl. 331-94.50C.

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Fischer, Josef; Baarfusser, Johann; and Maier, Helmut, to AGFA-Gevaert, A.G. Arrangement for continuously cleaning flexible layer substrates in tape form. 4,010,514, Cl. 15-306.00A.

Fischer, Otto H., to Stowell Industries Inc. Rotary spray station for bottle washers. 4,010,774, Cl. 134-104.000.

Fischer & Porter Co.: See—  
Herzl, Peter J., 4,010,645.

Fisher, Alfred J., III; and Collins, Cecil A. Latch structure for vehicle seats. 4,010,979, Cl. 297-379.000.

Fisher, Christopher L., to Armco Steel Corporation. Composite arch structure. 4,010,617, Cl. 61-45.00R.

Fitzsimons, Ron. Foot massager. 4,010,743, Cl. 128-57.000.

Flamand, Maurice, to Rockwell International Corporation. Tape wheel for shuttleless looms. 4,010,776, Cl. 139-449.000.

Flanagan, Charles D., to Texas Instruments Incorporated. Magnetic relay. 4,011,534, Cl. 335-186.000.

Fleck, Adolf: See—  
Dreher, Karl; Fleck, Adolf; Gotze, Christian; Ismann, Ernst; and Flugbeil, Mathias, 4,010,912.

Fleming, James William, Jr.; Jaeger, Raymond Edward; and Miller, Thomas John, to Bell Telephone Laboratories, Incorporated. GeO<sub>2</sub>-B<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> Optical glass and lightguides. 4,011,006, Cl. 350-96.00M.

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Fletcher-Terry Company, The: See—  
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Flix, Jean-Marie; and Payen, Guy. Mobile agricultural spray machine. 4,010,900, Cl. 239-168.000.

FMC Corporation: See—  
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Folser, Karl: See—  
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Muller, George H.; and VanWicklin, Warren A., Jr., 4,010,659.

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Forseen, Roger K.; and Hofacker, David A., to Minnesota Mining and Manufacturing Company. Articles providing sustained release and method of making. 4,011,061, Cl. 71-29.000.

Forsyth, Eric B., to Ensign Electronics, Inc. Time marking chronometer. 4,010,603, Cl. 58-39.500.

Fosler, Dick E., Jr.; and Krochieski, Thomas L., to Sperry Rand Corporation. Low power clock driver. 4,011,468, Cl. 307-270.000.

Fosnough, Robert D.; and Bennett, David F., to Essex International, Inc. Microwave oven timer and control circuit. 4,011,428, Cl. 219-10.55B.

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Foster, Alan Ernest: See—  
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Fox, William B., Jr., to United States of America, Air Force. Oxygen generation method. 4,011,306, Cl. 423-579.000.

Foxboro Company, The: See—  
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Franz, Joseph Phillip; and Plunkett, Allan Barr, to General Electric Company. Apparatus for regulating magnetic flux in an AC motor. 4,011,489, Cl. 318-227.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: See—  
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Fraser, Herbert James, to Australian Atomic Energy Commission. Logarithmic ratemeter with bistable signal comparison. 4,011,502, Cl. 324-78.00E.

Fred M. Dellorlano, Jr. & Donald P. Massa, Trustees of the Stoneleigh Trust: See—  
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Frederiksen, Thomas Marinus: See—  
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Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture; Photodegradable plastics containing halogenated diphenyl ethanes. 4,011,375, Cl. 526-1.000.

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Frese, Albert: See—  
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Freyler, Adalbert. Telescopic shock absorber. 4,010,940, Cl. 267-9.00B.

Freze, Benjamin H., to Challenge-Cook Bros., Incorporated. Continuous processing apparatus and method for textile fabrics. 4,010,550, Cl. 34-23.000.

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Frommel, John G., to Illinois Tool Works Inc. Fluid sensor. 4,011,538, Cl. 338-35.000.

Fu, Yuan C., to United States of America, Energy Research and Development Administration. Liquefaction and desulfurization of coal using synthesis gas. 4,011,153, Cl. 208-10.000.

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Fujita, Toshio; Ishida, Katusada; and Funakoshi, Takehiko. Method of adjusting two concentric windings in electrical induction devices. 4,010,536, Cl. 29-593.000.

Fujiwara, Hiroshi; Asano, Koichi; Takahashi, Asao; and Sugishita, Akio, to Maruzen Oil Co. Ltd. Method for diaphragm electrolysis of alkali metal halides. 4,011,147, Cl. 204-98.000.

Fukase, Hisahiko; and Yoneda, Minoru, to Ishikawajima-Harima Jukogyo Kabushiki-Kaisha; and Kayabakogyo Kabushiki-Kaisha. Servo-controller. 4,011,493, Cl. 318-568.000.

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Gabor, Robert J., to A & P Products Incorporated. Logic signal test device for indicating low, intermediate and high level signals. 4,011,508, Cl. 324-133.000.

Gaiser, Dieter; Koester, Eberhard; Schoettle, Klaus; and Guenther, Friedrich, to BASF Aktiengesellschaft. Magnetic tape cassette with screening shield. 4,011,593, Cl. 360-132.000.

Galantay, Eugene E.; and Kathawala, Faizulla G., to Sandoz, Inc. Hypolipidemic allene carboxylic acids. 4,011,339, Cl. 424-317.000.

Gale, David M., to Du Pont de Nemours & E. I., and Company. Toughened linear aromatic polymers. 4,011,293, Cl. 264-126.000.

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Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., 4,011,051.

Gallagher, Gregory, Jr.; and Kingsbury, William D., to SmithKline Corporation. 4-Sulfanilamidothiazole. 4,011,210, Cl. 260-239.950.

Gallagher, John S.: See—  
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Galvagni, Mario. Three dimensional pre-fabricated structural elements for building habitation units. 4,010,579, Cl. 52-79.800.



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Stenberg, Kaj, 4,010,795.  
Gar Design Research, Inc.: See—  
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Garber, Bernard. Shaped container. 4,010,860, Cl. 215-1.00R.  
Garchinsky, John S., to Gar Design Research, Inc. Adjustable traffic signal mounting assembly. 4,010,925, Cl. 248-295.000.  
Garcia, Arthur, to RCA Corporation. Directional power detector for propagating waves. 4,011,529, Cl. 333-10.000.  
Garcia, Juan A., to Exxon Production Research Company. Distributed load liner hanger and method of use thereof. 4,010,804, Cl. 166-315.000.  
Gardner, John Nicholson, to Hoffmann-La Roche Inc. Preparation and use of magnesium acetylene complex. 4,011,271, Cl. 260-638.00Y.  
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S.p.A. Cartridge for a ribbon of a typewriter or like office machines. 4,010,839, Cl. 197-151.000.  
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- Havens, Richard Calvin, to Motorola, Inc. Temperature compensated microwave cavity transistor oscillator. 4,011,527, Cl. 331-117.00D.
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- Heft, Eldon Bertel, to General Electric Company. Molded case circuit breaker with improved interrupting capacity. 4,011,420, Cl. 200-147.00R.
- Heiba, El Ahmadi I.; and Dessau, Ralph M., to Mobil Oil Corporation. Selective reactions of free radicals with olefins in the presence of an ion of Mn, V, or Ce. 4,011,239, Cl. 260-327.00S.
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- Heinrich, Manfred G., to Raymond Lee Organization, Inc., The, a part interest. Motor camper accessory. 4,010,973, Cl. 296-23.00R.
- Heitmann, Bob, to Hauni-Werke Korber & Co., KG. Splicing apparatus for webs of metallic foil or the like. 4,010,911, Cl. 242-58.400.
- Heitzman, Charles J. Pulsating fluid spray device. 4,010,899, Cl. 239-101.000.
- Helfont, Raymond. Sewing machine accessory. 4,010,701, Cl. 112-121.120.
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- Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., to Caterpillar Tractor Co. Composite wear-resistant alloy, and tools from same. 4,011,051, Cl. 29-182.000.
- Hempel, Rod A.; Tittman, Walter P.; and Sheth, Santosh D., to American Standard, Inc. Circulating fireplace system. 4,010,728, Cl. 126-120.000.
- Hemstreet, Harold S.; Markle, David A.; Newell, William H.; and Offner, Abe, to Perkin-Elmer Corporation, The. Optical projection apparatus. 4,011,011, Cl. 355-18.000.
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- Higginbottom, Harold P., to Monsanto Company. Aqueous resole resin solutions having dispersed inert salts. 4,011,186, Cl. 260-29.300.
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- Hodge, Trevor A. Air conveyor with tunnel guide. 4,010,981, Cl. 302-2.00R.
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- Hoffmann, Gerhard: See—  
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Kamatani, Yoshio; Okazaki, Hisayoshi; Imai, Ko; Fujita, Noriaki; Yamazaki, Yoshio; and Ogino, Katsuhiko, to Takeda Chemical Industries, Ltd. Production of L(+)-tartaric acid. 4,011,135, Cl. 195-30.000.  
Kameda, Yukihiko: *See—*  
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Kamiyama, Takamitsu: *See—*  
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Kaneko, Chikara: *See—*  
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Kantrowitz, Arthur R.; Gerry, Edward T.; Leonard, Donald A.; and Wilson, Jack, to Avco Corporation. High powered laser. 4,011,521, Cl. 331-94.50G.  
Kao, James T. F., to Ethyl Corporation. Phosphazene composition. 4,011,089, Cl. 106-15.0FP.  
Kaplan, Jean-Pierre: *See—*  
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Kapstad, Odd B. Sheet support apparatus. 4,010,517, Cl. 24-67.110.  
Kapustin, Vladislav Alexandrovich: *See—*  
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Kartinen, Ernest O., to Burmah Oil & Gas Company. Vapor removal apparatus for oil/water separator. 4,010,891, Cl. 233-3.000.  
Kaschak, Anthony A. Refrigerant transfer system. 4,010,623, Cl. 62-55.000.  
Kasperkovitz, Wolfedietrich Georg, to U.S. Philips Corporation. Integrated circuit. 4,011,580, Cl. 357-51.000.  
Kassel, Karl-Heinz: *See—*  
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Katchka, Barron L.: *See—*  
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Kathawala, Faizulla G., to Sandoz, Inc. Phenoxypheyl pyridyl compounds. 4,011,232, Cl. 260-297.00R.  
Kathawala, Faizulla G.: *See—*  
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Kato, Masanori: *See—*  
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Katsuo, Kenichi: *See—*  
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Kaufhold, Frederick Daniel: *See—*  
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Kaufman, Sydney M., to Ford Motor Company. Copper coated, iron-carbon eutectic alloy powders. 4,011,077, Cl. 75-212.000.  
Kaun, Thomas D.; Vissers, Donald R.; and Shimotake, Hiroshi, to United States of America, Energy Research and Development Administration. Uncharged positive electrode composition. 4,011,373, Cl. 429-218.000.  
Kaun, Thomas D., to United States of America, Energy Research and Development Administration. Porous carbonaceous electrode structure and method for secondary electrochemical cell. 4,011,374, Cl. 429-220.000.  
Kawachi, Manabu, to Pioneer Electronic Corporation. Tuning device for a radio receiver. 4,011,513, Cl. 325-312.000.

Kawada, Takehiko, to Denki Onkyo Company, Ltd. Cassette tape recorder with tape pad. 4,011,592, Cl. 360-130.000.  
Kawai, Yoshihisa, to Minolta Camera Kabushiki Kaisha. Operation control device for copying apparatus. 4,011,012, Cl. 355-55.000.  
Kawaki, Takao: *See—*  
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Kawamura, Masami; and Suzuki, Yukio, to Hitachi, Ltd. Transistor amplifier circuit. 4,011,519, Cl. 330-29.000.  
Kawano, Tsuyoshi: *See—*  
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Kawata, Yoshihiro; and Iwata, Kansei, to Iwatsu Electric Co., Ltd. Display apparatus. 4,011,546, Cl. 340-172.500.  
Kawatake, Katsunori: *See—*  
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Kawneer Company, Inc.: *See—*  
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Kay, Ian Trevor, to Imperial Chemical Industries Limited. Imidazopyrimidines useful as agricultural and horticultural fungicides. 4,011,325, Cl. 424-251.000.  
Kayabakogyo Kabushiki-Kaisha: *See—*  
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Keck, Karl: *See—*  
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Keil, Joseph W., to Dow Corning Corporation. Urethanes modified with siloxanes. 4,011,189, Cl. 260-33.6UB.  
Keizer, Alan S.; and Harris, Hugh R., to Jade Corporation, The. Apparatus for accurately bonding leads to a semi-conductor die or the like. 4,010,885, Cl. 228-6.00A.  
Keledy, Francis C.; and Nemes, Laszlo, to Trodyne Corporation. Differential pressure indicator including remote sensing means. 4,010,708, Cl. 116-65.000.  
Kelley, Leon O. Flow through brush cutter. 4,010,805, Cl. 172-698.000.  
Kellogg, Robert Melroy; and Kruger, Victor Robert, to International Business Machines Corporation. Centrifuge fluid container. 4,010,894, Cl. 233-27.000.  
Kemmerling, Robert A.: *See—*  
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Kennametal Inc.: *See—*  
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Kepplinger, Hannes; and Schweighofer, Hermann, to Steyr-Daimler-Puch Aktiengesellschaft. Small arm. 4,010,673, Cl. 89-191.00A.  
Kern, Loyd R.; and Perkins, Thomas K., to Petro-Canada Exploration Inc.; Imperial Oil Limited; and Canada-Cities Service, Ltd. Method for reducing power loss associated with electrical heating of a subterranean formation. 4,010,799, Cl. 166-248.000.  
Kerr, George T.: *See—*  
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Khismatulin, Enver Rakhmatullovich: *See—*  
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Kidd, Archibald Watson. Mobile saw bench for farm use and the like. 4,010,665, Cl. 83-477.200.  
Kikuci, Yoshiyuki: *See—*  
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Kilian, Robert J.; and Gallagher, John S., to Johnson & Johnson. Adhesive bonding to teeth of orthodontic brackets and the like. 4,010,545, Cl. 32-14.00A.  
Kim, In Su. Electron therapy device. 4,010,742, Cl. 128-24.400.  
Kimberly-Clark Corporation: *See—*  
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Kimmel, Milton Jay, to International Business Machines Corporation. Data processor for pattern recognition and the like. 4,011,547, Cl. 340-172.500.  
Kingsbury, William D.: *See—*  
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Kirkland, Arthur C. Variable rate vehicle suspension. 4,010,941, Cl. 267-57.000.  
Kissell, Fred N.; and Vinson, Robert P., to United States of America, Interior. Sampling method and apparatus. 4,010,647, Cl. 73-421.50R.  
Kistner, Hermann, to Maschinenbau Oppenweiler GmbH. Continuous feeder. 4,010,945, Cl. 271-151.000.  
Kjos, David M.; Jenness, Raymond C.; Sabaski, Richard E.; and Roloff, Carl A., to Allis-Chalmers Corporation. Grinding mill trunnion discharger to opposite facing screens. 4,010,904, Cl. 241-79.300.  
Klang, Bo Gunnar: *See—*  
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 Klören, Ulrich, to Ringfeder GmbH. Bolt tensioning arrangement. 4,010,669, Cl. 85-1.00T.  
 Klug, Joseph R., to American Hospital Supply Corporation. Lockable drawer compartment. 4,010,989, Cl. 312-204.000.  
 Kmentt, Waldemar E.: See—  
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 Kniesly, Richard A.; Colville, Larry L.; and Mullen, Jerrold L. Control for activating motor vehicle electrical load. 4,011,460, Cl. 307-10.0LS.  
 Knoblauch, Karl: See—  
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 Knutsen, Wallace N.: See—  
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 Ko, Wen-Chuang; and Sawatzky, Erich, to International Business Machines Corporation. Apparatus for measuring the beam current of charged particle beam. 4,011,449, Cl. 250-309.000.  
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 Kofink, Siegfried; Rich, Wolfgang; and Langen, Herbert, to Eberspacher, J. System for preheating a water-cooled vehicle engine and for heating the interior of the vehicle. 4,010,895, Cl. 237-12.30C.  
 Kohler, Marc W., to Puppet Workshop, Inc., The. Puppet assembling. 4,010,570, Cl. 46-154.000.  
 Koide, Masanobu: See—  
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 Kokusan Denki Co., Ltd.: See—  
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 Kolbinger, Hans; and Wossagk, Ulf, to Messerschmitt-Bolkow-Blohm GmbH. Driving mechanism for the cover of an ammunition magazine on armored land vehicles. 4,010,672, Cl. 89-1.802.  
 Komatsu, Koei: See—  
 Matsumoto, Shuichi; Nakamura, Ryuichi; Fukuhara, Seiji; Suzuki, Kazuo; and Komatsu, Koei, 4,011,386.  
 Komatsu, Nobuhiko, to Green Cross Corporation, The. Process for producing antitumor compound. 4,011,140, Cl. 195-80.00R.  
 Komatsu, Toshiyoshi, to Duskon Franchise Co., Ltd. Mop suited for dusting curved surfaces. 4,010,508, Cl. 15-104.940.  
 Komatsu, Toshiyoshi, to Duskon Franchise Co., Ltd. Mop having sleeve type detachable mop head. 4,010,511, Cl. 15-104.940.  
 Komori, Shigeki: See—  
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 Kowalski, Leon. Primer cord dispenser. 4,010,914, Cl. 242-129.620.  
 Koyama, Kazuo: See—  
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 Krieger, Raymond Buchheimer, Jr., to American Cyanamid Company. Apparatus for measuring the stiffness characteristic of structural adhesives. 4,010,641, Cl. 73-150.00A.  
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 Lambert, Emmanuel; and Leger, Lucien, to Glaverbel-Mecaniver S.A. Laminated glazing pane. 4,011,356, Cl. 428-34.000.  
 Lambert, Gerard Edouard; and Begis, Roger, to Societe Seveg Etudes Equipments Graphiques. Liquid level control. 4,010,683, Cl. 101-366.000.  
 Lambert, Lloyd J., Sr. Variable weight exercise machine. 4,010,947, Cl. 272-118.000.  
 Lambrecht, Richard M.; Packer, Samuel; Merrill, Jerald C.; Atkins, Harold L.; Wolf, Alfred P.; and Bradley-Moore, Patrick R., to United States of America, Energy Research and Development Administration. Production of <sup>210</sup>Pb-tris-hydroxymethyl amino methane. 4,011,307, Cl. 424-1.000.  
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- Menard, Marcel; Lim, Gary M. F.; and Conway, Terry T., to Bristol-Myers Company. Δ2,3-O-2-Isocephem-4-carboxylic acid and derivatives thereof as antibacterial agents. 4,011,216, Cl. 260-244.00R.
- Menter, Philip; and Bauer, Herbert. Toilet splash guard. 4,010,497, Cl. 4-1.000.
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- Nixon, Roy. Template for and method of cutting composition shingles for rapid and scrap-free installation. 4,010,592, Cl. 52-748.000.
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- Oas, David C.; and Kmentt, Waldemar E., to Beloit Corporation. Parison transfer device. 4,011,039, Cl. 425-397.000.
- O'Doherty, George O. P., to Eli Lilly and Company. Ring-substituted N-(2,2-difluoroalkyl)-o-phenylenediamine insecticides. 4,011,341, Cl. 424-324.000.
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- Okuzawa, Yasutoshi, to Fuji Photo Film Co., Ltd. View finder for cameras. 4,011,571, Cl. 354-219.000.
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- Orillo, Stephen, Jr.: *See—*  
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- Orlando, Anthony W., to International Business Machines Corporation. Internal division actuation of ventilated floppy disk stack. 4,011,590, Cl. 360-99.000.
- Orlando, Anthony W.; and Weidenhammer, James A., to International Business Machines Corporation. Internal division actuation of ventilated floppy disk stack. 4,011,591, Cl. 360-99.000.
- Osamu, Akashi; and Masazo, Nakamura. Apparatus for manufacture of continuous hinge. 4,010,524, Cl. 29-11.000.
- Oster, Frank: *See—*  
DiSanti, Nicholas; and Oster, Frank, 4,011,407.
- Osterholt, Anthony H. Molded part separation and storage. 4,010,596, Cl. 53-123.000.
- Osti, Alberto: *See—*  
De Feo, Francesco; Gonzati, Franco; and Osti, Alberto, 4,011,224.
- De Feo, Francesco; Gonzati, Franco; and Osti, Alberto, 4,011,227.
- Otto Boch Orthopädische Industries KG: *See—*  
Horvath, Eduard, 4,010,495.
- Otto, Ferdinand P.: *See—*  
Chibnik, Sheldon; and Otto, Ferdinand P., 4,011,167.
- Otto, Friedrich, to A. Stephan U. Sohne GmbH & Co. Machine for making and kneading dough. 4,010,932, Cl. 259-6.000.
- Otto, Heinz, to Volkswagenwerk Aktiengesellschaft. Bearing arrangement for a vehicle wheel. 4,010,986, Cl. 308-16.000.
- Oughton, Charles D.; and Bradley, Edward T., to Colorkrome, Inc. Electrophotographic camera. 4,011,568, Cl. 354-3.000.
- Oulton, David B., to Pylon Electronic Development Company Ltd. Tone operated switching arrangement. 4,011,486, Cl. 361-182.000.
- Outokumpu Oy: *See—*  
Blomqvist, Seppo Ilmari; Lilja, Launo Leo; Makitalo, Valto Johannes; Relander, John Henrik; Honkaniemi, Matti Elias; and Tuovinen, Frans Heikki, 4,011,290.
- Nyman, Bror Goran; Leimala, Raimo Juhani; and Back, Erik Gustav, 4,011,297.
- Ouwkerk, Cornelis: *See—*  
Gawne, George; and Ouwkerk, Cornelis, 4,011,284.
- Owens-Corning Fiberglas Corporation: *See—*  
Patterson, John L., 4,010,908.
- Owens-Illinois, Inc.: *See—*  
Ashcroft, Richard I., 4,011,122.
- Griffith, Edwin D., 4,011,347.
- McCollister, Howard L., 4,011,091.
- Miller, James Granville, 4,010,946.
- Veres, Frank, 4,011,093.
- Ox, Nikolai Alexandrovich: *See—*  
Filippov, Jury Vasilievich; Vendillo, Vsevolod Petrovich; and Ox, Nikolai Alexandrovich, 4,011,165.
- Oxenreider, Terry Russel, to General Battery Corporation. Epoxy sealed lead battery probe and method for inserting same. 4,010,537, Cl. 29-623.200.
- Packer, Samuel: *See—*  
Lambrecht, Richard M.; Packer, Samuel; Merrill, Jerald C.; Atkins, Harold L.; Wolf, Alfred P.; and Bradley-Moore, Patrick R., 4,011,307.
- Paice, Derek A.; and Shimp, Alan B., to United States of America, Interior. Undervoltage release with electrical reset for circuit breaker. 4,011,484, Cl. 361-59.000.
- Paivinen, John O.; and Eisenhower, Walter D., to MOS Technology, Inc. Field inversion control for N-channel device integrated circuits. 4,011,105, Cl. 148-1.500.
- Palmer, Patsy B.; and Tolnai, Julius L., to Price Pfister Brass Mfg. Co. Two part lip sealing mixing valve for lavatories, sinks, etc. 4,010,772, Cl. 137-625.170.
- Panigrahi, Godavarish, to Burroughs Corporation. Three phase charge-coupled device memory with inhibit lines. 4,011,548, Cl. 340-173.00A.
- Papa, Sisto: *See—*  
De Feo, Francesco; Papa, Sisto; and Traverso, Enrico, 4,011,209.

- Papineau, Jean Guy. Citrus fruit peeling implement. 4,010,541, Cl. 30-123.700.
- Papst-Motoren KG: *See—*  
Schmider, Fritz, 4,011,475.
- Parke, Davis & Company: *See—*  
Hayes, Robert L.; and Gould, Joseph C., 4,010,877.
- Parker, Roger Alan, to Richardson-Merrell Inc. Substituted thiophenecarboxylic acid and esters as hypolipidemic agents. 4,011,333, Cl. 424-275.000.
- Parker, Roger Alan, to Richardson-Merrell Inc. Use of substituted furan and thiophene carboxaldehydes as hypolipidemic agents. 4,011,334, Cl. 424-275.000.
- Parmkopf, Fiske O.; and Good, George E., to C F Braun & Co. Heat exchanger. 4,010,797, Cl. 165-159.000.
- Parsons, David Charles; Parsons, Wendy Anne; Pigott, Norman Brian; and Foster, Alan Ernest, to S.S.B. (Aerial Fixings) Limited. Attachment for brickwork. 4,010,924, Cl. 248-225.300.
- Parsons, James Henry. Safety match book. 4,010,846, Cl. 206-108.000.
- Parsons, Wendy Anne: *See—*  
Parsons, David Charles; Parsons, Wendy Anne; Pigott, Norman Brian; and Foster, Alan Ernest, 4,010,924.
- Particle Measuring Systems, Inc.: *See—*  
Knollenberg, Robert George; and Luehr, Robert E., 4,011,459.
- Pastor, Sheldon Lee; and Argento, Dan J., to Minnesota Mining and Manufacturing Company. Voice logging recorder for use with pre-loaded cassettes. 4,011,586, Cl. 360-61.000.
- Pater, Walter E.; and Rowley, James R., to PPG Industries, Inc. Front restraint device for shipping bins. 4,010,848, Cl. 206-448.000.
- Pater, Walter E.; and Rowley, James R., to PPG Industries, Inc. Nestable article shipping rack having pivotally mounted end restraints. 4,010,849, Cl. 206-448.000.
- Patik, Robert M. Personal clothing bag for washing machine. 4,010,785, Cl. 150-7.000.
- Patsey, John A., to United States Steel Corporation. Sonic interference suppressor. 4,010,635, Cl. 73-67.805.
- Patterson, Duane M.: *See—*  
Cocozella, Robert A.; Dal Pan, Florindo F.; Finelli, Thomas M.; and Patterson, Duane M., 4,010,690.
- Patterson, John L., to Owens-Corning Fiberglas Corporation. Method and apparatus for handling linear elements. 4,010,908, Cl. 242-36.000.
- Paulsson, Bo Gunnar. Apparatus for demonstrating electrical circuits and components. 4,010,555, Cl. 35-19.00A.
- Payen, Guy: *See—*  
Flix, Jean-Marie; and Payen, Guy, 4,010,900.
- Peacock, Alan: *See—*  
Walker, John Hirst; and Peacock, Alan, 4,010,618.
- Pearce, Jack L., to Markowitz, Monte, a part interest. Radio and television alarm system. 4,011,555, Cl. 340-280.000.
- Pearlman, Alan R.; and Gillette, Timothy C., to ARP Instruments, Inc. Dynamic filter. 4,011,466, Cl. 307-229.000.
- Pearson, James M.; and Yanus, John F., to Xerox Corporation. 2-Vinyl-fluorenone and derivatives thereof. 4,011,266, Cl. 260-590.00B.
- Pedersen, Vernon G., to Dacor Corporation. Regulator with water fill mechanism to prevent free flow. 4,010,746, Cl. 128-147.000.
- Pekkarinen, Michael O.: *See—*  
Assenheimer, Robert; and Pekkarinen, Michael O., 4,011,288.
- Pelletier, Claude; and Velte, Roger, to Societe Nouvelle de Roulements. Physical displacement sensing with differential capacitor. 4,011,500, Cl. 324-61.00R.
- Pelletier, Guy, to Bombardier Limitee. Tire retreading. 4,011,125, Cl. 156-394.000.
- Pemco, Inc.: *See—*  
Feurstein, Ludwig J.; Meives, Otis E.; Schelk, Roger E.; and Verhyen, Larry L., 4,011,155.
- Pendleton, Robert G.: *See—*  
Kaiser, Carl; and Pendleton, Robert G., 4,011,319.
- Pennebaker, William Boone, Jr.; Pennington, Keith Samuel; Seitz, Hugo Karl; and Hochberg, Frederick, deceased (by Hochberg, Lee, administratrix), to International Business Machines Corporation. Ultrasonic removal of solid impurities from recirculating ink. 4,011,157, Cl. 210-19.000.
- Pennie, Walter L.: *See—*  
Sundie, Richard D.; and Pennie, Walter L., 4,011,363.
- Pennington, Keith Samuel: *See—*  
Pennebaker, William Boone, Jr.; Pennington, Keith Samuel; Seitz, Hugo Karl; and Hochberg, Frederick, deceased, 4,011,157.
- Penwalt Corporation: *See—*  
Sandler, Stanley Robert, 4,011,194.
- Penrose, Alexander Ballingall: *See—*  
Leeming, Michael Raymond Graves; and Penrose, Alexander Ballingall, 4,011,343.
- Peremintina, Valentina Trofimovna: *See—*  
Tjurin, Boris Konstantinovich; Momot, Appolon Lukich; Volodin, Nikolai Lvovich; Peremintina, Valentina Trofimovna; Evdokimova, Anna Vasilievna; Churov, Vyacheslav Petrovich; Krugly, Samuil Markovich; and Garifzyanov, Gabdulhar Garifzyanovich, 4,011,251.
- Perkin-Elmer Corporation: *See—*  
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- Perkins Engines Limited: *See—*  
Stewart, William Findlay, 4,010,718.
- Perkins, Thomas K.: *See—*  
Kern, Loyd R.; and Perkins, Thomas K., 4,010,799.
- Pernick, David. Knit garment, knit blank therefor and method of making same. 4,010,627, Cl. 66-177.000.
- Perrault, R. Thomas: *See—*  
Perrault, Robert Thomas, 4,010,662.
- Perrault, Robert Thomas, to Perrault, R. Thomas. Flexible strap wrench. 4,010,662, Cl. 81-64.000.
- Persson, Curt Hardy. Device for suspending objects. 4,010,850, Cl. 211-1.300.
- Persson, Gert Artur, to Svenska Aktiebolaget Bromsregulator. Change-over valve, preferably for a railway vehicle. 4,010,771, Cl. 137-596.100.
- Pesaro, Mario: *See—*  
Dubs, Paul; Kuntzel, Heiner; Pesaro, Mario; and Schmidt, Harald, 4,011,233.
- Peska, Jan: *See—*  
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- Peters, Clifford M., to W-K-M Wellhead Systems, Inc. Velocity flow control valve for fluid line. 4,010,770, Cl. 137-492.500.
- Peters, Werner: *See—*  
Munzner, Heinrich; Heimbach, Heinrich; Korbacher, Werner; Peters, Werner; Juntgen, Harald; Knoblauch, Karl; and Zundorf, Dieter, 4,011,065.
- Peterson, Emery J. Grain drier. 4,010,552, Cl. 34-179.000.
- Peterson, Francis C., to C. Hager & Sons Hinge Manufacturing Company. Door closer having means to neutralize the door closing force exerted thereby. 4,010,572, Cl. 49-386.000.
- Peterson, John Paul, Jr.: *See—*  
Ruiz, Carl Phillip; and Peterson, John Paul, Jr., 4,011,296.
- Peterson, Marvin L.; and Cole, Charles F., Jr., to Continental Oil Company. Apparatus and method for determining moisture content in welding electrode coatings. 4,011,501, Cl. 324-65.00R.
- Peterson, Per Viking, to SCA Development Aktiebolag. Method of treating refining segments. 4,011,150, Cl. 204-129.350.
- Pettipierre, Jean Claude; and Garner, Robert, to Ciba-Geigy Corporation. Heterocyclic substituted chromenopyrazoles. 4,011,237, Cl. 260-310.00R.
- Petree, Marcella C.: *See—*  
Sochard, Irving I.; Petree, Marcella C.; Knutsen, Wallace N.; Warnock, Frederick E.; and White, Edward A., Jr., 4,010,689.
- Petro-Canada Exploration Inc.: *See—*  
Kern, Loyd R.; and Perkins, Thomas K., 4,010,799.
- Pettibone Corporation: *See—*  
Logus, Anthony T.; and Barnhart, Ronald W., 4,010,830.
- Pettit, Charles E., to Simmons Gun Specialties, Inc. Shotgun with adjustable ventilated sight rib. 4,010,564, Cl. 42-1.00S.
- Petty, William D.: *See—*  
Boudouris, Angelo; Petty, William D.; and Simonds, Clarence S., 4,010,910.
- Petzoldt, Karl; Vidic, Hans-Jorg; Prezewowsky, Klaus; Nishino, Yukishige; Wiechert, Rudolf; and Laurent, Henry, to Schering Aktiengesellschaft. 7-Hydroxyestradiols. 4,011,314, Cl. 424-241.000.
- Pfizer Inc.: *See—*  
Althuis, Thomas H., 4,011,324.
- Carroll, Ronnie D.; Moore, Bernard S.; and Tretter, James R., 4,011,231.
- Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,011,262.
- Leeming, Michael Raymond Graves; and Penrose, Alexander Ballingall, 4,011,343.
- Pflugbeil, Mathias: *See—*  
Dreher, Karl; Fleck, Adolf; Gotze, Christian; Ismann, Ernst; and Pflugbeil, Mathias, 4,010,912.
- Phaneuf, Roland A.; and Strack, Richard R., to American Optical Corporation. Optical fiber bundle image conduit. 4,011,007, Cl. 350-96.00C.
- Phelps, Robert A.; and Horst, William R., to NCR Corporation. Optical indicia marking and detection system. 4,011,435, Cl. 235-61.11E.
- Phillips Petroleum Company: *See—*  
Doss, Richard C., 4,011,121.
- Gilbert, Dixie E., 4,010,862.
- Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 4,011,058.
- Pollock, Lyle W.; and Dale, Glenn H., 4,010,779.
- Phillips, Robert C., to Gimix, Inc. Hold circuit for telephone. 4,011,413, Cl. 179-81.00R.
- Phoenix Gummiwerke A.G.: *See—*  
Eichholz, Werner; and Krebs, Gerd, 4,011,126.
- Eichholz, Werner; and Krebs, Gerd, 4,011,127.
- Piatkowski, Philip, Jr., to Ford Motor Company. Apparatus for generating an electrical signal indicative of liquid level. 4,010,650, Cl. 73-304.00C.
- Pickett, Victor W. Heavy duty denier type balance. 4,010,810, Cl. 177-157.000.
- Pickin, John Harlan; Compa, Russell Edward; and Joshi, Hargovind H. Marbled detergent bars. 4,011,170, Cl. 252-134.000.
- Pickles, Joseph, to Ferro Manufacturing Corporation. Seat adjusting mechanism. 4,010,927, Cl. 248-420.000.
- Pieniak, Heinz A., to Johnson & Johnson. Tab fastener having substantially coplanar diverging anchoring legs. 4,010,754, Cl. 128-287.000.
- Pierce, Walker L., Jr.: *See—*  
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., 4,011,051.
- Pietsch, Hanns: *See—*  
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Pigott, Norman Brian: *See—*  
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Pilkington Brothers Limited: *See—*  
Hynd, William Christie, 4,011,070.

Simpkin, Gordon Thomas; and Ashcroft, Kenneth, 4,011,359.

Piltch, Martin S.; Rink, John P.; and Tallman, Charles R., to United States of America, Energy Research and Development Administration. Pulsed infrared difference frequency generation in  $\text{CdGeAs}_2$ , 4,011,462, Cl. 307-88.300.

Pimenov, Viktor Alexeevich: *See—*  
Kaminsky, Igor Vasilievich; Protasov, Viktor Dmitrievich; Pimenov, Viktor Alexeevich; Barynin, Vyacheslav Alexandrovich; Shestakov, Vladimir Vladimirovich; Polyakov, Vladimir Larionovich; Severov, Genrikh Fedorovich; Zaitsev, Aron Iosifovich; and Stepanov, Stanislav Vasilievich, 4,010,906.

Pimshtein, Pavel Gdaliyevich; Shel, Marat Moiseevich; Khismatulin, Enver Rakhmatullovich; Borsuk, Evgeny Grigorievich; Novikov, Alexandr Nikolaevich; Makarov, Viktor Matveevich; Ziselman, Boris Grigorievich; Kuramzhin, Alexandr Valeryanovich; Usenko, Viktor Grigorievich; Globin, Nikolai Kirillovich; and Ivantsov, Vladimir Viktorovich. Multilayer pressure vessel, 4,010,864, Cl. 220-3.000.

Pinhas, Henri; and Beranger, Serge, to SERDEX - Societe d'Etudes, de Recherches, de Diffusion et d'Exploitation. Derivatives of pyridine-3-acetic acid, process for their preparation and applications thereof, 4,011,328, Cl. 424-263.000.

Pioneer Electronic Corporation: *See—*  
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Sunaga, Yoshimitsu, 4,011,585.

Pistner, Josef Siegfried; and Muhlfelder, Ludwig, to United States of America, Air Force. Spacecraft closed loop three-axis momentum unloading system, 4,010,921, Cl. 244-166.000.

Pitner, Alfred, to Nadella, a part interest. Method of producing a transmission device, 4,010,533, Cl. 29-523.000.

Pitts, James J.: *See—*  
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Pladys, Nestor Leon, to Societe Francaise des Petroles BP; and Sole-tanche. Partially buried tanks for the storage of petroleum products, 4,010,615, Cl. 61-500.

Plangger, David L.: *See—*  
Grover, Lawrence L.; and Plangger, David L., 4,011,491.

Plank, Charles J.; Rosinski, Edward J.; and Kerr, George T., to Mobil Oil Corporation. Conversion of polar compounds using a ZSM-5 zeolite catalyst, 4,011,278, Cl. 260-682.000.

Plast-O-Matic Valves, Inc.: *See—*  
De Lorenzo, Bruce L.; and McCarthy, Daniel J., 4,010,769.

Platt, Michael T.: *See—*  
Zyla, Gregory J.; and Platt, Michael T., 4,010,956.

Plueddemann, John P. Polysonic electronic system for a musical instrument and methods of utilizing and constructing same, 4,010,668, Cl. 84-1.160.

Plunkett, Allan Barr: *See—*  
Franz, Joseph Phillip; and Plunkett, Allan Barr, 4,011,489.

Plyler, Robert G.: *See—*  
Tolnar, Emil J., Jr.; Plyler, Robert G.; and Heilman, David R., 4,010,998.

Podell, Allen F.; Young, Leo; Karp, Arthur; and Chambers, Donald R., to Stanford Research Institute. Semi-lumped element coupler, 4,011,528, Cl. 333-10.000.

Pokora, Robert J.: *See—*  
Motz, Jerome C.; and Pokora, Robert J., 4,010,905.

Pollack, Jerry J.: *See—*  
Reim, Thomas E.; Pollack, Jerry J.; and Kemmerling, Robert A., 4,010,857.

Pollard, Ernest. Drive belting and drive belts manufactured therefrom, 4,010,655, Cl. 74-231.00P.

Pollin, Irvin, to United States of America, Army. Method and apparatus for pulse shaping in ballistic simulators, 4,010,631, Cl. 73-12.000.

Pollock, James J., to Dow Chemical Company, The. Valve, 4,010,929, Cl. 251-260.000.

Pollock, Lyle W.; and Dale, Glenn H., to Phillips Petroleum Company. Apparatus for recovery of vapor, 4,010,779, Cl. 141-44.000.

Polyakov, Vladimir Larionovich: *See—*  
Kaminsky, Igor Vasilievich; Protasov, Viktor Dmitrievich; Pimenov, Viktor Alexeevich; Barynin, Vyacheslav Alexandrovich; Shestakov, Vladimir Vladimirovich; Polyakov, Vladimir Larionovich; Severov, Genrikh Fedorovich; Zaitsev, Aron Iosifovich; and Stepanov, Stanislav Vasilievich, 4,010,906.

Pommerening, Uwe A.; and Richards, Glenn L., to Stromberg-Carlson Corporation. Timer apparatus for incrementing timing code at variable clock rates, 4,011,517, Cl. 328-130.000.

Ponticello, Ignazio S., to Eastman Kodak Company. Polymers of monomers containing active methylene groups and other ethylenically unsaturated monomers, 4,011,201, Cl. 260-65.000.

Pontius, Frank, to Western Geophysical Company of America. Multiple color light frequencies synthesized audio modulation, 4,011,416, Cl. 179-100.30K.

Poole, Ernest G.; and Hair, Lucius M., to Kendall Company, The. Retipped top-drive filling spindles, 4,010,600, Cl. 57-129.000.

Popp, Karl Hugo; Hess, Klaus; Simmler, Werner; Stickel, Richard; and Zuern, Ludwig, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Treatment of waste water produced in the manufacture of expandable polystyrene, 4,011,161, Cl. 210-44.000.

Porret, Daniel: *See—*  
Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, 4,011,235.

Port, David John: *See—*  
Powers, John Allen; MacInnis, Martin Benedict; and Port, David John, 4,011,073.

Pospischil, Reginhard, to Siemens Aktiengesellschaft. PCM regenerator, 4,011,406, Cl. 178-70.00R.

Post Office, The: *See—*  
Ridout, Philip Neale; and Ridout, Ian Bruce, 4,011,405.

Powell, Charles R. Steerable trailer, 4,010,816, Cl. 180-144.000.

Powell, Emlyn John; and Brown, James Strathearn, to James Strathearn Brown. Means for retaining articles, 4,010,521, Cl. 24-258.000.

Powers, John Allen; MacInnis, Martin Benedict; and Port, David John, to GTE Sylvania Incorporated. Flame spray powder of cobalt-molybdenum mixed metal agglomerates using a molybdenum salt binder and process for producing same, 4,011,073, Cl. 75-.5BB.

PPG Industries, Inc.: *See—*  
Pater, Walter E.; and Rowley, James R., 4,010,848.  
Pater, Walter E.; and Rowley, James R., 4,010,849.

Preist, Donald H., to Varian Associates. Modular electron discharge device, 4,011,481, Cl. 313-302.000.

Prentice, John E. Skirt for mobile homes, 4,010,963, Cl. 280-768.000.

Presti, Biagio, to Sarkes Tarzian, Inc. Special effects generator capable of repositioning image segments, 4,011,401, Cl. 358-212.000.

Preston, Thomas A. Unipolar pacing catheter with plural distal electrodes, 4,010,755, Cl. 128-404.000.

Pretet, Georges Jean-Marie, to Etat Francais represente par le Delege Ministeriel pour l'Armement. Towed device for measuring magnetic field and the vertical gradient thereof at sea, 4,010,706, Cl. 114-245.000.

Preti, George; and Huggins, George Richardson, to University of Pennsylvania, The Trustees of the. Method of predicting and detecting ovulation, 4,010,738, Cl. 128-2.00R.

Preus, Paul. Composition for separating hydrocarbons from water, 4,011,175, Cl. 252-427.000.

Preussag Aktiengesellschaft Metall: *See—*  
Wiekling, Hans Wilhelm; and Ehlers, Karl, 4,010,937.

Prezewowsky, Klaus: *See—*  
Petzoldt, Karl; Vidic, Hans-Jorg; Prezewowsky, Klaus; Nishino, Yukishige; Wiechert, Rudolf; and Laurent, Henry, 4,011,314.

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Palmer, Patsy B.; and Tolnai, Julius L., 4,010,772.

Priesman, Herman William, to Raymond Lee Organization, The, a part interest. Automobile tray, 4,010,696, Cl. 108-19.000.

Priest, David Charles; Sandner, Michael Ray; and Trecker, David John, to Union Carbide Corporation. Bis-(1,4-beta-amino carbonyl-ethyl)-piperazines, 4,011,223, Cl. 260-268.00R.

Procter & Gamble Company, The: *See—*  
Diehl, Francis Louvaine; Zeffren, Eugene; and Milbrada, Edward John, 4,011,169.

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Protasov, Viktor Dmitrievich: *See—*  
Kaminsky, Igor Vasilievich; Protasov, Viktor Dmitrievich; Pimenov, Viktor Alexeevich; Barynin, Vyacheslav Alexandrovich; Shestakov, Vladimir Vladimirovich; Polyakov, Vladimir Larionovich; Severov, Genrikh Fedorovich; Zaitsev, Aron Iosifovich; and Stepanov, Stanislav Vasilievich, 4,010,906.

Prussin, Samuel B.: *See—*  
Lozano, David S.; and Prussin, Samuel B., 4,010,872.

Puckett, Lawrence C. System for color presentation of information represented by amplitude varying video signal, 4,011,584, Cl. 358-82.000.

Pullman Transport Leasing Company: *See—*  
Adler, Franklin P., 4,010,853.

Puppet Workshop, Inc., The: *See—*  
Kohler, Marc W., 4,010,570.

Puritan-Bennett Corporation: *See—*  
Tipple, Neil A., 4,010,761.

Puro, John Frederick, to Facet Enterprises, Inc. Return spring for teeth clutch — two stage force, 4,010,832, Cl. 192-84.00C.

Pylon Electronic Development Company Ltd.: *See—*  
Oulton, David B., 4,011,486.

Pyrotec, Incorporated: *See—*  
Malinowski, William J., 4,011,458.

PZ Technology, Inc.: *See—*  
O'Neill, Cormac G., 4,011,474.

Quaker Oats Company, The: *See—*  
Bartsch, Arthur G., 4,011,345.

Quarles, John S.: *See—*  
Sayman, Robert W.; Quarles, John S.; and Hamilton, Howard J., 4,010,709.

Quigniot, Andre. Leading link type independent systems, 4,010,813, Cl. 180-73.00C.

Quillmann, Leo-Heinz. Omnidirectional sympathetically driven sound reproduction device, 4,010,821, Cl. 181-148.000.

Quirke, Patric C., to Whitewater Electronics, Inc. Temperature sensor that is non-responsive to transient conditions, 4,011,552, Cl. 340-228.00R.

Raetz, Karlheinz. Stirling cycle heat pump, 4,010,621, Cl. 62-6.000.

Rahman, Habibur, to Massey-Ferguson Inc. Two position seat and lock, 4,010,977, Cl. 297-92.000.

Rahtz, Dieter; Wendt, Hans; and Koch, Henning, to Schering Aktiengesellschaft. Benzimidazole derivatives and process for the production thereof, 4,011,322, Cl. 424-250.000.

Rakshys, Joseph W., Jr.: *See—*  
McKinley, Suzanne V.; and Rakshys, Joseph W., Jr., 4,011,268.

Ralston, Philip G., to Baxter Travenol Laboratories, Inc. Flexible, collapsible container for liquids having reinforced tail portion, 4,010,783, Cl. 150-1.000.

Ralston Purina Company: *See—*  
Ernst, Thomas J., 4,011,346.

Randall, Robert E., to Rowland, Incorporated. Method for producing sheet material with multicolor striated pattern and sheet material produced thereby, 4,011,292, Cl. 264-75.000.

Rapena Patent - und Verwaltungs-AG: *See—*  
Falkner, Raimund; and Grune, Heinz, 4,010,628.

Rapoport Printing Corporation: *See—*  
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Rapoport, Sidney L.; and Mitchell, Douglas F., to Rapoport Printing Corporation. Lithographic printing process, 4,011,085, Cl. 96-116.000.

Raptas, M. Ted: *See—*  
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Raquet, Erwin: *See—*  
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Raymond Lee Organization, The: *See—*  
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Denton, Ron, 4,010,503.  
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RCA Corporation: *See—*  
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DiSanti, Nicholas; and Oster, Frank, 4,011,407.  
Eiwen, George Ernest, 4,010,991.  
Firester, Arthur Herbert, 4,011,524.  
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Scholtus, Christiaan Gustaaf Adolf, 4,010,796.

Reaktor-Brennelement Union GmbH: *See—*  
Mathieu, Viktor; and Schafer, Reinhard, 4,011,037.

Rear, Ian Graeme. Rotary drill bit, 4,010,985, Cl. 308-8.200.

Redmann, Jerry L., Jr.: *See—*  
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Reed Industries, Inc.: *See—*  
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Reenstra, Arthur L., to Texas Instruments Incorporated. Magnetic speed sensing mechanism, 4,011,478, Cl. 310-155.000.

Rehfeld, Arthur W., to Lawrence Peska Associates, Inc., a part interest. Latch guard, 4,010,968, Cl. 292-346.000.

Reicheneder, Franz: *See—*  
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Reid, William R., Jr., to Imodco, Inc. Mooring terminal, 4,010,500, Cl. 9-8.00P.

Reim, Thomas E.; Pollack, Jerry J.; and Kemmerling, Robert A., to Republic Steel Corporation. Coal conditioning system, 4,010,857, Cl. 214-18.00R.

Reinke, Richard F. Metal roof shingle, 4,010,590, Cl. 52-533.000.

Reisman, Arnold: *See—*  
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Rejeski, William E.; and D'Aprile, Paul, to Wiremold Company, The. Clamp for flexible duct, 4,010,518, Cl. 24-73.00C.

Relander, John Henrik: *See—*  
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Renteria, Isaac, Jr., to Lawrence Peska Associates, Inc., a part interest. Gasoline tank closure for a motor vehicle, 4,010,967, Cl. 292-251.500.

Rentzea, Costin: *See—*  
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Republic Steel Corporation: *See—*  
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Rese, Arkadius; and Eberhardt, Hermann, to Eberhardt & Co. Apparatus for the automatic issuance and return of keys, 4,010,868, Cl. 221-9.000.

Research Corporation: *See—*  
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Research Institute for Medicine and Chemistry Inc.: *See—*  
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Reuter, David F., to General Motors Corporation. Transmission friction plate and device, 4,010,831, Cl. 192-70.200.

Reuter, Gerald L.; and Tsuk, Andrew G., to American Home Products Corporation. Prolonged release drug form for the treatment of bovine mastitis, 4,011,312, Cl. 424-78.000.

Revillet, Georges; and Sanz, Manuel C., to Micromedie Systems, Inc. Centrifuge equipment and analytical system using it, 4,010,892, Cl. 233-23.00A.

Rexnord Inc.: *See—*  
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Reymond, Jean-Claude: *See—*  
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Rich, Wolfgang: *See—*  
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Richardson-Merrell Inc.: *See—*  
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Ridan Computers, Inc.: *See—*  
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Ridout, Ian Bruce: *See—*  
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Ridout, Philip Neale; and Ridout, Ian Bruce, to Post Office, The. Digital data transmission systems, 4,011,405, Cl. 178-68.000.

Riedel, Richard: *See—*  
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Ring, David F., to Kimberly-Clark Corporation. Inserter for delivering soft, deformable tampons into body cavities and the combination of a tampon therewith, 4,010,751, Cl. 128-263.000.

Ringfeder GmbH: *See—*  
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Rink, John P.: *See—*  
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Rinn Corporation: *See—*  
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Risman, Per Olov G., to Husqvarna Vapenfabriks AB. Electric supply circuits for a microwave oven, 4,011,427, Cl. 219-10.55B.

Ritter, Helmut, to Herberlein & Co. AG. Thread delivery device for textile machines, 4,010,883, Cl. 226-171.000.

Robar, James D. J.; and Glass, David G., to Scds Systems Ltd. Fluid conductivity detecting means, 4,010,715, Cl. 119-14.140.

Robbi, Anthony Drea, to RCA Corporation. Low energy switching circuit, 4,011,464, Cl. 307-137.000.

Robbi, Anthony Drea, to RCA Corporation. Variable range automotive radar system, 4,011,563, Cl. 343-7.0VM.

Robert Bosch G.m.b.H.: *See—*  
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Robert R. Oldham, Inc.: *See—*  
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Robertson, Victor J.: *See—*  
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Rockett, Leonard R., Jr., to United States of America, Air Force. Surface potential stabilizing circuit for charge-coupled devices radiation hardening, 4,011,471, Cl. 307-308.000.

Rockland, Ronald H.; and Gobeli, David H., to Medtronic, Inc. Bipolar body tissue electrode, 4,010,758, Cl. 128-418.000.

Rockwell International Corporation: *See—*  
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Heimbigner, Gary L.; and Carlson, Robert G., 4,011,516.  
Molina, Orlando G., 4,011,174.  
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Rodriguez-Martinez, Dionisio, to Empresa Nacional del Aluminio, S.A. System for autocontrolling and regulating the average value of the voltage applied to processes for the electrolytic coloring of anodized aluminum, 4,011,152, Cl. 204-228.000.

Roe, Anthony Maitland: *See—*  
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Rogers, John R., to Texaco Inc. Seismic detector arrays, 4,011,539, Cl. 340-7.00R.

Rohde, Wolfgang, to Bergwerksverband GmbH. Arrangement for the treatment, particularly the drying, of particulate matter by entrainment in a gas, 4,010,551, Cl. 34-57.00R.

Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*  
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Rollason, Peter H.: See—  
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Rooij, Frits, to N. V. Optische Industrie "De Oude Delft": High voltage generator arrangement. 4,011,495, Cl. 321-18.000.

Root, Russell L., to Addressograph Multigraph Corporation: Apparatus for molding characters on a blank. 4,011,035, Cl. 425-121.000.

Rorer Italiana S.p.A.: See—  
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Rosbe, David J.: See—  
Spiekermann, John Clements, III; Rosbe, David J.; Kulesa, Edmund M.; Kulik, James; and Brasel, David F., 4,010,703.

Rosen, Evan W.: Take down blood donor seating apparatus. 4,010,978, Cl. 297-239.000.

Rosinski, Edward J.: See—  
Plank, Charles J.; Rosinski, Edward J.; and Kerr, George T., 4,011,278.

Ross, Louis Anthony Ralph: Pipe cleaning method and apparatus. 4,011,100, Cl. 134-8.000.

Ross, Sigmund L., to Shuffman, Rose, executrix: Method for cryothermal fracturing of rock formations. 4,010,803, Cl. 166-303.000.

Rossell, Allen J., to Burroughs Corporation: Full cycle current detector. 4,011,507, Cl. 324-127.000.

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Horwath, R. Otto; Lally, John A.; and Rotheim, Philip, 4,011,139.

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Rowcliffe, Arthur F.: See—  
Bloom, Everett E.; Stiegler, James O.; Rowcliffe, Arthur F.; and Leitaker, James M., 4,011,133.

Rowland, Incorporated: See—  
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Rowley, James R.: See—  
Pater, Walter E.; and Rowley, James R., 4,010,848.  
Pater, Walter E.; and Rowley, James R., 4,010,849.

Rowley, Robert John; and Allen, David, to Modular Distribution Systems Limited: Goods container for transport purposes. 4,010,990, Cl. 312-255.000.

Royal Business Machines, Inc.: See—  
Doollittle, Billy J., 4,011,018.

Rubel, Herbert J.: See—  
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Ruckel, Erwin Richard: See—  
Wang, Long Shyong; and Ruckel, Erwin Richard, 4,011,385.

Rudolph, Stephen Edward; and Glowaky, Raymond Charles, to Sherwin-Williams Company: The Mixed starch esters and the use thereof. 4,011,392, Cl. 536-108.000.

Ruff, David Lee, to Grefco Inc.: Building board products and process for producing same. 4,011,183, Cl. 260-9.000.

Ruff, Frank A.: See—  
Williams, Norman P.; Horton, Roald N.; and Ruff, Frank A., 4,011,532.

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Russell, Roger: See—  
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Russo, Angelo: Catapult basketball game. 4,010,953, Cl. 273-85.00C.

Ruter, Jörn; and Scholten, Heinz, to Chemische Werke Huls Aktiengesellschaft: Powdery coating composition. 4,011,188, Cl. 260-31.600.

Rychlewski, Thaddeus V.: See—  
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Rydborg, Allan: Multiple hand tool. 4,010,663, Cl. 81-71.000.

S & C Electric Company: See—  
Jackson, Hiram Solomon, Jr.; and Tobin, Thomas J., 4,011,537.

S.R.M. Hydromeknik Aktiebolag: See—  
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S.S.B. (Aerial Fixings) Limited: See—  
Parsons, David Charles; Parsons, Wendy Anne; Pigott, Norman Brian; and Foster, Alan Ernest, 4,010,924.

Sabaski, Richard E.: See—  
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Sacamani, Louis Paul: See—  
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Sacamani, Norma Rose; and Sacamani, Louis Paul: Food warmer and humidifier. 4,010,736, Cl. 126-369.000.

Saito, Teruo: See—  
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Saito, Toshio: See—  
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Saka, Mehmet, to International Computers Limited: Inverter with symmetry correction circuits. 4,011,494, Cl. 321-12.000.

Sakai, Takeo; Yoneyama, Masakazu; and Yamamoto, Nobuo, to Fuji Photo Film Co., Ltd.: Silver halide photographic material. 4,011,082, Cl. 96-95.000.

Sakakibara, Eiichi; Hashimoto, Iwao; and Hirohashi, Mitsuru, to Funai Pharmaceutical Industries, Ltd.: S-Inosylcysteine and a process for producing the same. 4,011,221, Cl. 260-252.000.

Sakasegawa, Koji; Kunioka, Kazuo; and Ohsumi, Atushi, to Nippon Kokan Kabushiki Kaisha: Multi-sectioned cooling method for heated steel material. 4,011,112, Cl. 148-134.000.

Sakuri, Osamu; Saito, Toshio; and Kato, Masanori, to Saito, Torazo: Nozzle for injection molding of thermoplastics. 4,010,903, Cl. 239-533.100.

Sami, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha: Apparatus for heating an intake manifold in an internal combustion engine. 4,010,724, Cl. 123-122.0AC.

Samour, Carlos M.; and Richards, Mildred C., to Kendall Company: The Monomeric emulsion stabilizers. 4,011,259, Cl. 260-485.00H.

Sandell, Lionel Samuel, to Du Pont de Nemours, E. I., and Company: Vesiculated silica microspheres. 4,011,096, Cl. 106-288.00B.

Sandler, Stanley Robert, to Pennwalt Corporation: Smoke retardants for polyvinyl halides and polystyrenes. 4,011,194, Cl. 260-45.75C.

Sandner, Michael Ray: See—  
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Sands, Robert E., to Mueller Co.: Two-way rotary plug valve. 4,010,930, Cl. 251-314.000.

Sandstrom, Wayne R.: See—  
Keturi, Raymond C.; and Sandstrom, Wayne R., 4,010,581.

Sanford, Carlton E.; and Kleven, Laurence P., to Texas Instruments Incorporated: Push-button switch. 4,011,422, Cl. 200-159.00B.

Sangway, Peter Charles: See—  
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Sankyo Electric Company Limited: See—  
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Santi, John Dominic, to Briggs & Stratton Corporation: Magnetically actuated switch for precise rapid cycle operation. 4,011,533, Cl. 335-154.000.

Santos, Gerard R., to Budd Company: The Means and methods for making a spiral muffler. 4,010,886, Cl. 228-173.000.

Sanz, Manuel C.: See—  
Revillet, Georges; and Sanz, Manuel C., 4,010,892.

Sarantakis, Dimitrios, to American Home Products Corporation: Cyclic undecapeptide analogs of somatostatin and intermediates. 4,011,182, Cl. 260-8.000.

Sarantakis, Dimitrios, to American Home Products Corporation: Des-(Ala<sup>1</sup>, Gly<sup>2</sup>, Lys<sup>4</sup>, Ser<sup>5</sup>, Thr<sup>6</sup>, Ile<sup>7</sup>, Val<sup>8</sup>, Phe<sup>9</sup>, Tyr<sup>10</sup>, Arg<sup>11</sup>)-D-Trp<sup>12</sup>-Ser<sup>13</sup> and intermediates. 4,011,207, Cl. 260-112.50S.

Sarkes Tarzian, Inc.: See—  
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Sasaki, Satoshi: See—  
Ishikawa, Masayuki; Kaneko, Chikara; Sasaki, Satoshi; Suda, Tatsuo; Yamada, Sachiko; and Sugimoto, Akiko, 4,011,250.

Sassi, Ralph: Wiper device for arcuate and flat surfaces. 4,010,513, Cl. 15-245.000.

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Sato, Yasuhiko; Inomata, Hiroshi; and Shiobara, Toshio, to Shinetsu Chemical Company: Method for the preparation of an organohydrogenpolysiloxane as a product of a partial addition reaction. 4,011,247, Cl. 260-348.05C.

Saucy, Gabriel: See—  
Cohen, Noal; and Saucy, Gabriel, 4,011,211.

Sauer, Barry W., to Glasrock Products, Inc.: Canine ear implant and method for supporting defective auricular cartilage. 4,010,494, Cl. 3-1.000.

Saunders, Frank L.; Kangas, Donald A.; and Friedrich, Ralph E., to Dow Chemical Company: The Electroconductive coating composition containing cationic latexes. 4,011,176, Cl. 252-500.000.

Savigny, Andre, to Societe de Vente de l'Aluminium Pechiney: Method of connecting electrical conductors and connections obtained thereby. 4,010,540, Cl. 29-630.00A.

Sawada, Hiroshi: See—  
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Sawaki, Mikio; Iwataki, Isao; Hirono, Yoshihiko; and Ishikawa, Hisao, to Nippon Soda Company Limited: Cyclohexane derivatives. 4,011,256, Cl. 260-468.00J.

Sawata, Shinji; Tani, Tatsuo; and Horigome, Takashi, to Agency of Industrial Science & Technology: Multi-stage system for accumulation of heat from solar radiant energy. 4,010,732, Cl. 126-271.000.

Sawatzky, Erich: See—  
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Sayers, George Alvin, to Du Pont de Nemours, E. I., and Company: Hindered phenol antioxidant composition containing an amino compound. 4,011,057, Cl. 44-52.000.

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Sayman, Robert W.; Quarles, John S.; and Hamilton, Howard J., to Shaw Industries, Inc.: Apparatus for randomly coloring carpet or other pile fabric. 4,010,709, Cl. 118-33.000.

SCA Development Aktiebolag: See—  
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Schaaf, Thomas K.: See—  
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Schenach, Thomas A., to Bray Oil Company: Synthetic lubricant compositions. 4,011,166, Cl. 252-32.70E.

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Schindehutte, Manfred; Raquet, Erwin; and Licht, Helmut, to Fried. Krupp Huttenwerke AG: Axles resiliently mounting wheels. 4,010,972, Cl. 295-11.000.

Schissler, Lloyd R.: See—  
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Schlaich, Jorg: See—  
Mayr, Gunter; Leonhardt, Fritz; Andra, Wolfhart; Baur, Willi; Zellner, Wilhelm; and Schlaich, Jorg, 4,010,580.

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Schmider, Fritz, to Papst-Motoren KG: Torque equalized brushless permanent magnet rotor motor. 4,011,475, Cl. 310-68.00R.

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Schoetensack, Wolfgang; and Riedel, Richard, to Byk Gulden Lomberg Chemische Fabrik GmbH: Hemorrhagic-lesion producing and anticoagulant-containing compositions and their use. 4,011,332, Cl. 424-273.000.

Schoettle, Klaus: See—  
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Scholin, Harold W.: Apparatus using variations in magnetic force to reciprocate a linear actuator. 4,011,477, Cl. 310-80.000.

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Scholtus, Christiana Gustaaf Adolf, to Reactor Centrum Nederland: Lattice, composed of strips with connecting brackets positioned in between. 4,010,796, Cl. 165-69.000.

Schulten, Rudolf; and Knoche, Karl Friedrich, to Rheinische Braunkohlenwerke AG: Process for obtaining hydrogen and oxygen from water. 4,011,305, Cl. 423-579.000.

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- Sundie, Richard D.; and Pennie, Walter L., to Allied Chemical Corporation. Curable amino resins. 4,011,363, Cl. 428-524.000.
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- Suzuki, Katsumi; Kawatake, Katsunori; Sawada, Hiroshi; and Matsuo, Hiroki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas cleaning apparatus for an internal combustion engine for a vehicle. 4,010,723, Cl. 123-119.00A.
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- Toman, Kurt, to United States of America, Air Force. Method of determining ionospheric reflection height. 4,011,565, Cl. 343-112.00A.
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- Torok, Ernest J.; and Hanson, Marlin M., to Sperry Rand Corporation. Method of improving the operation of a single wall domain memory system. 4,011,550, Cl. 340-174.0TF.
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- Treharne, Richard W.; and McKibben, Charlton K., to Charles F. Kettering Foundation. Method and apparatus for home production and application of nitrogen fertilizer. 4,010,897, Cl. 239-8.000.
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- Zurflueh, Rene: See—  
Hangartner, Walter; and Zurflueh, Rene, 4,011,335.
- Zyla, Gregory J.; and Platt, Michael T., to Zyla, said Gregory J., by said Michael T. Platt. Drag racing game apparatus. 4,010,956, Cl. 273-134.0CA.
- Zyla, said Gregory J.: See—  
Zyla, Gregory J.; and Platt, Michael T. (said Michael T. Platt assors. to), 4,010,956.

# CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 398,084	3,996,239	Feb. 3, 1976	Nov. 9, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Oct. 26, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 398,488	3,987,991	Feb. 24, 1976	Dec. 14, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 308,659	3,981,947	Jan. 27, 1976	Nov. 23, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 420,472	3,993,934	Feb. 24, 1976	Nov.



PI 36 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 452,672	3,981,602	Jan. 13, 1976	Jan. 21, 1977
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 427,883	3,982,277	Jan. 20, 1976	Feb. 21, 1977	B 452,883	3,981,735	Jan. 27, 1976	Jan. 21, 1977
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976	B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976	B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976	B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977	B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976	B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976	B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977	B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976	B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977	B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976	B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976	B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976	B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976	B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976	B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977	B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976	B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976	B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976	B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977	B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976	B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976	B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976	B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977	B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976	B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976	B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976	B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976	B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976	B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976	B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PI 37  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977	B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976	B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976	B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976	B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977	B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976	B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977	B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977	B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976	B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976	B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976	B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 473,183	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 474,573	3,988,735	Jan. 20, 1976	Oct. 26, 1976	B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976	B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976	B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977	B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976	B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977	B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976	B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976	B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976	B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976	B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976	B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976	B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976	B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976	B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976	B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976	B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977	B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977	B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976	B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976	B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976	B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976	B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976	B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977	B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977	B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977	B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977	B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976	B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976	B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976	B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976	B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976	B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976	B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976	B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976	B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976	B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976	B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977	B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976	B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976	B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976	B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977	B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976	B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977	B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977	B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976	B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976	B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976	B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977	B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976	B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976	B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976	B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976	B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976	B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976	B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976	B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976	B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976	B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976	B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976	B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976



PI 38 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977	B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976	B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977	B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976	B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977	B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 498,820	3,989,611	Feb. 10, 1976	Nov. 2, 1976	B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 498,951	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 499,171	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 499,209	3,996,670	Mar. 9, 1976	Dec. 14, 1976	B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 499,227	3,996,907	Mar. 2, 1976	Dec. 14, 1976	B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 499,324	3,985,192	Jan. 27, 1976	Oct. 12, 1976	B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 499,352	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 499,378	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 499,386	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 499,718	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 499,786	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 500,171	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 500,176	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 500,408	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 500,945	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 500,981	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 501,122	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 501,181	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 501,253	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 501,317	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,415	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 501,503	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 501,540	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,975	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,993	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 502,151	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 502,161	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 502,289	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 502,381	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 502,540	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 502,571	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,589	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 502,652	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,667	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 502,973	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 502,993	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 503,029	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 503,345	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 503,371	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 503,436	4,009,401	Mar. 30, 1976	Feb. 22, 1977	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 503,456	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 503,521	4,007,702	Mar. 23, 1976	Feb. 15, 1977	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,579	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 503,618	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,742	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,780	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,817	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 504,056	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 504,156	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 504,169	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 504,404	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 504,405	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 504,439	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,503	4,007,401	Apr. 13, 1976	Feb. 8, 1977	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 504,539	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 504,582	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,778	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,877	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,899	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 505,126	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 505,582	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 505,589	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 505,813	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 506,144	3,985,175	Jan. 13, 1976	Oct. 12, 1976	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 506,148	3,991,147	Feb. 10, 1976	Nov. 9, 1976	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 506,167	3,988,319	Feb. 3, 1976	Oct. 26, 1976	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
	3,990,652	Feb. 10, 1976	Nov. 9, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976

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AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976	B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976	B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976	B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976	B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977	B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977	B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977	B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976	B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977	B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976	B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976	B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976	B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976	B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976	B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976	B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976	B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976	B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976	B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976	B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976	B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976	B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976	B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976	B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976	B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976	B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977	B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977	B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976	B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976	B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976	B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 520,384	3,986,592	Jan. 24, 1976	Oct. 19, 1976	B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976	B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976	B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976	B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977	B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976	B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976	B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976	B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976	B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976	B 531,267	3,997,400	Feb. 24, 1976	Dec. 14, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977	B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977	B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976	B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976	B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976	B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976	B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976	B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976	B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976	B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976	B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976	B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976	B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976	B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976	B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976	B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976	B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976	B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976	B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976	B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977



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AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976	B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976	B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976	B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977	B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976	B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977	B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976	B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976	B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976	B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976	B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976	B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976	B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976	B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976	B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976	B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976	B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976	B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976	B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976	B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976	B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976	B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976	B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977	B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976	B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976	B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976	B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976	B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976	B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977	B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976	B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976	B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976	B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976	B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976	B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976	B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976	B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976	B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976	B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976	B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976	B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977	B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976	B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976	B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977	B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977	B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976	B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976	B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976	B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976	B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PI 41  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976				



# LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF MARCH, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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| <p>Arai, Atsuaki: <i>See—</i><br/>Yoshida, Yoshinobu; and Arai, Atsuaki, Re. 29,148.<br/>Fiala, Ernst, to Repa Feinstanzwerk GmbH. Energy absorber for automobile safety belts. Re. 29,147, Cl. 242-107.40A.<br/>Fuji Photo Film Co., Ltd.: <i>See—</i><br/>Yoshida, Yoshinobu; and Arai, Atsuaki, Re. 29,148.<br/>General Instrument Corporation: <i>See—</i><br/>Harten, John T.; and Zoladz, Frank J., Re. 29,150.<br/>Harten, John T.; and Zoladz, Frank J., to General Instrument Corporation. Convergence coil assembly for color television. Re. 29,150, Cl. 335-212.000.<br/>Qonaar Corporation: <i>See—</i><br/>Wimpffen, George I., Re. 29,146.</p> | <p>Repa Feinstanzwerk GmbH: <i>See—</i><br/>Fiala, Ernst, Re. 29,147.<br/>Union Oil Company of California: <i>See—</i><br/>Young, Donald C., Re. 29,149.<br/>Wimpffen, George I., to Qonaar Corporation. Housing for coin operated constructions. Re. 29,146, Cl. 70-170.000.<br/>Yoshida, Yoshinobu; and Arai, Atsuaki, to Fuji Photo Film Co., Ltd. Color photographic diffusion transfer process. Re. 29,148, Cl. 96-3.000.<br/>Young, Donald C., to Union Oil Company of California. Production of ammonium phosphates and product thereof. Re. 29,149, Cl. 423-313.000.<br/>Zoladz, Frank J.: <i>See—</i><br/>Harten, John T.; and Zoladz, Frank J., Re. 29,150.</p> |
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# LIST OF PLANT PATENTEEES

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| <p>Dalton, William E. Apple tree. 4,021, 3-8-77, Cl. 34.000.<br/>Driscoll Strawberry Associates, Inc.: <i>See—</i><br/>Johnson, Harold A., Jr., 4,022.</p> | <p>Johnson, Harold A., Jr., to Driscoll Strawberry Associates, Inc. Strawberry plant. 4,022, 3-8-77, Cl. 49.000.</p> |
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# LIST OF DESIGN PATENTEEES

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| <p>Alvarez, Teresita E., to Burlington Industries, Inc. Pantyhose. 243,561, 3-8-77, Cl. D2-6.000.<br/>Amoroso, Nicholas A., to Bright Star Industries, Inc. Bicycle reflector. 243,590, 3-8-77, Cl. D10-111.000.<br/>Anchor Hocking Corporation: <i>See—</i><br/>Benes, Frank J., 243,579.<br/>Angleman, John D.; and DuCret, Doris, to Bristol-Myers Company. Combined bottle and closure. 243,585, 3-8-77, Cl. D9-147.000.<br/>Araki, Toshihiro, to Japan Suncrux Co., Ltd. Clock. 243,586, 3-8-77, Cl. D10-15.000.<br/>Armstrong Cork Company: <i>See—</i><br/>Schouten, Gerard M., 243,577.<br/>Atari, Inc.: <i>See—</i><br/>Cheng, Regan L., 243,626.<br/>Sauter, Kenneth W., 243,625.<br/>Takaichi, Peter L., 243,624.<br/>Axelsson, Per Axel Torbjorn. Tooth brush. 243,568, 3-8-77, Cl. D4-25.000.<br/>Bartlett, Robert N., to Windsor Industries, Inc. Hot water extraction-type carpet cleaning apparatus and wheeled dolly therefor. 243,574, 3-8-77, Cl. D15-54.000.<br/>Bausch &amp; Lomb Incorporated: <i>See—</i><br/>Leeming, Arthur B., Sr.; and Speaker, Edwin A., 243,601.<br/>Belz, Frederick W. Automobile body. 243,595, 3-8-77, Cl. D12-92.000.<br/>Benes, Frank J., to Anchor Hocking Corporation. Pitcher or similar article. 243,579, 3-8-77, Cl. D7-64.000.<br/>Biondo, Joseph G., to Engelhard Minerals &amp; Chemicals Corporation. Disposable capsule for separately storing components of dental amalgams. 243,628, 3-8-77, Cl. D24-99.000.<br/>Bright Star Industries, Inc.: <i>See—</i><br/>Amoroso, Nicholas A., 243,590.<br/>Bristol-Myers Company: <i>See—</i><br/>Angleman, John D.; and DuCret, Doris, 243,585.<br/>Brych, Alfred, to Saft-Societe des Accumulateurs Fixes et de Traction. Lamp. 243,629, 3-8-77, Cl. D48-24.00A.<br/>Burke, Ronald L.; and Sulik, Jay R., to Zoecon Industries, Inc. Ear tag. 243,622, 3-8-77, Cl. D30-43.000.<br/>Burlington Industries, Inc.: <i>See—</i><br/>Alvarez, Teresita E., 243,561.<br/>Capitol Products Corporation: <i>See—</i><br/>Goss, Lorane C., Jr.; Cribben, James T.; and Miller, Joseph J., 243,581.<br/>Carlson, John A., to Conchemco, Incorporated. Bow string cable fitting. 243,606, 3-8-77, Cl. D22-99.000.<br/>Casparro, John J. Rotary advertising display. 243,640, 3-8-77, Cl. D96-12.00R.</p> | <p>Cheng, Regan L., to Atari, Inc. Game cabinet. 243,626, 3-8-77, Cl. D34-5.00J.<br/>Clower, Robert E. Child's coaster vehicle. 243,627, 3-8-77, Cl. D34-15.0AJ.<br/>Conchemco, Incorporated: <i>See—</i><br/>Carlson, John A., 243,606.<br/>Cone, Richard E.: <i>See—</i><br/>Lieding, Robert K.; and Cone, Richard E., 243,569.<br/>Craig, Randall T. Water sweeper. 243,610, 3-8-77, Cl. D23-35.000.<br/>Cribben, James T.: <i>See—</i><br/>Goss, Lorane C., Jr.; Cribben, James T.; and Miller, Joseph J., 243,581.<br/>Danat, Alfred W. Drinking mug. 243,578, 3-8-77, Cl. D7-5.000.<br/>Dart Industries Inc.: <i>See—</i><br/>Flaherty, Charles Martin, 243,573.<br/>Rabinowitz, Harold, 243,637.<br/>Davidson, Charles Patrick Duncan, to Joseph Lucas Limited. Bicycle frame. 243,598, 3-8-77, Cl. D12-111.000.<br/>DeCaro, Charles J., to Textron, Inc. Fastener. 243,580, 3-8-77, Cl. D8-388.000.<br/>de Massacre, Guy. Boot. 243,566, 3-8-77, Cl. D2-272.000.<br/>de Massacre, Guy. Boot. 243,567, 3-8-77, Cl. D2-272.000.<br/>de Massacre, Guy Charles. Ornamental design for a boot. 243,565, 3-8-77, Cl. D2-272.000.<br/>DuCret, Doris: <i>See—</i><br/>Angleman, John D.; and DuCret, Doris, 243,585.<br/>Eldon Industries, Inc.: <i>See—</i><br/>Evenson, Mel, 243,604.<br/>Engelhard Minerals &amp; Chemicals Corporation: <i>See—</i><br/>Biondo, Joseph G., 243,628.<br/>Escalante, Conrad J. Bezel flashing sign. 243,639, 3-8-77, Cl. D96-12.00R.<br/>Evenson, Mel, to Eldon Industries, Inc. List finder. 243,604, 3-8-77, Cl. D19-76.000.<br/>Excelco International Inc.: <i>See—</i><br/>Ho, Shelton Shiu-Tong, 243,587.<br/>Ho, Shelton Shiu-Tong, 243,588.<br/>Ficks Reed Company: <i>See—</i><br/>Wisner, John B., 243,571.<br/>Flaherty, Charles Martin, to Dart Industries Inc. Measuring cup rack. 243,573, 3-8-77, Cl. D6-114.000.<br/>Fratelli Saporiti: <i>See—</i><br/>Offredi, Giovanni, 243,572.<br/>Gilbert, Donald E. Light attracting insect electrocutor. 243,611, 3-8-77, Cl. D22-19.000.</p> |
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# LIST OF DESIGN PATENTEEES

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| <p>Gilbert, Donald E. Electric control unit for flying insects. 243,612, 3-8-77, Cl. D22-19.000.<br/>Gillette Company, The: <i>See—</i><br/>Poisson, Norman D., 243,638.<br/>Gilmartin, Harry M. Vehicle tire traction device. 243,599, 3-8-77, Cl. D12-154.000.<br/>Goss, Lorane C., Jr.; Cribben, James T.; and Miller, Joseph J., to Capitol Products Corporation. Guide spring for window sashes or similar article. 243,581, 3-8-77, Cl. D8-395.000.<br/>Headington, Marion Leon, Jr. Motorcycle camper housing. 243,597, 3-8-77, Cl. D12-103.000.<br/>Hilfiker Pipe Co.: <i>See—</i><br/>Hilfiker, William K., 243,613.<br/>Hilfiker, William K., to Hilfiker Pipe Co. Retaining wall stringer. 243,613, 3-8-77, Cl. D25-77.000.<br/>Ho, Shelton Shiu-Tong, to Excelco International Inc. Pendant watch. 243,587, 3-8-77, Cl. D10-30.000.<br/>Ho, Shelton Shiu-Tong, to Excelco International Inc. Wrist watch. 243,588, 3-8-77, Cl. D10-33.000.<br/>Igo, Toshio: <i>See—</i><br/>Murakami, Tsutomu; Igo, Toshio; Kawamura, Ken; Makino, Katsuhiko; Koda, Hironosuke; and Murakami, Shinzo, 243,630.<br/>International Standard Electric Corporation: <i>See—</i><br/>Knox, John E., 243,575.<br/>Japan Suncrux Co., Ltd.: <i>See—</i><br/>Araki, Toshihiro, 243,586.<br/>Joseph Lucas Limited: <i>See—</i><br/>Davidson, Charles Patrick Duncan, 243,598.<br/>Kawamura, Ken: <i>See—</i><br/>Murakami, Tsutomu; Igo, Toshio; Kawamura, Ken; Makino, Katsuhiko; Koda, Hironosuke; and Murakami, Shinzo, 243,630.<br/>Kaye, Gordon E., to P. R. Mallory &amp; Co., Inc. Electric battery. 243,615, 3-8-77, Cl. D13-8.000.<br/>Kaye, Gordon E., to P. R. Mallory &amp; Co., Inc. Electric battery. 243,616, 3-8-77, Cl. D13-8.000.<br/>Kaye, Gordon E., to P. R. Mallory &amp; Co., Inc. Electric battery. 243,617, 3-8-77, Cl. D13-8.000.<br/>Kaye, Gordon E., to P. R. Mallory &amp; Co., Inc. Electric battery. 243,618, 3-8-77, Cl. D13-8.000.<br/>Knox, John E., to International Standard Electric Corporation. Stand for a teleprinter. 243,575, 3-8-77, Cl. D6-181.000.<br/>Koch, Jeffrey F. Self-propelled hang glider carriage. 243,594, 3-8-77, Cl. D12-81.000.<br/>Koda, Hironosuke: <i>See—</i><br/>Murakami, Tsutomu; Igo, Toshio; Kawamura, Ken; Makino, Katsuhiko; Koda, Hironosuke; and Murakami, Shinzo, 243,630.<br/>Kreisel, Betty C. Head covering. 243,563, 3-8-77, Cl. D2-243.000.<br/>Kreisel, Betty C. Head covering. 243,564, 3-8-77, Cl. D2-243.000.<br/>Kruse, William H. Woman's two-piece bathing suit. 243,562, 3-8-77, Cl. D2-37.000.<br/>Ksenych, Nick. Livestock trailer. 243,596, 3-8-77, Cl. D12-102.000.<br/>Laurenzi, Richard F. Chair. 243,570, 3-8-77, Cl. D6-7.000.<br/>Leeming, Arthur B., Sr.; and Speaker, Edwin A., to Bausch &amp; Lomb Incorporated. Microscope. 243,601, 3-8-77, Cl. D16-57.000.<br/>Lieding, Robert K.; and Cone, Richard E. Baby carrier. 243,569, 3-8-77, Cl. D6-7.000.<br/>Lipford, John T.: <i>See—</i><br/>Smith, Harvey J., Sr.; and Lipford, John T., 243,593.<br/>Lowrance Electronics, Inc.: <i>See—</i><br/>Moore, John C., 243,589.<br/>Makino, Katsuhiko: <i>See—</i><br/>Murakami, Tsutomu; Igo, Toshio; Kawamura, Ken; Makino, Katsuhiko; Koda, Hironosuke; and Murakami, Shinzo, 243,630.<br/>Martin, Gilbert I.: <i>See—</i><br/>Rubin, Stuart C.; and Martin, Gilbert I., 243,636.<br/>Matsushita Electric Industrial Co., Ltd.: <i>See—</i><br/>Murakami, Tsutomu; Igo, Toshio; Kawamura, Ken; Makino, Katsuhiko; Koda, Hironosuke; and Murakami, Shinzo, 243,630.<br/>Miller, Bruce B. Pressure relief valve for respiratory inhalation systems. 243,635, 3-8-77, Cl. D83-1.00L.<br/>Miller, Joseph J.: <i>See—</i><br/>Goss, Lorane C., Jr.; Cribben, James T.; and Miller, Joseph J., 243,581.<br/>Mono, Rune G.; and Morichetto, Michele. Spout. 243,607, 3-8-77, Cl. D23-32.000.<br/>Mono, Rune G.; and Morichetto, Michele. Faucet. 243,608, 3-8-77, Cl. D23-23.000.<br/>Mono, Rune G.; and Morichetto, Michele. Handshower. 243,609, 3-8-77, Cl. D23-35.000.<br/>Moore, John C., to Lowrance Electronics, Inc. Sonar unit for fishermen. 243,589, 3-8-77, Cl. D10-46.000.<br/>Morichetto, Michele: <i>See—</i><br/>Mono, Rune G.; and Morichetto, Michele, 243,607.<br/>Mono, Rune G.; and Morichetto, Michele, 243,608.</p> | <p>Mono, Rune G.; and Morichetto, Michele, 243,609.<br/>Morrison, David J. Soap bar. 243,631, 3-8-77, Cl. D73-1.00A.<br/>Morrison, David J. Soap bar. 243,632, 3-8-77, Cl. D73-1.00A.<br/>Morrison, David J. Soap bar. 243,633, 3-8-77, Cl. D73-1.00A.<br/>Morrison, David J. Soap bar. 243,634, 3-8-77, Cl. D73-1.00A.<br/>Murakami, Shinzo: <i>See—</i><br/>Murakami, Tsutomu; Igo, Toshio; Kawamura, Ken; Makino, Katsuhiko; Koda, Hironosuke; and Murakami, Shinzo, 243,630.<br/>Murakami, Tsutomu; Igo, Toshio; Kawamura, Ken; Makino, Katsuhiko; Koda, Hironosuke; and Murakami, Shinzo, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 243,630, 3-8-77, Cl. D14-75.000.<br/>Offredi, Giovanni, to Fratelli Saporiti. Chair. 243,572, 3-8-77, Cl. D6-75.000.<br/>Olsson, Karl Axel Torbjorn, to Telefonaktiebolaget. Telephone instrument. 243,619, 3-8-77, Cl. D14-53.000.<br/>Owens-Illinois, Inc.: <i>See—</i><br/>Reynolds, Raymond G., 243,583.<br/>Reynolds, Raymond G., 243,584.<br/>P. R. Mallory &amp; Co., Inc.: <i>See—</i><br/>Kaye, Gordon E., 243,615.<br/>Kaye, Gordon E., 243,616.<br/>Kaye, Gordon E., 243,617.<br/>Kaye, Gordon E., 243,618.<br/>Poisson, Norman D., to Gillette Company, The. Safety razor blade assembly. 243,638, 3-8-77, Cl. D28-47.000.<br/>Priest, Lee-Louise H., to Zoecon Industries, Inc. Ear tag. 243,623, 3-8-77, Cl. D30-43.000.<br/>Rabinowitz, Harold, to Dart Industries Inc. Vacuum bottle tote bag. 243,637, 3-8-77, Cl. D87-1.00R.<br/>Reynolds, Raymond G., to Owens-Illinois, Inc. Plastic sleeve-encased bottle. 243,583, 3-8-77, Cl. D9-12.000.<br/>Reynolds, Raymond G., to Owens-Illinois, Inc. Bottle. 243,584, 3-8-77, Cl. D9-119.000.<br/>Robert Bosch G.m.b.H.: <i>See—</i><br/>Slany, Hans Erich, 243,600.<br/>Rubin, Stuart C.; and Martin, Gilbert I. Medicament dispenser for children. 243,636, 3-8-77, Cl. D83-12.00A.<br/>Russo, Michael T. Stake. 243,614, 3-8-77, Cl. D25-77.000.<br/>Saft-Societe des Accumulateurs Fixes et de Traction: <i>See—</i><br/>Brych, Alfred, 243,629.<br/>Salsgiver, John P. Educational chromatograph. 243,603, 3-8-77, Cl. D19-62.000.<br/>Sauter, Kenneth W., to Atari, Inc. Game cabinet. 243,625, 3-8-77, Cl. D34-5.00J.<br/>Schouten, Gerard M., to Armstrong Cork Company. Display rack for carpet samples or the like. 243,577, 3-8-77, Cl. D6-188.000.<br/>Shewmake, Frank Howard. Fishing lure. 243,605, 3-8-77, Cl. D22-27.000.<br/>Shirey, Robert D. Screw plug mounting for an electric immersion heater. 243,582, 3-8-77, Cl. D23-127.000.<br/>Slany, Hans Erich, to Robert Bosch G.m.b.H. Television camera. 243,600, 3-8-77, Cl. D16-1.000.<br/>Smith, Harvey J., Sr.; and Lipford, John T. Multipurpose knockdown handcart. 243,593, 3-8-77, Cl. D12-34.000.<br/>Speaker, Edwin A.: <i>See—</i><br/>Leeming, Arthur B., Sr.; and Speaker, Edwin A., 243,601.<br/>Sulik, Jay R., to Zoecon Industries, Inc. Ear tag. 243,621, 3-8-77, Cl. D30-43.000.<br/>Sulik, Jay R.: <i>See—</i><br/>Burke, Ronald L.; and Sulik, Jay R., 243,622.<br/>Taber, Helen L. Christmas wall hanging. 243,592, 3-8-77, Cl. D11-121.000.<br/>Taishoff, Howard Alan. Panel for display of time or frequency, or both. 243,591, 3-8-77, Cl. D10-125.000.<br/>Takaichi, Peter L., to Atari, Inc. Game cabinet. 243,624, 3-8-77, Cl. D34-5.00J.<br/>Telefonaktiebolaget: <i>See—</i><br/>Olsson, Karl Axel Torbjorn, 243,619.<br/>Textron, Inc.: <i>See—</i><br/>DeCaro, Charles J., 243,580.<br/>Updegraff, Edward R. Contact lens handling device. 243,602, 3-8-77, Cl. D16-83.000.<br/>Williams, Jack H. Listening center. 243,620, 3-8-77, Cl. D14-37.000.<br/>Windsor Industries, Inc.: <i>See—</i><br/>Bartlett, Robert N., 243,574.<br/>Wisner, John B., to Ficks Reed Company. Wicker chair. 243,571, 3-8-77, Cl. D6-57.000.<br/>Zinck, Richard. Tape storage rack. 243,576, 3-8-77, Cl. D6-185.000.<br/>Zoecon Industries, Inc.: <i>See—</i><br/>Burke, Ronald L.; and Sulik, Jay R., 243,622.<br/>Priest, Lee-Louise H., 243,623.<br/>Sulik, Jay R., 243,621.</p> |
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# CLASSIFICATION OF PATENTS

ISSUED MARCH 8, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 3	630 D 4,010,539	55 4,010,595	483 4,010,651	CLASS 106	418 4,010,756
1 4,010,494	CLASS 30	123 4,010,596	CLASS 74	1 4,011,087	419 P 4,010,757
12.4 4,010,495	123.7 4,010,541	374 4,010,597	10.33 4,010,652	15 FP 4,011,088	419 PS 4,010,758
13 4,010,496	164.9 4,010,542	376 4,010,598	230.17 C 4,010,654	15 R 4,011,089	419 PS 4,010,760
CLASS 4	316 4,010,543	CLASS 55	231 P 4,010,655	39.7 4,011,091	CLASS 131
1 4,010,497	381 4,010,544	25 4,011,065	245 S 4,010,656	52 4,011,093	21 B 4,010,762
180 4,010,498	CLASS 32	44 4,011,066	478 4,010,657	89 4,011,092	33 4,010,763
CLASS 5	14 A 4,010,545	354 4,011,067	552 4,010,658	93 4,011,094	CLASS 132
81 R 4,010,499	CLASS 33	459 D 4,011,068	688 4,010,660	183 4,011,095	45 R 4,010,764
CLASS 8	30 R 4,010,546	CLASS 57	781 R 4,010,653	288 B 4,011,096	CLASS 133
34 4,011,042	80 4,010,547	34 HS 4,010,599	CLASS 75	19 4,010,696	4 A 4,010,765
54 4,011,043	172 R 4,010,548	129 4,010,600	2 4,011,072	93 4,010,697	4,010,766
CLASS 9	317 D 4,010,549	160 4,010,601	.5 BB 4,011,073	111 4,010,698	CLASS 134
8 P 4,010,500	CLASS 34	CLASS 58	135 4,011,074	133 4,010,699	3 4,011,097
338 4,010,501	23 4,010,550	23 AC 4,010,602	171 4,011,075	CLASS 112	6 4,011,098
CLASS 12	57 R 4,010,551	39.5 4,010,603	211 4,011,076	79 R 4,010,700	7 4,011,099
86.7 4,010,502	179 4,010,552	CLASS 59	212 4,011,077	121.12 4,010,701	8 4,011,100
CLASS 13	CLASS 35	82 4,010,604	CLASS 76	225 4,010,702	10 4,011,101
20 4,011,394	9 C 4,010,553	CLASS 60	36 4,010,661	CLASS 113	57 R 4,011,102
25 4,011,395	19 A 4,010,555	39.14 4,010,605	CLASS 81	120 Y 4,010,703	104 4,010,774
CLASS 14	20 4,010,554	39.28 R 4,010,606	64 4,010,662	CLASS 114	CLASS 136
71.3 4,010,505	30 4,010,556	226 R 4,010,608	71 4,010,663	245 4,010,706	205 4,011,104
CLASS 15	35 C 4,010,557	274 4,010,607	CLASS 83	267 4,010,704	CLASS 137
22 R 4,010,506	CLASS 36	402 4,010,609	277 4,010,664	279 4,010,705	118 4,010,767
49 R 4,010,507	7.3 4,010,558	459 4,010,610	477.2 4,010,665	CLASS 115	218 4,010,768
104.94 4,010,508	128 4,010,559	516 4,010,611	678 4,010,666	12 R 4,010,707	312 4,010,769
192 4,010,510	CLASS 37	527 4,010,612	CLASS 84	CLASS 116	492.5 4,010,770
210 B 4,010,512	54 4,010,560	599 4,010,613	1.03 4,010,667	65 4,010,708	596.1 4,010,771
245 4,010,513	141 T 4,010,561	641 4,010,614	1.16 4,010,668	CLASS 118	625.17 4,010,772
306 A 4,010,514	CLASS 38	.5 4,010,615	CLASS 85	33 4,010,709	CLASS 138
CLASS 16	102.2 4,010,562	45 D 4,010,618	1 T 4,010,669	49 4,010,710	30 4,010,773
87.2 4,010,503	CLASS 40	45 R 4,010,616	45 4,010,670	211 4,010,711	142 4,010,775
158 4,010,504	301 4,010,563	69 R 4,010,619	47 4,010,671	306 4,010,712	CLASS 139
CLASS 17	CLASS 42	CLASS 62	CLASS 89	621 4,010,713	449 4,010,776
21 4,010,515	1 R 4,010,565	2 4,010,620	1.802 4,010,672	CLASS 119	CLASS 141
66 4,010,516	1 S 4,010,564	6 4,010,621	191 A 4,010,673	14.03 4,010,714	4 4,010,777
CLASS 23	69 R 4,010,566	48 4,010,622	CLASS 91	14.14 4,010,715	9 4,010,778
230 B 4,011,044	CLASS 43	55 4,010,623	47 4,010,674	CLASS 123	44 4,010,779
230 LC 4,011,046	17.5 4,010,567	159 4,010,624	CLASS 92	8.47 4,010,716	168 4,010,780
252 R 4,011,047	42.22 4,010,568	CLASS 64	54 4,010,675	32 EH 4,010,717	392 4,010,781
259 4,011,048	44.83 4,010,569	21 4,010,625	CLASS 93	41.35 4,010,718	CLASS 144
CLASS 24	CLASS 44	11 R 4,011,069	51 R 4,010,676	44 C 4,010,719	309 AC 4,010,782
67.11 4,010,517	52 4,011,057	29 4,011,070	58.2 R 4,010,677	103 R 4,010,720	CLASS 148
73 C 4,010,518	CLASS 46	31 4,011,071	77 FT 4,010,678	117 A 4,010,721	1.5 4,011,105
141 4,010,519	154 4,010,570	134 4,011,060	CLASS 96	119 A 4,010,722	2 4,011,106
205.13 R 4,010,520	CLASS 48	93 4,010,626	1 R 4,011,078	119 D 4,010,722	6 4,011,107
258 4,010,521	85.2 4,011,059	177 4,010,627	1.5 4,011,079	122 AC 4,010,724	11.5 P 4,011,108
CLASS 26	197 R 4,011,058	CLASS 70	Re.29.148 4,011,080	142.5 R 4,010,725	12 B 4,011,109
18.6 4,010,522	CLASS 49	170 Re.29.146 4,011,082	45.2 4,011,081	148 CC 4,010,726	4,011,110
CLASS 28	70 4,010,571	CLASS 71	95 4,011,082	190 DL 4,010,727	16.6 4,011,111
1.2 4,010,529	386 4,010,572	29 4,011,061	109 4,011,083	CLASS 126	134 4,011,112
72.11 4,010,523	479 4,010,573	92 4,011,062	115 P 4,011,084	120 4,010,728	175 4,011,113
CLASS 29	CLASS 51	CLASS 72	116 4,011,085	121 4,010,729	CLASS 149
11 4,010,524	121 4,010,574	181 4,010,628	136 4,011,086	140 4,010,730	19.4 4,011,114
25.13 4,010,525	229 4,010,575	368 4,010,629	CLASS 100	271 4,010,731	22 4,011,115
96 4,010,526	249 4,010,576	391 4,010,630	53 4,010,679	4,010,732	46 4,011,116
4,011,049	284 4,010,583	CLASS 73	152 4,010,680	4,010,733	88 4,011,117
4,011,050	295 4,011,063	12 4,010,631	CLASS 101	4,010,734	CLASS 150
4,010,527	4,011,064	46 4,010,633	38 R 4,010,681	CLASS 128	1 4,010,783
125 4,010,528	CLASS 52	67.8 S 4,010,634	148 4,010,686	2 B 4,010,737	7 4,010,784
156.8 B 4,010,530	1 4,010,577	4,010,635	288 4,010,682	2 R 4,010,738	8 4,010,785
156.8 H 4,010,531	58 4,010,578	4,010,636	366 4,010,683	2.05 G 4,010,739	35 4,010,787
182 4,011,051	79.8 4,010,579	4,010,637	382 MV 4,010,684	17 4,010,740	CLASS 151
182.5 4,011,052	80 4,010,580	71.4 4,010,637	415.1 4,010,685	20 4,010,741	2 A 4,010,788
182.7 4,011,053	220 4,010,581	139 4,010,639	453 4,010,687	24.4 4,010,742	CLASS 152
195 4,011,054	282 4,010,582	141 A 4,010,632	CLASS 102	57 4,010,743	182 4,010,789
199 4,011,055	299 4,010,584	141 R 4,010,638	65.2 4,010,688	75 4,010,744	CLASS 156
267 4,010,532	308 4,010,585	150 A 4,010,640	70.2 P 4,010,689	87 R 4,010,745	51 4,011,118
523 4,010,533	309.16 4,010,586	151 4,010,642	97 4,010,690	145.6 4,010,761	69 4,011,119
572 4,010,534	377 4,010,587	194 B 4,010,645	CLASS 104	147 4,010,746	74 4,011,120
577 4,010,535	398 4,010,588	194 EM 4,010,644	7 A 4,010,691	173 H 4,010,747	82 4,011,121
593 4,010,536	483 4,010,589	194 R 4,010,643	12 4,010,692	192 4,010,748	86 4,011,122
623.2 4,010,537	533 4,010,590	304 C 4,010,650	23 FS 4,010,693	214 C 4,010,749	345 4,011,123
630 A 4,010,538	732 4,010,591	387 4,010,646	CLASS 105	214 E 4,010,751	358 4,011,124
4,010,540	748 4,010,592	421.5 R 4,010,647	254 4,010,695	263 4,010,752	394 4,011,125
	CLASS 53	423 R 4,010,648	482 4,010,694	284 4,010,753	416 4,011,126
	29 4,010,593	425.4 R 4,010,649		404 4,010,755	4,011,127
	35 4,010,594				



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500	4,011,128	31 R	4,011,136	CLASS 221	420	4,010,927	309.5	4,011,235	CLASS 280
	CLASS 160	65	4,011,137	9	4,010,868	CLASS 250	309.7	4,011,238	
133	4,010,790		4,011,138	15	4,010,869	199	4,011,445	310 R	11.37 A
	CLASS 162	80 R	4,011,139			201	4,011,446	327 S	4,010,961
30 K	4,011,129		4,011,140	CLASS 222	222 R	237 R	4,011,447	332.2 A	4,010,962
151	4,011,130	103.5 R	4,011,141	78	4,010,870	309	4,011,448	340.3	4,010,963
279	4,011,131		4,011,142	93	4,010,871	311	4,011,449	340.9	
	CLASS 164	1 R	4,010,834	94	4,010,872	343	4,011,450	346.1 R	CLASS 283
34	4,010,791		4,010,835	101	4,010,873	344	4,011,451		56
76	4,010,792		4,010,836	321	4,010,874	352	4,011,452	346.3	4,010,964
82	4,010,793	7	4,010,837	517	4,010,875	363 S	4,011,453	348 R	CLASS 285
94	4,010,794		4,010,838	595	4,010,876	483	4,011,454	348 SC	173
	CLASS 165	98	4,010,838	CLASS 223	486	492 R	4,011,455	369	4,010,966
46	4,010,795	151	4,010,839	37	4,010,877	540	4,011,456	390	CLASS 292
69	4,010,796	CLASS 198	4,010,840	75	4,010,878	563	4,011,457	397.2	251.5
159	4,010,797	345	4,010,841	96	4,010,879	564	4,011,458	410.6	346
	CLASS 166	357	4,010,842	CLASS 224		576	4,011,459	413	CLASS 293
.5	4,010,798	394	4,010,843	42.42 A	4,010,880	CLASS 251	448.2 E	413	98
248	4,010,799	487	4,010,844	CLASS 225	100	31	465.5 R	448.2 E	CLASS 294
258	4,010,800	562		4,010,881	314	260	465.6	465.6	19 R
261	4,010,801	61.45 R	4,011,418	CLASS 226		260	465.6	465.6	81 R
281	4,010,802	67 B	4,011,419	11	4,010,882	314	465.6	465.6	CLASS 295
303	4,010,803	144 C	4,011,426	171	4,010,883	32.7 E	465.6	465.6	11
315	4,010,804	144 R	4,011,425	CLASS 227		42.7	465.6	465.6	CLASS 296
	CLASS 172	147 R	4,011,420	6 A	4,010,885	63.7	465.6	465.6	23 R
698	4,010,805	148 A	4,011,421	173	4,010,886	95	465.6	465.6	24 C
	CLASS 173	159 B	4,011,422	190	4,010,884	134	465.6	465.6	75
57	4,010,806	308	4,011,423	CLASS 229		180	465.6	465.6	CLASS 297
	CLASS 174	330		21	4,010,887	187 R	465.6	465.6	92
11 R	4,011,396	CLASS 204	4,011,143	52 B	4,010,888	299	465.6	465.6	239
42	4,011,397	15	4,011,144	69	4,010,889	301.19	465.6	465.6	379
52 PE	4,011,398	59 R	4,011,145	CLASS 233		427	465.6	465.6	441
	CLASS 175	66	4,011,146	1 R	4,010,890	500	465.6	465.6	CLASS 302
325	4,010,807	98	4,011,147	23 A	4,010,891	522	465.6	465.6	2 R
334	4,010,808	129	4,011,148	3 A	4,010,892	CLASS 254	465.6	465.6	CLASS 303
	CLASS 176	129.35	4,011,149	24	4,010,893	131	465.6	465.6	10
38	4,011,132	149	4,011,150	27	4,010,894	23	465.6	465.6	40
68	4,011,133	228	4,011,151	CLASS 235		6	465.6	465.6	140
	4,011,134	CLASS 206	4,011,152	61 PE	4,011,432	116	465.6	465.6	89
1	4,010,809	.82	4,010,845	61.1 E	4,011,433	CLASS 260	465.6	465.6	CLASS 307
157	4,010,810	108	4,010,846	61.7 B	4,011,433	2.5 A	465.6	465.6	10 LS
257	4,010,811	187	4,010,847	61.9 R	4,011,434	2.5 AB	465.6	465.6	88 LC
	CLASS 178	448	4,010,848	92 PE	4,011,436	2.5 AW	465.6	465.6	88.3
68	4,011,405	CLASS 208	4,010,849	151.11	4,011,437	4 AR	465.6	465.6	110
70 R	4,011,406	10	4,011,153	152	4,011,438	8	465.6	465.6	137
88	4,011,407	59	4,011,154	164	4,011,439	9	465.6	465.6	208
	CLASS 179	74 R	4,011,155	183	4,011,440	28.5 R	465.6	465.6	229
1.5 R	4,011,408	CLASS 209		193	4,011,441	29.2 N	465.6	465.6	251
2 A	4,011,409	8	4,011,156	CLASS 237	4,011,442	29.3	465.6	465.6	270
2.5 R	4,011,410	CLASS 210		12.3 C	4,010,895	29.6 F	465.6	465.6	278
6 E	4,011,411	23 R	4,011,157	CLASS 238		31.6	465.6	465.6	297
15 BA	4,011,412	19 R	4,011,158	2	4,010,896	33.6 UB	465.6	465.6	308
81 R	4,011,413	40	4,011,159	CLASS 239		33.6 B	465.6	465.6	8.2
90 B	4,011,414	242 R	4,011,164	8	4,010,897	37 P	465.6	465.6	16
99	4,011,415	CLASS 211		11	4,010,898	37 SB	465.6	465.6	187
100.3 K	4,011,416	1.3	4,010,850	101	4,010,899	40 R	465.6	465.6	CLASS 310
100.41 K	4,011,417	189	4,010,851	168	4,010,900	45.75 C	465.6	465.6	8.1
	CLASS 180	208	4,011,163	204	4,010,901	45.85 B	465.6	465.6	8.2
33 A	4,010,812	242 R	4,011,164	428.5	4,010,902	46.5 R	465.6	465.6	8.7
73 C	4,010,813	CLASS 212		533.1	4,010,903	47 C	465.6	465.6	8.7
82 R	4,010,814	8 R	4,010,852	CLASS 240		47 ET	465.6	465.6	4,010,936
132	4,010,815	61	4,010,853	7.55	4,011,443	47 CP	465.6	465.6	68 R
144	4,010,816	166	4,010,854	10 A	4,011,444	47 ET	465.6	465.6	70 R
	CLASS 181	CLASS 213		79.3	4,010,904	65	465.6	465.6	80 R
33 G	4,010,817	CLASS 214		295	4,010,905	75 M	465.6	465.6	155
36 A	4,010,819	16.4 A	4,010,855	CLASS 242		78 R	465.6	465.6	186
135	4,010,820	18 R	4,010,857	7.21	4,010,906	79.3 MU	465.6	465.6	CLASS 312
148	4,010,821	77 R	4,010,859	35.5 A	4,010,907	112 R	465.6	465.6	38
	CLASS 182	86 A	4,010,858	36	4,010,908	112.5 S	465.6	465.6	204
18	4,010,822	CLASS 215		55.18	4,010,910	156	465.6	465.6	255
128	4,010,823	100 A	4,010,862	55.3	4,010,909	207.5	465.6	465.6	CLASS 313
	CLASS 186	CLASS 216		58.4	4,010,911	239.55 R	465.6	465.6	217
1 C	4,010,824	1 R	4,010,860	67.1 R	4,010,912	243 C	465.6	465.6	302
9 R	4,010,825	11 B	4,010,861	107	4,010,913	244 R	465.6	465.6	CLASS 315
26	4,010,826	CLASS 219		107.4 A	4,010,914	247.1 H	465.6	465.6	361
	CLASS 188	10.55 B	4,011,427	129.62	4,010,915	250 A	465.6	465.6	CLASS 316
71.2	4,010,827	153	4,011,428	147 R	4,010,916	250 AH	465.6	465.6	2
71.8	4,010,828	486	4,011,429	157.1	4,010,917	252 P	465.6	465.6	CLASS 318
278	4,010,829	524	4,011,430	188	4,010,918	252	465.6	465.6	138
	CLASS 192	CLASS 220		191	4,010,918	256 R	465.6	465.6	139
4 A	4,010,830	1 C	4,010,863	CLASS 244		268 R	465.6	465.6	227
70.2	4,010,831	3	4,010,864	17.21	4,010,919	268 TR	465.6	465.6	269
84 C	4,010,832	6	4,010,865	89	4,010,920	278	465.6	465.6	327
87.11	4,010,833	20	4,010,866	166	4,010,921	283 CN	465.6	465.6	373
	CLASS 195	66	4,010,867	CLASS 248		287 D	465.6	465.6	568
30	4,011,135	CLASS 221		165	4,010,922	287 T	465.6	465.6	CLASS 321
		CLASS 222		183	4,010,923	288 R	465.6	465.6	12
		CLASS 223		225.3	4,010,924	293.85	465.6	465.6	18
		CLASS 224		295	4,010,925	296 R	465.6	465.6	27 R
		CLASS 225		411	4,010,926	297 R	465.6	465.6	CLASS 323
		CLASS 226				306.7 R	465.6	465.6	4
		CLASS 227				307 R	465.6	465.6	21
		CLASS 228				309.2	465.6	465.6	43.5 S
		CLASS 229							
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		CLASS 282							
		CLASS 283							
		CLASS 284							
		CLASS 285							
		CLASS 286							
		CLASS 287			</				

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CLASS 324	171	4,011,537	160 LC	4,011,001	132	4,011,593	52	4,011,310	195	4,011,354
61 R	4,011,500	CLASS 338		4,011,002	CLASS 361		65	4,011,311	214	4,011,355
65 R	4,011,501	35	4,011,538	4,011,008	47	4,011,483	78	4,011,312	CLASS 428	
78 E	4,011,502	CLASS 339		4,011,009	59	4,011,484	227	4,011,313	34	4,011,356
83 R	4,011,503	17 CF	4,010,992	24	4,011,010	127	4,011,485	241	215	4,011,357
115	4,011,504	31 R	4,010,993	3	4,011,568	182	4,011,486	243	287	4,011,358
117 R	4,011,505	36	4,010,994	38	4,011,569	CLASS 402		244	326	4,011,359
121 R	4,011,506	45 R	4,010,995	89	4,011,570	44	4,011,018	249	402	4,011,360
127	4,011,507	47 R	4,010,996	219	4,011,571	15	4,011,019	250	422	4,011,361
133	4,011,508	75 R	4,010,997	266	4,011,572	172	4,011,020	251	447	4,011,362
142	4,011,509	91 R	4,010,998	322	4,011,573	220	4,011,021	256	524	4,011,363
157	4,011,510	107	4,010,999	CLASS 355		40	4,011,022	263	CLASS 429	
CLASS 325		130 C	4,011,000	18	4,011,011	91	4,011,023	266	1	4,011,364
40	4,011,511	CLASS 340		55	4,011,012	79	4,011,024	267	60	4,011,365
150	4,011,512	7 R	4,011,539	75	4,011,013	153	4,011,025	273	61	4,011,366
312	4,011,513	25	4,011,540	116	4,011,014	199	4,011,026	275	66	4,011,103
464	4,011,514	147 LP	4,011,541	136	4,011,015	CLASS 408		275	104	4,011,367
470	4,011,515	166 R	4,011,542	195	4,011,016	79	4,011,024	282	121	4,011,368
CLASS 328		172.5	4,011,543	241	4,011,017	153	4,011,025	304	140	4,011,369
14	4,011,516	CLASS 329	4,011,544	CLASS 356		199	4,011,026	309	174	4,011,370
130	4,011,517	25	4,011,545	75	4,011,013	CLASS 415		317	218	4,011,371
CLASS 330		173 CA	4,011,546	116	4,011,014	121 B	4,011,027	317	220	4,011,372
23	4,011,518	174 TF	4,011,547	136	4,011,015	192	4,011,028	322	CLASS 431	
29	4,011,519	189 M	4,011,548	195	4,011,016	269	4,011,029	324	344	4,011,040
CLASS 331		228 R	4,011,549	241	4,011,017	CLASS 417		326	CLASS 432	
14	4,011,520	242	4,011,550	241	4,011,017	51	4,011,030	330	21	4,011,041
94.5 C	4,011,523	274 R	4,011,551	241	4,011,017	53	4,011,031	330	258	4,011,037
94.5 G	4,011,524	280	4,011,552	241	4,011,017	84	4,011,032	330	CLASS 526	
94.5 PE	4,011,525	324 AD	4,011,553	241	4,011,017	253	4,011,033	330	1	4,011,375
107 A	4,011,526	324 M	4,011,554	241	4,011,017	CLASS 423		330	11.1	4,011,376
117 D	4,011,527	336	4,011,555	241	4,011,017	4	4,011,296	330	13	4,011,377
CLASS 333		347 DD	4,011,556	241	4,011,017	235	4,011,297	330	19	4,011,378
366 R	4,011,527	366 R	4,011,557	241	4,011,017	243	4,011,298	330	22	4,011,379
10	4,011,528	CLASS 343		241	4,011,017	239	4,011,299	330	30	4,011,380
28 R	4,011,529	5 DP	4,011,561	241	4,011,017	313	Re.29,149	330	56	4,011,381
81 A	4,011,530	6.5 R	4,011,562	241	4,011,017	332	4,011,301	330	96	4,011,382
98 R	4,011,531	7 VM	4,011,563	241	4,011,017	461	4,011,302	330	154	4,011,383
CLASS 335		16 M	4,011,564	241	4,011,017	573 G	4,011,303	330	158	4,011,384
154	4,011,533	112 A	4,011,565	241	4,011,017	579	4,011,305	330	190	4,011,385
186	4,011,534	785	4,011,566	241	4,011,017	CLASS 424		330	259	4,011,386
212	Re.29,150	853	4,011,567	241	4,011,017	1	4,011,307	330	281	4,011,387
CLASS 336		CLASS 350		241	4,011,017	1.5	4,011,308	330	320	4,011,388
57	4,011,535	6	4,011,003	241	4,011,017	49	4,011,309	330	CLASS 536	
CLASS 337		90	4,011,004	241	4,011,017	CLASS 424		330	4	4,011,389
141	4,011,536	96 BC	4,011,007	241	4,011,017	1	4,011,307	330	2	4,011,390
		96 C	4,011,005	241	4,011,017	1.5	4,011,308	330	3	4,011,391
		96 M	4,011,006	241	4,011,017	49	4,011,309	330	145	4,011,392
				241	4,011,017			330	194	4,011,393



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1 : 4,010,623	4,010,890	4,011,213	4,010,860	4,010,564
4,011,014	4,010,891	4,011,472	4,010,882	4,010,569
4,011,048	4,010,898	4,011,474	4,010,930	4,010,576
2 : 4,010,581	4,010,919	4,011,481	4,010,933	4,011,023
4 : 4,010,499	4,010,931	4,011,487	4,010,943	4,011,141
4,010,549	4,010,935	4,011,509	4,010,950	4,010,648
4,010,585	4,010,942	4,011,516	4,010,954	4,010,712
4,010,614	4,010,958	4,011,523	4,010,988	4,010,725
4,010,745	4,010,959	4,011,528	4,011,000	4,010,741
4,010,955	4,010,962	4,011,536	4,011,030	4,010,901
4,010,978	4,010,968	4,011,538	4,011,031	4,011,089
4,011,072	4,010,974	4,011,542	4,011,051	4,010,587
4,011,295	4,010,995	4,011,551	4,011,171	4,010,631
4,011,438	4,011,022	4,011,562	4,011,304	4,010,640
4,011,470	4,011,052	4,011,574	4,011,345	4,010,641
4,011,527	4,011,053	4,011,575	4,011,372	4,010,689
4,011,549	4,011,053	4,011,575	4,011,372	4,010,716
4,011,561	4,011,092	4,010,512	4,011,373	4,010,944
5 : 4,010,532	4,011,101	4,010,574	4,011,374	4,011,010
6 : Re.29,149	4,011,104	4,010,800	4,011,380	4,011,116
4,010,500	4,011,114	4,010,801	4,011,392	4,011,423
4,010,509	4,011,117	4,011,146	4,011,398	4,011,499
4,010,519	4,011,122	4,011,439	4,011,403	4,011,532
4,010,550	4,011,154	4,011,459	4,011,413	4,011,564
4,010,550	4,011,158	4,011,587	4,011,419	Re.29,150
4,010,575	4,011,163	4,010,518	4,011,477	4,010,517
4,010,578	4,011,166	4,010,530	4,011,485	4,010,653
4,010,594	4,011,174	4,010,542	4,011,512	4,010,690
4,010,595	4,011,179	4,010,602	4,011,526	4,010,699
4,010,613	4,011,183	4,010,606	4,011,537	4,010,767
4,010,636	4,011,241	4,010,707	4,011,541	4,010,948
4,010,639	4,011,242	4,010,818	4,011,573	4,011,007
4,010,661	4,011,243	4,010,874	4,010,513	4,011,186
4,010,688	4,011,253	4,010,884	4,010,525	4,011,193
4,010,696	4,011,264	4,010,999	4,010,610	4,011,259
4,010,710	4,011,282	4,011,011	4,010,728	4,011,268
4,010,735	4,011,287	4,011,069	4,010,788	4,011,360
4,010,736	4,011,296	4,011,071	4,010,790	4,011,395
4,010,744	4,011,300	4,011,139	4,010,828	4,011,444
4,010,747	4,011,301	4,011,180	4,010,853	4,011,451
4,010,749	4,011,313	4,011,181	4,010,875	4,011,458
4,010,761	4,011,315	4,011,231	4,010,898	4,011,466
4,010,772	4,011,320	4,011,262	4,010,901	4,011,473
4,010,775	4,011,351	4,011,292	4,010,946	4,011,478
4,010,778	4,011,375	4,011,324	4,010,976	4,011,510
4,010,787	4,011,397	4,011,385	4,010,978	4,011,521
4,010,797	4,011,408	4,011,420	4,010,981	4,011,533
4,010,811	4,011,416	4,011,424	4,010,982	4,011,565
4,010,823	4,011,418	4,011,436	4,010,983	4,011,566
4,010,842	4,011,429	4,011,445	4,010,987	4,010,526
4,010,845	4,011,445	4,011,504	4,010,987	4,010,650
4,010,866	4,011,446	4,011,530	4,010,987	4,010,658
4,010,867	4,011,447	4,011,530	4,010,987	
4,010,871	4,011,447	4,011,530	4,010,987	
4,010,872	4,011,448	4,011,190	4,010,858	

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4,011,346	4,011,346	4,011,442	4,011,442	4,010,503	4,011,506
4,010,671	4,010,590	4,010,497	4,011,449	4,010,816	4,010,680
4,010,684	4,010,506	4,010,506	4,011,454	4,010,825	4,010,700
4,010,717	4,010,620	4,010,534	4,011,461	4,011,348	4,010,846
4,010,721	4,011,404	4,010,539	4,011,471	4,010,537	4,011,076
4,010,791	4,010,502	4,010,543	4,011,497	4,010,538	4,011,124
4,010,838	4,010,704	4,010,553	4,011,511	4,010,565	4,011,133
4,010,841	4,010,522	4,010,558	4,011,515	4,010,568	4,011,199
4,010,888	4,010,544	4,010,571	4,011,517	4,010,605	4,011,285
4,010,927	4,010,545	4,010,603	4,011,518	4,010,630	4,011,286
4,010,929	4,010,562	4,010,627	4,011,522	4,010,635	4,011,302
4,010,941	4,010,607	4,010,629	4,011,582	4,010,645	4,010,496
4,010,949	4,010,624	4,010,656	4,011,590	4,010,647	4,010,504
4,010,961	4,010,662	4,010,676	4,011,591	4,010,694	4,010,516
4,010,969	4,010,708	4,010,687	37 : 4,010,600	4,010,695	4,010,556
4,010,977	4,010,752	4,010,697	4,010,810	4,010,719	4,010,633
4,010,979	4,010,769	4,010,701	4,010,887	4,010,738	4,010,642
4,010,987	4,010,865	4,010,731	4,010,938	4,010,763	4,010,770
4,011,077	4,010,893	4,010,739	4,011,223	4,010,780	4,010,799
4,011,107	4,010,922	4,010,766	39 : 4,010,501	4,010,785	4,010,802
4,011,160	4,010,957	4,010,794	4,010,531	4,010,840	4,010,804
4,011,168	4,010,964	4,010,803	4,010,557	4,010,848	4,010,805
4,011,176	4,010,970	4,010,822	4,010,583	4,010,849	4,010,808
4,011,189	4,010,992	4,010,832	4,010,608	4,010,885	4,010,852
4,011,191	4,011,006	4,010,835	4,010,612	4,010,886	4,010,947
4,011,197	4,011,013	4,010,844	4,010,664	4,010,909	4,010,967
4,011,249	4,011,057	4,010,851	4,010,682	4,010,913	4,011,097
4,011,257	4,011,062	4,010,862	4,010,824	4,010,921	4,011,252
4,011,291	4,011,094	4,010,863	4,010,857	4,010,925	4,011,281
4,011,337	4,011,149	4,010,869	4,010,870	4,010,956	4,011,379
4,011,362	4,011,167	4,010,873	4,010,879	4,010,991	4,011,414
4,011,376	4,011,170	4,010,889	4,010,897	4,010,904	4,011,534
4,011,389	4,011,175	4,010,894	4,010,908	4,011,039	4,011,539
4,011,476	4,011,211	4,010,951	4,010,910	4,011,046	4,011,540
4,011,491	4,011,230	4,010,953	4,010,928	4,011,049	4,011,579
4,011,507	4,011,232	4,010,980	4,010,939	4,011,073	4,011,584
4,011,531	4,011,236	4,010,997	4,010,946	4,011,095	4,010,963
4,011,555	4,011,239	4,011,009	4,010,984	4,011,098	4,011,303
4,011,568	4,011,273	4,011,017	4,010,998	4,011,105	50 : 4,011,559
4,010,566	4,011,275	4,011,044	4,011,026	4,011,144	51 : 4,010,584
4,010,588	4,011,276	4,011,059	4,011,035	4,011,153	4,010,729
4,010,597	4,011,278	4,011,060	4,011,091	4,011,182	4,010,878
4,010,757	4,011,288	4,011,064	4,011,093	4,011,194	53 : 4,010,592
4,010,758	4,011,310	4,011,080	4,011,103	4,011,195	4,010,593
4,010,760	4,011,319	4,011,081	4,011,111	4,011,196	4,010,705
4,010,934	4,011,323	4,011,083	4,011,162	4,011,207	4,010,755
4,010,994	4,011,326	4,011,085	4,011,164	4,011,210	4,011,019
4,011,061	4,011,340	4,011,086	4,011,169	4,011,218	4,011,260
4,011,063	4,011,344	4,011,131	4,011,172	4,011,309	4,011,270
4,011,067	4,011,350	4,011,157	4,011,178	4,011,338	54 : 4,010,952
4,011,130	4,011,363	4,011,198	4,011,255	4,011,364	4,011,463
4,011,143	4,011,382	4,011,201	4,011,267	4,011,409	4,011,483
4,011,358	4,011,390	4,011,244	4,011,306	4,011,430	55 : 4,010,649
4,011,468	4,011,393	4,011,246	4,011,333	4,011,443	4,010,666
4,011,547	4,011,425	4,011,266	4,011,334	4,011,484	4,010,751
4,011,550	4,011,464	4,011,271	4,011,347	4,011,489	4,010,774
4,011,586	4,011,524	4,011,279	4,011,434	4,011,503	4,010,904
4,010,559	4,011,529	4,011,307	4,011,435	4,011,535	4,010,905
4,010,560	4,011,545	4,011,308	4,011,437	4,011,570	4,010,989
4,010,572	4,011,548	4,011,312	4,011,508	4,010,663	4,011,119
4,010,781	4,011,563	4,011,327	4,010,779	4,010,776	4,011,120
4,010,859	4,011,567	4,011,357	4,010,820	4,011,422	4,011,155
4,010,926	4,011,583	4,011,371	4,011,058	4,010,494	4,011,492
4,010,975	4,010,611	4,011,378	4,011,121	4,010,877	4,011,533
4,011,018	4,010,733	4,011,407	4,011,456	4,011,042	4,011,552
4,011,099	4,011,033	4,011,431	4,011,501	4,011,294	56 : 4,010,563

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1 : 243,578	243,623	20 : 243,606	34 : 243,585	243,601	40 : 243,589
5 : 243,611	243,624	22 : 243,605	243,590	243,615	42 : 243,577
243,612	243,625	25 : 243,580	243,592	243,616	243,581
6 : 243,563	243,626	243,603	243,628	243,617	243,582
243,564	243,636	243,638	243,637	243,618	46 : 243,596
243,594	243,639	243,614	36 : 243,561	243,593	48 : 243,595
243,597	243,640	243,635	39 : 243,570	243,569	243,620
243,602	243,562	243,631	243,571	243,579	243,621
243,604	243,574	243,632	243,576	243,583	243,622
243,610	243,573	243,633	243,576	243,584	53 : 243,599
243,613	243,627	243,634	243,591		

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Re. 29,107	3,963,800	3,987,892	3,994,239
D. 241,980	3,964,663	3,988,039	3,994,504
D. 242,765	3,965,193	3,988,113	3,995,296
D. 242,773	3,965,357	3,988,238	3,995,474
3,793,384	3,966,440	3,988,427	3,995,505
3,812,000	3,967,989	3,988,488	3,995,564
3,848,119	3,969,338	3,989,278	3,995,691
3,856,771	3,970,997	3,989,452	3,995,716
3,964,572	3,972,029	3,989,515	3,995,793
3,879,455	3,972,465	3,989,618	3,996,102
3,897,154	3,974,253	3,989,739	3,997,232
3,923,865	3,976,832	3,989,899	3,997,524
3,931,585	3,977,596	3,990,288	3,997,746
3,932,388	3,978,572	3,990,773	3,997,816
3,937,565	3,978,950	3,990,952	3,997,923
3,945,994	3,979,286	3,990,963	3,997,946
3,947,027	3,979,757	3,990,978	3,998,005
3,951,636	3,979,897	3,991,452	3,999,733
3,952,531	3,980,818	3,991,524	4,000,661
3,953,054	3,983,210	3,991,926	4,000,761
3,953,869	3,983,340	3,992,205	4,000,802
3,954,888	3,983,885	3,992,454	4,000,862
3,955,180	3,984,210	3,992,615	4,000,949
3,956,393	3,984,868	3,992,648	4,001,041
3,956,428	3,985,923	3,992,700	4,001,411
3,956,467	3,986,011	3,993,017	4,001,902
3,956,496	3,986,151	3,993,229	4,002,185
3,958,055	3,986,390	3,993,482	4,002,345
3,958,162	3,987,024	3,993,521	4,002,386
3,959,439	3,987,094	3,993,730	4,002,736
3,961,096	3,987,268	3,993,876	4,003,008
3,961,234	3,987,455	3,994,021	4,003,537
3,963,588	3,987,859	3,994,059	

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# PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

## CONDITION OF PATENT APPLICATIONS AS OF JANUARY 29, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director.....	6-17-76
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director.....	6-16-76
Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oro and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director.....	1-2-76
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director.....	4-22-76
Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director...	2-20-76
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director....	10-15-75
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director.....	3-1-76
Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director.....	1-2-76
Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, SANITATION AND CLEANING, WINDING AND MEASURING, GROUP 240—N. ANSHER, Director..	8-6-76
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director.....	4-2-76
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGNS, GROUP 280—C. D. QUARFORTH, Director.....	7-23-75
Industrial Arts; Household, Personal and Fine Arts.	
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director.....	3-26-76
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director.....	7-2-76
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director.	5-8-76
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director.....	2-2-76
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director.....	7-1-76
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	

Expiration of patents: The patents within the range of numbers indicated below expire during February 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,923,008 to 2,926,351, inclusive  
Plant Patents..... Numbers 1,901 to 1,918, inclusive

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# REISSUES

MARCH 15, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,151

## REPULSING CLAYS ON DRILL BITS

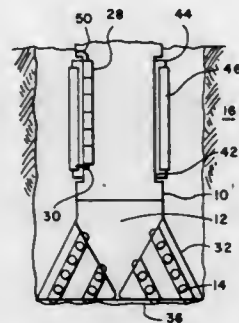
Stanley B. McCaleb, Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Original No. 3,818,996, dated June 25, 1974, Ser. No. 296,358, Oct. 10, 1972. Application for reissue Mar. 27, 1975, Ser. No. 554,883

Int. Cl.<sup>2</sup> E21B 7/00, 17/00

U.S. Cl. 175-57

8 Claims



3. A process for drilling wellbores through a sticking shale earth formation comprising: applying a rotating drill bit to the formation; and impressing a negative charge to the drill bit while drilling through the shale formation by locating directly adjacent the drill bit a metal having a higher electromotive force than that of the drill bit.

4. Apparatus for drilling through earth formations having a high concentration of fine materials including clays comprising: a drill bit having teeth; drill pipe attached to the drill bit and extending to the surface; and means for impressing a negative charge on the drill bit, said impressing means being a metal which is located between the teeth on the drill bit [ ], said metal including magnesium.

Re. 29,152

## PROCESS FOR THE ENZYMATIC ISOMERIZATION OF DEXTROSE TO LEVULOSE

Frederick C. Armbruster, La Grange; Robert E. Heady, Park Forest, both of Ill.; Robert P. Cory, deceased, late of La Grange, Ill., by Cynthia S. Cory, a/k/a Cynthia S. Timmerman, executrix, Danville, Ind., assignors to CPC International Inc., Englewood Cliffs, N.J.

Original No. 3,813,318, dated May 28, 1974, Ser. No. 181,639, Sept. 17, 1971. Application for reissue Apr. 16, 1976, Ser. No. 677,728

Int. Cl.<sup>2</sup> C12D 13/02

U.S. Cl. 195-31 F

12 Claims

1. A process for the production of levulose comprising:
  - (a) subjecting a microorganism of the Streptomyces genus to a mutagenic agent;
  - (b) isolating the mutant strain of the microorganism that has the capacity to form an appreciable quantity of xylose isomerase when cultivated in a nutrient medium that is free of xylose and xylose-supplying materials;
  - (c) cultivating the isolated mutant strain in a nutrient medium to produce xylose isomerase; and
  - (d) isomerizing dextrose to levulose with [said] a xylose isomerase [ ] enzyme preparation derived from a mutant strain of a Streptomyces microorganism, said mutant strain being characterized in that when cultivated in a nutrient culture medium that is free of xylose and xylose-supplying materials, it produces at least 50% more xylose isomerase activity than Streptomyces olivochromogenes ATCC No. 21,114 under identical conditions of cultivation.

10. A process for the production of levulose comprising: isomerizing dextrose to levulose with a xylose isomerase enzyme

preparation derived from a mutant strain of a Streptomyces microorganism, said mutant strain being a member selected from the group consisting of Streptomyces olivochromogenes ATCC No. 21,713, Streptomyces olivochromogenes ATCC No. 21,714 and Streptomyces olivochromogenes ATCC No. 21,715, variants and sub-mutants thereof.

Re. 29,153

## CERTAIN N-PHENACYL PYRIDINIUM HALIDES

Wendell Gary Phillips, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Original No. 3,776,916, dated Dec. 4, 1973, Ser. No. 260,672, June 7, 1972. Division of Ser. No. 878,918, Nov. 21, 1969, Pat. No. 3,702,361. Application for reissue Feb. 19, 1974, Ser. No. 443,554

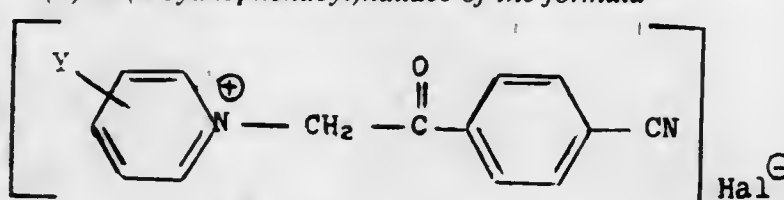
Int. Cl.<sup>2</sup> C07D 213/84

U.S. Cl. 260-294.9

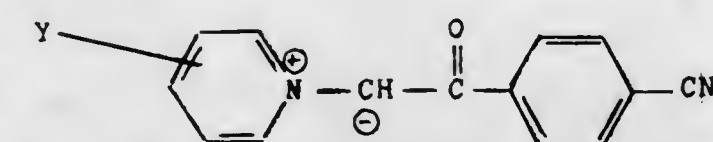
4 Claims

13. An N-substituted heterocyclic compound selected from the group consisting of

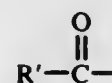
(1) N-(4-cyanophenacyl)halides of the formula



and (2) ylids of the formula



wherein "Hal" is a halogen of the atomic weight in the range of 35 to 127, and Y is selected from the group consisting of nitro, cyano and halogen of atomic weight in the range of 35 to 127, and acyl of the formula



wherein R' is lower alkyl.

Re. 29,154

## TRANSCEIVER CHANNEL SELECTOR

Louis E. Schonegg, Indianapolis, Ind., assignor to Regency Electronics, Inc., Indianapolis, Ind.

Original No. 3,854,093, dated Dec. 10, 1974, Ser. No. 353,140, Apr. 20, 1973. Application for reissue July 29, 1975, Ser. No. 600,084

Int. Cl.<sup>2</sup> H04B 1/40

U.S. Cl. 325-18

14 Claims

1. Channel selector means for a transceiver having a transmitter including a modulator and a receiver including a frequency mixer comprising:

- a. a first oscillator having an output connected to the mixer,
- b. first frequency determining means for causing said oscillator to oscillate at one of a first plurality of selected frequencies,
- c. said first frequency determining means including a first plurality of frequency resonant elements, there being a one-to-one correspondence between said frequency resonant elements and said frequencies,
- d. a second oscillator having an output connected to the modulator,

MARCH 15, 1977

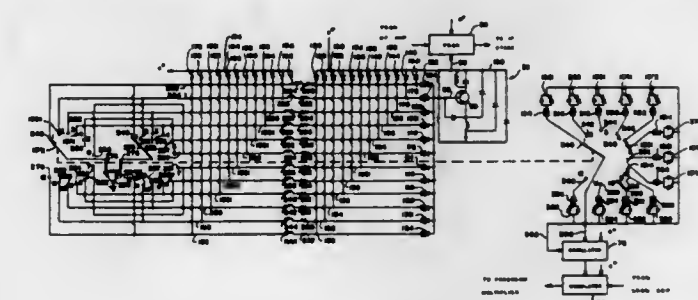
U.S. PATENT AND TRADEMARK OFFICE

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- e. second frequency determining means for causing said oscillator to oscillate at one of a second plurality of selected frequencies,
- f. said second frequency determining means including a second plurality of frequency resonant elements, there being a one-to-one correspondence between said last mentioned frequency resonant elements and said last mentioned frequencies,
- g. selectively operable first selection means for selecting a particular resonant element from said first plurality of frequency resonant elements and when operable [to associate] for associating said particular resonant element selected thereby with said first oscillator to determine said one of a first plurality of selected frequencies,
- h. selectively operable second selection means for selecting a particular resonant element from said first plurality of frequency resonant elements and, when operable, [to associate] for associating said particular resonant element selected thereby with said first oscillator to determine said one of a first plurality of selected frequencies,
- i. third selection means for selecting a particular resonant element from said second plurality of frequency resonant elements and associating said particular resonant element selected thereby with said second oscillator to determine said one of a second plurality of selected frequencies,
- j. a switch means for rendering said first selection means

operable and said second selection means inoperable when in a first state and said second selection means operable and said first selection means inoperable when in a second state,

k. means connected to said second selection means for actuating said second selection means to select a particu-



lar resonant element from said first plurality of resonant elements, and

l. means connected to said first and third selection means for actuating said first and third selection means in unison to select a particular resonant element from said first and second plurality of frequency resonant elements, respectively.



# PATENTS

GRANTED MARCH 15, 1977

## ERRATA

For CLASS	See PATENT NO.
403-171	4,011,638
035-007	4,011,671
047-055	4,011,677
403-231	4,011,706
081-186	4,011,778
089-047	4,011,794
404-015	4,012,156
429-048	4,012,234
427-212	4,012,507
358-084	4,012,583
358-302	4,012,584
358-285	4,012,585
358-285	4,012,586
358-213	4,012,587
358-150	4,012,592
178-069.1	4,012,598
325-028	4,012,662
361-213	4,012,666
361-016	4,012,667
361-044	4,012,668
361-097	4,012,669
361-117	4,012,670
361-249	4,012,671
361-422	4,012,672
361-196	4,012,673

# PATENTS

GRANTED MARCH 15, 1977

NOTE: A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

## GENERAL AND MECHANICAL

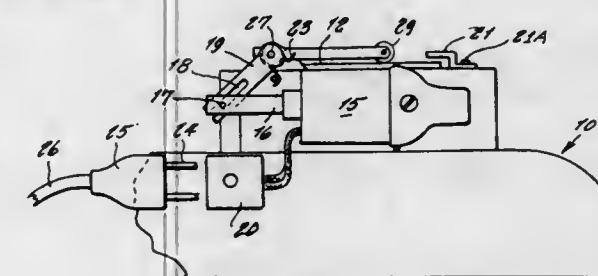
### 4,011,594 WELDING MASK WINDOW DOOR AUTOMATIC OPERATION

Antoine L. Guilbaud, c/o George Spector, 3615 Woolworth Building, 233 Broadway, and George Spector, 3615 Woolworth Building, 233 Broadway, both of New York, N.Y. 10007

Filed Sept. 29, 1975, Ser. No. 617,326  
Int. Cl.<sup>2</sup> A61F 9/06

U.S. Cl. 2-8

3 Claims



1. A welding mask having a door pivotally mounted on a door frame surrounding an opening said door being pivotally movable between an opened and a closed position, said door having a transparent, tinted window whereby a user can look through said door at strong light when said door is in closed position, in combination with electrically operated means mounted on said frame for pivoting said door from the open to the closed position, said means comprising solenoid relay means supported on said frame, a lever, said solenoid relay having a plunger pivotally engaging one end of said lever mounted rotatably on said frame side including an opposite end of said lever carrying a roller that bears against the front of said door to urge said door pivotally closed, when said relays are electrically actuated, including a spring biasing said door the open position.

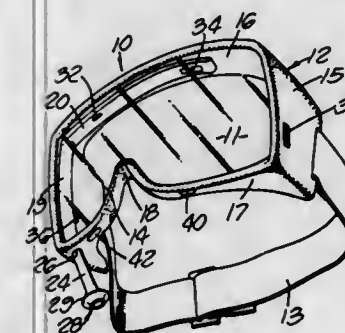
### 4,011,595 DEFOGGABLE GOGGLES

Michael Peter Shields, 6647 Glade St., Canoga Park, Calif. 91303

Filed Aug. 28, 1973, Ser. No. 392,253  
Int. Cl.<sup>2</sup> A61F 9/02

U.S. Cl. 2-436

8 Claims



1. Improved goggles of the type having a lens mounted in a one piece frame structure which includes rearwardly extending side, top and bottom peripheral wall members the rear edges of which are shaped to conform closely to the face of the wearer extending about the eyes and over the nose thereby defining an enclosed inner airspace between the lens and the face of the wearer, the improvement comprising:

two or more air inlet apertures formed in a first one or more of said wall members, manifold means affixed to one of said wall members other than said first wall members, said manifold means having an internal passage, means connecting said passage with said enclosed airspace, a hous-

ing having a chamber, said housing being coupled to and forming a part of said manifold, said chamber communicating with said passage; and conduit means coupled to said manifold means, said conduit means extending externally of said frame structure a distance sufficient to reach the mouth of the wearer thereof when said frame structure is positioned about the eyes and over the nose of the wearer, said chamber adapted to slideably receive said conduit means therein.

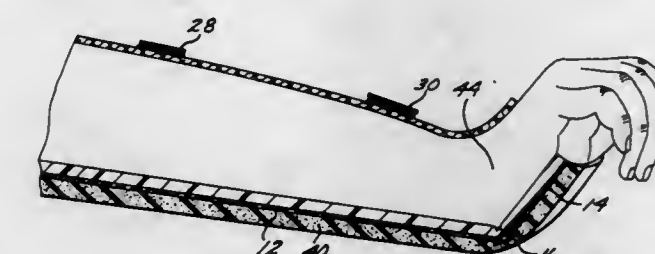
### 4,011,596 FOREARM AND WRIST PROTECTOR

Enrique G. Chang, 16992 Courtney Lane, Huntington Beach, Calif. 92649

Filed Dec. 3, 1975, Ser. No. 637,133  
Int. Cl.<sup>2</sup> A41D 13/08

U.S. Cl. 2-16

8 Claims



1. A protective device comprising: a rigid, load-bearing splint to extend along the underside of the forearm of the wearer thereof from the upper portion of the forearm to the metacarpal-phthlangic joint, overlying the palm of the hand, to provide protective, load-bearing support for the distal, ulna, radius and carpus of said wearer; cushion means carried on the outside surface of said splint means for absorption of impacts thereto; and limb encircling means including fastening means for repeated attachment and detachment for removably securing said splint to a wearer's forearm and hand.

### 4,011,597 BATHER'S CAP AND METHOD OF MAKING THE SAME

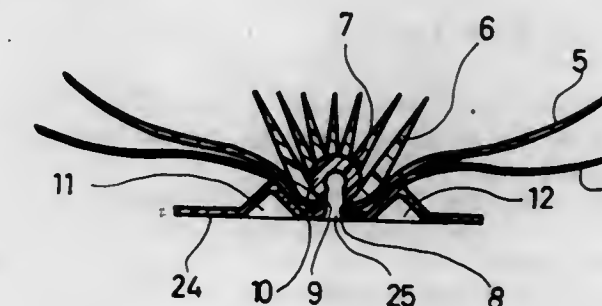
Friedrich Kraus, Lieschingstrasse 1, 7000 Stuttgart, Germany  
Filed Aug. 30, 1974, Ser. No. 502,009

Claims priority, application Germany, Aug. 31, 1973, 2343881; June 27, 1974, 2430837

Int. Cl.<sup>2</sup> A42B 1/12

U.S. Cl. 2-68

14 Claims



1. A bather's cap comprising, in combination, a cap body provided on its outer side with at least one elastic hollow mounting plug integral with said cap body and having an enlarged end constituting a head integrally joined to the adjoining portion of said cap body by a neck of a cross-section



smaller than that of said enlarged end, and at least one ornamental component having an opening of a predetermined cross-section smaller than the maximum cross-section of said enlarged end with said neck of said plug extending through said opening whereby said ornamental component is mounted on said cap between said enlarged end of said mounting plug and said adjoining portion of said cap body.

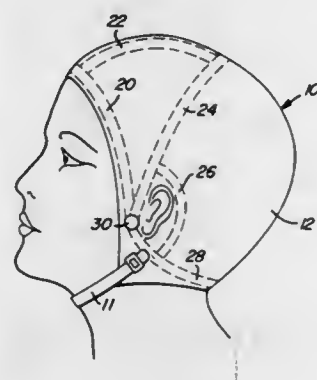
#### 4,011,598 BATHING CAP

Kittie Anne Sherr, 197 Inwood Ave., Upper Montclair, N.J. 07043, and Mirian Garabrant, 217 Montclair Ave., Montclair, N.J. 07042

Filed Aug. 15, 1975, Ser. No. 605,075  
Int. Cl.<sup>2</sup> A42B 1/12

U.S. Cl. 2—68

8 Claims



1. A bathing cap adapted for emplacement over the head of a wearer to secure the head during periods of bathing from penetration by a surrounding liquid medium, having in combination an outer water impervious covering and an inner framework, said framework comprising:

- a first resilient strip of material having a parabolic configuration and being adapted to extend around the forehead of the wearer from a first location on one side of the face near the ear to a second substantially symmetrical location on the opposite side of the face;
- a second strip of material adapted to surround the nape of the wearer's neck;
- means for pivotally connecting said first strip to said second strip at said first and second locations respectively; and
- means for maintaining a predetermined separation between said first and second strips, including brace means connected to said second strip of material on each side of the head about each ear and operatively connected to said first strip.

#### 4,011,599

#### ARTICLE OF APPAREL COLLAR AND LAPEL CONSTRUCTION

Roy L. Chaney, and Sandor G. Rada, both of Cape Girardeau, Mo., assignors to Ralph Edwards Sportswear, Inc., Cape Girardeau, Mo.

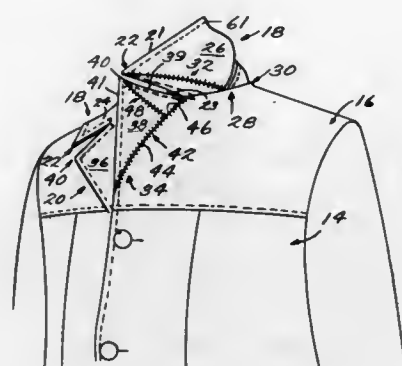
Filed Aug. 21, 1975, Ser. No. 606,586  
Int. Cl.<sup>2</sup> A41B 1/00, 3/00

U.S. Cl. 2—116

23 Claims

- 1. An article of apparel including
  - a. a body portion,
  - b. a collar formed separately from said body portion, said collar comprising two layers of material, a bottom layer and a top layer, said bottom layer comprising an underside, and said collar further comprising a pair of tips each formed by converging edges of said underside, and a base, and a seam extending from each tip toward said base on

the underside of said collar between said tip forming edges and joining said edges, and



c. means for attaching said collar to said body portion at the base of said collar.

#### 4,011,600

#### ADJUSTING DEVICE FOR HAT WITH SWEAT BAND

Marvin I. Malk, Denver, Colo., assignor to Imperial Caps, Inc., Denver, Colo.

Filed Sept. 27, 1973, Ser. No. 401,286  
Int. Cl.<sup>2</sup> A42B 1/22

U.S. Cl. 2—183

1 Claim



1. In a hat having a crown and a continuous intumed sweat band of flexible material secured along its lower edge to the lower internal periphery of the crown and lying along the inner surface of the crown; the improvement comprising draw band means permanently secured at one end to said sweat band at the inner side of said sweat band adjacent said crown and extending circumferentially along a portion of the interior circumference of the sweat band, a passage defining strip overlying said draw band means and secured to said sweat band above and below said draw band means to define a passage loosely enclosing said draw band means, said passage defining strip being of a circumferential extent less than that of the draw band, and cooperating flexible universally adjustable fastening means on said sweat band and said draw band for detachably securing the opposite end of said draw band to said sweat band, said fastening means being operable for adjusting the circumferential position of said draw band relative to said sweat band at any position falling within a given range of adjustment thereby to selectively adjust the fit of said hat to the head and comfort of a wearer.

#### 4,011,601

#### PROSTHETIC HEART VALVE

Michael Francis Clune, Oneonta, and John Richard Shanbrook, Schenectady, both of N.Y., assignors to Research Corporation, New York, N.Y.

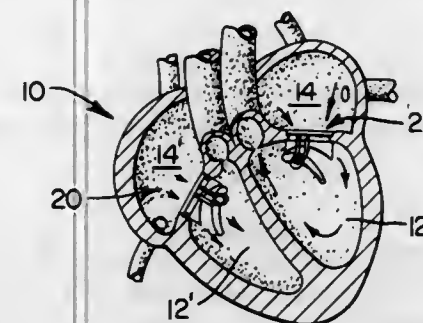
Filed Oct. 14, 1975, Ser. No. 622,061  
Int. Cl.<sup>2</sup> A61F 1/22

U.S. Cl. 3—1.5

7 Claims

1. A prosthetic heart valve comprising a base member and an occluder disc having upstream and downstream curvilinear faces, the downstream face being concave, and the upstream face being convex, said concave and convex faces defining a high camber airfoil-like structure having leading and trailing edge portions, means supporting the occluder disc for (a) movement longitudinally downstream relative to the base member to move the upstream face out of seating engagement with said base member, and (b) rotational movement about an axis between the leading and trailing edges of the disc and means on said base member providing a seat for the marginal

portion of the upstream curvilinear face of the disc said seat providing means having a curved profile that matches the



curved profile of the upstream curvilinear face of the occluder disc.

#### 4,011,602

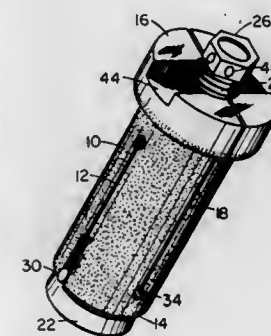
#### POROUS EXPANDABLE DEVICE FOR ATTACHMENT TO BONE TISSUE

Edmund F. Rybicki, Worthington, Ohio; Kenneth Ray Wheeler, Richland, Wash.; Lewis E. Hulbert, Columbus, Ohio; Manuel Tom Karagianes, Richland, Wash., and Craig R. Hassler, Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Oct. 6, 1975, Ser. No. 620,042  
Int. Cl.<sup>2</sup> A61F 1/24; A61C 13/00

U.S. Cl. 3—1.9

2 Claims



1. A device for attaching to substantially solid living tissue, comprising

- a body member having an outer surface shaped to fit approximately into an empty space in the tissue and having pores into which the tissue can grow to strengthen the bond between the device and the tissue,
- the body member comprising a cylindrical portion having at least one radial slit extending longitudinally from a first end to the vicinity of the opposite end thereof, at least one radial slit extending longitudinally from the second end to the vicinity of the first end thereof, and a tapered cylindrical hole extending coaxially from a wider circular opening in the first end to a narrower circular opening communicating with the second end,
- adjustable means for expanding the body member against the tissue to an extent such as to provide a compressive stress capable of maintaining a snug and stable fit and of enhancing the growth of the tissue into the pores in the body member,
- the adjustable means comprising a cylindrical member having a tapered portion fitting snugly into the tapered hole in the body member at the first end and a narrower portion extending through the second end, and means for controlling its position in the body member,
- the portion of the cylindrical member extending through the second end of the body member being threaded and the position controlling means comprising a threaded member positioned thereon so as to exert force against the second end, and
- means for holding the threaded member in a fixed position on the cylindrical member and means for preventing

relative rotation between the cylindrical member and the body member.

#### 4,011,603

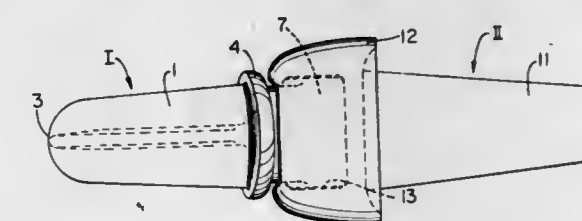
#### FINGER JOINT IMPLANT

Arthur D. Steffee, Gates Mills, Ohio, assignor to Laure Prosthetics, Inc., Portage, Mich.

Filed Aug. 29, 1975, Ser. No. 608,849  
Int. Cl.<sup>2</sup> A61F 1/24

U.S. Cl. 3—1.91

7 Claims



1. An implantable type endoprosthesis for a ginglymus joint, and in particular a finger joint, made of materials which are substantially inert to the body, comprising:

- a protuberant headed member comprising a stem portion for affixing said member in a bone, a neck portion on one end of said stem portion, and a protuberant head portion on said neck portion, said protuberant head portion being of cylindrical shape and having an axial length which is greater than its diameter;
- a socketed member comprising a stem portion for affixing said member in a bone, and a polymeric socket portion at one end of said stem portion having wall portions defining an at least partially semicylindrical socket cavity of radial and axial dimensions for snugly embracing said cylindrical head portion, said socket cavity being accessible through a generally rectangular aperture which is elongated in a direction parallel to the axial directions of said cylindrical head portion and said socket cavity;
- said socket portion having resilient lip means extending completely around the periphery of the aperture for reducing the size thereof so that it is smaller than the axial cross-section of said cylindrical head portion, whereby said resilient lip means resiliently retains said head portion within said socket cavity, said resilient lip means including a first pair of resilient lips extending along the opposite side edges of said aperture with the transverse spacing between the lips of said first pair being slightly less than the diameter of said cylindrical head portion, said lip means also including a second pair of resilient lips extending along the opposite end edges of said aperture for reducing the length of the aperture so that it is slightly less than the axial length of the cylindrical head portion, the lips of said second pair engaging the circumferentially extending edges of said cylindrical head portion at the opposite axial ends thereof, whereby said socket cavity has a depth as measured inwardly from the lips of said second pair which is substantially the same as the diameter of the cylindrical head portion so that the cylindrical head portion when removably retained within the socket cavity does not protrude radially outwardly beyond said lip means;
- whereby the relationship of said cylindrical head portion with said socket portion permits relative pivotal movement between said headed and socketed members only within a single plane so that said endoprosthesis approximates the motion of a natural ginglymus joint.



4,011,604

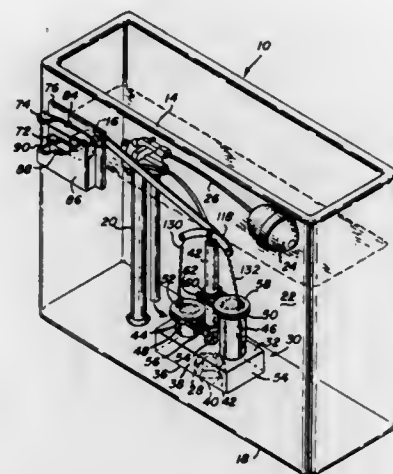
# APPARATUS EMPLOYING A THREE PORT CHAMBER AND TWO SELECTIVELY OPERABLE VALVES FOR CONTROLLING THE QUANTITY OF WATER FLUSHED BY A TOILET

Forrest C. Goldsworthy, 2595 Aragon Court, San Jose, Calif.  
95125

Filed Apr. 26, 1976, Ser. No. 680,047  
Int. Cl.<sup>2</sup> E03D 1/34, 5/02; A61B 19/00

U.S. Cl. 4-34

11 Claims



1. In a toilet including a tank having a water outlet, an improved apparatus for controlling the quantity of water flowing through the outlet comprising:

- a rotatable shaft having opposed first and second ends;
- a crank connected to said first end and being capable of rotating said shaft through first and second angles when a force is applied to it;
- means mounting said crank to the tank;
- an arm connected to said second end;
- means forming a chamber disposed in the tank and including first and second upwardly extending tubes forming first and second ports, respectively, and a third port arranged to discharge water through the water outlet, said first tube having an axial dimension that is greater than said second tube;

first valve means normally seated on said first port, said first valve means being movable from a normally closed position to an open position;

second valve means normally seated on said second port, said second valve means being movable from a normally closed position to an open position;

a pivot rod having first and second outer portions and an intermediate portion that is pivotally connected to said arm;

a first chain connected between said first outer portion and said first valve means and having a first length generally equal to the distance between such elements when said first valve means is in the closed position; and

a second chain connected between said second outer portion and said second valve means and having a second length generally equal to the distance between such elements when said first valve means is in the open position, whereby when said crank is rotated toward said first angle, said arm is raised causing said rod to pivot toward said first valve means, and said first chain to become taut and unseat said first valve means such that when said crank reaches said first angle said first valve means is moved into said open position causing water to flow through said first port and out of said third port, said first valve means being closed by the suction action of the outflowing water when it reaches a level slightly above that corresponding to said first port, and whereby when said crank is rotated through an angle greater than said first angle, said second chain becomes taut, said rod pivots toward said second valve means and thereafter unseats said second valve means such that when said

crank reaches said second angle said second valve means is moved into said open position causing water to flow through said first and second ports and out of said third port, said first port being closed when the water level falls to about that corresponding to said first port and said second port being closed when the water reaches a level slightly above that corresponding to said second port.

4,011,605

## FLUSHING AND REFILLING APPARATUS

Frans Harry Karlsson, Lund, and Per Torsten Faxen, Bromma, both of Sweden, assignors to Hykon-Patent Aktiebolag, Lund, Sweden

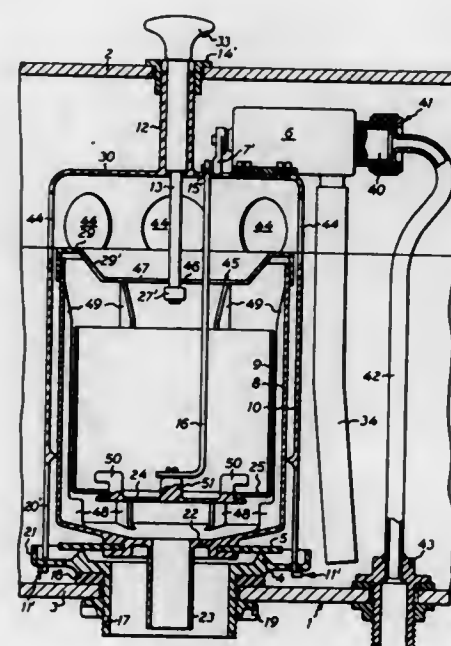
Filed Dec. 12, 1974, Ser. No. 532,115

Claims priority, application Sweden, Dec. 12, 1973, 7316760

Int. Cl.<sup>2</sup> E03D 1/36

U.S. Cl. 4-41

7 Claims



1. A flushing cistern having a flushing and refilling apparatus therein, a bottom discharge opening and a flushing valve seat connected to the bottom discharge opening, said apparatus comprising a refilling valve for regulating the flow of liquid into the cistern, a flushing valve for cooperating with said valve seat, an overflow member providing an overflow passage connecting said discharge opening to an upper level of the cistern, said overflow member being in the form of a cylindrical overflow tube which supports said flushing valve at its lower end and has a restricted tubular portion extending through and sealed in relation to said flushing valve, said tube being mounted coaxially in and guided by said cylindrical housing for vertical movement therein, a manually operable actuating mechanism for unseating said flushing valve and opening said refilling valve to start a flushing and refilling cycle, a refilling valve closing means mounted in said overflow passage to be weighted by liquid flowing into the overflow member and connected to said refilling valve and to said actuating mechanism to be moved by said actuating mechanism to an upper position upon starting of said cycle and to close said refilling valve when weighted by liquid flowing into the overflow member, said refilling valve closing means including a cylindrical open vessel mounted coaxially in said overflow tube for receiving and collecting liquid when liquid is flowing thereinto, said vessel having a bottom opening and a movable bottom wall member for closing said opening, said bottom wall member being movable relative to said vessel to form a bottom drain valve and being mounted to be opened when lifting force is imparted to said vessel to insure that the vessel may be emptied under movement to its upper position, a support in the form of a cylindrical housing having a vertical axis and at least one opening forming a communication between said cistern and the interior of said housing, said sup-

port and said refilling valve, flushing valve, overflow member and refilling valve closing means being assembled to form a unit of assembled parts having said support as a common support, said support and said cistern having mating coupling means forming an easily releasable coupling accessible from within the cistern for mounting and dismounting said unit, and said refilling valve being mounted on said support for supporting said refilling valve closing means.

4,011,606

## BEDPAN LINER, KIT AND METHOD

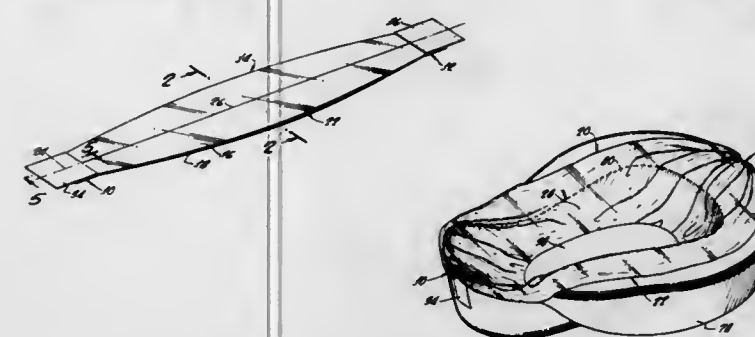
Catherine A. Scrafield, 465 Dartmoor St., Laguna Beach, Calif. 92651, and Margaret F. Leggat, 370 N. San Rafael, Pasadena, Calif. 91105

Filed Aug. 21, 1975, Ser. No. 606,440

Int. Cl.<sup>2</sup> A61G 9/00

U.S. Cl. 4-112

10 Claims



1. A disposable bedpan liner for use with a conventional bedpan having a basin to receive wastes, comprising: a sheet of flexible material for lining a bedpan basin, said sheet being gathered at opposite ends to form an elongated hammock-like expandable and contractible pouch; means securing said ends in the gathered condition; and, adhesive means for temporarily securing said sheet in an expanded condition to a bedpan.

4,011,607

## SWIMMING POOL COVER

Benjamin Davidoff, c/o Alcazar Pool Manufacturing Co., Inc., Irvington-on-Hudson, N.Y. 10533

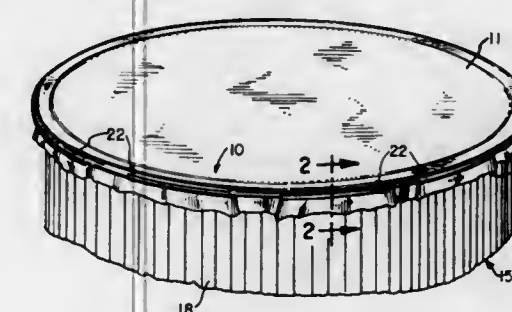
Continuation of Ser. No. 477,441, June 7, 1974, abandoned.

This application Dec. 17, 1975, Ser. No. 641,760

Int. Cl.<sup>2</sup> E04H 3/19

U.S. Cl. 4-172.12

3 Claims



1. A combination of a snap-on cover assembly and a swimming pool having a perimeter defined by a circumscribing coping, said coping includes a horizontal web portion and a depending vertical wall portion said wall portion terminating in a male locking lip of predetermined cross section,

a. said cover assembly comprising a sheet of flexible material of a size sufficient to completely cover said pool and said coping;

b. an elongated female resilient locking channel having an internal cross section generally congruent with said predetermined cross section of said male locking lip;

c. said locking channel including a flange portion and a tail portion interconnected by an arcuate portion and further including a knee portion interconnecting said arcuate and tail portions;

d. said male locking lip including a curl portion;

e. peripheral portions of said cover sheet being adapted to be juxtaposed to said locking lip and tightly clamped thereto by the snap-on placement of said locking channel thereover whereby said arcuate portion engages said male locking lip around said curl portion with said knee portion engaged adjacent and near the end of said curl portion and the flange portion matingly engaging a portion of said web wherein said cover will be securely locked in place by the mating of said channel with said lip with the peripheral cover portions interposed; and

f. whereby increased inwardly directed tensioning of said cover caused by the loading of the same will increase the degree of clamping of said cover to said coping.

4,011,608

## ELECTRIC TOILET DEODORIZER

Raymond H. Pearson, 627 Sherwood Drive, Richardson, Tex. 75080

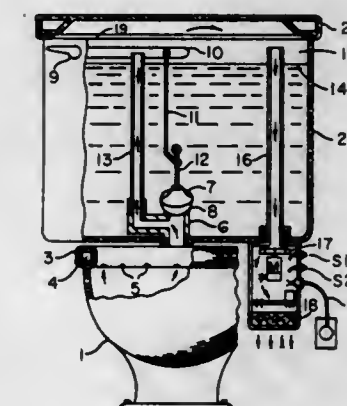
Continuation-in-part of Ser. No. 434,519, Jan. 18, 1974, Pat. No. 3,927,429. This application Dec. 22, 1975, Ser. No.

643,596

Int. Cl.<sup>2</sup> E03D 9/04; A47K 13/00

U.S. Cl. 4-213

6 Claims



1. A water closet deodorizing accessory, said water closet including a toilet bowl and water tank, said water tank including a flushing means and overflow duct, said accessory comprising air duct means communicative with said overflow duct, an air blower means having an intake side and a discharge side, said intake side communicative with said air duct means, and control means operable to initiate air flow through said air duct means, whereby odorous air may be drawn from said toilet bowl, through said overflow duct, said control means also operable to terminate said air flow, said control means including sensing means responsive to the change in operating characteristics of said air blower means when said overflow duct is flooded with water so as to impede said air flow when said toilet bowl is flushed, said sensing means having at least one parameter responsive to said change in operating characteristics, whereby said air flow may be terminated in response to said change in operating characteristics when said toilet bowl is flushed.

4,011,609

## HOSPITAL TROLLEYS

Farkas Bethlen, Richmond, England, assignor to G. D. Searle & Co., High Wycombe, England

Filed Oct. 6, 1975, Ser. No. 619,831

Claims priority, application United Kingdom, Oct. 8, 1974, 43567/74

Int. Cl.<sup>2</sup> A47B 83/04; A61G 1/02

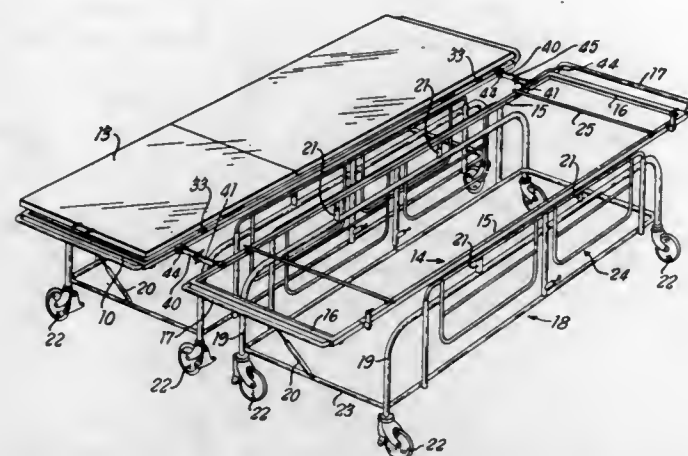
U.S. Cl. 5-81 B

9 Claims

1. A hospital trolley comprising: a patient support member; a framework member adapted to carry said support member, a guide rod attached to one of said members;



a hollow locating tube attached to the other of said members and adapted to cooperatively engage with said guide rod; and



a liner of low friction material adapted to be interposed between the outer surface of said guide rod and the inner surface of said locating tube when said guide rod is inserted into said locating tube.

4,011,610

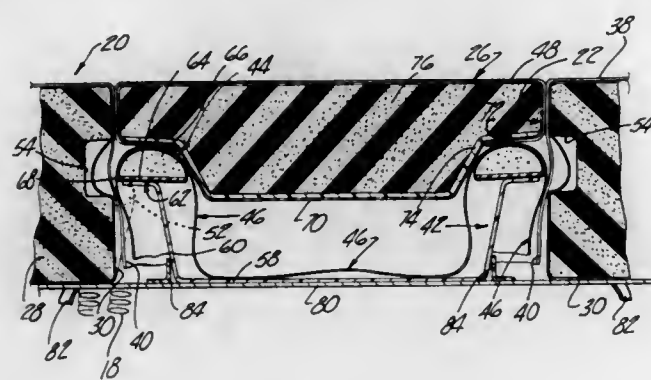
## BEDPAN SYSTEM

John Castlereagh Parker, III, 2127 Philomene, Lincoln Park, Mich. 48146

Filed Nov. 10, 1975, Ser. No. 630,163  
Int. Cl.<sup>2</sup> A61G 7/02

U.S. Cl. 5-90

14 Claims



1. In a bedpan system for use with hospital beds or the like, a foam mattress having a wall portion defining an aperture therein open at the upper surface of the mattress and projecting thereinto, a bedpan assembly comprising a pan portion and a seat portion and insertable into the aperture in said mattress with the seat portion disposed below the level of the upper surface of said mattress, a disposable flexible bag having a closed lower portion insertable through said seat portion into said pan portion and a mouth portion flexible over said seat portion, means for aiding in the support of said bedpan assembly in said aperture, said seat portion having a wall portion defining a central opening which opens into said pan portion, and a selectively removable mattress plug substantially conforming in peripheral shape to the shape of the aperture in said mattress and substantially conforming in height to the distance between said bedpan assembly and the upper surface of the mattress, and insertable in said aperture in a position to rest on said seat portion and present an upper surface substantially coplanar with the upper surface of said mattress, said mattress plug comprising a rigid base member having a depending central portion, an outer peripheral flange and a depending wall portion between said central portion and said flange, said plug peripheral flange overlying the upper surface of said seat portion and transferring the weight of said plug and of any weight on said plug to said upper surface of said seat, said plug wall portion depending within the opening in said seat portion and being closely adjacent to said wall

portion of said seat portion to control the lateral position of said plug relative to the surface of said mattress.

4,011,611

## OUTDOOR BEAN BAG

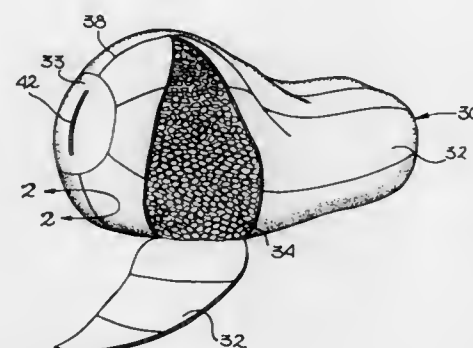
Steven N. Lederman, Beverly Hills, Calif., assignor to Lederman's Incorporated, Los Angeles, Calif.

Filed Sept. 26, 1975, Ser. No. 617,034

Int. Cl.<sup>2</sup> A47C 27/00

U.S. Cl. 5-361 B

6 Claims



1. An outdoor bean bag comprising:  
a multiplicity of resilient flowable pellets having a specific gravity of less than unity; and  
a flexible, water resistant cover forming a generally closed container filled by said multiplicity of pellets to less than 50 percent of the total interior volume of said container, said cover enclosing said multiplicity of resilient flowable pellets;  
wherein said pellets distribute themselves in said water resistant cover so as to conform with and comfortably support the contours of the user's body.

4,011,612

## COMBINATION LAWN AND GARDEN IMPLEMENT

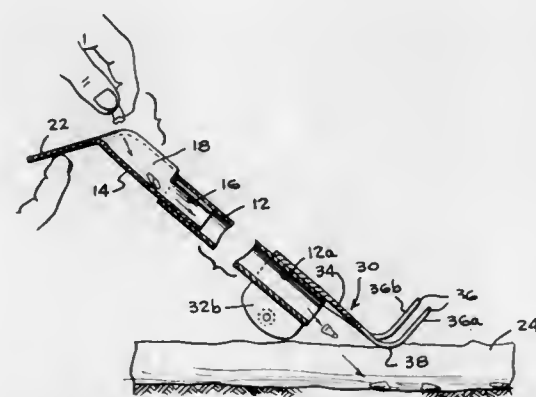
Wallace E. Atkinson, Petersburg, Va., assignor to Long Manufacturing Co., Inc., Petersburg, Va.

Filed Dec. 29, 1975, Ser. No. 645,032

Int. Cl.<sup>2</sup> B25F 1/00; H01B 49/04

U.S. Cl. 7-14.55

10 Claims



1. A lawn and garden implement comprising an elongated hollow tubular handle having first and second opposite open ends, a furrowing tool fixed onto said first open end shaped to define a concavely curved trough portion extending outwardly from said first end and terminating in a generally planiform toe flange inclined to the longitudinal axis of the handle and shaped to a predetermined furrow contour to form a furrow in the soil when the implement is drawn over the soil with said first end down and the handle disposed in a first inclined position locating the toe flange in downwardly extending generally vertical relation from the handle axis, the concavely curved trough having an open throat portion communicating with the bore of the hollow handle at said first end whereby

the trough portion may be disposed in upwardly facing inclined relation to receive seeds and guide them into the hollow tubular handle for gravitational movement therethrough and discharge into a furrow in the soil from said second end when the implement is in predetermined second inclined position with said second end down, and the length of said handle being such as to enable the user to manipulate the furrowing toe flange in the soil from a standing position.

4,011,613

## DURABLE-PRESS PROPERTIES IN COTTON CONTAINING FABRICS VIA POLYMERIC N-METHYLOL REAGENTS

Noelie R. Bertoniere; Stanley P. Rowland, and Earl J. Roberts, all of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 18, 1975, Ser. No. 633,067

Int. Cl.<sup>2</sup> D06M 13/48, 15/54

U.S. Cl. 8-191

2 Claims

1. A process for imparting durable-press properties to cotton containing fabrics comprising:  
a. impregnating a cotton containing fabric with an aqueous solution containing methyolated urea modified polyethylenimine, and an acid catalyst;  
b. drying the impregnated fabric from (a); and  
c. curing the dried fabric from (b).

4,011,614

## ADJUSTABLE FLOATATION BELT

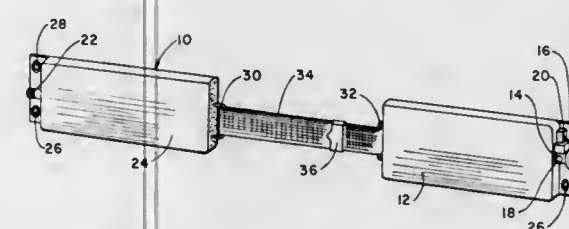
Robert Bell, Campbell, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 21, 1975, Ser. No. 624,378

Int. Cl.<sup>2</sup> B63C 9/18

U.S. Cl. 9-337

10 Claims



1. A water safety belt adapted to be worn around the waist of a person comprising first pneumatogenic means and second pneumatogenic means extending in a horizontal direction for a distance sufficient to substantially fit around the waist of a person, said first and second pneumatogenic means extending vertically for a distance substantially in the abdominal area, said first and second pneumatogenic means releasably joinable to one another by first tube means secured to and leading into said first pneumatogenic means and second tube means secured to and leading into said second pneumatogenic means, releasable coupling means for releasably joining said first and second tube means in a manner to form a conduit for the flow of a gas between said first and second pneumatogenic means, said releasable coupling means comprising collar means extending from the end of said first tube means and collar receiving means extending from the end of said second tube means, said collar means and said collar receiving means being adapted to couple to one another in order to hold said water safety belt around the waist of a person and to form a pneumatogenic seal, inflation means operably connected to said first pneumatogenic means through valve means for releasing gas into said tube means and said first and second pneumatogenic means, means for connecting the ends of said first and second pneumatogenic means opposite said first and second tube means.

4,011,615

## PERSONNEL TRANSFER GANGWAY

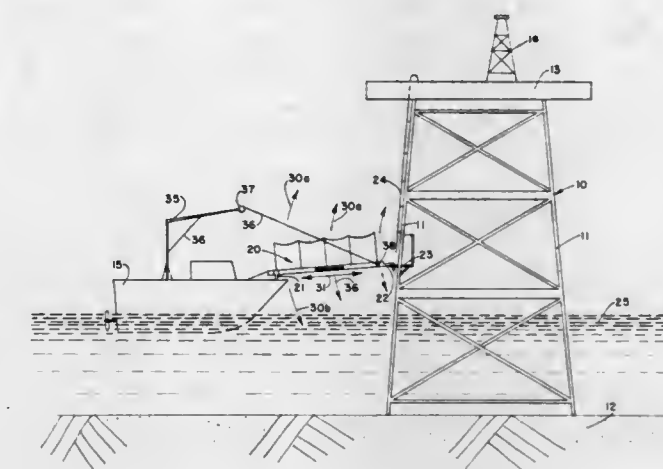
Orwin G. Maxson, and Marvin L. Peterson, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Nov. 12, 1975, Ser. No. 631,016

Int. Cl.<sup>2</sup> E01D 1/00

U.S. Cl. 14-71.1

4 Claims



1. A personnel transfer gangway between a ship and a fixed structure, said gangway having first and second ends comprising:  
a. first and second mating extensible member means comprising a first and second set of parallel-spaced bars, each set having a first end and a second end; means for rigidly securing said first end of each of said sets in a plane; means for slidably interlocking said second ends together; and spring biasing means mounted between said second ends of one set and the first ends of said remaining set;  
b. biasing means attached between said first and second extensible member means for forcing said extensible members to a predetermined length wherein force along the longitudinal axis of said mating extensible members will yieldably oppose elongating or shortening of said first and second mating extensible members about said predetermined length;  
c. means mounted to said first mating member at said first end of said gangway for securing said first mating member to said ship; and  
d. means mounted on said second mating member and said second end of said gangway for securing said second mating member to said fixed structure.

4,011,616

## TEETH CLEANING DEVICE

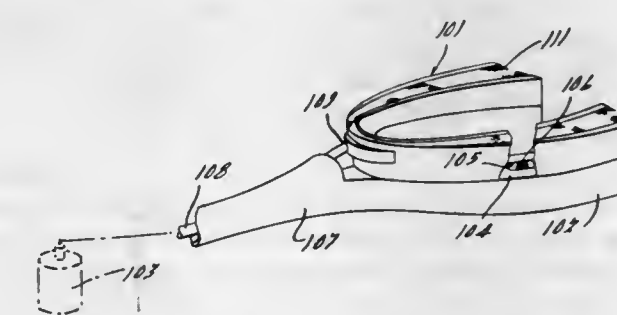
Carroll W. Kennedy, 696 Neff Road, Grosse Pointe, Mich. 48230

Filed May 14, 1975, Ser. No. 577,291

Int. Cl.<sup>2</sup> A46B 13/02

U.S. Cl. 15-21 R

9 Claims



1. A toothbrush having a horseshoe configuration and channel-shaped cross section, the brush being fabricated of soft material with embedded bristles on one side, a base detachable.



ably supporting said brush, a vibrator connected to said brush through said base, and a wall-mounted bracket supporting said vibrator and said brush, said base and brush being invertible whereby upper and lower teeth may be sequentially cleansed.

4,011,617

## CLEANER FOR TUBULAR PIN AND BOX ENDS

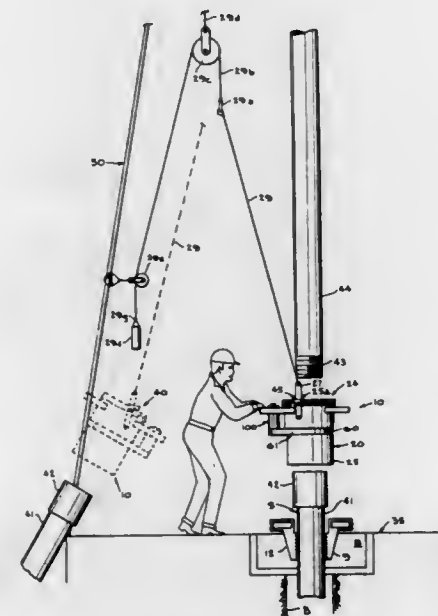
Lester W. Toelke, 12958A Trail Hollow, Houston, Tex. 77024; Malvern M. Hasha, 1527 Castlerock, Houston, Tex. 77090; Thomas W. Scott, 116 Maplewood Drive, Lafayette, La. 70501, and Jack W. Hayden, 5215 Stamper Way, Houston, Tex. 77027

Filed July 7, 1975, Ser. No. 593,525

Int. Cl.<sup>2</sup> B08B 9/02

U.S. Cl. 15—88

18 Claims



1. A cleaner for the threads on the pin and box ends of tubular members including:
  - a. housing means;
  - b. said housing means having open ends for receiving the pin end of a tubular member in one open housing end and the box end of a tubular member in the other open housing end;
  - c. brush means rotatably mounted in said housing means and positioned relative to said open housing ends for engaging the pin and box end threads on the tubular members; and
  - d. means for rotating said brush means to clean the engaged pin and box end threads of the tubular members.

4,011,618

## BARN CLEANER SCRAPER

Rodney O. Martin, Manlius, and John C. Whitman, Moravia, both of N.Y., assignors to Agway, Inc., DeWitt, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,639

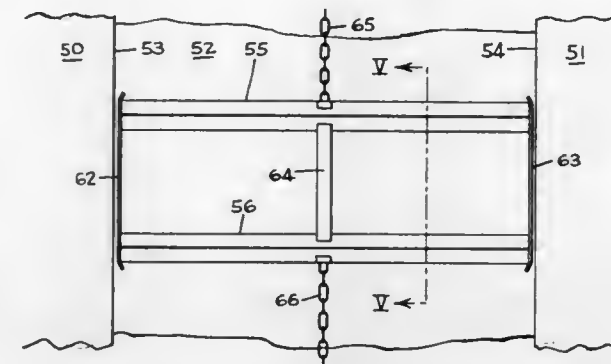
Int. Cl.<sup>2</sup> B65G 25/08

U.S. Cl. 15—93 R

5 Claims

1. A barn cleaner for scraping manure from an elongated rectangular area comprising scraping means extending transversely of said area and power means for moving said scraping means to and fro lengthwise of said area, a drive chain extending in opposite directions from said scraping means for connection with said power means, said scraping means comprising a scraping element extending across a major portion of said rectangular area and comprising a pair of flange elements connected along their upper edges and extending obliquely

downwardly to present an open side toward the surface to be scraped and provide a pair of scraping surfaces each inclined



4,011,619

## GOLF BALL WASHER HAVING SCRUB, CLEAN AND DRY ELEMENT

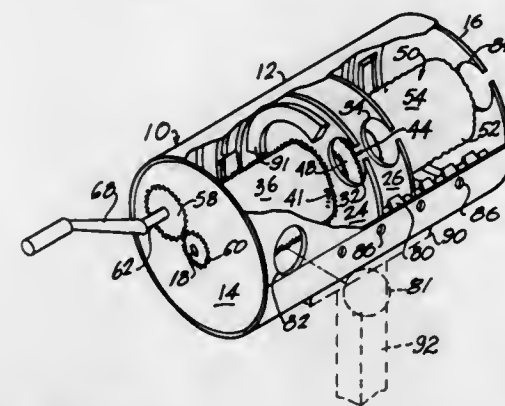
Edwin L. Michalak, P.O. Box 253, Tucker, Ga. 30084

Filed Apr. 1, 1976, Ser. No. 672,786

Int. Cl.<sup>2</sup> A63B 47/04

U.S. Cl. 15—97 R

10 Claims



1. In a golf ball washing device:
  - a. an elongated housing for containing a cleaning solution, end closures on said housing,
  - a first cleaning element mounted in said housing and comprising a surface similar to outdoor carpet material having small resilient fingers thereon,
  - a first baffle in said housing defining a first and second compartment therein,
  - at least one other second cleaning element in said second compartment having a pile surface comprising a highly absorbent material such as toweling,
  - means for rotating said first and second cleaning elements,
  - a spiral golf ball track on the inside of said housing and being wide enough to accommodate a golf ball and spaced from said cleaning elements so that a golf ball is forced into contact therewith during travel on said spiral track,
  - said first baffle having a golf ball hole therein and said track terminating at said hole to release said golf ball to said second compartment and second cleaning element.

4,011,620

## PIPELINE TOOL FOR LAUNCHING TWO PIPELINE CLEARING SPHERES

Donald Alan Southgate, London, England, assignor to The British Petroleum Company Limited, London, England

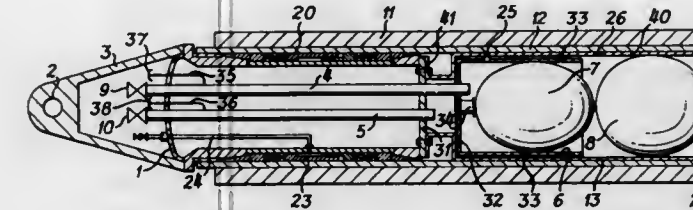
Filed Apr. 1, 1975, Ser. No. 564,130

Claims priority, application United Kingdom, Apr. 10, 1974, 15915/74

Int. Cl.<sup>2</sup> B08B 9/04

U.S. Cl. 15—104.06 A

2 Claims



1. A pipeline apparatus suitable for closing an open end of a pipeline and for carrying and individually launching two pipeline clearing spheres for clearing a pipeline comprising:
  - i. a first tubular member having a given diameter for longitudinally holding said pipeline spheres therein and having an open end for insertion into the open end of a pipeline and a closure opposite said open end;
  - ii. a second tubular member having a diameter from 0.7 to 0.98 that of said given diameter and positioned in said first tubular member for holding one of said spheres nearer the closure of said first tubular member, said second tubular member having a transverse closure and an open end;
  - iii. an outwardly radially expansible gripping and sealing means associated with said first tubular member and actuable by a fluid under pressure to grip the inside of a pipeline and seal thereagainst;
  - iv. means for supplying said fluid to actuate said gripping and sealing means; and
  - v. means for introducing compressed gas into the interior of said first and second tubular members at two longitudinally spaced apart locations to displace the spheres individually from the interior of the tubular members into the interior of a pipeline, the gas introduction location for said first tubular member being up to one given diameter from the first transverse closure and from 1/4 to 1 1/2 given diameters from the transverse closure of said second tubular member.

4,011,621

## WASHING APPARATUS

Joseph James King Irvine, 10 Ebrington Gardens, Belfast BT4 3BY, Northern Ireland

Filed Oct. 15, 1975, Ser. No. 622,616

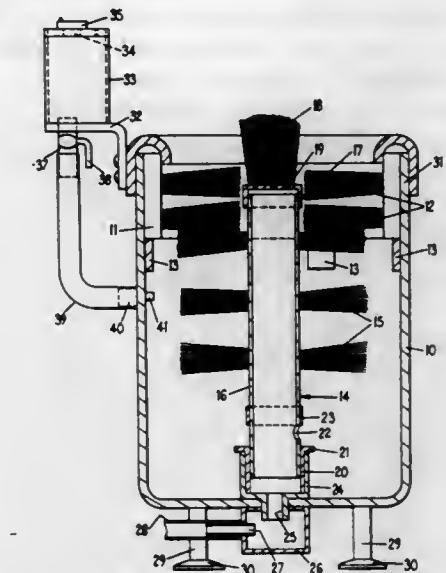
Int. Cl.<sup>2</sup> A47L 15/40, 15/44; B08B 3/02

U.S. Cl. 15—104.92

3 Claims

1. A washing apparatus for tumblers and the like comprising a container having an open top, inlet means in communication with the container for connection to an external supply of cleansing liquid to allow continuous flow from the supply into the container, a first stationary brush unit having a plurality of inwardly directed bristles and arranged peripherally on the container and a second stationary brush unit comprising an upright tubular member arranged centrally of the container and having a plurality of radially outwardly directed bristles, said tubular member having an open lower end in communication with said inlet means for passage of cleansing fluid into the tubular member, a top end which has a plurality of jet apertures therein, an aperture in the side of the tubular member adjacent the lower end thereof and adjustment means

associated with said aperture in the side of the tubular member to vary the rate of flow of liquid through said aperture and



consequently to vary the force of cleansing liquid passing through the plurality of jet apertures.

4,011,622

## ATTACHMENT FOR A ROLLER APPLICATOR

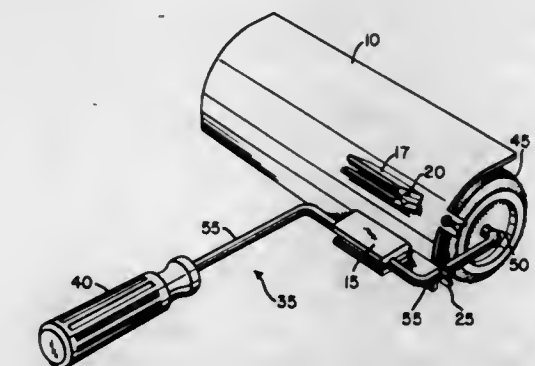
Charles A. Gillum, Hoffman Estates, and Theodore J. Kalata, Schaumburg, both of Ill., assignors to Kagil Corporation, Hoffman Estates, Ill.

Filed Oct. 14, 1975, Ser. No. 622,751

Int. Cl.<sup>2</sup> B05C 17/02

U.S. Cl. 15—248 A

2 Claims



1. An attachment for a roller pad paint applicator to prevent splattering of paint during the application by the paint roller, said paint roller having a handle portion, a cylindrical pad rotatable about a spindle, and an arm connecting said spindle to said handle, comprising:
  - a generally semi-cylindrical plastic shield curved about a central axis, and
  - a plurality of plastic clip means, integrally molded with said plastic shield, for attaching said shield to said arm so that the central axis of said shield is parallel with said spindle, each of said clip means circumferentially displaced with respect to the other clip means, each of said clip means comprising:
    - a slotted clip member formed integrally with said shield, extending radially from said shield, each slot positioned parallel to the central axis of said semi-cylindrical shield to allow said shield to be adjusted with respect to said paint roller by attaching said shield by individual ones of said clip means to said arm, and
    - an additional clip member positioned on an arcuate edge of said shield for attachment to said arm.



4,011,623

**APPARATUS FOR MECHANICALLY REMOVING MOISTURE FROM WEB-FORMED MATERIAL**

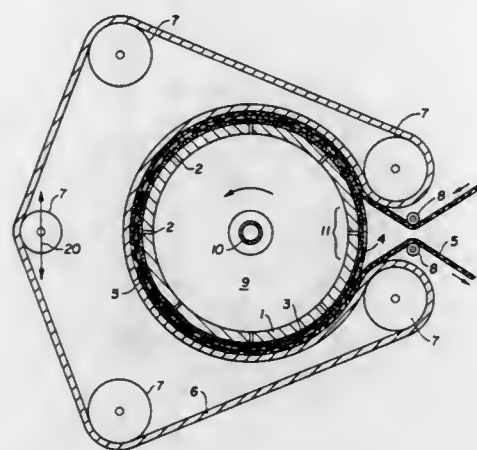
Manfred Pabst, Weiden near Cologne, and Kurt van Wersch, Wegberg, both of Germany, assignors to A. Monforts Maschinenfabrik, Monchen-Gladbach, Germany

Filed Jan. 21, 1976, Ser. No. 650,859

Claims priority, application Germany, Jan. 21, 1975, 2502149; Oct. 25, 1975, 2547917

Int. Cl.<sup>2</sup> A47L 5/38

U.S. Cl. 15—306 A



1. Apparatus for continuously mechanically removing moisture from web-shaped porous material, comprising a drum having a cylinder casing formed with holes therein, said drum being subjectible to negative pressure from within said cylinder casing, a cover layer of absorbent material formed with penetrating capillaries and uniformly disposed over said cylinder casing, means for guiding the web-shaped material about a part of the peripheral part of said cylinder casing and said cover layer disposed thereon, whereby the moisture to be removed from the material is sucked through said capillaries and said holes and carried off with the aid of said negative pressure, an air-impermeable endless entrainer spaced from said cover layer and engageable with the web-shaped material guided about said part of said peripheral surface of said cylinder casing, for pressing the web-shaped material, in cooperation with said negative pressure from within said cylinder casing, against said cylinder casing covered by said cover layer of absorbent material.

4,011,624

**CORDLESS VACUUM CLEANER**

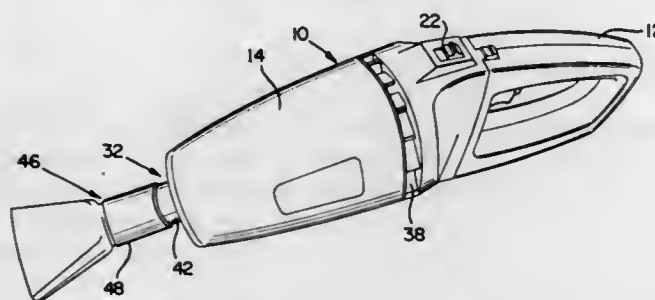
Mark Anton Proett, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 25, 1975, Ser. No. 607,637

Int. Cl.<sup>2</sup> A47L 5/24

U.S. Cl. 15—344

10 Claims



1. A battery-operated electric vacuum cleaner comprising an electric motor; switch means for connecting said motor to a battery for energization thereof; a fan driven by said motor; a canister for retaining dirt picked up by the cleaner; a filter bag mounted in said canister and arranged to remove dirt from the air stream produced by said fan; and an intake for said

canister, said intake comprising a passageway opening into said canister, said passageway having a substantially constant cross sectional area throughout its length; and a diffuser disposed at the outlet of said fan opening directly to the atmosphere for reducing back pressure across said fan and increasing the efficiency of said unit.

4,011,625

**LANCE TIP CONSTRUCTION**

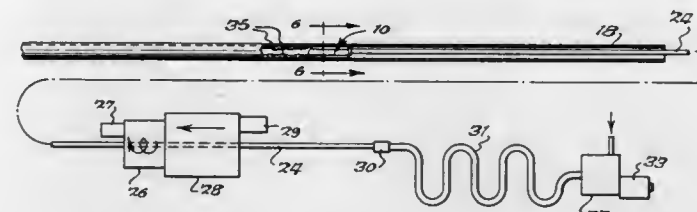
14 Claims Robert J. Goodwin, Hendersonville, N.C., assignor to C. H. Heist Corporation, Asheville, N.C.

Filed Sept. 8, 1975, Ser. No. 611,072

Int. Cl.<sup>2</sup> B08B 9/02

U.S. Cl. 15—104.1 R

25 Claims



21. A tube cleaning lance tip construction for insertion into a tube comprising a body portion, bore means effectively located on one side of said body portion for causing liquid to be ejected with a net lateral force component to bias said body portion toward said tube, and blade means extending longitudinally of said body portion and extending toward the inside of said tube for removing deposits therefrom.

4,011,626

**MEANS FOR POSITIONING A LONGITUDINAL BEARING**

Roy L. Chandler, Tarrant County, Tex., assignor to L. Ray Wood, Arlington, Tex.

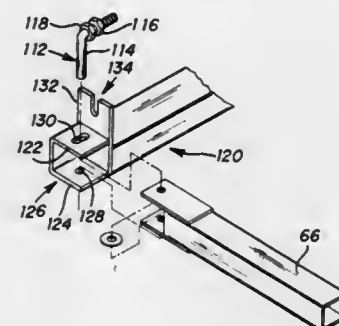
Division of Ser. No. 327,426, Jan. 29, 1973, Pat. No. 3,891,132. This application Apr. 7, 1975, Ser. No. 565,754

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> E05D 7/04

U.S. Cl. 16—129

8 Claims



1. Apparatus for adjusting the inclination of a bearing surface, comprising:

- a fixed structure having at least two spaced walls forming a groove therebetween, said groove providing access for a rotatable member which may be mated with the bearing surface;
- an aperture in a first one of the walls;
- a slot in the second of the two walls, the slot being opposite the aperture in first wall, and said slot extending in a direction which is generally perpendicular to the groove;
- a flange extending away from the second wall in a direction perpendicular to the opening of the groove, and said flange having an opening which lies in the plane defined by the aperture in the first wall and the slot in the second wall;
- an L-shaped member having a cylindrical bearing surface along a first leg and an irregular surface along the second

leg, with the first leg being adapted to engage the aperture and also to span the gap between the aperture and the slot, and the second leg being adapted to extend from the slot through the flange opening; and  
f. means for firmly securing the L-shaped member to the flange, including means for engaging the irregular surface on the second leg when said leg is inserted into the flange opening, and the inclination of the first leg with respect to the groove being adjustable in accordance with which portion of the second leg's irregular surface is utilized in securing the L-shaped member to the flange.

4,011,627

**ADJUSTABLE HINGE COUPLING OR THE LIKE**

Luciano Salice, Carimate, Italy, assignor to Arturo Salice SpA, Canto (Como), Italy

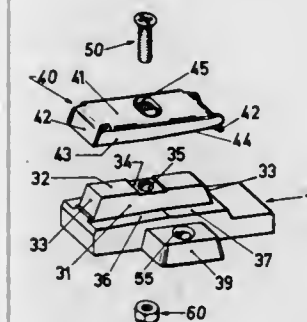
Filed June 2, 1976, Ser. No. 692,116

Claims priority, application Italy, June 3, 1975, 21594/75

Int. Cl.<sup>2</sup> E05D 7/04

U.S. Cl. 16—129

10 Claims



1. An adjustable coupling for interconnecting two relatively movable elements, comprising:  
a base securable to one of said elements;  
a cover engageable with said base and shiftable relatively thereto in a first dimension;  
first fastening means for immobilizing said cover with reference to said base in a selected relative position;  
a slider engageable with said cover and shiftable relatively thereto in a second dimension with limited relative mobility in a third dimension;  
second fastening means for immobilizing said slider with reference to said cover in a selected relative position; and  
a connector securable to the other of said elements, said connector being displaceably joined to said slider.

4,011,628

**HINGE MEANS FOR A PIVOTABLE WINDOW**

Sigurd Walter Bengtsson, Bruksgatan 17, Goteborg, Sweden

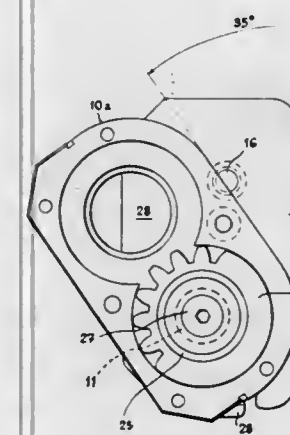
Filed Oct. 1, 1975, Ser. No. 618,388

Claims priority, application Sweden, Oct. 4, 1974, 7412523

Int. Cl.<sup>2</sup> E05D 11/08

U.S. Cl. 16—140

8 Claims



1. In a hinge means for a window comprising a casement and a frame pivotable about a horizontal axis with respect to

said frame said hinge means including a link having first and second pivots at its opposite ends for attachment to the casement and to the frame respectively, as well as means interconnecting said first and said second pivots so as to cause a controlled turning movement of said frame in relation to said casement, the improvement of

attachment means at said first pivot, including a fitting rigidly connected to said first pivot and a fitting plate for attachment to the casement,  
two hook members on said fitting, located one above the other and directed away from said first pivot,  
two grooves on said fitting plate for the reception of said hook members,  
each of said grooves having an entrance portion, open towards the inward side of the window, and being mainly horizontally directed, as well as a mainly vertical, downwardly directed portion, forming an extension of the inward end of said entrance portion.

4,011,629

**APPARATUS FOR TREATING AN ANIMAL CARCASS**

Arne Laursen, Roskilde, Denmark, assignor to Slagteriernes Forskningsinstitut, Roskilde, Denmark

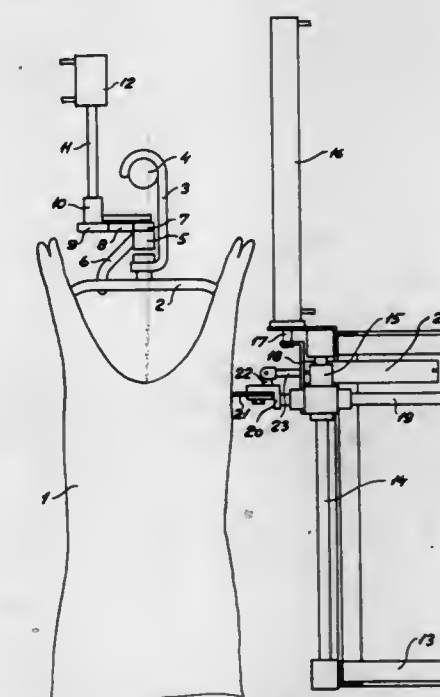
Filed July 11, 1974, Ser. No. 487,634

Claims priority, application Denmark, July 17, 1973, 3942/73

Int. Cl.<sup>2</sup> A22B 5/08

U.S. Cl. 17—17

6 Claims



1. An apparatus for treating an animal carcass, particularly a slaughtered pig, vertically suspended in a rotatably and retainably mounted suspension device comprising, in combination, a holder for a tool to treat the animal carcass, means for mounting the tool on said holder for engagement with the outer surface of the animal carcass, means for guidably supporting said holder for reciprocating movement in a vertical direction and for concomitant movement in a horizontal direction adjacent the animal carcass, means for automatically moving said holder reciprocally in said vertical direction on said supporting means, means for automatically moving said holder yieldingly in said horizontal direction for resilient engagement of the tool in said holder with the outer surface of the animal carcass with a predetermined force throughout variations in the contour of the carcass outer surface during the movement of said holder in the vertical direction.

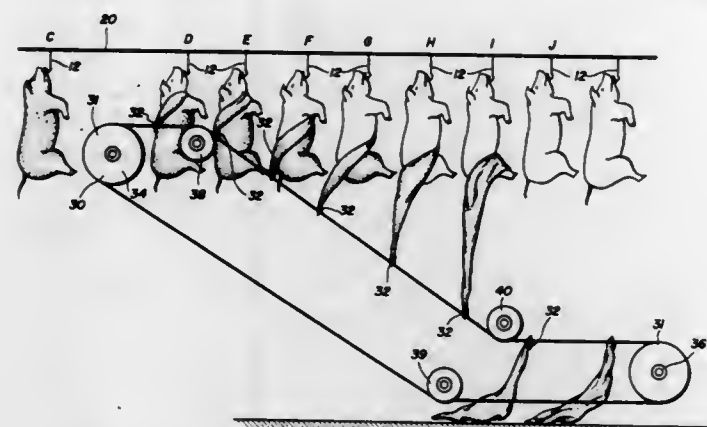


4,011,630

**HOG SKINNING METHOD AND APPARATUS**  
Edward Ochylski, 9155 S. Pleasant, Chicago, Ill. 60620  
Filed Jan. 7, 1974, Ser. No. 431,033  
Int. Cl.<sup>2</sup> A22B 5/16

U.S. Cl. 17-21

27 Claims



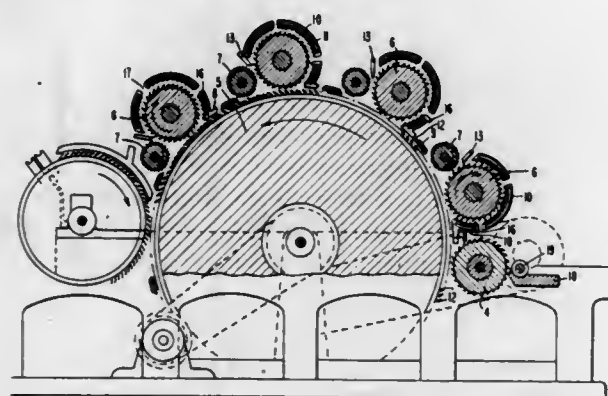
1. A method of skinning a hog comprising the steps of:
  - A. Suspending a hog carcass in a head-up position,
  - B. Freeing the hide from around the neck and head of the carcass, and
  - C. Grasping the freed hide at its upper end, and pulling downwardly on the hide to remove the hide from said carcass.
18. A hog dehider comprising:
  - A hog carcass suspension system adapted to suspend hog carcasses in the head-up position and move said carcasses through a dehider at a uniform speed;
  - a power driven hide removing means mounted adjacent to and below said hog carcass suspension system and adapted to move at the same horizontal speed as the hog carcass suspension system;
  - a hide grasping means carried by said power driven hide removing means, said grasping means adapted to grasp the hide of said carcasses near the upper portion thereof and connect said hide to said hide removing means;
  - said hide removing means adapted to cooperate with said hide grasping means and exert a downward pull on said hide to remove the hide from the carcass by drawing the hide downwardly.

4,011,631

**COMBING-CLEANING DEVICE FOR UNIVERSAL CARDS**  
Juan Barcons Estebanell, Avd. Doctor Fleming San Fructuoso de Bages, Barcelona, Spain  
Filed Dec. 9, 1975, Ser. No. 639,017  
Claims priority, application Spain, Mar. 26, 1975, 211105  
Int. Cl.<sup>2</sup> D01G 15/04

U.S. Cl. 19-100

7 Claims



1. A comber-cleaner assembly for a carding device of the type including a rotatable carding drum having a first direction of rotation and provided with means for carrying a fibrous web on the surface thereof, a feed roller for taking up the

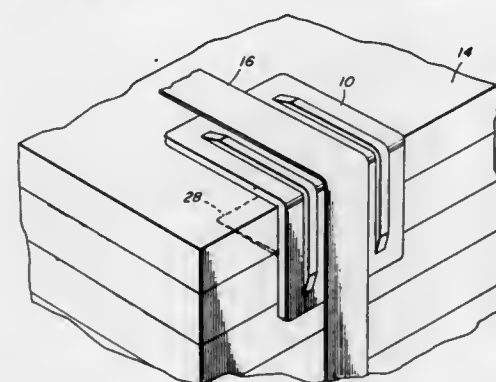
fibrous web from a table and a takerin roller cooperating therewith to deliver the fibrous web on the drum surface, said comber-cleaner assembly comprising at least one assembly grouping of cooperating cylindrical rollers, including a rotatable worker roller and a rotatable stripper roller mounted in specific relation to the carding drum, the worker and stripper rollers being rotatable in the same direction which corresponds to a second direction relative to the rotational direction of the carding drum, the worker roller being mounted upstream of the stripper roller relative to the direction of rotation of the carding drum, a plurality of plaque segments partially surrounding the stripper roller, the worker roller including means for picking up the fibrous web from the carding drum and carrying the fibrous web on the surface thereof for delivery to the stripper roller, the stripper roller including means for carrying the delivered web on the surface thereof, the plaque segments including means on the interior surface thereof which cooperate with the stripper roller for cleaning and combing the fibrous web as it is carried on the surface of the stripper roller, the stripper roller having a path of rotation for redelivering the cleaned and combed fibrous web onto the carding drum and extractor blade means positioned between a pair of plaque segments for removing impurities from the web.

4,011,632

**CORNER PROTECTOR FOR STRAPPED STACKS**  
Paul M. MacDonald, Scituate, Mass., assignor to PX Industries, Inc., Rockland, Mass.  
Filed Aug. 20, 1975, Ser. No. 606,168  
Int. Cl.<sup>2</sup> B65D 63/00

U.S. Cl. 24-16 R

2 Claims



1. A shield for protecting the corners of a stack of flat cartons and the like bound by strapping or the like, comprising
  - a. a pair of integral generally flat straight legs of substantially corresponding length, width and thickness oriented at an approximately 90° angle with respect to one another and adapted to be positioned over the corner of said stack, said legs defining a full supporting transverse surface at least at the corner formed by said legs, and
  - b. a single thin straight tapered lip integral with one of said legs and extending perpendicularly from the inner face thereof in generally parallel spaced relation to said other leg for insertion between adjacent cartons in said stack,
  - c. the inner face of said other leg being smooth and flat,
  - d. the outer faces of said legs being formed with a shallow channel extending in the direction of said legs.

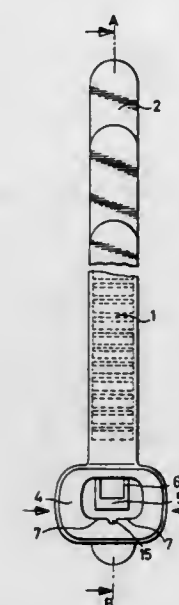
4,011,633

**CABLE BAND**  
Jürgen Seil, Norderstedt, Germany, assignor to ITW-Ateco G.m.b.H., Norderstedt, Germany  
Filed Nov. 5, 1975, Ser. No. 629,175  
Claims priority, application Germany, Nov. 29, 1974, 2456486

Int. Cl.<sup>2</sup> B65D 63/00

U.S. Cl. 24-16 PB

2 Claims



1. A one-piece cable band of flexible plastic material comprising a toothed band and a plug-in type socket at its one end, said socket consisting of an elastically deformable frame which is oval shape, a funnel-shaped opening having an interlocking latch projecting into said opening with said opening adapted to receive the tooth band while the interlocking latch engages teeth on said band, the longitudinal axis of said oval opening is substantially longer than the width of the tooth band so that the frame may be compressed in the direction of the longitudinal axis to unlock the tooth band, the wall forming the opening opposite the interlocking latch being relieved throughout its length and intermediate its side extremities by a groove extending substantially parallel with the axis of the opening whereby said frame can be compressed and deformed, said interlocking latch includes a hook-shaped portion integral with the side of the frame facing toward the toothed band and extending obliquely from the end of introduction towards the opposite side of the frame, said interlocking latch further including a pair of skin-like portions connecting the side edges of the interlocking latch with the support side of the frame to provide a resilient spring-like action to said latch, the free end of said latch terminating a predetermined distance from the end of the opening opposite the end of introduction, said predetermined distance being at least equal to the spacing of adjacent teeth on said band.

4,011,634

**LACING DEVICE FOR SKI BOOTS**  
Icaro Olivieri, 10, Via Feltrina Nord, Montebelluna, Italy (31044)

Filed June 25, 1976, Ser. No. 699,682

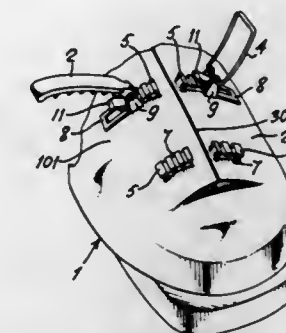
Claims priority, application Italy, July 4, 1975, 12686/75  
Int. Cl.<sup>2</sup> A43C 11/00; A43B 11/00

U.S. Cl. 24-70 SK

6 Claims

1. In a ski boot of the type comprising a ski boot upper provided with two flaps defining an opening, a lacing device including a hooked lever-like lacing member provided on one flap and intended to cooperate with a ring-like lacing member on the other flap, anchoring means for securing at least one of said lacing members hingedly and in a removable manner onto the corresponding flap, with possibility of adjustment of the distance of the lacing member with respect to the said opening, said anchoring means comprising:

- a. a slide guide element provided on the flap and presenting at least a guide arranged transversely with respect to the opening, said slide guide element presenting further at least two notches located at different distances with respect to the opening;

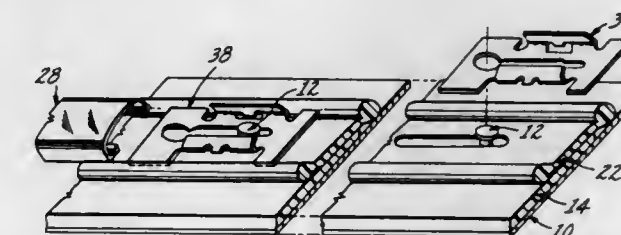


- b. a carrier plate onto which there is hingedly mounted the lacing member, said carrier plate presenting at least a suitable engaging portion capable of slidably engaging the corresponding guide provided on the slide guide element;
- c. a locking element provided on said carrier plate, and presenting at least a locking tooth or projection capable of engaging a notch located on the slide guide element.

4,011,635

**RETAINER CLIP**  
Engelbert Anthony Meyer, Bloomfield Hills, MI, assignor to USM Corporation, Boston, Mass.  
Filed Nov. 26, 1975, Ser. No. 635,677  
Int. Cl.<sup>2</sup> A44B 21/00; E04F 19/02  
U.S. Cl. 24-73 MF

12 Claims



1. A one-piece clip for assembling a U-shaped trim molding and an elongated flexible strip having beaded edge portions onto a panel surface provided with button headed stud fasteners, wherein the trim molding is located between the beaded edges of the flexible strip, comprising:
  - a body portion having disposed adjacent each end thereof a pair of oppositely directed feet lying in a plane parallel with the surface of the strip and extending outwardly from said body portion to a position contiguous with the bead at each edge of the strip to thereby substantially center said body portion on the strip;
  - resilient means for engaging the button head of said stud fastener to retain said clip and the strip adjacent the surface having the studs provided thereon; and
  - resilient means extending into said U-shaped trim molding and engaging the molding to retain and align the molding between the beaded edges of the flexible strip.

4,011,636

**CLIP CONSTRUCTION**  
Joseph J. Malachuk, 130 E. Division St., Wilkes-Barre, Pa. 18702

Filed Mar. 12, 1976, Ser. No. 666,217

Int. Cl.<sup>2</sup> A44B 21/00

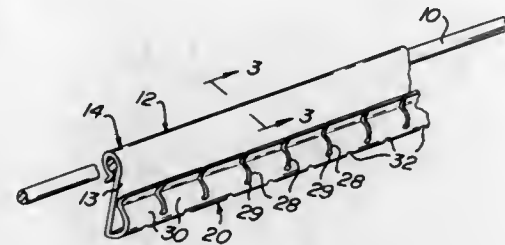
U.S. Cl. 24-137 R

9 Claims

1. A clip construction comprising a generally upright back part for connection to a support, a resilient front part connected to and extending outwardly and upwardly from a lower region of said back part and thence inwardly and upwardly toward an intermediate region of said back part, and an entry



lip connected to and extending outwardly from the upper end of said front part, for downward insertion of an article between said back part and entry lip intermediate said back and front parts with the latter deflected forwardly and its end in gripping engagement with said article, said back and front



4,011,637

**DEMOUNTABLE SWIVEL FASTENER WITH DETENT**

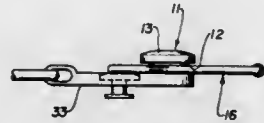
Harry E. Mazur, Box 4508, Palm Springs, Calif. 92262

Filed Nov. 21, 1975, Ser. No. 634,050

Int. Cl.<sup>2</sup> A44B 17/00

U.S. Cl. 24—224 SS

3 Claims

**1. A fastener comprising:**

a support,

a stud having one end mounted on said support and a shank extending substantially perpendicularly to a surface of said support and having at its opposite end a relatively enlarged head positioned at a predetermined spacing from said surface;

a clasp member having a thickness less than said spacing for confinement between said head and surface and formed with first and second openings respectively larger and smaller than said head and a passageway connecting said openings;

said smaller opening being formed in an end of said clasp member and sized to surround said shank between said head and surface to provide a free swiveling attached position on said shank;

said shank and passageway being formed to permit and to confine movement of said shank through said passageway along a single axis of lineal reciprocation between attached and detached positions in a predetermined angular position of said member on said shank;

means mounted on said support and providing a displaceable abutment movable into and from a position intersecting said axis and preventing and permitting respectively said axial reciprocation of said member and stud between attached and detached positions, said abutment in its axis intersecting position being positioned for engagement with said end for locking said member and stud in attached position;

means biasing said abutment to its said axis intersecting position; and

said first-named means being formed for manual engagement and displacement of said abutment from its said

position against the action of said biasing means thereby permitting displacement of said member and stud between attached and detached positions.

4,011,638

**JOINT CLAMP FOR JOINING INTERSECTING BRACE MEMBERS AND METHOD FOR MAKING SAME**

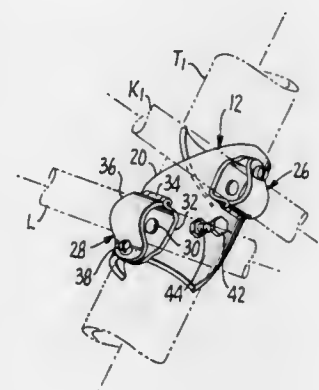
Jack A. Holt, Belmont, and Philip A. Torbet, San Mateo, both of Calif., assignors to The Burke Company, San Mateo, Calif.

Filed Dec. 18, 1975, Ser. No. 642,180

Int. Cl.<sup>2</sup> A44B 21/00; B25G 3/36

U.S. Cl. 403—171

5 Claims



1. An article of manufacture for joining first and second brace members to an elongate cylindric support, said article comprising a substantially rigid body including a wall defining an axially extending cylindric passage having a diameter corresponding substantially to the diameter of said cylindric support, said body having first and second axially spaced ends and a helical slot extending therearound and opening through said ends, said slot making no more than one-half convolution around said body and opening through said axially spaced ends to define simicircular end segments of the body spaced from one another relative the longitudinal axis of the body by 180° or less, said slot having a width greater than the diameter of said cylindric support so that said support may be passed through said slot and into said body and then rotated into a position in parallelism with the body wherein the wall of the body snugly embraces said cylindric support.

4,011,639

**CLIP**

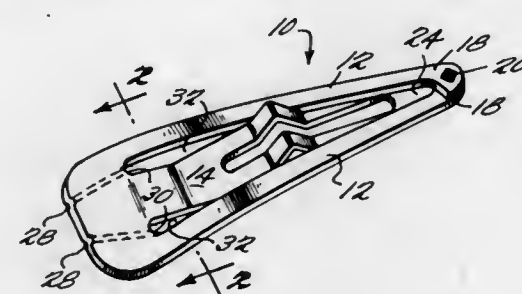
Otto Koleske, Sunbury, Pa., assignor to Wilson Manufacturing Corporation, Sunbury, Pa.

Filed Apr. 24, 1974, Ser. No. 463,807

Int. Cl.<sup>2</sup> A44B 21/00

U.S. Cl. 24—255 H

3 Claims

**1. A clip, comprising:**

a piece of flexible sheet material having a common base portion at one end; a center leg projecting from the base; and two outer legs projecting from the base in the same general direction as the center leg and flanking the center leg at the base; means connecting the outer legs together in laterally stressed condition, distally of the base, with the outer legs, as a corollary to their being connected,

being maintained closer together distally of the base than the width of the center leg at the same distance from the base, whereby the outer legs and base assume a concavo-convex condition which may be snapped to a reverse concavo-convex condition in order to bring the center and outer legs, distally of the base, alternatively into resilient mutual engagement, i.e. a "closed" condition, and substantial separation, i.e. an "open" condition; said clip being provided with the improvement wherein: said base, on the face thereof from which the center leg curves toward the observer when the clip is in said open condition, being provided with two impressed bend lines which respectively proceed from where the two outer legs flank one another and join the base and extend generally longitudinally and generally parallel to one another across the base to the opposite extent of the base, the impressed bend lines being sufficiently strongly impressed as to produce visually apparent changes in the spatial disposition of the base on opposite flanks of each bend line.

4,011,640

**YARN ENTANGLEMENT NOZZLE**

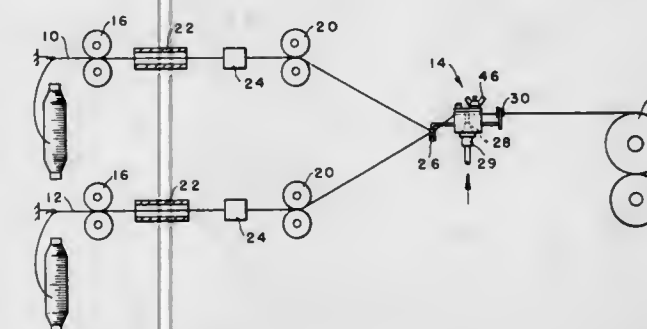
Jay Keith, Travelers Rest, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 20, 1975, Ser. No. 623,977

Int. Cl.<sup>2</sup> D02G 1/16

U.S. Cl. 28—1.4

3 Claims



1. A filament entangling air jet nozzle comprising: a body portion having a substantially planar surface, a cap portion having a substantially planar surface, means releasably securing said cap portion to said body portion with substantially all of the planar surface of said cap portion flush with the planar surface of said body portion and allowing said cap portion to be pivoted in a direction substantially parallel to the planar portion of said body portion when released, said body portion having a yarn slot therethrough, said cap portion having a yarn slot therethrough mating with the yarn slot of said body portion and an air orifice in said body portion communicating with said yarn slot in said body portion.

4,011,641

**JACKETED ROLLER FOR SYNTHETIC YARN SPINNING APPARATUS**

Yoshio Kitano, No. 40 Yamashina Nishino Rikyu-cho, Higashiyama, Kyoto, and Takuma Katsumata, No. 1-47, Oaza Takagami, Nakanosho, Inazawa, Aichi, both of Japan

Division of Ser. No. 314,419, Dec. 12, 1972, abandoned. This application Jan. 2, 1975, Ser. No. 538,213

Claims priority, application Japan, Dec. 17, 1971, 46-102895; May 30, 1972, 47-054191

Int. Cl.<sup>2</sup> D02J 1/22

U.S. Cl. 28—71.3

3 Claims

1. In an apparatus for spin drawing synthetic fiber, wherein a yarn is heat treated in successive stages on heated rollers each rotating at a speed higher than that of the preceding stage, the improvement comprising a jacketed, fluid-containing roller for the first stage of the successive stages of heated rollers, the jacketed roller comprising

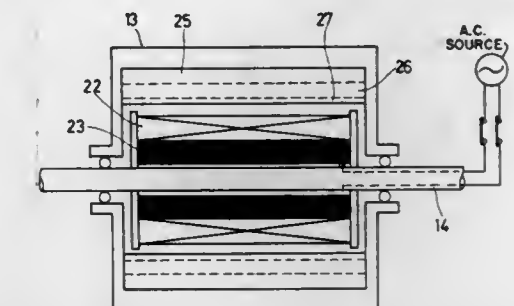
1. a shaft,

2. a fixed, non-rotatable inner core fastened about the shaft,

3. a roller rotatably mounted on the shaft and encompassing the inner core, the roller including

a. a tubular, electrically conductive member coaxial with, and hermetically affixed to, the inner wall of the roller, the conductive member having a higher electrical conductivity than the roller,

b. a tubular, non-magnetizable reinforcing member hermetically affixed to the inner surface of the conductive member,



c. a plurality of bore holes in the conductive member extending parallel to the axis of the roller and coextensive therewith,

d. a heat transfer fluid in each of the bore holes, the fluid dividing into a liquid and a vapor phase when the roller is heated and rotation of the roller forcing the liquid phase of the fluid radially outwardly under centrifugal force into engagement with the outer portion of each bore hole.

4,011,642

**METHOD FOR MANUFACTURING A SEALED BEAMED HEADLIGHT**

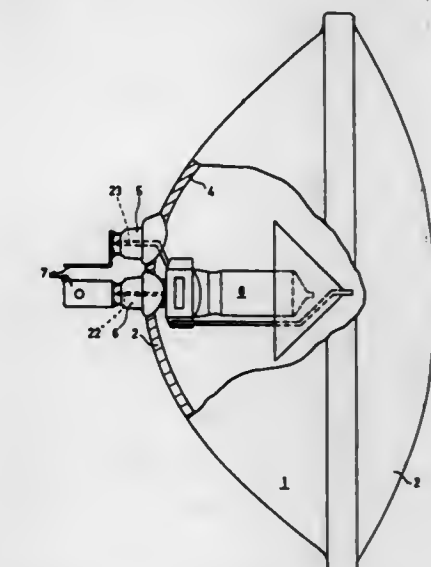
Klaus Meinecke, Brand; Dieter Wilhelm, Eschweiler; Leo Coir, Brand; Jurgen Tillack, Aachen; Helmut Samulowitz, Verlauteheide, and Karl Gebhardt, Stolberg, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 463,198, April 22, 1974, Pat. No. 3,904,904. This application July 17, 1975, Ser. No. 596,956 Claims priority, application Germany, Apr. 28, 1973, 2321709

Int. Cl.<sup>2</sup> H01J 9/18, 9/36

U.S. Cl. 29—25.16

4 Claims



1. A method of manufacturing a sealed beam lamp which comprises: providing an outer envelope including a reflector, providing a transparent front glass, providing a quartz halogen lamp disposed within said envelope, providing an elongated member for supporting the halogen lamp relative to the envelope, positioning said elongated member relative to said reflector, passing current through the elongated member sufficient to raise the temperature, thereof and facilitate permanent deformation; align deforming the elongated member to



the said halogen lamp relative to said reflector thereafter moving said elongated member relative to said reflector to a second position for joining and then joining said reflector to said elongated member.

4,011,643

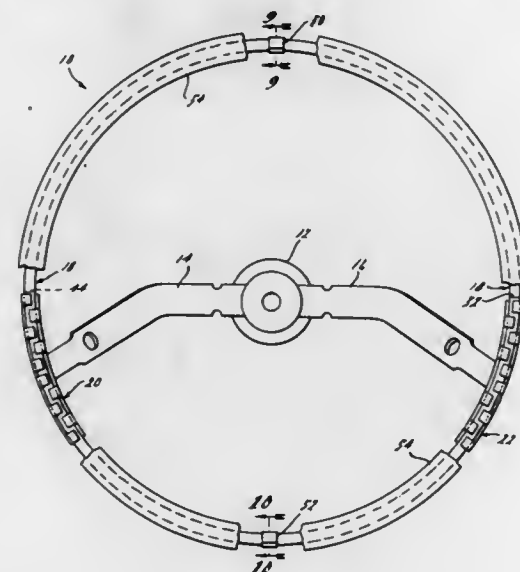
**METHOD FOR MAKING A STEERING WHEEL**

George H. Muller, Ann Arbor, and Warren A. VanWicklin, Jr., Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,412

Int. Cl.<sup>2</sup> B21D 53/26

U.S. Cl. 29—159 B



1. A method of manufacturing a steering wheel for a motor vehicle comprising the steps of:  
attaching a spoke to a steering wheel hub;  
forming a rim core by winding a metal member into a helix;  
securing said rim core to said spoke with the axis of said helix coinciding with the axis of rotation of said steering wheel.

4,011,644

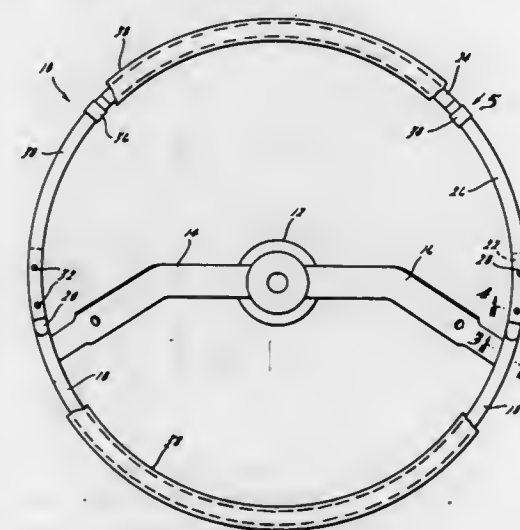
**METHOD FOR MANUFACTURING A STEERING WHEEL**

George H. Muller, Ann Arbor, and Warren A. VanWicklin, Jr., Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,413

Int. Cl.<sup>2</sup> B21D 53/26

U.S. Cl. 29—159 B



1. A method of manufacturing a steering wheel for a motor vehicle comprising the steps of:  
attaching a spoke to a steering wheel hub;  
forming a first rim core member having a substantially rigid body portion and end portions;

forming a second rim core member by winding a spring member into a helix;  
severing said helical spring member to form an arcuate spring section;  
securing the ends of said arcuate spring section to said end portions of said first rim core member;  
securing the end of said spoke to said first rim core member;  
covering said first rim core member and said arcuate spring section with a material providing a hand gripping surface.

4,011,645

**STEERING WHEEL METHOD OF MANUFACTURE**

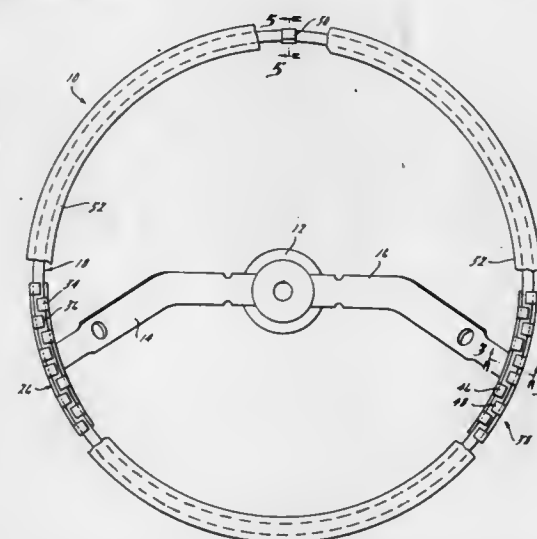
George H. Muller, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,518

Int. Cl.<sup>2</sup> B21D 53/26

U.S. Cl. 29—159 B

6 Claims



1. A method of manufacturing a steering wheel for a motor vehicle comprising the steps of:  
attaching a spoke to a steering wheel hub;  
affixing a channel shape attachment member to the outer end of said spoke;  
forming a flexible rim core from an annular leaf spring member;  
fitting a portion of said rim core in said channel shape attachment member;  
deforming said attachment member into gripping engagement with said rim core;  
covering said rim core with a member having a hand gripping surface.

4,011,646

**APPARATUS FOR ATTACHING FLEXIBLE PARTS AND/OR INNERSOLES WITH JOINT SPRINGS THROUGH RIVETING**

Hans Mohrbach, Rieschweiler, Pfalz, Germany, assignor to Ernst Mohrbach KG, Germany

Filed Oct. 15, 1975, Ser. No. 622,680

Claims priority, application Germany, Oct. 26, 1974, 2450957

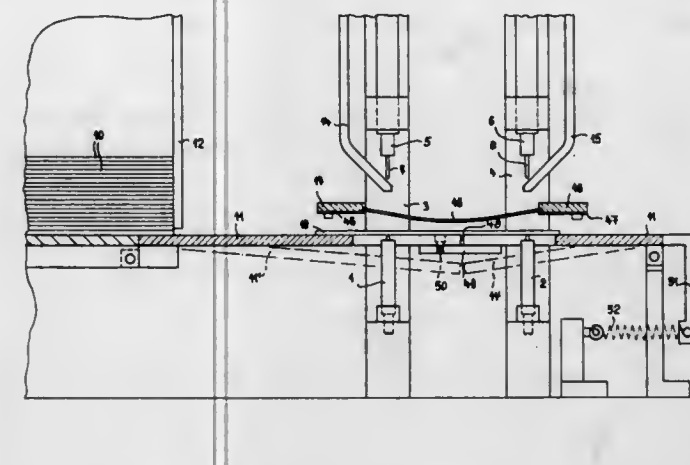
Int. Cl.<sup>2</sup> B23P 19/04; B23Q 7/10

U.S. Cl. 29—818

4 Claims

1. Apparatus for the connecting of flexible pieces such as innersoles, with shanks through riveting of the type having a stack and guide arrangement for the innersoles or flexible pieces, as well as a supply and guide arrangement for the rivets and two riveting devices for joining and riveting the two work pieces as well as a supply and guide arrangement for the shanks with a control for the release and carrying out of the different feeding and working operations, the improvement comprising a pair of magazines adapted to hold a stack of shanks therebetween, a pair of guide bars positioned below the magazines and adapted to receive a shank from the stack held within the magazines, each of said magazines containing

a hammer adapted to move toward each other to release the edges of the lowermost shank held in the magazines, each of said guide bars containing a guiding groove adapted to receive the edges of released shank, a movable slider for conducting individual shanks held between said grooves of the guide bars, to an end position of said grooves in which said shank is positioned above the flexible piece to which it is to be riveted, a pair of riveting devices adjacent the end position of the



grooves, each of said guide bars having a leaf spring at its end position forming the underside of the groove in that area whereby the shank in the end position in the grooves may be snapped out of said grooves, pivotally mounted table supporting the guide bars so that they may be depressed to bring the shank into contact with the flexible piece before being snapped out of said grooves, spring means biased to maintain the table in non-depressed condition.

4,011,647

**ELECTRICAL CONNECTOR AND CONTACTS THEREFOR**

Carl W. Peterson, Santa Ana, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 527,600, Nov. 27, 1974, Pat. No.

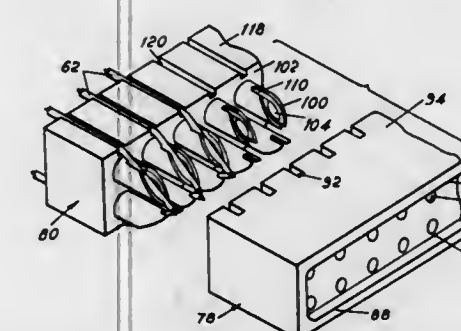
3,955,873, which is a continuation-in-part of Ser. No. 510,382, Sept. 30, 1974, abandoned. This application Dec. 15, 1975,

Ser. No. 641,094

Int. Cl.<sup>2</sup> H01R 43/04

U.S. Cl. 29—750

5 Claims



1. A tool for inserting an insulated conductor into a terminal device having a tubular section with first and second longitudinally extending slots therein on opposite sides thereof each extending to the rear of said tubular section with one of said slots extending to the forward end of said tubular section, comprising:

an elongated hollow body having a cylindrical bore therein extending to one end of said body;  
a cylindrical pin centrally mounted within said bore and spaced from the wall of said bore defining an annular space therebetween, said space being dimensioned to slidably receive said terminal device thereinto;  
said one end of said body being chamfered to provide an inclined front face extending at an acute angle with respect to the longitudinal axis of said body;

4,011,648

**BEARING PULLER DEVICE**

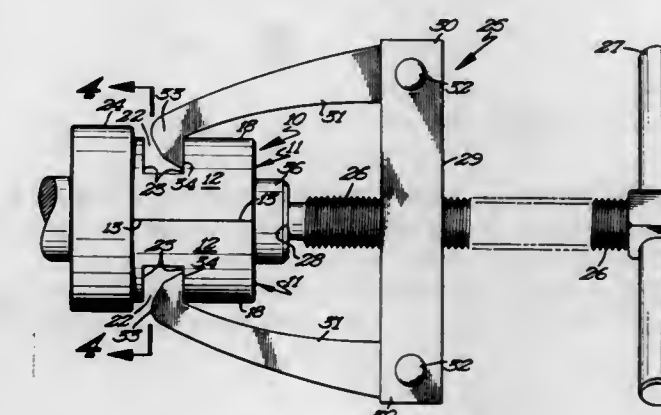
Milton Martinson, and Ernest C. Michelson, both of Ashby, Minn.

Filed Dec. 22, 1975, Ser. No. 643,310

Int. Cl.<sup>2</sup> B23P 19/04

U.S. Cl. 29—264

3 Claims



1. A bearing puller device for use in forceably pulling an inner bearing race sleeve from eccentric engaging relation with a shaft, the bearing having an annular groove therein, said bearing puller device comprising

a pair of semi-cylindrical sleeve elements having elongate straight longitudinal edges, and adapted to be positioned around and in clamping relation with the inner race of a bearing, the longitudinal edges of the sleeve elements engaging each other when the sleeve elements are disposed in clamping relation with the bearing race, each sleeve element having a pair of arcuate flanges, each flange extending rigidly inwardly from one end of the associated sleeve element, the radius of the flange at one end of each sleeve element being greater than the radius of the flange at the other end, the flange at one end of each sleeve element engaging in the groove of the bearing when the sleeve elements are disposed in clamping relation with the bearing race,

a rigid cylindrical collar being dimensioned to slide over and engage the exterior surface of the sleeve elements for retaining the latter in clamped relation with the bearing race,

each sleeve element having an elongate slot therein extending circumferentially thereof, said slots being disposed in diametrically opposed relation with respect to each other, and a pulling tool including an elongate handle, a pair of elongate gripping members adapted to engage in the slots of the sleeve elements to thereby grip the sleeve elements, and means interconnecting the gripping members with a handle whereby when the gripping members are moved longitudinally of the handle, the inner race of the bearing will be disengaged from mounted relation on the shaft.

4,011,649

**CLIP LOCK CLAMPING TOOL**

Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 31, 1975, Ser. No. 645,804

Int. Cl.<sup>2</sup> B23P 19/04

U.S. Cl. 29—267

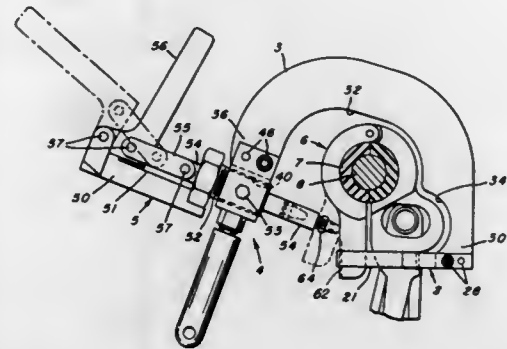
5 Claims

1. A clamping tool for disposing a resilient clip having two leg portions each with inwardly directed extensions thereon over a clamping structure adapted to be secured together by



forcing said extensions of said clip over mating ledges on said structure comprising:

- a seating member having a recess therein adapted to engage the head of the clip to be applied to the clamping structure,
- a generally C-shaped arm connected at the one end thereof to said seating member,



- a handle assembly located adjacent the other end of said C-shaped arm having a bore therethrough in the direction of the seating member, and
- a toggle assembly fitted into said bore and having a movable shaft connected thereto, said shaft having a tip adapted to be displaced along a line substantially centrally directed toward said recess in the seating member to engage the clamping structure and force said structure past said extensions of said clip.

4,011,650

## COLD WORKING PROCESS

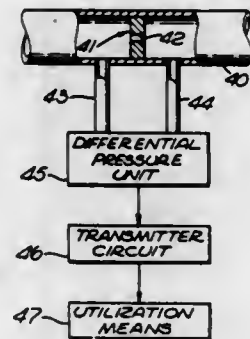
Richard Paul Granada, West Covina, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,036

Int. Cl.<sup>2</sup> B23P 17/00

U.S. Cl. 29—421 R

5 Claims



1. The method of making a force sensitive member comprising the steps of: forming a generally planar thin circular metal diaphragm with a generally symmetrical center and an axis through said center normal to the diaphragm plane; forming said diaphragm with a flat circular portion around said center and a flat annular portion at its outer edge between an inner circle and an outer circle concentric with said inner circle; forming said diaphragm with said annular portion in a position such that both of said circles are concentric with said diaphragm axis; forming said diaphragm in a manner such that said outer circle has a predetermined diameter; forming said diaphragm with a thickness that is substantially less than said outer circle diameter; forming said diaphragm with an intermediate portion connected between said circular and annular portions thereof; embossing said diaphragm on one side thereof to provide a wheel-shaped embossment on said one side thereof; relieving said diaphragm on the side thereof opposite said one side; embossing said diaphragm in a manner to provide a hub portion, a rim portion and a plurality of

spokes within said embossment; embossing said diaphragm in a manner to cause said hub portion to be connected from said diaphragm circular portion to said spokes; embossing said diaphragm in a manner to cause said hub portion to have a surface in the shape of one-half of a first torus cut by a plane normal to its axis where said first torus axis is congruent with said diaphragm axis; embossing said diaphragm in a manner to cause said rim portion to be connected from said spokes to said diaphragm annular portion and said rim portion to be spaced radially from said hub and to have a surface in the shape of one-half of a second torus cut by a plane normal to its axis where said second torus axis is also congruent with said diaphragm axis; said hub portion, said rim portion and said spokes all being embossed on the same side, i.e. said one side, of said diaphragm intermediate portion; said hub portion, said rim portion and said spokes all being concavo-convex and defining respective channels in the other side of said diaphragm due to the approximately uniform thickness thereof; the channel of each spoke communicating with both of those of said hub and rim portions; forming said diaphragm intermediate portion with a flat arcuate portion filling the gap between said connected between each pair of immediately adjacent spokes and filling the gap between and connected between the respective hub and rim portions connecting each said respective pair of immediately adjacent spokes; said spokes being uniformly distributed around and projecting in radial directions from said diaphragm axis; and holding said diaphragm annular portion while applying a force against the center of said diaphragm approximately normal thereto on said opposite side thereof of a magnitude sufficient to stretch said diaphragm beyond the yield point thereof.

4,011,651

## FIBRE MASSES

John Albert Avery Bradbury, and Matthew Giles Kendall, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 22, 1974, Ser. No. 444,963

Claims priority, application United Kingdom, Mar. 1, 1973, 10013/73; Jan. 28, 1974, 3941/74

Int. Cl.<sup>2</sup> B23P 17/00

U.S. Cl. 29—424

15 Claims

1. A method of constructing an assembly comprising an insulating mass of polycrystalline inorganic fibre within a cavity which comprises pre-compressing the fibre mass to a bulk density of 2 to 20 times its original bulk density by applying a removable binding agent to the fibre mass and mechanically compressing the fibre mass so that the binding agent retains the fibre mass in the pre-compressed state, introducing the pre-compressed fibre mass into the cavity and subsequently heating the fibre mass to remove the binding agent so that the pre-compression is released and the fibre is retained under compression by the walls of the cavity.

4,011,652

## METHOD FOR MAKING A PIPE COUPLING

Bobby E. Black, Chatsworth, Calif., assignor to PSI Products, Inc., Burbank, Calif.

Filed Apr. 29, 1976, Ser. No. 681,423

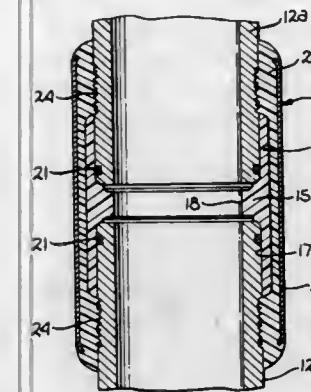
Int. Cl.<sup>2</sup> B21D 39/00; B23P 19/04

U.S. Cl. 29—455 R

9 Claims

1. A method for making an insulative pipe coupling comprising the steps of: forming an o-ring circumferential groove adjacent the end of two pipe stubs; inserting an o-ring onto each of said grooves; inserting said pipe stub ends with said o-ring into a center insulating sleeve;

injection moulding an outer insulative sleeve over said center sleeve and said pipe ends; and



pressing a metal outer sleeve onto said outer insulative sleeve.

4,011,653

## METHOD FOR MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT INCLUDING AN INSULATING GATE TYPE SEMICONDUCTOR TRANSISTOR

Taketoshi Kato, Yokohama, and Norio Kobayashi, Yokosuka, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

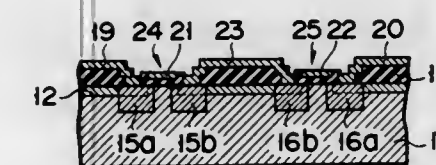
Continuation-in-part of Ser. No. 409,721, Oct. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 282,567, Aug. 21, 1972, abandoned. This application July 25, 1975, Ser. No. 598,758

Claims priority, application Japan, Aug. 23, 1971, 46-63649

Int. Cl.<sup>2</sup> B01J 17/00

U.S. Cl. 29—571

6 Claims



1. A method for manufacturing a semiconductor integrated circuit comprising the steps of: forming a first insulating layer on a semiconductor substrate of one conductivity type; etching, with a first mask plate having a predetermined transparent and opaque mask pattern the insulating layer to expose a surface part of the substrate and to leave separated parts on the substrate where gate insulators are to be formed, said first mask plate having separated opaque sections corresponding to said separated parts on the substrate; diffusing impurities into the substrate from the exposed surface thereof to form a current leakage preventing layer of the same conductivity type as and higher concentration than the substrate; forming a second insulating layer on the exposed surface of the substrate; etching the insulating layers to expose surface portions of the substrate; diffusing impurities from the exposed surface portions into the substrate to form source and drain regions of at least two field effect transistors such that portions of said source and drain regions underlie said first insulating layer, the current leakage preventing layer surrounding the transistors and contacting the regions of the transistors; etching, for each transistor and with a second mask plate having substantially the same mask pattern as said first mask plate but with the transparent and opaque portions of said mask plates reversed with respect to each other, the part of the first insulating layer between and on the part of the source and drain regions of each individual

transistor to form for each transistor an opening exposing a surface part of the substrate having the same dimensions as said separated parts, said second mask plate being oriented relative to said substrate in substantially the same manner as said first mask plate such that the transparent portions of said second mask plate are aligned with the portions of said substrate that were aligned with the opaque portions of said first mask plate; forming a gate insulator on the exposed surface part between the source and drain regions, the gate insulator also extending beyond the adjacent edges of the source and drain regions and being in at least partial overlapping relationship therewith; and forming a gate electrode on the gate insulator, the gate electrode being in at least partial overlapping relationship with the source and drain electrodes.

4,011,654

## EXHAUST GAS SENSOR PROBE METHOD OF MANUFACTURE

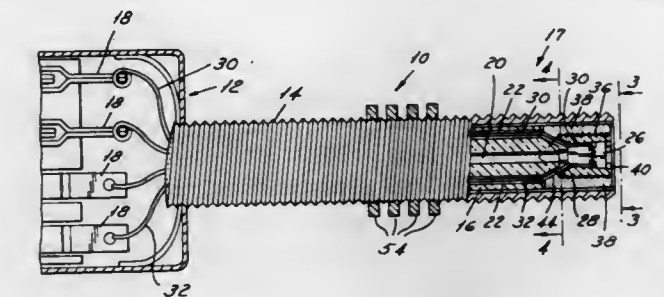
Gordon L. Beaudoin, Dearborn; Dante S. Giardini, Dearborn Heights, and Allen H. Meitzler, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 483,723, June 27, 1974, Pat. No. 3,936,794. This application Oct. 3, 1975, Ser. No. 619,342

Int. Cl.<sup>2</sup> H01C 7/02, 7/04

U.S. Cl. 29—612

2 Claims



1. A method of forming an exhaust gas sensor support member comprising the steps of: extruding an elongated tube of green alumina ceramic material; providing the tube with a plurality of substantially parallel longitudinally extending through passages; prefiring the tube until the green ceramic is machinable; machining one end of the tube of machinable green ceramic to form a cup-shaped end portion having a threaded outer surface; providing the inner surface of the cup-shaped end portion with a pair of transversely disposed confronting longitudinally extending sensor receiving slots; inserting a wafer of sensor material into the sensor receiving slots; and final firing the tube.

4,011,655

## EXHAUST GAS SENSOR PROBE METHOD OF MANUFACTURE

Gordon L. Beaudoin, Dearborn; Dante S. Giardini, Dearborn Heights, and Allen H. Meitzler, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 483,723, June 27, 1974, Pat. No. 3,936,794. This application Oct. 3, 1975, Ser. No. 619,343

Int. Cl.<sup>2</sup> H01C 7/02, 7/04

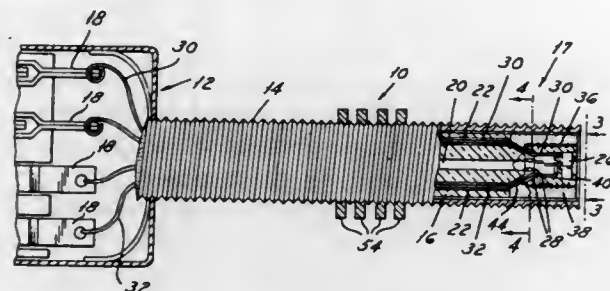
U.S. Cl. 29—612

3 Claims

1. A method of forming an exhaust gas sensor support member comprising the steps of: extruding an elongated tube of green alumina ceramic material; providing the tube with a plurality of substantially parallel longitudinally extending through passages; prefiring the tube until the green ceramic is machinable;



machining one end of the tube of machinable green ceramic to form a cup-shaped end portion having a threaded outer surface;



providing the inner surface of the cup-shaped end portion with a pair of transversely disposed confronting longitudinally extending sensor receiving slots; and final firing the tube.

#### 4,011,656 HAIR CUTTER

Christa Liedtke, Weg zur Platte 72, 43 Essen-Bredeney, Germany

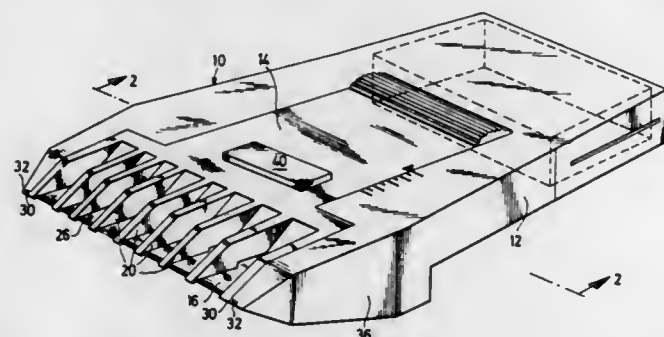
Filed June 20, 1975, Ser. No. 588,986

Claims priority, application Germany, June 26, 1974, 2430650

Int. Cl.<sup>2</sup> B26B 21/12

U.S. Cl. 30—30

5 Claims



1. A hair cutter comprising:
  - a blade carrier plate formed with a recess;
  - a cover plate;
  - guiding means for displaceably guiding said cover plate in said recess between two end positions, said guiding means permitting displacement of said cover plate relative to said blade carrier plate only in one direction along said recess;
  - at least one blade having a blade cutting edge interchangeably retained between said blade carrier plate and said cover plate, said cover plate having a row of teeth which project beyond the cutting edge and are adapted when drawn through the hair to orientate the hair in the manner of a comb, and to engage the hair in operation perpendicularly relative to said blade cutting edge, the cutting length being adjustable upon displacement of said cover plate relative to the blade carrier plate in said one direction along said recess so as to change the length of projecting of said row of teeth over said blade cutting edge;
  - inwardly pointed arresting teeth being mounted on a flanged downwardly facing side of said blade carrier plate;
  - a push button actuating element having a projecting portion projectingly extending through a complementary opening formed in said cover plate and slidably mounted therein for displacement of said push button actuating element relative to both the cover plate and the blade carrier plate in a second direction transverse to said one direction, said push button actuating element having laterally extending shoulders with upwardly pointing arresting teeth for operatively engaging said inwardly pointed arresting teeth of said blade carrier plate so as to arrest and define a desired cutting length;

spring means for biasing said push button actuating element in the arresting position with its upwardly pointing arresting teeth operatively engaging said inwardly pointed arresting teeth, whereby said shoulders are released from said inwardly pointed arresting teeth and said cover plate is free to be displaced together with said push button actuating element in said one direction upon pushing said projecting portion of said push button actuating element.

#### 4,011,657 KNIFE

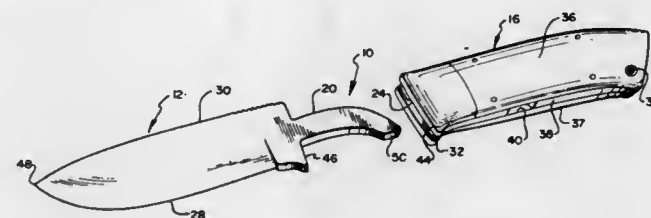
Larry F. Vance, Box 447, Pinedale, Wyo. 82941

Filed Nov. 21, 1975, Ser. No. 634,228

Int. Cl.<sup>2</sup> B26B 5/00

U.S. Cl. 30—337

9 Claims



1. A knife accommodating interchangeable blades comprising:
  - a handle for a blade, the handle comprising:
    - a hand gripping portion having a keyway at the forward end of the handle, the keyway receiving the base of the blade; and
    - an arcuate slot for receiving a dimensionally corresponding arcuate tang, the slot having a forward opening in the keyway at the forward end of the handle and extending through the handle to a side opening in the side of the handle, the arcuate slot curving toward the side of the handle corresponding to the working edge of the blade, the side opening permitting debris in the slot to be forced therefrom by the tang; and
  - a blade comprising a working edge and having an arcuate tang extending from the base of the blade, the tang curving toward the working edge of the blade and being dimensionally configured to be received in the slot in the handle, the base of the blade being received in the keyway.

#### 4,011,658

#### DEVICE FOR INSERTING DENTAL FLOSS THROUGH INTERPROXIMAL AREAS AND METHOD OF USING SAME

E. B. Tarrson, Chicago, Ill., and R. Young, Bowmanville, Canada, assignors to John O. Butler Company, Chicago, Ill. Continuation of Ser. No. 264,171, June 19, 1972, Pat. No. 3,929,144. This application Oct. 20, 1975, Ser. No. 624,037

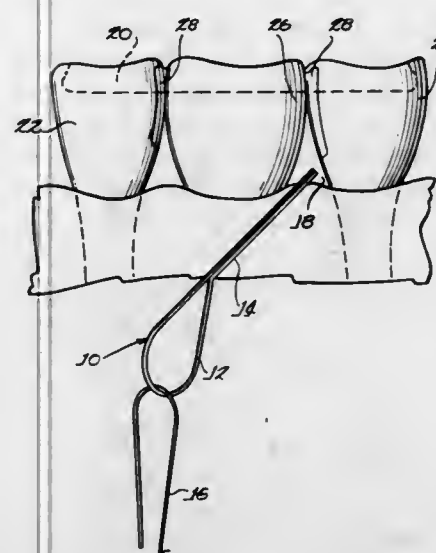
Int. Cl.<sup>2</sup> A61C 15/00

U.S. Cl. 32—40 R

7 Claims

1. A method of threading a long filament through an interstice comprising the steps of:
  - a. forming a relatively large looped portion of soft and flexible material of fine diameter joined together to form a unitary elongated guide member adjacent to and integral with said loop, said material being soft and flexible enough to deform and fit through said interstice and thereafter springing back into the shape of the original large loop form;
  - b. threading said long filament through said large looped portion;
  - c. projecting said guide member through said interstice and pulling said guide until said loop and long filament pass completely through said interstice, whereby said loop may be relatively large to eliminate all threading problems and yet extremely flexible so that the loop may be

deformed to be no larger in diameter than the interstice which it passes through, thereafter returning to its normal diameter; and



- d. removing said looped portion from its threaded association with said long filament.

#### 4,011,659 CENTERING APPARATUS

Torgny William Hörvallius, Gavle, Sweden, assignor to Aktiebolaget SAMEFA, Stockholm, Sweden

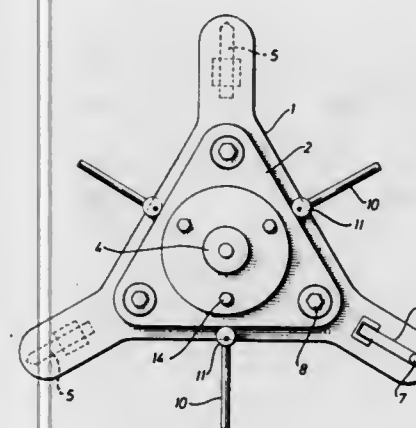
Filed Apr. 16, 1975, Ser. No. 568,732

Claims priority, application Sweden, Apr. 23, 1974, 7405412

Int. Cl.<sup>2</sup> G01B 5/24

U.S. Cl. 33—203

9 Claims



1. An apparatus for adjustment of a cylindrical holder into coaxial relation to a rotatable body, which holder is intended to be used in conjunction with measuring equipment for checking the direction or position of the rotatable body, comprising:
  - a base member having a flat surface and adapted to be attached to the body to be checked, or to a part rigidly secured to said body, e.g. a vehicle wheel, with said flat surface transverse to the rotational axis of said body;
  - an intermediate member mounted substantially concentrically on the base member, displaceable along said flat surface of said base member, and having guide means including a portion at least in part spherically shaped fixed thereon; and
  - said cylindrical holder being in turn mounted on said intermediate member, said cylindrical holder including a socket means slidably and tiltably receiving said spherically shaped portion of said guide means for permitting tilting of said cylindrical holder about said spherically shaped portion.

#### 4,011,660

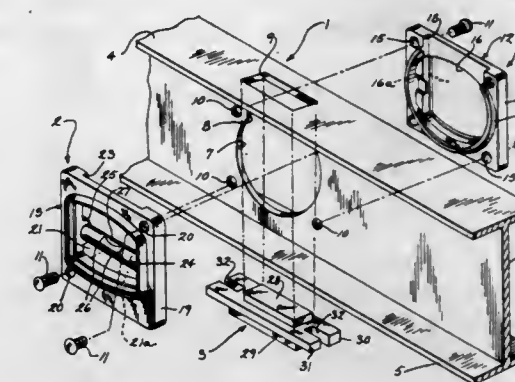
SPIRIT LEVEL WITH TOP WINDOW MOUNTING  
George A. Johnson, Mequon, Wis., assignor to Johnson Products Company, Inc., Milwaukee, Wis.

Filed Mar. 29, 1976, Ser. No. 671,584

Int. Cl.<sup>2</sup> G01C 9/28

U.S. Cl. 33—379

8 Claims



1. A spirit level comprising, in combination:
  - a. a frame having a web and at least one longitudinal flange disposed on an edge of said web,
  - b. said web having an opening disposed therein, and said flange having a window opening disposed therein adjacent to and continuous with said web opening,
  - c. a window element having a window portion disposed in said window opening, a window portion extending toward said web opening, and a central portion which forms first and second locating ledges extending longitudinally beyond said window portions,
  - d. and a bubble vial assembly comprising a pair of cases mounted on opposing sides of said web opening,
  - e. the first of said cases engaging said first locating ledge to hold said window element tightly against said flange,
  - f. and the second of said cases and said second locating ledge being spaced apart to provide for adjustment of said second case parallel to the plane of said web, said second case having a bubble vial mounted thereon.

#### 4,011,661

#### POWDERED EMULSION PRODUCT AND METHOD OF PRODUCTION

Hitoshi Sezaki, and Shozo Muranishi, both of Kyoto, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan Continuation of Ser. No. 519,048, Oct. 29, 1974, abandoned.

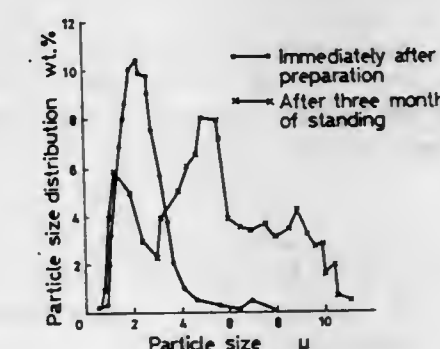
This application Dec. 15, 1975, Ser. No. 640,843

Claims priority, application Japan, Oct. 30, 1973, 48-121929; Oct. 30, 1973, 48-121930

Int. Cl.<sup>2</sup> F26B 7/00

U.S. Cl. 34—12

6 Claims



1. A method of preparing a powdered product suitable for preparing an emulsion which comprises: dispersing at least one substance selected from (a) a solution of a drug or nutrient in oil, or (b) an emulsion of an aqueous solution of a drug or nutrient in oil, in an aqueous solution containing 0.5–10.0% by weight of a surface layer former based on the



total weight of oil and water and thereafter spray-drying the dispersion.

**4,011,662**  
**AUTOMATIC VALVE ASSEMBLY AND**  
**HEATER/HUMIDIFIER CONVERTER FOR CLOTHES**  
**DRYER**

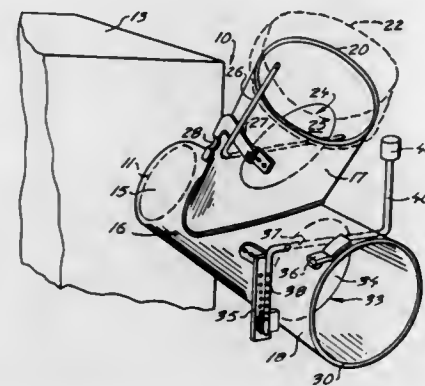
Howard Coe Davis, Surrey, and Nicholas Hoolsema, Langley,  
both of Canada, assignors to Delmarco Management Ltd.,  
Langley, Canada

Filed Mar. 19, 1976, Ser. No. 668,493

Int. Cl.<sup>2</sup> F26B 19/00

U.S. Cl. 34—90

14 Claims



1. An automatic valve assembly for use with a clothes dryer having an exhaust opening within a building, the valve assembly communicating with an inlet duct which is connected to the dryer exhaust opening, and dividing at a duct junction into first and second exhaust ducts; the first exhaust duct exhausting into the building, carrying a filter and having a manual valve adapted to close or open the first duct; the second exhaust duct exhausting outside the building and carrying the automatic valve assembly; the automatic valve assembly being characterized by:

- i. a valve plate mounted for rotation about a hinge axis between closed and open positions, the plate having a central axis which divides the plate into two generally equal areas, the hinge axis being parallel to and spaced from the central axis to journal the plate off-centered so that when the plate is exposed to a predetermined flow of air a force on the plate is generated which tends to swing the plate towards the open position,
- ii. releasable latch means cooperating with the plate to hold the plate closed until a predetermined excessive exhaust pressure is developed on an upstream side of the plate due to restriction of exhaust flow through the filter in the first exhaust duct,
- iii. pressure sensing means exposed to exhaust pressure on the upstream side of the valve plate and cooperating with the latch means to release the latch means when the exhaust pressure exceeds the predetermined excessive pressure,
- iv. steadying means cooperating with the plate to maintain the plate, when released, in the open position in which there is negligible restriction of air flow past the automatic valve.

**4,011,663**  
**APPARATUS FOR DRYING FABRICS**  
Richard E. Moyer, Fairport, N.Y., assignor to Synchro Systems, Inc., St. Johnsville, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,209

Int. Cl.<sup>2</sup> F26B 13/02

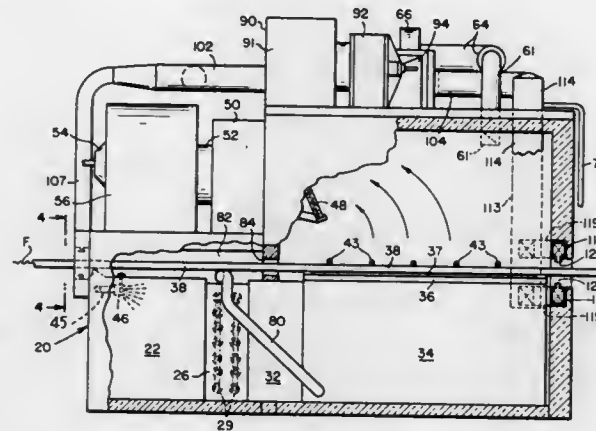
U.S. Cl. 34—155

10 Claims

1. Apparatus for drying wet fabrics, comprising a machine frame having therein a preheat chamber communicating with an entrance to said frame, and a diffusion chamber, communicating with an exit from said frame,

means for advancing a strip of wet fabric in a plane successively through said entrance, and preheat chamber, said diffusion chamber and said exit,

means for circulating superheated steam from a supply thereof through said diffusion chamber from an inlet adjacent one side of said diffusion chamber to an outlet adjacent the opposite side thereof, and transversely of the fabric in said diffusion chamber, whereby the steam is caused to pass through the last-named fabric from one side hereof to the other, thereby to drive moisture therefrom,



said circulating means including means for recirculating said steam back to said supply the steam has passed through said fabric, and duct means opening on said diffusion chamber at said one side of the fabric and directly connecting said diffusion chamber to said preheat chamber to feed part of the steam which enters said diffusion chamber to said preheat chamber before the last-named steam has passed through any fabric in said diffusion chamber.

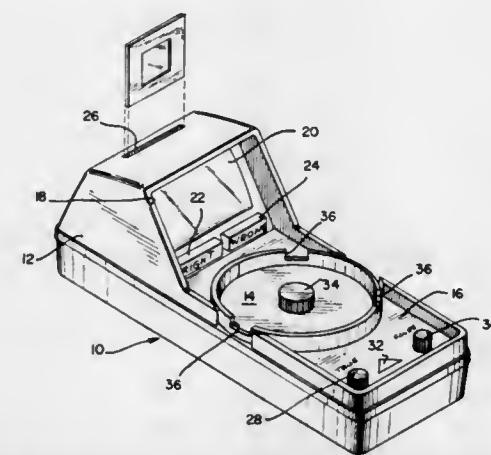
**4,011,664**  
**SELF-CORRECTING ANSWER MACHINE**  
Myron D. Weisberg, Bergenfield, and Selden Levy, Rivervale,  
both of N.J., assignors to Vis-Quiz, Inc., New York, N.Y.

Filed Aug. 6, 1975, Ser. No. 602,276

Int. Cl.<sup>2</sup> G09B 7/02

U.S. Cl. 35—9 B

6 Claims



1. A visual self-correcting answer machine in which questions are presented to a user and the user indicates whether the answer is TRUE or FALSE, there being provided means for indicating whether the user's answer is RIGHT or WRONG, said answer machine comprising a cabinet housing the components of said answer machine therewithin, a rotary dial plate mounted on said cabinet for receiving a circular question card containing questions printed thereon to be answered by the user, a question indicating area on said cabinet indicating the question to be answered, a pair of depressible switch means designating the choice of a TRUE or FALSE answer by the user, RIGHT and WRONG visual indi-

cations, electrical circuit means cooperatively keyed and connected to said rotary dial, to said pair of depressible switch means and to said visual indicators to indicate whether the user's answer of TRUE or FALSE was RIGHT or WRONG, wherein said rotary dial and said circular card comprises cooperating members enabling said card to be placed on said dial in only one spatial orientation wherein said electric circuit means comprises a rotary multiposition switch operated by said dial and having a plurality of positions corresponding to the number of questions on said card, said multiposition switch being wired to show whether an answer is TRUE or FALSE according to the position of said rotary multiposition switch, such that a plurality of different question cards can be used with said answer machine.

**4,011,665**  
**DEVICE FOR PROVIDING A SEMI-PERMANENT**  
**LUMINESCENT DISPLAY**

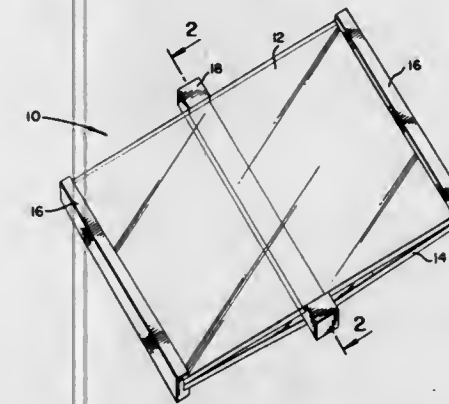
Lillian Port, 532 10th St., Brooklyn, N.Y. 11215

Filed Nov. 2, 1973, Ser. No. 412,186

Int. Cl.<sup>2</sup> B43L 1/12

U.S. Cl. 35—66

16 Claims



1. A display device for providing a semi-permanent luminescent display comprising a first sheet of substantially transparent material provided with a fluorescent dye dispersed throughout and provided with at least one smooth major surface; a dispersive second sheet of material having at least one smooth major surface disposed adjacent to and coextensive with said first sheet to position said respective smooth surfaces of said sheets in opposition to each other, at least one of said sheets being pliable to permit the selective application of pressure on portions thereof to cause said smooth surfaces to come into intimate contact with one another and to cause the same to adhere to each other in the regions of said selected portions to disperse the light which impinges at said portions and to result in a luminescent effect, said sheets being separable from one another to terminate the intimate contact at the interface between said smooth surfaces at the selected portions and terminate the luminescent effect.

**4,011,666**  
**SOLE PATTERN FOR SHOES**  
Gerhard Karl Lehmann, Vordingborg, Denmark, assignor to A/S Jac. Engelbrecht, Vordingborg, Denmark

Filed Aug. 21, 1975, Ser. No. 606,526

Claims priority, application Germany, June 27, 1975, 7520546

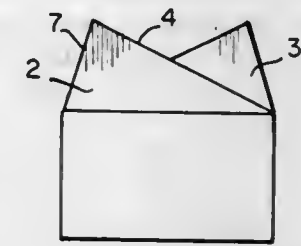
Int. Cl.<sup>2</sup> A43B 23/28

U.S. Cl. 36—59 C

6 Claims

1. A sole pattern for shoe soles of elastic yielding material, comprising: a plurality of rows of projections extending across said sole generally perpendicular to the longitudinal axis of the sole, each of said rows comprising a plurality of pairs of separate, spaced projections whose cross section decreases in a direction at right angles away from the sole, wherein the two projections of each pair are associated in such a way that the tread surface of one projection is sloped inwardly toward the

sole and lies in an inclined plane extending transversely of the sole, and the tread surface of the other projection is also sloped inwardly toward the sole and lies in a second inclined plane extending transversely of the sole, said first and said second mentioned inclined planes being oppositely directed,



and the tread surface of each projection being defined by a pair of side faces, and an end face that meets the tread surface to form an apex, at least said end face being inclined inwardly relative to a plane extending normally from the surface of said sole.

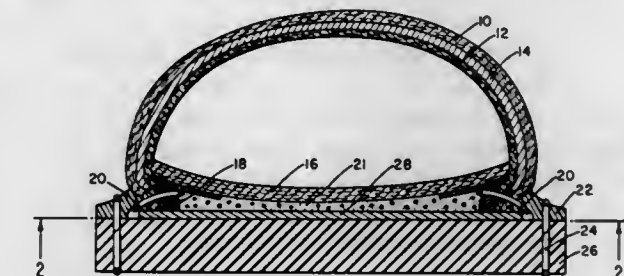
**4,011,667**  
**SAFETY SHOES**  
Wirt G. Greenan, Wakefield, Mass., assignor to Safety Box Toe Company, Wakefield, Mass.

Filed June 28, 1976, Ser. No. 700,101

Int. Cl.<sup>2</sup> A43C 13/14

U.S. Cl. 36—77 R

8 Claims



1. A safety box toe system comprising a welt shoe, a flangeless box toe of crush-resistant material mounted beneath the upper, a stress-absorbing plate disposed beneath the insole, aligned with the lower edge of the box toe and having its periphery lying adjacent the insole line, and an outsole of resilient material.

**4,011,668**  
**ADJUSTABLE DEFLECTOR FOR SNOW REMOVAL**  
**MACHINE**  
Ralph R. Gunderson, 8212 S. Homan, Chicago, Ill. 60652

Continuation-in-part of Ser. No. 337,918, March 5, 1973, Pat. No. 3,879,866. This application Mar. 3, 1975, Ser. No. 554,539

The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> E01H 5/04

U.S. Cl. 37—43 R

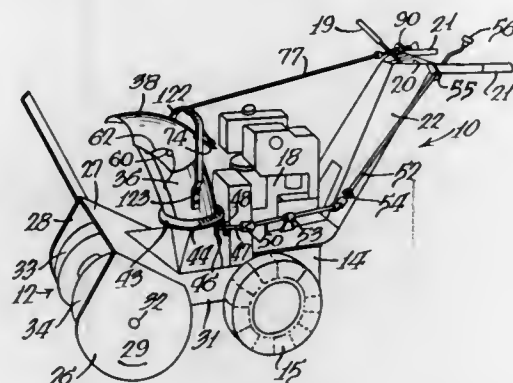
5 Claims

1. In a snow removal machine, an adjustable snow directional device for directing snow particles forwardly and laterally of the machine, comprising:

- a) an upright chute for receiving snow particles from the machine and directing said particles upwardly to an open upper end of said chute, said chute being rotatable about an upright axis of rotation;
- a) a deflector pivoted to the chute for swinging movement between an upper position and a lower position, the deflector being positioned transversely of the open upper end of the chute to intercept and to redirect snow particles outwardly of the open upper end of the chute, the swinging movement of the deflector between said upper and lower positions varying the direction of the path of snow particles from the chute;



retracting means normally urging the deflector toward said upper position;  
a support bracket;  
a stationary surface carried by the bracket;  
means for mounting the bracket to position the bearing surface on the axis of rotation of the chute; and  
means for selectively adjusting the deflector toward said lower position, the adjusting means including lever means on the deflector extending transversely of the axis of rotation of the chute, and a single, elongated, flexible



control cable extending to a control station, said control cable having an attaching portion secured to said lever means and passing rearwardly over the bearing surface on the bracket,

whereby movement of said control cable to counteract said retracting means will pivot said deflector downwardly to a preselected position of adjustment, and rotation of the chute about its axis of rotation will swing said attaching portion on a uniform radius about said axis of rotation so that the deflector is maintained in said preselected position of adjustment during said rotation.

4,011,669

# POWER SCRAPER WITH APRON ON A MOVABLE PIVOT AXIS

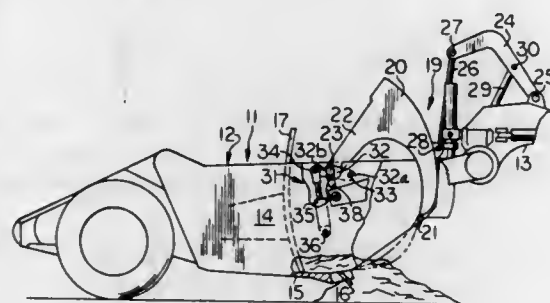
Ray H. Hahn, Dunlap, and Larry G. Eftefield, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 24, 1975, Ser. No. 644,231

Int. Cl.<sup>2</sup> E02F 5/00

U.S. Cl. 37-126 AD

10 Claims



1. An improved apron operating means for a power scraper which includes a tractor and a scraper with a bowl that has sidewalls and a floor provided with a forward cutting edge, and an apron mounted for movement about a pivot axis near the top of the scraper between an initial, elevated, unlatching position, a closed position with its lower edge against the bowl floor immediately adjacent the cutting edge, and an intermediate loading position with said lower edge in a plane above the cutting edge, said operating means comprising, in combination:

hydraulic cylinder means pivotally connected to the scraper and to the apron for moving the apron about said pivot axis between its elevated position and its closed position; and translating means operatively connecting the apron to the sidewalls of the bowl for automatically and continu-

ously shifting said pivot axis a short distance downwardly from an initial position during the entirety of said moving the apron about the pivot axis so that the path of the lower edge of the apron from elevated position toward intermediate position is forward of an arc of a circle struck about said initial position of the axis, and said path from intermediate position to closed position is below said arc.

4,011,670

# ROLLER MOUNTING

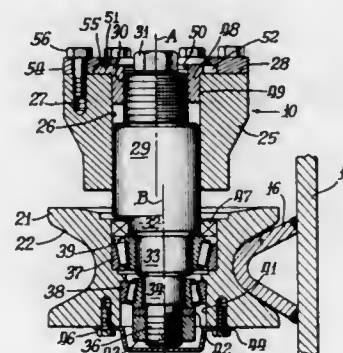
James P. Hutchings, Coal City, and Jack H. Trittipoe, Elwood, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 9, 1975, Ser. No. 566,463

Int. Cl.<sup>2</sup> E02F 3/76, 3/80

U.S. Cl. 37-126 R

4 Claims



1. A roller mounting providing independent axial and lateral adjustment of a roller, comprising:

a mounting bracket having a bore extending therethrough; an elongated shaft extending into said bore of the mounting bracket and having opposite ends, a longitudinal axis, an eccentric portion formed on one of said ends having an axis radially offset from the longitudinal axis of the shaft, and a threaded portion formed on said other end of the shaft;

a roller rotatably mounted on the eccentric portion of the shaft so that rotation of the shaft within the bore of the mounting bracket causes limited lateral movement of the roller relative to the mounting bracket;

retaining means having a threaded bore extending through screw threaded onto the threaded portion of the other end of the shaft so that rotation of the retaining means relative to the shaft and the mounting bracket causes the shaft to be selectively translated along its longitudinal axis for moving the roller axially relative to the mounting bracket; and

means for releasably locking the retaining means to the mounting bracket, said locking means being independent of contact with the shaft so that the shaft may be positioned at any one of a variety of axially spaced positions with respect to the retaining means and mounting bracket when the retaining means is locked to the mounting bracket, said locking means being of a construction sufficient for permitting the retaining means to be rotated relative to the mounting bracket and independently of the shaft for moving the shaft axially to said any one position.

4,011,671

# PROGRESSIVE WEIGHT CHART

Danny L. Fogel, 160 N. Shores Drive, Solana Beach, Calif. 92075, and Leonard M. Luttbeg, 2828 Upshur St., San Diego, Calif. 92106

Filed Feb. 10, 1975, Ser. No. 548,826

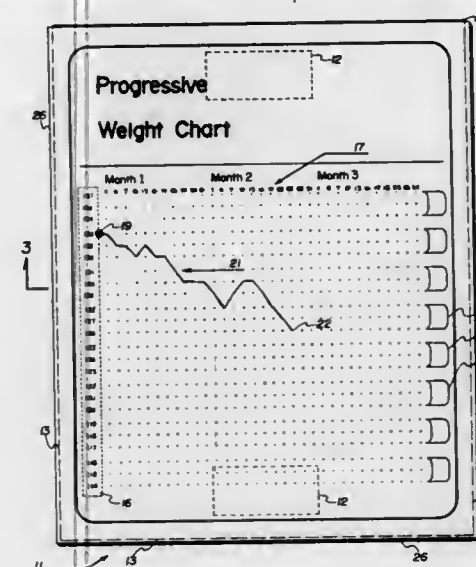
Int. Cl.<sup>2</sup> G09B 29/00

U.S. Cl. 35-7 R

1 Claim

1. A progressive weight chart comprising:  
a flat board member constituting the surface on which successive weight changes may be plotted, said member having a generally rectangular configuration;

a vertical weight scale disposed along one border of said member in proximity to the first edge thereof and forming one axis of said chart, successive numbers of said scale being grouped in groups of at least two numbers, each group being spaced from the next succeeding group by a greater vertical displacement than the vertical displacement between two adjacent numbers within each group;  
a time scale disposed at right angles to said weight scale adjacent to another border of said chart and forming a second axis of said chart; and



a plurality of incentive indicia disposed along the border in proximity with that edge of said board member opposite to said first edge, each of said incentive indicia extending along a distinct weight range corresponding to one of said groups; said incentive indicia being correlated with said groups of numbers of said weight scale so as to reflect the progressive weight changes plotted on said chart and any psychological affect thereof.

4,011,672

# MOUNTING FRAME

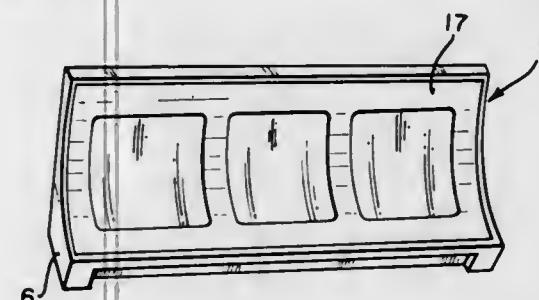
Gerald M. Grusin, Chicago, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Nov. 12, 1975, Ser. No. 631,291

Int. Cl.<sup>2</sup> G09F 3/18

U.S. Cl. 40-16.2

4 Claims



1. A holder for photographs or the like comprising spaced end walls of a triangular-like configuration each having a long edge and a short edge, creating respectively an apex and a base at their intersection with the approximate hypotenuse, which hypotenuse is concave, a first side wall affixed to the apex of each end wall, a second side wall affixed to the base of each end wall, an undercut extending along the inner side of each of said first and second side walls, a third wall affixed to and extending between said end walls, and located between said first and second side walls, a flexible sheet of a size to fit snugly between said end walls and the first and second side walls, opposite edges of the sheet being positioned in each of said undercuts, said sheet being flexed inward in a concave configuration against said third wall, and the photographs or

the like being positioned between and held in place by said sheet and said third wall whereby the holder may be placed in use in either of two positions: first residing on said long edge, or, second residing on said short edge.

4,011,673

# VISUAL INDICIA BEARING CLIP

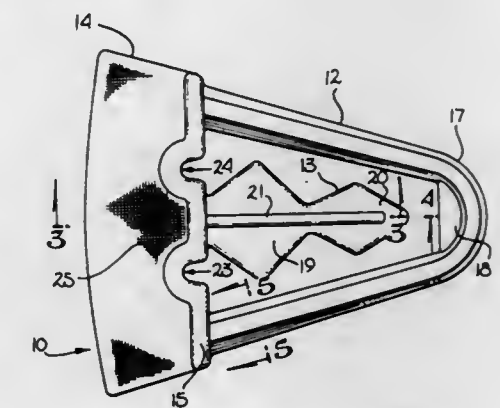
Irving Levine, 23555 Park Belmonte, Calabassas Park, Calif. 91302

Filed Nov. 19, 1975, Ser. No. 633,253

Int. Cl.<sup>2</sup> G09F 3/16

U.S. Cl. 40-23 A

7 Claims



1. A visual indicia clip apparatus comprising:  
a. a base member having visual indicia bearing means for receiving visual data, said base member including a pair of concave indentations disposed into the bottom surface thereof;  
b. an outer clamping limb depending from the bottom surface of said base member and having a pair of outer arms, said outer arms being substantially V-shaped, said outer clamping limb being tapered from the junction between each of said arms and the bottom surface of said base member; and  
c. an inner clamping arm depending from a ridge disposed along the bottom surface of the base member, said inner clamping arm being intermediate said concave indentations and centrally extending between the arms of said outer clamping limb, said inner clamping arm being in a planar relationship to said outer clamping limb, said inner clamping arm having first and second portions, said first portion being adjacent the bottom surface of said base member and extending laterally outwardly toward the outer arm of said outer clamping limb, the outermost lateral section of said first portion being tapered inwardly to a point adjacent said second portion, said second portion being tapered outwardly to a maximum which is less than the outermost lateral section of said first portion.

4,011,674

# MAGNETIC KINETIC AMUSEMENT DEVICES

Sava W. Jacobson, 4915 Tyrone Ave., Sherman Oaks, Calif. 91403

Division of Ser. No. 492,042, July 26, 1974, Pat. No. 3,908,307. This application Sept. 25, 1975, Ser. No. 616,762

Int. Cl.<sup>2</sup> A63H 33/26

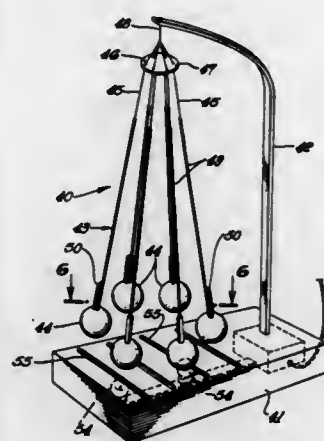
U.S. Cl. 40-39

3 Claims

1. A magnetic kinetic amusement device comprising:  
a frame,  
at least three magnetic elements,  
at least three mounting means supported by said frame, at least one magnetic element being mounted by each such means, said magnetic elements each having the same type of pole facing upwardly as each other magnetic element, said magnetic elements thus being supported in spaced, magnetically coupled relationship so that motion of one mounting means intermittently is interchanged magnetically with another such mounting means to produce inter-



mittent alternating motion of the magnetically coupled means, and  
wherein each mounting means comprises a design member situated at the bottom of an individual string, a magnetic element being attached to each such design member, each string being attached to a location on said frame



spaced from the location of attachment to the frame of each other string with said locations being spaced apart in more than one dimensional plane so that said design members are spatially distributed in three-dimensional array,  
each string permitting both swinging and rotational motion of the attached design member.

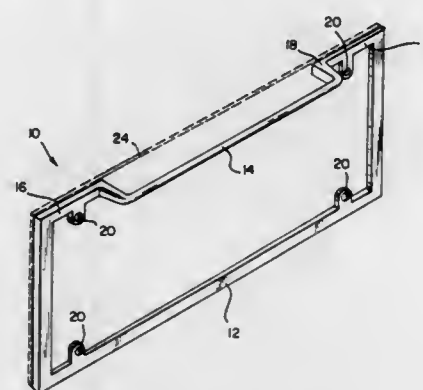
4,011,675

**REMOVABLE LICENSE PLATE HOLDER**

Gerald L. Herring, Freeport, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest  
Filed Jan. 14, 1976, Ser. No. 648,866  
Int. Cl.<sup>2</sup> G09F 7/00

U.S. Cl. 40-209

4 Claims



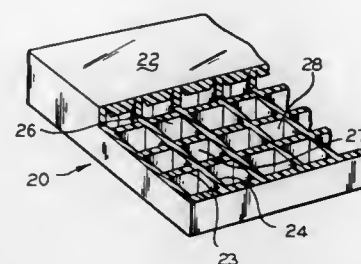
1. A vehicle license plate holder adapted to receive and be affixed to a license plate and as a unit engage therewith a vehicle bumper having first apertures therein comprising a substantially rectangular frame means, one side of said frame defining a first member out of planar alignment with the balance of said frame, said first member having inleted portions adjacent each distal end thereof, a shoulder communicating between each inleted portion and said first member, said inleted portions being in planar alignment with said frame, a plurality of second apertures defined on said frame means and being axially alignable with said first apertures, means for affixing said frame to said vehicle bumper through said first and second apertures, said means including an externally threaded bolt and an internally threaded nut adapted to engage said bolt and said plate, pivot means disposed on a distal end of said bolt, a second member integral with said pivot means and adapted to pivot about said pivot means between a position in planar alignment with said bolt and a position substantially perpendicular thereto, said second member adapted to engage said vehicle bumper through said first apertures.

4,011,676  
**PERSONALIZED MESSAGE SYSTEM AND PROCESS**  
Frederick J. Ritter, 6007 N. Sheridan Road, Chicago, Ill. 60660

Filed Jan. 8, 1975, Ser. No. 539,290  
Int. Cl.<sup>2</sup> G09F 7/06

U.S. Cl. 40-143

2 Claims



1. A personalized indicia apparatus comprising:  
an integral board means having a cellular structure comprising a plurality of fastening connector halves;  
a surface covering said cellular structure and concealing said plurality of fastening connector halves forming said cellular structure,  
said surface having means to facilitate the punching away of said surface over one or more of said fastening connector halves,  
said means for facilitating the punching away of said surface comprising a series of geometrically shaped fragile peripheral indentations in said surface,  
each of said series of said indentations aligned with one of said plurality of fastening connector halves respectively to enable facilitated removal of said surface in said geometric shape, directly over one of said plurality of fastening connector halves;  
said indicia means including mating fastening connectors whereby the indicia may be inserted through the punched areas positioned in place in the cellular structure, and means whereby the connectors on the indicia attach themselves to the connector halves in the cellular structure;  
said cellular structure comprising horizontal and vertical partitions beneath said surface between each of said series of geometrically shaped indentations, and  
said connectors completing a seizure responsive to a snug fit between the cellular walls of said fastening connector halves and said connectors, each of said connectors comprising at least one mating rod on said indicia means.

4,011,677

**FLOWER CORSAGE FRAME**

Mary Kathryn Higdon, and Zalita Higdon Speas, both of 1324 E. Grand, Ponca City, Okla. 74601

Filed June 16, 1975, Ser. No. 586,989

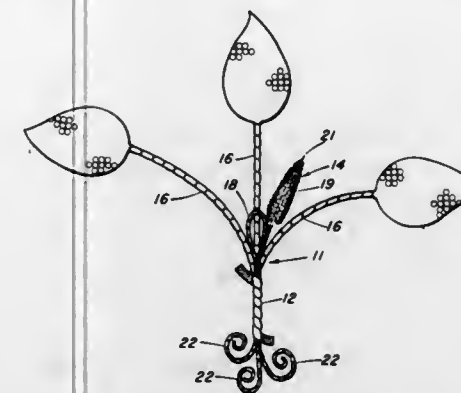
Int. Cl.<sup>2</sup> A01G 5/00

U.S. Cl. 47-55

8 Claims

1. A leaf-stem assembly for use in floral arrangements consisting essentially of:  
a. at least one leaf member, said leaf member consisting of at least two layers of material, said layers being sealed together;  
b. at least one stem member, one end portion of said stem member being positioned between said layers for a distance of at least one-half the length of said leaf member; and  
c. a wire member inserted through said leaf member at its

base portion and wrapped around the base portion of said leaf member and said stem member and thereafter ex-



tending along said stem member away from said leaf member to form a part of said stem member.

4,011,678

**SAFETY SYSTEM FOR FIREARM**

Eduard Brodbeck, Beringen, Switzerland, and Theobald Förster, Hohentengen, Germany, assignors to SIG Schweizerische Industrie-Gesellschaft, Germany

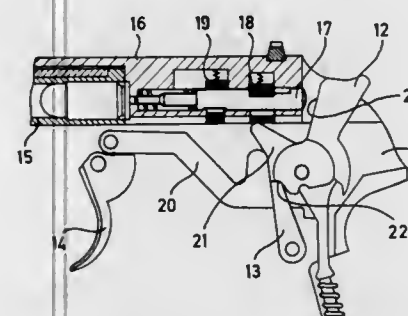
Filed May 20, 1976, Ser. No. 688,340

Claims priority, application Germany, June 27, 1975, 2528831

Int. Cl.<sup>2</sup> F41C 17/04

U.S. Cl. 42-70 F

4 Claims



1. A safety mechanism for firearms having a firing pin movable in a first direction to fire a cartridge and a first spring-loaded safety member movable in a second direction transverse to said first direction between a normal blocking position in which said first safety member engages a first recess formed on the firing pin and a release position in which the safety member is clear of said recess, comprising  
a second safety member movable between a release position in which said second safety member clears the firing pin and a blocking position in which said second safety member engages a second recess formed on said firing pin, and means for urging said second safety member towards said release position,  
said urging means and second safety member being structured and located so that an impact which causes said first safety member to move to its release position also causes said second safety member to move to its blocking position to prevent an unintentional firing of the cartridge.

4,011,679

**SPRING BIASED FISH HOOK SETTER.**

Melvin L. Smith, 12902 E. Sprague Ave., Spokane, Wash. 99216

Filed Jan. 10, 1974, Ser. No. 432,407

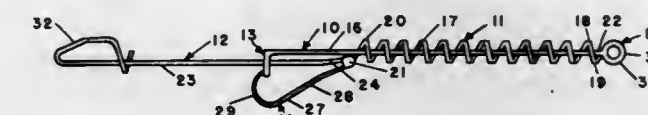
Int. Cl.<sup>2</sup> A01K 97/00

U.S. Cl. 43-15

1 Claim

1. A spring biased fishhook setting device, comprising, in combination:  
an extension type biasing spring defining an elongate central channel;

an elongate resilient first rod structurally joined to the first end of the biasing spring, having means for attachment of a fishing line at the end of joinder to the spring, extending through the central channel of the spring and a predetermined distance therebeyond to carry a substantially perpendicularly extending rod guide defining a central eye at a spaced distance from the first rod;  
an elongate resilient second rod structurally joined to the second end of the biasing spring and extending in substantially axial alignment away therefrom in the same direction as the first rod, to pass through and be slideably



carried in the central eye of the rod guide, and to extend therebeyond to carry means of attaching a fishing line thereto; and

a J-shaped setting hook structurally carried by the second end of the biasing spring to extend away from the spring and toward the rod guide with the open hook element oriented in the same direction as the extension of the rod guide from the first rod, said hook being manually movable against both lineal and rotary spring bias to releasably hook into the central eye of the rod guide and be released therefrom by predetermined tension force between the two line fastening means.

4,011,680

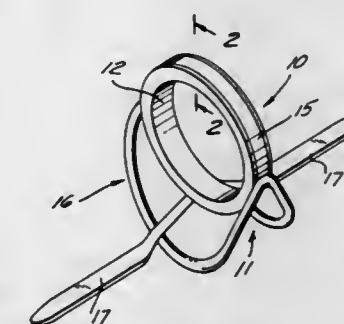
**LINE GUIDE FOR A FISHING ROD**

Donald D. Rienzo, Sr., Hicksville, N.Y., assignor to Allan Tackle Manufacturing Co., Inc., Hicksville, N.Y.  
Filed Oct. 31, 1975, Ser. No. 627,519

Int. Cl.<sup>2</sup> A01K 87/04

U.S. Cl. 43-24

7 Claims



1. A line guide for a fishing line comprising:  
a generally ring-shaped guide member made of a material consisting of titanium and ceramic as a binder, a matching shaped band of hard metal encompassing said guide member with a tight fit; and  
mounting means fixedly secured to said metal band for fastening the guide member and the band to a fishing rod.

4,011,681

**FISHING LURE**

Manuel D. Johnson, 3284 Gwengreen, Bridgeton, Mo. 63044  
Filed Oct. 28, 1975, Ser. No. 626,351

Int. Cl.<sup>2</sup> A01K 85/00

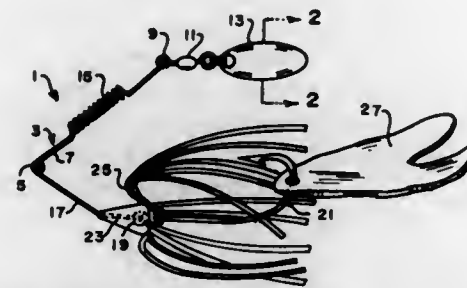
U.S. Cl. 43-42.11

12 Claims

1. A spinner bait comprising a wire harness having a forward apex portion to which a line or leader may be attached, a lower arm extending downwardly and rearwardly from the apex portion and terminating in a fish hook, and an upper arm extending upwardly and rearwardly from the apex portion and carrying at least one rotatable blade, characterized in that a substantial portion of said upper arm includes multiple bend



spring means for resiliently increasing the flexibility of said upper arm and for resiliently changing the length of said upper



arm to give the entire bait a pulsating motion as it is drawn through the water.

4,011,682

### TOY BACKDROP DISPLAY FOR SIMULATING ONE OR MORE ROOMS OF A DOLL HOUSE

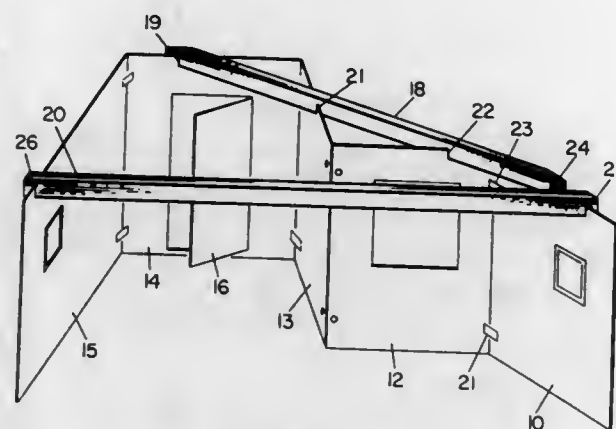
Julie Ann Ach, Long Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 14, 1976, Ser. No. 649,759

Int. Cl.<sup>2</sup> A63H 3/52

U.S. Cl. 46—21

3 Claims



1. An easily assembled and disassembled backdrop display for simulating one or more rooms of a house, such as a doll house, comprising, in combination:

at least one pair of relatively flat simulated wall panels, means coupling said panels together about edges thereof for forming a corner, said coupling means permitting said first and second panels to be moved about said coupled edges relative to one another whereby said panels may form a large plurality of corner angles;

a beam, said beam constructed of plastic material and having a U-shaped channel-like cross-section and a predetermined longitudinal axis;

said beam containing;

a first pair of notches, with the notches of said first pair located in opposite sides of said beam and defining a first passage axis therethrough at an angle to said beam axis; a second pair of notches, with the notches of said second pair located in opposite sides of said beam for defining a second passage axis therethrough inclined to said beam axis and intersecting said first passage axis;

said second pair of notches being spaced a predetermined distance from said first pair of notches;

said first pair of notches being shaped for receiving therewithin and holding said first panel at a predetermined angle and position thereon and said second pair of notches being shaped for receiving therewithin and holding said second panel at a predetermined angle and position thereon;

whereby said beam holds said panels at a predetermined corner angle and increases the stability of said structure by adding weight to said panel edges at a location spaced from said corner and simulates a beamed ceiling; and

third and fourth simulated wall panels, means coupling said third and fourth panels together about edges thereof for forming a corner, said latter coupling means permitting said third and fourth panels to be moved about their said coupled edges relative to one another whereby they may form a large plurality of corner angles;

said beam further containing;

a third pair of notches with the notches of said third pair located in opposite sides of said beam to define a third passage axis inclined to said beam axis and a fourth pair of notches, with the notches of said fourth pair located in opposite sides of said beam to define a fourth passage axis inclined to said beam axis and intersecting said third axis, and

said third pair of notches being shaped for receiving within and holding said third panel at a predetermined angle and position thereon and said fourth pair of notches being shaped for receiving within and holding said fourth panel at a predetermined angle and position thereon.

4,011,683

### SECTIONAL TOY BLOCK

Emilio José Jordão De Sousa, Rua do Salitre 171-3°, Lisboa, Portugal

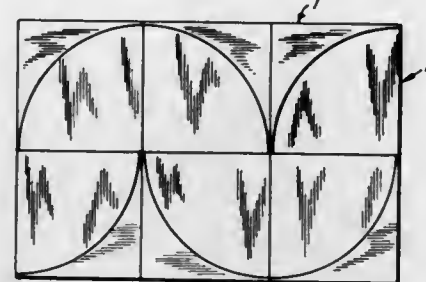
Filed Aug. 21, 1975, Ser. No. 606,590

Claims priority, application Portugal, Feb. 21, 1975, 6433

Int. Cl.<sup>2</sup> A63H 33/08

U.S. Cl. 46—25

9 Claims



1. A three-dimensional block capable of being interfitted with a second identical block to form a polyhedron, said block comprising first and second integral juxtaposed portions of generally triangular shape having bases lying in a common plane, side faces lying in parallel planes, end faces superimposed on one another, and hypotenuse faces which are complementary in shape to one another and which are inclined in opposite directions and contained in planes which intersect one another whereby when the hypotenuse faces of a second block are placed on the hypotenuse faces of said one block the polyhedron is formed.

4,011,684

### CONTROL MECHANISM FOR MODEL AIRCRAFT

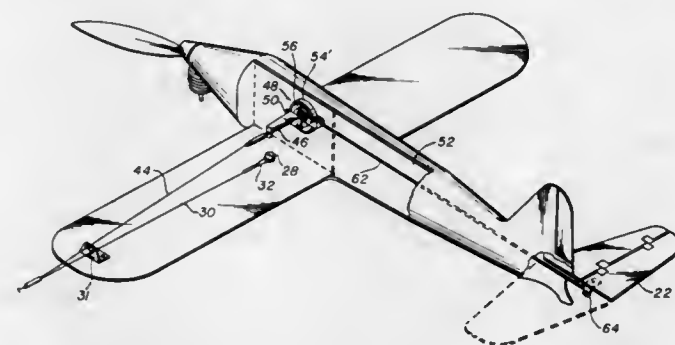
Victor Stanzel, Schulenberg, Tex. 78956

Filed June 2, 1975, Ser. No. 582,590

Int. Cl.<sup>2</sup> A63H 27/04

U.S. Cl. 46—77

9 Claims



1. In a self-supporting model aircraft of the type wherein

control of the aircraft about its lateral axis is accomplished by means of movement of a control surface on the aircraft, the improvement which comprises:

a control device on said aircraft for controlling movement of said control surface;

a control line capable of transmitting torsional force having one end non-rotatably attached to said aircraft and the other end attached to a control handle for rotating said control line;

a flexible shaft means having one end non-rotatably attached to said control line at a point intermediate said control line's attachment to said aircraft and to said control handle and the other end non-rotatably attached to said control device,

whereby torsional forces for controlling said aircraft are transmitted through said control line and flexible shaft to said control device for controlling movement of said control surface.

4,011,685

### PLANT INJECTION METHOD AND APPARATUS

William A. Boyd, 430 N. Mashta Drive, Key Biscayne, Fla. 33149, and Richard T. Britt, 4580 NW. 79th Ave., Miami, Fla. 33166

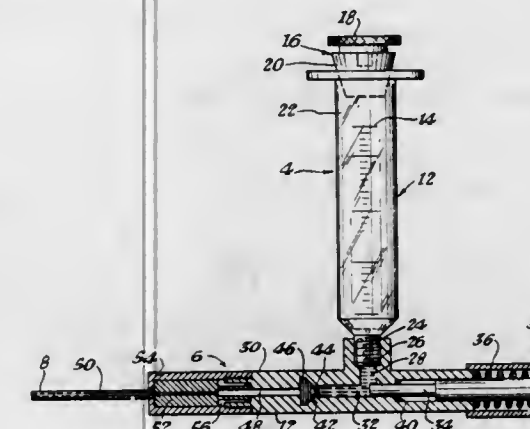
Continuation of Ser. No. 482,268, June 24, 1974, abandoned.

This application Dec. 22, 1975, Ser. No. 642,780

Int. Cl.<sup>2</sup> A01G 29/00

U.S. Cl. 47—57.5

17 Claims



1. A novel method of injecting plant material comprising: injecting a needle into the plant material, placing pressurized fluid through said needle into said plant, the fluid under pressure initially being in an amount sufficient to create a force to seal the surrounding plant material and the outer wall of the needle together to seal the fluid under pressure placed into the plant material from escaping out of the plant material adjacent the outer wall of the needle, subsequently providing additional fluid under pressure to place additional fluid into the plant material, stopping additional fluid input through the needle into the plant material.

4,011,686

### DOOR INTERLOCK SECURITY DEVICE

Edgar A. Jett, III, and Maurice L. Phillips, both of Richmond, Va., assignors to Carmine Foods, Inc., Richmond, Va.

Filed Aug. 4, 1975, Ser. No. 601,668

Int. Cl.<sup>2</sup> E06B 7/00

U.S. Cl. 49—68

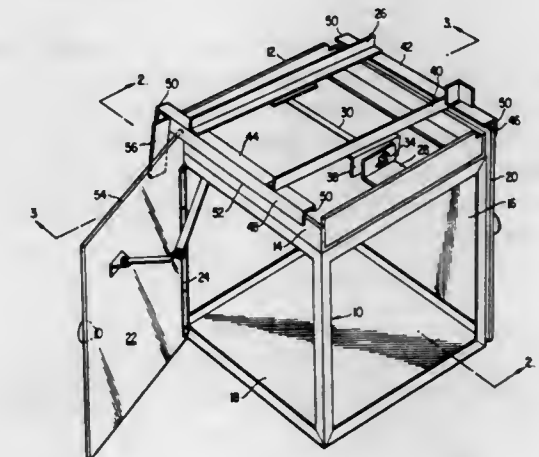
11 Claims

1. A security device comprising:

a frame for defining a chamber;

first and second doors mounted to said frame adjacent openings into said chamber for movement between closed positions, in which they cover said openings, and open positions, in which they do not cover said openings; and

a rigid rocker arm having first and second opposite extremities located adjacent to edges of corresponding first and second doors, said rigid rocker arm being mounted to said frame for rocking movement between a first-door blocking position and a second-door blocking position, each of said first and second extremities of said rocker arm including a latch means for alternately occupying a blocking position blocking the movement of said correspond-



ing door from said closed to said open position and a non-blocking position allowing said corresponding door to move from said closed to said open position, said latch means moving between said blocking and unblocking positions when said rocker arm rocks, and for engaging an edge of said corresponding door when said corresponding door is in an open position to prevent the rocker arm from rocking.

4,011,687

### AIR CONDITIONER WINDOW SASH

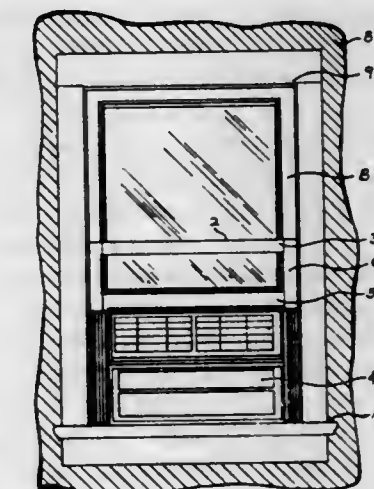
Gary Siegle Disharoon, 1301 Earle Ave., Chesapeake, Va. 23324

Filed Nov. 25, 1975, Ser. No. 635,384

Int. Cl.<sup>2</sup> E06B 7/03

U.S. Cl. 49—70

1 Claim



1. A double hung window assembly adapted to receive a receptacle enclosing an air conditioner unit or the like comprising:

a vertically movable upper window sash adapted to close substantially the upper half of the opening defined by said window assembly when situated at an uppermost position thereof, said upper window sash including a bottom rail positioned at substantially the vertical midpoint of said opening defined by said window assembly when situated at said uppermost position thereof; and

a vertically movable lower window sash adapted to close a portion of substantially the lower half of said opening defined by said window assembly, said lower window sash



including a top rail operationally positionable at the level of and operationally abutting said bottom rail of said upper window sash when said upper window sash is situated at said uppermost position thereof, said lower window sash further including a bottom rail operationally positioned a predetermined distance above the lower edge of said opening defined by said window assembly when said top rail thereof is operationally at the level of and abutting said bottom rail of said upper window sash when said upper window sash is at said uppermost position thereof, said bottom rail of said operationally positioned lower window sash being adapted to abut the upper surface of a receptacle enclosing an air conditioner unit or the like mountable in said opening defined by said window assembly with the lower surface thereof resting upon said lower edge of said opening defined by said window assembly.

4,011,688

**DOOR CLOSURE MECHANISM**

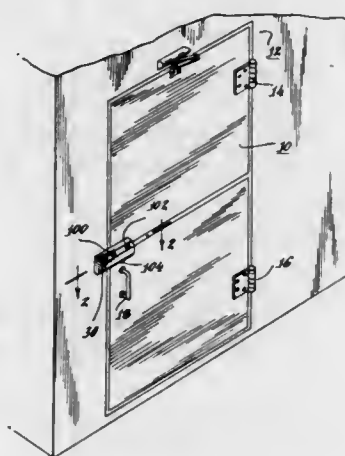
Charles Geiss, Bayport, N.Y., assignor to All-Shield Enclosures, Inc., Westbury, N.Y.

Filed Jan. 16, 1975, Ser. No. 541,418

Int. Cl.<sup>2</sup> E05F 11/34

U.S. Cl. 49—139

8 Claims



1. In a radiation attenuating door closure mechanism, the improvement comprising, a frame, a door mounted with respect to said frame so as to have an open and closed position relative to said frame, first and second closure members designed to close in axial alignment along their respective central axes, one of said members affixed to said door, the other of said member to said frame, said first member including a threaded shaft mounted on a floating platform and extending from said platform, said shaft mounted for positioning of its longitudinal axis in a direction generally normal to said door and frame, said platform mounted on a flexible support, said flexible support providing a plurality of degrees of freedom for varying the position of said platform with respect to said first member such that said shaft axis is self-aligning with said second member central axis, said second member including a threaded receptacle aligned with and forming said central axis of said second member for receiving said threaded shaft, and means for rotating said threaded shaft into said threaded receptacle, thereby drawing and securing said door to said frame.

4,011,689

**GRINDING MACHINE**

Artemio S. Cozzini, 3464 N. Dousman, Milwaukee, Wis. 53212

Filed Sept. 5, 1975, Ser. No. 610,845

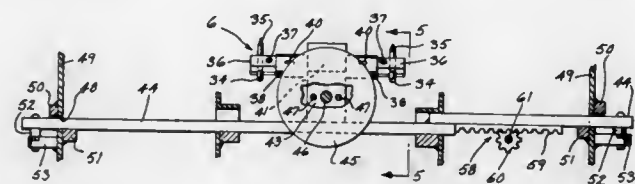
Int. Cl.<sup>2</sup> B24B 53/04

U.S. Cl. 51—5 D

15 Claims

1. A grinding machine, comprising a supporting structure, a pair of grinding wheels mounted for rotation with respect to the supporting structure, each grinding wheel having a gener-

ally cylindrical surface and an outer beveled surface disposed at an angle of less than 45° with respect to said cylindrical surface, said beveled surfaces disposed in mating relation to grind a blade inserted therebetween, dressing means including a separate dressing element for each grinding wheel for dressing the beveled surface of the respective grinding wheels,



support means to carry the dressing means, and mounting means for mounting the support means for movement in a non-linear path with respect to the supporting structure such that each dressing element will move across the respective beveled surface to dress the same during movement of said support means.

4,011,690

**PIPE CLEANING APPARATUS**

John Colin Braithwaite, Newcastle, and John Lawton Edwards, Ashington, both of England, assignors to British Gas Corporation, London, England

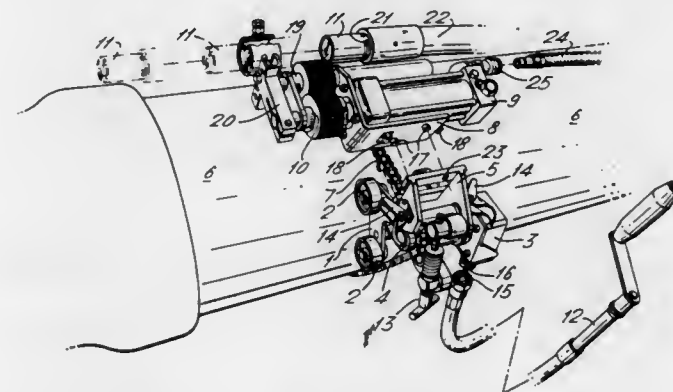
Filed Feb. 19, 1976, Ser. No. 659,357

Claims priority, application United Kingdom, Feb. 27, 1975, 8291/75

Int. Cl.<sup>2</sup> B24C 3/06, 3/32

U.S. Cl. 51—8 R

4 Claims



1. An apparatus for cleaning a surface of a pipe by grit blasting which comprises a carriage provided with a driving mechanism, a tensioning device and a fixing plate, the carriage being movably attached to the pipe by a chain which passes around the pipe and over part of a rotatable toothed cog, which cog is the final drive of the drive mechanism, and attached to the fixing plate is a body provided with an air motor which comprises means for operating a piston in a longitudinal direction along the pipe, and fixed to the piston is a grit blasting nozzle, wherein, in use, the apparatus travels around the pipe by rotating the final drive cog from the drive mechanism, whilst the nozzle reciprocates over a set longitudinal area of the pipe.

4. A method of cleaning a surface of a pipe by grit blasting using the apparatus according to claim 1, comprising the following steps, attaching the carriage to a pipe by means of a chain and tensioning the carriage by means of the tensioning device, attaching the body, including the air motor piston and grit nozzle, to the fixing plate on the carriage, applying the necessary compressed air power to the motor and grit to the nozzle, fixing the hand operated drive to the drive mechanism and rotating the apparatus around the pipe with a piston reciprocating over a set longitudinal area of the pipe.

4,011,691

**METHOD AND DEVICE FOR REMOVAL OF FINS FROM WORKPIECES**

Peter Grund, Lutzelsachsen, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 440,334, Feb. 7, 1974,

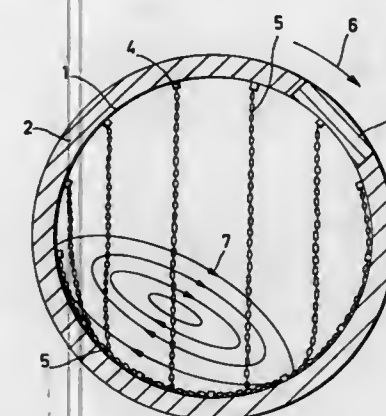
abandoned. This application July 9, 1975, Ser. No. 594,299

Claims priority, application Germany, Mar. 24, 1973, 2314821

Int. Cl.<sup>2</sup> B24B 1/00

U.S. Cl. 51—314

8 Claims



1. A method of removing flashing, fins and the like from molded workpieces comprising the steps of detachably mounting chains to the inner wall of a rotatable drum with each chain being mounted at only one end thereof so as to be free hanging and with each chain having a length no greater than the inside diameter of the drum and with the chains being mounted at spaced locations completely around the inner wall of the drum, subjecting the workpieces to a coolant to embrittle the flashing thereon, disposing the embrittled workpieces inside the rotatable drum through an opening in its circumferential wall, closing the drum opening, rotating the drum about its horizontal axis so that the vertical disposition of each chain is changed as each chain moves in a vertical plane around the drum axis, impacting the chains against the flashing for removing the flashing from the workpieces by the action of the chains against the embrittled flashing, and withdrawing the deflashed workpieces from the same drum opening through which they were inserted.

4,011,692

**METHOD OF AND DEVICE FOR GRINDING GROOVES**

Jules Bos, and Günter Von Der Kall, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

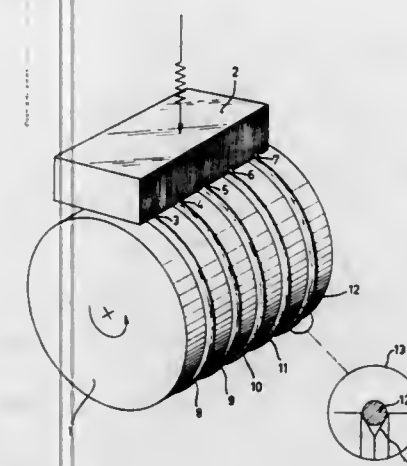
Filed June 26, 1975, Ser. No. 590,437

Claims priority, application Netherlands, July 5, 1974, 7409107

Int. Cl.<sup>2</sup> B26B 1/00; H01F 7/00

U.S. Cl. 51—323

4 Claims



1. A method of manufacturing the core for a magnetic head comprising the following steps:

providing a first block of ferrite;  
providing a number of mutually parallel grooves in a surface of said first block of ferrite said grooves being ground by pressing said first block against a rotating drum having a circumferential groove and at least one metal wire disposed in said groove with at least a part of the cross section of said wire projecting above the surface of said drum;  
providing a second block of ferrite; positioning said surface of said first block against a surface of said second block of ferrite  
connecting said first and second blocks with a non-magnetic material intermediate at least portion of said surface of said first block and said surface of said second block;  
severing the resulting assembly into individual head cores by making sawcuts extending parallel to said grooves.  
2. A core for a magnetic head manufactured in accordance with the method as claimed in claim 1.

4,011,693

**CLEANER FOR CAUTERIZING IMPLEMENTS**

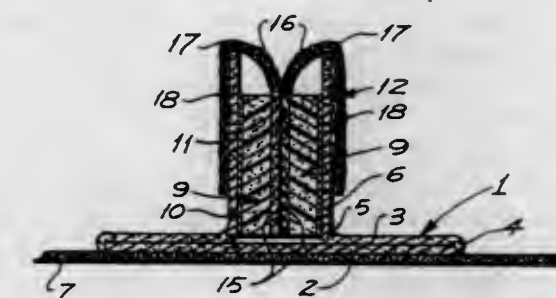
John D. Eldridge, Jr., 310 S. Bayfront, Balboa Island, Calif. 92662, and William D. DeMayo, 511 Hazel Drive, Corona Del Mar, Calif. 92625

Continuation-in-part of Ser. No. 567,627, April 14, 1975, Pat. No. 3,982,357. This application Feb. 9, 1976, Ser. No. 656,417

Int. Cl.<sup>2</sup> B24D 15/08

U.S. Cl. 51—354

4 Claims



1. A cleaner for cauterizing implements, comprising:  
a. a mounting member having a mounting surface and a pair of upstanding webs flexibly connected to the mounting member;  
b. a pair of flat magnet units secured to confronting sides of the webs;  
c. and a covering including abrasive material over the confronting sides of the magnet units;  
d. the magnets exerting a mutually attractive force yieldably maintaining the abrasive coverings in mutual contact; said force diminishing on separation of the abrasive coverings upon insertion of a surgical implement therebetween.

4,011,694

**METHOD AND APPARATUS FOR GUYING A LOAD BEARING MEMBER**

Frederic E. Langford, Redmond, Wash., assignor to Formac International Inc., Seattle, Wash.

Filed Nov. 28, 1975, Ser. No. 635,908

Int. Cl.<sup>2</sup> E04H 12/20

U.S. Cl. 52—1

20 Claims

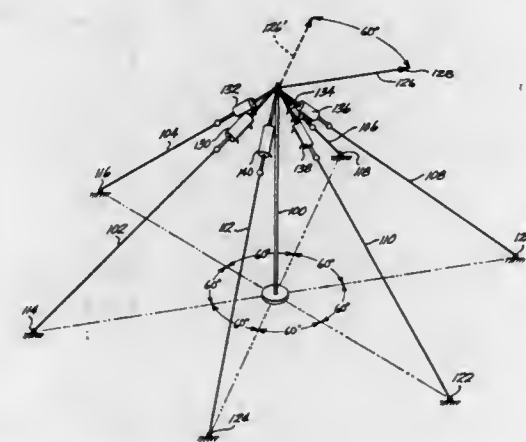
1. In an apparatus for guying a load bearing member capable of having a variable force exerted thereon in a predetermined direction including

a first guy and means for attaching said first guy to said load bearing member and to an anchor so as to place said first guy under a predeterminable tension load when said variable force is exerted on said member,  
a second guy and means for attaching said second guy to said member and to a second anchor so as to place said



second guy under a predeterminable tension load when said variable force is exerted on said member, said second guy being oriented relative to said predetermined direction so that the predeterminable tension load in said first guy is greater than the predeterminable tension load in said second guy,

an improvement for transferring a portion of the load being borne by said first guy to said second guy when said variable force is exerted on said member, comprising: extensible means serially interconnected with said first guy between said member and said anchor so that the tension



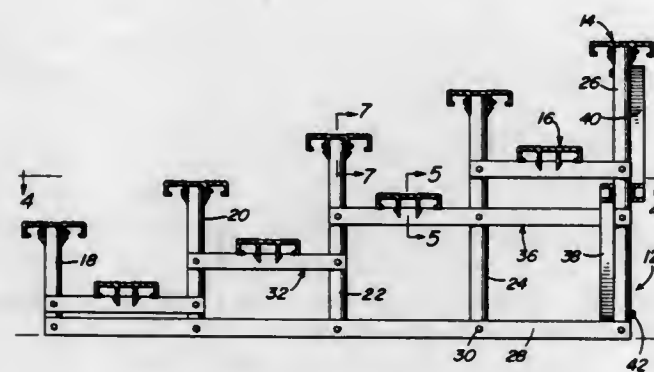
load placed on said first guy is transferred along a load path from said load bearing member through said guy and said extensible means to said anchor, said extensible means for effectively lengthening said first guy when the tension load therein reaches a predetermined value in response to an increase in said variable force exerted on said member and for maintaining the tension load on said first guy substantially equal to said predetermined value as said first guy is effectively lengthened, thereby allowing said load bearing member to translate in said predetermined direction to increase the load being borne by said second guy as said load bearing member translates.

#### 4,011,695 BLEACHER SYSTEM

William B. Simmons, Sr., Geneva, Ala., assignor to William M. Russell, Jr. and Mary L. Russell, both of Geneva, Ala.  
Filed Oct. 7, 1975, Ser. No. 620,363  
Int. Cl.<sup>2</sup> E04H 3/12; E04C 3/02

U.S. Cl. 52-8

15 Claims

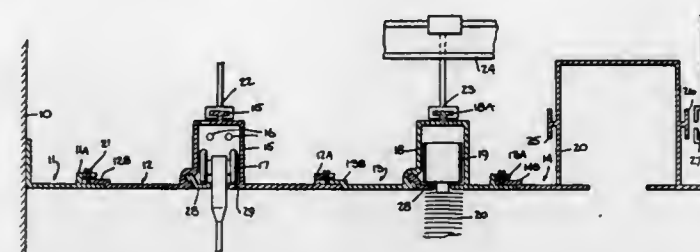


1. In a bleacher structure having adjacent tubular posts interconnected by supports and channel shaped members connected to the supports between the posts, each of said channel-shaped members having parallel spaced supporting flanges resting on associated supports, a load supporting web interconnecting the supporting flanges, and spaced reinforcing flanges intermediate the supporting flanges depending from the web below the supporting flanges, and fastener means for securing the reinforcing flanges to the associated supports.

4,011,696  
MULTIPLE-LINE SOFFIT SYSTEM  
Carlton Klein, New York, N.Y., assignor to New York Flameproofing Company, Inc., New York, N.Y.  
Filed July 17, 1973, Ser. No. 380,069  
Int. Cl.<sup>2</sup> B09F 7/19

U.S. Cl. 52-39

4 Claims

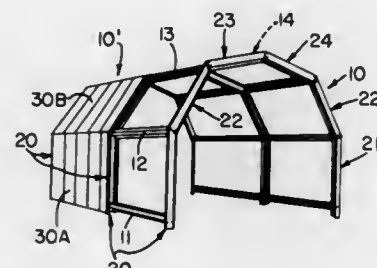


1. A soffit system for supporting wall and window coverings having hardware components from which the coverings are suspended, said system comprising a series of like interlocking track modules fabricated of extruded aluminum, each including a recessed channel having a narrow entrance extending the full length of the module, said entrance being defined by a gate pivoted on one side of the channel and adapted to swing inwardly and a ledge projecting from the other side of the channel and spaced from the gate to form said narrow entrance, said module having a recess formed at the junction of the channel and the module wall to define an arcuate socket extending the full length of the module, said gate being formed of a plastic material having a relatively low coefficient of friction and having a bead at one edge extending the full length thereof which is received in said socket to create a hinge requiring no pin, said gate being liftable to admit the hardware components of a particular covering into said channel whereby when said gate is thereafter closed, it entraps the components, each module having at its ends complementary joining elements whereby adjoining elements may be interlocked to provide as many channels as is required by the window and wall coverings, said module channel having integral therewith at its top a coupling head with a T-formation which extends the full length of the module whereby said module may be supported from an overhead structure by means of hangers having a complementary formation.

4,011,697  
BUILDING CONSTRUCTION  
James L. Fedolfi, Concord, N.H., assignor to Luke J. Roddy, West Roxbury, Mass.  
Filed Dec. 8, 1975, Ser. No. 638,549  
Int. Cl.<sup>2</sup> E04B 1/32

U.S. Cl. 52-90

5 Claims



1. A building structure module for defining a roofed-over, walled enclosure and supporting at least one hundred pounds per square foot live load, comprising, means defining a supporting skeleton of girts arrayed as gambrel arch frames at two ends of the module, and wherein the girts of the end frames of each gambrel arch are secured end to end and comprise overlapping girt end faces with a higher one resting on a lower one at each angle bend of the gambrel arch to distribute roof loading, and further comprising,

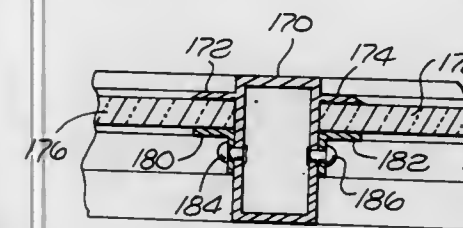
means defining horizontal purlins interconnecting the frames, the girts and purlins being arranged in a truss-free gambrel arch and overlaid with essentially end-to-end arrayed panels of at least 50,000 psi yield strength, along the side wall, mid roof and top roof sections of the gambrel arch.

4,011,698  
CONSTRUCTION APPARATUS AND METHOD  
Richard L. Sklaar, 320 S. Clark Drive, Los Angeles, Calif. 90048

Continuation of Ser. No. 450,011, March 11, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,470  
Int. Cl.<sup>2</sup> E04B 5/52

U.S. Cl. 52-98

2 Claims



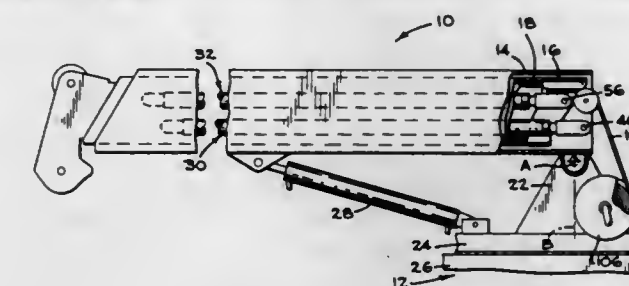
1. A structure comprising: a plurality of elongated construction members each including a body having a longitudinal surface and an outwardly extending longitudinal rib formed integrally with said body and disposed perpendicular to said surface, said rib having sufficient structural strength to support a panel member thereagainst without failure of said rib throughout the load range normally applied to said panel; at least one of said elongated construction members further including an additional rib extending outwardly therefrom and displaced 180° from said longitudinal rib, said additional rib being load bearing and having a reduced thickness immediately adjacent said body and having sufficient structural strength to support said panel under normal load ranges, a portion of said first surface of said panel along another edge thereof seated against said additional rib; a panel member having one edge seated on said longitudinal surface of said body and a portion of a first surface of said panel adjacent said edge seated against said rib in bearing relationship; right angle rigid clip means having first and second orthogonally disposed arms, said first arm bearing against said panel member and said second arm bearing against said body, said clip means seated against the opposite surface of said panel member, said clip means, prior to being secured in place, being freely movable transversely of the longitudinal axis of said construction member to any position along said longitudinal surface of said construction member for seating securely against a panel member of any desired thickness; and securing means affixing said clip means rigidly to said body, said securing means being affixed to said body and said clip means through openings provided in said body only after said panel member is seated against said rib and said clip means is seated against said panel and said construction member surface, thereby to secure said panel member in place.

4,011,699  
TELESCOPIC BOOM QUICK RETRACT HYDRAULIC CIRCUIT  
Roger D. Mickelson, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 27, 1975, Ser. No. 608,111  
Int. Cl.<sup>2</sup> E04H 12/34; F15B 7/00

U.S. Cl. 52-115

7 Claims



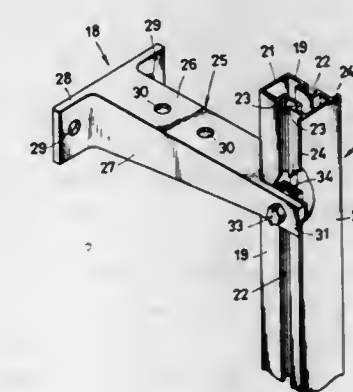
1. In a crane having a boom with telescopic sections including a base boom section, a mid boom section, and a tip boom section, a first hydraulic motor connected between the base boom section and the mid boom section for extension and retraction of the mid boom section with respect to the base boom section, and a second hydraulic motor connected between the mid boom section and the tip boom section for extension and retraction of the tip boom section with respect to the mid boom section, each of said motors comprising a cylinder with a piston slidable therein to define an extend chamber and a retract chamber on opposite sides, respectively, of the piston, each piston having a rod connected thereto and extending from the cylinder, said piston rods having two passages in communication with said chambers, respectively, the piston rod of said second motor connected for movement in unison with the cylinder of said first motor, a hydraulic circuit including a source of fluid under pressure and including a valve having a first valve portion between said source and said first motor and having a second valve portion between said source and said second motor, a reel to hold hydraulic lines leading from said second motor rod, the improvement comprising a retract hydraulic line connecting the retract chambers of said motors to pass fluid between said second valve portion and said retract chamber of the second motor through the retract chamber of said first motor, and an extend hydraulic line connecting said extend chamber of said second motor to said valve over the reel.

4,011,700  
ADJUSTABLE-HEIGHT POST ASSEMBLY FOR READY INSTALLATION ON A WINDOW FRAME OR THE LIKE  
Yukio Sado, Asahi, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Toyko, Japan  
Filed Nov. 20, 1975, Ser. No. 633,957  
Claims priority, application Japan, Nov. 27, 1974, 49-144528

Int. Cl.<sup>2</sup> E04H 1/00

U.S. Cl. 52-235

3 Claims



1. An assembly comprising in combination:



- a. a post of uniform cross-sectional shape throughout its length, said post including a pair of oppositely facing side walls, therebeing a pair of oppositely opening undercut grooves extending longitudinally along the length of said side walls respectively;
- b. a pair of brackets spaced along the length of said post, each bracket comprising (1) means for mounting the same on a desired stationary surface, and (2) a pair of integral spaced clamping jaws at one end receiving said post and said undercut grooves therebetween in direct contact with said respective oppositely facing side walls of said post;
- c. two pairs of nuts respectively disposed in said oppositely facing grooves; and
- d. two pairs of bolts respectively extending through holes in said clamping jaws into said nuts in said grooves.

4,011,701

## MODULAR HOME WALL CONSTRUCTION CORNER JOINT

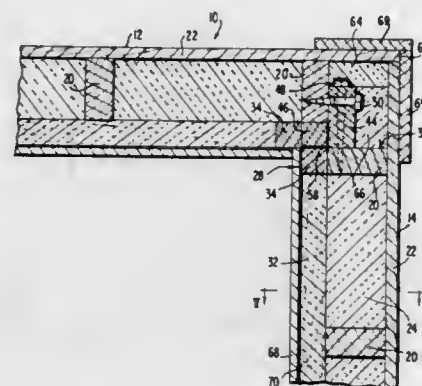
Kalevi Matti Turkia, Williamsport, Pa., assignor to Capital Housing, Inc., Avis, Pa.

Filed Mar. 29, 1976, Ser. No. 671,856

Int. Cl.<sup>2</sup> E04B 1/00; E04C 1/10

U.S. Cl. 52—275

3 Claims



1. An improved modular home wall construction corner joint, said corner joint being formed of first and second, end joined wall assemblies, each wall assembly comprising:
  - inner and outer walls,
  - edge abutting inner and outer wall frames,
  - said outer wall frame comprising:
    - horizontally spaced, vertical studs,
    - a lower horizontal base beam underlying the lower ends of said studs and being fixed thereto,
    - an upper cross beam spanning the upper ends of said vertical studs, being fixed thereto and forming with said vertical studs and said base beam a series of parallel vertical cavities,
    - vertical strips of thermal insulation material positioned within said vertical cavities and having at least the ends thereof fixed to said cross beam and said base beam,
  - said inner wall frame overlying and being fixed to said inner wall frame and comprising vertical studs at respective ends of said inner wall frame and vertically spaced, horizontal cross beams spanning between said vertical end studs and lying across and in contact with said vertical studs of said outer wall frame and forming horizontal cavities therebetween,
  - horizontal strips of thermal insulation material positioned within said horizontal cavities and having their ends respectively fixed to respective end studs of said outer wall frame such that the edges of said strips of said vertical and horizontal thermal insulation material strips intersect each other to substantially eliminate cold spots within the walls of said wall assemblies, limited to crossover contact of said cross beams of said inner wall frame and said vertical studs of said outer wall frame,
  - the end studs of at least one wall frame of each wall assembly being longitudinally offset relative to the end studs of

the other wall frame to form an interfitting step for receiving the ends of an abutting wall assembly, means for nesting the end studs of respective wall assemblies together at right angles to each other at said step, an air infiltration barrier strip interposed between the abutting end studs of respective assemblies at said step to form an effective water tight corner joint, said outer walls extending beyond the end studs of respective wall assemblies and abutting each other to form a vertical corner cavity with said end studs of respective wall assemblies, and thermal insulation material strips overlying respective faces of said end studs within said cavity to reduce heat loss through said corner joint.

4,011,702

## BUILDING WALL CONSTRUCTIONS

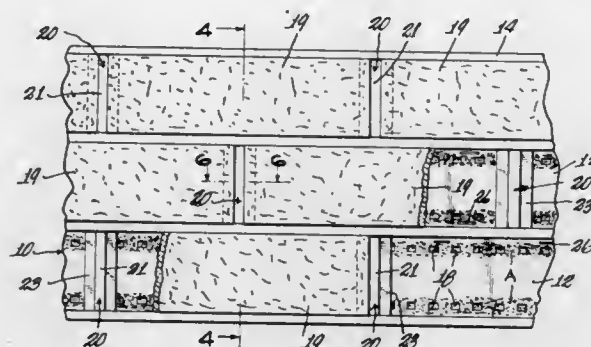
Andrew M. Matyas, 1642 North Road SE., Warren, Ohio 44484

Filed Apr. 18, 1975, Ser. No. 569,371

Int. Cl.<sup>2</sup> E04C 5/18; E04F 13/08

U.S. Cl. 52—387

4 Claims



1. A building construction for fabricating a veneer facing wall, comprising:
  - a flat panel formed of thin, rigid material, said panel having pairs of spaced parallel ridges co-extensive with the longitudinal length thereof and forming a flat-bottomed trough between each pair, each ridge being U-shaped in cross-section to form a bight and legs extending at right angles from said bight and integrally joined at right angles with an adjoining trough portion,
  - a plurality of veneer building blocks, each formed as a rectangular slab of a predetermined length and of a width to fit flatwise within a trough and closely but freely and without interference fit between bight legs of adjacent ridges, said blocks being of a thickness at least equal to the depth of a trough so that outer faces of said blocks are exposed, and with the bights of said ridges exposed between said blocks,
  - the bottom of each trough having a series of lanced-out portions along a line but inward of each ridge, each lanced-out portion providing a lip displaced from the inner surface of said trough and projecting from an outer surface of the same, and each lip being aligned with the opening formed in the lancing operation,
  - adhesive material between the inner face of each of said blocks and the inner surface of a said trough for holding said building blocks in place,
  - said adhesive material being applied in layer form along the line of and over said lanced-out portions to interlock with the same, and
  - said building blocks being assembled with said panel by pressing individual blocks into a said trough and against said adhesive to urge some of the latter through the openings formed by the lanced-out portions, said displaced lips providing a stop for said adhesive material to restrain it from falling from the outer surface of said trough.

4,011,703

## BUILDING ELEMENT FOR MAKING INSULATING PANELS AND PANELS ASSEMBLED THEREFROM

Umberto Tanzilli, Via Ippolito Nievo 1, Sora, Frosinone, Italy

Filed June 25, 1975, Ser. No. 590,263

Claims priority, application Italy, June 27, 1974, 12205/74

Int. Cl.<sup>2</sup> E04C 2/42

U.S. Cl. 52—618

6 Claims



1. A plastic building element comprising a plurality of identical first substantially square plates arranged in spaced relationship in a first coplanar rectilinear row, the spacing between successive first plates being equal to the longitudinal dimension of said first plates; a plurality of identical second rectangular plates arranged in spaced relationship in a second coplanar rectilinear row spaced from, parallel to, and aligned with said first row, the longitudinal dimension of said second plates and the spacing between successive second plates being equal to the longitudinal dimension of said first plates, and the transverse dimension of said second plates being less than the transverse dimension of said first plates; and a plurality of webs respectively connecting the adjacent edges of a first plate and a second plate, each web being perpendicular to said first row and said second row, and each web lying entirely within the edge of its associated first plate and externally of the edge of its associated second plate.

4,011,704

## NON-GHOSTING BUILDING CONSTRUCTION

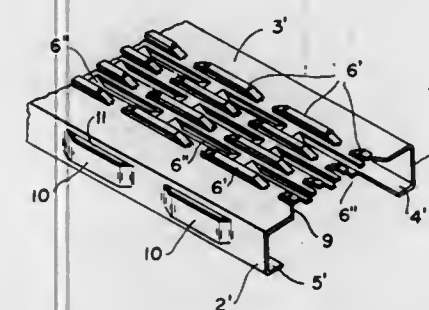
Theodore S. O'Konski, Wheeling, W. Va., assignor to Wheeling-Pittsburgh Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 175,967, Aug. 30, 1971, abandoned. This application Nov. 1, 1972, Ser. No. 302,830

Int. Cl.<sup>2</sup> E04C 3/09, 3/32

U.S. Cl. 52—735

5 Claims



1. A metal structural channel member formed of a single thickness of sheet metal and having a side panel and two end panels at opposite ends of the side panel, said side panel having a plurality of closely spaced parallel rows of areas each severed therefrom along two coextensive parallel slits and stretched laterally from the plane of the side panel to a plane parallel to the original plane of the side panel, said areas being characterized by an absence of slits between the parallel slits, the areas in adjacent rows being staggered with respect to each other and displaced to opposite sides of the original plane of the side panel to provide a multiplicity of different tortuous paths through the side panel of the channel member for lengthening the thermal conduction path from end panel to end panel to inhibit heat conduction therethrough from end panel to end panel and for enhancing heat radiation therefrom.

4,011,705

## METHOD FOR CONSTRUCTING A THIN-SHELL CONCRETE STRUCTURE DESIGNED FOR LIFTING WITH HYDRAULIC APPARATUS

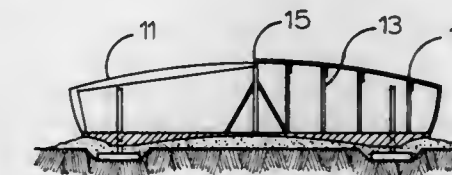
Peter Martin Vanderklaauw, 1450 Madruga Ave., Coral Gables, Fla. 33146

Filed Oct. 31, 1975, Ser. No. 627,835

Int. Cl.<sup>2</sup> E04B 1/00; E04H 1/00

U.S. Cl. 52—745

8 Claims



1. A method of constructing a thin-shell concrete structure comprising the steps:
  - a. preparing foundation pads at spaced zones about the perimeter of the structure to be erected;
  - b. forming a circular base for a concrete floor of sand, gravel or soil in the area bound by the foundation pads;
  - c. shaping the surface of the circular base by revolving a screed about a point at the center of the circular base;
  - d. placing vertical columns on each foundation pad;
  - e. placing reinforcing steel on the screed circular base;
  - f. pouring a concrete floor on the base including about the vertical columns;
  - g. forming an insulating liner having circular side walls and a dome-shaped top;
  - h. temporarily supporting the liner top from the concrete floor;
  - i. forming a concrete coating on the external surface of the side walls of the insulating liner;
  - j. forming a concrete coating on the external surface of the dome-shaped insulating liner; and
  - k. removing the temporary supports for the liner top after the concrete is cured.

4,011,706

## CORNER CONNECTOR FOR BOARD SHAPED COMPONENT PARTS

Hans-Werner Düpre, 154, Osnabrücker Landstrasse, 11 Gutersloh, 483, Germany

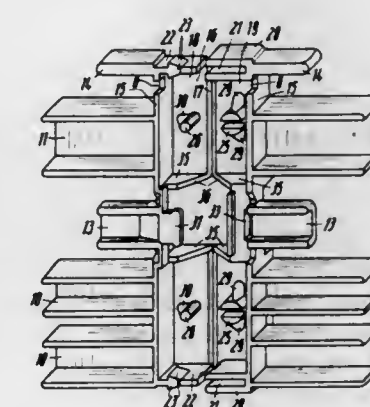
Filed May 30, 1975, Ser. No. 582,294

Claims priority, application Germany, June 1, 1974, 2426723

Int. Cl.<sup>2</sup> F16B 2/20

U.S. Cl. 403—231

9 Claims



1. A corner connector for board shaped component parts comprising: a hinge member of a continuous sheet of plastic material having a first half and a second half formed and connected to pivot about a hinge line, each of said first and second halves having a flat outer surface, a flat inner surface parallel with said flat outer surface, a first edge surface defining part of said hinge line, and a second edge surface spaced from the first edge surface.



from said first edge surface a distance equal to the width of said flat outer and inner surfaces, a first side wall extending transversely to said flat inner surface of said first half at said second edge surface, said first side wall being formed integrally with said second edge surface of said first half, a second side wall extending transversely to said flat inner surface of said second half at said second edge surface, said second side wall being formed integrally with said second edge surface of said second half, said first and second side walls both extending parallel to each other and a similar distance from their respective edge surfaces, a plurality of means for engaging the board shaped component parts extending outwardly from each of said first and second side walls in a direction perpendicular to said second edge surfaces and away from said hinge line formed by said first edge surfaces of said first and second halves, first means extending perpendicularly from said flat inner surfaces of said first half away from said flat outer surface for interengaging with similar means on said flat inner surface of said second half, and second means extending perpendicularly from said flat inner surface of said second half away from said flat outer surface similar to said means on said flat inner surface of said first half for interengaging therewith, whereby when said first and second halves are pivoted about said hinge line said means for interengaging on said flat inner surfaces of said first and second halves are locked together to thereby form the corner connector.

4,011,707

## CROSS TEE END JOINT FOR SUSPENDED CEILING SYSTEM

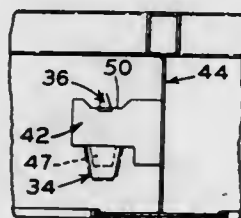
Ernest B. Nute, Jr., Mountville, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed July 2, 1975, Ser. No. 592,557

Int. Cl.<sup>2</sup> F16B 7/22

U.S. Cl. 52—664

2 Claims



1. A suspended ceiling grid structure adapted to support ceiling panels and the like, comprising:

- a. a main runner having a vertical web and oppositely disposed flanges,
- b. a cross tee having a vertical web and oppositely disposed flanges, a locking tongue means extending from at least one end of said cross tee,
- c. said locking tongue means extending generally perpendicular from the plane of the vertical web of the cross tee and being parallel with and adjacent with the vertical web of the main runner when the cross tee and main runner are properly positioned relative to each other,
- d. said vertical web of said main runner having a means engaging the bottom of said tongue means to hold said tongue means adjacent said vertical web of said main runner and restraining said tongue means from movement back and forth along the longitudinal axis of said vertical web of said main runner and restraining said cross tee fixedly in position relative said main runner, said means engaging the bottom of said tongue means is a bracket means engaging the bottom of said tongue means and said bracket means extends from the vertical web of the main runner structure and has an extension which extends parallel with the plane of said tongue means to hold said tongue means adjacent said vertical web of said main runner and to hold said cross tee and main runner in a fixed position, said tongue means has a notch forming

shoulders on the bottom edge thereof which engage the sides of the bracket means to restrain the tongue means from movement along the longitudinal axis of said vertical web of said main runner, and

- e. said vertical web of said main runner further having a means which engages the top of said tongue means to restrain said tongue means from movement upward to prevent said tongue means from disengagement from said means engaging the bottom of said tongue means, said means engaging the top of said tongue means being a lance extending from the vertical web of said main runner.

4,011,708

## BAG HANDLING APPARATUS

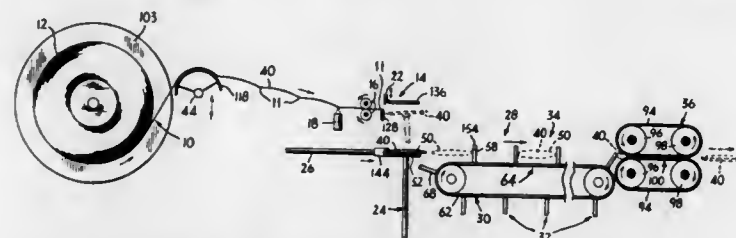
Fred P. Brown, Jr., Centerville, Mass., assignor to Packaging Industries, Inc., Hyannis, Mass.

Filed Nov. 26, 1974, Ser. No. 527,360

Int. Cl.<sup>2</sup> B65B 5/00, 43/26

U.S. Cl. 53—187

4 Claims



1. Bag handling apparatus comprising: means for severing individual bags from a continuous web of bags; carrier means engaging each bag severed from said web and transporting it along a predetermined path with an open end of each of said bags disposed for insertion of an article, said carrier means including pairs of spaced lugs for retaining respective ones of said severed bags while transporting them along said predetermined path; means for conveying each bag severed from said web to said carrier means, said conveying means having means for pushing against one edge of a severed bag to bring the opposite edge of said bag to bear against the first lug of a pair of said lugs on said carrier means for opening said end of said severed bag, the other of said pair of lugs thereafter being brought to bear against said one edge of said bag to retain said bag in its opened condition while being transported along said predetermined path; and means at an end of said predetermined path for sealing said open end of said bags.

4,011,709

## HARVESTING PLATFORM

Roger Eugene Mott, Bettendorf, Iowa, and Darwin Carl Bichel, East Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Nov. 13, 1974, Ser. No. 523,507

Int. Cl.<sup>2</sup> A01D 69/00

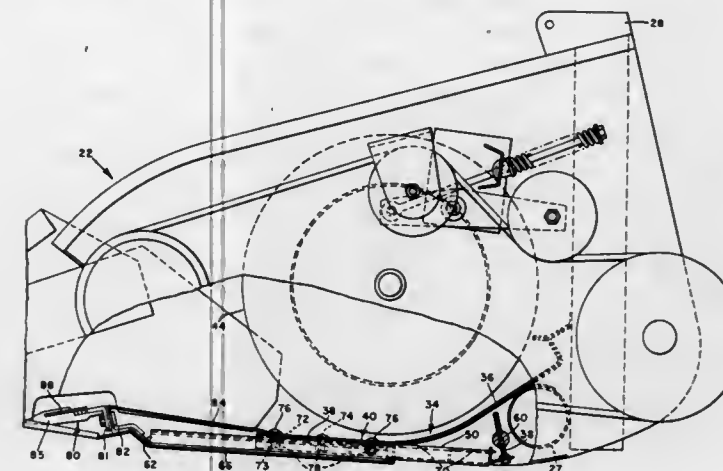
U.S. Cl. 56—10.4

4 Claims

1. A harvesting platform for mobile harvesting machine comprising: a transversely elongated platform frame having opposite sides; a platform floor extending between the opposite sides; a transverse crop conveyor means mounted on the frame above the floor for moving the crop laterally on the platform; a transverse cutter bar extending between the opposite sides of the platform frame forwardly of the floor; a drive means for driving the cutter bar and including a drive mechanism mounted on one end of the cutter bar and having a rotary input element and a reciprocating output element connected to the cutter bar; and means mounting the cutter bar on the platform frame for selective tilting adjustment about a transverse horizontal axis to vary the tilt of the cutter bar relative to the ground, the drive mechanism on the end cutter bar tilting with the cutter bar; a belt drive on one side of the

platform, drivingly connected to the drive mechanism and including a belt tensioning means operative to supply belt

the hay inlet aperture each time the plunger moves into the rear bale chamber and each time the plunger moves into the forward bale chamber.



4,011,710

## BALER WITH DOUBLE-ACTING PLUNGER

Helwig Schmitt, Raiffeisenstrasse 5, 3523 Grebenstein near Kassel, Germany

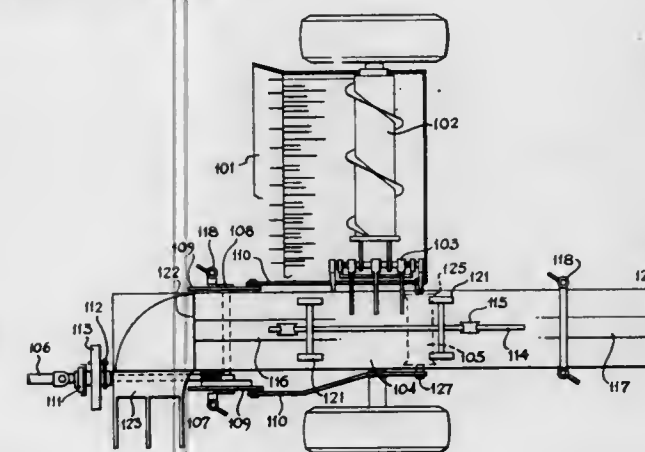
Filed Oct. 23, 1974, Ser. No. 517,129

Claims priority, application Germany, Oct. 25, 1973, 2353381

Int. Cl.<sup>2</sup> B30B 1/06, 9/38

U.S. Cl. 56—341

1 Claim



1. A hay baler comprising a mobile frame, a hay pickup mounted on one side of the mobile frame, a pair of generally fore and aft extending bale chambers having common generally straight top, bottom and side walls, mounted on the side of the frame adjacent to the hay pickup, a hay inlet aperture in one side wall of the bale chambers substantially mid-way between the ends of the wall, feed means to feed hay from the hay pickup through the hay inlet aperture, a plunger moveably supported in the bale chambers, plunger guide means mounted on the top and bottom walls for guiding the plunger in a generally fore and aft straight line, drive means for reciprocating the plunger back and forth so that it alternately moves hay to the rear and compresses it in one of the bale chambers and then moves hay to the front and compresses it in the second bale chamber, said drive means including a shaft rotatably mounted adjacent to the bottom wall of the bale chambers, drive means to rotate the shaft, a crank member mounted on the shaft adjacent to each side wall, the forward bale chamber having a connecting rod connected to each of the crank members and a trunion projecting from each side of the plunger and the adjacent side wall of the bale chambers, the connecting rod on the side of the bale chambers adjacent to the hay pickup including a generally horizontal portion and a generally vertical portion which leave the hay inlet aperture in one side wall of the bale chamber unobstructed when the plunger moves into the rear bale chamber, and drive means to drive said feed means to feed hay from the hay pickup through

4,011,711

## BALE ACTUATED CONTROL FOR THE REAR ROLL FORMING CHAMBER IN A CROP MATERIAL ROLL FORMING MACHINE

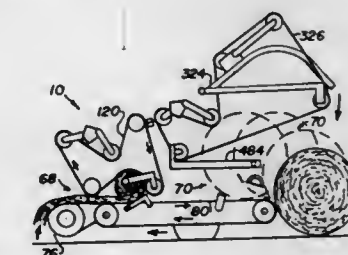
Aquila D. Mast, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Feb. 9, 1976, Ser. No. 656,760

Int. Cl.<sup>2</sup> A01D 39/00

U.S. Cl. 56—341

13 Claims



1. In a crop material roll forming machine, the combination comprising: a mobile frame adapted to move across a field; means on said frame for delivering crop material to said machine; a rear roll forming chamber on said frame including means for forming a roll of crop material therein and operable to discharge said roll therefrom; a front roll forming chamber on said frame including means for initiating formation of another roll therein; means on said frame for causing transfer of said another roll to said rear chamber after said roll in said rear chamber has been discharged; mechanism on said frame operable for adjusting an inlet opening to said rear chamber between a first size adapted to allow the delivery therethrough of crop material for forming of a roll in said rear chamber and a second size larger than said first size and adapted to allow the transfer therethrough of said another roll from said front chamber into said rear chamber; and means on said frame for controlling the operation of said inlet opening adjusting mechanism, said controlling means including a member positioned for actuation by said another roll when the same is transferred into said rear chamber such that upon actuation of said member by said another roll, said controlling means causes operation of said mechanism to adjust said inlet opening of said rear chamber from its second to its first size.

4,011,712

## THREAD DRAFF TUBE FOR OPEN-END SPINNING MACHINES

Gerhard Egbers, Enningen, and Peter Artzt, Reutlingen, both of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Sept. 5, 1975, Ser. No. 610,662

Claims priority, application Germany, Sept. 21, 1974, 2445206

Int. Cl.<sup>2</sup> D01H 1/12

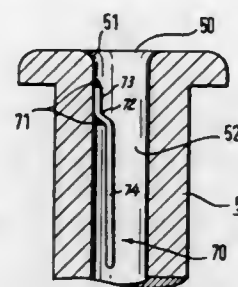
U.S. Cl. 57—58.89

4 Claims

1. In an open-end spinning machine, a spinning rotor having an annular fiber-collection surface, a thread drawoff tube having a bore therethrough disposed with its axis substantially perpendicular to a plane of the fiber-collection surface, and thread drawoff means for drawing off thread formed in the spinning rotor through the drawoff tube bore and thereby bending the thread around the drawoff tube infed mouth, the improvement comprises plucking means in the drawoff tube



bore at a location spaced from the drawoff tube infed mouth for periodically plucking the thread portion extending through



the tube bore, and mounting means for mounting said plucking means in the drawoff tube bore.

4,011,713

### BATTERY POWERED ELECTRONIC TIMEPIECE WITH VOLTAGE REGULATION

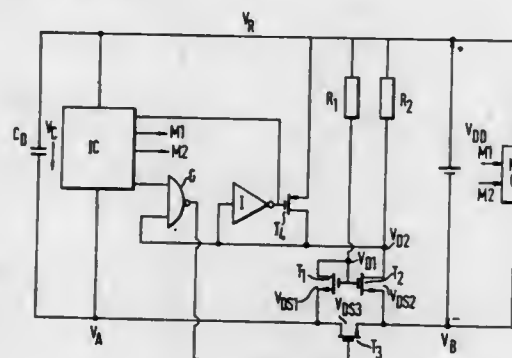
Pierre A. Sauthier, Bruegg, and Werner Fehr, Zurich, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland  
Filed June 17, 1975, Ser. No. 587,726

Claims priority, application United Kingdom, July 15, 1974, 31255/74

Int. Cl.<sup>2</sup> G04C 3/00; H02J 1/00

U.S. Cl. 58—23 BA

10 Claims



1. In a battery powered electronic timepiece of the type having an oscillator for generating high frequency electric pulses, a frequency divider responsive to said high frequency electric pulses for producing low frequency electric pulses, a stepping motor responsive to said low frequency electric pulses for driving a display means, and a battery for energizing said oscillator, frequency divider and the stepping motor, the improvement comprising: a capacitor coupled to said oscillator and said frequency divider; and a switch means controlled by pulses from said frequency divider for providing a low resistance path from the battery to the condenser in the intervals between motor stepping pulses and a high resistance path from the battery to the condenser during motor stepping pulses, whereby during motor stepping pulses the oscillator and frequency divider are energized substantially entirely from the capacitor.

4,011,714

### DEVICE FOR MAINTAINING THE OSCILLATION OF A BALANCE FOR A TIMEPIECE

Tsutomu Ishizuka, Noda, and Seiji Ichikawa, Aizuwakamatsu, both of Japan, assignors to Rhythm Watch Co. Ltd.

Filed Mar. 17, 1975, Ser. No. 558,857

Claims priority, application Japan, Mar. 19, 1974, 49-30827[U]; Aug. 30, 1974, 49-103307[U]

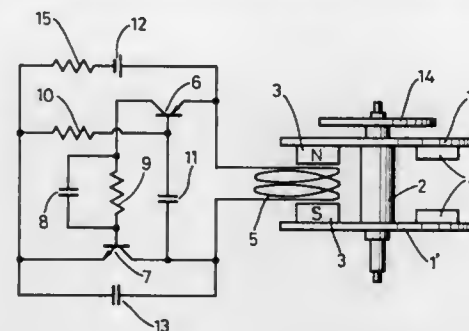
Int. Cl.<sup>2</sup> G04C 3/04

U.S. Cl. 58—28 R

4 Claims

1. A device, for maintaining the oscillation of a balance of a timepiece, comprising, in combination, a rotatably mounted balance wheel formed of two concentric axially spaced discs;

two permanent magnets each secured on a respective disc with their poles of respective different polarities facing each other; a stationary coil electromagnetically coupled to said magnets and combining pick-up and driving functions; two complementary transistors, each including a base, a collector and an emitter; a single RC circuit included in said device and connecting the collector of one transistor to the base of the other transistor; said single RC circuit consisting of a first condenser and a first resistor connected in parallel; a second resistor and a second condenser having first terminals connected to the base of said one transistor, and having second terminals; a DC power source, a third resistor having a first



terminal connected to one terminal of said power source; the second terminal of said second resistor being connected to the second terminal of said third resistor and to the emitter of said other transistor; the second transistor of said second condenser being connected to one terminal of said coil; and the collector of said other transistor; a third condenser connected between a first junction point, connecting the second terminal of said second resistor to the emitter of said other transistor, and a second junction point, connecting the second terminal of said second condenser to said one terminal of said coil; the emitter of said one transistor being connected to the other terminal of said power source and to the other terminal of said coil.

4,011,715

### CHAIN LINK

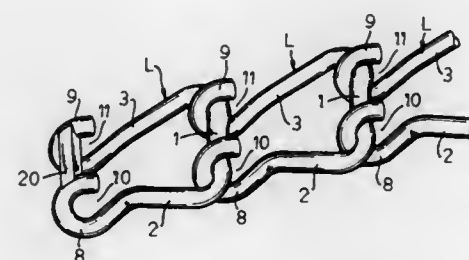
Edward A. Graetz, Pound, Wis., assignor to Graetz Manufacturing, Inc., Pound, Wis.

Filed Nov. 28, 1975, Ser. No. 635,874

Int. Cl.<sup>2</sup> F16G 15/04

U.S. Cl. 59—85

4 Claims



1. A generally U-shaped chain link fabricated from a rod of metal and having a transverse bight portion with a pair of legs extending therefrom, said legs each having a free end and having a hook formed at said free end, said hooks defining with their respective legs a relatively narrow opening, said legs adjacent said bight portion each having a transverse slot-like recess extending thereacross so as to form a narrower portion of said leg which is of a thickness less than said opening, said legs being curved and including a first portion adjacent said bight portion and a second portion adjacent said hook, the first portions of said pair of legs defining a first plane and the second portions of said pair of legs defining a second plane disposed at an angle with respect to said first plane whereby the links must be folded together completely to permit their separation and the length of said transverse bight portion being greater than the transverse distance defined by said hooks.

4,011,716

### FUEL CONTROL SYSTEM FOR GAS TURBINE ENGINE

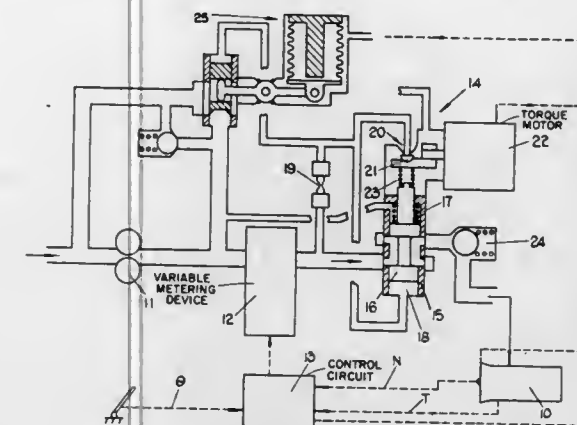
Trevor Stanley Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England  
Filed Apr. 3, 1975, Ser. No. 564,606

Claims priority, application United Kingdom, May 21, 1974, 22533/74

Int. Cl.<sup>2</sup> F02C 9/10

U.S. Cl. 60—39.28 R

5 Claims



1. A servo-operated shut-off valve for a gas turbine engine fuel control system, comprising a main valve having a control element movable in first and second directions in response to an increase and a decrease respectively in a servo pressure signal, a pivot valve including a control member movable in a first direction to increase said servo pressure signal and in a second direction to decrease said servo pressure signal, and a resilient coupling between said control element and said control member, said coupling acting, when said control element moves in its first direction, to urge said pilot valve in its first direction, and when said control element moves in its second direction to urge said pilot valve in its second direction.

4,011,717

### CONTROL SYSTEM FOR A GAS TURBINE

Horace George Turner, Chandler's Ford, and Robert Spurgeon Wood, Gosport, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

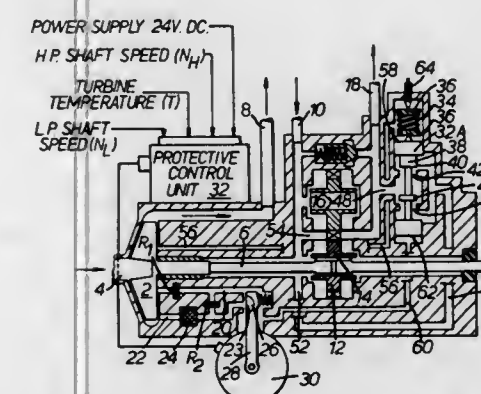
Filed Nov. 22, 1974, Ser. No. 526,163

Claims priority, application United Kingdom, Nov. 23, 1973, 54491/73

Int. Cl.<sup>2</sup> F02C 9/08

U.S. Cl. 60—39.28 R

3 Claims



1. A control system for an aircraft gas turbine engine, which control system comprises a fuel pressurizing impeller which is driven as a function of the engine speed, two fuel flow restrictors which are each of a fixed size and which are supplied with fuel at different pressures from the impeller, a common fuel conduit which is in communication with said restrictors and which receives fuel at a pressure dependent upon the relative sizes of said restrictors, electrically actuated means for varying the fuel pressure in the common fuel conduit, and fuel flow

control means which is operated according to the varying fuel pressure in the common fuel conduit and which is effective to control the fuel flow for the engine thereby to control the output of the engine.

4,011,718

### GAS TURBINE CONSTRUCTION

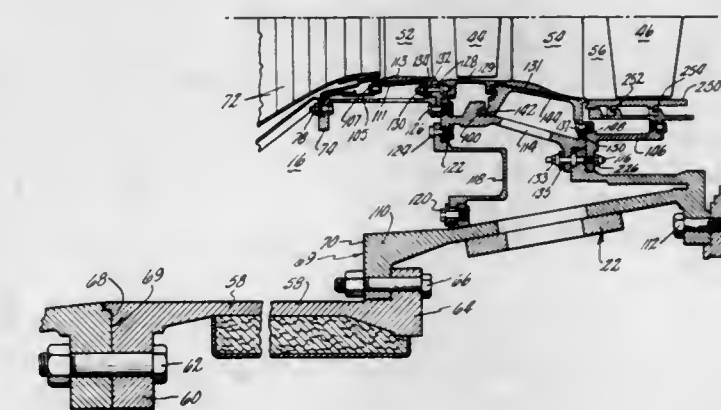
Herbert Frederick Asplund, South Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 1, 1975, Ser. No. 601,564

Int. Cl.<sup>2</sup> F02C 7/00; F01D 9/00

U.S. Cl. 60—39.31

18 Claims



18. A gas turbine engine having:

- A. an outer case concentric about an axis,
- B. a two-stage gas turbine enveloped within said outer case and comprising:
  1. axially spaced first and second stage stator assemblies,
  2. a first stage rotor assembly positioned between said stator assemblies,
  3. a second stage rotor assembly positioned immediately adjacent said second stage stator assembly and on the opposite side thereof from said first stage rotor assembly.
- C. means to support said rotor and stator assemblies so that the blades of said rotor assemblies and the vanes of said stator assemblies are in axial alignment,
- D. means to provide forward access to said turbine through an opening in said case,
- E. means supporting the first stage vanes so that, without disassembling any other parts of said engine, the first stage vanes may be disconnected and removed through said case opening,
- F. means supporting said first stage blades so that, with the first stage vanes removed and without disassembling any other parts of said engine, the first stage blades may thereafter be disconnected and removed through said case opening,
- G. means supporting said second stage vanes so that, with the first stage vanes and blades removed and without disassembling any other parts of said engine, the second stage vanes may thereafter be disconnected and removed through said case opening, and
- H. means supporting said second stage blades so that, with said first stage vanes and blades, and said second stage vanes removed, and without disassembling any other parts of said engine, said second stage blades may thereafter be disconnected and removed through said case opening.



4,011,719

## ANODE FOR ION THRUSTER

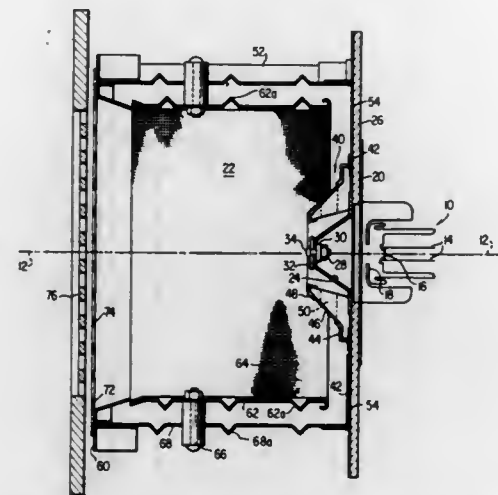
Bruce A. Banks, Olmsted Township, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 8, 1976, Ser. No. 665,033

Int. Cl.<sup>2</sup> F02K 9/00

U.S. Cl. 60-202

4 Claims



1. In an ion thruster comprising an ion discharge chamber within which ions are to be formed, ion focusing screens in communication with said discharge chamber and an anode within said discharge chamber, said anode comprising a mesh screen.

4,011,720

## GAS GENERATOR OR ROCKET MOTOR WITH SELECTIVE DISCRETE TIME VS. OUTPUT PROFILES

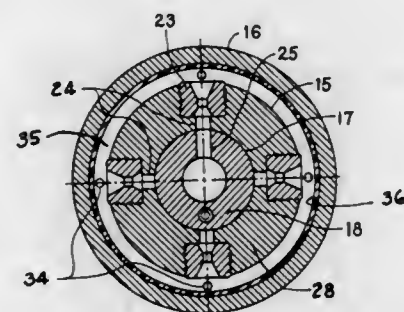
Thomas J. Kirschner, Jr., Port Deposit, Md., assignor to Thiokol Corporation, Newtown, Pa.

Filed May 13, 1975, Ser. No. 577,123

Int. Cl.<sup>2</sup> F02K 9/04

U.S. Cl. 60-254

4 Claims



3. In a rocket motor having variable flow rates and thrust output, a combustion chamber closed at one end, a solid gas producing propellant contained therein, ignition means therefor, a head enclosing the opposite end of the combustion chamber, the improvement comprising, in combination, a bore in said head, a rotor disposed in said bore in said head and adapted for rotation therein to various selective positions, passage means in said rotor in communication with said combustion chamber and passing radially through a side wall of said rotor, substantially gas-tight seals between said rotor and said head on opposite sides of said passage means, a plurality of primary nozzles having their longitudinal axes radially disposed in said head and separately in communication with said rotor passage means when the rotor is selectively rotated to its various positions and each of said primary nozzles having different throat cross-sectional areas, means attaching said head to the combustion chamber, means collecting gas passed through said primary nozzles and at least one exit nozzle extended through said head attaching means and in communication with said gas collecting means.

4,011,721

## FLUID CONTROL SYSTEM UTILIZING PRESSURE DROP VALVE

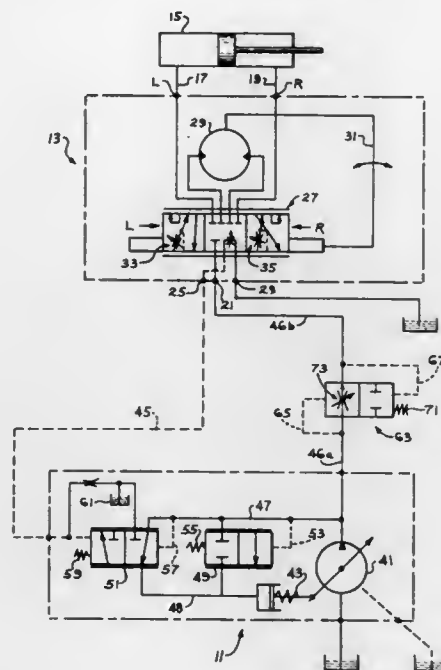
James Kwok-Fun Yip, Richfield, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 14, 1976, Ser. No. 676,831

Int. Cl.<sup>2</sup> F16H 39/46

U.S. Cl. 60-445

9 Claims



1. A system for controlling the flow of fluid from a variable fluid delivery source to a fluid actuated device, said system comprising:

- a first valve means in fluid communication with the variable fluid delivery source and with the fluid actuated device, said first valve means including a first orifice variable between a minimum orifice area corresponding to a minimum system flow rate and a maximum orifice area corresponding to a maximum system flow rate;
- means for maintaining the variable fluid delivery source output pressure at a generally constant level above the load on the fluid actuated device as said first orifice varies from said minimum orifice area to said maximum orifice area;
- second valve means being in series flow relationship between the variable fluid delivery source and said first variable orifice of said first valve means;
- said second valve means including a valve member biased towards a closed position in the absence of at least a predetermined minimum fluid pressure, said valve member defining a second variable orifice operable to maintain a relatively constant pressure drop across said second valve means as said system flow rate varies from said minimum to said maximum.

4,011,722

## VARIABLE DISPLACEMENT HYDRAULIC PUMP APPARATUS

J. Howard Drake, 2619 Lindentree Lane, Santa Clara, Calif. 95051

Filed May 10, 1976, Ser. No. 684,638

Int. Cl.<sup>2</sup> F15B 15/18; F16H 39/46

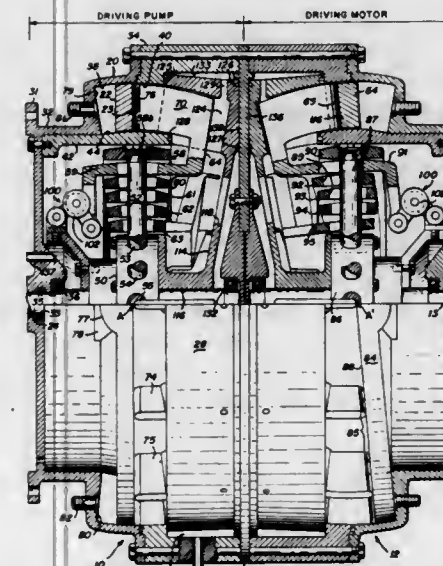
U.S. Cl. 60-465

12 Claims

1. A hydraulic pump comprising:

- a housing having first and second facing, spherically surfaced, concentric wall portions cooperating with an end wall portion to form an annular cavity;
- a divider plate affixed to one end of said housing and having fluid inlet and outlet ports therein disposed in spaced apart facing relationship with said end wall portion;
- an annular control ring disposed within said cavity and mounted to rotate therewithin about a diameter thereof

which passes through the geometrical center point of said concentric wall portions, one side of said control ring cooperating with said end wall portion and parts of said first and second wall portions to form at least one hydraulic ring control chamber, and another side of said control ring cooperating with other parts of said first and second wall portions to form a hydraulic working chamber; an elongated shaft extending into said housing with its axis passing through said center point; a rotor assembly affixed to said shaft and including an annular vane housing sealingly sandwiched between the portions of said housing forming said cavity and said divider plate, said vane housing being affixed to said shaft, and having a plurality of openings disposed around an annular segment thereof for communicatively coupling said cavity with said inlet and outlet ports, said vane housing further having a plurality of vane sleeves disposed between said openings,



- a hub and pin assembly affixed to said shaft and including a plurality of elongated pins extending radially outwardly from said shaft with their center lines disposed in a plane normal to the axis of said shaft at said center point,
- a plurality of concentric gimbal rings disposed about said shaft with each such ring being pivotally attached to a pair of said pins,
- a plurality of vanes attached to various ones of said gimbal rings, said vanes each being disposed within one of said sleeves and extending through said working chamber into engagement with said other side of said control ring to divide said working chamber into subchambers, whereby the positioning of said control ring at other than normal to said shaft causes the volumetric dimensions of said subchambers to vary as said rotor assembly revolves.

4,011,723

## FLUID POWER SYSTEM

James J. Ross, 28715 Barkman, Roseville, Mich. 48066

Filed June 28, 1974, Ser. No. 484,342

Int. Cl.<sup>2</sup> F05B 11/16

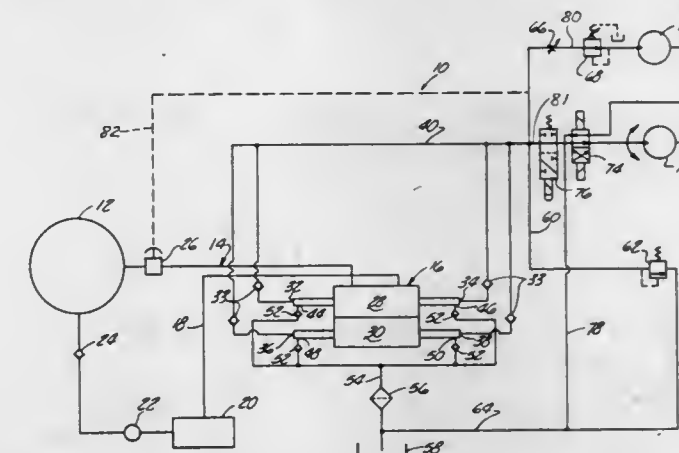
U.S. Cl. 60-486

2 Claims

1. A fluid power system comprising, in combination:

- a steam generator (12) and a first conduit means (14) connecting the steam generator (12) to a steam driven hydraulic pump (16);
- said steam driven hydraulic pump (16) comprising a housing (100,100') having a first bore (102) within which is reciprocally mounted a first piston (108) dividing said

first bore (102) into opposing first and second chambers (104, 106) alternately communicable with said steam generator (12); valve means (116) for selectively communicating said steam generator (12) to said opposing first and second pressure chambers (104, 106) so as to reciprocate said first piston (108) within said first bore (102); said first piston (108) having oppositely-extending coaxially disposed first and second piston means (130,132), the outer ends of which are disposed for reciprocal movement in opposing third and fourth pressure chambers (134,136) and which alternately compress and expand fluid therein for delivering pressurized fluid from one of said third and fourth pressure chambers (134,136) while fluid is drawn into the other of said third and fourth pressure chambers (134,136); a second bore (102') disposed in said housing (100,100'); said second bore (102') containing a second piston (108') which divides said second bore (102') into opposing fifth and sixth pressure chambers (104', 106') that are communicable with said steam generator (12); valve means (116') for communicating said opposing fifth and sixth pressure chambers (104', 106') that are communicable with said steam generator (12); said second piston (108') having opposing coaxially extending piston means (130', 132') reciprocally operable in opposing seventh and eighth pressure chambers (134', 136') for alternately compressing and expanding fluid therein to deliver fluid under pressure from one of said opposing fifth and sixth pres-



sure chambers (104', 106') while the other of said opposing fifth and sixth pressure chambers (104', 106') receives fluid at a low pressure; third means (110, 112, 114, 122', 124', 126') associated with said first piston in said first mentioned bore (102) which are operable to actuate the valve (116') associating with said second mentioned piston (108') to communicate pressure to a select one of the fifth and sixth pressure chambers (104', 106') associated therewith; and fourth means (110', 112', 114', 122, 124, 126) associated with said second piston (108') which are operable upon actuation and after a selected movement of said second piston (108') for operating said first mentioned valve (116) with selectively communicating fluid under pressure to one of said pressure chambers (104, 106) associated with said first mentioned piston (108) whereby said first and second pistons (108, 108') are reciprocable in opposite directions for delivering fluid under pressure to a plurality of fluid circuits; said fluid power system further comprising second conduit means (18) connecting the steam driven hydraulic pump (16) to said steam generator (12) via a condenser (20); a first fluid circuit (81) connecting the hydraulic output of said steam driven hydraulic pump (16) to a plurality of first rotary bidirectional hydraulic motors (72); first means (74) disposed between said hydraulic pump output and said first rotary bidirectional hydraulic motors (72) for controlling the direction of flow between said steam driven hydraulic pump (16) and said first rotary bidirectional hydraulic motors (72) and a reservoir (58)



to which the inlet of said steam driven hydraulic pump (16) is connected;

a second fluid conduit (60) comprising a relief valve (62) for limiting the pressure at which fluid is delivered from said steam driven hydraulic pump (16), the outlet of said relief valve (62) being connected to said reservoir (58); and

a third fluid conduit (80) comprising a pressure regulating valve (68) and a variable flow control valve (66) for maintaining the pressure and rate of flow of fluid to a second rotary hydraulic motor (70) at a predetermined value; and

second means (82, 26) disposed between said fluid circuits (81, 60, 80) and said steam generator (12) for sensing the load on said plurality of first rotary bidirectional hydraulic motors (72) for controlling the steam generated by said steam generator (12).

4,011,724

## DUAL FORCE ACTUATOR

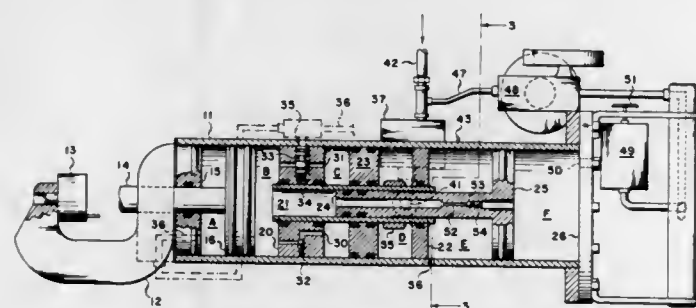
Ralph K. Landes, Atlanta, and William E. Thomas, Marietta, both of Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Sept. 16, 1971, Ser. No. 181,176

Int. Cl.<sup>2</sup> F15B 3/00

U.S. Cl. 60—567

5 Claims



1. Apparatus for operating an actuator member at plural levels of force comprising:

- a cylinder means having a hollow bore therein;
- an actuating piston means reciprocally contained within said bore and having first and second sides;
- an actuating means operably connected to said cylinder means;
- a first pressure controlled means contained within said cylinder means and operative to produce and apply fluid pressure to said first side of said actuating piston means at a first level of pressure, said first pressure controlled means including a first pressure producing piston slidably contained within said cylinder means and slidably movable to selectively exert said first level of fluid pressure on said first side of said actuating piston means;
- a second pressure controlled means contained within said cylinder means and operative to produce and apply fluid pressure to said first side of said actuating piston means at a second level of pressure higher than said first level of pressure, said second pressure controlled means including a second pressure producing piston contained within said cylinder in axial alignment with said first pressure producing piston and slidably movable to selectively exert said second level of fluid pressure on said first side of said actuating piston means, said second level of pressure produced by said second pressure controlled means adapted to become operative on said actuating piston means without releasing said first level of pressure produced by said first pressure controlled means whereby said first level of pressure becomes amplified and once established is continuous until amplified;
- pressure release means for removing fluid pressure from said first side of said actuating piston means;
- means for exerting a fluid pressure on the second side of said actuating piston means to return said actuating piston

ton means to a retracted position upon release of fluid pressure on said first side of said actuating piston means;

a first partition means fixedly disposed within said cylinder means to separate said actuating piston means and said first pressure producing piston;

a first fluid passage means contained in said first partition means to establish communication between the first pressure piston side and the actuating piston means said of said first partition means; and

one-way valve means contained in said first passage means to permit fluid to flow only from said first pressure piston side of said first partition means to said actuating piston means side thereof.

4,011,725

## ANNULAR PISTON ENGINE WITH AFTERBURNER AND POWER TURBINE

William V. Bachmann, 22517 Ten Mile Road, St. Clair Shores, Mich. 48080

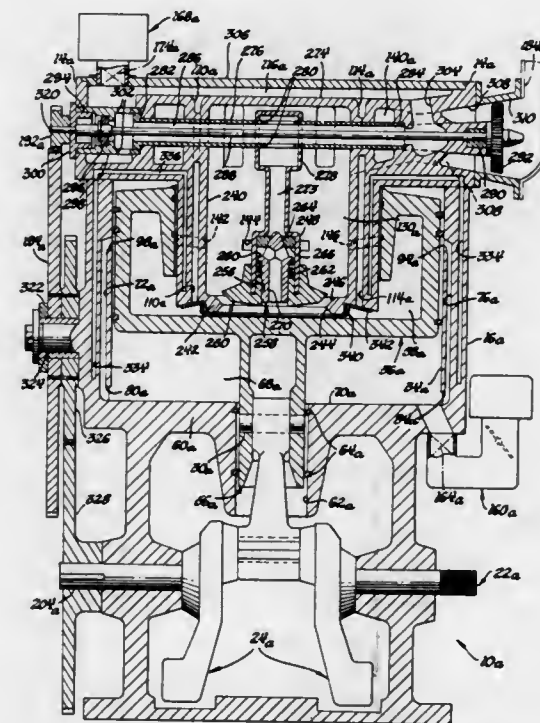
Division of Ser. No. 462,790, April 22, 1974, Pat. No. 3,885,386, which is a continuation-in-part of Ser. No. 363,247, May 23, 1973, Pat. No. 3,807,168, which is a continuation of Ser. No. 116,892, Feb. 19, 1971, abandoned. This application

May 19, 1975, Ser. No. 578,555

Int. Cl.<sup>2</sup> F02G 3/02; F02C 3/00, 7/00

U.S. Cl. 60—624

17 Claims



1. In a composite internal combustion engine having engine housing means, reciprocating power piston means and power turbine assembly means, the improvement of having said engine housing means comprising first and second engine housing section means, wherein said first engine housing section means carries said power turbine assembly means therein, wherein said first and second engine housing section means cooperate when in assembled relationship to define axially extending cylinder walls for the reciprocating reception therein of said piston means, wherein one of said cylinder walls is carried by said first engine housing section means, and wherein said first engine housing section means operatively forms closure wall means at one end of said axially extending cylinder walls.

4,011,726

## DELTA CULVERT

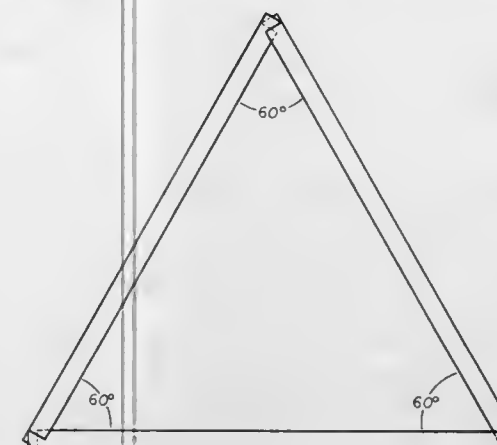
Glenn A. Cooper, Jr., Springfield, Va., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 5, 1975, Ser. No. 629,477

Int. Cl.<sup>2</sup> E02B 11/00; F16L 9/22

U.S. Cl. 61—16

2 Claims



1. The constructional wall section of a tubular article in the form of a three-sided culvert, the said wall section fabricated by bonding together with a waterproof, cold setting, resorcinol-resin adhesive, a plurality of individual structural components, each of said structural components defined individually as an elongated member shaped as a regular right parallelepiped with square cross section; said member notched at one end only with a face width notch formed by two intersecting cuts, to wit, a first cut beginning at the edge intersection of an end and a face of the member and extending into the member, at an angle of thirty degrees relative the face plane of the member, for a distance sufficient to completely accept the unnotched end of a counterpart structural component member, the notch subsequently completed with a second cut perpendicular said first cut and extending from the bottom of the said first cut to the aforementioned member face with which face the plane of the said second cut will exhibit an angle of sixty degrees, all components with notched faces in the same plane, all adjacent components with notched ends and unnotched ends alternating, and all components with notched ends uniformly extending beyond adjacent component unnotched ends a distance substantially one-half the face width of a component, the term plurality for claim purposes in this application being restricted numerically to even whole numbers thereby to produce 3 separate constructional wall section groups, the groups namely a first group of at least two units composed of an even number of structural components, a second group of at least two units composed of structural components double in number the components of the first group and a third group composed of structural components triple in number the components of the first group.

4,011,727

## MOVABLE CABLE PLOW FOR CONSTRUCTING UNDERWATER CABLE

Kinya Suzuki; Kenji Mori, both of Tokyo; Yasuo Takeuchi; Yuzo Tokumaru, both of Yokohama; Kichizo Noji; Yutaka Okada, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo; Sumitomo Electric Industries, Ltd., Osaka and Sumitomo Heavy Industries, Ltd., Tokyo, all of Japan

Filed July 25, 1975, Ser. No. 599,230

Claims priority, application Japan, July 26, 1974, 49-85108; July 26, 1974, 49-85109

Int. Cl.<sup>2</sup> B63B 35/04; E02F 5/02, 5/18

U.S. Cl. 61—72.4

3 Claims

1. Apparatus for dredging a groove in a sea bed for depositing an underwater cable in the groove, said apparatus comprising:

a main body towable horizontally along a surface of the sea bed,

a plow for dredging the groove in the sea bed,

attachment means for attaching said plow to said main body such that said plow extends vertically with respect thereto,

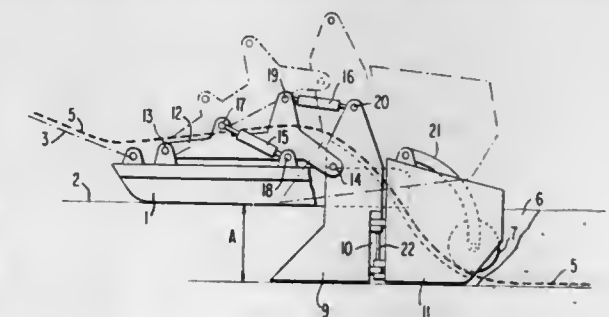
said attachment means comprising at least one Y-shaped arm,

means for pivoting the non-forked end of said at least one arm to said main body for pivoting in the plane of the arm about a horizontal axis, so as to provide a vertically upper and lower fork for said arm at the rear end of said main body,

means for pin connecting the lower fork to said plow intermediate of its ends, for pivoting said plow about a horizontal axis relative to said at least one arm,

a first hydraulic cylinder pin connected at one end to said upper fork of said at least one arm and pin connected at the other end to said plow above the pin connection between said plow and said lower fork, and

a second hydraulic cylinder secured at one end to said main body and at the other end to said at least one arm rear-



wardly of the pin connection of said at least one arm to said main body such that operation of said first hydraulic cylinder causes said plow to pivot relative to said at least one arm to vary the angle of attack of said plow with respect to said sea bed and operation of said second hydraulic cylinder causes said arm to pivot about its pin connection to pivot relative to said main body,

whereby, said plow may be lifted vertically without change in orientation with respect to said sea bed during operation, and

a planar cable guide member and torsion bar hinge means for mounting said planar guide member to the rear of said plow such that said guide member extends vertically and constitutes an extension of said plow and pivots about a vertical axis under the restraint of said torsion bar,

whereby, when the direction in which the plow is towed is changed to avoid an obstacle or hard ground, only the plow is required to travel in the new direction with the cable guide member pivoting laterally with respect to the plow under the torsion bar restraint to minimize transmission of lateral forces to the main body to ease the change in direction of the plow and to minimize the danger of the plow tipping.

4,011,728

## MEANS FOR PRODUCING SUBAQUEOUS AND OTHER CAST-IN-PLACE CONCRETE STRUCTURES IN SITU

Lee A. Turzillo, 2078 Glengary Road, Akron, Ohio 44313

Division of Ser. No. 542,050, Jan. 17, 1975, which is a division of Ser. No. 44, Jan. 24, 1970, Pat. No. 3,726,950, which is a

continuation-in-part of Ser. No. 647,026, June 19, 1967, abandoned, which is a continuation-in-part of Ser. No.

365,431, May 6, 1964, Pat. No. 3,345,824. This application

Mar. 18, 1976, Ser. No. 668,231

Int. Cl.<sup>2</sup> E02D 7/00, 5/34, 5/64

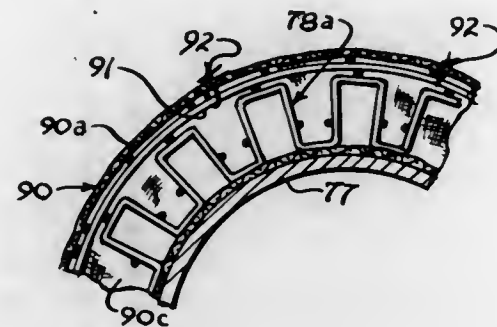
U.S. Cl. 61—86

4 Claims

1. A mold for forming cast-in-place concrete or like body from fluid, self-hardenable cementitious material to given



shape and size in a subaqueous or other situs comprising: a flexible walled, bag-like container, a self-supportingly rigid matrix of openwork material received within said container, means for maintaining said matrix fixedly positioned at the situs, means for supporting said container with opposing walls in coextending relation to said fixedly positioned matrix, tension-restraining tie-elements of predetermined length con-



nected between said matrix and opposing walls of said container for controlling limited oppositely outward distension of said opposing walls away from said matrix as determined by the length of said tie-elements, upon reception of fluid self-hardenable cementitious material within said container to expand the walls thereof to such given shape and size of the body formed by the fluid cementitious material.

4,011,729

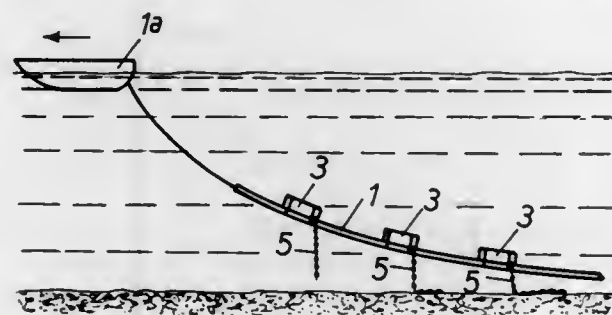
**DEVICE FOR LAYING SUBMARINE PIPELINES**  
Louis Kermel, Le Mesnil-Saint-Denis, France, assignor to C. G. Doris, Paris, France

Filed Sept. 23, 1975, Ser. No. 616,018

Claims priority, application France, Oct. 3, 1974, 74.33292  
Int. Cl.<sup>2</sup> F16L 1/00

U.S. Cl. 61-112

4 Claims



1. Apparatus for recovering guide chains in a device for laying a submarine pipeline comprising means for towing the pipeline and displacing it parallel to the sea bed, comprising in combination, a float, attaching means for removably attaching said float to said pipeline, a chain, means securing said chain to said float, and release means separating the float from said pipeline to carry therewith said chain to the surface.

4,011,730

**GELLED CRYOGENIC LIQUIDS AND METHOD OF MAKING SAME**

Sanders D. Rosenberg, Sacramento, and Eugene M. Vanderwall, Citrus Heights, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

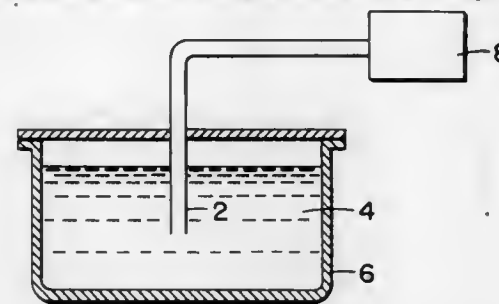
Continuation-in-part of Ser. No. 36,416, May 11, 1970, abandoned. This application Apr. 28, 1975, Ser. No. 572,240  
Int. Cl.<sup>2</sup> F25C 3/00

U.S. Cl. 62-1

20 Claims

1. A gelled cryogenic liquid composition consisting essentially of at least one of liquid methane and liquid natural gas and of a gelling agent taken from the class consisting of finely

divided ice particles and finely divided methyl alcohol particles, the gelling agent being present in the range of 0.1 percent



to 3.0 percent by weight of the liquid methane and liquid natural gas.

4,011,731

**AIR CONDITIONING APPARATUS UTILIZING SOLAR ENERGY AND METHOD**

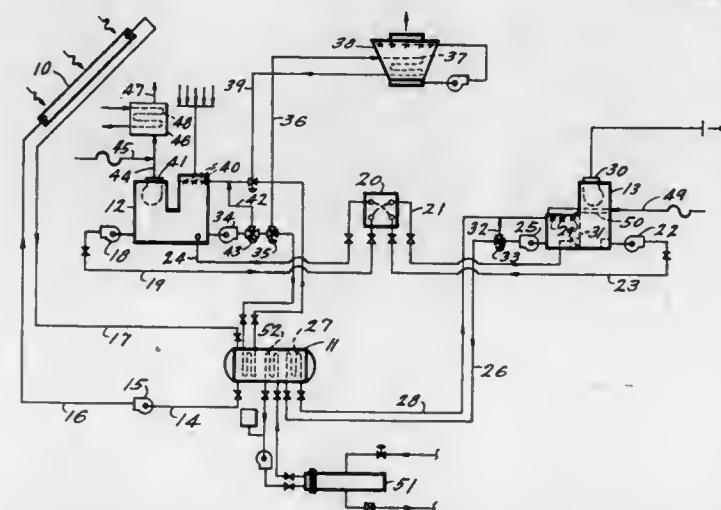
Gershon Meckler, 2750 Ridge Valley, Atlanta, Ga. 30326

Filed Nov. 15, 1974, Ser. No. 524,255

Int. Cl.<sup>2</sup> F25B 27/00

U.S. Cl. 62-2

11 Claims



1. Apparatus for conditioning air comprising, in combination, a contactor, means for circulating air to be conditioned to said contactor in contact with an aqueous hygroscopic solution, a hygroscopic solution regenerator, means for circulating a concentrated hygroscopic solution from said regenerator to said contactor, means for circulating a dilute hygroscopic solution from said contactor to said regenerator, means for circulating regenerating air through said regenerator in contact with the hygroscopic solution therein whereby such solution is concentrated, a solar collector, means for transferring heat from said solar collector to the hygroscopic solution being regenerated in said regenerator, an absorption refrigerator including a generator and an evaporator, means for transferring heat from said solar collector to said generator, a heat exchange coil located in said evaporator to be cooled by refrigerant, and means for removing heat from the hygroscopic solution which contacts air circulated through said contactor including means for circulating a controlled portion of the hygroscopic solution in said contactor through said heat exchange coil.

4,011,732

**HEAT-STATIONED BAYONET CONNECTOR FOR CRYOGENIC FLUID LINES**

Paul R. Doherty, Woburn, and Robert W. Johnson, Holbrook, both of Mass., assignors to Helix Technology Incorporated, Waltham, Mass.

Filed Feb. 14, 1974, Ser. No. 442,326

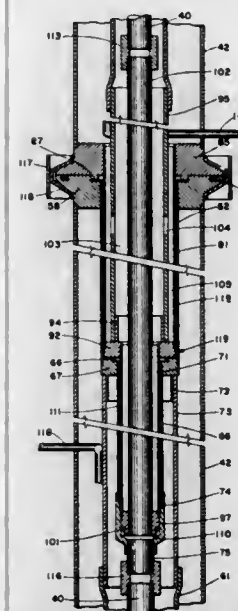
Int. Cl.<sup>2</sup> F17C 7/02

U.S. Cl. 62-55

23 Claims

1. In a heat-stationed bayonet connector suitable for joining cryogenic fluid transfer lines including male and female sec-

tions engageable to form a continuous cryogenic liquid process line with a radiation shielding means therearound for shielding radiation therefrom, the improvement comprising: a support means for supporting the connector outside the radiation shielding means; a heat station means for intercepting heat flow, said heat station means being positioned on said radiation shielding means and bonded thereto; a first tubular means located between and concentric with said process line and said radiation shielding means for inter-connecting said process line and said radiation shielding means, a first end of said first tubular means being attached to said heat station and



a second end thereof being attached to said process line at a position offset from said heat station along said process line; and a second tubular means located outside and concentric with said radiation shielding means for interconnecting said radiation shielding means to said support means, a first end of said second tubular means being attached to said heat station and a second end thereof being adapted for attaching to said support means, at a position offset from said heat station along said process line, whereby when said radiation shielding means are cooled said heat station means is cooled to intercept heat flow from said support means to said process line.

4,011,733

**APPARATUS AND PROCESS FOR CARBONATING LIQUIDS**

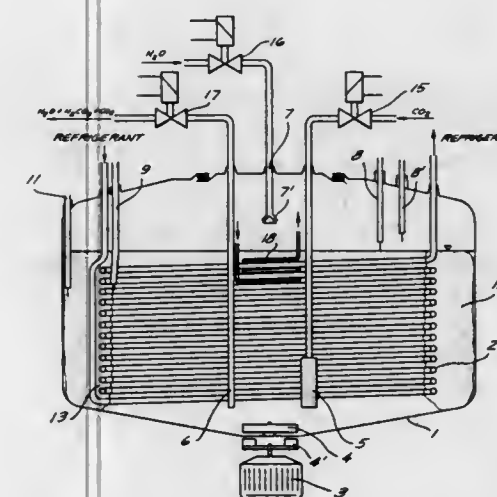
Alexander Kückens, Hamburg, and Horst Kohl, Reinfeld, both of Germany, assignors to DAGMA GmbH & Co., Reinfeld, Germany

Filed July 29, 1975, Ser. No. 600,063

Int. Cl.<sup>2</sup> F25D 11/00

U.S. Cl. 62-59

22 Claims



1. An apparatus for carbonating liquids, particularly for carbonating beverages, comprising a container; cooling means in said container and operative for forming at the interior and

the exterior of said cooling means a respective interior and exterior surrounding ice layer; first admitting means and second admitting means operative for admitting a carbonating gas and a liquid into said container for thermal contact with at least said interior ice layer so as to be cooled and mixed therein; means for dispensing the mixture from said container; and means for maintaining said interior ice layer at a thickness which is smaller than the thickness of said exterior ice layer.

8. An apparatus for carbonating liquids, particularly for carbonating beverages, comprising a container; cooling means in said container and operative for forming at the interior and the exterior of said cooling means a respective interior and exterior surrounding ice layer, said cooling means is connected to said container and forms a first electrode means; first admitting means and second admitting means respectively operative for admitting a carbonating gas and a liquid into said container for thermal contact with at least said interior ice layer so as to be cooled and become mixed therein to form a carbonating gas-liquid mixture; means for dispensing said mixture from said container; and means for preventing the thickness of at least said interior ice layer from exceeding a predetermined thickness, said means including second electrode means insulated from said container and cooperating with said first electrode means.

4,011,734

**CRYOGENIC PRESSURE REGULATOR**

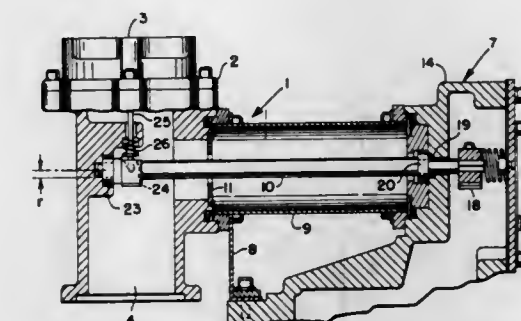
Robert L. Jones, Irvine, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed May 8, 1975, Ser. No. 575,627

Int. Cl.<sup>2</sup> F25B 49/00

U.S. Cl. 62-132

2 Claims



1. A pressure regulator comprising a body having a passage therethrough including an inlet adapted for connection to a fluid pressure source and an outlet; an inlet valve in said body including small and large valve members spring-biased to close said passage and being movable to define respective small and large variable area orifices; a valve actuator in said body having one side exposed to fluid under pressure downstream of said outlet and movable thereby according to the magnitude of such fluid under pressure; and motion transmitting means operatively engaged with said actuator and inlet valve to sequentially actuate said small and large valve members to successively progressively increase the flow areas of the respective variable area orifices responsive to movement of said actuator in one direction by decreasing downstream fluid pressure; said actuator comprising a flexible diaphragm which is spring-biased in such one direction; said motion transmitting means comprising a central axially extending rod on said diaphragm; a crankshaft journaled in said body having a crank arm at one end pivotally connected to said rod and having a cam at the other end; a cam follower engaged with said cam to sequentially engage said small and large valve members responsive to turning of said crankshaft in said one direction by movement of said diaphragm in said one direction thus to progressively increase the small variable area orifice to predetermined maximum size and then to progressively increase the large variable area orifice; the radius of said crank arm being several times the radius of engagement of said cam and follower to produce a large mechanical advantage of actuator force to cam follower force to provide a narrow



pressure control band despite large variations in inlet fluid pressures and flow demands; said body comprising separate parts for said inlet valve and for said actuator; said body parts being connected together by means which thermally isolate the body part containing said actuator from the body part containing said inlet valve in the case of connection of said inlet to a cryogenic fluid pressure source; said crankshaft being elongated between said arm and said cam and extending laterally of said outlet; said body parts having spaced-apart portions, and a spacer tube surrounding the crankshaft between said arm and cam and extending between said spaced-apart portions to define a laterally extending pocket open at one end to said passage downstream of said inlet valve and closed at the other end; said means for thermally isolating said body parts from each other comprising said spacer tube and crankshaft being of material having a low thermal conductivity.

4,011,735

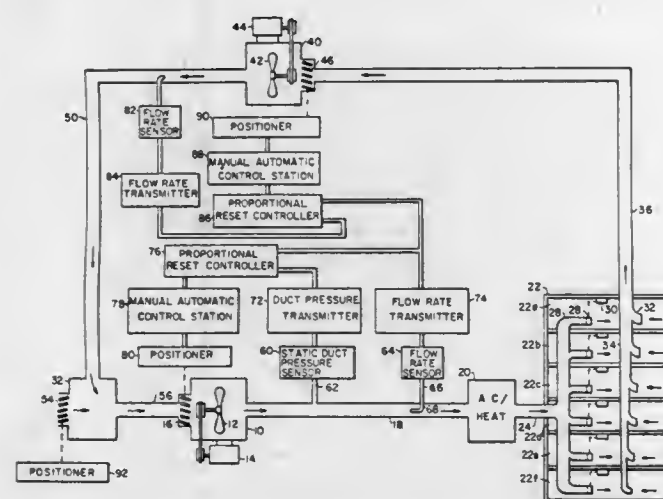
**BLOWER SYSTEM AND CONTROL SYSTEM THEREFOR**  
Lyle F. Martz, Verona, and John W. Nanz, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 420,483, Nov. 30, 1973, abandoned, and a continuation of Ser. No. 359,398, May 11, 1973, abandoned, which is a continuation of Ser. No. 265,385, June 22, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,590

Int. Cl.<sup>2</sup> F24F 3/02

U.S. Cl. 62—186

7 Claims



1. A blower system for a central air conditioning installation servicing a facility having variable air supply flow rate requirements in accordance with attaining desired atmospheric conditions within each portion of the facility serviced by the installation, comprising:

- a supply blower,
- duct means connected to said supply blower for receiving and conveying an air supply flow from said supply blower to air conditioning means, the air as conditioned therein being supplied to said facility,
- first sensing means communicating with said duct means for sensing the air supply flow rate therewithin and producing a first pneumatic signal representative thereof,
- second sensing means communicating with said duct means for sensing the static duct pressure therewithin as corresponding to the discharge pressure of said supply blower and producing a second pneumatic signal representative thereof,
- a proportional plus reset controller,

means for transmitting the first pneumatic signal to said proportional plus reset controller as a set point signal, and for transmitting the second pneumatic signal to said proportional reset controller as a feedback signal, said transmitting means including tuning means for adjusting said first and second pneumatic signals in accordance

with a predetermined desired relationship of the discharge pressure of said supply blower and the supply flow rate,

said proportional plus reset controller being operable to produce a pneumatic output control signal dependent on the difference between the feedback pneumatic signal and the set point pneumatic signal, and adjustment means responsive to the pneumatic output control signal of said proportional plus reset controller for adjusting the output of said supply blower to establish said desired relationship of the discharge pressure of said supply blower with respect to the supply flow rate.

4,011,736

**COLD STORAGE TANK**

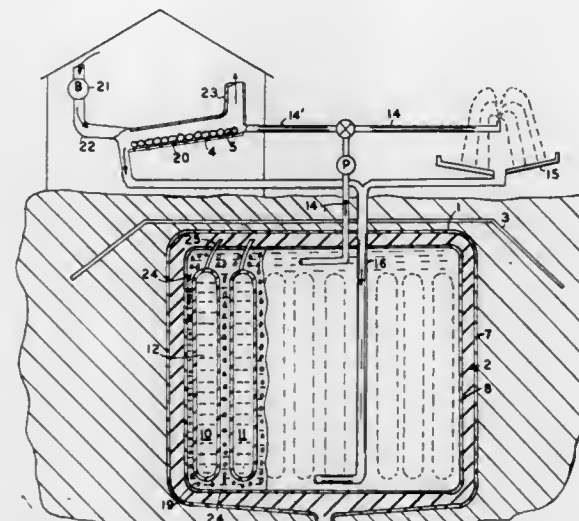
Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,057

Int. Cl.<sup>2</sup> F25D 23/12, 17/02, 11/04; B65G 5/00

U.S. Cl. 62—260

9 Claims



1. Cold storage tank means mounted in a pit in the ground, said pit having continuous sides and a bottom, a lining of incompressible insulation on the interior surface of said pit, an inner tank lining the interior surface of said insulation, a rigid cellular structure substantially filling said inner tank, a plurality of bags of freezable liquid mounted inside the cells of said rigid cellular structure, low freezing point liquid substantially filling said inner tank and the voids surrounding said liquid bags, first heat exchange means for removing heat from said low freezing point liquid to freeze said freezable liquid, and second heat exchange means for adding heat to said low freezing point liquid to melt said freezable liquid, thereby producing a useful cooling effect.

4,011,737

**DEVICE FOR FASTENING A WHEEL DISC ON A SHAFT**  
Wolfgang Kruger, Kohlstatstr. 26, 8069 Priel, and Hagen Hanser, Pagodenburg-strasse, 8000 Munich 60, both of Germany

Filed Dec. 11, 1975, Ser. No. 639,817

Claims priority, application Germany, Dec. 21, 1974, 2460739

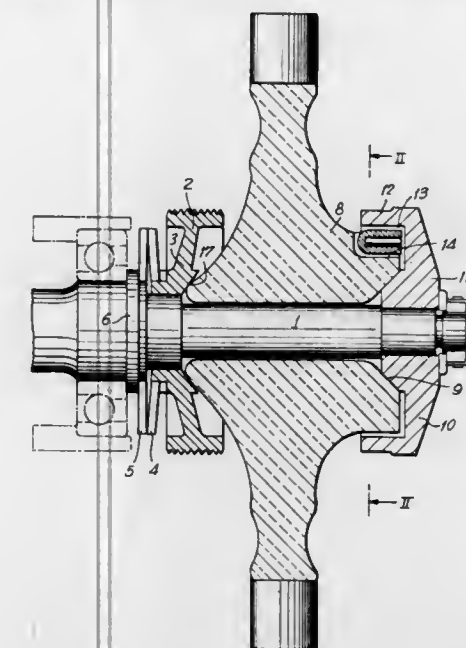
Int. Cl. F16D 3/18

U.S. Cl. 64—9 A

2 Claims

1. In a torque-transmission coupling for a disc formed of brittle material, particularly a ceramic turbine disc, a shaft for mounting said disc thereonto, at least one axially pre-stressed cone pair for centering said disc on said shaft, said disc including a hub having a cylindrical extension, said extension being formed with profiled longitudinal grooves on the outer periphery thereof, said grooves having respective side walls, a cylindrical coupling bell having a bore and a coupling region and

being rigidly fastened to said shaft, profiled longitudinal protuberances having concave side edges, said protuberances fitting into and engaging said longitudinal grooves within said bore for torque transmission, the improvement comprising said at least one axially pre-stressed cone pair being disposed in the coupling region of said coupling bell, and rollers radially and



tangentially fitting between said concave side edges of said longitudinal protuberances and said side walls of said longitudinal grooves, respectively, for torque transmission distributed uniformly over the circumference of the coupling bell to said shaft through centrifugal force utilization, whereby thermal stresses between said disc of brittle material and said shaft, said cone pair, and said coupling bell are prevented.

4,011,738

**MANUFACTURING OF PANTYHOSE OR TIGHTS USING A CIRCULAR KNITTING MACHINE**

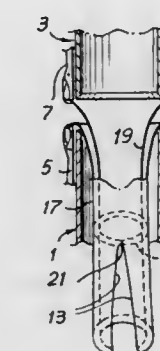
Edoardo Furia, Florence, Italy, assignor to Nova Tec Establishment, Liechtenstein

Continuation-in-part of Ser. No. 171,169, Aug. 12, 1971, abandoned. This application Mar. 27, 1974, Ser. No. 455,387

Int. Cl.<sup>2</sup> D04B 9/10; A41B 9/14

U.S. Cl. 66—14

8 Claims



1. A method for forming a panty hose having two tubular leg portions and a pant portion using a circular knitting machine having two groups of needles, comprising forming the pant portion by conjoint oscillation of the two groups of needles to produce courses of stitches extending over substantially 360°; passing a yarn from one group to the other group of needles at the end of each oscillation so as to form inner and outer longitudinally split tubular layers of fabric which are joined together along their longitudinal edge portions; and forming the leg portions by continuous conjoint rotation of the two groups of needles with an independent feed to each group of needles so as to produce one leg portion within the other leg portion, the said other leg portion having a plain stitch and the said one leg portion having a purl stitch while the leg portions are disposed one within the other during formation thereof.

4,011,739

**FEEDING APPARATUS FOR SHEET-LIKE MATERIALS**  
Yoshinosuke Mori, Migaku Suzuki, both of Ootake; Atsushi Kawai, Hiroshima, and Seigi Suzuki, Ootake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

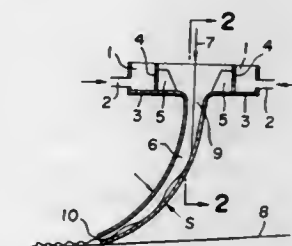
Filed Sept. 24, 1975, Ser. No. 616,366

Claims priority, application Japan, Oct. 23, 1974, 49-122278

Int. Cl.<sup>2</sup> D04B 9/46

U.S. Cl. 68—181 R

10 Claims



1. A feeding apparatus for a sheet-like material, which comprises:  
a liquid supplying tank;  
a downwardly extending curved slit type guide passage for the sheet-like material having a slit which is gradually decreased from an upper inlet portion thereof to a lower outlet portion;  
means for supplying liquid from said liquid supply tank to both sides of said inlet portion of said guide passage for introducing said liquid stream into said slit type guide passage from along the entire width of both sides of said guide passage; and  
means for rectifying said stream of liquid from said supply means upstream of said inlet portion of said guide means in such a manner that substantially no flow pattern occurs in the direction of the width of said guide passage.

4,011,740

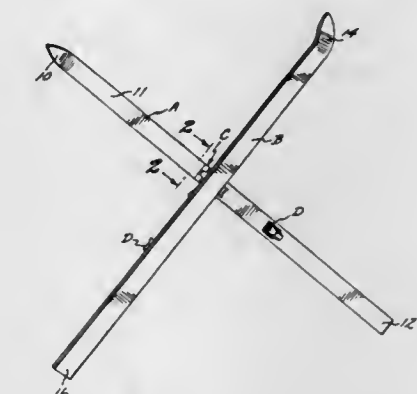
**ANTI-THEFT SKI LOCK ASSEMBLY**

Per A. Ljungberg, 319 Onyx Ave., Balboa Island, Calif. 92662  
Filed June 7, 1976, Ser. No. 693,328

Int. Cl.<sup>2</sup> E05B 73/00

U.S. Cl. 70—58

5 Claims





- b. a second lock member that includes a second plate that has first and second oppositely disposed side surfaces, a third rib that extends outwardly from said second side surface, with said third rib of such width and depth as to be removably insertable in said elongate space, said third rib having a transverse opening therein that may be aligned with said opening in said first rib, and a recess in said third rib that is normal to said transverse opening and in communication therewith;
- c. first means for securing said first lock member to said first ski, with said first side surface of said first lock member in abutting contact with said top surface of said first ski and said first and second ribs and elongate space extending longitudinally relative to said first ski;
- d. second means for securing said second lock member to said second ski, with said first side surface of said second lock member in abutting contact with said top surface of said second ski and said third rib transversely disposed relative to said second ski; and
- e. a lock assembly that includes an elongate lock body that slidably and snugly engages said openings in said first and third ribs when said openings are aligned, a lock pin transversely movable relative to said body and alignable with said recess, and third means for moving said pin between a projecting and retracted position, said pin when in said projecting position and in engagement with said recess holding said first and second lock members in interlocking engagement and said first and second skis in said cross configuration, and said pin when in said retracted position permitting said lock assembly to be withdrawn from said openings in said first and third ribs and said first and second skis separated.

4,011,741

## LOCK CYLINDER WITH DUAL DRIVERS

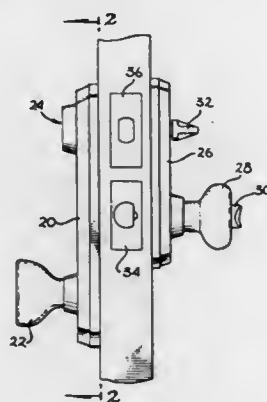
Roger J. Nolin, Monterey Park, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Filed Apr. 6, 1976, Ser. No. 674,228

Int. Cl.<sup>2</sup> E05B 63/14

U.S. Cl. 70-107

14 Claims



1. In a door latch and lock assembly having a dead bolt, apparatus for withdrawing both the latch bolt and the dead bolt upon rotation of the key comprising:
- a cylinder housing containing a plurality of pins;
- a plug within said cylinder housing having a front portion and a rear portion and containing a plurality of tumblers in cooperative disposition with respect to said pins, said plug having a key receiving slot on the front face thereof in cooperative disposition with respect to said tumblers;
- a first drive means coupled to the rear portion of said plug, said first drive means being a lost motion drive for driving a dead bolt between latched and unlatched positions; and
- a second drive means substantially rigidly secured to the rear portion of said plug for driving a latch bolt between latched and unlatched positions.

4,011,742  
LOCK DEVICE

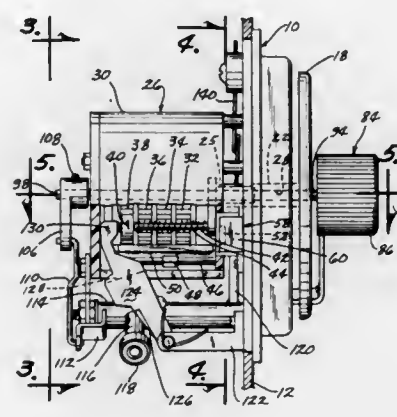
Raymond J. Klein, North Hollywood, Calif., assignor to Dial Corporation of America, Denison, Iowa

Filed Aug. 4, 1975, Ser. No. 601,584

Int. Cl.<sup>2</sup> E05B 37/02

U.S. Cl. 70-305

4 Claims



1. A lock device comprising
- support means;
- a latch bolt assembly movably mounted on said support means for movement from a closed position to an open position;
- a control member movable from a locked position retentively engaging said latch bolt assembly to an unlocked position freeing said latch bolt assembly for movement to its open position;
- a plurality of ratchets within said lock mechanism, said ratchets normally retentively engaging said control member and holding said control members against movement to said unlocked position, said ratchets being rotatable to a predetermined position to release said control member and permit said control member to move to said unlocked position;
- spring means for yieldably urging said ratchets away from said predetermined position;
- a manually operable rotating member;
- pawl means movable from an initial position engaging one of said ratchets to a plurality of stepping positions engaging the remainder of said ratchets one at a time, said rotating member being drivingly connected to said pawl means for moving said pawl means and causing rotation of the ratchet engaged by said pawl means;
- a reset bar having a flange thereon engaging said ratchets for preventing rotation of said ratchets in the direction urged by the spring means, said reset bar being movable out of engagement with said ratchets for permitting said ratchets to rotate in response to said spring means;
- a rotatable knob operatively connected to said latch bolt assembly for causing movement of said latch bolt assembly to its open position;
- reset mechanism drivingly connected to said rotatable member, said reset mechanism including a first reset member engageable with said pawl means and engageable with said reset bar, said first reset member being movable in response to rotation of said knob and opening of said latch bolt assembly to move said pawl means to its initial position and to move said reset bar out of engagement with said ratchets whereby said ratchets will rotate to their normal position retentively holding said control member against movement to said unlocked position.

4,011,743  
STAND SPEED REFERENCE CIRCUIT FOR A CONTINUOUS TANDEM ROLLING MILL

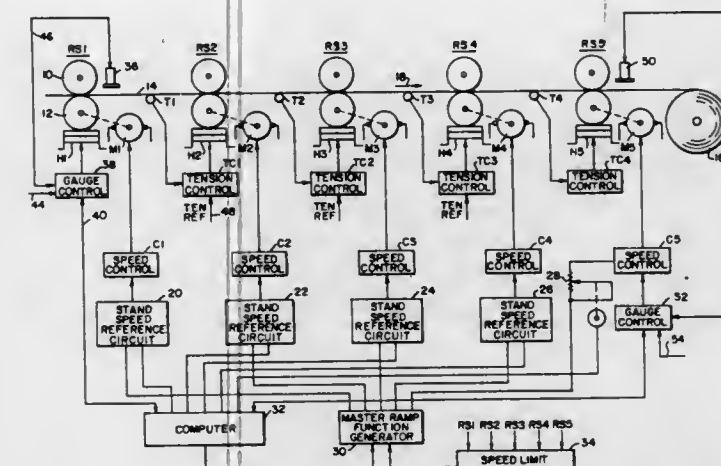
Robert S. Peterson, and John W. Cook, both of Williamsville, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1976, Ser. No. 678,527

Int. Cl.<sup>2</sup> B21B 37/00, 37/14

U.S. Cl. 72-12

8 Claims



1. In a continuous rolling mill, a stand speed reference circuit for supplying speed reference signals to each of a plurality of selected stands respectively comprising:
- speed reference means for deriving a variable potential which is a function of the respective stand speed and for delivering said speed reference signal;
- means coupled to said speed reference means for storing a voltage signal which is a function of said variable potential;
- first summation means for receiving said stored voltage signal, and the instantaneous magnitude of said variable potential, and for delivering a first summation signal;
- a ramp function generator means for receiving a signal (1-P.U.) multiplier during gauge change transition, the P.U. multiplier being:

$$P.U. = \frac{S(i+1)H(i+1)2}{S(i)H(i)2}$$

where  $S(i+1)$  = the original schedule (1) speed of the transition stand;

$S(i)$  = the original schedule (1) speed of the stand next behind the transition stand;

$H(i+1)2$  = the new schedule (2) roll gauge for the transition (i+1) stand;

$H(i)2$  = the new schedule (2) roll gauge for the ith stand;

- and for delivering a voltage which is a function of the incremental desired change in speed for all stands being then changed;
- multiplying means connected to receive and multiply said stored voltage and said incremental desired change voltage, and for delivering a product voltage;
- a second summation means connected to receive said first summation signal and said product voltage, and for delivering an error signal;
- control means connected to receive a first schedule stand speed reference signal and said error signal, and for delivering a control signal to said speed reference means, the magnitude of said variable potential being successively a function of said first schedule stand reference signal and said error signal respectively;
- means for controllably interrupting the connection of said first schedule stand reference signal, and said error signal to said control means, and for controllably decoupling said storing means from said variable potential, the stored voltage upon decoupling being the input to said first

summation means, so that said error signal is applied to said control means only when the discrete stand speed is to be changed upon making a gauge change in the first rolling schedule.

4,011,744  
METHOD AND MEANS FOR SHAPING PARTS BY HYDRAULIC EXTRUSION

Vladislav, Ivanovich Ershov, ulitsa Volgina, 19, kv. 16, and Nikolai Dmitrievich Livenko, ulitsa Profsojuznaya, 100, korpus 4, kv. 198, both of, Moscow, U.S.S.R.

Division of Ser. No. 408,004, Oct. 19, 1973, Pat. No.

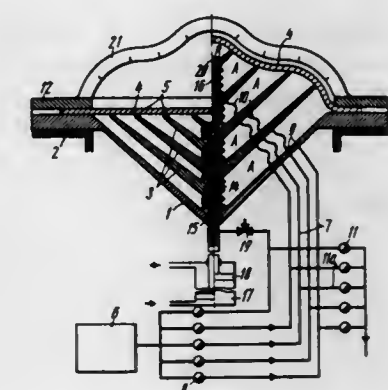
3,910,086. This application Feb. 25, 1975, Ser. No. 552,780

Claims priority, application U.S.S.R., Mar. 30, 1973, 1902339; July 5, 1973, 1931501

Int. Cl.<sup>2</sup> B21D 26/04

U.S. Cl. 72-57

1 Claim



1. A method for shaping parts by hydraulic extrusion, comprising the steps of: profiling a sheet metal workpiece by liquid simultaneously supplied to different zones of said workpiece at different pressure values corresponding to the shape of said workpiece, said workpiece having a central part and a flange section, said liquid comprising a variable-pressure deforming agent, the variable liquid pressure increasing the wall thickness in the central part of said workpiece and decreasing the wall thickness in the flange section of the workpiece the elasticity of the workpiece remaining substantially unchanged by said liquid.

4,011,745  
SEMICONDUCTOR SENSORS

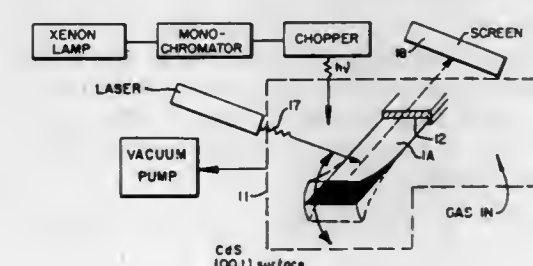
Harry C. Gatos, Weston, Mass., and Jacek Lagowski, Warsaw, Poland, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 492,118, July 26, 1974, abandoned, which is a division of Ser. No. 290,666, Sept. 21, 1972, Pat. No. 3,887,937. This application Nov. 7, 1975, Ser. No. 629,839

Int. Cl.<sup>2</sup> G01N 23/00

U.S. Cl. 73-23

11 Claims



1. A gas sensor comprising:
- a. a semiconductor wafer formed of a non-centrosymmetric



material having a high energy gap and selected from the group consisting of materials having wurtzite and zinc-blende structure;

- b. a vacuum chamber containing the wafer and adapted to receive traces of a gas that introduces surface states in the wafer through absorption;
- c. a source of illumination whose energy corresponds to the energy of the introduced surface states, said source illuminating the wafer for causing the latter to deflect an amount dependent on the wavelength of the illumination; and
- d. means for measuring the deflection of the wafer for detecting the presence of said gas in the chamber.

4,011,746

**LIQUID DENSITY MEASUREMENT SYSTEM**

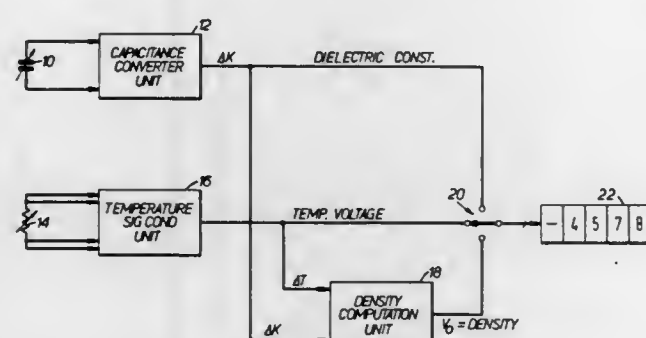
Paul G. Weitz, Jr., Salisbury, and David A. Lamphere, Milton, both of Vt., assignors to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,584

Int. Cl.<sup>2</sup> G01N 9/00; G01R 27/26

U.S. Cl. 73—32 R

11 Claims



1. A liquid density measurement system, comprising:
  - a capacitance probe mounted for immersion in a mass of liquid the density of which is to be measured, the capacitance of the probe being dependent on the dielectric constant of the liquid;
  - a capacitance converter unit connected to the probe and arranged to produce a first signal the magnitude of which is dependent on the dielectric constant of the liquid;
  - temperature sensing means mounted for immersion in the liquid and responsive to variations in temperature thereof;
  - a temperature signal conditioning unit connected to the temperature sensing means and arranged to produce a second signal the magnitude of which is dependent on the temperature of the liquid; and
  - a density computation unit connected to receive and individually scale said first and second signals, the computation unit including summing means arranged to sum the scaled first and second signals to produce an output signal proportional to the density of the liquid.

4,011,747

**METHOD AND APPARATUS FOR ACOUSTIC SCANNING USING WAVES SCATTERED BY AN ACOUSTIC GRATING**

H. John Shaw, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed June 20, 1975, Ser. No. 588,694

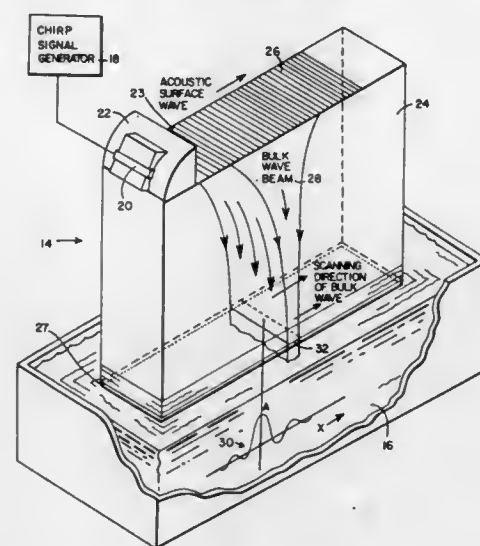
Int. Cl.<sup>2</sup> H03H 9/26

U.S. Cl. 73—67.5 R

50 Claims

1. Apparatus for generating focused acoustic bulk waves, comprising:
  - a. means for generating a chirp pulse output;
  - b. a solid medium for transmitting acoustic waves;
  - c. an array of perturbations located on one surface of the solid medium; and
  - d. transducer means operatively connected to the generat-

ing means and the solid medium for converting the chirp pulse from the generating means into surface acoustic waves propagating along the perturbation array surface of the solid medium, said surface acoustic waves being in-



wardly scattered into the solid medium by said perturbation array and converged into a focused beam of acoustic bulk waves angularly directed from the direction of propagation of the surface acoustic waves.

4,011,748

**METHOD AND APPARATUS FOR ACOUSTIC AND OPTICAL SCANNING OF AN OBJECT**

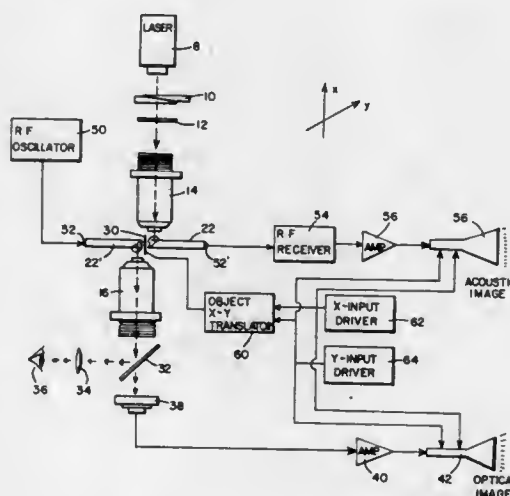
Walter L. Bond, Los Altos, Calif.; Rudolf Kompfner, Oxford, England, and Ross A. Lemons, Mountain View, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Sept. 18, 1975, Ser. No. 614,440

Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73—67.6

33 Claims



1. A microscope for scanning an object with light and acoustic waves, comprising:
  - a. optical lens means for focusing light on an object located at the optical focal plane of said lens so that the light passes through the object and is modulated thereby;
  - b. photodetector means for converting the modulated light into a corresponding electrical signal;
  - c. optical lens means located between the optical focal plane and the photodetector means for receiving the light modulated by the object and directing the light onto the photodetector means;
  - d. means connected to the photodetector means for recording the electrical signal corresponding to the light modulated by the object;
  - e. means for generating acoustic waves;
  - f. means connected to the acoustic wave generating means for propagating the acoustic waves therefrom;
  - g. acoustic lens means connected to the acoustic wave

propagating means for focusing the acoustic waves on the object located at the acoustic focal plane of said lens so that the acoustic waves pass through the object and are modulated thereby;

- h. transducer means for converting the modulated acoustic waves into a corresponding electrical signal;
- i. means located between the acoustic focal plane and the transducer means for propagating the acoustic waves modulated by the object to the transducer means;
- j. means connected to the transducer means for recording the electrical signal corresponding to the acoustic waves modulated by the object; and
- k. means providing relative movement between the object and the acoustic and optical focal planes so that the object is scanned by the light and acoustic waves.

4,011,749

**VIBRATION TESTING SYSTEM**

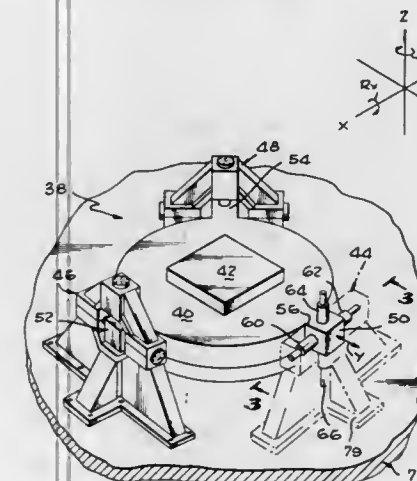
Klaus L. Cappel, Madison, Ala., assignor to Wyle Laboratories, El Segundo, Calif.

Filed Feb. 2, 1976, Ser. No. 654,114

Int. Cl.<sup>2</sup> B06B 1/00

U.S. Cl. 73—71.6

14 Claims



1. Apparatus for moving a load, comprising:
  - a table having an actuator-movable portion with opposite sides; and
  - hydraulic moving means for moving said table, including a pair of hydraulic actuators having bearing means bearing against the opposite sides of said actuator-movable table portion;
  - each of said hydraulic actuators being constructed to move its bearing means parallel to an imaginary X axis; and
  - each of said bearing means slideably bearing against a corresponding side of said table portion, to permit slideable movement of said table portion in a direction along an imaginary Z axis which is perpendicular to said imaginary X axis.

4,011,750

**METHOD AND APPARATUS FOR ULTRASONIC EXAMINATION OF OBJECTS**

David Errol Robinson, Avalon Beach, Australia, assignor to The Commonwealth of Australia care of the Secretary Department of Health, Australian Capital Territory, Australia

Continuation-in-part of Ser. No. 367,628, June 6, 1973, abandoned. This application June 30, 1975, Ser. No. 591,311

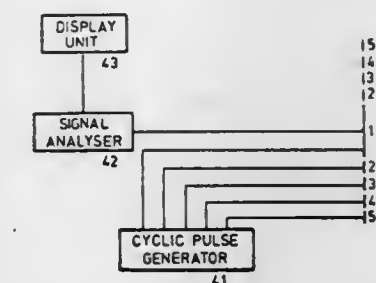
Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73—67.7

18 Claims

9. A method of ultrasonic examination of an object comprising the steps of transmitting pulses of ultrasonic energy into the object and receiving echoes of said pulses of ultrasonic energy reflected by acoustic impedance discontinuities within the object, wherein:
  - said pulses are transmitted along a single axis by a central transducer and by a plurality of annular transducers posi-

tioned concentrically with said axis of the central transducer, and echoes of pulses transmitted into the object by each of said central transducer and said annular transducers reflected along said single axis are received by said central transducer,



said method including separately storing and then subsequently analyzing said received echoes of pulses transmitted by each of said central transducer and said annular transducers to extract velocity, scattering and multiple reflection information.

4,011,751

**BRAKE TESTER**

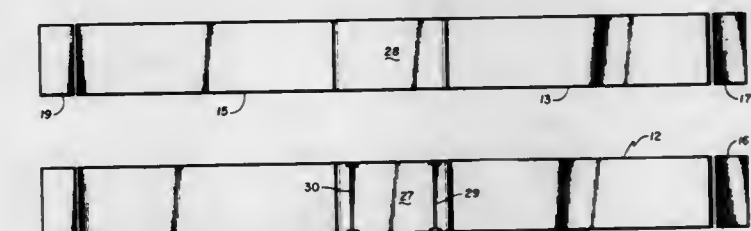
Arnold A. Weiss, Minneapolis; Daniel M. Motl, New Brighton, and Eugene D. Johnston, St. Paul, all of Minn., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Feb. 27, 1976, Ser. No. 662,018

Int. Cl.<sup>2</sup> G01L 5/28

U.S. Cl. 73—122

10 Claims



6. Vehicle brake testing apparatus comprising:
  - two pairs of tread plates upon which wheels of the vehicle are to be driven and stopped by braking, there being one pair of tread plates for the front wheels and one for the rear wheels,
  - means for mounting each tread plate for longitudinal movement independently of the other tread plates,
  - means connected to each tread plate for producing an analog electrical braking signal dependent in value upon the braking force on the wheel engaging the tread plate,
  - means for converting the analog signals to corresponding digital signals,
  - digital computing means for computing the values of various relations between the values of the various digital signals corresponding to said analog signals,
  - and digital display means having electronic display elements and means selectively energizing said display elements to indicate digitally the values of said various relations.

4,011,752

**ADAPTIVE SPEED AND DIRECTION ANALYZER**

William B. Fowler, Wenatchee, Wash., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 6, 1976, Ser. No. 656,032

Int. Cl.<sup>2</sup> G01W 1/02

U.S. Cl. 73—189

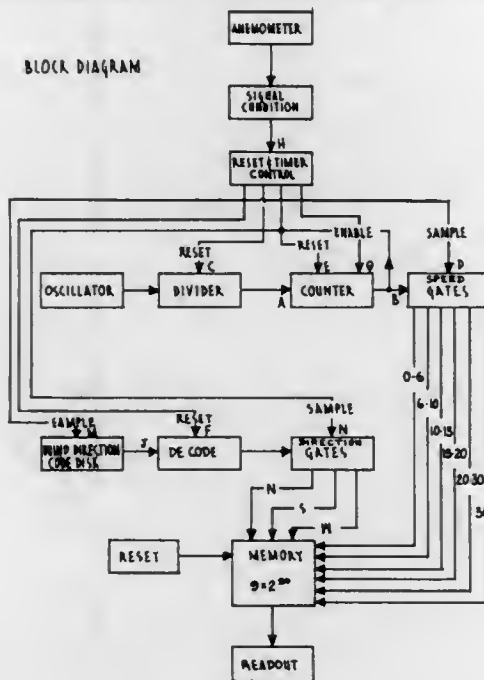
1 Claim

1. An apparatus capable, at a selected location and employing a preselected distance increment of fluid travel as a basis, of cumulatively and continuously measuring, storing, and



indicating the average speed during and the direction existent at the end of each of said measured increments of fluid travel, said average speed being measured and indicated within the appropriate member of a plurality of preselected speed classes, each speed class encompassing a preselected span of speeds, and said direction being measured and indicated within the appropriate member of a plurality of preselected direction classes, each direction class encompassing a preselected span of directions, and said apparatus in addition capable of cumulatively and continuously measuring, storing, and indicating, based on said preselected distance increments of fluid travel, the average speed in each of a plurality of preselected direction classes, said average speed being measured and indicated within the appropriate member of a plurality of preselected speed classes, each speed class encompassing a preselected span of speeds, and each of said direction classes encompassing a preselected span of directions, said apparatus comprised of the following components together with associated circuitry, each component recited as means plus function:

1. fluid motion sensing means adapted to accept as mechanical input, the movement of an ambient fluid over a preselected distance increment of fluid travel and to generate from said input of fluid motion electronic output signals related to the speed of the moving fluid, said sensing



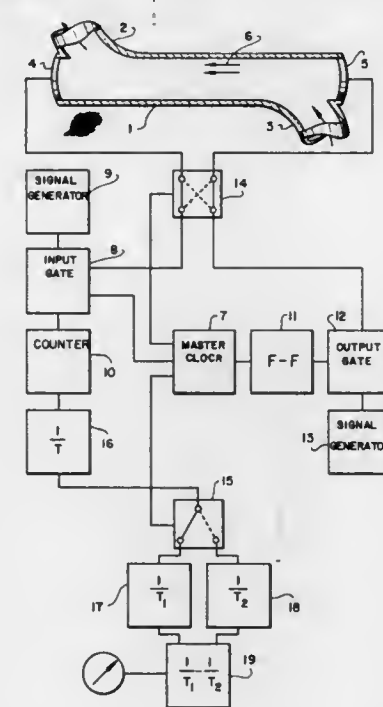
- means additionally adapted to respond to changes of direction of the fluid in motion, accept the changes of direction as input and mechanically operate circuit switches to implement selection of the appropriate member of a plurality of preselected direction classes corresponding to the direction of the moving fluid;
- means for signal conditioning adapted to accept the electrical output of the sensing means and condition this output to a form suitable for use with the following apparatus components;
- reset and timer control means adapted to receive as input the signal from the signal conditioning means and to generate output signals coordinating and actuating operations of the velocity and direction monitoring components of the apparatus as follows;
- a first preselected plurality of electronic gates and gate selection means adapted to separate and accept severally the fluid velocity-related output signals of the reset and timer control means for a numerically equivalent plurality of preselected velocity classes;
- a second preselected plurality of electronic gates and gate selection means adapted to separate and accept severally the fluid direction-related output signals of the reset and timer control means for a numerically equivalent plurality of preselected directional sectors;
- electronic memory means adapted to accumulate and

store the output signals generated by means of (1) adapted by means (2), coordinated by means (3) and segregated by means (4) and means (5);

7. data display means adapted to convert the stored signals of memory means (6) above to readout.

**4,011,753**  
**METHOD AND DEVICE FOR MEASURING THE FLOW VELOCITY OF MEDIA BY MEANS OF ULTRASOUND**  
 Eberhard Hausler, Saarbrücken, Germany, assignor to Drägerwerk Aktiengesellschaft, Germany  
 Filed June 26, 1975, Ser. No. 590,631  
 Claims priority, application Germany, June 29, 1974, 2431346

Int. Cl.<sup>2</sup> G01F 1/66  
 U.S. Cl. 73—194 A 11 Claims

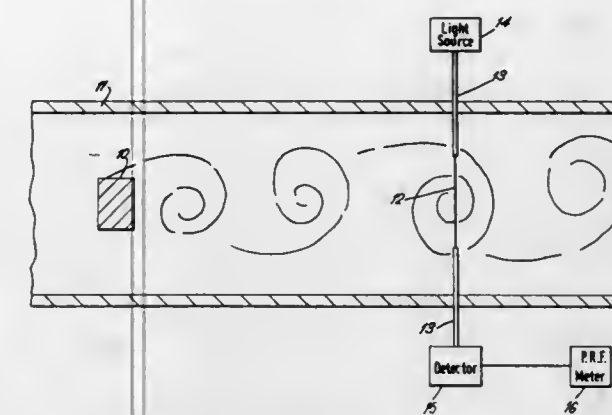


1. In a method of measuring the flow velocity of media in conduits by means of ultrasound, with the ultrasonic waves being produced by electric signals at one end of a measuring section, transmitted through the measuring section, and re-transformed into electric signals at the other end, the improvement comprising determining the transit time  $T_1$  of the ultrasound in the flow direction and the transit time  $T_2$  of the ultrasound in the opposite direction; digitizing the two transit times  $T_1$  and  $T_2$ ; inverting the digitized values into their respective reciprocal values  $1/T_1$  and  $1/T_2$ ; establishing the difference  $1/T_1 - 1/T_2$  between the two reciprocal values; and determining the flow velocity  $v = s/2 (1/T_1 - 1/T_2)$  from such difference, where  $v$  is the flow velocity of the media and  $s$  is the length of the measuring section.

**4,011,754**  
**FLOWMETER**  
 Gillies D. Pitt, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.  
 Filed June 7, 1976, Ser. No. 693,526  
 Int. Cl.<sup>2</sup> G01F 1/32

- U.S. Cl. 73—194 VS 11 Claims
1. A flowmeter comprising: a conduit section for providing a fluid flow path; a body fixed relative to said conduit section inside thereof in a position and being constructed to cause vortex shedding in a fluid flowing in a predetermined direction in said conduit section; an optical fiber supported inside said conduit section downstream of said body in a position such that light passing therethrough is modulated by vortices cre-

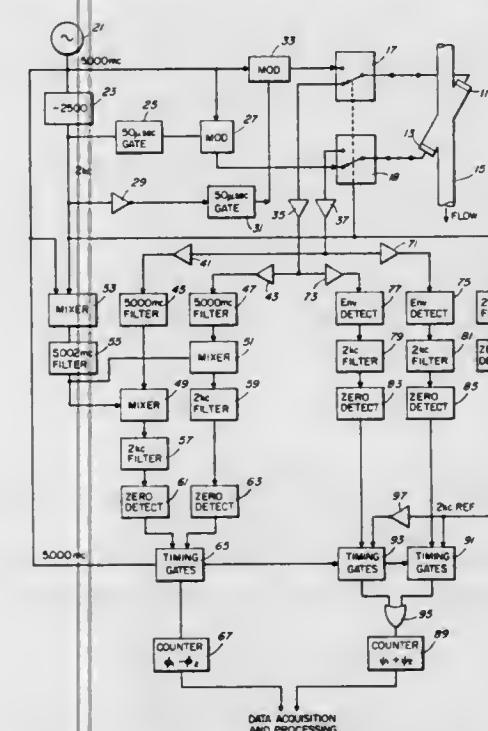
ated by said body, said fiber having a refractive index somewhat greater than that of said fluid; and sensor means con-



nected from said fiber to sense changes in the illumination transmitted thereby.

**4,011,755**  
**ACOUSTIC FLOWMETER**  
 Norman E. Pedersen, Wilmington, and James E. Bradshaw, Tyngsboro, both of Mass., assignors to Panametrics, Inc., Waltham, Mass.  
 Filed Oct. 23, 1975, Ser. No. 625,170  
 Int. Cl.<sup>2</sup> G01F 1/66

U.S. Cl. 73—194 A 8 Claims

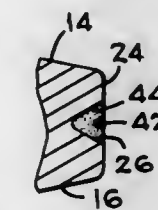


1. Acoustic flowmeter apparatus comprising: a pair of acoustic transducers located at upstream and downstream positions respectively relative to a conduit in which flow velocity is to be measured; signal generating, modulating and switching means interconnected with said transducers for transmitting a modulated signal from one transducer to the other, alternately upstream and downstream, the signal transmitted in each direction comprising a gated burst of a measurement frequency, repeated periodically, the received signal at the then non-transmitting transducer being a delayed version of the transmitted signal, the delay being variable as a function of the flow velocity;
- narrow band filter means for extracting the measurement frequency component from the downstream received modulated signal to provide a first continuous sine-wave signal;
- narrow band filter means for extracting the measurement frequency component from the upstream received modulated signal to provide a second continuous sine-wave signal; and

timing means for measuring the difference in phase directly between said first and second continuous sine-wave signals, the flow velocity being proportional to said measurement.

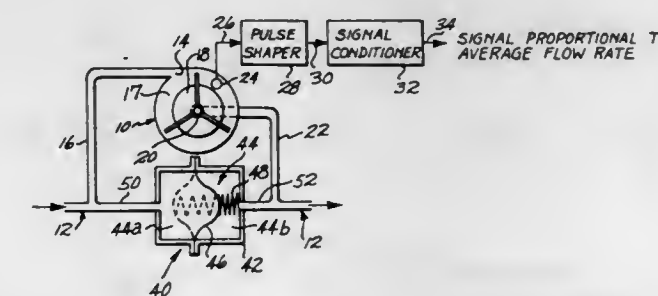
**4,011,756**  
**METALLIC HOT WIRE ANEMOMETER**  
 Fred R. Lemos, San Jose, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.  
 Filed Sept. 5, 1975, Ser. No. 610,802  
 Int. Cl.<sup>2</sup> G01F 1/68

U.S. Cl. 73—204 9 Claims



1. A hot wire anemometer for measuring air flow along a path comprising a metallic body, said body defining a narrow edge face and tapering surfaces diverging rearward from said edge face, said body defining first and second cylindric holes terminating at their outer ends at spaced apart locations in said edge face and at their other ends at a portion of the body remote from said edge face, first and second electrical conductor rods disposed in respective said holes and having distal ends accessible from said edge face, means circumscribing said conductor rods for electrically insulating said conductor rods from one another, a probe wire secured to the distal ends of said conductor rods, and means for securing said probe wire throughout its length to said edge face, said securing means partially circumscribing said wire, said securing means comprising a ceramic adhesive whereby said probe wire may be operated at a temperature at least as high as 1,300° F.

**4,011,757**  
**DEVICE FOR BYPASSING FLOW RATE PULSATIONS AROUND A FLOW RATE TRANSDUCER**  
 Wilfried Baatz, Bellevue, Wash., assignor to FloScan Instrument Company, Inc., Seattle, Wash.  
 Filed May 14, 1975, Ser. No. 577,188  
 Int. Cl.<sup>2</sup> G01F 1/06, 1/502  
 U.S. Cl. 73—229 18 Claims



1. A device for use with a flow rate transducer means, said transducer means for measuring flow rate through a conduit, said flow rate transducer means having a fluid inlet and a fluid outlet and being capable of providing a signal indicative of flow rate therethrough, said device for bypassing flow rate pulsations occurring in said conduit around said transducer at low flow rates, said device comprising: a housing defining a fluid chamber, said chamber having a wall and an axis, a flexible diaphragm means mounted in said chamber and being oriented transversely to said axis, said diaphragm having a central portion intersected by said axis, said



diaphragm means having a periphery affixed to said housing in fluid sealing relationship so as to divide said chamber into a first compartment and a second compartment, said diaphragm means being movable between at least a first position and a second position, said diaphragm means being biased toward said first position and away from said second position,

first means associated with said housing for placing said first compartment in fluid communication with the inlet to said fluid transducer, said first means including an inlet conduit means in said housing defining a fluid inlet to the first compartment of said chamber, the central portion of said diaphragm means in said first position lying adjacent said fluid inlet, said fluid inlet lying on said axis and being positioned in said housing so as to inject a fluid jet into said chamber substantially along said axis and to direct said fluid jet to impinge upon the central portion of said diaphragm means, said diaphragm means in said second position being flexed away from said first position toward said second compartment of said chamber responsive to fluid flow into said first compartment, and second means associated with said housing for placing said second compartment in fluid communication with the outlet from said transducer.

4,011,758

**MAGNETOSTRICTIVE PRESSURE TRANSDUCER**

Arthur L. Reenstra, Attleboro, Mass., and George Trenkler, East Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

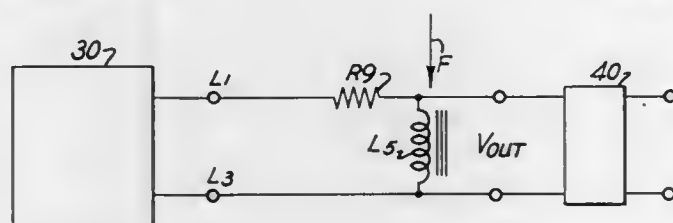
Continuation of Ser. No. 428,485, Dec. 26, 1973, abandoned.

This application Oct. 17, 1975, Ser. No. 623,867

Int. Cl.<sup>2</sup> G01L 19/04

U.S. Cl. 73—393

11 Claims



1. A system for measuring pressure comprising:

- means including an element responsive to the application of a force thereto for causing a change in magnetic inductance of the element proportional to said force;
- force directing means for directing said force applied to the element along a single axis of the element;
- a voltage divider comprising a temperature responsive resistor serially connected to a winding, the winding magnetically coupled to said element;
- means to energize the winding for creating a magnetic field; and
- means coupled to the junction of the voltage divider for detecting an output signal.

4,011,759

**DIFFERENTIAL PRESSURE GAUGE**

James W. Phillips, and Terrence J. Troyer, both of Michigan City, Ind., assignors to Dwyer Instruments, Inc., Michigan City, Ind.

Filed Dec. 11, 1975, Ser. No. 639,969

Int. Cl.<sup>2</sup> G01L 7/08

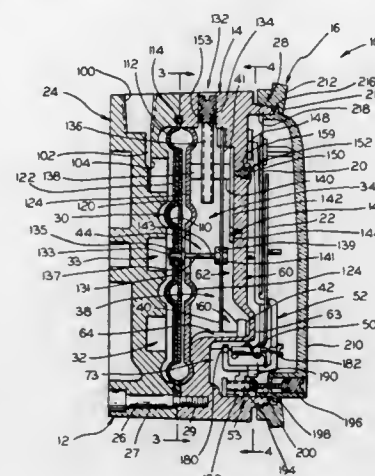
U.S. Cl. 73—407 R

16 Claims

1. In a gauge that includes linear to rotary motion transforming means including a helix journaled for rotation about its longitudinal axis, with the helix having an indicator connected thereto, a magnet for producing rotational movement of said helix about its said axis in response to linear movement of the magnet alongside and lengthwise of said helix axis, and a housing for the helix and magnet,

the improvement wherein:

said magnet has a planar face of quadrilateral configuration, with said magnet being disposed to position said pole face thereof facing the helix, with the plane of the pole face extending parallel to the helix axis, said helix being formed to define one helically contoured edge projecting therefrom in uniformly spiralled relation thereto, said helix edge and said magnet pole face being in close adjacency, said pole face defines a first pair of opposed sides that parallel said axis of said helix, and a second pair of op-



posed sides that are respectively normally disposed relative to said pole face first pair of opposed sides, whereby said pole face defines right angle corner portions, said magnet defining a magnetic axis extending perpendicular to said pole face, said magnet being disposed relative to said helix such that said magnetic axis substantially intersects said helix axis, said helix edge being contoured to dispose the portion of same that is adjacent said pole face in substantial alignment with a pair of oppositely disposed corner portions of said pole face, laterally of said helix axis in the direction of said pole face.

4,011,760

**MEASURING PROBE FOR GAS MEASURING APPARATUS**

Dieter Heller, and Helmut Hannemann, both of Lubeck, Germany, assignors to Drägerwerk Aktiengesellschaft, Germany

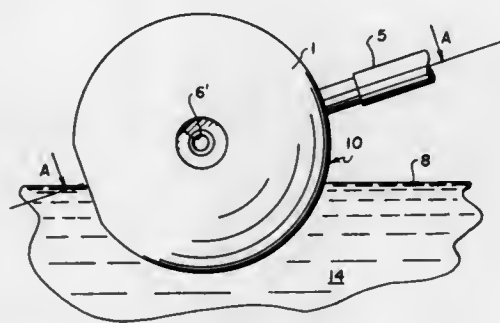
Filed Dec. 5, 1975, Ser. No. 638,171

Claims priority, application Germany, Dec. 18, 1974, 2459826

Int. Cl.<sup>2</sup> G01N 1/22

U.S. Cl. 73—421.5 R

4 Claims



1. A measuring probe for gas measuring apparatus, comprising a probe head, a probe line for conveying the measured gas to the gas measuring apparatus connected into said probe head, said probe head comprising a float having at least one intake opening for the measured gas, and a connecting passage connected between the opening and said probe line, a pipe located within said probe head, said probe head being a foamed plastic material, said pipe defining the passage con-

nected between the opening and said probe line, said pipe comprising a T-shape piece.

4,011,761

**WHEEL BALANCER**

Jinichi Ito, Tokyo, Japan, assignor to Yamada Yuki Seizo Co., Ltd., Japan

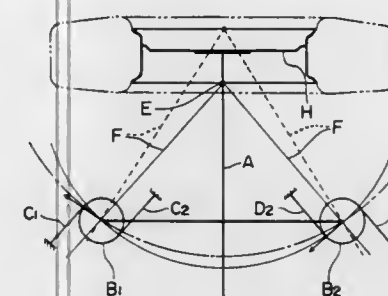
Filed Dec. 22, 1975, Ser. No. 643,251

Claims priority, application Japan, Dec. 23, 1974, 49-147880; Feb. 28, 1975, 50-25408; Feb. 28, 1975, 50-25409; Mar. 4, 1975, 50-26883

Int. Cl.<sup>2</sup> G01M 1/02, 1/22

U.S. Cl. 73—462

10 Claims



1. A wheel balancer comprising a wheel having an amount of unbalance to be measured, a base, a rotary shaft for rotatably mounting said wheel thereon, an instantaneous center of vibration of said wheel being movable along a center axis of said rotary shaft, a pair of supporting shafts for supporting said rotary shaft, a rocking body connected between said rotary shaft and said pair of supporting shafts, said supporting shafts being transverse to said rotary shaft and located on a circle having a center which is coincided with said instantaneous center of vibration of said wheel and arranged at both sides of said rotary shaft, a pair of spring-receiving bodies mounted on said base, and a pair of spring members for holding said supporting shafts, respectively, each spring member being disposed within a spring-receiving body, each spring member having one end spaced apart from its associated said supporting shaft and connected thereto and another end secured to its associated said supporting shaft and made stationary to its associated spring-receiving body, each of said supporting shafts being movable in a direction of a tangent touching said circle as said instantaneous center of vibration moves along said axis of said rotary shaft, whereby said amount of unbalance is measured from the amount of vibration of said wheel.

4,011,762

**WHEEL BALANCING APPARATUS**

Richard S. Kubik, 1030 Villa Vista Drive, Colby, Kans. 67701

Filed Dec. 8, 1975, Ser. No. 638,664

Int. Cl.<sup>2</sup> G01M 1/02, 1/12

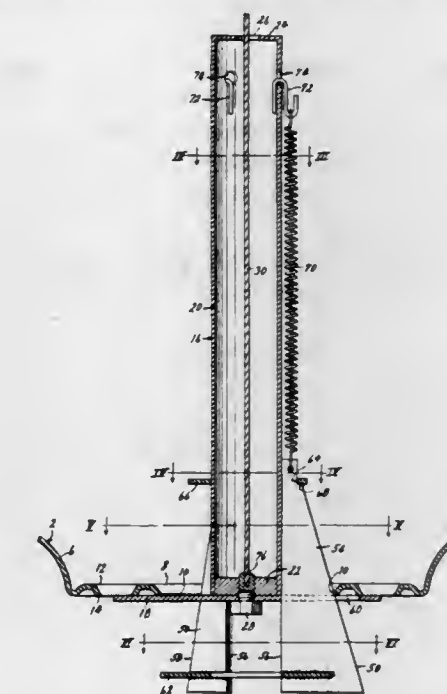
U.S. Cl. 73—484

1 Claim

1. In a wheel balancing device for automotive wheels:

- a planar support plate adapted to be placed beneath the central disc of a wheel in overlying relation to the central hub aperture of said wheel to support said wheel in a generally horizontal plane,
- a rigid tube affixed at its lower end to said support plate concentrically therewith and extending upwardly therefrom accurately at right angles to the plane thereof,
- a generally vertical flexible cable,
- attaching means connecting the lower end of said cable to said support plate such that the lowermost flexure joint of said cable is disposed at least slightly above the center of gravity of a wheel carried on said support plate, said cable extending upwardly through and above said tube,
- centering means operable to center said wheel concentrically with said tube and the lower end of said cable, said centering means comprising an upwardly tapering, generally conical assembly carried by said support plate and

consisting of a plurality of planar blades disposed in planes radial to said tube and spaced regularly thereabout, said blades projecting slidably through notches formed radially in said support plate, whereby said assembly may be moved slidably in a direction parallel to said tube, the inner edges of said blades resting in sliding engagement with said tube, and the outer edges of said blades sloping downwardly and outwardly, connecting means rigidly joining said blades together beneath the level of said support plate, and resilient means biasing said conical assembly yieldably upwardly relative to said support plate, whereby to adjust the circle defined by the



outer edges of said blades at the upper surface of said support plate to the diameter of the central hub aperture of said wheel, said resilient means biasing said conical assembly upwardly comprising a plurality of tension springs each connected at its lower end to the upper end of one of said blades, and at its upper end to said tube, f. a gauge member carried rigidly by said tube at the upper end thereof and having an aperture formed therein accurately concentric with said tube, said cable extending upwardly through said aperture, and g. means for suspending said cable from its upper end to support said wheel.

4,011,763

**SHAFT TURNING MECHANISM**

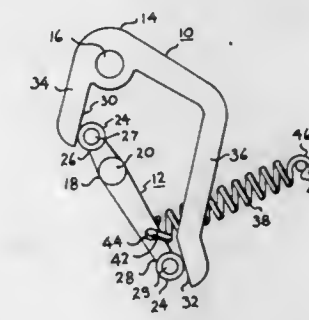
Andrew H. Caldwell, Roanoke, Va., assignor to General Electric Company, New York, N.Y.

Filed June 13, 1975, Ser. No. 586,770

Int. Cl.<sup>2</sup> F16H 21/44

U.S. Cl. 74—100 R

3 Claims



1. A linkage arrangement for converting rotation of a first shaft in either of two directions into unilateral rotation of a second shaft comprising:

- a substantially u-shaped member attached at a bight thereof to said first shaft adapted to be rotated in either of two directions;



- b. an elongated link attached at an intermediate point thereof to said second shaft, said linkage being engageable at the ends thereof with inner surfaces of opposing legs of said u-shaped member whereby bilateral rotation of said first shaft effects a unilateral rotation of said second shaft; and
- c. biasing means connected to said link for urging the ends thereof into contact with said legs of said u-shaped member.

4,011,764

## STEERING GEAR WITH VARYING TRANSMISSION RATIO

Günther Buck, Tettang; Alfred Seifried, Friedrichshafen; Albert Zettel, Schwabisch Gmund, all of Germany, and Hans-Christof von Fraunberg, deceased, late of Iggingen, Germany (by Sigrid Köhler-Feuerle, heiress), assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

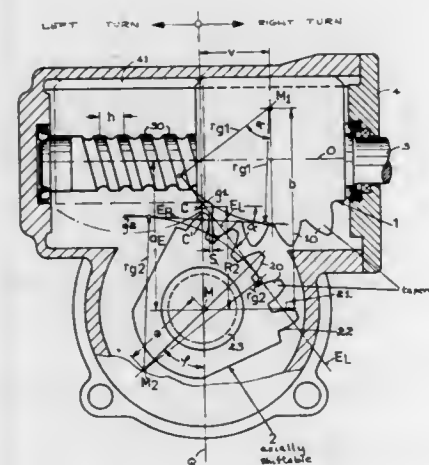
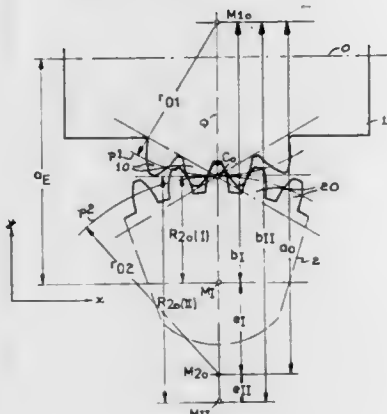
Filed July 30, 1973, Ser. No. 383,495

Claims priority, application Germany, July 29, 1972, 2237421

Int. Cl.<sup>2</sup> B62D 1/20

U.S. Cl. 74—499

6 Claims



1. A gear coupling comprising:
- a first tooth carrier linearly shiftable in a predetermined plane and provided with a first set of identically profiled involute teeth; and
- a second tooth carrier swingable about a pivotal axis transverse to said plane and provided with a second set of identically profiled involute teeth, each of said tooth carriers having a base line with a constant radius of curvature in said plane, at least one of said radii being of finite magnitude, said first and second sets of teeth meshing with each throughout a range of displacement between two limiting positions flanking a midposition in which the centers of curvature of the base lines of said first and second sets of teeth are offset from said pivotal axis on a line perpendicular to the direction of shift of said first

tooth carrier, said first and second sets of teeth engaging each other with clearances which are substantially zero in said midposition but which progressively increase toward said limiting positions and with a transmission ratio varying substantially monotonically between said midposition and each of said limiting positions.

4,011,765

## BALL AND CONE FRICTION TRANSMISSION WITH OPTIMALLY ADAPTED CONE ANGLE

Heinrich Tippmann, Munich, Germany, assignor to ITT Industries, Inc., New York, N.Y.

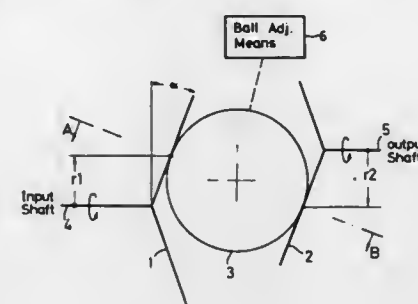
Filed July 23, 1975, Ser. No. 598,211

Claims priority, application Germany, Aug. 1, 1974, 2437174

Int. Cl.<sup>2</sup> F16H 15/16, 15/26, 15/08

U.S. Cl. 74—193

3 Claims



1. A friction type, variable-ratio mechanical transmission having a pair of rotationally-mounted, concave members generally facing each other with a laterally adjustable rotational member therebetween and in frictional contact with said concave members, comprising:

means defining a conical surface on each of said concave members, each of said conical surfaces having an apex; and a rotatable shaft joined to each of said concave members at said apex thereof, said shafts extending axially in spaced mutually parallel relationship oppositely from the direction of concavity of the corresponding conical surface to provide said concave member rotational mounting;

the angle made between each of said conical surfaces and a line normal to the corresponding shaft being not less than 18° nor more than 28°.

4,011,766

## ENDLESS POWER TRANSMISSION BELT

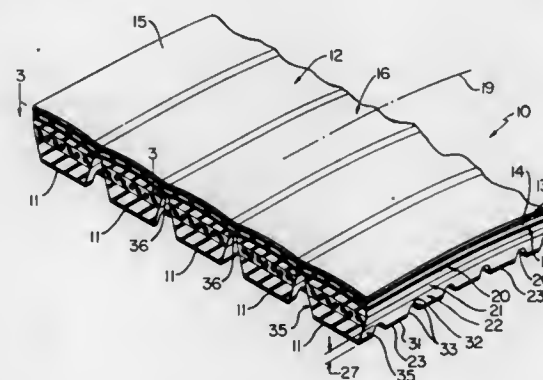
Dale L. Waugh, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Feb. 19, 1976, Ser. No. 659,312

Int. Cl.<sup>2</sup> F16G 5/00, 1/22, 5/10

U.S. Cl. 74—234

20 Claims



1. An endless power transmission belt for operation in an endless path comprising a plurality of laterally spaced belt elements and a tie band interconnecting said belt elements, each of said elements comprising, a tension section, a load-carrying section, and a compression section, each of said

elements having a plurality of teeth defined in its compression section, said teeth in each belt element being staggered relative to teeth of an immediately adjacent belt element, said teeth providing optimum flexibility for said belt characterized by a substantially uniform bending modulus, said staggered relation of the teeth assuring the belt is free of hinge points and also assuring quieter operation thereof in associated sheaves.

4,011,767

## AXIALLY ADJUSTABLE MOUNTING FOR A BELT IDLER

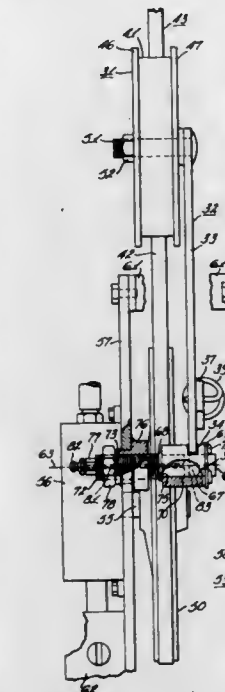
John P. Nelson, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Feb. 9, 1976, Ser. No. 656,332

Int. Cl.<sup>2</sup> F16H 7/10

U.S. Cl. 74—242.15 R

11 Claims



1. An adjustable mounting arrangement permitting axial adjustment of the position of belt idler means, comprising:
- a support having an internally threaded opening there-through,
- a support shaft having
- an externally threaded portion in cooperative threaded engagement with said threaded opening with a part thereof extending beyond one side of said support,
- a wrench receiving portion on the end of said support shaft extending beyond said one side of said support,
- a bearing portion on the opposite end of said support shaft and disposed on the other side of said support,
- belt idler means supported on said bearing portion for relative movement about the axis thereof, and
- lock means engageable with said shaft and support for selectively locking said support shaft in selected positions of threaded adjustment relative to said support.

4,011,768

## PUMP SWASH PLATE CONTROL LINKAGE

Dean James Tessenske, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Apr. 16, 1975, Ser. No. 568,703

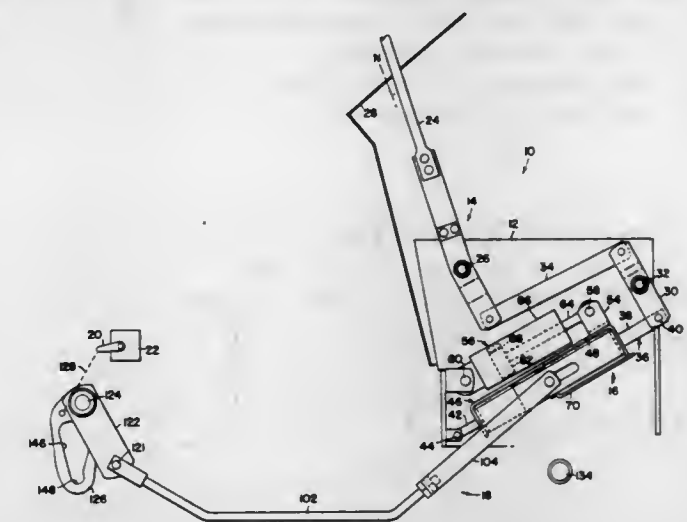
Int. Cl.<sup>2</sup> G05G 1/00

U.S. Cl. 74—479

5 Claims

1. For use in controlling an adjustable swash plate of a variable displacement hydraulic drive pump of a hydrostatic transmission, a manual control linkage comprising: a manually shiftable input linkage means; an output linkage means adapted for connection to said adjustable swash plate; a motion-moderating means connecting said input linkage means to said output linkage means for transferring the motion of said input linkage means to said output linkage means at a

preselected maximum rate of speed regardless of the rate of speed that motion is manually imparted to said input linkage means; and said motion-moderating means including a motion-transferring member mounted for movement in opposite first and second directions; dash pot means connected to said motion-transferring member for regulating the rate of speed of the movement of the member such that said preselected maximum rate of speed is not exceeded; first connecting means connecting said input linkage means to said motion-transferring member and including resilient means normally in a



self-restored state wherein it exerts no force tending to move said motion-transferring member, but being selectively deflectable in opposite directions by said input linkage means when the latter is operated to move at a rate of speed greater than said preselected maximum rate to establish first and second loaded conditions tending to move said motion-transferring member in its said opposite first and second directions; and second connecting means connecting said output linkage means to said motion-transferring member for movement with the latter.

4,011,769

## VEHICLE REAR-VIEW MIRROR MOUNTING ARRANGEMENT

Kenneth Paul Davis, Harlington, England, assignor to Magnatex Limited, Middlesex, England

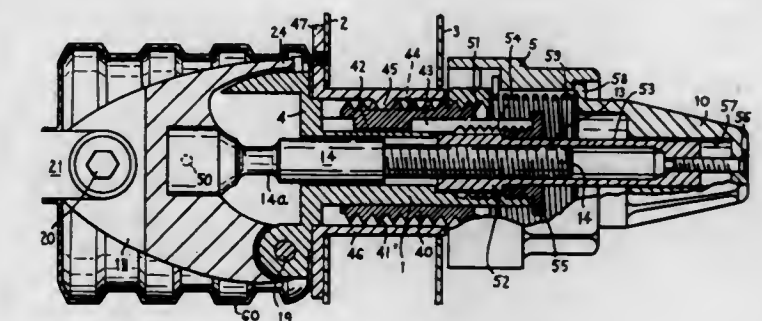
Filed Oct. 28, 1975, Ser. No. 626,125

Claims priority, application United Kingdom, July 23, 1975, 31285/75

Int. Cl.<sup>2</sup> F16D 11/00; A47G 1/24

U.S. Cl. 74—479

8 Claims



1. A mounting arrangement for mounting a vehicle rearview mirror on the outside of a part of a vehicle body, comprising:
- a. a tubular bearing member adapted to be mounted to extend through and be turnable in the body part and having an outer and an inner end and defining a passage extending therethrough,
- b. a mirror support member,
- c. hinge means having an axis extending transversely to the axis of said bearing member and hinging said mirror support member to the outer end of said bearing member for hinging about the axis of the hinge means,



- d. a first rotatable control member connected to the inner end of the bearing member for turning the bearing member about its axis,
- e. a reduction drive connecting said first control member to said bearing member,
- f. a push member axially movable in the passage in said bearing member,
- g. a second rotatable control member,
- h. screw-thread means coupling the inner end of said push member to said second control member,
- i. means holding said second control member axially captive with the inner end of said bearing member, and
- j. means operative in response to axial movement of said push member to cause the mirror support member to hinge about said hinge means.

4,011,770

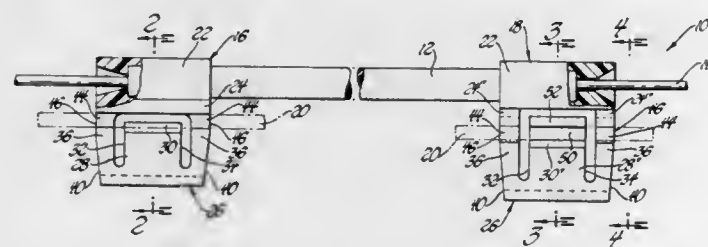
## MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

Grant A. Webb, Northville, Mich., assignor to Teleflex Incorporated, North Wales, Pa.

Filed Aug. 8, 1975, Ser. No. 602,999  
Int. Cl.<sup>2</sup> F16C 1/00

U.S. Cl. 74—501 R

11 Claims



1. A motion transmitting remote control assembly of the type for transmitting motion in a curved path by a flexible motion transmitting core element, said assembly comprising: guide means; a flexible motion transmitting core element movably supported by said guide means; a support fitting for disposition in an aperture and attached to one of said guide means and said core element, said support fitting including flange means for engaging the wall at one extremity of the aperture to prevent the fitting from moving through the aperture as it is inserted therein, a body extending from said flange means, a pair of spaced flexible legs extending from said body generally toward said flange means in a cantilevered fashion and defining shoulders disposed in spaced relationship to said flange means for moving through the aperture as said fitting is inserted therein and to engage the wall at the opposite extremity of the aperture for retaining the fitting therein, each of said legs having first and second laterally spaced sides extending from said body toward said flange means, said body including pilot means disposed laterally outwardly of each of said sides of said legs for guiding said fitting into the aperture, said body having a generally U shape in cross section to define a completely void space extending laterally therethrough between said pilot means and between said legs so that said legs may flex toward one another, said legs and said pilot means being integrally connected adjacent the base of said U shape.

4,011,771

## STEERING RANGE SELECTOR

Charles V. Harris, Cerritos; Lowell F. Pickett, Los Alamitos, and George A. Schlanert, Tustin, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 16, 1975, Ser. No. 622,955

Int. Cl.<sup>2</sup> G05G 7/04; B64C 25/50

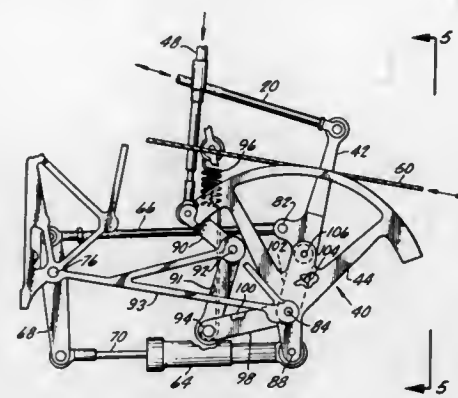
U.S. Cl. 74—522

19 Claims

1. In a control system for a steerable wheel on an aircraft, selectable means for changing the ratio of inputs thereto to outputs therefrom, said means including:

- input motion receiving means;
- output motion transmitting means;

selectably engageable and disengageable linkage means to restrain said output motion transmitting means to move at a first predetermined ratio with respect to said input motion receiving means; and resilient linkage means connected between said input mo-



tion receiving means and said output motion transmitting means, said resilient linkage means being sized to urge said output motion transmitting means to move at a second predetermined ratio with respect to said input motion receiving means when said selectably engageable and disengageable linkage means are disengaged.

4,011,772

## STEERING WHEEL FOR A MOTOR VEHICLE

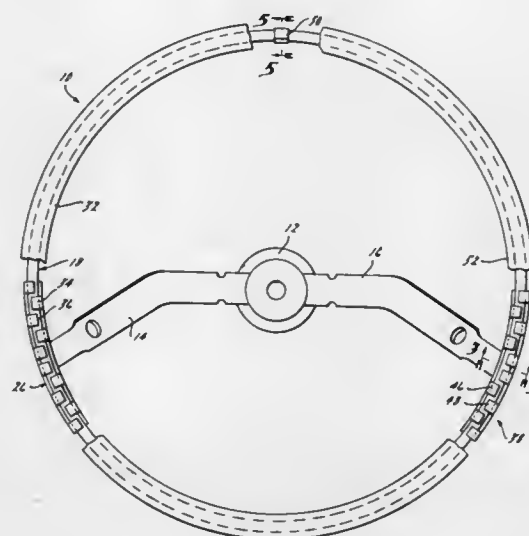
George H. Muller, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,642

Int. Cl.<sup>2</sup> B62D 1/04; G05G 1/10

U.S. Cl. 74—552

9 Claims



1. A steering wheel for a motor vehicle having a hub, a spoke attached to said hub and a rim core assembly attached to said spoke;

- said rim core assembly comprising a plurality of leaf spring members;
- each of said leaf spring members having a circular shape in the plan view;
- said rim core assembly being resiliently deformable in response to an impact load imposed upon said assembly in a direction parallel to the axis of said steering wheel.

4,011,773

## STEERING WHEEL

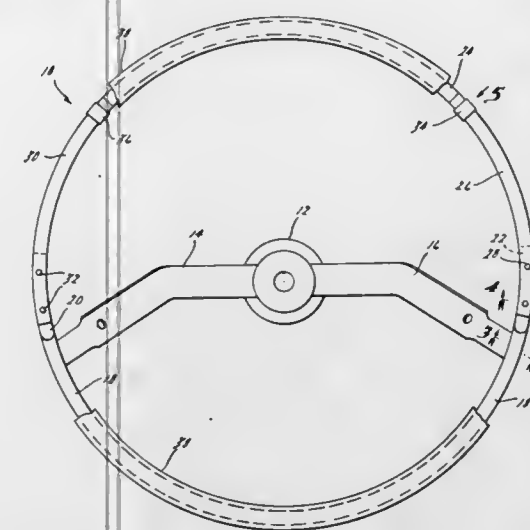
George H. Muller, Ann Arbor, and Warren A. VanWicklin, Jr., Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 19, 1975, Ser. No. 642,643

Int. Cl.<sup>2</sup> B62D 1/04; G05G 1/10

U.S. Cl. 74—552

15 Claims



1. A steering wheel for a motor vehicle having a rim means with a flexible rim portion;

- said steering wheel comprising a hub and a spoke having its inner end connected to said hub;
- said rim means being secured to the outer end of said spoke;
- said rim means comprising a rigid rim core member of generally arcuate shape in plan view;
- said rim means also including a flexible rim core member of generally arcuate shape in plan view secured to said rigid rim core member and combining with said rigid member to form a structure of annular shape;
- said flexible rim core member being deflectable under an impact load imposed upon the mid point of said flexible member in a direction parallel to the axis of rotation of said wheel;
- said rigid rim core member being substantially rigid with respect to an impact load imposed upon the mid point of said rigid member that is equal in magnitude and parallel in direction to said first mentioned impact load.

4,011,774

## GEAR WHEEL CASING

Börje Sigurd Moosberg, Morrum, Sweden, assignor to Abu Aktiebolag, Svängsta, Sweden

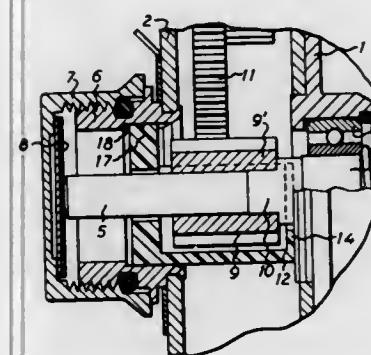
Filed Nov. 3, 1975, Ser. No. 628,396

Claims priority, application Sweden, Nov. 13, 1974, 7414235

Int. Cl.<sup>2</sup> F16H 57/02; A01K 89/00

U.S. Cl. 74—606 R

4 Claims



1. In a device, such as a fishing reel, having a gear housing, the combination in said housing of a gear casing and a gear, said gear casing being formed as a capsule comprising a cylin-

drical wall having an opening formed therein so that said wall is C-shaped in cross-section, the inner radius of curvature of said cylindrical wall being slightly more than the outer radius of curvature of said gear and said opening formed therein being sufficient to permit the insertion of said gear through said wall, said cylindrical wall corresponding in length to the axial dimension of said gear, said capsule further having disc-shaped end walls on said cylindrical wall to limit axial movement of said gear, at least one of said end walls having an opening formed therein to permit insertion of a shaft to engage said gear, said opening in said cylindrical wall being further of sufficient circumferential dimension to permit engagement of said gear by a further gear outside said capsule, whereby said capsule with said gear may be assembled in said gear housing as a unit.

4,011,775

## TRANSMISSION INCLUDING A HYDRODYNAMIC TORQUE CONVERTER

Karl Gustav Ahlen, Bromma Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm-Vallingby, Sweden

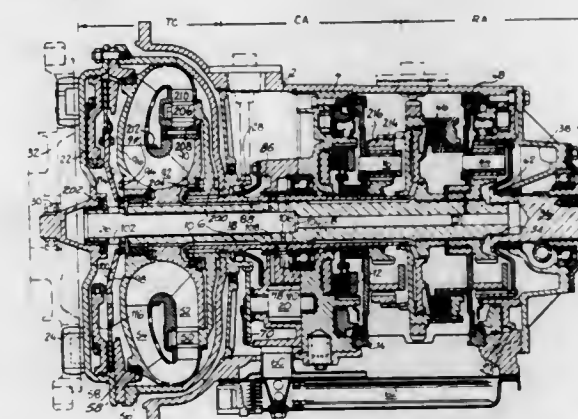
Filed Feb. 12, 1975, Ser. No. 549,371

Claims priority, application United Kingdom, Feb. 14, 1974, 6856/74; Dec. 18, 1974, 54769/74

Int. Cl.<sup>2</sup> F16H 47/00

U.S. Cl. 74—732

6 Claims



1. A transmission including a hydrodynamic torque converter of the type having a turbine member which has a turbine shaft operatively associated therewith, rotatable casing member having a pump part operatively associated therewith and a stationary housing, and utilizing a guide member having a guide vane ring mounted in a guide vane shaft, which guide member in one driving range acts as a turbine part for transmitting torque via a gear to the turbine shaft and which, in another driving range, is held stationary to function as a stationary guide vane ring, characterized in that between the guide vane shaft and the turbine shaft there is disposed an engageable and releasable planet gear and between said guide vane shaft and the stationary housing there is disposed a brake to stall the guide vane shaft or release it for rotation in either direction, and in that independent radial and axial bearings are included between each of the said members of the torque converter and the other members thereof allowing radial displacement within the clearance of the radial bearing independent of axial force on the axial bearing.



4,011,776

## TRANSMISSION

Masayuki Kodama, and Shintaro Uchiyama, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

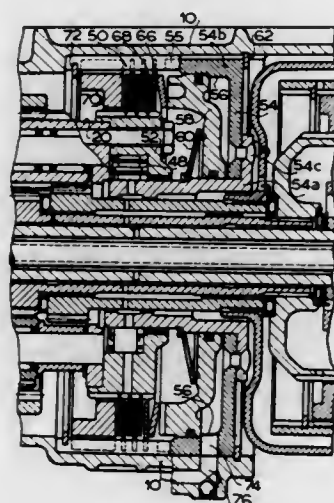
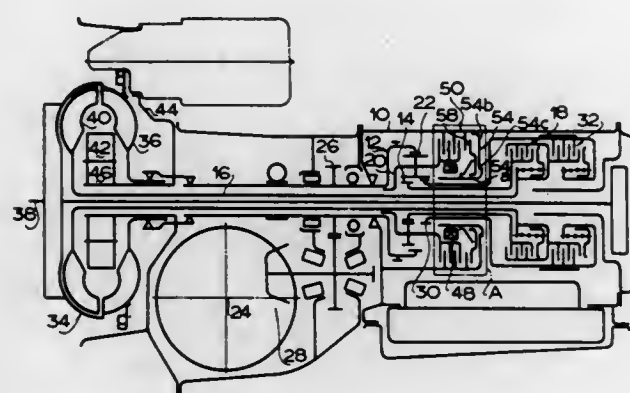
Filed Nov. 20, 1975, Ser. No. 633,918

Claims priority, application Japan, Dec. 2, 1974, 49-145587[U]

Int. Cl.<sup>2</sup> F16H 3/44

U.S. Cl. 74-789

5 Claims



1. In a transmission, a casing made of a first material, a planetary gear unit coaxially disposed in said casing, said planetary gear unit including a carrier of planetary gears, a one-way brake means for braking said carrier, said one-way brake means being coaxially disposed in said carrier, said one-way brake means including an inner race and an outer race, said outer race being secured to said carrier, a member comprising a first part made of a second material and a second part made of said first material, said first part forming said inner race, said second part being secured to said casing, and said first and said second part being secured to each other, whereby a driving torque reaction on said carrier is received on said casing through said one-way brake means and said member.

4,011,777

## MULTI SPINDLE LATHES

Edmund Alexander McConnell, Coventry, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England

Filed Sept. 8, 1975, Ser. No. 610,913

Claims priority, application United Kingdom, Sept. 12, 1974, 39745/74

Int. Cl.<sup>2</sup> B23B 3/34, 19/02, 5/22

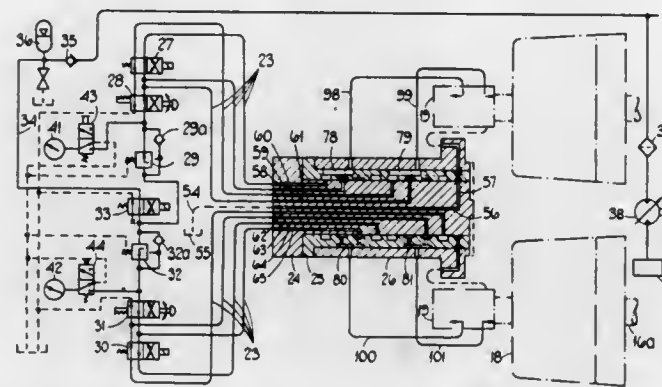
U.S. Cl. 82-3

10 Claims

1. In a multi-spindle lathe having an indexable drum

mounted on a fixed part of the lathe, a plurality of work spindles rotatably mounted in the drum, chucks on the respective spindles, fluid pressure operated piston and cylinder units on the respective spindles to actuate the chucks thereon, the combination comprising:

a fluid distributor to distribute fluid to and from the respective units to cause actuation of the chucks in predetermined sequence, the distributor having a part fixed to the drum and indexable with it, fluid connections being provided between said part of the distributor and the respective units, the distributor also having a further part non indexable with the drum and secured with respect to a fixed part of the lathe; and



at least two valves on the fixed part of the lathe, arranged to control flow of fluid to the further part of the distributor and connected thereto by fluid connections, one of the valves being arranged to select the direction of flow of fluid to and from the distributor to actuate the chucks in either of two opposite directions for internal or external gripping, and the other of the valves being arranged to select the pressure of fluid to the units at either of two different fluid pressures, the valves being connected to control a plurality of the units on the respective spindles of the lathe.

4,011,778

## ADJUSTABLE WRENCH

Lars Magnus Delin, Strandvagen 37, S-182 62 Djursholm, Sweden

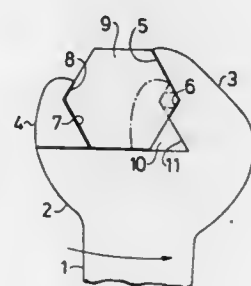
Filed June 19, 1975, Ser. No. 588,506

Claims priority, application Sweden, June 24, 1974, 7408269

Int. Cl.<sup>2</sup> B25B 13/12

U.S. Cl. 81-186

2 Claims



1. An adjustable wrench, comprising in combination:  
a. a handle;  
b. a rigid jaw integral with said handle and a slidable jaw adjustably carried on said handle;  
c. each of said jaws having a first longer wrenching face and an adjacent second shorter wrenching face,  
1. said wrenching faces of both jaws intersecting each other at an angle of 120° for simultaneously engaging two adjacent sides of a hexagonal nut,  
2. said first wrenching faces being engageable with diametrically opposite sides of the nut, and engaging along the entire sides of the nut, said second wrenching faces being engageable with diametrically opposite sides of the nut,

4,011,780

## APPARATUS FOR TRIMMING AND/OR SUBDIVIDING MILL PRODUCT AT A COIL FORMING STATION

Siegfried David, Hilchenbach, Germany, assignor to Morgan Construction Company, Worcester, Mass.

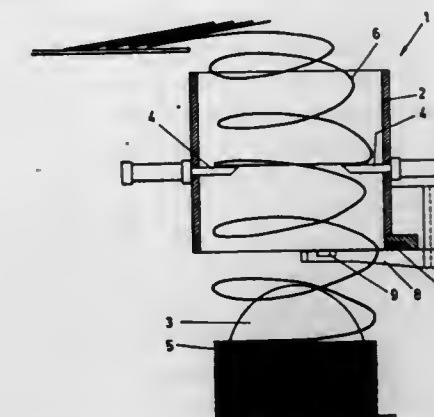
Filed Mar. 10, 1976, Ser. No. 665,402

Claims priority, application Germany, Apr. 10, 1975, 2515643

Int. Cl.<sup>2</sup> B21F 11/00

U.S. Cl. 83-167

6 Claims



4,011,779  
APPARATUS FOR CUTTING AN ELONGATE MEMBER OF ARBITRARY LENGTH INTO SHORTER SECTIONS OF PREDETERMINED LENGTHS

Gudbrand Gunnarson Berg, 2890 Bruflat, Bruflat, Norway

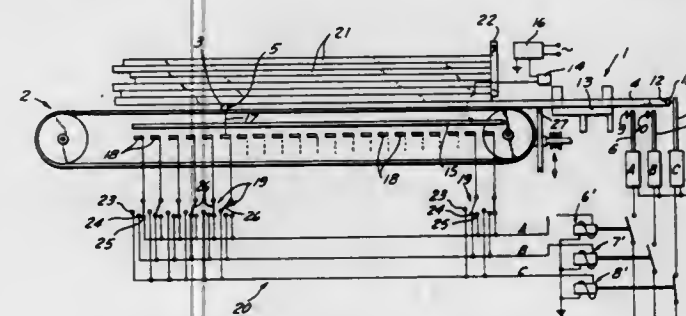
Continuation-in-part of Ser. No. 549,625, Feb. 13, 1975, abandoned, which is a continuation of Ser. No. 447,176, Feb. 28, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,887

Claims priority, application Norway, Mar. 1, 1973, 73836

Int. Cl.<sup>2</sup> B26D 5/38, 5/20

U.S. Cl. 83-71

8 Claims



1. An apparatus for cutting an elongate member of arbitrary length into shorter sections of predetermined respective lengths, comprising a cutting element, means for advancing the elongate member past the cutting element, a plurality of abutment members located at different positions forward of the cutting element, operating means whereby the abutment members are selectively brought into and removed from the path of movement of the elongate member, a plurality of sensor devices arranged at equally spaced intervals to the rear of the cutting element for sensing the length of the elongate member that is to the rear thereof, the programmable means connected between the sensor devices and said operating means to determine which of said abutment members is brought into the path of movement of said elongate member, and thereby the length of the elongate member that is forward of the cutting element, in dependence upon the length of the elongate member that is to the rear of the cutting element; and wherein the means for advancing the elongate member comprise a member engaging the rear end of the elongate member, and the apparatus further comprises an electrical conductor extending parallel to the path of movement of the elongate member at the rear of the cutting element and a contact member engaging the rear end of the elongate member and slidably connected to said electrical conductor and engaging the sensor devices as the elongate member is advanced thereby to indicate the position of the rear end of the elongate member.

4,011,781

## CUTOFF DIE

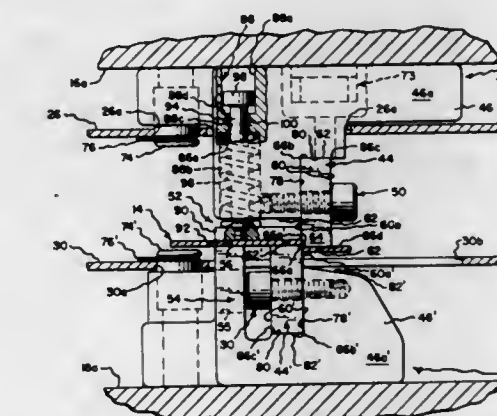
Lawrence V. Whistler, Jr., 251 Doncaster Road, Kenmore, N.Y. 14217

Filed Jan. 9, 1976, Ser. No. 648,000

Int. Cl.<sup>2</sup> B26D 7/02, 7/26

U.S. Cl. 83-387

13 Claims



1. In a device for severing a workpiece including a punch unit, a die unit each of said punch and die units having at least one elongated cutting edge adapted to be arranged in an operative cutting position, and means for moving said punch



and die units relatively towards one another with said cutting edges arranged in said operative cutting position to effect severing of said workpiece, wherein at least one of said punch and die units includes a steel having a rectangular cross-sectional configuration defined by parallel clamping surfaces and parallel bearing surfaces, said clamping and bearing surfaces cooperating to form at their junctures four elongated cutting edges; a retainer for supporting said steel, said retainer defining a retainer clamping surface arranged parallel to the direction of movement of said punch and die units relatively towards one another and a retainer bearing surface arranged normal to said retainer clamping surface and connected to said retainer clamping surface along a marginal edge thereof training in said direction of movement, and clamping means for releasably clamping said clamping surfaces alternately in engagement with said retainer clamping surface with said bearing surfaces alternately disposed in bearing engagement with said retainer bearing surface for selectively placing said four cutting edges one at a time in said operative cutting position; the improvement in combination, characterized in that said steel has squared ends and a lengthwise dimension as measured between said squared ends in excess of the lengthwise dimension of said retainer as measured lengthwise between opposite ends of said retainer clamping and bearing surfaces, and said steel is formed with a locator receiving bore opening extending between said clamping surfaces and being arranged centrally thereof, said retainer is formed with a locator receiving opening passing through said retainer clamping surface and arranged centrally between said opposite ends and spaced from said retainer bearing surface through a distance corresponding to the spacing between said locator receiving bore opening and said bearing surfaces, said one of said punch and die units additionally includes a locator pin having first and second ends, said first end being positionally fixed within said locator receiving opening of said retainer, and said second end is shaped and sized to slidably engage only with facing wall surfaces of said locator receiving bore opening disposed immediately adjacent a plane passing centrally through said locator receiving bore opening and arranged parallel to said bearing surfaces, whereby said second end and said facing wall surfaces cooperate to center said steel in a direction lengthwise of said retainer clamping surface with said squared ends projecting equidistances beyond said opposite ends.

4,011,782

## POWER MITER SAW

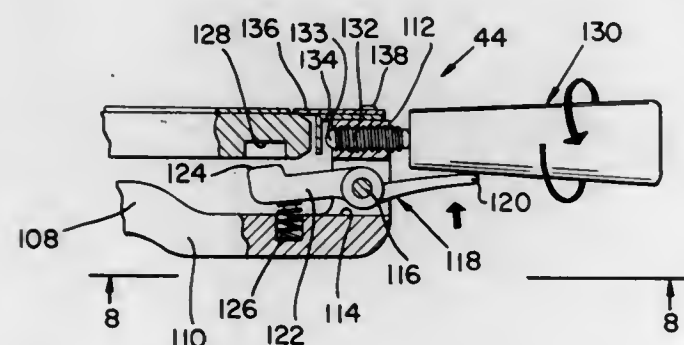
Donald Lawrence Clark; Floyd Samuel Fraunfelder, Jr., both of Lancaster, Pa., and Robert Richard Ruth, Baltimore, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 25, 1975, Ser. No. 616,610

Int. Cl.<sup>2</sup> B27B 5/20

U.S. Cl. 83—471.3

24 Claims



1. In a power miter saw of the type comprising a bridge-shaped base and a swinging lever pivotally mounted therebelow for motion about a vertical axis, the improvement comprising mounting means at the rear end of said swinging lever for mounting saw means thereon, said mounting means comprising means to normally bias said saw means to an up position with respect to said base, said mounting means comprising means to define the upper and lower limits of motion of said saw means with respect to said base, and said mounting means comprising means to manually lock said saw means in a down position in closely spaced relation to said base, said mounting means comprising a saw arm carrying said saw means on the forward end thereof, said mounting means comprising a pair of boss portions formed one on said saw arm and the other on the rear end of said swinging lever, a pin member carried by one of said boss portions, an arcuate slot and a hole deeper than the depth of said arcuate slot formed in the other of said boss portions, said pin member being so configured with respect to said one of said boss portions that the free end of said pin is positioned in said arcuate slot formed in said one of said boss portions in the assembled together condition of said boss portions, and said hole being located at the end of said slot corresponding to said down position.

4,011,783

## CIRCULAR SAW

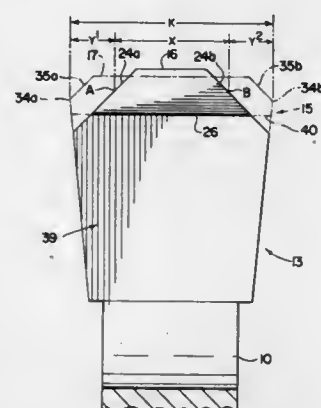
Leonard James Mobley, Tallmadge, Ohio, assignor to Lear-Sigler, Inc., Santa Monica, Calif.

Filed Jan. 22, 1976, Ser. No. 651,572

Int. Cl.<sup>2</sup> B23D 45/00; B27B 33/08

U.S. Cl. 83—846

1 Claim



1. A circular saw having a hard disc-like body with pairs of cutting teeth at its periphery, each pair of teeth consisting of one high tooth (13) and one low tooth (15), and characterized in that:

- both teeth of each pair have two laterally-separated negatively-raked cutting edges which slope toward each other from the sides of the tooth to a transverse radially outer cutting edge which is parallel to the rotational axis of the saw;
- the transverse radially outer cutting edge of each high tooth (13) being radially offset a greater distance from the rotational axis of the saw than the corresponding transverse edge of each low tooth (15); and
- the negatively-raked sloping cutting edges of each low tooth (15) being laterally separated a greater amount than the lateral separation between the negatively-raked sloping cutting edges of each high tooth (13).

4,011,784

## TRANSPPOSITION APPARATUS FOR AN ELECTRONIC MUSICAL INSTRUMENT

Tutomu Fukui, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 420,501, Nov. 30, 1973, abandoned.

This application Feb. 24, 1975, Ser. No. 552,086

Claims priority, application Japan, Dec. 19, 1972, 47-127395

Int. Cl.<sup>2</sup> G10H 1/00

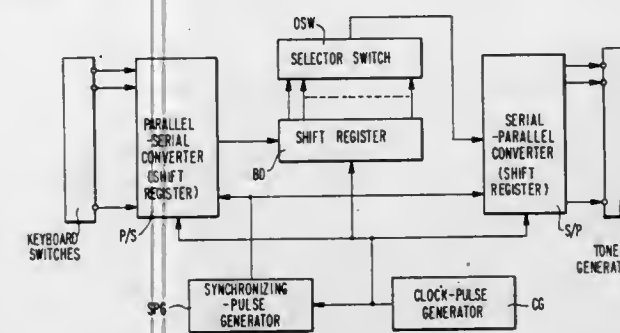
U.S. Cl. 84—1.01

2 Claims

1. A transposition apparatus for an electronic musical instrument having a plurality of keyboard switches comprising:

- first shift register having a plurality of stages equal to the

number of keyboard switches plus a number of additional stages equal to the number of desired transpositions, each of said switches being connected to the input of a corresponding first shift register stage, said first shift register converting the parallel keying pattern represented by switches actuated by keys on said musical instrument to a serial pulse signal where the bit positions of the pulses in said signal correspond to said actuated switches, said additional stages serving to prevent signals for low-pitch tones from being shifted as signals for high-pitch tones, b. delay means connected to receive said serial pulse signal for delaying the signal by a predetermined number of bit positions,



- second shift register connected to receive the delayed serial pulse signal for converting the received signal to a parallel keying pattern transposed from said original keying pattern, said transposed keying pattern being used to control the tone generator in the musical instrument,
- a clock-pulse generator connected to both of said first and second shift registers to shift bits out of said first shift register and to shift bits into said second shift register, and
- a synchronizing-pulse generator connected to receive clock pulses from said clock-pulse generator and periodically producing a synchronizing pulse to reset both of said first and second shift registers.

4,011,785

## NAIL AND POWERED NAILER

John R. Schrepferman, Merriam, Kans., assignor to Bliss & Laughlin Ind., Inc., Oak Brook, Ill.

Continuation-in-part of Ser. No. 153,756, June 16, 1971, abandoned. This application Apr. 18, 1973, Ser. No. 352,243

Int. Cl.<sup>2</sup> F16B 15/00

U.S. Cl. 85—10 R

5 Claims



1. A full headed nail comprising, a shank member and a flat head member, said head member having a peripheral edge defining a pair of arcuate sections disposed at opposite ends of a major diametrical axis and a pair of parallel segmented portions of equal length disposed at opposite ends of a minor diametrical axis, the length of said major diametrical axis being substantially greater than twice the diameter of said shank member, the length of said minor diametrical axis being substantially equal to twice the effective diameter of said shank member, the major portion of its shank being surface finished with

minute pits having small sharply shaped walls as produced with grit-blasting the shank with No. 80 grain size aluminum oxide grit to frictionally engage wood fibers without tearing them when passing laterally therethrough.

4,011,786

## EXPANDABLE DOWEL

Heinrich Liebig, Wormser Strasse 23, Pfungstadt, Germany

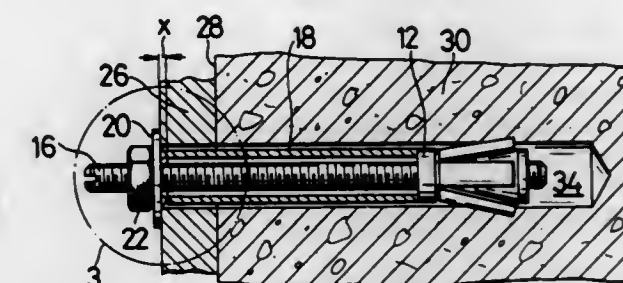
Filed Dec. 5, 1975, Ser. No. 637,957

Claims priority, application Germany, Dec. 10, 1974, 2458317

Int. Cl.<sup>2</sup> F16B 13/04

U.S. Cl. 85—74

8 Claims



1. An expandable dowel for insertion into a borehole, comprising: expandable sleeve means with at least one slot extending from one end thereof, at least one expanding member engaging said sleeve means at said one end for expansion thereof, spacer sleeve means adjacent that end of said expandable sleeve means which is opposite said one end and having an end face, a screw-threaded bolt in screw-threaded engagement with said expanding member and having a shaft which is passed through said spacer sleeve means and said expandable sleeve means, means on said screw-threaded bolt adjacent said spacer sleeve means for retaining said spacer sleeve means on said screw-threaded bolt, and washer means located between said spacer sleeve means and said means on said screw-threaded bolt, said washer means having a first substantially flat portion located outside the projection of a borehole into which the dowel is to be inserted and a second portion within the projection of the borehole, said second portion being provided with deformable sections bent outwardly with respect to the plane of said washer means and extending in a direction toward said spacer sleeve means, whereby upon tightening of said means on said screw-threaded bolt said sections first engage said end face of said spacer sleeve means and thereafter are deformed back into the plane of said washer means.

4,011,787

## MINE ROOF BOLT ASSEMBLY

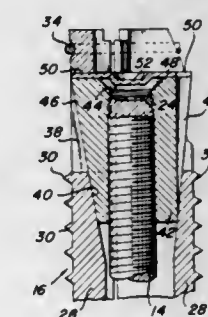
Lewis P. White, 3436 Brookwood Road, Birmingham, Ala. 35223, and Francis E. White, 1437 Panorama Drive, Vestavia Hills, Ala. 35216

Filed June 20, 1975, Ser. No. 588,904

Int. Cl.<sup>2</sup> F16B 33/04; E21D 21/00

U.S. Cl. 85—76

9 Claims



1. A mine roof bolt assembly including:

- a roof bolt, one end of which is threaded,
- an expansion shell threadedly engaged with the threaded end of said roof bolt and comprising a plurality of leaves,



- c. a first means for normally holding said leaves together,  
 d. said expansion shell further including wedge means between said leaves in threaded engagement with the threaded end of said roof bolt, a portion of said wedge means engaging said leaves for forcing the latter outwardly upon movement of said wedge means longitudinally of said roof bolt and leaves,  
 e. a stop member positioned between said leaves beyond the threaded end of said roof bolt,  
 f. said stop member including a body portion in the path of the threaded end of said roof bolt,  
 g. said stop member body portion having means for engaging the central part of the terminal of the roof bolt threaded end and spacing the body portion from the periphery of the roof bolt, said stop member engaging and limiting the penetration of the roof bolt into the expansion shell whereby movement of said wedge means in a direction to force said leaves outwardly, is effected, and  
 h. a second means on said stop member body portion engageable with said leaves for limiting the longitudinal movement of the stop member with respect to said leaves under urging of said roof bolt.

4,011,788

## STRIPPER/DE-LINKING MECHANISM

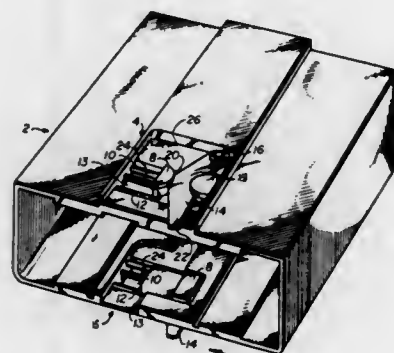
Frederick P. Reed, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 16, 1976, Ser. No. 649,627

Int. Cl.<sup>2</sup> F41D 9/02

U.S. Cl. 89—33 C

8 Claims



1. In an automatic or semiautomatic weapon system having a receiver including a firing chamber, an ammunition belt feed tray mechanism for feeding rounds individually to said firing chamber, an ammunition belt of the disintegrating type in said tray mechanism, with individual round link members, each of said members totally circumscribing its corresponding round, and weapon system recoiling parts, the improvement comprising:

link stripper and delinker means carried by said feed tray mechanism adjacent said firing chamber for movement from a first position to a second position to strip and delink each link from the next succeeding link in the linked belt prior to introduction of the delinked round into the receiver,

said stripper delinker means comprising a pair of spaced units, each unit comprising a movable body member having a link engaging stripper and delinking shoulder, and guide means carried by the feed tray mechanism for guiding movement of said stripper delinker body member between said positions.

means carried by the recoiling parts to actuate movement of the stripper delinker means from said first position to said second position to effect said stripping and delinking function, and

means for automatically moving said stripper delinker means from said second position to said first position upon completion of the stripping and delinking function.

4,011,789

## GUN FIRE CONTROL SYSTEM

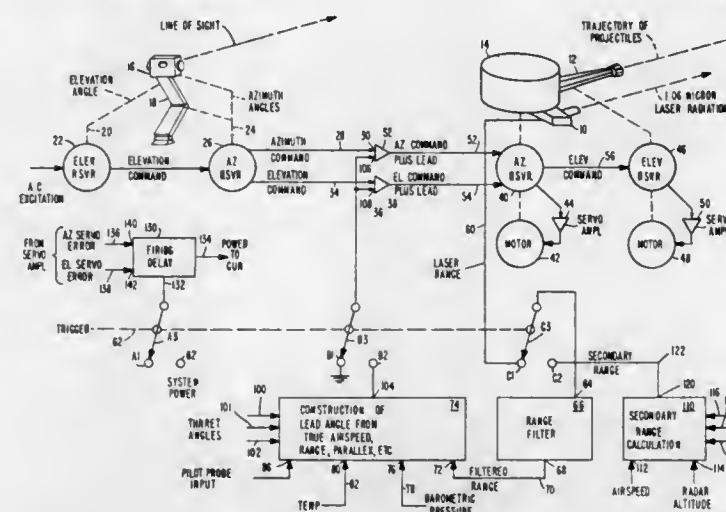
Louis B. Bresee, Jr., So. Burlington; Charles A. Brownlee, Essex Junction, and Robert A. Leightner, Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed May 6, 1974, Ser. No. 467,529

Int. Cl.<sup>2</sup> F41G 3/02

U.S. Cl. 89—41 EA

5 Claims



1. In a gun and fire control system having:  
 a gun, mounted in a turret which is aimed by a servo system, and having a firing mechanism and a trigger to fire said gun;  
 a remote gunner's sight for providing target elevation and azimuth signals to said servo system;  
 a computer for providing a lead angle signal to said servo system;  
 the improvement of:  
 a laser range finder mounted to and boresighted with said gun, for providing a real target range signal to said computer;  
 first means coupled to said servo system, to said computer and to said trigger for decoupling said lead angle signal from said servo system until said trigger is actuated to fire said gun, and upon said trigger being actuated to fire said gun, coupling said lead angle signal to said servo system to cause said servo system to drive said gun and said laser range finder from a line of sight orientation while said gunner's sight remains unaffected and available for continuing to provide target elevation and azimuth signals to said servo system to a line of fire orientation.

4,011,790

## RECOIL CONVERTER FOR SELF POWERED GUN

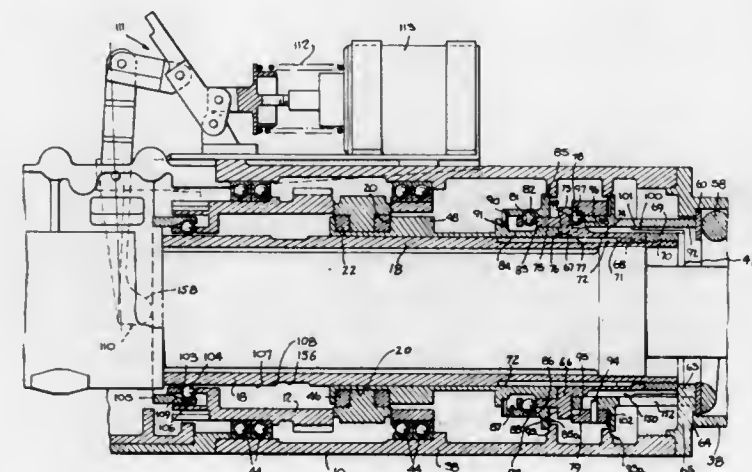
Lawrence Ray Folsom, Schenectady, N.Y., and Roger Eugene Gaboriault, Williston, Vt., assignors to General Electric Company, Burlington, Vt.

Filed July 28, 1975, Ser. No. 600,179

Int. Cl.<sup>2</sup> F41D 3/06

U.S. Cl. 89—162

10 Claims



1. A gun having a cycle of operation and comprising:  
 a housing;  
 gun barrel means journaled for reciprocation relative to said housing;

- an operating mechanism including means journaled for rotation relative to said housing and rotating continuously through said cycle of said gun;  
 motion conversion means for converting reciprocation to rotation; and  
 coupling means for coupling said motion conversion means to and between said gun barrel means and said operating mechanism for less than the totality of said cycle of operation of said gun.

4,011,791

## TOOL CHUCKING DEVICE

Horst Lanzberger, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

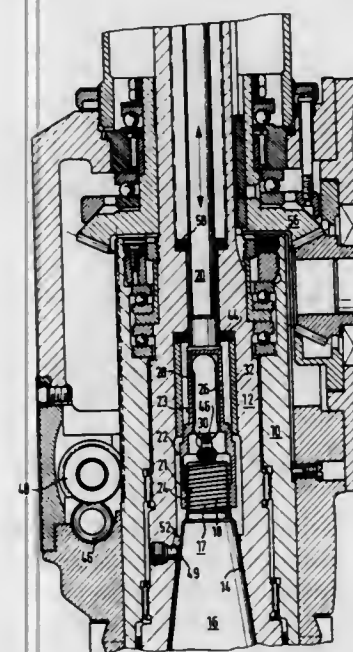
Filed Sept. 25, 1975, Ser. No. 616,588

Claims priority, application Germany, Oct. 23, 1974, 2450323

Int. Cl.<sup>2</sup> B23C 5/26

U.S. Cl. 90—11 D

9 Claims



1. A tool chucking device having an axially displaceable draw-in bar mounted inside a hollow spindle, and carrying a coupling head means thereon which is adapted to positively engage a shank of a tool, comprising the improvement wherein said coupling head means includes a slotted resiliently expandable sleeve-like member having an internal grooved profile, wherein said tool shank has a complementary external grooved profile adapted to engage said internal grooved profile, wherein expanding means are provided for expanding the slotted sleeve-like member during a displacement in ejecting direction for the purpose of releasing the tool shank and wherein said expanding means comprises stationary pin means projecting into a slot in said slotted sleeve-like member, said pin means and said slotted sleeve-like member having cooperating cam faces which make mutual contact during said displacement of said slotted sleeve-like member in said ejecting direction to thereby cause said sleeve-like member to be expanded.

4,011,792

## ROTARY TOOL EXHAUST HOOD

Wallace J. Davis, Route 11, Box 290, Lenoir, N.C. 28645

Filed Nov. 7, 1975, Ser. No. 629,868

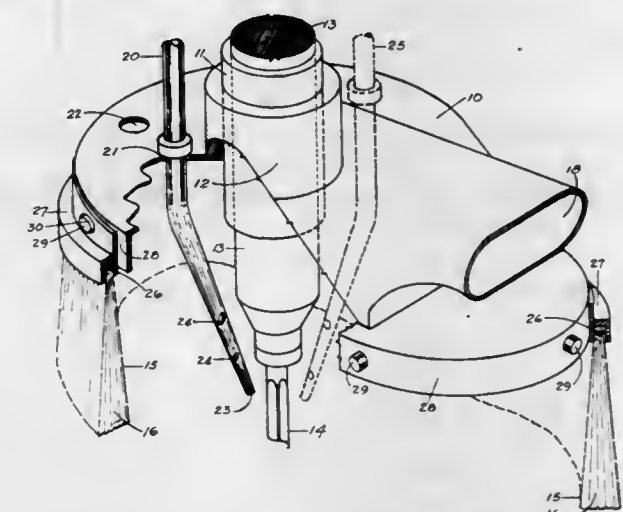
Int. Cl.<sup>2</sup> B23C 1/00; B23B 51/06, 39/00

U.S. Cl. 90—11 R

3 Claims

1. A machine tool having in combination a motor driven chuck carrying a rotary cutting tool which, in operation, throws off a stream of relatively heavy chips and other particles, a hood or bonnet mounted on the machine having means providing for axial adjustment of the same, said hood having a body extending over an area surrounding the tool, a skirt

attached to the hood and arranged to drop down around and enclose the tool, said skirt embodying bristles incorporating appropriate interstices for admitting ambient air, said hood having an exhaust opening for connecting the same with an exhaust system, the suction from which draws a suction air



stream through and out of the hooded space, and means for introducing under the hood a jet of air under pressure directed at said stream of chips, discharging the same into the suction air stream for effective capture and withdrawal of the chips with the air stream.

4,011,793

## PORTABLE BORING BAR

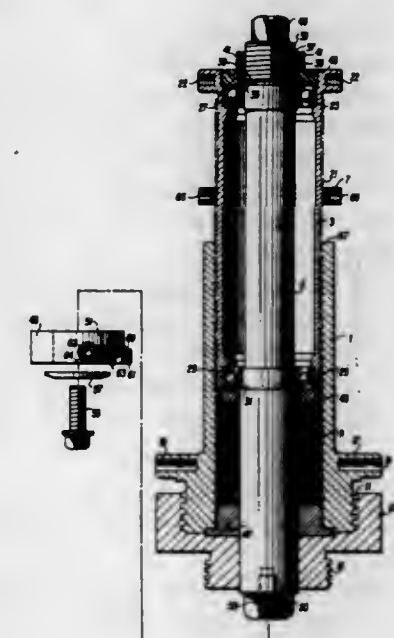
Ernest E. Grimsley, 4533 Wake Forest Road, Portsmouth, Va. 23703

Filed Oct. 7, 1975, Ser. No. 620,408

Int. Cl.<sup>2</sup> B23C 1/20

U.S. Cl. 90—12.5

10 Claims



1. A tool adapted for boring the seal ring seats of high pressure valves, said tool comprising:

a hollow cylindrical housing support having threads on its interior surface;  
 a rotatable cylindrical feed screw having exterior threads thereon for engaging the threads on said interior surface; means holding a cutting tool;  
 a drive shaft extending through and beyond said feed screw and said housing support, said drive shaft having a diameter much smaller than the internal diameter of said feed screw;  
 means at one end of said drive shaft for connecting said



drive shaft to a driving means and means at the other end for receiving said means holding a cutting tool; first and second bearing means mounted inside said feed screw rotatably supporting said drive shaft in fixed relation to said feed screw whereby said drive shaft and tool holder are moved axially as said feed screw is rotated relative to said housing support.

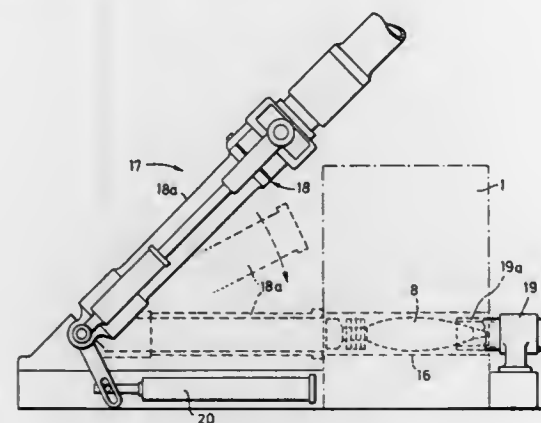
4,011,794

# MAGAZINE-LOADING DEVICE FOR GRENADE LAUNCHERS

Matatjahu Leshem, 79 Shderot Hanassi, Haifa, Israel (34642)  
Filed Apr. 25, 1974, Ser. No. 464,276  
Int. Cl.<sup>2</sup> F41F 9/06

U.S. Cl. 89-47

8 Claims



1. A magazine-loading device for loading grenade launchers with shells comprising, in combination:

- an elongated shell storage enclosure which is upwardly inclined with respect to the horizontal, for receiving a series of shells in side-by-side relationship and transversely directed with respect to the longitudinal axis of said enclosure, the enclosure including an oval recessed surface for contacting the corresponding side surfaces of said shells and means for inhibiting movement of said shells in the transverse direction;
- releasable shell retaining means associated with the enclosure for releasably retaining each of the shells in the enclosure against downward displacement under gravity;
- a shell receiving unit located substantially horizontally at the lower end of the enclosure for receiving the lowermost shell located in the enclosure when said retaining means retaining said lowermost shell is released; and
- shell displacing means associated with said shell receiving unit for displacing a shell located in the unit into the barrel of a grenade launcher.

4,011,795

# IMPACT TOOL

Henry P. Barthe, Pittsburgh, and John S. Schroeder, Sewickley, both of Pa., assignors to Schroeder Brothers Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1975, Ser. No. 561,419

Int. Cl.<sup>2</sup> F01L 25/04

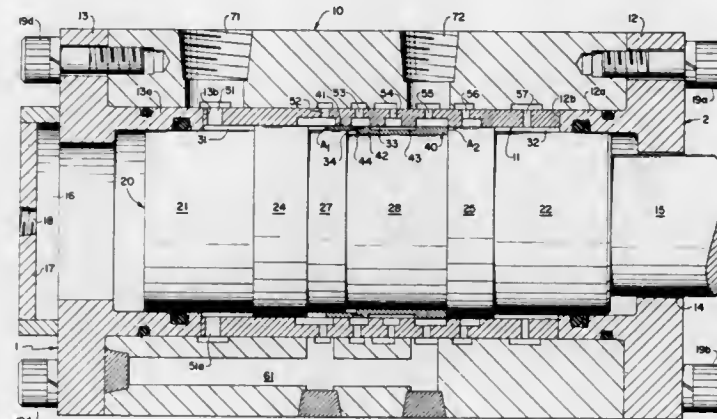
U.S. Cl. 91-286

4 Claims

1. A hydraulic impact tool for use in a hydraulic system comprising a pump, hydraulic fluid, and reservoir, said tool comprising:

- a housing defining a cylindrical bore having a central portion of increased section,
- a ram slidable in the housing between stored energy and impact positions,
- an energy storage means for biasing the ram toward the impact position,
- said ram having lift and closure cylindrical pistons secured thereto so that the housing, the ram and the pistons define at least two chambers, one between the pistons having a fixed volume and an expansible volume lift chamber,

- said ram between said pistons having two cylindrical portions of different cross section,
- axially spaced ports comprising:
  - at least one main transfer port opening into said fixed volume chamber,
  - at least one main exhaust port opening to said fixed volume chamber,
  - at least one slid valve exhaust port opening to said fixed volume chamber but closable by said lift piston on said ram,
  - at least one main inlet port opening to said fixed volume chamber,
  - at least one lift chamber transfer port opening into said expansible volume lift chamber, all said main transfer and lift chamber transfer ports being in direct communication,



G. a cylindrical valve sleeve positioned within the said fixed volume chamber and movable relative to the ram and housing,

- said sleeve having a radial end surface having an area  $A_1$ ,
- said sleeve having another radial end surface having an area  $A_2$  such that the area  $A_1$  is less than the area  $A_2$ ,
- said sleeve having transfer means thereon for connecting either the main exhaust port with the main transfer port or the main inlet port with the main transfer port, the aforesaid ram, valve sleeve and axially spaced ports arranged such that the sleeve is carried mechanically in one direction by the lift piston until the surface  $A_2$  enters the main inlet port and thereafter the sleeve is moved relative to the ram by hydraulic pressure and such that the slide is carried mechanically in the other direction until the ram lift piston opens the slide valve exhaust port and thereafter, the valve sleeve is moved relative to the ram by hydraulic pressure.

4,011,796

# RADIAL HYDRAULIC PUMP OR MOTOR WITH IMPROVED PISTONS AND SLIPPERS

Lewis C. Erickson, 3328 E. Superior St., Duluth, Minn. 55804

Filed Jan. 16, 1975, Ser. No. 541,401

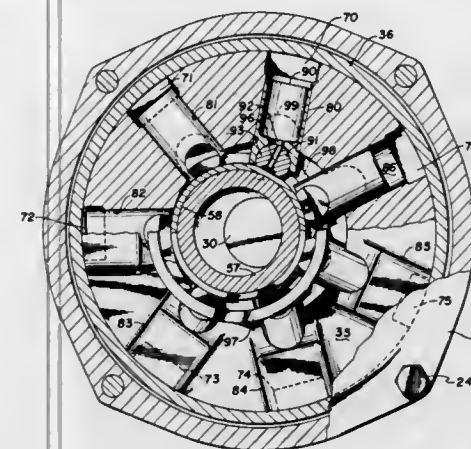
Int. Cl.<sup>2</sup> F01B 13/06

U.S. Cl. 91-488

7 Claims

- A fluid pump or motor comprising:
  - housing means having a central opening in one side thereof and having fluid inlet and outlet ports therein, said housing means having slipper bearing means formed in the end thereof opposite said central opening, the axes of said slipper bearing means and the central opening being eccentrically aligned;
  - shaft means rotatably supported within the central opening of said housing means;
  - piston means for operating in a cylinder, the end portion nearest the axis of said shaft having a slot formed therein of circular cross-section segment exceeding 180°, the axis of which is parallel to that of said shaft means;
  - a slipper of substantially circular cross-section nested in each slot of each piston means, said slipper extending beyond the walls of each piston in reduced and equal radial configuration;

- a pair of retaining rings secured over the outer radial surface of that portion of each slipper extending beyond the walls of each piston means;
- rotor means having a plurality of radially arranged cylinders, each cylinder having a port at the outer end thereof, and having the walls of each cylinder nearest the center of said rotor means being cut away to allow clearance for said slipper and piston means assembly to the degree said



piston means is entirely contained within said cylinder at its maximum point of eccentricity, said rotor means being fixedly secured to said shaft;

- and radial valve means having a first part secured to said housing means and communicating with said inlet and outlet ports and having a second part formed in said rotor means with a plurality of conduits and ports communicating respectively with each cylinder port.

4,011,797

# OIL-COOLED PISTON FOR A HEAT ENGINE

Andre Cornet, Levallois-Perret, France, assignor to DAMPERS Societe Anonyme, Boulogne, France

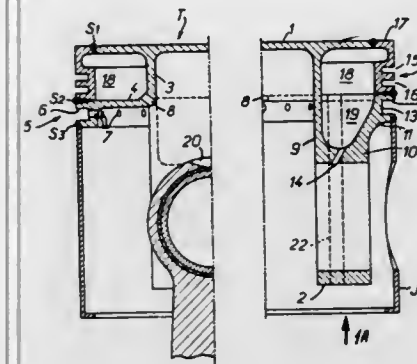
Filed July 15, 1974, Ser. No. 488,228

Claims priority, application France, July 19, 1973, 73.26584

Int. Cl.<sup>2</sup> F02F 3/20

U.S. Cl. 92-186

24 Claims



- An oil-cooled piston comprising a crown, a radial flange and means axially offsetting said flange beneath said crown, a ring section rigidly secured to said crown and flange for piston-ring support and defining therewith a circumferentially continuous annular oil chamber axially between said flange and crown and radially within the piston-ring support region of said ring section, a cylindrical skirt rigid with said flange and extending axially downward therefrom, two laterally spaced downward projections independent of said skirt and rigid with said crown and flange at opposed radial offsets from the piston axis and in radial clearance relation with said skirt, transversely aligned wrist-pin bearing means in said projections at a location axially beneath said flange and ring section, each of said projections having an upwardly open cavity extending from the region of said wrist-pin bearing means and upwardly through said flange and thus forming a local axially

downwardly extending region of the oil chamber, and inlet and outlet flow-circulating means communicating with the chamber.

4,011,798

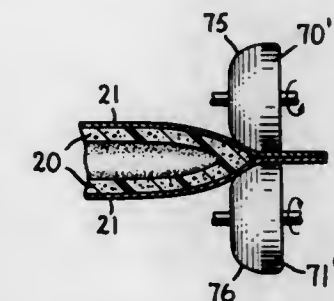
# METHOD OF MAKING SHIPPING BAG

John D. Bambara, Osterville, and Dennis Knaus, Centerville, both of Mass., assignors to Packaging Industries, Inc., Hyannis, Mass.

Division of Ser. No. 419,923, Nov. 29, 1973, abandoned. This application Oct. 24, 1975, Ser. No. 625,700  
Int. Cl.<sup>2</sup> B31B 39/60

U.S. Cl. 93-35 R

8 Claims



1. A method of making a cushioned bag of multilayer material having first and second exterior faces formed by outer surfaces of at least one exterior layer of relatively thin, fibrous, and flexible sheet material, an inner layer lining substantially the entire bag interior and comprising at least one sheet of foamed plastic; the method comprising the steps of:

automatically bringing together along a path of travel two long sections of the multilayer material, positioning surfaces of the foamed plastic of the sections adjacent one another inside the thin, fibrous and flexible sheet of the two sections to form outer layers from the thin, fibrous and flexible sheet,

joining together the two long sections at intervals spaced along the length thereof to form attached bags of the multilayer material, said step of joining comprising applying sufficient heat and pressure to the two sections at said intervals to entirely collapse the foamed plastic along thin strips transverse to the path of travel and to join the outer layers of the thin, fibrous and flexible sheet substantially face-to-face along the strips, thereby forming a bonded together, two layer, marginal seam area where the outer surface forming, thin, fibrous, and flexible sheets are securely joined together,

forming adjacent the transverse strips a continuum of the foamed plastic spanning the joined strips inside the bag, said step of forming a continuum including applying less heat and pressure than applied to the transverse strips adjacent the transverse strip towards the bag interior to join the adjacent surfaces of the foamed plastic absent total collapse of the foam, thereby forming a second joined internal seam area that includes the joined foam spanning the marginal seam area adjacent thereto, whereby bag seams are formed with an improved seal and cushioning across the seam.

4,011,799

# CARTON ERECTING APPARATUS

Francis A. Chidsey, Devon, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Nov. 10, 1975, Ser. No. 630,142

Int. Cl.<sup>2</sup> B31B 1/80

U.S. Cl. 93-53 SD

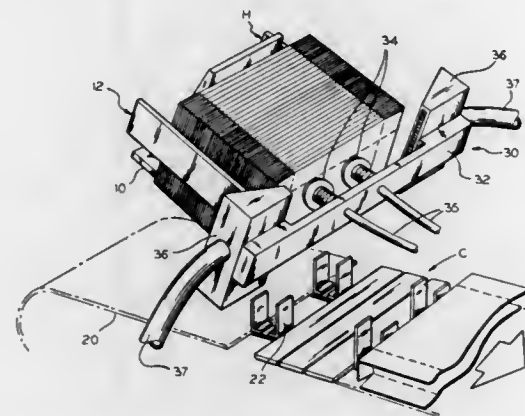
6 Claims

1. In an apparatus for erecting collapsible, open-ended, tubular cartons each comprising a plurality of foldably interconnected panels, the combination of:

- a hopper member for holding a plurality of cartons in flattened condition;



- b. a conveyor member positioned adjacent said hopper member and including retaining means, which are spaced from each other a distance equal to the width of an erected carton, for retaining erected cartons therebetween;
- c. carton erecting and transfer structure mounted for reciprocal movement between said hopper member and said conveyor member;
- d. said structure including:



- i. vacuum transfer means for engaging a panel of one of said cartons in said hopper member;
- ii. moveable plenum means adjacent at least one end of said structure for applying positive air pressure against at least one end of said one carton to erect said carton as said carton is transferred by said structure from said hopper member to said conveyor member;
- e. means for moving said structure between said hopper member and said conveyor member whereby said plenum means moves in unison with said vacuum transfer means.

4,011,800

## BOTTOM SEAL HORN AND MANDREL

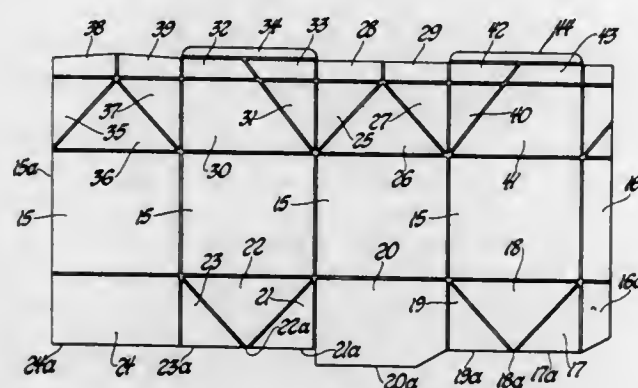
Jr. Walke, Wixom, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 31, 1976, Ser. No. 672,092

Int. Cl.<sup>2</sup> B32B 31/00

U.S. Cl. 93—59 MT

17 Claims



1. Vibration sealing apparatus for sealing a rectangular end closure of a thermoplastic coated paperboard carton, said apparatus comprising: a vibrating horn having a rectangular work face; a stationary mandrel having a rectangular work face for opposing the work face of the horn with the end closure of the carton therebetween; one of the rectangular work faces defining an elongated depression extending between a pair of opposite edges thereof with a predetermined depth; said one work face also defining a pair of spaced depressions associated with each of said opposite edges of the work face to which the elongated depression extends; said spaced depressions having a greater depth than the elongated depression; each pair of spaced depressions having a configuration cooperatively defined by the depressions thereof and being oriented to oppose the other pair of spaced depressions

in a spaced relationship; at least one of the spaced depressions of each pair overlapping with the elongated depression from the same side thereof; the other work face having generally diagonal depressions defining a junction; and the other work face also including at least one triangular projection at the junction of the diagonal depressions.

4,011,801

## UNITARY AIR-DIFFUSING WEDGE STRIP IN AIR PROJECTION GRILLE

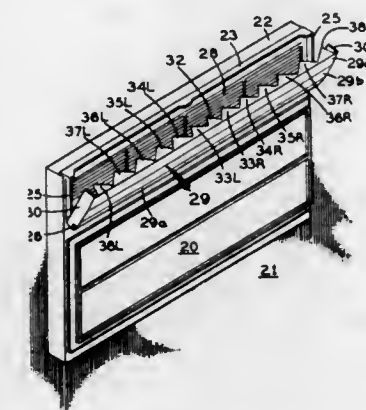
Herbert F. Bruns, Coral Gables, Fla., assignor to Bruns Technology, Inc., Coral Gables, Fla.

Continuation-in-part of Ser. No. 385,833, Aug. 6, 1973, abandoned. This application May 6, 1975, Ser. No. 575,146

Int. Cl.<sup>2</sup> F24F 13/08

U.S. Cl. 98—40 D

9 Claims



1. In an air diffuser to be mounted downstream from a source of pressurized supply air, said diffuser comprising: a unitary wedge strip having a base and a row of adjoining, tetrahedral wedges on one side of the base, said row of wedges extending transverse to the supply air flow downstream from said source;

each wedge in the row having opposite, flat, triangular side faces which extend away from the base at opposite acute angles and intersect each other along an apex line which is inclined away from the base in the downstream direction;

and the adjacent side faces of successive wedges in the row at their respective lines of intersection with the base converging toward each other in said downstream direction and intersecting each other at the downstream side of the wedge strip, whereby to provide channels for the supply air flow between successive wedges which at the base narrow to a point and provide V-shaped exit openings for the air at the downstream side of the wedge strip;

the improvement wherein:

the successive wedges along the row in at least one lateral direction outward from a reference point lean progressively toward the base, with the downstream edges of the laterally inboard side faces of successive wedges in said one lateral direction being progressively longer and the downstream edges of the laterally outboard side faces of said wedges being progressively shorter,

whereby the confronting side faces of said successive wedges compress and accelerate input supply air which is forced in and flows through the narrowing channels and out of the V-shaped exit openings to form coherent jets which induce surrounding ambient and supply air.

4,011,802

## MAKEUP AIR DEVICE FOR GREASE EXTRACTION VENTILATOR

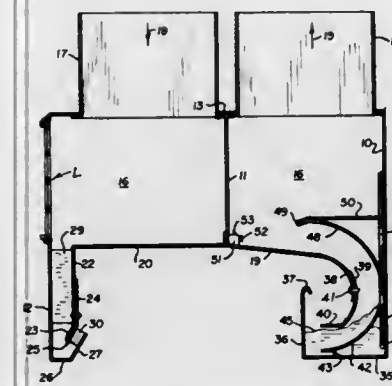
Victor D. Molitor, Denver, and Arlen W. Gallagher, Arvada, both of Colo., assignors to Stainless Equipment Company, Englewood, Colo.

Filed Jan. 27, 1975, Ser. No. 544,138

Int. Cl.<sup>2</sup> F23J 11/02

U.S. Cl. 98—115 K

6 Claims



1. The combination of a makeup air device and a grease extraction ventilator, wherein:

said ventilator is provided with an intake and means for adjusting the amount of air and smoke, grease and the like to flow through said ventilator;

said ventilator includes a water bath chamber having a front wall with said intake above said front wall;

a plate forms the lower boundary of a chamber for flow of the air and products passing through said water bath, the underside of said plate forming the upper boundary of said intake;

said makeup air device includes an air chamber adjacent said ventilator, a passage from said chamber leading to an outlet adapted to direct air toward said intake and means for adjusting the amount of air to be directed toward said intake;

said makeup air chamber having a bottom wall adjoining said boundary plate and said passage extending downwardly from said air chamber to said outlet; and

said outlet having upwardly inclined walls for directing air towards said bottom wall of said makeup air chamber for flow past and along the underside of said boundary plate to said intake.

4,011,803

## RANGE-HOOD INSTALLATION DEVICE

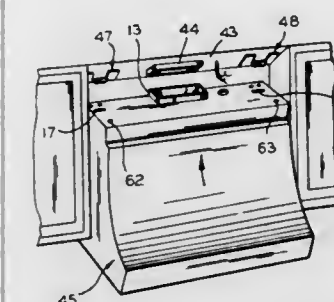
Leonard G. Pfaffinger, Morango, Ill., assignor to Aubrey Manufacturing, Incorporated, Union, Ill.

Filed Apr. 10, 1975, Ser. No. 566,974

Int. Cl.<sup>2</sup> F23J 11/00

U.S. Cl. 98—115 K

6 Claims



1. An installation mounting device facilitating the positioning and secure restraining of a suspended fixture assembly, said device comprising:

a. bracketing body means mounted onto a surface means against which said suspended fixture assembly will be juxtaposed, said bracketing body means including latching means to mechanically latch to said suspended fixture assembly.

said bracketing body means comprising means for fixedly mounting said bracketing body means to said surface means so as to enable firm engagement of said bracketing body means juxtaposed to said surface means; and latching means including protruding portion means which insert through and automatically snap behind slotted orifice means to fixedly suspend said fixture means, and

b. said slotted orifice means on said suspended fixture assembly receiving said latching means to attach and maintain said suspended fixture assembly juxtaposed to the surface means onto which said bracketing body means is affixed.

4,011,804

## GRILLE TENDER

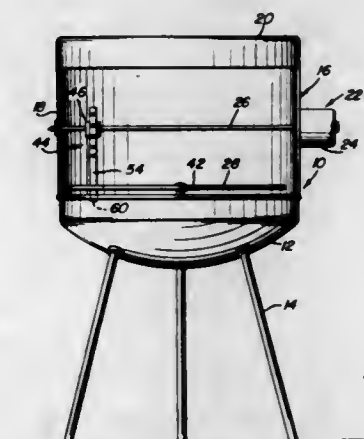
James R. Crockett, Sr., 3327 Zuni Circle, Las Vegas, Nev. 89109

Filed Jan. 21, 1976, Ser. No. 651,158

Int. Cl.<sup>2</sup> A47J 37/04

U.S. Cl. 99—421 H

9 Claims



1. In combination, a broiler of the type including a horizontally disposed rotary grille mounted for rotation about an upstanding axis centrally disposed relative to the plan area of said grille and including sets of grille bars crossed relative to each other, a horizontal elongated motor-driven spit mounted above and extending across said grille, and an elongated drive member transversely mounted on said spit for rotation therewith and including one end portion projecting endwise outwardly from the spit a distance greater than the vertical spacing between said grille and spit engageable with successive grille bars of said grille upon swinging movement of said one end portion of said drive member through its lowermost arc of travel to intermittently angularly advance said grille each time said one end portion swings through said lowermost arc.

4,011,805

## CONVECTION STEAMER APPARATUS AND METHOD FOR PROCESSING FOOD ITEMS OR THE LIKE

Elmer S. Vegh, Lyndhurst; William F. Castle, Cleveland; Leonard P. Hadvany, Olmsted Falls; Donald F. Klier, Parma, and David S. Schwesler, Cleveland, all of Ohio, assignors to Alco Standard Corporation, Cleveland, Ohio

Filed Feb. 19, 1975, Ser. No. 550,973

Int. Cl.<sup>2</sup> F24D 1/00; A47J 27/04, 27/16

U.S. Cl. 99—467

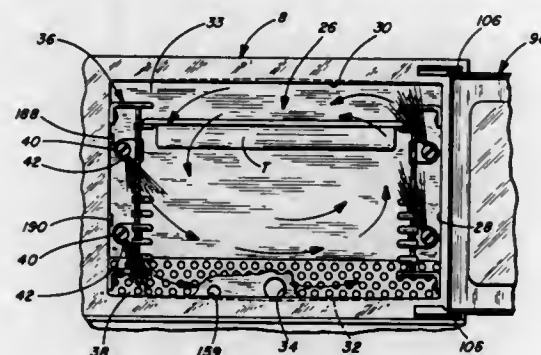
12 Claims

1. A convection steamer apparatus having improved heat-transfer characteristics for processing food items or the like comprising:

at least one steam chamber defined by a bottom, top, rear and oppositely disposed side walls adapted to receive food items in supported relation therein, steam generator means for supplying regulated amounts of steam under pressure into said chamber, distribution means including a plurality of spaced-oppositely disposed pipe means disposed adjacent associated of



said side walls adapted to deliver substantially dry steam in a generally orbital path around food items to be processed within said chamber, diffuser means operably connected to said steam generator means and directly communicating with said distribution means for introducing substantially dry steam into said distribution pipe means, and



pressure differential generator means communicating with said chamber exteriorly thereof for inducing a substantially zero pressure in said chamber by removing air and unused steam from said chamber by condensing said steam with liquid pressure thereby to induce turbulent flow of said substantially dry steam in said orbital path during the processing of said food items.

4,011,806

# APPARATUS FOR MAKING FEED STUFF CONTAINING BAGASSE, PROTEIN AND YEAST

Yoshiaki Kimura, 902, Aza-Ameku, Naha, Okinawaa, Japan  
Division of Ser. No. 283,156, Aug. 23, 1972, Pat. No. 3,903,307. This application May 19, 1975, Ser. No. 578,488  
Claims priority, application Japan, Aug. 30, 1971, 46-65808; Aug. 30, 1971, 46-66421; Aug. 30, 1971, 46-65806; Aug. 30, 1971, 46-65807

Int. Cl.<sup>2</sup> A23N 17/00

U.S. Cl. 99-485

10 Claims

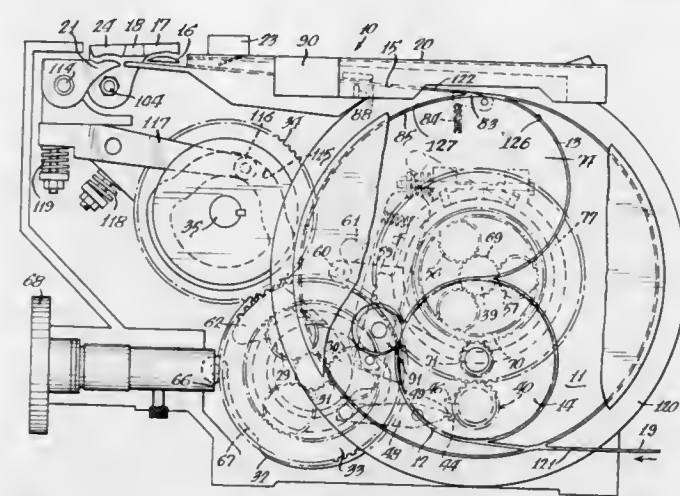
1. In a plant for providing feed suitable for consumption by animals, fermentation means for providing a fermentation product from a material such as a suitably treated raw bagasse, supply means for supplying a substantially dry crushed product, mixing means, conveyer means extending between and communicating with said mixing means and said supply means as well as said fermentation means for conveying to said mixing means both the product supplied by said supply means and the fermentation product of said fermentation means, said mixing means being adapted to mix both of said products together, and shaping means operatively connected with said mixing means for receiving therefrom a mixture mixed by said mixing means and for providing from said mixture feed units having a shape determined by said shaping means, said shaping means including a pair of elongated endless belts situated one over the other for defining between themselves an elongated belt-shaped space for receiving the mixture from said mixing means and for forming the mixture into an elongated belt-shaped configuration, zig-zag means cooperating with said belts for receiving the belt-shaped product and for directing the latter back and forth along a zig-zag path in a drying atmosphere, said zig-zag means including conveyers which convey the product along said zig-zag path and which include wire-net members, the latter becoming separated from each other at a predetermined location, and a cutting means situated at the latter location and cooperating with said conveyers of said zig-zag means for cutting the dried product previously conveyed along said zig-zag path into predetermined lengths.

8. The combination of claim 1 and wherein a tank means communicates with said mixing means for adding to the mixture therein a nutritious product such as a suitable protein.

4,011,807  
STRAP FEEDING AND TENSIONING MACHINE  
Robert J. Kobiella, Rolling Meadows, Ill., assignor to Signode Corporation, Glenview, Ill.  
Filed Jan. 21, 1976, Ser. No. 650,923  
Int. Cl.<sup>2</sup> B65B 13/02

U.S. Cl. 100-2

18 Claims



10. A method of feeding strap about a package at a relatively high rate to form a loop and thereafter tensioning the formed loop about the package at a relatively lower rate comprising the steps of

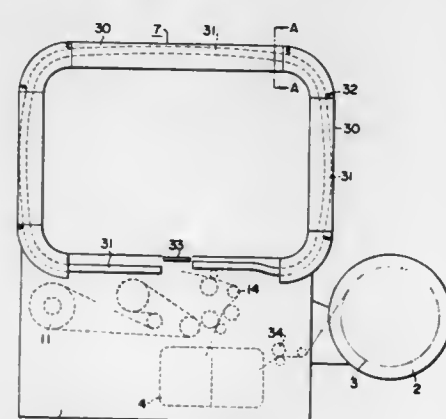
directing a strap to a stationary winder drum and about a high-speed wheel rotatably mounted on said winder drum; driving said high-speed feed wheel at a relatively high rate; feeding strap about said high-speed wheel so as to form a loop about a package and provide overlapping strap portions at one portion of the loop; terminating the strap feeding when a sufficient length of strap has been paid out to form said loop about the package; holding the leading end portion of the strap looped about the package; and thereafter rotating said winder drum at a relatively slow rate to pull tension in the strap forming the loop by winding the strap about the drum.

4,011,808  
STRAPPING BAND GUIDE FOR AUTOMATIC STRAPPING MACHINE  
Minoru Aoki, and Yoshiaki Kasuga, both of Yokohama, Japan, assignors to Nichiro Kogyo Company, Ltd., Yokohama, Japan

Filed July 31, 1975, Ser. No. 600,596  
Claims priority, application Japan, Aug. 5, 1974, 49-93885  
Int. Cl.<sup>2</sup> B65B 13/04

U.S. Cl. 100-26

5 Claims



1. In band strapping apparatus, a body having a table for supporting an article during banding, improved guide means through which a band may be fed endwise around said article and reversed and withdrawn therefrom to enwrap the article comprising:

an arch frame having an elongated side wall extending in the form of an upright loop from one side to another of said table; an elongated U-sectioned arch guide having a shape following the contour of said side wall and a groove along one side defining a band passage; biasing means pressing said one side of said arch guide to seat it against said side wall and thereby define a band passage in said arch guide closed by said side wall; said arch guide being locally separable in a direction transverse to said side wall enabling it to deflect and progressively and continuously release band from said band passage along the length of said arch frame whereby said band is prevented from turning back on itself during said progressive release, and said arch guide is deflectible in a direction parallel to said side wall enabling it to be seated adjustably thereon despite minor variations in shape between said arch guide and said side wall and to accommodate undulations of said band during feeding thereof through said guide means.

4,011,809  
PRESS WITH HYDRAULIC OVERLOAD SAFETY DEVICE AND RAM WEIGHT COUNTERBALANCING MECHANISM

Eugen Waller, Goepfingen; Wolfram Büchler, Donzdorf; Rolf Kellenbenz, Goepfingen; Franz Schneider, Goepfingen, and Burkhard Schumann, Goepfingen, all of Germany, assignors to L. Schuler GmbH, Germany

Filed Mar. 24, 1975, Ser. No. 561,166

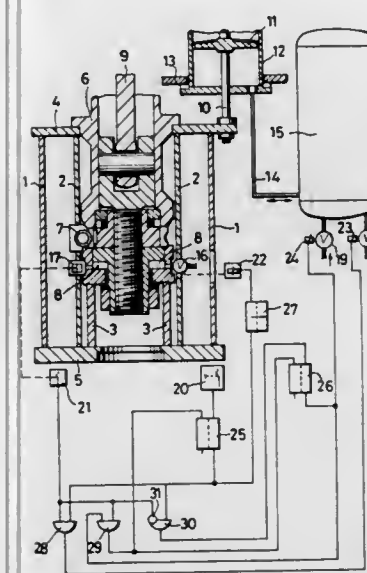
Claims priority, application Germany, Apr. 3, 1974, 2416102; Jan. 15, 1975, 2501275

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B30B 15/28, 15/14

U.S. Cl. 100-48

20 Claims



1. A press comprising mechanical drive elements acting on a ram through at least one pressure cushion serving as a hydraulic overload safety device, at least one cylinder-piston unit means operating under the effect of a compressed fluid for counterbalancing the weight of the ram associated with an upper die of the press, and a control system for adjusting fluid pressure in the cylinder-piston unit means to a value for counterbalancing the weight, this control system including pressure relief valve means and pressure meter means associated with the pressure cushion, the pressure relief valve means being operable before setting of the fluid pressure value for release of pressure from the pressure cushion, the pressure meter means accurately detecting the pressure in the pressure cushion in a measuring range including a predetermined value, actuating means for initiating the setting of a fluid pressure value for counterbalancing the weight, the pressure relief valve means being responsive to the actuating means for oper-

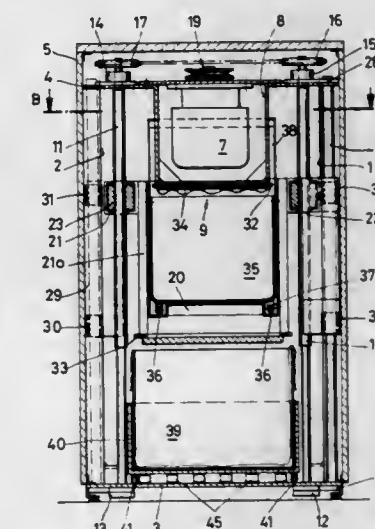
ation thereof, and supply valve means and discharge valve means for supplying and discharging compressed fluid to and/or from the cylinder-piston unit means, the supply and discharge valve means being responsive to the actuating means and the pressure meter means for operation thereof.

4,011,810  
GARBAGE DISPOSAL UNIT  
Blaz Santic, Burgau, Germany, assignor to Karl Menzle & Sohne, Gunzberg, Germany  
Filed Dec. 23, 1975, Ser. No. 643,870  
Claims priority, application Germany, Dec. 23, 1974, 2461242

Int. Cl.<sup>2</sup> B30B 7/02, 15/06

U.S. Cl. 100-229 A

9 Claims



1. A garbage disposal unit comprising frame means defining said disposal unit with an upper end and a lower end, a stationary compacting piston fixedly mounted to said frame means near the upper end of said disposal unit, a stationary receptacle member mounted near the lower end of said disposal unit, a combination piston-receptacle member movably mounted intermediate said stationary piston and said receptacle member, means mounting said combination member for vertical movement within said disposal unit to effect compaction of material contained within said combination member by said piston and compaction of material contained within said receptacle member by said combination member, said piston, said combination member and said receptacle member being configured for nesting interfitting relationship therebetween, and drive means for driving said combination member between operative engagement with said piston and said receptacle member.

4,011,811  
MULTIPLE DOCUMENT PRINTING SYSTEM  
Robert D. Kodis, Brookline, Mass., assignor to Di/An Controls, Inc., Boston, Mass.

Filed Oct. 20, 1975, Ser. No. 623,566

Int. Cl.<sup>2</sup> B41J 3/24

U.S. Cl. 101-93.07

12 Claims

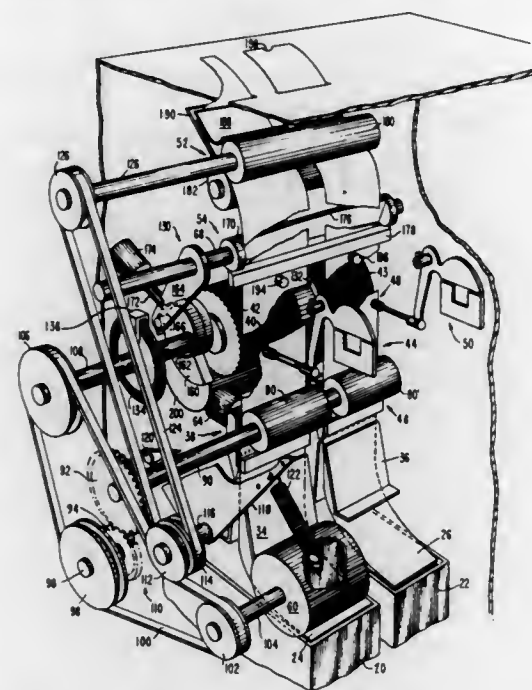
1. A system for simultaneously printing at least two document blanks, said system comprising:

- a motor;
- cylindrical print drum means rotated by said motor, said print drum means having at least two sets of characters disposed in rows and arcuate columns about the periphery thereof;
- ballistic hammer means for each said set of characters, a first print station located between one of said set of characters and one of said ballistic hammer means, a second print station located between the other of said set of characters and the other of said ballistic hammer means, said first and second print stations juxtaposed along a line that is parallel to the rotational axis of said print drum



means, said first print station receiving one of said document blanks, said second print station receiving the other of said document blanks;

d. feed means operatively connected to said motor for independently advancing each said document blank into and through its respective print station, said print drum



means and said ballistic hammer means cooperating to print said document blanks as they pass through their respective print stations;

e. severing means operatively connected to said motor for severing said printed document blanks; and

f. dispensing means operatively connected to said motor for dispensing said severed printed document blanks.

4,011,812

### MACHINE FOR PRINTING DIFFERENT COLORS SIMULTANEOUSLY BY THE OFFSET METHOD

Manuel Julian Lecha, Mallorca 49, Barcelona, Spain

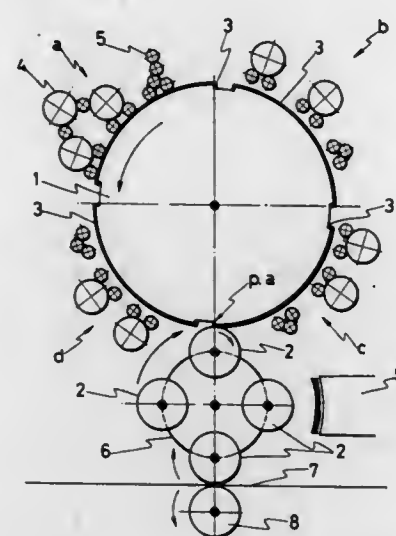
Continuation of Ser. No. 301,247, Oct. 26, 1972, abandoned.

This application May 31, 1974, Ser. No. 475,246

Int. Cl.<sup>2</sup> B41F 5/16

U.S. Cl. 101-176

3 Claims



1. A machine for printing a plurality of colors by the offset method, said machine comprising:

a single sectored plate cylinder, means to mount said single sectored plate cylinder to rotate at a predetermined circumferential speed, said plate cylinder having equally spaced around the periphery thereof a plurality of equal length zones, each of said zones having fixed thereto an ink receiving sector, each of said sectors having associated therewith separate individual arrangements of ink

and water fountains and rollers for a separate of said plurality of colors, means for moving each of said fountain and roller arrangements into contact with only a predetermined one of said sectors to apply thereto the separate color thereof;

a plurality of rubber printing cylinders, the circumferential length of each of said printing cylinders being equal to the length of each of said sectors of said plate cylinder;

a rotatable support mounting at equal angles around the periphery thereof said plurality of printing cylinders, means for incrementally rotating said support to sequentially bring each of said printing cylinders to a first position to be in contact with said sectors of said plate cylinder and thereafter to a second position to be in contact with a surface to be printed; and

means to rotate each of said printing cylinders at a first circumferential speed in said first position and at a second circumferential speed in said second position.

4,011,813

### LABEL DISPENSING AND APPLYING APPARATUS

Bernard Sams, London, England, assignor to Norprint Limited, England

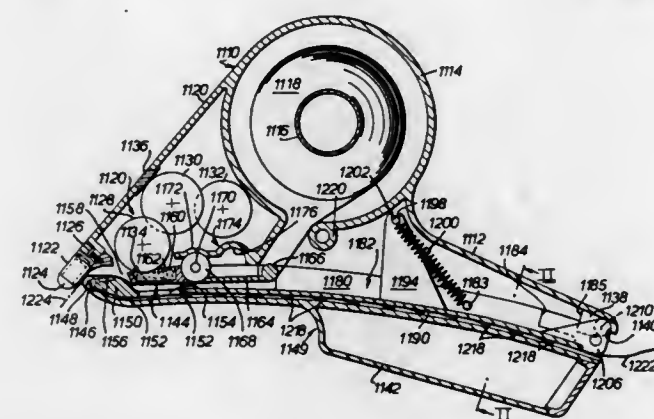
Division of Ser. No. 283,212, Aug. 23, 1972, Pat. No. 3,890,188. This application May 20, 1975, Ser. No. 579,139

Claims priority, application United Kingdom, Aug. 25, 1971, 39850/71; Jan. 29, 1972, 4305/72

Int. Cl.<sup>2</sup> B41F 1/08

U.S. Cl. 101-288

8 Claims



1. In a label applicator, a casing, a label-carrying web store mounted on said casing, a print head assembly mounted within said casing for printing labels withdrawn from said store, means adjacent said print head assembly for detaching a label printed by said print head assembly from the web, a first member having barbs thereon and a platen surface which serves to support a label during the printing operation, said first member being movable relative to said casing and arranged to have its barbs engage the web, a second member having barbs thereon and mounted for limited pivotal movement relative to said casing, and actuating means operable to actuate said first barbed member in one direction to draw a fresh length of web over the barbs of said second barbed member during a first part of a working cycle, and to bring a label carried by said first member into contact with said print head assembly to print that label, said first barbed member being movable in the opposite direction during the second part of the working cycle, causing the fresh length of web to engage the barbs of said second barbed member, and draw a length of web from said store equal to one label length and simultaneously detach the label printed during the first part of the working cycle from the web by passage of the web over said detaching means.

4,011,814

### PRINT STOCK GUIDE FOR IMPACT PRINTERS

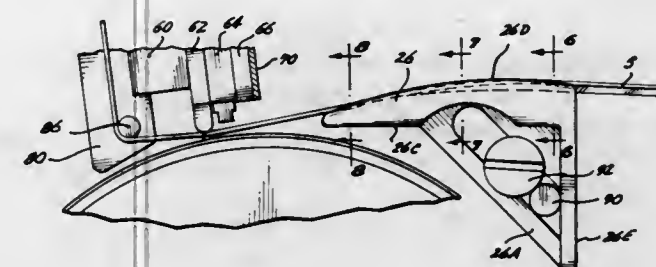
Kenneth G. Real, Redmond, Wash., assignor to Interface Mechanisms, Inc., Mountlake Terrace, Wash.

Filed Nov. 13, 1975, Ser. No. 631,744

Int. Cl.<sup>2</sup> B41F 1/08

U.S. Cl. 101-288

11 Claims



7. A guide means for aligning an elongated strip of print stock with respect to a print station of an impact printer, the elongated strip having a front surface and a back surface and being longitudinally moved in a predetermined direction to and from the print station by a print stock drive means, said guide means comprising a body having a base portion including means for permitting said guide means to be secured to the impact printer, and further having a guide portion upstanding from the integral with said base portion, said guide portion having a guide surface with first and second ends, either the front surface or the back surface of the elongated strip traversing said guide surface from said second end to said first end when moved by the print stock drive means in the predetermined direction when said guide means is secured to the impact printer, said guide surface at said first and said second ends being substantially planar, said guide surface at said second end having a predetermined angle of inclination with respect to a planar surface parallel to said substantially planar first end, said predetermined angle of inclination differing from zero, and said guide surface uniformly decreasing said angle of inclination from said second end to said first end in a direction of said guide surface parallel to the predetermined direction of elongated strip movement.

4,011,815

### SAFE-HANDLING ARMING APPARATUS FOR PERFORATING GUNS

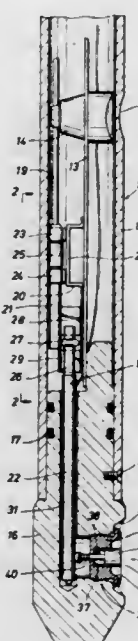
Jose B. Garcia, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,693

Int. Cl.<sup>2</sup> F42C 15/00

U.S. Cl. 102-20

16 Claims



5. Apparatus comprising:

a hollow body having an access opening cooperatively arranged therein;

explosive means including a charge-detonating explosive train in said body and having a receptor explosive and a selectively-initiatable donor explosive adapted for detonating said receptor explosive;

explosive-arming means in said body and selectively operable when said access opening is uncovered for alternatively establishing said charge-detonating train either in an armed operating status where initiation of said donor explosive will be effectual for detonating said receptor explosive or in a disarmed operating status where initiation of said donor explosive will be ineffectual for detonating said receptor explosive; and

status-indicating means operable when said access opening is covered for providing a visual indication exterior of said body representative of at least one operating status of said charge-detonating explosives.

4,011,816

### CONTINUOUS LINE CONFINED DETONATING FUSE TO PROVIDE A SERIES OF WORK PULSES (U)

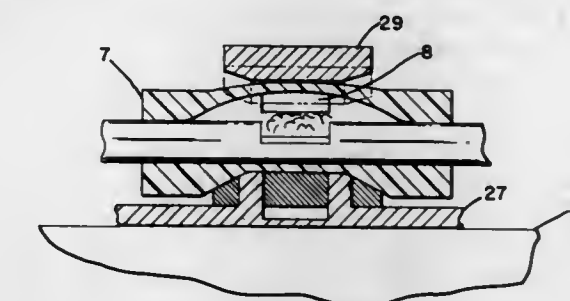
Vernon L. Smith, and Jack F. Hecht, Sr., both of Santa Cruz, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 6, 1971, Ser. No. 187,135

Int. Cl.<sup>2</sup> C06C 5/00; F42B 3/10

U.S. Cl. 102-27 R

9 Claims



1. A detonating fuse comprising:

a. a continuous line of metal encased secondary explosive covered with at least one layer of covering means;

b. at least one segment of said covering means being removed from said fuse thereby exposing said metal;

c. at least one detonation confining means positioned over said at least one segment, said confining means consisting of a molded elastomeric segment located and encompassing said removed segments of said coverings; whereby

d. detonation of said fuse causing said at least one detonation confining means to expand outward and retain gases within said at least one segment produced by said detonation.

4,011,817

### LIQUID PROPELLANT WEAPON SYSTEM

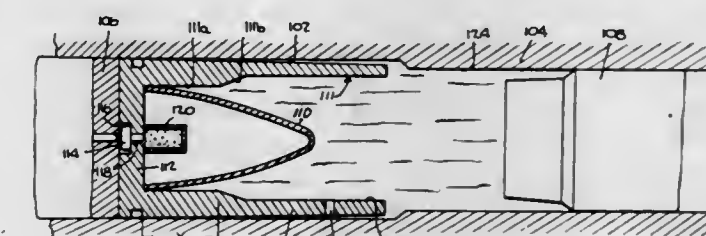
Eugene Ashley, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed May 7, 1975, Ser. No. 575,283

Int. Cl.<sup>2</sup> F42B 5/16, 9/14

U.S. Cl. 102-38

19 Claims



1. A round of ammunition comprising:



a projectile having a first average density;  
a cavity generator having a second average density; and  
a charge of liquid propellant having a third average density which is greater than said second average density;  
said charge of liquid propellant being disposed between said projectile and said cavity generator;  
said generator being adapted to enter into said charge and form a cavity in the aft portion of said charge which is aft of said generator.

4,011,818

## WARHEAD EXPLOSIVE LINER

Max J. Stosz, Jr., Ellicott City, and Harold F. Eccleston, Jr., Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1976, Ser. No. 672,697

Int. Cl.<sup>2</sup> F42B 13/00

U.S. Cl. 102—56 R

14 Claims

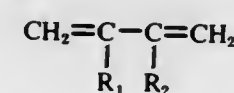
1. In a warhead having a casing, a liner covering the inner surface of the casing, and a rubbery, plasticized explosive within the casing, the improvement comprising:

using as said liner a two layer composite comprising:

A. a first layer composed of a filled polyurethane elastomer formed by curing a mixture comprising:

1. a hydroxy-terminated polydiene intermediate polymer wherein:

a. the polydiene chain of the hydroxy-terminated polydiene intermediate polymer is formed by polymerizing 1,3-diene monomers of 4 to 6 carbon atoms, the monomers having the formula:



wherein R<sub>1</sub> is selected from the group consisting of —H, —CH<sub>3</sub> and —CH<sub>2</sub>CH<sub>3</sub> and R<sub>2</sub> is selected from the group consisting of —H and —CH<sub>3</sub>, provided that when R<sub>1</sub> is —CH<sub>2</sub>CH<sub>3</sub>, R<sub>2</sub> is —H, and wherein the polydiene chain may be of either a single monomer type or a mixture of different monomer types of the above formula;

- b. the polydiene chain of the hydroxy-terminated polydiene intermediate polymer has a cis-1,4-type of unsaturation content of from 10 to 30 percent, a trans-1,4-type of unsaturation content of from 40 to 70 percent, and a vinyl (1,2)-type of unsaturation content of 10 to 30 percent;
- c. the hydroxy-terminated polydiene intermediate polymer has an average of from about 1.8 to about 2.5 predominantly primary, terminal allylic hydroxy groups per average molecule; and
- d. the average molecular weight of the hydroxy-terminated polydiene intermediate polymers is from about 1,000 to about 5,000;
2. a hydrocarbon process oil, wherein the weight of hydrocarbon process oil used is from more than zero to about 4 times the weight of hydroxy-terminated polydiene intermediate polymer used;
3. a diisocyanate in an amount sufficient to supply from about 0.7 to about 1.3 isocyanate functional groups for each hydroxy functional group on the intermediate polymer;
4. hollow phenolic microspheres constituting from more than zero to about 20 percent by weight of the total uncured mixture;
5. carbon black constituting from more than zero to about 15 percent of the total weight of the mixture; and
6. asbestos fibers constituting from more than zero to about 8 percent of the total weight of the mixture;

B. a second layer composed of a hard, solvent-resistant epoxy-polyamide;  
the first layer covering the inner surface of the warhead casing and the second layer covering the inner surface of the first layer.

4,011,819

## STRESS RELIEVED MOLDED COVER ASSEMBLY AND METHOD OF MAKING THE SAME

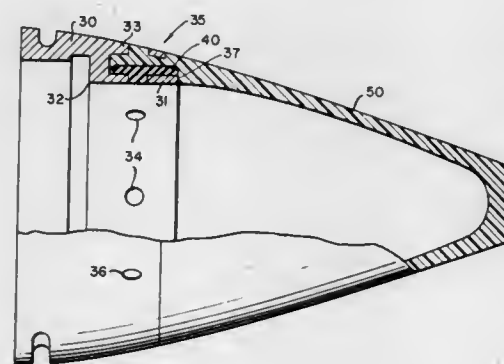
Hyman Kessler, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1976, Ser. No. 663,313

Int. Cl.<sup>2</sup> B29C 5/00; B29D 3/00; B29F 1/00

U.S. Cl. 102—70.2 P

11 Claims



1. A stress-relieved, molded hollow cover, comprising:  
A support ring having a marginal recess area;  
An elastomer band disposed within said marginal recess surrounding a portion of said support ring;  
A hollow portion of thermoplastic material injection molded directly about and enveloping the band of elastomer, interlocked with said ring and axially extending from said ring, said hollow portion cooperating with said ring to form said hollow cover.

4,011,820

## METHOD AND MEANS FOR STABILIZING AND POSITIONING A TROLLEY HANGER RELATIVE TO A CONVEYOR RAIL

Joseph Heber Bordenave, South San Francisco, and Robert Falls, Millbrae, both of Calif., assignors to The Cincinnati Butchers' Supply Company, Cincinnati, Ohio

Filed Sept. 26, 1975, Ser. No. 617,009

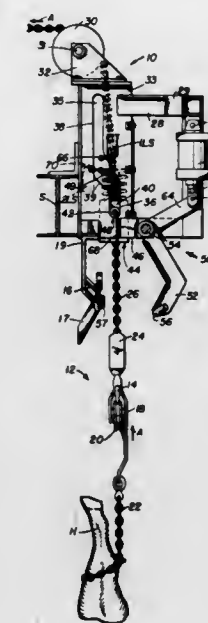
Int. Cl.<sup>2</sup> B61B 3/00

U.S. Cl. 104—97

28 Claims

1. For use with a trolley hanger which has a rail engaging wheel adapted to be landed on a conveyor rail, and a trolley hanger engaging frame connecting the trolley wheel to a hoisting mechanism, a stabilizer means comprising:  
mounting means connected to the conveyor rail; and  
a trolley hanger engaging means mounted on said mounting means so that the engaging frame is located between said trolley hanger engaging means and the rail, said trolley hanger engaging means including abutting means for abuttingly engaging the trolley hanger frame, said abutting means being pivotally connected to said mounting frame to be approximately co-level with the rail, actuator means for actuating said abutting means mounted on said mounting means, said linking means connecting said abutting means to said actuating means in a manner so that said abutting means can be moved from a normal, retracted position spaced apart from the rail a distance sufficient to allow free movement of the trolley when same is located between said abutting means and the rail

into a stabilizing position when the wheel is hoisted above the rail by the hoisting mechanism with said abutting



means holding the trolley frame in a position to land the trolley wheel on the rail.

4,011,821

## TABLE

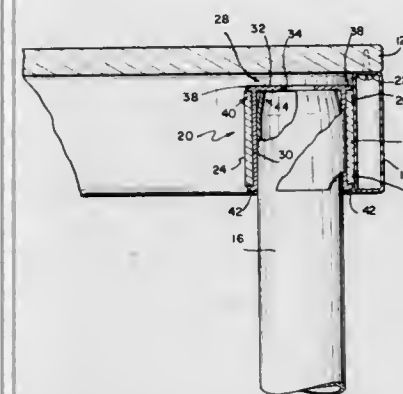
Jerry L. Neal, Columbus, Ind., assignor to Cosco, Inc., Columbus, Ind.

Filed Oct. 29, 1975, Ser. No. 626,990

Int. Cl.<sup>2</sup> A47B 3/06

U.S. Cl. 108—156

10 Claims



1. In combination, a table comprising a generally planar top unit, a plurality of legs, a plurality of sockets each having a sleeve connected to said top unit with its central axis generally normal to the plane of said top unit and an elastomeric bushing received within said sleeve and shaped for snug reception of one end of one of said legs, said bushings each having a radially inwardly extending upper face at the upper end thereof to limit upward leg movement therein, each of said bushings also having tabs extending radially outwardly from said upper face and radially outwardly extending flange means at the lower end thereof for respective reception over and engagement with the upper and lower extents of the associated sleeve to limit bushing movement within said sleeve, and a clip mounted on the underside of said top unit and having a plurality of recesses formed therein for receiving said plurality of legs, said plurality of legs being selectively and alternately receivable in said sockets for placing the table in an upright condition and in said clip for placing the table in a knocked-down condition.

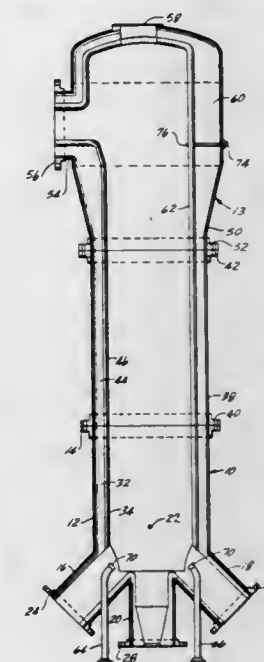
4,011,822  
BURNER FOR DECARBONIZING ORGANIC CHAR  
Charles K. Choi, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Aug. 11, 1975, Ser. No. 603,873

Int. Cl.<sup>2</sup> F23D 1/00

U.S. Cl. 110—28 R

7 Claims



1. A burner for decarbonizing char comprising an elongated combustion chamber; a first inlet pipe at one end of the chamber for directing the char particles into said combustion chamber; at least one second inlet pipe at said one end of the chamber adjacent the first inlet pipe for directing an air stream into the chamber; an outlet at the other end of the chamber; and water injecting means including fogging means for introducing and dispersing water in a finely divided state into the second inlet for controlling the temperature of combustion of the char in the air stream in said combustion chamber and maintaining a substantially uniform temperature profile in said combustion chamber.

4,011,823

## TUFTING TOOL FOR EVEN STITCHING

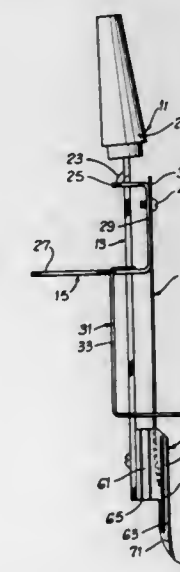
George L. Houghton, Santa Ana, and Fred F. Fredensberg, Long Beach, both of Calif., assignors to Rug Crafters, Santa Ana, Calif.

Filed Jan. 30, 1976, Ser. No. 653,926

Int. Cl.<sup>2</sup> D05C 15/06

U.S. Cl. 112—80

11 Claims



1. A tufting tool comprising:  
an elongated body;  
a shuttle mounted on said body for reciprocating movement relative to said body;



an elongated resilient plunger attached to said shuttle for movement with said shuttle;

a needle mounted on said body adjacent one end of said body, said needle having a yarn receiving passage and a plunger receiving passage with the plunger receiving passage being adapted to receive at least a portion of the plunger;

said needle including a first portion attached to the body and a penetrating portion projecting from said first portion and terminating in a relatively sharp point remote from said first portion, said yarn receiving passage extending through the first portion and the penetrating portion;

said penetrating portion and said resilient plunger being adapted for insertion and into and withdrawal from a backing material as the body and the plunger are relatively reciprocated; and

said penetrating portion including cam means having a throw of at least about 0.020 inch and cooperable with the backing material as the penetrating portion is withdrawn from the backing material with the plunger remaining in the backing material for resiliently loading the plunger so that upon complete withdrawal of the penetrating portion from the backing material the plunger resiliently moves the needle forward relative to the plunger whereby the needle undergoes a controlled advancing movement along the backing material.

4,011,824

## COMPETITION SAILING JACKET

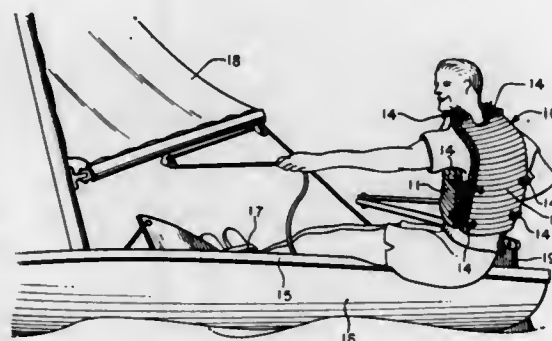
Margaret Kaynor, Peter Branning, and Bruce Nolan, all of Miami, Fla., assignors to Florida Sailing Systems, Inc., Miami, Fla.

Filed Dec. 10, 1975, Ser. No. 639,419

Int. Cl.<sup>2</sup> B63B 9/08

U.S. Cl. 114—270

9 Claims



1. A competition sailing weight jacket providing a desired predetermined trim weight when wetted, said jacket comprising, in combination:

at least one vest section having two substantially identical layers, each of said layers including substantially identical inner and outer panels joined together along their margins to form interior compartments, at least one of said panels being formed of a relatively loosely woven fabric allowing water to pass therethrough, said layers being joined together along at least a portion of their margins to form an additional compartment therebetween;

first and second blanket-like masses of water absorbent material disposed within respective ones of said compartments, the weight of the water capable of being absorbed by said masses providing a predetermined portion of said desired predetermined trim weight, said inner panels being cross-stitched to respective ones of said outer panels to hold said water absorbent material in position; and fastening means for securing said vest section to the body of a user.

4,011,825

## SWASH PLATE

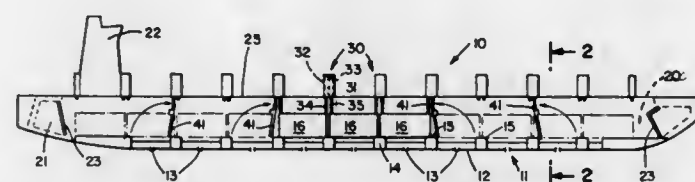
William Everett Kirby, Victoria, Hong Kong, and David Jackson Seymour, Daly City, Calif., assignors to Wharton Shipping Corporation, Panama, Panama

Continuation-in-part of Ser. No. 583,440, June 3, 1975, abandoned. This application Apr. 20, 1976, Ser. No. 678,623

Int. Cl.<sup>2</sup> B63B 25/00

U.S. Cl. 114—260

20 Claims



1. In a waterborne vessel having a hull with rigid supporting and hull-reinforcing structure, a bow, a stern, and sidewalls providing a series of buoyancy compartments and a hollow interior defining at least one hold, means communicating between said hold and the sea water for enabling free passage of water into and out of said hold at all times and having gate means for flotation loading thereof, so that said hold is partially flooded, said vessel being for transport of a plurality of buoyant cargo carriers such as barges, lighters and pontoons placed by flotation loading through said gate means into predetermined locations within said hold, wherein each said carrier is partially supported by its own buoyancy and is also so connected to the vessel as to enable exchange of buoyancy between said carrier and said vessel and wherein the number of said predetermined locations may exceed the number of carriers placed in the hold on a given voyage, the improvement comprising:

movable swash blockage means secured within said hold for movement into a carrier-protecting position extending across substantially the entire width of said hold for protecting said carriers by impeding the slosh of flood water accumulated within said hold which may be induced by pitching and other motion of said vessel and for movement into a stowed position during flotation loading and unloading of said carriers and for accommodation of additional carriers.

4,011,826

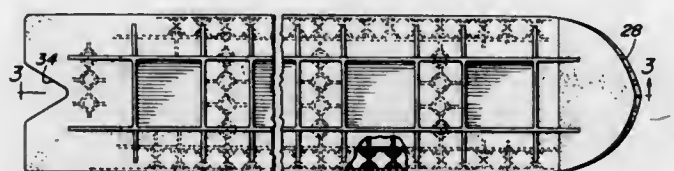
MARINE VESSEL WITH VERTICAL ANNULAR WALLS  
Alfred A. Yee, 1441 Kapiolani Blvd. Suite 810, Honolulu, Hawaii 96814

Filed Nov. 14, 1975, Ser. No. 632,076

Int. Cl.<sup>2</sup> B63B 5/14

U.S. Cl. 114—65 A

11 Claims



1. A marine vessel for storage, support or transportation of material comprising a continuous rigid exterior peripheral wall, a continuous rigid bottom wall connected to and extending between the lower portions of said peripheral wall to define an enclosure, a plurality of rigid annular walls connected to and extending axially upward from said bottom wall to define a plurality of compartments separate from each other, a rigid top wall connected to said peripheral wall, and at least one intermediate wall generally paralleling said top and bottom walls and being disposed in adjacent spaced relation to one of said walls, certain of said annular walls extending rigidly between the intermediate wall and the adjacently related top or bottom wall, said rigid annular walls, peripheral wall, top and bottom walls and intermediate wall being of integral

cementitious construction with the annular walls being rigidly connected with each other and the other wall forming the enclosure, said annular walls being cylindrical.

4,011,827

## MACHINE FOR CLEANING THE BOTTOM OF BOATS

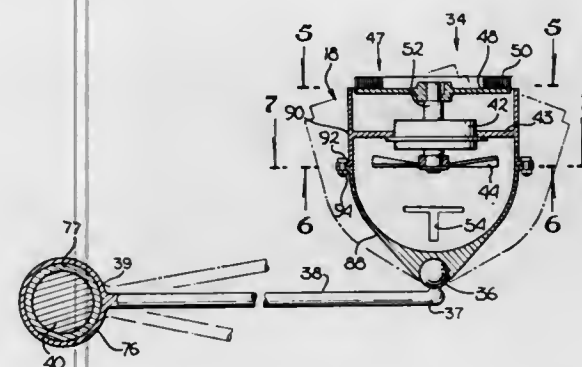
Ben Fond, 13955 Tahiti Way, Marina del Rey, Calif. 90291

Filed Jan. 12, 1976, Ser. No. 648,208

Int. Cl.<sup>2</sup> B63B 59/00

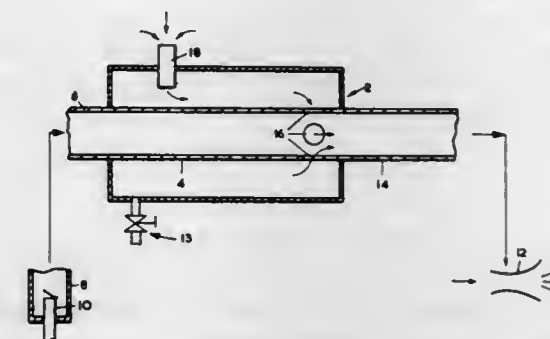
U.S. Cl. 114—222

10 Claims



5. A boat hull cleaning apparatus comprising:

- a plurality of brushing devices each disposed within an associated housing and coupled to a supporting structure, each housing being located below the surface of a body of water when in normal use, each said brushing device having a rotatable base member with a plurality of cleaning surfaces extending outwardly therefrom such that substantially all said cleaning surfaces lie in a common plane, said base member having an opening so as to permit water to pass therethrough;
- motor means disposed within each associated housing and coupled to an associated brushing device for positioning and rotating said brushing device, said motor means comprising a motor and an associated rotatable shaft, said shaft having at least one blade disposed at a front end thereof, configured for moving said brushing devices toward a boat hull, and said base member disposed at a second end thereof, said housing having an opening adjacent said blade such that as said blade rotates, water enters said housing through the opening in said base member and is forced out through the opening in said housing.



valve in response to variations in said intermittent gas pressure from said source intermittently operates said signalling device.

4,011,829

## CLOSURE HAVING INDICATING MEANS

Doris Beryl Wachsmann, 1666 Malvern Road, Glen Iris, Victoria 3146, and Reginald Francis Thomas, Taradale Garage, Calder Highway, Taradale, Victoria 3447, both of Australia

Filed Sept. 24, 1975, Ser. No. 616,303

Claims priority, application Australia, Oct. 1, 1974, 9102/74; Nov. 19, 1974, 9663/74; Apr. 8, 1975, 1159/75

Int. Cl.<sup>2</sup> G09F 9/00

U.S. Cl. 116—121

8 Claims



1. A counting screw cap for a container comprising three members arranged for rotation relative to one another, the first of said members being provided with an internal screw thread for engagement with a complementary screw thread on the neck of the container, the second of said members being arranged to be manually grasped for removing the cap from the container and replacing it on the container, there being provided a lost motion drive between said first and second members whereby said second member is enabled to rotate through a predetermined angle in each direction without causing rotation of said first member while rotation of the second member beyond the predetermined angle causes rotation of the first member to screw the latter onto, or remove it from, the neck of the container, the third member being interposed between the first and second members in such manner that it is driven by the second member during a substantial part of the lost motion rotation of the second member relative to the first member in one direction and restrained against motion by the first member during a substantial part of the lost motion rotation of the second member relative to the first member in the opposite direction, a series of numbers marked on one of said members at an angular spacing slightly less than said predetermined angle, and indicating means associated

4,011,828

## RESPIRATORY SIGNALLING DEVICE

Geoffrey Donald Black, Sawbridgeworth, England, assignor to The Medishield Corporation Limited, London, England

Filed Oct. 1, 1975, Ser. No. 618,356

Claims priority, application United Kingdom, Oct. 1, 1974, 42625/74

Int. Cl.<sup>2</sup> A62B 7/00; G01L 19/12

U.S. Cl. 116—70

6 Claims

1. In a signalling device for an artificial respirator the combination comprising: a chamber, an outlet in one wall of said chamber adapted to be connected to an aspirator, means defining first and second inlets communicating with the interior of said chamber, fluid flow responsive acoustic signalling means operably connected with one of said first and second inlets and interconnecting the interior of said chamber with said signalling means, shroud means connected to the other of said inlets, a gas pressure responsive expiratory valve selec-



with one of said members other than the one on which said numbers are marked, one of said member carrying said numbers and said member having indicating means being said third member, and said indicating means in co-operation with said numbers indicating the number of times said second member has been caused to perform a cycle of one rotation in one direction relative to said first member through at least said predetermined angle and one rotation in the opposite direction relative to said first member through at least said predetermined angle.

4,011,830

## RIBBON INKING MACHINE

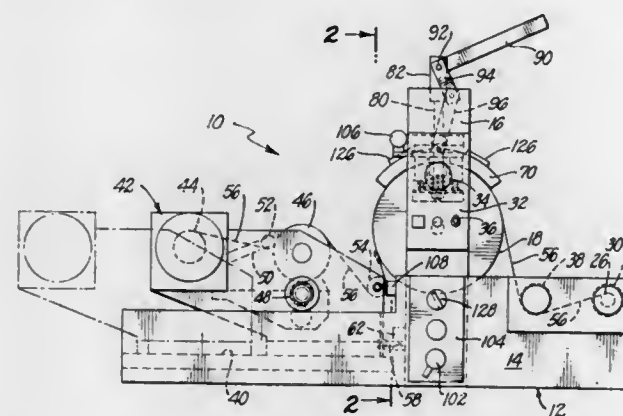
Frank R. Anderson, Hacienda Heights, and Albert J. Castro, Cudahy, both of Calif., assignors to Westates Space-Era Products, Inc., S. El Monte, Calif.

Filed May 12, 1975, Ser. No. 576,599

Int. Cl.<sup>2</sup> B05C 1/08, 9/14

U.S. Cl. 118—60

6 Claims



1. In a ribbon inking machine having a frame, a drum mounted on said frame, a carriage movably mounted on said frame so as to be capable of being moved towards and away from said drum, a ribbon feeding means mounted on said carriage, ribbon inking means mounted on said carriage, and ribbon takeup means mounted on said frame the improvement which comprises:

- guide rod means located adjacent to said drum,
- a pressing element mounted on said guide rod means so as to be capable of being moved on said guide rod means towards and away from said drum,
- flexible band means located on said pressing element so as to extend around said guide rod means,
- tightening means for tightening said band means relative to said guide rod means so as to position said pressing element in a desired position with respect to said guide rod means, and
- mechanical means for moving said pressing element with respect to said drum and said guide rod means, said mechanical means being capable of being used to space said pressing element away from said drum.

4,011,831

## OIL METERING BLADE LOADING ASSEMBLY

Oskar J. Braun, Williamson, and Thomas A. Rengert, Macdon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1975, Ser. No. 626,905

Int. Cl.<sup>2</sup> B05C 11/04

U.S. Cl. 118—60

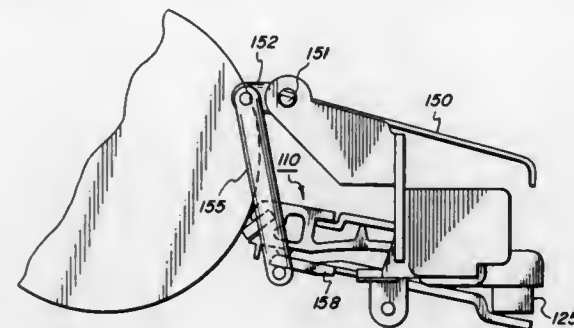
2 Claims

1. In an oil wetted heated pressure roll fusing apparatus for fusing toner images to copy sheets produced from a xerographic copying machine, an improved oil metering blade assembly comprising:

- a frame;
- a blade assembly positioned on said frame including a blade holding member mounted on pin means which is pivotable on said frame,

first spring means for engaging said pin means for positioning said assembly in said frame,

a blade member supported by said blade holding member in contact with an oil wetted fuser roll surface to effect a uniform oil film thereon,



second spring means including a pressureing loading member for applying a loading force on said blade holding member and blade member,

said second spring means being positioned to apply said loading force at a single point on an axis through said pin means to effect a uniform load distribution along the longitudinal extent of said blade member.

4,011,832

## BUILD CONTROL FOR FLUIDIZED BED WIRE COATING

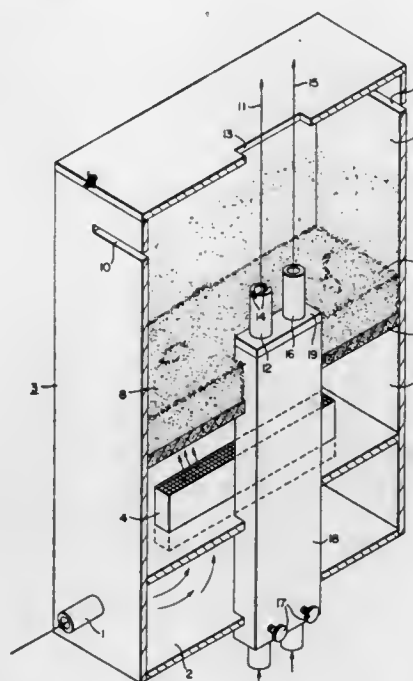
Dean C. Westervelt, Acme, Pa., and Robert E. Pierce, Abingdon, Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1975, Ser. No. 553,201

Int. Cl.<sup>2</sup> B05C 11/16

U.S. Cl. 118—301

15 Claims



1. In an apparatus for coating an elongated member with an aerated powder by passing said elongated member through said aerated powder, build control means for controlling the build of said powder on said elongated member, said build control means comprising a barrier which at least partially shields only a portion of an outside cross-sectional perimeter of said elongated member from said aerated powder.

4,011,833

## RECIPROCATING DEVICE HAVING VIBRATION REDUCING MEANS

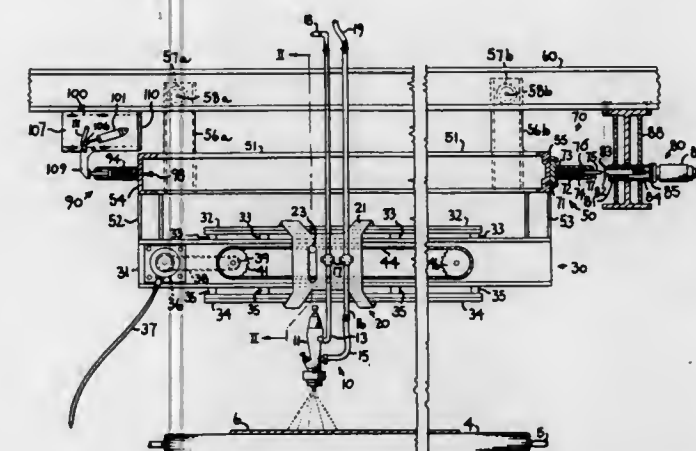
Charles T. Hawkins, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 411,952, Nov. 1, 1973, Pat. No. 3,937,092, which is a division of Ser. No. 229,385, Feb. 25, 1972, Pat. No. 3,796,184. This application Aug. 18, 1975, Ser. No. 605,475

Int. Cl.<sup>2</sup> B05B 3/00

U.S. Cl. 118—323

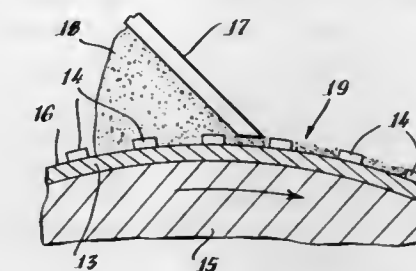
14 Claims



1. In an apparatus for reciprocating a dispensing device along a given axis of reciprocation in spaced relation to a substrate, wherein the apparatus is of the type having means for supporting the substrate; means connected to the dispensing device for imparting accelerating and decelerating forces to the dispensing device and a reciprocating motion to the dispensing device along the given axis of reciprocation; and means for supporting the dispensing device in facing relation to the substrate; the improvement comprising:

- oscillating means;
- means for mounting said oscillating means for movement along a path substantially parallel to the given axis of reciprocation;
- means operatively connected to said oscillating means and to the reciprocating motion imparting means for transferring substantially all of the accelerating and decelerating forces associated with the reciprocation of the dispensing device to said oscillating means so as to oscillate said oscillating means along the path substantially parallel to the given axis of reciprocation of the dispensing device and substantially opposite to the motion of the dispensing device; and
- shock absorbing means for countering the motion of said oscillating means produced by the accelerating and decelerating forces associated with the reciprocation of the dispensing device.

tapered to resemble a wedge as seen in horizontal cross-section, the elements being so oriented on said donor surface that



each element has a tapered end pointing in substantially the same direction as a tapered end of every other element.

4,011,835

## TONER CONVEYOR

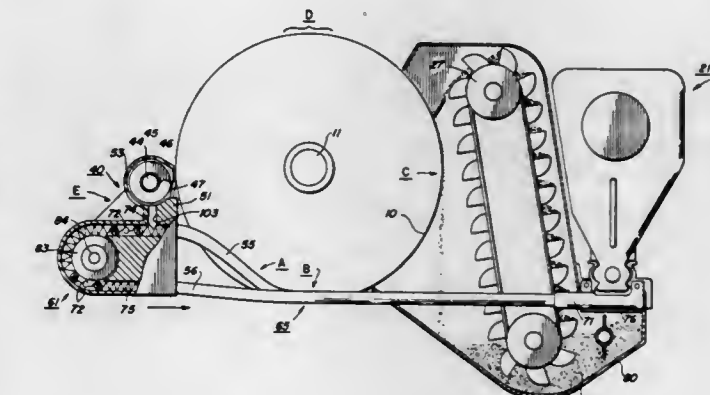
William G. Lewis, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 25, 1976, Ser. No. 689,752

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 118—652

9 Claims



1. In an apparatus for returning the residual toner remaining on a photoconductive surface after image transfer to a remote developer station for reuse in the xerographic developer process wherein residual particulate toner is removed from the photoconductive surface at a cleaning station, collected by a collection means, and returned by a tubular conduit connecting said collection means and the developer station, an endless conveyor means arranged to be driven sequentially through said tubular conduit past said collection means and developer station, the improvement in which said endless conveyor means comprises an endless helical spring means and a plurality of floats nested in said spring means for pushing developer along said tubular conduit.

4,011,836

## PET COMMODE

Franklin Temel, 1050 NE. 91st Terrace, Miami Shores, Fla. 33138

Filed Sept. 22, 1975, Ser. No. 615,493

The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> A01K 29/00

U.S. Cl. 119—1

8 Claims

1. In a pet commode including: a housing having a bottom provided with an outlet passage; means located in said housing and defining a floor for supporting a pet and receiving its bodily waste products, said floor being mounted for pivotal movement about a substantially horizontal axis for permitting waste products deposited on said floor to fall onto said housing bottom surface; water spray means located in said housing for directing water sprays against said floor, whereby the surface of said floor which receives waste products is struck by such sprays when said floor undergoes such pivotal move-

4,011,834

## TOUCHDOWN ELECTROSTATIC DEVELOPMENT APPARATUS

Craig H. Stephan, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 2, 1975, Ser. No. 618,870

Int. Cl.<sup>2</sup> G03G 15/08

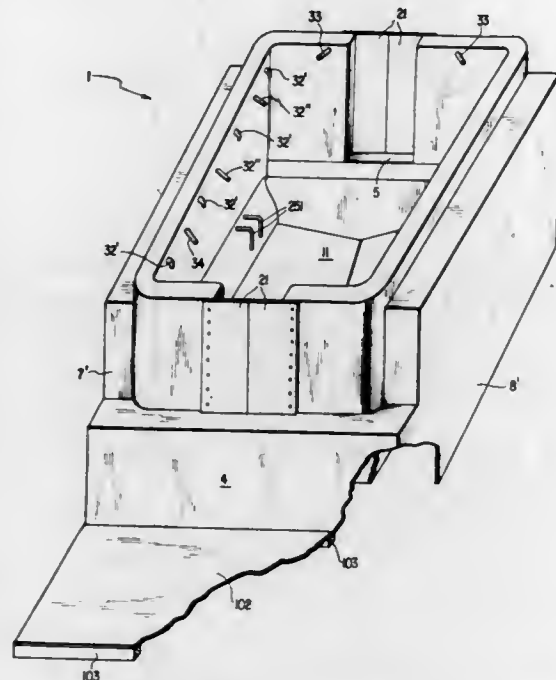
U.S. Cl. 118—653

7 Claims

1. An electrosopic-developer donor member comprising a surface, and having adhered on its surface a plurality of raised, discrete microelements having vertically essentially straight sides, the ratio of length to width of said microelements being greater than one, at least one end of each element being



ment; controllable water delivery means connected to said spray means for delivering water thereto; controllable drive means connected to said floor for imparting such pivotal movement thereto; and control means connected to said water delivery means for causing said delivery means to deliver



water under pressure to said spray means, the improvement wherein said controllable drive means comprise an electric motor having its shaft connected to said floor and having its electrical power inputs connected to have the delivery of operating power thereto controlled by said control means.

4,011,837

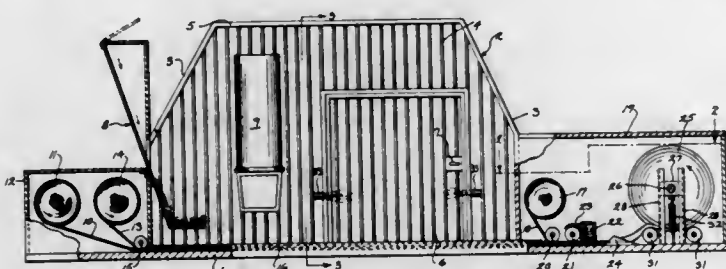
## SELF-CLEANING ANIMAL KENNEL

Leo P. Ksioszk, N98 W15754 School Road, Germantown, Wis. 53022

Continuation-in-part of Ser. No. 550,964, Feb. 19, 1975, abandoned. This application Nov. 26, 1975, Ser. No. 635,688 Int. Cl.<sup>2</sup> A01K 1/02

U.S. Cl. 119-1

9 Claims



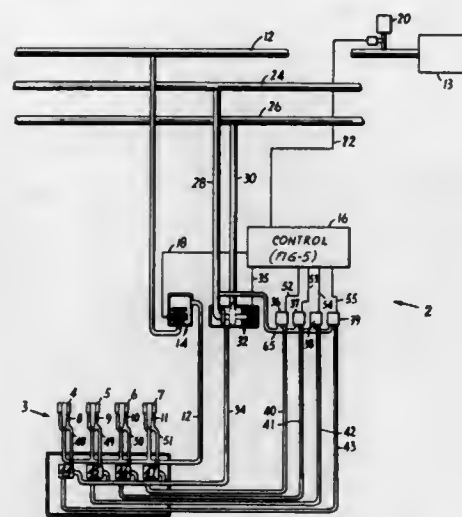
7. An apparatus for collecting and disposing of animal waste, comprising a base structure, an impervious sheet disposed on the base and adapted to receive waste from an animal, said sheet being mounted for movement across the base, means for applying a sheet of absorbent material to the upper surface of the impervious sheet to cover said waste and provide a composite sheet structure, deodorizing means for applying a deodorizing material to the outer surface of the absorbent sheet, edge folding means for folding the side edges of the composite sheet structure inwardly, and winding means for winding the composite sheet structure into coiled form.

4,011,838  
ELECTRONIC MILKER  
Sven-Ake Nordegren, Soedertelje, Sweden, and Douglas J. Norton, Red Hook, N.Y., assignors to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 25, 1976, Ser. No. 670,112  
Int. Cl.<sup>2</sup> A01J 5/04

U.S. Cl. 119-14.08

18 Claims



1. A milking machine system comprising:  
a cluster of teat cups having teat-receiving liners;  
a milk line for receiving milk from the cluster;  
a flow rate sensing device associated with the milk line for sensing the rate of milk flow within the line;  
a timing device for measuring lapses of predetermined periods of time;  
first vacuum means connected to the milk line for creating a working vacuum in the teat cups;  
second vacuum means connected to the teat cups for creating a massage vacuum;  
pulsator means associated with the teat cups for creating periodic pulses of the massage vacuum; and  
system control means operatively connected to the flow rate sensing device and to the timing device for controlling the character of the working and massage vacuums applied to the teat cups in response to the rate of milk flow within the milk line and in response to the lapses of the predetermined periods of time.

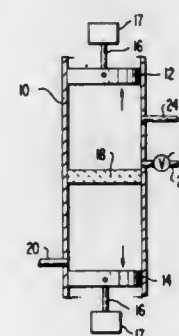
4,011,839

## METHOD AND APPARATUS FOR PROMOTING COMBUSTION IN AN INTERNAL COMBUSTION ENGINE USING A CATALYST

William C. Pfefferle, Middletown, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Murray Hill, N.Y.  
Division of Ser. No. 256,432, May 31, 1972, Pat. No. 3,923,011. This application Nov. 28, 1975, Ser. No. 636,022 Int. Cl.<sup>2</sup> F02B 75/12

U.S. Cl. 123-1 R

7 Claims



1. In an internal combustion engine including a cylinder, piston means arranged for reciprocation within the cylinder and cooperating therewith to define a compression zone which is compressed as the piston means moves in a compres-

sion stroke from a minimum compression position to a maximum compression position, inlet means for supplying combustion-oxygen-bearing air and carbonaceous fuel to the cylinder, and exhaust means for exhausting combustion product gas from the cylinder, the improvement comprising:

first and second pistons forming said piston means and operatively disposed in opposed relationship along said cylinder to define said compression zone between said pistons;  
oxidation catalyst means disposed in said cylinder between said pistons at a location which is within the compression zone when said pistons are in relative positions corresponding to said maximum compression position, said catalyst means having gas flow paths therethrough to permit flow therethrough of gases within said cylinder, and  
said catalyst means being effective during operation to initiate combustion of a fuel-lean mixture of carbonaceous fuel and air passing in contact therewith at a temperature below 3,500° F with resultant substantially complete combustion to carbon dioxide of said fuel;  
and control means associated with said inlet means for supplying air to said compression zone for compression during each piston compression stroke, and for supplying carbonaceous fuel to the compression zone at a predetermined time, cooperating with the disposition of the portion of said inlet means carrying said fuel to the cylinder, to effect contact of said fuel with said oxidation catalyst means at a time commencing with the latter portion of each compression stroke,  
said control means being adjustable to supply a sufficient total quantity of air, relative to the quantity of said carbonaceous fuel, to give an air:fuel weight ratio of at least about 20:1 and to provide for passage in contact with said oxidation catalyst means of a fuel-lean combustible air-fuel mixture with a theoretical adiabatic flame temperature in the range of from about 1,800° F to about 3,500° F.

4,011,840

## DRIVE SYSTEM FOR A MOTOR VEHICLE

Hans-Joachim M. Forster, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

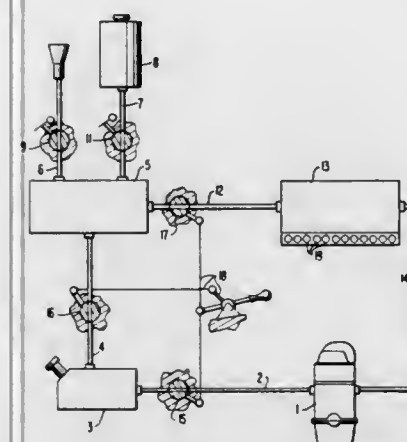
Filed Apr. 28, 1975, Ser. No. 572,191

Claims priority, application Germany, Apr. 30, 1974, 2420820

Int. Cl.<sup>2</sup> F02B 43/08

U.S. Cl. 123-3

26 Claims



1. A drive for a motor vehicle with an internal combustion engine which is supplied with fossil fuels from a fuel tank by way of a fuel line, characterized in that the fuel tank is operatively connected also with a cracking carburetor means from which a line leads to a hydride storage means which, in turn, is operatively connected with the combustion engine, the combustion engine being operable in areas of high traffic density with at least a hydrogen-fuel-gas mixture as well as with a high excess of air whereas, upon shifting over, it can be

operated with fossil fuel and with an air ratio number of about 1 on open highways.

4,011,841

## GASOLINE ENGINE OF FOUR-CYCLE IGNITION TYPE

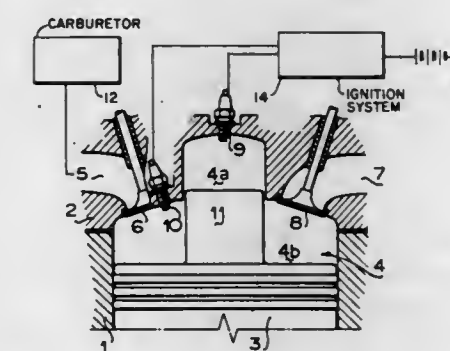
Tadanori Sato, Hachioji; Toshiaki Matsushita, Hino, and Isao Matsuno, Tachikawa, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1975, Ser. No. 555,060

Claims priority, application Japan, Mar. 5, 1974, 49-25451 Int. Cl.<sup>2</sup> F02B 3/00

U.S. Cl. 123-32 B

10 Claims



1. A method of operating a gasoline-powered internal combustion engine having a combustion chamber, comprising the steps of  
supplying a homogeneous air-fuel mixture into the combustion chamber,  
dividing the combustion chamber into temporarily non-communicating first and second combustion spaces starting before reaching top dead center for a predetermined time interval by having a piston assume a position near top dead center, during a compression stroke, with a cylinder head, said piston and said cylinder head being cooperatively stepped, with said first combustion space having a volume smaller than that of said second combustion space; and  
igniting by means of a spark plug means located in the first and second combustion spaces the air-fuel mixtures in the first and second combustion spaces, respectively, at different timings during the predetermined time interval when said first and second combustion spaces are non-communicating, thereby effecting combustions of the air-fuel mixtures in the first and second combustion spaces at first and second flame propagation speeds, respectively.

4,011,842

## PISTON MACHINE

Francis William Davies, 3366 Whittier Ave., Victoria, B.C., Canada (V8Z 3P9), and Joseph Walcer, 7160 Veyaness Road, Saanichton, B.C., Canada (V0S 1M0)

Filed Sept. 8, 1975, Ser. No. 611,305

Int. Cl.<sup>2</sup> F02B 75/28

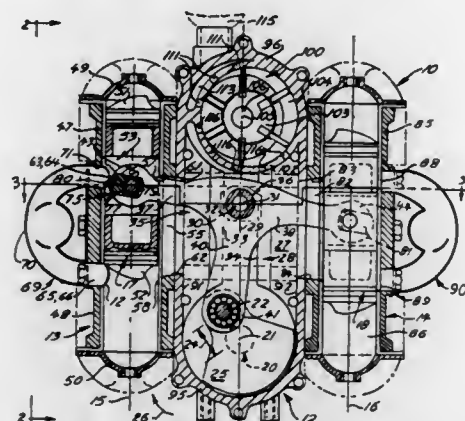
U.S. Cl. 123-61 R

14 Claims

1. A reciprocating piston machine characterized by: a crankcase, a crankshaft having a crankpin and being mounted for rotation relative to the crankcase about a crankshaft axis; first and second spaced parallel cylinders having cylinder axes straddling and disposed normally to the crankshaft axis; first and second pistons mounted for reciprocation within the respective cylinders; inlet and exhaust ports in the respective cylinders; valve means controlling the inlet and exhaust ports and synchronized with the respective pistons to open and close the cylinder ports as required; the machine being further characterized by:  
i. a guide means within the crankcase disposed between and parallel to the cylinder axes,  
ii. a crosshead complementary to the guide means and

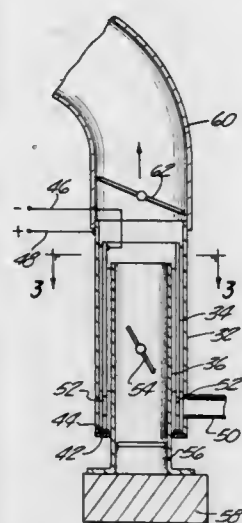


mounted for reciprocation along the guide means, the crosshead having a journal,  
 iii. a connecting member having a crank connecting arm, first and second piston connecting arms, and a journal to journal the connecting member on the journal of the crosshead, the crank connecting arm journaled on the



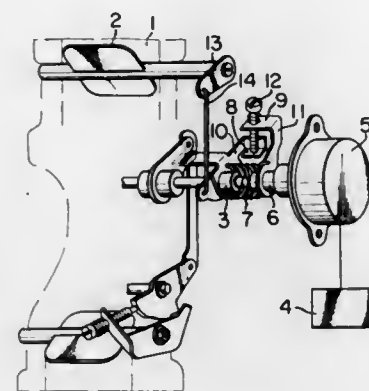
crankpin and the first and second piston connecting arms having outer ends cooperating with the first and second pistons respectively,  
 so that the pistons reciprocate within the respective cylinder, the connecting means rotates relative to the crosshead, and the crosshead reciprocates relative to the guide means with rotation of the crankshaft.

**4,011,843**  
**VAPORIZED FUEL FOR INTERNAL COMBUSTION ENGINE AND METHOD AND APPARATUS FOR PRODUCING SAME**  
 Arnold I. Feuerman, 5179 Corners Drive, West Bloomfield, Mich. 48033  
 Filed Feb. 27, 1975, Ser. No. 553,566  
 Int. Cl.<sup>2</sup> F02B 51/04  
 U.S. Cl. 123—119 E



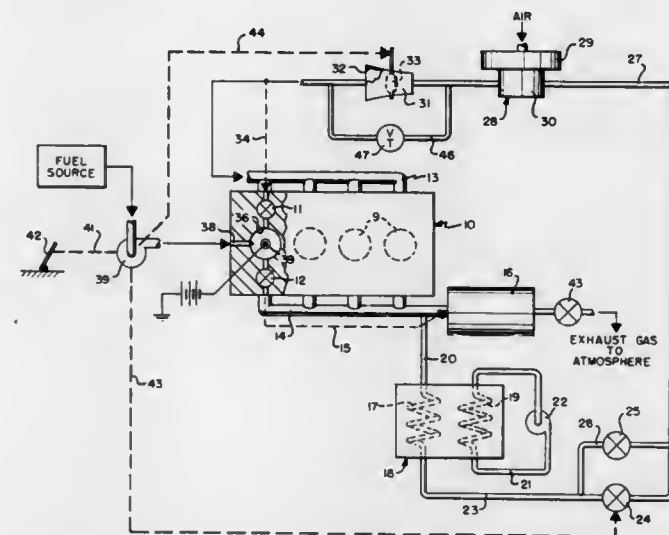
1. An internal combustion engine comprising: a source of electrolytically conductive waterhydrocarbon emulsion; a source of electric current; a vaporizer including means adapted to pass electric current through a quantity of said emulsion to generate a vapor from the emulsion; a combustion chamber; means for introducing the vapor produced by the passage of said electric current through said emulsion into said combustion chamber; means for introducing air into said combustion chamber; and means for igniting the air-vapor mixture.

**4,011,844**  
**AUTOMATIC CHOKE VALVE APPARATUS IN AN INTERNAL COMBUSTION ENGINE**  
 Yoshiaki Hirosawa, Tokyo; Toshio Nomura, Niiza, and Masahiko Iiyama, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
 Filed June 16, 1975, Ser. No. 587,383  
 Int. Cl.<sup>2</sup> F02M 1/10; F02D 11/08; F02M 23/04  
 U.S. Cl. 123—119 F 4 Claims



1. In automatic choke valve apparatus for an internal combustion engine in which the degree of opening of a choke valve is selectively controlled by a drive pulse motor drivingly coupled to the valve and a pulse circuit controlling the pulse motor, the improvement wherein said circuit comprises a pulse generator which oscillates at a fixed frequency, and produces an output pulse signal for operation the drive pulse motor, and means coupled to said pulse generator at the output thereof for intermittently controlling the output pulse signal in accordance with engine temperature.

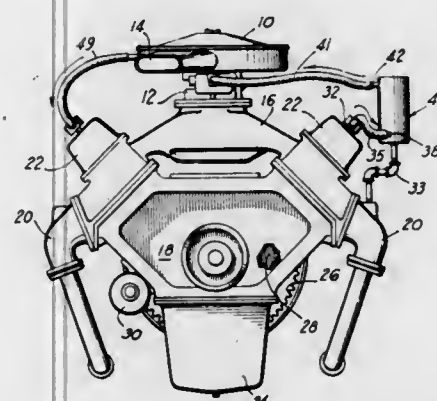
**4,011,845**  
**INTERNAL COMBUSTION ENGINE OPERATION UTILIZING EXHAUST GAS RECIRCULATION**  
 Edward A. Mayer, Newburgh, and Donald W. Plungis, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.  
 Continuation of Ser. No. 259,064, June 2, 1972, abandoned.  
 This application Dec. 17, 1974, Ser. No. 533,588  
 Int. Cl.<sup>2</sup> F02B 33/00  
 U.S. Cl. 123—119 A 6 Claims



1. In an internal combustion engine having at least one combustion chamber including; exhaust and intake valves communicated therewith, the latter mentioned valve being operable to cyclically admit a preliminary combustion supporting gaseous mixture to said combustion chamber, and an exhaust valve being operable to pass a hot exhaust stream therefrom, and fuel injection means communicated with said combustion chamber being operable to cyclically introduce a stream of fuel to the latter,  
 conduit means communicating said exhaust valve with said

intake valve to segregate and carry a stream of gas to the latter;  
 gas mixing means positioned in said conduit means, and being communicated with a source of a combustion supporting medium to intermix the latter with said stream of exhaust gas whereby to form a preliminary gaseous mixture;  
 first flow regulating means having a by-pass means therein; being positioned in said conduit means at a point down stream of said gas mixing means to receive said preliminary mixture of exhaust gas and combustion supporting medium, said first flow regulating means being connected to said intake valve whereby to controllably regulate the flow of said preliminary gas mixture, passing to said intake valve, and  
 second flow regulating means having by-pass means therein, being disposed in said conduit means upstream of said gas mixture means, and being operable to regulate the flow of said exhaust gas stream subsequent to discharge thereof from said exhaust valve.

**4,011,846**  
**ANTI-POLLUTION DEVICE**  
 Joseph F. Gagliardi, Orlando, Fla., assignor to Did-Mor Engineering and Manufacturing Co., Chattanooga, Tenn.  
 Filed Mar. 24, 1975, Ser. No. 561,551  
 Int. Cl.<sup>2</sup> F02M 25/06  
 U.S. Cl. 123—119 A 10 Claims

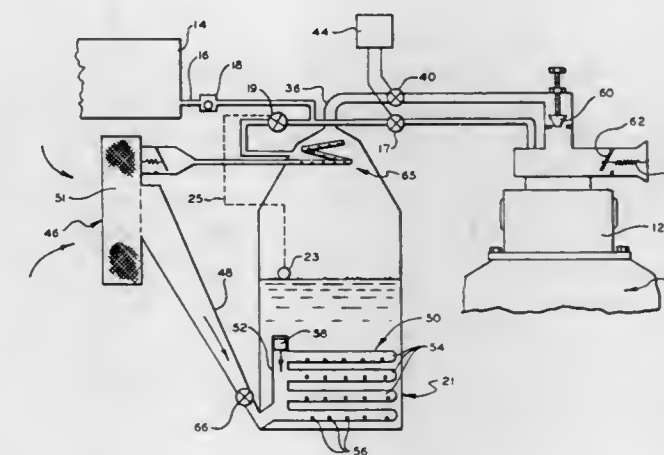


1. A pollution control device for an internal combustion engine comprising a housing having a first inlet for receiving fluids from an engine crankcase, a second inlet for receiving fluids from an engine exhaust manifold, and an outlet for returning fluids to the engine combustion chambers; a first partition having an opening therethrough mounted within said housing between said inlets and said outlet to separate a fluid mixing compartment adjacent said inlets from a fluid heating compartment; a second partition having at least one aperture therethrough mounted within said housing between said first partition and said outlet to separate a fluid filtering compartment adjacent said outlet from said fluid heating compartment; and a tube having at least one port therein mounted within said housing and extending through said fluid mixing compartment between said second inlet and said first partition opening.

**4,011,847**  
**FUEL SUPPLY SYSTEM**  
 Robert D. Fortino, Pinnacle Road, West Monroe, N.Y. 13167  
 Filed Aug. 23, 1974, Ser. No. 500,074  
 Int. Cl.<sup>2</sup> F02M 17/22  
 U.S. Cl. 123—134 4 Claims

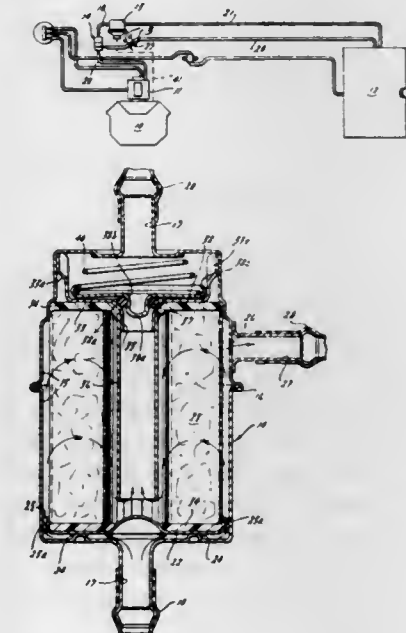
1. An internal combustion engine including a fuel supply system having a tank for liquid fuel and a line for supply thereof to a carburetor adapted to provide an atomized fuel charge to the engine cylinder for combustion therein, said system comprising:  
 a. an auxiliary tank containing liquid fuel;  
 b. first and second intake means for atmospheric air;

c. first and second outlet means communicating with said first and second intake means, respectively, and both arranged within said auxiliary tank for escape of the air from said first intake means below the level of liquid fuel and from said second intake means above the level of liquid fuel therein;  
 d. a vaporized fuel supply line connected between the upper side of said auxiliary tank and the carburetor of the engine, said vaporized fuel supply line including internal means for creating turbulence in the vapor flowing there-through;



e. first and second valve means movable between fully open and closed positions and respectively arranged in the liquid and vaporized fuel supply lines; and  
 f. control means actuable to move one of said valve means to the open position and the other of said valve means to the closed position alternately, with each successive actuation of said control means;  
 g. an air filter and an air intake valve associated with said second intake means, said intake valve being biased to a normally closed position and movable to an open position to admit air into the upper portion of said auxiliary tank in response to pressure therein falling below atmosphere.

**4,011,848**  
**FUEL FILTER AND ROLL-OVER VALVE**  
 Thomas Tucker Coddington, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.  
 Filed Aug. 15, 1975, Ser. No. 605,098  
 Int. Cl.<sup>2</sup> F02M 59/46; F16K 17/36; B60K 28/00  
 U.S. Cl. 123—136 7 Claims



1. In combination with an automotive vehicle having a fuel tank and an engine, fuel supply conduit means connected with said tank, a fuel pump driven by said engine and located in



said conduit means for pumping fuel from said tank for use by said engine, means dependent upon operation of said pump to open said fuel conduit means comprising valve means operable at a closed condition to close said conduit means and operable at first and second stage open conditions respectively to provide a comparatively small first stage high resistance opening and a larger second stage low resistance opening for said conduit means, yieldable means normally urging said valve means to its closed condition, first pressure actuated means having a first area exposed to the fuel pressure in said conduit means between said tank and valve means and responsive to the latter pressure when said pump is operating for urging said valve means to its first stage open condition in opposition to said yieldable means, second pressure actuated means having a second area larger than said first area and exposed to the fuel pressure in said conduit means downstream of said first area and responsive to the latter pressure in cooperation with the pressure on said first area when said pump is operating for urging said valve means to its second stage open condition in opposition to said yieldable means, said yieldable means including means for yieldably urging said valve means to its closed condition with adequate force to oppose opening of said valve means in response to the maximum potential static fuel pressure in said conduit means against both said first and second areas resulting from vehicle roll-over when said pump is not operating.

4,011,849

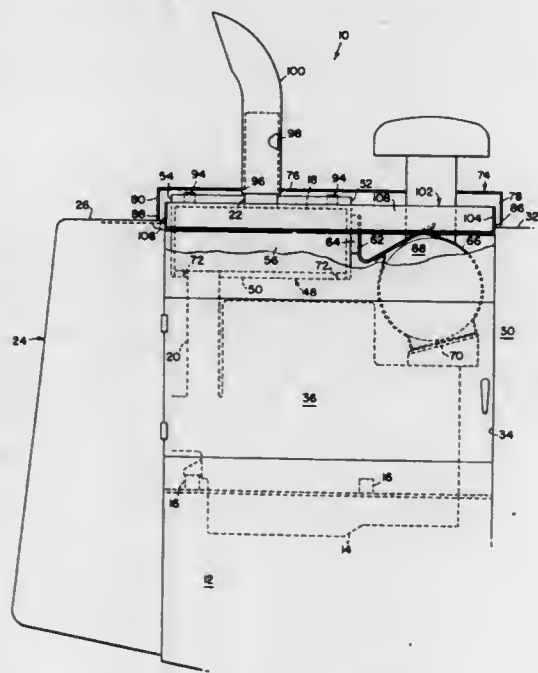
**COMBINED ENGINE AND MUFFLER COMPARTMENT**  
David Dennis Latham, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 5, 1976, Ser. No. 655,519

Int. Cl.<sup>2</sup> F02B 77/00

U.S. Cl. 123—198 E

5 Claims



1. In a vehicle having an engine support frame, an internal combustion engine connected to the frame by a plurality of engine mounts having the capability of preventing vibrations from being transmitted to the engine from the frame, a muffler having a generally horizontally disposed shell spaced above the engine and having inlet and outlet pipes respectively projecting downwardly and upwardly from the shell with the inlet pipe being connected to the engine, and a compartment substantially enclosing the muffler and engine, the improvement comprising said compartment including edge means defining an opening located above the engine and having an upper portion of the muffler shell located therein; an upper heat shield section spaced above said opening and being dimensioned so as to overlap said edge means in its entirety; said upper heat shield section having an opening therein; an exhaust pipe fixed to the upper heat shield section in communi-

cation with said opening; said outlet pipe projecting into said exhaust pipe and being spaced therefrom so as to leave an annular space between the exhaust and outlet pipes; a lower heat shield section in the form of a box having an open top located beneath said upper heat shield section and having the muffler shell located therein; and means supporting said upper and lower heat shield sections on said engine exclusive of said frame.

4,011,850

**FUEL VAPORIZER FOR INTERNAL COMBUSTION ENGINES**

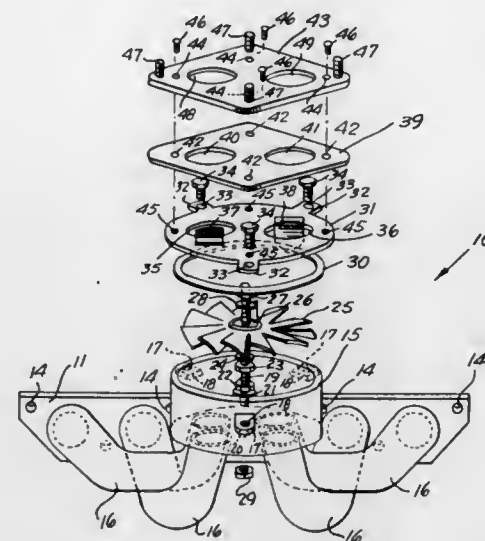
Kenneth L. Knox, Sr., 1796 Hillboro Ave., Reno, Nev. 89502

Filed July 30, 1975, Ser. No. 600,320

Int. Cl.<sup>2</sup> F02M 29/00

U.S. Cl. 123—141

1 Claim



1. In combination with an internal combustion engine a fuel vaporizer comprising an intake manifold plate adapted to be connected to the engine, a plurality of pipes communicating with said engine through said plate and rigidly connected to said plate said pipes having substantially equal lengths and diameters, a generally cylindrical housing rigidly secured to the opposite end of said pipes and communicating therewith, an impeller blade in said housing rotated at high speed by air and fuel passing through said housing for vaporizing the fuel, means providing a mounting for a carburetor including a flat plate positioned closely adjacent said impeller blade and having a pair of relatively large bores equispaced on opposite sides of the axis of said impeller blade and communicating with the carburetor, and air deflection means including a pair of elements carried by said flat plate and extending respectively transversely of said bores with said elements sloping oppositely of each other and toward said impeller for causing the flow of air to impinge on the impeller blade in a direction to drive the impeller blade at high speed.

4,011,851

**DISTRIBUTOR ASSEMBLY FOR A VEHICLE**

Eden E. Beutler, 4830 Zube Court, Carmichael, Calif. 95608

Filed Aug. 25, 1975, Ser. No. 607,223

Int. Cl.<sup>2</sup> F02P 7/02

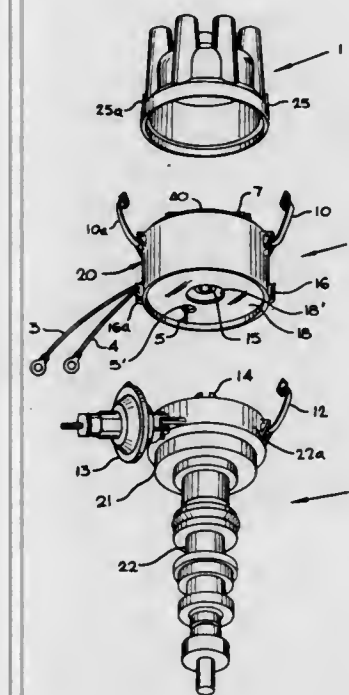
U.S. Cl. 123—146.5 A

7 Claims

1. In a distributor assembly for a vehicle including a distributor cap having a plurality of spaced contact terminals internally thereof and a rotor shaft assembly having a vacuum advance mechanism adapted to be engaging by a vacuum advance actuating pin and an upper housing assembly operatively connected to said vacuum advance mechanism with a rotor shaft axially extending through said rotor shaft assembly adapted to be connected to the lower end of a connecting shaft, and a rotor adjusted to be removably secured to the upper end of said connecting shaft, the improvement which comprises:

a removable cartridge assembly including a housing having

an outer wall and closed at one end by a top wall and the lower end by a bottom wall and having said connecting shaft axially extending therethrough and rotatable therein, said connecting shaft extending through said top wall and having rotor connecting means at its upper end for fixedly and removably securing said rotor thereto for rotation therewith in a predetermined orientation and accessible through said bottom wall and having a rotor shaft connecting means at its lower end for fixedly and removably securing said rotor shaft thereto for rotation therewith, said cartridge assembly further including first distributor cap connecting means associated with said housing for fixedly and removably securing said cartridge assembly to said distributor cap and second connecting means associated with said housing for fixedly and removably securing said cartridge assembly to said rotor shaft assembly, said cartridge assembly further including said vacuum advance actuating pin therein extending through said bottom wall and having its lower end operatively engaging said vacuum advance mechanism when said



cartridge assembly is connected to said rotor shaft assembly, said rotor selectively engaging said contact terminals when said cartridge assembly is connected to said distributor cap, said cartridge assembly further including a cam rotatably connected to said connecting shaft internally of said housing between said top and bottom walls, and a breaker point assembly mounted internally of said housing and breaker point assembly actuating means associated with both said cam and said breaker point assembly for actuating said breaker point assembly when said cam is rotated, the upper end of said vacuum advance actuating pin being operatively connected to said breaker point assembly, and a pair of electrical connecting means, one of said electrical connecting means being operatively connected at one end to said breaker point assembly and having its free end extending out of said cartridge assembly and the other of said electrical connecting means being operatively connected at one end to said cartridge assembly and having its free end extending to a point remote from said cartridge assembly.

4,011,852

**CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINES**

Walter Rasch, Nurnberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Nurnberg, Germany

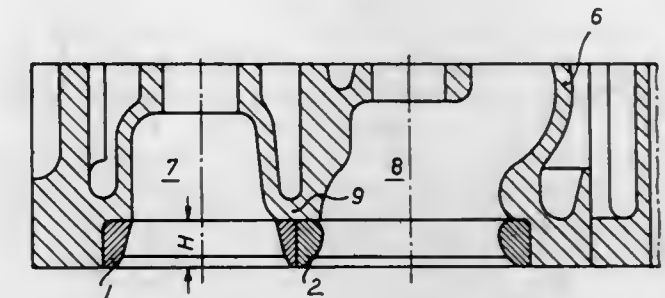
Filed Feb. 14, 1975, Ser. No. 550,154

Claims priority, application Germany, Feb. 16, 1974, 2407528

Int. Cl.<sup>2</sup> F22B 5/00

U.S. Cl. 123—188 S

4 Claims



1. A cylinder head for internal combustion engines with at least two passages arranged adjacent to each other and respectively provided for valves, which includes in combination a plurality of pressed-in seating rings corresponding in number to that of said passages into which said rings are pressed and associated therewith, each of said seating rings having parallel end faces with an outer peripheral surface extending between and connecting said end faces, that outer peripheral surface being cylindrical over the major periphery of said ring and provided with an outer flattened peripheral area, each two flattened areas of two adjacent rings facing each other and directly engaging each other, each flattened outer peripheral area extending over the entire height of the pertaining seating ring between said end faces, said seating rings over the entire height thereof being press-fitted tightly into recesses of the cylinder head without providing a partial gap as seen over periphery thereof.

4,011,853

**ARCHERY PEEP SIGHT**

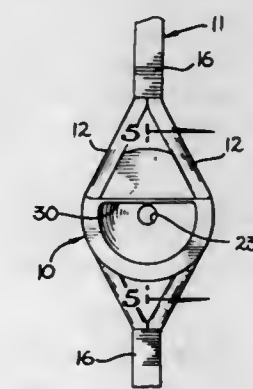
James D. Fletcher, P.O. Box 218, Bodfish, Calif. 93205

Filed July 31, 1975, Ser. No. 600,609

Int. Cl.<sup>2</sup> F41B 5/00

U.S. Cl. 124—87

7 Claims



1. An archery peep sight for mounting upon an archery bowstring comprising a symmetrical member having first and second end faces in planes that are in parallel spaced relation to one another, a sight opening centrally disposed through said symmetrical member, the axis of said sight opening being perpendicular to each one of said planes of said symmetrical member, a first recessed portion being symmetrically disposed into said first end face, the apex of said first recessed portion said sight opening, a second recessed portion being disposed into said second end face and being including an end portion



of complementary to a portion of said first recessed portions, said second recessed portion including a planar surface adjacent said sight opening and lying in a continuous plane extending in the general direction of the axis of the sight opening, the plane of said planar surface being perpendicular to the plane of said second end face, and a pair of parallel, archery bowstring receiving channels disposed on the periphery of said symmetrical member and intersecting the planes of said faces, the archery bowstring receiving channels being engageable by separated portions of a single archery bowstring.

4,011,854

# MOUNT FOR CONTINUOUSLY ORIENTING A COLLECTOR DISH IN A SYSTEM ADAPTED TO PERFORM BOTH DIURNAL AND SEASONAL SOLAR TRACKING

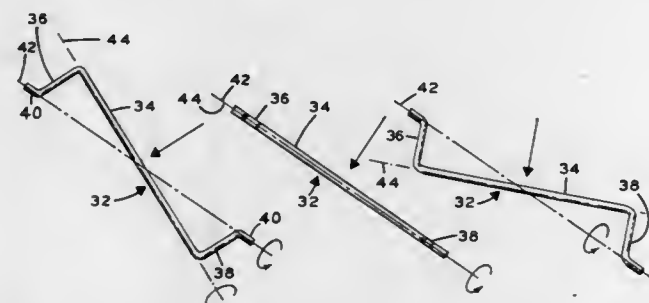
Lott W. Brantley, Union Grove, and Billy D. Lawson, Madison, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 29, 1976, Ser. No. 653,422

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—270

6 Claims



1. In a solar tracking system including a solar energy collector dish, an improved mount for continuously orienting the dish relative to the sun comprising:

- A. means for maintaining the collector dish in a reference plane through which a line projected from the sun extends substantially perpendicularly as the earth rotates on its polar axis, including a rigid axle having a linear midportion connected in supporting relation with said dish and oppositely extended end portions normally related to the midportion;
- B. each of the extended end portions having an outwardly projected end which extends in opposing directions with respect to each other and coaxial to an axis of rotation;
- C. spaced journal means connected to said end portions at said projected ends thereof for supporting said axle for angular displacement about said axis of rotation parallel to said polar axis and obliquely related to an axis coincident with the longitudinal axis of symmetry for the midportion of the axle; and
- D. drive means connected with said axle for angularly displacing said axle about said axis of rotation.

4,011,855

# SOLAR COLLECTOR

Frank R. Eshelman, 910 Fifth St., Ames, Iowa 50010

Filed May 31, 1974, Ser. No. 475,208

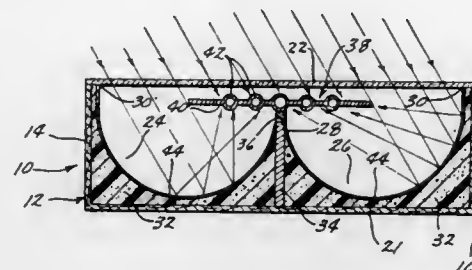
Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—270

9 Claims

1. A solar collector comprising:
  - a light collecting member having an outer surface of light absorptive material adapted to retain a maximum amount of light which strikes said collecting member;
  - said light collecting member having at least one fluid passageway therein;
  - a light reflecting member having upper margins defining a light receiving opening, and having at least one concave surface extending between and below said upper margins,

said concave surface comprising in cross section two curves following circular paths and intersecting at a point beneath and between said upper margins  
said light collector being substantially smaller than the width of said opening;



said light reflector being positioned with respect to said light collector so that every light ray entering said opening is directed into engagement with said light collector  
said light collecting member extending over portions of both of said curves and being below said upper margins of said opening.

4,011,856

# SOLAR FLUID HEATER

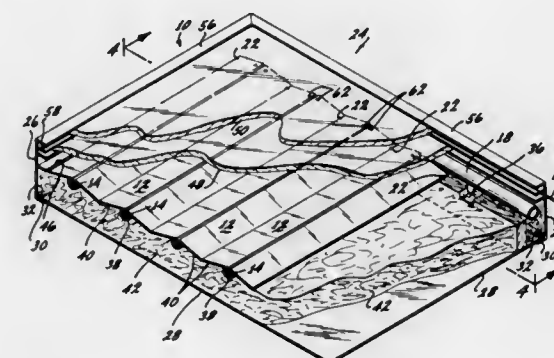
Robert George Gallagher, El Cajon, Calif., assignor to Energy Systems, Inc., El Cajon, Calif.

Filed Mar. 28, 1975, Ser. No. 563,091

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—271

19 Claims



1. A solar energy fluid heater comprising:
  - an open housing having rigid bottom and side panels;
  - a plurality of abutting solar panels for collecting solar energy positioned within said housing, said solar panels each having an upper surface positioned below the opening in said housing for collecting solar energy, an open circular channel formed in the center portion of said panel having an opening smaller than the diameter of said channel along the longitudinal center of the solar panel, said channel being below said opening and said upper surface and the portions of the upper surface adjacent each side of said opening having a linear downward slope;
  - a conduit member positioned within said channel said conduit having a diameter greater than the relaxed diameter of said channel and a length sufficiently long to extend from each end of said solar panel;
  - header members one connecting each adjacent end of said conduit and extending to the exterior of said housing;
  - a plurality of support members having a spaced apart relationship positioned along said bottom panel of said housing for spacing said solar panels from said bottom panel;
  - insulation means positioned between said solar panels and said bottom;
  - at least one panel of translucent material spaced above said upper surface of said solar panel having a sealed relationship with said side panels and forming a closure for the opening of said housing; and
  - pressure applying means for securing the edges of the adja-

cent panels in firm physical contact to ensure heat transfer between said adjacent panels by conduction.

4,011,857

# SOLAR ENERGY CONVERTER AND ELONGATED FRESNEL LENS ELEMENT

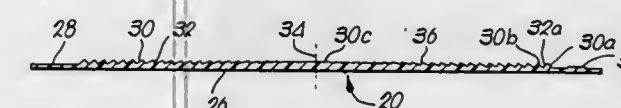
Harold D. Rice, 25th and McGee Trafficway, Kansas City, Mo. 64141

Filed Nov. 24, 1975, Ser. No. 634,763

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—270

32 Claims



1. A solar radiation concentrator comprising:
  - a sheet element having a series of elongated, generally straight, side-by-side, essentially parallel, radiation focusing surfaces conjointly presenting a solar radiation focusing area,
  - said surfaces being of transversely angular configurations relative to one another, causing solar rays impinging on said area to be focused by the surfaces onto an elongated zone spaced from the area of narrower width than the latter to concentrate the radiation in said zone,
  - each of said surfaces having an angularity at one end thereof which is different from the angularity of such surface at the opposite end of the same, whereby the zone of focus is oriented with the longitudinal axis thereof at an angle relative to the longitudinal lengths of said surfaces.

4,011,858

# SOLAR CONCENTRATOR

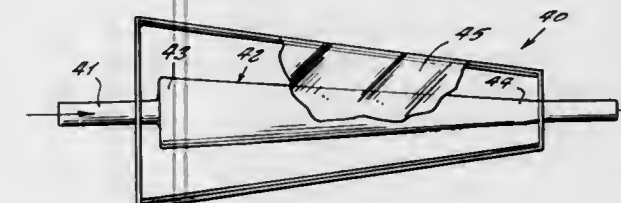
Earl R. Hurkett, 311 W. Platte, Fort Morgan, Colo. 80701

Filed Feb. 9, 1976, Ser. No. 656,648

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—271

2 Claims



1. A solar concentrator, comprising in combination, an elongated reflector, which is a parabola cross-sectional shape, a reflective material on an inner surface of said reflector, a pipe extending along a longitudinal axis of said reflector and being located along a focal point of said reflector, and means for rotating said reflector in order to follow a path of the sun; said pipe having a portion thereof extending within said reflector, a glass tube enclosing said portion, an outwardly extending sleeve integral with each end wall of said reflector, said sleeves being axially aligned, said pipe extending through said sleeves, said sleeves being supported within bearings mounted in stanchions stationarily placed upon a supporting surface, one said sleeve having a gear secured thereto, said gear engaging a gear mounted on a shaft of an electric motor, and a portion of said pipe contained within said reflector being diametrically enlarged at one end, said pipe portion, accordingly, being conical in configuration, said diametrically enlarged end of said pipe portion being located adjacent an end of said pipe that forms an entry for cold water passing through said pipe.

4,011,859

# METHOD FOR CONTINUOUSLY MEASURING THE CO<sub>2</sub> CONTENT IN BREATHING GASES

Horst Frankenberger, Bad Schwartau, Germany, assignor to Drägerwerk Aktiengesellschaft, Germany

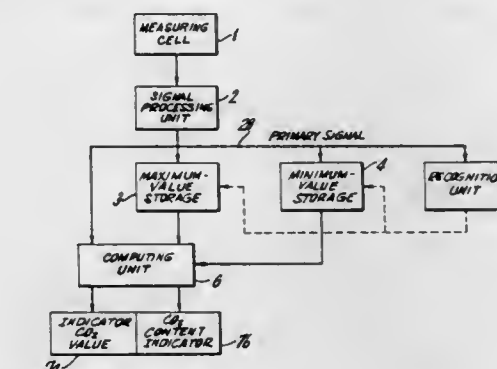
Filed Sept. 2, 1975, Ser. No. 609,564

Claims priority, application Germany, Sept. 5, 1974, 2442589

Int. Cl.<sup>2</sup> A61B 5/00

U.S. Cl. 128—2 C

3 Claims



1. A gas measuring method on the principle of infrared absorption for continuous measuring of the CO<sub>2</sub> content in breathing gases while using a measuring cell along with a luminous source, an interference filter accorded to CO<sub>2</sub>, and a photodetector, wherein the measured values of the measuring cell which is placed in the breathing-air stream are processed in a signal processing unit which is controlled by a breathing-air phase recognition unit, the respective maxima and minima of the measured values in each breathing phase are stored in a maximum-value storage and a minimum-value storage, said values, controlled by the breathing-air phase recognition unit, are divided and the logarithm is taken thereof in a computation unit and, since

$$\frac{I_{\text{expir.}}}{I_{\text{inspir.}}} = C_{\text{CO}_2}$$

the CO<sub>2</sub> content at the end of the expiration phase is indicated in an indicating unit.

4,011,860

# CALIBRATED BLOOD PRESSURE MEASURING SYSTEM AND METHOD

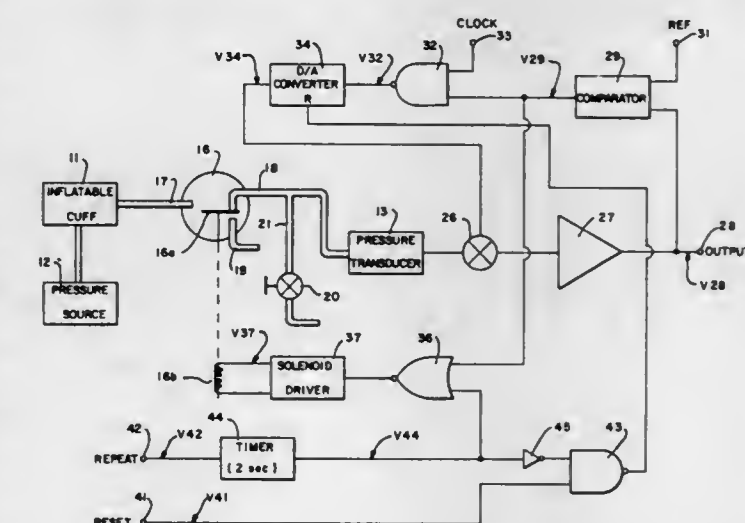
John J. Lee, Cupertino, Calif., assignor to Filac Corporation, Sunnyvale, Calif.

Filed Oct. 20, 1975, Ser. No. 623,719

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128—2.05 M

8 Claims





an inflatable cuff for occluding the flow of blood in a portion of the circulatory system of a patient, a pressure source connected to the cuff for delivering air to the cuff to inflate the same, and transducer means connected to the cuff for delivering an output signal corresponding to the pressure in the cuff, the improvement comprising: valve means connected between the cuff and the transducer means for controlling communication between the cuff and the transducer means, means for conditioning the valve means to disconnect the transducer means from the cuff at the outset of a blood pressure measurement, a reference signal source, means for changing the level of the output signal to calibrate the system at the outset of the measurement, and means for comparing the output signal with the reference signal and conditioning the valve means to reconnect the transducer means to the cuff when the output signal reaches a predetermined level relative to the reference signal.

7. In a method for calibrating a blood pressure measuring system comprising an inflatable cuff for occluding the flow of blood in a portion of the circulatory system of a patient, a pressure source connected to the cuff for delivering air to the cuff to inflate the same, and a transducer connected to the cuff for delivering an output signal corresponding to the air pressure in the cuff, the steps of: disconnecting the transducer from the cuff and establishing a reference pressure in the transducer at the outset of a blood pressure measurement, comparing the output signal with a reference signal, adjusting the level of the output signal in discrete increments until the output signal reaches a predetermined level relative to the reference signal, and reconnecting the transducer to the cuff when the output signal reaches the predetermined level.

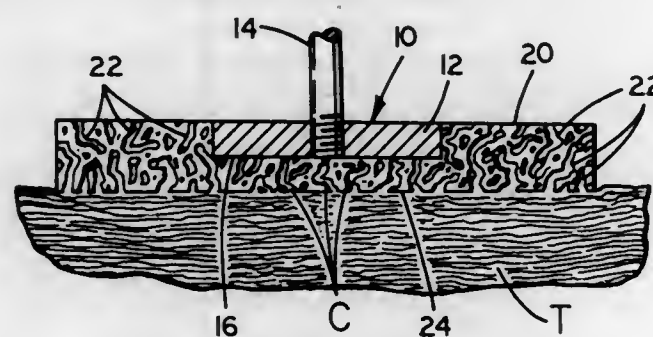
#### 4,011,861 IMPLANTABLE ELECTRIC TERMINAL FOR ORGANIC TISSUE

Carl C. Enger, Lakewood, Ohio, assignor to Case Western Reserve University, Cleveland, Ohio

Continuation-in-part of Ser. No. 457,467, April 3, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,191  
Int. Cl.<sup>2</sup> A61B 5/04; A61N 1/04

U.S. Cl. 128-2.06 E

26 Claims



1. A non-reacting implantable electric terminal for an organic tissue comprising: an electrically conductive portion having a surface thereof adapted to contact tissue electrolyte, said surface being completely surrounded and in intimate contact with an inert non-absorbable porous material having interconnected and continuous pores of an average diameter of between 10 and 500 microns so as to permit ingress of blood capillaries and intermeshing with said tissue without the formation of a fibrous tissue interface adjacent said surrounding part, and to permit electrolytes in the tissue to pass there-through and to be in continuous contact with said electrically conductive portion, and means for connecting the electrically conductive portion of said electric terminal to an electrical circuit means.

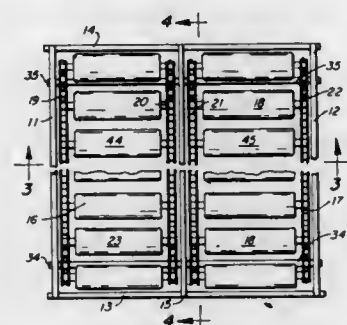
#### 4,011,862 MASSAGING SUPPORT APPARATUS

Michael Kosiak, 3305 Skycroft Circle, Minneapolis, Minn. 55418

Continuation-in-part of Ser. No. 545,726, Jan. 31, 1975, abandoned. This application Nov. 17, 1975, Ser. No. 632,179  
Int. Cl.<sup>2</sup> A61H 11/00

U.S. Cl. 128-58

25 Claims



1. Apparatus for supporting a human body in a partially cradled and varied pressure manner to facilitate the movement of blood through those tissues of the body as pressed by the weight of the body against the apparatus, said apparatus comprising:

- a frame;
- a pair of endless flexible belt assemblies, each said belt assembly comprising a plurality of transverse roller members arranged in substantially parallel relationship;
- means for mounting each said belt assembly on said frame so that each forms a body support span consisting essentially of an upper stretch of said roller members thereof, said body support span of one said belt assembly being laterally juxtaposed to said body support span of the other said belt assembly;
- means for moving each said belt assembly to cause said roller members thereof to move in sequence along the length of said body support span formed thereby, whereby those tissues of a body as pressed by its weight against a said span are subjected to a stroking action of alternate pressure and release of pressure as effected by said movement of said roller members; and
- track means for supporting at least a portion of said roller members of one said span in an angular relationship to at least a portion of the roller members of the other said span at least during times when the weight of a body rests in part on each said portion, said angular relationship being such that the medial juxtaposed ends of those said roller members of each said portion are relatively more displaced downwardly than the outside lateral ends thereof, thereby to partially cradle a body resting in part on each said span.

#### 4,011,863 SUPRACONDYLAR PROSTHETIC NAIL

Robert E. Zickel, 235 E. 42nd St., New York, N.Y. 10017

Filed July 19, 1976, Ser. No. 706,470

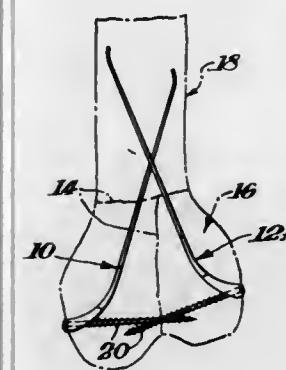
Int. Cl.<sup>2</sup> A61F 5/04; A61B 17/18

U.S. Cl. 128-92 BA

10 Claims

1. A supracondylar prosthetic nail comprising a substantially flat elongated length of biocompatible metal having plan and elevational configurations, the plan configuration tapering from a relatively larger head to a rounded blunt tip about half the thickness of the head, the elevational configuration having a relatively thin tapered elongated midportion and arcuate head and tip ends extending on the same side of the midportion, the arcuate head end having ample inner and outer radii providing a thickness at the extremity similar to that of the plan head configuration, the arcuate tip end of the elevational configuration having relatively smaller radii

smoothly continuing the smaller end of the midportion a short distance, and a hole for a retaining screw through the end of



the head being disposed substantially at right angles to the midportion in the elevational configuration.

#### 4,011,864 RESPIRATORY APPARATUS

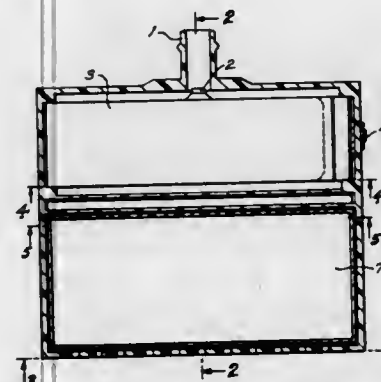
Paul Guichard, 10 Rue Gaston Darley, a Nemours 77140, France

Continuation-in-part of Ser. No. 392,341, Aug. 28, 1973, Pat. No. 3,902,486. This application Oct. 23, 1974, Ser. No. 517,429

Claims priority, application France, Aug. 29, 1972, 72.30599; Oct. 19, 1972, 72.37010; July 16, 1973, 73.25957; Oct. 24, 1973, 73.37979; Dec. 28, 1973, 73.47116  
Int. Cl.<sup>2</sup> A61M 16/00

U.S. Cl. 128-140 N

9 Claims



1. In portable nasal diffuser apparatus comprising a respiratory assembly including means for communicating with the respiratory tract of a user and provided with two apertures, first and second respective valve means at said apertures operating alternately during exhalation and inhalation by the user such that when one aperture is open the other is closed, one of said apertures communicating via the respective valve means with the atmosphere, a reservoir having an inlet and containing means for treating air admitted into the reservoir, means connecting the reservoir to the respiratory assembly at the other of the apertures thereof, such that upon inhalation said valve means associated with the said other aperture is opened and air is admitted to the reservoir and flows through the treating means therein to the respiratory assembly and to the user, and means for effecting heating of the air supplied to the reservoir including means for enabling the reservoir to be positioned proximate the body of the user to capture heat therefrom, said treating means comprising a filter substance and a housing containing said filter substance and having openings for passage of air through said filter substance, said means for communicating with the respiratory tract of the user comprising a flexible nasal mask, said body including a first portion with said one aperture therein, and a second portion connected to said connecting means, said first and second valve means being supported in said body, each said valve means comprising a flat member pivotably connected in said body adjacent its respective aperture, said flat members

being disposed horizontally, said one aperture being disposed in said one portion of said body below its respective flat member, said connecting means extending below the other flat member, and abutment means extending internally in said body proximate said apertures to support the respective valve members in a position of rest such that each valve member is movable in one direction only to be opened, an improvement wherein said treating means comprises an atomizer containing a volatile aromatic product, and push-button means for activating said atomizer to directly introduce vaporized aromatic product into said respiratory assembly along with respired air.

#### 4,011,865 DUST-PROOF PROTECTION MASK OF FACE COVERING TYPE

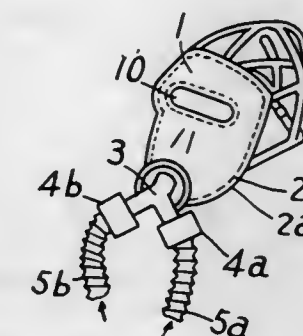
Mitsu Morishita, No. 698, Takemukai, Myohoji, Sumaku, Kobe, Japan

Filed Sept. 26, 1975, Ser. No. 617,121

Int. Cl.<sup>2</sup> A62B 7/12

U.S. Cl. 128-142.3

1 Claim



1. A dust-proof protective mask comprising a mask body adapted to fit onto a wearer's face, said mask body having an air inlet opening, a first air inlet pipe connected to said air inlet opening, an electrically driven air blower on said first air inlet pipe for feeding air under pressure to said air inlet opening, an air filter on said first air inlet pipe, a second air inlet pipe connected to said first air inlet pipe, a manually-operated air blower means mounted on said second inlet pipe and operably mounted in parallel with said electrically driven air blower, said first and second air inlet pipes each having lower ends, a three-way valve to which said lower ends of said first and second air inlet pipes are connected for selectively switching flow of atmospheric air to said first or second air inlet pipes, said mask body having a peripheral edge, clearance means on said peripheral edge for leaking out air from between said clearance means and the user's face, said mask body having a viewing opening, a transparent viewing member, means mounting said transparent viewing member in said viewing opening to provide a clearance space between said transparent viewing member and said viewing opening for allowing air on the inside of the mask to blow out through said clearance space, a colored transparent welding light shielding member mounted on the inside of said transparent viewing member, said shielding member having a height less than the height of said transparent viewing member, said shielding member having an upper edge disposed above the level of the user's eyes, said shielding member being effective to shut off harmful rays of ultra-violet, infrared rays and the like from the user's eyes, said transparent viewing member having an upper portion extending above an upper edge of said shielding member and disposed between said upper edge of said shielding member and the upper edge of said viewing opening, whereby the wearer of the mask may freely see the outside through said upper portion of said transparent viewing member.



4,011,866

**ELECTRONICALLY CONTROLLED PULMONARY VENTILATOR**

Fritz F. Klein, Hudson, N.H., and Oliver C. Morse, III, Berkeley, Calif., assignors to Automatic Breathing Apparatus Co., Inc., Boston, Mass.

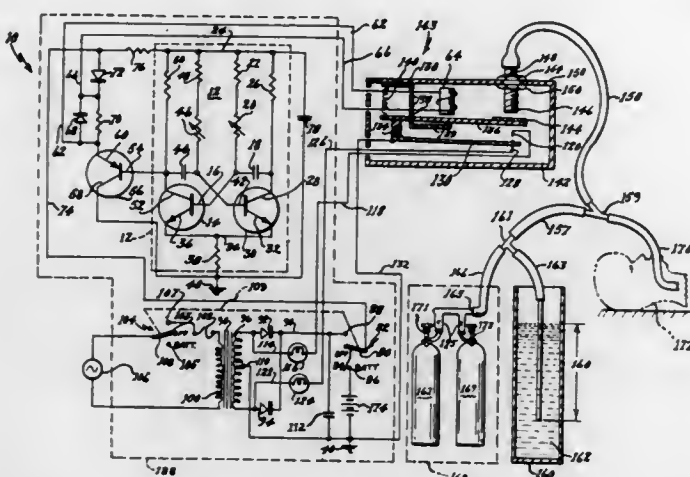
Continuation of Ser. No. 430,602, Feb. 5, 1965, abandoned.

This application Aug. 26, 1968, Ser. No. 767,016

Int. Cl.<sup>2</sup> A62B 7/02

U.S. Cl. 128—145.8

8 Claims



1. In a pulmonary ventilator for use with a reservoir of gas having an outlet at a preselected pressure, the combination of three intercommunicating gas flow channels, one of said gas flow channels adapted for coupling to said outlet of said gas reservoir, another of said gas flow channels adapted for insertion in the trachea of a pulmonary ventilation recipient, a single relay breathing control valve means having a single breathing control valve in said ventilator, the third of said gas flow channels being an exhaust channel coupled to said single breathing control valve of said single relay breathing control valve means for selectively closing and opening said third channel to passage of said gas and thereby respectively applying said preselected pressure gas to said trachea and exhausting said gas through said third channel, and electronic timer control means coupled to the relay of said relay breathing control valve means to cause alternate closing and opening of said single breathing control valve in accordance with a preselected time schedule.

4,011,867

**DIVER'S PRESSURE CHAMBER SYSTEM**

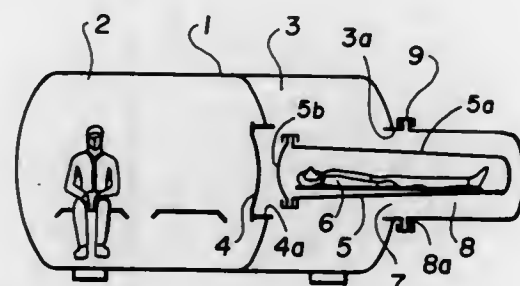
Arne-Johann Arntzen, Fyllingsdalen, Norway, assignor to Drägerwerk Aktiengesellschaft, Germany

Filed Sept. 30, 1975, Ser. No. 618,131

Claims priority, application Germany, Oct. 4, 1974, 2447362

Int. Cl.<sup>2</sup> B63C 11/32; A61M 16/02

U.S. Cl. 128—204



1. A diver's pressure chamber system for use with a fixed pressure chamber having a sealable access and using a transportable sealed diver's transfer container for the diver, comprising, a tubular projection formed around the access, a separate portable cylindrical lock space part hermetically engageable and sealable with said tubular projection and

defining with said tubular projection and said access a pressurizable lock space which may be brought to a desired transfer pressure, and a sealed diver's transfer container positionable in said lock space having a removable sealing cover which may be removed when the lock space is brought to a pressure comparable to the transfer container and to the pressure chamber.

4,011,868

**HYPODERMIC SYRINGE WITH ARTICULATE PLUNGER**

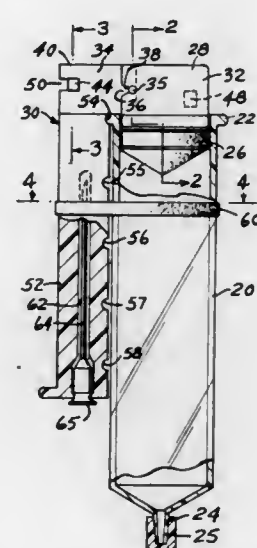
John H. Friend, 10200 Arno Road, Galt, Calif. 95632

Filed May 19, 1975, Ser. No. 578,676

Int. Cl.<sup>2</sup> A61M 5/00

U.S. Cl. 128—218 P

15 Claims



1. In a hypodermic syringe, the combination of: a barrel open at one end and having a discharge port at the other end; a plunger head slidably mounted in the barrel to discharge the contents of the barrel through the discharge port; and a shank connected to the plunger head; said shank being foldable from an operating configuration aligned with the plunger head to an angular configuration to cooperate with the barrel to limit movement of the plunger in at least one direction relative to the barrel; said combination including cooperative means on the shank and barrel, respectively, to releasably engage each other at the angular configuration of the shank to immobilize the plunger head in the barrel.

4,011,869

**TUBULAR CUTTING INSTRUMENT**

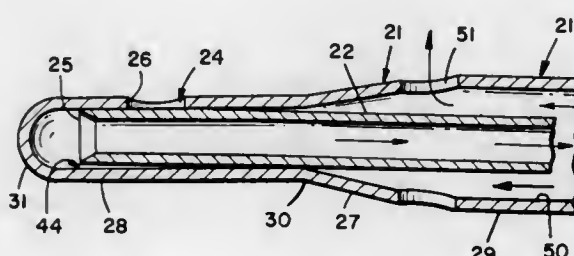
William Seiler, Jr., Van Nuys, Calif., assignor to David Kopf Instruments, Tujunga, Calif.

Filed Aug. 1, 1975, Ser. No. 600,897

Int. Cl.<sup>2</sup> A61M 1/00; A61F 9/00; A61B 17/32

U.S. Cl. 128—276

7 Claims



1. In a cutting instrument having an elongated tubular housing formed with a cutting orifice, a resilient, inner tubular member slidably mounted coaxially within said tubular housing, and driving means for reciprocating said inner tubular member, the improvement comprising:

means defining a bend in said tubular housing between said driving means and said cutting orifice displacing said cutting orifice in a direction toward said resilient, inner tubular member, such that as the end of said resilient, inner tubular member passes across said cutting orifice, said end is resiliently urged into shearing contact with said cutting orifice.

4,011,870

**NEEDLE INSTRUMENT**

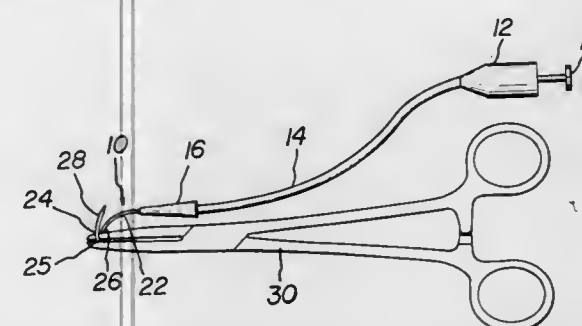
Michael Goldstein, 192 15C 67th Ave., New York, N.Y. 11635

Filed Mar. 5, 1976, Ser. No. 664,327

Int. Cl.<sup>2</sup> A61B 17/32

U.S. Cl. 128—276

6 Claims



1. A needle instrument for performing peripheral iridectomy for narrow angle glaucoma comprising a hollow needle having a bore extending therethrough and having a first bend and a second bend, said first bend being substantially a right angle bend and contained substantially within a single plane, said second bend being substantially a U-shaped bend and being disposed in a plane substantially perpendicular to said first plane, a source of suction and means connecting said needle to said source of suction such that suction may be drawn through said bore of said needle, said needle instrument being adapted to be grasped by a hemostat or the like along said U-shaped bend to facilitate manual manipulation during performance of the peripheral iridectomy.

4,011,871

**WATER-DISPERSIBLE BARRIER FILMS FOR BODY FLUID RETENTION**

Arnold Jay Taft, East Brunswick, N.J., assignor to Personal Products Company, Milltown, N.J.

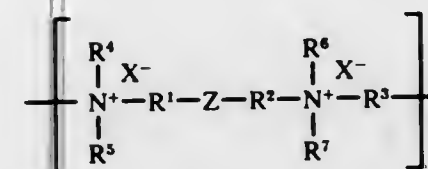
Filed Mar. 17, 1975, Ser. No. 559,205

Int. Cl.<sup>2</sup> C07C 87/30

U.S. Cl. 128—284

11 Claims

1. In a product for absorbing body fluids including a barrier film for retaining said body fluids, the improvement which comprises employing as said barrier film a polymeric film of a cationic polyurethane having a repeating unit of the formula:



wherein R<sup>1</sup> and R<sup>2</sup> are selected from the group consisting of —CH<sub>2</sub>— and alkylene containing 2 to 4 carbon atoms, inclusive; Z is a linking condensation residue of a polyisocyanate with a polyol and contains at least four urethane linkages; R<sup>3</sup> is alkylene containing 2 to 4 carbon atoms, inclusive; R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> are lower alkyl containing 1 to 4 carbon atoms, inclusive; X is a halogen selected from the group consisting of chlorine and bromine, and m is an integer of sufficient magnitude to form a film; the equivalent weight of the polymer, expressed as the ratio of the molecular weight of the repeating unit divided by the number of R<sup>+</sup> in the repeating unit, being

from about 500 to about 2000, whereby said film is resistant to body fluids but dispersible in water.

4,011,872

**ELECTRICAL APPARATUS FOR TREATING AFFECTED PART IN A COELOMA**

Osamu Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

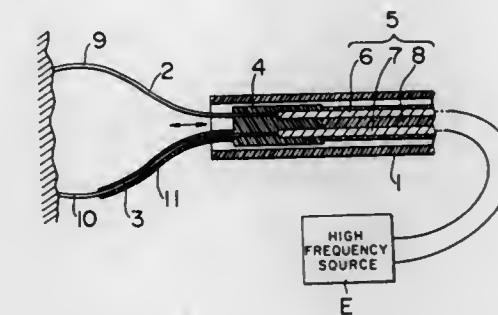
Filed Mar. 28, 1975, Ser. No. 563,071

Claims priority, application Japan, Apr. 1, 1974, 49-37269; Apr. 1, 1974, 49-37270

Int. Cl.<sup>2</sup> A61B 17/36

U.S. Cl. 128—303.14

10 Claims



1. An electrical apparatus for treating an affected part in a coeloma comprising:

an electrically insulating, hollow, flexible tube having a distal end and a proximal end and adapted to be inserted into a coeloma and having an opening in its distal end; an electrode operating member formed of an insulating material and having a first end facing said distal end of said flexible tube and a second end facing said proximal end of said flexible tube, said electrode operating member being slidably disposed within said flexible tube such that said electrode operating member can slide towards and away from said distal end of said flexible tube;

a plurality of treating electrodes each being formed of a resilient, conductive material, each of said treating electrodes having a free end and a base end, said base ends of said treating electrodes being attached to said first end of said electrode operating member, said free ends of said treating electrodes extending towards said opening in said flexible tube for movement out of and into said opening in said flexible tube in response to movement of said electrode operating member;

an operating wire extending from said proximal end of said flexible tube into said flexible tube and secured to said second end of said electrode operating member for causing displacement of said electrode operating member in response to displacement of said operating wire into and out of said flexible tube, said operating wire including power cable means for supplying a high frequency current to the treating electrodes.

4,011,873

**SURGICAL INSTRUMENT FOR LIGATURES**

Axel Hoffmeister, Kantstr. 13, 68 Mannheim, 1, Germany

Filed July 11, 1975, Ser. No. 595,011

Claims priority, application Germany, July 13, 1974, 7423891[U]

Int. Cl.<sup>2</sup> A61B 17/12, 17/06

U.S. Cl. 128—326

3 Claims

1. A surgical instrument for ligatures, comprising: a handle provided with an opening therein, a rod, means removably mounting said rod in said handle, two spools, and means mounting said spools on said rod for independent rotation with respect to each other, and a tube having a first open end attached to said handle so as to provide communication between said handle and said tube and a second closed end, a curved portion interme-



diate said ends of said tube, the outer surface of said tube electrode, having legs connected together, said hooks opening at the inner portion of said curve having a cylindrical by resilience of said legs, a compression coil spring around



surface and two openings provided in said curved portion of said tube and positioned diametrically to each other.

4,011,874

**DORNO RAY TRANSMITTING SHEET**

Masahiro Segawa, Iwaki; Mitsuo Onozuka, Yokohama; Ichiroh Ishibashi, Iwaki; Shinsuke Yoshikawa, Iwaki, and Shigeru Saitoh, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed June 17, 1974, Ser. No. 480,447

Claims priority, application Japan, June 16, 1973, 48-67894  
Int. Cl.<sup>2</sup> A61N 5/06; G02B 1/04; C08F 3/22

U.S. Cl. 128-362

5 Claims

1. A melt-molded polyvinylidene fluoride or polymonochlorotrifluoroethylene sheet having a thickness of about 20  $\mu$  to 2 mm and a spherulite size of between about 0.1 to 10  $\mu$ , whereby the sheet transmits between about 40% and about 80% of the dorno rays in a wavelength region of about 2,800 to 3,300 Å; said sheet having been formed by stretching in at least one axial direction a sheet formed from polyvinylidene fluoride or polymonochlorotrifluoroethylene resin having an inherent viscosity ranging from about 0.8 to 1.8.

4. A sun-room containing at least one light-admitting plate for admitting physiologically active rays in sunlight, said light-admitting plate comprising a plate of melt-molded polyvinylidene fluoride or polymonochlorotrifluoroethylene plate having a thickness of about 20  $\mu$  to 2 mm and a spherulite size of between about 0.1 to 10  $\mu$ , whereby the plate transmits between about 40% and about 80% of the dorno rays in a wavelength region of about 2,800 to 3,300 Å; said plate having been formed by stretching in at least one axial direction a plate formed from polyvinylidene fluoride or polymonochlorotrifluoroethylene resin having an inherent viscosity ranging from about 0.8 to 1.8.

4,011,875

**MEDICAL ELECTRODES**

Siegfried R. Lehr, Mottlst. 17, D8 Munich 40, and Alfred Schaudig, Athosstr. 9a, 8 Munich, both of Germany  
Filed Feb. 25, 1974, Ser. No. 447,241

Claims priority, application Germany, Feb. 27, 1973, 2309749

Int. Cl.<sup>2</sup> A61N 1/04

U.S. Cl. 128-418

3 Claims

1. A medical electrode for implantation in a body, comprising a hollow conductor, 2 forcep-like hooks at the tip of the



said legs, forcing said legs into itself, thus closing said hooks and a guide stylet for remotely opening said hooks.

4,011,876

**DEVICE FOR WITHDRAWING TOBACCO FROM THE MAGAZINE OF A TOBACCO DISTRIBUTOR**

Günter Wahle, Reinbek, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

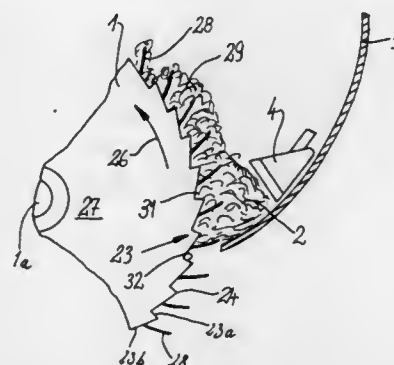
Filed May 15, 1975, Ser. No. 577,750

Claims priority, application United Kingdom, June 4, 1974, 24593/74

Int. Cl.<sup>2</sup> A24C 1/02, 5/39

U.S. Cl. 131-109 R

10 Claims



1. In a tobacco distributor for cigarette making machines, a combination comprising a magazine arranged to store a supply of tobacco particles, particularly a supply consisting mainly of relatively long and relatively short tobacco shreds; and a device for withdrawing tobacco from the supply in said magazine, including an entraining member having an annulus of teeth and projections extending outwardly from said teeth, and means for moving said teeth along an endless path a portion of which is immediately adjacent to the supply of tobacco in said magazine so that the teeth and projections in said portion of said path remove, support and advance a substantially continuous layer of tobacco particles from said supply.

4,011,877

**MOUTHPIECE FOR SMOKING TOBACCO**

Ivan Mikhailovich Fedorchenko, ulitsa Vladimirskaia, 51/53, kv. 32; Vasily Sergeevich Pugin, ulitsa Dobrokhiova, 2, kv. 32; Vladimir Itskhok-Nukhimovich Ablov, ulitsa Pozharskogo, 2, kv. 23; Iuliy Yakovlevich Fridman, Novo-Gostomelskoe shosse, 17, kv. 65, and Mikhail Shaevich Goldberg, ulitsa Patrisa Lumumby, 20, kv. 59, all of Kiev, U.S.S.R.

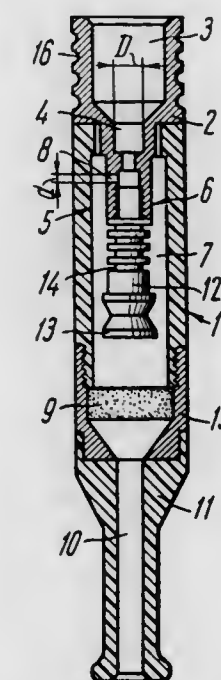
Continuation of Ser. No. 507,530, Sept. 19, 1974, abandoned, which is a continuation of Ser. No. 344,029, March 22, 1973, abandoned. This application Feb. 26, 1976, Ser. No. 661,805

Claims priority, application U.S.S.R., June 12, 1972, 1790302

Int. Cl.<sup>2</sup> A24F 13/04, 1/08

U.S. Cl. 131-187

4 Claims



1. A mouthpiece for smoking tobacco and tobacco articles, comprising: a body member having a cavity; a filter member made of sintered metal material and located axially in said cavity of said body; a holder arranged co-axially with said body, said holder having a cavity designed to contain tobacco or tobacco articles; an inlet channel for the passage of smoke in said holder in communication with said cavity of said holder; a portion including one end of said holder located in said cavity of said body and removably fastened therein; said holder portion of said body having a radial orifice formed therein communicating with said inlet channel and having a diameter which is considerably smaller than the diameter of said inlet channel, said orifice defining a first reduced area passageway for said smoke to ensure the conversion of the resin vapours in the smoke into a liquid and to settle them down on the inner surface of said body, said end of the holder being spaced from the filter member; the inner surface of said body and a section of the outer surface of said holder portion located in said cavity of said body defining a substantially annular passage in communication with said inlet channel through said radial orifice, said substantially annular passage defining a free space for receiving said smoke from said orifice and in which said smoke expands and cools, said portion of said holder in said body comprising an elongated stem having a plurality of peripheral grooves in its outer surface and terminating in an enlarged free end spaced upstream from said filter means, said enlarged free end and the inner surface of said body defining therebetween a second reduced area passageway for said smoke to further cause the liquid in said smoke to settle on to said enlarged free end, the smoke in said body cavity expanding after passing said second reduced area passageway and then passing through said filter means.

4,011,878

**PROCESS FOR PERMANENTLY WAVING HAIR USING A SELF-HEATING NEUTRALIZING COMPOSITION**

CONTAINING A WATER-SOLUBLE SULFITE, METABISULFITE OR BISULFITE AND H<sub>2</sub>O<sub>2</sub>

Jean-Louis Abegg, and Claire Gayet, both of Paris, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France Division of Ser. No. 346,025, March 29, 1973, Pat. No. 3,865,930. This application Nov. 29, 1974, Ser. No. 528,481  
Claims priority, application Luxembourg, Apr. 4, 1972, 65099

Int. Cl.<sup>2</sup> A45D 7/06; A61K 7/09, 7/11

U.S. Cl. 132-7

4 Claims

1. A process for effecting the second stage of a permanent wave operation of the hair, said hair previously having been reduced, rinsed and wound on rollers, comprising the steps of treating said hair for a period of about 5 to 15 minutes with a composition consisting essentially of a mixture of a first component comprising a water-soluble salt selected from the group consisting of sodium, potassium and ammonium sulfite; sodium, potassium and ammonium metabisulfite; and sodium, potassium and ammonium bisulfite; and a second component comprising H<sub>2</sub>O<sub>2</sub>, the said components being present in amounts such that the said mixture exhibits a temperature rise of about 15° to 25° C and contains free H<sub>2</sub>O<sub>2</sub> in amounts of about 0.5-3 percent by weight of said composition, removing said rollers and rinsing said hair.

4,011,879

**COMBINATION APPLICATOR-DISPENSER HAIR STYLER**

Shepard D. Roberts, P.O. Box 136-Brevoort Station, Brooklyn, N.Y. 11216

Filed June 3, 1976, Ser. No. 692,319

Int. Cl.<sup>2</sup> A45D 2/12

U.S. Cl. 132-9

8 Claims



1. A hair treatment applicator-dispenser comprising, a container for containing; therein a preparation usable for application to hair; a hair curler closing said container; said hair curler comprising a removable tubular cover on said container closed at one end and closing said container in use as a cover and usable as a hair curler having a length sufficient for wrapping hair therearound; said curler including a tubular hood removably mounted on said container axially over said cover; and said hood having one end closed and another open when removed from said container and a cross section dimensioned for fitting axially over said cover in use as a hair curler with hair wrapped therearound.

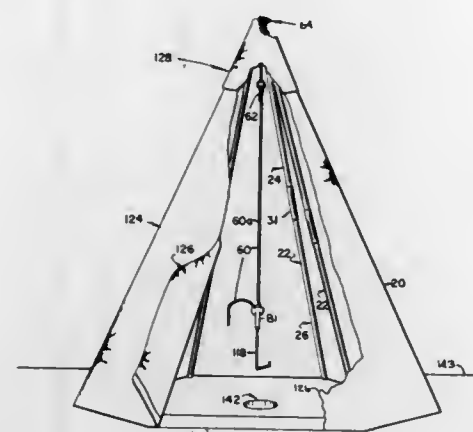


# 4,011,880 TENT STRUCTURE

Glen E. Shoults, 421 W. Elm St., Hartford City, Ind. 47348  
Filed Sept. 11, 1975, Ser. No. 612,327  
Int. Cl.<sup>2</sup> A45F 1/16

U.S. Cl. 135-1 C

3 Claims



1. Tent structure comprising:  
a plurality of elongate tent staves pivotally connected at one of their respective ends to a common member and supportable at their distal ends to a tent supporting surface;  
a tent cover;  
means for connecting said cover in supported relation to said staves to define a tent enclosure when said staves are pivoted divergently from one another;  
an elongate tensile strand;  
means for connecting one end of said strand to said common member; and said strand adapted to be coupled at its distal end to the supporting surface, said staves being placed in compression upon application of a tensile stress to said strand;  
said common member comprises an elongate pin;  
each of said staves having a bracket at said one of their respective ends;  
each bracket having a pin receiving opening therein;  
said pin being inserted through said openings; and  
means for resiliently compressing said brackets towards one another longitudinally of the pin so that when said staves are pivoted convergently, said brackets can move longitudinally of and pivotally about said pin.

# 4,011,881

## LARGE SHELTER STANDING UMBRELLA

Klaus Becher, Gummersbach, Germany, assignor to Carl Becher oHG Planen-und Zelte-Fabrik, Gummersbach, Germany

Filed Aug. 26, 1975, Ser. No. 607,798  
Claims priority, application Germany, Aug. 31, 1974, 2441817; July 24, 1975, 2533049

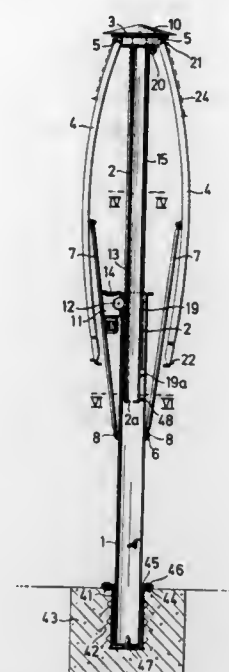
Int. Cl.<sup>2</sup> A45B 19/04, 25/14, 25/18

U.S. Cl. 135-20 M

13 Claims

1. A large shelter standing umbrella comprising a tubular support having upper and lower end portions, a slide member having upper and lower end portions, means mounting said slide member for internal telescopic reciprocal movement relative to said tubular support, a plurality of spokes pivoted at one end to the upper end portion of said slide member, a plurality of struts each pivoted at one end to an associated one of said spokes and at another end being pivotally connected to said tubular support, means carried by said support upper end portion for elevating and lowering said slide member relative to said support, said elevating and lowering means including a gear, said gear being in mesh with a longitudinally extending radially outwardly projecting toothed rack carried by said slide member, guide means internally of said tubular support for axially guiding the reciprocal movement of said slide mem-

ber and limiting rotational motion thereof relative to said tubular support, and said guide means include a radially inwardly opening groove carried by said tubular support corresponding in cross section to that of said toothed rack.



# 4,011,882

## METHOD FOR TRANSPORTING SWEET AND SOUR HYDROCARBON FLUIDS IN A PIPELINE

Robert V. Nivens, Billings, Mont.; Billy J. Williams, Ponca City, Okla.; Irvin Toole, Jr., Humble, and Elliott C. Fenton, Houston, both of Tex., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 407,030, Oct. 16, 1973, abandoned. This application Mar. 4, 1976, Ser. No. 663,947  
Int. Cl.<sup>2</sup> B08B 9/00

U.S. Cl. 137-15

14 Claims

1. A method for minimizing sulfur contamination of sweet hydrocarbon fluids transported in a pipeline for the transportation of sweet and sour hydrocarbon fluids said method consisting essentially of:  
a. transporting a sour hydrocarbon fluid containing from 0 to about 2000 ppm of a corrosion inhibiting additive through said pipeline and thereafter;  
b. transporting a sweet hydrocarbon wash solution containing from about 10 to about 2000 ppm of a mixture of amines consisting essentially of light amines having a molecular weight from about 31 to 150 and heavy amines having a molecular weight from 151 to about 500 wherein the molar ratio of said light amine to said heavy amine varies from about 10:1 to about 1:10; from 0 to about 2000 ppm of a corrosion inhibiting additive; from 0 to about 500 ppm of a surfactant and from 0 to about 1500 ppm of an alkanol containing from 1 to about 6 carbon atoms in an amount sufficient to provide a wash solution contact time with the interior pipeline surfaces of at least about 1 minute and, thereafter;  
c. transporting said sweet hydrocarbon fluids containing from 0 to about 200 ppm of a corrosion inhibiting additive, said mixture of amines or mixtures of said additive and said mixture of amines through said pipeline.

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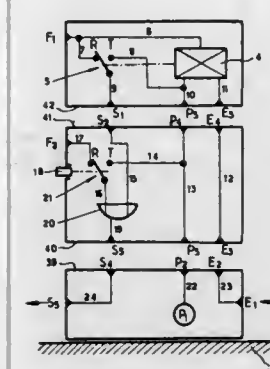
## MANUAL CONTROL DEVICE FOR PNEUMATIC SYSTEMS

Eric Petrimaux, Evreux; Felix Lameyre, Rueil-Malmaison, and Daniel Bouteille, Marnes-la-Coquette, all of France, assignors to La Telemecanique Electrique, France  
Filed Oct. 9, 1975, Ser. No. 620,080

Claims priority, application France, Oct. 9, 1974, 74.34051  
Int. Cl.<sup>2</sup> F16K 11/20

U.S. Cl. 137-110

2 Claims



1. An auxiliary manual control device for a pneumatic system, said pneumatic system comprising: a plurality of baseplates each provided with a junction face and input, output and pressure supply channels, each of said channels having an orifice on the junction face of the baseplates, said pneumatic system further comprising a plurality of active pneumatic cells each having a junction face and input, output and pressure supply channels, each of said channels having an orifice on the junction face of the cell, wherein the auxiliary manual control device comprises a body having first and second opposite junction faces and input and pressure supply channels directly connecting first and second input and pressure supply orifices respectively located on said first and second junction faces of the body; first and second output orifices respectively located on said first and second junction faces of the body, the first junction face of a baseplate and the first junction face of the body being adapted to cooperate whereby their respective input, output and pressure supply orifices are interconnected; the second junction face of the casing and the junction face of an active cell being adapted to cooperate whereby their respective input, output and pressure supply orifices are interconnected, the casing further having an exhaust channel and a further channel which is connected to the pressure supply channel within the casing; an OR gate provided within said body and having an output connected to the said first output orifice of the body, said OR gate further having a first input connected to the second output orifice of the body, and a second input; a manually operated monostable pneumatic reverser switch provided within said body and having a first position in which it connects the second input of the OR gate to the exhaust channel and a second position in which it connects the second input of the OR gate to the said further channel.

# 4,011,884

## LIQUID-LEVEL VALVING DEVICE PARTICULARLY USEFUL AS AUTOMATIC RELIEF VALVE

Mordeki Drori, 89 Zahal St., Kiron, Israel

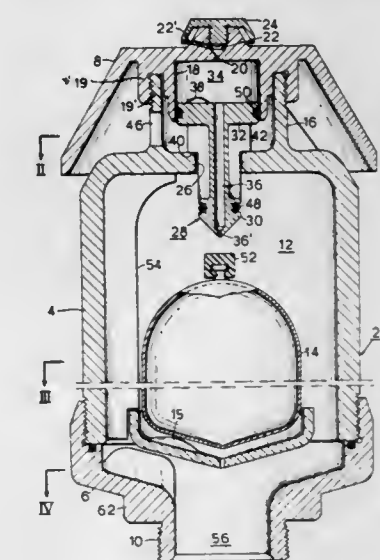
Filed Feb. 4, 1975, Ser. No. 546,913  
Claims priority, application Israel, Feb. 12, 1974, 44200  
Int. Cl.<sup>2</sup> F16K 31/34

U.S. Cl. 137-202

5 Claims

1. A liquid-level responsive valving device comprising: a housing defining a first chamber and including an end wall having a central opening therethrough; an annular support circumscribing said opening externally of said first chamber; a cap including an inner annular wall and an outer annular wall coaxial therewith, said outer annular wall being internally threaded and threadably received on said annular support

with the inner annular wall constituting an open cylinder facing and in alignment with said opening in the housing end wall; a control member axially movable in said opening and having a first end disposed within said first chamber and an opposite end carrying a piston movable within said cylinder and defining a second chamber therewith; said second chamber having a small vent opening in a wall thereof; said control member being formed with a bore extending axially therethrough and establishing communication between the two chambers; the cross-sectional area of said first end of the control member in the first chamber being less than that of said opposite end thereof in the second chamber, and the mouth of the bore at said one end of the control member in the first chamber being of larger diameter than that of the vent opening in the second chamber, such that upon an increase in pressure in the first chamber, the pressure in the second chamber is likewise increased which pressure, by virtue of the larger surface area in the second chamber, causes the control member to be moved further into the first chamber; a float in the



first chamber coaxial with and axially spaced from the control member; a pilot valve element fixed to the end of the float facing said first end of the control member; said float being movable towards and away from said first end of the control member according to the quantity of liquid in the first chamber to bring the pilot valve element into engagement therewith to close the mouth of said bore whereupon the pressure in the first chamber moves the control member away from the float and further into said second chamber, or in disengagement therefrom to open the mouth of the bore whereupon the pressure in the second chamber moves the control member towards the float and further into said first chamber, guiding means in the first chamber guiding the movement of the float towards and away from the control member; and a main valve communicating with the first chamber and operated by the control member such as to be opened upon the movement of the control member further into the first chamber and to be closed upon the movement of the control member further into the second chamber.

# 4,011,885

## MANIFOLD-VALVE STRUCTURE

Joseph H. DeFrees, 414 Liberty St., Warren, Pa. 16365  
Filed Sept. 11, 1975, Ser. No. 612,484

Int. Cl.<sup>2</sup> F16K 11/10

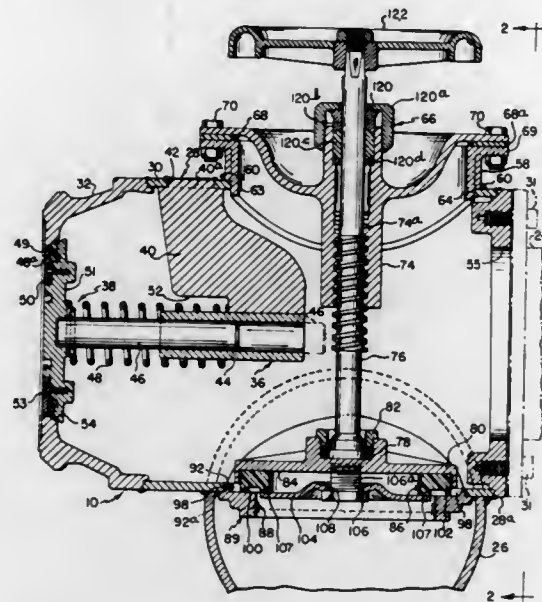
U.S. Cl. 137-267

12 Claims

1. In a liquid control means for controlling liquid flow to and from a multi-compartmented liquid storage tank, said means comprising a manifold extending lengthwise and a plurality of spaced adapter portions, each of which extends in a direction generally transverse of the direction of extension of said manifold, and being nested at one side thereof in said manifold, each said adapter portion having an aperture in the opposite side thereof with a collar projecting from said aperture, said collar supporting thereon an actuatable valve in-



cluding a stem and a valve head which extends inwardly into said adapter portion in a direction toward said manifold, a valve seat formed adjacent said one side of said adapter portion and defining an opening communicating the interior of said adapter portion with the interior of said manifold, and said valve head being adapted to engage said seat to seal the manifold from said adapter portion interior, said valve head upon predetermined actuation of said valve being adapted for movement away from said valve seat to communicate the interior of the respective of said adapter portions with the interior of said manifold, each said adapter portion including



a coupling section having means thereon for coupling it to a source of liquid for supplying the latter to the associated tank via said adapter portion, said adapter portion including an inlet opening in said coupling section for such liquid and an exit opening spaced from said coupling section and in generally aligned relation to said inlet opening, said exit opening being adapted for communication with the tank and said valve being adapted to control the flow of liquid from the associated tank via the respective of said adapter portions to said manifold, said valve head when in closed condition being in generally non-interfering condition to the flow path of liquid from said inlet opening to said exit opening.

4,011,886

## SLEEVE VALVE

Charles D. Wood, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Continuation of Ser. No. 365,629, May 31, 1973, abandoned.

This application May 14, 1975, Ser. No. 577,468

Int. Cl.<sup>2</sup> F16K 31/124

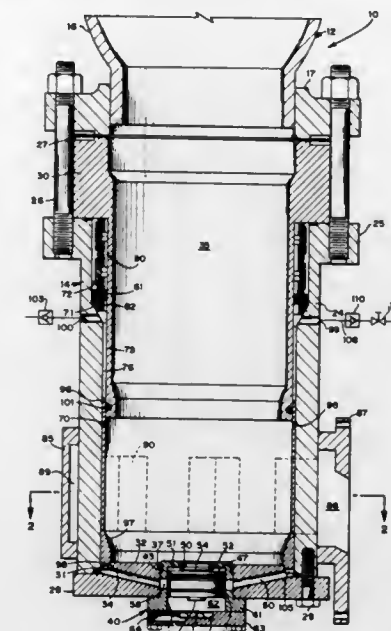
U.S. Cl. 137-492.5

21 Claims

1. A quick opening and closing sleeve valve for controlling the discharge of fluid under pressure generated by a series of repetitive explosions at a relatively rapid rate comprising:

- an upright housing member defining an interior pressure chamber adapted to receive said fluid pressure at said relatively rapid rate;
- at least one outlet port in said housing member in fluid communication with said interior pressure chamber;
- a sleeve vertically disposed in said interior pressure chamber and freely slidable relative to said housing member in response to a fluid pressure, said sleeve movable at least in part because of gravity between a first position blocking off the fluid communication between said outlet port and said interior pressure chamber and a second position permitting such communication, said sleeve having a valve actuation surface sealed from communication with said interior pressure chamber in said first sleeve position;
- valve seat means associated with said housing and adapted to engage said sleeve in sealing engagement in said first sleeve position;

means associated with the end of said sleeve opposite the sealing surface thereof during only the latter part of the travel of said sleeve from said first position to said second position, and during only the first part of the travel of the sleeve from said second position to said first position, for aiding in the automatic closing of said sleeve in said first position at the end of each cycle of operation of said sleeve valve; and



pilot valve means controlling communication between said source of fluid pressure and an actuation surface associated with said sleeve, said pilot means including means responsive to a predetermined rise in pressure to shift said pilot valve to communicate said pressure to said valve actuation surface thereby actuating said sleeve to said second position.

4,011,887

## FLUID POWER CONTROL APPARATUS

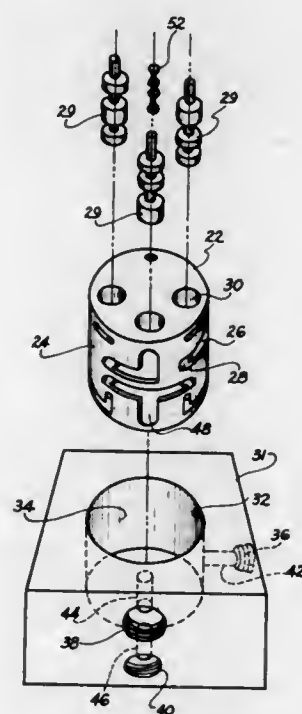
Robert E. Raymond, Zanesville, Ohio, assignor to R. E. Raymond Co. Inc., Zanesville, Ohio

Filed Feb. 23, 1976, Ser. No. 660,332

Int. Cl.<sup>2</sup> F15B 13/02

U.S. Cl. 137-608

12 Claims



1. In a fluid power control apparatus, the combination of a control housing means comprising a core member having a closed continuously curved outer wall surface and a receptacle means provided with an opening, said core member being

mounted in said opening in a sealed and fixed relationship between the outer wall surface of said core and the adjacently disposed inner wall surfaces defining said opening; a plurality of recesses formed in at least one of said adjacently disposed wall surfaces defining fluid paths between said wall means for communication of fluid in axial and circumferential directions; a plurality of passages in said housing means in communication with certain of said recesses for the communication of fluid to or away from said fluid paths formed between said wall means; valve means disposed in communication with said passages in said housing means to define a predetermined fluid circuit between said valve means, said passages and said fluid paths; and inlet and outlet port means in said housing means adapted for communicating said fluid circuit to external fluid power operative elements.

4,011,888

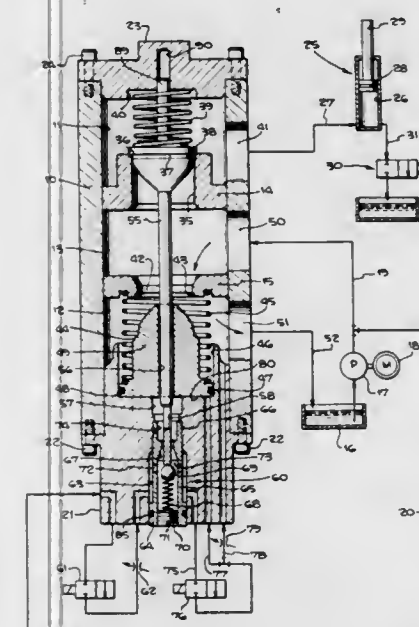
## UNITARY ELEVATOR UP LEVEL CONTROL VALVE

Robert J. Welch, Dunwoody, Ga., and William A. P. Lawrence, Simi Valley, Calif., assignors to Elevator Equipment Co., Los Angeles, Calif.

Filed Mar. 12, 1976, Ser. No. 666,235

Int. Cl.<sup>2</sup> F15B 13/043

U.S. Cl. 137-612.1





4,011,890

## GAS MIXING VALVE

Lennart Valentin Andersson, Alvsjo, Sweden, assignor to Sjukmek, Sjukvardsmekanik HB, Alvsjo, Sweden

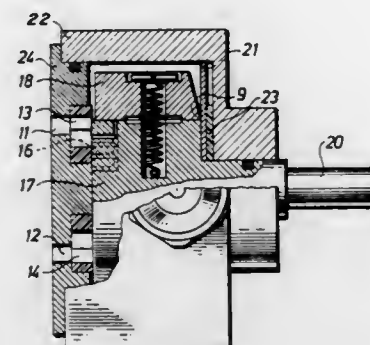
Filed Nov. 4, 1975, Ser. No. 628,757

Claims priority, application Sweden, Nov. 25, 1974, 7414804

Int. Cl.<sup>2</sup> F16K 11/00

U.S. Cl. 137—625.4

8 Claims



1. A gas mixing valve comprising a housing having two separate inlets and a common outlet, a gas dispensing device located between said inlets and said outlet and comprising an adjustable slide block formed with a plurality of substantially parallel gas channels, each having one end communicating with a selected one of said inlets and an opposite end at the outlet side, a valve flap common to said opposite ends of said channels and being normally biased against said opposite ends of said gas channels to prevent gas flow to said outlet.

4,011,891

## PROPORTIONAL FLOW CONTROL VALVE

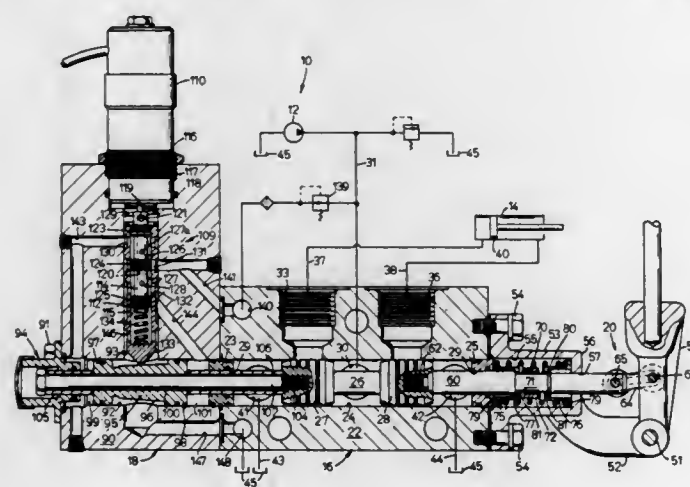
Dale A. Knutson, Oconomowoc, and Kishor J. Patel, Hales Corners, both of Wis., assignors to Applied Power Inc., Milwaukee, Wis.

Filed Aug. 6, 1975, Ser. No. 602,443

Int. Cl.<sup>2</sup> F15B 9/03

U.S. Cl. 137—625.62

4 Claims



1. In a servo means:  
a piston movable in one direction or another from a null position to perform a function;  
first and second equally sized piston areas connected to said piston;  
a selectively operable pilot valve comprising first and second adjustable orifice means each having a null position and other selective positions for applying fluid pressure to said first and second piston areas, respectively, to move said piston in said one direction or another, respectively, the extent of piston movement being proportional to the amount of fluid applied;  
feedback means connected between said piston and said pilot valve to maintain said piston in a position to which it is moved;

first fixed orifice means connected between said first adjustable orifice means and said first piston area to relieve fluid pressure from said first piston area when fluid pressure is being applied to said second piston area, said first fixed orifice means also serving to divert fluid from said first piston area whenever the pilot valve is not activated and thereby preventing movement of said piston from the null position;

second fixed orifice means connected between said second adjustable orifice means and said second piston area to relieve fluid pressure from said second piston area when fluid pressure is being applied to said first piston area, said second fixed orifice means also serving to divert fluid from said second piston area whenever the pilot valve is not activated and thereby preventing movement of said piston from the null position, said first and second fixed orifice means being larger than said first and second adjustable orifice means in the null position, respectively; and

biasing means acting on said piston for maintaining said piston in null position, said biasing means exerting a force on said piston which is greater than the force exerted by fluid when said pilot valve is not activated.

4,011,892

## THREE PORT NON-INTERFLOW POPPET VALVE

Slawomir Kowalski, Rockaway, N.J., assignor to Marotta Scientific Controls, Inc., Boonton, N.J.

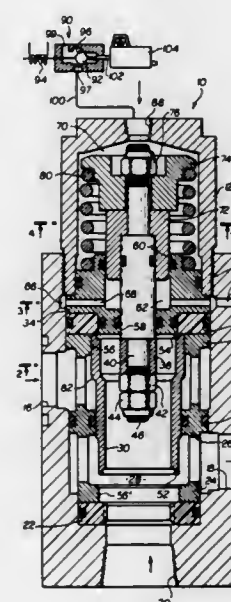
Filed Mar. 14, 1975, Ser. No. 558,370

The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> F15B 13/043

U.S. Cl. 137—625.66

5 Claims



1. A valve structure for sub-sea well heads and the like including in combination a housing enclosing a valve chamber, poppet valve seats at opposite end portions of the chamber, a valve element having opposite end portions each of which comprises a poppet valve that contacts with one of the respective valve seats when the valve element is moved toward that valve seat, the valve element having a passage there-through for the flow of fluid through the valve element from one end to the other, a partition intermediate the ends of the chamber dividing the chamber into a pressure section and an exhaust section, a guide bearing in the partition and through which the valve element slides, a seal for the guide bearing separating the sections on opposite sides of the partition from one another, pressure and exhaust ports in the housing communicating with the respective sections of the valve chamber, cylindrical wall surfaces extending from both of the valve seats in the direction of movement of the valve element and sur-

rounding each of the poppet valves closely to prevent flow of fluid past each poppet valve until the poppet valve moves beyond the end of said wall surface, the lengths of the cylindrical wall sections being correlated with the length of the valve element so that the poppet valve that is moving away from its seat reaches the end of its surrounding wall surface at approximately the same time that the poppet valve at the other end of the valve element reaches the beginning of its surrounding wall surface.

4,011,893

## FLOW CONTROL VALVE

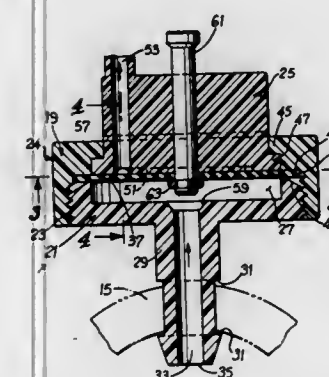
Clarence Bentley, 9256 Stamps Ave., Downey, Calif. 90240

Filed Feb. 3, 1975, Ser. No. 546,548

Int. Cl.<sup>2</sup> F16D 1/00; B05B 15/00

U.S. Cl. 138—43

20 Claims



1. A flow control valve adapted for use with a fluid which is subject to pressure variations, said valve comprising:  
wall means for defining a valve chamber, said wall means having an interior surface defining a wall of said valve chamber, a first portion of said wall of said valve chamber having means defining a groove therein facing into said valve chamber;  
inlet passage means extending from said valve chamber and defining an inlet to said valve chamber;  
outlet passage means leading from said groove and terminating in an outlet and defining a port at said groove;  
a resilient element having means defining an aperture therein;  
means for retaining the resilient element in said valve chamber in generally confronting relationship to said groove and with the aperture being communicable with the groove whereby a flow path from the inlet to the outlet is established through said valve chamber, said aperture, and said groove;  
the resilient element being resiliently to permit the pressure of the fluid in said valve chamber to resiliently deflect the resilient element into said groove an amount which increases with increasing fluid pressure in said valve chamber to thereby provide a pressure dependent restriction to fluid flow through said groove; and  
said wall means including control means for moving at least one of the said resilient element and said first portion of said wall to vary the length of the groove through which the fluid flows in moving from the aperture to the outlet whereby the fluid flow rate through the groove can be adjusted.

4,011,894

## FLUID FLOW CONTROL

Gene A. Barnes, De Kalb, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 256,149, May 23, 1972, Pat. No. 3,837,362. This application July 10, 1974, Ser. No. 490,164

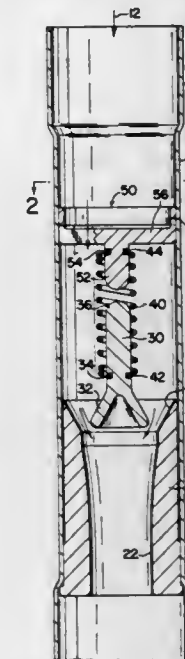
Int. Cl.<sup>2</sup> F15D 1/02

U.S. Cl. 138—46

5 Claims

1. A fluid flow control for maintaining a constant flow comprising a tubular conduit fitting, a flow restrictor in said

fitting, a metering pin means movably mounted adjacent to said restrictor so that movement of said pin means relative to said restrictor varies the flow through said restrictor, a resilient tension coil spring is provided for mounting said pin means, a portion of said pin means is received within said coil spring and frictionally bears against said coil spring to damp out any tendency of the spring to vibrate, said spring means



has a groove in the outer surface thereof receiving the end coil of said spring whereby said pin means is attached to said spring, said pin means creating a pressure drop thereacross which pressure drop varies proportionally with the fluid flow, said pin means being movable in response to said pressure drop whereby as said flow tends to vary said pressure drop tends to vary proportionately to maintain a relatively constant flow through said control.

4,011,895

## TAPE-SUPPORTED SLIDE FASTENER ELEMENT

Ruggero Dal Negro, Via Cusani 10, Milan, Italy

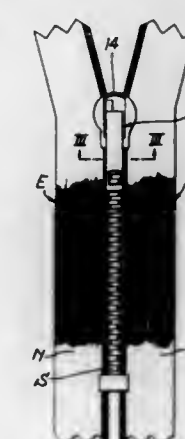
Filed Sept. 14, 1972, Ser. No. 289,063

Claims priority, application Italy, May 9, 1972, 24080/72. The portion of the term of this patent subsequent to Mar. 15, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> D03D 1/00; A44B 19/00

U.S. Cl. 139—384 B

4 Claims



1. a slide-fastener half comprising:  
a fastener element in the shape of a continuous coil with spaced-apart turns provided at one side with coupling heads that are substantially bisected by a midplane of the coil;  
a core extending longitudinally of said coil through said turns; and  
a stringer tape anchored to said coil on the side thereof



opposite said coupling heads, said tape having a body disposed in a plane parallel to said midplane but offset therefrom and substantially tangent to the underside of said coil, said tape having a lower extension in said parallel plane underlying part of said coil but terminating short of said coupling heads, said tape further having an upper extension hugging part of said coil and terminating above said midplane short of said coupling heads, said tape consisting of a multiplicity of warp threads interlinked by a single weft thread, said warp threads including a set of main warp threads in said body, a set of first ancillary warp threads in said lower extension and a set of second ancillary warp threads in said upper extension, said weft thread passing around said core on the side thereof proximal to said coupling heads, said second ancillary warp threads being more numerous than said first ancillary warp threads, said first and second ancillary warp threads having substantially the same mutual spacing.

4,011,896

# APPARATUS FOR RAPIDLY DISPENSING BEER INTO OPEN CUPS

John W. Nilon, and Thomas J. King, both of Ridley, Pa., assignors to Nilon Bros., Philadelphia, Pa.

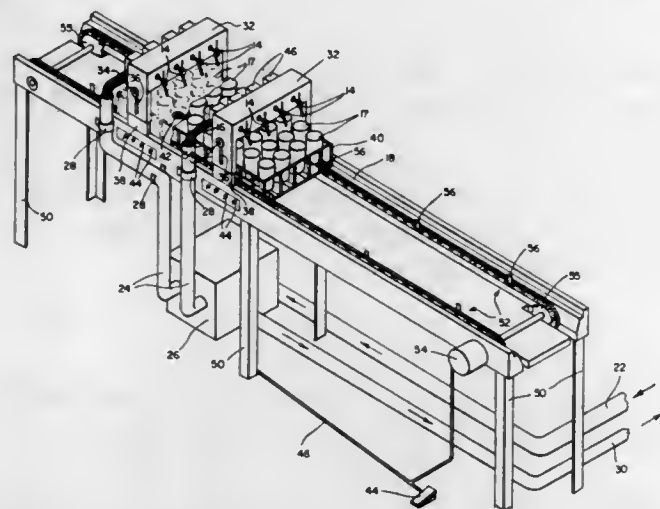
Continuation of Ser. No. 284,103, Aug. 28, 1972, abandoned.

This application Aug. 18, 1975, Ser. No. 605,435

Int. Cl.<sup>2</sup> B65B 3/04

U.S. Cl. 141—82

16 Claims



1. Apparatus for simultaneous and rapid dispensing of beer into successive pluralities of open cups by cooling the beer to a sufficiently low dispensing temperature so as to permit the beer to be poured at a rapid dispensing rate without a substantial head as compared with the head typically formed at a dispensing temperature above 32° F, said apparatus comprising:

- a refrigerated vessel for storing beer in substantial volume so as to provide a supply of beer to fill the successive pluralities of cups;
- a plurality of side-by-side dispensing taps adapted to dispense beer into the successive pluralities of cups at the dispensing temperature;
- a plurality of dispensing lines connecting said vessel with said dispensing taps so as to permit the flow of beer from the refrigerated vessel to the taps;
- cooling coils for cooling a coolant to a temperature substantially below 27° F;
- coolant line means connected to said cooling coils for circulating said coolant;
- means for establishing a sufficiently close heat exchanging relationship between said dispensing lines and said coolant line means such that the beer flowing through the dispensing lines is cooled to a temperature below 32° F at the dispensing taps as a result of the heat exchanging relationship between the coolant and the beer;
- successively arranged pluralities of side-by-side open cups; and

means for supporting said successive pluralities of side-by-side open cups beneath said dispensing taps for side-by-side filling of said side-by-side open cups from said dispensing taps with beer at a temperature below 32° F without forming a substantial head.

4,011,897

# INTERLOCK SYSTEM FOR A GASOLINE DISPENSING NOZZLE

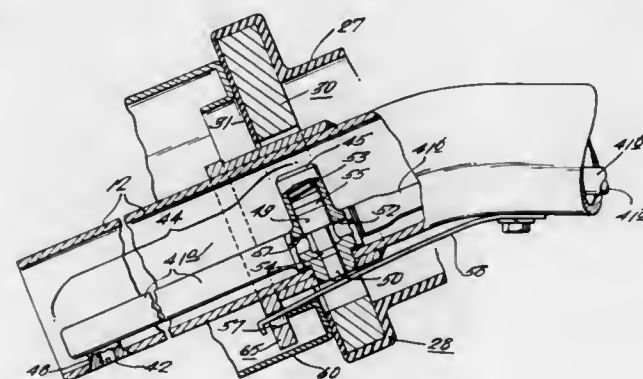
William B. Hansel, Media, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Filed Nov. 25, 1975, Ser. No. 635,189

Int. Cl.<sup>2</sup> B65B 57/06

U.S. Cl. 141—207

5 Claims



1. A nozzle for dispensing fluid which is designed to permit operation of the nozzle only when the discharge spout of the nozzle is properly inserted into the fillpipe inlet of the tank being filled, with the discharge spout being inserted in the fillpipe a predetermined distance and the lower side of the discharge spout being urged toward the inside of the fillpipe inlet, so that in the event the nozzle falls from the fillpipe, dispensing of fluid is immediately terminated, said nozzle comprising:

- a. a nozzle housing;
- b. a discharge spout, connected to the nozzle housing, for insertion into the fillpipe of the tank to be filled;
- c. a main nozzle valve in the nozzle housing;
- d. means for controlling the position of the nozzle valve for regulating the dispensing of fluid through the nozzle housing and discharge spout, said controlling means having an enabling position wherein the position of the main nozzle valve can be regulated and a disabling position wherein the main nozzle valve remains in or obtains a closed position; and
- e. interlock means, responsive to the discharge spout being inserted into the fillpipe a predetermined distance and the lower side of the discharge spout being urged toward the inside of the fillpipe inlet, for maintaining the controlling means in a disabled condition at all times except when the discharge spout is inserted in the fillpipe inlet the predetermined distance and the lower side of the discharge spout is urged toward the inside of the fillpipe inlet, thereby assuring that the nozzle cannot be operated except when it is properly inserted in the fillpipe of the tank being filled and that its operation will be immediately terminated should the nozzle fall from the fillpipe.

4,011,898

# WALLET-BAG

Kenneth L. Hubbard, Philadelphia, Pa., assignor to Urbane Habitats, Philadelphia, Pa.

Filed May 21, 1976, Ser. No. 688,691

Int. Cl.<sup>2</sup> A45C 3/04

U.S. Cl. 150—35

10 Claims

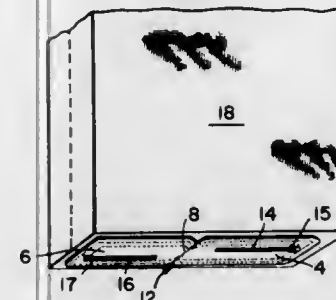
- 1. A combined wallet, shopping bag, and over-the-shoulder purse comprising
- a sheet having two half portions connected together along a central crease line,

closure means operative when said two half portions of said sheet are folded over on said central crease line to hold said half portions together,

a pocket opening in at least one of said half portions of said sheet,

a foldable cloth bag having a bottom sewn to said sheet with said sidewalls extending substantially from the edges of said sheet,

foldable strap means for carrying said container,



said strap means having attachments to the sidewalls of said bag at positions remote from the bag portion attached to said sheet,

said bag being foldable and containable within the confines of said sheet when said two half portions are folded over and held together, and

said sheet forming the bottom portion of the bag when the bag is opened into operative position.

4,011,899

# STEEL MEMBER FOR REINFORCING RUBBER COMPOSITIONS AND METHOD OF MAKING SAME

John M. Chamberlin, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 551,224, Feb. 19, 1975, abandoned.

This application Apr. 27, 1976, Ser. No. 678,485

Int. Cl.<sup>2</sup> B60C 9/18, 9/16

U.S. Cl. 152—361 R

7 Claims



7. A pneumatic tire comprising a plurality of essentially rectangular steel reinforcing ribbons having a width in the range of 10 to 200 mils and a thickness in the range of 5 to 90 mils and an aspect ratio of at least 2 and being adhesively bonded therein along at least one plane wherein said ribbons are in parallel side-by-side relationship, said ribbons having an ultimate tensile strength of at least 200 KSI, a carbon content ranging from about 0.4% to about 0.9% and a heat treated and quenched microstructure of tempered martensite, bainite or mixtures thereof.

4,011,900

# HATCH COVER ARRANGEMENTS

Moritz Hopland, Kleppesto, Norway, assignor to MacGregor International S.A., Basel, Switzerland

Filed Feb. 4, 1975, Ser. No. 546,874

Claims priority, application Norway, Feb. 12, 1974, 461/74

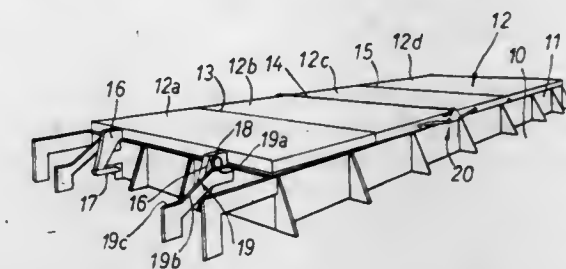
Int. Cl.<sup>2</sup> E05F 15/00

U.S. Cl. 160—188

7 Claims

- 1. A hatch cover arrangement which comprises a cover made up of cover sections directly hinged together in series and adapted to be pivoted from an active horizontal position above a hatch coaming defining a hatch opening to an inactive, upwardly swung, vertical position at least partially out-

side said opening, a cover lifting device arranged in opposite relation on each exposed longitudinal side of said cover and comprising two lifting arms in combination with not more than two lifting cylinders, said lifting arms each being hingedly connected at one end to a respective one of two adjacent cover sections and at the opposite end to a hinge arm construction common to said arms which construction is separately hinged to said adjacent cover sections and a wheel mounted for the support of said hinge arm construction be-



tween the latter and said longitudinal side of said cover at the junction between said adjacent cover sections and designed for rotation along a guide extending longitudinally of said coaming, and means for actuating said not more than two lifting cylinders of said cover lifting device to cause said lifting arms to pivot the cover sections reversibly between said inactive and active positions while rotating said wheel along said guide towards and away from one end of said coaming, the common hinge construction and associated lifting arms of each cover lifting device being arranged laterally outside said guide and the locations at which said lifting arms are hingedly connected to said construction being below the level of said guide.

4,011,901

# METHOD DETERMINING THE SUITABILITY OF METAL COMPOSITIONS FOR CASTING

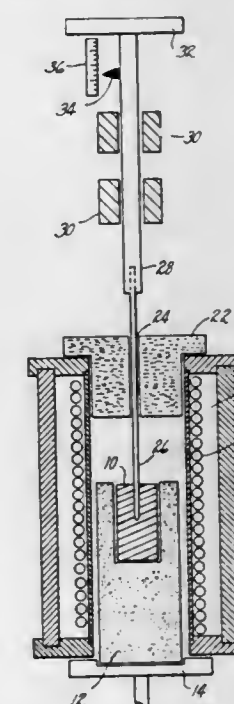
Merton C. Flemings, Cambridge, and Kenneth P. Young, Arlington, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 10, 1976, Ser. No. 665,604

Int. Cl.<sup>2</sup> B22D 1/02

U.S. Cl. 164—4

16 Claims



1. A process for determining the castability of a metallic composition comprising a metal matrix containing secondary solid and up to about 65 weight percent of discrete degenerate dendrites based upon the weight of said matrix which comprises:

- a. heating said metallic composition,
- b. contacting a probe under force to a surface of said composition,
- c. determining a parameter of distance the probe travels within said composition as a function of said force,



d. said probe and force being calibrated with samples of the metallic composition to determine the range of values for said parameter which corresponds to acceptable castability of said metallic composition prior to determining the castability of said metallic composition.

9. The process of casting a metallic composition comprising a metal matrix containing secondary solid and up to about 65 weight percent of discrete degenerate dendrites based upon the weight of said matrix which comprises:

- heating said metallic composition,
- contacting a probe under force to a surface of said composition,
- determining a parameter of distance the probe travels within said composition as a function of said force,
- casting said composition when at least about 50% of said secondary solid has become liquid and between 25 and 90% of the total composition has become liquid,
- said probe and force being calibrated with samples of the metallic composition to determine the range of values for said parameter which corresponds to acceptable castability of said metallic composition prior to determining the castability of said metallic composition.

4,011,902

## DEVICE FOR PRESSURE CASTING

Peter Koch, Niederuzwil, and Eduard Beyer, Gossau, both of Switzerland, assignors to Gebrueder Buehler AG, Switzerland

Division of Ser. No. 511,801, Oct. 3, 1974, Pat. No. 3,964,537.

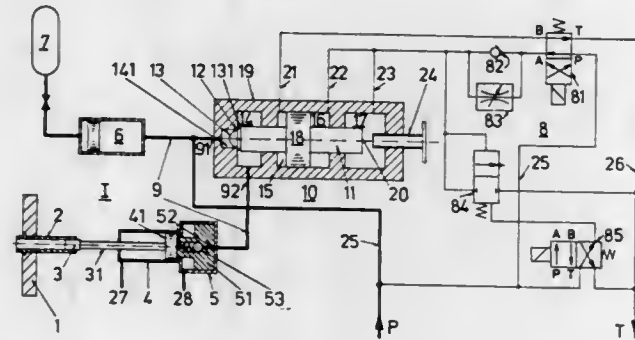
This application Jan. 15, 1976, Ser. No. 649,362

Claims priority, application Switzerland, Oct. 8, 1973, 14300/73; May 3, 1975, 6026/74

Int. Cl.<sup>2</sup> B22D 17/10

U.S. Cl. 164—314

19 Claims



1. In a pressure casting machine for casting, into a mold cavity, a melt quantity metered out in accordance with the volume of the cavity, by diminishing a space, receiving the metered quantity and extending between the casting gate, leading into the mold cavity, and a filling inlet in a two-phase manner including a shot pre-filling phase followed by a mold-filling phase, and of the type including a substantially horizontal shot sleeve leading to the mold cavity, an injection piston movable in the shot sleeve and fixedly connected to the shot piston of a shot-piston-cylinder unit, a pressure accumulator, means for controlling the pressure casting cycle, and a shot valve interposed in a fluid pressure line extending between the pressure accumulator and the shot-piston-cylinder unit, the improvement comprising, in combination, a valve seat in said shot valve between a passage chamber and a connection bore in said shot valve; a valve body mounted in said shot valve and cooperable with said valve seat; said shot valve being formed with at least one pressure chamber serving to press the valve body against the valve seat, a pressure fluid receiving tank; a volume governor adapted to connect each pressure chamber to said pressure fluid receiving tank, for relieving the pressure; said shot valve including at least one stroke chamber adapted to be subjected to fluid under pressure; means connecting one of said passage chamber and said connection bore to said pressure accumulator and the other of said passage chamber and said connection bore to said shot-piston-cylinder unit; and a volume-control body connected to said valve body and having a diameter decreasing in the direction of said connection bore and projecting into said connection bore; said

volume-control body being connected to said valve body through a cylindrical surface of said volume-control body which cylindrical surface is short relative to the stroke of said valve body and forms, in combination with said connection bore, a sealing.

4,011,903

## DAMPER FOR HEATING/COOLING SYSTEM

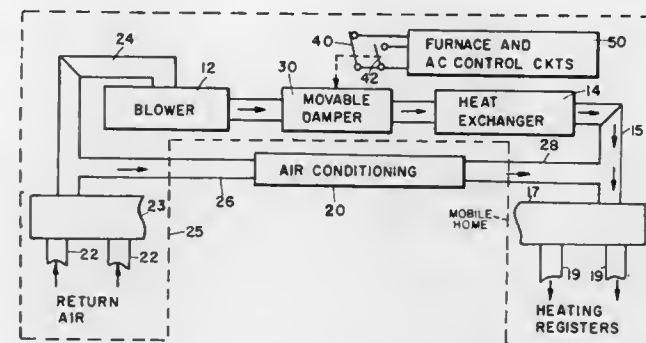
Frank Harbin, and Harry W. Slater, both of Holland, Mich., assignors to Lear Siegler, Inc., Holland, Mich.

Filed Mar. 24, 1975, Ser. No. 561,412

Int. Cl.<sup>2</sup> F24F 3/02

U.S. Cl. 165—27

3 Claims



1. A damper and control for permitting use of common ducts in a heating/cooling system in which separate air forcing means are provided for a furnace associated therewith and an air conditioning unit associated therewith, said damper and control comprising:

- a stationary plate mounted to the furnace in the air flow path and including a relatively large aperture extending through said plate;
- a sliding plate movable between a first position which restricts the aperture of said stationary plate and a second position wherein said aperture is unrestricted;
- camming means comprising an elongated cam plate with a pair of spaced flanges extending outwardly therefrom, said cam plate coupled to said sliding plate approximately parallel to the direction of motion of said sliding plate; and
- electrical switch means comprising first and second electrical switches positioned to be alternately actuated by one of said flanges of said cam plate for providing a signal usable by a furnace control circuit to deactivate the furnace when said apertures are restricted by said sliding plate.

4,011,904

## COMBINATION HEAT EXCHANGER AND BLOWER

Henry F. Hope, 3192 Huntingdon Road, Huntingdon Valley, Pa. 19006, and Steven F. Hope, 2548 Wyandotte Road, Willow Grove, Pa. 19090

Filed Apr. 2, 1974, Ser. No. 457,273

Int. Cl.<sup>2</sup> F28F 13/06

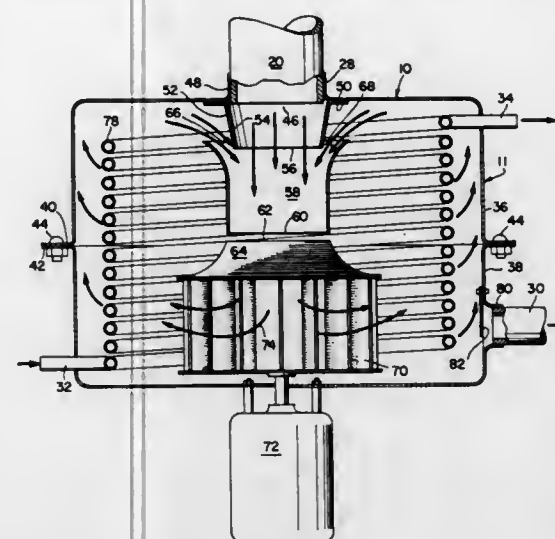
U.S. Cl. 165—108

15 Claims

1. In a combination heat exchanger and blower apparatus having a housing defining a chamber, a hot gas inlet into the chamber, said gas inlet having guide means for directing the air flow into said chamber, a gas outlet from the chamber, a helical heat exchanger coil mounted inside the chamber and adapted to convey a heat exchange medium, and a fan having its impeller rotatably mounted within the chamber, said impeller having a suction inlet for receiving a flow of gas, and a discharge outlet for discharging the gas in a lateral direction relative to the direction of gas flow into the suction inlet, the improvement comprising:

- a conduit within said housing interposed between said hot gas inlet and the suction inlet of the impeller, said conduit providing a passageway with an inlet adjacent and in alignment with the hot gas inlet into the chamber, and an outlet adjacent and in alignment with the suction inlet of the impeller, said passageway directing the flow of gases from the hot gas inlet directly to the suction inlet of the impeller, said discharge outlet of the impeller being unobstructed by

the conduit for permitting gas to be laterally propelled from the impeller directly into the chamber;



said heat exchanger coil being positioned about said conduit and said impeller to directly intercept the lateral flow of the propelled gas.

4,011,905

## HEAT EXCHANGERS WITH INTEGRAL SURGE TANKS

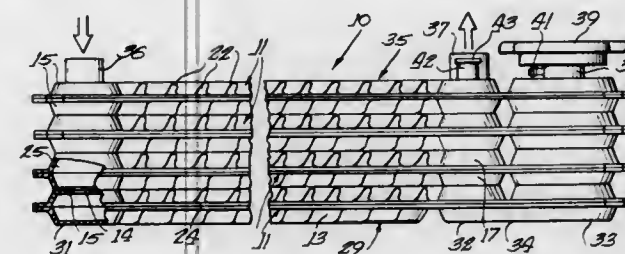
Gregory Stephen Truscott Millard, Brampton, Canada, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 18, 1975, Ser. No. 641,807

Int. Cl.<sup>2</sup> F28D 9/00; F28F 3/08, 9/22; F01P 3/22

U.S. Cl. 165—175

20 Claims



1. A heat exchange plate comprising a heat exchange portion and an extended portion, said heat exchange portion having an inlet port, an outlet port and a core portion extending therebetween defining a flow path between the ports, and a surge chamber formed in the extended portion and adapted to communicate with said flow path.

4,011,906

## DOWNHOLE VALVE FOR PARAFFIN CONTROL

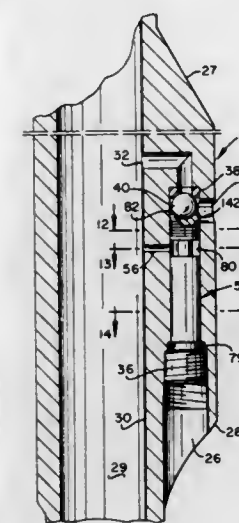
Harvey C. Alexander, 610 W. 69th St., Odessa, Tex. 79762, and Ray E. Hudson, 2422 Beechwood, Odessa, Tex. 79761

Filed Oct. 31, 1975, Ser. No. 627,477

Int. Cl.<sup>2</sup> E21B 37/00, 43/00, 43/24

U.S. Cl. 166—105

9 Claims



1. In an oil well having a production string concentrically disposed within a borehole to form an annulus therebetween,

a production pump at the end of the production string for pumping fluid up through the production string, a string of sucker rod leading down through the production string for actuating the pump from the surface of the ground, the improvement comprising:

- a tool sub, means series connecting said sub within the production string at an intermediate position thereof;
- said sub having an axial passageway formed therethrough, with the sucker rod extending through said axial passageway in spaced relationship to the side walls thereof;
- an enlargement forming part of said sub and radially extending away from said axial passageway;
- means defining a lateral passageway within said enlargement through which fluid can flow from said axial passageway into the casing annulus; means forming a working chamber which is in communication with said lateral passageway; a valve means positioned within said working chamber for controlling the flow of fluid through said lateral passageway;

said valve means includes a valve seat positioned within said lateral passageway, a valve element, a piston, a cylinder, and a spring means;

said valve element normally being forced into sealing engagement with said valve seat to prevent flow through said passageway, said piston having opposed ends with one end thereof being engaged against said valve element, said piston being reciprocally received in sealed relationship within said cylinder with said spring means being located within said cylinder and forced into engagement with the end of said piston which is opposed to said valve element, adjustment means by which said cylinder is forced towards said valve seat to thereby vary the biasing force of said spring means;

said end of said piston which is reciprocally received within said cylinder includes a reduced diameter marginal portion arranged such that said piston and cylinder form a variable chamber therebetween; means forming a bleed passageway from said axial passageway into said variable chamber; said lateral passageway includes an outlet which is formed between said piston and said valve seat so that when said valve element is displaced from said seat, flow can occur from said axial passageway, through said lateral flow passageway, including said seat, and into the annulus.

4,011,907

## KNOCKDOWN CENTRALIZER

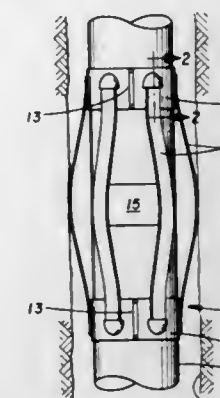
Henry J. Clay, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 19, 1975, Ser. No. 642,264

Int. Cl.<sup>2</sup> E21B 17/10

U.S. Cl. 166—241

10 Claims



1. In a knockdown centralizer of the type having at least two separate end collars with a plurality of openings therein for receiving a plurality of spring bands in non-welded interlocking fulcrumed engagement with said end collars, the improvement comprising:

- inwardly projecting lug means, attached to opposite end portions of each of said spring bands, for providing arcuate inner longitudinal interlock surfaces;
- arcuate inner longitudinal surfaces of said end collars



defining opening means, in said end collars, for receiving and longitudinally restraining said lug means while allowing rotation between said lug means and said opening means; and

c. an overlying means, connected to each of said end collars, for partially radially overlying said opening means and radially inwardly restraining said lug means within said opening means.

4,011,908

# MICELLAR FLOODING PROCESS FOR RECOVERING OIL FROM PETROLEUM RESERVOIRS

LeRoy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 376,530, July 5, 1973, abandoned, and a continuation-in-part of Ser. No. 466,540, May 3, 1974, abandoned. This application May 6, 1975, Ser. No. 575,020

Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 166—273

20 Claims

1. In the method for recovering petroleum from a subterranean reservoir in which a micellar solution is injected into the reservoir through an injection well in communication therewith, and thereafter an aqueous flooding medium is injected to drive the micellar solution towards one or more spaced production wells from which fluids are recovered, the improvement which comprises injecting into said reservoir prior to the injection of said micellar solution an aqueous alkaline alkali metal silicate pretreating solution having a  $M_2O/SiO_2$  molar ratio of between about 1 and 4, wherein M is an alkali metal atom.

4,011,909

# METHOD OF USING CEMENTING COMPOSITION HAVING IMPROVED FLOW PROPERTIES

Sally Lee Adams, Pittsburgh; Fred David Martin, McMurray, both of Pa., and Michael M. Cook, Buxford, Mass., assignors to Calgon Corporation, Pittsburgh, Pa.

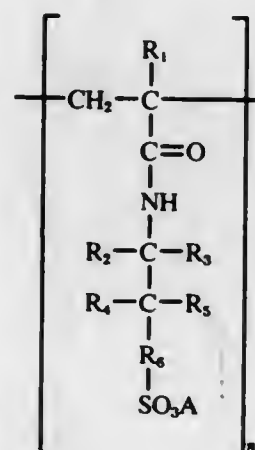
Continuation-in-part of Ser. No. 610,197, Sept. 4, 1975, which is a division of Ser. No. 465,936, May 1, 1974, Pat. No. 3,936,408. This application Jan. 29, 1976, Ser. No. 653,576

Int. Cl.<sup>2</sup> E21B 33/13

U.S. Cl. 166—293

10 Claims

1. In the method of cementing a well comprising the step of pumping an aqueous hydraulic cement slurry into place in the annular space between the well casing and the well bore-hole, the improvement comprising employing therein an aqueous hydraulic cement slurry composition having improved flow properties comprising hydraulic cement in admixture with from about 0.01 to about 5.0 percent by weight, based on weight of hydraulic cement on a dry basis, of a polyamido-sulfonic compound having recurring units represented by the following formula:



wherein  $R_1$  is hydrogen or methyl;  $R_2$ ,  $R_3$ ,  $R_4$ , and  $R_5$  are each independently selected from the group consisting of hydrogen, phenyl, straight or branched alkyl of from one to twelve carbon atoms, and cycloalkyl of up to six carbon atoms;  $R_6$  is straight or branched alkyl of one to twelve carbon atoms, cycloalkyl of up to six carbon

atoms, phenyl, or is absent; A is hydrogen, alkali metal ion or ammonium; and  $n$  is an integer of from 2 to about 100, such that the weight average molecular weight of the polyamido-sulfonic compound is from about 200 to about 10,000; and sufficient water to make a pumpable slurry which is capable of setting to form a monolithic solid.

4,011,910

# POLYMER FLOODING IN HIGH PERMEABILITY RESERVOIRS

John S. Rhudy; William B. Gogarty; Bruce L. Knight, Littleton; and James H. Fullinwider, Aurora, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed June 13, 1973, Ser. No. 369,642

Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 166—274

1 Claim

1. In a process of recovering hydrocarbon from a hydrocarbon-bearing subterranean formation having a stratum(s) which has a permeability greater than 500 md and having at least one injection means in fluid communication with at least one production means and wherein an aqueous polymer solution is injected into the stratum and displaced toward the production means to recover hydrocarbon therethrough, the improvement comprising:

- (1) injecting a first aqueous polymer solution comprised of a polymer having an average molecular weight greater than 10,000,000 and the molecular weight being sufficiently large to substantially effect a permeability reduction of the formation rock to the flow of the aqueous polymer solution, and
- (2) then injecting a second aqueous polymer solution comprised of an N-sulfohydrocarbon-substituted acrylamide polymer having an average molecular weight less than 10,000,000 and the molecular weight being sufficiently low to not substantially effect a further permeability reduction of the formation rock but the molecular weight being sufficiently large to impart increased viscosity to the second aqueous polymer solution for favorable mobility control in the displacement of hydrocarbon from the formation.

4,011,911

# PORTABLE FIRE EXTINGUISHER

Quinn W. Gow, 251 E. 157th St., Gardena, Calif. 90248

Continuation-in-part of Ser. No. 455,978, March 29, 1974, abandoned, which is a continuation-in-part of Ser. No.

257,201, May 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 217,793, Jan. 14, 1972, abandoned. This application July 11, 1975, Ser. No. 595,059

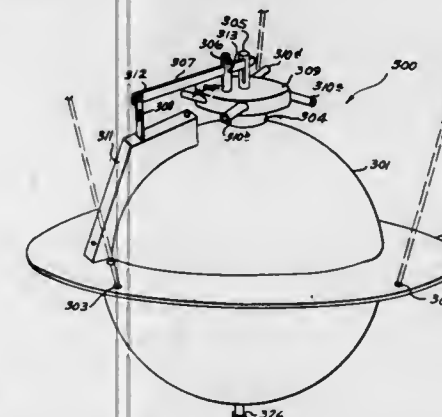
Int. Cl.<sup>2</sup> A62C 37/30

U.S. Cl. 169—29

9 Claims

1. A fire extinguisher comprising:
  - a. hollow housing means for storing a fire extinguishing composition;
  - b. rotatable means in communication with the interior of

- said housing means for dispersing said composition in response to a predetermined condition;
- c. frangible sealing means disposed between said housing means and said rotatable means;
- d. means for rupturing said frangible sealing means in response to said predetermined condition;
- e. link means formed of a fusible material normally preventing said rupturing means from rupturing said frangible sealing means;



- f. trigger means removably engaged with said link means and normally retaining said link means in said rupture preventing condition; and
- g. means for actuating said trigger means in response to said predetermined condition, to cause said trigger means to become disengaged from said link means, so that said rupturing means will be released upon the melting of said link means in response to a localized temperature condition or upon the actuation of said trigger means.

4,011,912

# UNEARTHING DEVICE FOR HARVESTING GROUND VEGETABLES, SUCH AS TURNIPS

Matheus-Willem Verplanke, IJzendijke, Netherlands, assignor to Wilhelm Stoll Maschinenfabrik GmbH, Lengede-Broistedt, Germany

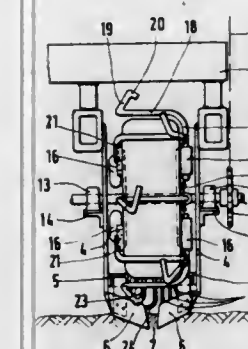
Filed Sept. 10, 1975, Ser. No. 612,207

Claims priority, application Germany, Sept. 12, 1974, 2443609

Int. Cl.<sup>2</sup> A01D 19/02

U.S. Cl. 171—101

6 Claims



1. In a digging device for a single-or-multiple-row turnip harvesting machine having at least one unearthing share which consists of two unearthing share halves, conveyor elements provided in the zone above and laterally beside the unearthing share halves, said conveyor elements being rotatably driven about an axis which lies transversely to the direction of travel and extending approximately parallel with the ground and being provided with conveyor teeth and in which each laterally define a turnip conveying channel, the conveyor teeth of said conveyor elements moving in conveying direction in the area of the unearthing shares, the improvement comprising wherein for both unearthing share halves the conveyor teeth are constructed as conveyor arms supported pivotally and spaced laterally from one another in radial bearing sleeves mounted on a common hub against the force of a spring element, whereby, starting from one bearing sleeve, the radially extending section of the conveyor arm changes at a selected

distance from the axis of the hub into an axially parallel lever arm section which extends from one hub side to the other hub side, to which lever arm section is connected a section which projects approximately radially and in the direction of rotation slightly forwardly, the outer end of said section has a catch section which is bent against the direction of rotation of the conveyor arms and slightly toward the turnip conveying channel.

4,011,913

# TILLER WITH FOLDING HANDLE AND CLUTCH CONTROL

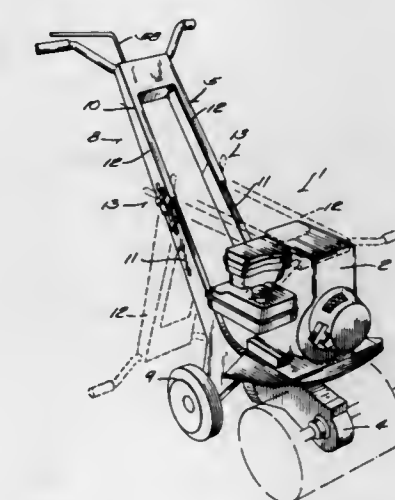
John W. Davies, III, Plymouth; Edward W. Enters, Fredonia, and Eugene A. DuPas, Plymouth, all of Wis., assignors to Gilson Bros. Co., Plymouth, Wis.

Filed Feb. 23, 1976, Ser. No. 660,127

Int. Cl.<sup>2</sup> A01B 33/02, 33/08; B62D 51/04

U.S. Cl. 172—42

10 Claims



1. In a tiller having an engine, a tine assembly, and a clutch mechanism having an operative state completing a drive connection from said engine to said tine assembly and an inoperative state interrupting that drive connection, the improvement of

a folding handle comprising: a lower elongated portion, an upper elongated portion, and connecting means joining said upper and lower portions and operative to selectively clamp said upper and lower portions against relative movement and in a position with their respective longitudinal axes generally aligned and further operative to release said upper portion for limited longitudinal movement with respect to said lower portion sufficient to release said upper portion for pivotal movement thereof relative to said lower portion.

and a clutch control connected to and operative to switch said clutch mechanism being said operative and inoperative states, said clutch control comprising:

first elongated rod means, means connecting said first rod means to said upper handle portion for movement therewith and relative thereto,

motion transmitting means operatively associated with and movable to establish the operative and inoperative states of said clutch mechanism,

and means for operatively connecting said first rod means to said motion transmitting means so that movement of said first rod means relative to said upper handle portion is transmitted to said clutch mechanism to establish selectively the operative and inoperative states of said clutch mechanism and further operative to interrupt said operative connection of said first rod means and said motion transmitting means when said upper handle portion has been moved longitudinally sufficient to release said upper handle portion for pivotal movement.



4,011,914

## FIELD MARKING SYSTEM

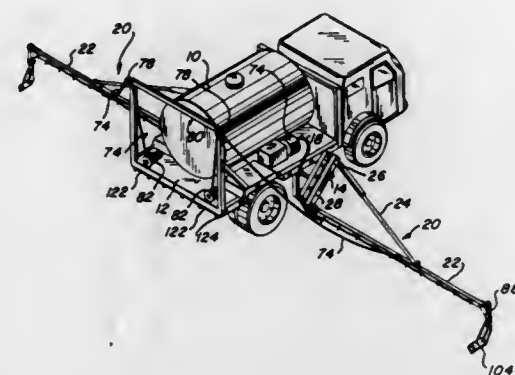
Willard Owen Elmer, P.O. Drawer C, Indianola, Nebr. 69034

Filed Nov. 22, 1974, Ser. No. 526,147

Int. Cl.<sup>2</sup> B05B 1/20; A01B 49/06

U.S. Cl. 172-126

2 Claims



1. Agricultural apparatus for use with a vehicle for delivering a material, such as a fertilizer or pesticide, along two parallel spaced field paths, one at each side of the vehicle and along another parallel central path therebetween, and for marking the outer edges of the entire path on the field so that upon the next pass of the vehicle across the field a like entire path may be supplied with the material without substantial voids or overlaps of delivered material, comprising:

- a pair of boom support members, each being rigidly affixable to an opposite side of the vehicle and between its ends,
- each boom support member being mounted for major pivotal movement about a first axis lying in a substantially vertical plane adjacent one side of the vehicle and disposed at a forwardly and upwardly median acute angle of the order of 40° to 60° relative to the forward direction of the vehicle,
- a boom supported by each of the boom support members with means securing the inner or proximate end of each boom to its support member for minor limited pivotal movement about a second axis substantially normal to said first axis,
- a field marker carried by the outer end of each boom constantly supporting each end against downward gravitational movement and as limited by the depth of a continuous furrow formed thereby in the soil,
- each marker being so constructed to engage an obstacle in the soil, such as a rock or the like, and pass over same, swinging the boom about said first axis in a rearward and upward direction about said first axis, the boom swinging forwardly and downwardly to its normal operative position after the marker has passed over the obstacle, said second axis permitting minor swinging of the boom thereabout independent of movement thereof about said first axis,
- each marker being caster mounted to the end of its boom for free rotation about a substantially vertical axis and disposed rearwardly of its caster axis to permit it to pivotally trail the boom and follow a curved path equidistant from a curved path of the vehicle,
- fixed material distributing means rigidly affixable to the rear end of the vehicle substantially parallel to the booms and of a length substantially that of the distance between the inner ends of the booms for distributing the material to said central path,
- said first axes permitting the booms to be swung to transport positions substantially normal to their operative positions in which they are disposed at upwardly and rearwardly angles of said 40° to 60°.

4,011,915

## TOOL SHANK MOUNTING ASSEMBLY

Charles W. Anderson, Kewanee, Ill., assignor to Chromalloy

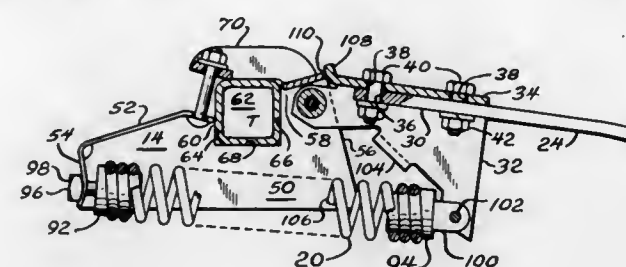
American Corporation, St. Louis, Mo.

Filed Nov. 10, 1975, Ser. No. 630,418

Int. Cl.<sup>2</sup> A01B 61/04

U.S. Cl. 172-265

6 Claims



1. In an agricultural implement having a tool bar of generally rectangular cross section to which is removably mounted a spring-cushioned tool shank assembly, the improvement wherein the assembly comprises first and second units, the first unit embodying a shank support member having a pair of spaced vertical sidewalls joined by an integral top wall having a lip portion over the forward end of the shank support member, said top wall containing a generally rectangular shaped opening intermediate its forward and rear ends and said side walls each having a cutout in the upper edge thereof below said opening, said cutouts and opening together defining a tool bar receiving recess in which the forward and rear side edges are spaced apart to closely engage the tool bar received therein, the rear edges of said cutouts having a height approximating the corresponding cross sectional dimension of said tool bar and the forward edges of said cutouts having a height approximately at least half said cross sectional dimension, a clamp arm having a forward portion overlying said recess and a depending rear portion having spaced walls straddling the side walls of the shank support member behind said cutouts, a pivot pin pivotally connecting said straddling walls of the clamp arm to the shank support member behind its tool bar receiving recess, and bolt means releaseably securing the forward end of the clamp arm to the top wall of the shank support member forwardly of said recess, the underside of the forward portion of the clamp arm snugly engaging the top surface of the tool bar upon tightening of the bolt means to rigidly secure the assembly to the tool bar, first unit further embodying a channel-shaped shank holding member having a forwardly inclined base wall and spaced generally parallel depending sides, said spaced sides of the shank holding member having forward portions extending through the open rear end of the shank support member and pivotally mounted on said pivot pin, and a tension spring at least partially confined within the interior of the shank support member below its tool bar receiving recess, one end of said tension spring being fixed to the lip portion of the top wall forwardly of the tool bar receiving recess and below the pivot pin on which the shank holding member swings, the other end of the tension spring being fixed to the lower end of the shank holding member below and behind said pivot pin, comprising a tool shank embodying a leaf spring having a forwardly curved lower end portion to which is replaceably connected a soil engaging tool point, said tool shank having a straight end portion which is detachably bolted to the base wall of the shank holding member of the first unit, the sides of the shank holding member of the first unit having forwardly disposed outwardly turned flange portions which engage with the rear edge of the shank support member sidewalls below and behind the pivot pin under the tension of the spring member to define the working position of the soil engaging tool point, the forward end of the shank holding member base wall constituting a second stop spaced above said pivot pin which engages the rear edge of the top wall of the shank support member to limit the angular swing of the shank and its soil engaging tool point, said second unit including the tool shank and its soil engaging tool point being readily detachable from the first unit for ready replacement without disconnecting the spring or disturbing the relationship of the members of the first unit.

4,011,916

## CHISEL PLOW MOUNT

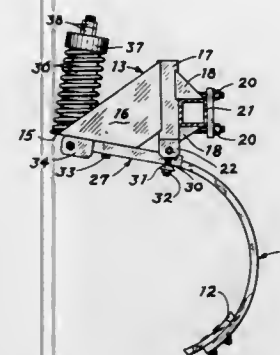
Archie Neal, and Paul Moore, both of Garfield, Wash., assignors to Love Company, Garfield, Wash.

Filed July 11, 1975, Ser. No. 595,020

Int. Cl.<sup>2</sup> A01B 65/00

U.S. Cl. 172-710

7 Claims



1. A chisel plow mount for agricultural implements, comprising:

- a forwardly protruding mounting bracket adapted to be fixed to a tool bar;
- a transverse horizontal pivot shaft fixed across the lower portion of the mounting bracket;
- a forwardly protruding shank retainer in the form of a downwardly-facing channel with longitudinal flanges projecting downward from a central web, the web having a pivotal connection with said pivot shaft at its upper surface adjacent the rearward end of the shank retainer;
- a bent chisel plow having a forwardly projecting shank at its upper end overlying the web within the area bounded by said flanges;
- a transverse clamping bar across the lower surfaces of the flanges of the shank retainer and the shank radially below the pivot shaft;

means for fixing the forward end of the shank to the shank retainer at a position forward from the pivot shaft;

upright compression spring means supported on the mounting bracket at a location above the forward end of the shank retainer;

and tension means operatively connected between the forward end of the shank retainer and the upper end of the upright compression spring means for resisting downward movement of the forward end of the shank retainer by the compression of said compression spring means.

4,011,917

## PROCESS AND UNIVERSAL DOWNHOLE MOTOR FOR DRIVING A TOOL

Wladimir Tiraspolsky, 69 au VichnBrenson, 92130 Issy-les-Moulineaux, France, and Roger Francois Rouviere, Quartier les Ribet, 13770 Venelles, France

Continuation of Ser. No. 498,701, Aug. 19, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,494

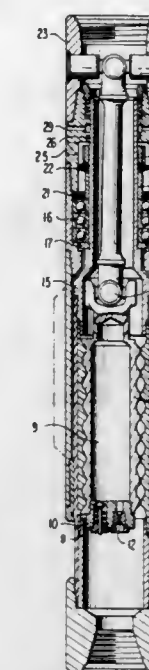
Int. Cl.<sup>2</sup> E21B 3/12

U.S. Cl. 175-107

18 Claims

1. Downhole motor for driving an earth-boring tool, supported from a drill stem and comprising a helicoidal shaft and a tubular body having a helicoidal lining, said shaft and body comprising two helicoidal gears located within each other, comprising K and K+1 teeth respectively, arranged for creating an encapsulation of a given pitch direction, said shaft being located within said tubular body, means for mounting said shaft in order that it is angularly fixed, but free to undergo a nutating movement, a casing rigidly secured to said drill stem, upper and lower radial bearing means and thrust bearing

means for rotatively mounting said body within said casing, means for connecting said tool with said rotating body, and



means for supplying a driving fluid between said shaft and said tubular body.

4,011,918

## STABILIZER FOR DRILL STRINGS

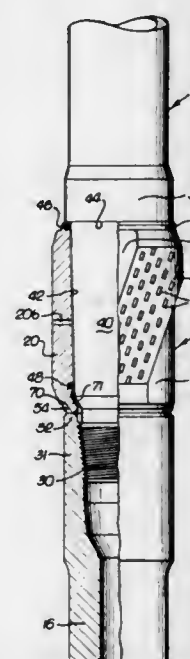
Rainer Jürgens, Celle, Germany, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Jan. 21, 1976, Ser. No. 650,897

Int. Cl.<sup>2</sup> E21B 17/10; E21C 9/00

U.S. Cl. 175-325

16 Claims



1. A rotary drill string stabilizer apparatus for use in rotary drilling of a bore hole; comprising a body structure having first connecting means adapted to secure such structure in a tubular running string, said body structure including a body member having a conical outer surface and a passage therethrough through which drilling fluid from the tubular running string can flow, a stabilizer comprising a stabilizer sleeve having a conical inner surface matching the conical configuration of said conical outer surface of said body member, said stabilizer sleeve being mounted on said body member with said conical outer and inner surfaces in friction contact, longitudinally spaced peripheral seals preventing fluid leakage between said inner and outer surfaces from the region between said seals, means for conducting fluid under pressure to the region between said conical inner surface and conical outer surface and between said seals to expand said sleeve and enable said sleeve to be moved relatively longitudinally along said conical outer surface to shrink-fit said sleeve on said body member upon relieving of the fluid pressure, said sleeve having a projecting



portion at the small diameter end of said conical inner surface extending laterally inwardly toward the axis of said body member, said body member having second connecting means at the small diameter end of said conical outer surface, a companion member secured to said second connecting means and bearing against said projecting portion to exert a compressive force thereon urging said sleeve in a direction toward the large diameter end of said conical outer surface, the co-engaging bearing surfaces of said projecting portion and said companion member being of substantial radial extent and disposed substantially normal to the axis of said body member, stabilizer sleeve, and companion member.

#### 4,011,919 TIRE ROLLER

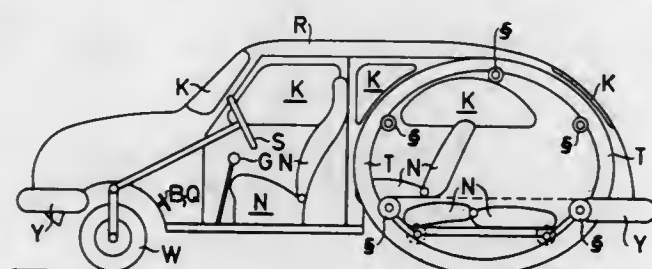
Theodore Oskar Groeger, 2 Collamore Circle, West Orange, N.J. 07052

Continuation-in-part of Ser. No. 444,007, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 343,732, April 19, 1973, abandoned. This application Sept. 25, 1975, Ser. No. 616,574

Int. Cl.<sup>2</sup> B60K 1/00, 3/00

U.S. Cl. 180-1 R

32 Claims



1. A vehicle comprising: a) a chassis having on opposite sides at least three bearing rolls rotatably mounted on substantially horizontal axes, which are distributed over substantially the periphery of said chassis-sides and connected therewith; b) a pair of annular, elastic running tires, the outer surface of each tire contacting the ground in use and the inner surface contacting said rolls at each chassis-side, which tires are so deformed by said rolls when bearing the vehicle's weight on the ground, that each tire has several different radii of curvature, all of which remain larger than any of the rolls' radii of curvature, and the rolls' distance above the ground is larger than the tires' thickness; c) at least one stabilizer contacting the ground in use, which is resiliently and rotatably connected with another side of said chassis; d) power means operatively connected with said vehicle and e) braking means operatively connected with said vehicle and only a lower front bearing roll, whereby, when said tires are braked, the area of said outer tire surface which contacts the ground is increased.

#### 4,011,920

SYNCHRONIZED VEHICLE FLUID DRIVE SYSTEM  
Donald L. Bianchetto, Coal City, and Jesse L. Field, Jr., Braidwood, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 25, 1975, Ser. No. 607,511

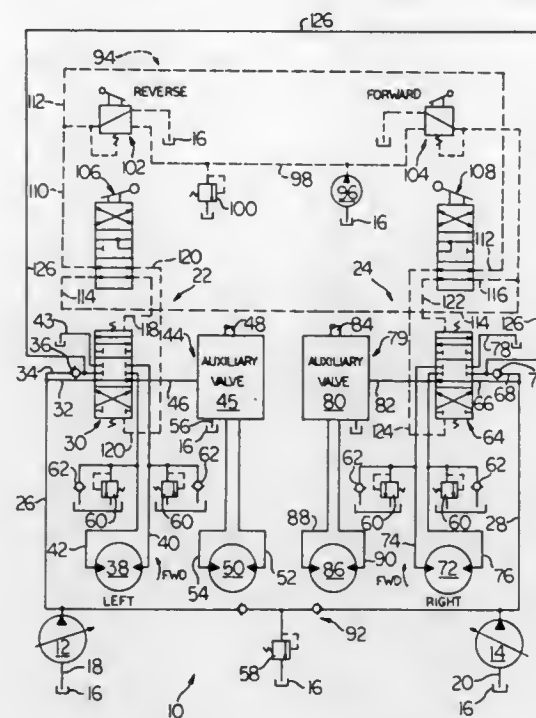
Int. Cl.<sup>2</sup> B62D 11/04

U.S. Cl. 180-6.48

5 Claims

1. A synchronized vehicle fluid drive system comprising: a vehicle; a pair of motors operative to drive the opposite sides of said vehicle; a pair of pressure supplying fluid pumps; a pair of open loop circuits individually communicating one of said pumps with one of said motors through an open center distributor valve for operation thereof, each of said circuits also having a supply conduit with a load check valve therein upstream of said distributor valve, and a synchronizing line disposed in fluid communication between said supply conduits of said open loop circuits

connectably intermediate each of said load check valves and said distributor valves at the opposite ends thereof for



equalizing fluid flow to said motors and to assure straight line travel of said vehicle when desired.

#### 4,011,921

APPARATUS FOR GUIDING WARM AIR OBTAINED AFTER COOLING OF AN ENGINE IN A MOTORIZED TWO-WHEELED VEHICLE

Tuneaki Sakamoto, Shiki, and Takeshi Hashimoto, Tachikawa, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

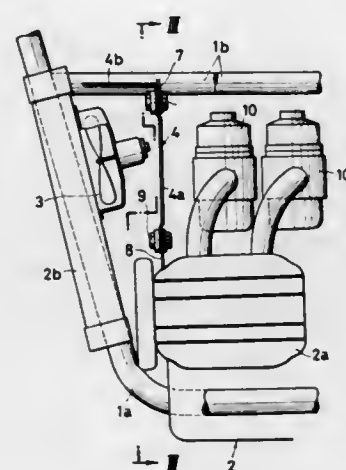
Filed Aug. 29, 1975, Ser. No. 609,059

Claims priority, application Japan, Sept. 4, 1974, 49-105599

Int. Cl.<sup>2</sup> B62D 63/04

U.S. Cl. 180-33 R

6 Claims



1. In a two-wheeled vehicle having a body, an internal combustion engine mounted on the body, and a blower means for cooling the engine, an improvement comprising a guide plate adjacent the blower means to direct warm air obtained after cooling outside the vehicle body, said engine being of water-cooled type and including a radiator mounted on the body in front of the engine, said blower means being on said radiator at the rear thereof in adjacent facing relation with said engine, said guide plate being between said engine and said blower means, said guide plate including a vertical portion rearwards of said blower means and a horizontal portion extending above said blower means, the body having spaced pipes above the engine, said vertical portion of the guide plate extending downwardly from the pipes, said horizontal portion extending forwardly said pipes.

#### 4,011,922

MUFFLER CONSTRUCTION

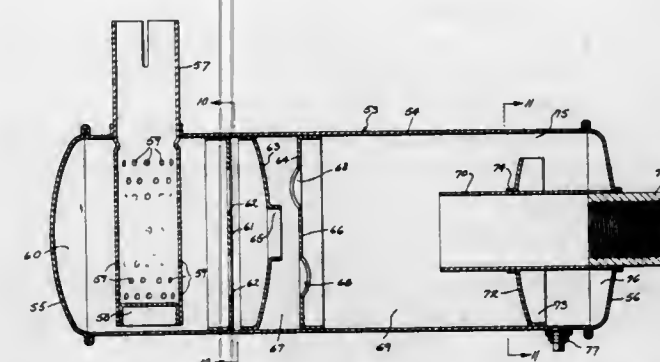
Gary Dennis Goplen, Monona, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed July 18, 1975, Ser. No. 597,030

Int. Cl.<sup>2</sup> F01N 1/08, 3/06

U.S. Cl. 181-57

11 Claims



1. A muffler for an internal combustion engine, comprising a housing having an exhaust gas inlet and an exhaust gas outlet, a pair of baffle members disposed in generally parallel spaced relation within said housing with the space between said baffle members defining an intermediate chamber, the upstream baffle member having an opening for the passage of exhaust gas and said downstream baffle members having a closed portion disposed in alignment with said opening in the upstream baffle member, the spacing between said baffle members is less than the diameter of said opening, and outlet means disposed in said downstream baffle member between said closed portion and the periphery of said downstream baffle member, said outlet means providing communication between said intermediate chamber and said outlet.

#### 4,011,923

MOBILE SEISMIC ENERGY SOURCE

Herbert Talke, Laatzen; Gerhard Müller, Sehnde, and Jürgen Schmidt, Bolsehle, all of Germany, assignors to Prakla-Seismos GmbH, Hannover, Germany

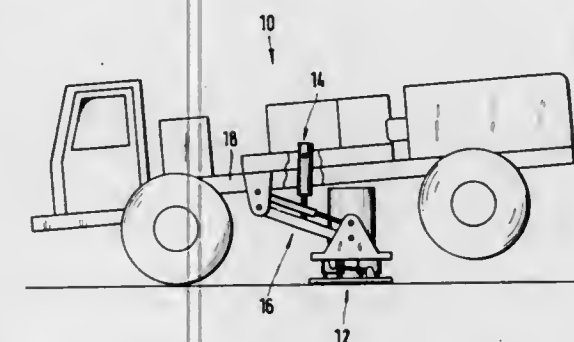
Filed Sept. 9, 1975, Ser. No. 611,672

Claims priority, application Germany, Mar. 6, 1975, 2509704

Int. Cl.<sup>2</sup> G01V 1/04

U.S. Cl. 181-114

10 Claims



1. A vehicular system for imparting seismic energy to a ground surface, the system defining a vehicular mass and comprising:

- A vehicle chassis for supporting front and rear axles;
- A vibrator type seismic energy source having a base plate for imparting seismic energy to the ground surface;
- An under-chassis frame pivotally mounted to said chassis intermediate said axles for supporting said energy source under said chassis and intermediate said axles, the frame including at least one arm and a corresponding bracket, the arm having first and second ends pivotally connected to the chassis and to the bracket respectively, wherein the bracket is supportably coupled to the energy source and provides therefor a pivot point with said second end; and
- A lifting mechanism adjustably extending under said chassis, including only a single, fluid operated jack having

one end pivotally connected to the chassis and another end pivotally coupled to the one arm intermediate the bracket and the chassis, for advancing the frame to positions relatively away-from and adjacent-to the chassis to thereby advance the base plate into and out of ground engagement respectively, whereby pressure from at least part of said vehicular mass is transferred to said base plate when the frame is in said away-from position.

#### 4,011,924

DEVICE FOR PRODUCING MECHANICAL WAVES  
Maurice Barbier, Ousse, France, assignor to Societe Nationale des Petroles d'Aquitaine, Paris, France

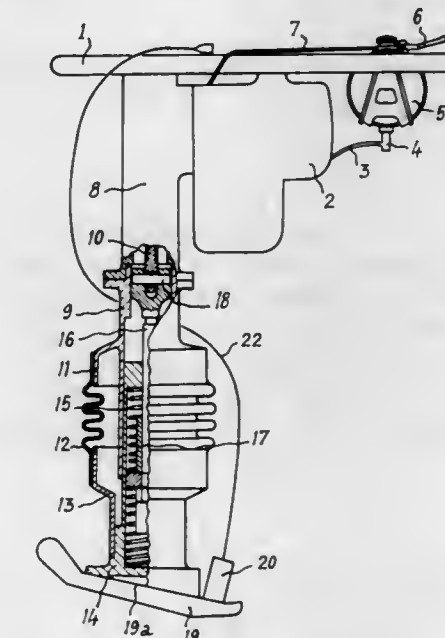
Filed Oct. 1, 1974, Ser. No. 511,013

Claims priority, application France, Oct. 15, 1973, 73.37807

Int. Cl.<sup>2</sup> G01V 1/14

U.S. Cl. 181-121

14 Claims



1. A seismological apparatus for generating terrestrial compressions having variable time intervals therebetween comprising:

- a percussion mass,
- means for driving said percussion mass to strike a ground surface intermittently thereby causing impacts at a repetition rate in the range of 0.5 to 100 Hz,
- said impacts being terrestrially transmitted as waves of compression,
- means for varying the repetition rate of said impacts, said means operable during the intervals between said impacts, and
- first sensing means for providing a signal representing times of occurrences of said impacts.

#### 4,011,925

STETHOSCOPE

Alan French, Warwick, and George Winthrop Torrey, West Barrington, both of R.I., assignors to Avid Corporation, East Providence, R.I.

Filed Jan. 23, 1976, Ser. No. 651,640

Int. Cl.<sup>2</sup> A61B 7/02

U.S. Cl. 181-131

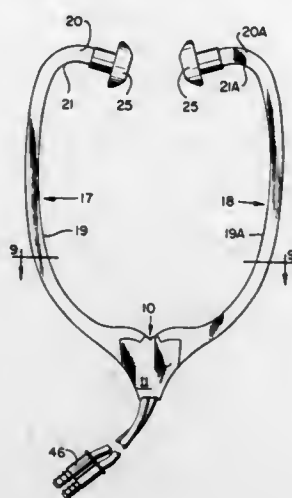
5 Claims

1. A stethoscope fabricated as a unitary structure comprising:

- a body having a left wing and a right wing,
- a left arm provided with a channel having two walls,
- friction joint means between one of said two walls and said left wing,
- the other of said two walls providing hinge attaching means between said left arm and said body,
- a right arm provided with a channel having two walls,



friction joint means between one of said last mentioned two walls and said right wing, the other of said last men-



tioned two walls providing hinge attaching means between said right arm and said body.

4,011,926

## STABILITY STEPLADDERS

Clayton E. Larson, Brooklyn, N.Y., and Edwin H. Lemp, Bel-lows Falls, Vt., assignors to White Metal Rolling & Stamping Corporation, Brooklyn, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,391

Int. Cl.<sup>2</sup> E06C 5/36, 7/42

U.S. Cl. 182-107

6 Claims



1. A stepladder having high stability against lateral tilting comprising:

- a front section including a pair of side rails with a bottom step and a plurality of other spaced apart steps fixed between the side rails;
- a rear propping section including a pair of side rails and brace members for holding the side rails in spaced apart relation, said rear propping section being pivoted to said front section;
- a pair of channel members each comprising a central web and a pair of integral front and rear webs extending normally from the central web, said front and rear webs being longer than the central web forming a pair of lugs upon one end of each channel member;
- the inside distance between said front and rear webs of said channel members being substantially equal to the width of the side rails of said front section;
- a padded foot member fixed transversely of each channel member at the end opposite to said lugs;
- said channel members being pivoted by said lugs to said side rails above said bottom step to swing outwardly from said side rails between a closed position and an extended position, the pivot point for said channel members being such that said padded foot members extend in both said closed and said extended positions beyond the lower end of said front section side rails;

front brace members angled at each side of said front section between the forward edge of each side rail and the forward edge of said bottom step;

rear brace members angled at each side of said front section between the rearward edge of each side rail and the rearward edge of said bottom step;

a pair of front and a pair of rear slotted arms pivoted upon said front and rear webs respectively of each channel member;

capped lugs carried by each of said front and rear brace members, said lugs extending through the slots in said arms to limit the movement of said channel members in the extended position, and

moveable stop members to engage at least one of said pairs of slotted arms to lock said channel members in the extended position.

4,011,927

## LONG TIME PERIOD ASTABLE MULTIVIBRATOR CIRCUIT WITH INDEPENDENTLY ADJUSTABLE TIME CONSTANTS

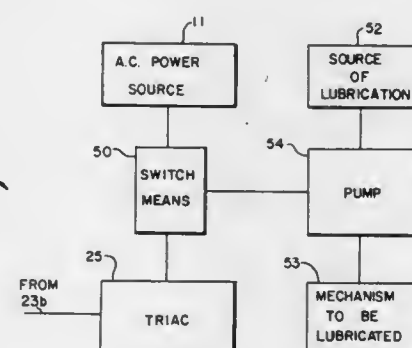
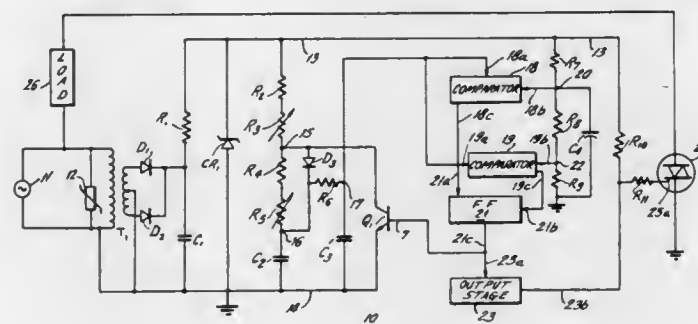
Carl H. Smith, Spring Valley, N.Y., assignor to Auto Research Corporation, Rochelle Park, N.J.

Filed Mar. 7, 1975, Ser. No. 556,204

Int. Cl.<sup>2</sup> B61D 15/00; H03K 5/13

U.S. Cl. 184-26

11 Claims



1. Electronic solid state dual timer means for activating load means at periodic intervals comprising:
- a capacitor;
  - electronic switch means;
  - first comparator means coupled to said capacitor for activating said switch means when said capacitor discharges to a first predetermined voltage level;
  - second comparator means coupled to said capacitor for deactivating said switch means when said capacitor charges to a second predetermined level higher than said first predetermined level;
  - charging means coupled to said switch means for charging said capacitor at a first rate when said switch means is activated, said charging means including a first resistor means for controlling the charging rate of said capacitor;
  - discharging means coupled to said switch means for discharging said capacitor at a second rate when said switch means is deactivated, said discharging means including second resistor means for controlling the discharging rate of said capacitor;
  - said first and second resistor means having different magnitudes of ohmic value.

4,011,928

## ELEVATOR SYSTEM

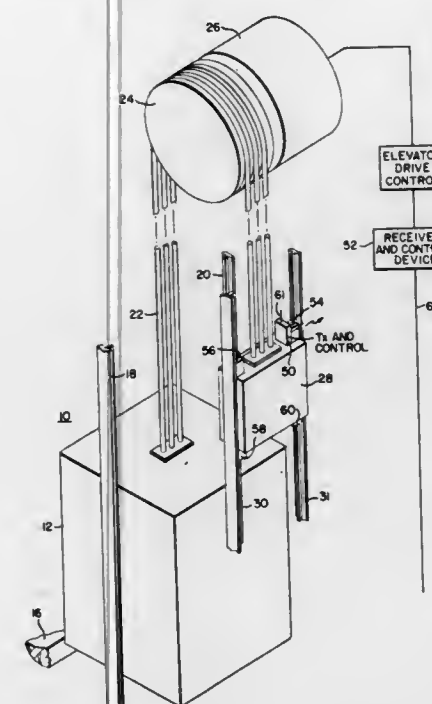
Richard M. Spear, Jersey City, and Lawrence P. Tosato, Millburn, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 6, 1975, Ser. No. 584,431

Int. Cl.<sup>2</sup> B66B 13/24

U.S. Cl. 187-29 R

9 Claims



1. An elevator system, comprising:
- a movable component,
  - motive means for driving said movable component,
  - guide means for guiding said movable component in a vertical path,
  - detector means operable from a first to a second condition in response to a predetermined horizontal movement of said movable component,
  - transmitter means carried by said movable component, said transmitter means providing an output signal only when said detector means is in its first condition,
  - and receiver means remote from said movable component responsive to said transmitter means, said receiver means including control means operable from a first to a second condition when said receiver means fails to receive an output signal from said transmitter means,
  - said control means modifying the operation of said motive means when it is in its second condition.

4,011,929

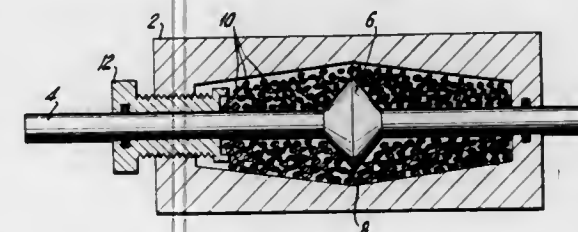
DAMPENING DEVICE USING A SILICONE RUBBER  
Edward M. Jeram, Burnt Hills, and Richard A. Striker, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed May 2, 1975, Ser. No. 573,827

Int. Cl.<sup>2</sup> F16F 9/30

U.S. Cl. 188-268

11 Claims



1. In a damper comprising a closed chamber, a movable piston rod extending through said chamber, an enlarged piston head on said rod, a compressible solid mass under pressure and located within said chamber for producing a damping

force on said rod and piston head, a bypass means associated with said piston head providing for transfer of said compressible solid mass therethrough, and a means for varying the pressure of the compressible solid mass in said chamber within a pressure range required to produce damping on said rod, the improvement which comprises utilizing as said solid, an unfilled silicone rubber composition produced by curing a composition comprising 0.1-2.0 parts of peroxide catalyst to 100 parts of a polymer composition consisting of 95-99.5 mole % of dimethyl siloxane units, 0.05-2.0 mole % of methyl vinyl siloxane units, 0.001-5.0 mole % of trimethyl siloxane units, and said silicone rubber composition being fragmentable into particulate form after curing.

4,011,930

## MEANS TO PRESENT LUBRICATING AND COOLING FLUID TO FRICTION MATERIAL IN A WET BRAKE SYSTEM

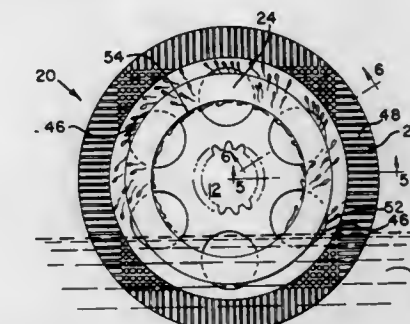
Robert R. Coons, Indian Head Park, and Richard G. Hennessey, Oak Lawn, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 12, 1976, Ser. No. 676,098

Int. Cl.<sup>2</sup> F16D 13/72, 65/853

U.S. Cl. 192-113 B

15 Claims



1. In a friction disc having a core plate with a centrally disposed axle receiving aperture and frictional material bonded thereto for use in a fluid environment the improvement comprising:
- a fluid baffle ring, being a thin flat ring of inelastic material significantly wider than its own thickness, bonded face-to-face to the core plate of the friction disc inboard of the friction material.

4,011,931

## BILL ESCROW AND STORAGE APPARATUS FOR VENDING MACHINE

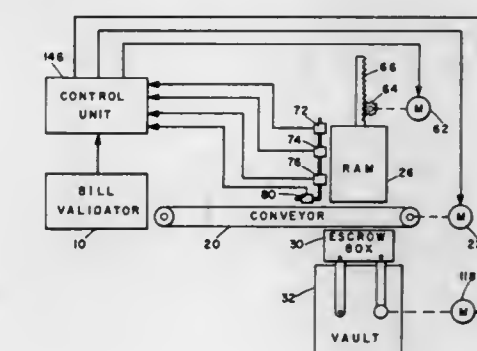
James Kenneth Wyckoff, San Diego, Calif., assignor to Cubic-Western Data, San Diego, Calif.

Filed Feb. 13, 1976, Ser. No. 657,882

Int. Cl.<sup>2</sup> G07F 7/04

U.S. Cl. 194-4 C

12 Claims



1. Bill escrow and storage apparatus, comprising:
- a validator unit for validating paper money bills and having an outlet through which each accepted bill is ejected;
  - a track attached to said validator unit to receive bills therefrom, said track being elongated and having a handling station spaced from the validator unit;



conveyor means mounted in said track for moving a bill from the validator unit to said handling station; an escrow box mounted adjacent said handling station; said escrow box having retaining means for holding a bill therein; transfer means mounted at said handling station for transferring a bill from said track into said escrow box; a vault mounted adjacent said escrow box; actuating means coupled to said transfer means for selectively transferring a bill into said escrow box and from said escrow box into said vault; ejection means coupled to said escrow box for selectively ejecting a bill therefrom; said track has an opening therein at said handling station; said transfer means comprising a ram reciprocally movably mounted on the side of the track opposite said escrow box; and said actuating means driving said ram through the opening to push a bill from said track into said escrow box.

4,011,932

## SERIAL PRINTING DEVICE

Horst Wurscher, Wilsdorf, and Horst-Werner Bach, Kirburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

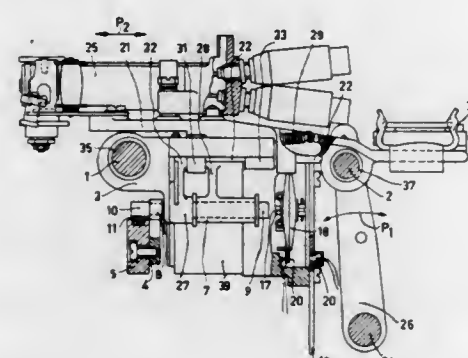
Filed July 23, 1975, Ser. No. 598,178

Claims priority, application Germany, Aug. 13, 1974, 2438735

Int. Cl.<sup>2</sup> B41J 19/00

U.S. Cl. 197—82

10 Claims



1. In a serial printing device, an improved mounting and transport mechanism for a printing head, comprising first and second elongated guide rails parallel to each other, a rack extending parallel to said first guide rail across an entire width of printing, a first frame, means for transporting said first frame, comprising an electric motor mounted on said first frame, a drive shaft extending transversely to said first guide rail, and a pinion on the shaft, said pinion engaging said rack, a second frame slidably mounted on at least said second guide rail for motion along said second guide rail, means for supporting said second frame with respect to said first guide rail, means for mounting a printing head on said second frame, and means for interconnecting said first and said second frames for relative motion, comprising a bearing bushing mounted in one of the frames, and a pin rigidly mounted in the other frame transversely to said guide rails and slidably fitted in said bearing bushing.

4,011,933

## RIBBON DRIVE MEANS

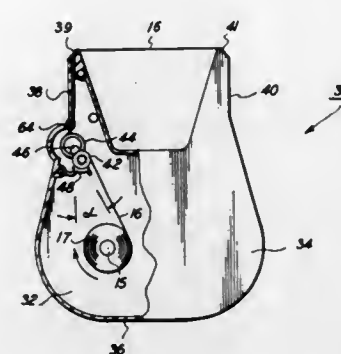
Jack L. Kern, Arlington, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1975, Ser. No. 619,547

Int. Cl.<sup>2</sup> B41J 33/26

U.S. Cl. 197—151

10 Claims



1. In a ribbon cartridge having a top cover section, a bottom cover section, a sidewall connecting section, a ribbon supply means, a ribbon tension control means, and a ribbon take-up means, the improved ribbon drive means comprising:

a rotatably supported drive roller; a ring containing an inside opening; a post positioned within the inside opening of the ring, the post further positioned in such proximity to the drive roller that a nip is formed between an outside surface of the ring and an outside surface of the drive roller; said post having a predetermined diameter sufficiently less than a predetermined diameter of the inside opening of the ring to permit the ring to pivotally move with respect to the nip as well as rotate in cooperation with the drive roller;

said ribbon, as it passes from the ribbon supply means to the ribbon take-up means, passes around a predetermined portion of the outside surface of the ring and then through the nip, whereby said ribbon, upon rotation of the drive roller, causes the ring to pivot with respect to the nip causing a wedging action between the ring and the drive roller at the nip and against the ribbon at the nip, with the rotational movement of the drive roller and the ring cooperating to advance the ribbon through the nip.

4,011,934

## INK RIBBON AND PIVOTABLE HIGH SPEED PRINTING DEVICE MOVABLE FROM PRINTING TO NON-PRINTING POSITION

Bernt Inge Lennart Ploby, Jarfalla, and Erik August Wilhelmsson, Stockholm, both of Sweden, assignors to Facit Aktiebolag, Atvidaberg, Sweden

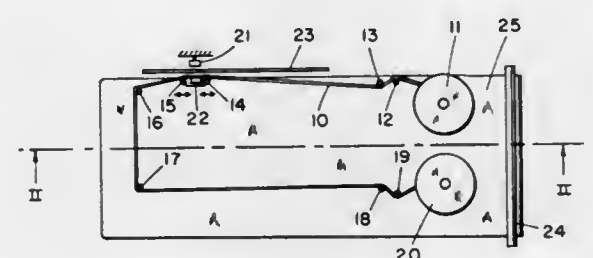
Filed Oct. 30, 1975, Ser. No. 627,084

Claims priority, application Sweden, Nov. 4, 1974, 7413814

Int. Cl.<sup>2</sup> B41J 33/02

U.S. Cl. 197—154

5 Claims



1. In an ink ribbon arrangement for a high speed printer having a printing device movable in a given direction with respect to a recording medium, a pair of spools, an ink ribbon extending between said spools, and ribbon guides positioned

to direct said ink ribbon between said spools in a path which extends past said printing device; the improvement comprising a first means mounting said spools and said ribbon guides to form a single frame unit, and a second means pivoting said frame unit for rotation about an axis perpendicular to said given direction, said second means including means including an electromagnet mounted and arranged to move said frame unit to a printing position by rotation about said axis, with the lengthwise direction of said ribbon extending inclined to said given direction whereby said printing device passes substantially diagonally over said ink ribbon during printing, and in a non-printing position by rotation about said axis whereby the portion of said ink ribbon extending along the recording path of said printing device assumes a position parallel to said given direction.

4,011,935

## SORTING MACHINES

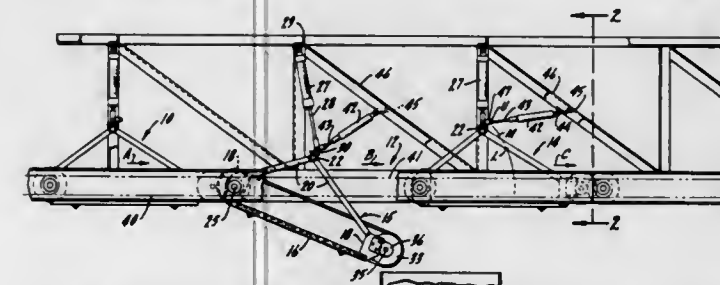
John P. Massey, 421 Ruby St., Clarendon Hills, Ill. 60514

Filed Sept. 8, 1975, Ser. No. 611,146

Int. Cl.<sup>2</sup> B65G 47/64

U.S. Cl. 198—365

6 Claims



1. A sorting conveyor apparatus for sorting a variety of articles of indefinite configuration comprising a tandem series of sequentially arranged combination conveyordischarge stations, each station comprising:

a station frame mounted for movement in two opposed directions between a conveyor position, in which the frame is aligned with the adjacent stations both fore and aft, to convey articles therebetween, and a discharge position in which one end of the frame is displaced from the adjacent station to discharge an article entering the station;

a conveyor section mounted on the frame and extending longitudinally for substantially the full length of the station frame;

actuator means for moving the frame between its conveyor position and its discharge position;

and shock absorber means being connected at one end to the frame and at the other end to a fixed support, said shock absorber means having an extendible and compressible element constructed to offer substantially no resistance to frame movement during initial movement out of one position and up to a predetermined point whereafter said element retards movement of the frame until the other position is reached, in both directions.

4,011,936

## CONVEYOR POSITIONING STRUCTURE FOR LOADING AND CONVEYING MACHINES

Henry C. Hall, Green Bay, Wis., assignor to Northwest Engineering Company, Green Bay, Wis.

Filed Jan. 2, 1976, Ser. No. 646,044

Int. Cl.<sup>2</sup> B65G 41/02

U.S. Cl. 198—517

16 Claims

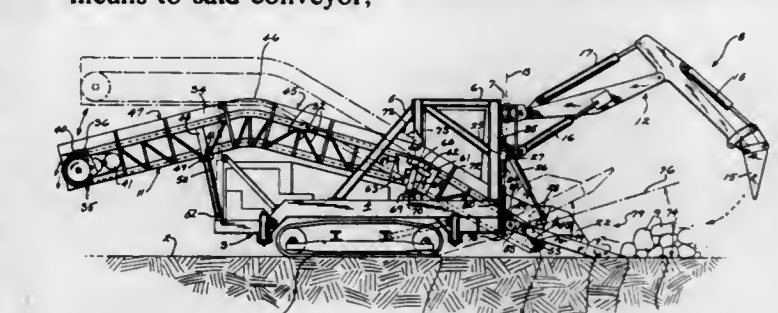
1. In a machine for loading and conveying loose material such as rocks and the like:

a. transport means for supporting and moving said machine on the ground,

b. a machine frame carried by said transport means,

c. material gathering means connected to the front portion of said frame,

d. an elongated conveyor extending from the front to the rear of the machine,



f. means mounting the rear portion of said apron for pivotal movement about a transverse horizontal axis,

g. means pivotally mounting the front portion of said conveyor to said apron,

h. and means for vertically adjusting said apron so that the said front portion of said conveyor is simultaneously vertically adjusted.

4,011,937

## APRON ATTITUDE ADJUSTMENT FOR LOADING AND CONVEYING MACHINES

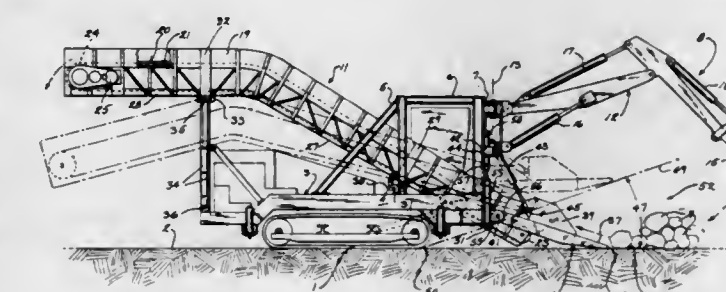
Sheldon J. Brandtjen, Green Bay, Wis., assignor to Northwest Engineering Company, Green Bay, Wis.

Filed Jan. 2, 1976, Ser. No. 646,011

Int. Cl.<sup>2</sup> B65G 41/02

U.S. Cl. 198—517

12 Claims



11. In a machine for loading and conveying loose material such as rocks and the like:

a. transport means for supporting and moving said machine on the ground,

b. a frame carried by said transport means,

c. material gathering means mounted to the front portion of said frame,

d. an elongated inclined conveyor extending from the front to the rear of the machine,

e. an apron disposed at the front of the machine and extending forwardly from adjacent the front portion of said conveyor for transfer of material from said gathering means to said conveyor,

f. means mounting the rear portion of said apron for pivotal movement about a transverse horizontal axis,

g. means for pivoting said apron about said axis for selective engagement or disengagement of the front apron portion with the ground,

h. and means for adjusting said mounting means and said axis vertically.

4,011,938

## SUSPENSION IDLER

Arthur F. Kain, 1726 Virginia Court, Lakeland, Fla. 33803

Filed Sept. 8, 1975, Ser. No. 611,312

Int. Cl. B65g 15/08

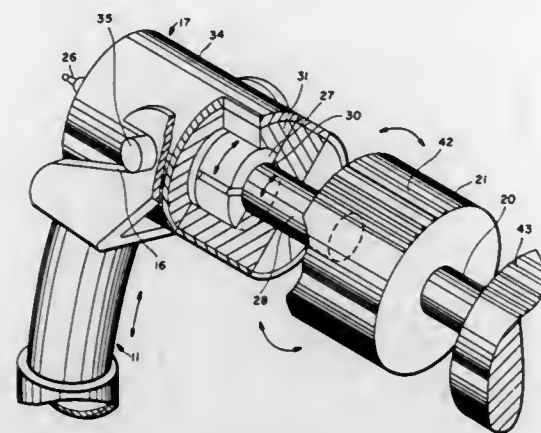
U.S. Cl. 198—824

13 Claims

1. A conveyor idler comprising:



- a. an elongated, flexible, solid molded polymer idler member having a plurality of rollers formed thereon each roller having a friction surface molded therein, said idler member having a pair of enlarged end portions molded thereon;
- b. a pair of terminal supports, each said terminal support



having a pair of polymer members shaped to enclose one said enlarged end portion of said conveyor idler and a casing holding said pair of polymer members therein; and

c. mounting means attached to each said terminal support for mounting said terminal support to a conveyor idler support framework whereby a conveyor may be supported by a one-piece flexible and rotatable idler.

4,011,939

# CLOSED LOOP CLEATED BELT/GROOVED PULLEY CONVEYOR SYSTEM

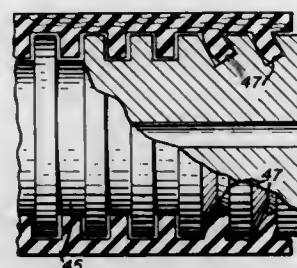
René A. Conrad, Woodside, Calif., assignor to Dynaloc Corporation, San Mateo, Calif.

Filed Sept. 26, 1975, Ser. No. 616,907

Int. Cl.<sup>2</sup> B65G 15/62

U.S. Cl. 198—840

11 Claims



1. A closed loop conveyor system comprising:
- a generally cylindrical drive pulley and a generally cylindrical return pulley, at least one of said drive and return pulleys having a plurality of annular grooves of predetermined depth formed in its outer surface along a portion of its axial length with some of said grooves being inclined and formed by a pair of spaced-apart frusto-conical side surfaces and a bottom surface; and
- a conveyor belt disposed around said drive and return pulleys and including a carcass having an exterior load-carrying surface and an interior surface with a plurality of integrally formed, spaced-apart, groove-engaging cleats protruding therefrom, said cleats being aligned in at least one row formed in the direction of belt travel, said cleats being elongated in the row direction and having a predetermined height slightly larger than said predetermined depth, whereby said cleats engage said bottom surface and cause said internal surface to remain out of frictional contact with said outer surfaces as said belt passes around said pulleys.

4,011,940

# HINGED STORAGE CONTAINER FOR TAPE CARTRIDGE WITH SELF-ALIGNING WALLS

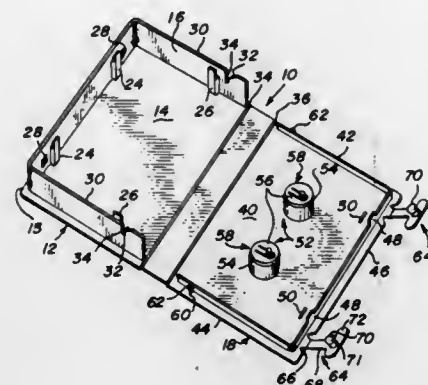
Lloyd D. Neal, Redwood City, and Allan R. Northrup, Cupertino, both of Calif., assignors to Amaray International Corporation, San Jose, Calif.

Filed Dec. 12, 1975, Ser. No. 640,037

Int. Cl.<sup>2</sup> B65D 43/16, 51/04, 85/67

U.S. Cl. 206—1.5

2 Claims



1. A storage container for storing an article comprising:
- a first wall having opposed front and back edges, opposed side edges, and a first inner surface;
- a second wall having opposed front and back edges, opposed side edges, and a second inner surface;
- a pair of opposed side walls extending inwardly from said second inner surface proximate said respective opposed side edges, each side wall including an elongated ramp declined toward said second inner surface and terminating in a notch;
- a front wall extending inwardly from said second inner surface proximate said front edge and connecting said side walls;
- a back wall including first and second hinges connected to said respective back edges such that said first inner surface is capable of being moved into a facing relationship relative to said second inner surface, said first and second hinges being formed of a resilient material and serving to normally bias said first and second walls apart, said first, second, back, front and side walls serving to form an enclosure for storing an article when said front edges are aligned;
- a first rib extending inwardly from said first inner surface a distance from said side edges and said front edge that is slightly greater than that corresponding to the location of said side and front walls such that said first rib is enclosed by said side and front walls when said walls are formed into said enclosure;
- a pair of rigid second ribs, each being molded to a respective outer surface of said first rib in alignment with said notches when said walls are formed into said enclosure, and having a ramp-engaging surface whereby when said inner surfaces are moved into a facing relationship said ramp-engaging surfaces engage said ramps, and whereby continued movement forces said ramp-engaging surfaces to slide relative to said ramps and into engagement with said respective notches, said movement serving to correspondingly move said second wall to a location such that said respective front edges of said first and second walls are aligned;
- a pair of third ribs each extending inwardly from said first inner surface at locations outside and parallel to respective ones of said first ribs, said first and third ribs serving to capture said side walls when said walls are formed into said enclosure; and
- latching means for securing said first, second, back, front and side walls into said enclosure when said front edges are aligned.

4,011,941

# CONTACT LENS CAPSULE

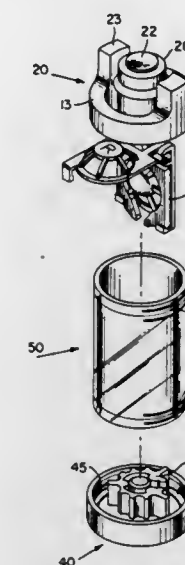
Frederick L. Parsons, Ridgewood, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 28, 1975, Ser. No. 572,551

Int. Cl.<sup>2</sup> A45C 11/00; B08B 3/04

U.S. Cl. 206—5.1

15 Claims



1. A capsule for soft contact lenses which comprises:
- a hollow, cylindrical body of sufficient diameter to receive a pair of contact lenses;
- a detachable closure means for attachment to one end of the hollow body and able to form a water proof seal when attached to the body, and having a catalyst attached thereto;
- a second removable closure means for attachment to the other end of the hollow body and having at least one passageway extending therethrough and terminating at its outer end and in an annular truncated conical groove.

4,011,942

# WRISTWATCH DISPLAY CASE HAVING DETACHABLE FLEXIBLE WATCH-SUPPORTING CUFF

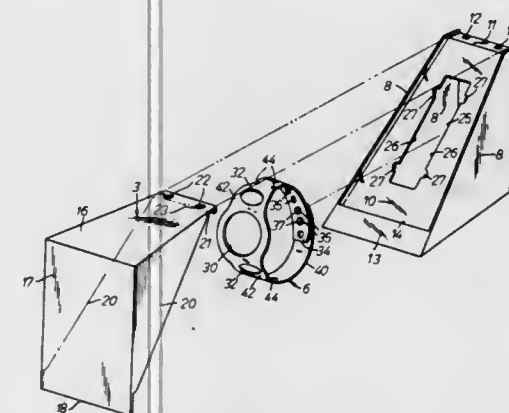
Louis John Crosslen, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Filed Feb. 24, 1976, Ser. No. 660,866

Int. Cl.<sup>2</sup> B65D 5/50, 1/34

U.S. Cl. 206—45.14

12 Claims



8. In a display case for a device having a flexible band defining a loop:
- a wall having a slot therethrough for receiving said band, said slot having a pair of notches near each end thereof, each notch in each pair being disposed in a side edge of said slot,
- and a flexible cuff for insertion within said loop for releasably supporting said device on said wall,
- said cuff having two spaced-apart portions and each portion being wider than said slot but narrower than the com-

4,011,943

# TRANSPORTATION AND DISPLAY CASE FOR HOLDING SMALL ARTICLES SUCH AS PRALINES

Giordano Galli, Neu Isenburg; Inge Hansen, Frankfurt am Main, and Friedrich Reichert, Steinbach, all of Germany, assignors to Ferrero GmbH, Frankfurt am Main, Germany

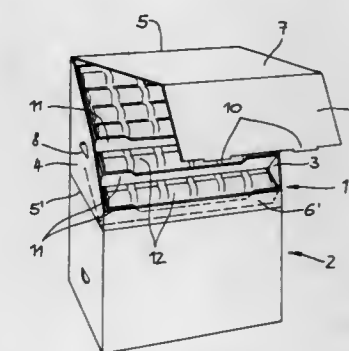
Filed Jan. 14, 1976, Ser. No. 649,003

Claims priority, application Germany, Jan. 22, 1975, 2502502

Int. Cl.<sup>2</sup> B65D 5/50, 5/52

U.S. Cl. 206—44 R

14 Claims



1. A transportation and display case for holding individual small articles such as pralines which are stored on a plurality of levels, characterized in that the individual small articles are arranged adjacent to one another ready for removal on trays comprising at the upper and lower side of their side wall sections connecting parts which are staggered with respect to one another and adapted to be brought into engagement with one another and the rear wall of the container comprising mounting supports providing the individual trays with an inclined position.

4,011,944

# DISPOSABLE SURGICAL EQUIPMENT TRAY

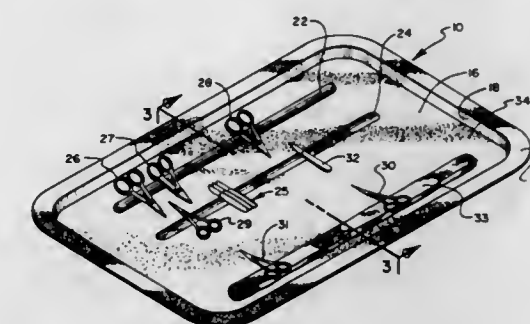
Denton A. Cooley; Charles C. Reed, both of Houston, and Russell G. Sharp, Sugar Land, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Filed Nov. 17, 1975, Ser. No. 632,337

Int. Cl.<sup>2</sup> B65D 1/34, 25/14

U.S. Cl. 206—557

1 Claim



1. A tray for surgical instruments comprising:
- a unitary molded tray constructed of rigid plastic and comprising a recessed base, a raised sidewall extending around the entire periphery of the base and a laterally extending lip contiguous with and projecting from the sidewall, the sidewall laterally extending lip configured to nest within a conventional Mayo stand ring;
- at least one elongated upstanding ridge formed on the unitary molded tray and at least one elongated recess formed



in the unitary molded tray, each of the ridge and recess facilitating finger access of instruments placed thereon; and  
a thin layer of organic, cellular, sponge-like material which is absorbent and sterilizeable, the sponge-like material being bonded over the entire exposed upper surface of the tray, including each ridge and recess.

4,011,945

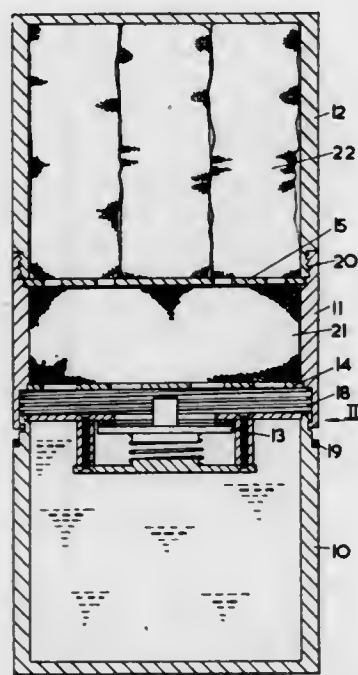
## FIRST AID EQUIPMENT

Edmund Alexander Bourne, Farnborough, and James Gerard Fitzgerald, London, both of England, assignors to National Research Development Corporation, London, England  
Filed Sept. 9, 1975, Ser. No. 611,686

Claims priority, application United Kingdom, Sept. 13, 1974, 40128/74

Int. Cl.<sup>2</sup> A61B 19/02; B65D 69/00  
U.S. Cl. 206—223

15 Claims



1. A first aid kit for treating burns to human or animal tissue and comprising a reservoir for water and a compartment or compartments containing absorbent dressing and non-toxic endothermic reactor, the reservoir being normally sealed from the compartment or compartments but being rapidly openable to allow water into the compartment or compartments, and the arrangement being such that when the kit is charged the reservoir may be opened to allow water to the compartment or compartments at will to be cooled by reaction with the reactor and to be absorbed by the dressing.

4,011,946

## MERCHANDISE PACKAGING DEVICE

Sidney Savage, Canton, Ohio, and Thomas J. Ham, Stone Mountain, Ga., assignors to The Akro Corporation, Canton, Ohio

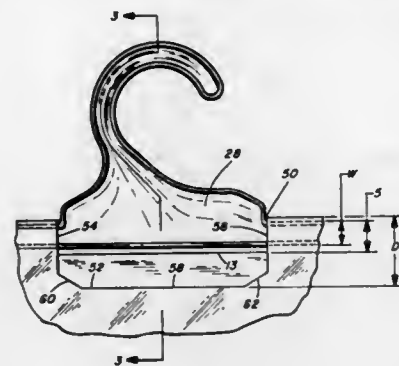
Filed Nov. 24, 1975, Ser. No. 634,415  
Int. Cl.<sup>2</sup> B65D 85/00

U.S. Cl. 206—284

1 Claim

1. A device for displaying floor mats and the like in vertical position wherein a sheet of flexible material is folded to form two side panels and a connecting web and wherein the web has a circular opening and wherein a hanger has a central portion which extends upwardly through the opening and terminates in a hook and has a pair of arms extending outwardly from the central portion which engage the underside of the web, and wherein the side panels receive the mat to be displayed, wherein the improvement comprises,  
the connecting web has a slot adjacent the mid portion thereof and one of the side panels has a slot which communicates with the slot in the web,

the hanger has an elongated flat central portion together with arms which extend in opposite directions from the central portion,  
the arms of the hanger occupy the space between the connecting web and the upper edge of the mat and the central portion of the hanger projects through the slot in the web, and  
the slot in the side panel has an area sufficient to receive the flat central portion of the hanger, whereby the hanger together with the arms when rotated can be positioned downwardly in a direction toward said panel.



4,011,947

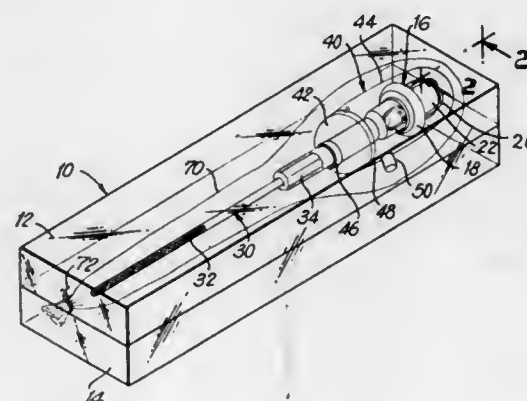
## PACKAGED PROSTHETIC DEVICE

Philip Nicholas Sawyer, 7600 Ridge Blvd., Brooklyn, N.Y. 11209

Filed May 22, 1975, Ser. No. 579,791

Int. Cl.<sup>2</sup> A61F 1/22; B65D 85/54  
U.S. Cl. 206—363

28 Claims



1. A protected prosthetic device comprising a sterilized and cleaned prosthetic structure, a support detachably engaging said structure and adapted to constitute a handle for the same, and hermetically sealed protective means encapsulating said structure, said support extending hermetically through said means, said means being openable to render said structure accessible, said means including at least two parts, one of which is mounted on said support and the other of which is detachably mounted on the first part whereby said structure can be cleaned and then encapsulated while being maneuverable by the use of said support.

4,011,948

## EGG CRATE

Houston Rehrig, Pasadena, and Bud E. Sanders, North Hollywood, both of Calif., assignors to Rehrig Pacific Company, Los Angeles, Calif.

Continuation of Ser. No. 321,591, Jan. 8, 1973, abandoned.  
This application July 7, 1975, Ser. No. 593,253

Int. Cl.<sup>2</sup> B65D 21/01

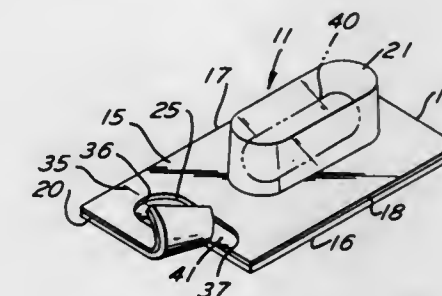
U.S. Cl. 206—507

13 Claims

1. An egg crate comprising:  
a generally rectangular bottom panel having first, second, third and fourth edges,

first, second, third and fourth upstanding side panels attached to said bottom panel, respectively along said first, second, third and fourth edges with said first and said third side panels, and said second and said fourth side panels, respectively, being opposite one another,  
said first and third side panels each having an upper portion and a lower portion, each of said lower portions comprising a plurality of alternating inner and outer substantially planar offset panels joined along their adjacent edges by elongated flanges, said inner offset panels being disposed in a first side plane intersecting the plane of said bottom panel and being inclined outwardly with respect thereto, said outer offset panels being disposed in a second side plane intersecting the plane of said bottom panel, the bottom edges of said outer offset panels being spaced outwardly of the bottom edges of said inner offset panels, said second side plane being inclined outwardly at a greater angle than said first side plane, said inner offset panels being generally in the configuration of an isosceles

ary of the carrier layer to define a hole, a blister formation on said carrier layer spaced from said cut-out and opening to one side of said carrier layer, and a relatively flexible closure layer on said one side of and in facing engagement with said carrier layer extending across and in closing relation with both said blister and cut-out, said carrier and closure layers being releasably adhesively secured together throughout the entire extent of their facing engagement for maximum strength and



resistance to blister opening except by the predetermined procedure, and a weakened severance line formed in said carrier and closure layers extending between spaced edge locations of said layers and generally chordally across said cut-out, for deliberate manual separation along said severance line to expose for intentional grasping only a closure layer portion retained with a straight severance edge relatively taut in position extending across said cut-out between spaced bounding edge regions of said hole.

4,011,950

## CIGARETTE MONITORING APPARATUS

Robert W. McLoughlin, Belfast, and Colin P. Nuttall, Bangor, both of Northern Ireland, assignors to Gallaher Limited, Belfast, Northern Ireland

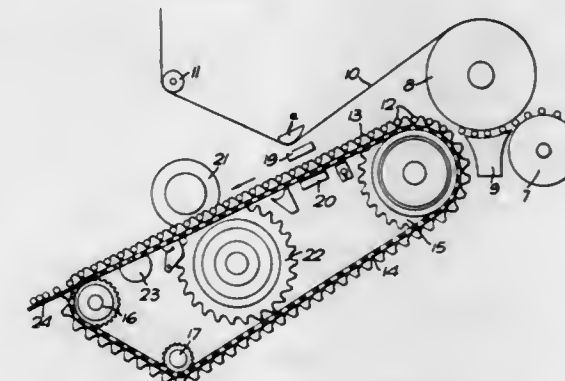
Filed Sept. 19, 1975, Ser. No. 614,790

Claims priority, application United Kingdom, Sept. 23, 1974, 41326/74

Int. Cl.<sup>2</sup> B07C 5/344

U.S. Cl. 209—73

9 Claims



1. Apparatus for monitoring the assembly of filter tipped cigarettes, said apparatus comprising: means for continuously advancing a succession of assembled cigarettes transversely to their length through an optical device; said optical device including at least two transmitters for transmitting beams of light across the plane of movement of the cigarettes at different angular orientations relative to the movement plane, each beam being interrupted by each advancing cigarette for a time depending on the effective transverse dimension of the cigarette as seen by that beam, and photosensitive elements for receiving the beams of light from said transmitters and for providing a signal corresponding to the time during which the respective beam of light is interrupted; and signal combining means coupled to said photosensitive elements and responsive to the combined magnitude of the signals of said photosensitive elements for responding to a defective cigarette if the combined magnitude of said signals is outside a predetermined range.

4,011,949

## PACKAGE CONSTRUCTION FOR OPENING ONLY BY A PREDETERMINED PROCEDURE

Robert J. Braber, and Paul L. Weber, both of Harleysville, Pa., assignors to The Lehigh Press, Inc., Harleysville, Pa.

Filed June 18, 1975, Ser. No. 588,067

Int. Cl.<sup>2</sup> B65D 83/04

U.S. Cl. 206—532

4 Claims

1. A package construction for opening only by a predetermined process comprising a generally flat carrier layer having a through cut-out located in spaced relation within the bound-



4,011,951

**BRACKET FOR SMALL ANIMAL FEEDER**

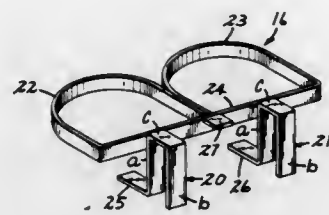
Richard J. Boyer, Rte. No. 1, Eagle Bend, Minn. 56446

Filed Feb. 2, 1976, Ser. No. 654,619

Int. Cl.<sup>2</sup> A47G 29/00; A47K 1/08; A01K 5/01

U.S. Cl. 211-71

1 Claim



1. A mounting bracket comprising, in combination: a pair of hook members each in the form of an inverted U sized to fit over the upper edge of a rail member and comprising a pair of spaced leg portions joined by a body portion; a bar secured orthogonally at spaced points there along to first legs of said hook members near said body portions; hoop members secured to said bar in side-by-side relation to extend from said bar in a direction away from said hook members; lip members secured to said first legs of said hook members near the free ends thereof to extend in the same direction of said hoop members, so that an object such as a feed bucket placed within, a hoop member may rest on a lip member; and means secured to said bar between said hook members and extending from said bar in the direction of the bodies of said hooks, for resting on the top of a rail member.

4,011,952

**MANUAL SORTER**

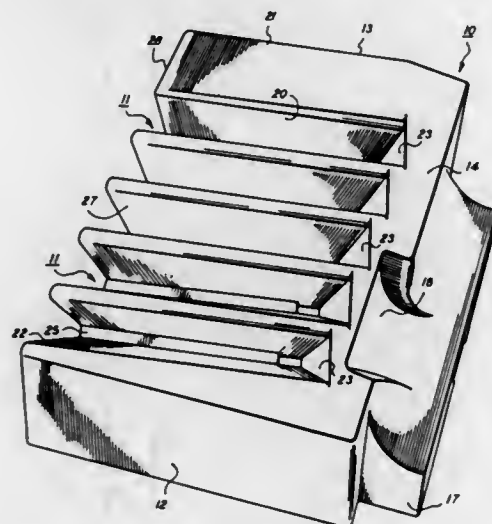
Craig A. Smith, and Leonard Schachner, both of Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 16, 1975, Ser. No. 541,543

Int. Cl.<sup>2</sup> B42F 7/10

U.S. Cl. 211-10

12 Claims



1. A manual sorter apparatus, said sorter having a plurality of sheet receiving bins arranged one behind the other in a substantially horizontal direction from a front portion to a rear portion of said sorter, said sorter further including a first side portion extending between said front and rear portions, each of said bins defining a sheet receiving opening at a top portion of said sorter, said top portion extending between said side,

front, and rear portions, each of said bins having a first surface for supporting a side of said sheet, said first surface extending downwardly and rearwardly from said top portion, and outwardly and forwardly from said side portion of said sorter, each of said bins further having a second surface for supporting a first edge of said sheet, said second surface extending downwardly from said top portion, and a third surface for supporting a second and different edge of said sheet, said third surface extending outwardly and upwardly from said side portion, said sorter being adapted to be positioned with said first side portion adjacent a sheet output device of a reproducing machine with said front to back arrangement of said bins being in a direction transverse to the direction in which sheets are fed into said output device, surfaces, said opening allowing small foreign objects to exit from said bins.

4,011,953

**SPECTACLE RACK**

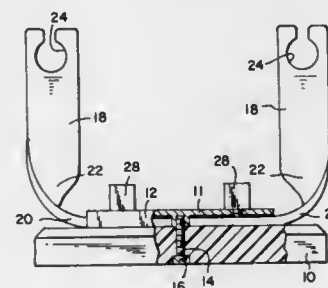
Stefan Engelman, 61-38 164th St., Flushing, N.Y. 11365

Filed Aug. 15, 1975, Ser. No. 606,342

Int. Cl.<sup>2</sup> A47F 7/00

U.S. Cl. 211-13

5 Claims



1. A spectacle holder for holding a pair of spectacles comprising, a substantially horizontally disposed base portion, a slotted channel member integral with and horizontally disposed on the upper surface of said base portion, said channel member defining a slot extending inwardly from opposite ends of said channel member, a pair of arms each having a base portion and an upper portion, each arm base portion adapted to slide independently in said channel member and being slideably mounted within said slot from said opposite ends and an aperture in each of the upper portions of said arms each adapted to receive a portion of said spectacles, said apertures being disposed within the same plane and spaced apart a distance substantially equal to the distance between said upper portions of said arms.

4,011,954

**DISPLAY STAND**

Giordano Galli, Larchenweg 15, 6078 New-Isenburg, Germany

Filed Aug. 10, 1973, Ser. No. 387,377

Claims priority, application Germany, Aug. 11, 1972, 2239682

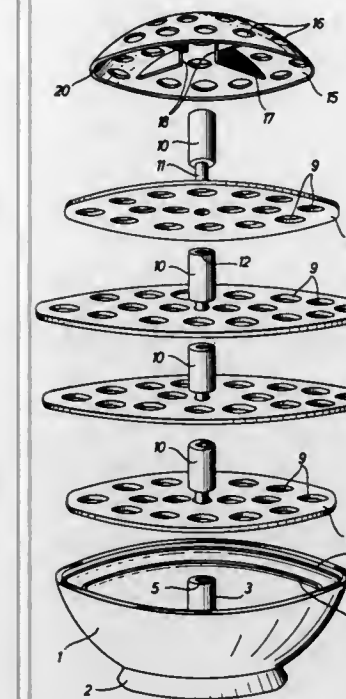
Int. Cl.<sup>2</sup> A47G 19/28

U.S. Cl. 211-14

9 Claims

1. A display stand comprising an upper domed portion, said portion having a plurality of holes therein for receiving objects to be inserted therein, a bottom portion in the shape of a bowl, a plurality of article supporting plates and spacer elements, removably mounted in stacked condition between said bottom portion and said upper portion, and means formed on said upper and bottom portions for providing for an interfitting engagement therebetween so

that said supporting plates and spacers can be removed and said upper domed portion can be disposed in direct failure, said upper works cannot be pulled or tilted beyond the points where said stop bar or said strap engage said collar.



4,011,956

**CLOSURE MECHANISM FOR BOTTOM DUMP HOPPER CARS**

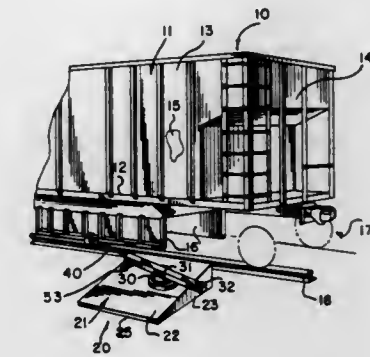
Dan R. Green, Portage, and Ernest J. Nagy, Munster, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Aug. 15, 1975, Ser. No. 605,104

Int. Cl.<sup>2</sup> B61D 7/30

U.S. Cl. 214-63

10 Claims



interfitting engagement with said lower portion to form a holder structure.

4,011,955

**SEA CRANE TIEDOWN**

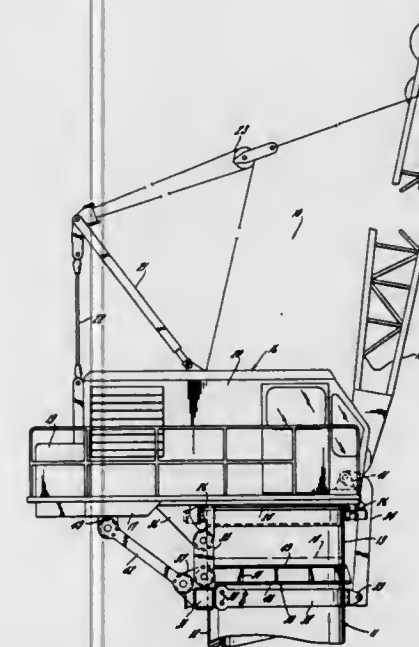
James G. Morrow, Sr., and David J. Pech, both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Mar. 29, 1976, Ser. No. 671,315

Int. Cl.<sup>2</sup> B66C 23/52

U.S. Cl. 212-3

3 Claims



1. In a sea crane including a cylindrical pedestal supporting a roller path on which is rotatably mounted an upper works having a boom at one end and supporting a counterweight at the other end, the improvement comprising, in combination, an annular collar fixed around said pedestal well below said roller path, an arcuate stop bar suspended from said bed so as to hang beneath said collar and adjacent said pedestal, said bar being out of contact with both said pedestal and said collar and being on the side of the pedestal opposite said boom, a strap anchored at its ends to the ends of said bar and embracing said pedestal beneath said collar, said strap being out of contact with both said pedestal and said collar, and a plurality of tension links coupling said bed and both said bar and said strap so that, in the event of structural

1. For a hopper car having a hopper positioned between a pair of side sills, door means supported on said car for hinging movement on longitudinal axis parallel to said sills from an open substantially vertical position to a closed substantially horizontal position beneath said hopper, the improvement comprising: a door means closing mechanism including a support stationarily positioned to one side of a track on which said car is positioned, a closing arm including means supporting said arm for rotating movement about a vertical axis on said support whereby said arm is movable in a generally arcuate path around said axis, actuating means movably connected to said arm to extend and retract lengthwise relative to said arm during pivotal movement thereof, engageable means on said door means, indexing means engaging and positioning said actuating means whereby the same is in an initial actuating position to engage said engageable means on said door means when said car is moved on said track alongside said support thereby rotating said arm to provide a lateral force moving said door means inwardly to a closed position, and motor means connected to said arm for rotating said arm and actuating means again into engaging position with said indexing means.

4,011,957

**FOLDING EJECTOR LINKAGE FOR MATERIAL HANDLING MACHINERY**

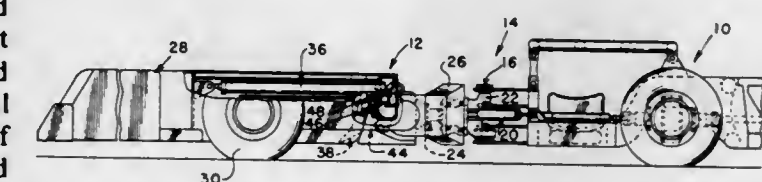
Randall R. Bendtsen, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 16, 1976, Ser. No. 649,874

Int. Cl.<sup>2</sup> B60P 1/00

U.S. Cl. 214-82

26 Claims



1. An ejector assembly for a hauling vehicle of a type having a relatively fixed container portion and a movable container



portion, motor means being operable to move the movable container portion into a first position for forming an enclosure to receive a load, the motor means also being operable to move the movable container portion from its first position for unloading of the vehicle, the ejector assembly comprising an ejector element being arranged in a retracted position within the movable container portion in said first position.

bracket means mounted upon the ejector element, jack means including an extendable and retractable component, and a folding link pivotably connected with the jack means, the jack means being pivotably connected with one container portion and the folding link being pivotably connected with the other container portion, the jack means and folding link being extended toward a parallel alignment with each other and the jack means entering into engagement with the bracket means as the movable container portion is moved from its first position relative to the fixed container portion, thereby conditioning the jack means to subsequently operate the ejector element for completing removal of the load from the vehicle.

4,011,958

## BOAT TRAILER

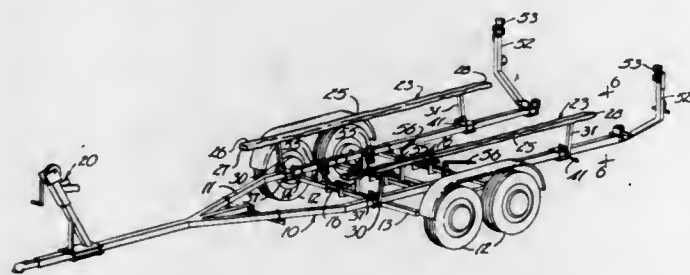
Lawrence K. Carrick, Spokane, Wash., assignor to Calkins Manufacturing Company, Spokane, Wash.

Filed Aug. 4, 1975, Ser. No. 601,916

Int. Cl.<sup>2</sup> B60P 1/52

U.S. Cl. 214-84

7 Claims



1. A boat trailer for carrying a shallow keel type sailboat having a central elongated keel of substantial weight and a hull having a front bow and a contoured lower hull configuration formed along the respective sides of the keel, comprising:

- a wheel supported framework having a forward end adapted for connection to a towing vehicle;
- bow securing means mounted to the forward end of the framework for selective engagement of the bow of a boat while in a loaded position on the trailer;
- a plurality of keel rolls rotatably mounted to the framework along the longitudinal central portion thereof, said keel rolls being adapted to engage and support the keel of a boat;
- elevated longitudinal bunk means movably mounted to the framework along opposite transverse sides of the keel rolls, said bunk means having forward and rear ends, each bunk means comprising an elongated normally horizontal member of flexible material having an upwardly facing areal hull-engaging surface for flexibly bending to conform to the lower hull configuration of a boat at the sides of its keel and for preventing lateral tipping of a boat while in a loaded condition on the trailer;
- forward upright bunk supports mounted to the framework, said forward upright bunk supports being pivotably connected to the forward ends of the respective bunk means;
- rear upright bunk supports pivotally mounted to the framework, said rear upright bunk supports being connected to the rear ends of the respective bunk means;
- and means operatively connected between the rear upright bunk supports and the framework for selectively pivotally moving the rear upright bunk supports relative to the

framework for varying the transverse spacing between the rear ends of the bunk means between boat carrying positions wherein the bunk means are substantially parallel to one another for flexible engagement against the hull of a boat while in a loaded condition on the trailer and boat loading or unloading positions wherein the bunk means converge forwardly from laterally spaced rear ends in substantially horizontal positions to clear the boat hull.

4,011,959

## BUCKET-POSITIONER CIRCUIT WITH "NO DETENT" OPERATION

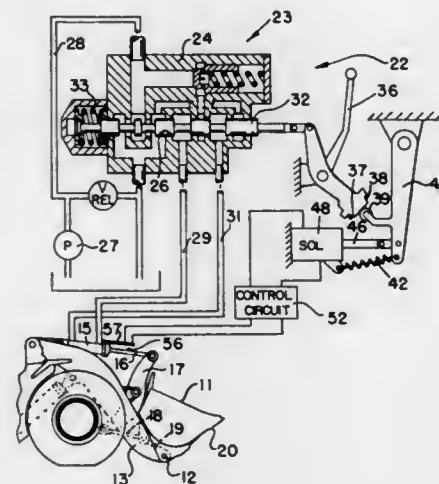
Stamos I. Papisideris, Bristol, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 13, 1976, Ser. No. 657,982

Int. Cl.<sup>2</sup> E02F 5/14

U.S. Cl. 214-762

8 Claims



1. A bucket-positioner for a loader vehicle having a bucket pivotably supported on a lift frame and a hydraulic tilt jack having telescoping cylinder and rod members for pivoting said bucket to and between rack-back and dump positions upon telescoping movement of said tilt jack members, a hydraulic valve operatively associated with said tilt jack, said valve having first and second positions for causing said tilt jack to move said bucket towards said rack-back and dump positions, respectively, and a third position for holding said tilt jack against operation, means biasing said valve to its third position, detent means for holding said valve in its first or second position, when moved thereto, and means including an electrically energizable solenoid for disabling said detent means when said solenoid is in one of its states of energization or de-energization the improvement comprising:

- a. a magnet mounted on one of said tilt jack members,
- b. a pair of proximity switches mounted on the other of said tilt jack members for sequential actuation by said magnet upon telescoping movement of said tilt jack members in either direction, at least one of said switches having normally open switch contacts,
- c. a relay having a relay coil and contacts actuated by said relay coil when energized,
- d. a source of electrical energy,
- e. circuit means for connecting said relay coil to said source for energization of said relay upon actuation of said one proximity switch by said magnet,
- f. holding circuit means for maintaining the connection of said relay coil, when energized, to said source through normally open contacts of said relay,
- g. circuit means for connecting said solenoid to said source in response to said relay being in one of its states of energization or de-energization,
- h. means actuable in response to a proximate position of said magnet to the other of said switches for breaking said holding circuit means.

4,011,960

## SECURITY SCREW CAP

Yves Mauvernay, Riom, France, and Franz Zberg, Fribourg, Switzerland, assignors to S.A.S. Trading S.A., Switzerland

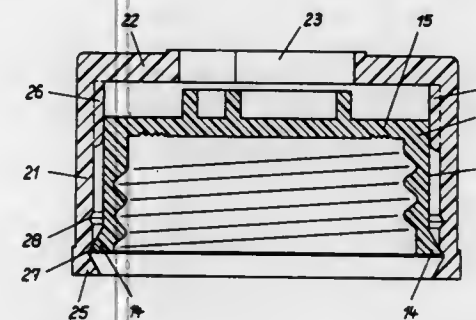
Filed Apr. 30, 1976, Ser. No. 682,097

Claims priority, application Switzerland, July 11, 1975, 9130/75

Int. Cl.<sup>2</sup> B65D 55/02, 85/56; A61J 1/00

U.S. Cl. 215-220

9 Claims



1. A security screw cap for receptacles for preventing access to dangerous products that may be contained therein by children but which may be used by adults as a normal screw cap, comprising:

- a first internally threaded sleeve having an upper part closed by a disc including on its upper surface a contour in relief, and having on a lower part of its outer wall a plurality of regularly spaced abutments; and
- a second, external sleeve having an upper disc including means defining a complementary recess to said contour in relief of the first sleeve, and the inner surface of the wall of which has (a) at its lower part a continuous rim cooperating with said abutments of the first sleeve to hold it clipped in the second sleeve, (b) at its upper part a plurality of guide ribs allowing free rotation of the second sleeve on the first sleeve and (c), between said ribs and said rim, two continuous circular grooves for selectively receiving said abutments, said grooves being separated by a distance such that when said abutments are engaged in the groove nearest said rim said contour in relief is located below the plane of the disc of the second sleeve to provide a security position allowing free rotation of the second sleeve in both directions and when said abutments are brought into the groove furthest away from said rim by a pressure on the second sleeve after previously positioning it to bring said contour in relief to face said complementary recess the second sleeve is fixed to the first sleeve by engagement of said contour in relief in said complementary recess, the two sleeves being able to remain in this position to allow a normal use of the screw cap, or to be returned into said security position, after screwing the first sleeve onto a receptacle, by simply pulling on the second sleeve.

4,011,961

## PLASTIC CONTAINER AND BREAKABLE SEALING UNIT ULTRASONICALLY WELDED THERETO

Paul Oskar Birger Widen; Kurt Arne Emil Jansson, and Anders Tore Kers, all of Uppsala, Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden

Filed Sept. 3, 1975, Ser. No. 609,959

Claims priority, application Sweden, Sept. 6, 1974, 7411316

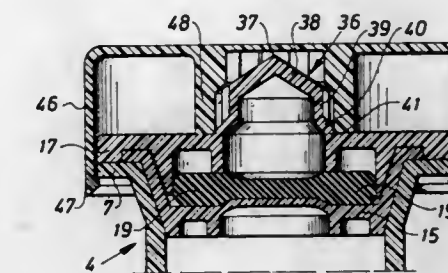
Int. Cl.<sup>2</sup> B65D 41/50

U.S. Cl. 215-232

7 Claims

6. In combination: a container of plastic material having a throat; and a sealing unit comprising a sealing member provided with an outer flange bearing on, and ultrasonically welded to, said throat to seal the interior of said container, said flange extending inwardly from the periphery of said member, said member further including an upwardly projecting pointed portion in the central region of said flange and a connecting portion connecting said upwardly projecting por-

tion to said flange, said connecting portion having a low resistance to breakage for permitting said upwardly projecting



portion to be broken off from said flange to provide an opening in said sealing member.

4,011,962

## TWO PIECE CLOSURE FOR CONTAINERS

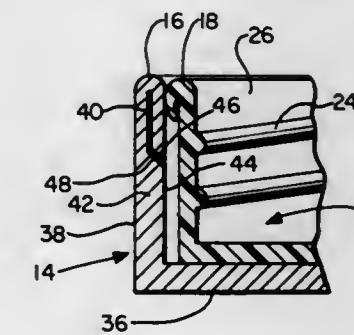
Donald George Favell, Hamden, Conn., assignor to VCA Corporation, Baton Rouge, La.

Filed June 1, 1976, Ser. No. 691,243

Int. Cl.<sup>2</sup> B65D 41/04

U.S. Cl. 215-334

10 Claims



1. A two-piece closure for containers comprising:

- a. a metal outer cap having a top wall integrally formed with an annular downwardly depending side wall, said side wall having a smooth, rounded edge formed by a U-shaped fold of a thin portion of said side wall which portion is of such a thickness that said fold has a thickness approximately equal to the thickness of that portion of said side wall adjacent to said thin portion; and,
- b. an inner cap fixed within said outer cap, said inner cap having a top wall integrally formed with an annular downwardly depending side wall, and an attaching means for attaching said closure to said container.

4,011,963

## CRYOGENIC VESSEL

Chin Huan Cheng, and Burton D. Brubaker, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 370,242, June 15, 1973, abandoned.

This application Dec. 27, 1974, Ser. No. 537,057

Int. Cl.<sup>2</sup> B65D 25/18

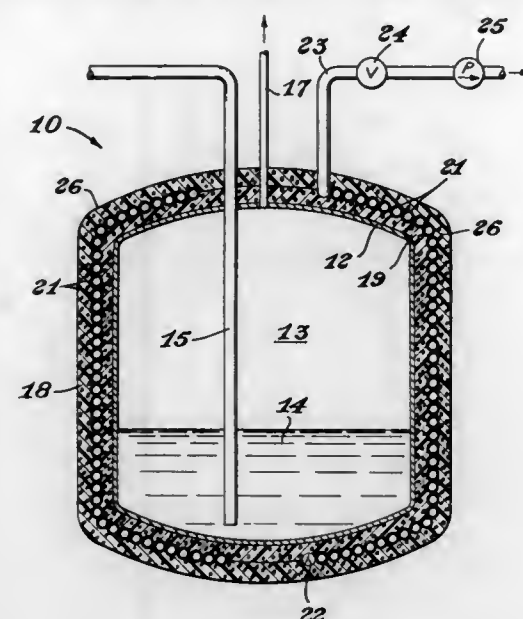
U.S. Cl. 220-9 LG

10 Claims

1. An improved cryogenic vessel, the cryogenic vessel defining a liquid-receiving cavity and an insulating layer, the insulating layer being of a material of generally low thermal conductivity, the improvement which comprises incorporating within the insulating layer a layer of thermally insulating tubing, the tubing containing



a gas under a pressure not greater than one millimeter of



mercury absolute to thereby provide improved thermal insulation of the vessel.

4,011,964

# EQUATORIAL PROFILE FOR LARGE SPHERICAL TANKS

Arne Tonnessen, Moss, Norway, assignor to Moss Rosenberg Verft A/S, Norway

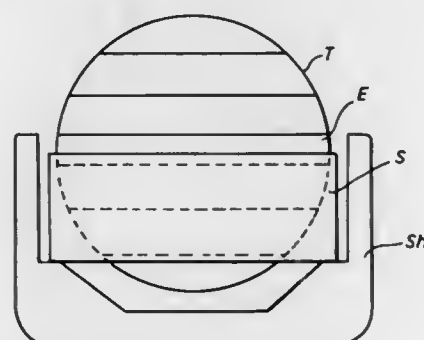
Filed Oct. 16, 1975, Ser. No. 623,029

Claims priority, application Norway, Apr. 24, 1975, 751471

Int. Cl.<sup>2</sup> B65D 87/08, 87/32; F17C 13/08

U.S. Cl. 220-69

4 Claims



1. In an equatorial profile operable to constitute a part of the shell of a large spherical tank which part of the shell presents an exterior encircling projection cooperable with supporting means for the spherical tank, and wherein the projection and remainder of the equatorial profile are arranged to define therebetween a groove with a rounded bottom, the improvement comprising

means adjacent the area of said groove bottom for deflecting the neutral axis of said projection toward the neutral axis of the remainder of the equatorial profile on the other side of the groove, and means adjacent the area of said groove bottom for deflecting the neutral axis of said remainder of the profile on the other side of the groove toward the neutral axis of said projection.

4,011,965

# ENVELOPE-VENDING MACHINE

Robert E. Fitzgerald, P.O. Box 100, Barrington, Ill. 60010

Filed Jan. 21, 1976, Ser. No. 650,888

Int. Cl.<sup>2</sup> B65H 3/36

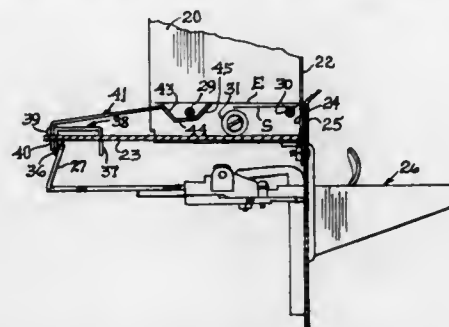
U.S. Cl. 221-40

2 Claims

1. In an envelope-vending machine having a coin-controlled manually operated activating mechanism that effects vending

of an envelope through a dispensing slot provided by the machine, wherein the improvement provides

- a vertical envelope supply compartment having a bottom wall juxtapositioned with respect to the dispensing slot of the machine,
- a pair of envelope-supporting rods extending in spaced parallel relation above said bottom wall of said compartment and the dispensing slot of the machine,
- a dispensing member reciprocally movable through said compartment over said bottom wall through a plane normal to the dispensing slot of the machine,



- a spring-biased envelope-engaging plate connected to and movable linearly through said compartment with said dispensing member and into contact with said one of said rods and yieldably movable thereby through a substantially vertical component into contact with and beneath the sealing flap of the lowermost envelope of the supply of envelopes within said compartment, with said envelope-engaging plate adapted to push the sealing flap of the envelope out of the dispensing slot of the machine upon complete reciprocal movement of said dispensing member over said bottom wall of said envelope supply compartment.

4,011,966

# DISTRIBUTOR FOR CIGARETTE ROD MAKING MACHINES OR THE LIKE

Günter Wahle, Reinbek, and Jürgen Gomann, Dassendorf, both of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

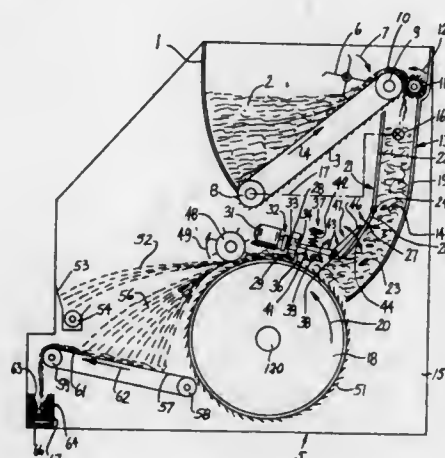
Filed Mar. 2, 1976, Ser. No. 663,119

Claims priority, application Germany, Mar. 6, 1975, 2509720

Int. Cl.<sup>2</sup> B67D 5/14

U.S. Cl. 222-55

10 Claims



1. In an apparatus for producing and processing a homogenized layer of fibrous particles, particularly in a distributor for shredded tobacco, a combination comprising a source of fibrous particles, said source having an outlet and said outlet having a variable cross-sectional area; a conveyor having means for removing from said outlet a continuous layer of fibrous particles and for advancing said layer in a predetermined direction along a predetermined path wherein said

layer has an exposed side; a barrier adjacent to said path and having a first surface in contact with the exposed side of said layer and a second surface adjacent to said first surface, extending substantially transversely of said path and facing counter to said direction so that at least some fibrous particles of said layer are intercepted by and pile up at said second surface; means for moving said barrier substantially transversely of said path whereby said first surface homogenizes that portion of said layer which is moved beyond said second surface; sensor means for monitoring the quantity of piled-up particles at said second surface; and adjusting means operatively connected with said sensor means and arranged to vary the cross-sectional area of said outlet in response to variations in the quantity of piled-up particles at said second surface.

4,011,967

# ELECTRONIC SYSTEM DEVICE FOR CONTROL OF INGREDIENT DISPENSING IN A CUP BEVERAGE VENDOR

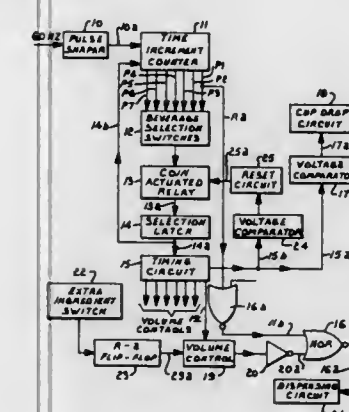
Richard J. Halsey, Grandview, and Melvin R. Heilman, Kansas City, both of Mo., assignors to The Vendo Company, Kansas City, Mo.

Filed July 21, 1975, Ser. No. 597,429

Int. Cl.<sup>2</sup> G01F 11/00

U.S. Cl. 222-70

9 Claims



1. An apparatus having mechanisms for dispensing ingredients capable of producing a beverage of cup proportion, said apparatus comprising:

means for selecting a beverage to be dispensed by said apparatus;

a source of said ingredients constituting said beverage;

electronic means for producing a time base; said time base producing means including a timing circuit means for producing an output voltage that varies linearly with respect to time, and means for initiating the production of said output voltage in accordance with the occurrence of preselected events including the selection of a beverage by said selection means;

means for correlating said electronically produced time base with a quantity of ingredients; and

means for causing said correlated quantity of said ingredients to be dispensed from said ingredients source by said mechanisms thereby producing a cup portion of said beverage.

4,011,968

# COLLAPSIBLE CONTAINERS

Russell Park McGhie, Somers, N.Y., and Joseph George Ferraro, Wyckoff, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 393,307, Aug. 31, 1973, abandoned, which is a continuation of Ser. No. 200,922, Nov. 22, 1971, abandoned. This application Apr. 25, 1975, Ser. No. 571,511

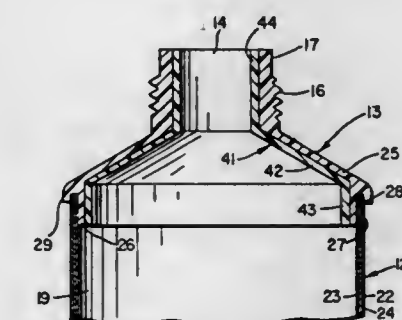
Int. Cl.<sup>2</sup> B65D 35/12

U.S. Cl. 222-107

1 Claim

1. A collapsible container comprising a tubular body made from a single blank of flexible sheet material having its oppo-

site side edges overlapped to provide a longitudinal seam, said blank comprising a sheet of metal foil extending over substantially the full area of the blank and having non-metallic thermoplastic material surface bonded at least along side edge areas of one surface of said foil which is to be the inner surface of the tube body in such locations as to provide a heat sealed narrow band of thermoplastic material along and within said longitudinal body seam upon overlap of the side edges of the blank to form a tube body and an integral one-piece preformed non-metallic solid head member of thermoplastic material having an annular skirt telescoped within an end of said tube body, and insert element of a material that is less subject to oxygen absorption and less permeable to the product in the tube body than the material of said head member



tightly frictionally disposed within said head member for isolating coextensive surfaces of said head member with respect to the product in the container, said metal foil having a further area of thermoplastic material surface bonded thereon on said one surface at least in a narrow band at the tube body upper end surrounding said skirt, said areas of thermoplastic material being substantially continuous, and said tube body and head member being heat sealed together at said annular band in an annular region extending entirely around said skirt, an external skirt on said head member closely surrounding the outer side of said tube body around said heat sealed region, said skirts being spaced at their root ends by an annular shoulder against which the tube body is disposed in end abutment and said insert element having an external lip underlying the lower edge of said annular skirt.

4,011,969

# MATERIAL DISPENSER

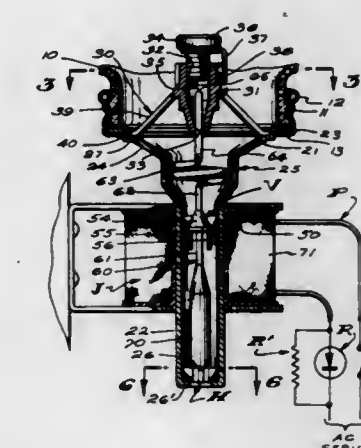
Ernest Newell Martin, 1027 E. 5th St., Escondido, Calif. 92025

Filed May 19, 1976, Ser. No. 688,007

Int. Cl.<sup>2</sup> B65G 3/12, 27/24

U.S. Cl. 222-196

16 Claims



1. A material dispenser comprising a material receiver, an elongate vertical material conducting duct communicating with and depending from the receiver and having a lower open discharge end, a vertically opening orifice smaller in diameter than the duct and positioned in the duct above the lower end thereof, an elongate valving member normally engaged in the orifice in a normal closed position and shiftable vertically



relative thereto to an open actuated position, an elongate vertically armature in the duct below the orifice and valve member and freely shiftable vertically in the duct from a lower normal position to an upper actuated position therein, means drivingly connecting the armature and the valve member, an annular coil about the duct and positioned so its field intersects the upper portion of and extends above the armature when said armature in its normal position is drivingly elevated in the duct and the valve member is moved from its normal to its actuated position when the coil is energized, a power supply with on and off switch means connected with and selectively operable to cyclically energize the coil, an elongate vertical stem with an upwardly disposed striker end projecting upwardly from the valve member, an anvil normally spaced above the stem and engaged by the striker end of the stem when the armature, valve member and stem are drivingly elevated by the coil, said stem having axially compressible spring means biased by the kinetic energy of the mass of the structure elevated by the coil when it is stopped by the anvil and which yieldingly urges the valve member and armature downwardly toward their normal positions between cyclical energization of the coil.

12. A material dispenser comprising a material receiver, an elongate vertical material conducting duct communicating with and depending from the receiver and having a lower open discharge end, a vertically opening metering orifice in the duct, a valving member normally engaged in the orifice in a normal closed position and shiftable vertically to an open position, an armature freely engaged in the duct and shiftable upwardly therein from a lower normal position, means drivingly connecting the armature and the valve member, an annular coil about the duct and positioned so its field normally intersects the armature whereby the armature is drivingly elevated and the valve member is moved to its open position when the coil is energized, a power supply connected with and operable to cyclically energize the coil and including a half-wave rectifier in series with the coil and a resistor in parallel with the rectifier, whereby the coil is energized by pulsating direct current and supplemental alternating current.

4,011,970

## SAFETY ACTUATOR CAP

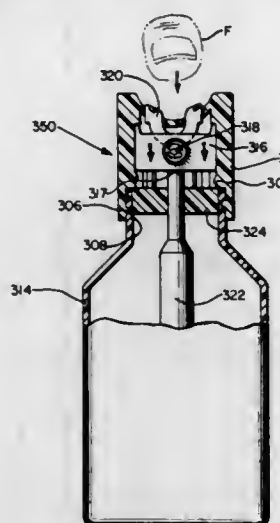
William G. Crowle, Deerfield, and Efrem M. Ostrowsky, Highland Park, both of Ill., assignors to VCA Corporation, Baton Rouge, La.

Filed May 20, 1976, Ser. No. 688,229

Int. Cl.<sup>2</sup> B65D 83/14

U.S. Cl. 222—321

13 Claims



1. A safety overcap for use on containers which have a dispensing stem extending through the top of the container, which overcap comprises:

- an actuator means attached to the stem;
- an outer shell enclosing said actuator and attached to said container by attaching means, said outer shell having
  - a dispensing window via which said product leaves the enclosed area of said outer shell and
  - a pair of spaced apart apertures positioned in the proximity of said actuator; and

c. a U-shaped communicator having its bottom portion slidably contacting said actuator and having the upper portion of its legs extending through said apertures.

4,011,971

## DEVICE FOR DISPENSING LIQUIDS FROM A SEALED CONTAINER AND FOR PRESERVING UNDISPENSED PORTIONS THEREOF

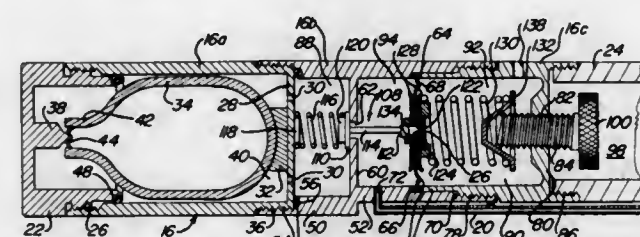
Edward R. Haydon, Steamboat Springs, Colo., assignor to Edward R. Haydon, Steamboat Springs, Colo.

Filed Dec. 29, 1975, Ser. No. 644,933

Int. Cl.<sup>2</sup> B65D 83/14

U.S. Cl. 222—399

1 Claim



1. A device for preserving perishable liquids in a container sealed by a cork-type closure and for providing means for selectively removing the liquids from the container comprising:

- an elongated housing having first and second compartments, said compartments being separated by a partition having an opening therethrough,
- means for releasably retaining a pressurized canister of an innocuous gas in said first compartment and means for puncturing such a canister to release the gas therein into the first compartment,
- a diaphragm in said second compartment dividing the compartment into first and second sections, and resilient means in said second section yieldingly resisting flexing movement of the diaphragm into the second section, said housing having a vent opening therethrough in communication with said second section such that said second section is pressurized at the ambient atmospheric pressure,
- closure means operatively connected to said diaphragm for selective movement therewith, said closure means normally operative to close said opening in the partition between compartments but movable with selected movement of the diaphragm to open said opening,
- first conduit means in fluid communication with said first section and having means adapted to enable the conduit to penetrate the cork-type closure of the container to establish fluid communication between the first section and the interior of said bottle such that innocuous gas can be selectively transferred from the housing to the container,
- second conduit means connected to said housing and also having means adapted to enable the second conduit to penetrate the cork-type closure of the container, said second conduit providing means for removing liquid from the container, and
- valve means in said second conduit means to control the flow of liquid therethrough.

4,011,972

## CONTINUOUS FLOW CENTRIFUGE APPARATUS

Victor V. Pederson, Los Altos, and Herschel E. Wright, Santa Clara, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 28, 1975, Ser. No. 626,551

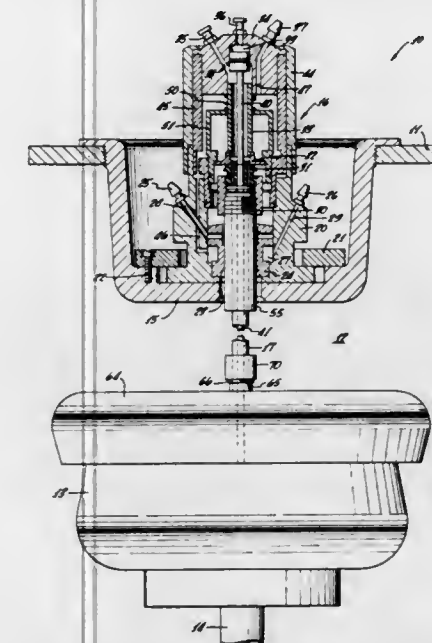
Int. Cl.<sup>2</sup> B04B 15/00

U.S. Cl. 233—1 A

4 Claims

1. In a continuous flow centrifuge apparatus including a housing defining a vacuum chamber, a rotor positioned in said

vacuum chamber, a first rotary transfer tube and a second rotary transfer tube connected to said rotor for conducting a sample to and from said rotor, said second rotary transfer tube being coaxially aligned within said first rotary transfer tube, a stationary inlet/outlet assembly connected to said housing for conducting said sample to and from said first and second rotary transfer tubes, and a bushing surrounding said first transfer tube for creating an oil film to provide a vacuum seal around said first transfer tube, the improvement comprising: an elongate, cylindrical sleeve surrounding, spaced from, and coaxial with said first transfer tube, adjacent the



upper end thereof, positioned between said first transfer tube and said bushing to form a vacuum annulus between said first transfer tube and said sleeve, the upper end of said sleeve including a stem connected to said upper end of said first transfer tube, said oil film around said first transfer tube being created between said bushing and the outer surface of said sleeve whereby the vacuum annulus formed between the inner surface of said sleeve and the outer surface of said first transfer tube minimizes heat transfer between said oil film and said sample conducted through said first and second transfer tubes.

4,011,973

## CAP SHAPE PRESERVING DEVICE

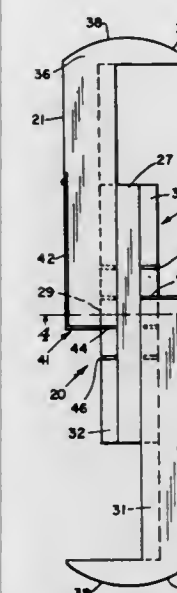
James A. Leach, Box 449 Main St., Ashby, Mass. 01431

Filed Mar. 26, 1976, Ser. No. 670,901

Int. Cl.<sup>2</sup> D06C 15/00

U.S. Cl. 223—84

10 Claims



1. A cap shape-preserving device adapted to fit compactly in the pocket of the user, said device comprising:

at least two elongated members of rigid material, and of predetermined length, normally overlapping each other in compacted, pocket carrying position; rib and undercut groove means holding said members together laterally to slide longitudinally upon each other; from said compacted position to expanded cap shape preserving position; and latching mechanism normally locking said members in said compacted position against relative sliding movement and adapted to lock said members in selected positions of expansion.

4,011,974

## VEHICLE CARGO STRAP

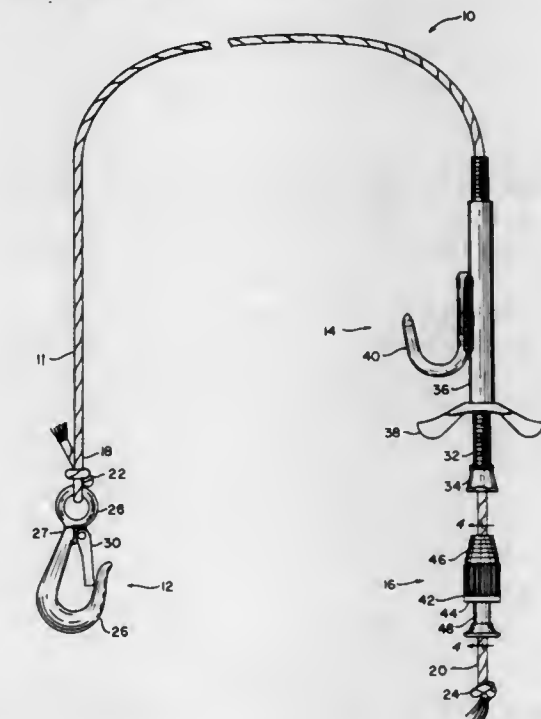
Dominick Frank Scarola, 242 W. Mount Pleasant Ave., Livingston, N.J. 07039

Filed June 6, 1975, Ser. No. 584,255

Int. Cl.<sup>2</sup> B60R 9/04, 11/00; B61D 45/00; F16G 11/10

U.S. Cl. 224—42.1 B

7 Claims



1. Vehicle cargo strap for securing a load to a vehicle comprising:

- an elongate flexible connecting member with a first and second end;
- a fastening means attached proximal to said first end of said connecting member for fastening said first end to the vehicle;
- a hook means secured to a sleeve, said sleeve slidably, coaxially mounted on said connecting member, said hook means for fastening said second end of said connecting member to a vehicle; and
- a positioning means, slidably, coaxially mounted on said connecting member between said sleeve and the second end of said connecting member, said positioning means for positioning said hook means along said connecting member, said positioning means including pinching means for securing said positioning means to said connecting member.

4,011,975

## WEB HANDLING SYSTEM

Fred P. Brown, Jr., Centerville, Mass., assignor to Packaging Industries, Inc., Hyannis, Mass.

Filed Sept. 8, 1975, Ser. No. 611,234

Int. Cl.<sup>2</sup> B65H 25/24

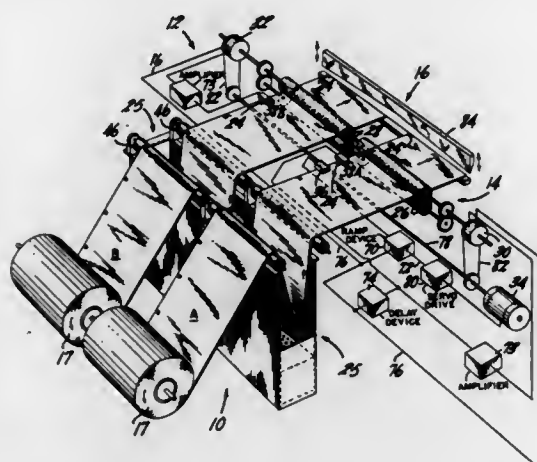
U.S. Cl. 226—2

12 Claims

- A method of web handling including the steps of
  - moving a first web along a predetermined path of travel,
  - moving a second web along a predetermined path of travel,



- c. detecting the approach to a web processing station of a preselected web portion of the first web,
- d. decelerating both of the first and second webs upon said step of detecting the approach of only the preselected web portion of the first web,
- e. stopping the decelerating first web with said preselected portion in registration with the web processing station,



- f. stopping the decelerating second web with a preselected portion of said web in registration with the web processing station independently of the step of stopping the first web,

whereby both said first and second webs are accurately aligned with said station despite relative misalignment of the first and second webs prior to stoppage, the webs to simultaneously processed at said station.

4,011,976

# METHOD AND SYSTEM FOR CONTROLLING WEB SPEED

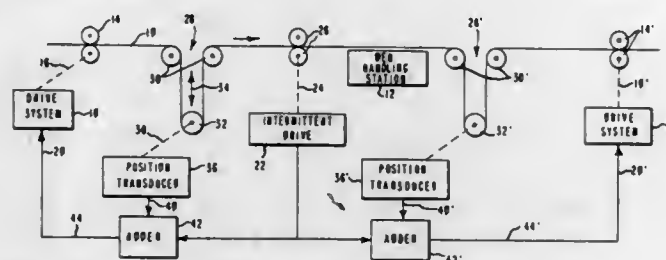
Thomas Marion Greer, Brevard, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 15, 1975, Ser. No. 622,675

Int. Cl.<sup>2</sup> B65H 25/04

U.S. Cl. 226—8

10 Claims



1. A method of controlling the speed of a web in a web transport, having a dancer roll and both continuous and intermittent drives, utilizing the average position of the dancer roll comprising the steps of:

- generating a first signal having unidirectional and bidirectional components corresponding to the instantaneous position of said dancer roll,
- generating a second signal having a bidirectional component related to the web movement produced by said intermittent drive,
- algebraically combining said first and second signals to produce a resultant signal indicative of the average position of said dancer roll, and
- controlling said continuous drive with said resultant signal, thereby to maintain the speed of said web relatively constant.

4,011,977

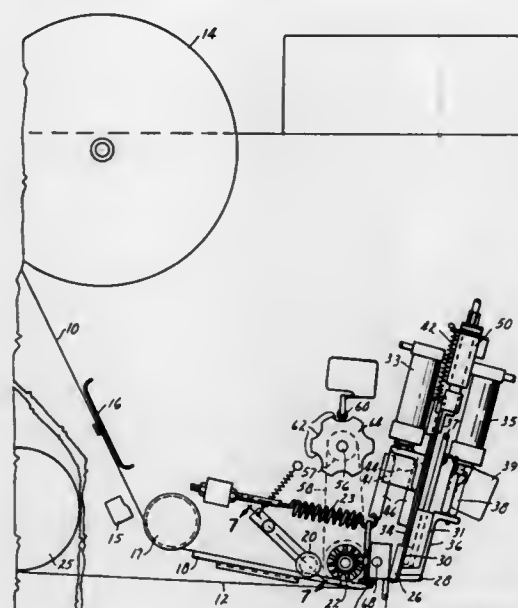
# TAPE HANDLING APPARATUS

Larry A. Bettenhausen, West Lakeland Township, Washington County; James H. Casey, Roseville, both of Minn., and Robert A. Luhman, Cylon Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 436,874, Jan. 28, 1974, Pat. No. 3,929,552. This application Sept. 25, 1975, Ser. No. 616,641  
Int. Cl.<sup>2</sup> B65H 23/34

U.S. Cl. 226—88

2 Claims



1. In a machine for handling a length of tape comprising a backing, a pressure-sensitive adhesive coating on one surface of said backing, a lofty fibrous surface on said backing opposite said adhesive coated surface, and a release liner applied to said adhesive coated surface, said liner having a width greater than that of said backing and extending outward from each side of said backing along the length thereof, the combination of

- a platen for supporting said tape, said platen having a width not exceeding that of said backing,
- a guide roller engageable with said fibrous surface to hold said tape on the platen, said roller having radially extending end flanges positioned along the edges of the platen to engage and bend the outward extending edges of said tape along the edges of said platen to guide said tape along said platen, and
- a driven roller having a toothed outer peripheral surface positioned above the platen with the toothed surface engageable with said fibrous surface of said tape to frictionally move said tape along said platen.

4,011,978

# PLASTIC BAG MACHINE

Hans Lehman, Niederkassel-Mondorf; Heinz-Eugen Klüppel, Niederkassel-Lulsdorf, and Karl Dreckmann, Hennes-Sieg-Altenbodingen, all of Germany, assignors to Hans Lehman, Niederkassel-Mondorf, Germany

Filed July 24, 1975, Ser. No. 598,775

Claims priority, application Germany, Aug. 2, 1974, 2437325

Int. Cl.<sup>2</sup> B65H 17/22

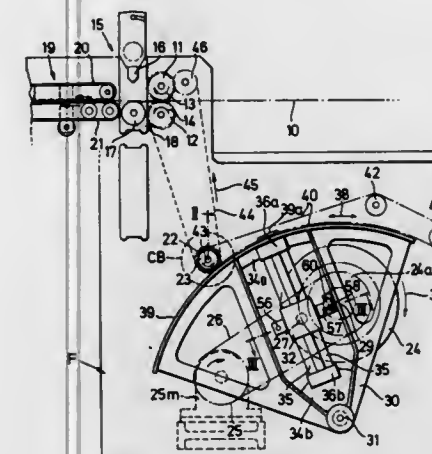
U.S. Cl. 226—142

16 Claims

1. In a machine handling material to be processed at a work station in web form, and feeding the web to the work station intermittently by sections of a predetermined length, web feeding mechanism comprising:

- a pair of web feed rolls intermittently rotationally driven to feed, in each period of rotation, a respective web section length;
- a continuously rotationally driven crank disk bearing a crank pin;

- means adjustably securing the crank pin on the disk at a selected radial distance from the disk rotational axis;
- a lever arm pivotally mounted with pivot axis parallel to and eccentric to said disk axis, to oscillate over the disk;
- a slide block supported on the lever arm to slide radially relative to the arm pivot axis, and having the crank pin pivotally engaged therein, whereby the arm is swung between two extreme positions with a longer time interval for the swing in one direction and a shorter time interval for the opposite swing in the other direction;
- means for converting the oscillating motion of the said arm into derived rotational motion reversing in rotational sense with the swinging of the arm;



- transmission means including alternately engaged clutch and brake means for transmitting to said rolls a rotational motion derived from the arm during one of said intervals by clutch engagement, and interrupting motion transmission to the rolls for the other interval by clutch disengagement with brake engagement;
- said clutch and brake means comprising an electromagnetically actuated clutch,
- an electromagnetically actuated brake, and
- switch means supported on said slide block, and actuated upon the arm reaching the extreme positions of its oscillation for controlling the alternating engagement of the said clutch and brake.

4,011,979

# PORTABLE WELDING JIG

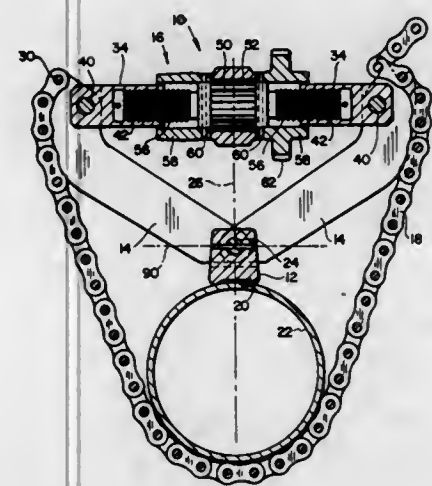
Paul Hagen, Thunder Bay, and Lucien Delisle, St. Foy, both of Canada, assignors to Pelco Tools Limited, Markham, Canada

Filed Sept. 2, 1975, Ser. No. 609,378

Int. Cl.<sup>2</sup> B23K 37/04

U.S. Cl. 228—49

7 Claims



1. A portable welding jig comprising
- a. pressure plate means shaped to engage a minor peripheral portion of the circumference of a conduit,

- b. a pair of lever arm members each having an inner end and an outer end, the inner ends of the lever arms being pivotally mounted on said pressure plate and the outer ends of said lever arms being spaced from one another above said pressure plate,
- c. flexible conduit embracing means having opposite ends connected to each outer end of said lever arms, said flexible conduit embracing means extending from said arms below said pressure plate and being adapted to embrace a conduit and extend tangentially upwardly therefrom to said outer ends of the lever arms,
- d. drive means disposed above said pressure plate and connected to said outer ends of said lever arms, said drive means being operative to move said outer ends of said lever arms towards and away from one another by movement of said arms in an arc about their pivotal connection with said pressure plate, the movement of said lever arms towards one another causing the flexible conduit embracing means to tighten against a conduit and driving the pressure plate radially inwardly to deflect the portion of the conduit engaged by the pressure plate radially inwardly to permit spot welding of the inwardly deflected portion with respect to a second conduit.

4,011,980

# FLOW-OVER MASS SOLDERING

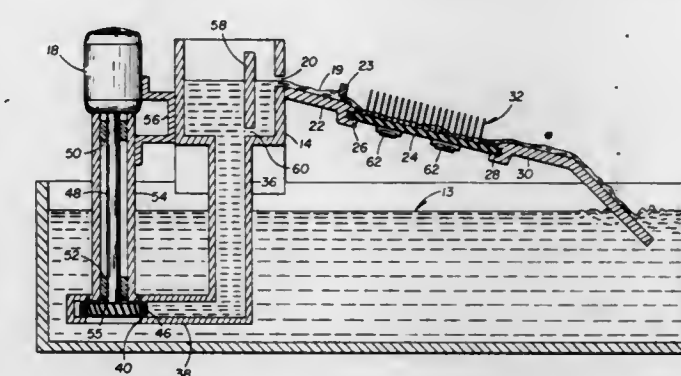
Howard A. Dvorak, Brookfield, and William R. Studnick, Bolingbrook, both of Ill., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,466

Int. Cl.<sup>2</sup> H05K 3/34

U.S. Cl. 228—180 R

10 Claims



1. The method of connecting lands on opposite sides of a printed wiring board to electrical terminals which have been inserted through apertures in the lands, and the board, which comprises:

- supporting the printed circuit board in a position at an inclination to the horizontal;
- flowing molten solder from an upper edge of the printed circuit board over an upwardly-facing surface of the board so that portions of the molten solder flow by gravity into the apertures and onto the lands on the underside of the board;
- interrupting the flow of molten solder over the upwardly facing surface of the printed circuit board after a predetermined time period sufficient to flow the solder onto the lands on the underside of the board; and
- permitting the molten solder in the holes in the printed circuit board to solidify to connect the lands of the board to the terminals in the holes.



4,011,981

**PROCESS FOR BONDING TITANIUM, TANTALUM, AND ALLOYS THEREOF**

Peter A. Danna, Milford, Conn.; Richard A. Holcomb, Lake Charles, La., and Richard J. Roethlein, Stafford Springs, Conn., assignors to Olin Corporation, New Haven, Conn.  
Filed Mar. 27, 1975, Ser. No. 562,729

Int. Cl.<sup>2</sup> B23K 1/20

U.S. Cl. 228—208

23 Claims

1. A process for bonding a first film-forming metal selected from the group consisting of titanium, tantalum, zirconium, niobium, tungsten and alloys thereof to a second metal which comprises:

- applying a first coating of a platinum metal component selected from the group consisting of platinum group metals, platinum group metal compounds, and mixtures thereof to said first film-forming metal;
- applying a second coating of copper to said first coating, and
- soldering said second metal to said second coating of copper on said first film-forming metal.

4,011,982

**SURFACE JOINING BY BONDING OF METAL AND DEPOSITED METAL**

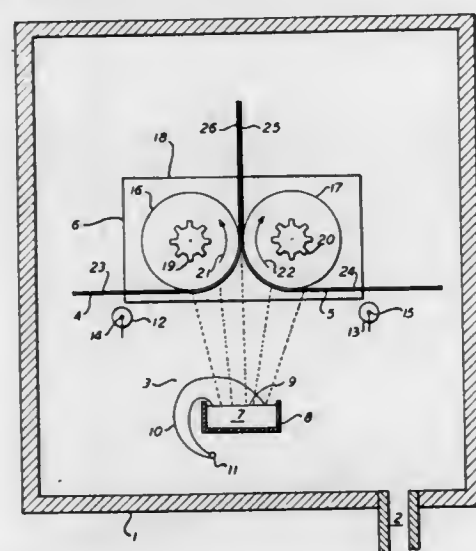
William G. Marancik, Basking Ridge, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Sept. 15, 1975, Ser. No. 613,645

Int. Cl.<sup>2</sup> B23K 19/00

U.S. Cl. 228—208

14 Claims



1. A method of joining a first surface of a first continuous strip and a second surface of a second continuous strip, comprising:

- placing the first surface and the second surface in a vacuum environment;
- vacuum vapor depositing a metal layer on the first surface;
- preparing the second surface in vacuum to expose fresh metal;
- continuously placing the deposited metal and the exposed metal in contact in vacuum; and, still in vacuum,
- applying pressure to the contacted metal sufficient to join the surfaces.

4,011,983

**BAG CONTAINER**

William Henry Greene, 1637 Van Buren Ave., St. Paul, Minn. 55104

Filed Feb. 24, 1976, Ser. No. 660,798

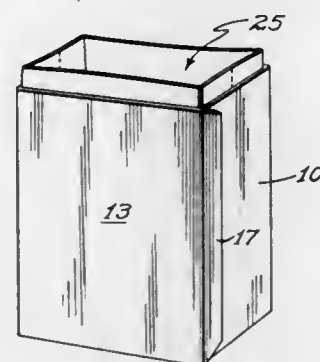
Int. Cl.<sup>2</sup> B65D 5/60

U.S. Cl. 229—14 BE

1 Claim

- In combination:  
a rectangular container for a grocery bag or the like including:  
rectangularly extending vertical walls foldable from a flat form to a rectangular form,

- a bottom panel hingedly secured to the lower edge of one of said walls and foldable to form a bottom for said container on which said grocery bag may rest,
- a grocery bag having a flat bottom resting upon said bottom panel and shaped to fit within rectangularly arranged vertical walls,
- a first flange connecting said bottom panel to the lower edge of said one of said walls,
- a crease intermediate the edge of said first flange connected to said bottom wall and the edge thereof connected to said bottom panel whereby said flange may flex,



said bottom panel being slightly longer in a direction normal to said crease than the distance between said one wall and the opposite wall,

- a second flange on said bottom wall along the edge thereof connected to said flange and lying inwardly of said opposite wall, said second flange extending downwardly inwardly of said opposite wall to terminate adjacent the lower edge of said opposite wall, whereby the downward folding of said bottom panel will cause said first flange to fold along said crease.

4,011,984

**CARTON BLANK, CARTON AND METHOD OF FORMING CARTON**

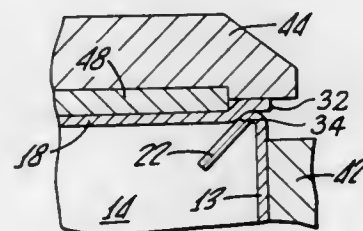
Mitchel J. Matovich, Jr., Los Gatos, Calif., assignor to Nolex Corporation, Los Angeles, Calif.

Filed Nov. 3, 1975, Ser. No. 628,444

Int. Cl.<sup>2</sup> B65D 5/06

U.S. Cl. 229—37 R

9 Claims



- A blank foldable to form a carton comprised of:  
a body of sheet material;  
said body having a plurality of parallel first indentation lines defining side wall panels of the carton and establishing folding lines;  
said body further having second indentation lines generally normal to the first indentation lines defining at the ends of said side wall panels either an end closure panel or a sealing tab, limited to a total of two end closure panels, and establishing folding lines for said end closure panel and sealing tabs;  
said end closure panels having a configuration and area substantially the same as the cross-sectional configuration and area of the carton formed by folding said blank along the first indentation lines into an open-ended tube;  
said end closure panels being marginally embossed along their free edges to impart to said end closure panels curving and sloping surfaces spaced inwardly from the free edges of those panels;

each of said end closure panels being depressible to bring its curving and sloping surfaces into surface contact with the folded sealing tabs at its end of the tube to bend said sealing tabs obliquely downwardly at an angle of greater than 90° with respect to the plane of said side wall panels to close that end of the carton.

4,011,985

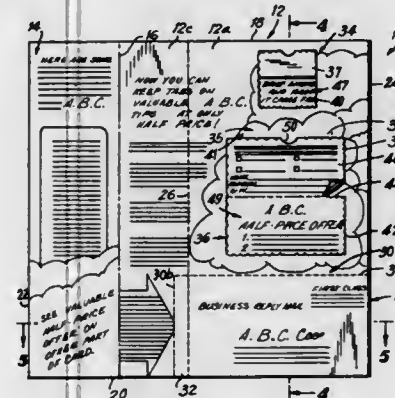
**COMBINED ADVERTISING INSERT AND MAILING ENVELOPE**

Walter A. Simson, 230 Beverly Road, Scarsdale, N.Y. 10583  
Filed Aug. 21, 1975, Ser. No. 606,362

Int. Cl.<sup>2</sup> B65D 27/00; G09F 1/04

U.S. Cl. 229—68 R

12 Claims



- An insert for a magazine of the saddle stitch type, comprising a flap; a generally rectangular advertising page connected to said flap along a first fold line which fold line is generally coextensive with the crease lines of the pages of the magazine to position said flap and said advertising page on opposite sides of the saddle of the magazine when the insert is placed into the same, said advertising page comprising first and second overlapping panels connected to each other at a second fold line substantially parallel to said first fold line, said first panel being wider than said second panel to form a double thickness page portion and a single thickness page portion which is between said flap and said double thickness portion; tear line means extending from said second fold line to a point beyond said double thickness portion to delineate one side of an envelope pocket on said double thickness portion and a closure tab on said single thickness portion, said tear line means generally separating said double thickness portion into an envelope panel portion and a window panel portion; a plurality of window means in one of said panels of said window panel portion for permitting the lifting of a portion of one of said panels to expose information in registry with the resulting opening on the other of said panels, said window means generally being spaced from each other along a predetermined direction; and adhesive means joining said first and second panels to each other at selected portions thereof, said adhesive means including adhesive strips provided along the edges of said window panel portion along and on both sides of a portion of said tear line means, along said envelope pocket, and along said closure tab, adhesive strips being provided and oriented generally normally to said predetermined direction between adjacent window means, whereby said first and second panels are connected to each other substantially about the peripheries of each of said window means.

4,011,986

**INTERPOSER MECHANISM**

Richard C. O'Brien, deceased, late of Dayton, Ohio (by Elva R. O'Brien, executrix), assignor to O.K. Partnership, Cincinnati, Ohio

Filed Apr. 14, 1976, Ser. No. 676,758

Int. Cl.<sup>2</sup> G06K 1/05

U.S. Cl. 234—47

20 Claims

- In a coder for selectively notching articles having a sorting edge to encode the articles, said coder comprising:

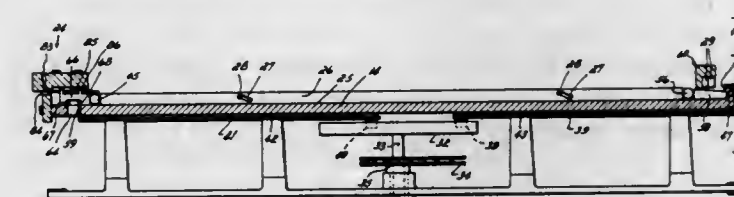
article support means for supporting an article to be encoded;

a plurality of knife blades, each of said knife blades being movable transversely of said article to form a notch in said article;

a plurality of actuating members, one of said members being interconnected to each knife blade, said actuating members being slidably disposed in a plurality of parallel slots; each of said knife blades being shifted transversely of said slot in response to movement of its associated actuating member;

the improvement comprising an interposer mechanism for selectively displacing said actuating members and knives in accordance with a preselected code, said interposer mechanism comprising:

a solenoid disposed above each of said slots and spaced longitudinally from the ends of said actuating members; an interposer blade disposed in each of said slots for slidable movement therein;



said interposer blade being disposed longitudinally beyond the actuating member in said slot and being effective, when moved in the direction of said actuating member, to cause said member to be shifted longitudinally within said slot;

said interposer blade being positionable in an initial position beneath, and spaced from, said solenoid, whereby when said solenoid is energized, said interposer blade is elevated to a position in which a portion of said blade is disposed above said slot;

a pusher assembly being positionable in an initial position above the ends of said slots;

said pusher assembly including a magnet and associated pole member, said pole member being effective to engage any blade elevated in response to actuation of one of said solenoids, and being effective to capture said blade when said solenoid is deenergized;

said pusher assembly being shiftable in a direction longitudinally of said slots and being effective to push the blades captured by said pole member longitudinally of said slots to thereby shift the corresponding members.

4,011,987

**AIRCRAFT DESCENT PROFILE CALCULATOR**

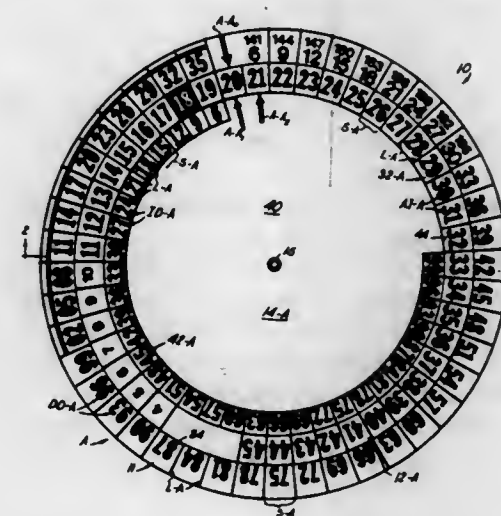
Frank L. Cheek, 1 Cedar Mountain Trail, Suwanee, Ga. 30072

Filed Jan. 22, 1976, Ser. No. 651,553

Int. Cl.<sup>2</sup> G06C 3/00

U.S. Cl. 235—88 N

5 Claims



- An aircraft descent calculator comprising:



a central member defining an outer annular dial face about the periphery thereof;  
 an intermediate member defining an intermediate annular dial face about the periphery thereof, said intermediate member rotatably mounted on said central member in juxtaposition with said central member so that said intermediate dial face lies adjacent the inside of said outer dial face and is rotatable with respect to said outer dial face about a common axis of rotation coinciding with the center of said outer dial face;  
 an inner member defining an inner annular dial face about the periphery thereof, said inner dial member rotatably mounted on said intermediate member in juxtaposition with said intermediate dial face about said common axis of rotation; and,  
 each of said dial faces divided into equal angular spaces so that said angular spaces on each of said dial faces is selectively alignable with the angular spaces on the adjacent dial face, said intermediate dial face having aircraft altitude indicia recorded thereon increasing in said prescribed altitude increments in a first direction around said intermediate dial face, said outer dial face having aircraft DME (distance measuring equipment) distance recorded thereon increasing in prescribed distance increments in one direction around said outer dial face, and said inner dial face having aircraft DME distance recorded thereon increasing in said prescribed distance increments in the direction around said inner dial opposite to said one direction around said outer dial face so that said dial face can be manipulated to determine positions on a prescribed aircraft descent profile.

4,011,988

# DEVICE FOR CONTROLLING THE FLOW OF COOLING WATER IN AN INTERNAL COMBUSTION ENGINE

Masao Inagaki, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

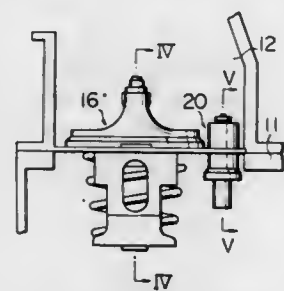
Filed July 16, 1975, Ser. No. 596,408

Claims priority, application Japan, July 22, 1974, 49-83293

Int. Cl.<sup>2</sup> F01P 7/02

U.S. Cl. 236—34.5

5 Claims



1. A device for controlling the flow of coolant circulating between the radiator and the water jacket in an internal combustion engine, comprising:

- single coolant passage means interconnecting the radiator and the water jacket, and;
- thermal reactive valve means, disposed in said passage means, for providing a first opening and a second opening for permitting the coolant to flow therethrough, said first opening having a first thermal reactive valve to open for passage of coolant at a predetermined first temperature of the coolant and said second opening having a second thermal reactive valve to open for passage of coolant at a predetermined second temperature of the coolant, said second valve opening at a lower coolant temperature than the first valve and the area of the first opening being larger than that of the second opening.

## 4,011,989 METAL BUILDING WITH INTEGRATED HOT WATER HEATING SYSTEM

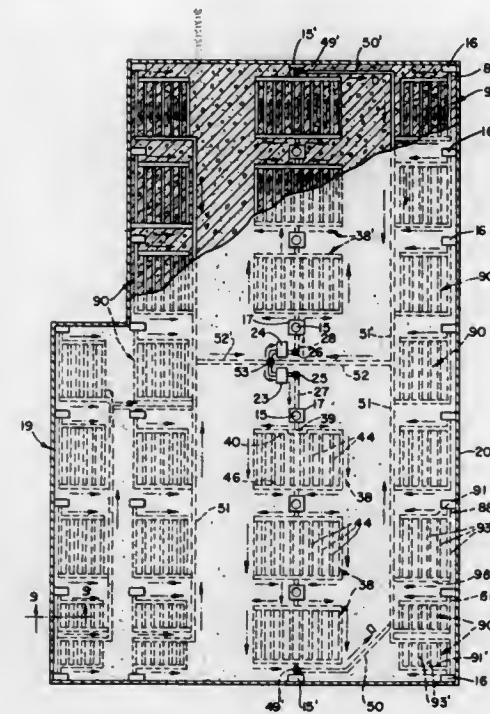
Richard E. Diggs, 12A Road, Carthage, Mo. 64836

Filed Aug. 14, 1975, Ser. No. 604,663

Int. Cl.<sup>2</sup> F24D 3/00

U.S. Cl. 237—59

34 Claims



1. A building with an integrated heating system, comprising: a building having a floor and a frame including upright, tubular, fluid-conveying columns supported on the floor and sloping, tubular, fluid-conveying roof beams supported on and in fluid communication with the columns, the columns being hollow and fluid tight so that heat exchange fluid can be circulated throughout said building frame; a plurality of heating grid means in the floor, said heating grid means each including a plurality of pipes connected to receive fluid from the columns, selected one of said columns having valves therein for controlling flow of fluid therethrough so that heating grid means fluidly connected to said selected columns can be individually controlled; heater means connected to heat the fluid; and fluid circulating means connected to circulate the fluid through the heater means, the columns and roof beams and the heating grid means to heat the building to a substantially uniform temperature throughout.

4,011,990

# CENTER PIVOT IRRIGATION SYSTEM

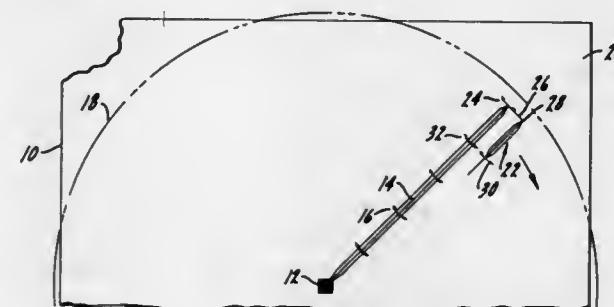
Charles H. Meis, Genoa; David A. Siekmeier, Columbus, and Arthur L. Zimmerer, Lindsay, all of Nebr., assignors to Lindsay Manufacturing Company, Lindsay, Nebr.

Filed Mar. 24, 1976, Ser. No. 669,918

Int. Cl.<sup>2</sup> B05B 3/12

U.S. Cl. 239—11

32 Claims



1. A method of operating a center pivot irrigation system to irrigate a field which has one or more noncircular areas, the system including a main irrigation pipe system with sprinkler units thereon supported at intervals on wheeled towers and

arranged to pivot about a center and a wheeled extension with sprinkler units thereon pivotal adjacent the end of the main pipe system, including the steps of simultaneously pivoting and sprinkling with the main pipe system through a generally circular part of the field to be irrigated and, at the same time, positioning the extension within the circular area and with its sprinkler units deenergized, stopping the main pipe system opposite a noncircular area to be irrigated outside of the circular area of the field and deenergizing its sprinkler units, pivoting the extension about the now stationary outer end of the main pipe system through an arc that extends outside of the circular area into the noncircular area and operating the sprinkler units on the extension so as to irrigate the noncircular area while holding the main pipe system stationary and its sprinkler units deenergized, pivoting the extension back to a position within the circular area and stopping its pivoting motion and deenergizing its sprinkling units, thereafter moving the main pipe system again and energizing its sprinkler units with the extension and its sprinkler units deenergized until the system is again opposite a noncircular area to be irrigated where the cycle is repeated.

4,011,991

# ELECTROSTATIC POWDER PAINTING APPARATUS

Senichi Masuda, 40-10-605, 1-chome, Nishigahara, Kita-ku, Tokyo, Japan

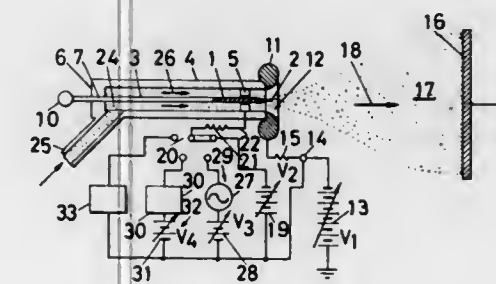
Filed July 29, 1975, Ser. No. 599,994

Claims priority, application Japan, Aug. 4, 1974, 49-89351

Int. Cl.<sup>2</sup> B05B 5/02; B05C 5/00

U.S. Cl. 239—15

16 Claims



1. An electrostatic powder painting apparatus characterized in that said apparatus comprises a discharge electrode including a corona discharge portion having a small radius of curvature for producing corona discharge for charging powders, a driving electrode having a large radius of curvature which is disposed in the vicinity of said corona discharge portion and insulated from said discharge electrode, powder supply means for supplying paint powders to the vicinity of a corona discharge space formed between said corona discharge portion of said discharge electrode and said driving electrode, a driving D.C. high voltage source coupled between said driving electrode and a body to be painted for applying a D.C. high voltage between said body to be painted and said driving electrode to establish a driving electric field which drives the charged powders towards said body to be painted to be adhered thereto, and a charging variable high voltage source coupled between said discharge electrode and said driving electrode for applying a variable high voltage between said discharge electrode and said driving electrode to produce a variable corona discharge current consisting of a flow of ions of the same polarity as said driving electrode relative to said body from said corona discharge portion of said discharge electrode to said driving electric field, whereby said powders may be charged, driven and electrostatically adhered onto said body to be painted while controlling the magnitude of said corona current independently of said driving electric field in a manner to accommodate the nature of the paint powders employed.

4,011,992

# SYSTEM FOR HEAT CONDITIONING OF NON-STICK LIQUID PREPARATION FOR SPRAYING ON GRILL

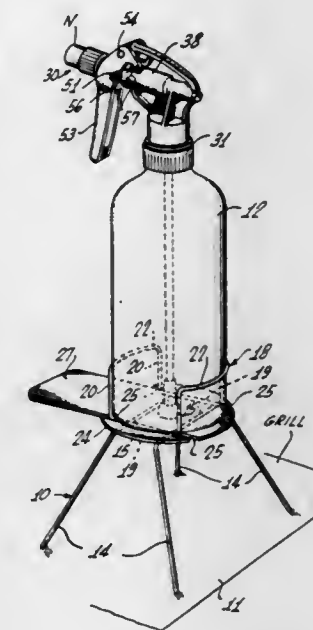
Russell D. Olsen, Culver City, Calif., assignor to Par-Way Mfg. Co., Los Angeles, Calif.

Filed July 23, 1975, Ser. No. 598,344

Int. Cl.<sup>2</sup> B05B 1/24; B67D 5/62

U.S. Cl. 239—135

6 Claims



1. A warming device for use with a cooking surface adapted to be maintained at a standardized cooking temperature of the order of approximately 350°-400° F., for spraying a normally viscous, liquid, vegetable and lethechin non-stick substance from a container vessel onto such cooking surface, said container vessel having a mouth at the top, and a spray attachment joined to the latter, said spray attachment having a liquid passage leading from said vessel, a generally laterally discharging spray nozzle at a discharge end of said passage, with an orifice adapted to emit a fine spray of non-viscous liquid therefrom, and valve and pumping means for developing a pressure in said passage back of said nozzle for causing said non-stick substance to discharge in a fine spray when said substance has been warmed to a temperature level below said cooking surface temperature range but sufficiently high to reduce its viscosity by an amount enabling it to spray from said nozzle, comprising:

- a heat conducting stand adapted for support on said heated cooking surface,
- said stand comprising a pair of inverted, substantially U-shaped wire forms, each with a pair of legs and an interconnecting, horizontal top segment, in an arrangement with said top segments horizontal and spaced transversely of one another,
- a pair of transversely spaced wires extending across and joined integrally to said segments, said wires having at their ends vertical extensions and interconnecting generally arcuate rails furnishing support means to receive and position the lower end portion of said vessel, and
- a metal heat conductive platform in the form of a plate mounted on and removably secured to said transversely spaced wires, and provided with notches to pass said extensions in a clamping engagement.



4,011,993

## APPARATUS FOR PAINT APPLICATION

Makoto Mizuno; Yoshio Nishiumi, both of Tokyo, and Yukio Nagasaka, Kawagoe, all of Japan, assignors to Atom Chemical Paint Co., Ltd., Tokyo, Japan

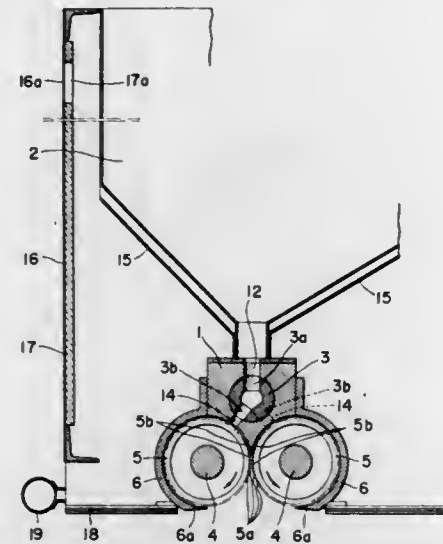
Filed May 27, 1975, Ser. No. 580,613

Claims priority, application Japan, Mar. 26, 1975, 50-039372[U]

Int. Cl.<sup>2</sup> B05B 3/02

U.S. Cl. 239—214

3 Claims



1. An apparatus for paint application comprising a paint supply means incorporating therein a valve means and provided, on its lower portion, with a plurality of paint discharging orifices in two rows in an opposite relation, a tank communicating with said paint supply means for containing a paint, a pair of rollers each provided at the external periphery thereof with a vast plurality of projecting teeth extending in the axial direction of the roller and grooves formed side by side with the projecting teeth, said rollers being attached to said paint supply means to rotate inwardly and located adjacent said orifices, and a pair of cover members associated with said pair of rollers, each said cover member being connected at its one end to the external surface of said paint supply means to cover one of the rollers and having, at its other end, an edge portion which is disposed adjacent the lower side of the respective roller.

4,011,994

## TRANSPORTABLE GROUND SPRAYING DEVICE

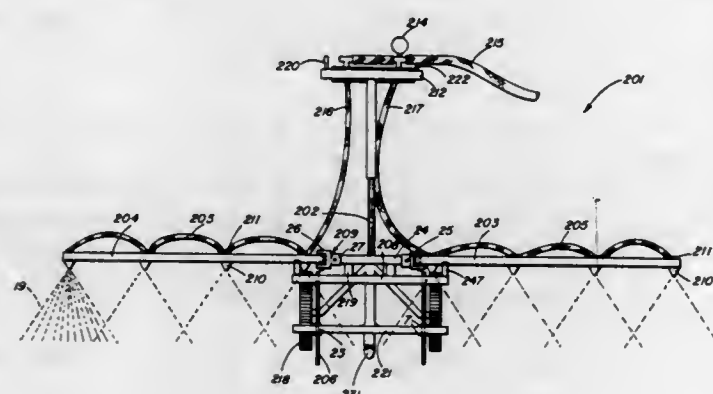
Richard R. Lenz, 15 Michel Drive, Henrietta, N.Y. 14467

Filed Sept. 18, 1975, Ser. No. 614,477

Int. Cl.<sup>2</sup> B05B 1/20

U.S. Cl. 239—287

7 Claims



1. A transportable and collapsible ground sprayer comprising:

- a. a collapsible frame having an adjustable handle section, a depending leg section and a guide situated therebetween;
- b. a pair of inwardly collapsible wheels rotatably attached to the leg section;

- c. an elongated support member secured to the frame by said guide, said elongated support member having an upper portion and a lower portion;
- d. an adjustable platform attached to the lower portion of the elongated support member said platform having a lower crossbar member, an upper crossbar member and at least two thread bearing members fixedly attached to the upper crossbar member and adjustably connected to the lower crossbar member in a manner such that the distance therebetween can be adjusted by rotating the thread bearing members;
- e. a boom support fixedly attached to the upper crossbar member of the adjustable platform;
- f. connecting members attached to each end of the boom support;
- g. a boom pivotably and hingedly affixed to each end of the boom support by said connecting members wherein each boom is transversely rotatable in a plane parallel to the ground surface and vertically rotatable in a plane substantially perpendicular to the ground surface;
- h. nozzles attached to the booms;
- i. a flexible, non-corrosive hose having an inlet attached to the upper portion of the elongated support member and an outlet bearing a fluid conducting relationship to the spray nozzle.

4,011,995

## BURNER NOZZLE ASSEMBLY

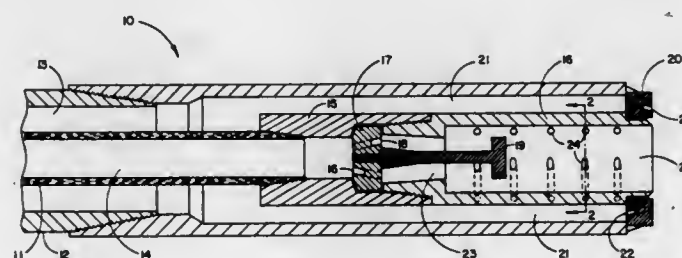
William F. Krause, Jr., Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 9, 1975, Ser. No. 566,618

Int. Cl.<sup>2</sup> F23D 15/00

U.S. Cl. 239—404

8 Claims



1. A burner nozzle assembly including: a first hollow elongated body; a second hollow elongated body internal to said first body and spaced from said first body to form an annular space therebetween; said second body having a plurality of openings therethrough near one end thereof providing fluid communication between said annular space and the interior of said second body; a member capping said annular space at said one end; deflector means positioned inside said second body in the vicinity of said openings; a plate member positioned intermediate said first body and said second body, said plate member having a plurality of openings therethrough, each of said openings being angularly directed tangentially to an internal surface of said second body and outward from said first body to said second body; and said deflector means comprising a stem portion and a flanged head portion mounted on one end of said stem portion, the other end of said stem portion being connected to said plate member.

4,011,996

## SWIRL TYPE PRESSURE FUEL ATOMIZER

Shoichi Tsuji, Hoya; Minoru Asai, Kamagaya, and Yuichi Fujii, Funabashi, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 405,559, Oct. 25, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,446

Int. Cl.<sup>2</sup> B05B 1/34

U.S. Cl. 239—491

5 Claims

1. A burner assembly comprising a housing having a passage

4,011,998

## FORAGE HARVESTER HAVING COMBINED CUT-AND-THROW CYLINDER

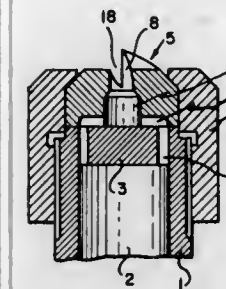
Adin Frank Holdeman, and Howard James Ratzlaff, both of Hesston, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Oct. 30, 1975, Ser. No. 627,054

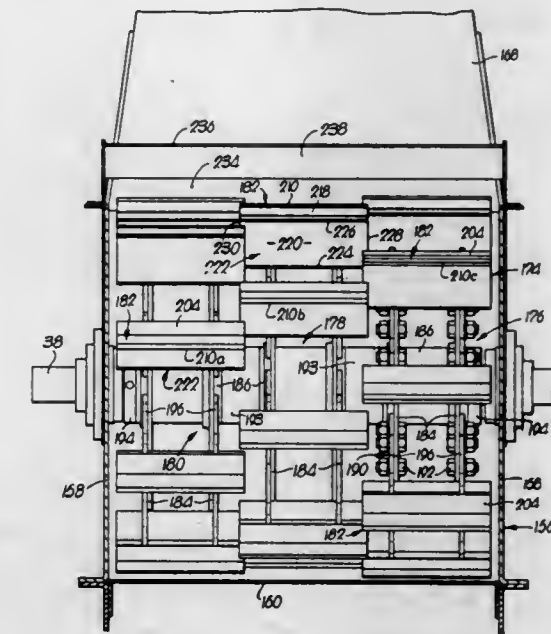
Int. Cl.<sup>2</sup> B02C 18/18

U.S. Cl. 241—55

13 Claims



grooves formed therein, each groove defined by a first wall extending from the end of said tip and located in a plane including the longitudinal axis of the tip and a second wall which extends from the base of said first wall to the first wall of an adjacent groove, to divide the fuel discharging from said nozzle tip into a plurality of separate spray patterns.



1. In a high efficiency crop harvester: a cutting chamber having a crop inlet and a crop discharge spout spaced from said inlet; a shearbar adjacent said inlet; means for feeding crops through said inlet and past the shearbar at a predetermined rate of feed; and an elongated cutting cylinder rotatable within said chamber across the path of travel of entering crops and cooperable with the shearbar to sever the crops into segments, said cylinder including at least one elongated cutting means having a longitudinal axis that extends helically and longitudinally around the axis of rotation of the cylinder between the opposite ends of the latter, said cutting means including a plurality of separate, parallel knife segments arranged in longitudinally and circumferentially offset relationship to one another along the longitudinal axis of the cutting means, said knife segments having cutting edges which define the periphery of the cylinder, each knife segment being provided with its own radially inwardly disposed cup for receiving crops severed by its knife segment and sweeping the same around the chamber and out the spout, said cups being elongated and transversely concave with their longitudinal axes substantially parallel to the axis of rotation of the cylinder and substantially perpendicular to said path of travel of the entering crops.

4,011,999

## SELF CLEANING TRASH SHREDDER

Walter M. Glaeser, Affton, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

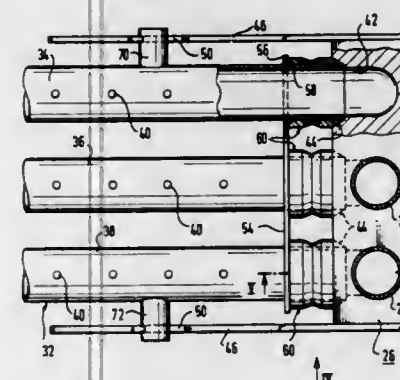
Filed July 2, 1975, Ser. No. 592,633

Int. Cl.<sup>2</sup> B02C 13/286

U.S. Cl. 241—79.1

5 Claims

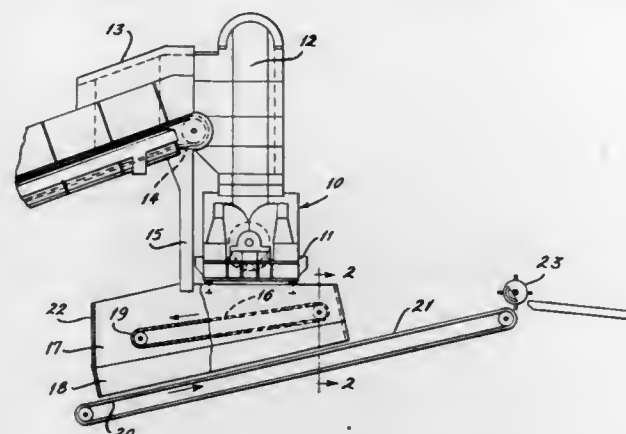
1. In trash shredder and conveying apparatus the combination of a trash shredder having a trash receiving inlet and a shredded trash discharge, a first elongated conveyor set at a downward slope to a discharge end and being aligned below said trash discharge to catch the shredded trash and move it to said discharge end, a second elongated conveyor set at an upward slope from a receiving end and being aligned with and



1. A quick-release spray tube coupling arrangement for washing machines comprising a sealing ring surrounding one end of a spray tube in sleeve-like manner, said sealing ring having a sealing portion with a tapered end, an elastically axially compressible central part supporting and connecting said tapered end on a supporting ring portion fixed on said spray tube in an axial direction, said spray tube extending into an opening in a coupling member with said tapered end of said sealing ring engaging said opening, a lock mechanism clamping said spray tube and subjecting it to a bias toward the coupling opening and subjecting said sealing ring to axial displacement as a whole on the end portion of the spray tube facing the coupling member without changing the shape of said tapered end sealing portion.

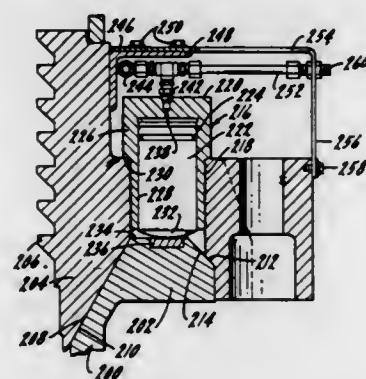


extending in the direction of elongation of and spaced vertically below said first conveyor and having said receiving end spaced from said discharge end of said first conveyor, said second conveyor have a higher linear speed than said first conveyor and also a greater slope than the slope of said first conveyor, said conveyors being spaced farthest apart between said discharge end of said first conveyor and the underlying receiving end of said second conveyor, the vertical spacing



**4,012,000**  
**CRUSHING MACHINE CLEARING SYSTEM**  
D. Carter Davis, Menomonee Falls, and Ulhas S. Sawant, Sussex, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.  
Filed May 27, 1975, Ser. No. 580,925  
Int. Cl.<sup>2</sup> B02C 2/04

U.S. Cl. 241-290



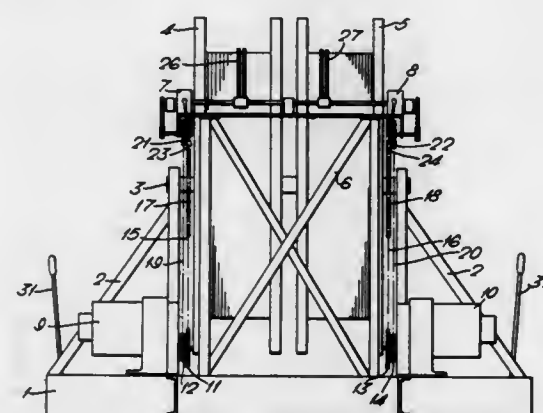
1. A hydraulic system or bowl release for a gyratory crusher having a circumferential main frame element, a bowl-supporting ring element tiltably mounted on the upper end of the main frame element and constructed to be releasably held down against the main frame element by a spring release, and a plurality of hydraulic jacks arranged circumferentially about and effective between the main frame and bowl-supporting ring elements, the jacks being at least partially countersunk into one of the elements and operative, as a group, to apply an axial thrust to the other element to elevate the bowl-supporting ring element from the main frame element so that the crushing cavity of the crusher may be cleared of uncrushable material, the hydraulic jacks being countersunk into the bowl-supporting ring element, each of the jacks including a cylinder and piston countersunk and screw-threaded down into the bowl-supporting ring element with a substantial amount of the lower portion of the cylinder being positioned inside of the ring element, the lower portion of the cylinder having a thin-

ner wall section than the upper portion with a shoulder between the two portions in engagement with the upper surface of the bowl-supporting ring element, and friction-reducing elements in the upper surface of the main frame element opposite the piston of each of the jacks to create slippage to accommodate side loads during jacking and cavity clearance.

**4,012,001**  
**CABLE SPINNING**  
Hugh Stewart Geddes Knox, Broadmead, Dalton Road, Croft, Yorkshire, England  
Continuation-in-part of Ser. No. 385,580, Aug. 3, 1973, abandoned. This application Feb. 5, 1975, Ser. No. 547,404  
Claims priority, application United Kingdom, Aug. 4, 1972, 36617/72

Int. Cl.<sup>2</sup> B65H 75/00  
U.S. Cl. 242-54 R

8 Claims



1. A machine for reeling and unreeling wire for use in an aerial spinning process for forming suspension cables in the construction of a suspension bridge, comprising in combination, a frame including a nonrotatable shaft, two permanently mounted reels for reeling and unreeling said wire, each reel being mounted on said nonrotatable shaft and rotatable about said shaft in either direction, and separate, independent and reversible variable speed drive means for each reel including a positive driving connection to each reel for driving each reel in either direction of rotation independently of each other.

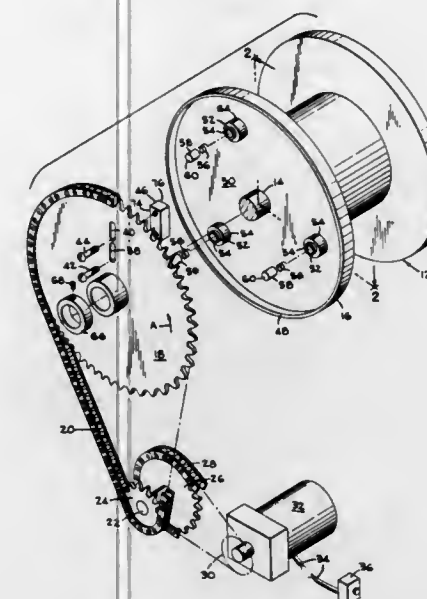
**4,012,002**  
**AUTOMATIC COUPLING MECHANISM FOR HOSE REELS**  
Dean McDonald, and Michael R. Williams, both of Jonesboro, Ark., assignors to FMC Corporation, San Jose, Calif.  
Filed May 19, 1976, Ser. No. 687,777  
Int. Cl.<sup>2</sup> B65H 75/00, 75/38

U.S. Cl. 242-54 R

8 Claims

1. A reeling apparatus comprising:  
a motor;  
a rotatable drive member in driving communication with said motor;  
a reel mounted in juxtaposed relationship with said drive member; and  
coupling means movably mounted upon said drive member

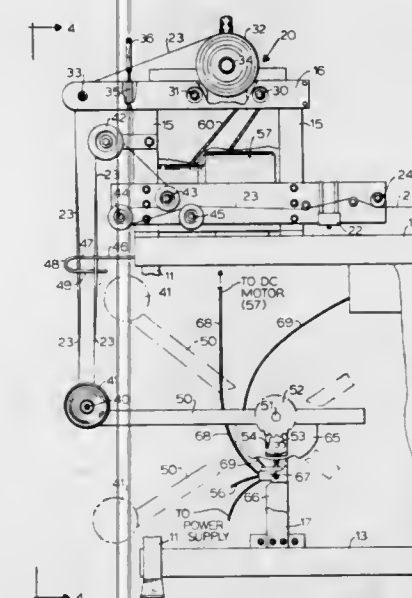
for engaging said reel when said drive member is moved into a first rotative position and for disengaging said reel



when said drive member is moved into a second rotative position.

**4,012,003**  
**FEEDING AND PROPELLING SYSTEM FOR THE TAPE IN A SEED-TAPE MANUFACTURING MACHINE**  
Troy L. Cochran; Melvin D. Kirkpatrick, both of Salinas, and Robert J. Walder, Soquel, all of Calif., assignors to Union Carbide Corporation, New York, N.Y.  
Continuation of Ser. No. 208,281, Dec. 15, 1971, abandoned.  
This application Nov. 19, 1973, Ser. No. 416,761  
Int. Cl.<sup>2</sup> B65H 17/12, 25/22, 27/00  
U.S. Cl. 242-55

8 Claims



1. In a seed-tape manufacturing machine having a main tape driving means for driving tape past a seed-dispensing means, peripheral contact means for engaging the periphery of a drum-like cylinder of tape for positively unwinding it, the combination therewith of:

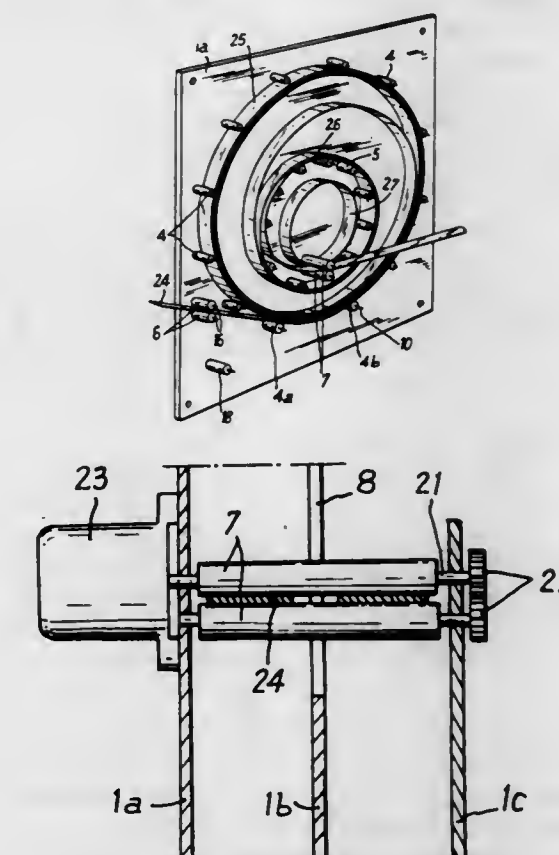
guide-and-tension means for guiding the unwound tape under tension to said main tape driving means,  
said guide-and-tension means including a first shaft adjacent to said peripheral contact means, over which said tape passes, and a second shaft over which said tape passes in tension between said first shaft and said main tape driving means,

a pivoted beam supporting said second shaft for movement toward and away from said first shaft according to the length of said tape, by swinging said beam upon its pivot, said guide-and-tension means maintaining a substantially constant tape tension even when the relative speeds of tape unwinding and the speed of tape drive are different, a first centering tape guide secured in a stationary laterally central position between said peripheral contact means and said first shaft,  
a DC motor driving said peripheral contact means completely independently of said main drive means, a potentiometer controlling the speed of said DC motor, varying means for changing the resistance of said potentiometer so as to vary the speed of said DC motor, transmitting means connecting said beam to said varying means, so that a change in position in said second shaft automatically causes a change in the speed of said DC motor that tends to drive the peripheral contact means at the same speed as the main tape driving means is driving the tape.

**4,012,004**  
**DEVICE FOR THE ACCUMULATION OF MATERIALS IN STRIPS**  
Sylvain Tonellato, 15, rue Pierre Desjardins, 78800 Houilles, France  
Filed Jan. 16, 1976, Ser. No. 649,940  
Claims priority, application France, Jan. 17, 1975, 75.01448

Int. Cl.<sup>2</sup> B65H 17/48  
U.S. Cl. 242-55.19 R

5 Claims



1. A device for the accumulation of elongated strip material of considerable length, said device comprising: an outer cage, an inner cage, said two cages being substantially cylindrical and comprising sets of horizontal rollers mounted for rotation on fixed pivots disposed substantially between two parallel vertical plates, said cages and said plates defining an accumulation space slightly wider than the width of said strip material in which the strip material is accumulated in a single spiral coil comprising at least two turns and forming outer and inner spirals, multiple pairs of gripper rollers for gripping respective strip material spirals to the inside and outside of said inner and outer spirals, respectively, and wherein the inner turn of the inner spiral is nipped at both its ends between at least one



inner pair of said gripper rollers to form a helicoidal floating turn and one of said plates has an opening within the inner cage through which the inner pair of gripper rollers and one end of said helicoidal floating turn protrudes from said accumulation space.

4,012,005

## ROTATIONAL TAPE ACCUMULATOR

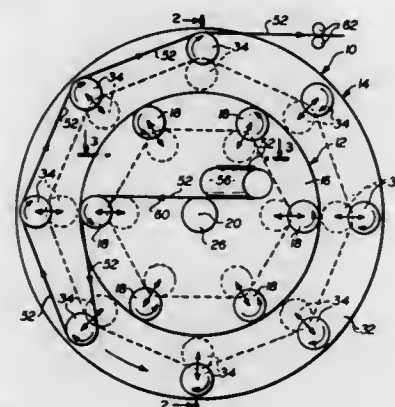
Harold J. Hattersley, Jr., Bricktown, N.J., assignor to General Cable Corporation, Greenwich, Conn.

Filed Mar. 11, 1976, Ser. No. 665,795

Int. Cl.<sup>2</sup> B65H 17/02, 17/48

U.S. Cl. 242—55

8 Claims



1. A tape accumulator including in combination an inner frame and an outer frame, one of which is rotatable with respect to the other about an axis, each of the frames having a plate portion with a circle of angularly spaced shafts supported by the frame and extending therefrom generally parallel to the axis of the frame, a roll on each of the shafts rotatable with respect to its supporting frame, the rolls of each frame supporting spirally wound reels of tape in the accumulator, means for rotating one of the frames in a direction to wrape tape in spiral layers on one of the frames when said frames have relative rotation with respect to one another during which tape is accumulated by said accumulator for maintaining a continuous supply of tape to a production unit while one end of the tape is stopped for splicing an additional tape to the trailing end of the tape wound on the accumulator, at least one of the frames having means for connecting the shafts with the plate portion of the frame, and the connecting means being movable with respect to the plate in directions having components that are radial with respect to the axis of the plates whereby the rolls are movable inward toward the axis to compensate for the fact that successive layers of tape wound on the rolls are applied from the inside of the spirals of tape so that the inside radius of each spiral decreases as successive layers accumulate.

4,012,006

## CONTINUOUS LOOP TAPE CARTRIDGES

Edward Alexander Leshik, London, England, assignor to Hellerman Cassettes Limited, Crawley, England

Filed Sept. 30, 1975, Ser. No. 618,287

Claims priority, application United Kingdom, Oct. 1, 1974, 42550/74; Oct. 1, 1974, 42553/74

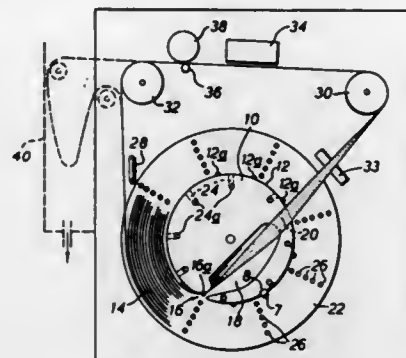
Int. Cl.<sup>2</sup> B65H 17/48

U.S. Cl. 242—55.19 A

14 Claims

1. A tape cartridge, comprising:
  - a. a base;
  - b. a tape-pack carrier mounted non-rotatively on said base, said tape-pack carrier comprising a cylindrical hub projecting upwards from said base, said hub containing a recess, and an axial slot extending radially inwardly from the periphery of said hub in communication with said recess;
  - c. tape-guiding means on said base;
  - d. a length of tape wound as a pack around said hub, said

tape passing successively off the innermost turn of said pack, through said slot, in a 90° twisted relation within said recess to a horizontal plane, and over the top of said hub and pack at a point diametrically opposite said slot, said tape then being twisted back again through 90° to a vertical plane and passing around said guiding means to



- return to said pack as the outermost turn thereof, said tape being in a continuous loop; and
- e. at least one radial duct extending through said hub to the cylindrical peripheral surface thereof, to convey air to said pack to provide an air-bearing for the tape at least between said innermost turn and said cylindrical surface of said hub.

4,012,007

## PAPER TOWEL HOLDER

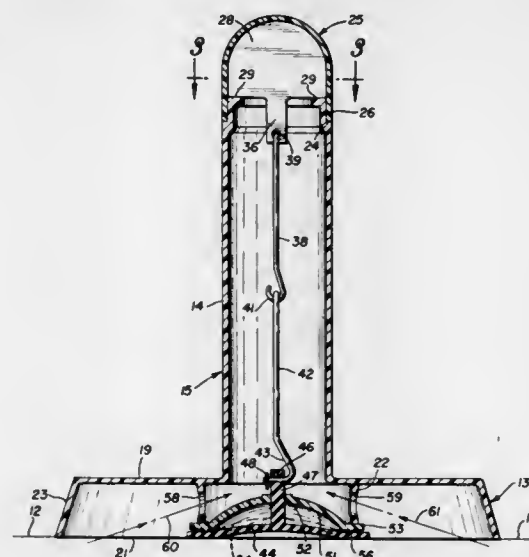
Donald W. Cunningham, 1403 S. Dudley St., Lakewood, Colo. 80226

Filed Aug. 1, 1975, Ser. No. 601,247

Int. Cl.<sup>2</sup> A47K 10/24, 10/32

U.S. Cl. 242—55.54

9 Claims



1. A holder for tube core types of roll paper towels adapted for selective positioning and mounting on a flat support surface adjacent user work stations comprising a base element having planar contact surfaces for engaging said support surface at widely spaced apart positions, a standard disposed in normal position with respect to said base and of exterior size for close engagement with the interior of said tube core whereby relative rotation as between said tube core and said standard is frictionally resisted, said base providing a recess therein intermediate opposed contact surfaces of said base, a suction cup within said recess having its outer edges disposed in planar positions with respect to the contact surfaces of said base and, accordingly, in position for contact with said support surface, said suction cup further being isolated and free of major torsion forces that may be exerted by and on said base and standard, actuator means on said standard inclusive of an output element providing translational relative motion with respect to said base and suction cup and, accordingly,

directed toward and away from said support surface, and connector means for the transmission of tension loadings joining the said output element for said actuator means and said suction cup whereby vacuum influences are relieved and induced beneath said suction cup for selectively holding the suction cup and, accordingly, said holder and the contact surfaces thereof securely on said support surface at adjusted positions.

4,012,008

## WINDOW SASH BALANCER

Suichi Hosooka, Namerikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

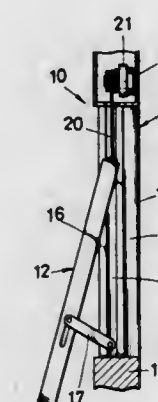
Filed Oct. 29, 1975, Ser. No. 626,825

Claims priority, application Japan, Nov. 6, 1974, 49-135028[U]

Int. Cl.<sup>2</sup> B65H 75/48; E05D 13/12

U.S. Cl. 242—107

4 Claims



1. A balancer for use with window sashes, comprising in combination:

- a. a housing;
- b. a shaft rotatably supported in said housing and having one end projecting beyond said housing;
- c. a spring member disposed within said housing and having one end secured to said housing and the other end to said shaft, said spring member being adapted to normally bias said shaft in a one direction of rotation;
- d. a drum of a frustoconical shape secured to said projecting end of said shaft;
- e. a wire member wound around and secured to said drum and providing a spiral groove; and
- f. a cord coiled along said spiral groove and having one end fixed to said drum, the other end being adapted to be secured to the window sash, the unwinding of said cord being in the same direction as the tensioning of said spring member.

4,012,009

## TEXTILE BEAM

Arthur S. O'Malley, and Eli G. Byrum, Jr., both of Charlotte, N.C., assignors to Hayes-Albion Corporation, Charlotte, N.C.

Filed Oct. 24, 1975, Ser. No. 625,468

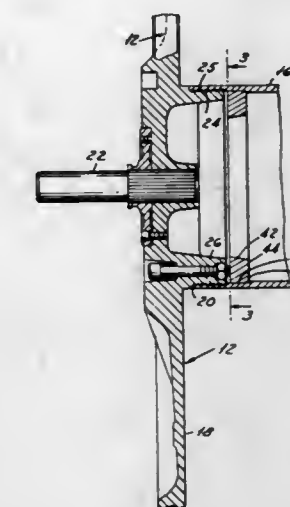
Int. Cl.<sup>2</sup> B65H 75/14

U.S. Cl. 242—118.62

9 Claims

1. In a textile beam including a tubular cylindrical barrel and a pair of heads each attached to one of the ends of the barrel by engagement between threaded portions provided on the head and the barrel, the improvement comprising retaining means positioned radially inwardly of said threaded portions on the head and the barrel for applying

a separating force therebetween in a direction generally parallel to the axis of the barrel, said force increasing the



frictional resistance in said threaded portions to relative rotational movement between said head and barrel.

4,012,010

## THREAD DISPENSER

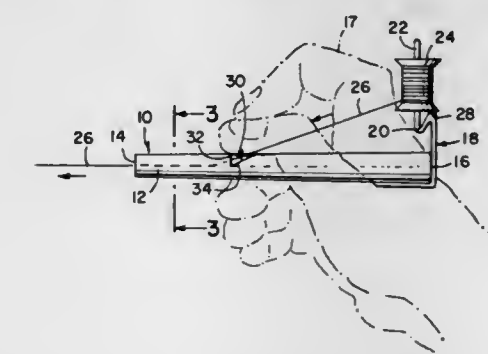
Robert W. Friedman, 159 Reynolds Road, West Islip, N.Y. 11795

Filed Dec. 2, 1975, Ser. No. 636,923

Int. Cl.<sup>2</sup> B65H 49/00

U.S. Cl. 242—129.8

3 Claims



1. A device for dispensing thread from a spool comprising: an elongated tubular handgrip tapering in diameter along its length between front and rear ends respectively of relatively smaller and relatively larger diameter; said handgrip having a notch through its wall at a location intermediate said front and rear ends; said handgrip being proportioned to be gripped in the nature of a pen; a wire secured to the rear end of said handgrip and extending radially of said handgrip, said wire being bent to support said spool of thread at its end; whereby said thread from said spool may be trained through said notch into the interior of said handgrip and out said front end.

4,012,011

## TAPE CASSETTE

Shoichi Saito, Nakano, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1975, Ser. No. 624,482

Claims priority, application Japan, Oct. 21, 1974, 49-121744; Oct. 21, 1974, 49-127660[U]; Oct. 21, 1974, 49-127661[U]; Oct. 21, 1974, 49-127662[U]

Int. Cl.<sup>2</sup> G03B 1/04; G11B 15/32, 23/04

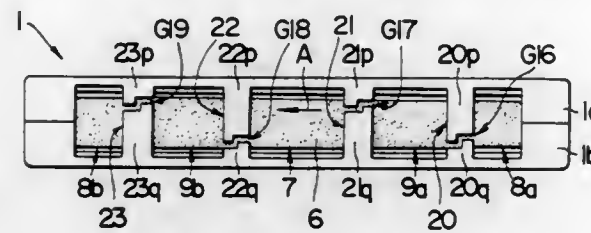
U.S. Cl. 242—199

17 Claims

1. A tape cassette comprising a pair of casing halves which are abutted together, the pair of casing halves including a plurality of frame portions extending therefrom to define a plurality of tape exposure ports, the frame portions disposed in abutting relationship having a complementary configura-



tion to each other and defining a gap therebetween which extends in a direction different from the running direction of



a magnetic tape contained in the cassette along the tape exposure ports.

4,012,012

## SUPPLEMENTAL OIL SYSTEM FOR ENGINES

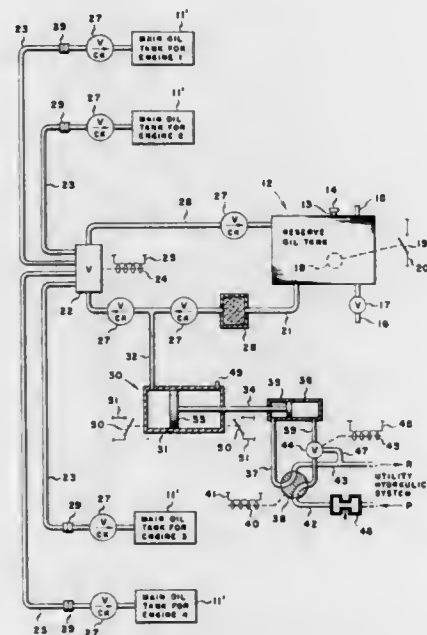
George E. Ligler, Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Oct. 30, 1975, Ser. No. 627,123

Int. Cl.<sup>2</sup> B64D 33/00

U.S. Cl. 244-1 R

6 Claims



1. The combination with an airplane having a wing with multiple turbo-jet engines and each having an associated main oil tank mounted thereon, of a supplemental oil system to replenish oil in each main oil tank, said system comprising:

- a reserve tank of oil located internally of said airplane;
- a pipeline connecting said reserve tank to each said main tank;
- a container having a measured capacity less than that of said reserve tank located in said pipeline;
- valving in said pipeline operable to permit the flow of oil from said reserve tank to said container and a distribution valve to control the flow of oil from said container to a selected one of said main tanks; and
- a force pump to assure the flow of oil from said reserve tank to said container and to each said main tank when free to do so upon the operation of said valving.

4,012,013  
VARIABLE CAMBER INLET FOR SUPERSONIC AIRCRAFT

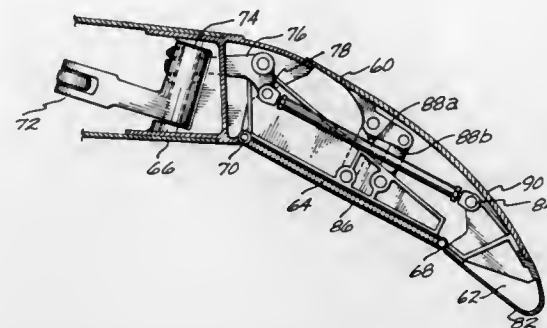
William Henderson Ball, and Kichio Keith Ishimitsu, both of Mercer Island, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 5, 1976, Ser. No. 655,329

Int. Cl.<sup>2</sup> B64D 33/02

U.S. Cl. 244-53 B

2 Claims



1. In a rectangular cross sectioned air inlet for an engine operatively associated with a supersonic aircraft, the air inlet having an outer surface exposed to ambient air and an inner surface forming the primary passageway for intake of air to the engine, and means for varying the capture area of the primary passageway comprising:

- a. a first ramp mounted to the top forward edge of the inlet, said first ramp having three portions, a fore portion, a middle portion, and an aft portion, the fore portion pivotally mounted to the middle portion, the middle portion pivotally mounted to the aft portion, and, the aft portion mounted to the inlet so that the fore portion can pivot relative to the middle portion, and the middle portion can pivot relative to the aft portion;
- b. a second ramp mounted to the bottom forward edge of the inlet, said second ramp having three portions, a fore portion, a middle portion, and an aft portion, the fore portion pivotally mounted to the middle portion, the middle portion pivotally mounted to the aft portion and, the aft portion mounted to the inlet so that the fore portion can pivot relative to the middle portion, and the middle portion can pivot relative to the aft portion;
- c. actuating means mounted to the inlet for varying said first and second ramps from first positions used when the aircraft is in subsonic flight to second positions used in supersonic flight whereby the capture area of the primary passageway is increased; and
- d. pivoting means for pivoting the fore and middle portions of said ramps relative to each other and the aft portion, said pivoting means being mounted within said ramp and connected to said actuating means.

4,012,014

## AIRCRAFT FLIGHT CONTROLLER

Lawrence E. Marshall, Ferguson, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Sept. 11, 1975, Ser. No. 612,359

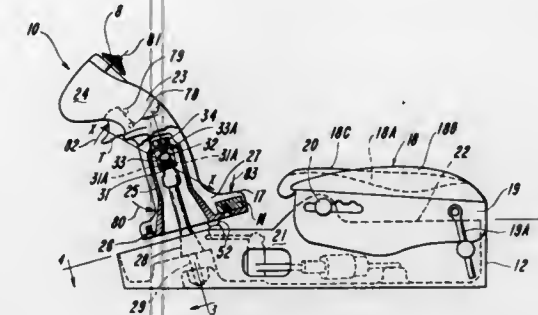
Int. Cl.<sup>2</sup> B64C 13/04

U.S. Cl. 244-83 F

7 Claims

1. An aircraft flight controller for imparting signals to the aircraft attitude controls comprising: a hand grip member, a universal joint device mounted within said grip member to locate the intersection of a plurality of aircraft attitude axes at substantially the center of the fist gripping said grip member, a fixed post supporting said universal joint device such that said hand grip member is free to swing relative to said post and

in directions about any of said axes, and signalling devices operatively connected to said hand grip member at locations



displaced from each other and from said intersection of said axes.

4,012,015

## CONTROL AND SYNCHRONIZATION OF TWIN ENGINES WITH A MASTER THROTTLE LEVER

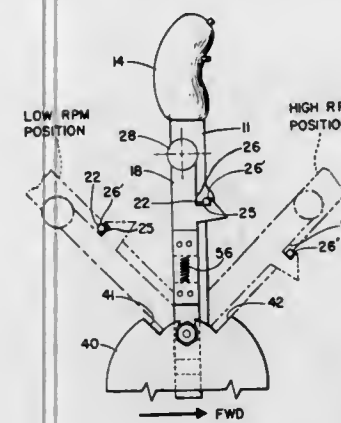
Lewis A. Nelson, Los Angeles, and Herbert L. Cox, Manhattan Beach, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Dec. 29, 1975, Ser. No. 644,860

Int. Cl.<sup>2</sup> B64C 13/04, 13/08

U.S. Cl. 244-83 F

11 Claims



1. In an aircraft having two engines, a pilot's throttle lever assembly for speed control and continuous synchronization of said engines throughout their operational range, said lever assembly comprising:

- a. an elongated master throttle lever pivotally mounted on a transverse shaft, said master lever having a fixed pin extending laterally therefrom in a parallel direction with said transverse shaft;
- b. a first slave throttle lever pivotally mounted on said transverse shaft, linkage connecting means on said first slave lever for connection to a first engine throttle operation linkage, said first slave lever having means defining a locking detent adapted to releasably engage said fixed pin of said master lever to assure unison of movement between said master lever and said first slave lever when said fixed pin is releasably held in engagement with said locking detent by an elastic means; and
- c. a second slave throttle lever pivotally mounted on said transverse shaft, other linkage connecting means on said second slave lever for connection to a second engine throttle operating linkage, said second slave lever having means defining an elongated detent adapted to releasably engage said fixed pin of said master lever to provide for limited movement of said master lever relative to said second slave lever when said fixed pin is releasably held in engagement with said elongated detent by an elastic means and thereby providing means readily allowing for continuous synchronization of said engines by movement of said master throttle lever.

4,012,016

## AUTONOMOUS VARIABLE DENSITY AIRCRAFT

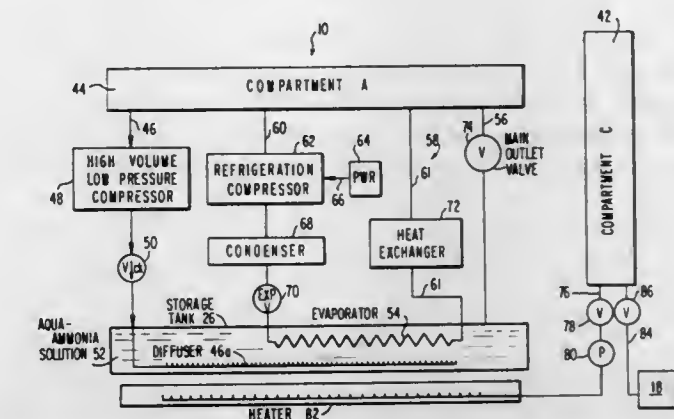
Arthur Clyde Davenport, New Orleans, La., assignor to Dynapods, Inc., New Orleans, La.

Filed Sept. 15, 1975, Ser. No. 613,640

Int. Cl.<sup>2</sup> B64B 1/62

U.S. Cl. 244-97

9 Claims



1. An autonomous variable density aircraft comprising: an aircraft body, means defining a variable volume chamber, means carried by the aircraft body for selectively and reversibly varying the amount of ammonia gas within said variable volume chamber to vary the density of said aircraft,

a storage tank carried by said aircraft body, a mass of water within said storage tank, said ammonia gas varying means comprising means for controlling the flow of ammonia gas from said variable volume chamber to said storage tank for diffusion within said water to form an aqua-ammonia solution, means for driving ammonia gas from said aqua-ammonia solution and transporting released ammonia gas from said storage tank to said variable volume chamber, said means for feeding ammonia gas from said variable volume chamber to said storage tank comprises a return extending from said variable volume chamber to said storage tank and terminating in a gas diffuser immersed within said solution and said means for driving ammonia gas from said aqua-ammonia solution comprises heater means operatively positioned with respect to said storage tank for heating said aqua-ammonia solution and driving ammonia gas therefrom by increase in temperature of said aqua-ammonia solution.

4,012,017

## ROTARY KITE

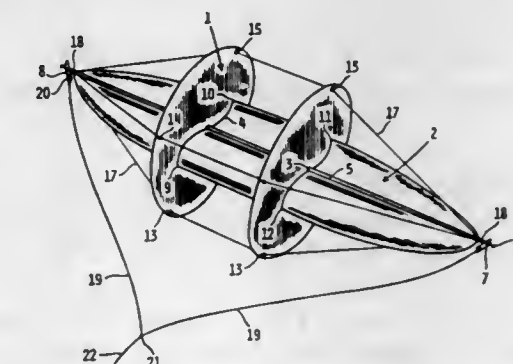
Lyle William Springston, 1011 W. Raven Road, Peoria, Ill. 61614, and Richard Lyle Springston, 1014 Main St., Peoria, Ill. 61606

Filed June 8, 1976, Ser. No. 693,742

Int. Cl.<sup>2</sup> B64C 31/06

U.S. Cl. 244-153 A

1 Claim



1. A rotary kite consisting of a single elongated airfoil ele-



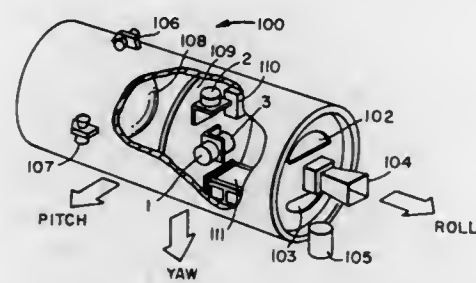
ment rounded at each end, a dowel-type shaft extending from slightly beyond one end of said airfoil element to slightly beyond the other end of said airfoil element, said shaft being mounted upon only one surface of said airfoil element and being centered upon said surface, a pair of circular stabilizer disks mounted on said airfoil element, each disk containing an opening at the center of the disk for passage of said shaft therethrough and an elongated S-shaped slot to accommodate passage of said airfoil element therethrough thereby causing the airfoil element to form a concave shape on one side of the shaft and a convex shape on the other side of the shaft, and a plurality of lines attached at specific locations on each disk for interconnecting one of said pair of disks with the other of said pair of disks and for anchoring the disks to both ends of said shaft.

4,012,018

**ALL SKY POINTING ATTITUDE CONTROL SYSTEM**  
Kenneth R. Lorell, Palo Alto, and James P. Murphy, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.  
Filed Oct. 4, 1973, Ser. No. 403,695  
Int. Cl.<sup>2</sup> B64G 1/10

U.S. Cl. 244-165

20 Claims



1. In a space vehicle, an attitude control system comprising: a sunsensor and a startracker, each having an optical axis, said axes being orthogonally disposed and forming a first set of orthogonal coordinates; a plurality of strapped-down gyroscopes, each having an input axis, said axes being orthogonally disposed and forming a second set of orthogonal coordinates; a first means responsive to an output of said gyroscopes for determining the drift of each of said gyroscopes; a second means for determining the degree of misalignment between said first and said second set of orthogonal coordinates; and a means responsive to said first and said second means for pointing said vehicle at a predetermined target.

4,012,019

**CAR SIGNALING SYSTEM**

Hisakatsu Kiwaki, and Hiroshi Okubo, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 19, 1975, Ser. No. 605,832

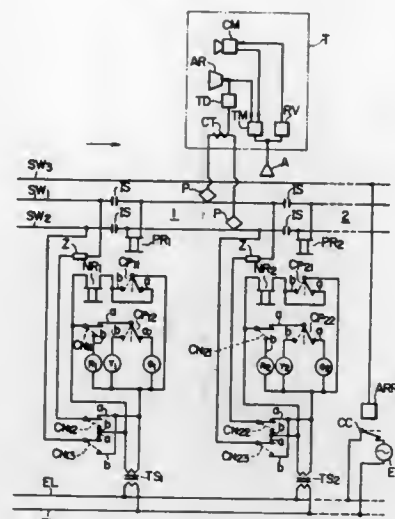
Claims priority, application Japan, Aug. 26, 1974, 49-97100  
Int. Cl.<sup>2</sup> B61L 21/06

U.S. Cl. 246-34 R

18 Claims

1. A signaling system for cars having wheels adapted for running along a track, said signaling system comprising: at least two signal wires disposed to extend along said track; main pantograph means mounted on each of said cars for making sliding engagement with one of said signal wires; subsidiary pantograph means mounted on each of said cars for making sliding engagement with the remainder of said signal wires, said main and subsidiary pantograph means being connected electrically; and

first means for detecting the relative interval between said



cars in response to the sliding movement of said main and subsidiary pantograph means along said signal wires.

4,012,020

**AUTOMOBILE AIR CONDITIONING SYSTEM**  
Don P. Dixon, and George B. Kobel, both of San Antonio, Tex., assignors to DPD Mfg. Co., Inc., San Antonio, Tex.

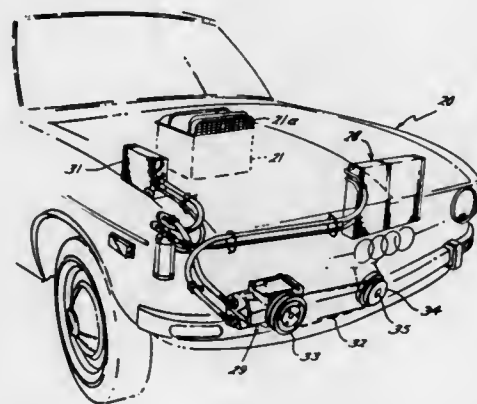
Division of Ser. No. 488,735, July 15, 1974, Pat. No.

3,978,814. This application Apr. 25, 1975, Ser. No. 571,505

Int. Cl.<sup>2</sup> F04B 39/00; F25B 1/00

U.S. Cl. 248-14

7 Claims



1. A bracket for mounting the compressor of an air conditioning system within an automobile, comprising a base plate having one side for supporting the compressor and slots therethrough to receive bolts for connection to the one side of the compressor, and means for mounting the base plate on the engine block of the automobile, including first and second mounting plates, and an intermediate plate connecting the mounting plates in generally parallel offset planes, only one of the plates of said mounting means being directly connected to one end of the base plate with the first and second mounting plates extending at an acute angle thereto, and each of said mounting plates having bolt holes therethrough.

4,012,021

**MULTI-ADJUSTABLE ELECTRIC MOTOR SUPPORT**  
Rolland R. Duceppe, 2227 1st St., Richelieu, Quebec, Canada

Filed Apr. 9, 1975, Ser. No. 566,367

Int. Cl.<sup>2</sup> H02K 5/00

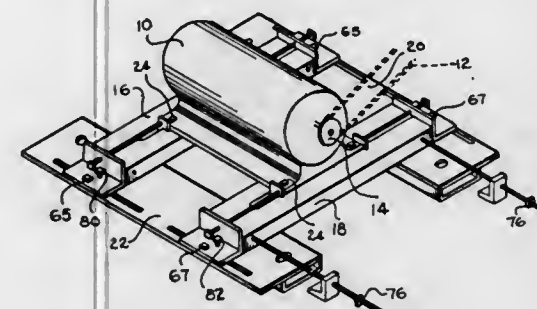
U.S. Cl. 248-23

2 Claims

1. A support for mounting a motor in a variety of flat and angular positions, the said support comprising: a first pair of parallel beams for supporting the said motor, the said first beams comprising a reversed U-shaped cross-section and an L-shaped rigidly secured at each end thereof, each of said first beams being provided with a slot in the upper surface thereof, and two guide means

slidingly mounted in each said slot for abutting against the side of the motor, the said motor being adapted to be releasably secured to said first beams through said slots, screw means threadedly engaged through said L-shaped plates at each end of said first pair of beams and abutting against the said guide means for slidingly displacing the said motor over said first beams,

a second pair of parallel beams transversely disposed under said first beams, the said second beams being rectangular hollow channels having flat top and lower surfaces, and a lip extending outwardly of and in the same plane as said top surface, each said lip being provided with a slot for



receiving a tightening bolt mounted through said L-shaped plates at the end of said first beams and adapted to immobilize in translation the said first beams, the said top surface of the second beams being provided with holes for receiving bolts adapted to sink below the upper surface of said second beams and secure the lower surface thereof to a base,

spacing means comprising screws threadedly mounted through said L-shaped plates and abutting against the said lip for slightly changing the angle of at least one of the first beams relative to the second beams, the said spacing means being adapted to be fixed relative to said second beams by said tightening bolts.

4,012,022

**BREAKAWAY MIRROR MOUNTING**

Itsuo Tomita, Hiratsuka, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

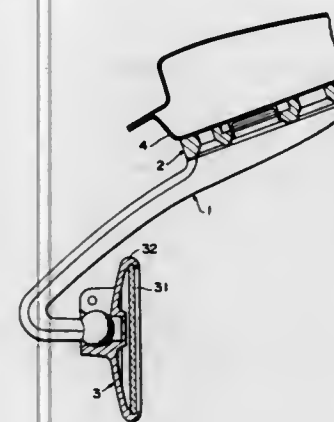
Filed Aug. 11, 1975, Ser. No. 603,283

Claims priority, application Japan, Aug. 12, 1974, 49-91532; Aug. 12, 1974, 49-91531

Int. Cl.<sup>2</sup> A47F 7/14

U.S. Cl. 248-475 A

5 Claims



1. A breakaway mirror mounting for detachably attaching a rear view mirror device to the interior structure of a motor vehicle comprising:

a mirror;  
a mirror supporting arm having said mirror attached at one end of said arm;  
a synthetic resin base plate having upper and lower surfaces and constructed for the upper surface to be secured to the interior structure of a motor vehicle; and

means for detaching the mirror and the mirror supporting arm as a whole from the base plate upon application of a force greater than a predetermined magnitude to the mirror supporting arm;

said means for detaching the mirror and the mirror supporting arm comprising an abutting surface provided on the other end of the mirror supporting arm, a supporting surface provided on said lower surface of the base plate, a platform provided on said abutting surface, an engaging projection including a head portion and a neck portion extending from said platform, said base plate having therethrough an accommodation opening partially formed by inner walls, and a pair of resilient engaging strips each extending from opposing edges of said accommodation opening and being separated from each other at their adjacent ends to define between them a gap smaller in width than said head portion, said strips having a configuration corresponding to that of said head portion;

said accommodation opening being formed with slanting surfaces along its lower side edges;

said platform having side surfaces slanting at an angle corresponding to the slanting angle of the slanting surfaces of said opening;

said head portion of said engaging projection having on opposite edges respective lateral protrusions, the upper surface of each said protrusion gradually sloping upwardly toward the top portion of the engaging projection; said engaging strips having upper and lower surfaces, said upper surface including a portion extending from the inner walls substantially at a right angle, said lower surface being comprised of an upwardly sloping portion and connected thereto at its lower end to said slanting surface and a supporting surface continuously connected to the slanting surface at the lower end of the slanting surface to cause the lower surface to present a gradual upward curvedness so as to impart more thickness to the bottom side of the strip near the inner walls, the connection between the inner walls and the upper surface portion being located outwardly of the connection between the slanting surface and the lower surface portion, upon the insertion of said engaging projection into said accommodation opening, to expand said gap so that the strips permit the insertion of the projection and hold the same by its lateral protrusions.

4,012,023

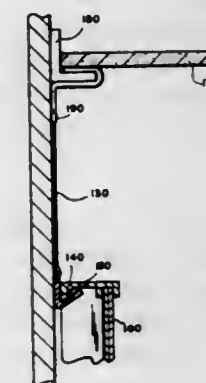
**GRID CLIP APPARATUS FOR HANGING PICTURES**  
James W. Melanson, Concord, N.H., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Mar. 17, 1976, Ser. No. 667,477

Int. Cl.<sup>2</sup> A47G 1/16

U.S. Cl. 248-489

2 Claims



1. A device for hanging pictures and the like from a suspended ceiling border framework comprising: a first piece secured to the rear of the picture and having a flat elongated flange, two opposed tabs and a flat plate,



the flat plate being secured to the rear of the picture and having a hole through which a nail and the like may be inserted to secure the first piece to the picture, the flange extending downwardly and rearwardly from the bottom end of the flange, and the tabs extending vertically downwardly from the sides of the flange at its rear end; a hook, the hook having a U-shaped portion that encircles the rear end of the flange and that lies on the top and bottom faces of the flange, and the hook further having a second portion extending upwardly from the forwardmost end of that face of the U-shaped portion which lies on the top face of the flange, with the second portion being generally parallel to the picture and having a hole; an elongated vertical wire secured at its lower end to the hook by extending through the hole in the hook; and clip means secured to the upper end of the wire and engaging said framework.

4,012,024

# KEY-JOINT FORMING DIVIDER STRIP WITH UPSTANDING SCREED ADAPTED FOR USE WITH CONCRETE SLABS

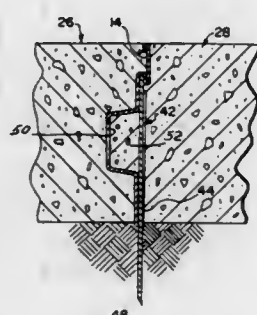
Peter D. Courtois, Oceanside, Calif., assignor to Superior Concrete Accessories, Inc., Franklin Park, Ill.

Filed Feb. 3, 1976, Ser. No. 654,948

Int. Cl.<sup>2</sup> E01C 11/04

U.S. Cl. 249—9

2 Claims



1. A forming unit adapted to establish a key-joint between a pair of adjacent concrete slabs, and comprising, in combination, a plurality of horizontally aligned and spaced stakes set with their upper ends positioned uniformly and appreciably below the grade level which is to be established by the upper surfaces of the slabs, and a horizontally elongated divider strip formed of sheet metal, supported on said stakes and bridging the distance between each pair of adjacent stakes, said divider strip having a lower key-joint forming section and an upper substantially planar vertical screed section, said lower section including upper and lower vertical coplanar parts abutting the stakes on one side thereof, and an intermediate laterally offset key deformation portion extending between and connecting said upper and lower coplanar parts, the upper edge of said upper part of said lower key-forming section being provided with a narrow laterally turned flange extending in a direction opposite to that of the key deformation portion, the distal edge of said laterally turned flange being provided with an integral downturned flange, said downturned flange, together with the laterally turned flange and said upper planar part, defining a downwardly opening stake-receiving channel into which the upper ends of the stakes project, the lower edge of said downturned flange being provided with an integral upward fold which establishes said upper vertical screed section and renders the latter for the most part of single thickness, the lateral extent of said laterally turned flange on the upper edge of said upper planar part being substantially equal to the thickness of the upper ends of said stakes whereby such ends are received within said downwardly opening stake-receiving channel with a snug frictional fit, and whereby flexing of said screed section in the direction of the key deformation portion will serve to widen the channel to facilitate entry of the upper ends of said stakes into said channel.

## 4,012,025 MOLD FOR PLASTICS, PARTICULARLY MULTI-COMPONENT PLASTICS INJECTION MOLD HAVING BLIND CHANNEL

Rudolf Ernst, Munich-Solln; Fritz W. Schneider, Strasslach-Hailafing, and Helmut Clausen, Strasslach-Munich, all of Germany, assignors to Firma Elastogran Maschinenbau GmbH & Co., Munich, Germany

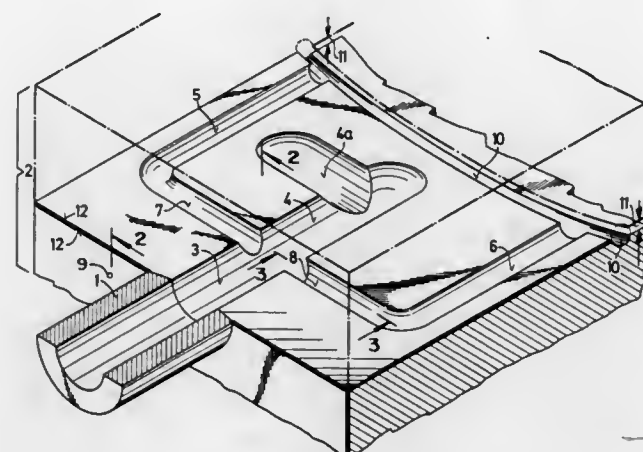
Filed Apr. 10, 1975, Ser. No. 566,692

Claims priority, application Germany, Apr. 13, 1974, 2418247

Int. Cl.<sup>2</sup> B29F 1/00

U.S. Cl. 249—105

3 Claims



1. In a mold for multi-component plastics wherein cooperating mold sections confront each other at plane surfaces and cooperate with each other to define a plastics-receiving portion and a mold cavity communicating with the plastics-receiving portion to receive plastics therefrom, the plastics-receiving portion including a sprue runner, a blind channel with an inlet end in unobstructed open communication and longitudinal alignment with the sprue runner and having substantially the same cross-sectional flow area as the sprue runner, the inlet end being the only plastics flow access to the blind channel, and a sprue runner branch in communication with the sprue runner and intersecting the sprue runner in a direction transversely of the sprue runner, the sprue runner branch delivering plastics to the mold cavity, the sprue runner branch having a significant restriction to flow of plastics from the sprue runner as compared to the free flow of plastics through the unobstructed open communication into the blind channel from the sprue runner, the restriction being located adjacent the intersection of the sprue runner branch with the sprue runner.

4,012,026

# APPARATUS FOR FORMING PLAQUES

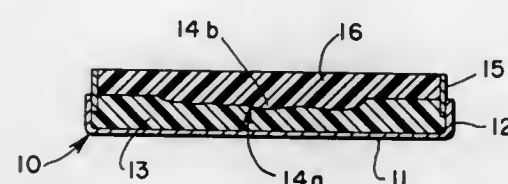
Denzil G. Chambers, 2432 MacArthur Blvd., Apt. 104, Irving, Tex. 75062

Filed Jan. 27, 1975, Ser. No. 544,506

Int. Cl.<sup>2</sup> B28B 7/06

U.S. Cl. 249—134

9 Claims



1. An apparatus for producing plaques by impression molding comprising:

- a. an impression frame having a base section and upstanding wall sections;
- b. a plastic impression retaining means capable of receiving and retaining an impression, said impression retaining means being disposed within said impression frame and supported by the base of said impression frame; and

c. a molding frame having upstanding walls defining a continuous wall section with open ends, said molding frame fitted wholly within the upstanding wall sections of said impression frame and supported by said plastic impression retaining means such that the lower edge of said continuous wall section sealedly engages said plastic impression retaining means with the upper edge of said continuous wall section extending above said plastic impression retaining means thereby forming the mold defined by the surface of said plastic impression retaining means and the upstanding continuous wall section of said molding frame.

4,012,027

# METAL CUTTING MACHINE WITH SCRAP SAVING FEATURE

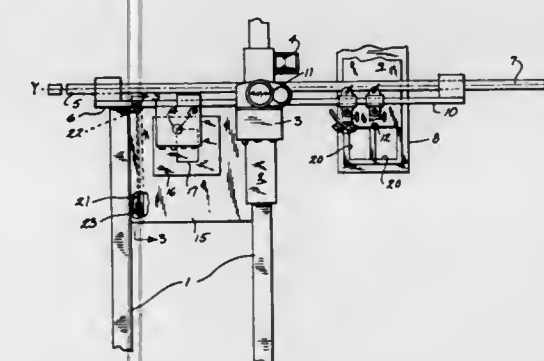
Harry Hooper, Brookfield, Wis., assignor to C-R-O Engineering Co., Inc., Brookfield, Wis.

Filed Mar. 24, 1976, Ser. No. 670,048

Int. Cl.<sup>2</sup> B23K 7/02

U.S. Cl. 266—58

6 Claims



1. In a machine for cutting a plurality of identical parts from a plate-like workpiece wherein a tracing head is adapted to follow a template mounted on a cutting table for driving a workpiece cutting head through a plurality of successive cutting cycles: selectively actuatable means for shifting said template a pre-selected fixed distance automatically at the end of one cutting cycle to thereby re-position said template for the next succeeding cutting cycle.

4,012,028

# FURNACE OF A CONTINUOUS METAL STRIP HEAT-TREATMENT PLANT

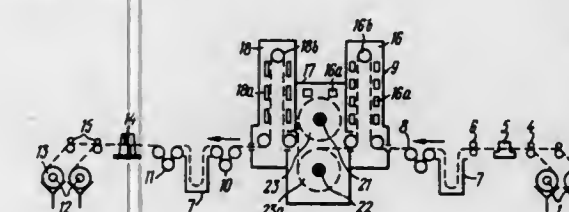
Vladimir Izrailevich Dunaevsky, ulitsa Oktyabrskoi Revolutsii, 17, kv. 9, Slavyansk; Nikolai Mikhailovich Krikly, ulitsa Parkovaya, 69, kv. 67; Eduard Sergeevich Kotelevets, ulitsa Parkovaya, 3, kv. 25, both of Kramatorsk; Vladilen Nikolaevich Apterman, ulitsa V. Maslovka, 8, kv. 207; Mikhail Ilich Oginsky, ulitsa Zhukovskogo, 2, kv. 16, both of Moscow; Stanislav Tikhonovich Pliskanov, prospekt Lenina, 62, kv. 13, Zhdanov, and Boris Ioinovich Kaushansky, ulitsa Karla Marxa, 28, kv. 2, Slavyansk, all of U.S.S.R.

Filed May 8, 1975, Ser. No. 575,965

Int. Cl.<sup>2</sup> C21D 9/56, 9/68

U.S. Cl. 266—103

3 Claims



1. A furnace for a continuous metal strip heat treatment plant comprising: a heat-insulated cell having an inlet and an outlet for the metal strip; heating elements arranged within said cell, and means for moving said strip within said cell in the

course of heat treatment, said means including: at least a pair of coiling drums disposed substantially parallel to each other and having separable segments split along the longitudinal plane of said drums for clamping said strip and coiling it in a bifilar manner and uncoiling it successively on said drums; drives for reversing the rotation of said drums and further drives for opening and closing said segments; at least a pair of guide rolls disposed within said heat-insulated cell, one of the guide rolls of said pair of rolls being arranged within said cell at the inlet for said strip and intended for alternately feeding the strip to the coiling drums before it is coiled thereon in a bifilar manner, and the other one of said guide rolls of said pair being arranged within said cell at the outlet for said strip for alternately discharging the strip from the coiling drums after the bifilar coil has been wound; each of the rolls of said pair of guide rolls being mounted within said cell on a carriage to move thereon for feeding the strip into the coiling drums and discharging it therefrom in a plane substantially parallel to the plane passing through the axes of rotation of the coiling drums; and drive means for moving said carriages.

4,012,029

# TUNDISHES

Claude Seguin, Orgeval, and Bernard de Wiet, Valence, both of France, assignors to Fosco Trading A.G., Chur, Switzerland

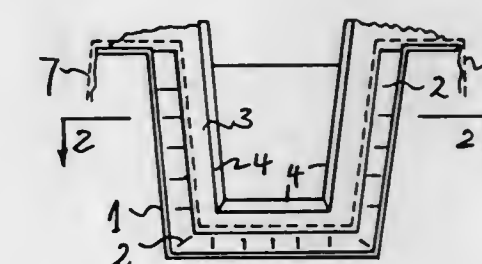
Filed July 30, 1974, Ser. No. 493,893

Claims priority, application United Kingdom, July 30, 1973, 36185/73

Int. Cl.<sup>2</sup> C21B 3/00

U.S. Cl. 266—275

12 Claims



1. In a tundish comprising an outer metal casing and a permanent lining of refractory material adjacent the casing, the improvement which comprises providing a layer of essentially unbonded particulate refractory material adjacent and parallel the permanent lining and, adjacent the layer of particulate refractory material and in parallel spaced relation to the permanent lining, an expendable lining made up of a set of slabs of refractory heat-insulating material.

4,012,030

# FIXTURE FOR PRECISION POSITIONING OF WORK PIECES

Tore Gottfrid Hesselgren, Johannesbo, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sept. 10, 1975, Ser. No. 612,259

Claims priority, application Sweden, Sept. 20, 1974, 7411857

Int. Cl.<sup>2</sup> B23Q 1/04

U.S. Cl. 269—60

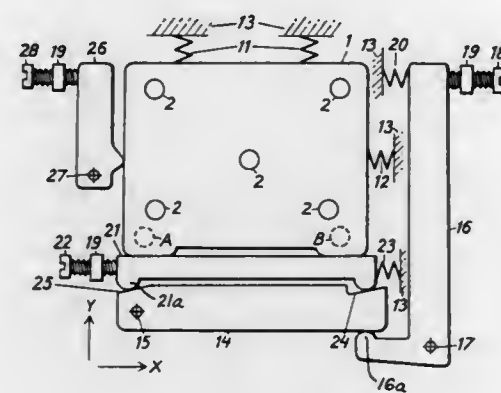
4 Claims

1. A device for precision positioning of work pieces on the work table of a machine tool, said device comprising in combination:

- a fixture in the form of a substantially rectangular plate disposed parallel to the work table and rotatable and displaceable relative thereto in two non-linear directions; first spring means pressing the fixture against said work table; a bar disposed adjacent to one edge of said fixture parallel thereto and pivotal about one end; second spring means disposed at the edge of the fixture opposite to said one edge and biasing the fixture toward said bar for dis-



placement of the fixture in one direction; a two-arm first lever, one arm being parallel to another edge of the fixture and the other arm underlying said bar for pressure coaction therewith in opposition to the second spring means, said first lever being pivotal about a point inter-



mediate the two arms; and a first positioning means coacting with said one arm of the first lever for pivoting the other arm into pressure coaction with said bar for selectively pivoting the same thereby rotating the fixture against the action of the second spring means.

4,012,031

**LOCK VALVE FLOW CONTROL ARRANGEMENT**

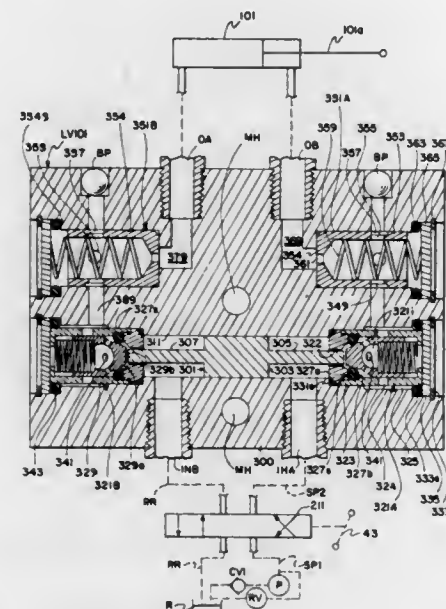
Larry D. Mitchell, Ballwin, and Edward M. Mason, St. Louis, both of Mo., assignors to Affiliated Hospital Products, Inc., St. Louis, Mo.

Filed Mar. 25, 1975, Ser. No. 561,885

Int. Cl.<sup>2</sup> A61G 13/00; F15B 13/042

U.S. Cl. 269—325

4 Claims



1. In combination, an operating table having a top for supporting a patient, means for adjusting the top for variably positioning the patient including at least one double-acting hydraulic cylinder, a reservoir for hydraulic fluid, a foot pedal operated hydraulic pump having an inlet receiving fluid from the reservoir and an outlet for delivery of fluid under pressure on operation of the pedal, a control valve having an inlet receiving fluid from the pump outlet, an outlet for returning fluid to the reservoir, and first and second transfer ports, said control valve being adapted to be set in a closed position blocking the transfer ports, a first open position for delivery of fluid under pressure through said first port and venting of the second port to the reservoir and in a second open position for delivery of fluid under pressure through said second port and venting of said first port to the reservoir, and flow control

means in the system between said control valve and said cylinder comprising means providing a first passage interconnecting said first port and one end of said cylinder and a second passage interconnecting said second port and the other end of the cylinder, a first check valve in the first passage arranged to open in response to setting of the control valve in its said first open position and operation of the pump for delivery of fluid under pressure to said one end of the cylinder, a second check valve in the second passage arranged to open in response to setting of the control valve in its second position and operation of the pump for delivery of fluid under pressure to said other end of the cylinder, means responsive to delivery of fluid under pressure to the first check valve to open the second check valve and responsive to delivery of fluid under pressure to the second check valve to open the first check valve, first pressure responsive flow regulating means in said first passage between the first check valve and said one end of the cylinder responsive solely to pressure from said one end of the cylinder to effect flow regulation for effecting relatively smooth flow of fluid from said one end of the cylinder to the reservoir when said control valve is set in its second position, and second pressure responsive flow regulating means in said second passage between the second check valve and said other end of the cylinder responsive solely to pressure from said other end of the cylinder to effect flow regulation for effecting relatively smooth flow of fluid from said other end of the cylinder to the reservoir when said control valve is set in its first position.

4,012,032

**DOCUMENT REPRODUCTION HAVING OUTPUT MEANS WITH PLURAL OUTPUTS OPERABLE IN A PLURALITY OF MODES**

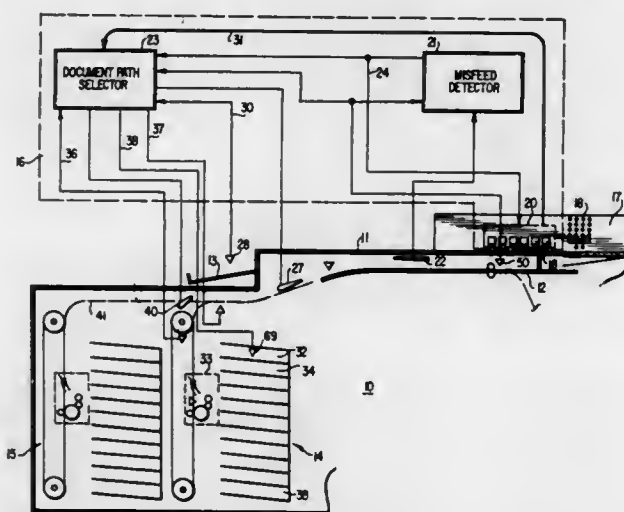
James Charles Rogers, Wyckoff, N.J., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,250

Int. Cl.<sup>2</sup> B65H 29/60

U.S. Cl. 271—64

5 Claims



1. Document reproduction apparatus for selectively making one or more individual duplicate documents from an original document, or for making a number of collated document sets of a multi-page original document,

including in combination:

a copy tray adapted to receive said individual duplicate documents;

a first sensor cooperating with said tray and operable to detect the presence of a first given number of duplicate documents therein;

a second given number of collator bins, each said bin adapted to receive a third given number of duplicate documents;

second sensor means cooperating with said bins and operable to indicate the presence of said third given number of duplicate documents in one of said bins;

document deflector/conveyor means operable to selectively

convey duplicate documents from a copier to said tray and to said bins, such that duplicate documents are sequentially deposited in the first to the Nth bin; operator control means enabling selection of a copy or collate mode of operation; automatic control means actuable by said operator control means and constructed to facilitate a copy request for a number of noncollated copies greater than said first given number or a collate request for a number of collated sets greater than said second given number; and document path control means in said automatic control means responsive to said first and second sensor means, and having means operable to control said sheet deflector/conveyor means to route all noncollate duplicate documents to said tray when a copy request is less than said first given number; and to route said first given number of duplicate documents to said tray and thereafter route no more than said third given number of duplicate documents copies to each of said bins.

4,012,033

**CONVEYING AND STACKING APPARATUS**

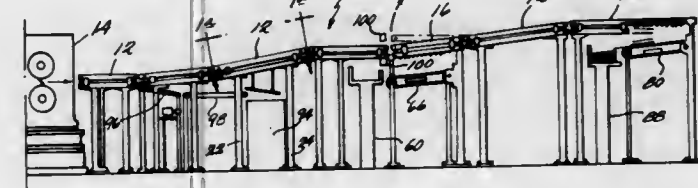
John C. Parrish, II, 504 Conquistador Drive, Largo, Fla. 33540

Filed Apr. 24, 1974, Ser. No. 463,785

Int. Cl.<sup>2</sup> B65H 21/62, 29/24

U.S. Cl. 271—64

17 Claims



12. An apparatus for conveying and stacking individual sheets of material, said device comprising:

a first means for conveying individual sheets disposed adjacent to a sheet producing source and arranged to receive sheets from said source;

a second conveying means which may be disposed in a first position for receiving and transporting the sheets from said first conveying means, said second conveying means also being movable to a second position which prevents the sheets from being received and transported by said second conveying means;

means disposed adjacent to said second conveying means for reversing the direction of conveyance of sheets which have passed from said first conveying means when said second conveying means is disposed in said second position;

air jet means disposed adjacent to said second conveying means and arranged to operatively urge the sheets toward a third conveying means when said second conveying means is in said second position;

stacking means for receiving sheets transported from said third conveying means;

wherein the conveying means are disposed above a floor surface or the like by means of a plurality of supports; said second conveying means is pivotally secured at a first end thereof to one of said supports and has a second end which may be displaced in relation to a floor surface or the like so that said second conveying means is movable to first and second positions and a plurality of positions therebetween by being pivoted about said first end; wherein an actuating means disposed adjacent to said second end is arranged to pivotally move said second conveying means;

wherein said actuating means comprises a hydraulic cylinder having an arm which is operatively connected to said

second conveying means so that said second conveying means may be pivoted to a plurality of positions upon actuation of said hydraulic cylinder; and wherein said air jet means comprises a plurality of nozzles disposed above a passline of conveyance of the sheets from said first conveying means when said second conveying means is disposed in said second position, said air jet nozzles providing for jets of air to be forced onto the sheets thereby urging the sheets toward said third conveying means, said reversing means preventing the sheets from being displaced beyond a predetermined distance along the passline from said first conveying means, said nozzles being movable with said second conveying means.

4,012,034

**MULTIPLE MODULAR SORTER SYSTEM**

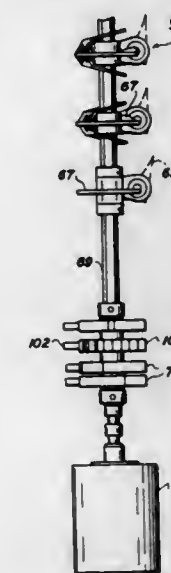
John A. Nelson, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1975, Ser. No. 616,796

Int. Cl.<sup>2</sup> B65H 29/58

U.S. Cl. 271—173

1 Claim



1. An improved control system for modular sorter assemblies which distribute copy sheets into bins in collated sets from document information reproduced by a copier/duplicator machine comprising:

a plurality of modular sorter assemblies operative to receive copy sheets sequentially, an array of sorting bins in each assembly to receive copy sheets in collated sets,

gate members associated with each of the bins to deflect copy sheets thereinto from a sheet path,

gating means operative to control the distribution of copy sheets into the next modular sorter assembly after sorting is completed in the bins in a particular assembly,

a cam member associated with each assembly, said cam member having a plurality of cam indents with each indent corresponding to an associated gate member or gating means and arranged for controlling the opening and closing of said gate members and gating means in a predetermined sequence,

drive means for rotating said cam member and actuating said gate members and gating means, and

circuit means including a photodetector means operating two contacts which are opened and closed as sheet presence and absence is detected at the bins entrance and switching means associated with said contacts and activated by said cam member for energizing said drive means to actuate said gate members and said gating means in proper sequence in response to the presence and absence of copy sheets at the entrance of the bins, wherein said switching means includes a single pole double throw switch which changes state from a first condition when said cam member rotates to position a predeter-



mined detent at said switch to a second condition when said cam member further rotates to move said predetermined detent away from said switch, wherein the movement of the cam member occurs for both the presence and absence of sheets at the bin's entrances.

4,012,035

## SORTER CONTROL SYSTEM

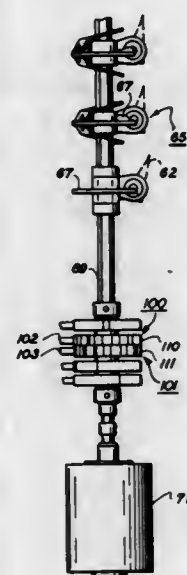
John A. Nelson, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1975, Ser. No. 616,797

Int. Cl.<sup>2</sup> B65H 29/58

U.S. Cl. 271-173

2 Claims



1. An improved control system for modular sorter assemblies which distribute copy sheets into bins in collated sets from a document information reproduced by a copier/duplicator machine comprising:

a plurality of modular sorter assemblies operative to receive copy sheets sequentially, an array of sorting bins in each assembly to receive copy sheets in collated sets, gate members associated with each of the bins to deflect copy sheets thereinto from a sheet path, gating means operative to control the distribution of copy sheets into the next modular sorter assembly after sorting is completed in the bins in a particular assembly, first and second cam members associated with each sorting assembly, each cam member having a plurality of cam indentations with each indentation corresponding to an associated gate member or gating means, said indentations on said first cam member being offset from indentations on said second cam member, said cam members being arranged for controlling the opening and closing of said gate members and gating means in a predetermined sequence, drive means for rotating said cam members and actuating said gate members and gating means, circuit means including a photodetector means operating two contacts which are opened and closed as sheet presence and absence is detected at the bins' entrance and switching means for energizing said drive means to move said cam members and to actuate said gate members and said gating means in proper sequence in response to the presence and absence of copy sheets at the entrance of the bins,

wherein said switching means includes two single pole single throw switches, each switch being operated by an associated cam member when said cam member is rotated, wherein the movement of the cam members occurs for both the presence and absence of sheets at the bins' entrances.

4,012,036

## DOCUMENT HOPPER

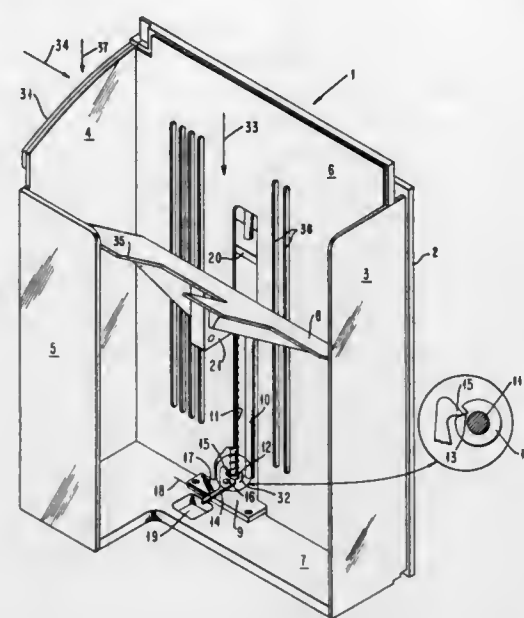
Gary Leo Sokol, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 10, 1976, Ser. No. 694,864

Int. Cl.<sup>2</sup> B65H 43/04

U.S. Cl. 271-215

10 Claims



1. A hopper for receiving documents in an orderly manner when sequentially fed thereinto, said hopper comprising:

- a. a platform upon which said documents are stacked when fed into said hopper;
- b. a leadscrew operably connected to said platform and rotatable thereby; and
- c. means for releasing said leadscrew for rotation in one direction for lowering said platform under the weight of said platform for acceptance of additional documents in said hopper.

4,012,037

## SCORE KEEPING UNITS

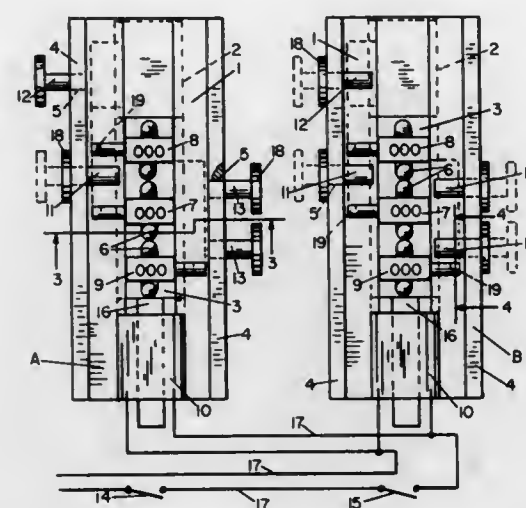
Vernon Kinser, McDonald Township, Barry County, Mo. 65677

Filed Dec. 8, 1975, Ser. No. 638,933

Int. Cl.<sup>2</sup> A63B 71/06

U.S. Cl. 273-1 ES

7 Claims



1. In scoring units of the kind described, in combination, a plurality of counters, a carriage on which said counters are mounted, a plurality of pin means to actuate said counters, said pin means being shiftable into position to trip said counters, solenoid operators disposed to move said carriage, and controlling means to control said carriage movement whereby when the pin means are shifted into said trippable positions and said controlling means operated, the carriage is moved by said solenoid to cause said pin means to trip said counters.

4,012,038

## MAGNETIC TOY

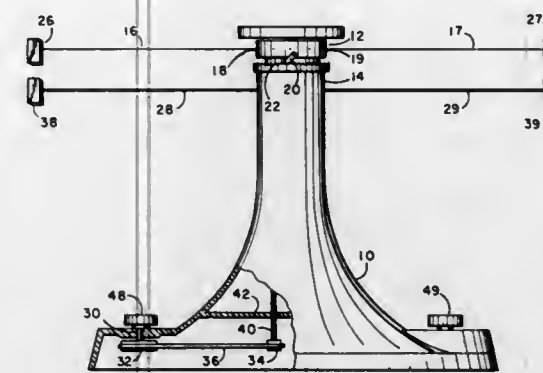
Gregory R. Brotz, 25 N. Point Drive, Sheboygan, Wis. 53081

Filed Mar. 3, 1976, Ser. No. 663,463

Int. Cl.<sup>2</sup> A63F 9/00

U.S. Cl. 273-1 M

8 Claims



1. A magnetic toy comprising:

- a casing;
- a rotatable pivotal member on top of said casing having a plurality of apertures located on its outer circumference;
- a pivotal member rod, one end of which is inserted into one of said apertures;
- a pivotal member bar magnet rotationally mounted at the other end of said pivotal member rod;
- a neck section of said casing located below said pivotal member;
- a lower rod extending out from said neck section parallel to said pivotal member rod;
- a lower bar magnet mounted at the end of said lower rod positioned below said pivotal member bar magnet wherein said pivotal member bar magnet and said lower bar magnet are affected by each other's magnetic field; and
- means for rotating said lower rod.

4,012,039

PERMANENT FORM-FITTING, NON-SLIP COVER FOR HANDGRIPPING PORTION OF BASEBALL BATS, GOLF CLUBS AND THE LIKE

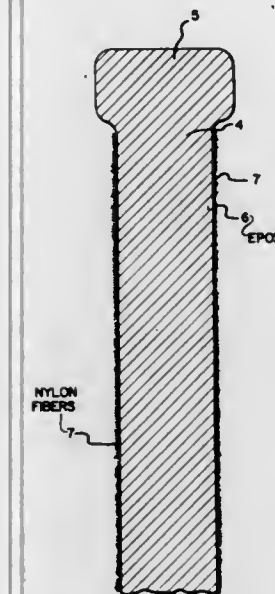
Herman Yerke, Largo, Fla., assignor to Joe Hall, Jr., Clearwater, Fla.

Continuation-in-part of Ser. No. 379,200, July 13, 1973, abandoned. This application July 22, 1974, Ser. No. 490,778

Int. Cl.<sup>2</sup> A63B 59/06, 53/14

U.S. Cl. 273-72 R

1 Claim



1. In combination with a baseball bat having a hand-gripping portion, a slip-resistant cover for said hand-gripping portion, said cover comprising:

a coating of epoxy of substantially uniform thickness disposed in surrounding relation to said hand-gripping portion of the baseball bat; said coating of epoxy being directly applied to said hand-gripping portion of the baseball bat; a plurality of nylon fibers having longitudinal dimensions between 30 and 90 mils; one end of each of said plurality of said fibers being directly imbedded in said coating of epoxy on the hand-gripping portion of the baseball bat; the other end of each of said plurality of said fibers extending outwardly from said coating of epoxy on the hand-gripping portion of the baseball bat, and said plurality of said fibers covering substantially the entire exposed surface of said coating of epoxy on the hand-gripping portion of the baseball bat.

4,012,040

## MAGNETIC HOCKEY GAME

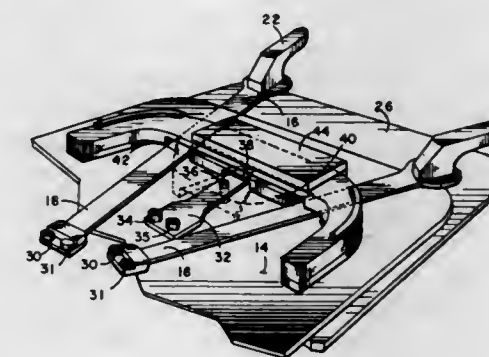
Gilbert Fernandes, 238 Robert St., Westport, Mass. 02790

Filed May 17, 1976, Ser. No. 686,785

Int. Cl.<sup>2</sup> A63F 7/06, 7/10

U.S. Cl. 273-85 A

12 Claims



1. A manually-operated magnetic game having forward player-pieces and goalie player-pieces having magnets affixed to their bases arranged upon a playing board surface, said player-pieces movable by magnets located under said playing board surface, said game comprising:

- a plurality of movable arm members having said magnets located under said playing board surface mounted at one end, each of said movable arm members being associated with one of said forward player-pieces;
- a base member located below said playing board surface upon which said movable arm members are slideably positioned;
- an arm member handle affixed to the other end of each of said movable arm members;
- an elevated rink border affixed to the perimeter of said playing board surface;
- a goalie arm member located beneath said playing board surface and resting upon said base member and having an aperture defined therein;
- a goalie arm member magnet affixed at one end of said goalie arm member;
- a goalie arm member pivot affixed to said base member and extending into said aperture within said goalie arm member;
- a guide restraining member positioned above said goalie arm member having a recess defined therein to allow pivotal movement of said goalie arm member upon said goalie arm member pivot; and
- a guide member laterally slideably positioned under said guide restraining member having a guide member slot defined therein arranged to engage the other end of said goalie arm member so that lateral force applied by a movable arm member against said guide member causes said goalie arm member to pivot causing said goalie arm member's associated goalie player-piece located on said playing board surface to move in front of its goal.



4,012,041

## GAME BALL REPRESSURIZING METHOD

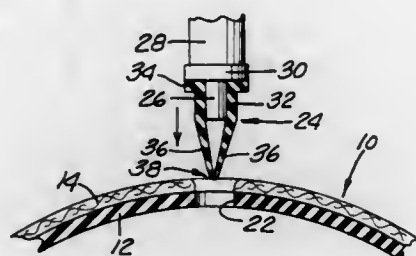
Allan C. Hoffman, 5876 Republic Ave., Riverside, Calif. 92504

Filed Oct. 20, 1975, Ser. No. 623,795

Int. Cl.<sup>2</sup> A63B 39/04, 41/12

U.S. Cl. 273-61 D

1 Claim



1. The method of repressurizing a dead inflatable game ball having an imperforate hollow rubber shell, comprising the steps of:

1. drilling a hole through the rubber shell, using a tool that removes material and leaves a cylindrical hole in the shell;
2. inserting an inflation check valve of soft resilient rubber into the hole, said check valve having a cylindrical barrel portion that fits snugly into the hole, and said barrel portion terminating in a wedge-shaped configuration formed by two opposed, converging, sealing lips that come together separably along a line of contact at their inner extremities to open the valve and seal the valve against escape of air when the pressure inside the ball exceeds atmospheric pressure;
3. securing the check valve in place, so that it will not be dislodged during violent play; and
4. forcing air through the inflation check valve whereby said lips separate at said line of contact and air passes into the interior of the ball.

4,012,042

## INVERTIBLE POCKETED TARGET FOR A DISC THROWING GAME

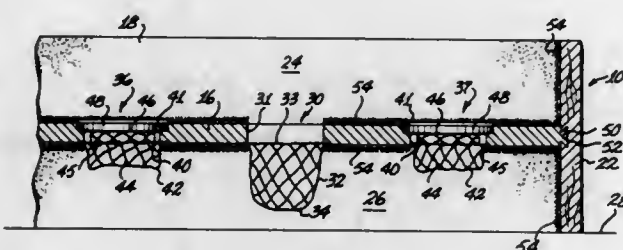
Steve J. Blasingame, 1111 12th Ave., Yuma, Ariz. 85364

Filed Jan. 19, 1976, Ser. No. 650,060

Int. Cl.<sup>2</sup> A63B 67/06

U.S. Cl. 273-95 R

5 Claims



1. A game apparatus comprising:

- a. at least one target structure having a first and a second tray-shaped openings facing oppositely with respect to each other;
- b. a floor in said target which forms a common bottom for the first and the second tray-shaped openings thereof;
- c. said target having an upright position in which the first tray-shaped opening thereof is facing upwardly and an inverted position in which the second tray-shaped opening thereof is facing upwardly;
- d. said floor having a central projectile receiving all formed therein and having a plurality of satellite projectile receiving wells formed therein in an array about said central well, said central well and said satellite wells each having a scoring value;
- e. each of said satellite wells including a pocket means, said pocket means affixed to said floor for closing said satellite

wells in the upright position of said target and for forming projectile receiving containers in the inverted position of said target; and

- f. a plurality of projectiles for throwing at said central well when said target is in its upright position and for throwing at said central well and said satellite wells when said target is in the inverted position thereof.

4,012,043

## ARROW VANE

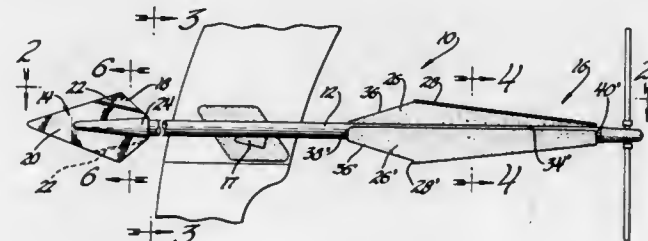
Richard F. Carella, 35572 Strathcona, Mount Clemens, Mich. 48043

Filed Feb. 14, 1974, Ser. No. 442,419

Int. Cl.<sup>2</sup> F41B 5/02

U.S. Cl. 273-106.5 C

12 Claims



2. An arrow comprising a shaft with a forward end and a rearward end, first support means extending tangentially from said shaft, a first vane extending laterally from said first support means at a position spaced from said shaft and on the same side of said first support means as said shaft so as to extend over said shaft, said first vane being disposed with the spacing between said first vane and said shaft decreasing from the end of said first vane nearest the forward end of said shaft to the end of said first vane nearest the rearward end of said shaft to define a pocket of decreasing volume from front to rear.

4,012,044

## HANGMAN GAME APPARATUS

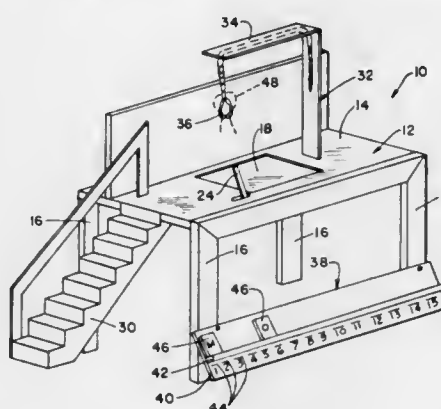
James Grossi, 101 Twin Rivers Drive, Toms River, N.J. 08753

Filed Oct. 1, 1975, Ser. No. 618,329

Int. Cl.<sup>2</sup> A63F 3/00; A63H 3/16

U.S. Cl. 273-130 E

3 Claims



1. A hangman game comprising: a miniature three dimensional gallows having a platform including an operable trap door and a noose pendently suspended over the trap door; component means for constructing a representation of a human figure to be suspended from said noose, said component means including separate head, torso, arm and leg components; said components carrying mutually engageable magnetic buttons for removably engaging said components to each other to construct said representation in steps starting with said head component; said head component being proportioned to be carried in said noose.

2. The game of claim 1 further comprising a plurality of blocks having letter indicia thereon, and a rack for said blocks

4,012,046

## GAME OF SKILL AND CHANCE

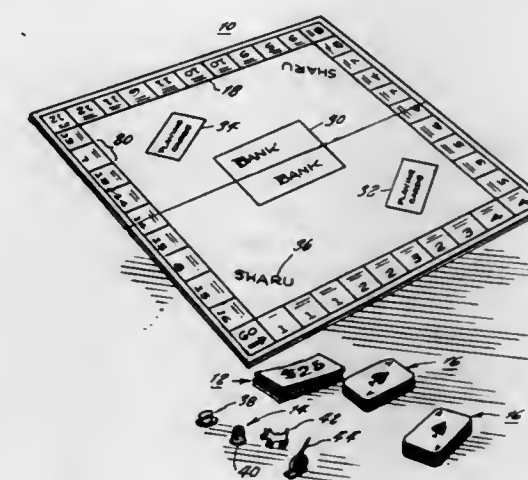
Hendrik Liket, 32 Bergen Blvd., Fairview, N.J. 07022

Filed June 9, 1975, Ser. No. 585,072

Int. Cl.<sup>2</sup> A63F 3/00, 9/14

U.S. Cl. 273-134 C

8 Claims



1. In a game apparatus, the combination of a game board having a continuous path around its perimeter divided into consecutive spaces bearing instructions representing amounts to be paid or received during the game, each of said spaces defining a playing position, a plurality of playing pieces one for each of the game players, said playing pieces being of a size to fit within said playing positions, play money of different denominations for distribution of part thereof to each player, and at least two decks of standard playing cards for distribution of at least some of the cards in equal allotment to each of the players, the cards simultaneously bearing indications representing the number of playing positions to be moved by a playing piece and also bearing representations forming a part of win determining means, said game board further comprising a bank area for storing the remainder of the play money not distributed to the players and said apparatus further comprising a plurality of additional cards, all of a single type, said single type being one of the types already included within each of said decks of playing cards.

4,012,047

## AUTOMATIC RECORD CHANGER

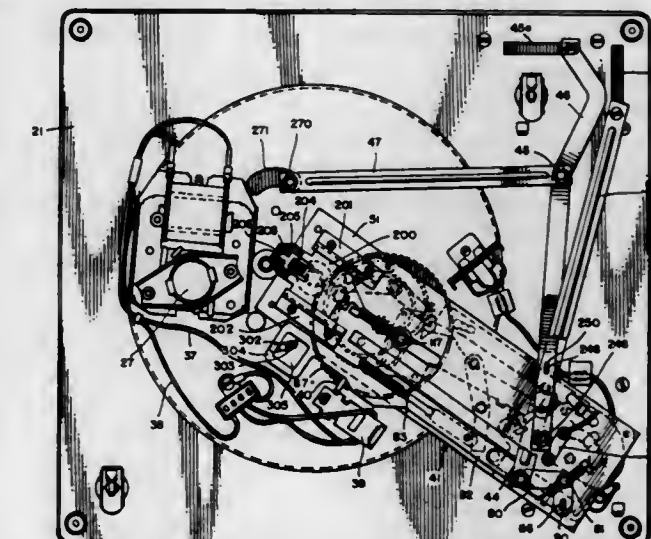
Secundino Rodriguez Sandoval, Mexico City, Mexico, assignor to Investigaciones Tecnologicas Electromecanicas y Electronicas, S.A., Mexico City, Mexico

Filed Mar. 5, 1975, Ser. No. 555,557

Int. Cl.<sup>2</sup> G11B 15/00

U.S. Cl. 274-10 R

11 Claims



1. An automatic record changer for playing phonograph records comprising: a frame (21),

secured to said platform for indicating correctly guessed letters of a preselected word.

4,012,045

## JURISPRUDENCE-EDUCATIONAL GAME

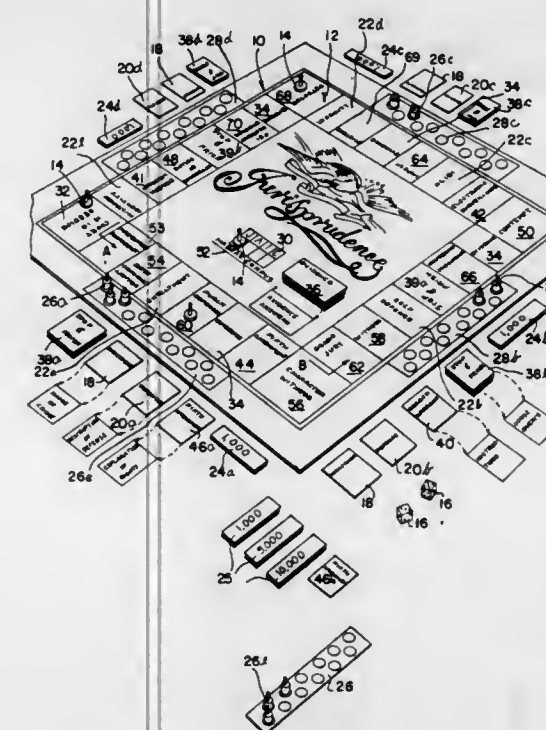
James N. Vail, 900 Golfview Drive, Glenview, Ill. 60025

Filed May 5, 1975, Ser. No. 574,697

Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273-134 B

7 Claims



1. An entertaining and teaching game device comprising: A game board having a plurality of various different discrete areas thereon which are arranged in a continuous path, said discrete areas including areas having identification thereon for cooperation with a plurality of game elements which have related identification thereon; A plurality of marker pieces for marking movement along said path of two or more players; Means for determining by lot increments of advance of marker pieces of successive players so as to position said marker pieces of said various discrete areas; A plurality of game elements adapted for distribution to the players which game elements each have at least two faces with one of the faces thereof having an identification thereon which is related to the identification on certain of said discrete areas on said board and the other one of said faces having information thereon which requires a response by the player according to the knowledge of the player; Certain of said game elements having on said other one of said faces information which requires the player to exercise his judgement according to his knowledge as to how best to respond in order to further his progress toward obtaining reward indicators; Certain others of said game elements having information on said other one of said faces which enables the player to respond according to his knowledge and to obtain or lose reward indicators; and A plurality of reward indicators which are distributable to the players in accordance with their correctness in responding to the information on said game elements and to the positioning of said markers on certain of said discrete areas.

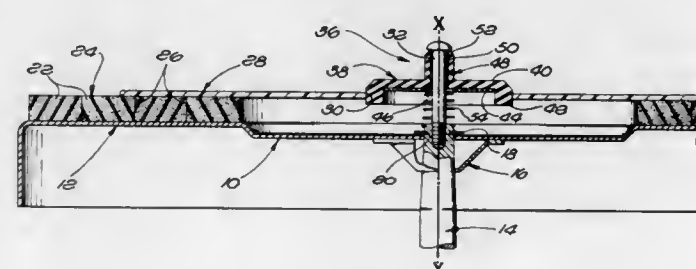


a turntable (22) rotatably mounted on the frame, the turntable having an upper surface for supporting records to be played and a lower surface and a center opening, power means (27) for rotating the turntable, switch means (39) for energizing the power means, a record spindle (23) received by the center opening of the turntable and secured to the frame, the turntable being rotatable about the spindle, a gear (62) secured to the lower surface of the turntable for rotation therewith and having gear teeth on the outer periphery thereof, a cam wheel (56) rotatably mounted on a shaft (57) on the frame below the lower surface of the turntable, the cam wheel having a cam groove (111) and a cam surface (114) provided thereon and having gear teeth around substantially the entire outer periphery thereof which are engageable with the gear teeth of the turntable gear whereby rotation of the gear will rotate the cam wheel when their respective gear teeth engage, the cam wheel having a recessed portion (59) in the outer periphery thereof which is not engageable with the gear teeth of the turntable gear whereby the cam wheel will not be rotated by the gear when the recessed portion of the cam wheel faces the gear, an elongated tone arm (24), a shaft (125) supporting the tone arm and extending generally perpendicularly thereto, the shaft being rotatably mounted on the frame whereby rotation of the shaft moves the tone arm over the outer surface of the turntable, an elongated slide bar (116) having a pair of ends and extending in a direction generally perpendicular to the axis of rotation of the cam wheel, a cam follower (138) on one end of the slide bar positioned on the cam groove (111), the cam groove being shaped to slide the slide bar longitudinally from a first to a second position and back to the first position as the cam wheel makes one revolution, translating means (135, 142, 170) movably mounted on the frame and operably connected to the other end of the slide bar and to the tone arm shaft (125) for translating sliding movement of the slide bar into rotational movement of the tone arm shaft, abutment means (65) movably mounted on the cam wheel (56) and engageable with the turntable gear (62) for rotating the cam wheel when the abutment means engages the turntable gear so that the cam wheel gear teeth engage the teeth of the turntable gear and the cam wheel continues to rotate for one revolution, cam start means (104) movably mounted on the frame for moving the abutment means into engagement with the turntable gears, a switch arm (82) slidably mounted on the frame, start means (44, 80) on the frame for slidably moving the switch arm, the switch arm being engageable with the switch means (39) and being movable by the start means between an off position in which the switch means does not energize the power means and an on position in which the switch means energizes the power means, means (85) for resiliently biasing the switch arm to the off position, a stop member (92) pivotally mounted on the frame for movement between first and second positions, means (97) for resiliently biasing the stop member to its second position in which it is engageable with the switch arm (82) for holding the switch arm in the on position, a stop bar (221) slidably mounted on the frame, and a slide (200) movably mounted on the frame below the spindle and having a cam-engaging portion engaging the cam surface (114) on the cam wheel (56), a spring (210) urging the cam-engaging portion of the slide against the cam surface, the cam surface being shaped to permit movement of the slide between extended and retracted positions as the cam wheel rotates,

the stop bar (221) being engageable by the slide (200) when the slide moves to its retracted position, engagement of the stop bar by the slide moving the stop bar into engagement with the stop member (92) and pivoting the stop member toward its first position to permit movement of the switch arm to the off position.

**4,012,048**  
**ACOUSTIC DAMPING TURNTABLE AND ADAPTER**  
William R. Hawkins, Panorama City, Calif., assignor to Newcomb Audio Products Co., Sylmar, Calif.  
Filed May 2, 1975, Ser. No. 574,047  
Int. Cl.<sup>2</sup> G11B 3/60  
U.S. Cl. 274-39 R

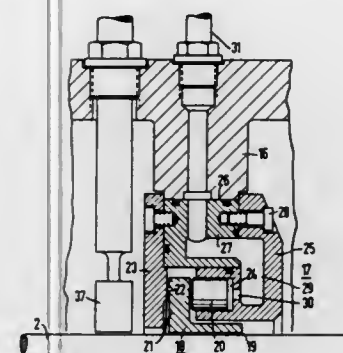
1 Claim



1. In a turntable for recording discs:
  - a. a turntable having a record bearing surface thereon;
  - b. means supporting said turntable for rotation about its axis;
  - c. a spindle pin carried by the turntable extending axially upwardly of the bearing surface for centering recording discs on said turntable;
  - d. a sleeve guidingly mounted on said spindle pin for slidable movement thereon;
  - e. means determining an upward limit to the movement of said sleeve;
  - f. spring means carried by the turntable for urging said sleeve towards its said upper limit;
  - g. a composite integral adapter ring of acoustic damping material and secured to said sleeve for mounting thereby and movement as a unit therewith, said adapter ring having an upper small diameter part and a lower large diameter part adapted respectively to engage the spindle holes of larger and smaller diameter recording discs;
  - h. said composite adapter ring also having a substantially flat pad part at the base of said small diameter part and extending to the top of said large diameter part;
  - i. means forming a recess in said turntable for receiving said adapter ring with said pad part coplanar with said bearing surface when said pad part is engaged by a recording disc with a smaller spindle hole;
  - j. said spring yielding upon application of the weight of said smaller spindle hole recording disc;
  - k. the coupling between said spindle pin and said recording discs for centering thereof being dependent upon the acoustic damping material of said adapter ring;
  - l. said record bearing surface comprising a pad of foam rubber-like acoustic damping material, said pad having a plurality of surface separated contiguous interfitted annular sections, the innermost annular section forming at least the upper part of said turntable recess, acoustic vibrations from the turntable to a recording disc mounted on said bearing surface being dependent for their transmission either upon said pad or said composite adapter ring.

**4,012,049**  
**FLOATING RING SEAL MEANS**  
Dietrich Lambrecht; Erich Weghaupt, both of Mulheim (Ruhr); Lothar Grimm, and Helmut Munch, both of Frankenthal, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany  
Filed Oct. 31, 1974, Ser. No. 519,623  
Claims priority, application Germany, Nov. 2, 1973, 2354998  
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976  
Int. Cl.<sup>2</sup> F16J 15/34, 15/40  
U.S. Cl. 277-27

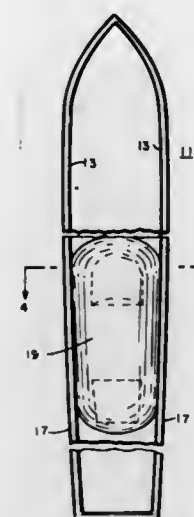
8 Claims



1. In a rotating shaft machine having a housing and a pressurized chamber, floating ring seal means for rotating shafts for sealing off the pressurized chamber from a chamber at atmospheric pressure, and having a pump for cooling liquids; a floating ring seal in said housing, said ring having a radial flange which presses one side against the wall of said housing to provide a seal to prevent flow of liquid between said side of said radial flange and said housing wall, pistons located in the housing acting on the other side of said radial flange to avoid radial vibration of said floating ring with vibration of the rotating shaft and force it against the housing wall, said pistons being connected to and pressurized by a pressure source whose pressure increases proportionally to an increasing number of rotations of the rotating shaft.

**4,012,050**  
**SKI PROTECTOR**  
Charles Miller, 17 Sutro Heights, San Francisco, Calif. 94121  
Filed Sept. 29, 1975, Ser. No. 617,650  
Int. Cl.<sup>2</sup> A63C 11/20  
U.S. Cl. 280-11.38

4 Claims

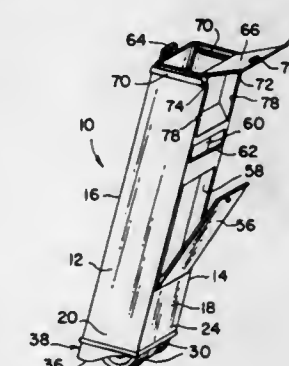


1. A ski protector comprising an elastic boot formed of one piece polybutylene rubber and having a sole portion with continuous walls therealong in the outline of a ski, the walls being of a height slightly greater than thickness of a ski and having upper inwardly projecting flanges for partially overlapping the upper surface of a ski, the portions of the ski protec-

tor formed for disposition along the edges of the skis being formed of a greater depth of cross-section thickness to insulate the edges of the skis from damage or causing damage when brought into contact with another object, said boot being formed to permit it to be stretched over the bottom and sides and the edges of the top surface of the ski such that the sole portion is positioned against the bottom of the ski with the sides of the ski closely surrounded by the walls of the boot and the edges of the upper surface of the ski being overlapped by the inwardly projecting flanges on the walls, mating releasable strips affixed across the bottoms of the soles of the boots in opposed mating relation such that when the skis are pressed with their bottoms in abutting relation the adhesive strips will engage each other to secure the boots together for transporting the skis enclosed therein as a single unit, and a protective cover for the safety bindings of skis, said cover being formed to seal with the upper surface of a ski disposed in said boot around said binding and to encapsulate said binding thereunder, said cover being held in position by having its lateral edges captured under the flange portions of said ski protector proximate said bindings when said protector is fitted onto said ski.

**4,012,051**  
**GOLF CLUB CARRIER**  
Donald N. Embinder, 1029 Harrison St., Hollywood, Fla. 33020  
Filed Dec. 23, 1975, Ser. No. 643,862  
Int. Cl.<sup>2</sup> B62B 1/20  
U.S. Cl. 280-47.19

5 Claims



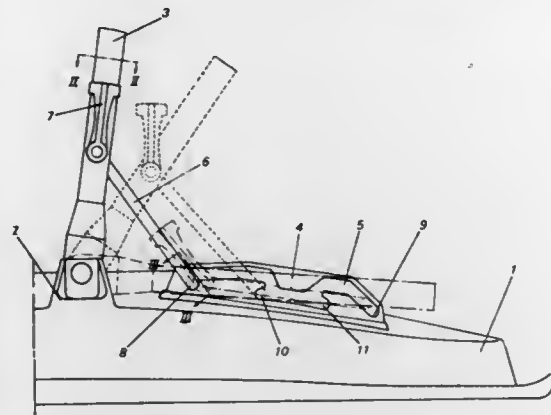
1. A golf club carrier device comprising: an elongated rigid walled golf bag; ground engaging wheel means rotatably mounted on the bottom of said golf bag; rest means projecting downward from the bottom of said golf bag for engaging the ground when said bag is in substantially upright orientation; and plate means movably mounted at the top of said golf bag for selectively either being positioned for covering said golf bag or being positioned to serve as a handle for translating said golf bag on said wheel means.

**4,012,052**  
**DEVICE FOR LIMITING PIVOTAL MOVEMENTS OF A LAWN MOWER HANDLE**  
Karl Torsten Lennart Engdahl, Malmo, Sweden, assignor to Flymo Societe Anonyme, Zug, Switzerland  
Filed Oct. 2, 1975, Ser. No. 618,801  
Claims priority, application United Kingdom, Oct. 11, 1974, 44073/74

Int. Cl.<sup>2</sup> B62B 11/00  
U.S. Cl. 280-47.37 R  
1 Claim  
1. A device for limiting the pivotal movements of a lawn mower handle pivotally connected to a lawn mower housing, characterized by a connecting link which at one end is pivotally connected to a part of said handle and at the other end protrudes into a slot arranged in an element rigidly connected to the housing, the said slot limiting the vertical movements of the said link other end, the said slot being provided with



branched-off, blind-end slot parts which the said link other end may leave only by a reverse movement followed by a manual elevating movement wherein the said link has a por-



tion extending through said handle and secured to a resilient fork part for arresting said handle at a pre-determined relative angle between said link and said handle.

#### 4,012,053 SPLASH GUARD

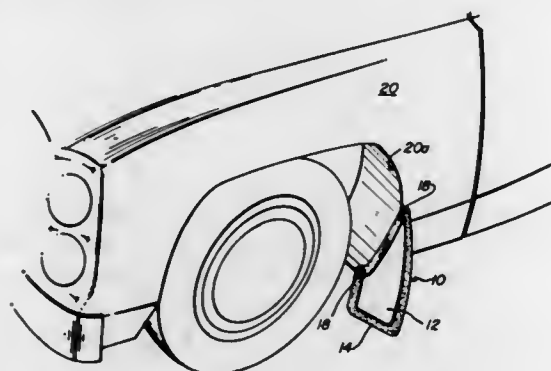
Robert G. Bode, Chicago, Ill., assignor to Custom Accessories, Inc., Skokie, Ill.

Filed Sept. 22, 1975, Ser. No. 615,787

Int. Cl.<sup>2</sup> B62D 25/16

U.S. Cl. 280—154.5 R

3 Claims



1. A splash guard for attachment to the normally curved fender of a vehicle consisting of: a resilient, flexible, splash-prevention, one-piece body portion, the outer edges of which are normally thin and have a knifelike sharpness, a permanent, unitary, continuous, flexible, protective border intimately bonded to and covering entirely the outer edges of the one-piece body portion to prevent contact by the hand of a user of the splash guard with the normally thin and sharp edges of the body portion, said protective border having substantially flattened sides which extend inwardly from the outer edges of the body portion and overlie only the marginal areas of the body portion adjacent to the outer edges thereof on both sides of the body portion, said protective border being formed of a material which is different from the material of which the body portion is formed and being flexible with and remaining intimately bonded to the outer edges of the body portion when the splash guard is flexed to enable it to conform to the normal curvature of a fender of a vehicle, and spaced openings through the protective border and the body portion along a margin of the splash guard for receiving fasteners by means of which the splash guard is attached to the fender of a vehicle.

#### 4,012,054 BICYCLE SAFETY DEVICE

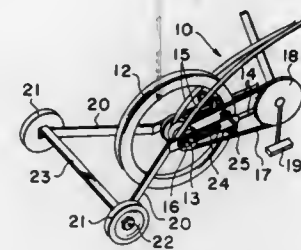
Paul A. Moore, 9825 Park Lane Court, Dallas, Tex. 75220

Filed Nov. 19, 1975, Ser. No. 633,272

Int. Cl.<sup>2</sup> B62D 63/00

U.S. Cl. 280—239

5 Claims



1. A safety apparatus for stabilizing a bicycle when the front wheel of said bicycle is elevated above ground level which comprises:

- a. a pair of oppositely disposed rigid arm means adapted to be rigidly affixed to the rear portion of said bicycle, one on each side of the rear wheel of said bicycle, and further being adapted to extend rearwardly and outwardly in a substantially horizontal direction from the rear axle of said bicycle when both the rear and front wheels of said bicycle are in contact with the ground, said rigid arm means terminating at ends spaced apart and rearward of the rear wheel of said bicycle;
- b. means for rigidly affixing said rigid arm means to the rear portion of said bicycle;
- c. a pair of roller wheels having a diameter substantially smaller than the diameter of said rear wheel of said bicycle;
- d. means to affix one of each of said roller wheels in rotatable relationship to each of said arm means adjacent the ends thereof; and
- e. a brace means to affix to the ends of said arm means to rigidly hold said ends in spaced-apart relationship.

#### 4,012,055 METHOD AND APPARATUS FOR EXTENDING A MOTORCYCLE FORK

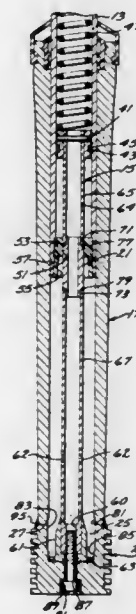
Robert J. Ottow, 6815 San Vicente, Paramount, Calif. 90723

Filed Mar. 22, 1976, Ser. No. 669,030

Int. Cl.<sup>2</sup> B62K 25/08

U.S. Cl. 280—276

6 Claims



1. A motorcycle fork extension for extending the travel of a

motorcycle fork of the type including a downwardly biased damper rod having a head on the bottom end thereof and a fork slider fitted telescopically over the bottom extremity of a fork tine receiving such rod, said extension comprising:

- a damper rod extension of a selected length received medially in said rod and having the opposite ends thereof affixed to the ends of upper and lower sections of said damper rod;
- a slider extension affixed to the lower end of said slider and including an upwardly opening cylindrical registration chamber of at least said selected lengths for receipt of said head; and
- means affixing the bottom end of said damper rod to said extension.

#### 4,012,056

#### VISUAL GUIDE DEVICE FOR HITCHING VEHICLES

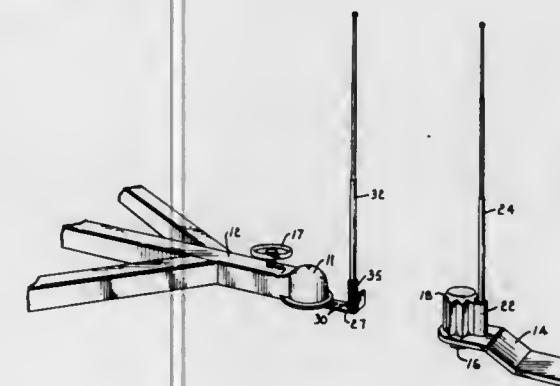
Justin D. Christensen, 6808 W. 69th St., Overland Park, Kans. 66204

Filed Dec. 29, 1975, Ser. No. 644,533

Int. Cl.<sup>2</sup> B60D 1/06

U.S. Cl. 280—477

6 Claims



1. A guide device for assisting in the positioning of a first vehicle having a hitch ball with respect to a second vehicle having a hitch socket, said guide device comprising:

- a first sight member for sighting by the vehicle driver;
- a ball member coupled with said first sight member to mount same to said hitch socket, said ball member being removably insertable in said socket and fitting tightly therein to mount said first sight member in generally upward extension from said socket to a height visible to the driver;
- a second sight member for sighting by the vehicle driver; and
- a mounting member coupled with said second sight member to mount same to said hitch ball, said mounting member attaching directly to said hitch ball to mount said second sight member in generally upward extension therefrom to a height visible to the driver for positioning in proximity to said first sight member, whereby said ball and socket are positioned in proximity to one another.

#### 4,012,057 SKI BRAKE

Guy Courvoisier, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge-Geneva, Switzerland

Filed Feb. 4, 1976, Ser. No. 655,265

Claims priority, application Switzerland, Feb. 6, 1975, 001469/75

Int. Cl.<sup>2</sup> A63C 7/10

U.S. Cl. 280—605

12 Claims

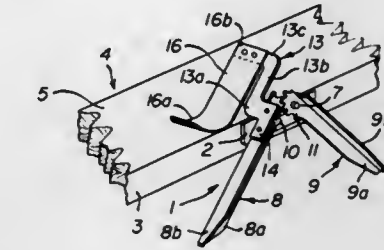
1. A self-arresting ski including a runner and a brake operative upon removal of a skier's boot from an upper surface of said runner, said brake comprising:

- a pair of spurs pivotally mounted on a lateral face of said runner at longitudinally spaced locations;
- coupling means interconnecting said spurs for joint rotation

956 O.G.—33

in opposite directions about axes transverse to said lateral face;

treadle means extending from at least one of said spurs above the upper surface of said runner for depression by a skier's boot secured to the runner, said treadle means upon such depression maintaining said spurs in a re-



tracted position of substantial mutual alignment alongside said lateral face; and

biasing means for exerting upon said spurs a force tending to swing said spurs from said retracted position into a working position in which said spurs diverge downwardly with lower extremities projecting beyond a lower surface of said runner while pointing in opposite directions.

#### 4,012,058

#### MAGNETIC COUPLER FOR ENGINE EXHAUST DUCTS

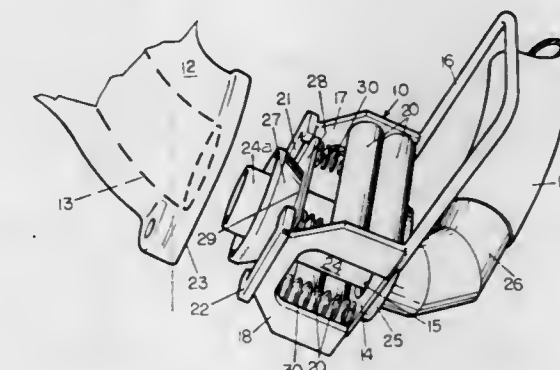
James E. Patton, R.R. No. 3, 1950 Beery Road, Elida, Ohio 45807

Filed Feb. 17, 1976, Ser. No. 658,411

Int. Cl.<sup>2</sup> F16L 25/00

U.S. Cl. 285—9 M

4 Claims



1. A coupler for an exhaust duct of an engine block of magnetically attractable metal comprising a generally U-shaped bracket of magnetizable metal adapted to be placed in contact with the magnetic engine block, permanent magnets carried by said bracket and so arranged as to magnetize the bracket sufficiently that it will engage and hold itself to said exhaust duct, a spring tensioned gas tube carried by and having limited movement within said bracket and adapted to be spring urged to align with the engine exhaust duct for conducting the products of combustion therefrom, and collars on said tube spaced from each other for limiting gas tube movement in opposite directions, one collar engageable with said bracket, and an apertured plate through which said tube slides for engagement by the other collar.

#### 4,012,059

#### PIPE CONNECTOR

Robert R. Luke, and Edmund A. Fisher, both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Sept. 8, 1975, Ser. No. 611,259

Int. Cl.<sup>2</sup> F16L 55/00

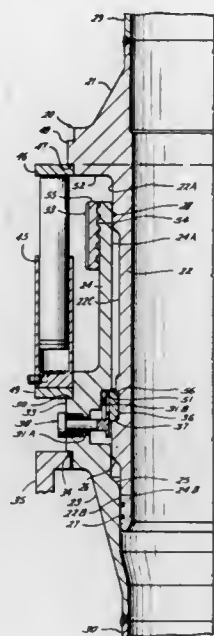
U.S. Cl. 285—18

17 Claims

1. A pipe connector, comprising first and second tubular members having telescopically interfitted end portions, means for latching the end portions of the tubular members



against separation when so interfitted, means for sealing the end portions with respect to one another when so latched, one of said members being stretchable so as to preload the latching means, and an externally manipulatable part connected to the second member for axial movement with respect thereto, said



part and said first tubular member having oppositely facing shoulders which move axially away from one another as said one member is stretched, whereby said part may be manipulated to move the shoulder thereon against the shoulder on the first member so as to hold the preload on the latching means.

4,012,060

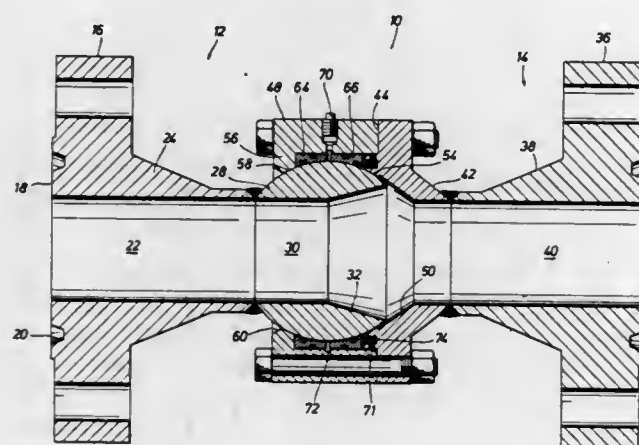
## BALL FLEX UNION

Bobby J. Reneau, Rte. 11, Box 380-B, Houston, Tex. 77039  
Filed Mar. 31, 1975; Ser. No. 563,373

Int. Cl.<sup>2</sup> F16L 19/02

U.S. Cl. 285-93

5 Claims



1. A pipe fitting for use with non aligned pipes, comprising a male member;  
a female member;  
said male member comprising  
a connective pipe portion;  
a ball at the end of said pipe portion having an axially aligned passage therethrough and connected with said pipe portion  
said female member comprising  
a connective pipe portion;  
an encircling housing means having a hollow cylindrical portion which communicates with the connective pipe portion;  
seal means located in said housing means of said female portion, said seal means having two facing portions and

jointly having a spherically contoured exposed face for contact against said ball which face encircles said ball and which further permits rotation of said ball in said housing means to continue sealing against leakage, said seal including a means for preventing leakage between said seal means and said housing means;  
said means further being constructed and arranged to clamp said ball in said housing means and limit movement thereof from said housing means except rotation which is permitted;  
wherein said housing means includes  
a flanged flared receptacle connected to said pipe portion;  
an axial hollow tubular housing;  
an internal, encircling shoulder on each of said receptacle and said tubular housing, said shoulders having a curved conforming face which captures said ball therebetween; and  
wherein said encircling shoulders are formed on separable members including said receptacle and said housing which align and join together axially about said ball.

4,012,061

## DUAL CONDUIT DRILL STEM MEMBER

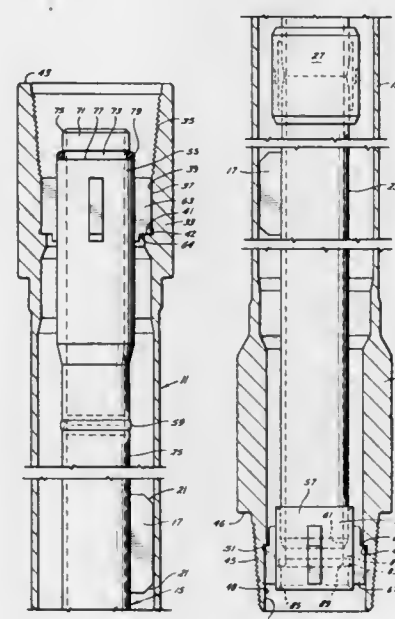
Wallace Fred Olson, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Filed Dec. 23, 1974, Ser. No. 535,193

Int. Cl.<sup>2</sup> F16L 47/00

U.S. Cl. 285-133 A

31 Claims



1. Dual conduit drill stem member comprising:  
outer and inner tubular elements disposed one about the other and separated radially providing a flow passage therebetween as well as a flow passage through the inner tubular element,  
connection means at each end of the drill stem member for making connections with correlative means on adjacent drill stem members to transmit tension, torsion and compression therebetween and to provide fluid communications between the inner tubular element of the drill stem member and the inner element of the adjacent members and between the outer tubular element of the drill stem member and the outer member of the adjacent members, and  
means interconnecting the inner tubular element with the outer tubular element at both ends of the inner tubular element, the inner tubular element including two portions connected together by coupling means including a portion having a lower elastic modulus than that of said two portions of the inner tubular element, said coupling

means providing fluid communication and transmitting mechanical loads between said two portions of the inner tubular element,  
said coupling means comprising a steel collar including two parts whose adjacent ends are telescopically connected and a rubber sleeve bonded to the interior of the collar at both parts thereof,  
the two parts of the collar being threaded interiorly and the ends of the two portions of the inner tubular element connected by said coupling means being exteriorly threaded and screwed into said threaded collar parts.

4,012,062

## SANDING DEVICE FOR A MOTOR VEHICLE

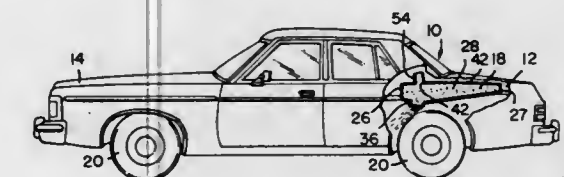
Joseph A. Gropp, Sr., Coral Spring, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Oct. 16, 1975, Ser. No. 623,265

Int. Cl.<sup>2</sup> B60B 39/06

U.S. Cl. 291-25

1 Claim



1. A sanding device for a motor vehicle adapted for depositing a non-skid substance at a controlled rate forwardly of each rear wheel, which comprises:

- a. a roof of said motor vehicle having an interior chamber therein adapted to receive said non-skid substance therein;
- b. a pair of chutes communicating in fluid serial connection with said chamber, each said chute extending downwardly to a point forwardly of each said rear wheel, each said chute having a lower open opening;
- c. a deflector shield affixed to said open lower end of each said chute;
- d. a pair of U-shaped channel flanges affixed to said lower end of each said chute;
- e. a pair of slide plates, one of said slide plates slidably disposed in each said pair of U-shaped flanges for opening and closing each said lower end of each said chute;
- f. a pair of springs, one of each said springs communicating between each said plate and each said chute for normally keeping each said chute closed;
- g. a shift lever adapted to be pivotally mounted on an interior floor of said motor vehicle;
- h. a Y-shaped cable assembly, a stem of said cable assembly affixed to said shift lever, a free end of each arm of said cable assembly affixed to one of said plates;
- i. means for injecting said non-skid material into said chamber through said roof of said motor vehicle;
- j. a float ball disposed in said chamber, said ball lighter than said non-skid material disposed in said chamber;
- k. one end of a pivot arm affixed to said float valve;
- l. a microswitch adapted to be mounted on said motor vehicle, said microswitch affixed to another end of said pivot arm; and
- m. a light means adapted to be mounted in a dashboard of said motor vehicle, said light means wired in series to said microswitch and a battery of said motor vehicle.

4,012,063

## INTERLOCK LATCH ASSEMBLY FOR CENTRIFUGALS

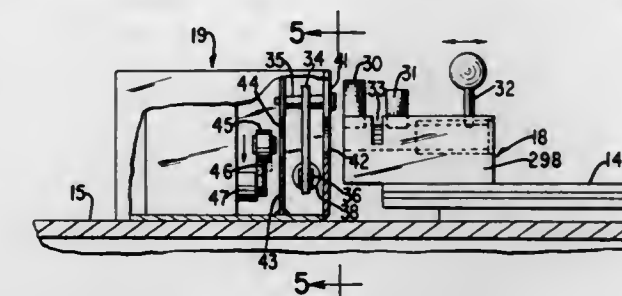
John W. Sherlock; George R. Haigh, both of East Moline, and Donald L. Ropp, Colona, all of Ill., assignors to Ametek, Inc., New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 631,691

Int. Cl.<sup>2</sup> B04B 7/06

U.S. Cl. 292-57

6 Claims



1. In an apparatus having a rotatable member enclosed in a housing and actuatable by power means and an access cover to said rotatable member mounted on said housing and pivotable between open and closed positions, the combination of a slidable and rotatable locking bolt on one of said access cover and said housing and slidably and rotatably movable between locked and unlocked positions when the cover is in its closed position, first and second keys on the inner end of said bolt, pivoted pawl latching means on the other of said housing and access cover for latching said locking bolt in its locked position for energizing said power means, fluid operated means pivoted to one end of and for means actuating said pawl latching means for releasing said latching means, means responsive to the rotation of said rotatable member for prevention of energization of said releasing means when the rotatable member rotates so that said releasing means cannot be actuated during rotation of the rotatable member, and means for energizing said releasing means when the rotary speed of said rotatable member is zero so that actuation of said release means is prevented while said rotatable member is rotating.

4,012,064

## DOOR LOCK

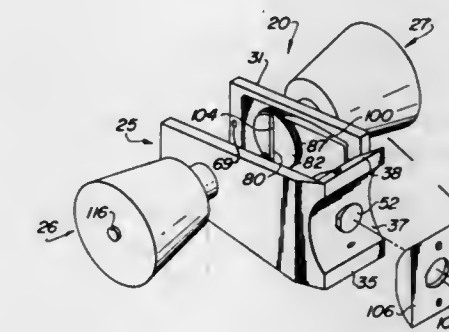
Joseph J. Malachuk, 130 E. Division St., Wilkes-Barre, Pa. 18702

Filed Jan. 20, 1976, Ser. No. 650,706

Int. Cl.<sup>2</sup> E05C 1/12

U.S. Cl. 292-169.18

2 Claims



1. A door lock comprising a generally U-shaped body for mounting astride a door edge, said body including inside and outside face parts for location on opposite sides of a door and a bridging part connecting said face parts and extending across the door edge, a bolt shiftably mounted in said bridging part for movement between an extended locking position and a retracted open position, inside manual actuating means rotatably carried by said inside face part, outside manual



actuating means rotatably carried by said outside face part, linkage means interconnected between each of said actuating means and said bolt for selectively retracting and extending the latter upon actuating means rotation, said linkage means comprising a rotary member in the respective face part connected to the associated actuating means for rotation thereby, and a connecting member connected between said bolt and the respective rotating member for movement with the latter to shift said bolt, a locking member selectively shiftable through said inside face part between an extended release position clear of the associated connecting member and a retracted locking position extending across a path of the associated connecting member to limit movement of the latter and prevent retraction of said bolt, a releasing extension on said locking member in said inside face part and shiftable with said locking member between locking and releasing positions, and guide means fixed in said inside face part in the path of movement of said locking member extension in its locking position to shift the latter and said locking member to its releasing position upon rotation of said inside actuating means.

4,012,065

## CONTAINER SECURING DEVICE

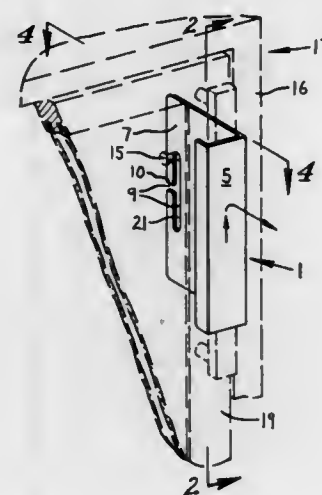
Clair J. Miller, 5813 NE. 35th Place, Portland, Ore. 97211

Filed June 16, 1975, Ser. No. 587,374

Int. Cl.<sup>2</sup> E05C 19/18

U.S. Cl. 292-288

1 Claim



1. The combination of a container defining a door frame with a pin thereon, an outwardly pivotable door having a door handle, the door attached to the container in closable relation to the door frame and a securing device wherein the improvement comprises:

- a removable securing device having a first, second, and third side, the sides defining an elongate U-shaped channel adapted to cover the handle;
- a horizontal slot in the first side, the horizontal slot intersecting
- a vertical slot to form a passageway containing a substantially 90° angle;
- the first side removably attached to the container between the door frame and the door so that during attachment of the securing device, the slot engages the pin on the door frame sequentially, the first engagement being along the horizontal slot and the second engagement being along the vertical slot;
- and upon attachment the second and third sides substantially surround and cover the door handle;
- whereby outward opening of the door is prevented.

4,012,066

## LOCK ASSEMBLY FOR AUTOMATICALLY DEAD BOLTING A CLOSURE

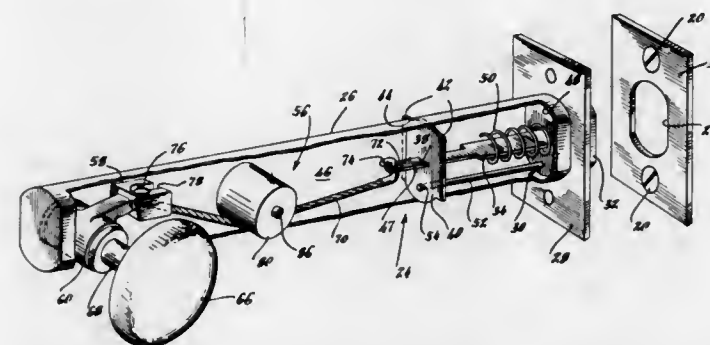
Ronald M. Salvatore, Stamford, Conn., assignor to Accurate Lock and Hardware Co., Stamford, Conn.

Filed Oct. 28, 1975, Ser. No. 626,343

Int. Cl.<sup>2</sup> E05B 15/02

U.S. Cl. 292-341.13

15 Claims



1. A lock assembly for automatically dead bolting a closure, such as a fire safety door, to a closure frame, such as a fire safety door jamb, in the event of fire raising the ambient temperature about a predetermined temperature, said lock assembly comprising:

- A. striker plate means, for defining a bolt hole, mounted on one of said closure and closure frame;
- B. a cooperating latching assembly mounted on the other of said closure and closure frame and including:
  - 1. a housing,
  - 2. a bolt assembly mounted on said housing for reciprocal movement to and from a latched position projecting into said bolt hole and for further movement to an extreme dead bolted position projecting into said bolt hole beyond the latched position,
  - 3. stop means operable when said bolt assembly is moved to the dead bolted position to prevent movement of said bolt assembly out of said dead bolted position,
  - 4. means for urging said bolt assembly toward the dead bolted position; and
  - 5. bolt actuator means for moving said bolt assembly to and from its latched position and ultimately to its dead bolted position, said actuator means comprising:
    - a. crank means,
    - b. substantially inextensible cable means for interconnecting said crank means and said bolt assembly, and
    - c. means, disintegratable at the predetermined temperature,
      - 1. for guiding said cable means through a first non-linear path of active length sufficient only to permit said bolt assembly to be reciprocated to its latched position; and
      - 2. for disintegrating at the predetermined temperature to permit said cable means to traverse a second path of active length sufficient to permit said bolt assembly to be reciprocated to the dead bolted position.

4,012,067

## REFUSE COLLECTION DEVICE

Donald P. Travis, 25292 Staysail Drive, Dana Point, Calif. 92629

Filed Sept. 29, 1975, Ser. No. 617,518

Int. Cl.<sup>2</sup> A01K 29/00

U.S. Cl. 294-19 R

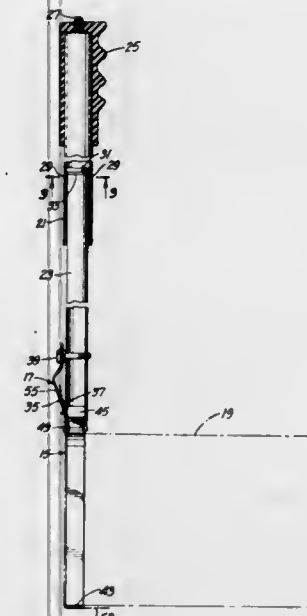
6 Claims

1. A refuse collection device comprising:
- an elongated handle;
  - a bag supporting member;
  - means for attaching the bag supporting member to the handle adjacent one end of the handle;
  - at least a portion of the bag supporting member projecting from the handle and at least partially circumscribing a

region, said region being adapted to receive an open ended bag with a peripheral region of the bag around the opening thereof being folded over said portion of the bag supporting member;

manually operable clamping means adjacent said one end of said handle for clamping a region of the bag whereby the bag can be retained on the refuse collection device;

said handle including a tube having an end portion which includes said one end of said handle, said bag supporting



member having end portions which are received within said end portion of said tube and means for retaining said end portions of said bag supporting member within said tube; and

said clamping means including a clamping member, said refuse collection device including a fastener attaching said clamping member to said handle and projecting into said tube adjacent the end portions of the bag supporting member.

4,012,068

## LITTER TONGS

Edward L. Apodaca, 11896 Lavinia Lane, North Glenn, Colo. 80233

Filed Aug. 12, 1975, Ser. No. 604,051

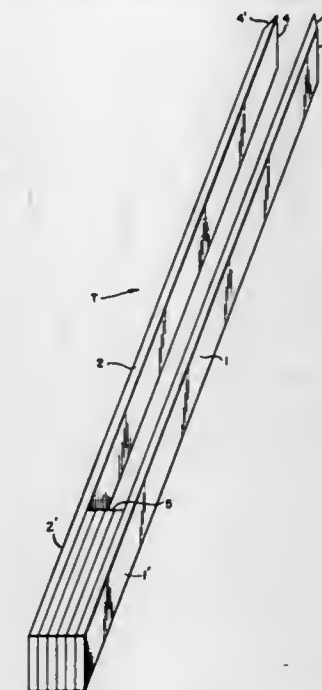
Int. Cl.<sup>2</sup> B25B 9/02

U.S. Cl. 294-33

2 Claims

1. A unitary tong for picking up litter from a urinal by flexing the jaws thereof, comprising
- a. a pair of jaws of rectangular cross-section integrally joined together at one of the ends thereof by a solid joint and extending in spaced parallelism from said joint to free terminals at the opposite ends of said jaws,
  - b. each of said jaws being of identical construction and of uniform rectangular cross-section up to said free terminals with a width of approximately four times its thickness to permit easy flexing and ready movement of said jaws towards each other by the application of manual pressure applied at any part and beyond the junction thereof, thereby to effect the approach of the free terminals of said jaws into close juxtaposition for grasping securely any litter therebetween, each of said jaws being of a length about sixteen times its width and normally spaced from each other a distance slightly greater than said width, and
  - c. the free terminal of each jaw being of the same width as the remainder thereof but beveled to a sharp edge from

the outer to inner face thereof, so that the juxtaposed sharp edges of both jaws, as well as the rectangular cor-



ners at the opposite ends thereof, are adapted to reliably grasp all types of litter therebetween.

4,012,069

## LOADING APPARATUS

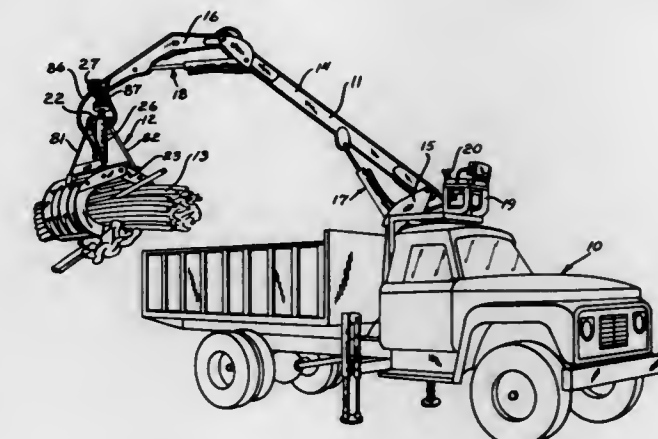
William S. Carson, 218 Escambia Drive, Winter Haven, Fla. 33880

Filed Mar. 31, 1976, Ser. No. 672,056

Int. Cl.<sup>2</sup> B66C 3/16

U.S. Cl. 294-70

4 Claims



1. A loading apparatus for picking up trash, brush, and the like comprising a lifting head adapted to be connected to a lifting boom and a bucket supported by the lifting head, the bucket including a pair of bucket jaws which are mounted for pivotal movement about a generally horizontally axis, each of the bucket jaws including

- a. a pair of flat, curved end walls extending generally arcuately downwardly from said horizontal axis in a plane which extends generally perpendicularly to the horizontal axis, the end walls being spaced apart in a direction parallel to the horizontal axis and including a pair of flat side surfaces which extend parallel to said plane and curved inner and outer edges,
- b. a plurality of flat, curved ribs, each of the curved ribs extending generally arcuately downwardly from said horizontal axis between the end walls in a plane which extends generally perpendicularly to said horizontal axis and including a pair of flat side surfaces which extend parallel to said plane and curved inner and outer edges, the ribs being spaced apart in a direction parallel to said horizontal axis,



- c. a curved side wall secured to the outer edges of the ribs and to the outer edges of the end walls and terminating in a lower edge adjacent the lower ends of the ribs and end walls providing a clamshell edge;
- d. a tooth secured to one of the flat side surfaces of each of the ribs and extending inwardly beyond the inner edge of the rib and terminating in a trash-engaging point, the points of the teeth being generally aligned with a plane extending from the pivot axis to the clamshell edge, means connected to the lifting head and the bucket for pivoting the bucket jaws between a closed position in which the clamshell edges of the jaws are positioned adjacent each other and an open position in which the clamshell edges of the jaws are spaced apart, the teeth of each of the jaws extending generally toward the teeth of the other jaw when the bucket jaws are closed and the points of the teeth of each of the jaws being positioned adjacent the points of the teeth of the other jaw when the bucket jaws are closed, the curved inner edges of the ribs being engageable with brush and the like when the jaws move toward the closed position and the teeth being engageable with trash with the jaws move toward the closed position.

4,012,070

## CONVERTIBLE CAMPER VEHICLE

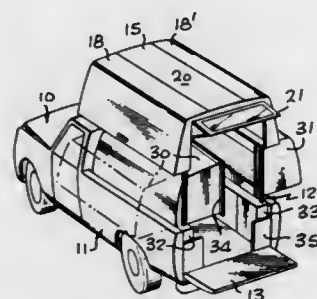
Lester L. Mertz, 8529 Comanche Ave., Canoga Park, Calif. 91306

Filed July 31, 1975, Ser. No. 600,818

Int. Cl.<sup>2</sup> B60P 3/32

U.S. Cl. 296—27

6 Claims



1. A self contained mobile vehicle comprising:  
a body having a convertible enclosed living compartment;  
a pair of berth pods defining the opposite sides of said compartment and laterally extendable on said vehicle body;  
means cooperatively carried on each of said berth pods and said vehicle body for sliding said pods laterally so as to extend said pods outwardly from the opposite sides of said vehicle body;  
a raisable top carried on said body having a first roadable position enclosing said berth pods with downwardly depending side panels constituting opposite vehicle body sides and top closures and a second position raised above said body to permit lateral extension of said berth pods defining an interior compartment suitable for standing and moving about therein; and  
said side panels are foldable side covers pivotally carried along opposite side marginal regions of said top and deployable over the length of each of said berth pods to complete enclosure of said interior compartment when said top is in its second position; and  
means carried on said body operably connected to said top for raising and lowering said top in either of said first and second positions.

4,012,071

## CAB MOUNTING DEVICE

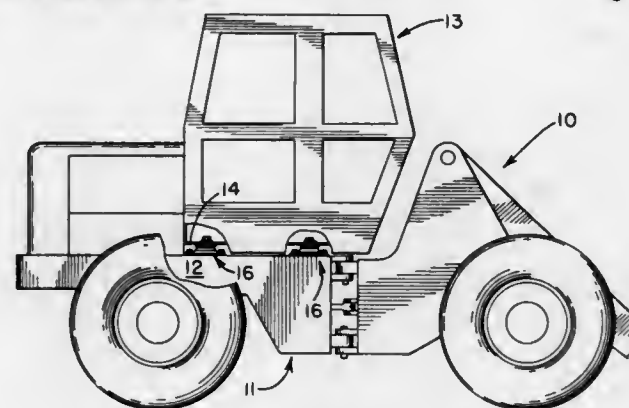
Gary E. Jones, Aurora; Dean H. Hart, Yorkville, and Rueben R. Brunka, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 4, 1975, Ser. No. 601,282

Int. Cl.<sup>2</sup> B62D 23/00

U.S. Cl. 296—35 R

6 Claims



1. Mounting means for limiting transmission of vibration imposed on a first member to a second member, the mounting means comprising:

- a mounting flange mounted relative to the first member, said mounting flange having a tube-like projection extending generally upwardly of said first member and a top portion extending inwardly of said tube-like projection said top portion defining a bore generally coincident with the longitudinal axis of the tube-like projection;
- an elastomeric cushioning member substantially surrounding said top portion and extending downwardly of said tube-like projection, said elastomeric cushioning member bonded to said top portion and said tube-like projection and defining an axial bore substantially aligned with the longitudinal axis of the axial bore located in said top portion;
- a fastening nut bondingly associated with the elastomeric cushioning member interior of the tube-like projection; tubular bushing means contained in the axial bore of the elastomeric cushioning member engaging the fastening nut at one end and extending upwardly therefrom in said axial bore of the elastomeric cushioning member a predetermined distance less than the depth of said axial bore of the elastomeric cushioning member, and;
- fastening means threadably engaging said fastening nut and disposed through said tubular bushing means for urging said second member toward said first member when said second member is engaged with said elastomeric cushioning member so that said elastomeric cushioning member is compressed between said second member and said fastening nut an amount determined by the length of the tubular bushing means without deformation of the tubular bushing means.

4,012,072

## FLEXING MULTI-FIRMNESS SEAT COVER

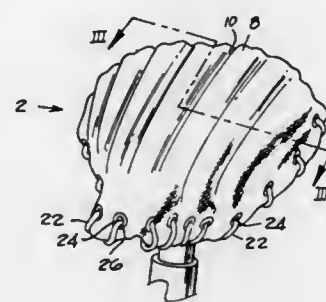
Leif A. Hansen, 2000 Broadway, San Francisco, Calif. 94123

Filed Jan. 19, 1976, Ser. No. 650,568

Int. Cl.<sup>2</sup> A47C 27/00

U.S. Cl. 297—219

9 Claims



1. Cover means for covering a seat of established construction, said cover means comprising; exterior surface material

means for directly engaging a user of said seat, said external surface material means being formed to include a plurality of adjacently extending raised means and groove means for providing circulation of air between said user and said exterior surface means and for flexing compressively and expansively with movements of said user to substantially reduce relative movements and friction wear between said user and said exterior surface material means, said adjacently extending raised means being separated one from another by said groove means and having substantial height with respect to said groove means, said raised means and groove means functioning to reduce relative movements between said user and said surface material means by rolling in fixed contact with said user and moving together and apart in accordian-like fashion, said cover means including fastening means for rapidly and readily removably securing said cover means to said seat.

4,012,073

## THREE-POINT SAFETY BELT, MORE PARTICULARLY FOR CHILDREN

Hans-Jochim Lorenz, Hamburg, Germany, assignor to Stakupress Gesellschaft für Stahl und Kunststoffverarbeitung mbH &amp; Co. KG, Norderstedt, Germany

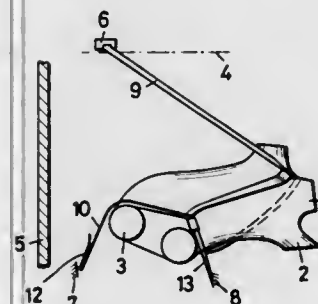
Filed Feb. 25, 1976, Ser. No. 661,310

Claims priority, application Germany, Mar. 6, 1975, 2509758

Int. Cl.<sup>2</sup> A62B 35/00

U.S. Cl. 297—389

6 Claims



1. In a motor vehicle passenger safety belt with a three-point connection to the motor vehicle comprising a pelvic belt with two end parts connected to the motor vehicle for extension from opposite sides of a passenger and having fastening means for fastening the end parts together for fastening the pelvic belt across the passenger and a shoulder belt connected to the motor vehicle and to one end part of the pelvic belt extending from one side of the passenger and so as to cross in front of the passenger downwardly over a shoulder on said one side toward the other side of the passenger when the end parts of the pelvic belt are fastened together, the improvement wherein the safety belt further comprises a back belt connected at one end to the shoulder belt at the shoulder of the passenger and at its opposite end to the other end part of the pelvic belt so as to extend over at least a portion of said shoulder and cross in back of the passenger toward said other side of the passenger for firmly securing the upper body of the passenger between said shoulder and back belts while permitting full lateral upper body movement toward said other side without shoulder strap release from the passenger.

4,012,074

## DEVICE FOR ADJUSTING THE LEGS OF ADJUSTABLE WHEELCHAIRS

Bernard M. O'Reilly, 470 Earle St., and James F. Best, 105 W. Suffolk Ave., both of Central Islip, N.Y. 11722

Filed Dec. 2, 1975, Ser. No. 636,922

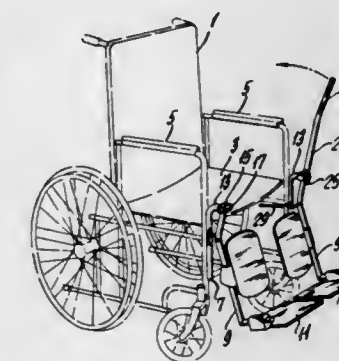
Int. Cl.<sup>2</sup> A47C 7/50

U.S. Cl. 297—434

2 Claims

1. A wheelchair including a frame, a seat mounted on said frame, a plurality of wheels, means to rotably mount said

wheels on said frame, a pair of support members connected to said frame, two adjustable legs each pivotally attached to one of said support members, each of said legs comprising a bar member pivoted near its top to said support member and a foot support member attached near the opposite end of said bar member, said bar member having a rounded top portion, in combination therewith, a device for elevating and lowering said legs of said wheelchair, said device comprising a generally elongated member comprising as integral portions thereof, a first elongated portion having a free end and adapted to be



- gripped and operated by the invalid using the wheelchair, a second generally elongated portion having a free end integral with said first elongated portion and formed angularly with said first elongated portion, a generally C-shaped clamping portion integral with and at the free end of said second elongated portion, said clamping portion being formed of opposite first and second side portions, a lip portion integral with and extending from one of said side portions in the same direction as said side portion, said clamping portion being adapted to exert leverage on said leg to raise said leg by fitting on its top rounded portion.

4,012,075

## DEVICE FOR ADJUSTING THE LEGS OF ADJUSTABLE WHEELCHAIRS

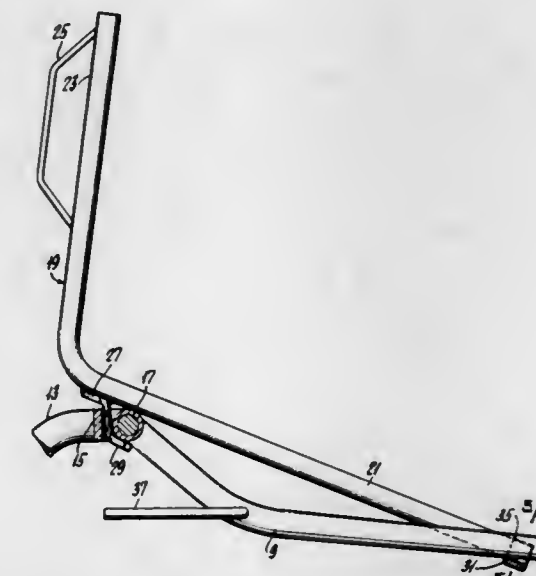
Bernard M. O'Reilly, 470 Earle St., and James F. Best, 105 W. Suffolk Ave., both of Central Islip, N.Y. 11722

Filed Dec. 2, 1975, Ser. No. 636,991

Int. Cl.<sup>2</sup> A47C 7/50

U.S. Cl. 297—434

8 Claims



1. A device for elevating and lowering the legs of a wheelchair of the type equipped with adjustable legs, which device is a generally inverted L-shaped member comprising a first elongated member having a free end and a second elongated member having a free end formed angularly with said first elongated member, means secured substantially at the juncture of the first elongated member and the second elongated member for attachment to said wheelchair adjacent each leg thereof and a cross member transversely secured at the free



end of said first elongated member adapted for supporting either leg of the wheelchair.

4,012,076

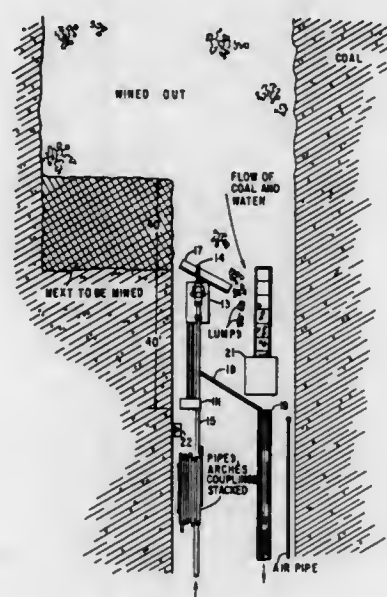
**PROCESS FOR HYDRAULICALLY MINING COAL**

Kouichi Shoji, Tokyo, Japan; Ronald E. Sieling, 31 Waterhouse Ave., St. Ives, New South Wales, 2075 Australia; Joe T. Taylor, St. Ives, Australia, and Robert G. Heers, Oakland, Calif., assignors to Kaiser Resources Ltd., Vancouver, Canada; Mitsui Mining Co., Tokyo, Japan; a part interest Division of Ser. No. 350,509, April 12, 1973, abandoned, and a continuation-in-part of Ser. No. 299,200, Oct. 20, 1972, abandoned. This application Oct. 31, 1974, Ser. No. 519,625 (Filed Under Rule 47)

Claims priority, application Canada, Apr. 13, 1972, 139608 Int. Cl.<sup>2</sup> E21F 41/00

U.S. Cl. 299—17

28 Claims



1. The method of hydraulically mining coal from a panel of coal of preselected average thickness comprising:

1. driving at least one entry upward through the panel to a predetermined terminus thereof at an average slope of at least about 5°;
2. installing a fluming system in said entry that slopes in the same direction as the entry;
3. positioning a monitor within said entry, said monitor comprising a nozzle adapted for pivotal motion vertically and horizontally, and being connected to means for receiving water under pressure;
4. ejecting a jet of high pressure water from said nozzle against the panel of coal to cut the coal from the face area of the panel and break the coal into pieces of varying size;
5. feeding the cut and broken coal through a further breaking means located near said face area prior to transporting the coal from the face area;
6. feeding the coal from the breaking means to said fluming system; and
7. transporting the mined coal with the aid of gravity through said sloping fluming system with water from the nozzle as a coal-water slurry.

4,012,077

**LINEAR CUTTING ROTARY HEAD CONTINUOUS MINING MACHINE**

Wallace W. Roepke, Excelsior; David P. Lindroth, Apple Valley, and Joseph W. Rasmussen, Minneapolis, all of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 2, 1976, Ser. No. 702,373

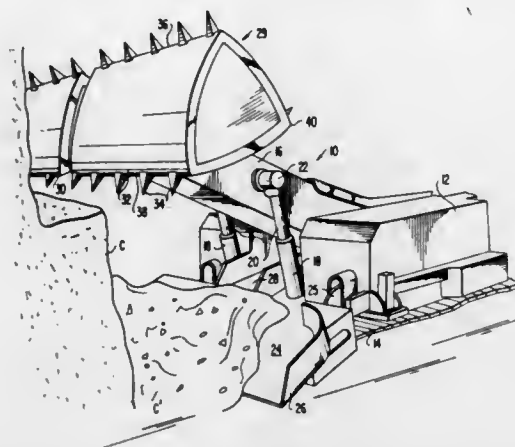
Int. Cl.<sup>2</sup> E21C 27/24

U.S. Cl. 299—76

10 Claims

1. A continuous mining machine for mining a horizontally extending coal vein or the like, said machine comprising:

a chassis movable longitudinally parallel to said vein a boom carried by said chassis for pivotable movement at right angles to the direction of chassis movement, shaft means mounted to said boom for rotation about its axis at right angles to the longitudinal axis of said boom, means for rotating said shaft, at least one rotary cutting head, triangular-shaped in cross



section mounted on said shaft for rotation about an elliptical eccentric path, and longitudinally spaced cutting bits mounted on said triangular-shaped rotary head at the apices thereof; whereby, said cutting bits follow a square cutting path during rotation of said at least one rotary head and effect linear shear and sump cuts of said coal vein during rotation thereof.

4,012,078

**WHEEL COVER SNAP ON FASTENER**

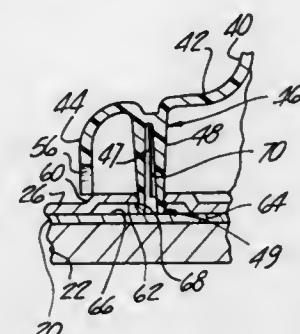
Dale J. Meyers, Logan, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 8, 1975, Ser. No. 638,813

Int. Cl.<sup>2</sup> B60B 7/00

U.S. Cl. 301—37 TP

2 Claims



1. A removable wheel cover for a vehicle wheel having a rim and a disk fixed thereto which has a plurality of prong receiving holes in a mounting bolt hole circle area thereof with the disk arranged to provide a space having a predetermined axial dimension between the inner margin of each prong receiving hole and the surface on which a disk bears when mounted on a vehicle, and a fastener comprising; at least two prongs carried by said removable wheel cover and extending generally axially from one face thereof with the free end of each of said prongs being constructed and arranged to pass through one of the prong receiving holes, each of said prongs having a pair of generally axially extending transversely spaced apart fingers and a generally axially extending opening therein between said fingers, cam means on each of said fingers of each said prong adjacent said free end thereof and constructed and arranged to engage the inner margin of its associated prong receiving hole and urge the free end of its associated prong into firm engagement with the surface on which the disk bears when mounted on the vehicle, and a web received in said opening between a pair of fingers of each of said prongs, said web

extending generally in a plane between diagonally opposed side edges of said pair of fingers and being homogeneously integral therewith, and said wheel cover, prongs, fingers, cam means, and web being a one-piece homogeneously integral body of a plastic material with said fingers and said web being resiliently flexible whereby when the free end of each of said prongs is inserted into its associated prong receiving hole, the free ends of said fingers of each pair are generally radially displaced toward each other to flex said fingers of said pair and distort their associated web so that when their associated cam means passes through said associated prong receiving hole, said flexed fingers of each pair and their associated distorted web move their associated cam means into engagement with the inner margin of said associated prong receiving hole to urge the free ends of said prongs into firm engagement with the surface on which the disk bears when mounted on a vehicle to securely and tightly releasably mount the removable wheel cover on the vehicle wheel.

4,012,079

**BRAKE CONTROL APPARATUS ACTUATED BY SENSING THE DECELERATION OF A VEHICLE**

Hiroshi Takeshita, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

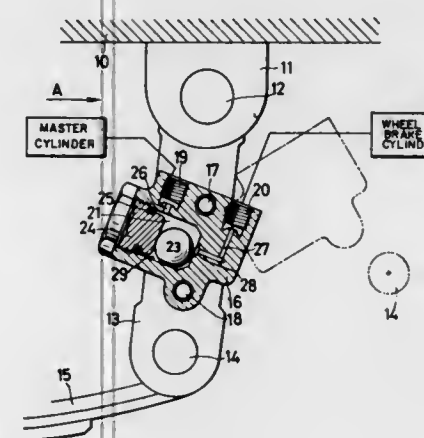
Filed May 20, 1975, Ser. No. 579,244

Claims priority, application Japan, May 20, 1974, 49-56361

Int. Cl.<sup>2</sup> B60T 8/22, 8/24, 8/26

U.S. Cl. 303—6 C

4 Claims



1. In a vehicle having a frame member and a movable spring suspension member, wheel brake cylinders and a master cylinder, and a fluid passage connecting said wheel brake cylinders to said master cylinder, the improvement, which includes a brake control apparatus actuated by sensing the deceleration of said vehicle consisting of:

- a single arm member swingably secured directly upon said frame member at one end thereof and swingably secured directly upon said movable spring suspension member at the other end thereof for directly interconnecting said frame and spring suspension members;
- said brake control apparatus being fixedly secured upon said arm member including a main body, an inlet port fluidically communicated with said master cylinder, an outlet port fluidically communicated with said wheel brake cylinders, and a valve member interposed between said inlet and outlet ports for controlling the fluid pressure flow from said master cylinder to said wheel brake cylinders by sensing a predetermined deceleration of said vehicle, which is also dependent upon the load weight of said vehicle, when said vehicle is braked.

4,012,080

**PNEUMATIC TO HYDRAULIC CONVERTER WITH INTEGRAL DUMP CHAMBER**

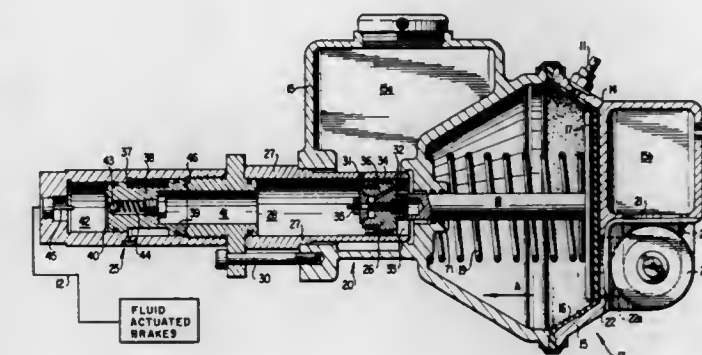
Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 417,707, Nov. 30, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,939

Int. Cl.<sup>2</sup> B60T 8/10

U.S. Cl. 303—114

7 Claims



1. In combination with a braking system for a vehicle having wheels, said system having fluid actuated brakes and skid control means for detecting skidding of said wheels, a fluid powered motor for applying and releasing said fluid applied brakes, said motor having a dump chamber selectively connectable to said motor to control skidding of said wheels during brake application in response to said control means, said motor comprising:

fluid pressure responsive motor means, said motor means comprising a housing which defines a working chamber having at least one movable wall, said motor being responsive to the admission of pressurized fluid to drive said movable wall to expand said working chamber and apply said brakes with a force proportional to the pressure in said working chamber;

conduit means adapted for connection to a source of pressurized fluid;

dump chamber means located adjacent said working chamber, said dump chamber means being open to atmosphere through an exhaust orifice, said dump chamber means and said orifice being sized for permitting rapid depressurization of said working chamber from a first pressure level at which skidding of said wheels occurs to a second pressure level at which said wheels are released from skidding; but for minimizing further depressurization of said working chamber following release of said wheels, whereby repressurization of said working chamber may be rapidly accomplished to a pressure level below that where skidding occurs to reapply said brakes; and

selectively operable valve means responsive to said control means located adjacent said working chamber, said valve means interconnecting said working chamber, said conduit means and said dump chamber means, said valve means serving in one position thereof to admit pressurized fluid from said conduit means to said working chamber while closing communication between said working chamber and said dump chamber means; and in another position thereof to admit pressurized fluid from said working chamber to said dump chamber means while simultaneously maintaining pressurized fluid in said conduit means.



4,012,081

**VALVE AND RESPONSIVE CIRCUIT FOR ANTI-SKID HYDRAULIC BRAKING SYSTEM**

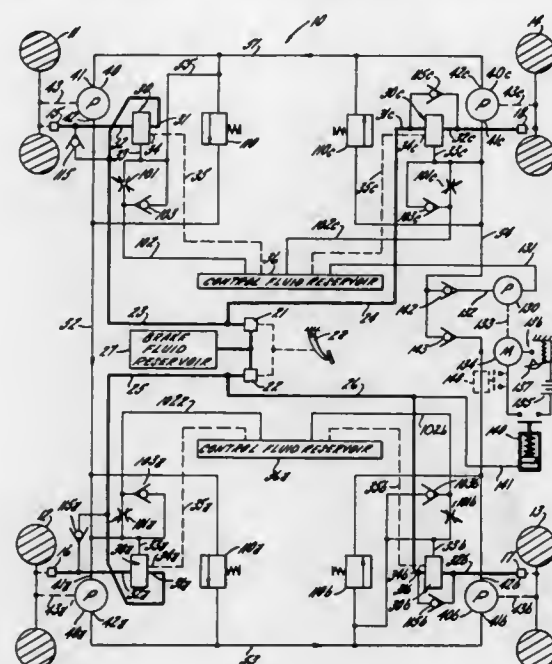
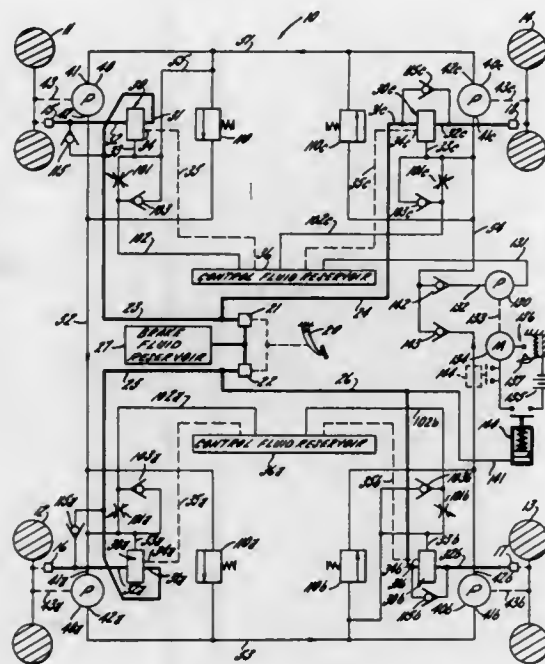
Richard A. Doversberger, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Oct. 22, 1975, Ser. No. 624,984

Int. Cl.<sup>2</sup> B60T 8/04

U.S. Cl. 303-115

14 Claims



3. In an hydraulic braking system for a vehicle having wheel brakes employing respective wheel cylinders, means including pressure lines and a pedal-controlled source of pressurized brake fluid for applying fluid to the wheel cylinders in proportion to the pressure exerted on the pedal for braking the vehicle to a stop, means coupled to each wheel for generating a control signal in response to a relatively slipping condition of incipient skid and which varies in accordance with the degree of slip, brake release valve means interposed in the associated brake line and having a piston responsive to the control signal for isolating the release valve means and associated wheel cylinder from the master cylinder during the initial portion of piston movement, the piston defining a cavity of variable size communicating with the wheel cylinder for sequentially relieving the pressure of the brake fluid applied to the wheel cylinder, the piston having a biasing spring for normally minimizing the size of the cavity but for permitting the cavity to vary in size on a continuous modulated basis in accordance with the control signal thereby to prevent the wheel from going into a full skidding condition, and check valves respectively connected from the wheel cylinders to the source bypassing the brake release valve means and faced for return of fluid to the source for insuring immediate release of pressure at the wheel cylinders upon release of pressure at the source notwithstanding the isolating effect of the brake release valve means.

4,012,082

**CONTROL CIRCUIT FOR ANTI-SKID HYDRAULIC BRAKING SYSTEM**

Richard A. Doversberger, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed Oct. 22, 1975, Ser. No. 624,715

Int. Cl.<sup>2</sup> B60T 8/087

U.S. Cl. 303-116

21 Claims

1. In an hydraulic braking system for a vehicle having wheel brakes employing respective wheel cylinders, means including a master cylinder and brake pedal for applying brake fluid to the wheel cylinders in proportion to the pressure exerted on the pedal for braking the vehicle to a stop, a positive displacement hydraulic pump coupled to each wheel, each pump having an input connection and an output connection, the

pumps being connected in a series loop circuit charged with control fluid so that control fluid circulates idly at low pressure in the loop as long as the wheels rotate at the same speed but with back pressure being developed at the input connection of a pump associated with a wheel which is in a relatively slipping condition of incipient skid by reason of the excess control fluid fed thereto, brake release valve means responsive to the back pressure of control fluid for correspondingly re-

lieving the pressure of the brake fluid applied to the associated wheel cylinder thereby to prevent the wheel from going into a full skidding condition, an auxiliary source of pressurized control fluid, first means responsive to deceleration of the vehicle, second means responsive to lack of flow of control fluid in the loop, means for normally isolating the auxiliary source from the loop circuit, and means operated upon joint response of the first and second means for connecting the auxiliary source to the loop circuit.

4,012,083

**MAGNETIC BEARINGS**

Helmut Habermann, Vernon, and Maurice Brunet, Foret de Vernon, both of France, assignors to Societe Anonyme dite: Societe Europeenne de Propulsion, Puteaux, France

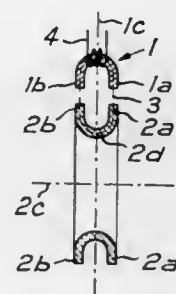
Filed May 5, 1975, Ser. No. 574,690

Claims priority, application France, May 9, 1974, 74.16080

Int. Cl.<sup>2</sup> F16C 39/00

U.S. Cl. 308-10

2 Claims



1. A device including a rotor rotatable about an axis and an active magnetic bearing magnetically supporting said rotor for rotation, said magnetic bearing having a stator defining an electromagnetic circuit including at least one electromagnet which, when energized, has a pair of fixed north and south poles, said electromagnet having a U-shaped cross section in a plane including said axis of rotation of the rotor and opening towards said axis of rotation, the parallel extending side portions of said electromagnet forming respectively said fixed north and south poles and being separated by a plane of symmetry which lies perpendicular to said axis of rotation;

said rotor having a circumference in the shape of an annulus whose cross section is in the shape of a U, the legs of which radially aligned to face said side portions of said electromagnet.

4,012,084

**SELF-ALIGNING LOAD TRANSMISSION POST**

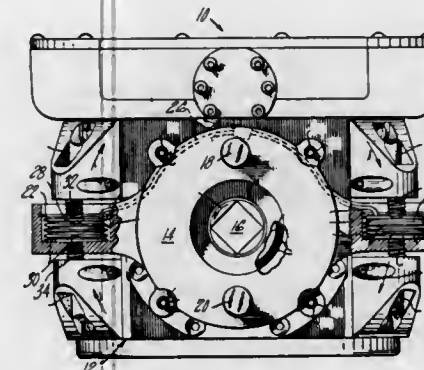
Donald H. Ranheim, Jr., East Hartford, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Filed Jan. 28, 1975, Ser. No. 544,860

Int. Cl.<sup>2</sup> F16C 7/00, 9/00, 11/00

U.S. Cl. 308-2 R

6 Claims



1. A self-aligning post for transmitting a load to a bellows including:

- a cylindrical body portion having a planar end surface substantially perpendicular to the axis of said cylindrical body portion; and
- a semispherical tip, said tip having a flat surface perpendicular to the central axis of said tip and in contact with said planar surface of said cylindrical body portion, said tip also having a spherical shaped surface for engagement with a concave receptacle of the bellows, the radius of curvature of said spherical surface being less than the radius of the concave receptacle, whereby said spherical shaped surface of said tip is always in contact with the same part of the concave receptacle of the bellows when imposing a load, regardless of the alignment of said cylindrical body portion with respect to the bellows.

4,012,085

**SHAFT SUPPORT MEANS**

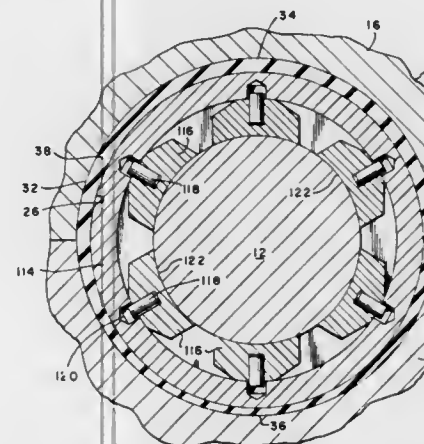
Fred Kurt Kunderman, Olean, N.Y., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 16, 1975, Ser. No. 623,203

Int. Cl.<sup>2</sup> F16C 27/00, 35/00

U.S. Cl. 308-26

5 Claims



1. Improved shaft support means for turbo-machines or the like having a generally horizontally oriented rotor and shaft assembly journaled in a housing, said support means comprising:

- a bore in said housing;

a groove in said housing in said bore, said groove being of less depth adjacent the lower portion of said bore; bearing means located in said bore and encircling said shafts; and, a toroidal member of resilient material encircling said bearing means and located in said groove in resilient supporting engagement with said bearing means whereby the lesser depth of said groove causes said member to exert a greater upward force on said bearing to compensate for the weight of said rotor and shaft assembly.

4,012,086

**SHAFT MOUNTED BEARING FOR WITHDRAWAL OVER BURRS ON SHAFT**

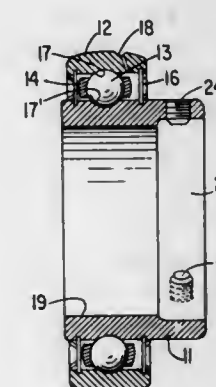
Claus A. Kruse, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed June 16, 1975, Ser. No. 586,899

Int. Cl.<sup>2</sup> F16C 33/30; B25G 3/02

U.S. Cl. 308-236

4 Claims



1. In the combination with a shaft, a bearing mounted on said shaft having outer and inner race members with a raceway therebetween and anti-friction bearing members in said raceway, said inner race member having an integral locking portion axially displaced from said raceway and with at least one radially extending threaded bore in said locking portion, a set screw threadably maintained in said threaded bore for radial threaded movement into said shaft at a point coextensive with said threaded bore to impinge upon and lock into said shaft and raise a burr thereon extending radially toward said bore and normally acting to impede separation of said shaft and said bearing when said set screw is retracted, the improvement comprising means in said inner race member for avoiding said burr impediment from preventing said separation of shaft and bearing, said means comprising a circumferential relief bore extending inside said locking portion over the entire 360° thereof and opening from the outer axial end of said locking portion, said relief bore having an axial width greater than the dimension of said threaded bore from said outer axial end of said locking portion and a radial height from said shaft greater than the height of any burr raised on the shaft by said set screw, whereby upon retraction of said set screw from a locking position on the shaft, said shaft and said bearing may be separated in an axial direction away from a burr on said shaft.

4,012,087

**CARD INDEX BOX**

Robert L. Edwards, Jr., 388 St. Mary's Parkway, Buffalo Grove, Ill. 60090

Filed July 21, 1975, Ser. No. 597,346

Int. Cl.<sup>2</sup> A47B 63/00; B65D 1/34

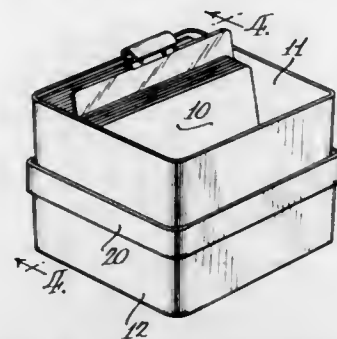
U.S. Cl. 312-183

5 Claims

1. A card file case for containing separator cards and index cards therein comprising a one piece, generally rectangular receptacle including front and back vertical walls and means for retaining said cards in an angular position from the verti-



cle, which means comprise inwardly angled projecting walls at the front and back of the receptacle which are an integral part



of the receptacle, said projecting walls being formed by angled recesses in said front and back verticle walls.

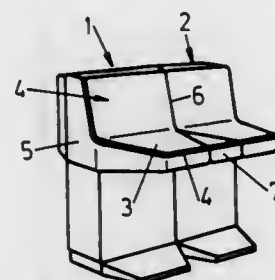
4,012,088

**MONITORING AND CONTROL ARRANGEMENT**  
Winfried Platz, Rathsberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany  
Filed June 28, 1974, Ser. No. 484,464  
Claims priority, application Germany, Sept. 19, 1973, 2347179

Int. Cl.<sup>2</sup> A47B 47/00, 77/00

U.S. Cl. 312-198

4 Claims



1. In a monitoring and control arrangement including a plurality of control desks supporting control, measuring and monitoring elements, each of said desks having a substantially horizontally positioned control surface, and said desks being constructed so as to be selectively arranged in an extended position or curved about a working location, the improvement comprising; each said control desk forming an independent component, said horizontal control surface of each said desk being a generally regularly-shaped trapezoid, the smaller of the parallel sides of said trapezoid forming the forward end edge of said control desk facing towards the operating personnel for said arrangement; generally triangular spaces being formed between adjacent horizontal control surfaces of said control desks in the extended positioning of the latter; and triangularly-shaped cover members positioned in said spaces, said cover members having upper surfaces substantially coplanar with said horizontal control surfaces so as to form a continuous control surfaces for said arrangement.

4,012,089

#### ELECTRONIC EQUIPMENT ENCLOSURE

Clyde L. Ward, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1974, Ser. No. 459,139

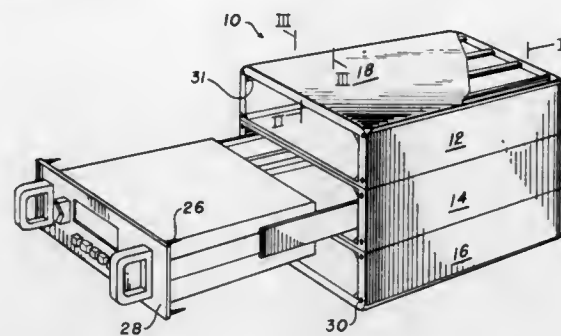
Int. Cl.<sup>2</sup> B21D 39/00; A47B 77/08

U.S. Cl. 312-236

3 Claims

1. An electronic instrument enclosure comprising: molded outer and inner spaced independent shells having walls, each shell having a common front opening; a drawer for supporting an electronic package positionable within said opening; a filler material having structural dampening properties intermediately positioned in the spaces between said walls of the outer and inner shells forming an integral sandwiched construction;

said outer shell constructed of a hard, impact-resistant plastic material; the inner surfaces of the outer shell having formed therein recesses;



self-contained heat pipes positioned within said recesses to provide a passive cooling system for the electronic package; said inner shell walls having imbedded therein hardware supporting components.

4,012,090

#### KNOCKDOWN PUT-TOGETHER DRAWER

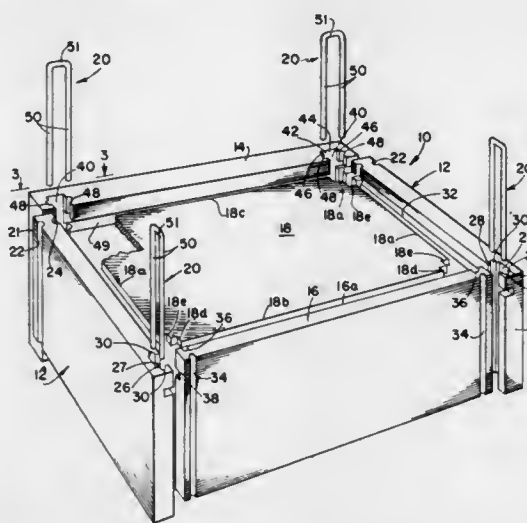
Raymond Pfeifer, 5530 S. Lake Shore Drive, Chicago, Ill. 60616, and Roger Ringger, 7480 SW. Fifth St., Plantation, Fla. 33314

Filed Nov. 5, 1975, Ser. No. 629,145

Int. Cl.<sup>2</sup> A47B 47/04; B65D 9/34

U.S. Cl. 312-330 R

4 Claims



1. A knockdown put-together drawer for a dresser, cabinet, desk and the like, said knockdown drawer comprising a pair of spaced sides, a bottom, a back and a front, each of said spaced sides having an inwardly facing vertically extending channel adjacent each of the rear ends thereof to receive the opposite ends of the back, said side channels each having a pair of oppositely positioned vertically extending grooves and said back having a pair of vertically extending grooves one on each side of the back and adjacent each of its opposite ends cooperating with the pair of oppositely positioned grooves in the sides, said bottom secured to said sides, a U-shaped interlocking member having spaced generally parallel sides and a connecting end portion with said spaced parallel sides of said interlocking member insertable in said side and back grooves through the open bottom thereof to engage said cooperating grooves to interlock said parts together, with said connecting end portion engaging the bottom of said back member to limit the insertion of said U-shaped interlocking member.

4,012,091

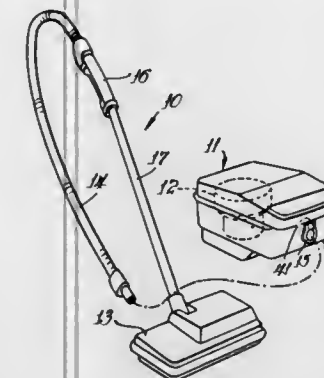
#### VACUUM CLEANER WITH REPLACEABLE ELECTRICAL TERMINALS

George Alfred Westergren, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.  
Filed Nov. 7, 1975, Ser. No. 629,844

Int. Cl.<sup>2</sup> H01R 3/04

U.S. Cl. 339-15

14 Claims



1. In a current-carrying vacuum cleaner hose having an end provided with a pair of exposed electrical contacts, the improvement comprising:

a terminal adaptor including a mounting member, and a pair of double-ended electrical terminals carried by said mounting member having a first end engaging said hose and electrical contacts, and an exposed opposite end; and means for releasably retaining said adaptor adjacent said hose end with the first end of said terminals in electrical contact with said hose end contacts, said adaptor being arranged to permit an electrical connector to be removably connected to the opposite exposed end of said terminals.

4,012,092

#### ELECTRICAL TWO-WAY TRANSMISSION SYSTEM FOR TUBULAR FLUID CONDUCTORS AND METHOD OF CONSTRUCTION

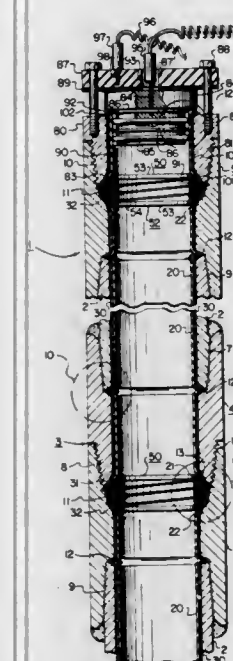
Josiah J. Godbey, 812 Nottingham Drive, Richardson, Tex. 75080

Filed Mar. 29, 1976, Ser. No. 671,245

Int. Cl.<sup>2</sup> H01R 3/04

U.S. Cl. 339-16 R

21 Claims



1. A method of constructing an electrical coaxial conductor assembly to provide an electrical transmission system for a tubular fluid conductor composed of electrically conductive pipe and means externally connecting the adjacent ends of adjacent lengths of pipe in spaced relationship which comprises

utilizing the pipe and external connecting means as an outer electrical conductor for the coaxial conductor assembly, forming an inner electrical conductor for said coaxial conductor assembly of thin ductile electrically conductive tubes having less diameter and slightly greater length than the interior of said pipe of the outer electrical conductor, snugly enveloping the exterior of each tube of the inner electrical conductor in elastic dielectric material, positioning each enveloped tube within each pipe of said outer electrical conductor,

flaring the end portions of each tube into contiguous conformity with the interior of each pipe and over the transverse faces of its ends so as to prevent relative longitudinal displacement therebetween,

deforming each tube radially outward between its flared end portions into contiguous conformity with the interior of each pipe,

the elasticity of the enveloping dielectric material permitting expansion thereof into sealing engagement with each pipe upon said flaring and outward radial deformation of each tube so as to electrically insulate each pipe from each tube throughout the length of said material,

the adjacent flared end portions of adjacent tubes of said inner electrical conductor being spaced from each other upon coupling of the adjacent ends of adjacent lengths of pipe in spaced relationship,

electrically insulating said adjacent end portions of coupled pipe from said adjacent tube ends by positioning elastic dielectric annular means between and in engagement with said tube ends for deformation into sealing engagement with the contiguous surfaces of said tube and pipe ends upon coupling of said pipe, and

electrically connecting adjacent flared tube ends by embedding electrical contact means in the inner peripheral portions of the elastic dielectric annular means.

11. In a tubular fluid conductor composed of electrically conductive pipe and means externally connecting the adjacent ends of adjacent lengths of pipe in spaced relationship, an electrical transmission system including

coaxial electrical conductor means having inner and outer tubular electrical conductors,

the outer electrical conductor being composed of the pipe and external connecting means,

the inner electrical conductor comprising tubes of electrically conductive material mounted in and complementary to each pipe of the outer electrical conductor,

a sheath of dielectric material complementary to and enveloping each tube of the inner electrical conductor for electrically insulating the exterior of said tube from each pipe of said outer electrical conductor,

each inner conductor tube and its sheath being of slightly greater length than the interior of each outer conductor pipe whereby the extremities of said tube and sheath project slightly beyond the ends of said pipe;

said projecting extremities of each inner conductor tube and its sheath being flared over the transverse faces of the ends of each outer conductor pipe so as to anchor said tube and sheath against longitudinal displacement relative to said pipe,

an annular body of elastic dielectric material adapted to be mounted between the adjacent ends of adjacent pipe so as to be engaged and deformed by said adjacent pipe ends into fluid-tight sealing engagement therewith as well as with adjacent flared extremities of said tubes and sheaths, and

resilient electrical contact means embedded in the inner peripheral portion of each annular elastic dielectric body and having portions exposed for engagement with said adjacent flared extremities of said adjacent inner conductor tubes.



4,012,093

## CONNECTOR ARRANGEMENT FOR THIN, DEFLECTABLE CONDUCTORS

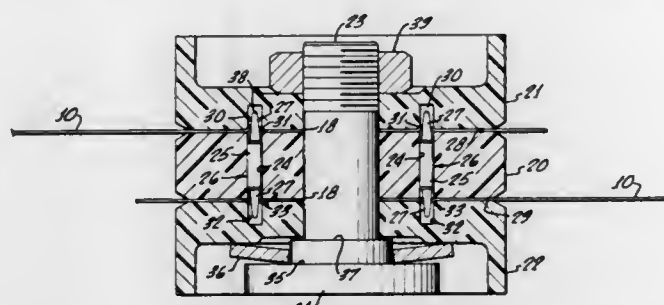
Merlin L. Crane, Banning, assignor to The Deutsch Company Electronic Components Division, Banning, Calif.

Filed Aug. 25, 1971, Ser. No. 174,696

Int. Cl.<sup>2</sup> H05K 1/02

U.S. Cl. 339—17 F

16 Claims



1. In combination with a printed circuit tape, said tape including flexible sheet means of dielectric material, and a plurality of relatively thin flat spaced electrical conductors secured to and carried by said sheet means, said conductors having openings therethrough, said openings being arranged in a circular pattern, a device for forming an electrical connection with said tape comprising

- a first element of substantially rigid dielectric material,
- a second element of substantially rigid dielectric material,
- a plurality of spaced pins of electrically conductive material carried by said second element,
- said pins having tapered portions projecting outwardly from a surface of said second element,
- said pins being arranged in a circular pattern concentric with said pattern of said openings,
- said tapered portions being received in said openings in said conductors and deflecting said conductors outwardly along the surfaces of said tapered portions for forming electrical connections therewith,
- said first element having apertures receiving said tapered portions of said pins and said deflected portions of said conductors,
- means for rotationally indexing said tape relative to said pins,
- and means relatively urging said first element against said surface of said second element for gripping said conductors between said surface of said second element and the peripheries of said apertures in said first element,
- said peripheries of said apertures in said first element closely circumscribing said tapered portions for providing only limited portions of said conductors for deflection by said tapered portions.

4,012,094

## ELECTRON TUBE SOCKET HAVING SPRING-WIRE CONTACTS

Marinus VanRenssen, Leola, and Myron Henry Wardell, Jr., Lititz, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed June 13, 1974, Ser. No. 479,138

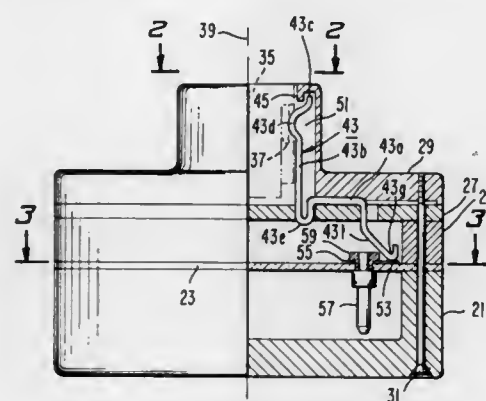
Int. Cl.<sup>2</sup> H05K 1/12

U.S. Cl. 339—17 D

1 Claim

1. An electron-tube socket comprising
  - A. a cap having a cavity therein for receiving a tube base including a plurality of pins in a circular array about an axis,
  - B. a wire holder adjacent said cap,
  - C. a plurality of spring wires having a round cross-section arranged in a circular array about said axis, each spring wire including
    - i. a single base portion clamped in a fixed position between said cap and said wire holder,

- ii. an extended portion terminating in a free end which extends towards the open side of said cavity and including a contacting section adapted for contacting one of said pins,
  - iii. and a transitional portion connecting said base portion with said extended portion and adapted to urge said contacting section against said pin,
- D. means for clamping said cap and said holder together, and
- E. means within said cap for limiting the travel of said free end of each wire,



said cap having longitudinally-extending recesses in the walls of said cavity adapted to maintain the extended portions of said wires in alignment,

said socket containing a circuit board therein and at least some of said spring wires include also an auxiliary portion connected to said base portion and having a free end extending away from said open side of said cavity, said auxiliary portion being adapted to make spring contact to said circuit board contained in said socket.

4,012,095

## COAXIAL INTERFACE ADAPTOR HAVING DUAL-IN-LINE CONFIGURATION

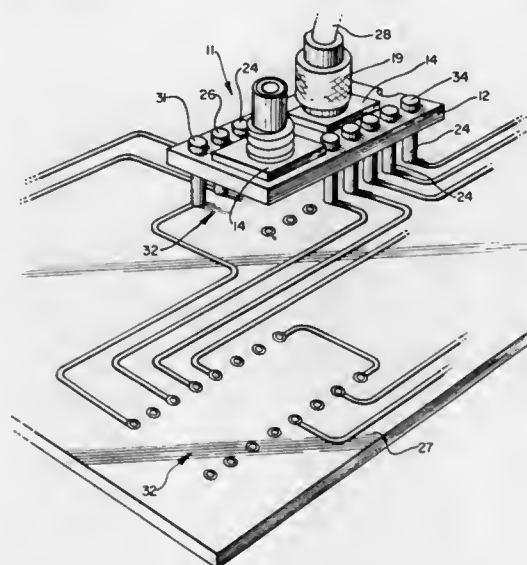
Leonard A. Doucet, Norton, Mass., and Richard M. Grubb, Cumberland, R.I., assignors to Augat, Inc., Attleboro, Mass.

Filed Oct. 2, 1975, Ser. No. 618,785

Int. Cl.<sup>2</sup> H05K 1/00

U.S. Cl. 339—17 C

15 Claims



1. A coaxial interface adaptor for coupling a coaxial cable to a dual-in-line array of holes in an electronic interconnection board, said adaptor comprising:
  - a substantially flat rectangular substrate having spaced parallel rows of a plurality of regularly spaced holes adjacent to the opposite long edges thereof, at least one coaxial connector location being defined by a plurality of ground post holes through said substrate and having a signal pin hole therethrough within the confines of said coaxial connector location;

4,012,097

## COMBINED TEST CLIP AND COMPONENT EXTRACTION TOOL

Walter J. Long, Upland; Lawrence E. Wysocki, Covina, and George M. Wohlhieter, Upland, all of Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

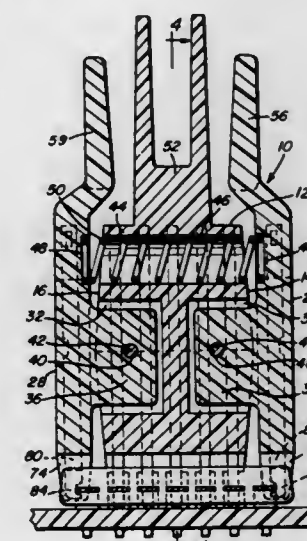
Filed Oct. 17, 1975, Ser. No. 623,332

Int. Cl.<sup>2</sup> H01R 13/62

U.S. Cl. 339—45 M

13 Claims

- a layer of electrically conductive material substantially covering a first side of said substrate, said layer having electrically separate coplanar ground conductor and signal conductor areas;
- a coaxial connector mounted to the second side of said substrate, said connector having a plurality of ground posts extending through said ground post holes in said substrate and a signal pin extending through said signal pin hole, said ground posts being connected electrically to said ground conductor and said signal pin being electrically connected to said signal conductor; and
- a contact pin mounted in each of at least some of said holes adjacent the opposite edges of said substrate, said contact pins extending from said first side of said substrate, said adaptor thereby having a dual-in-line configuration.



1. A combined test clip and electronic component extraction tool comprising:
  - a. a main body including opposite ends, opposite sides, a top and a bottom;
  - b. a pair of upstanding levers pivotally secured intermediate their upper and lower end portions to opposite ends of the body for limited oscillation about an axis transverse to the sides of the main body;
  - c. means for yieldingly biasing the upper ends of the levers apart;
  - d. a plurality of elongated upstanding longitudinally spaced conductive side contacts insulated from each other and supported by and projecting downwardly from each side of the main body; and
  - f. a pair of upstanding, opposing, conductive contacts depending from each lever, each lever-depending contact having an exposed upper and lower end, the lower end of each lever-depending contact comprising conductive hooks opening inwardly toward the opposing lever.

4,012,098

## ELECTRICAL CONNECTOR

Emil J. Tolnar, Jr., Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

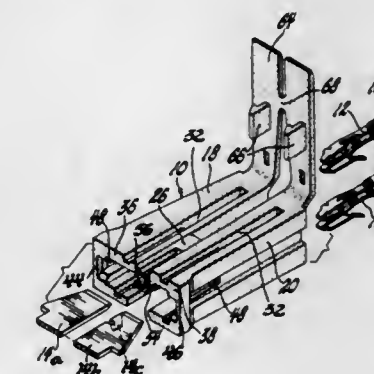
Filed July 2, 1976, Ser. No. 702,216

Int. Cl.<sup>2</sup> H01R 13/54

U.S. Cl. 339—61 R

3 Claims

1. In combination in a connector block, a connector block body member, a plurality of interconnection stations on said block, each of said interconnection stations comprising a pair of pins secured transverse to said body member in said body member, said pair of pins projecting beyond one side of said body member, conductors on both sides of said body member attached to selected ones of said pair of pins, said conductors being directed to locations spaced from said connector block, at least one of said pair of pins projecting beyond the other side of said body member, test pin members secured within said connector block body member, each of said test pin members being associated with only one of said interconnection stations for enabling selective testing of said interconnection stations, test connection means for electrically connecting selected ones of said pair of pins at said interconnection station to selected ones of said test pin members, at least one plug connector member including at least two recesses therein and electrical conductor means disposed within said recesses for selectively electrically interconnecting said pair of pins at said interconnection station, and said recesses receiving said pair of pins in detachable mating relationship.



1. A unitary connector body of molded dielectric material for connection to a pair of laterally spaced electrical terminals each having a latch shoulder extending laterally in a direction away from the other terminal comprising:



a first elongated hollow member for housing an electrical terminal matable with one of said first mentioned terminals and a second elongated hollow member for housing an electrical terminal matable with another of said first mentioned terminals, said members each having a forward portion for receiving one of said first mentioned terminals, an intermediate portion and a rearward portion, bridge means interconnecting the intermediate portions of said members and normally laterally spacing said members in generally parallel relationship, said bridge means including hinge means and said members being relatively rigid whereby said forward portions move laterally away from each other responsive to movement of said rearward portions toward each other, said forward portions being generally C-shaped in lateral section defining side openings toward the bridge means for permitting lateral movement of said forward portions away from each other when a pair of laterally spaced terminals in fixed spatial relationship are disposed in said forward portions, and each of said forward portions having a rearwardly facing shoulder which is at a forward end thereof and opposite its side opening for locking engagement with respective laterally projecting latch shoulders of a pair of electrical terminals whereby the connector body is adapted to be detachably connected to a pair of laterally spaced electrical terminals in fixed spatial relationship.

4,012,099

## ZERO INSERTION FORCE SOCKET

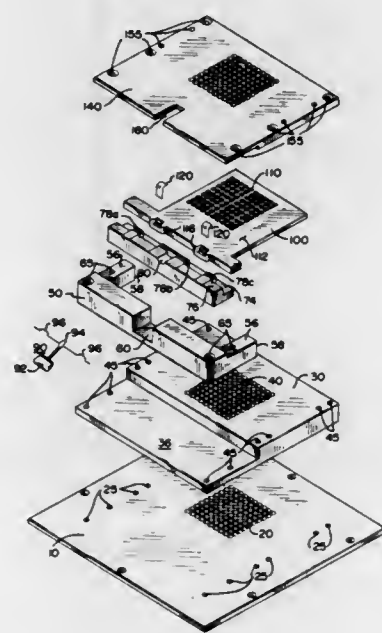
John L. Worcester, Walnut Creek, Calif., assignor to E-H Research Laboratories, Inc., Oakland, Calif.

Filed May 1, 1975, Ser. No. 573,625

Int. Cl.<sup>2</sup> H01R 13/54

U.S. Cl. 339-75 M

3 Claims



1. In a zero insertion force socket for an active electrical device having a plurality of pin leads said socket including bottom plate means with a matrix of apertures through each of which passes a conductor lead terminating in a two pronged connector jack, and a top plate with a corresponding matrix of apertures for receiving said pin leads and juxtaposed opposite said matrix of apertures in said bottom plate means into each of which extends said two pronged connector jack, and a slidable middle plate positioned between said bottom plate means and said top plate with a matrix of apertures correspondingly juxtaposed between said matrices of apertures of said bottom plate and said top plate, each of said jacks being located in a respective aperture of said middle plate and where

movement of said slidable middle plate causes each of said two pronged connector jacks to make physical contact and electrical connection with a pin lead inserted through an aperture in said top plate into said jack, the improvement comprising: said top plate and said bottom plate means consisting of electrically conductive material for electromagnetically shielding said conductors and associated connector jacks from each other and said slidable middle plate consisting of insulating material and together with a plurality of tubular conductors having one end affixed to each aperture of said bottom plate means and with said respective conductor leads which terminate in said jacks extending coaxially there-through, said tubular conductors diverging into the half space defined by said bottom plate means and on the opposite side of said bottom plate means as said top plate, the other end of each of said tubular conductors terminating in a predetermined one of a plurality of planes substantially parallel to said bottom plate means.

4,012,100

## ELECTRICAL JUNCTION CONNECTOR MODULE

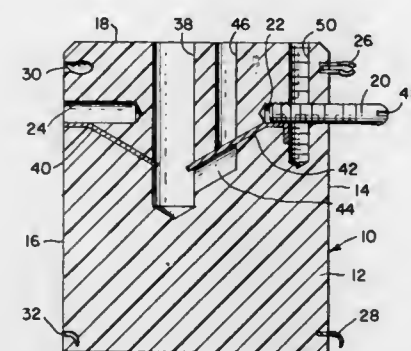
Armando J. Viscosi, 1360 E. 95th St., Brooklyn, N.Y. 11236

Filed Nov. 20, 1975, Ser. No. 633,626

Int. Cl.<sup>2</sup> H01R 9/12

U.S. Cl. 339-95 D

5 Claims



1. An electrical junction connector for electrically interconnecting the ends of a plurality of wires, said connector comprising: a plurality of blocks of dielectric material; said blocks being adapted to be stacked in side by side adjacent relationship; each block having:

- oppositely facing first and second surfaces for abutting adjacent ones of said blocks;
- an electrically conductive socket means formed in said first surface;
- an electrically conductive plug means extending from said second surface for engaging the socket means of an adjacent one of said blocks;
- a third surface extending between said first and second surfaces;
- a first bore opening on said third surface for receiving the end of one of said wires; and
- an electrical conductor means extending within said block from said socket means and from said plug means to said first bore.

4,012,101

## CIRCUIT TERMINATION DEVICE

Anthony John Damoisiaux, Basingstoke, and Raymond George Evans, Kingsclere, near Newbury, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed June 6, 1975, Ser. No. 584,277

Claims priority, application United Kingdom, July 18, 1974, 31845/74

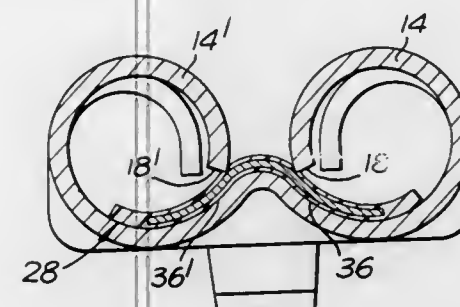
Int. Cl.<sup>2</sup> H01R 11/20

U.S. Cl. 339-97 C

4 Claims

1. A termination device for a flexible circuit or printed circuit having a conductor comprising:  
a metallic member of generally rectangular form having a

base and a pair of parallel, deformable sidewalls integral with said base at opposed sides thereof; said sidewalls being turned over toward each other with their edges directed downwardly toward said base, said turned-over sidewalls being spaced from each other to define a gap therebetween; a central elongated portion of said base projecting upwardly toward said gap, said elongated portion having concave surfaces extending along the sides thereof underlying said edges, respectively;



said edges being spaced above said elongated portion of said base a distance sufficient to allow said circuit to be inserted therebetween; and said sidewalls being shaped so that when they are forced downwardly toward said base, said sidewalls will move in a curved path generally complementary to the curvature of said concave surfaces to grip said circuit between said sidewalls and said base and to rupture the insulation, if any, on said circuit in a scraping manner without piercing the conductor of said circuit.

4,012,102

## SOLDERLESS ELECTRICAL CONTACT

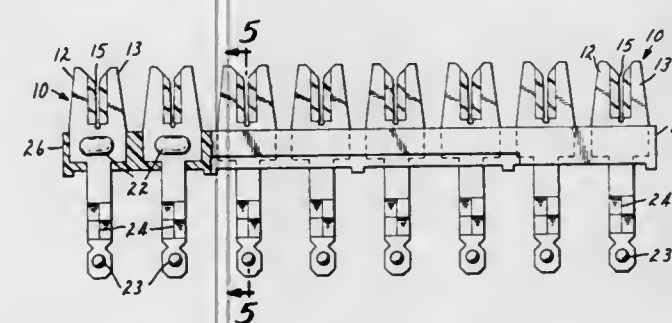
Thomas M. Cherney, Minneapolis, and Robert S. Dodsworth, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 26, 1976, Ser. No. 689,977

Int. Cl.<sup>2</sup> H01R 9/08

U.S. Cl. 339-97 P

8 Claims



1. A solderless electrical contact comprising a thin resilient flat plate having at least one pair of parallel extended legs defining an open-ended wire-receiving slot, said legs being similarly coined along said wire-receiving slot, said coining being progressively deeper into the thickness of said flat plate from the open end of said slot toward the closed end thereof to taper said slot from a width adjacent the open end of said slot of less than the thickness of said flat plate to a lesser width adjacent the closed end of said slot, whereby effective electrical connection can be made to two small diameter insulated conductors pressed into said wire-receiving slot.

4,012,103

## ANTISHOCK, INSULATED CONNECTOR

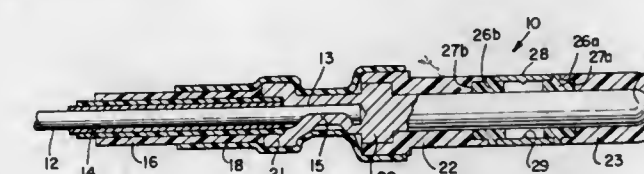
Frank C. Lunquist, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Sept. 3, 1975, Ser. No. 610,068

Int. Cl.<sup>2</sup> H01R 13/52

U.S. Cl. 339-111

12 Claims



1. An antishock electrical connector adapted for the environment of an animal body, comprising:  
a. a first electrically conductive member;  
b. an electrical conductor affixed to and electrically coupled to said first electrically conductive member;  
c. a layer of insulating material disposed about substantially the entire surface of said first electrically conductive member;  
d. a second electrically conductive member disposed over said insulating layer and adapted to make electrical contact with said first electrically conductive member; and  
e. means for disposing said second electrically conductive member in a spaced relationship with said first conductive member to prevent extraneous charges applied to said second electrically conductive member from passing thereacross to said first electrically conductive member, and for providing a liquid-tight seal between said insulating layer and said second electrically conductive member to prevent the entrance of liquid into the space between said first and second electrically conductive members, said means permitting disposition of said second electrically conductive member between a first, normal position wherein said first and second electrically conductive members are spaced from each other, and a second, flexed position wherein said first and second electrically conductive members are in electrical contact with each other, thus forming an electrical circuit from said first conductive member through said second conductive member to said conductor.

4,012,104

## BATTERY TERMINAL CONNECTOR AND HOUSING ASSEMBLY

Richard R. Wening, 2113 N. Eastside St., Santa Ana, Calif. 92701

Continuation-in-part of Ser. No. 405,587, Oct. 11, 1973, Pat. No. 3,867,007, which is a continuation-in-part of Ser. No. 293,334, Sept. 29, 1972, Pat. No. 3,790,920, which is a continuation-in-part of Ser. No. 154,737, June 21, 1971, Pat. No. 3,718,891. This application Feb. 10, 1975, Ser. No. 548,588

The portion of the term of this patent subsequent to Feb. 27, 1990, has been disclaimed.

Int. Cl.<sup>2</sup> H01R 13/52, 11/26

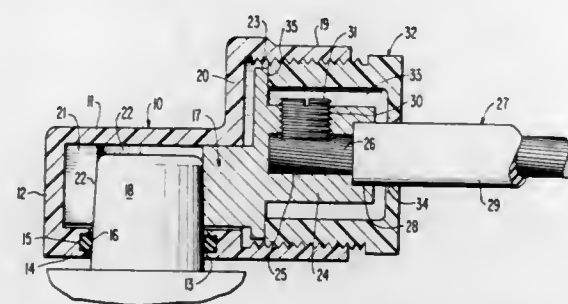
U.S. Cl. 339-116 C

4 Claims

1. A battery terminal connector and housing assembly comprising a split connector cap having a bore to grippingly engage a storage battery terminal post, said connector cap having an extension adapted for connection detachably with a battery cable so that such a cable can be mechanically and electrically coupled to the connector cap, a full circle flat abutment face on the connector cap projecting radially of said extension, a housing member for the connector cap substantially enclosing it and having an opening adapted to receive a battery terminal post and being in registration with said bore of the split connector cap, and a pressure sleeve having screw-threaded engagement with said housing member and sur-



rounding and substantially enclosing said extension of the connector cap and having a leading annular flat abutment face adapted to frictionally engage said full circle abutment face of



the connector cap and to exert pressure thereon with said pressure distributed evenly around the full circumferential engagement areas of the flat abutment face and said full circle abutment face.

4,012,105

## COAXIAL ELECTRICAL CONNECTOR

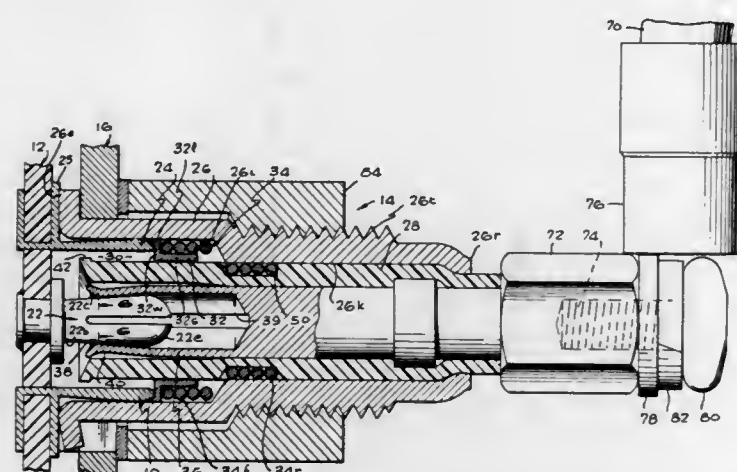
Christopher Scott Biddle, Issaquah, Wash., assignor to Bell Industries, Inc., Los Angeles, Calif.

Filed Sept. 30, 1974, Ser. No. 510,434

Int. Cl.<sup>2</sup> H01R 17/18

U.S. Cl. 339—177 R

9 Claims



1. An electrical connector for receiving and making electrical contact with a plug, comprising:  
an outer shell with an open forward end;  
a ring-shaped contact disposed in said outer shell; and  
a coil spring having a forward spring portion movably disposed in said outer shell and bearing against said ring-shaped contact to urge said contact towards said open forward end of said shell;  
said coil spring having a rearward end portion; and including  
means firmly pressing radially against said rearward end portion of said coil spring for fixedly holding said rearward end portion and making low resistance contact therewith.

4,012,106

## INSULATED TERMINAL CONSTRUCTION

John Richard Filson, Melville, N.Y., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed June 20, 1975, Ser. No. 588,608

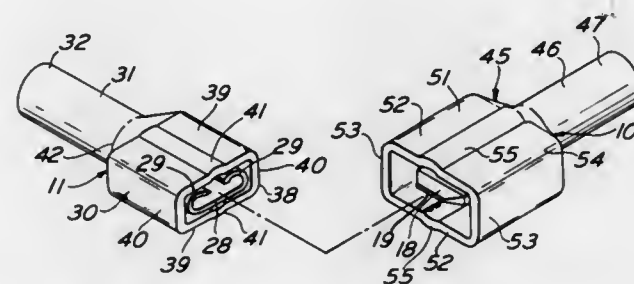
Int. Cl.<sup>2</sup> H01R 11/22

U.S. Cl. 339—211

2 Claims

1. In combination, an insulated female terminal comprising a conductor receiver female terminal barrel, a single female element extending longitudinally from said barrel terminating in an open end, and a female terminal sheath of insulating material extending about said barrel and female element; and an insulated male terminal comprising a conductor receiver male terminal barrel, a male element extending longitudinally from said male terminal barrel and terminating in a free end

for mating engagement in the female element, and a male terminal sheath of insulating material extending along said male terminal barrel and spacedly surrounding said male element for encompassing said female terminal sheath when said elements are in said mating engagement, said female terminal barrel being of a diameter greater than the transverse dimension and less than the lateral dimension of said single female element, and said female terminal sheath having a barrel receiving portion and an integral female element-receiving portion, the barrel-receiving sheath portion having a diameter approximately equal to the transverse dimension of



and less than the lateral dimension of said female element-receiving sheath portion, said female terminal barrel and female element being insertable into said female terminal sheath by passage of said terminal barrel through said female element-receiving sheath portion, said female terminal barrel-receiving sheath portion being generally cylindrical, and said female element sheath receiving portion being of generally flat cross-sectional configuration, opposed medial regions of said female element-receiving sheath portion being symmetrically distended to define cylindrical longitudinal extensions of said barrel-receiving sheath portion, for passage therethrough of said female terminal barrel.

4,012,107

## FEMALE TERMINALS

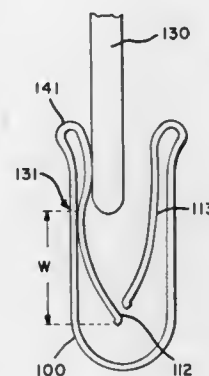
Robert Franklin Cabaugh, Elizabethtown, and Norwood Claude Graeff, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 17, 1975, Ser. No. 641,399

Int. Cl.<sup>2</sup> H01R 13/12

U.S. Cl. 339—258 P

11 Claims



1. A female contact comprising:  
a tubular portion having an inner surface and open at one end;  
at least one contact finger extending outwardly and upwardly from a given portion of the open end of said tubular portion and bent back upon itself to extend into the interior of said tubular portion downwardly and closely adjacent the section of the inner surface of said tubular portion near the said given portion of said open end thereof and then following a curved path, having a generally concave side and a generally convex side, away from said section of said inner surface and towards the other side of said tubular portion with the concave side of said curved finger facing said other side of said tubular portion.

4,012,108

## HOLOGRAM MEMORY APPARATUS

Akira Ishii, Kawasaki, and Keiichi Ueno, Tokyo, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

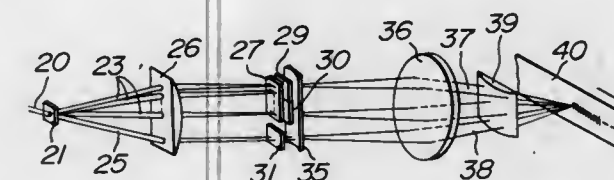
Filed Jan. 15, 1975, Ser. No. 541,303

Claims priority, application Japan, Jan. 17, 1974, 49-7509

Int. Cl.<sup>2</sup> G03H 1/30, 1/16

U.S. Cl. 350—3.5

14 Claims



1. A hologram memory apparatus for recording information as one-dimensional holograms, comprising:  
optical source means for producing a coherent light beam;  
beam splitter means for dividing the coherent light beam into at least one signal light beam and a reference light beam;  
first optical means having a common optical axis for said at least one signal light beam and said reference light beam for focusing said light beams into parallel beams, said focused reference light beam being spaced from said focused at least one signal light beam by a distance of slightly greater than  $L/2$ ;  
light switch means for intercepting said at least one signal light beam and controllably transmitting a plurality of linearly arrayed signal light beams corresponding to information to be recorded, said light switch means having a length  $L$ ;  
polarization controlling means for spatially dividing said light switch means into two  $L/2$  regions wherein the electric vectors of the contiguous transmitted signal light beams of one region intersect the electric vectors of the contiguous transmitted signal light beams of the other region orthogonally, the electric vector of said reference light beam being at  $45^\circ$  to each of the electric vectors of the transmitted signal light beams from said two regions;  
memory means having a surface in which said one-dimensional holograms are to be recorded; and  
second optical means having a common optical axis for said transmitted signal light beams and said reference light beam for focusing said light beams on the surface of said memory means to form interference patterns, the apertures of said first and second optical means being on the order of  $3/2 L$ .

4,012,109

## HIGH MAGNIFICATION OPTICAL APPARATUS

Robin John Freeman, Woking, England, assignor to Vision Engineering Limited, Woking, England

Continuation-in-part of Ser. No. 863,952, Oct. 6, 1969, abandoned. This application Nov. 29, 1971, Ser. No. 202,743

Claims priority, application United Kingdom, Dec. 12, 1968, 59137/68; Aug. 19, 1971, 38943/71

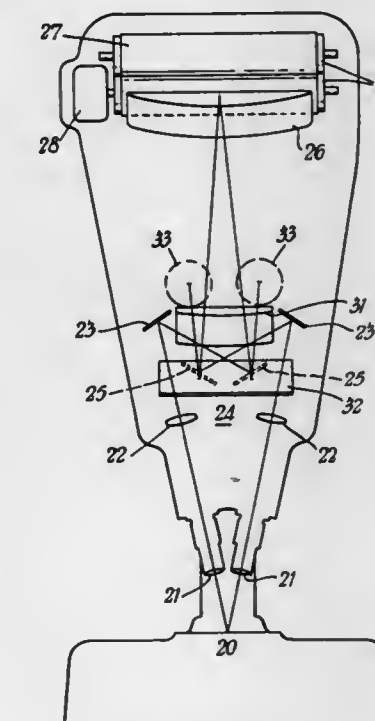
Int. Cl.<sup>2</sup> G02B 21/22

U.S. Cl. 350—36

6 Claims

1. Apparatus producing an enlarged exit pupil, comprising:  
a. means for positioning at said apparatus an object to be viewed;  
b. objective lens means spaced from said object;  
c. projection lens means spaced from said objective lens means in the optical path proceeding from said objective lens means;  
d. first field lens means positioned in said optical path beyond said projection lens means;  
e. a reflective lenticulated surface over which discrete lenticles are distributed positioned in said optical path be-

yond said first field lens means at focal plane of the image so that each lenticule reflects light incident thereon back through said first field lens means;  
f. second field lens means positioned in the continuing optical path reflected from said lenticulated surface;  
g. reflecting means on the side of said second field lens means opposite said lenticulated surface and oriented to reflect the light incident thereon to the eye of an observer, and



h. means to provide uniform motion of said lenticulated surface in a direction to cause the depressions of said lenticles to scan across light pencils incident thereon at a speed such that the persistence of vision and form of the said depressions of said lenticles effectively multiplies the angle of light egress from said surface of said light pencils whereby effectively to produce said enlarged exit pupil at the eye of said observer.

4,012,110

## BINOCULAR OPTICAL APPARATUS WITH ADJUSTABLE INTEROCULAR DISTANCE, PARTICULARLY FOR MICROFILM VIEWERS

Rudi Schael, Kandinskystr. 27, D-8 Munich 71, and Kurt Kellner, Langburgenerstr. 2, D-8 Munich 90, both of Germany

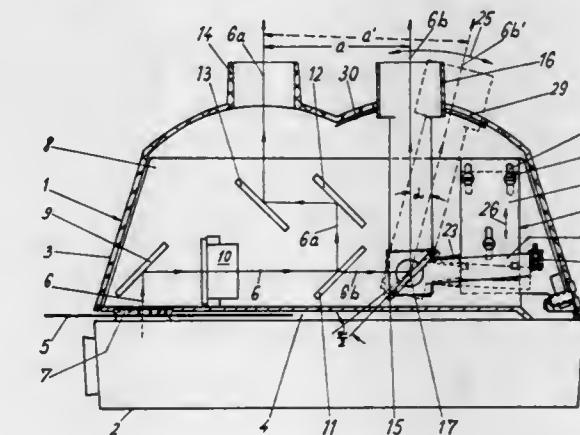
Filed Jan. 26, 1976, Ser. No. 652,393

Claims priority, application Germany, Jan. 28, 1975, 2503419

Int. Cl.<sup>2</sup> G02B 7/12, 27/02

U.S. Cl. 350—75

17 Claims



1. In a mechanism for the adjustment of interocular distance in binocular optical apparatus provided with objective and



eyepiece lens systems whereby a magnified image of an object is provided at said eyepieces, a plurality of mirrors disposed between said object and said eyepieces, wherein at least one eyepiece is movable to angularly position the optical axis of one said movable eyepiece relative to the axis of the other eyepiece for providing diverse interocular distances corresponding to variations of human eye separations, the improvement comprising a rotatable mirror disposed in the optical axis of one said movable eyepiece and means for angularly rotating said mirror at one half the angular rate of one said movable eyepiece, said means comprising a plate member linearly displaceable, a pair of levers having a common fulcrum axis, the first of said levers supporting said rotatable mirror for rotation of the reflecting surface of said mirror about said fulcrum axis, said first lever having an end attached to said plate member for displacement thereby, the second of said levers having an arm supporting one said movable eyepiece and another arm connected to said plate member such that said rotation of said eyepiece causes linear motion of said plate member and pivoting of said first lever about said fulcrum axis, said first lever and the second arm of said second lever having lengths in the ratio of 2 to 1 such that for every pivoting of said eyepiece about a predetermined angle said mirror is pivoted of one half of said angle.

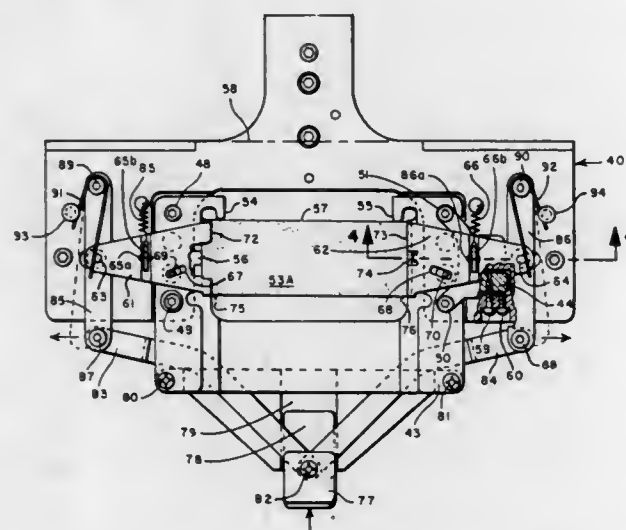
4,012,111

**MICROSCOPE OBJECT SLIDE POSITIONING SYSTEM**  
Earl E. Masterson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 25, 1975, Ser. No. 607,514  
Int. Cl.<sup>2</sup> G02B 21/26

U.S. Cl. 350-90

10 Claims



1. An apparatus for rigidly and precisely positioning an object slide relative to a microscope stage comprising:
  - a stage traverse support plate to receive and support a slide carrier tray;
  - a slide carrier tray fixed in predetermined relation to said stage traverse plate and carried thereby, said carrier tray having a recess therein for receiving an object slide;
  - predetermined, fixed alignment registration means on said slide carrier tray for determining the positive alignment of a slide in said recess, said alignment registration means determining the location of the rearward directed side and one end of said slide in said recess;
  - retractable clamping means cooperating with said alignment registration means for urging and maintaining said slide against said alignment registration means, said slide clamping means further comprising:
    - a pair of oppositely disposed retaining means adapted to position said slide operating on the outward directed side and the ends of said slide to urge said slide to a predetermined position against said registration means and said recess;
    - means generating a force for maintaining said retaining means against said slide; and

release means for operating on said retaining means said release means for generating forces simultaneously opposing said force for maintaining each of said retaining means said release means functioning to retract said retaining means for removing and inserting slides in said system.

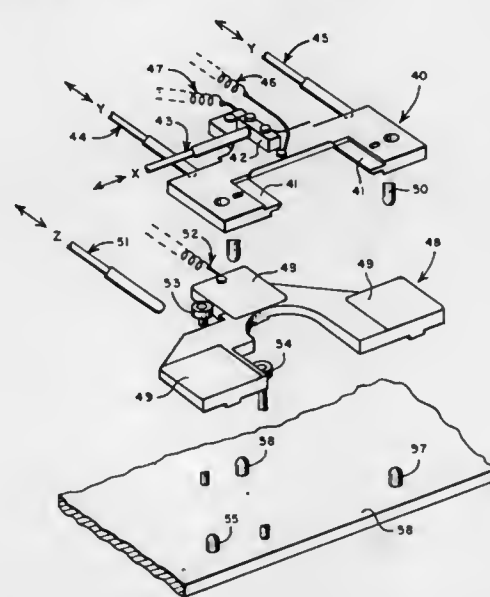
4,012,112

**MICROSCOPE STAGE POSITIONING SYSTEM**  
Earl E. Masterson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 25, 1975, Ser. No. 607,634  
Int. Cl.<sup>2</sup> G02B 21/26

U.S. Cl. 350-90

15 Claims



1. A precision, automatically controllable microscope stage positioning system, said system comprising:
  - a slide carrier means for carrying a mounted object slide;
  - a stationary stage support base member disposed beneath said slide carrier means;
  - a wedge-shaped member sandwiched in slidable relation between said slide carrier means and said base member, such that slide carrier means is freely slidably carried on the upper surface of said wedge-shaped member and said wedge-shaped member is slidably mounted on said base member in a manner such that the movement thereof substantially parallel to the wedge taper produces a corresponding movement of the upper surface of the wedge shaped member along the z axis perpendicular to the upper surface thereof;
  - x and y drive means for precisely positioning said slide carrier means in the x-y plane, said x-y plane being parallel to said surface of said wedged shaped member, by the movement thereof along the x and z axes of said plane, said x and y drive means further comprising independent axially adjustable, reversible pusher means operating against said slide carrier means for urging said slide carrier means in one direction along each of said x and said y axes;
  - resilient return means opposing said pusher means and holding said slide carrier means in continual contact therewith; and
  - z drive means for positioning said slide carrier means along the z axis, said z axis being perpendicular to said x-y plane, said drive means comprising independent axially adjustable, reversible pusher means operating against said wedge-shaped member for urging said wedge-shaped member in one direction parallel to said taper;
  - resilient return means opposing said pusher means and holding said wedged shaped member in continual contact therewith;
  - reversible actuating means for axially adjusting said pusher means; and
  - control means for controlling said actuating means.

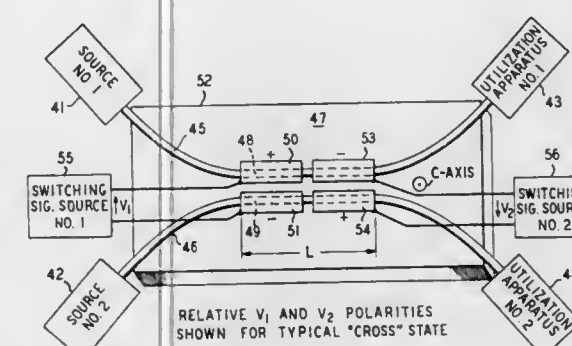
4,012,113

**ADJUSTABLE OPTICAL SWITCH OR MODULATOR**  
Herwig Werner Kogelnik, 118 Buttonwood Drive, Fair Haven, N.J. 07701, and Ronald Vernon Schmidt, 323 Arlene Terrace, Matawan, N.J. 07747

Filed Dec. 17, 1975, Ser. No. 641,649  
Int. Cl.<sup>2</sup> G02B 5/16

U.S. Cl. 350-96 C

12 Claims



1. A switch comprising a pair of waveguides having mutually parallel portions in sufficient proximity for  $\Delta\beta$ -switched directional coupling therebetween, and control means comprising at least two sets of control elements disposed about said parallel portions of said waveguides and coupled sequentially thereto to define at least two asynchronous sequential coupling sections along said parallel portions, and means for supplying control signals to make the phase mismatch of opposite sign in two sequential ones of said sections to achieve a cross state.

4,012,114

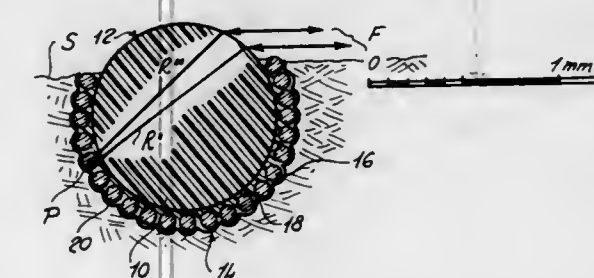
**HIGH EFFICIENCY REFLECTING SYSTEM, AND METHOD**

Ludwig Eigenmann, Vacallo, Ticino, Switzerland  
Filed May 19, 1975, Ser. No. 578,922

Claims priority, application Italy, May 20, 1974, 22963/74  
Int. Cl.<sup>2</sup> G20B 5/22

U.S. Cl. 350-104

7 Claims



1. A retroreflecting device, comprising at least one transparent, substantially spherical element having a first refractive index such that a ray impinging said element is refracted and at least partially focused regardless of the angle of impingement; reflecting means arranged to retroreflect rays which pass through said element; and a transparent medium securing said reflecting means to and spacing said reflecting means from said element, said medium including one portion which has a second refractive index different from said first refractive index, and said medium further including another portion which extends from said one portion to said element, said other portion of said medium having a refractive index at locations adjacent said element which substantially equals said first refractive index, and said other portion of said medium having a refractive index at locations adjacent said one portion of said medium which substantially equals said second refractive index, the refractive index of said other portion of said medium varying substantially progressively from said first refractive index to said second refractive index so that said other portion of said medium acts as an optical transition zone.

4,012,115

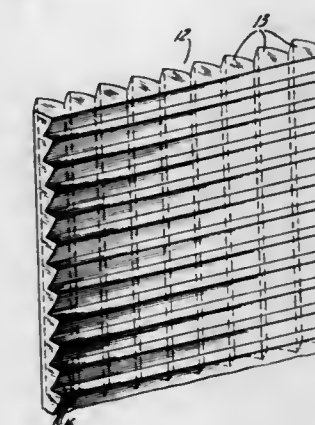
**SAWTOOTH SHAPED FRONT SCREEN**

John Brown, Flemington, N.J., assignor to Qantix Corporation, Flemington, N.J.

Filed July 10, 1975, Ser. No. 594,721  
Int. Cl.<sup>2</sup> G03B 21/60

U.S. Cl. 350-128

12 Claims



1. A front projection screen having a transparent front light receiving surface and reflecting means spaced from said transparent front light receiving surface for reflecting light incident thereon through said transparent front light receiving surface; said front projection screen being characterized in that a plane intersecting said transparent front light receiving surface and said reflecting means intersects said reflecting means in a straight line and said transparent front light receiving surface in a line at least a portion of which is tilted with respect to said straight line.

4,012,116

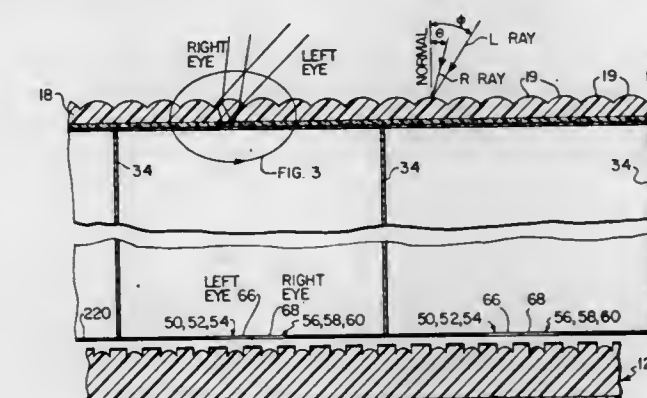
**NO GLASSES 3-D VIEWER**

George Johannus Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.

Filed May 30, 1975, Ser. No. 582,170  
Int. Cl.<sup>2</sup> G02B 27/26

U.S. Cl. 350-132

8 Claims



1. An apparatus for three-dimensional microfiche viewing, including,
  - a viewing screen defined by a lenticular plate having a plurality of integral, convex lenses regularly arrayed over its exterior surface and having an opaque coating on its interior surface;
  - a pair of apertures in said opaque coating associated with each convex lens and in general alignment therewith, one of each pair termed the right aperture and the other of said pair termed the left aperture;
  - said left and right aperture of each said aperture pair being spaced from each other, and each aperture pair being positioned with respect to its associated convex lens;
  - whereby light emanating from the left apertures of each pair and passing to the convex lenses is refracted and



leaves the said plate at a first angle to its plane, and whereby light emanating from the right apertures of each pair and passing to the convex lenses is refracted and leaves the said plate at a second and different angle to its plane,

- e. each left aperture of said pair having a light polarizer of one direction and each right aperture of said pair containing a light polarizer of an orthogonal direction,
- f. whereby polarized light of one direction incident upon all of the apertures from below the viewing screen will pass through either the right or the left apertures of each pair but not through other apertures of each pair, and whereby polarized light of an orthogonal direction will pass through the other apertures of each pair.

4,012,117

## LIQUID CRYSTAL MODULE

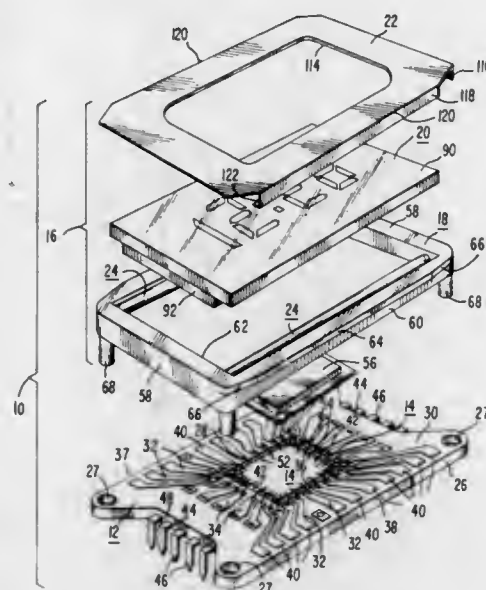
Angelo Gino Lazzery, Oaklyn, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,671

Int. Cl.<sup>2</sup> G02F 1/13

U.S. Cl. 350-160 LC

9 Claims



1. A liquid crystal assembly comprising:  
a carrier having a surface and an array of first metallized paths on said surface,  
a semiconductor integrated circuit mounted on said carrier, different terminals of said circuit being electrically connected to different ones of said first metallized paths,  
an apertured frame, an electrical connector mounted within said frame,  
said connector comprising a body of resilient material having an oblong cross section and a plurality of conductive lines on the outside surface of said body wherein the width of said conductive lines is less than the spacing between adjacent ones of said first and second metallized paths,  
a liquid crystal cell comprising a substrate in contact with a liquid crystal material and an array of second metallized paths on an exposed surface of said substrate, and  
means for mounting said cell and said carrier on opposite sides of said frame with said connector clamped and resiliently deformed therebetween, such that said connector conductive lines resiliently press against each path of a different pair of said first and second metallized paths to provide an electrical connection therebetween.

4,012,118  
TEXTURE TRANSFORMATIONS IN OPTICALLY  
NEGATIVE LIQUID CRYSTALS

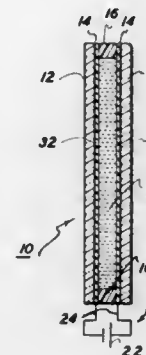
James H. Becker, Denton, Tex., and Joseph J. Wysocki, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 506,141, Sept. 16, 1974, Pat. No. 3,960,439. This application Jan. 22, 1976, Ser. No. 651,307

Int. Cl.<sup>2</sup> G02F 1/13

U.S. Cl. 350-160 LC

3 Claims



1. A method for transforming an optically negative liquid crystalline composition from the Grandjean texture state to the focal-conic texture state and back to the Grandjean texture state, comprising the steps of:

- a. providing between a pair of non-injecting electrodes, at least one of which is transparent, a layer of an optically negative liquid crystalline composition in the Grandjean texture state comprising an optically negative liquid crystalline material and an additive, said additive comprising a material selected from the group consisting of electrophoretic materials, dielectrophoretic materials, dipolar materials and mixtures thereof; and
- b. transforming said composition into the focal-conic texture state and then into the Grandjean texture state by applying a D.C. electrical field between said two electrodes and without changing the magnitude of said applied D.C. electrical field.

4,012,119

DIRECT CURRENT LIQUID CRYSTAL DISPLAY WITH  
HIGHLY REFLECTING DIELECTRIC MIRROR

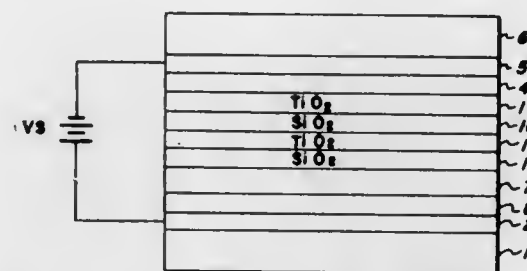
James E. Adams, Webster, and Gary A. Dir, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,081

Int. Cl.<sup>2</sup> G02F 1/13

U.S. Cl. 350-160 LC

10 Claims



1. A liquid crystal display for reflection viewing of a direct current electro-optic change in a liquid crystal layer by a reflection bandwidth having a center wavelength,  $\lambda$ , comprising:  
between two electrodes a layer of liquid crystalline composition in contact with a dielectric mirror; said dielectric mirror having a thickness effective for conducting direct current and comprising at least one pair of titanium dioxide and silicon dioxide layers, each layer having an optical thickness of  $nt = [(m+1)/4]\lambda$  where  $n$  is the index of refraction,  $t$  is the layer thickness and  $m$  is selected from the group consisting of 0 and positive whole numbers; said layer of titanium dioxide being in contact with said layer of liquid crystalline composition.

4,012,120

## GUIDED WAVE ACOUSTO-OPTIC DEVICE

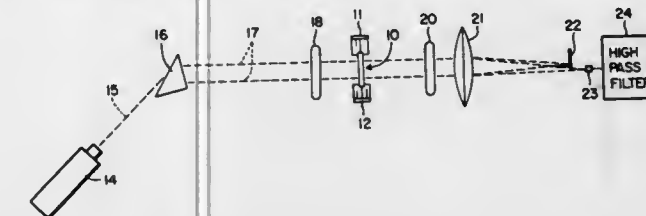
Reynold S. Kagiwada, Los Angeles, and David B. Hall, Manhattan Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed May 14, 1975, Ser. No. 577,266

Int. Cl.<sup>2</sup> H03H 9/26, 9/32; G02F 1/11; G06F 7/56

U.S. Cl. 350-161 W

9 Claims



7. An acousto-optic interaction device comprising:  
a. a substrate capable of supporting an acoustic surface wave;  
b. said substrate having an outer layer of a predetermined thickness and of a higher optical index of refraction than that of the bulk of said substrate for guiding an optical beam therethrough;  
c. a first interdigital transducer disposed on said substrate at one end thereof;  
d. a second interdigital transducer disposed on the other end of said substrate, whereby said transducers are capable of launching two acoustic surface waves travelling in opposite directions for interaction with a light beam passing through said surface layer;  
e. means for impressing a received signal on one of said transducers; and  
f. additional means for impressing a stored signal on the other one of said transducers.

4,012,121

TEXTURE TRANSFORMATIONS IN OPTICALLY  
NEGATIVE LIQUID CRYSTALS

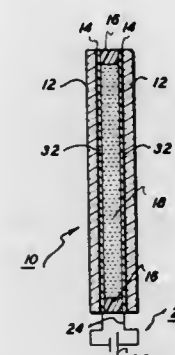
James H. Becker, Denton, Tex., and Joseph J. Wysocki, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 506,141, Sept. 16, 1974, Pat. No. 3,960,439. This application Jan. 22, 1976, Ser. No. 651,302

Int. Cl.<sup>2</sup> G02F 1/13

U.S. Cl. 350-160 LC

2 Claims



1. A method for providing a display comprising the steps of:  
a. providing a layer of an optically negative liquid crystalline composition between a pair of non-injecting electrodes at least one of which is transparent, wherein said composition comprises optically negative liquid crystalline material and an additive, said additive comprising a material selected from the group consisting of electrophoretic materials, dielectrophoretic materials, dipolar materials and mixtures thereof, and providing said composition in the Grandjean texture state;  
b. applying a first D.C. electrical field pulse across said layer sufficient to cause said composition to be transformed to the focal-conic texture and terminating said pulse as the current through said composition becomes substantially zero; and

- c. applying a second D.C. electrical field pulse across said layer of the same polarity and magnitude as said first D.C. electrical field pulse, said second D.C. electrical field pulse having a duration sufficient to transform said composition to the Grandjean texture state.

4,012,122

LIQUID CRYSTALLINE PLATEN FOR AN  
ELECTROPHOTOGRAPHIC PRINTING MACHINE

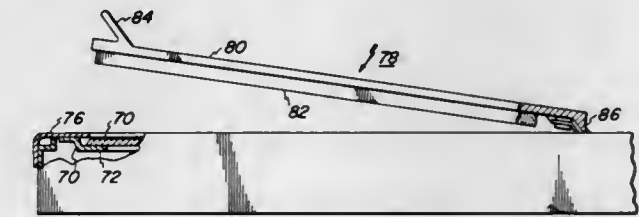
James H. McVeigh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 456,089, March 29, 1974, Pat. No. 3,936,172. This application Apr. 28, 1975, Ser. No. 572,030

Int. Cl.<sup>2</sup> G02F 1/13

U.S. Cl. 350-160 LC

6 Claims



1. An apparatus for housing a substantially opaque document having indicia on one surface thereof, including:  
a normally transparent support member having the opaque document disposed thereon with the surface having the indicia being adjacent to said support member, said support member being adapted to become opaque when electrically excited;  
means for illuminating the opaque document, said support member being interposed between the opaque document and said illuminating means; and  
means for electrically exciting said support member so that selected portions thereof become opaque to thereby mask predetermined regions of the indicia on the opaque document with the unmasked portions thereof being illuminated.

4,012,123

BINOCULAR DEVICE FOR DISPLAYING NUMERICAL  
INFORMATION IN FIELD OF VIEW

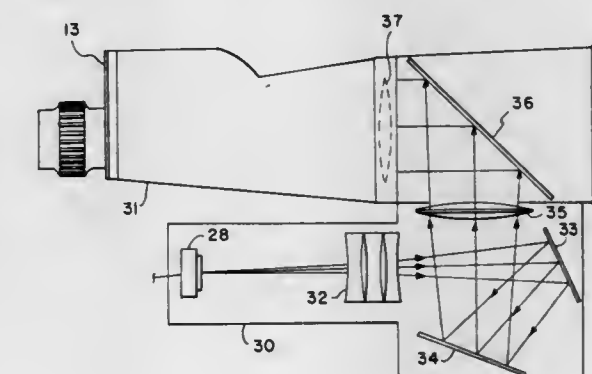
Harry V. Fuller, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 28, 1975, Ser. No. 608,482

Int. Cl.<sup>2</sup> G02B 27/14

U.S. Cl. 350-174

7 Claims



1. Apparatus for displaying, in the field of view of binoculars, numerical information about an object being viewed by the binoculars comprising:  
binoculars, including an objective lens and two barrels;  
means for sensing information about said object;  
transmitter means for transmitting said information;  
receiver means for receiving said transmitted information;  
means for transforming said received information into nu-



merical form and displaying it on an incandescent read-out; and  
optical means attached to said binoculars for superimposing said incandescent readout onto the field of view of said binoculars.

#### 4,012,124 ADJUSTABLE MOUNTING DEVICE FOR OPTICS LENS SYSTEMS

Katuhiko Toda, Yokohama; Mamoru Shimazaki, Tokyo, and Michiharu Suwa, Fuchu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

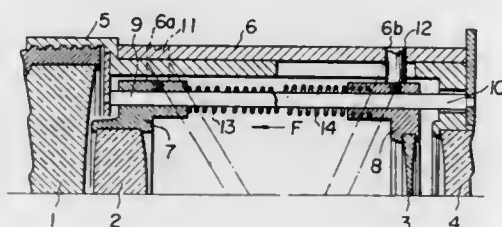
Continuation of Ser. No. 396,299, Sept. 11, 1973, abandoned.

This application May 16, 1975, Ser. No. 578,269  
Claims priority, application Japan, Sept. 14, 1972, 47-92339

Int. Cl.<sup>2</sup> G02B 15/14

U.S. Cl. 350—187

14 Claims



1. A zoom lens mounting mechanism for an optical lens system having at least one variator lens and one compensator lens movable along a common optical axis, said mechanism comprising:

- a first support means for said variator lens;
- a second support means for said compensator lens;
- position-adjusting means rotatable by external actuation and arranged upon rotation to move said variator lens and said compensator lens relative to each other along said optical axis, said position-adjusting means having:
  - a first cam groove slidably engaging said first support means and capable of moving said first support means along said optical axis through a distance dependent upon the amount of rotation of said position-adjusting means to thereby effect substantial variation of the position of said variator lens on said optical axis; and
  - a second cam groove slidably engaging said second support means along said optical axis through a distance dependent upon the amount of rotation of said position-adjusting means in a direction always opposite to that in which said first support means is moved by said first cam groove to thereby effect substantial variation of the position of said compensator lens on said optical axis; and
  - spring means arranged to exert forces always toward said first and second support means from a common direction almost parallel to said optical axis to urge said first and said second support means for abutment against respective one side walls of said first and said second cam grooves respectively;

whereby the force of said spring means acting on said position-adjusting means through said first and said second support means is reflected at two contact points between said first support means and said first cam groove and between said second support means and said second cam groove to respective directions, with those components of the reflected forces which act individually in either of the directions of rotation of said position-adjusting means being opposite in direction to each other to effectively cancel the spring force in the direction of rotation of said position-adjusting means.

#### 4,012,125 NONDISTORTING MIRRORS WITH SPECIFIED ANGULAR MAGNIFICATION OR DEMAGNIFICATION

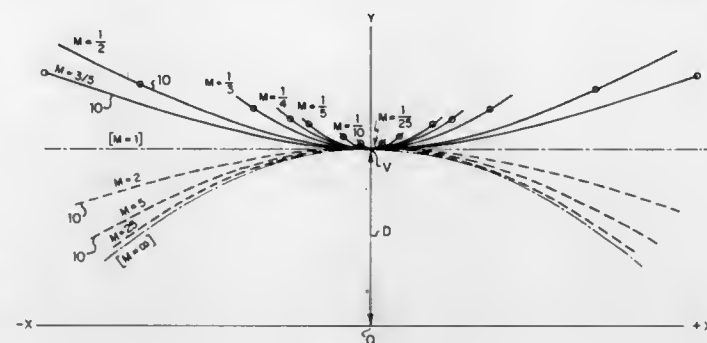
Philip J. Hart, 843 Ross Court, Palo Alto, Calif. 94303

Filed Jan. 7, 1975, Ser. No. 539,050

Int. Cl.<sup>2</sup> G02B 5/10

U.S. Cl. 350—296

28 Claims



1. A mirror having a reflective surface curved in at least one plane in accordance with the following mathematical relation (here expressed in polar coordinates):

$$r = \frac{D}{\left( \cos \frac{1+M}{2M} \theta \right) 2M/(1+M)}$$

where the mirror has a vertex and also has an axis of symmetry lying in said plane, passing through the origin of coordinates, intersecting the mirror at the vertex thereof, and intersecting the projection of a light ray that is incident at any given point on the mirror in said plane and that is reflected from the given point to the origin of coordinates;  $r$  (the radius vector) extends from the origin of coordinates to the given point on the mirror;  $D$  is a fixed distance and extends from the origin of coordinates to the vertex of the mirror;  $\theta$  (the vectorial angle) is the angle subtended between the vertex of and the given point on the mirror relative to the origin of coordinates;  $M$  (the angular magnification) is the ratio of the angle  $\theta$  to the angle subtended between the vertex of and the given point on the mirror relative to the point of intersection of said axis of symmetry with said projection; and  $M$  has a fixed value lying within the limits  $0 < M < 1/2$ ,  $1/2 < M < 1$ , and  $1 < M < \infty$ .

#### 4,012,126 OPTICAL SYSTEM FOR 360° ANNULAR IMAGE TRANSFER

Gottfried R. Rosendahl, and Wiley V. Dykes, both of Winter Park, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1974, Ser. No. 458,610

Int. Cl.<sup>2</sup> G02B 13/06, 17/08

U.S. Cl. 350—198

3 Claims

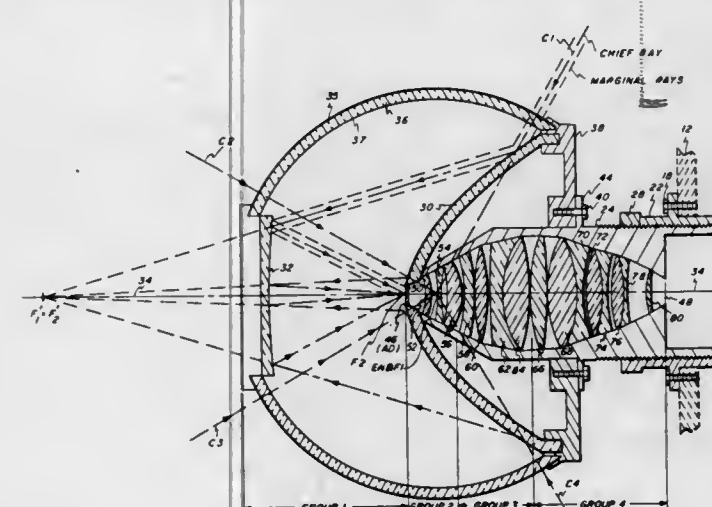
1. An optical system of 360° annular image transfer comprising:

- spaced primary and secondary hyperbolically surfaced mirrors each having near and far focal points, said primary mirror having an apex;
- said primary mirror being formed with a relatively small radius of curvature and small eccentricity in relation to said secondary mirror such that the angle difference between different rays accompanying and parallel to a chief ray in object space and in meridional plane becomes negligible;
- an envelope of optically suitable transparent material having an outer and inner surface generated in symmetry from said near focal point of said primary mirror and attached to said mirrors to hold the same in spaced axial symmetry;
- a refraction lens system of positive and negative lens components;

said primary and secondary mirrors and said lens system constituting a total optical system having an entrance pupil;

said mirrors being faced with the mirrored surfaces toward each other and held in a spaced relationship by said envelope such that said entrance pupil of said total optical system coincides with the near focal point of said primary mirror, the near focal point of said secondary mirror approximates the apex of said primary mirror, and the far focal points of said mirrors coincide to form a confocal set of mirrors;

said primary mirror being centrally apertured to form an



aperture stop to pass reflected light rays to said refraction lens system;

said refractive lens system including a heat resistant lens component of negative power between 0.75 and 1.25 of the overall power of the refractive system positioned in the immediate area of said aperture stop to provide a strong positive contribution to Petzval curvature of the system; and

three successive groups of lenses to respectively bend the chief rays toward the optical axis of the lens system into approximately parallel position thereto, to provide correction for axial color and color magnification and finally to bring the light rays back to the image plane.

#### 4,012,127 MAGNIFYING ATTACHMENT FOR TELEPHONE BUTTONS AND THE LIKE

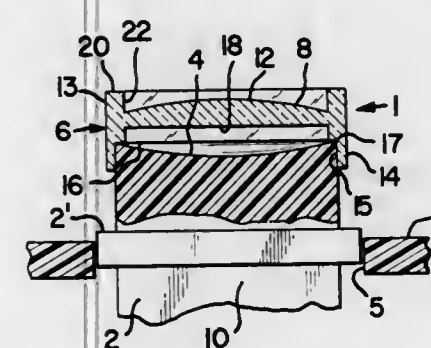
Lawanda Charleen Bolander, 4230 Wiedenmann Place, Kansas City, Mo. 64111

Filed Sept. 17, 1975, Ser. No. 614,004

Int. Cl.<sup>2</sup> G02B 7/02; B41V 5/12, 5/16

U.S. Cl. 350—243

6 Claims



1. A magnifying attachment for use on push buttons such as those used on a touch dial telephone and the like, said attachment including:

- a transparent image magnifying member having a convex outer disposed surface;
- a peripheral skirt integral with and depending from said magnifying member for cooperative engagement with

portions of a push button having indicia on an end thereof, said skirt mounting said magnifying member in overlying relation to said end and indicia for magnifying the indicia;

- a shoulder on the interior of said skirt and engageable with said button end to limit movement of said skirt onto said button and position said magnifying member relative to said indicia;
- an upstanding peripheral rib integral with and extending around said magnifying member and forming a shoulder for engagement with an operator's finger to prevent same from slipping off said magnifying member convex surface.

#### 4,012,128 METHOD AND APPARATUS FOR DETERMINING VISUAL LATENCY

David Regan, Newcastle-under-Lyme, England, assignor to Wilkinson Sword Limited, England

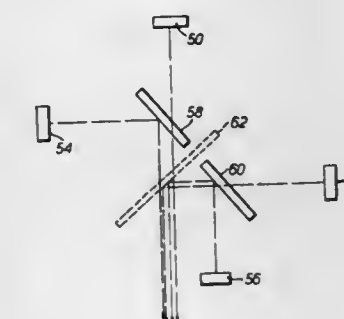
Filed May 23, 1975, Ser. No. 580,474

Claims priority, application United Kingdom, June 7, 1974, 25352/74

Int. Cl.<sup>2</sup> A61B 3/02

U.S. Cl. 351—17

31 Claims



1. A method of testing vision, including the steps of producing randomly time-separated groups of visual stimuli each group consisting of a predetermined number of successive stimuli, each stimulus in a said group being separated from the next stimulus in that group by a controllable-length time interval, varying the length of each said controllable-length time interval, and assessing the minimum said controllable-length time interval for which the subject under test can discern the separate stimuli.

13. A method of testing vision, comprising the steps of producing a visual stimulus of periodically varying intensity for a small discrete portion of a subject's visual field, changing the amplitude of the intensity variations, and assessing the minimum amplitude value for which the subject can discern the variations.

#### 4,012,129 OPTICAL DEVICE FOR PRE-OPERATIVE CATARACT PATIENTS

William H. Byler, 690 Osceola Ave., Winter Park, Fla. 32789

Filed May 23, 1975, Ser. No. 580,318

Int. Cl.<sup>2</sup> G02C 7/16, 9/04

U.S. Cl. 351—46

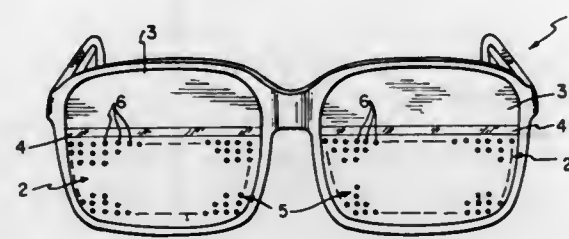
12 Claims

1. An optical device in combination with means for holding the device in position before the eye, said optical device including:

- an opaque mask for mounting before the eye;
- a horizontal slotted opening extending completely across said mask centrally thereof, said opening having a height of about 1 to 6 mm.;
- an array of discrete circular transparent areas on said mask, said areas being disposed below said slotted opening.



ing and each having equal diameters of between about 0.5 and 1.2 mm. and located on centers spaced equally from each other from between about 1.5 to 4 mm.;



- d. said transparent areas providing light transmission in direction normal to the surface of between about 3 and 10 percent of the light striking the total area of the mask covered by said array; and  
e. said mask being opaque above the slotted opening.

4,012,130

## FRAMES FOR EYEGLASSES

Henri Guillet, 2 Blvd. Georges Clemenceau, 01100 Oyonnax, France

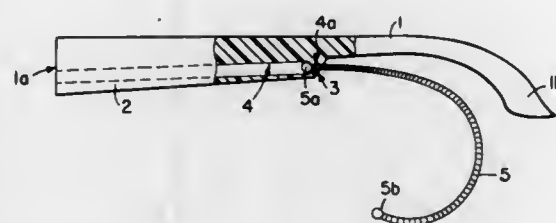
Filed Feb. 9, 1976, Ser. No. 656,665

Claims priority, application France, Feb. 12, 1975, 75.04905

Int. Cl.<sup>2</sup> G02C 5/06

U.S. Cl. 351-114

6 Claims



1. In an eyeglass frame of the type having temple members extending rearwardly from a main frame to which they are pivoted, each temple member comprising:

- a rigid member having an inner end and having an outer end terminating in a rigid earpiece shaped to pass over the ear and extend behind it;
- a flexible earpiece member attached to said temple member intermediate its inner and outer ends and shaped normally to assume an arcuate position beneath the rigid earpiece to grip the ear and hold the glasses frame more tightly against the face of the wearer;
- means selectively operable to retract the flexible earpiece member from its normal position and release its grip on the ear,
- said selectively operable means comprising means for retracting the flexible earpiece member and positioning and holding the flexible member against the underside of the rigid earpiece, whereby the flexible earpiece member lies along the rigid earpiece and conforms with the shape thereof.

4,012,131

## HIGH STRENGTH OPHTHALMIC LENS

David A. Krohn, Southbridge, Mass.; Emil W. Deeg, Woodstock, Conn., and Robert E. Graf, Southeridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Aug. 20, 1975, Ser. No. 606,033

Int. Cl.<sup>2</sup> G02C 7/02

U.S. Cl. 351-159

7 Claims

1. A chemically-strengthened ophthalmic glass lens having a compressively-stressed ion-exchanged surface zone that is at least 60 microns in depth, said lens being formed from a silicate glass comprising by weight about 3 to about 11 percent

sodium oxide, about 7 to about 15 percent potassium oxide, up to about 5 percent of other alkali metal oxides, about 12 to about 20 percent of a total of sodium and potassium oxides and other alkali metal oxides, a minimum of 3 to about 6 percent of calcium oxide, the calcium oxide being balanced by an amount of about 3 to about 11 percent of a metal oxide selected from the group consisting of zinc oxide, magnesium oxide, and mixtures thereof, the oxides selected from said group being present in an amount sufficient to assure that the rate of diffusion and depth of penetration obtained during ion exchange of said lens is not detrimentally affected by the presence of the calcium oxide during ion exchange, and the balance of lens being silica.

4,012,132

## BROADCAST MARKET SURVEY DATA STORAGE AND RETRIEVAL SYSTEM AND METHOD

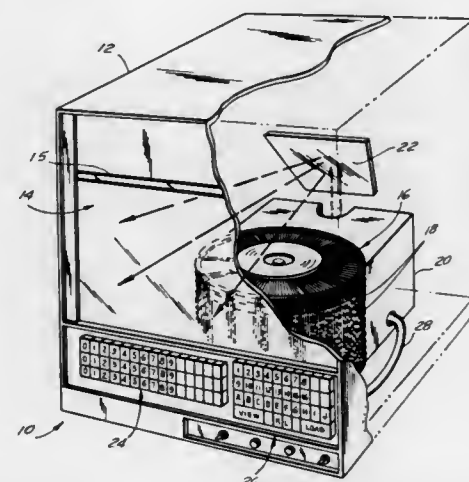
Jonathan D. Lazarus, New York, N.Y., assignor to American Broadcasting Companies, Inc., New York, N.Y.

Filed Dec. 13, 1974, Ser. No. 532,480

Int. Cl.<sup>2</sup> G03B 23/08

U.S. Cl. 353-25

4 Claims



1. A system for storing and retrieving market research information, said information including reports from a plurality of different sources, said system comprising a plurality of photographic record members, each bearing, in reduced size, the information for an integral number of basic market categories, each of said record members bearing corresponding reports from each source for the same market category, the information forming each report being separated into a plurality of segments, each segment being recorded at the same position on each record member, selecting means for selecting one of said record members in accordance with a predetermined code identifying a selected basic market category, said selecting means including a keyboard with a plurality of keys, means for communicating between said keyboard and said selecting means for selecting the record member and the position of the data on said record member to be displayed in accordance with a code, the code for data at any given position of one of said reports having a predetermined relationship to the code for data at a corresponding position of each other of said reports, in order to facilitate switching back and forth between different reports rapidly, the keys on said keyboard being arranged so that a key for one data item in one report is located immediately adjacent to the corresponding key for the corresponding data item on another report so as to facilitate the display of corresponding data from each of the reports, said selecting means including means for changing the illuminated image from one to another corresponding report.

4,012,133

## SHOPPING AID DISPLAY VIEWER

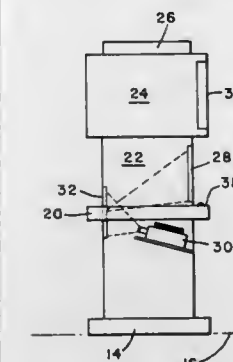
James J. Burton, Mendenhall Drive, Winston-Salem, N.C. 27107

Filed Sept. 22, 1975, Ser. No. 615,397

Int. Cl.<sup>2</sup> G03B 23/02

U.S. Cl. 353-25

10 Claims



1. A shopping aid display viewer comprising: a housing having a daylight viewing screen formed therein, said screen having a front and back side and being adapted for viewing from the front side images projected on the back side thereof; a slide projector for projecting images of photographic slides bearing information about purchasable products and the like on said screen; mirror means arranged to reflect images bearing information projected by said slide projector onto the back side of said viewing screen; a second viewing area carried by said housing having a front and back side and being adapted for viewing from outside said housing; a locator map displayed on said second viewing area; means associated with said locator map selectively indicating thereon upon actuation a specific location where said purchasable product and the like may be found; automatic telephonic means supported by said housing; a control panel having means to selectively and automatically control said projector, said locator map associated means, and said telephonic means whereby an image bearing information about purchasable products and the like can be projected on said viewing screen, a location for purchasing such products and the like can be designated on the locator map, and the location can be connected automatically through the telephone means.

4,012,134

## BIDIRECTIONAL WEB MEDIUM DRIVE

Edward S. Silver, Hackensack, and Robert E. Tucker, Passaic, both of N.J., assignors to Computer Specialties Corporation, Palisades Park, N.J.

Division of Ser. No. 468,353, May 9, 1974, Pat. No. 3,926,513.

This application Dec. 12, 1975, Ser. No. 640,095

Int. Cl.<sup>2</sup> G03B 23/12; B65H 59/00; G03B 1/04; G11B 15/32

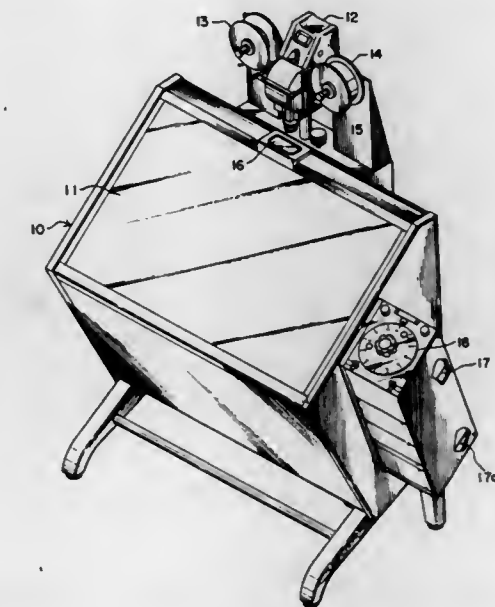
U.S. Cl. 353-26 R

5 Claims

1. A bidirectional web medium drive for moving a web of material such as a photographic film between two reels comprising:

- first and second reversible motors;
- drive means each having an input coupled to the output of each of said motors, and an output which is restricted from rotation unless the input is driven;
- first and second spindles each connected to each output of said drive means, said spindles adapted to receive and support the reels;
- a torque controller coupled to one of said motors for maintaining an output torque to that motor;
- at least two spaced-apart idler rollers pivotably disposed between the reels for contact with one side of the web so that when a torque is applied to the web by the takeup reel, the web is held substantially planar between said idler rollers;
- a projector having its optical axis disposed between the idler rollers and normal to the web surface;

a screen disposed in the projection path of said projector for displaying images formed on said web;  
a variable speed controller coupled to the other of said motors for controlling the output speed of that motor; and  
switch means coupled to said torque and speed controllers for running said first and second motors in the same direction, said switch means having at least two positions so that when said switch means is in a first position, the torque controller is connected to said first motor to apply



a torque to said first spindle causing its associated reel to be the web take-up reel, and the speed controller is connected to said second motor to apply a selected speed to the second spindle causing its associated reel to be the web supply reel, and when said switch means is in a second position, said torque controller is connected to said second motor and said speed controller is connected to said first motor and the direction of rotation of said motors is reversed so that the reel on said first spindle becomes the supply reel and the reel on said second spindle becomes the take-up reel.

4,012,135

## MOTION PICTURE CAMERA

Yoshio Komine, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

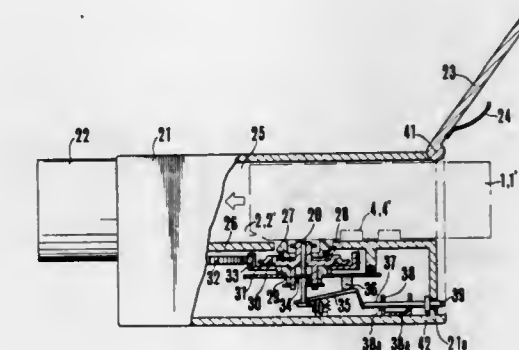
Filed Mar. 11, 1975, Ser. No. 557,304

Claims priority, application Japan, Mar. 15, 1974, 49-29815; June 5, 1974, 49-63788; June 5, 1974, 49-63789; June 6, 1974, 49-64383

Int. Cl.<sup>2</sup> G03B 23/02

U.S. Cl. 352-72

23 Claims



1. A motion picture camera provided with a cartridge chamber to be charged with a film cartridge of the type having a disengageable reversion preventing mechanism and a device for selectively disabling the reversion preventing mechanism of said film cartridge charged within said cartridge chamber,



said camera further comprising an elongate pin having a head portion thereof, said portion being selectively engageable with the reversion preventing mechanism of said film cartridge charged within said cartridge chamber, said elongate pin further having a flange for limiting the extension of the head portion into said cartridge chamber; means mounting thereon said elongate pin for movement between a first position wherein said head portion is effective to disable the reversion preventing mechanism of said charge cartridge and a second position wherein said elongate pin is in a retracted position relative to the cartridge chamber so as to be ineffective to disable said reversion preventing mechanism; first means for urging said elongate pin toward said first position, said urging means having a spring being engageable with said pin; blocking means for retaining forcedly said elongate pin in said second position against the force of said urging means until the charging or removing of said cartridge into or from the cartridge chamber is completed; said blocking means comprises a second urging means for urging said elongate pin toward said second position with a force larger than the force of said first urging means which effects to urge said elongate pin toward said first position, and a release member for overcoming the energizing force of said second urging means so as to permit the displacement of said elongate pin to said first position.

4,012,136

# PROJECTION DEVICE FOR PHOTOGRAMMETRICAL PURPOSES

Harald de la Croix, Weimar, and Wilfried Müller, Jena, both of Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

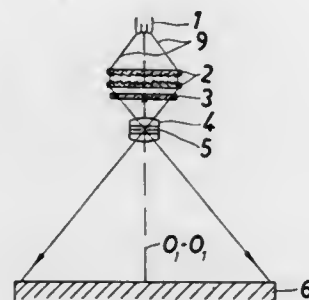
Filed Feb. 5, 1975, Ser. No. 547,752

Claims priority, application Germany, Mar. 5, 1974, 176944

Int. Cl.<sup>2</sup> G03B 21/20, 21/14

U.S. Cl. 353—102

6 Claims



1. A projection device of wide angular field of lens, comprising, in sequence along and in alignment with an optical axis, a light source for emitting a bundle of white light symmetrically about said optical axis, a Fresnel condenser, said light source being arranged in the object plane of said Fresnel condenser, said Fresnel condenser including two Fresnel lenses, at least one of said Fresnel lenses having at least two sets of Fresnel flanks each set comprising  $n$  flanks, each flank having at least foci  $F_1, F_2, \dots, F_n$  for different spectral colors  $C_1, C_2, \dots, C_n$ , the relative inclinations of said flanks being such that a different one of said foci  $F_1, F_2, \dots, F_n$  of each flank is coincident, to constitute said condenser as means producing a substantially achromatic image at said coincident foci, a picture carrier located adjacent to said Fresnel condenser, an objective, said picture carrier being arranged in the object plane of said objective, a diaphragm being provided in said objective and disposed at said coincident foci, said diaphragm passing substantially only light focussed at said coincident foci and being arranged substantially in the image side focal plane of said Fresnel condenser, and a projection table being located in the image plane of said objective, said image plane being optically conjugated to the object plane of said objective.

4,012,137

# OPTICAL SYSTEM HAVING A ROTATING SCREEN

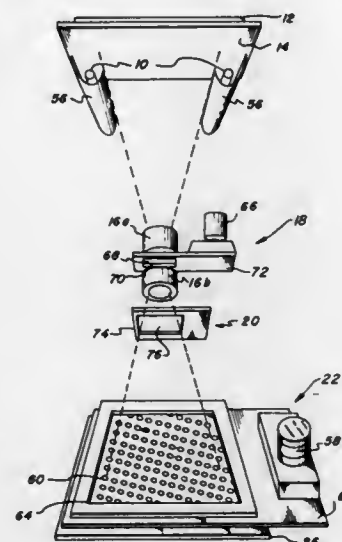
Robert N. Goren, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 17, 1975, Ser. No. 541,748

Int. Cl.<sup>2</sup> G03G 15/26

U.S. Cl. 355—4

14 Claims



1. An optical system for projecting a light image of an original document onto a light sensitive member, including: means for illuminating the original document; means, in a light receiving relationship with the light rays transmitted from the original document, for forming a light image thereof, a screen member interposed in the optical path so that the light image passes therethrough; means for rotating said screen member at a substantially constant angular velocity; means for activating said illuminating means at pre-selected time intervals as said screen member rotates to generate successive half-tone light images at different angles of said screen member; a substantially opaque member having a plurality of different size apertures therein, said opaque member being operatively associated with said image forming means; and means for rotating said opaque member in synchronism with the rotation of said screen member, said opaque member being rotated to locate a pre-selected size aperture in the optical light path upon actuating said illuminating means.

4,012,138

# ELECTROSTATIC PHOTOGRAPHIC COPYING APPARATUS

Takaji Washio, Toyonaka, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Filed Nov. 26, 1973, Ser. No. 419,047

Claims priority, application Japan, Nov. 30, 1972, 47-120246

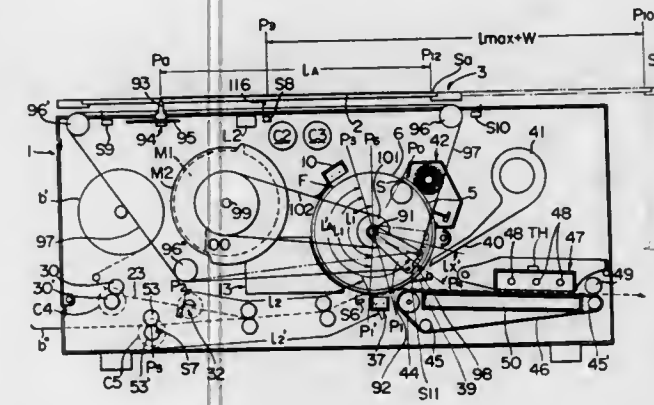
Int. Cl.<sup>2</sup> G03G 15/30

U.S. Cl. 355—8

12 Claims

9. In an electrostatic photocopying apparatus: a drum, with a photosensitive element of a predetermined length, extending therearound, so as to encompass a first angle; a carrier for moving an original image to be copied: an imaging station; means for focusing a portion of the original image onto the photosensitive element of the drum at said imaging station; means for rotating the drum, past the imaging station to expose successive portions of said photosensitive element with said focusing means;

means for advancing said carrier relative to said imaging station from an initial position spaced from said imaging station to focus successive portions of said original on said photosensitive element; means for coordinating the advance of the carrier with the rotation of the drum to duplicate the original image, as a charge image on the drum; means for advancing copy paper to a transfer point, wherein said transfer point is juxtaposed with said drum and circumferentially spaced from said imaging station by a distance less than the length of photosensitive element and by an angle less than the angle encompassed by the photosensitive element;



means for coordinating the advancing means for copy paper, so that the copy paper arrives at the transfer station, when the charge image on the photosensitive element of the drum arrives at the transfer station; means for returning said carrier to the initial position thereof, after one revolution of said drum during which a portion of the image is transferred to the copy paper; and means for subsequently advancing said carrier only after a subsequent revolution of said drum, in order that the entire length of said photosensitive element may engage said copy paper, the portion not engaging said copy paper on the first revolution engaging the copy paper on the second revolution.

4,012,139

# ELECTROSTATIC COPYING APPARATUS HAVING COPY PAPER CUT LENGTH CONTROL

Takaji Washio, Toyonaka, Koichi Sasaki, and Tatsuo Aizawa, both of Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

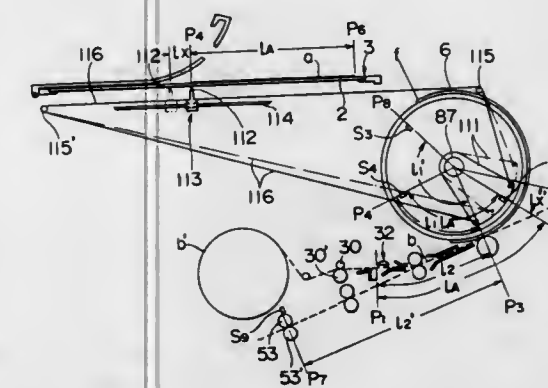
Division of Ser. No. 399,516, Sept. 21, 1973, Pat. No. 3,923,391. This application Apr. 22, 1975, Ser. No. 570,427

Claims priority, application Japan, Sept. 24, 1972, 47-95460

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355—13

5 Claims



1. An electrostatic photographic copying apparatus comprising: a frame member having a transparent plate on which to place an original to be copied;

4,012,140

# COPIER DOCUMENT LOADING SYSTEM

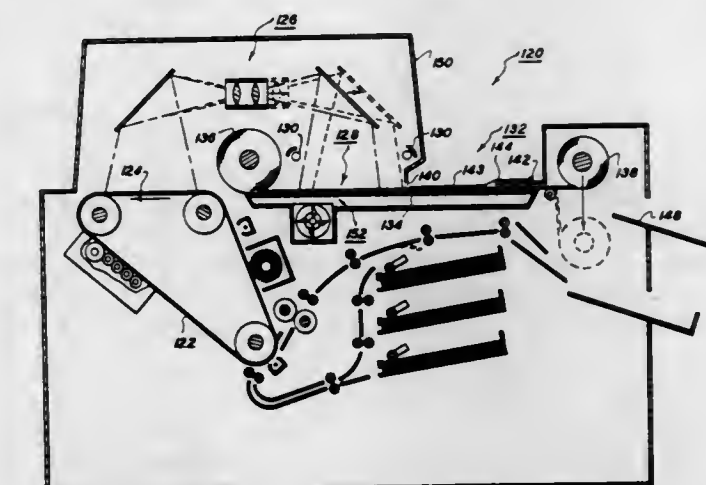
Dennis P. Gerbasi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 30, 1975, Ser. No. 600,331

Int. Cl.<sup>2</sup> G03G 15/28; G03B 27/62

U.S. Cl. 355—76

2 Claims



1. In a copying apparatus in which documents having a given front edge to rear edge dimension are manually loaded for copying onto an advanceable integral document supporting and transporting web including vacuum document retaining means for retaining documents without slippage on said integral web for copying, the improvement in document load-



ing and registration means for assisting in the manual loading of documents onto said web front edge first with a pre-registered non-skewed orientation of the documents relative to said web without restraining the front edge of the documents, comprising:

slidable document supporting surface means extending to a terminating edge closely adjacent said web for only partially, slidably, supporting a rear portion of a document, document rear edge stop means transverse said document supporting surface means for manually registering the rear edge of the document on said document supporting surface means with a front portion of the same document partially overlying said web, said document rear edge stop means being spaced from said terminating edge of said document supporting surface means and said web by a distance less than the front to rear edge dimensions of the document being registered, said document rear edge stop means extending upwardly relative to said document supporting surface means and transversely to said web, and means for advancing said web after a document has been registered against said rear edge stop means with said vacuum document retaining means activated to prevent slippage between said web and the document and to pull the entire document slidably from said document supporting surface means onto said web.

4,012,141

# IDENTIFICATION OF GEMSTONES BY RELATIVE REFLECTANCE MEASUREMENTS COUPLED WITH A SCALE CALIBRATED IN GEM NAMES

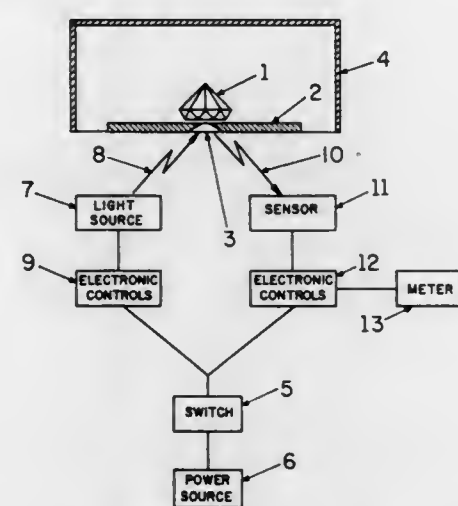
Walter William Hanneman, 18675 Sheffield Road, Castro Valley, Calif. 94546

Continuation of Ser. No. 524,647, Nov. 18, 1974, abandoned. This application Mar. 10, 1976, Ser. No. 665,573

Int. Cl.<sup>2</sup> G01N 21/48

U.S. Cl. 356—30

8 Claims



1. An instrument for identification of polished gemstones, comprising:

a plate having a small hole therethrough, said plate being adapted to support a gemstone on the top thereof with a polished surface of said gemstone positioned over said hole; means for emitting light positioned under said plate so that light emitted thereby strikes an area of the bottom of the plate, said hole being included in said area, whereby the amount of light reflected from said area depends upon the presence or absence of a gemstone over said hole, and upon the reflectance of any gemstone so present; means for receiving light reflected from said area and for converting the amount of light received to an electrical signal; a meter having a scale calibrated in accordance with the relative reflectances of various gemstones; and

means for connecting the electrical signal to said meter, whereby said meter provides an indication of the identity of a gemstone positioned over said hole.

4,012,142

# COPYING MACHINE

Shiro Serikawa, Akishima, Japan, assignor to Coper Co. Ltd., Tokyo, Japan

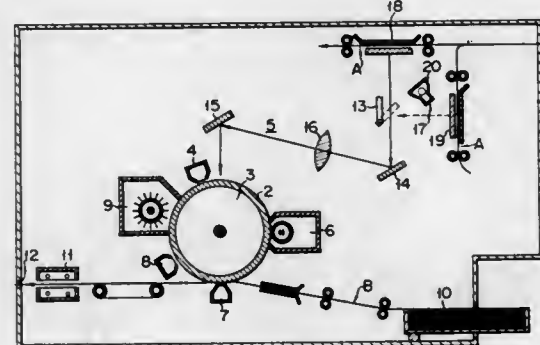
Filed Aug. 28, 1975, Ser. No. 608,712

Claims priority, application Japan, Sept. 2, 1974, 49-105568[U]

Int. Cl.<sup>2</sup> G03B 27/70, 27/54

U.S. Cl. 355—66

5 Claims



1. A copying machine comprising a housing having first and second original exposing sections to receive an original in position, photosensitive means provided within the housing, an optical system for illuminating said first and second original exposing sections and selectively directing to said photosensitive means a light reflected from the original in the original exposing section, and means for copying the original through said photosensitive means, said optical system including a selective optical member for permitting a real image to be obtained from the original in the first original exposing section when it is brought into a first position and a mirror image to be obtained from the original in the second original exposing section when it is brought into a second position including a reflector adapted to reflect the light from one of said first and second original exposing sections, a light source for selectively illuminating said first and second original exposing sections, and a shield cover for said light source selectively movable between a first position and a second position and adapted to illuminate said first original exposing section when it is brought into said first position and said second original exposing section when it is brought into said second position.

4,012,143

# MULTI-AXIS LASER SCANNER

David J. Buscher, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 10, 1975, Ser. No. 621,320

Int. Cl.<sup>2</sup> G06K 9/08

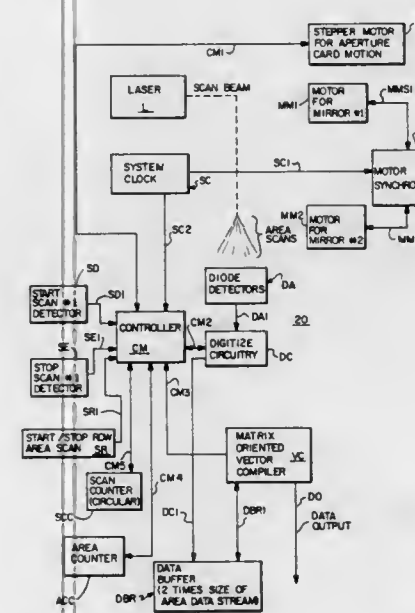
U.S. Cl. 356—71

8 Claims

1. A multi-axis laser scanner for generating and compacting digital data from information recorded on a surface area, comprising:

laser means providing a pulsed laser beam; first and second multi-faceted rotating mirror means in the path of said laser beam on orthogonally disposed first and second axes of rotation, respectively, for mutually reflecting said laser beam in a scanning raster; control means for said mirror means constraining said mirror means to direct said laser beam scanning raster over a predetermined pattern of discrete areas; information means having an information containing surface comprising a major information area consisting of a plurality of incremental information areas each definable by said predetermined pattern of discrete areas;

feed means for said information means sequentially presenting each of said plurality of incremental areas into the path of said laser beam to be scanned by said raster in said predetermined pattern of discrete areas; detecting and digitizing means responsive to the interaction of said scanning raster and said information surface providing a plurality of discrete digital data streams represent-



tative of the information on said major information area as obtained from each discrete area in said predetermined pattern; and matrix oriented data compaction means receiving said discrete data streams and providing a compacted completely determinister output data stream representative of the total information on said major information surface.

4,012,144

# SPECTROSORPTANCE MEASURING SYSTEM AND METHOD

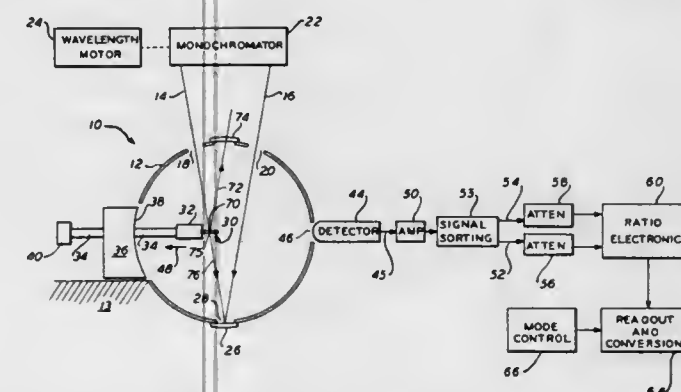
Sidney Hedelman, San Francisco, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Aug. 7, 1975, Ser. No. 602,841

Int. Cl.<sup>2</sup> G01N 21/00; G01J 1/04

U.S. Cl. 356—73

9 Claims



1. Apparatus for measuring the absolute absorptance of a relatively thin sample displaying both specularly reflecting and transmitting characteristics, comprising:

an integrating sphere; means for directing relatively monochromatic reference and sample beams into said sphere from a pair of angularly spaced ports; detector means positioned at said sphere to receive illumination from said internal sphere wall, including the illumination arising from the first reflectance from that portion of the sphere wall directly illuminated by said sample and reference beams;

baseline compensator means for equalizing the reference and sample electrical signals from said detector with said sample removed from said sample beam; means for positioning said sample within said sphere in the path of said sample beam, and at such position with respect to said detector that said detector views the illumination of the sphere wall, and substantially excludes the specular and scattered components of the reflected and transmitted light energy from said sample until after said energy strikes the sphere wall; ratio electronics means for comparing the light falling on said detector due to illumination of the sphere wall via the sample to the light falling on said detector due to illumination by said reference beam, thereby to directly measure the quantity of incident sample beam energy transmitted and reflected by said sample; and means for converting the determined ratio into absorptance of the said sample.

4,012,145

# SPECTROSCOPIC ANALYSIS APPARATUS EMPLOYING MEASUREMENT AND REFERENCE RADIATION

Francois Marie Maurice Chabannes, Paris; Edouard Sylvain Milot, Boulogne; Pierre Raymond Louis Godfrin, Suresnes, and Pierre Philippe Louis Mailly, Villejuif, all of France, assignors to Etat Francais, France

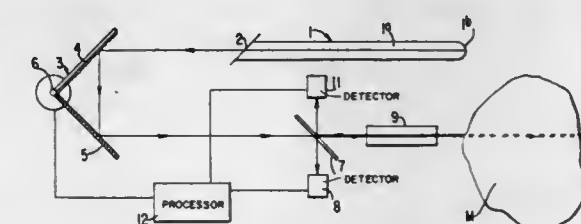
Filed Sept. 6, 1974, Ser. No. 503,759

Claims priority, application France, Sept. 20, 1973, 73.33695

Int. Cl.<sup>2</sup> G01J 3/42

U.S. Cl. 356—88

23 Claims



1. Apparatus for the spectroscopic analysis of a sample of material for determining the chemical composition of the sample, the apparatus comprising:

a coherent radiation source for producing, in succession, respective ones of a plurality of different wavelengths of the coherent radiation, the source having an active material from which there can be produced the said different wavelengths of coherent radiation, reflecting means for reflecting radiation in the source, and a wavelength selecting means operable by variation of its angular orientation relative to the axis of propagation of coherent radiation in the source to sequentially select respective ones of the different wavelengths; a separator for separating the radiation into a measurement portion for irradiating a sample of material and a reference portion; a reference detector arranged to receive the reference portion and to produce a reference signal representing the reference portion; a measurement detector arranged to receive the radiation from the sample of material due to the irradiation of the sample by the measurement portion and to produce a measurement signal representing the said radiation from the sample; and a processing circuit for processing the reference and measurement signals in dependence upon variation of the said angular orientation of the selecting means to produce numerical data relating to the spectral analysis of the sample; said processing circuit comprising: an angular position detecting means for producing position signals representing the angular orientations of the selecting means relative to the said axis of propagation;



a selector arrangement connected to receive the position signals for producing indicator signals indicating a particular orientation of the selecting means, and thus the production of a particular wavelength of radiation, and indicating that the reference and measurement signals associated with that orientation are to be processed by the processing circuit;

a comparator connected to receive the reference signals and operable to produce a comparison signal indicating the presence of a reference signal;

first and second, controllable data producing circuits connected to receive the reference and measurement signals respectively to produce analogue signals representing data relating to the spectroscopic analysis of the sample;

a trigger arranged to produce, in dependence upon the comparison signal and the indicator signal, a control signal for the data producing circuits;

first and second analogue to digital converters connected to receive the analogue signals from the first and second data producing circuits respectively; and

an interface circuit connected to receive the said data from the converters.

4,012,146

# **TWO WAVE LENGTH, SCANNING AND INTEGRATION TYPE METHOD OF MICROSPECTROPHOTOMETRICALLY MEASURING THE LIGHT ABSORBANCY OF A SPECIMEN AND MICROSPECTROPHOTOMETER FOR AUTOMATICALLY CARRYING OUT THE METHOD OF MEASUREMENT**

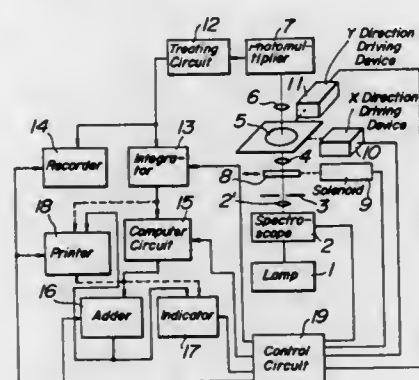
Setsuya Fujita, Kyoto, and Ichiro Sawamura, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Dec. 19, 1973, Ser. No. 426,240

Claims priority, application Japan, Dec. 20, 1972, 47-127097

Int. Cl.<sup>2</sup> G01J 3/42

U.S. Cl. 356—96

2 Claims



2. A two wave length, scanning and integration type microspectrophotometer for measuring the total amount of light absorbed by a colored specimen, comprising:

a control circuit

means connected to said control circuit for moving said specimen in X and Y directions,

means for producing light spots having wave lengths  $\lambda_1$ ,  $\lambda_2$  whose light absorbancies to the color of the specimen are maximum and minimum, respectively,

means connected to said control circuit for sequentially scanning a part of said specimen along the same path in the X direction by means of said light spots and changing over the wave length  $\lambda_1$  to the wave length  $\lambda_2$  and vice versa,

means connected to said control circuit for detecting the light transmitted through the specimen to produce an electrical signal indicative of the light absorbancy of the specimen,

means connected to said control circuit for screening the light path during said changing over operation and during movement of the specimen in the Y direction

means connected to said control circuit for integrating the signals indicative of said absorbancy every one scanning step to obtain signals representing the amount of light absorbed by a part of said specimen,

means connected to said control circuit for accumulating said signals representing the amount of light absorbed by said part of the specimen every one scanning step and for subtracting the signals representing the amount of light absorbed by said part of the specimen at the wave length  $\lambda_2$  from the signals representing the amount of light absorbed by said part of the specimen at the wave length  $\lambda_1$  to obtain signals representing the true amount of light absorbed by said part of the specimen, and

means connected to said control circuit for accumulating said signals representing the true amount of light absorbed by the specimen and for adding all of said signals representing the true amounts of light absorbed by all parts of the specimen obtained by repeating said scanning every scanning line to obtain signals representing the total amount of light absorbed by said specimen.

4,012,147

# **SLIT-LESS SPECTROMETER**

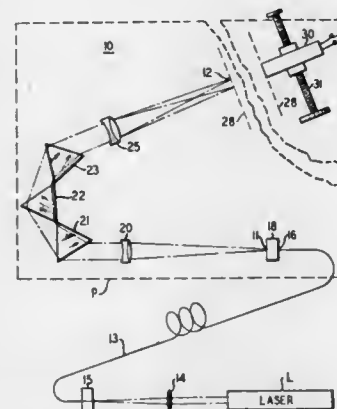
George Edouard Walrafen, 347 Old Army Road, Basking Ridge, N.J. 07920

Filed Nov. 6, 1974, Ser. No. 521,178

Int. Cl.<sup>2</sup> G01J 3/10, 3/28

U.S. Cl. 356—98

2 Claims



1. A spectrometer arrangement comprising a rigid support member and optical means affixed thereto for defining an optical path between an object plane and an image plane, said arrangement being adapted for receiving an optical fiber including core constituents and having a first end of diameter d, said arrangement including means including an optical fiber coupler cooperative with said fiber for providing at said first end a source of visible radiation of diameter d including spectral components characteristic of said constituents in said object plane, optical means for forming said radiation into a beam of parallel rays, means operative upon said beam to produce a plurality of dispersed chromatically variant images of said source each representative of a different one of said spectral components, (and) detection means for detecting the energy density of each of said images, said detection means having a light-receiving surface of about diameter d located in said image plane and means for moving said light-receiving surface from one of said images to another.

4,012,148

# **PROJECTION SCOPE AND POSITIONING SYSTEM**

William F. Marantette, and Ruth B. Marantette, both of 20624 Earl St., Torrance, Calif. 90503

Filed Dec. 15, 1975, Ser. No. 640,494

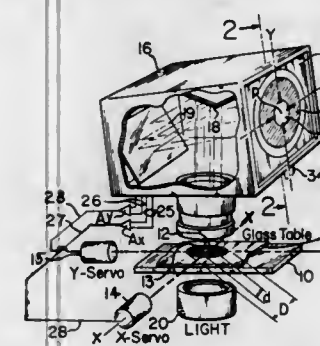
Int. Cl.<sup>2</sup> G01B 11/26; G02B 27/34

U.S. Cl. 356—172

7 Claims

1. A method for automatically positioning an art work target in the form of an annular opaque pad having a transparent center at the precise center of a given point and visually viewing the centering operation, including the steps of:

- projecting an image of the art work target onto a rear projection screen;
- positioning two pairs of identical elongated photo cells along two X and Y orthogonal axes respectively at points equally spaced a given distance from the intersection point of said orthogonal axes so that the photo cells in the pair on the X axis are equally spaced on either side of the intersection point in the X direction and the photo cells in the pair on the Y axis are equally spaced on either side of the intersection point in the Y direction;
- mounting said two pairs of photo cells behind the rear projection screen so that the shadows cast by said photo cells appear on said screen superimposed on said image, said intersection point of said X and Y axes defining said given point on which said target is to be centered;
- moving said photo cells making up said two pairs in directions towards and away from said intersection point until a portion of the shadow cast by each of said cells appears in the opaque pad area of said image and the



remaining portion appears in the transparent center of said image, the equal spacing of the photo cells from said intersection point being maintained;

- detecting the light responsive signals from each of said photo cells;
- generating an X output signal constituting a function of the difference in the output signals from said pair of cells lying on said X axis;
- generating a Y output signal constituting a function of the difference in the output signals from said pair of cells lying on said Y axis, and,
- automatically energizing X and Y servo motors with said X and Y output signals to shift said art work target in X and Y directions to thereby shift the position of said image relative to said X and Y axes until the transparent center of said art work image precisely coincides with said intersection point at which time the X and Y signals are zero so that said servo motors are automatically de-energized.

4,012,149

# **MEASURING METHOD AND EQUIPMENT FOR LOCATING A BREAK IN AN OPTICAL CABLE**

Rémy A. Bouillie, route de Treguier, Lannion, France (22300), and Pierre Lamouler, Maudez, Lanvellec, France (22420)

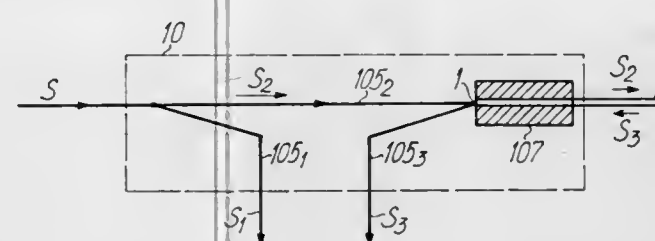
Filed July 1, 1975, Ser. No. 592,167

Claims priority, application France, July 26, 1974, 74.25993

Int. Cl.<sup>2</sup> G01N 21/16, 21/32

U.S. Cl. 356—237

2 Claims



1. An apparatus for determining the position of a break in a fiber of an optical cable comprising:

generating and directing means providing a train of recurrent light pulses toward an end of said optical cable;

said generating means including a laser source of said recurrent light pulses, an electrical pulse generator, means to feed electrical power to said generator and an amplifier connecting said generating means and said laser source;

an optical separator means located along the emitting axis of said light pulses generated from said laser source comprising at least a first, a second and a third optical fiber for dividing said train of said light pulses into a first train of light pulses along said first optical fiber, a second train of light pulses along said second optical fiber, and for reflectively directing a third train of light pulses along said third optical fiber;

optical concentrator means for directing said second train of light pulses to the end of the optical cable being tested;

first receiving means including a first electro-optical transducer for receiving said first train of light pulses and converting said first train of light pulses into a first electrical signal;

second receiving means including a second electro-optical transducer for receiving said third train of light pulses reflectively along said third optical fiber of said optical separator means after said second train issues from said second optical fiber and is reflected from said second train of light pulses by a break in the fiber of said optical cable;

said second receiving means converting said third train of light pulses into a second electrical signal; and,

electrical time measurement means receiving said first and second electrical signals for measuring the time delay interval between a light pulse of said first train and a light pulse of said third train to thereby determine the position of the break in a fiber of said optical cable.

4,012,150

# **HOLOGRAPHIC LIGHT LINE SIGHT**

Juris Upatnieks, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Aug. 18, 1975, Ser. No. 605,404

Int. Cl.<sup>2</sup> G02B 27/34

U.S. Cl. 356—247

10 Claims



1. A sight of the type described comprising: a substantially transparent plate having formed thereon a hologram recording a single line of light on an otherwise substantially blank surface, the recorded light line having one end proximate the hologram and the other end relatively distant from the hologram and terminating at a point within the field of view of the major portion of the hologram; a coherent light source; optical means for illuminating the hologram with the light source to reconstruct a virtual image of the light line so that an observer viewing a scene through the illuminated hologram may observe the super-position of the light line with the scene.



4,012,151

**ATTACHMENT FOR HAND OPERATED PAINT ROLLERS**

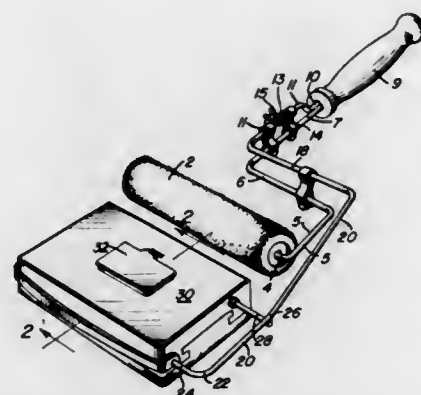
Brower C. Spransy, 4516 Rynex Drive, Alexandria, Va. 22312

Filed Mar. 24, 1975, Ser. No. 561,616

Int. Cl.<sup>2</sup> A47L 1/08; B43M 11/02

U.S. Cl. 401-23

5 Claims



1. In combination with a cylindrical paint-applying roller which includes a support means extending axially from one end of the roller, said support means including a section which is parallel to the axis of the roller, and a further section which extends from said first-named section substantially perpendicularly to the axis of the roller; an elongated extension which occupies a plane which is perpendicular to the axis of the roller and is adjacent and movably attached to said section of the support means which is perpendicular to the axis of the cylinder, said extension comprising a right-angularly extending section which is parallel with the axis of the roller, an elongated section which extends beyond the axis of the roller, and a section which extends right-angularly from said elongated section and into parallelism with said roller; a section which extends between and in parallelism with said last-named section and said roller, a paint container carried by said two last-mentioned sections and extending parallel with and in front of said roller, and a paint-applying pad removably carried by and in communication with the interior of said paint container.

4,012,152

**PAINT-APPLYING DEVICE**

Wilhelm F. Lupkes, Kaap Hoorn 13, Veendam, Netherlands

Filed July 24, 1975, Ser. No. 598,960

Claims priority, application Netherlands, Dec. 5, 1974, 7415896

Int. Cl.<sup>2</sup> B43M 11/02

U.S. Cl. 401-218

7 Claims

1. A paint applicator comprising:

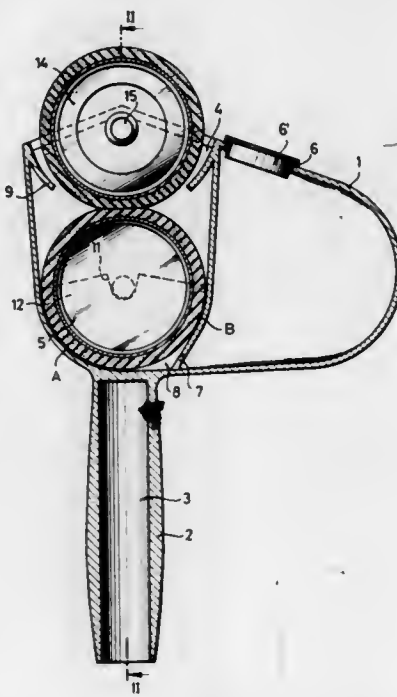
a housing having a handle and forming a roller compartment adjacent said handle;

a paint transfer roller having a cylindrical profile and a paint applicator roller rotatably disposed parallel and operatively abutting each other in said roller compartment and being oriented perpendicularly and centrally disposed in tandem to said handle, said paint transfer roller being adjacent said handle, the roller compartment including side walls and end walls, said side walls having flanges extending from the edges of said end walls inwardly to the interior of said housing defining a housing outlet through which said paint applicator roller projects;

said housing outlet defining edges of the housing adjacent to a cylindrical surface of said paint applicator roller, said flanges extending from said housing outlet into said housing in a direction towards said transfer roller and away from said side walls;

a partition wall joined to one of said side walls and laterally adjacent said rollers dividing said housing into said roller compartment and a separate paint container, said partition wall being substantially parallel to said handle and curving at a portion adjacent thereto arcuately toward

said handle and defining thereat an aperture means opening into said roller compartment adjacent said handle; each of said flanges together with said paint applicator roller defining a slot which diverges outwardly from an interior of said housing to the exterior thereof, and one of said flanges together with one of said side walls and the other of said flanges with said partition wall forms therebetween means to prevent the free flow of paint out of said housing outlet;



said housing having wall portions at the interior of said end walls which closely follow the cylindrical profile of said transfer roller to prevent the flow of paint around the ends of said transfer roller; and recess means formed in said end walls of said housing in said roller compartment in a portion adjacent said handle, said transfer roller including axle portions rotatably disposed in said recess means, the latter opening in a direction toward said housing outlet and substantially having a U-shape for removably receiving said axle portions.

4,012,153

**STRUCTURAL CONNECTION MEANS**

Martin J. Pidgeon, 7123 Bellaire Ave., Des Moines, Iowa

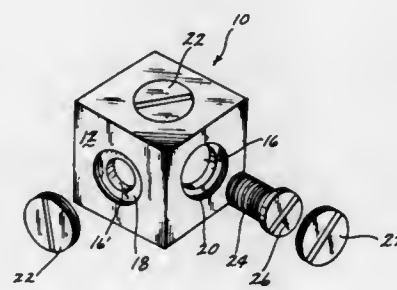
50311, and Roy E. Green, 8900 Carole Circle, Des Moines, Iowa 50322

Filed Mar. 21, 1975, Ser. No. 560,774

Int. Cl.<sup>2</sup> F16D 1/00

U.S. Cl. 403-170

10 Claims



1. A connector assembly comprising,

a block structure having a plurality of outer faces and a hollow interior compartment,

each of said outer faces having a threaded aperture formed therein which communicates with said hollow interior compartment, each of said apertures having inner and outer ends,

each of said apertures having a recessed portion at the outer end thereof which is in communication with the respective outer face, the inner end of each of said apertures being in communication with said compartment,

structural components being positioned in an abutting relationship adjacent at least some of the outer faces of said block structure and having internal threaded portions registering with the said aperture formed in the associated outer face, said structural components having planar surfaces,

a threaded stud bolt threadably received by the said aperture and internal threaded portions of said structural components, one end of said stud bolt being positioned in said internal threaded portion, the head portion of said stud bolt being positioned in said interior compartment closely adjacent the inner end of said aperture so that said stud bolts do not interfere with each other,

said apertures which receive said stud bolts having means associated therewith for limiting the longitudinal movement of said stud bolt relative thereto so that said structural components may be drawn into rigid abutting engagement with said associated outer face so that the planar surfaces of said structural components are properly aligned with the outer faces of said block structure; said recesses being adapted to receive a closure plug therein.

4,012,154

**THREADLESS LOCKING DEVICE**

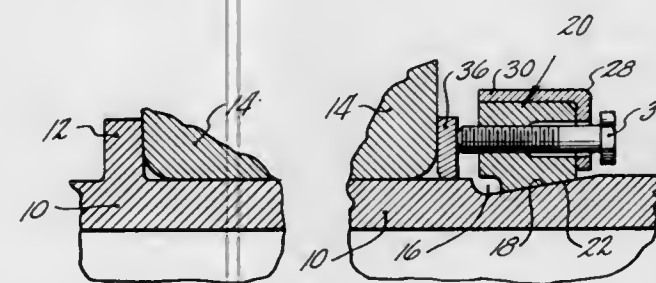
Robert J. Durwin, Trumbull, and Joseph H. Mancini, Shelton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 28, 1973, Ser. No. 401,799

Int. Cl.<sup>2</sup> F16B 21/00

U.S. Cl. 403-261

7 Claims



1. In combination, a shaft having an annular indentation including a conical bottom surface, a segmented ring having a mating conical inner periphery adapted to be seated in said indentation, said segments having half-lap joints at their meeting ends, joining pins extending through the mutually overlapping ends of said segments, a retaining ring secured to a radial face of said segmented ring having a peripheral flange overlying and closely embracing the outer periphery of said segments, and clamping bolts located about the periphery of said rings extend through said rings in an axial direction and are threaded into said segments and extend therebeyond.

4,012,155

**SNAP LOCK CONNECTOR FOR COMPONENTS SUCH AS KNOCK-DOWN FURNITURE COMPONENTS**

Max O. Morris, 582 E. Sunset Highway, Issaquah, Wash. 98027

Filed May 2, 1975, Ser. No. 574,017

Int. Cl.<sup>2</sup> F16B 21/06

U.S. Cl. 403-290

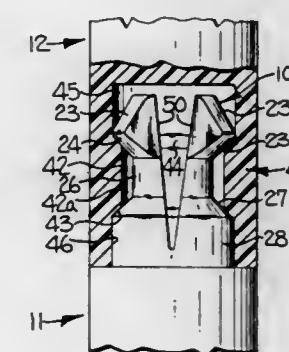
7 Claims

1. A snap lock connector for use in connecting and disconnecting components, such as furniture components, and being characterized by a rigid construction which provides longitudinal stabilization of the components in the locked condition by preventing relative longitudinal movement or pivoting between the components; said connector comprising:

an elongate male member for forming an extension from one of the components to be assembled and having a generally bulbous outer end defining opposing, curved,

oppositely and outwardly extending, leading and trailing, camming surfaces generally around at least a portion of the circumference thereof, a longitudinally extending intermediate portion extending from said trailing surface and being of smaller transverse cross-sectional dimensions than said bulbous outer end, and a generally non-flexible rear end portion extending longitudinally from said intermediate portion and being of a predetermined configuration having cross-sectional dimensions at least as large as said bulbous outer end;

a female member for forming an elongate, internal passageway within the other of the components to be assembled and having an inner portion of slightly larger dimensions than said bulbous outer end of said male member, and inwardly and longitudinally extending projection forming an intermediate portion for restricting the dimensions of said passageway at said intermediate portion to less than the dimensions of said bulbous outer end of said male member, and a longitudinally extending generally non-flexible outer portion of slightly larger dimensions than said bulbous outer end of said male member, and being of a predetermined configuration corresponding generally to the predetermined configuration of said rear end portion of said male member for snugly receiving same when said members are in locking engagement, said projection defining opposing, curved, oppositely and inwardly extending, leading and trailing, camming surfaces; one of said male and female members comprising flexible,



resilient material and having a longitudinal cut-out partially therethrough for rendering a portion other than said generally non-flexible portion of said one member expandable and contractable; and

said leading, camming surface of at least one of said male and female member comprising a lesser included angle with respect to a longitudinal axis than said trailing camming surface for locking of said members with less force than unlocking of said members;

whereby, said male member may be inserted into and withdrawn from said female member for locking of said members by forced sliding engagement of said leading camming surfaces and for unlocking by forced sliding engagement of said trailing camming surfaces of said male and female members causing flexible contraction of said expandable and contractable portion of said one member for allowing passage of said bulbous outer end of said male member past said projection in said intermediate portion of said female member, and so that, when said male member is inserted into said female member and is in locking engagement therewith, said trailing camming surface of said male member will be in engagement with said trailing camming surface of said female member and said generally non-flexible rear end portion of said male member will be snugly received in said generally non-flexible outer portion of said female member of generally the same configuration for providing a rigid connection with longitudinal stabilization of said male and female members to prevent relative movement or pivoting between said members and thus the components being connected.



4,012,156

**RETRACTABLE SAFETY SPEED BUMP**

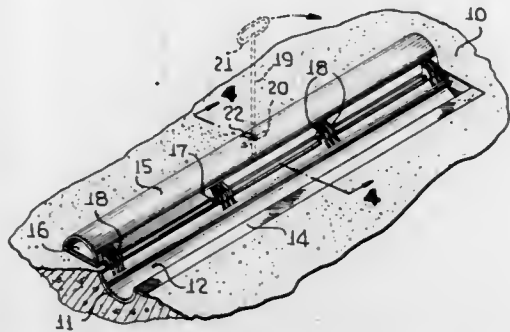
William Turner, Box 1012, Walterboro, S.C. 29488, and John Heath Turner, 2305 Huntingdon Road, Huntingdon Valley, Pa. 19006

Filed Mar. 4, 1976, Ser. No. 664,040

Int. Cl.<sup>2</sup> E01F 11/00

U.S. Cl. 404—15

8 Claims



1. A retractable speed bump comprising a concave section adapted for mounting fixedly within a roadway recess and being upwardly open, and a complementally shaped movable section nestably engagable within said concave section and when in such position having a top plate portion substantially flush with the roadway surface within which the concave section is mounted, said movable section shiftable to an active speed bump forming position wherein the movable section is inverted and has said top plate portion disposed lowermost and resting on the roadway surface at one side of said roadway recess and said concave section.

4,012,157

**CONNECTING DEVICE**

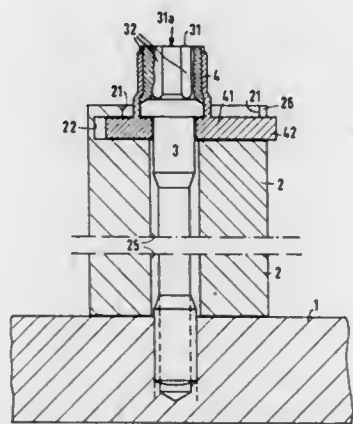
Klaus Krause, Nurnberg, and Ludwig Ilgmeier, Erlangen, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Mar. 1, 1976, Ser. No. 662,811

Int. Cl.<sup>2</sup> F16B 5/02

U.S. Cl. 403—20

8 Claims



1. Device for connecting a first component to a second component, the first component being formed with a recess extending therethrough and comprising, serially and in communication with one another, an elongated recess portion of given diameter, a first shallow recess portion coaxial to and having a larger diameter than said elongated recess portion, part of said first shallow recess portion being an undercut of an end wall portion of the first component, and a second shallow recess portion eccentric to said first shallow recess portion and to said elongated recess portion, said first component being formed with a lateral groove at the location of and communicating with said shallow recess portions, a pin-shaped member having a shaft with a head at one end thereof and formed with a thread at the other end thereof, said shaft extending through said recess formed in the first component and being securable by the threaded end thereof in a correspondingly threaded bore formed in the second component so

that said pin-shaped member by said head thereof engages the first component at one side of the latter and presses the first component at the opposite side thereof against the second component, and means for securing said pin-shaped member against rotation relative to the first component, said securing means comprising a cup-shaped member surrounding said head of said pin-shaped member and engageable with said head so as to be mutually fixed against relative rotation, said cup-shaped member having a disc-shaped base receivable in said undercut part of said first shallow recess portion and formed with a projection engageable in said lateral groove so as to secure said cup-shaped member and said pin-shaped member accordingly against rotation relative to the first component, said head being formed with means accessible from the free end surface thereof and engageable by a pin rotating device for rotating said pin-shaped member relative to said cup-shaped member so as to disengage said pin-shaped member from said cup-shaped member.

4,012,158

**ADJUSTABLE SEAT-BACK MECHANISM**

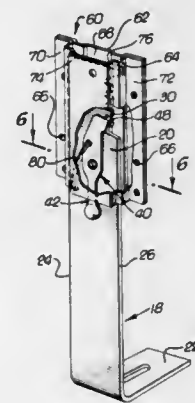
Henry J. Harper, 720 Greentree Road, Pacific Palisades, Calif. 90272

Filed Sept. 15, 1975, Ser. No. 613,629

Int. Cl.<sup>2</sup> F16B 7/14; A47C 1/00

U.S. Cl. 403—107

1 Claim



1. In an adjustable seat-back mechanism, the combination of:
  - a. an upright, flat mounting bar having horizontally spaced first and second upright edges;
  - b. said first edge of said mounting bar having vertically spaced teeth therein;
  - c. a tubular bracket on and movable vertically of said mounting bar and having horizontally spaced first and second, upright edges respectively adjacent said first and second edges of said mounting bar;
  - d. said first edge of said bracket having an opening therein adapted to register with said teeth on said first edge of said mounting bar;
  - e. a lever within said bracket and adjacent said mounting bar and having upper and lower ends and pivotally connected to an inner surface of said bracket intermediate the upper and lower ends of said lever;
  - f. said lever having at its upper end an element selectively engageable either with one of said teeth on said first edge of said mounting bar, or insertable into said opening in said first edge of said bracket to disengage said teeth;
  - g. a leaf spring for biasing said element into selected engagement with said teeth on said first edge of said mounting bar;
  - h. said lever having an inverted L-shaped recess therein receiving an upper end of said leaf spring and connecting said upper end of said leaf spring to said lever;
  - i. the lower end of said leaf spring being seated against said second edge of said bracket; and
  - j. said lower end of said lever depending below the lower end of said bracket.

4,012,159

**KEY-JOINT FORMING DIVIDER STRIP AND SCREED FOR USE WITH CONCRETE SLABS**

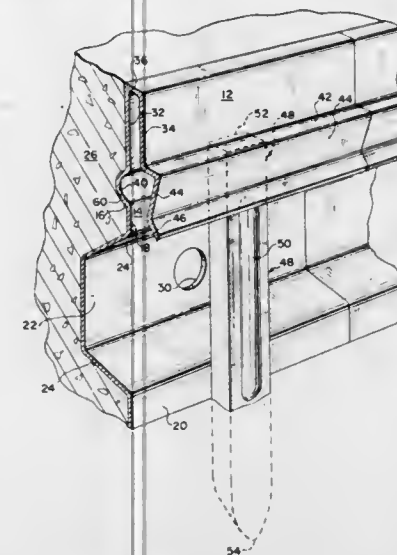
Homer E. Berry, Parsons, Kans., assignor to Superior Concrete Accessories, Inc., Franklin Park, Ill.

Filed Mar. 22, 1976, Ser. No. 668,818

Int. Cl.<sup>2</sup> E01C 11/02

U.S. Cl. 404—68

2 Claims



1. A forming unit adapted to establish a key-joint between a pair of adjacent concrete slabs and comprising, in combination, a plurality of horizontally aligned and spaced stakes having relatively thick upper ends and set with such ends uniformly below grade level, and a horizontally elongated divider strip formed of sheet material, supported on said stakes and bridging the distance between each pair of stakes, said divider strip having a lower key-joint forming section and an upper vertically extending screed section, said lower key-joint forming section having upper and lower vertical coplanar parts abutting against the adjacent sides of the stakes, and an intermediate laterally offset key deformation portion extending between and connecting said upper and lower coplanar parts, said vertically extending screed section being in the form of a hollow inverted U-shaped structure extending along the upper region of said divider strip and including a vertical inner wall portion which is connected to said upper part of the lower key-joint forming section, a vertical outer wall portion consisting of an upper component positioned in opposed and parallel relation with said inner wall portion and spaced from the latter a distance less than the thickness of the upper end of a stake, and a depending lower component, and a narrow planar horizontal top wall extending between the upper regions of said vertical inner and outer wall portions, connected thereto by sharp right angle bends, and constituting a screed surface of appreciable width, one of said vertical wall portions being formed directly beneath the inverted U-shaped structure with a right angle bend which establishes an outwardly extending seating and impact shoulder which bears against and is seated upon the upper ends of said stakes, the lower component of said outer vertical wall portion extending downwardly and inwardly in order to form beneath the level of said seating and impact shoulder a spring apron which yieldingly bears against the other sides of said stakes and serves to draw said upper and lower coplanar parts against the stakes, the lower edge region of said spring apron being turned outwardly and establishing a cam surface which, upon application of the divider strip to the stakes, serves to flex the apron outwardly so as to receive the upper ends of the stakes between said upper part of the lower key-joint section and the apron, said downwardly and inwardly extending spring apron and the out-turned lower edge region thereof being joined together by an inwardly extending apex portion which prior to application of the divider strip to the upper ends of the stakes is spaced from said upper part of the lower key-joint section a distance less than the thickness of said upper ends of the stakes.

4,012,160

**PAVING MACHINE WITH ENCLOSED MATERIAL COMPARTMENT**

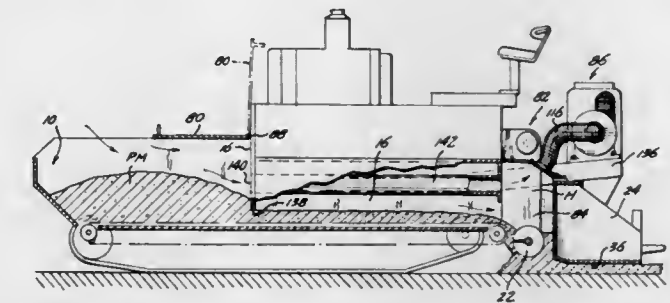
Jimmy L. Parker, 19909 Filbert Drive, Bothell, Wash. 98011  
Continuation-in-part of Ser. No. 452,056, March 18, 1974,  
Pat. No. 3,967,912. This application Apr. 19, 1976, Ser. No. 678,146

The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> E01C 19/00

U.S. Cl. 404—84

5 Claims



4. In a paving machine comprising a pair of endless feed conveyors arranged to deliver paving material rearwardly from a hopper to the inboard ends of a pair of transverse augers which spread the material outwardly and deposit it onto the surface being paved forwardly of a leveling screed which trails the augers, the improvement comprising:
  - a fixed height opening at the hopper to control the amount of paving material that is delivered from the hopper onto each feed conveyor;
  - a separate variable speed drive means for each feed conveyor, each of which is operatively connected to its feed conveyor;
  - control means for the feed conveyor drive means, including a separate sensor for each feed conveyor, each of which is mounted on the paving machine adjacent the discharge end of its feed conveyor and at the inboard end of the associated auger, for measuring changes in the level of the paving material deposited onto the surface below the sensor and producing a signal proportional to said changes, and means operatively connected to said sensor which is responsive to the signal indicating changes in the level of the paving material at the sensor, for proportionally and substantially instantaneously increasing the drive speed of the associated feed conveyor as the level drops and proportionally and substantially instantaneously decreasing the drive speed of such feed conveyor as the level rises;
  - a separate variable speed drive means for each auger, each of which is operatively connected to its feed conveyor;
  - control means for the auger drive means, including a separate sensor for each auger, each of which is mounted on the paving machine adjacent the outboard end of its auger for measuring changes in the level of the paving material deposited onto the surface below the sensor and producing a signal proportional to said changes, and means operatively connected to said sensor which is responsive to the signal indicating changes in the level of the paving material at the sensor, for proportionally and substantially instantaneously increasing the drive speed of the associated auger as the level drops and proportionally and substantially instantaneously decreasing the drive speed of such auger as the level rises, whereby the feed conveyors and the augers are continuously being independently and automatically driven at speed proportional to the demand for paving material at the discharge ends thereof;
  - wall means enclosing at least a substantial portion of the hopper, feed conveyor and augers; and
  - pollution control means on said machine for collecting pollutants from the enclosed regions.



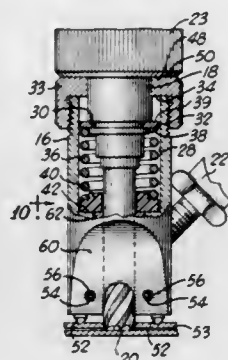
4,012,161

## ROTARY CUTTING DEVICE

William E. Shultz, 239 N. Main St., Lombard, Ill. 60148  
Division of Ser. No. 470,165, May 15, 1974, abandoned. This  
application Nov. 4, 1975, Ser. No. 628,484  
Int. Cl.<sup>2</sup> B23B 35/00

U.S. Cl. 408-1 R

4 Claims



1. A method of separating two pieces of metal joined by a spot-weld comprising:

- disposing a cutting bit having a flat cutting end of a cutting instrument in position to overlie said spot-weld;
- maintaining a cutting end of said cutting instrument in position over said spot-weld by engaging a first metal piece in a plurality of locations with a plurality of rigid conically pointed projections extending from said cutting end of the cutting instrument;
- forcing said rigid points to extend into a surface of said first metal piece by applying a downward force on said cutting instrument near the cutting end of said cutting instrument;
- forcing the cutting bit into engagement with the surface of said first piece of metal and into the spot welded portion of said first piece while said rigid points extend into said surface of said first metal piece;
- cutting said first piece of metal to remove said spot welded portion of said first piece;
- controlling the longitudinal depth of the cutting bit to cut substantially only the first piece of metal;
- separating the pieces of metal.

4,012,162

## ALL PURPOSE MAGNETIC BASE DRILL

Wesley S. Warren, 4298 Chimney Pointe Drive, Bloomfield Hills, Mich. 48013

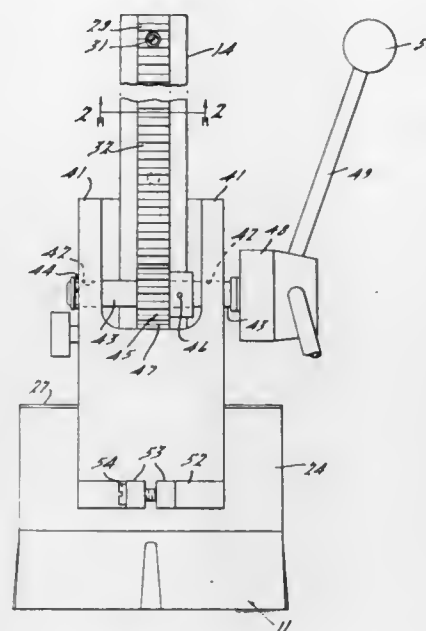
Filed Feb. 10, 1975, Ser. No. 548,423  
Int. Cl.<sup>2</sup> B23B 45/14

U.S. Cl. 408-76

2 Claims

2. In a portable drill press, a circular base having a central aperture, a column in said aperture extending upwardly from said base, means for securing the bottom of said column within said aperture, a sleeve substantially the diameter of said base secured thereabove in alignment therewith forming an area for elements to be carried therein, a motor bracket having a vertical central portion disposed along the side of said base and sleeve, an upper and lower portion at the top and bottom of the motor bracket extending therefrom in opposite direction and in unit relation therewith, said upper portion having aperture means which receives said column above said sleeve, a pinion carried by said upper portion, a rack having teeth on one side and a form on the opposite side which mates with a form on the column, said teeth engaged with the teeth of the pinion, a support on the lower portion of said bracket for supporting a drill unit, an annular recess extending within said base outwardly of said central aperture, a magnetic coil mounted in said recess to extend about the bottom of said column, the base being of the magnetic type for retaining the

drill in place on magnetizable material, and a plate to which said magnetic base is securable, said plate having an extending



4,012,163

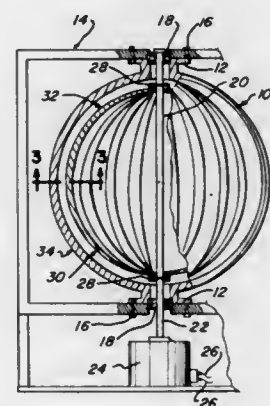
## WIND DRIVEN POWER GENERATOR

Franklin W. Baumgartner, Denver, and John Michael Murphy, Littleton, both of Colo., assignors to Franklin W. Baumgartner, Denver, Colo., a part interest

Filed Sept. 8, 1975, Ser. No. 611,090  
Int. Cl.<sup>2</sup> F03D 7/06

U.S. Cl. 415-2

10 Claims



1. A wind driven power generator comprising:  
a rotor including a rotor shaft mounted for rotation about an upright axis and a plurality of narrow elongate rotor blades secured to the shaft for rotation therewith;  
each rotor blade extending throughout a substantial portion of the axial length of the rotor in a general radial plane including the axis of the rotor shaft and cooperating with the other blades to define a surface of revolution;  
each blade having a cross sectional shape configured and arranged to present an outer surface, at least the major portion of which extends rearwardly and inwardly with respect to the surface of the rotor to be rotationally driven by contact of air flowing inwardly toward the center of the rotor;  
wind controlling shield means surrounding the rotor and conformed to define a free flow air inlet area adjacent to the rotor blades which is substantially less than the maximum projected area of the shield means in a plane normal to the direction of the relative wind and serving to increase the velocity of the air flow contacting the rotor blades well above the velocity of the relative wind;  
the shield means being operative to cause the high velocity

- air flow to travel in a direction generally perpendicular to the axis of the rotor shaft;  
a power transmitting axial extension of the rotor shaft extending outward of the shield means;  
and power absorbing load means connected to the extension;  
the shield means being in the general form of a surface of revolution conforming to the surface of revolution defined by the rotor and being sufficiently larger to provide running clearance for the rotor;  
the shield means comprising a plurality of narrow elongate upright shield elements, each lying in a general upright radial plane including the axis of the rotor shaft and peripherally spaced to define between them a plurality of narrow upright free flow inlet air passages adjacent to the rotor blades;  
the total area of the passages exposed to the prevailing relative wind being substantially less than the projected area of the shield means in a plane normal to the direction of the prevailing relative wind.

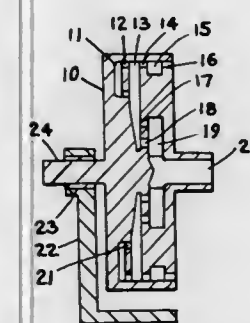
4,012,164

## ROTOR WITH RECIRCULATION

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042  
Continuation-in-part of Ser. No. 501,064, Aug. 27, 1974, Pat. No. 3,939,661. This application Nov. 28, 1975, Ser. No. 636,310  
Int. Cl.<sup>2</sup> F04D 5/00

U.S. Cl. 415-53 R

5 Claims



1. A rotor for pressurizing of a fluid and comprising:  
a. a fluid entry to said rotor near the center of rotation of said rotor;  
b. a set of fluid nozzles for passing said fluid and oriented to discharge said fluid forwardly in the direction of rotation;  
c. a vortex cavity within said rotor to receive said fluid from said fluid nozzles; for pressurizing said fluid;  
d. a fluid discharge means from said vortex cavity adapted for discharging the fluid that entered the rotor through said fluid entry;  
e. a fluid recirculation means for recirculating a part of said fluid from said vortex cavity into fluid recirculation nozzles; with the fluid recirculation nozzles discharging said fluid forwardly into said vortex cavity in the direction of rotation; with the recirculation nozzles being located inwardly toward rotor center from the vortex cavity area where the fluid is taken from said cavity for recirculation.

4,012,165

## FAN STRUCTURE

Alfred Henry Kraig, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

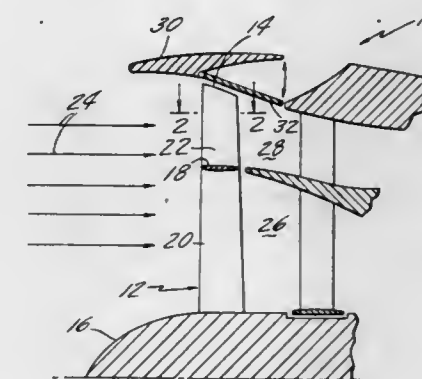
Filed Dec. 8, 1975, Ser. No. 638,883  
Int. Cl.<sup>2</sup> F01D 17/00

U.S. Cl. 415-145

3 Claims

1. In a turbofan engine having a rotor which is mounted for rotation with respect to a stationary fan case, the improvement which comprises:  
a plurality of circumferentially spaced fan blades extending radially from the rotor toward the fan case wherein each fan blade has

an inward region which is contoured for the conversion of dynamic energy within subsonic and low supersonic streams to pressure energy and  
an outward region which is contoured for the conversion of dynamic energy within a high supersonic stream to pressure energy within a subsonic stream and wherein said contour of the outward region is adapted to form between each pair of adjacent blades  
a convergent passage for the gradual deceleration of the supersonic stream and



- a throat downstream of the convergent passage for containment of a normal shock wave between adjacent blades;  
a mid-span shroud positioned on each blade to separate said inward subsonic and low supersonic region from said outward high supersonic region; and  
at least one starting and stabilizing door in said stationary case which is radially opposes the fan blade tips and which is moveable with respect thereto to vary the area of the convergent passage and of the throat for positioning the shock wave at the throat.

4,012,166

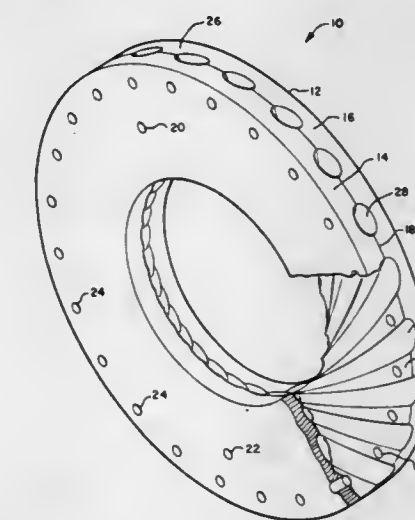
## SUPERSONIC SHOCK WAVE COMPRESSOR DIFFUSER WITH CIRCULAR ARC CHANNELS

Merle L. Kaesser, Waterloo, Iowa, and Homer J. Wood, Sherman Oaks, Calif., assignors to Deere & Company, Moline, Ill.

Filed Dec. 4, 1974, Ser. No. 529,498  
Int. Cl.<sup>2</sup> F04D 21/00, 29/44

U.S. Cl. 415-181

21 Claims



1. A diffuser for use with a centrifugal compressor comprising first and second body halves mating along a central plane to define an annular diffuser body having a central axis, an inner circumference adapted for concentric disposition about the periphery of a centrifugal compressor in close proximity thereto, and an outer circumference, said diffuser body having a plurality of curved diffusion channels defined therein which extend between the inner and outer circumference and which curve toward a direction of a tangential velocity component of



gases entering the diffuser channels at the inner circumference, the diffusion channels having a cross section perpendicular to a central longitudinal axis therealong which is at least generally circular and a divergence angle which increases with distance from the inner circumference without sharp transitions in the diffusion channel walls to provide each channel with a diameter that increases at an increasing rate as distance from the inner circumference increases, adjacent diffusion channels intersecting near the inner circumference along a sharp, generally elliptical edge which is in close proximity to the outer circumference of a centrifugal compressor.

4,012,167

# **TURBOMACHINERY VANE OR BLADE WITH COOLED PLATFORMS**

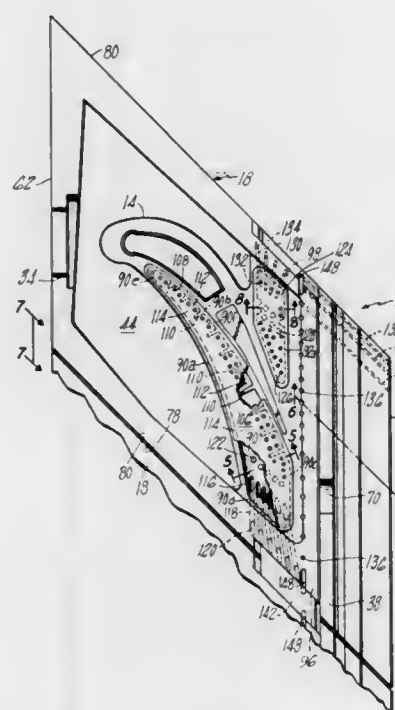
Melvin Lee Noble, San Diego, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 14, 1975, Ser. No. 622,321

Int. Cl.<sup>2</sup> F01D 5/18

U.S. Cl. 416—97 A

9 Claims



1. A turbomachinery airfoil member adapted to be supported to extend across a heated gas passage in turbomachinery and having:

A. a platform located at one end of the airfoil member and positioned and shaped to form a boundary of the heated gas passage and including:

1. a heated gas passage defining wall member,

B. means to cool said platform including:

1. wall means shaped to define a chamber of shallow height and including and extending substantially parallel to said wall member,

2. at least two cooling fluid inlet apertures in said wall means opposite said platform wall member, said apertures being selectively shaped and oriented to direct a stream of cooling fluid therethrough to impinge against said platform wall member in response to pressure differential across said inlet apertures,

3. at least one cooling fluid exhaust aperture in said wall means selectively positioned to define a cooling fluid flow path across said chamber from said inlet apertures to said exhaust aperture, and

4. dam means extending across the height of said chamber adjacent said inlet apertures and being selectively shaped to cooperate with said wall means to define a cavity separate from but communicating with the cooling fluid flow path to protect the impingement jets of cooling fluid passing through said inlet apertures from cross-flow interference from the cooling fluid passing through the cooling fluid flow path until impingement against said platform wall member has occurred.

4,012,168

# **TWISTED FLEX FAN**

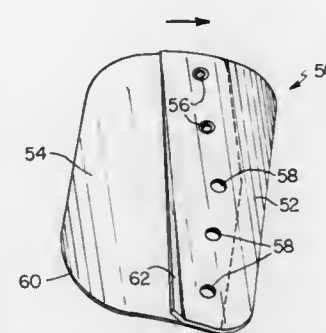
Michael Thomas Spellman, Indianapolis, Ind., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed May 12, 1975, Ser. No. 576,728

Int. Cl.<sup>2</sup> F04D 29/38

U.S. Cl. 416—132 A

7 Claims



1. A fan blade construction adapted for use in an internal combustion engine and for a fan formed of resilient sheet material, said blade having the form of a cutout from a cylinder, with the longitudinal axis of a blade being at an angle greater than zero degrees but less than ninety degrees to the longitudinal axis of the cylinder, the improvement comprising, the blade having a leading edge portion which is stiffened and having a flexible trailing portion, the juncture of the said flexible portion and the said stiffened portion being substantially linear, the width of the flexible trailing portion measured from its trailing edge to its juncture with the leading edge portion being greater at its radially innermost portion than at its radially outermost portion, whereby under normal operating conditions the trailing edge will flex at higher fan blade speeds to thereby diminish the effective pitch of the blade at such speeds.

4,012,169

# **ROTOR FOR ROTATING WING TYPE AIRCRAFT**

René Louis Mouille, Aix en Provence; René Louis Coffy, Marseille; Michel Aimé Hancart, Marignane, and Daniel Mao, Marseille, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

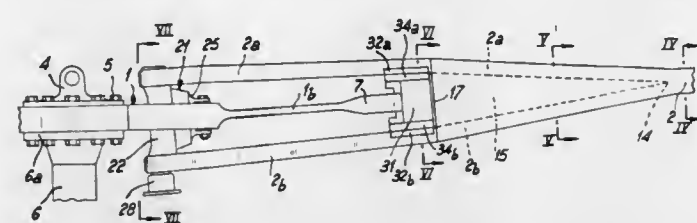
Continuation-in-part of Ser. No. 469,045, May 10, 1974, Pat. No. 3,967,918. This application Mar. 22, 1976, Ser. No. 669,086

Claims priority, application France, May 10, 1973, 73.16887; Mar. 7, 1974, 74.07776; Mar. 26, 1975, 75.09504

Int. Cl.<sup>2</sup> B64C 27/38

U.S. Cl. 416—134 A

7 Claims



1. A rotor for a rotating-wing craft comprising a driving shaft, a flat star-shaped rotor hub made of resin-reinforced glass fibres and substantially extending in a plane perpendicular to said driving shaft, said rotor having a central part adapted for being secured to the end of said driving shaft and a plurality of flat arms extending each from said hub central part substantially along a radial axis in said plane, said hub central part and flat arms having, in the direction perpendicular to said plane, respective thicknesses of substantially different values so that said central part is rigid and said flat arms are flexible in said direction, a same plurality of rotor blades having each a fork-shaped root part, disposed in closed relationship to the outer end of one of said hub arms, and having two arms extending substantially along the radial axis of the

respective hub arm at a distance from the two faces of said flat arm respectively, first and second means for connecting the fork-shaped root part of each rotor blade to said hub central part and to the outer end of said hub arm respectively, said first and second connecting means being adapted for permitting resiliently limited rotations and sliding displacement of said blade root part around and along said radial axis in relation to said hub central part and arm, and said first connecting means being further adapted for transmitting centrifugal radial forces from said rotor blade directly to said rigid hub central part, whereby flapping movements of the rotor blades in said direction are permitted by the flexible hub flat arms and said connecting means.

4,012,170

# **FABRICATED CROWN PLATE FOR FRANCIS-TYPE HYDRAULIC TURBINE RUNNER**

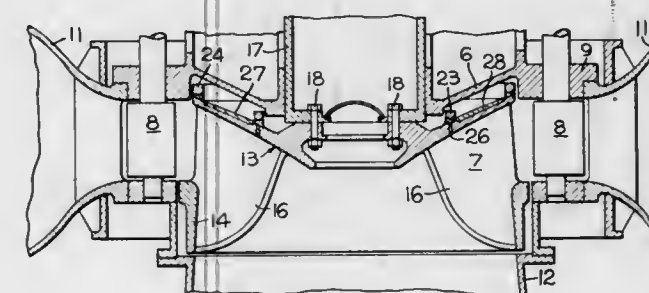
Robert G. Grubb, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 18, 1975, Ser. No. 605,755

Int. Cl.<sup>2</sup> F01D 5/14

U.S. Cl. 416—186 R

1 Claim



1. A turbine and pump runner having a crown and a band with a plurality of circumferentially spaced runner buckets connected therebetween, said crown comprising: an integrally formed inner circular section extending in a plane substantially transverse to the axis of rotation of the runner and forming a bucket mounting surface; at least two integrally formed arcuate outer sections rigidly connected to said inner section by a circular weldment and to one another and forming with said inner section a continuation of said bucket mounting surface; a plurality of runner buckets connected to said bucket mounting surface; and a runner seal ring connected to the surface of said crown opposite to said bucket mounting surface and being concentric with and overlying said circular weldment.

4,012,171

# **BLADE AND MOUNTING MEANS**

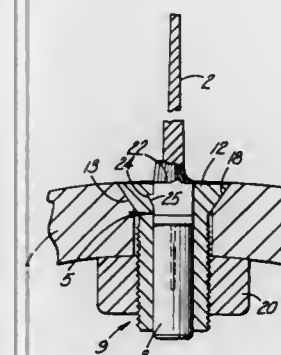
Michael N. Suvak, 34900 Forest Lane, Solon, Ohio 44139

Filed Apr. 24, 1974, Ser. No. 463,570

Int. Cl.<sup>2</sup> F04D 29/36

U.S. Cl. 416—207

4 Claims



1. In blade and mounting means of the class described, in combination, a blade member, a shank thereon, a stem extending from the shank, an adapter to receive therein the stem and at least a portion of the shank aforesaid, said adapter

including means to grip the stem and the shank portion upon application of pressure to the adapter, and instrumentalities including a nut to engage said adapter to apply such pressure when said adapter is mounted in a blade carrier, the adapter including a tubular body, having a head formed with a frusto-conical surface and a recess, threads are formed on the exterior of the body, a diametral slot extends across the adapter body in alignment with the recess, said slot extending axially along the adapter body, the nut is engaged with the threads, and the interior of the body is formed to receive the stem of the blade member to grip the same in the body as the nut is tightened on the threads when the adapter is in position on the blade carrier, the said shank enclosed portions conform to the frusto-conical surface on the head of the adapter, the blade member includes an edge extending outwardly beyond the shank aforesaid to overlie a surface of such blade carrier, a thin fin is formed integrally with the edge of the blade to extend from the same near the said shank, said fin being crushed against such surface as to cause the edge to be sealed there against when the adapter is tightened by manipulation of the nut.

4,012,172

# **LOW NOISE BLADES FOR AXIAL FLOW COMPRESSORS**

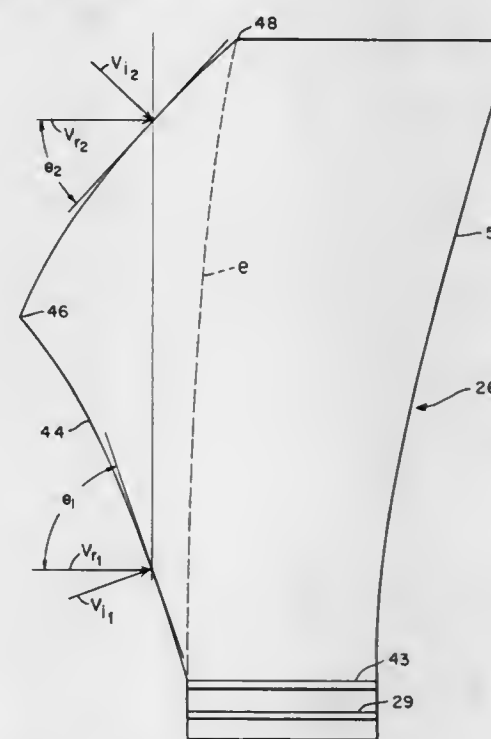
Pierre G. Schwaar, Monroe, and John A. O'Connor, Orange, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Sept. 10, 1975, Ser. No. 612,220

Int. Cl.<sup>2</sup> F04D 29/38

U.S. Cl. 416—228

1 Claim



1. In an axial flow compressor: a rotor having a circumferential row of radially projecting blades, each blade having means at its hub end for attaching it to the rotor, each blade being in the form of an airfoil having a progressively decreasing camber and progressively increasing angle of twist from its hub end to its tip end, said rotor having a rate of rotation at which at least an outer portion of the blade has a velocity, relative to the air flow therepast, which is at a sonic value or greater, said relative velocity being sufficient to generate a shock wave on the leading blade edge disposed normal to the direction of relative airflow, characterized in that the profiles of each blade at the inner, or hub end, and at the outer or tip end of said outer portion are of conventional length, the leading edge of said outer portion is swept forwardly from its hub end on a curve having a progressively de-



creasing slope relative to the direction of air flow, outwardly to a point of sweep reversal spaced inwardly from the tip end of the blade and, from said point of reversal, the leading edge is swept rearwardly to the tip end of the blade on a curve also having a progressively decreasing slope relative to the direction of air flow therepast, said slope at all points along the forwardly and rearwardly swept portions of the leading edge being such that the flow velocity component normal thereto remains below a sonic value, and

the trailing edge of said outer portion of the blade is smoothly curved in a rearward direction from its hub end to its tip end, whereby the chord length of the blade profiles progressively become greater than conventional lengths outwardly to said point of sweep reversal and then the profile chord lengths progressively decrease to the conventional length profile at the tip end of the blade, and

further characterized in that

the point of curvature reversal is so disposed that the centers of gravity of the blades profiles progressively shift in one direction relative to the major and minor axis of inertia of the attachment means from the hub end of said outer portion to said point of sweep reversal and then shift in the opposite direction, relative to said axis of inertia, from the point of sweep reversal to the tip end, a distance such that a summation of the centrifugal bending moments is essentially balanced relative to the attachment means due to the straddling of the axis of inertia by the centers of gravity of the blade profiles.

4,012,173

## VARIABLE STROKE COMPRESSOR

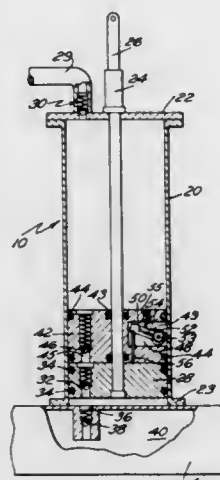
Kirke B. Everson, Jr., 394 New Meadow Road, Barrington, R.I. 02806

Filed Jan. 26, 1976, Ser. No. 652,473

Int. Cl.<sup>2</sup> F04B 19/00, 21/04, 39/10; F01B 31/14

U.S. Cl. 417-259

4 Claims



1. A compressor comprising a casing with substantially closed upper and lower ends, an inlet port adjacent the lower end and an outlet port adjacent the upper end, a piston rod passing through the upper end, a packing sealing the rod and upper end yet permitting reciprocation thereof, a lower piston coupled to the piston rod, an upper piston slidably disposed on the rod, check valves in the upper and lower pistons permitting upward flow, means acting on the upper piston to retard reciprocable downward movement thereof in said casing, said piston rod coupled to a source of energy to reciprocate the rod and said lower piston.

4,012,174

## FUEL PRIMING PUMP

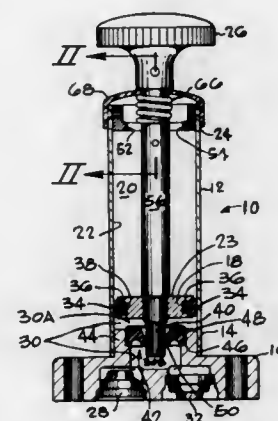
Jack N. Seibel, and Ronald C. Stump, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 20, 1975, Ser. No. 623,856

Int. Cl.<sup>2</sup> F04B 49/00, 21/02

U.S. Cl. 417-307

14 Claims



1. In a manually activated fuel priming pump for an internal combustion engine comprising a housing having a barrel communicating at a first end thereof with a flange disposed transversely to the barrel, a plunger communicating with a handle adjacent said first end of said barrel, said plunger being mounted for reciprocal motion in a chamber of said barrel to selectively pump fuel from a first valve into said chamber below said plunger on retraction thereof and from said chamber out of a second valve on advancing of said plunger, said first and second valves being located in the flange of the housing, a plunger having therearound means slidably sealing it with low friction against a bore defining said chamber, an improvement which comprises:

- a member co-axial with said plunger and extending therefrom towards said flange; and
- member-bore seal means slidably sealing said member to said bore and disposed intermediate said first and second valves and said plunger to allow flow of said fuel from said chamber below said plunger to said second valve and to sealingly retard flow of said fuel past said seal means in a reverse direction.

4,012,175

## VALVE AND PUMP CONTROL FOR A HYDRAULIC SYSTEM

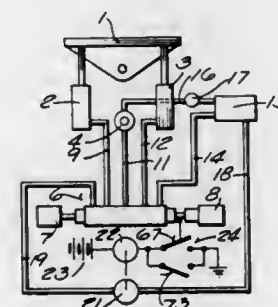
George D. Simonds, Jr., Mequon, Wis., assignor to Douglas Dynamics Corporation, Milwaukee, Wis.

Filed Dec. 31, 1975, Ser. No. 645,516

Int. Cl.<sup>2</sup> F04B 9/00

U.S. Cl. 417-316

11 Claims



1. A combination valve, valve actuator and pump control for use in a hydraulic system wherein said valve is manipulated by said valve actuator to control flow in said hydraulic system and a pump is controlled by said pump control to produce flow in said hydraulic system and wherein said valve includes a body,

a valve member in said body movable between first, second and third positions, means defining a plurality of flow ports in said body operatively associated with said valve member so that as said valve member assumes said first, second and third positions fluid flow circuits are established through said valve, and shaft means connected to said valve member for transmitting movement to said valve means, said shaft means projecting exteriorly of said body; said valve actuator including operating means engaging said shaft means and having first, second and third states of operation corresponding to said first, second and third valve member positions; said pump control includes switch means in the circuit for said pump means to alternately activate and deactivate said pump means circuit; and means connecting said operating means directly to said shaft means and including switch actuating means assuming positions relative to said switch means in accordance with whether said operating means is in said first, second or third states of operation, in said first state of operation said switch means deactivating the circuit to said pump means and activating the circuit to said pump means when said operating means is in said second and third states of operation and after said valve member has moved to said second and third positions.

4,012,176

## FLUID-DRIVEN MOTOR AND FERTILIZER FEEDING DEVICE UTILIZING SAME

Mordeki Drori, 89 Zahal St., Kiron, Israel

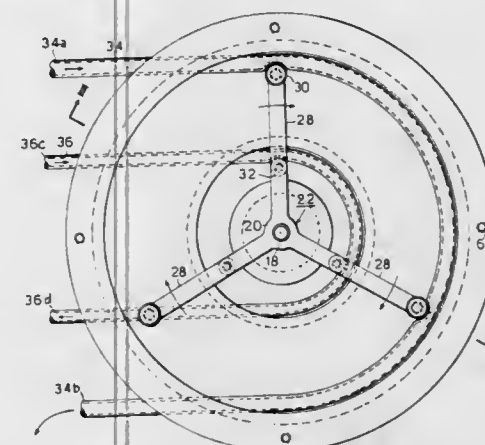
Filed Feb. 21, 1975, Ser. No. 551,999

Claims priority, application Israel, Mar. 8, 1974, 44372

Int. Cl.<sup>2</sup> F04B 17/00

U.S. Cl. 417-405

10 Claims



1. A fluid-driven feeding device comprising: a housing; a rotor rotatably mounted within the housing; a collapsible pressurized tube having a loop disposed within the housing, one end of the pressurized tube being connectable to a source of pressurized fluid and the other end being vented to the atmosphere; a collapsible feeding tube having a loop disposed within the housing, one end of the feeding tube being connectable to a source of fluid material to be fed therethrough and through the opposite end thereof; and pinch roller means carried by the rotor and engageable with said loops of both collapsible tubes whereby the pressurized fluid in the collapsible pressurized tube acts on the pinch roller means to rotate the rotor causing same as it rotates to collapse the feeding tube and thereby to feed the fluid material therethrough.

4,012,177

## BLOOD PUMP TUBE ELEMENT

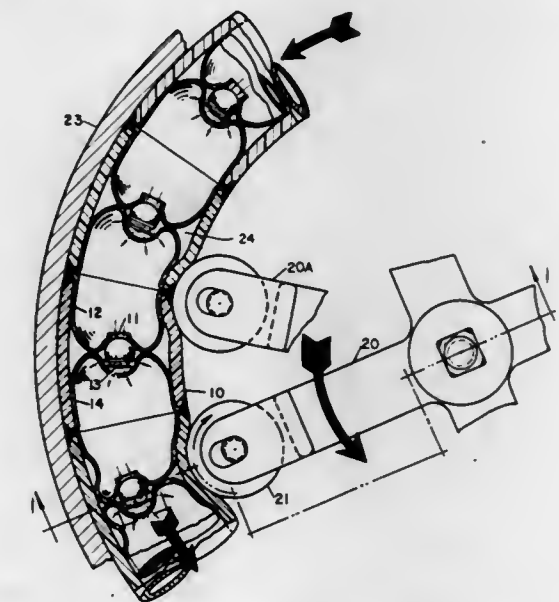
Sam S. Yakich, 2400 Wilkinson Blvd., Apt. 329, Charlotte, N.C. 28208

Filed Aug. 31, 1973, Ser. No. 393,568

Int. Cl.<sup>2</sup> F04B 43/08, 43/12

U.S. Cl. 417-477

1 Claim



1. A Blood Pump Tube Element including:

- A. a sequential plurality of resilient bag-like chambers wherein each chamber has one outlet comprising a single hole in the surface of the chamber and each chamber surface opposite to the outlet has a plurality of holes for forming an inlet; including resilient spherical balls for closing each said single hole outlet even when the balls are deformed due to side pressures since the chambers will follow the same deformation and metallic helical springs for biasing the balls against the walls of the bag-like chambers containing the outlet holes and for displacing the walls inwardly to secure more closing contact area around the balls when side pressures are applied to the balls; and wherein the plurality of said chambers being fused together so as to connect the outlet and inlet surfaces of consecutive chambers; said spring-biased balls, located inside cavities formed by chamber surfaces containing the consecutive outlet and inlet holes, acting as separating valves between the bag-like chambers,
- B. an outer resilient tube about the said sequential plurality of bag-like chambers fused at spots to the plurality of bag-like chambers, and
- C. rollers mounted at ends of arms fixed about a shaft driven by an electric motor; said rollers contacting the outer tube; said arms being provided with longitudinal slots to carry position-adjustable attachment means for the rollers, thereby enabling the adjustment of side pressure or the amount of fluid to pass through the bag-like chambers.

4,012,178

## HYDRAULIC PUMP WITH REPLACEABLE PUMPING MEMBER

Benjamin V. Puckett, 13529 Charlwood Circle, Cerritos, Calif. 90701

Division of Ser. No. 351,461, April 16, 1973, Pat. No. 3,883,272. This application Feb. 25, 1975, Ser. No. 552,927

Int. Cl.<sup>2</sup> F04B 43/08, 45/06

U.S. Cl. 417-478

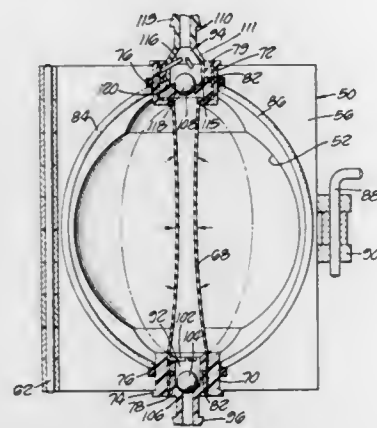
7 Claims

1. A hydraulic pump comprising a casing and a pumping unit comprising:

- a. a fluid impermeable elastic tubular member;
- b. a first and second pair of sealing rings sealingly connected to said elastic tubular member, each pair having:
  - 1. an outer tubular ring surrounding a portion of the outer wall of said elastic tubular member, said outer tubular



- ring including means for aligning and holding said sealing rings in said casing;
- an inner tubular ring within said elastic tubular member and having an annular groove around the outer circumference of said inner tubular ring;
  - an O-ring within said annular grooves of said first and second inner tubular rings, said O-rings being in fluid sealing engagement with the inner surface of said elastic tubular member;



- said first pair of sealing rings having an inlet valve within the inner tubular ring, and
- said second pair of sealing rings having an outlet valve within the inner tubular ring, said elastic tubular member and said first and second pair of sealing rings defining a disposable unit which may be inserted in, or removed from the interior chamber of said casing which comprises means for creating alternately positive and negative pressure within the chamber to intermittently expand said elastic tubular member in said interior chamber.

4,012,179

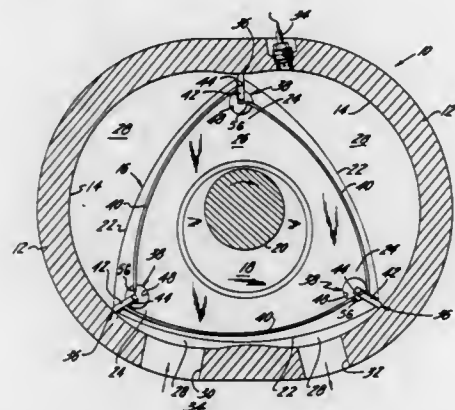
**SEALING GRID FOR A ROTARY PISTON MECHANISM**  
Thomas C. Roberts, Ridgewood, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Mar. 27, 1975, Ser. No. 562,806

Int. Cl.<sup>2</sup> F01C 19/04, 19/08

U.S. Cl. 418—120

5 Claims



- In a rotary piston mechanism having end walls spaced apart by a peripheral wall to define therebetween a housing cavity within which a rotor is supported for planetary rotation, the rotor having opposite side faces and peripheral surfaces intersecting each other to form apex portions and defining with the housing cavity a plurality of working chambers which successively expand and contract in volumetric size as the rotor planetates within said housing cavity, an improved sealing grid for substantially isolating the working chambers from each other, the sealing grid comprising:
  - an apex seal assembly for each of the rotor apex portions;
  - each of said apex seal assemblies has a blade means supported in a radially extending apex groove in each of the apex portions of the rotor;

- an apex seal pin for each apex portion carried in each side face and at each apex portion of the rotor;
- a plurality of gas seal strips carried in each side face of the rotor;
- each gas seal strip extending at one end in engagement with a blade means associated with one apex portion and out of contact with the apex seal pin associated with this blade means and to engagement with the apex seal pin associated with the next adjacent apex seal pin;
- a first spring for each gas seal strip disposed in said rotor side faces to urge the associated gas seal strip toward and against the adjacent end wall; and
- a biasing means for each gas seal strip, including a wedge element and a second spring, separate from each of the first springs, carried in each of the apex seal pins so as to engage one end of the associated gas seal strip and urge the latter endwise to thereby maintain the other end of the associated gas seal strip in engagement with the blade means associated with the next adjacent apex portion.

4,012,180

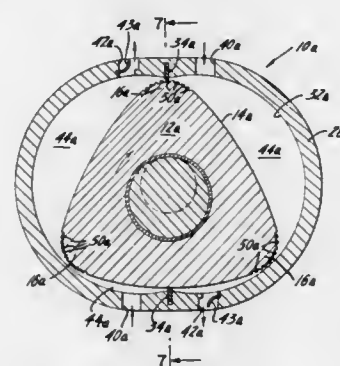
**ROTARY COMPRESSOR WITH LABYRINTH SEALING**  
Murray Berkowitz, Woodcliff Lake, and George H. Woodier, Ringwood, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Dec. 8, 1975, Ser. No. 638,646

Int. Cl.<sup>2</sup> F01C 19/02

U.S. Cl. 418—141

10 Claims



- A rotary mechanism such as a compressor, expansion engine or the like comprising:
  - an outer body comprising a pair of axially-spaced end walls and an intermediate wall defining a cavity therebetween;
  - an inner body mounted for relative rotation within said cavity and having its axis eccentric to the axis of said outer body, the peripheral surface of said inner body having a plurality of nose portions and being substantially a hypotrochoid and the inner peripheral surface of said outer body intermediate wall being substantially the outer envelope of the peripheral surface of the inner body such that a plurality of fluid working chambers are formed between said inner body and said intermediate wall peripheral surface;

- at least one radially-movable seal strip carried by said intermediate wall and disposed parallel to the axis of said mechanism at a position such that the inner edge of said strip substantially generates the hypotrochoidal peripheral surface of the inner body during relative rotation of said bodies and means for urging said seal strip radially inwardly into sealing engagement with said hypotrochoidal peripheral surface;
- said outer body having intake and outlet ports for communication with said working chambers and disposed on opposite sides of said seal strip; and
- at least one of said peripheral surfaces having labyrinth-type recesses over at least a portion of said surfaces to provide sealing cooperation between the nose portions of the inner body and said intermediate wall peripheral surface.

4,012,181

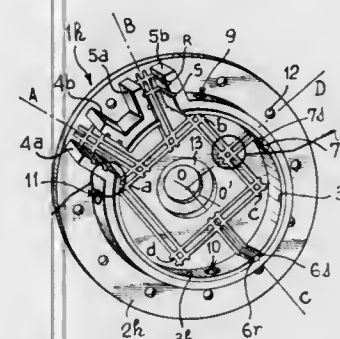
**ENGINE WITH ROTOR, OF NEW TYPE**

Andre Brullert, 6, rue des Peintres Parrocel, and Andre Gabriel Hoss, 23 Boulevard Saint-Ruf, both of Avignon, Vaucluse, France (84000)

Continuation-in-part of Ser. No. 441,216, Feb. 11, 1974, Pat. No. 3,914,075. This application Aug. 4, 1975, Ser. No. 601,608

Claims priority, application France, Feb. 12, 1973, 73.04931; Feb. 20, 1973, 73.05946

Int. Cl.<sup>2</sup> F01C 19/08; F03C 3/00; F04C 15/00; F16J 15/16  
U.S. Cl. 418—144 10 Claims



- In a rotary engine having at least one rotor:
  - a stator for the rotor, said stator including a pair of end plates, a casing at least partially surrounding said rotor and joining said end plates at each end, and fluid admission and exhaust tubes;
  - rotatable means journaled in said end plates for displacing the rotor to form working chambers in the stator; and
  - a network of rectilinear grooves formed on the internal surfaces of said casing and said end plates and rectilinear segments mounted in each of said grooves sized smaller than the grooves for both lateral and longitudinal movement therein, said network including:
    - groups of at least two grooves and segments each across said casing radially arranged with respect to said rotatable means;
    - groups of at least two grooves and segments each polygonally arranged around said rotatable means in said end plates and
    - groups of at least two grooves and segments each interconnecting said radially and polygonally arranged groups of grooves and segments;
- each of said segments cooperating with at least one other segment through interacting cut-away portions of the segments, said cut-away portions permitting both lateral and longitudinal movement of the segments.

4,012,182

**MACHINES FOR ENERGY CONVERSION**

Gösta Svensson, Sandelsgatan 23 B, 115 33 Stockholm, Sweden

Filed Nov. 12, 1975, Ser. No. 631,406

Claims priority, application Sweden, Nov. 26, 1974, 7414821

Int. Cl.<sup>2</sup> F04C 1/00

U.S. Cl. 418—153

11 Claims

- In a machine for energy conversion which includes two relatively movable parts defining a working chamber provided with inlets and outlets for a working medium, and in which both of said parts have members extending into said working chamber and serving as pistons and abutments respectively, said members being arranged to sealingly engage wall portions of the opposed and cooperating parts defining the working chamber, and at least said member or members of said one part are operative to permit passage of the member or members of the other part by being displaced transversely of the direction of relative movement, thus reducing its transverse area, the improvement that both of said members of said two

relatively movable parts extend into the working chamber, divide the same and sealingly engage the wall portions defining said chamber, said members each include a number of juxtaposed elements engaging each other and/or the wall portions of the chamber in a sealing fashion, wherein each of said elements includes a pair of thin plate portions of resilient material engaging each other along at least one edge transverse to the direction of relative movement and wherein said

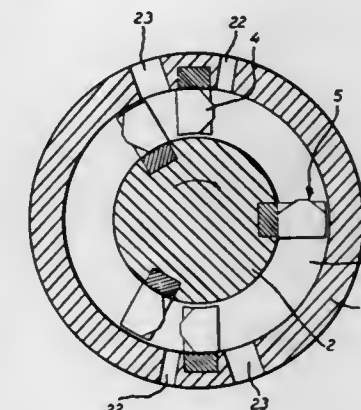


plate portions in un-biased position diverge from the engaging edge and sealingly engage flank surfaces of adjoining elements of same member and/or chamber wall portion facing such flank surface, and in biased position, upon meeting cooperating elements of said member of the opposed part, being flexed towards each other, thus allowing the likewise flexed plate portions of said elements of said opposed part member to pass through.

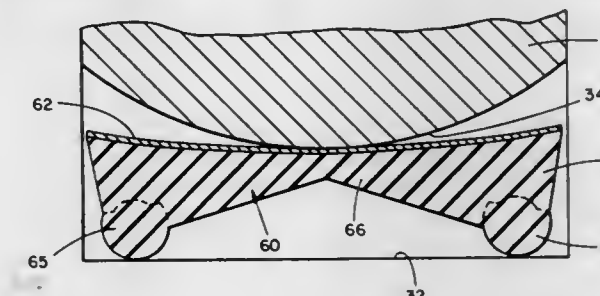
4,012,183

**ROTARY VANE COMPRESSOR WITH VANE EXTENSION MEANS**

Peter Trent Calabretta, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 9, 1975, Ser. No. 639,030

Int. Cl.<sup>2</sup> F01C 1/00; F04C 17/00; F16F 3/10  
U.S. Cl. 418—238 3 Claims



- In a rotary compressor of the type including a cylindrical rotor having a plurality of extensible vanes received in complementary vane slots, the improvement comprising: means defining a convex edge on the radially inner portion of said vanes, and a resilient element engageable with said convex edge, said resilient element comprising a metal spring member and an elastomeric member bonded thereto having an intermediate section normally spaced from the bottom of said vane slots and adapted to flex downwardly upon engagement by said vane, said resilient element being sufficiently rigid to prevent collapse thereof in response to increased centrifugal forces.

4,012,184

**FORTUNE COOKIE MACHINE**

Kwok Chuen Ma, 144 Hester St., New York, N.Y. 10013

Filed May 21, 1975, Ser. No. 579,346

Int. Cl.<sup>2</sup> B29D 23/03

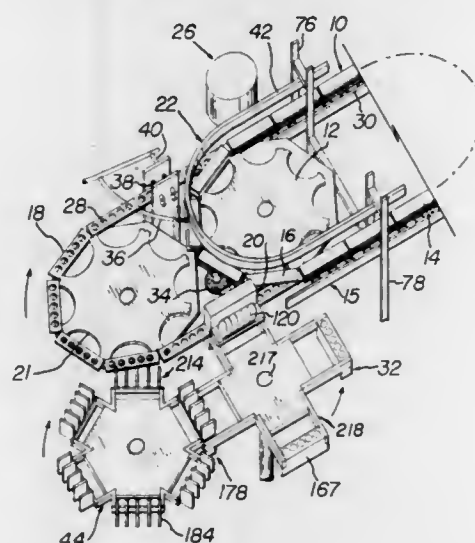
U.S. Cl. 425—112

9 Claims

- Fortune cookie making apparatus comprising a plurality of pivotally connected carriers arranged in a first endless



closed loop, first drive means operable engageable with said carriers to move the carriers about said first closed loop, each of said carriers comprising a bottom plate and a top plate, means pivotally mounting said top plate on said bottom plate to provide for raising of said top plate relative to said bottom plate, engageable means on said carrier, lift means disposed along a section of said first closed loop and being operably engaged by said lift means to raise said top plate relative to said bottom plate, a plurality of pivotally connected intermediate plates arranged in a second endless closed loop, second drive means operably engageable with said intermediate plates to move the intermediate plates about said second loop, a first portion of said first closed loop being coincident with a first portion of said second closed loop such that said intermediate plates are disposed between respective top and bottom plates of said carriers along said first portions of said first and second



closed loops, said second closed loop having a second portion defining a path of travel for said intermediate plates which is different from the path of travel of said carriers about said first closed loop, said intermediate plates having mold openings for receiving dough, feeding means fixedly disposed adjacent said second loop for feeding dough to said mold openings in said intermediate plates, paper feeding means disposed adjacent said second closed loop for depositing a length of paper on the cookie in said mold opening, an actuating wheel disposed adjacent said second closed loop, first folding means mounted on said actuating wheel and operable to receive said cookie from said mold openings and fold the cookie along two parallel fold lines, an operating wheel disposed adjacent to said actuating wheel, and second folding means mounted on said operating wheel and operable to receive said cookie from said first folding means and to effect a second fold on said cookie to thereby form a fortune cookie.

4,012,185

## CONFECTION MAKING MACHINE

William M. Poore, Huntington Beach, and Herbert W. Hecken-dorf, Upland, both of Calif., assignors to Frosty-Bite Confections, Huntington Beach, Calif.

Filed Jan. 8, 1973, Ser. No. 322,084

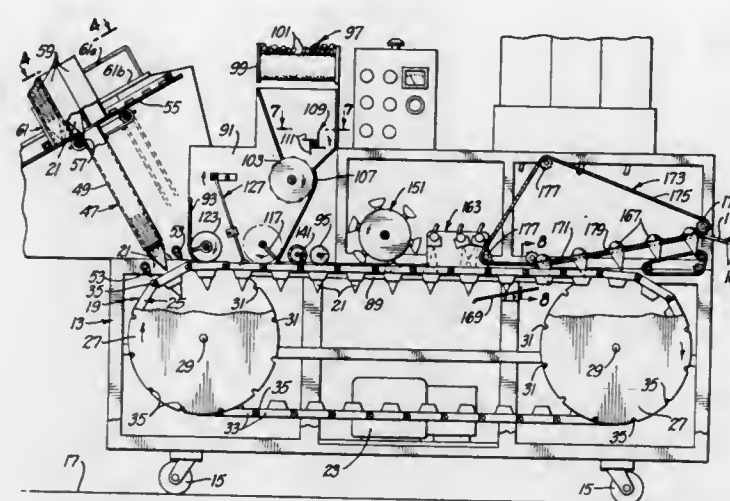
Int. Cl.<sup>2</sup> A23G 9/08, 9/28

U.S. Cl. 425—120

16 Claims

1. A machine for making a confection including an open top container and ice fragments, said machine comprising:  
a supporting structure;  
a conveyor mounted for movement on said supporting structure, said conveyor including a plurality of container mounts;  
means for moving said conveyor so that said container mounts are moved through a plurality of stations;  
first and second dams mounted on said supporting structure adjacent said conveyor, said dams being spaced from each other so that said conveyor conveys the containers from the first dam to the second dam;

means for delivering ice fragments to a location intermediate said dams;  
first means for moving the ice fragments from said location toward said first dam;  
each of said container mounts being adapted to hold one of the containers so that ice fragments can be deposited in



the containers from above while such container is intermediate said dams;  
compacting means intermediate said dams for compacting ice fragments in the containers between said dams; and  
shaping means for shaping at least an outer portion of the ice fragments in the containers, said conveyor moving the containers from the second dam to the shaping means.

4,012,186

## PANEL FORMING DEVICE

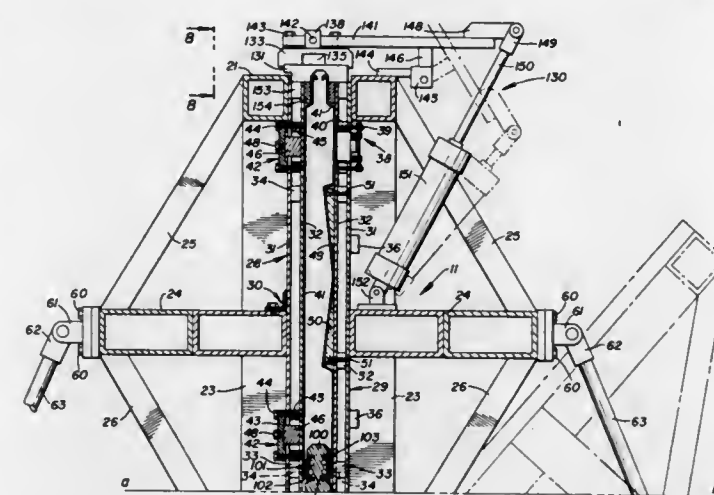
Dario J. Ramazzotti, Tallmadge; Geza A. Thiry, Ravenna, and James Genis, Clinton, all of Ohio, assignors to McNeil Corporation, Akron, Ohio

Filed Mar. 19, 1975, Ser. No. 560,094

Int. Cl.<sup>2</sup> B29D 27/04

U.S. Cl. 425—123

25 Claims



1. Apparatus for making panels having two sidewall forming skins and an insulation material therebetween comprising two mold platens, means selectively swinging each said mold platen about a common axis from an open position for loading the skins and unloading the panels to a closed position for receiving the insulation material, means selectively holding a skin on each said mold platen, core means extendable between said mold platens to close one end of the panel, nozzle means making multiple passes between the skins to dispense the insulation material between the skins, the first of said multiple passes dispensing the insulation material on said core means, and lid means activated during the last pass of said nozzle means to close the other end of the panel and to thereby form with the skins and said core means an enclosed cavity for the insulation material.

4,012,187

## INJECTION BLOW MOLDING WITH PRELIMINARY INJECTION BLOW MOLD

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Green Brook, N.J.

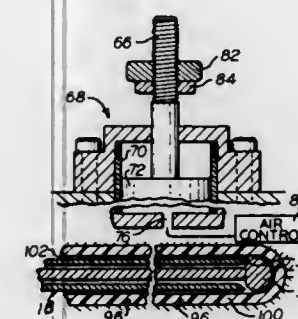
Continuation of Ser. No. 518,185, Oct. 25, 1974, abandoned.

This application Apr. 12, 1976, Ser. No. 676,108

Int. Cl.<sup>2</sup> B29C 17/07

U.S. Cl. 425—242 B

6 Claims



1. Injection blow molding apparatus including an injection mold, a blowing mold, core rods to which a parison is applied in the injection mold, a core rod indexing support movable to transfer the core rods from the injection mold to the blowing mold, each of the core rods having a valve operable to control flow of air from within the core rod to the inside surface of the parison to blow the parison, means for operating the core rod valves when the core rods are located in the blowing mold, and means for operating the core rod valves when the core rods are in the injection mold so as to partially expand the parison into contact with the injection mold and spaced from the core rod, means operable to suck back thermoplastic from the injection mold after injection molding, and said means for operating the core rod valves at the injection mold provides air to the inside of the parison after said means to suck back thermoplastic material from the injection mold is actuated so that a negative pressure is applied to the outside of the parison, and a positive pressure is applied to the inside of the parison in the injection mold to provide the partially expanded parison, whereby said indexing support is operable to transfer the partially expanded parison from the injection mold to the blowing mold for final blowing.

4,012,188

## PRESSURE FORMING APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 170,625, Aug. 10, 1971, which is a continuation-in-part of Ser. No. 813,804, March 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 501,174, Oct. 22, 1965, abandoned, which is a

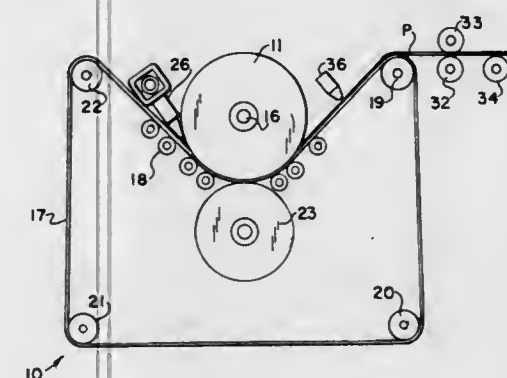
continuation-in-part of Ser. No. 393,292, Aug. 31, 1964, abandoned, and Ser. No. 559,232, Jan. 16, 1956, abandoned.

This application June 16, 1975, Ser. No. 587,532

Int. Cl.<sup>2</sup> B29C 15/00

U.S. Cl. 425—373

8 Claims



1. An apparatus for molding comprising:  
a first molding member including a cylindrical drum,  
means for rotationally supporting said drum for rotation about its longitudinal axis,

means for power rotating said drum,  
a second molding means having a cylindrical surface conforming to the cylindrical surface of said drum,  
means for supporting said second molding means with said cylindrical surface thereof disposed a distance away from a substantial portion of the cylindrical surface of said drum to provide an annular volume between said second molding means and said cylindrical surface of said drum, and  
means for sealing the longitudinal edge portions of said second molding means and said cylindrical surface of said drum,  
means for injecting a thermoplastic material in a plastic condition under pressure into said annular volume wherein said thermoplastic material is made to conform to said annular volume,  
means for solidifying a first portion of the material injected between the annular surface between said drum and said second molding means,  
said second molding means extending partially around said drum a sufficient distance to permit the molten thermoplastic material injected into said annular volume to solidify within said annular volume between said second molding means and said drum,  
means for retaining said molten thermoplastic material within said annular volume and preventing the flow of said molten material laterally outwardly from said annular volume as it is injected therein by said injection means until it is at least solidified therein, and  
means located beyond the end of said second molding means and the annular volume defined by said second molding means and the cylindrical surface of said drum for guiding the solidified shape formed of said thermoplastic material in said annular volume away from said drum.

4,012,189

## HOT GAS GENERATOR

Alfred Vogt, Schaan, Liechtenstein, and Hans Mueller, Wartau-Weite, Switzerland, assignors to Interliz Anstalt, Vaduz, Liechtenstein

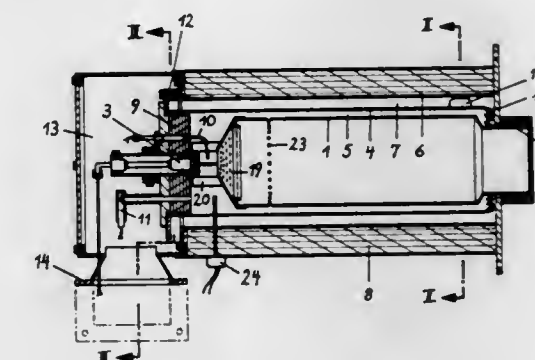
Filed Nov. 13, 1975, Ser. No. 631,545

Claims priority, application Germany, Dec. 7, 1974, 2457963

Int. Cl.<sup>2</sup> F23D 15/02

U.S. Cl. 431—353

6 Claims



1. A hot gas generator for the production of hot combustion gases from liquid fuel comprising a cylindrical combustion chamber, an inner air-feed cylinder concentrically disposed about said cylindrical combustion chamber, an inner air conduit between said cylindrical combustion chamber and said inner air-feed cylinder, an outer air-feed cylinder concentrically disposed about said inner air-feed cylinder, an outer air conduit between said inner and outer air-feed cylinders, fuel nozzle means arranged at one longitudinal end of said cylindrical combustion chamber, an exhaust port arranged at the opposite longitudinal end of said cylindrical combustion chamber, said inner and outer air conduits communicating with one another at the exhaust end of said cylindrical com-



bustion chamber, guide means disposed on one longitudinal end of said inner air-feed cylinder for imparting a rotary motion to the air passing into said inner air-feed cylinder from said outer air-feed cylinder, said inner air conduit and the inside of said cylindrical combustion chamber communicating with one another at the end of the cylindrical combustion chamber on which the fuel nozzle means is arranged, said outer air conduit receiving combustion air from a blower or the like, a baffle plate disposed on the longitudinal end of said cylindrical combustion chamber on which the fuel nozzle means is arranged, said baffle plate having a central opening for the introduction of fuel from said fuel nozzle means, said baffle plate having a plurality of opening means for combustion air to pass from said inner air conduit to the inside of said cylindrical combustion chamber, said opening means imparting a rotary motion to the air passing into said cylindrical combustion chamber, said latter rotary motion being imparted to the air relative to the longitudinal axis of said cylindrical combustion chamber.

4,012,190

## ANNEALING LEHR

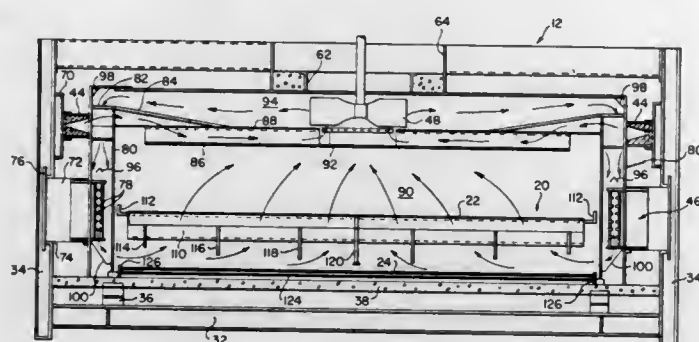
Charles E. Dicks, Uniontown, and Clifford O. Burton, Perryopolis, both of Pa., assignors to E. W. Bowman Incorporated, Uniontown, Pa.

Filed Sept. 15, 1975, Ser. No. 613,203

Int. Cl.<sup>2</sup> F27B 9/00

U.S. Cl. 432

16 Claims



1. An annealing Lehr comprised of a plurality of heating section serially arranged to form a continuous treating chamber through which the ware passes during the annealing operation; an endless foraminous conveyor belt for supporting the ware to be annealed, and means for supporting both the charging and return flights of said belt within said treating chamber, comprising an upper skid frame for supporting the charging flight of said belt and a lower skid frame positioned adjacent the bottom of said treating chamber for supporting the return flight of said belt; a circulating chamber including a top portion at the top of each treating chamber and a down duct portion at each side of said treating chamber, said down duct terminating below said conveyor belt to permit treating gases to pass upwardly through said belt and over said ware; a circulating fan mounted in the top portion of said circulating cham-

ber and communicating with the top of said treating chamber for recirculating the treating gases which have passed over said ware, and electrical heating means mounted in and spaced from the walls of said down ducts at each side of the Lehr generally laterally adjacent the charging flight of said conveyor, said treating gases circulated by said fan passing downwardly through said down ducts, over said electrical heating means and upwardly through said conveyor and over said ware supported thereon.

4,012,191

## SYSTEM FOR RECOVERING HEAT FROM THE EXHAUST GASES OF A HEAT GENERATOR

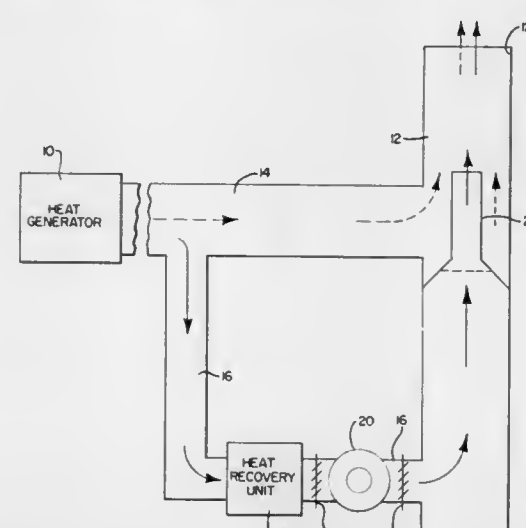
Jerome Richard Lisankie, Morris Plains, and George Kratsios, Verona, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed June 18, 1975, Ser. No. 588,076

Int. Cl.<sup>2</sup> F28F 1/10

U.S. Cl. 432-179

4 Claims



1. A system for recovering heat from the exhaust gases of a heat generator, comprising a discharge stack, first conduit means connecting said heat generator to said discharge stack, fan means to force said gases from said heat generator through said first conduit means to said discharge stack, a heat recovery unit connected to said first conduit means for removing heat from said gases before passage to said discharge stack, an inlet opening formed in said discharge stack at a location downstream from the connection between said first conduit means and said discharge stack, second conduit means connected to said heat generator and to said opening for providing an unobstructed direct passage between said heat generator and said discharge stack, and an inner stack disposed in said discharge stack and extending for the length of said opening in a spaced relation thereto for isolating the gases from said first conduit means from the gases from said second conduit means during the flow of said gases through said discharge stack and passed said opening.

## CHEMICAL

4,012,192

## OXIDATION OF VAT OR SULFUR DYES WITH VANADATE ACTIVATED BROMATE OR IODATE

Richard L. Doerr, Orange, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 468,703, May 10, 1974, Pat. No. 3,944,382. This application Nov. 24, 1975, Ser. No. 634,795

Int. Cl.<sup>2</sup> C09B 9/00

U.S. Cl. 8-34

5 Claims

1. In a process for oxidizing vat or sulfur dyes present in reduced form on cotton or regenerated cellulose textile fibers by contacting said dye with an aqueous oxidant solution, the improvement wherein said aqueous oxidant solution consists essentially of

- 0.01-10% of an oxidizing agent comprising an alkali metal, alkaline earth metal or ammonium bromate or iodate and
- 0.005 to 5% by weight of an alkali metal, alkaline earth metal or ammonium vanadate and wherein at least one of (a) and (b) is an alkaline earth metal,
- the remainder water.

4,012,193

## BISAZOMETHINE DYES FOR METAL-MODIFIED POLYOLEFINS

Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

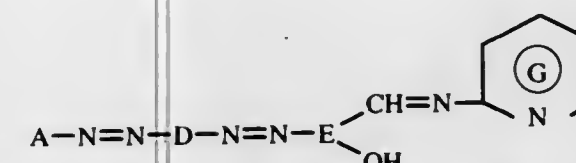
Filed Sept. 2, 1975, Ser. No. 609,682

Int. Cl.<sup>2</sup> C09B 31/14, 45/48

U.S. Cl. 8-42 D

10 Claims

1. A bisazomethine dye of the formula



wherein:

- A is a benzene or naphthalene nucleus, the benzene nucleus being unsubstituted or substituted with up to 3 substituents and the naphthalene nucleus being unsubstituted or substituted with up to 2 substituents, said substituents being independently selected from alkyl of 1-4 carbons; alkoxy of 1-4 carbons; nitro; cyano; fluorine; chlorine; bromine; trifluoromethyl; hydroxyl; RCOO—, where R is alkyl of 1-4 carbons; carboxyl; ROO—, where R is alkyl of 1-4 carbons; RCO—, where R is alkyl of 1-4 carbons; benzoyl; RCONH—, where R is alkyl of 1-4 carbons; ArCONH—, where Ar is phenyl; or carbamyl, the nitrogen of which is unsubstituted or singly or doubly substituted with alkyl of 1-4 carbons;
- D is a benzene or naphthalene nucleus, the benzene nucleus being unsubstituted or substituted with up to 2 substituents and the naphthalene nucleus being unsubstituted or substituted with up to 2 substituents, said substituents being independently selected from alkyl of 1-4 carbons; alkoxy of 1-4 carbons; —OCH<sub>2</sub>CH<sub>2</sub>OH; —OCH<sub>2</sub>CH<sub>2</sub>CN; chlorine or bromine;
- E is a salicylaldehyde or an o-hydroxy-naphthaldehyde nucleus each nucleus being unsubstituted or substituted with up to 2 substituents independently selected from alkyl of 1-4 carbons; alkoxy of 1-4 carbons; cyano; fluorine; chlorine or bromine; and
- G is a 2-aminopyridine nucleus which is unsubstituted or substituted with up to 2 substituents independently selected from alkyl of 1-4 carbons; alkoxy of 1-4 carbons; nitro; chlorine or bromine.

4,012,194

## EXTRACTION AND CLEANING PROCESSES

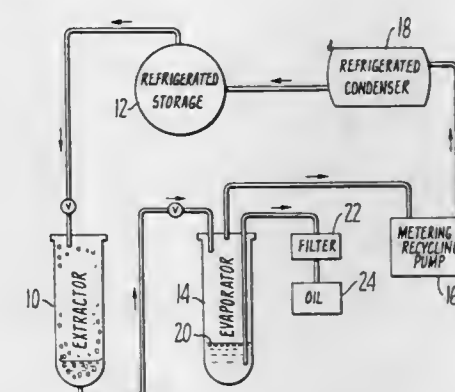
Raymond L. Maffei, 639 Front St., San Francisco, Calif. 94111

Continuation of Ser. No. 186,089, Oct. 4, 1971, abandoned. This application Aug. 2, 1973, Ser. No. 384,908

Int. Cl.<sup>2</sup> D06L 1/02

U.S. Cl. 8-142

1 Claim



1. A garment cleaning process consisting essentially of passing liquid carbon dioxide through garments to be cleaned by placing the garments within a closed container and admitting liquid carbon dioxide into the container from a refrigerated storage container, transferring the liquid carbon dioxide from the container to an evaporator, removing the dissolved garment soil material from the carbon dioxide by converting the liquid carbon dioxide to gaseous carbon dioxide in the evaporator, collecting the garment soil material in the evaporator and discarding it, and transferring carbon dioxide from the evaporator to a refrigerated condenser and then to the refrigerated storage container.

4,012,195

## CATALYZED HYDRAZINE COMPOUND CORROSION INHIBITING COMPOSITION AND USE

Manfred G. Noack, Northford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 21, 1975, Ser. No. 606,550

Int. Cl.<sup>2</sup> C23F 11/00, 11/12, 11/14

U.S. Cl. 21-2.7 R

24 Claims

1. A composition, comprising:

- a hydrazine compound; and
- about 0.002 parts to about 0.04 parts by weight of an organo metallic complex per part of hydrazine compound, said organometallic complex being the reaction product of: (i) an inorganic salt selected from the group consisting of salts of cobalt, manganese and copper; and (ii) one or more organic ligands selected from the group consisting of unsubstituted and substituted orthodiamino aromatic compounds, unsubstituted and substituted orthodihydroxy aromatic compounds and unsubstituted and substituted orthoaminohydroxy aromatic compounds.

4,012,196

## COLORIMETRIC METHOD FOR DETERMINING TOTAL LIPIDS IN HUMAN FLUIDS

Christopher S. Frings; Ted W. Fendley, both of Birmingham, Ala., and Ralph T. Dunn, Tampa, Fla., assignors to Damon Corporation, Needham Heights, Mass.

Continuation of Ser. No. 372,267, June 21, 1973, abandoned.

This application May 19, 1975, Ser. No. 578,726

Int. Cl.<sup>2</sup> G01N 33/16, 21/02

U.S. Cl. 23-230 B

8 Claims

1. A process for determining total lipid concentration in an animal fluid containing at least 1 mg. lipids per ml. which comprises:

- reacting a sample of the animal fluid with sulfuric acid in a container;
- subsequently adding directly to the animal fluid-sulfuric acid reaction product in said container, a phospho-vanillin reagent comprising—



an aqueous solution of vanillin and phosphoric acid having a mole ratio of vanillin to phosphoric acid between  $1.12 \times 10^{-3}$  and  $2.08 \times 10^{-3}$  to form a chromogen without transferring a specific volume of the sulfuric acid-animal fluid mixture to a second container prior to adding the phospho-vanillin reagent, the mole ratio of phosphoric acid to sulfuric acid added to the animal fluid being between 9.5 and 55.5; and,

c. measuring the light absorbance of said chromogen, the concentration of total lipids being determined from the measurement of light absorbance of said chromogen, said mole ratio of vanillin to phosphoric acid and said mole ratio of phosphoric acid to sulfuric acid enabling the addition of the phospho-vanillin reagent directly to the animal fluid-sulfuric acid reaction product and eliminating the necessity of transferring a specific volume of sulfuric acid-animal fluid mixture to a second container prior to adding the phospho-vanillin reagent.

4,012,197

# TITRATION APPARATUS AND METHOD THEREFOR

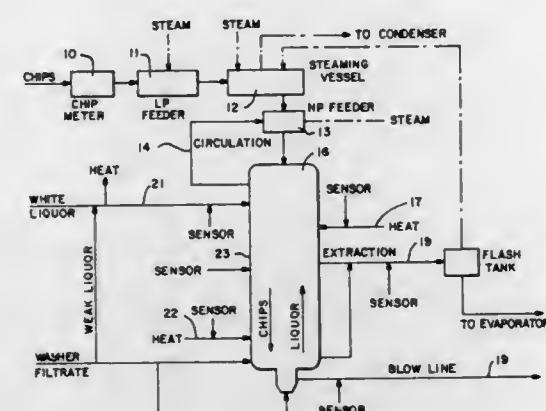
John J. Howarth, Monte Sereno, Calif., assignor to Measurex Corporation, Cupertino, Calif.

Filed Nov. 7, 1975, Ser. No. 629,859

Int. Cl.<sup>2</sup> G01N 31/16; D21C 3/24

U.S. Cl. 23—230 A

14 Claims



13. A method for the on-line measurement of the concentration of an analyte in a container within a reaction system having severe ambient conditions and having a sample vessel suspended inside said container from a wall comprising the following steps: trapping said analyte in said sample vessel; thereafter injecting a titrant into said sample vessel; isolating from said sample vessel from the other analyte in said reaction system during said titrant injection; and sensing an abrupt change in conductivity of said analyte in said sample vessel during injection of said titrant; and purging said sample vessel.

4,012,198

# IMMUNODIFFUSION DEVICE

Norman Boyne Finter, Sevenoaks; Leonard William Jerome Bishop, Beaconsfield, and June Dalziel Almeida, London, all of England, assignors to Burroughs Wellcome Co., Raleigh, N.C.

Continuation of Ser. No. 381,228, July 20, 1973, abandoned.

This application Feb. 27, 1975, Ser. No. 553,692

Claims priority, application United Kingdom, July 25, 1972, 34643/72

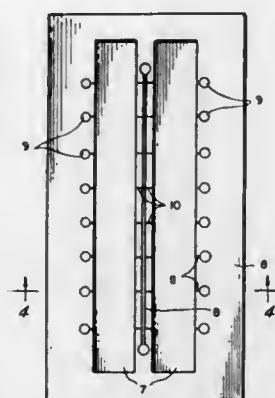
Int. Cl.<sup>2</sup> G01N 31/02

U.S. Cl. 23—253 R

1 Claim

1. A device suitable for use in carrying out immunodiffusion comprising a container having a base wall and side walls, said walls defining therebetween two parallel troughs for accommodating a substrate, a slit in the body of the container extending between said two troughs, a plurality of channels extending from said slit to said troughs, and a plurality of wells and conduits located in the side walls of said container corresponding to each of said channels whereby an immunological

reagent placed in said slit would diffuse into a substrate located in each of said troughs via a channel and combine in said



substrate with an homologous immunological reagent having diffused into said substrate from corresponding conduit and well.

4,012,199

# CHEMICAL REACTION AND PRODUCTION SYSTEMS WITH A SPECTRO-OPTICAL DIGITIZER

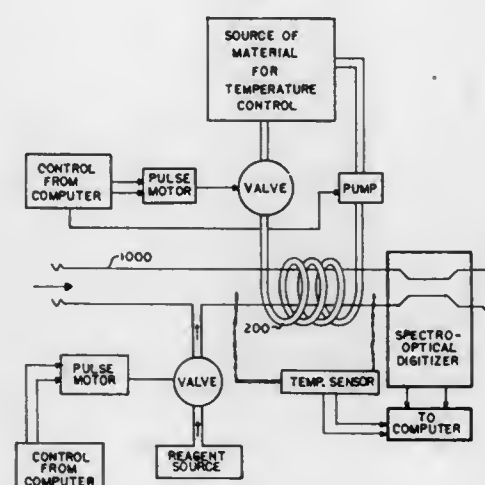
Paul P. Luger, Spokane, Wash., assignor to The Pioneer Educational Society, Portland, Oreg.

Continuation-in-part of Ser. Nos. 32,578, April 28, 1970, Pat. No. 3,875,410, and Ser. No. 238,574, March 27, 1972, Pat. No. 3,999,063, and Ser. No. 404,180, April 9, 1972, Pat. No. 3,998,644, and Ser. No. 563,158, March 28, 1975. This application Sept. 4, 1975, Ser. No. 610,190

Int. Cl.<sup>2</sup> G01D 5/34; G01N 21/28

U.S. Cl. 23—253 A

26 Claims



1. In a chemical, reaction production system,
  - a. reagent material,
  - b. a reaction product A at a molecular concentration to be measured and controlled,
  - c. a sensing device called a spectro-optical digitizer comprised of:
    1. a first source of electromagnetic flux,
    2. a phototube-amplifier arrangement,
    3. the cathode of said phototube-amplifier arranged to receive spectral lines produced by said first source of electromagnetic flux in said chemical reaction production system due to the presence of said reaction product A in said reagent material.
  - d. a variable speed motor driven by the output signal from said phototube-amplifier arrangement,
  - e. a light chopper comprised of the following: a mask containing an optical aperture, an arm carried on a rotating shaft, a second source of electromagnetic flux, a phototransducer assemblage arranged to be illuminated by said optical aperture, which said optical aperture is illuminated by said second source of electromagnetic flux,

6. said variable speed motor being connected to drive said rotating shaft,
7. said rotating arm so arranged to impede said second source of electromagnetic flux from reaching said optical-aperture, during a portion of the path of motion of said arm, thus generating a signal in said phototransducer,
8. a counter-timer arrangement connected to said phototransducer assemblage to produce time interval value measurements between said signals or groups of signals,
- d. said first source of electromagnetic flux and said phototube-amplifier arrangement of said sensing device being so arranged in respect to said chemical reaction production system as to be responsive to change in said molecular concentration of said reaction product A.
- e. a control device for said chemical reaction production system capable of changing said molecular concentration,
- f. a linkage between said sensing device and said control device capable of maintaining control over said control device responsive to said time interval value measurements obtained from said sensing device.

4,012,200

# APPARATUS FOR REMOVING LIQUID FROM THE INSIDE OF A TEST TUBE

Jan de Leeuw, Akersberga, Sweden, assignor to AutoChem Instrument Aktiebolag, Bromma, Sweden

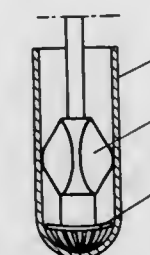
Filed Feb. 12, 1976, Ser. No. 657,690

Claims priority, application Sweden, Feb. 24, 1975, 7502005

Int. Cl.<sup>2</sup> B01L 11/00; B08B 5/04, 9/00

U.S. Cl. 23—259

3 Claims



1. Apparatus for removing liquid from the inside of a test tube, the apparatus comprising an evacuation tube connected to a vacuum source and means connected to the evacuation tube having a diameter greater than the outer diameter of the evacuation tube, characterized in that said means is constituted by an elastic plate arranged at the end of the tube, the plate having a diameter slightly smaller than the inner diameter of the test tube, a centering means arranged on the evacuation tube to provide a uniform annular slot between the plate and the inner wall of the test tube, the lower side of the plate being provided with radial grooves, the elasticity of the plate being such that when pressed against the bottom of a test tube the grooves and the bottom of the test tube will form channels in communication with the evacuation tube.

4,012,201

# REACTOR

Stanley Powell, Stockton-on-Tees, and Glyn Thomas, Middlesbrough, both of England, assignors to Tioxide Group Limited, Billingham, England

Division of Ser. No. 441,941, Feb. 13, 1974. This application Oct. 23, 1974, Ser. No. 517,394

Claims priority, application United Kingdom, Mar. 22, 1973, 13752/73

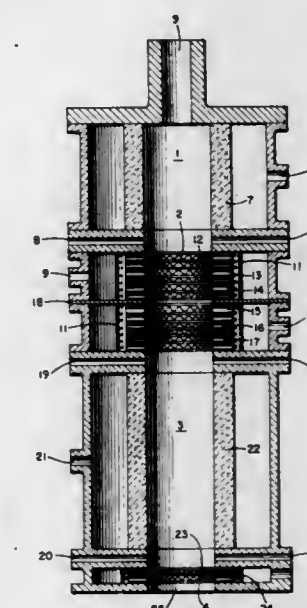
Int. Cl.<sup>2</sup> C01G 23/04; B05B 11/14; F23D 11/12

U.S. Cl. 23—277 R

16 Claims

1. In a reactor suitable for reacting a metal halide vapor and

an oxidizing gas at an elevated temperature to produce the corresponding metal oxide, said reactor comprising an inlet port at one end of said reactor for introducing hot gas thereinto, an outlet port at the opposite end of said reactor for removing reaction products therefrom and a reaction section in said reactor between said inlet port and said outlet port, the improvement comprising the side walls of said reaction section comprising a plurality of crimped annular plates separated by uncrimped annular plates, said crimped and uncrimped annular plates being disposed generally perpendicular to the longitudinal axis of said reaction section, the crimps of said crimped annular plates being generally radially directed with respect to the longitudinal axis of said reaction



section, whereby generally radially extending orifices through said reaction section side walls are formed between adjacent crimped annular plates and uncrimped annular plates; said reactor further comprising means for introducing at least one reactant radially inwardly through said orifices into the interior of said reaction section and means surrounding said reaction section walls for facilitating uniform introduction of reactants through said orifices; the openings of said orifices through the radially inner and outer surfaces of said reaction section side walls being distributed in a substantially continuous manner around the circumference of the side walls whereby the introduction of reactant gas through said side walls into the reaction section is effected substantially uniformly around the circumference of the reaction section.

4,012,202

# PYROSCRUBBER

Henry James Byrne, Two Mountains; Raman Radha Sood, and David Michael Stokes, both of Arvida, all of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Apr. 2, 1975, Ser. No. 564,531

Claims priority, application United Kingdom, Apr. 3, 1974, 14886/74

Int. Cl.<sup>2</sup> C10B 11/10; F23G 7/06

U.S. Cl. 23—277 C

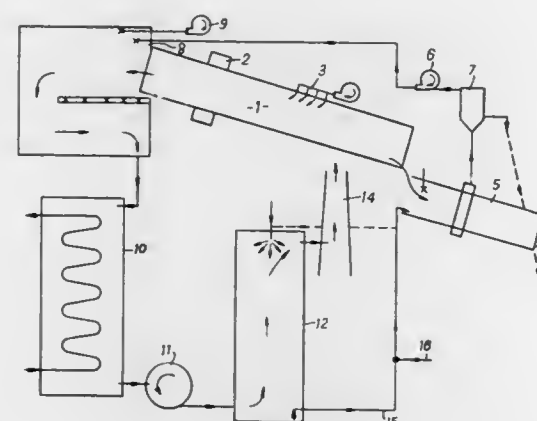
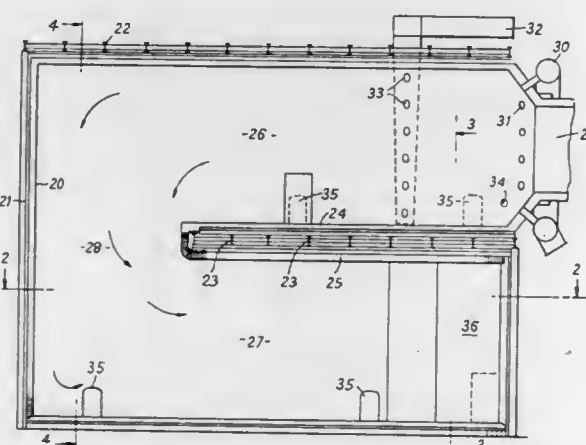
4 Claims

1. A pyroscrubber device for removal and combustion of coarse, dense coke particles entrained in a stream of waste gas from a coke calcining furnace, comprising:

- a. structure, including wall members, defining
  - i. an elongated, U-shaped refractory-lined combustion chamber comprising a substantially rectangular upper passage and a substantially rectangular lower passage disposed under said upper passage,
  - ii. a relatively large waste gas inlet disposed at one end of said upper passage for directing a stream of waste gas from the coke calcining furnace substantially along the center of the upper passage,



- iii. a plurality of relatively small air inlet orifices arranged symmetrically about said waste gas inlet for directing jets of air obliquely toward the center of said upper passage to effect thorough mixing of air with the waste gas in a zone of the upper passage near the waste gas inlet and to propel the waste gas along the upper passage;
  - iv. a gas outlet in a vertical side wall and close to the end of the lower passage proximate to said one end of said upper passage;
  - v. a stack for discharge of waste gas to atmosphere;
  - vi. structure defining a passage for conducting waste gas from said gas outlet to said stack; and
  - vii. gas flow control means in said passage for controlling flue draught in said stack;
- b. means for supplying air under pressure to said air inlet orifices; and

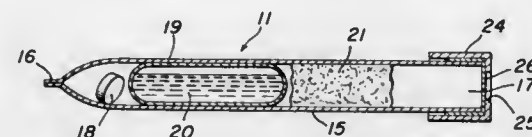


- c. means for receiving waste gas from the coke calcining furnace and introducing the waste gas into said waste gas inlet;
- d. said upper passage communicating with said lower passage at the end of said upper passage opposite to said waste gas inlet for causing gas passing from the upper passage to the lower passage to undergo reversal in flow direction and consequent slip of entrained solid, dense coke particles in relation to the admixed air to accelerate combustion of the particles; and
- e. said upper and lower passages presenting a substantially unrestricted path for flow of waste gas therethrough and said gas undergoing a further substantial change in flow direction in passing from said lower passage to said outlet to promote further slip of said particles.

**4,012,203**  
**GAS GENERATING APPARATUS FOR USE WITH CULTURE TRANSPORT AND STORAGE**  
 Charles Eugene Rosiere, East Aurora, N.Y., assignor to Marion Laboratories, Inc., Kansas City, Mo.  
 Filed Jan. 30, 1976, Ser. No. 654,027  
 Int. Cl.<sup>2</sup> B01J 7/02

U.S. Cl. 23-282

7 Claims



1. A gas generating apparatus comprising:  
 an elongated flexible tube closed at one end and having an opening at the other end,  
 a carbon dioxide generating material in the tube,  
 an ampoule in the tube containing a liquid which is reactive with the carbon dioxide generating material to produce carbon dioxide, said ampoule being rupturable by squeezing the outside of the tube to free the liquid to contact the carbon dioxide generating material, and  
 a plug located in the tube between the ampoule and the opening in the tube which prevents liquid from flowing from the tube after the ampoule is opened but which permits flow of the carbon dioxide gas generated in the tube out of the opening.

**4,012,204**  
**ALUMINUM ALLOY REINFORCED WITH ALUMINA FIBERS AND LITHIUM WETTING AGENT**  
 Paul Gordon Riewald; William Henry Krueger, and Ashok Kumar Dhinra, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
 Continuation-in-part of Ser. No. 522,881, Nov. 11, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,356  
 Int. Cl.<sup>2</sup> C22C 1/09

U.S. Cl. 29-191.2

22 Claims

1. A composite reinforced with 10-80 volume percent of polycrystalline alumina fibers and having a matrix of an aluminum alloy containing about 0.5-5.5% by weight of lithium in which the fibers have a reaction sheath of a thickness less than 15% of the total fiber diameter and the composite has a porosity of less than about 10%.

**4,012,205**  
**THICKENED HYDROCARBON FUELS**  
 Leonard Cohen, Bel Air, Md., and William J. Connick, Jr., New Orleans, La., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 5, 1966, Ser. No. 519,171

Int. Cl.<sup>2</sup> C10L 7/00, 7/02

U.S. Cl. 44-7 C

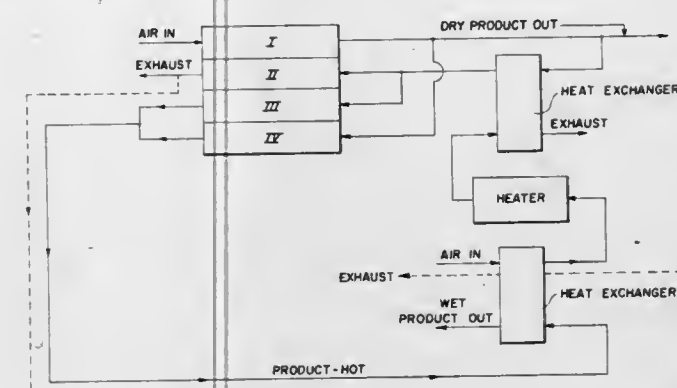
8 Claims

1. A composition of matter consisting essentially of a combustible liquid hydrocarbon and a reaction product of tolylene diisocyanate with a member of the group consisting of:  
 a. a mixture comprising a member of the group consisting of oleylamine and linoleylamine with the bis(3-amino-propylamino) derivatives of dimerized linoleyl acid,  
 b. a mixture comprising a member of the group consisting of oleylamine and linoleylamine with a member of the group consisting of 1,4-di(aminomethyl) cyclohexane and methane diamine,  
 c. a mixture of  $\beta$ -amino derivatives of 15-20 carbon n-alkanes.

**4,012,206**  
**AIR CLEANING ADSORPTION PROCESS**  
 Robert A. Macriss, Deerfield; William F. Rush, Arlington Heights, and Sanford A. Weil, Chicago, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.  
 Continuation-in-part of Ser. No. 314,400, Dec. 2, 1972, Pat. No. 3,844,737, which is a continuation-in-part of Ser. No. 24,373, March 31, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,784  
 Int. Cl.<sup>2</sup> B01D 53/06

U.S. Cl. 55-34

7 Claims



1. A process for air cleaning by the removal of water and one or more undesired gaseous components selected from the group consisting of  $\text{NO}_x$ ,  $\text{SO}_x$  and  $\text{CO}_2$  by a continuously adsorbing and regenerating of the adsorbent body, atmospheric pressure and low pressure drop process comprising the steps:

continuously passing air to be treated through an adsorbent body consisting essentially of thin sheets or layers of fibrous material containing about 10% to about 90% by weight of a finely divided crystalline molecular sieve material for a time sufficient to permit the molecular sieve material to adsorb the  $\text{NO}_x$ ,  $\text{SO}_x$  and  $\text{CO}_2$  from said air to an acceptable pollutant level and removing dry and clean product air in a first phase; and  
 regenerating said adsorbent body by continuously passing countercurrent to the treatment air through said adsorbent body in a second phase a portion of the dry and clean product air heated to a temperature of more than about 300° F. removing the pollutants from said adsorptive body and then passing a portion of the dry and clean product air countercurrently through said adsorbent body in a third phase until the desired amount of moisture is removed and the adsorbent body cooled for recycle of the adsorbent body to the first phase.

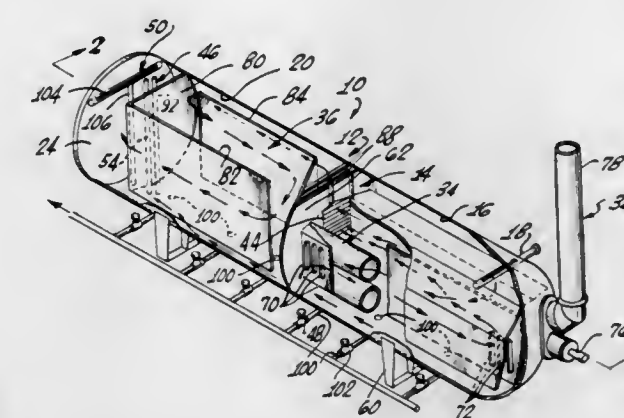
**4,012,207**  
**EMULSION TREATER**  
 Jeffrey A. Jones, Taft, Calif., assignor to Chanslor-Western Oil and Development Company, Santa Fe Springs, Calif.  
 Filed Apr. 5, 1976, Ser. No. 673,588  
 Int. Cl.<sup>2</sup> B01D 19/00

U.S. Cl. 55-174

22 Claims

1. An emulsion treater for oil/water emulsion, such as oil well production, comprising:  
 an elongate emulsion tank to be disposed in a normal position with its longitudinal axis generally horizontal, baffle means within said tank defining an emulsion heating chamber at one end of the tank having an emulsion inlet to said chamber, an emulsion settling chamber at the other end of the tank, and an emulsion flow path for conducting emulsion from said inlet to an oil recovery zone in said settling chamber,  
 said flow path including a horizontally folded, generally sinuous portion in said heating chamber comprising successive normally generally horizontal segments of said flow path forming emulsion preheating, direct heating, and post heating zones respectively, disposed in parallel, horizontally side by side heat transfer relation with each

direct heating zone located between a preheating zone and a post heating zone and communicating at one end to the adjacent end of the preheating zone and at the other end to the adjacent end of the post heating zone, and said flow path further including a normally, generally horizontal portion in said settling chamber forming an emulsion settling zone,

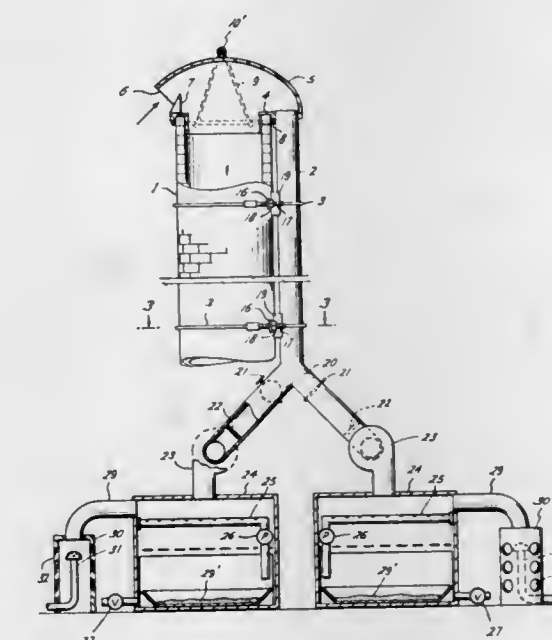


emulsion heating means within each direct heating zone, vapor removal means for exhausting vapor from the top of said zones,  
 water removal means for draining water from the bottom of said zones, and  
 oil removal means for extracting oil from an intermediate level of said oil recovery zone.

**4,012,208**  
**ANTI-POLLUTION UNIT FOR ATTACHMENT ON SMOKE STACKS, AND THE METHOD OF REDUCING SMOKE STACK POLLUTION**  
 Lawrence E. Arnim, and Lawrence E. Arnim, Jr., both of 516 W. Main St., Houston, Tex. 77006  
 Filed Aug. 20, 1975, Ser. No. 606,178  
 Int. Cl.<sup>2</sup> B01D 47/06

U.S. Cl. 55-223

6 Claims



1. In an anti-pollution device for attachment to smoke stacks, a crown formed to be detachably mounted on the top of a smoke stack and to extend over and above the top of the stack, a supporting harness on said crown having an adjustable horizontal cable around said crown at its juncture with the stack, and adjustable cross cables extending from said horizontal cable to a ring mounted in the outside top wall of the crown at its vertical axis, said crown having an opening into the ambient atmosphere, said opening forming a lateral air inlet in said crown and a conduit leading from and in flow connection with said crown and mounted in parallel relation



with said stack, a baffle in said crown directing a flow of air across the top of the stack and into said conduit, said conduit terminating in a dual connection, each leg of said dual connection having a fan mounted therein adapted to selectively form an air stream through said crown and conduit when said stack is in operation, entraining the emission from the stack, and each leg terminating in an independent housing, means for maintaining a water spray in each of said housings through which said stack emission is selectively passed, and means for discharging the washed gas from said chamber.

4,012,209

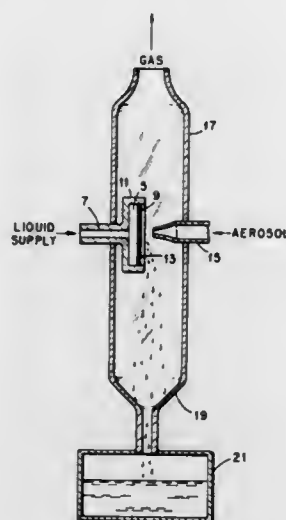
**LIQUID FILM TARGET IMPINGEMENT SCRUBBER**  
William J. McDowell, Knoxville, and Charles F. Coleman, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 5, 1976, Ser. No. 674,200

Int. Cl.<sup>2</sup> B01D 47/00

U.S. Cl. 55—240

4 Claims



1. In an impingement separator for removing particulates from an aerosol including an impingement chamber having a gas inlet and a gas outlet spaced therefrom, a nozzle provided in said gas inlet for jetting said aerosol onto a liquid film covered target for collection of said particulates from the aerosol jet by said liquid film, the improvement comprising:

- a container spaced from the gas inlet and gas outlet and having a liquid inlet connected to a liquid supply and containing a pressurized liquid;
- at least one liquid-permeable impact target covering an outlet of the container in liquid communication with said container on an inner surface thereof so that a film of said liquid is present over the outer surface of said target formed by said liquid exuding through said target, said target outer surface being disposed confronting said aerosol jet nozzle; and
- liquid-receiving means in said chamber for receiving said liquid exuded through said target so that said particles collected by said liquid film are continuously removed from said target outer surface into said receiving means.

4,012,210

**GRANULAR GAS FILTER ARRANGEMENT**

John M. Morris, Louisville, Ky., assignor to Rexnord Inc., Racine, Wis.

Filed Feb. 23, 1976, Ser. No. 660,363

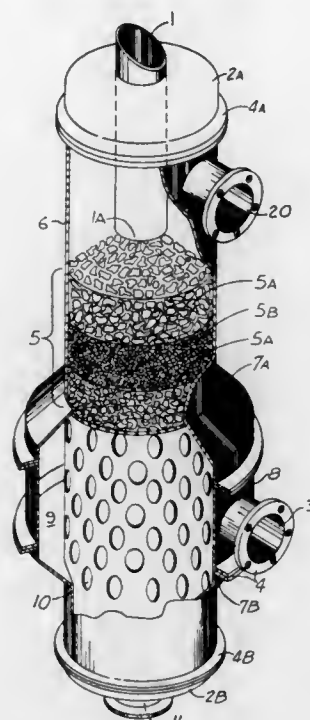
Int. Cl.<sup>2</sup> B01D 45/00

U.S. Cl. 55—479

9 Claims

- 1. A moving bed filter arrangement including:
  - a. An enclosed generally vertical vessel defining a gas cleaning chamber, said vessel having granular filter media inlet means in the upper portion thereof and granular filter media outlet means in the lower portion thereof;
  - b. at least one first gas conduit means communicating with the upper portion of said vessel;

- c. gas plenum means surrounding the periphery of the lower portion of said vessel;
- d. apertures in the sidewall of said vessel means communicating with the lower portion of said vessel and said plenum means;
- e. gas conduit means communicating with said plenum means;



- f. filter media inlet tube means extending into said vessel from said media inlet opening into said chamber for admission of filter media to said chamber; and
- g. means to remove granular filter media from said vessel by means of said filter media outlet means; and
- h. a bed of granular filter media disposed within said vessel between said granular material inlet and outlet means.

4,012,211

**FILTER FOR OCCUPANT RESTRAINT SYSTEM FLUID SUPPLY**

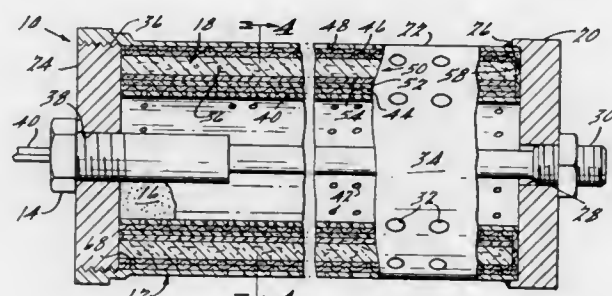
George W. Goetz, Detroit, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed June 30, 1975, Ser. No. 591,911

Int. Cl.<sup>2</sup> B01D 29/26

U.S. Cl. 55—485

11 Claims



- 1. A filter for a radially outward flow gas generator comprising:

- a radially resilient tubular assembly having a longitudinal slit formed therein extending the length thereof, and including:
  - a. fluid permeable outer support means;
  - b. inner support means formed of fluid permeable material and disposed radially inwardly of said outer support means and including means for longitudinally closing the radially inward end of said slit to prevent the passage of gas through the slit; and
  - c. a plurality of layers of generally tubular concentric deformable fibrous filter material, disposed between said inner and outer support means each having longitudinal

slits which are aligned with one another such that they all lie in substantially the same plane, said sheets being adapted to effect filtration of the combustion products of the gas generator.

4,012,212

**PROCESS AND APPARATUS FOR LIQUEFYING NATURAL GAS**

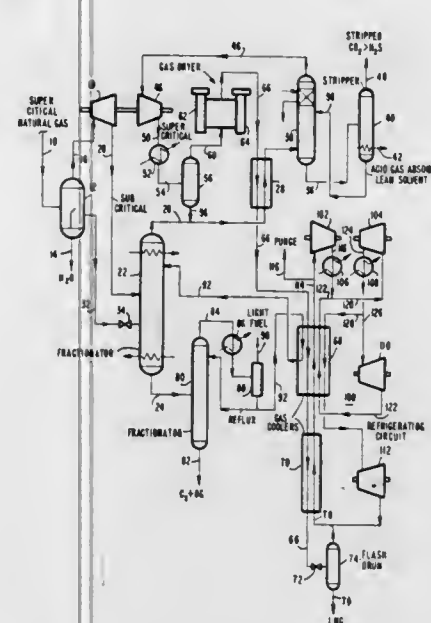
Ludwig Kniel, Scarsdale, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed July 7, 1975, Ser. No. 593,222

Int. Cl.<sup>2</sup> F25J 3/02

U.S. Cl. 62—28

13 Claims



- 1. A method of liquefying natural gas having a pressure above the critical pressure thereof, which comprises:

- a. expanding said natural gas to a pressure below the critical pressure thereof;
- b. introducing the expanded gaseous stream of step (a) into a fractionating zone to remove as a liquid a C<sub>5</sub>+ hydrocarbon stream;
- c. compressing the resulting gas stream recovered from step (b) to a pressure above the critical pressure thereof;
- d. cooling the cooled gas stream of step (c);
- e. expanding said cooled gas stream from step (d) to effect liquefaction of a major portion of said cooled gas stream of step (d), and
- f. recovering said liquified major portion.

4,012,213

**APPARATUS FOR FORMING REFRACTORY FIBERS**

John S. Haggerty, Lincoln; Wilson P. Menashi, Lexington, and Joseph F. Wenckus, Needham, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Division of Ser. No. 369,884, June 14, 1973, Pat. No.

3,944,640, which is a continuation of Ser. No. 68,810, Sept. 2, 1970, abandoned. This application Mar. 19, 1975, Ser. No.

559,797

Int. Cl.<sup>2</sup> C03B 37/02

U.S. Cl. 65—13

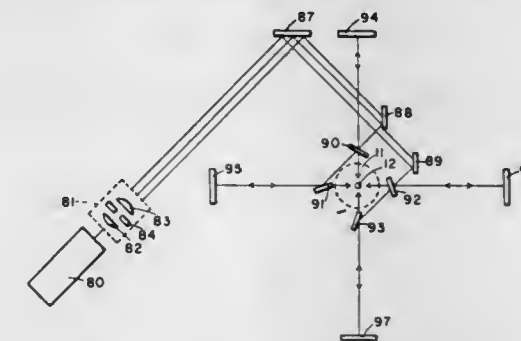
8 Claims

- 1. An apparatus for forming refractory fibers, comprising in combination

- a. a feed rod of refractory material in which a melt volume is maintained principally through surface tension forces;
- b. two oppositely disposed rod holding means arranged to hold first and second solid sections of said refractory material, said first of said solid sections being said feed rod and said second of said solid sections terminating in a fiber drawn from said melt volume;
- c. laser means to provide radiant energy to form a heating

zone of sufficiently high energy density and total power to form said melt volume in said feed rod while retaining in said melt volume a high degree of stability to perturbations from its equilibrium shape;

- d. optical means adapted to divide said radiant energy from said laser means into a plurality of beams symmetrically positioned about the axis of said feed rod;
- e. means to focus said plurality of beams onto said melt volume and to direct said radiant energy in a manner to limit the extent of said heating zone so that it is no greater than the length of said melt volume;
- f. first translational moving means connected to said rod holding means holding said first solid section and arranged to introduce said feed rod into said heating zone



thereby to continuously form said melt volume of said refractory material;

- g. second translational moving means connected to said rod holding means holding said second section and adapted to draw said fiber from said continuously formed melt volume; and
- h. driving means for driving said first and second translational moving means at velocities such that the product of fiber cross section, fractional density, and drawing velocity is essentially equal to the product of feed rod cross section, fractional density and moving velocity, whereby said translational moving means in conjunction with the configuration of said heating zone maintains said melt volume in its stable condition.

4,012,214

**METHOD OF MAKING A COLD CATHODE GAS LASER DISCHARGE TUBE**

Takao Furuse; Akira Kuroiwa, and Sadatane Sakuma, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

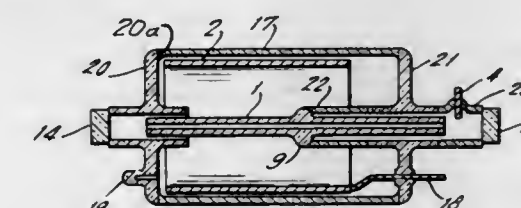
Filed Aug. 15, 1975, Ser. No. 605,144

Claims priority, application Japan, Aug. 19, 1974, 49-94717

Int. Cl.<sup>2</sup> C03C 29/00; C03B 23/20

U.S. Cl. 65—34

2 Claims



- 1. A method of making a cold cathode gas laser discharge tube of reduced size, comprising the steps of:

- preparing a capillary glass tube having a substantially straight longitudinal axis; an anode electrode; a first envelope member consisting of a first hollow cylindrical glass portion having an internal diameter larger than the external diameter of said capillary glass tube, a first annular disc flange portion of glass extending radially from said hollow cylindrical glass portion intermediate the ends thereof and at least one electrode supporting terminal member extending through said first annular disc flange portion, said first hollow cylindrical glass portion and said



first annular disc flange portion being formed jointly by press molding; a second envelope member consisting of a second hollow cylindrical glass portion having an internal diameter larger than the external diameter of said capillary glass tube and a second annular disc flange portion of glass extending radially from said second hollow cylindrical glass portion intermediate the ends thereof, said second hollow cylindrical glass portion and said second annular disc flange portion being formed jointly by press molding; a hollow cylindrical cold cathode electrode having an internal diameter larger than the external diameter of said first and second hollow cylindrical glass portions, respectively, of said first and second envelope members; and a hollow cylindrical glass envelope member having an internal diameter larger than the external diameter of said hollow cylindrical cold cathode electrode;

heat-sealing said anode electrode to one end region of said first hollow cylindrical glass portion of said first envelope member;

inserting said capillary glass tube into said first hollow cylindrical glass portion through the other end region thereof to such an extent that said capillary glass tube terminates at the leading end thereof axially short of said anode electrode;

heat-sealing said capillary glass tube to said first hollow cylindrical glass portion at the axial end thereof remote from said anode electrode while holding said capillary glass tube in substantially coaxial relation with said first hollow cylindrical glass portion;

securing said hollow cylindrical cold cathode electrode at one axial end thereof to the adjacent end of said electrode supporting terminal member so that the axis of said cathode electrode is substantially coaxially aligned with the axis of said capillary glass tube;

heat-sealing said annular disc flange portion of said second envelope member to said hollow cylindrical glass envelope member at one end thereof while holding the adjacent end region of said second hollow cylindrical glass portion inserted in said hollow cylindrical cold cathode electrode;

heat-sealing said annular disc flange portion of said first envelope member to said hollow cylindrical glass envelope member at the other end thereof with the end region of said capillary glass tube remote from said anode electrode inserted in said adjacent end region of said second hollow cylindrical glass portion in substantially coaxial relation therewith;

sealingly securing optical window members to the respective axially outer ends of said first and second hollow cylindrical glass portions thereby to complete a gas-tight structure enclosing said capillary glass tube and said hollow cylindrical cold cathode electrode; and sealing an ionizable gas in the interior space of said gas-tight structure.

4,012,215

#### PRECISION MOLDING OF SHAPED BODIES SUCH AS RETRO-REFLECTORS

Kurt Schwab, Innsbruck, and Josef Steinlechner, Milserheide, both of Austria, assignors to D. Swarovski & Co., Wattens-Tirol, Austria

Filed Aug. 11, 1975, Ser. No. 603,491

Claims priority, application Germany, Aug. 13, 1974, 2438836

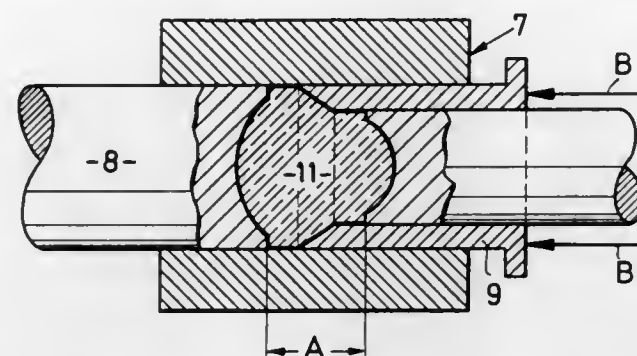
Int. Cl.<sup>2</sup> B29C 11/00; B29D 11/00; C03B 11/08

U.S. Cl. 65-66

10 Claims

1. A process for forming a formable mass into a body having surfaces of precise, predetermined configuration and at least one other surface which need not be of precise configuration, comprising the steps of introducing such formable mass from which such body is to be formed into a mold having a cavity introducing forming dies into said mold; positioning said dies

in a predetermined fixed relation while forming said mass into a preliminary shape having said surfaces of precise, predetermined configuration, and effecting a final molding of the



formable mass by formation of said one surface which need not be of precise configuration while said forming dies are maintained in said fixed relation.

4,012,216

#### APPARATUS FOR THE PRODUCTION OR TREATMENT OF FLAT GLASS

Jean Marchand, Alseberg, Belgium, assignor to Glaverbel-Mecaniver S.A., Watermael-Boitsfort, Belgium

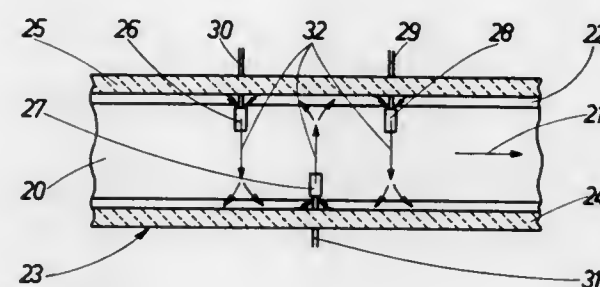
Filed Aug. 28, 1975, Ser. No. 608,773

Claims priority, application United Kingdom, Aug. 28, 1974, 37685/74

Int. Cl.<sup>2</sup> C03B 18/02

U.S. Cl. 65-99 A

12 Claims



1. In a process for the production or treatment of flat glass in an elongate tank containing a bath of molten material including delivering glass to the bath, advancing the glass along a path in contact with the bath towards an outlet for the glass from the tank, and creating displacements of said molten material in one part of the width of said bath, the improvement comprising inducing in the molten material opposed currents each directed toward one of the sides of the tank across an entire zone of the tank where the viscosity of the glass lies in the range between  $10^{5.2}$  and  $10^{6.9}$  poise and causing said currents to flow across substantially the full width of the glass for preventing formation in the finished glass of faults or surface defects caused by advancing of the glass along the tank in contact with the molten material in the bath.

4,012,217

#### BENDING SILICON RODS INTO U-SHAPES

Konrad Reuschel, Vaterstetten; Ulrich Rucha, and Gerhard Schrotter, both of Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 7, 1975, Ser. No. 629,916

Claims priority, application Germany, Nov. 18, 1974, 2454592

Int. Cl.<sup>2</sup> C03B 23/06

U.S. Cl. 65-102

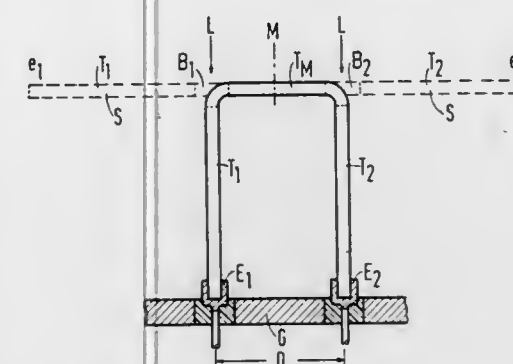
16 Claims

1. In a method for depositing silicon on surfaces of a U-shaped carrier member comprised of silicon, involving the steps of

A. mounting a U-shaped carrier member rod by its free ends in an upright position in a treating zone, each such free

end contacting a different electrode member for passage of an electric current therethrough, and

B. heating the so mounted rod by an electric current passed therethrough while simultaneously flowing a reaction gas through said treating zone to deposit uniformly silicon on surface portions of said so mounted rod, the improvement which comprises bending at predetermined zones heated to plasticity into a U-shaped configuration an initially substantially straight, elongated silicon starting rod having a transverse thickness ranging from about 3 to 50 mm and a homogeneous cross section without substantially length-



ening or shortening said rod, said bending is accomplished by the steps of

A. heating said starting rod at locations thereof which are to be bent to form said U-shaped configuration to a temperature from about  $1100^{\circ}$  to  $1400^{\circ}\text{C}$  and which is sufficient to place such locations in a plastic state,

B. applying bending forces to said so heated rod adjacent to, and on each side of, said locations,

C. bending with said forces at said locations said so heated rod into a predetermined, desired U-shaped configuration, and

D. cooling the resulting rod at said locations to a solid state.

4,012,218

#### METHOD AND APPARATUS FOR MELTING GLASS

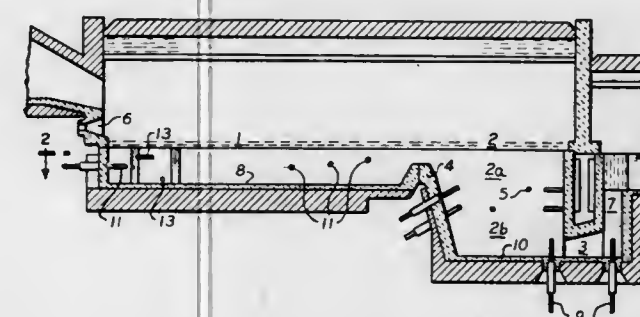
Helmut Sorg, Im Himbeergrund 33, 8752 Glatbach, and Helmut Pieper, Buchenstrasse 19, 877 Lohr, both of Germany

Filed Nov. 13, 1975, Ser. No. 631,563

Int. Cl.<sup>2</sup> C03B 5/02

U.S. Cl. 65-135

17 Claims



1. Glass melting furnace comprising a melting section, a refining section adjacent to the melting section, an enclosed heating section above and common to the melting and refining sections, the depth of the refining section being at least twice the depth of the melting section, means to supply unmelted glass batch to the surface of the molten glass bath in the melting and refining sections, means to heat the heating section such that the batch is heated and melted at the interface between the molten glass bath and the batch, and outlet means at the bottom of the refining section for discharging refined molten glass.

11. Method for melting and refining glass in a furnace containing a molten glass mass in a melting zone and an adjacent refining zone having a depth at least twice the depth of the melting zone, said furnace having a common heating zone above the melting and refining zones, which comprises:

i. applying a layer of unmelted batch mixture to the surface of said molten glass mass in the melting and refining zones;

ii. subjecting the batch mixture to heat energy from the heating zone over the entire surface of the unmelted batch to melt same at the interface between the molten glass mass and the batch;

iii. withdrawing refined molten glass from the bottom of the refining zone thereby causing molten glass to flow from the melting zone to the refining zone and to descend in the refining zone where the molten glass is homogenized without supplying energy thereto.

4,012,219

#### METHOD FOR RECLAIMING VARIEGATED WASTES

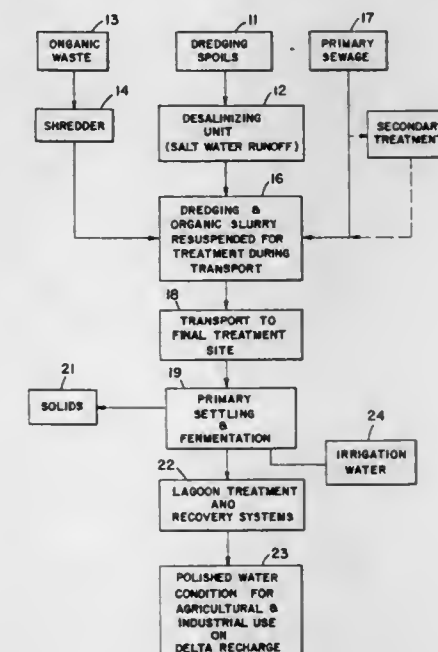
Walter Josephs, 1924 Courtland Ave., Oakland, Calif. 94601

Continuation-in-part of Ser. No. 569,553, April 18, 1975, abandoned. This application May 6, 1976, Ser. No. 683,786

Int. Cl.<sup>2</sup> C05F 11/08

U.S. Cl. 71-9

4 Claims



1. A method for reclaiming waste products and dredging spoils, comprising the steps of:

desalinating clay-bearing dredging spoils by placing the spoils in corrals, segregating the sea water from the sediment, and draining away the sea water, mixing said desalinated dredging spoils with sewage to form a slurry,

pipng said slurry to a disposal site and mixing said slurry during piping to effect exposure and adsorption of contaminants of said primary sewage to the clay particles of said dredging spoils,

separating said slurry into solids and waste water, said solids including said contaminants adsorbed to said clay particles, and composting said solids remaining after separation of said slurry.

4,012,220

#### COMPOSITION FOR SUPPLYING THE SPECIFIC DEFICIENCY IN MICROELEMENTS OF PLANTS CULTIVATED ON PEATY SOILS

Sandor Szalay, and Zoltan Samsoni, both of Debrecen, Hungary, assignors to Magyar Tudományos Akademia Atommag Kutato Intezete, Debrecen, Hungary

Filed Aug. 8, 1975, Ser. No. 603,200

Claims priority, application Hungary, Aug. 15, 1974, MA 2597

Int. Cl.<sup>2</sup> C05G 3/00, 3/06

U.S. Cl. 71-11

3 Claims

1. An aqueous micronutrient foliage spray for the foliage of plants cultivated on a peat soil which consists essentially of an



aqueous solution containing 0.1 to 5% by weight of  $Mn^{2+}$  0.03 to 1.2%  $Cu^{2+}$  and 0. to 1.6%  $Fe^{2+}$  in addition to sufficient tartaric acid reducing agent to prevent oxidation of the manganese and iron on the foliage of the plants to insoluble oxide-hydroxide, and an effective amount of a chelating agent to complex the manganese, copper and iron to maintain the same in solution, the solution, having a pH of 4 to 6 and the ratio of copper to manganese being 1:3 to 1:6.

4,012,221

**SLOW RELEASE COPPER TOXICANT COMPOSITIONS**  
Katherine E. Walker, Akron, and Nathan F. Cardarelli, Barberton, both of Ohio, assignors to International Copper Research Association Inc., New York, N.Y.

Filed May 13, 1975, Ser. No. 577,051

Int. Cl.<sup>2</sup> A01N 11/04

U.S. Cl. 71-66

8 Claims

1. A sustained release toxicant composition comprising a moderately vulcanized elastomeric matrix selected from ethylene-propylene copolymer, styrene-butadiene copolymer, isobutylene-isoprene copolymer, polybutadiene or natural rubber having substantially uniformly dispersed therein up to about 5 parts by weight ammonium sulfate per 100 parts of said elastomer and from about 75 parts to about 400 parts per 100 parts by weight of said elastomer of a water-soluble, elastomer-insoluble inorganic copper compound, said copper compound being capable of releasing copper ions when in contact with water.

4,012,222

**HERBICIDAL COMPOSITIONS CONTAINING DIOXOLANE SUBSTITUTED ANILIDS AND METHOD THEREFOR**

Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

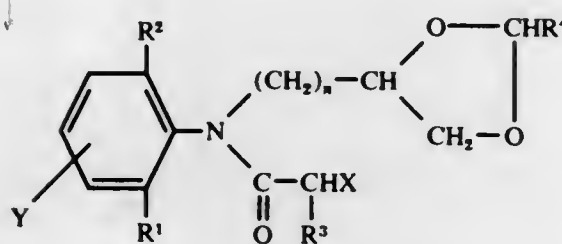
Division of Ser. No. 523,388, Nov. 13, 1974, Pat. No. 3,946,045. This application Jan. 5, 1976, Ser. No. 646,719 The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> A01N 9/00

U.S. Cl. 71-88

9 Claims

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein Y is selected from the group consisting of hydrogen, lower alkyl and halogen, R<sup>1</sup> is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; R<sup>2</sup> is lower alkyl; R<sup>3</sup> and R<sup>4</sup> are independently selected from the group consisting of hydrogen and lower alkyl; X is halogen; and n is the integer 1 or 2.

4,012,223

**THIADIAZOLYLIMIDAZOLIDINONES HERBICIDES**  
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

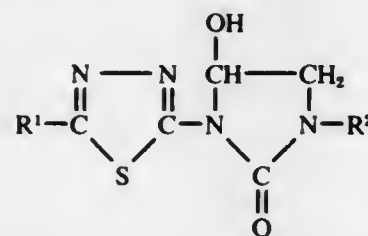
Division of Ser. No. 442,702, Feb. 15, 1974, Pat. No. 3,920,674, which is a continuation-in-part of Ser. No. 432,269, Jan., 1974, abandoned. This application Aug. 28, 1975, Ser. No. 608,473

Int. Cl.<sup>2</sup> A01N 9/22

U.S. Cl. 71-90

2 Claims

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein R<sup>1</sup> is cycloalkyl of from 3 to 7 carbon atoms optionally substituted with lower alkyl, lower alkoxy, chlorine, bromine, or hydroxy, and R<sup>2</sup> is lower alkyl.

4,012,224

**HERBICIDAL USE OF  $\beta$ -AMINOATROPONITRILES**  
James Richard Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

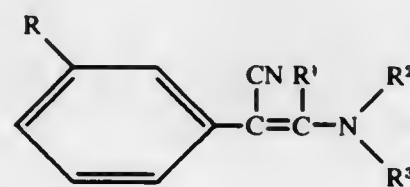
Filed Dec. 2, 1975, Ser. No. 636,884

Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 71-105

7 Claims

1. A method of reducing the vigor of weeds which comprises contacting the weeds with an herbicidally-effective amount of a compound of the formula



wherein R represents hydrogen, chloro, fluoro, bromo or trifluoromethyl; R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> independently represent hydrogen, methyl or ethyl.

4,012,225

**HERBICIDAL 1-ALKANOYLOXY-HALOETHYL UREA**  
Malcolm Scott Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

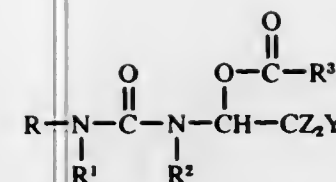
Division of Ser. No. 423,598, Dec. 10, 1973, Pat. No. 3,916,010, which is a continuation-in-part of Ser. No. 385,521, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 124,422, March 16, 1971, abandoned, and Ser. No. 124,423, March 16, 1971, abandoned. This application May 30, 1975, Ser. No. 582,482

Int. Cl.<sup>2</sup> A01N 9/24

U.S. Cl. 71-106

12 Claims

1. A method for controlling undesirable vegetation which comprises applying thereto an herbicidally effective amount of a compound of the formula



wherein R is phenyl substituted with 1 to 2 fluorine or chlorine; R<sup>1</sup> is hydrogen or alkyl of 1 to 4 carbon atoms, R<sup>2</sup> is alkyl of 1 to 4 carbon atoms; Z is chlorine or bromine; Y is hydrogen or Z, and R<sup>3</sup> is hydrogen.

4,012,226

**PROCESS FOR STEEL PRODUCTION**  
Günther Geck, Hagen, and Jürgen Langhammer, Bremen-Platjenwerbe, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

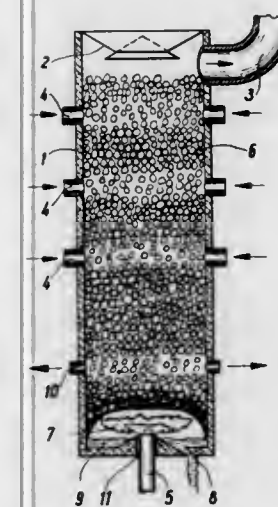
Filed May 23, 1974, Ser. No. 472,891

Claims priority, application Germany, May 25, 1973, 2326684

Int. Cl.<sup>2</sup> C21B 13/14

U.S. Cl. 75-38

15 Claims



1. A process for the production of steel from a reducible iron-containing charge, comprising the steps of introducing said charge into a generally vertically extending zone so as to form a downwardly moving charge column in said zone; directly reducing said charge in a first portion of said zone by contacting said charge with a reducing substance thereby forming sponge iron from said charge; melting said sponge iron in a second portion of said zone by directing a flame against the bottom of said column, said flame being produced by combustion in said second portion of said zone of a mixture which includes fuel and oxygen, and said oxygen being present in an amount which is less than that necessary for complete combustion of said fuel so that melting of said sponge iron occurs under substantially non-oxidizing conditions; passing at least part of the combustion gases generated by said combustion through at least part of said column and in countercurrent motion to the latter; and withdrawing the molten material produced by melting of said sponge iron from said zone.

4,012,227

**HIGHLY CASTABLE, WELDABLE, CORROSION RESISTANT STAINLESS STEEL**

Robin Mackay Forbes Jones, Titusville, and Walter Adrian Petersen, Ridgewood, both of N.J., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed June 19, 1975, Ser. No. 588,197

Int. Cl.<sup>2</sup> C22C 38/44, 38/54

U.S. Cl. 75-122

2 Claims

1. A highly-castable, ductile, corrosion resistant and weldable stainless steel consisting essentially of, by weight, from

4,012,228

**LOW INTRINSIC VALUE ALLOYS**

Ronald P. Dudek, River Grove; Peter Kosmos, Alsip, and John A. Tesk, Woodridge, all of Ill., assignors to Howmedica, Inc., New York, N.Y.

Filed May 14, 1976, Ser. No. 686,346

Int. Cl.<sup>2</sup> C22C 30/00

U.S. Cl. 75-134 C

7 Claims

1. An alloy consisting essentially of the following constituents in the indicated percentages by weight:

Constituents	Proportional Range
Gold	0-45%
Platinum	0-30%
Palladium	0-20%
Copper	30-55%
Gallium	5-10%
Zinc	0-1%
Iridium	0-0.01%

with the proviso that the total of said gold, platinum and palladium is at least about 35%.

4,012,229

**DUCTILE COBALT-BASE ALLOYS**

Robert B. Herchenroeder, and Coleman M. Augustine, Jr., both of Kokomo, Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Oct. 10, 1972, Ser. No. 295,992

Int. Cl.<sup>2</sup> C22C 19/07

U.S. Cl. 75-171

3 Claims

1. A cobalt-base alloy characterized by improved ductility at high temperatures of about 2000° F. and consisting essentially of about 15 to 30% chromium, about 10 to 30% nickel, an effective amount from about 1 to 8% molybdenum to impart ductility, up to about 10% tungsten, about 8 to 20% tantalum and the balance cobalt with incidental modifiers and impurities in ordinary amounts.

4,012,230

**TUNGSTEN-NICKEL-COBALT ALLOY AND METHOD OF PRODUCING SAME**

James M. Dickinson, and Robert E. Riley, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 7, 1975, Ser. No. 593,356

Int. Cl.<sup>2</sup> C22C 1/04; B22F 3/16

U.S. Cl. 75-212

1 Claim

1. A method of producing a dense tungsten-nickel-cobalt alloy which comprises (a) coating tungsten particles with a nickel-cobalt alloy, (b) pressing the coated particles into a coherent compact shape, (c) heating said compact in a hydrogen atmosphere to a temperature in the range of 1200° C to 1400° C and maintaining this temperature for a period of about 2 hours, (d) increasing the temperature to a range of 1300° C to 1530° C and holding at this elevated temperature



for a period of about one hour, (e) cooling to a temperature of about 1200° C, replacing the hydrogen atmosphere with an inert argon atmosphere while maintaining 1200° C temperature for a period of about ½ hour, and (f) cooling the tungsten-nickel-cobalt alloy compact to room temperature while maintaining this argon atmosphere.

4,012,231

# PROCESS FOR THE MANUFACTURE OF FILLERS FROM SOLID WASTE

Gottfried Dreer, 43 Jrawohlstrasse, Essen, Germany (4300)  
Filed Feb. 18, 1975, Ser. No. 550,585

Claims priority, application Germany, Feb. 15, 1974, 2407383

Int. Cl.<sup>2</sup> C04B 31/40

U.S. Cl. 106—288 B

4 Claims

1. A process for the production of fillers from solid waste which for conversion into compost, is first ground, magnetically freed from iron particles, supplied with sewage sludge or water, fractionated into portions of different size and treated in a fermentation process for about 24 hours at 65° C while fresh air is continuously fed, the improvement comprising forming a mixture of the compost and a solvent in a first heatable tank at a ratio of 1:2-4 parts by weight of compost:solvent and stirring said mixture from the start to the end of the introduction of the components therein; maintaining the contents in the first tank for a period of time ranging from about 10 to 16 hours; heating to dryness the contents of the first heatable tank; transferring the contents of the first heatable tank to a second tank; adding to said second tank about 2-3 percent of chlorinated paraffin and about 1-3 percent antimony trioxide; mixing the contents in said second tank; and heating the contents of the second tank until dryness is reached.

4,012,232

# STABILIZED PHOTOCROMIC MATERIALS

Donald R. Uhlmann, Newton; Elias Snitzer, Wellesley; Richard J. Hovey, Sturbridge, Nori Y. C. Chu, Southbridge, all of Mass., and Joseph T. Fournier, Jr., Storrs, Conn., assignors to Nori Y. C. Chu, Southbridge, Mass.

Filed Dec. 23, 1974, Ser. No. 535,452

Int. Cl.<sup>2</sup> G02B 5/23

U.S. Cl. 106—308 B

18 Claims

1. A stabilized photochromic particle for incorporation into a plastic host to impart photochromic properties thereto, said particle comprising an organic photochromic pigment crystal having a diameter in the range of 30 Å to 1 micron, said photochromic crystal having a protective coating on substantially the entire surface thereof effective to render the photochromic crystal impervious to the effects of oxygen, moisture, monomers, catalysts, and other chemicals used in the formation of the plastic host which are deleterious to said crystal.

4,012,233

# CONVEYOR FOR CONTAINERS FOR CARRYING OBJECTS OF GLASS OR SIMILAR MATERIALS, WHICH OBJECTS ARE TO BE HARDENED CHEMICALLY BY SURFACE TREATMENT

Harald Damer, Weimar; Kurt Kessler, Jena; Ulrich Kühne, Torgau; Kurt Schneider; Karl Unbehaun, both of Jena; Manfred Wilke, Jena-Lobeda, and Johannes Franke, Jena, all of Germany, assignors to VVB Haushalts-und Verpackungsglas, Jena, Germany

Filed July 18, 1975, Ser. No. 597,110

Claims priority, application Germany, July 31, 1974, 180213

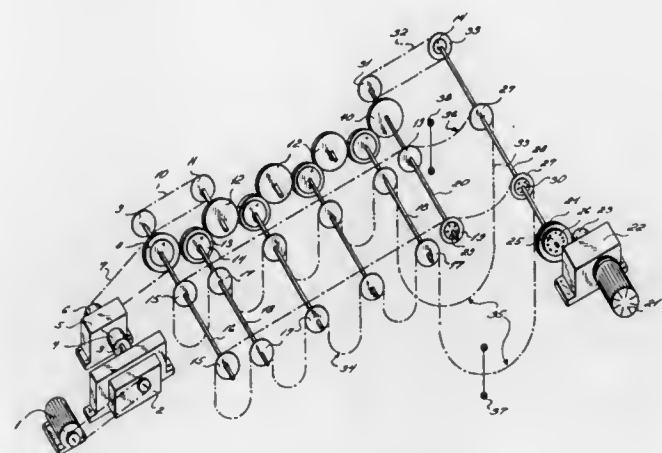
Int. Cl.<sup>2</sup> B08B 3/08

U.S. Cl. 134—75

3 Claims

1. In combination with at least one vessel for containing a liquid substance for surface treating objects of glass or similar materials, a conveyor for transporting the objects through treatment, loading and unloading zones comprising at least

one vessel for containing the liquid substance, the conveyor comprising a plurality of sprocket wheels, means for driving said sprocket wheels, sprocket chain means trained over said sprocket wheels and freely hanging therebetween, means for carrying the glass objects so mounted on said sprocket chain means as not to permit the glass objects substantially to change their orientation with a change in the orientation of said sprocket chain means, said sprocket wheels and said



sprocket chain means being so arranged that the glass objects are first carried downwardly into the vessel and are then carried upwardly out of the vessel with the opening of any cavity in each of the objects facing downwardly during the upward movement, said driving means including clutch means for engaging and disengaging selected ones of said sprocket wheels for changing the depth of chain dip between selected ones of said sprocket wheels.

4,012,234

# WATER ACTIVATION AND PRESSURE EQUALIZATION OF ELECTROCHEMICAL BATTERIES

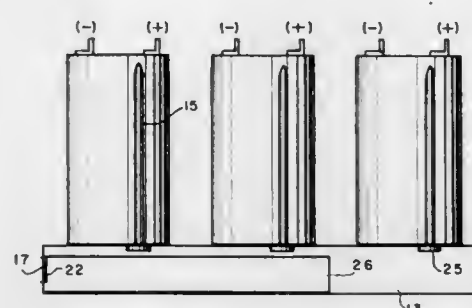
Dennis W. Kraft, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 14, 1975, Ser. No. 595,586

Int. Cl.<sup>2</sup> H01M 6/00

U.S. Cl. 429—48

15 Claims



1. A fully charged battery pack adapted to be stored for an extended period and then put into use in a body of water below some predetermined depth comprising:

- at least one electrochemical battery having positive and negative plates and an electrolyte for generating electricity, said battery having its electrolyte removed after the battery is fully charged;
- a reservoir having a water inlet admitting water into said reservoir, said reservoir containing a substance for restoring an electrolyte in said battery;
- means positioned within said water inlet for closing said inlet to prevent entry of water below a predetermined depth pressure, thereby admitting water under pressure through said water inlet into said reservoir when said battery pack is dropped into said body of water;
- a tube connecting said reservoir to said battery; and
- means associated with said tube responsive to pressure from said body of water for forcing said substance through said tube into said battery under depth pressure of said body of water.

4,012,235

# SOLID PHASE EPITAXIAL GROWTH

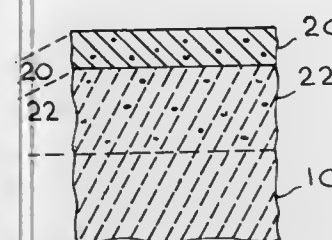
James W. Mayer; Marc A. Nicolet, and Silvanus S. Lau, all of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 4, 1975, Ser. No. 565,129

Int. Cl.<sup>2</sup> H01L 21/20

U.S. Cl. 148—1.5

6 Claims



1. A method of growing epitaxially a doped silicon layer upon a silicon substrate comprising, depositing over said silicon substrate a first material layer selected from one of palladium, vanadium, titanium, and nickel, depositing over said first metal layer a doping layer of one of, antimony, phosphorus, aluminum, boron, gallium, indium, thallium, arsenic, and bismuth, depositing over said doping layer a layer of silicon, heating said substrate and layers to a first temperature below their eutectic point temperature until said silicon layer forms a silicide of said first metal layer, and heating said substrate and layers at a second temperature which is higher than the first temperature but still below said eutectic temperature to cause migration of said dopant and said silicon through said silicide layer and nucleation and growth thereof upon the surface of said crystal.

4,012,236

# UNIFORM THERMAL MIGRATION UTILIZING NONCENTRO-SYMMETRIC AND SECONDARY SAMPLE ROTATION

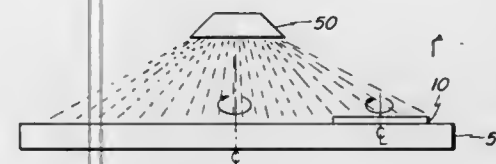
Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,675

Int. Cl.<sup>2</sup> H01L 21/228

U.S. Cl. 148—1.5

13 Claims



1. An improved method for migrating a molten zone through a solid body of semiconductor material comprising the process steps of:

- a. selecting a body of single crystal semiconductor material having two major opposed surfaces which are, respectively, the top and bottom surfaces thereof, a predetermined type conductivity, a predetermined level of resistivity, a preferred diamond cubic crystal structure, a preferred planar crystal orientation for at least the top surface which is one selected from the group consisting of (100), (110) and (111), and a first preferred crystal axis and a vertical axis which are each substantially perpendicular to at least the top surface and substantially parallel with each other;
- b. depositing a layer of a metal of a predetermined thickness and having a predetermined geometrical configuration on the surface having the preferred planar orientation;

- c. placing the body on a supporting surface at a predetermined distance from a vertical axis thereof;
- d. rotating the body simultaneously both in a noncentro-symmetrical manner about the vertical axis of the supporting surface and about its own vertical axis;
- e. heating the body and the deposited metal to a predetermined elevated temperature sufficient to form a melt of a metal-rich semiconductor material on the surface of the body while continuing the simultaneous dual rotation cycle of the body;
- f. establishing a temperature gradient substantially parallel with the vertical axis of the body and the first preferred crystal axis of the crystal structure of the material while continuing the simultaneous dual rotation cycle of the body, the surface on which the melt is formed being at the lower temperature, and
- g. migrating each melt of metal-rich semiconductor material as a molten zone through the solid body of semiconductor material for a sufficient period of time to reach a predetermined distance into the body from the top surface, while continuing the simultaneous dual rotation cycle of the body, to form in situ at least one region of recrystallized semiconductor material of the body having solid solubility of the deposited metal therein, a substantially uniform cross-sectional area and a substantially uniform level of resistivity throughout the entire region.

4,012,237

# ZIRCONIUM MODIFIED NICKEL-COPPER ALLOY

John D. Whittenberger, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 5, 1975, Ser. No. 584,094

Int. Cl.<sup>2</sup> C22F 1/02

U.S. Cl. 148—2

5 Claims

2. A method of improving the mechanical strength of nickel-copper alloys containing about 30 weight percent copper at elevated temperatures without affecting the oxidation characteristics comprising the steps of adding about 0.2 weight percent zirconium to said alloys to modify the same, casting the modified alloys into ingots, hot rolling said ingots into sheets at about 1450 K, warm rolling said sheets at about 920 K, and thermomechanically processing said modified alloy to produce a dispersion of Ni<sub>3</sub>Zr precipitates, said thermomechanical processing comprising the steps of solution treating said sheets for ½ hour at 1365 K in hydrogen, and annealing said sheets for ½ hour to 3 hours at a temperature between 1025 K and 1225 K in hydrogen.

4,012,238

# METHOD OF FINISHING A STEEL ARTICLE HAVING A BORONIZED AND CARBURIZED CASE

Stanley R. Scales, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 387,566, Aug. 10, 1973, Pat. No. 3,922,038. This application Sept. 25, 1975, Ser. No. 616,537

Int. Cl.<sup>2</sup> C23C 9/08, 9/10

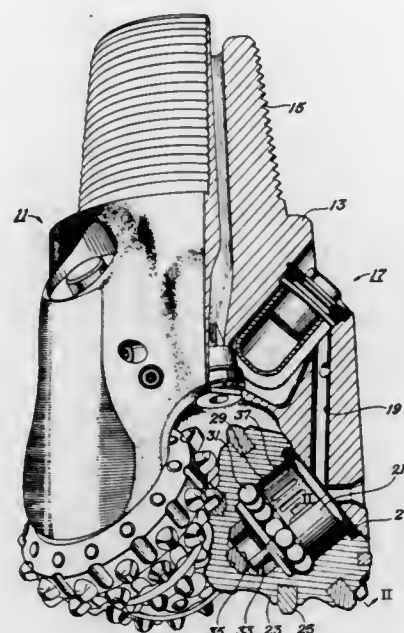
U.S. Cl. 148—6

7 Claims

1. The method of manufacturing steel friction bearing members requiring a strong and tough wear resistant surface, said method comprising the steps of: carburizing said surface to produce a carburized case of selected depth;



applying a finish to the carburized surface smoother than the desired final smoothness;



boronizing the carburized case;  
hardening the carburized case; and  
tempering the carburized case.

4,012,239

#### PROCESS FOR TREATING STEEL SHEETS FOR THE PURPOSE OF ENAMELLING THE SHEETS

Charles Georges Henri Brun, Montataire, and Philippe Marcel René Tirmarche, Prouvy, both of France, assignors to Union Siderurgique du Nord et de l'Est de la France, par abreviation "USINOR", Paris, France  
Continuation-in-part of Ser. No. 418,145, Nov. 21, 1973, abandoned. This application Mar. 6, 1975, Ser. No. 555,923  
Claims priority, application France, Nov. 21, 1972, 72.41241; Nov. 7, 1973, 73.39504

Int. Cl.<sup>2</sup> C23D 3/00

U.S. Cl. 148—6.3

18 Claims

1. Process for treating a steel sheet for the purpose of enamelling same and in particular directly enamelling the sheet with one coat, comprising depositing on the sheet, after rolling the sheet, a coat of a material selected from the group consisting of nickel, cobalt, and mixtures thereof, nickel acetate, nickel nitrate, cobalt acetate, cobalt nitrate and mixtures thereof in an amount of 0.45–20 g/m<sup>2</sup> calculated as the elemental metal, annealing the sheet under a decarburizing atmosphere consisting of hydrogen, water vapour and nitrogen, the hydrogen content being 10–75% and the H<sub>2</sub>/H<sub>2</sub>O ratio being within the range from 3 to 6, to substantially totally decarburize it and, during the cooling step of the annealing cycle, subjecting the coated sheet to the action of an oxidizing atmosphere of hydrogen, water vapour and nitrogen containing 2–7% water vapour and having a H<sub>2</sub>/H<sub>2</sub>O ratio which is less than 6.

4,012,240

#### Cu-Ni-Sn ALLOY PROCESSING

Robert Alfred Hinrichsen, Basking Ridge, and John Travis Plewes, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Oct. 8, 1975, Ser. No. 620,644

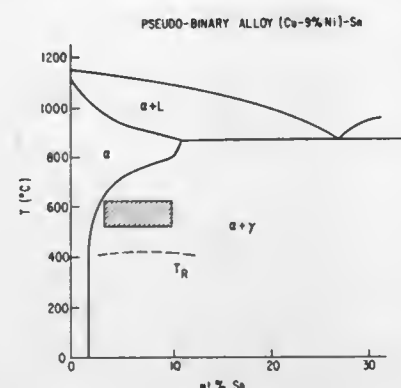
Int. Cl.<sup>2</sup> C22F 1/08

U.S. Cl. 148—11.5 C

6 Claims

1. A method for processing a cast Cu-Ni-Sn ingot consisting essentially of an alloy having a composition of from 3–30% nickel, from 3–10% tin, and remainder copper and which at room temperature is in a two-phase state and which at a temperature significantly higher than room temperature and slightly below the melting temperature of said alloy is in a single-phase state, CHARACTERIZED IN THAT said ingot is worked by an amount corresponding to at least 30 percent

area reduction at a temperature at which said alloy is in a two-phase state and which lies above the reversion temperature of said alloy and near the recrystallization temperature of said alloy.



ture of said alloy and near the recrystallization temperature of said alloy.

4,012,241

#### DUCTILE EUTECTIC SUPERALLOY FOR DIRECTIONAL SOLIDIFICATION

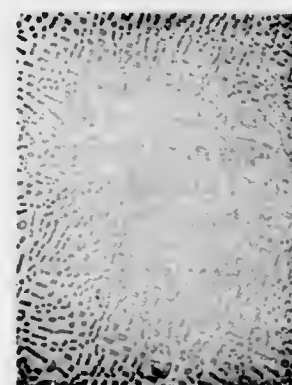
Franklin D. Lemkey, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 22, 1975, Ser. No. 570,923

Int. Cl.<sup>2</sup> C22C 19/03

U.S. Cl. 148—32

4 Claims



TRANSVERSE SECTION

1. A directionally solidified nickel alloy article, of essentially eutectic composition having a matrix comprised predominantly of gamma prime (Ni<sub>3</sub>Al) and at least 20 volume percent of an alpha (Mo) fibrous second phase in an aligned form.

4,012,242

#### LIQUID EPITAXY TECHNIQUE

Herbert F. Matore, Los Angeles, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Nov. 14, 1973, Ser. No. 415,762

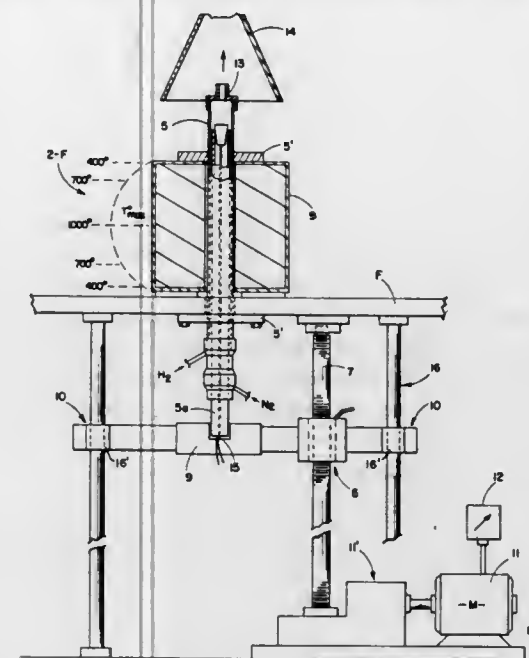
Int. Cl.<sup>2</sup> H01L 21/208

U.S. Cl. 148—172

8 Claims

1. A method for producing a superior heteroepitaxial semiconductor junction comprising superposing a prescribed doped limited volume unsaturated melt directly upon a host substrate and subjecting the resulting material to a four phase thermal cycle adapted to provide a moving external thermal gradient and a prescribed internal fixed thermal gradient across the melt-substrate interface; the first phase comprising heating to a temperature such that the substrate is melted back to a prescribed degree and with prescribed diffusion, the dissolved substrate saturating the melt; the second phase comprising cooling at a rate adapted to rapidly arrest melting back of the substrate and terminate upward thermal momentum with attendant supersaturation; the third phase comprising cooling at a rate of 0.1°–1.0° C per minute to initiate slow recrystallization and diffusion; the fourth phase comprising cooling at a rate of 2°–5° C per minute to recrystallize the

entire melt-substrate combination; wherein said limited volume is that volume which will be saturated by the substrate



during melting back; whereby a graded epitaxial junction of a crystal layer having a prescribed volume and stoichiometry with very low dislocation incidence is obtained.

4,012,243

#### METHOD OF FABRICATING MULTICOLOR LIGHT DISPLAYS UTILIZING ETCH AND REFILL TECHNIQUES

John G. Keil, Scottsdale, and Michael G. Coleman, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

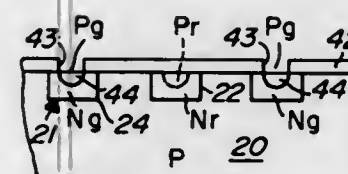
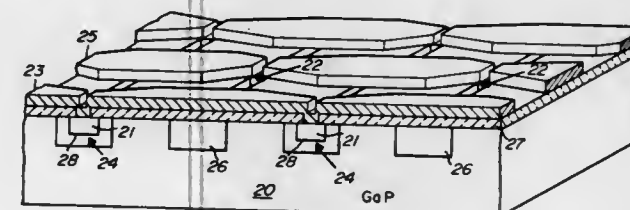
Continuation of Ser. No. 198,221, Nov. 12, 1971, abandoned.

This application Sept. 19, 1973, Ser. No. 398,747

Int. Cl.<sup>2</sup> H01L 21/20, 21/82, 29/207

U.S. Cl. 148—175

3 Claims



1. A process for the manufacture of a multicolor monolithic light display comprising:

- etching a first set of channels in a monolithic substrate of one conductivity type;
- epitaxially filling said channels with a first monocrystalline material containing a first conductivity effecting material of opposite conductivity type;
- forming regions of said one conductivity type into selected portions of said channel;
- etching a second set of channels in the surface of said substrate;
- epitaxially filling said second channels with a second monocrystalline material containing a second conductivity effecting material of said opposite conductivity type;
- forming regions of said one conductivity type into selected portions of said second channel.

4,012,244  
HIGH DENSITY IMPULSE SOLID PROPELLANT  
Martin H. Kaufman, and Peter L. Stang, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1961, Ser. No. 99,967

Int. Cl.<sup>2</sup> C06B 45/10

U.S. Cl. 149—19.3

5 Claims

1. A high density solid propellant composition comprising zirconium hydride, ammonium perchlorate and a copolymer of vinylidene fluoride and perfluoropropylene.

4,012,245

#### CAST TNT EXPLOSIVE CONTAINING POLYURETHANE ELASTOMER WHICH IS FREE FROM OILY EXUDATION AND VOIDS AND UNIFORMLY REMELTABLE

H. William Voigt, Jr., Stanhope, N.J.; Lawrence W. Pell, St. Simon's Island, Ga., and Jean P. Picard, Morristown, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 475,078, May 31, 1974, abandoned.

This application Mar. 8, 1976, Ser. No. 664,798

Int. Cl.<sup>2</sup> C06B 45/10

U.S. Cl. 149—19.4

7 Claims

1. A castable high explosive composition which is essentially free from oily exudation on storage and voids and can be remelted and resolidified essentially without loss of homogeneity and explosive properties, which consists essentially of an explosive component consisting essentially of 2,4,6-trinitrotoluene and up to about 80% by weight of the explosive component of at least one crystalline explosive of the group cyclotrimethylenetrinitramine and cyclotetramethylenetrinitramine, and from about 0.1 to 5 weight percent of a polyurethane elastomer-producing system consisting essentially of an organic polyisocyanate, a hydroxyl-terminated 1,4-butadiene polymer liquid resin of hydroxyl functionality between 2 and 3, and an abietyl alcohol.

4,012,246

#### SUPER FINE PETN THIN LAYER SLURRY EXPLOSIVE

Charles D. Forrest, Hollister, Calif., assignor to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Continuation-in-part of Ser. No. 434,754, Jan. 31, 1974, Pat. No. 3,912,560. This application Oct. 14, 1975, Ser. No.

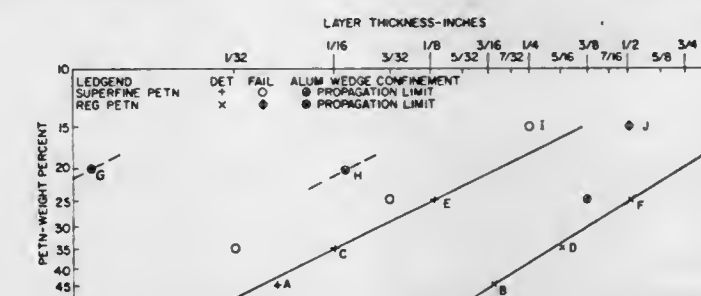
622,319

The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C01B 31/32, 25/32

U.S. Cl. 149—47

8 Claims



1. An improved slurry explosive able to propagate in very thin layers comprising a mixture of, by weight:

- approximately 15% to 45% by weight of sensitized super-fine particle pentaerythritol tetranitrate (PETN), said sensitized particles having an average diameter of approximately 6.5 microns and further comprising interstitial voids defining a gas phase; and,
- approximately 45% to 27% by weight of a material selected from the group consisting of ammonium nitrate, potassium, barium and sodium nitrate; and



- C. approximately 10% by weight of a liquid anti-freeze agent; and  
 D. approximately 0.5% to 0.7% of a material selected from the group consisting of guar gum and polyacrylamide; and  
 E. a cross-linking agent; and  
 F. water.

4,012,247

# METHOD AND DEVICES FOR ROAD SURFACE MARKING

Ludwig Eigenmann, Vacallo, Ticino, Switzerland

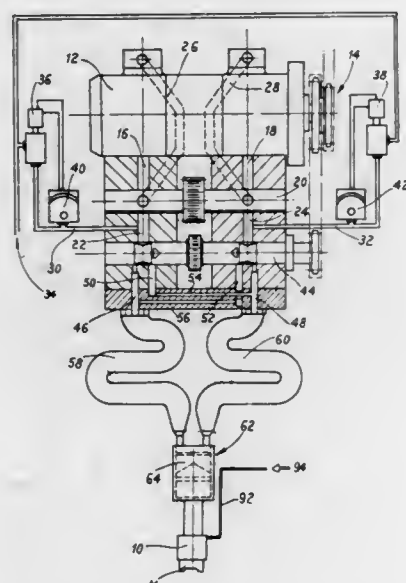
Filed Jan. 26, 1976, Ser. No. 652,524

Claims priority, application Italy, Jan. 27, 1975, 19621/75

Int. Cl.<sup>2</sup> E01C 19/00

U.S. Cl. 156—71

18 Claims



1. A method of forming a traffic-regulating indicium on a pavement, comprising forming a primer layer on said pavement by applying thereto a fluid composition which includes cross-linkable components, said composition having such a viscosity upon application thereof to said pavement that said composition intimately contacts said pavement, and said composition being capable of rapidly attaining a viscosity in the range of about  $10^3$  to  $10^4$  cP when said composition has a viscosity below said range upon being applied to said pavement, said composition further being capable of undergoing an increase in viscosity on said pavement from said range to a higher viscosity of at least  $10^5$  cP within a few minutes; and applying a marker tape to said primer layer when the viscosity thereof is approximately in said range to thereby preliminarily bond said marker tape to said primer layer, said marker type becoming more securely bonded to said primer layer as the viscosity of said primer layer increases from said range towards said higher viscosity.

4,012,248

# METHOD AND MEANS FOR PROVIDING A FOAMED PLASTIC SURFACE WITH A RELIEF STRUCTURE

Björn S. Rump, Genf, Switzerland; Bengt Johnard, Mondal, Sweden, and Walter Schlegel, Oberrieden, Switzerland, assignors to Societe d'Etudes du Procédé Noridem, Glarus, Switzerland

Filed May 24, 1973, Ser. No. 363,609

Claims priority, application Switzerland, May 24, 1972, 7640/72

Int. Cl.<sup>2</sup> B32B 3/00, 5/20, 31/00

U.S. Cl. 156—79

24 Claims

1. An article for simultaneously providing one side of a foamable substrate with an embossed design and a colored pattern in coincidence with said embossed design, comprising a preform including a non-foamable transparent film and a removable carrier material for supporting said film, said film having printed thereon a pattern in printing inks, at least one

of said printing inks containing a foam inhibitor/accelerator material.

7. In a process for simultaneously providing one side of a foamable substrate with an embossed design and a colored pattern, wherein, during the course of foaming, foam inhibitor/accelerator material penetrates into the foamable substrate at certain locations, the improvement comprising the steps of:

- applying, to one side of the substrate to be foamed, a preform including a non-foamable transparent film and a removable carrier material for supporting said film, said film having printed thereon a pattern in printing inks, at least one of said printing inks containing a foam inhibitor/accelerator material to form a composite material;
- heating the composite material to a temperature at which said non-foamable film adheres to said one side of the foamable substrate;
- removing the carrier material; and
- further heating the composite material to the foaming temperature of the substrate to obtain an embossed design coinciding with a colored pattern on said one side of the foamable substrate.

4,012,249

# REINFORCED MATTING AND A PROCESS AND APPARATUS FOR ITS PRODUCTION

Hans Stapp, Momlingen, Germany, assignor to Akzona Incorporated, Asheville, N.C.

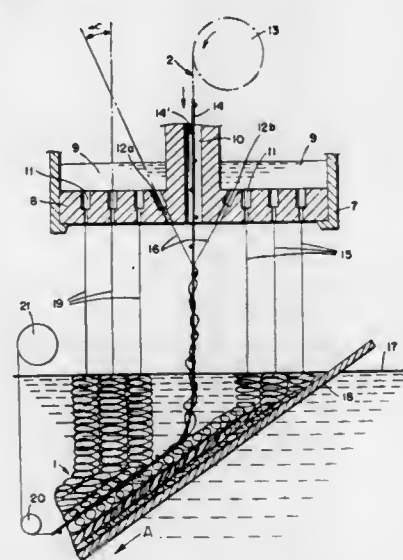
Filed July 3, 1975, Ser. No. 593,054

Claims priority, application Germany, July 3, 1974, 2431871

Int. Cl.<sup>2</sup> D04H 3/16

U.S. Cl. 156—167

14 Claims

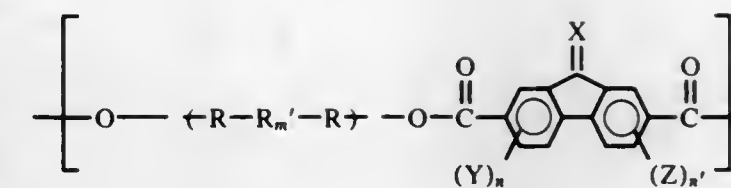


1. A process for the production of a reinforced matting of melt-spun, interlooped, substantially amorphous and continuous synthetic thermoplastic polymer filaments which comprises:

- conducting a continuous band of a flat, latticed structure as a reinforcing member downwardly into and then through a liquid cooling bath;
- simultaneously melt-spinning a plurality of said thermoplastic polymer filaments downwardly toward said bath to form interlooped filaments adhering to each other at random overlapping points of intersection, said spinning taking place from at least two rows of spinning orifices disposed adjacently on either side of said reinforcing member;
- applying at least part of the freshly spun filaments onto both sides of said reinforcing member by directing adjacent filaments on either side thereof at an angle inclined from the vertical direction to impinge upon and randomly penetrate said reinforcing member above the bath surface; and
- completely solidifying the freshly spun filaments only after

their entry into said cooling medium such that in a bath zone near the surface of the cooling medium the filaments remain sufficiently tacky to adhere to each other at their overlapping points of intersection.

12. Apparatus for the production of a continuous reinforced matting of melt-spun thermoplastic filaments comprising: a spinning head mounted vertically above a cooling bath and having a central feed slot extending therethrough in the spinning direction to permit the passage of a latticed reinforcing sheet downwardly toward the bath surface; means to conduct said reinforcing sheet continuously from a feed supply through said feed slot and into said cooling bath; and at least one row of spinning nozzles in said spinning head located on each side of and directly adjacent the feed slot, at least part of the nozzles in each row adjacent the feed slot being inclined at an angle of about  $10^\circ$  to  $70^\circ$  from the vertical to direct the melt-spun filaments onto the reinforcing sheet at a point above said bath surface under a force sufficient to permit loops of the filaments to penetrate the latticed structure of the sheet.



wherein

X is oxygen or dicyanomethylene;  
 Y and Z are independently selected from the group consisting of  $\text{NO}_2$ , halogen,  $-\text{CN}$  and  $-\text{CF}_3$ ;  
 R is a hydrocarbylene radical having from 1 to 10 carbon atoms;  
 R' is oxygen or sulfur;  
 m is 0 or 1; and  
 n and n' can range from 0 to 3  
 said electronically active insulating polymer film being transparent, capable of facile transport of electrons which are injected into it upon photoexcitation of the contiguous photoconductive layer and incapable of substantial spectral response within the wavelength of spectral response of the photoconductive layer.

4,012,250

# IMAGING SYSTEM

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 2, 1970, Ser. No. 77

Int. Cl.<sup>2</sup> G03G 13/22

U.S. Cl. 96—1 PS

12 Claims

1. An imaging method comprising the steps of:
- providing an imaging member comprising a substantially electrically insulating softenable layer containing migration material, said migration material comprising a dye, said softenable layer capable of having its resistance to migration of said migration material decreased sufficiently to allow migration of said migration material in depth in said softenable layer, said softenable layer overlying a dye transfer layer which is overlying a substrate, said dye transfer layer capable of being rendered more dye receptive than said substrate;
  - applying an electrical imagewise migration force to said migration material;
  - developing the softenable layer by decreasing the resistance of said softenable layer to migration of the migration material at least sufficient to allow an imagewise migration of migration material to said dye transfer layer; and
  - rendering said transfer layer dye receptive whereby said dye material dyes said transfer layer.

4,012,251

# MULTI-LAYERED PHOTOCONDUCTIVE MEMBER

Sam R. Turner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 22, 1975, Ser. No. 580,119

Int. Cl.<sup>2</sup> G03G 5/06, 5/04, 5/08

U.S. Cl. 96—1 PC

18 Claims

1. An electrophotographic imaging member having a composite photoconductive insulating film wherein one layer of said film comprises a photoconductive material capable of substantial spectral response in the visible region of the electromagnetic spectrum and a second layer of electronically active insulating polymer contiguous with said photoconductive layer, said electronically active insulating polymer comprising recurring structural units of the formula:

4,012,252

# IMAGING PROCESS UTILIZING

3-BROMO-N-2''-PYRIDYL-8,13-DIOXODINAPHTHO-(2,1-b; 2',3'-d)-FURAN-6-CARBOXAMIDE

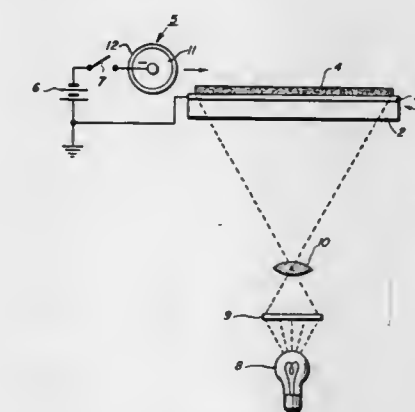
Robert J. Gruber, Pittsford, and Nicholas J. Germano, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 411,596, Oct. 29, 1973. This application Sept. 30, 1975, Ser. No. 618,299

Int. Cl.<sup>2</sup> G03G 17/04

U.S. Cl. 96—1 PE

4 Claims



1. A suspension for photoelectrophoretic imaging comprising finely divided particles of 3-bromo-N-2''-pyridyl-8,13-dioxodinafto-(2,1-b;2',3'-d)-furan-6-carboxamide in an electrically insulating carrier liquid.

4,012,253

# HOLOGRAPHIC RECORDING MEDIUM

Robert Allen Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 309,754, Nov. 27, 1972, abandoned. This application Oct. 16, 1974, Ser. No. 515,369

Int. Cl.<sup>2</sup> G03G 5/00, 5/10; G03C 5/04

U.S. Cl. 96—1.5

3 Claims

1. A medium for recording and erasing phase holograms in the form of a surface relief pattern consisting essentially of in sequence an electrically conductive substrate, a photoconductive insulating layer, a transparent, polar, barrier layer, and an electrically alterable storage layer consisting essentially of a linear, microcrystalline hydrocarbon polymer having a molecular weight in the range from about 300 to about 2000.



4,012,254

## NOVEL PHOTOCONDUCTIVE WATERLESS LITHOGRAPHIC PRINTING MASTERS, AND PROCESS OF PREPARATION

Richard G. Crystal, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 28, 1975, Ser. No. 572,682

Int. Cl.<sup>2</sup> G03G 5/04

U.S. Cl. 96—1.5

12 Claims

1. A process for preparing a nonimaged photoconductive waterless lithographic printing master comprising providing a heterogeneous copolymer containing an adhesive species of polysiloxane groups and an imaging material adhesive species of organic thermoplastic groups, providing a solvent which will preferentially dissolve one of said species, placing said copolymer in said solvent wherein the nonsoluble species forms micelles, providing a photoconductive pigment and dispersing said pigment in the resultant solution, providing a suitable master substrate and coating the resultant suspension on said master substrate, and allowing the solvent to evaporate whereby the soluble species forms the matrix in which the pigment is dispersed.

12. A photoconductive nonimaged waterless lithographic printing master comprising:

- a suitable master substrate, and
- a heterogenous copolymer adhered to said substrate comprising an adhesive species formed of adhesive polysiloxane groups which can be cured or coalesced to an ink releasable elastomeric condition and an imaging material adhesive species formed of organic thermoplastic blocks which can be alternately softened such as by heat and/or solvent, and hardened so as to bond a particulate imaging material thereto, said adhesive species containing an activating amount of photoconductive particles dispersed therein.

4,012,255

## OVERCOATED ELECTROSTATOGRAPHIC PHOTORECEPTOR

Thomas B. McMullen, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 6, 1976, Ser. No. 683,987

Int. Cl.<sup>2</sup> G03G 5/04

U.S. Cl. 96—1.5

9 Claims

1. An improved electrostatographic photoreceptor which comprises:

- a conductive substrate;
- a layer of an alloy of selenium and arsenic as photoconductive insulating material in operative contact with the conductive substrate; and
- an overcoating uniformly covering the exposed surface of said photoconductive material, the overcoating comprising:
  - an organic material comprising a crosslinkable polymeric composition of:
    - a first polymer which is the addition polymerization product of methyl methacrylate, n-butylacrylate and acrylic or methacrylic acid, and
    - a second polymer which is the addition polymerization product of styrene and maleic anhydride, together with
  - a particulate wax-like, normally solid, low molecular weight tetrafluoroethylene telomer in an amount from about 15 to 75 weight percent of said overcoating.

4,012,256

## PHOTO-IMAGING UTILIZING ALKALI-ACTIVATED PHOTOPOLYMERIZABLE COMPOSITIONS

Steven Levinos, Chatham, N.J., assignor to Keuffel &amp; Esser Company, Morristown, N.J.

Filed Sept. 25, 1972, Ser. No. 291,851

Int. Cl.<sup>2</sup> G03C 5/00, 1/68

U.S. Cl. 96—35.1

4 Claims

1. The method of forming a polymeric image which comprises:

- providing photo-imaging material comprising a support and a coating thereon of a composition comprising an ethylenically unsaturated polymerizable compound, a photo-initiator comprising the combination of a photoreducible dye and an alkanolamine, and sufficient acid to normally maintain said composition at a pH value below about 4.5, thereby rendering said material substantially insensitive to visible light;
- alkalizing at least a section of the coated composition of said material to render the pH value of said composition section greater than about 7.0; and
- exposing imagewise to visible light said alkalized composition section, thereby effecting polymerization of said composition in light-exposed areas.

4,012,257

## METHOD OF PRODUCING A GRAVURE PRINTING SURFACE UTILIZING A CONTINUOUS AND SCREENED NEGATIVE

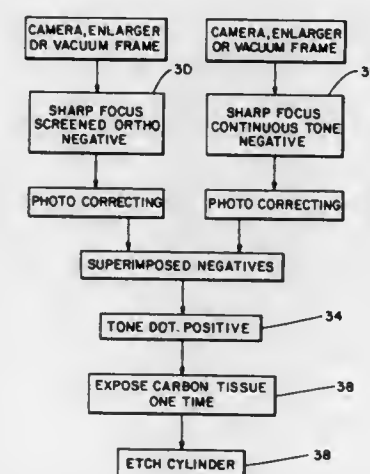
Frank T. Geris, 2900 Maple Ave., Downers Grove, Ill. 60515

Continuation-in-part of Ser. No. 516,171, Oct. 21, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 658,028

Int. Cl.<sup>2</sup> G03C 5/00

U.S. Cl. 96—36.4

20 Claims



1. A method of producing a gravure printing surface comprising the steps of:

- photographically producing a continuous tone negative in sharp focus;
- photographically producing a grey screened negative on orthochromatic film also in sharp focus;
- superimposing the continuous tone and screened negatives in register;
- producing a tone dot positive from the superimposed negatives; and
- producing said gravure printing surface from said positive by exposing a carbon tissue resist and etching in the conventional manner.

4,012,258

## PROCESS FOR FORMING COLOR PHOTOGRAPHIC IMAGES

Tamotsu Kojima; Shui Sato; Wataru Fujimatsu; Hiroyuki Imamura, and Takaya Endo, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1975, Ser. No. 568,054

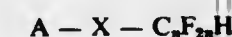
Claims priority, application Japan, Apr. 12, 1974, 49-41465

Int. Cl.<sup>2</sup> G03C 7/00

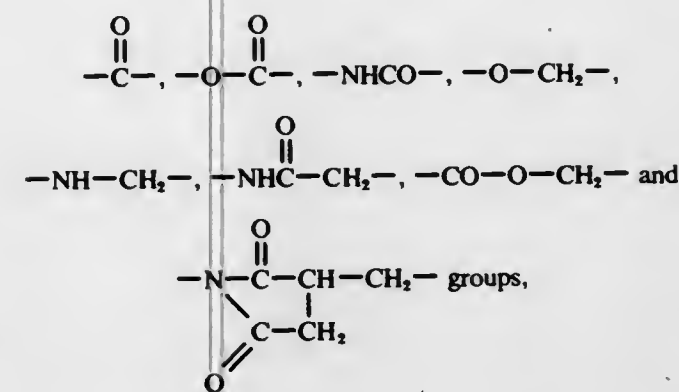
U.S. Cl. 96—55

5 Claims

1. A method of processing an exposed light-sensitive silver halide color photographic material by a developer, which method comprises conducting said processing in the presence of a coupler represented by the following formula



wherein A is the residue of a coupler which is selected from the group consisting of benzoylacetylacetanilide and pivaloylacetylacetanilide yellow couplers, 1-phenyl-5-pyrazolone, indazolin-3-one and pyrazolo-benzimidazole magenta couplers, and phenol and naphthol cyan couplers; X is a biradical which is selected from the group consisting of



provided that the left bond of the group is attached to A while the right bond is connected to  $-C_nF_{2n}H$ ; and n is an integer of 1 to 18 inclusive; further provided that X is not  $-NHCO-$  of which N is attached to A when the following three conditions are simultaneously met, one of the conditions being that A is a phenol or naphthol cyan coupler residue, another being that the hydrogen atom of  $-C_nF_{2n}H$  is at the  $\omega$ -position thereof, the other being that n is an even number of 2 to 14.

4,012,259

## PHOTOGRAPHIC SILVER HALIDE EMULSION AND ELEMENT AND METHOD OF FORMING COLOR PHOTOGRAPHIC IMAGES

Akio Okumura; Akira Sato; Seiji Ichijima; Keisuke Shiba, and Kiyoshi Nakazyo, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 14, 1974, Ser. No. 469,923

Claims priority, application Japan, May 16, 1973, 48-54456

Int. Cl.<sup>2</sup> G03C 7/00, 1/40

U.S. Cl. 96—56.5

35 Claims

1. A method of forming color photographic images which comprises developing an image-exposed photographic silver halide emulsion layer with a primary aromatic amino developing agent in the presence of a yellow color forming coupler, said coupler having an open chain active methylene group bonded to two adjacent carbonyl groups, one of the hydrogen atoms of the active methylene group being substituted by a 2,5-dioxo-1-imidazolidinyl group, in which the nitrogen atom at the 3-position and the carbon atom at the 4-position are connected to form a ring through a divalent aliphatic group having 3 or 4 carbon atoms.

4,012,260

## ACTIVATOR-STABILIZERS IN HEAT DEVELOPABLE PHOTOGRAPHIC MATERIALS AND PROCESSES

Dorsey G. Dickerson, and Paul B. Merkel, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

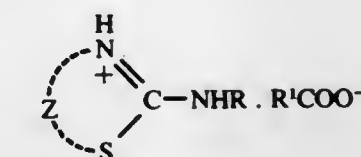
Filed Feb. 19, 1975, Ser. No. 551,182

Int. Cl.<sup>2</sup> G03C 1/02, 1/48

U.S. Cl. 96—114.1

14 Claims

1. A heat-developable and heat-stabilizable photographic element comprising a support having thereon in reactive association a photographic silver salt, a photographic silver salt developing agent and a stabilizing concentration of an activator-stabilizer represented by the formula:



wherein

Z is alkylene having 2 to 3 carbon atoms in the alkylene chain,

R is hydrogen, alkyl containing 1 to 3 carbon atoms, cycloalkyl containing 5 to 6 carbon atoms, or aralkyl containing 7 to 10 carbon atoms,

R'COO<sup>-</sup> is an acid anion which is decarboxylatable at temperatures above about 80° C., and tautomers corresponding to said activator-stabilizer.

13. A method of developing and stabilizing an image in a heat-developable and heat-stabilizable photographic element comprising a support having thereon a layer comprising photographic silver halide, a polymeric binder, a silver halide developing agent and a stabilizing concentration of an activator-stabilizer which is a compound selected from the group consisting of

2-amino-2-thiazolinium trichloroacetate, bis(2-amino-2-thiazolinium)oxalacetate, and combinations of these thiazolinium compounds,

comprising heating said element to a temperature within the range of about 90° C. to about 160° C. for about 1 to about 4 seconds.

4,012,261

## BIOCIDAL COMPOSITIONS CONTAINING MONOCYCLIC POLYOXYMETHYLENEOXAZOLIDINES

Henri Sidi, Paramus, and Hilding R. Johnson, Wayne, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Division of Ser. No. 519,884, Oct. 31, 1974, Pat. No. 3,962,271, which is a division of Ser. No. 447,797, March 4, 1974, Pat. No. 3,890,264. This application Sept. 4, 1975, Ser. No. 610,194

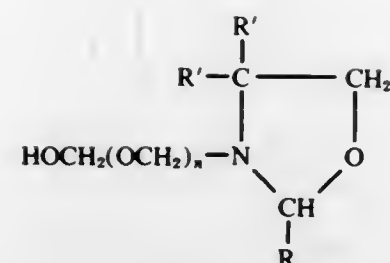
Int. Cl.<sup>2</sup> C09D 5/14; A01N 9/28

U.S. Cl. 106—15 R

6 Claims

1. A biocidal composition for use in controlling the growth of bacteria and fungi in aqueous surface-coating compositions that is an aqueous solution containing 20 percent to 80 percent by weight of a biocidal component that comprises a monocyclic polyoxymethyleneoxazolidine having the structural formula





wherein R represents hydrogen, alkyl of 1 to 6 carbon atoms, phenyl, halophenyl, or  $-(\text{CH}_2)_m\text{CH}_2\text{OH}$ ; each R' represents alkyl of 1 to 6 carbon atoms or  $-\text{CH}_2\text{OH}$ ; m represents a number in the range of 0 to 2; and n represents a number in the range of 1 to 4.

4,012,262

# MANUFACTURE OF THERMALLY-INSULATING, REFRACTORY ARTICLES

Denis Arthur John Patterson, "The Cottage", Newbridge Green, Upton-on-Severn, Worcestershire, and Thomas Albert Williams, "Fairways", Mill Lane, Blakedown, Kidderminster, Worcestershire, both of England

Filed Feb. 8, 1974, Ser. No. 440,704

Int. Cl.<sup>2</sup> B28B 7/36

U.S. Cl. 106—38.22

33 Claims

1. A molding composition for the manufacture of thermally insulating refractory articles, comprising a liquid, about 1 to 20 percent by weight on a dry basis of organic fibrous material and about 60 to 95 percent by weight on a dry basis of particulate refractory material, the liquid being present in an amount such that the composition is of plastic consistency and has a minimum apparent viscosity of about 200,000 centipoises at a temperature of 25° C.

4,012,263

# ALKALI-FREE GLASSES

James Allen Shell, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 10, 1975, Ser. No. 548,264

Int. Cl.<sup>2</sup> C03C 3/04

U.S. Cl. 106—52

12 Claims

1. A glass composition containing  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{CaO}$  and  $\text{BaO}$  and consisting essentially of compositions selected alternatively from one of the group of compositional ranges A and B below:

COMPOSITIONAL RANGE A	
COMPONENTS	PERCENT BY WEIGHT
$\text{SiO}_2$	50-52.1
$\text{Al}_2\text{O}_3$	8-10.9
$\text{CaO}$	8.7-11.1
$\text{BaO}$	26.6-30.3

COMPOSITIONAL RANGE B	
COMPONENTS	PERCENT BY WEIGHT
$\text{SiO}_2$	52.8-59
$\text{Al}_2\text{O}_3$	10.9-14.1
$\text{CaO}$	7.7-14.4
$\text{BaO}$	15.5-26.6
$\text{MgO}$	0-2.4

4,012,264

# EARLY STRENGTH CEMENTS

Ransom James Murray, Gravesend, and Arthur William Brown, London, both of England, assignors to The Associated Portland Cement Manufacturers Limited, London, England

Continuation of Ser. No. 386,625, Aug. 8, 1973, abandoned.

This application Mar. 25, 1975, Ser. No. 561,881

Claims priority, application United Kingdom, Aug. 16, 1972, 38202/72

Int. Cl.<sup>2</sup> C04B 7/02, 7/32

U.S. Cl. 106—89

12 Claims

1. An early strength hydraulic cement comprising a mixture of a cement prepared from a clinker rich in  $\text{C}_{12}\text{A}_7$  and poor in other calcium-aluminum compounds such as  $\text{CA}$  or  $\text{C}_3\text{A}$  with a Portland cement, said mixture including at least 10% by weight of  $\text{C}_{12}\text{A}_7$ , a majority of the balance comprising calcium silicates and including at least 10% by weight of  $\text{C}_3\text{S}$ .

4,012,265

# LOW-DENSITY MICROCELLULAR FOAM AND METHOD OF MAKING SAME

James A. Rinde, Livermore, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 2, 1975, Ser. No. 609,641

Int. Cl.<sup>2</sup> C08L 1/12

U.S. Cl. 106—122

2 Claims

1. A cellulose acetate foam having a density in the range of 0.065 to  $0.6 \times 10^3 \text{ kg/m}^3$  and a cell-size in the range of 0.3 to 2  $\mu\text{m}$ .

4,012,266

# METHOD AND APPARATUS FOR FILAMENT WINDING ON A CORRUGATED FORM TO PRODUCE A CYLINDRICAL CORRUGATED GLASS FIBER PART

Donald L. Magee, Rte. 8, Lincoln, Nebr. 68506; Walter A. Bailey, 3440 N. 66th St., Lincoln, Nebr. 68507, and Roger P. Bailey, 4131 Clifford Drive, Lincoln, Nebr. 68506

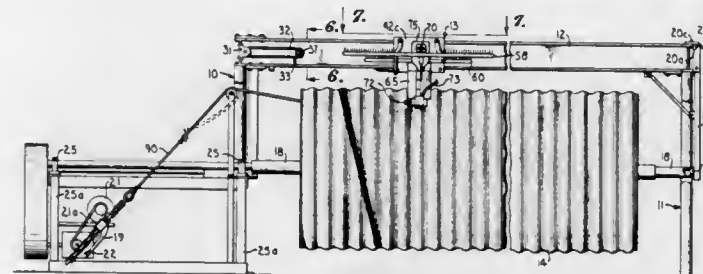
Continuation of Ser. No. 282,255, Aug. 21, 1972, abandoned.

This application Oct. 31, 1974, Ser. No. 519,547

Int. Cl.<sup>2</sup> B65H 81/00

U.S. Cl. 156—173

8 Claims



1. The method of filament winding on a cylindrical form to thereby form a cylindrical part, said method including the steps of

- a. causing relative motion between said form and a glass fiber applicator,
- continuously delivering liquified resin and catalyst to a receptacle to combine the resin and catalyst,
- applying said combined liquified resin and catalyst in said receptacle to a glass fiber band,
- varying the proportional amount of catalyst to resin that is applied to said glass fiber band at preselected times during the filament winding operation,
- wrapping said glass fiber band with said resin catalyst combination coating thereon on said form in a spiral pattern, permitting said glass fiber to harden on said form thereby forming said cylindrical part, and
- removing said hardened part from said form after a predetermined period of time.

4,012,267

# PROCESS FOR PRODUCING PULTRUDED CLAD COMPOSITES

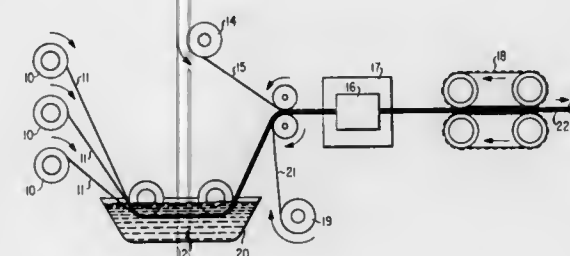
Theodore Harold Klein, Livingston, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 10, 1975, Ser. No. 594,580

Int. Cl.<sup>2</sup> B29G 7/00; B32B 15/14

U.S. Cl. 156—178

12 Claims



1. A continuous process for forming a composite of a fibrous first material clad with at least one second metal foil cladding material comprising:

- a. impregnating a continuous length of a fibrous first material with a contracting liquid resin,
  - b. combining the impregnated fibrous first material in a continuous manner with a continuous length of a second metal foil cladding material,
  - c. pultruding in a continuous manner the combination of the first and second materials through a forming and curing die,
- thereby continuously and simultaneously forming and fully curing a clad composite.

4,012,268

# CONTINUOUS BUSINESS FORM OR THE LIKE ADAPTED FOR SUBSEQUENT PROCESSING INTO ORIGINAL INDICIA BEARING LOTTERY TICKETS, ENVELOPES OR THE LIKE

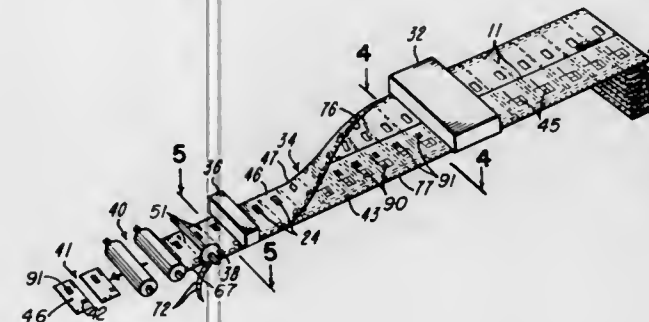
Edward L. Johnsen, 12 Fox Meadow Lane, Wayland, Mass. 01778

Division of Ser. No. 433,463, Jan. 15, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,231

Int. Cl.<sup>2</sup> B31F 1/00

U.S. Cl. 156—200

11 Claims



1. A method of producing a series of interconnected blanks suited for processing into individual envelopes, lottery tickets or like articles having an under ply containing original, directly applied indicia on one surface thereof and a cover ply disposed in substantial overlying relationship with said under ply, concealing selected portions of said indicia, comprising the steps of:

- a. continuously advancing an endless web of material toward an accumulating station;
- b. transversely subdividing said web into a series of interconnected blanks, the width of each of which is defined by at least two longitudinal, contiguous, coplanar panels which collectively define the cover ply and under ply panels of the article;
- c. selectively applying an adhesive to a surface of one of the plys to be positioned adjacent at least two sides of the

concealed portion thereby generally surrounding the concealed portion for positioning the indicia in a pocket area which is substantially completely and permanently sealed to the cover ply in a manner such that improper access to the pocket area is impractical;

- d. accumulating said series of interconnected blanks for further processing, and thereafter;
- e. continuously advancing said interconnected blanks toward an indicia applying station;
- f. applying original indicia directly to an upper surface of the under ply panel; and
- g. continuously folding and activating the adhesive for substantially permanently bonding said cover ply panel in substantial overlying relationship with said under ply panel thereby positioning the concealed portions of the indicia in the pocket area, and completing a series of interconnected envelopes, lottery tickets or like articles each having indicia concealed inside a substantially completely and permanently sealed pocket area.

4,012,269

# METHOD OF MAKING A WATER BED

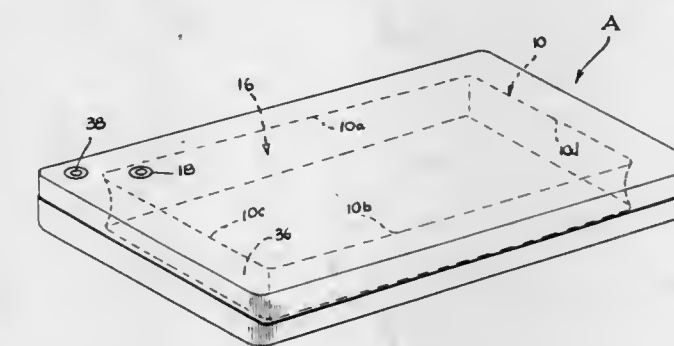
John D. Tabata, Los Angeles; Enrique Cantillo, Santa Ana, and Frank M. Tabata, Los Angeles, all of Calif., assignors to American Thermo-Seal, Inc., Los Angeles, Calif.

Division of Ser. No. 470,956, May 17, 1974, Pat. No. 3,918,110. This application Oct. 17, 1975, Ser. No. 623,467

Int. Cl.<sup>2</sup> B32B 31/00

U.S. Cl. 156—251

16 Claims



1. A method of making a generally rectangularly shaped water bed mattress for supporting a body thereon and where said mattress comprises upper and lower generally rectangular walls, with a first continuous inner wall of generally rectangular configuration extending between said upper and lower walls and forming a water chamber therebetween, and a second continuous peripheral wall of generally rectangular configuration located outwardly of said first continuous wall and which is in spaced apart relationship therefrom, thereby forming an air chamber between portions of said upper and lower walls and said first continuous inner wall and second continuous peripheral wall and which air chamber surrounds said water chamber; said method comprising forming an inner continuous peripheral wall from a plurality of upstanding sections which are connected at corner margins by permanently formed arcuate segments which are permanently convex to said water chamber, forming a first water tight lap seal securing said upper wall to the upper margin of said continuous inner wall continuously along the entire peripheral length thereof, forming said first continuous inner wall with said upstanding wall sections having a sufficient amount of material so that all wall sections of said inner wall are permanently convex to said water chamber and with said upper and lower margins thereof being permanently spaced outwardly from said water chamber with respect to a midpoint of said upstanding wall sections located between said upper and lower margins, and where the upper and lower margins of said arcuately shaped corner margins are also spaced outwardly from said water chamber with respect to the midpoints of said arcuate segments forming said corner margins.



4,012,270

# METHOD OF IMPROVING THE ADHESION OF PROPYLENE POLYMERS TO ENAMEL COATED METAL SURFACES

Chester W. Fitko, Chicago, Ill., assignor to The Continental Group Inc., New York, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,513

Int. Cl.<sup>2</sup> C09J 5/00

U.S. Cl. 156—306

15 Claims

1. A method of heat sealing a propylene polymer to a metal surface which comprises:

- preparing a solution of a carboxyl modified polypropylene resin by dissolving an adhesion promoting amount of the resin in a solvent heated to a temperature greater than 100° C, the solvent being selected from the group consisting of saturated and olefinic unsaturated aliphatic acids and alcohols having 10 to 22 carbon atoms and saturated and unsaturated hydrocarbons having 10 to 30 carbon atoms,
- adding the resin solution to an enamel coating formulation so that the modified enamel coating formulation is comprised of a solids mixture of about 60 to about 95% by weight of an epoxy resin about 5 to about 40% by weight of a urea formaldehyde resin and about 0.01 to about 5% by weight of the carboxyl modified polypropylene resin,
- applying the modified coating formulation to the metal surface,
- baking the modified coating formulation to cure and harden the coating,
- heat sealing a propylene polymer layer to the hardened enamel coated metal surface and then,
- cooling the heat sealed assembly to ambient temperature.

4,012,271

# WATER-COOLED SUPPORT BAR

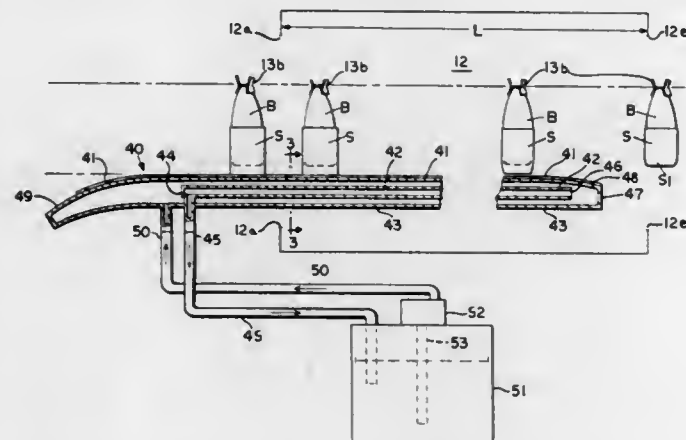
Marshall G. Brummett, Toledo; Russell W. Heckman, Perrysburg; George A. Nickey, and James E. Taylor, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 17, 1976, Ser. No. 658,631

Int. Cl.<sup>2</sup> B65C 9/00

U.S. Cl. 156—423

14 Claims



12. In an apparatus for shrinking tubular sleeves of heat shrinkable thermoplastic onto glass containers, the combination comprising an elongated oven enclosure open at its opposite ends to define the entrance and exit thereto and operable for heat shrinking said thermoplastic sleeves in snug fitting surface relationship on said glass containers during movement through the oven, a conveyor having spaced apart chucks thereon supporting glass containers in an upright position, the containers having loose fitting tubular sleeves of said thermoplastic positioned thereon to depend a predetermined amount below the bottom of the containers, said conveyor travelling in a path extending longitudinally through said oven enclosure.

a horizontally extending elongated support bar mounted below the path of said conveyor, a portion thereof ex-

tending outwardly from said oven entrance and the remaining portion extending into the oven, the uppermost surface of said support bar adapted to engage the bottom edge of the sleeves positioned on the containers and maintain that position until shrunk onto the containers. a cooling means connected to said support bar to maintain the uppermost surface thereof at a temperature to avoid sticking of the plastic sleeves engaged thereon, and a friction reducing coating on said uppermost surface extending substantially the length of said support bar, whereby said plastic sleeves are guided thereby.

4,012,272

# APPARATUS FOR MAKING REINFORCED FLEXIBLE HOSE

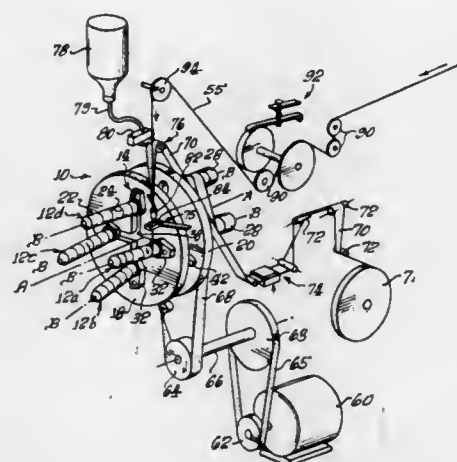
Larkin Hall Tiner, 487 Esther St., Costa Mesa, Calif. 92627

Filed Aug. 22, 1975, Ser. No. 606,869

Int. Cl.<sup>2</sup> B65H 81/04

U.S. Cl. 156—429

3 Claims



1. An apparatus for continuously forming a flexible reinforced, tubular hose from a continuous, flexible plastic ribbon, and including therein a continuous spring wire, comprising, in combination:

- at least four cylindrically-shaped mandrels having a mandrel head provided with a plurality of spaced-apart annular grooves disposed therein and a mandrel shaft connected at one end thereof;
- a drive spindle attached to each of said shafts of said mandrels;
- a first stationary carriage plate having a plurality of radially disposed slots therein to correspond to each of said mandrels, said mandrels being adjustably mounted within said slots;
- a second carriage plate arranged to be rotatably adjustable, said plate having a plurality of slots radially disposed therein and arranged to adjustably receive said mandrels therein, said first and second plates being axially aligned along a central axis thereof;
- means for adjusting said mandrels in said first and second plates, whereby each of said mandrels is simultaneously arranged to form a skewed, offset arrangement relative to the central axis of said plates, and whereby said grooves of each mandrel are progressively offset from the grooves of the preceding mandrel in a clockwise direction, wherein each longitudinal axis of each mandrel is arranged and fixed in an oblique direction with respect to that of said central axis of said carriage plates thereby forming a circumferential, convoluted configuration of said flexible hose, and whereby said hose is fed outwardly from said mandrel substantially along said central axis of said plates and wherein said means for adjusting said mandrels comprise:

an adjustable block member slidably received in each slot of each carriage plate;

a floating, bearing means mounted to said shafts of said mandrels and supported within each block member; and

4,012,274

# SPLICER FOR HEAT COHERING BELTS

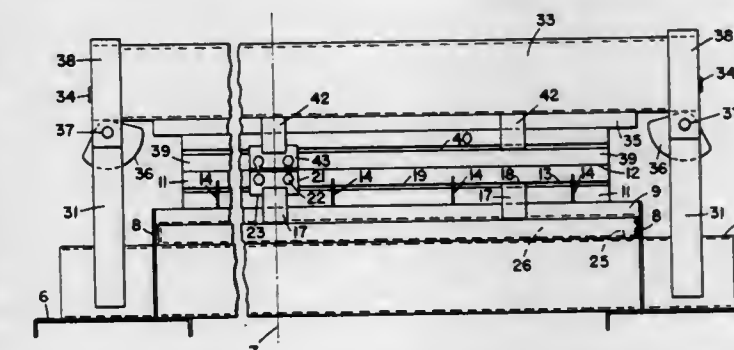
Nils Lang-Ree, Los Altos, Calif., assignor to N.P.I. Corporation, Burlingame, Calif.

Filed Oct. 17, 1975, Ser. No. 623,366

Int. Cl.<sup>2</sup> B30B 15/06, 15/34; B65H 69/08

U.S. Cl. 156—502

3 Claims



1. A splicer for heat cohering belts comprising a base including an elongated lower platen frame; a lower, flexible elongated platen on said lower platen frame, said lower platen being a thermally conducting bar having transverse gaps extending partially therethrough from the bottom thereof; a first heater in said lower platen; an elongated upper platen frame; an upper, rigid, elongated platen on said upper platen frame; a second heater in said upper platen; means including a shaft rotatable on said base and a cam fixed on said shaft and engaging said upper platen frame for moving said upper platen toward and away from said lower platen; means including a bail fixed on said shaft for holding said upper platen in a fixed position; an expansible means between said base and said lower platen for forcing said lower platen toward said upper platen, and means secured to the center only of said lower platen frame and to the center only of said lower platen for holding the center of said lower platen at the center of said lower platen frame.

4,012,273

# HAND OPERATED TAPE WRAPPER

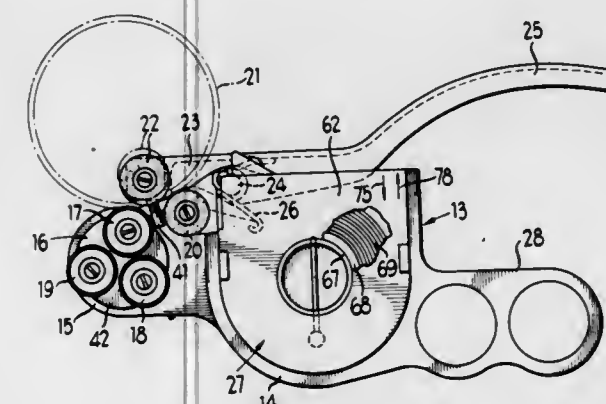
Egons Inka, Chicago, Ill., assignor to Crane Packing Company, Morton Grove, Ill.

Filed Nov. 6, 1975, Ser. No. 629,280

Int. Cl.<sup>2</sup> B65H 81/00

U.S. Cl. 156—490

4 Claims



1. A hand tool for wrapping tape around a pipe, said tool comprising an elongated frame, means on the frame for removably holding a supply of tape in coiled form, said tape supply comprising a dispenser and means in the dispenser for rotatably supporting a roll of tape, a pair of rollers at one end of the frame, a handle on the other end of said frame, other means on the frame for supporting said rollers for rotation thereon about parallel axes, a lever pivotally attached to said frame at a location between said pair of rollers and said handle to hold said frame and lever in substantially parallel relationship to one another, a roller at one end of said lever adjacent said pair of rollers rotatable about an axis parallel with the axes of said pair of rollers, a handle at the other end of said lever aligned with and spaced from said frame handle, and means for resiliently urging said lever roller toward and between said pair of rollers whereby squeezing the handles together separates the lever roller from said pair of rollers, one end of said pipe being insertable between said lever roller and said pair of rollers, said tape from said tape supply being insertable between said pipe and said pair of rollers to be pressed against said pipe by said resiliently urged lever roller, and means on said tape supply dispenser for cutting off a piece of tape from said roll of tape.

4,012,275

# APPARATUS FOR MAKING PLASTIC GLOVES

Sören Sjöholm, and Einar Andersson, both of Lesjöfors, Sweden, assignors to Parena Plast AB, Lesjöfors, Sweden

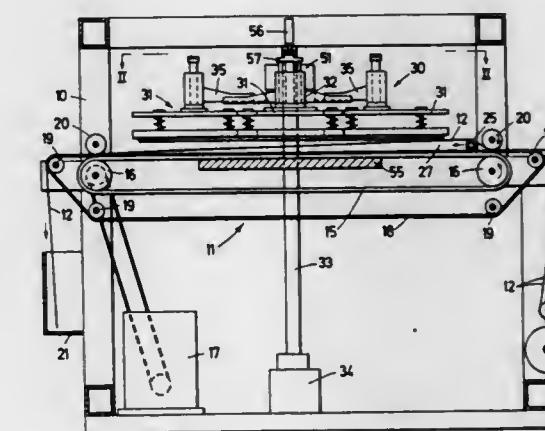
Filed Jan. 20, 1976, Ser. No. 650,609

Claims priority, application Sweden, Feb. 4, 1975, 7501199

Int. Cl.<sup>2</sup> B32B 31/00; B26D 7/06

U.S. Cl. 156—515

8 Claims



1. Apparatus for making a glove from a double thermoplastic film web, comprising a conveyor mechanism for intermittently advancing a double thermoplastic film web along a feed path through a cutting and welding station, said conveyor mechanism including an endless conveyor belt and means for maintaining the film web in constant engagement with the conveyor belt at two locations along the feed path on opposite sides of the cutting and welding station; a flat web-supporting bed disposed at the cutting and welding station below the feed path; a cutting and welding tool disposed at the cutting and



welding station at a level above the feed path and the web-supporting bed and having a vertically movable, heated die formed to the shape of the glove to be made and a mechanism for lowering the die into contact with the film web and for raising the die clear of the film web after the web has been cut and welded by the die; said conveyor mechanism including spacing means for keeping the film web spaced above the conveyor belt at the cutting and welding station when the die is raised clear from the film web; and a transfer mechanism including a suction member engageable with the film web at the cutting and welding station to grip a glove parted from the film web and movable in synchronism with the conveyor belt to a delivery station to deliver the gripped glove.

4,012,276

**APPARATUS FOR THE MANUFACTURE BY MACHINE OF MULTILAYER CORRUGATED PAPER MATERIAL**  
Manfred K. Schertler, Neuburg, Danube, Germany, assignor to Kartonagen. Schertler, Manfred K. Schertler & Co., Neuburg, Danube, Germany

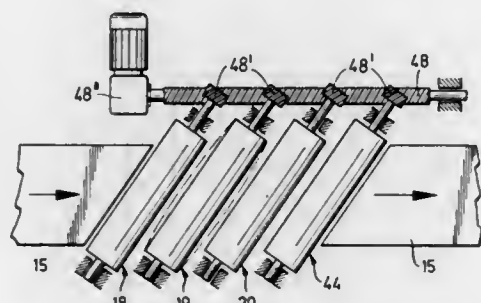
Filed May 28, 1975, Ser. No. 581,639

Claims priority, application Germany, Nov. 11, 1974, 2453297

Int. Cl.<sup>2</sup> B31F 5/00

U.S. Cl. 156—558

11 Claims



1. An apparatus for the manufacture of laminated corrugated strips, each corrugated strip including a pair of planar paper outer layers and corrugated layer means between said outer paper layers, comprising:

a cold setting, waterproof adhesive;  
adhesive applying means for applying a layer of said cold setting, waterproof adhesive on one of said pair of planar paper outer layers;  
superposing means immediately adjacent an output end of said adhesive applying means for superposing a corrugated strip onto said layer of adhesive;  
compressing means immediately adjacent an output end of said superposing station for applying a pressure to said superposed corrugated strips and said adhesive layer to elastically deform the corrugations in said corrugated layer means whereby a waterproof barrier is created between said superposed corrugated strips, said compressing means including a plurality of motor-driven roller pairs arranged one behind the other and including means for adjusting the spacing between said roller pairs, the rollers of said roller pairs being skewed with respect to the path of movement of said laminated corrugated strips through said compressing means; and  
conveying means for conveying said corrugated strips to said adhesive applying means, said superposing means and said compressing means.

4,012,277

**APPARATUS FOR APPLYING THERMOACTIVATABLE ADHESIVE COATED LABELS**

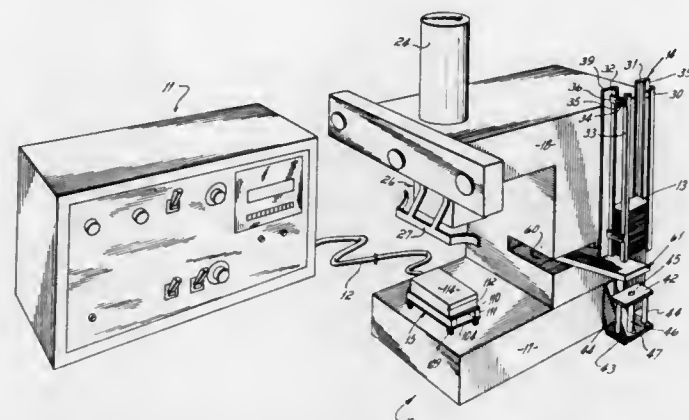
Luke G. Lundskow; Robert J. Jaarsma, and Bobby J. Clay, all of Cincinnati, Ohio, assignors to Natmar, Inc., Cincinnati, Ohio

Filed Oct. 14, 1975, Ser. No. 622,034

Int. Cl.<sup>2</sup> B65C 5/04, 9/14, 9/36

U.S. Cl. 156—571

11 Claims



1. In apparatus for applying to an article a label of the type having a thermoactivatable adhesive coated on one side thereof, the combination of:

a first platen for supporting said article;  
a second platen;  
means having at least one of said platens;  
a label support disposed remote from said platens;  
a transfer arm adapted for movement from a position adjacent said label support to a position adjacent to said first platen;  
vacuum conduit means carried by said transfer arm for applying a vacuum to one area of a label;  
heating means carried by said transfer arm for heating a second area of said label remote from said first to thermally activate an area of said adhesive;  
means for shifting said transfer arm from a position in contact with a label on said support to bring said label into contact with an article on said first platen, whereby said label is tacked to said article;  
means for shifting said transfer arm away from said first platen; and  
means for forcing one of said platens against the other to apply heat and pressure to said label and article to effect a bond therebetween.

5. In apparatus for applying to an article a label of the type having a thermoactivatable adhesive coated on one side thereof, the combination of:

a lower platen for supporting said article;  
an upper platen;  
means heating at least one of said platens;  
a magazine for supporting a stack of labels in superposed relationship remote from said platens;  
a label support platform;  
picker means for serially removing said labels from said magazine and depositing them on said platform;  
a transfer arm adapted for movement from a position adjacent said label support platform to a position adjacent to said lower platen;  
vacuum conduit means carried by said transfer arm for applying a vacuum to one area of a label;  
heating means carried by said transfer arm for heating a second area of said label remote from said first to thermally activate an area of said adhesive;  
means for shifting said transfer arm from a position in contact with a label on said platform to bring said label into contact with an article on said lower platen, whereby said label is tacked to said article;  
means for shifting said transfer arm away from said lower platen; and

means for forcing one of said platens against the other to apply heat and pressure to said label and article to effect a bond therebetween.

4,012,278

**FEED WATER AND CONDENSATE SAMPLE ANALYZER FOR POWER PLANTS**

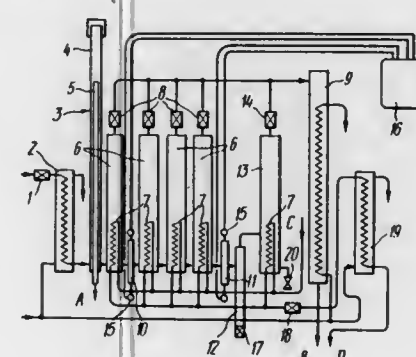
Alexei Alexeevich Mostofin, ulitsa Karbysheva, 4, korpus 1, kv. 92, and Nina Sergeevna Sorokina, ulitsa Dmitrievskaya, 10, kv. 1, both of Leningrad, U.S.S.R.

Filed Sept. 19, 1975, Ser. No. 615,075

Int. Cl.<sup>2</sup> G01N 27/42; B01D 1/02

U.S. Cl. 159—30

3 Claims



1. A feed-water and liquid condensate sample analyzer for power plants, for a continuous analysis, comprising: a pressure column communicating with a concentrator for the sample, which produces at its outlet a sample with a minimum content of gaseous components of the sample being analyzed, and made up of a plurality of evaporators connected in series downstream of the phase flow of the sample; a throttle at the outlet of a steam-gaseous mixture of each of said evaporators; an electro-conductivity sensor at the outlet of said concentrator; said throttle of a first evaporator downstream of the sample flow having an aperture for the passage of the mixture, which aperture is smaller than apertures of said throttles of the other evaporators, and the size of said aperture is such that it ensures a level of a liquid phase so high as to ensure degassing of carbonic acid only; and a second electro-conductivity sensor between said first and said other evaporators, whose output is proportional to the content of ammonia in the liquid phase, with the result that the analyzer allows measurements of the content of both the salts and the ammonia in the process of the continuous analysis.

4,012,279

**PROCESS OF PRODUCING PULP, FOR MANUFACTURE OF FIBERBOARD, IN A CLOSED BACKWATER SYSTEM**  
Stig Selander, and Karl Cederquist, both of Stockholm, Sweden, assignors to Stig Selander, Stockholm, Sweden

Filed Dec. 30, 1974, Ser. No. 537,470

Claims priority, application Sweden, Dec. 28, 1973, 7317565

Int. Cl.<sup>2</sup> D21C 3/24; D21F 11/00

U.S. Cl. 162—13

11 Claims

6. In a process for manufacturing fiberboard according to the wet method and with a closed backwater system which includes in sequence the steps of: defibrating lignocellulose fiber containing chips within a disintegrating apparatus in an atmosphere or saturated steam, suspending the defibrated material discharged from the defibrating step in backwater serving as propellant liquid to form a pulp suspension, forming wet sheets from the pulp suspension, mechanically separating off water from the wet sheets and recycling the water as backwater to form a new pulp suspension and drying the sheets by evaporation of water, the improvement comprising the steps of liberating steam from the defibrated material and preheating the chips with said steam to a temperature in the range of 90° to 100° C, then de-watering the steam-heated chips to a

4,012,280

**DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL WITH AN ALKALINE LIQUOR IN THE PRESENCE OF A CYCLIC KETO COMPOUND**

Harry Hutchinson Holton, Beloeil, Canada, assignor to Canadian Industries, Ltd., Montreal, Canada

Filed Aug. 30, 1976, Ser. No. 718,980

Claims priority, application United Kingdom, Sept. 5, 1975, 36636/75; Sept. 5, 1975, 36637/75; Sept. 5, 1975, 36638/75; Sept. 5, 1975, 36639/75

Int. Cl.<sup>2</sup> D21C 3/02, 3/20, 9/10

U.S. Cl. 162—65

11 Claims

1. A process for the delignification of lignocellulosic material comprising the steps of

1. treating the lignocellulosic material in a closed reaction vessel with an alkaline pulping liquor containing from 0.001% to 10.0% by weight based on the lignocellulosic material, of a cyclic keto compound selected from the group consisting of naphthoquinone, anthraquinone, anthrone, phenanthrenequinone, the alkyl, alkoxy and amino derivatives of said quinones, 6,11-dioxo-1H-anthra-[1,2-c]pyrazole, anthraquinone-1,2-naphthacridone, 7,12-dioxo-7,12-dihydroanthra[1,2-b]pyrazine 1,2-benzanthraquinone and 10-methylene anthrone, the treatment taking place at a maximum temperature in the range of from 150° C. to 200° C. for a period of 0.5 to 480 minutes, and  
2. displacing the pulping liquor from the lignocellulosic material with water or an aqueous liquor inert to the lignocellulosic material to obtain a delignified cellulosic material.

4,012,281

**WET LAID LAMINATE AND METHOD OF MANUFACTURING THE SAME**

Warren C. Mayer, Somerville, and Donald V. Skistimas, Milltown, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 4, 1975, Ser. No. 555,230

Int. Cl.<sup>2</sup> D21F 11/00; B32B 7/14

U.S. Cl. 162—127

14 Claims

1. An improved wet laid fibrous laminate comprising a first layer consisting of fibrous material having a length of from 1 millimeter to 3 millimeters and an adhesive binder distributed in a print pattern throughout the layer whereby the layer has excellent wet and dry abrasion resistance and a second layer consisting of less than 60 percent of wood pulp fibers and from 40 percent to 100 percent of synthetic textile fiber having a length of ¼ inch to 1 inch, said second layer being substantially free of binder material and being adhered to the first layer through the frictional entanglement of the textile fiber with the first layer and by the adhesive binder to provide an easily handleable absorbent laminate, said laminate having a bulk density of from 4 to 8 cubic centimeters per gram.

13. A method of manufacturing a wet laid fibrous laminate comprising depositing a first aqueous slurry of wood pulp fibers and synthetic textile fibers on a permeable screen to form a first layer consisting of less than 60% wood pulp fibers and from 60–100% synthetic textile fibers, depositing a second aqueous slurry of shot fibers consisting of short fibers having a length of from one to three millimeters on top of the first fibrous layer, removing a portion of the water from said fibrous layers to form a laminate, removing the laminate from the wire screen, applying an adhesive binder to the fibrous layer containing the fibers having a length of from one to three millimeters in an intermittent print pattern wherein the first



layer remains substantially free of binder, drying the laminate with the adhesive binder thereon to remove the remaining water and cure the adhesive binder.

4,012,282

# **MULTIPLE LEAD SEAL ASSEMBLY FOR A LIQUID-METAL-COOLED FAST-BREEDER NUCLEAR REACTOR**

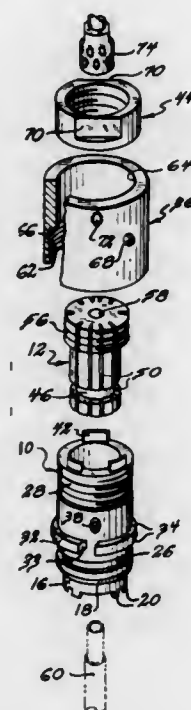
Ernest Hutter, Wilmette, and John A. Pardini, Brookfield, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 17, 1976, Ser. No. 686,989

Int. Cl.<sup>2</sup> G21C 17/10

U.S. Cl. 176—87

3 Claims



1. A reusable multiple lead seal assembly comprising:
  - a hollow seal shell having a circumferential channel in its inner surface and a port through a wall of the seal shell connecting the circumferential channel with the outer surface of the seal shell;
  - means for sealably attaching the seal assembly to an end of a test assembly, including a plurality of antirotation lugs projecting from the seal shell for engagement with antirotation notches in the end of the test assembly to prevent rotation of the lead seal assembly with respect to the test assembly;
  - a seal body disposed in the seal shell, the surface of the seal body having a plurality of flutes, a circumferential body channel contiguous to the circumferential channel in the seal shell and forming a conduit therewith, which channel intersects each flute, and a threaded end of the seal body having an outer diameter less than the outer diameter of the seal shell;
  - means for sealing the multiple lead seal assembly;
  - at least one instrument lead in each flute of the seal body; and
  - a jacking nut having threaded engagement with the threaded end of the seal body and movable against the end of the seal shell surrounding the seal body wherein when the jacking nut is screwed against the seal body the seal body will shear and release from the seal shell, breaking the seal without damage to the seal assembly and leads.

4,012,283

## **ENZYME SEPARATION**

Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England  
Division of Ser. No. 469,221, May 13, 1974, abandoned, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.

This application Sept. 2, 1975, Ser. No. 609,618

Claims priority, application United Kingdom, Feb. 11, 1971, 3469/71

Int. Cl.<sup>2</sup> C07G 7/02

U.S. Cl. 195—66 R

14 Claims

1. A process for the separation of mixtures containing a plurality of enzymes at least one of which requires a coenzyme for its reactivity, which comprises contacting the enzyme mixture in solution with a reactive matrix comprising an insoluble organic polymer support material having chemically attached thereto a co-enzyme which has reactivity for one or more of the enzymes so that the enzymes become attached to the support through said co-enzyme, removing the support containing said attached enzymes from the solution and eluting the enzymes sequentially from the support.

4,012,284

## **PROCESS OF PREPARATION OF ANTIBIOTIC F.I. 1762 DERIVATIVES**

Aurelio Di Marco; Graziana Canevazzi; Arpad Grein, all of Milan; Piergiuseppe Orezzi, Rivanazzano Pavia, and Marcello Gaetani, Milan, all of Italy, assignors to Societa' Farmaceutici Italia, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 322,847, Nov. 12, 1963, Pat. No. 3,872,085. This application Oct. 6, 1964, Ser. No. 404,550

Claims priority, application Italy, Nov. 16, 1962, 22651/62

Int. Cl.<sup>2</sup> C12D 9/14

U.S. Cl. 195—80 R

3 Claims

1. A process for the preparation of a new antibiotic F.I. 1762, which comprises cultivating the Streptomyces 1762 under aerobic conditions in a liquid nutrient medium containing a carbon source, a nitrogen source and mineral salts, at a temperature between 25° and 37° C, over a period of time from 3 to 7 days, and extracting the formed antibiotic from the fermentation broth at a pH between 8 and 9 by means of a water-immiscible solvent, isolating and purifying the antibiotic F.I. 1762.

4,012,285

## **ANALYSIS OF ISOENZYME PATTERNS**

Gerhard Pfeleiderer, Witten; Hermann Lang, Darmstadt; Norbert Hennrich, Darmstadt, and Hans Dieter Orth, Darmstadt, all of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Germany

Filed Nov. 27, 1973, Ser. No. 419,283

Claims priority, application Germany, Dec. 1, 1972, 2258822

Int. Cl.<sup>2</sup> C12K 1/04; G01N 31/14

U.S. Cl. 195—103.5 R

12 Claims

1. A process for the quantitative determination of at least one diagnostically relevant isoenzyme form of a human enzyme occurring in a plurality of genetically defined, immunologically differentiable multiple isoenzyme forms, which comprises:
  - a. quantitatively measuring the total enzyme activity of said multiple isoenzyme forms in a human body fluid, tissue extract or excretion sample;
  - b. admixing a portion of said sample with a one to tenfold theoretical excess, based on the amount of antisera to the human isoenzyme antigens required to precipitate at least 90% of said antigens, of a precipitating antibody against an isoenzyme group of a heterologous species corresponding to a diagnostically relevant isoenzyme form, which antibody is substantially free of immunological activity against other of said multiple isoenzyme forms, to

produce a substantially quantitative antigen-antibody immunoprecipitin complex consisting essentially of said diagnostically relevant human isoenzyme form and said antibody;

- c. substantially quantitatively separating said immunoprecipitin complex from the resultant admixture so that at least 90% of the diagnostically relevant human isoenzyme form activity is removed therefrom; and
- d. quantitatively measuring the total enzyme activity of the remaining multiple isoenzyme forms substantially free of the diagnostically relevant human isoenzyme form, whereby the diagnostically relevant human isoenzyme form can be quantitatively determined.

4,012,286

## **DETERMINATION OF CREATINE PHOSPHOKINASE IN BODY FLUIDS**

James Allen Sanderson, and William S. Stavropoulos, both of Indianapolis, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 9, 1976, Ser. No. 675,389

Int. Cl.<sup>2</sup> G01N 31/14, 33/00

U.S. Cl. 195—103.5 R

6 Claims

1. An improved method for the determination of creatine phosphokinase in a body fluid wherein the body fluid is incubated with a mixture containing a thiol activator, creatine phosphate, hexokinase, glucose-6-phosphate dehydrogenase, glucose, nicotinamide adenine dinucleotide, adenosine-5'-diphosphate and a tetrazolium salt dye until a measurable color develops and the color is measured wherein the improvement comprises:
  - a. incubating the body fluid with the thiol activator, creatine phosphate, hexokinase, glucose-6-phosphate dehydrogenase, glucose, nicotinamide adenine dinucleotide, and from 0.02 to 0.10% weight/volume of a nonionic ether-ester polyoxyethylated vegetable oil surfactant for a time sufficient to activate the creatine phosphokinase;
  - b. mixing the resulting incubate with adenosine-5'-diphosphate, the tetrazolium salt dye, and adenosine-5'-monophosphate;
  - c. incubating the resulting mixture for a time sufficient to develop measurable color; and
  - d. stopping the reaction after a pre-determined time with an acid.

4,012,287

## **METHOD AND REAGENT FOR THE QUANTITATIVE ANALYSIS OF TRIGLYCERIDES**

Brigitte Carl, and Jaroslav Stourac, both of Berlin, Germany, assignors to Dr. Bruno Lange GmbH, Berlin, Germany

Filed Nov. 18, 1975, Ser. No. 632,984

Int. Cl.<sup>2</sup> G01N 33/16, 31/14

U.S. Cl. 195—103.5 R

6 Claims

4. In a method for the quantitative analysis of triglycerides by enzyme hydrolysis of said triglyceride in an alkaline aqueous medium to form glycerol, followed by quantitative analysis of the glycerol, the improvement which consists of adding a catalytic amount of a low molecular weight chlorinated hydrocarbon to the hydrolysis medium to accelerate the hydrolytic cleavage.

4,012,288

## **TISSUE CULTURE CLUSTER DISH**

George F. Lyman, Weston, and Alan Lowry, Canton, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Oct. 6, 1975, Ser. No. 619,603

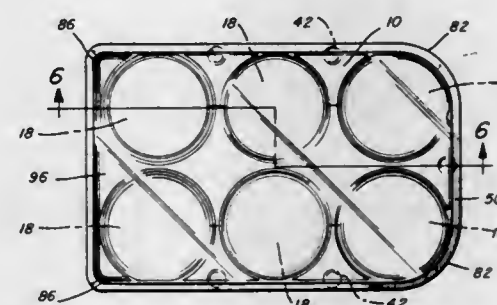
Int. Cl.<sup>2</sup> C12K 1/10

U.S. Cl. 195—139

17 Claims

1. A tissue culture cluster dish assembly comprising:
  - a base having formed within it a plurality of wells for receiving materials,

said wells formed in said base having flat bottoms for distortion free viewing, by a user, of the material received, and undergoing change, in said wells, said base having a front end and a back end; a lid for covering said base and the wells therein, said lid having a front end and back end, said lid being removably locatable on said base, said lid and said base being formed of a transparent material, said base having a base rim running around said base, said base rim having a lower edge which constitutes the lowest extremity of said base and which lies in a plane so that said base may be supported thereon when placed upon a planar surface, said flat bottoms of said wells lying in a plane elevated above and parallel to the plane in which said lower edge of said base rim lies so that said well bottoms cannot be scratched or soiled by making contact with any planar horizontal surface upon which said base may be placed, said wells formed in said base each having vertical well walls, said well walls each having upper edges which constitute the upper extremities of said base and which all lie in the same plane which is parallel to that in which said lower edge of said base rim lies, said well walls having, at their bottoms, ribs extending downwardly below the plane in which said well bottoms lie, said ribs running around the peripheries of said well bottoms thereby reducing the likelihood of the scratching



and soiling of the lower surfaces of said well bottoms when said tissue culture cluster dish is being handled.  
17. A tissue culture cluster dish assembly comprising: a base having formed within it a plurality of wells for receiving materials, said wells formed in said base having flat bottoms for distortion free viewing, by a user, of the material received, and undergoing change, in said wells, said base having a front end and a back end; a lid for covering said base and the wells therein, said lid having a front end and back end, said lid being removably locatable on said base, said lid and said base being formed of a transparent material, said base having a base rim running around said base, said base rim having a lower edge which constitutes the lowest extremity of said base and which lies in a plane so that said base may be supported thereon when placed upon a planar surface, said flat bottoms of said wells lying in a plane elevated above and parallel to the plane in which said lower edge of said base rim lies so that said well bottoms cannot be scratched or soiled by making contact with any planar horizontal surface upon which said base may be placed, said base having a plurality of upwardly extending protrusions having upper extremities all lying in a plane parallel to and above that in which the lower edge of said base rim lies, said lid having a lower lip, lying in a plane and constituting the lower extremity of said lid, for engagement with and support from below by said upper extremities of said protrusions in said base,



said base having no side walls on at least its two sides so that viewing from the side through the lid is not hindered and inadvertent sealing cannot occur, said lid, when in place on said base, having contact with said base only by its engagement with said protrusions in said base.

4,012,289

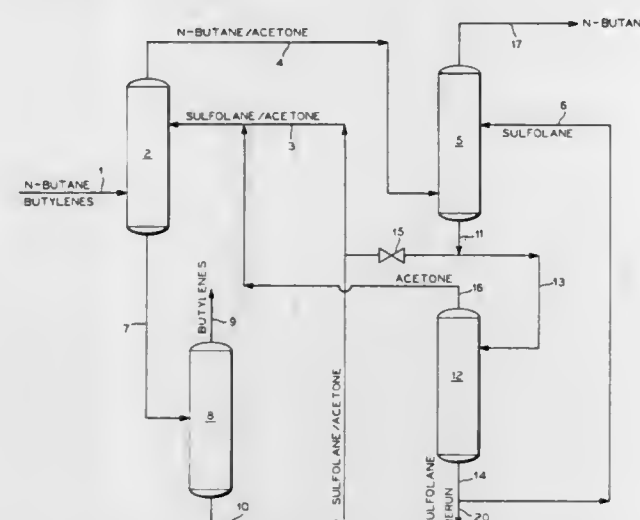
**N-BUTANE/ACETONE SEPARATION USING SULFOLANE**  
Donald M. Haskell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 14, 1975, Ser. No. 621,886

Int. Cl.<sup>2</sup> B01D 3/34, 3/40

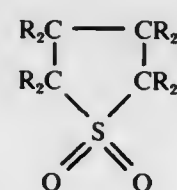
U.S. Cl. 203—51

8 Claims



1. A process to separate a first mixture of n-butane and from about 0.7 to 4.5 weight percent acetone which method comprises

a. contacting said mixture in a fluid contacting zone with a sulfolane having the formula



in which the radicals R which can be the same or different are individually selected from the group consisting of hydrogen, alkyl radicals having 1 to 4 carbon atoms, cycloalkyl radicals having 3 to 6 carbon atoms, and phenyl, which radicals R in turn can be unsubstituted or substituted by alkyl, cycloalkyl and aryl radicals, said sulfolane having 4 to 12 carbon atoms per molecule, and

b. removing a first stream consisting essentially of n-butane and being essentially free of acetone and a second stream consisting essentially of sulfolane and acetone from said contacting zone.

4,012,290

**ELECTROCHEMICAL DETECTION FOR LEAD ALKYL**  
Donald C. Olson, Florissant, Mo., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 501,513, Aug. 29, 1974, Pat. No. 3,960,690. This application Jan. 23, 1976, Ser. No. 651,679  
Int. Cl.<sup>2</sup> G01N 27/46

U.S. Cl. 204—1 T

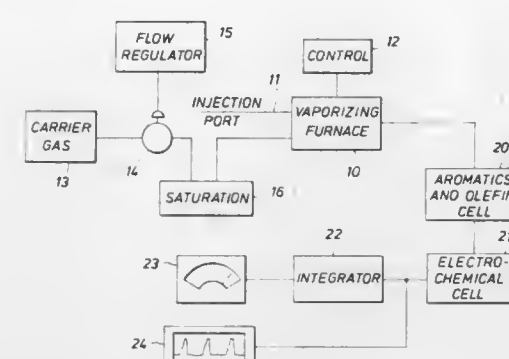
4 Claims

1. A method for measuring trace amounts of lead alkyls in gasolines comprising:

vaporizing a sample of the gasoline containing the trace amounts of lead alkyls;

passing the vaporized sample through a filter to separate the interfering aromatic and olefin components from the lead alkyls in the sample;

injecting the filtered sample into an electrochemical cell having an electrolyte; and



measuring the current produced by the electrochemical cell.

4,012,291

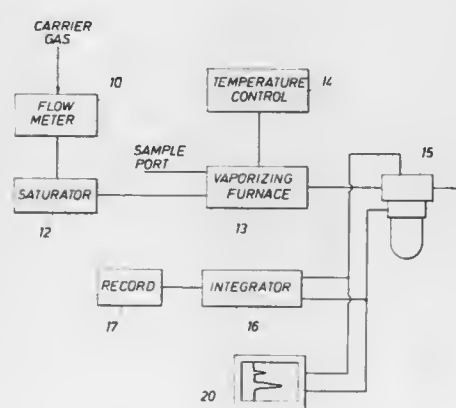
**ELECTROCHEMICAL OLEFIN DETECTOR FOR GASEOUS STREAMS**

Donald C. Olson, Florissant, Mo., and Michael P. Guillory, La Place, La., assignors to Shell Oil Company, Houston, Tex.  
Continuation-in-part of Ser. No. 501,513, Aug. 29, 1974, Pat. No. 3,960,690. This application July 25, 1975, Ser. No. 599,267

Int. Cl.<sup>2</sup> G01N 27/46

U.S. Cl. 204—1 T

2 Claims



1. A method for measuring the quantity of olefins present in a hydrocarbon sample comprising:  
vaporizing a sample of the hydrocarbon sample;  
passing the vaporized sample to an electrochemical cell, said cell being filled with an electrolyte comprising a solution of HgSO<sub>4</sub> in H<sub>2</sub>SO<sub>4</sub>/H<sub>2</sub>O/dioxane; and  
measuring the current produced by the cell.

4,012,292

**IMAGE RECORDING MEMBER**

Takutoshi Fujiwara; Yasushi Takatori, both of Tokyo; Masahiro Haruta, Funabashi; Akemi Shimosawa, Tokyo, and Katsuhiko Nishide, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 23, 1975, Ser. No. 615,908

Claims priority, application Japan, Sept. 25, 1974, 49-110092

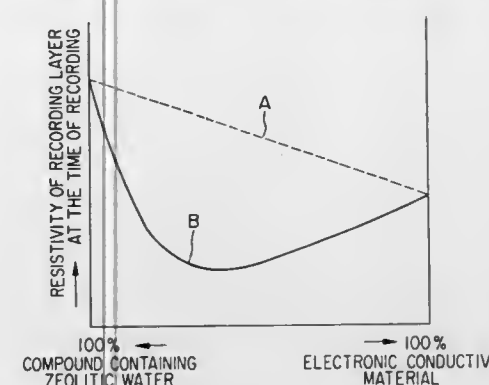
Int. Cl.<sup>2</sup> B41M 5/20; G01D 15/34

U.S. Cl. 204—2

21 Claims

1. An image recording member which comprises a support and a recording layer overlying the support, said recording layer being mainly composed of a binder, a component capable of forming an image when electric current is applied thereto, and a conductive component composed of a mixture of a compound containing zeolitic water and an electrically conductive material selected from the group consisting of finely divided metal powders, metal oxides selected from PbO,

ZnO, MgO, Ni<sub>2</sub>O<sub>3</sub>, CdO, Fe<sub>2</sub>O<sub>3</sub>, Ag<sub>2</sub>O, HgO, Bi<sub>2</sub>O<sub>3</sub>, CeO, V<sub>2</sub>O<sub>5</sub>, Sb<sub>2</sub>O<sub>3</sub>, SnO<sub>2</sub>, BaTiO<sub>3</sub>, In<sub>2</sub>O<sub>3</sub>, Nb<sub>2</sub>O<sub>5</sub>, MnO<sub>2</sub> and La<sub>2</sub>O<sub>3</sub>, metal sulfates, metal halides, metal carbonates, metal carbide



and intermetallic compounds doped with a metal, wherein the amount of the electrically conductive material is between 5-70% by weight based on the compound containing zeolitic water.

4,012,294

**GOLD SULFITE BATHS CONTAINING ORGANOPHOSPHOROUS COMPOUNDS**

Salvatore Losi, Geneva, Switzerland; Pierre LaLanne, Gex, France; Rene Henzi, and Erwin Marka, both of Geneva, Switzerland, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Division of Ser. No. 386,798, Aug. 8, 1973, Pat. No. 3,904,493.

This application Aug. 26, 1975, Ser. No. 607,742

Claims priority, application Switzerland, Aug. 10, 1972, 11975/72; Aug. 6, 1973, 11388/73

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C25D 3/48, 3/62

U.S. Cl. 204—43 G

5 Claims

1. In an aqueous electroplating bath for the deposition of gold or a gold alloy from a sulfite complex, the improvement comprising including from 1 mg/l up to solubility limit of the bath of a soluble diphosphonic compound of the formula (HO)<sub>2</sub>PO—B—PO(OH)<sub>2</sub> as a free acid, salified or esterified, wherein B is a linear, branched or cycle containing alkylene or aralkylene hydrocarbon chain of 1 to 30 carbon atoms, saturated or unsaturated, which may be interrupted with a heterofunction selected from the group consisting of -O- and -NH-, and which contains at least one carbonyl or halide substituent.

4,012,295

**ELECTROLYTICALLY INDUCED POLYMERIZATION UTILIZING BISULFITE ADDUCT FREE RADICAL PRECURSOR**

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed July 21, 1972, Ser. No. 273,903

Int. Cl.<sup>2</sup> C25B 3/00; C08G 2/02

U.S. Cl. 204—72

3 Claims

1. A method of polymerizing a polymerizable ethylenically unsaturated compound which comprises:

a. combining said compound with an aldehyde/bisulfite adduct;

b. effecting intimate contact between said polymerizable compound/adduct combination and the respective anode and cathode of an electrolytic circuit, said anode comprising metallic copper; and

c. effecting current flow in said circuit, thereby generating cupric ions at said anode and, upon the resulting introduction of said cupric ions into said combination, generating polymerization-initiating catalyst species in said combination.

4,012,296

**ELECTRODE FOR ELECTROLYTIC PROCESSES**

Donald E. Stephens, and Tilak V. Bommaraju, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,428

Int. Cl.<sup>2</sup> C25B 11/06, 11/10, 13/08, 1/46

U.S. Cl. 204—98

10 Claims

8. In a method of electrolyzing aqueous solutions of an alkali metal chloride wherein chlorine is liberated at the anode, the improvement which comprises using as said anode, a composite structure comprising a valve metal substrate having adhered thereto and extending over at least a portion of the surface thereof, a coating consisting essentially of a mixed oxide of ruthenium and hafnium wherein the molar ratio of ruthenium:hafnium is from about 0.25 to about 4.0.



4,012,297

**MERCURY RECOVERY AND RECYCLE PROCESS**

Edward Nicholas Balko, Trenton, Mich.; William Francis Schmitt, Port Edwards, Wis., and Shyam Dattatreya Argade, Woodhaven, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 16, 1976, Ser. No. 649,817

Int. Cl.<sup>2</sup> C25B 1/36

U.S. Cl. 204—99

5 Claims

1. A process for the purification of solids and liquid waste streams from a mercury amalgam chlorine plant employing an aqueous brine stream containing metallic mercury and soluble and insoluble mercury salts comprising

- purifying said brine stream by adding sodium carbonate and sodium hydroxide to precipitate said mercury and mercury salts therefrom;
- separating said mercury and mercury salts from the brine stream and reacting said mercury and mercury salts with sulfuric acid;
- adjusting the pH of the slurry resulting from the reaction of step (b) from about 6.0 to 9.0 and oxidizing all of said metallic mercury and insoluble mercury salts present into soluble mercury salts, with an amount of oxidant sufficient thereto;
- filtering the slurry and washing the solids whereupon the solids are removed;
- removing residual oxidant, adjusting the pH of the solution from about 2.5 to about 6.0 and precipitating the mercury contained therein by adding an amount of sulfide source sufficient thereto;
- filtering off the mercury sulfide and allowing the filtrate to be discharged;
- dispersing said mercury sulfide in a brine solution, adjusting the pH to about 8 to 10, oxidizing the mercury forming soluble mercuric chloride;
- combining the brine solution of step (g) with said brine stream of step (a).

4,012,298

**PROCESS FOR THE ELECTROLYTIC RECOVERY OF GALLIUM AND/OR ALKALI METALS**

István Somosi; Béla Tóth; József Boros, and János Vitéz, all of Ajka, Hungary, assignors to Ajkai Timfoldgyar es Alumini-umkobo, Ajka, Hungary

Filed Sept. 12, 1975, Ser. No. 612,803

Claims priority, application Hungary, May 21, 1975, AA 814

Int. Cl.<sup>2</sup> C25C 1/22

U.S. Cl. 204—105 R

8 Claims

1. A process for the electrolytic recovery of gallium from an aluminate liquor of the production of crystalline alumina and containing sodium as well as gallium, the process comprising the steps of:

- applying a mercury layer to a surface of a carrier electrode of a metal more electronegative than mercury until mercury coats said surface to form a mercury cathode;
- electrolyzing said aluminate liquor at a temperature of less than 50° C with said mercury cathode to initially deposit sodium upon said mercury cathode and then depositing gallium thereon; and
- solubilizing the gallium from said mercury cathode by treating the same with a gallium-solubilizing medium, thereby regenerating said mercury cathode for reuse of the same in step (a) for further acceptance of said recoverable metal.

4,012,299

**METALLIC DESCALING SYSTEM**

Donald R. Zaremski, Cheswick, Pa., and Albert Krepler, Vienna, Austria, assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa. and Ruthner Industrienanlagen Aktien-gesellschaft, Vienna, Austria

Filed Apr. 1, 1976, Ser. No. 672,585

Int. Cl.<sup>2</sup> C25F 1/04, 1/06

U.S. Cl. 204—141.5

5 Claims

1. A process for descaling a metallic body, which comprises the steps of: immersing said body in a first electrolyte, said electrolyte being an aqueous solution having, by weight, at least 60% potassium hydroxide, at least 5% water and no more than 30% potassium nitrate, and a total amount of potassium hydroxide and potassium nitrate of at least 80%; passing an electric current through said body and first electrolyte for a period of at least 3 seconds; removing said body from said first electrolyte after scale on said body has been conditioned for subsequent removal; subsequently immersing said body in a second electrolyte of an aqueous solution of at least one neutral salt from the group consisting of the chloride, sulfate, and nitrate of an alkali metal or ammonium; passing an electric current through said body and second electrolyte for a period of at least 4 seconds; and removing said body from said second electrolyte.

4,012,300

**METHOD OF ALTERING THE FRIABILITY OF ABRASIVE PARTICLES**

Robert John Caveney, 57 Victoria Ave., Sandringham, Johannesburg, Transvaal, South Africa

Filed Feb. 18, 1975, Ser. No. 550,577

Claims priority, application South Africa, Feb. 22, 1974, 74/1183

Int. Cl.<sup>2</sup> B01J 1/10

U.S. Cl. 204—157.1 H

5 Claims

1. A method of decreasing the friability of diamond particles selected from SD, MD and RD diamond particles including the step of subjecting the particles to an irradiation capable of causing internal defects in the particles and consisting of an integrated flux of particles in the range 10<sup>17</sup> to 10<sup>20</sup> particles/cm<sup>2</sup> or gamma irradiation.

4,012,301

**METHOD AND APPARATUS FOR THE INITIATION OF CHEMICAL REACTIONS**

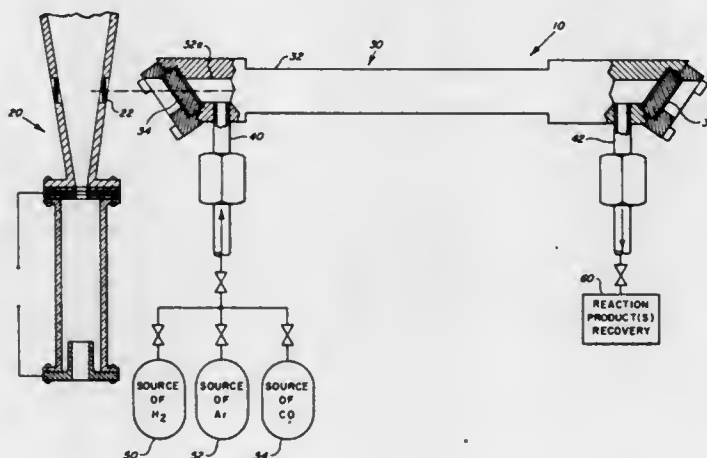
Joseph W. Rich, East Aurora, and John W. Raymonda, Williamsburg, both of N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

Filed July 28, 1975, Ser. No. 599,512

Int. Cl.<sup>2</sup> B01J 1/10; B01K 1/00

U.S. Cl. 204—157.1 R

16 Claims



1. A method for initiating and accelerating vapor phase chemical reactions in a mixture of reactant species including the steps of:
  - supplying a plurality of reactant species to a reaction chamber;

continuously flowing the reactant species through the reaction chamber; maintaining the reaction chamber at a pressure such that the vibration-rotation spectra of the reactant species are pressure-broadened to enhance the efficiency of absorption of laser radiation;

selectively exciting vibrational modes of at least one of the continuously flowing reactant species with a continuous wave laser which emits radiation that is absorbed by the vibrational mode of at least one reactant species to achieve a condition of high molecular vibrational excitations and low translational temperature to create a nonequilibrium mixture of the reactant species whereby the rate of vapor phase chemical reactions is accelerated while the translational and rotational modes of the mixture of reactant species is maintained relatively cold; and withdrawing the reaction products from the reaction chamber.

2. The method of claim 1 further including the step of supplying diluent at a pressure in the range of 20 to 100 atmospheres so that the vibration-rotation spectrum of the reactant species to be excited is pressure-broadened.

4,012,302

**PHOTOCURABLE COMPOSITIONS CONTAINING S-ARYL ARYL CARBOTHIOIC ACID ESTERS AS PHOTOINITIATORS**

Richard H. S. Wang; James G. Pacifici, and Gordon C. Newland, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

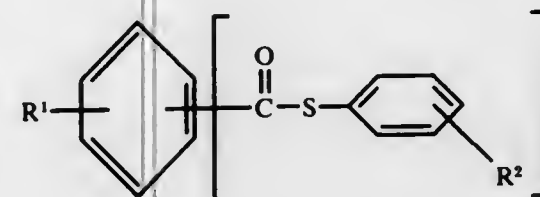
Filed Feb. 17, 1976, Ser. No. 658,328

Int. Cl.<sup>2</sup> C08L 1/00; C08F 8/18, 2/46

U.S. Cl. 204—159.12

7 Claims

1. A composition comprising a photocurable ethylenically unsaturated compound and an S-aryl arylcarbothioic acid ester or a bis-S-aryl arylcarbothioic acid ester photoinitiating effective amount of a compound having the formula:



wherein  $n$  is 1 or 2 and  $\text{R}^1$  and  $\text{R}^2$  are the same or different and are hydrogen, alkyl of up to about 12 carbon atoms, alkoxy of up to about 12 carbon atoms, halogen, phenyl, phenoxy or 2-benzoxazolyl.

4,012,303

**TRIFLUOROSTYRENE SULFONIC ACID MEMBRANES**

Vincent F. D'Agostino, Huntington Station; Joseph Y. Lee, Lake Grove, and Edward H. Cook, Jr., Lewiston, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls and RAI Research Corporation, Hauppauge, both of N.Y.

Filed Dec. 23, 1974, Ser. No. 535,636

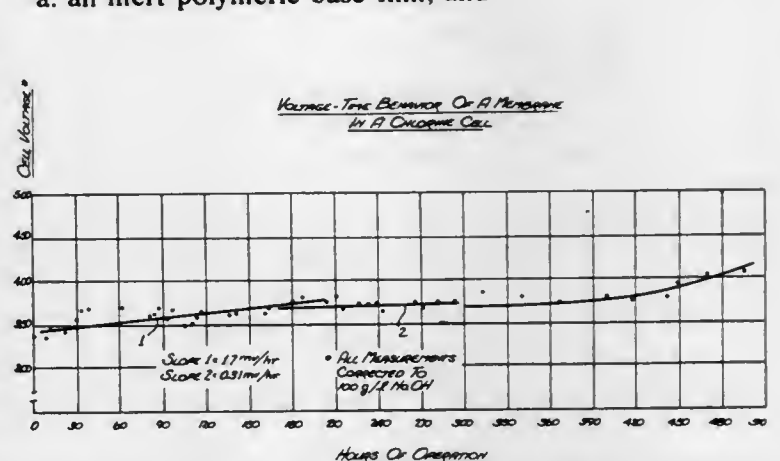
Int. Cl.<sup>2</sup> C25B 13/08; H01M 8/10

U.S. Cl. 204—159.17

12 Claims

1. A membrane adapted for use in electrochemical cells comprising:

a. an inert polymeric base film; and



b. sulfonated  $\alpha$ ,  $\beta$ ,  $\beta$ -trifluorostyrene irradiation grafted on said film.

4,012,304

**METHOD OF RADIATION POLYMERIZATION AND COPOLYMERIZATION OF ISOBUTYLENE BY A CATIONIC MECHANISM**

Miroslav Marek; Ludek Toman, and Jan Pecka, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 275,157, July 26, 1972, Pat. No.

3,897,322. This application Apr. 3, 1975, Ser. No. 564,605 Claims priority, application Czechoslovakia, July 29, 1971, 5555/71

Int. Cl.<sup>2</sup> C08D 1/00; C08F 1/16

U.S. Cl. 204—159.24

5 Claims

1. A method for the polymerization and copolymerization of mono-olefinic monomers polymerizable by a cationic mechanism, which comprises subjecting to a source of light selected from the group consisting of ultraviolet light, visible light, and infrared light at a temperature between about 0° C. and about -140° C. a polymerizable mixture selected from the group consisting of isobutylene and mixtures of isobutylene with at least one diolefinic monomer selected from the group consisting of butadiene and isoprene in the presence of at least one halide catalyst selected from the group consisting of tetravalent vanadium, titanium and zirconium halides and in the presence of at least one activator for said halide catalyst selected from the group consisting of finely divided aluminum, carbon, copper, iron, and zinc, the molar ratio of said halide catalyst to said activator ranging from 10<sup>3</sup> to 10<sup>-3</sup> part of halide catalyst to 1 part of activator.

4,012,305

**PRODUCTION OF 1-METHYL-3-PHENYLINDANS**

Martin Fischer, Ellerstadt; Hans-Juergen Quadbeck-Seeger, Ludwigshafen; Gerhard Kilpper, Mannheim; Hans-Georg Schecker, Ludwigshafen, and Waldemar Koehler, Frankfurt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 25, 1973, Ser. No. 354,222

Claims priority, application Germany, May 6, 1972, 2222368

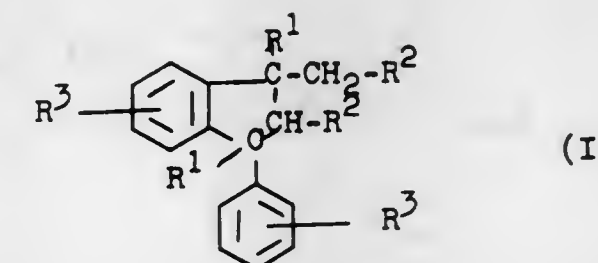
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07C 3/24

U.S. Cl. 204—162 R

13 Claims

1. A process for the production of a 1-methyl-3-phenylindane of the formula (I):





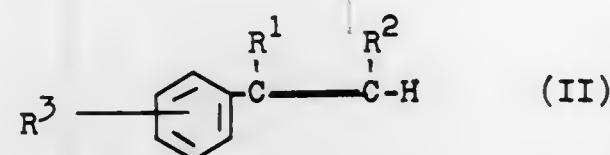
in which

R<sup>1</sup> is alkyl or hydrogen;

R<sup>2</sup> is alkyl or hydrogen; and

R<sup>3</sup> is alkyl, hydrogen or halogen

by dimerization of styrene in the presence of a catalyst wherein the reaction is carried out with a styrene of the formula (II):



in which R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> have the above meanings, in the presence or absence of an oxidizing agent and in the presence of an organic compound capable of absorbing light of from 2000 to 8000 Å and irradiated with said light.

#### 4,012,306

### PRODUCTION OF HIGHLY SOLUBLE, SOLID, RESINOUS, HIGHLY CHLORINATED ALPHA-OLEFINIC HYDROCARBON MATERIAL

Albert J. Henderson, Coraopolis, and John E. Krol, Moon Township, both of Pa., assignors to Neville Chemical Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 449,756, March 11, 1974, Pat. No. 3,896,183, which is a continuation-in-part of Ser. No. 267,444, June 29, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,908

Int. Cl.<sup>2</sup> B01J 1/10; C07C 17/06

U.S. Cl. 204—163 R

19 Claims

1. A solid resinous chlorinated alpha-olefinic hydrocarbon material, which chlorinated alpha-olefinic hydrocarbon material contains above about 65% chlorine; has a ring and ball softening point of above about 90° C; and is completely soluble and gel-free initially and after 24 hours in xylene (50% solution -25° C.)

#### 4,012,307

### METHOD FOR CONDITIONING DRILLED HOLES IN MULTILAYER WIRING BOARDS

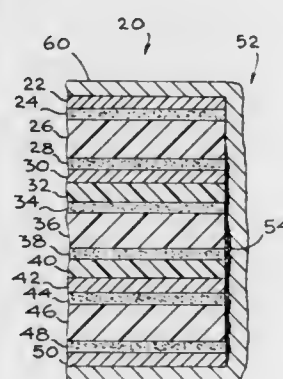
Eugene Phillips, Diamond Bar, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Dec. 5, 1975, Ser. No. 638,008

Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—192 E

10 Claims



1. A method for conditioning drilled holes in multilayer printed wiring boards prior to metal plating of conductive layer interconnects, which comprises the steps of:

- baking the printed wiring boards at a temperature of about 49°-71° C. for a pre-selected length of time;
- installing the printed wiring boards into a plasma reactor chamber;
- evacuating the plasma reactor chamber to a first pre-selected pressure;
- injecting into the reactor chamber a gas capable of forming an oxidizing plasma selected from the group consisting of oxygen and a mixture of oxygen and carbon tetrafluoride so that the partial pressure of the gas is at a second pre-selected pressure;

ing an oxidizing plasma selected from the group consisting of oxygen and a mixture of oxygen and carbon tetrafluoride so that the partial pressure of the gas is at a second pre-selected pressure;

- activating the radio frequency generator connected to the reactor chamber to create a gas plasma in the chamber;
- maintaining the generator in an activated condition to maintain the plasma in the chamber for a pre-selected length of time;
- deactivating the radio frequency generator and admitting air into the reactor chamber to equalize the internal pressure with that of the atmosphere;
- purging the gases from the reactor chamber after air is admitted thereinto; and
- opening the reactor chamber and removing the printed wiring boards therefrom.

#### 4,012,308

### ION SENSITIVE COMBINATION ELECTRODE

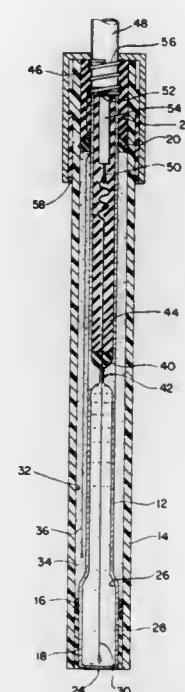
Paul Jerrold-Jones, Claremont, and Irwin H. Krull, Santa Ana, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 7, 1975, Ser. No. 629,833

Int. Cl.<sup>2</sup> G01N 27/30, 27/36

U.S. Cl. 204—195 F

11 Claims



5. An electrochemical combination electrode assembly comprising:

- an elongated, generally tubular electrode body having an ion-sensitive structure closing one end thereof;
- an internal electrolyte reservoir within the electrode body adjacent the ion-sensitive structure;
- a constriction within the electrode body intermediate the ends thereof and defining a capillary passage through the constriction having one side adjacent the internal electrolyte reservoir;
- a first electrolyte within the internal electrolyte reservoir;
- an indicating half cell disposed in the internal electrolyte reservoir and immersed in the first electrolyte therein and having a conductive portion passing out of the reservoir to provide electrical contact for the indicating half cell;
- first elastomeric plug means sealing a side of the capillary passage remote from the internal electrolyte reservoir to seal the first electrolyte within the internal electrolyte reservoir for preventing formation and migration of air bubbles through the internal electrolyte reservoir to the ion-sensitive structure;
- an elongated, generally tubular container coaxially surrounding the electrode body and together therewith defining an annular reference electrolyte reservoir therebetween;
- a second electrolyte within the annular reservoir;

a reference half cell disposed in the annular reservoir and immersed in the second electrolyte therein and having a conductor portion thereof passing out of the reservoir to provide electrical contact for the reference half cell;

a liquid junction structure for providing communication between a sample to be measured and the annular reservoir; and

second elastomeric plug means situated in contact with the second electrolyte sealing the latter within the annular reservoir for preventing formation and migration of air bubbles through the annular reservoir to the liquid junction structure, whereby the electrode assembly can be used in any physical orientation, each respective elastomeric plug means providing an expansive seal for the respective electrolyte reservoirs thereby compensating for differing temperature coefficients of expansion of the electrode body, the tubular container, and the first and second electrolytes.

#### 4,012,309

### APPARATUS FOR MANUFACTURING PELLET SIZING SCREEN RODS

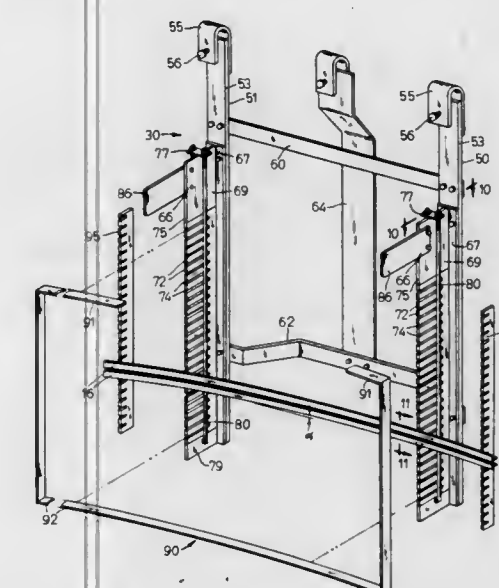
Dean R. Eslien, and James Salmick, both of Abrams, Wis., assignors to Ultra Plating Corporation, Green Bay, Wis.

Filed May 27, 1975, Ser. No. 581,092

Int. Cl.<sup>2</sup> C25D 17/08, 17/06

U.S. Cl. 204—297 W

12 Claims



1. Apparatus for electroplating a plurality of elongated metal rods comprising:

- a source of direct current comprising a pair of output terminals of opposite polarity;
- means for selectively reversing the polarity of said pair of output terminals to initially effect etching and then to effect plating;
- a support frame for said rods including a pair of spaced apart elongated electrically conductive insulated members;
- means for rigidly supporting said conductive members in spaced apart relationship;
- first and second electrical connecting means for electrically connecting different points on said conductive members to said one output terminal;
- releasably adjustable clamping means on each of said electrically conductive members for releasably supporting said rods at a non-horizontal angle to facilitate upward travel of gas bubbles formed on a surface of said rods during plating and for electrically connecting two spaced apart points on each rod to one of said output terminals;
- an electrically conductive thief on said support frame electrically connected to said conductive members and adapted to lie in substantially the same plane in which said rods are adapted to lie and adapted to surround said rods;

means for electrically connecting at least two spaced apart points on said thief to said one output terminal; and

plating anode means connected to the other of said output terminals and comprising first and second anode sections adapted to be disposed on opposite sides of said rods, each anode section being directly proportional in surface area to the area of the rods it is adapted to confront, with the total surface area of said anode being at least about 25% greater than the total surface area to be plated.

#### 4,012,310

### ELECTROSTATIC WATER TREATMENT SYSTEM

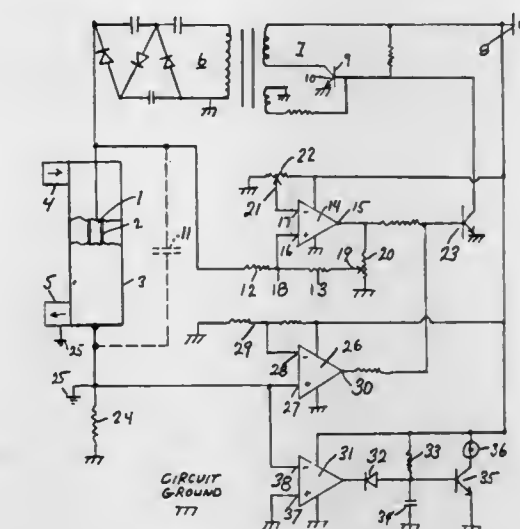
David C. Clark, and John K. Barnard, both of Erie, Pa., assignors to Progressive Equipment Corporation, Erie, Pa.

Filed Sept. 11, 1975, Ser. No. 612,466

Int. Cl.<sup>2</sup> B03C 5/02

U.S. Cl. 204—305

12 Claims



1. An electrostatic water treatment system having an insulated electrode and a ground electrode and adapted to receive water to be treated between the electrodes so the electrodes are in capacitance relation to each other through the water to be treated, said insulated electrode having an insulated coating for insulating it from the water, said ground electrode adapted to be in contact with the water, a power supply having a positive terminal connected to said insulated electrode and a negative terminal connected to said ground electrode for charging said insulated electrode to a high positive d.c. voltage relative to said ground electrode, and means for alternately turning the power supply on when the voltage drops to a lower limit and off when the voltage rises to an upper limit, said means further providing a small alternating voltage superimposed on said d.c. voltage.

#### 4,012,311

### SHORT RESIDENCE TIME LOW PRESSURE HYDROLYSIS OF CARBONACEOUS MATERIALS

Marvin Greene, Somerset, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed Oct. 30, 1975, Ser. No. 627,448

Int. Cl.<sup>2</sup> C10G 1/06

U.S. Cl. 208—8

12 Claims

1. A process for treating carbonaceous material with hydrogen, in the absence of added catalyst, to produce a high yield of carbonaceous tars, comprising, in serial combination,

- adding liquid or crushed solid carbonaceous material into a first reaction zone of a reactor having at least two reaction zones; and a pressure of between atmospheric pressure and 450 psia;
- adding hot hydrogen to the stream of carbonaceous material to effect a reaction with same to produce reaction products at a temperature of between 400° C and 2000° C.;
- quenching the mixture of step (b) while insuring that the total residence time of heat-up, reaction and quenching



- of said mixture varies from about 2 milliseconds to about 2 seconds;
- d. removing at least a portion of the reaction products from said quenched mixture of step (c); and
- e. introducing the residual carbonaceous material into a subsequent reaction zone and repeating steps (a) - (d) for said subsequent reaction zone.

## 4,012,312

## HYDROCARBON HYDROCRACKING PROCESS

Jarold A. Meyer, Concord, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 438,504, Jan. 31, 1974, Pat. No. 3,978,001, which is a continuation-in-part of Ser. No. 250,399, May 4, 1972, abandoned. This application Dec. 22, 1975, Ser. No. 643,565

Int. Cl.<sup>2</sup> B01J 37/02, 27/24; C10G 13/06

U.S. Cl. 208—111 10 Claims

1. In a process comprising contacting a hydrocarbon feedstock and hydrogen with a hydrocracking catalyst under hydrocarbon hydrocracking conditions, the improvement comprising preparing said catalyst by:

- A. forming in an aqueous medium a gelatinous precipitate and a finely divided transition series organic-metal compound, said gelatinous precipitate comprising, on a water-free basis, from 40 to 95 weight percent alumina and 60 to 05 weight percent silica, and said organic-metal compound comprising a precipitate formed by reaction in the aqueous medium of a transition series metal compound dissolved therein with 1,2,3-benzotriazole;
- B. intimately intermixing the gelatinous precipitate and the organic-metal compound within 2 hours of formation of the gelatinous precipitate, thereby forming a catalyst precursor;
- C. converting said precursor to a catalyst, the converting including at least a step of heating the precursor at a temperature in the range 500°-1800° F for a period in the range 1 to 48 hours, said catalyst being porous and having a surface area in the range from 50 to 700 m<sup>2</sup>/g.

## 4,012,313

## CATALYTIC REFORMING PROCESS AND CATALYST

Waldeen C. Buss, Richmond, and Harris E. Kluksdahl, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 355,606, April 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 301,696, Oct. 27, 1972, Pat. No. 3,852,190. This application Sept. 12, 1975, Ser. No. 613,011

Int. Cl.<sup>2</sup> C10G 35/08

U.S. Cl. 208—139 8 Claims

1. A process for reforming a naphtha feedstock which comprises contacting said feedstock at reforming conditions with a catalyst comprising platinum, rhenium and chloride on an alumina support, said catalyst having been prepared by the steps of:

- a. selecting an alumina support obtained by removing water from aluminum hydroxide produced as a by-product from a Ziegler higher-alcohol synthesis;
- b. forming said alumina into an alumina catalyst support in particulate form;
- c. calcining said support at a temperature between 1000° F and 1500° F until the surface area of the support is in the range from 140 m<sup>2</sup>/g to 240 m<sup>2</sup>/g;
- d. impregnating the resulting calcined support with a platinum compound and a rhenium compound in the presence of enough chloride so that the impregnated composition, after drying and before calcining, contains more than 1.4 weight percent total chloride;
- e. drying the resulting impregnated composition to provide a dried composition containing said more than 1.4 weight percent total chloride; and

- f. calcining the resulting dried composition at a temperature between about 500° F and about 1200° F until the total chloride content of said composition is between about 0.8 and about 1.2 weight percent of the total weight of said catalyst.

## 4,012,314

## TREATING COAL LIQUEFACTION PRODUCT OIL

William M. Goldberger, and Bobby P. Faulkner, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Sept. 5, 1975, Ser. No. 610,639

Int. Cl.<sup>2</sup> C10G 31/10

U.S. Cl. 208—251 R 20 Claims

1. A method of treating an oil derived by liquefaction of coal particles and containing unreacted solid matter to separate at least some of the unreacted solid matter therefrom and collect it in an aqueous medium, which comprises controlling the specific gravity of the oil, by mixing it with another liquid, by controlling its temperature, or both, to provide an oleaginous fluid having a substantially lower specific gravity than the aqueous medium, contacting the fluid with the aqueous medium, moving the fluid in such a manner as to provide a substantial acceleration thereto in a direction to drive at least some of the solid matter away from the fluid and into the aqueous medium, and separating the aqueous medium with the solid matter contained therein from the fluid.

## 4,012,315

## TRAP TO REMOVE METALS UTILIZING A SULFUR MODIFIED SUBSTRATE AND ELECTROPHORESIS

Israel J. Heilweil, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 321,116, Jan. 4, 1973, abandoned.

This application Oct. 31, 1975, Ser. No. 627,723

Int. Cl.<sup>2</sup> C10G 29/04

U.S. Cl. 208—253 5 Claims

1. A method for removing metal contaminants from substantially hydrocarbon streams comprising contacting said substantially hydrocarbon streams with two successive bed sections; said first bed section containing a solid substrate selected from the group consisting of silicas, aluminosilicates, clays, metal oxides, metal sulfides, macroreticular resins, high surface area resins and polymers containing polar groups such as OH, N, SO<sub>3</sub><sup>-</sup> and COO<sup>-</sup>, upon which sulfur particles ranging in size up to an effective diameter of about 0.1 microns are deposited; and said second bed section containing particles comprising at least two of aluminum, cobalt, iron and carbon, whereby sulfur reaction products of said metal contaminants are produced in said first bed section and are plated out on the particles in said second bed section.

## 4,012,316

## SOLIDS CLASSIFICATION DEVICE

Sven E. Ostlund, Stockton, and Robert S. Bailey, Sr., Sacramento, both of Calif., assignors to Envirotech Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 442,716, Feb. 14, 1974, abandoned. This application Apr. 18, 1975, Ser. No. 569,250

Int. Cl.<sup>2</sup> B03B 5/28

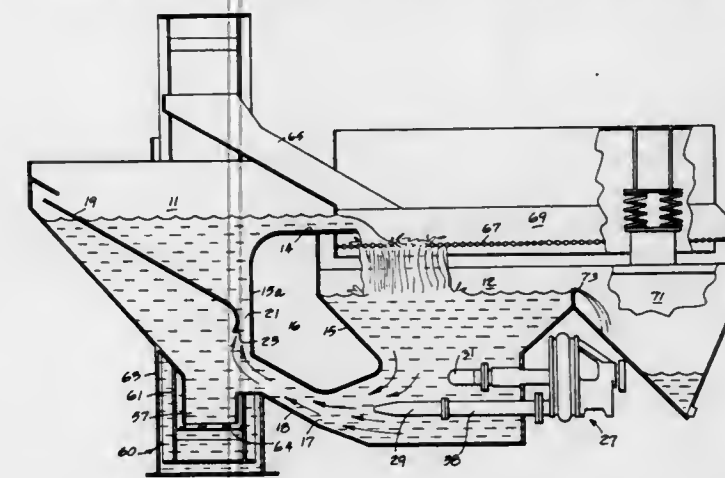
U.S. Cl. 209—10 14 Claims

1. A device for classifying a stream of solid fragments, comprising:

a. side-by-side first and second liquid-holding compartments separated by a partition wall which is arranged to form a weir between the compartments;

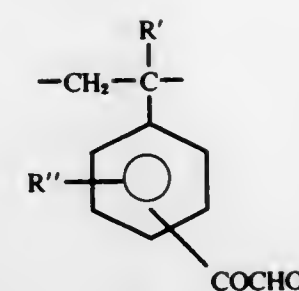
b. a downwardly inclined perforated plate mounted transversely across said first compartment to divide said first compartment into a lower region and a separation compartment above said lower region, the lower edge of said

- plate being spaced from said partition wall to define therewith a flow throat area to permit liquid flow communication between said lower region and said separation compartment;
- c. a flow tube extending through said partition to conduct the liquid from the lower region of said second compartment into said lower region of said first compartment, said flow tube having an enlarged mouth in said second compartment, an outlet in said first compartment and being generally quadrangular in cross-section;
- d. a pump having an inlet which is connected into said second compartment to withdraw a fraction of the liquid therefrom;
- e. a single eductor nozzle, whose outlet is generally rectangular in cross-section, fixedly connected to the outlet of said pump and arranged at the mouth of said flow tube in said second compartment for receiving the liquid from

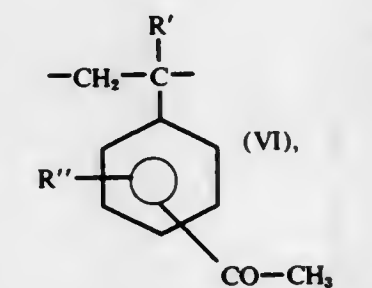
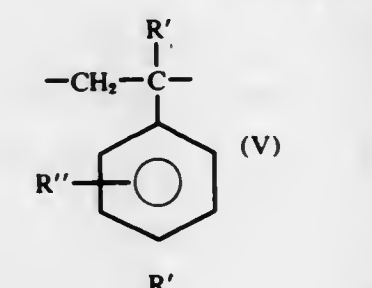
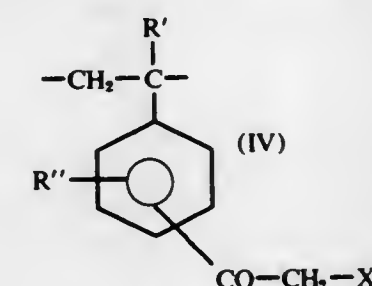


said pump and for ejecting that liquid into said flow tube so as to induce the liquid which surrounds the eductor to also flow through said flow tube so as to establish a circulation of the liquid between said first and second compartments with the liquid in said first compartment flowing upwardly through said separation compartment and then over said weir, said eductor nozzle being constructed and located relative to said mouth of said flow tube so as to produce a flow pattern of the liquid which has a generally uniform upward velocity transversely across said separation compartment; and

f. means for directing a stream of solid fragments for classification into said flow throat area the flow of the liquid through said flow throat area being such that the heavier solids settle through said throat and the lighter solids pass with the liquid over said weir into said second compartment.



or recurring units of formula (VII) and recurring units selected from units of the formula:



at least 0.01% of the recurring units being recurring units of formula (VII); and

b. correspondingly 50-0% of recurring units of a non-aromatic ethylenically unsaturated monomer, in which R' represents a hydrogen atom or a methyl radical, R'' represents a hydrogen atom or a methyl or ethyl radical and X represents a halogen atom; at least one of the aromatic rings in the recurring units of formulae (VII), (IV), (V), and (VI) optionally being substituted by halogen.

## 4,012,318

## METHOD FOR THE RECYCLE TREATMENT OF WASTE WATER FROM CHROMIUM PLATING

Toshio Hayashi, Inuyama, Japan, assignor to Kayabakoyo-Kabushiki-Kaisha, Tokyo, Japan

Continuation of Ser. No. 398,602, Sept. 19, 1973, abandoned.

This application Mar. 31, 1975, Ser. No. 563,729

Claims priority, application Japan, Sept. 22, 1972, 47-95535; Sept. 22, 1972, 47-95536; Sept. 22, 1972, 47-95537

Int. Cl.<sup>2</sup> C02B 1/20, 1/42, 1/56

U.S. Cl. 210—28 19 Claims

1. A method of recycling chromium plating waste water which contains dissolved chromium and dissolved base metals which are precipitable, by adjustment of pH to a range of approximately 7 to 9, comprising the steps of adjusting the pH of the chromium plating waste water to a range of approximately 7 to 9 and thereby precipitating said dissolved metals from said waste water while the chromium remains in solution in said waste water;

## 4,012,317

## PROCESS FOR EXTRACTING UREA FROM A SOLUTION WITH ALKENYLAROMATIC POLYMERS WITH α-KETOALHYDIC GROUPS

Emile Kuntz, and Jean Pierre Quentin, both of Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 328,591, Feb. 1, 1973, Pat. No. 3,933,753. This application July 5, 1974, Ser. No. 486,098

Claims priority, application France, Feb. 4, 1972, 72.03804 Int. Cl.<sup>2</sup> B01D 15/00

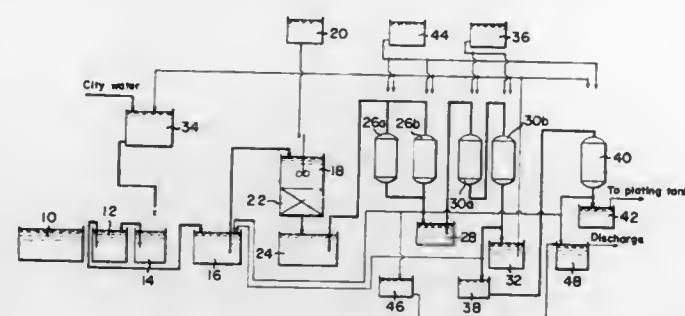
U.S. Cl. 210—24 12 Claims

1. Process for extracting urea from a solution containing urea which comprises contacting the solution with an alkenylaromatic polymer consisting essentially of:

a. 50 to 100 % of recurring units of the formula:



contacting at least one portion of the resulting liquid with an acidic cation exchange resin in the free acid form so as to lower the pH and obtain a dichromic acid-containing solution;  
adsorbing dichromate ions from said solution with an anion exchange resin;



desorbing adsorbed dichromate ions from said anion exchange resin so as to obtain an effluent chromium-containing solution; and recycling said solution to a chromium-plating bath.

4,012,319

## WASTE WATER TREATMENT

Ernest R. Ramirez, Lemont, Ill., assignor to Swift and Company, Chicago, Ill.

Continuation of Ser. No. 438,737, Feb. 1, 1974, abandoned.  
This application Dec. 1, 1975, Ser. No. 636,513

Int. Cl.<sup>2</sup> B03D 1/00; C02C 5/12

U.S. Cl. 210-44

17 Claims

1. A process for coagulating, agglomerating, and floating suspended and dissolved material in a waste water comprising flowing a waste water containing suspended and dissolved material through a flow path along an electrode grid within a tank, supplying an electric current gradient along said electrode grid, said electric current gradually diminishing in density along said flow path, the greatest density being at the influent end of the flow path, contacting said flowing waste water with said electrode grid and said gradually diminishing gradient of average current densities, forming microbubbles by electrolytically decomposing the waste water, and creating high water turbulence within the waste water only at the influent end, said high water turbulence being created and maintained within the grid itself and thereabove by the microbubbles formed by said influent end greatest current density.

4,012,320

## METHOD FOR IMPROVING THE QUALITY OF CONTAMINATED WASTE WATER

Jesse R. Conner, Pittsburgh; Edward A. Zawadzki, McMurray, and Ronald J. Polosky, Pittsburgh, all of Pa., assignors to Chemfix Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 453,844, March 22, 1974, abandoned. This application July 22, 1975, Ser. No. 598,069

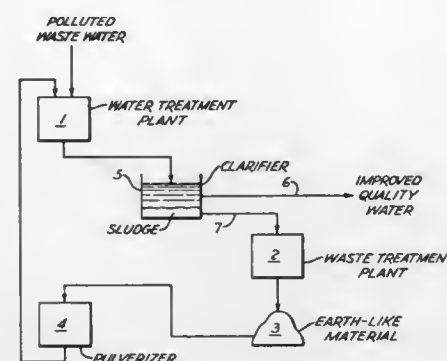
Int. Cl.<sup>2</sup> C02B 1/20

U.S. Cl. 210-45

7 Claims

1. A method for improving the quality of contaminated waste water by reducing the pollutants therein so that it can be reused or safely discharged, comprising pulverizing solid material obtained by mixing with liquid or semi-liquid waste material an aqueous solution of an alkali metal silicate and a silicate setting agent from the group consisting of Portland cement, lime, gypsum and calcium chloride, the amounts of said silicate and setting agent used being such as caused them to chemically react with each other and convert the mixture into a consolidated chemically and physically stable earth-like material substantially insoluble in water and with its pollutants entrapped in the solidified silicate, mixing an effective amount of the pulverized material with said waste water and maintaining them together long enough for the pulverized material to

react with pollutants in the waste water to reduce the amount of said waste water pollutants and thereby improve the quality



of the water, and then separating from the water said pulverized material and pollutants.

4,012,321

## OXIDATION OF REFRACTORY ORGANICS IN AQUEOUS WASTE STREAMS BY HYDROGEN PEROXIDE AND ULTRAVIOLET LIGHT

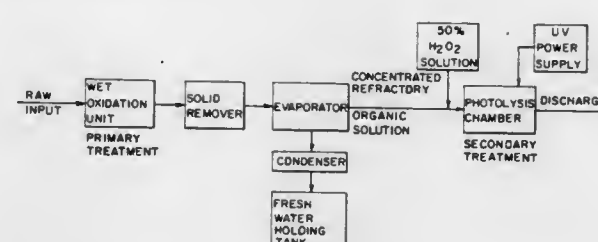
Edward Koubek, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1975, Ser. No. 561,829

Int. Cl.<sup>2</sup> C02C 5/04

U.S. Cl. 210-63 R

7 Claims



1. A method for lowering the chemical oxygen demand (COD) of an aqueous waste body, consisting essentially of measuring the COD of said aqueous waste body; adding an aqueous solution of hydrogen peroxide to said aqueous waste body, wherein the requisite number of grams of hydrogen peroxide equals no less than 2.1 times said measured chemical oxygen demand; agitating said aqueous waste body and hydrogen peroxide; flowing said aqueous waste body and hydrogen peroxide through a container; and irradiating said aqueous waste body and said hydrogen peroxide as it flows through said container with ultraviolet light at a wavelength no greater than 2600 Angstroms.

4,012,322

## MACERATOR-STERILIZER SEWAGE TREATMENT SYSTEM

Philip A. Saigh, Morton Grove, and Albert J. Glueckert, Skokie, both of Ill., assignors to General American Transportation Corporation, Chicago, Ill.

Filed May 5, 1975, Ser. No. 574,535

Int. Cl.<sup>2</sup> E03D 1/00

U.S. Cl. 210-86

24 Claims

1. A sterilizer sewage treatment system useful in an overall toilet system to collect, treat and discharge toilet waste, which comprises:

a collection tank having an inlet, through which liquid sewage is fed to said collection tank, and an outlet;  
a sterilization tank having an inlet and an outlet;  
transfer pump means connected to said outlet of said collection tank;  
power-operated valved transfer means connected to said transfer pump means and said inlet of said sterilization tank;

power-operated valved discharge means connected to said outlet of said sterilization tank;

heater means mounted on said sterilization tank; and electrical means to control and operate said transfer pump means, said power-operated valved transfer means, said power-operated valved discharge means and said heater means, said electrical means including:

sensing means mounted on said collection tank and operative in response to a condition provided by a predetermined accumulation of liquid sewage received in said collection tank;

means responsive to the operation of said sensing means to operate said power-operated valved transfer means for an opening of its valve to communicate said transfer pump means with said sterilization tank for a predetermined period of time and then to close that valve;

means responsive to the operation of said sensing means to initiate the operation of said transfer pump means;

means responsive to the operation of said sensing means to prevent continued operation of said transfer pump means after a predetermined period of time of operation so that the operation of said transfer pump means provides a predetermined amount of waste from said collection tank to said sterilization tank;

means responsive to the operation of said sensing means to initiate the operation of said heater means;

of said transfer pump means so that said transfer pump means can operate again whenever said sensing means is operative in response to said condition in said collection tank.

4,012,323

## SEPARATOR APPARATUS

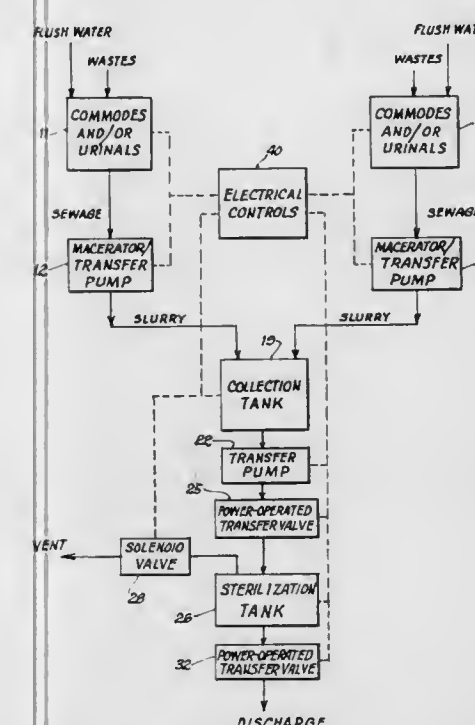
Momir Babunovic, Des Peres, Mo., assignor to Barry-Weh-miller Company, St. Louis, Mo.

Filed Aug. 18, 1975, Ser. No. 605,724

Int. Cl.<sup>2</sup> B01D 25/08

U.S. Cl. 210-232

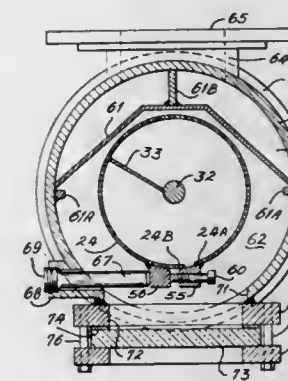
1 Claim



temperature-sensing switch means operative in response to the temperature of the waste in said sterilization tank being raised to a predetermined temperature by said heater means, said switch means when operated being effective to cease the operation of said heater means; timer means when initiated operates said power-operated valved discharge means to change its valve from an open position to a closed position or from a closed position to an open position;

first time-delay means initiated in response to the operation of said temperature-sensing switch means, when the waste in said sterilization tank reaches said predetermined temperature to operate said timer means, after a predetermined delay, to open said power-operated valved discharge means and, after a further delay, to close said power-operated valved discharge means; and

second time-delay means initiated in response to the operation of said temperature-sensing switch means, when the waste in said sterilization tank reaches said predetermined temperature, to operate after a predetermined delay, during which said valve of said power-operated valved discharge means has opened and then closed, said means preventing the continued operation



1. In separator apparatus, for extracting insolubles and pulpy material from a fluid carrier medium, having a casing providing an inlet for the fluid carrier medium burdened with insolubles and pulpy material and an outlet for the insolubles and pulpy material substantially free of the fluid carrier medium; a perforated screen member extending between the inlet and outlet to divide the casing into an inner space inside said screen member and an outer space between said screen member and the interior of said casing; other outlet means in said casing for the fluid carrier medium substantially free of insolubles and pulpy material; elongated baffle means in said casing between said screen and said other outlet means for maintaining said screen member submerged in fluid carrier medium to the extent of the elongation of said baffle means; and a rotary conveying member in said screen member and extending from said inlet to said outlet to lift the insolubles and pulpy material to said outlet while the fluid carrier medium flows through said perforated screen member to said outer space; the improvement of said perforated screen member being split longitudinally to wrap about said rotary conveying member and form margins at the split; first means secured to and extending along one margin of said screen member and adjustably overlapping the other margin to close the space at the split and prevent leakage; second means carried by and extending along said other margin of said screen member; adjustment elements spaced along the length of and engaging said first and second means to change the spacing therebetween and vary the wrap of said split screen member about said rotary conveying member to compensate for wear of said rotary conveying member; and means in said casing forming an access opening to the interior for exposing said perforated screen member at the location of said adjustable means, said access opening means normally making said casing fluid tight.



4,012,324

**CROSSLINKED, INTERPOLYMER FIXED-CHARGE MEMBRANES**

Harry P. Gregor, Leonia, N.J., assignor to Harry P. Gregor, Leonia, N.J.

Division of Ser. No. 166,606, July 27, 1971, Pat. No. 3,808,305. This application Jan. 15, 1974, Ser. No. 433,930  
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976Int. Cl.<sup>2</sup> B01D 31/00, 13/00

U.S. Cl. 210—500 M

3 Claims

1. A chemically cross-linked non-fouling polymeric membrane including polyelectrolytes having fixed-charge groups and characterized by a hydraulic permeability of  $10^{-3}$  to  $10^{-7}$  cm/sec. atm. measured in water or dilute salt solution under a pressure of 60 to 100 psi, a water content of from about 15 to about 75%, and characterized by a uniform porosity which produces a salt rejection of from 1.0 to 85% measured using 0.01 M potassium chloride solution at 25°C and 60 to 100 psi.

4,012,325

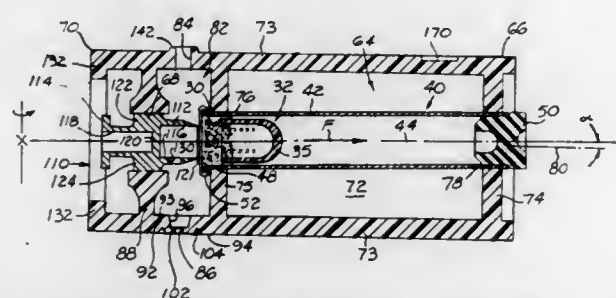
**BIOLOGICAL FLUID DISPENSER AND SEPARATOR**

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 539,557, Jan. 8, 1975, abandoned. This application May 27, 1975, Ser. No. 581,345  
Int. Cl.<sup>2</sup> B01D 21/26

U.S. Cl. 210—516

29 Claims



1. A blood serum separation device, comprising opposed walls arranged about an axis to define a blood separation compartment having a blood inlet portion, a serum collecting portion and a blood cell-collecting portion, the serum-collecting portion being adjacent one end of the compartment, at least one of said walls being provided with a venting aperture having a maximum effective diameter of air flow which is less than that which will permit blood to flow therethrough under a pressure of about  $1.245 \times 10^{-5}$  dynes/cm<sup>2</sup>;

means for temporarily blocking flow of serum out of said one compartment end;

and a movable plug positioned transversely across said compartment, and in said serum-collecting portion adjacent to said blocking means and in contact with the walls of said compartment around the entire perimeter of said walls, for interrupting fluid flow of serum through the compartment, said plug comprising an inorganic thixotropic polymeric gel which is inert to the serum, whereby flow of blood serum to said serum collecting portion occurs when a centrifugal force sufficient to initiate separation of the blood serum from the blood cells is generated against the plug away from said one end.

8. A blood serum separation device, comprising opposed walls arranged about an axis to define a blood separation compartment said compartment having opposed ends, a serum-collecting portion adjacent one compartment end, and a cell-collecting portion adjacent the other end;

closure means for closing said other end;

means for temporarily blocking flow of serum out of said one compartment, said means including a valve capable of permitting selective flow of serum;

a movable plug positioned transversely across said compart-

ment, and in said serum-collecting portion adjacent to said blocking means and in contact with the walls of said compartment for interrupting fluid flow of serum through the compartment, said plug being provided with means permitting flow of blood serum to said serum collecting portion when a centrifugal force sufficient to initiate separation of the blood serum from the blood cells is generated against the plug towards said closure means; and

a chamber adjacent said serum-collecting portion, the interior walls of said chamber being generally cylindrically shaped, defining a chamber axis, a passageway being provided in said chamber walls which fluidly connects the chamber to the interior of said compartment, said valve including at least one valve stem within said chamber closing off said passageway, said stem being mounted for rotation about said chamber axis.

4,012,326

**ADDITIVES FOR CLOTHES DRYERS**

Jerome Rudy, Livingston, N.J., and Anthony A. Rapisarda, Elmhurst, N.Y., assignors to Lever Brothers Company, New York, N.Y.

Filed June 29, 1971, Ser. No. 158,090

Int. Cl.<sup>2</sup> D06M 13/46

U.S. Cl. 252—8.8

10 Claims

1. A composition of matter in solid form for the application of an adjuvant to a fabric in a tumbler-type dryer, consisting essentially of an adjuvant for said fabric and a distributing agent therefor, said adjuvant being present in an effective concentration not exceeding about 95% by weight and selected from the group consisting of fabric softeners, optical brighteners and anti-static agents and said distributing agent being selected from the group consisting of ammonium carbonate and water-soluble, lower molecular weight, innocuous hydroxy carboxylic acids which promote the spreading of the adjuvant.

4,012,327

**THICKENED ALCOHOL WELL TREATING COMPOSITIONS**

Jerry Emile Boothe, Coraopolis, and Fred David Martin, McMurray, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Feb. 12, 1975, Ser. No. 549,397

Int. Cl.<sup>2</sup> E21B 43/26

U.S. Cl. 252—8.55 R

8 Claims

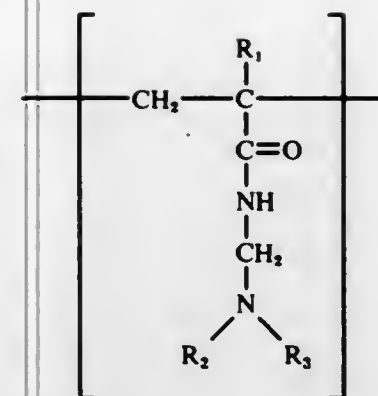
5. A substantially anhydrous alcohol base fracturing fluid composition for use in fracturing subterranean formations comprising:

a. one or more substantially anhydrous alcohols of the formula:



where  $n$  is an integer of 1 to 5; said substantially anhydrous alcohols containing from 0 to about 5 percent by weight of water; and

b. at least 0.5 percent by weight of the alcohol of a thickening agent composition containing repeating units of the formula:



where  $R_1$  is hydrogen or methyl, and  $R_2$  and  $R_3$  are each independently selected from alkyl radicals of one to five carbon atoms; and wherein the molecular weight of said composition is at least about 5,000.

4,012,328

**ACID SOLUBLE PACKER AND WORKOVER FLUID**

Mervel P. Hunter, Karl E. Gillenwater, and Henry J. Warren, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 345,926, March 29, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,881

Int. Cl.<sup>2</sup> C09K 3/00, 7/00; E21B 43/22

U.S. Cl. 252—855 R

3 Claims

1. A method for preparing an acid soluble well completion packer fluid comprising forming an aqueous homogeneous solution of carboxymethyl cellulose, adding a weighting material to provide desired density, crosslinking the carboxymethyl cellulose by adding chromium compound selected from the group consisting of chromic chloride and chromic acetate and mixing therewith a chemically basic material at such a rate to avoid precipitating the chromium compound.

4,012,329

**WATER-IN-OIL MICROEMULSION DRILLING FLUIDS**

John B. Hayes, Gerald W. Haws, and William B. Gogarty, all of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 391,109, Aug. 27, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,280

Int. Cl.<sup>2</sup> C09K 7/02, 7/06

U.S. Cl. 252—8.5 P

24 Claims

1. An oil-external microemulsion drilling fluid which will conduct sufficient electrical current needed for electrical logging of a subterranean formation, the microemulsion comprised of about 15% to about 90% by volume water, about 5 to about 84% by volume liquid hydrocarbon, about 1% to about 30% by volume of a sodium petroleum sulfonate having an average equivalent weight of about 350 to about 525, and about 0.1% to about 15% by weight, based on the water, of a water-dispersible clay, said clay having been incorporated in the microemulsion by mixing it with the water phase and then mixing the clay-water mixture with the remaining ingredients of the microemulsion.

4,012,330

**LITHIUM SALTS OF HYDROCARBON SUBSTITUTED AMIC ACID AS LOW ASH RUST INHIBITORS**

Philip W. Brewster, Wyoming, Canada, assignor to Exxon Research &amp; Engineering Co., Linden, N.J.

Filed Feb. 10, 1975, Ser. No. 548,615

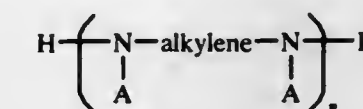
Int. Cl.<sup>2</sup> C10M 1/24

U.S. Cl. 252—33.6

9 Claims

1. An oil composition comprising a major proportion of lubricating oil, and a minor rust inhibiting proportion, in the range of about 0.2 to 4.0 weight percent, of lithium salt of an

amide of a hydrocarbon substituted succinic acid; said hydrocarbon substituent containing 12 to 20 carbon atoms and being selected from the group consisting of alkenyl and alkyl groups; said amide being the reaction product of said acid with a nitrogen material selected from the group consisting of ammonia, alkylene polyamines of the general formula:



wherein  $n$  is an integer less than about 10 and A is selected from the group consisting of hydrogen and a lower alkylene radical having less than about 8 carbon atoms, and said alkylene polyamines substituted with one or more hydroxy alkyl substituents on a nitrogen atom, in which the hydroxy alkyl group has less than about six carbon atoms.

8. A rust inhibiting oil concentrate comprising a mineral oil and about 10 to 50 wt. % of the lithium salt of the amide of dodecenyl succinic acid and tetraethylene pentamine.

4,012,331

**SULPHUR COMPOUNDS**

Gerald John Joseph Jayne; Herbert Frank Askew, both of Wokingham, and David Robert Woods, Bracknell, all of England, assignors to Edwin Cooper and Company Limited, Bracknell, England

Filed July 21, 1975, Ser. No. 597,674

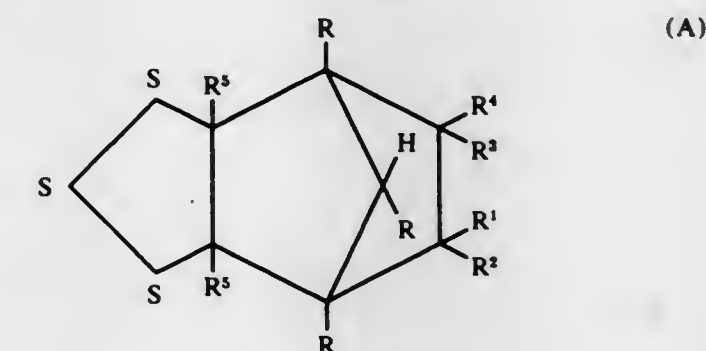
Claims priority, application United Kingdom, July 25, 1974, 32976/74

Int. Cl.<sup>2</sup> C10M 1/38

U.S. Cl. 252—48.2

17 Claims

1. A process for the preparation of a sulphur compound suitable for use as a lubricant additive, said process comprising reacting a trithiolan compound having the general formula:



wherein:

- each of  $R$ ,  $R^2$  and  $R^4$  when taken singly is a hydrogen atom, an alkyl group containing from 1 to about 15 carbon atoms, an aryl group containing from 6 to about 15 carbon atoms or a cycloalkyl group containing from 4 to about 10 carbon atoms;
- each  $R^1$  and  $R^3$  when taken singly is a hydrogen atom, an alkyl group containing from 1 to about 15 carbon atoms, an aryl group containing from 6 to about 15 carbon atoms, a cycloalkyl group containing from 4 to about 10 carbon atoms or an alkenyl group containing from 2 to about 10 carbon atoms or  $R^1$  and  $R^3$  taken together form the group  $-CHY.CY=CY-$  in which Y is a hydrogen atom or a methyl group or  $R^1$  and  $R^2$  taken together form an alkylidene group containing from 1 to about 6 carbon atoms; and
- $R^5$  is a hydrogen atom or an alkyl group containing from 1 to about 15 carbon atoms

with a thiol compound in the presence of a base, said thiol compound being selected from the group consisting of thiophenol, alkyl substituted thiophenol, thiosalicylic acid, thioacetic acid, mercapto acetic acid, 1 thioglycerol, thioglycolic



acid, thiobenzoic acid, thiolactic acid, benzyl mercaptan, alkyl substituted benzylmercaptan, alkyl and alkoxyalkyl esters of thioglycolic acid and 3-mercaptopropionic acid, mercaptosuccinic acid, ethanolamine thioglycolate, furfuryl mercaptan, 2,5-dimercapto-1,3,4-thiadiazole, hydrocarbyl polyol esters of thioglycolic acid and 3-mercaptopropionic acid, and aliphatic hydrocarbyl thiols and dithiols in which the hydrocarbyl group contains 1-12 carbon atoms.

4,012,332

# RUBBER VULCANIZATION ACCELERATOR COMPOSITION

Rudolf Adolf Behrens, Gladstone, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 438,098, Jan. 30, 1974, abandoned.

This application Mar. 16, 1976, Ser. No. 667,326

Int. Cl.<sup>2</sup> C08K 5/40, 5/43, 5/44

U.S. Cl. 252-182

10 Claims

1. A rubber vulcanization accelerator composition comprising (a) from about 0.1 to 1.5 parts of a benzothiazole-2-sulfenamide, (b) from about 0.02 to 1.5 parts of a thiuram sulfide or a metal dithiocarbamate, said metal being selected from the group consisting of zinc, cadmium, tellurium, bismuth, nickel, selenium and lead, and (c) from about 0.002 to 1.5 parts of copper 2-mercaptopbenzothiazole per each 100 parts of said rubber; the weight ratio of said components (a), (b) and (c) being in the range from about 10:1:0.05 to 1:1:1, respectively.

4,012,333

# METHOD OF MAKING GELS BASED ON BIOLOGICALLY PRODUCED POLYSACCHARIDES

Gordon A. Towle, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed May 23, 1975, Ser. No. 580,262

Int. Cl.<sup>2</sup> B01J 13/00

U.S. Cl. 252-316

3 Claims

1. A process for preparing a firm continuous body of a gel of a beta-1,3-glucan polysaccharide which comprises preparing a solution of said beta-1,3-glucan in an aqueous medium having a pH of at least about 10.5 and subjecting said solution under quiescent conditions to an atmosphere of a gaseous acid anhydride under conditions of time and gas pressure sufficient to cause said anhydride to diffuse through said solution and effect gelling.

4,012,334

# ANTIFOAM COMPOSITIONS AND PROCESS FOR THE PREPARATION AND USE THEREOF

William J. Raleigh, Watervliet, and Richard M. Ronda, Mechanicville, both of N.Y., assignors to General Electric Company, Watford, N.Y.

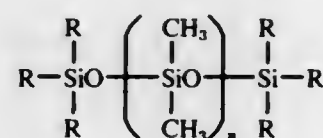
Filed Nov. 12, 1974, Ser. No. 523,280

Int. Cl.<sup>2</sup> B01D 19/04

U.S. Cl. 252-321

22 Claims

1. An antifoam composition comprising:  
a. a linear dimethylpolysiloxane fluid having the general formula



wherein R is the same or different and is selected from the group consisting of hydrocarbon radicals and substituted hydrocarbon radicals and n is a number sufficient to provide a viscosity of from about 100 to about 70,000 centistokes at 25° C in intimate admixture with

b. the reaction product of precipitated silica filler and hexamethyldisilazane prepared by contacting precipitated

silica with hexamethyldisilazane in the absence of the dimethylpolysiloxane fluid of component (a).

4,012,335

# PROCESS FOR REMOVING INTERMITTENT ORGANIC COMPOUNDS FROM GASEOUS STREAMS

Rudolph C. Woerner, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 498,388, Aug. 19, 1974, Pat. No. 3,962,127. This application Oct. 28, 1975, Ser. No. 625,937

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> B01D 15/06

U.S. Cl. 252-419

8 Claims

1. A process for regenerating a contact mass catalyst having coked thereon burnable carbonaceous material comprising:

- contacting said coked catalyst with a first gaseous stream containing from about 15 to 20 percent by volume of oxygen, said gaseous stream being at a temperature in the range of 800° to 1500° F,
- said first gaseous stream volatilizing a portion of said carbonaceous materials from said catalyst,
- admixing a portion of said gaseous stream from step (b), said portion comprising the initial 5 to 8 volume percent of said gaseous stream from step (b), said initial portion comprising principally hydrocarbons, with a second gaseous stream containing at least about 10 volume percent oxygen,
- converting said carbonaceous materials in said gaseous mixture of step (c) in a catalytic burner into CO<sub>2</sub> and water at a temperature in the range of 800° to 1500° F, and
- recovering a gaseous stream from step (d) having substantially less of said carbonaceous materials than said mixture.

4,012,336

# ALKALINE EARTH METAL ORGANOMETALLIC COMPOUNDS, THEIR PREPARATION BY METALLATION AND CATALYSTS COMPRISING SAME

Ivan Glen Hargis, Tallmadge, and Russell Anthony Livigni, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 524,336, Nov. 15, 1974, Pat. No. 3,966,638, which is a division of Ser. No. 69,476, Sept. 3, 1970. This application Apr. 29, 1976, Ser. No. 681,499

Int. Cl.<sup>2</sup> B01J 31/12

U.S. Cl. 252-431 R

5 Claims

1. A composition of matter useful as a homogeneous anionic polymerization catalyst comprising active catalyst material dissolved in an aprotic polar solvent selected from the group consisting of dialkoxypolyalkanes, dialkoxypolyalkanes, heterocyclic ethers, dialkyl ethers, peralkyl alkylene polyamines, peralkyl phosphoramides and mixtures thereof formed by reacting in said solvent metal selected from the group consisting of barium, strontium and calcium with arylalkane compound selected from the group consisting of triphenylmethane; 1,3,3-triphenyl propene; bis(2-methoxyphenyl) methane; 1,1,2-triphenyl ethane and 1,1-diphenyl alkanes and mixtures thereof in which the alkane group has 1 to 10 carbon atoms to convert at least part of said arylalkane compound into active catalyst material comprising an organometallic compound having an ionic carbon to metal bond of the formula:

R-M+R-

wherein R is the organic anion of said organometallic compound formed by removal of a proton from said arylalkane compound and

M is the metal moiety of said organometallic compound and is selected from the group consisting of calcium, strontium and barium.

4,012,337

# HIGH SURFACE AREA ALPHA ALUMINAS

Howard Lee Mitchell, III, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 450,767, March 13, 1974, abandoned.

This application July 7, 1975, Ser. No. 593,844

Int. Cl.<sup>2</sup> B01J 27/04, 27/10

U.S. Cl. 252-439

9 Claims

1. A reforming catalyst comprising a halogenated composite of alpha alumina of surface area ranging about 100 m<sup>2</sup>/g to about 600 m<sup>2</sup>/g, and a Group VIII noble metal in concentration ranging from about 0.1 to about 10 percent, halogen in concentration ranging from about 0.3 to about 1.5 percent.

9. The catalyst of claim 1 in sulfided form and containing up to about 2 percent sulfur.

4,012,338

# PROCESS FOR MANUFACTURING A CARRIER OF TITANIUM DIOXIDE

Donald Urwin, Cleveland, England, assignor to Tioxide Group Limited, Cleveland, England

Filed July 10, 1975, Ser. No. 594,872

Claims priority, application United Kingdom, Aug. 10, 1974, 35347/74

Int. Cl.<sup>2</sup> B01J 21/06

U.S. Cl. 252-461

11 Claims

1. A process for the manufacture of a carrier for an active entity which comprises selecting by sieving from raw anatase titanium dioxide the fraction having a particle size within the range of 150 microns to 350 microns and heating the selected fraction at a temperature of from 850° C. to 1300° C. for a time sufficient to produce a product having a hardness of at least 40, a bulk density of at least 0.8 grams per milliliter and a specific surface area of less than 5 square meters per gram.

4,012,339

# METHOD FOR IMPROVING PHYSICAL PROPERTIES OF CATALYST MATERIALS THROUGH THE INCORPORATION OF FINES THEREIN AND CATALYST PREPARED BY THE METHOD

Robert Henry Ebel, Riverside, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 4, 1975, Ser. No. 628,715

Int. Cl.<sup>2</sup> B01J 21/04

U.S. Cl. 252-463

8 Claims

1. In a process of producing a particulate catalyst material comprising preparing a moldable aqueous paste of an inorganic oxide gel, molding said paste to provide a structured catalyst material, and stabilizing the structured material by drying and calcining, the improvement which comprises employing as said inorganic oxide gel one containing at least about 5 weight percent of calcined fines, based on the total weight of said inorganic oxide gel and said fines, said fines having a particle size less than about 100 mesh and at least 30 weight percent of said fines having a particle size less than about 325 mesh.

4,012,340

# PROCESS FOR PREPARING CATALYSTS FOR HYDRODESULFURIZATION

Tatsuo Morimoto, Yokohama, Japan, assignor to Chiyoda Kako Kensetsu Kabushiki Kaisha, Yokohama, Japan

Continuation-in-part of Ser. No. 222,640, Feb. 1, 1972, Pat. No. 3,954,673. This application Apr. 10, 1975, Ser. No. 566,817

Claims priority, application Japan, Feb. 1, 1971, 46-3946

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> B01J 21/04, 23/28

U.S. Cl. 252-465

7 Claims

1. A process for preparing a hydrodesulfurization catalyst which has fine pores sharply distributed in the range of 50 to 200A and comprising the steps of:

i. adding a molybdate to a water soluble aluminum complex represented by the formula



wherein

1 < n < 100,

3n > m,

n/(3n-m) ≤ 16, and

X is an anion selected from the group consisting of Cl, NO<sub>3</sub>,

1, Br and ClO<sub>4</sub>,

whereby there is obtained a uniform solution composition;

ii. treating the uniform solution composition of (i) hydrothermally at a temperature of from about 120° to about 330° C;

iii. adding thereto a water soluble salt of nickel or cobalt;

iv. further adding thereto and mixing a member selected from the group consisting of diethylene glycol, glycerin, polyethylene glycol, carboxymethylcellulose, microcrystalline cellulose, hexamethylene tetramine, azodicarbonamide and dinitrosopentamethylene tetramine; and

v. treating the resultant mixture by drying, calcinating and grinding whereby said catalyst is obtained.

4,012,341

# UNIQUE ALL SYNTHETIC DETERGENT SHAMPOO BAR

Philip Orshitzer, Staten Island, N.Y., and Antoni Macander, Ridgefield, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 24, 1975, Ser. No. 589,968

Int. Cl.<sup>2</sup> C11D 1/83, 1/70, 1/14

U.S. Cl. 252-548

3 Claims

1. A solid all synthetic detergent shampoo bar comprising from about 10-60% of a water soluble, solid, polyethoxylated dialkyl phenol wherein each of the alkyl groups contain more than 8 carbon atoms; from about 30-60% of a sodium or potassium higher alkyl sulfates wherein the alkyl group contains between 12 and 20 carbon atoms; and from about 10-40% of the monoethanolamide of stearic acid.

4,012,342

# CATALYST-CONTAINING FIBERS AND THE POLYMERIZATION OF OLEFINS THEREON

Herbert W. Dougherty, Cranford, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 715,178, Feb. 14, 1958, abandoned, which is a division of Ser. No. 550,515, Dec. 1, 1955, Pat. No. 3,008,943. This application Feb. 18, 1963, Ser. No. 259,439

Int. Cl.<sup>2</sup> C08J 9/26

U.S. Cl. 260-2.5 B

6 Claims

1. A high molecular weight, normally solid polymer of a lower alpha olefin coated on organic fibers containing polar groups wherein said fibers are cellulose fibers or fibers of plastic polymers having recurring amide groups in their molecules.

4,012,343

# CROSSLINKED OLEFIN POLYMER HAVING IMPROVED FLAME RETARDANCE

Charles F. Raley, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 53,332, July 8, 1970, abandoned, and Ser. No. 168,756, Aug. 3, 1971, abandoned.

This application Sept. 9, 1974, Ser. No. 504,019

Int. Cl.<sup>2</sup> C08J 9/10; C08K 3/02, 5/02

U.S. Cl. 260-2.5 FP

14 Claims

1. In an olefin polymer composition containing a halogenated organic moiety which is active chlorinated organic compound, active brominated organic compound, passive brominated organic compound or hexachlorocyclopentadiene, dimerized hexachlorocyclopentadiene, hexachloro-



domethylene tetrahydrophthalic acid or a derivative thereof and having the halogen concentration from about 5 to about 95 weight percent based on said moiety, the olefin polymer being selected from the group consisting of homopolymers and copolymers of aliphatic hydrocarbon monoolefins having no more than 12 carbon atoms, substituted  $\alpha$ -monoolefins wherein the substituent is carboxylic acid, alkyl or haloalkyl ester of carboxylic acid wherein alkyl or haloalkyl has from 1 to 12 carbon atoms, acyl having from 1 to 12 carbon atoms, carboxylate having from 1 to 12 carbon atoms, alkoxy having from 1 to 12 carbon atoms, and aryloxy having 6 to 12 carbon atoms, the improvement wherein the olefin polymer is cross-linked to at least its gel point and contains a flame retarding amount of elemental phosphorus having a specific gravity greater than 2.0.

4,012,344

# TIRE TREAD COMPOSITIONS HAVING IMPROVED LOW TEMPERATURE PROPERTIES

Harvey L. Cohen, Matawan, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 475,988, June 3, 1974, Pat. No. 3,919,130. This application Oct. 6, 1975, Ser. No. 619,635

Int. Cl.<sup>2</sup> C08L 7/00, 23/20

U.S. Cl. 260—4 R

6 Claims

1. A tire tread composition exhibiting improved wet skid resistance and low temperature properties, the rubber polymer component comprising a blend of at least one general purpose rubber selected from the group consisting of natural rubber, polyisoprene, styrene butadiene, and polybutadiene and at least 20 wt. % of an elastomeric copolymer of isobutylene and cyclopentadiene, based on the weight of the copolymer plus said general purpose rubber, wherein said copolymer contains from at least 5% to less than 20 mol % of cyclopentadiene.

4,012,345

DES-(ALA<sup>1</sup>, GLY<sup>2</sup>), MET<sup>11</sup>, SRIF AND INTERMEDIATES  
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

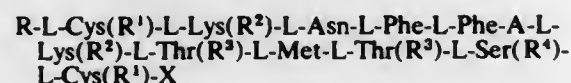
Filed Jan. 30, 1976, Ser. No. 654,147

Int. Cl.<sup>2</sup> C07C 103/52; A61K 37/00; C08L 89/00

U.S. Cl. 260—8

8 Claims

6. A compound of the formula



wherein:

A is L-tryptophyl or D-tryptophyl

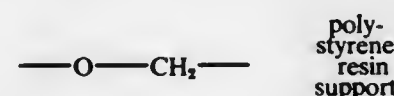
R is hydrogen, formyl, trifluoroacetyl, phthalyl, toluenesulfonyl, o-nitrophenylsulfonyl, benzyloxycarbonyl, p-methoxybenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, 2-bromobenzyloxycarbonyl, 2-chlorobenzyloxycarbonyl, 1-(p-biphenyl)-1-methyl-ethoxy carbonyl, tert-butyloxycarbonyl, diisopropylmethoxycarbonyl, allyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl, amyloxycarbonyl,  $\alpha,\alpha$ -dimethylbenzyloxycarbonyl,  $\alpha,\alpha$ -dimethyl-3,5-dimethoxybenzyloxycarbonyl, benzhydryloxycarbonyl, 9-fluoroenylmethoxycarbonyl, isobornyloxycarbonyl, adamantyloxycarbonyl;

R<sup>1</sup> is a protecting group for the sulfhydryl group of the two cysteinyl moieties independently selected from the group consisting of benzyl, 3,4-dimethylbenzyl, p-methoxybenzyl, p-nitrobenzyl, p-chlorobenzyl, trityl, benzhydryl, tetrahydropyranyl, acetamidomethyl, t-butylthio, ethylthio, ethylcarbamoyl, benzylthiomethyl or benzoyl;

R<sup>2</sup> is formyl, trifluoroacetyl, phthalyl, toluenesulfonyl, o-nitrophenylsulfonyl, benzyloxycarbonyl, p-methoxybenzyloxycarbonyl, p-nitrobenzyloxycarbonyl, 2-bromobenzyloxycarbonyl, 2-chlorobenzyloxycarbonyl, 1-(p-biphenyl)-1-methyl-ethoxy carbonyl, tert-butyloxycar-

bonyl, diisopropylmethoxycarbonyl, allyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl, amyloxycarbonyl,  $\alpha,\alpha$ -dimethylbenzyloxycarbonyl,  $\alpha,\alpha$ -dimethyl-3,5-dimethoxybenzyloxycarbonyl, benzhydryloxycarbonyl, 9-fluoroenylmethoxycarbonyl, isobornyloxycarbonyl, adamantyloxycarbonyl;

R<sup>3</sup> and R<sup>4</sup> are protecting groups for the hydroxyl group of the threonyl and seryl moieties, independently selected from the group consisting of benzoyl, tert-butyl, benzyl. The preferred protecting group for R<sup>3</sup> and R<sup>4</sup> is benzyl; X is selected from the group consisting of OH, OCH<sub>3</sub> and an anchoring bond used in solid phase synthesis linked to a solid resin support represented by the formula



said protecting groups defined by R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> being capable of being split off chemically under conditions that do not cleave said peptide chain and at least one of R, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> being a protecting group when X is OH.

4,012,346

# ACRYLIC SYNTHETIC FIBERS HAVING AN ANIMAL HAIR-LIKE TOUCH AND ITS METHOD OF MANUFACTURE

Muneto Makiyama, Akashi; Taizo Yasumoto, Takasago; Shoji Kumazawa, Takasago; Shoichi Murata, Takasago, and Shiro Miya, Mino, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 556,217, March 7, 1975, abandoned. This application June 3, 1975, Ser. No. 583,513  
Claims priority, application Japan, Mar. 9, 1974, 49-27411; Mar. 9, 1974, 49-27412

Int. Cl.<sup>2</sup> C08L 1/10

U.S. Cl. 260—17 A

18 Claims

1. Acrylic synthetic fibers having an animal hair-like touch, said fibers consisting essentially of

- A fiber forming copolymer consisting essentially of 30 or more weight % of acrylonitrile, 70 and less weight % of vinyl chloride and/or vinylidene chloride and 0 to 10 weight % of other polymerizable vinyl monomers,
- 0.1 to 8.0 parts of at least one metallic compound selected from the group consisting of SiO<sub>2</sub>, TiO<sub>2</sub>, ZrO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Sb<sub>2</sub>O<sub>3</sub>, MgO, CaO, ZnO, SnO, Ti(OH)<sub>4</sub>, ZrO(OH)<sub>2</sub>, Al(OH)<sub>3</sub>, Mg(OH)<sub>2</sub>, Zn(OH)<sub>2</sub>, AlPO<sub>4</sub>, Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>, CaSO<sub>4</sub>, BaSO<sub>4</sub>, ZnS, 2PbCO<sub>3</sub>·Pb(OH)<sub>2</sub> and 2PbO·Pb·PHO<sub>3</sub>·1/2H<sub>2</sub>O, to 100 parts of the said copolymer and
- 1.0 to 8.0 parts of at least one cellulose ester to 100 parts of the said copolymer.

4,012,347

# ANTIFOULING COMPOSITION

Melvin H. Gittlitz, Edison, N.J., and Aaron Freiman, Brooklyn, N.Y., assignors to M & T Chemicals Inc., Greenwich, Conn.

Filed Nov. 3, 1975, Ser. No. 628,360

Int. Cl.<sup>2</sup> C08K 5/58, 5/57

U.S. Cl. 260—27 R

5 Claims

1. An antifouling coating composition comprising between 5 and 30% by weight of film-forming synthetic organic film-forming polymer and rosin, a pigment, between 10 and 40% by weight of an organic liquid diluent and between 1 and 25% by weight of a triorganotin compound of the formula R<sub>3</sub>SnX or (R<sub>3</sub>Sn)<sub>2</sub>Y, wherein R<sup>1</sup> is selected from the group consisting of alkyl radicals containing between 1 and 4 carbon atoms, R<sup>2</sup> is a cycloalkyl radical containing between 5 and 8 cyclic carbon atoms, X is selected from the group consisting of fluorine, chlorine, bromine, hydroxyl, alkoxy (—OR<sup>3</sup>), thioalkoxy (—SR<sup>3</sup>) and carboxyl radicals, (—OOCR<sup>3</sup>), wherein R<sup>3</sup> is alkyl and contains between 1 and

12 carbon atoms, Y is oxygen or sulfur and a is the integer 1 or 2, and wherein the weight of rosin in said composition is between 0.25 and 3 times the weight of said film-forming polymer.

4,012,348

# METHOD OF PREPARING A MIXTURE FOR MAKING EXTRUDED RESIN ARTICLES

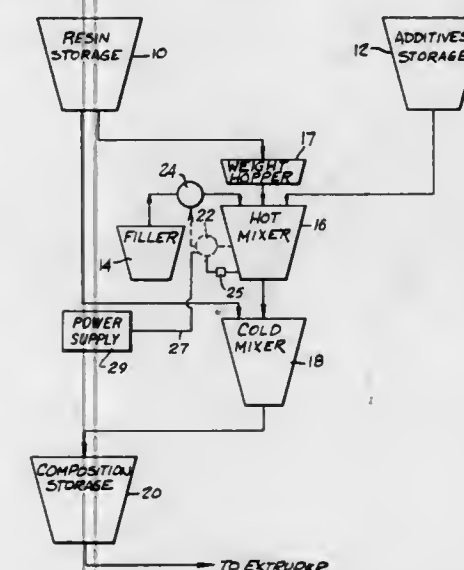
Joseph John Chelland, Littleton, and Fred Everett Love, Denver, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 29, 1974, Ser. No. 528,111

Int. Cl.<sup>2</sup> C08L 9/100; C08J 3/20

U.S. Cl. 260—28.5 R

10 Claims



1. In a method of making an extruded resin article, which method includes preparing a mixture including a first resin in particulate form with a non-resinous filler material in finer particulate form dispersed throughout said resin, air-conveying said mixture to the point at which the article is to be made from a remote location and making said article from said mixture by means of extrusion, the improvement comprising:

- providing a second resin in particulate form, said second resin being such that
  - it has a melting point below that of said first-mentioned resin,
  - when initially heated to its melting point, said second resin will adhere to adjacent particles of said first-mentioned resin and filler material but will not be immediately absorbed by said adjacent particles, and
  - said second resin promotes fusion of said first resin during said extrusion;
- substantially uniformly mixing said particles of second resin throughout said particles of first resin prior to combining said filler material with said first resin to provide a substantially homogeneous mixture of the two;
- during said mixing step, heating said resins to the point at which said second resin initially melts such that the particles of second resin adhere to particles of the first resin;
- after said second resin has reached said melting point and before it has a chance to be completely absorbed by said first resin, dispersing said filler material substantially throughout said first and second resins such that the particles of filler material adhere to said second resin particles; and
- preventing said melted particles of second resin from being completely absorbed by said first resin particles or particles of filler material.

4,012,349

# PROCESS FOR PREPARING NON-IONIC POLYURETHANE EMULSIONS

Kazuo Matsuda; Hidemasa Ohmura, and Hiraakazu Aritaki, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Division of Ser. No. 527,247, Nov. 26, 1974, Pat. No. 3,951,897. This application Jan. 12, 1976, Ser. No. 648,361  
Claims priority, application Japan, Nov. 27, 1973, 48-133215

Int. Cl.<sup>2</sup> C08G 18/32; C08J 3/06

U.S. Cl. 260—29.2 TN

10 Claims

1. A method for preparing a polyurethane aqueous emulsion in which the polyurethane component is a polyurethane-urea-polyamine containing in the molecule a cross-linkable halohydrin structure, which comprises:

- reacting (I) organic polyhydroxyl reactant mixture consisting essentially of 15 to 80 weight percent of a water-soluble polyoxyethylene glycol having a molecular weight of 200 to 10,000, and the balance a water-insoluble organic polyhydroxyl compound having a molecular weight of 200 to 10,000 and (II) an excess of organic polyisocyanate to produce an isocyanate-terminated prepolymer, and
- reacting said prepolymer with (III) polyalkylene polyamine having at least two groups selected from the group consisting of primary amino groups and secondary amino groups and also having a functional group of the formula



where X is chloro or bromo, the total mole number of primary and secondary amino groups in the polyalkylene polyamine being greater than the total mole number of isocyanate groups in said prepolymer, the reaction being carried out until the presence of —NCO groups cannot be detected, whereby to form polyurethane-urea-polyamine,

- reacting the polyurethane-urea-polyamine with a cyclic dicarboxylic acid anhydride, and
- mixing the reaction product of step 4 with water to form a polyurethane emulsion.

4,012,350

# LIQUID ADHESIVE FROM PHENOPLAST AND M-AMINOPHENOL

Oliver W. Burke, Jr., Fort Lauderdale, and Barbara P. Hunt, Pompano Beach, both of Fla., assignors to Oliver W. Burke, Jr., Fort Lauderdale, Fla.

Division of Ser. No. 219,173, Jan. 19, 1972, Pat. No. 3,922,468. This application Dec. 7, 1973, Ser. No. 422,777  
Int. Cl.<sup>2</sup> C08L 61/14

U.S. Cl. 260—29.3

15 Claims

1. An improved adhesive composition for bonding substrates to one another, said adhesive composition being a liquid dispersion comprising, by weight, the combination of:

- 5 to 250 parts of liquid dispersing medium,
- 10 parts of phenoplast material selected from the members of the class consisting of group (I) that heat curable phenoplasts containing methylol groups; group (II), mixtures of (1) novolac phenoplasts substantially free from methylol groups with (2) at least sufficient methylene donor material to enable heat curing of the same; group (III) mixtures of (1) phenoplasts which complex with metal oxides with (2) at least sufficient material selected from the oxides and hydroxides of the metals calcium, magnesium and zinc, to complex with the phenoplast; and group (IV) heat curable combinations of the foregoing,
- 0 to 150 parts of modifying polymer, and
- 0 to 30 parts of material selected from the oxides and hydroxides of the metals calcium, magnesium, and zinc, and said composition being improved in that it has mixed therein
  - 1 to 40 parts by weight of m-aminophenol.



4,012,351

# STABILIZATION OF ACIDIC AQUEOUS COATING COMPOSITIONS CONTAINING AN ORGANIC COATING-FORMING MATERIAL

Wilbur S. Hall, Plymouth Meeting, and Harry M. Leister, Ambler, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 308,176, Nov. 20, 1972, Pat. No. 3,839,097, which is a continuation-in-part of Ser. No. 257,107, May 26, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,160  
Int. Cl.<sup>2</sup> C08L 9/08

U.S. Cl. 260—29.6 R

20 Claims

1. In an acidic aqueous coating composition comprising (A) solid particles of an organic coating-forming material dispersed in the aqueous phase of said composition by an anionic or nonionic dispersing agent or a mixture thereof and (B) an oxidizing agent, wherein said composition is effective in forming on a metallic surface immersed therein, in the absence of the use of electricity, an organic coating which increases in weight or thickness the longer said surface is immersed in said composition, the improvement comprising including in said composition a surfactant having cationic properties in an amount of at least about 0.5 g/l of composition.

4,012,352

# POLYVINYL ALCOHOL MICROGELS

Alden J. Deyrup, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 5, 1972, Ser. No. 259,552  
Int. Cl.<sup>2</sup> C08F 27/04, 3/34

U.S. Cl. 260—29.6 BM

5 Claims

1. A solution of polyvinyl alcohol microgel comprising water, 0.05 to 10% by weight of polyvinyl alcohol and 0.2 to 2 parts by weight of tetraivalent titanium ion being used per 100 parts by weight of polyvinyl alcohol, said microgel being derived from polyvinyl alcohol which has a Hoesppler viscosity of 4 to 150 centipoises measured as a 4% aqueous solution at 20°C. by the falling ball method, and in which at least 50 mole percent of the monomeric units are vinyl alcohol units, wherein the improvement comprises the polyvinyl alcohol microgel being a stable fluid of polyvinyl alcohol partially crosslinked with tetraivalent titanium ions and water, said fluid having a Brookfield viscosity of 15 to 500 centipoises, said Brookfield viscosity being at least 15% greater than the viscosity of the aqueous polyvinyl alcohol solution from which the microgel is derived.

4,012,353

# COPOLYMER HAVING QUATERNARY AMMONIUM, N-ALKOXYALKYL AMIDO, AND CARBOXY GROUPS, OPTIONALLY EPOXY RESIN, AND AQUEOUS DISPERSIONS

David Gilbert Chasin, and Joseph Feltzin, both of Wilmington, Del., assignors to ICI United States Inc., Wilmington, Del.

Filed Feb. 3, 1975, Ser. No. 546,344  
Int. Cl.<sup>2</sup> C08F 20/06, 22/06

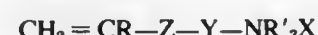
U.S. Cl. 260—29.6 NR

7 Claims

1. A cationic cross-linkable thermosettable copolymer stable in aqueous emulsions prepared from a monomer system which comprises:

- 30–80 percent by weight of a non-functional alpha,beta-ethylenically unsaturated main monomer selected from the group consisting of styrene, alkyl styrenes, alkyl acrylates, methacrylates, vinyl ethers, vinyl acetates and substituted vinyl derivatives;
- 0.1 to 15 percent by weight of an alpha,beta-ethylenically unsaturated monomer containing carboxyl groups;
- up to 15 percent of acrylamide and N-alkyl substituted acrylamides;
- 1–15 percent by weight of an N-alkoxyalkylamido group containing alpha,beta-ethylenically unsaturated monomer; and

- up to 12 percent by weight of a cross-linkable epoxy resin modifier; and
- 1–15 percent by weight of an alpha,beta-ethylenically unsaturated monomer having the following general formula:



wherein

- R is H or  $-\text{CH}_3$ ;  
Z is  $-\text{CO}_2$ ,  $-\text{CONH}-$ ;  
Y is an alkylene group;  
R' is a monovalent alkyl group the three of which may be the same or different; and  
X is an anion;  
said alkyl group in said above described compounds being hydrocarbon radicals having 1–4 carbon atoms.

4,012,354

# COMPOSITION AND METHOD OF FLOCCULATING MINERAL SOLIDS COLLOIDALLY SUSPENDED IN AN AQUEOUS MEDIUM

Stewart N. Paul, Ontario, Canada, assignor to Chemed Corporation, Cincinnati, Ohio

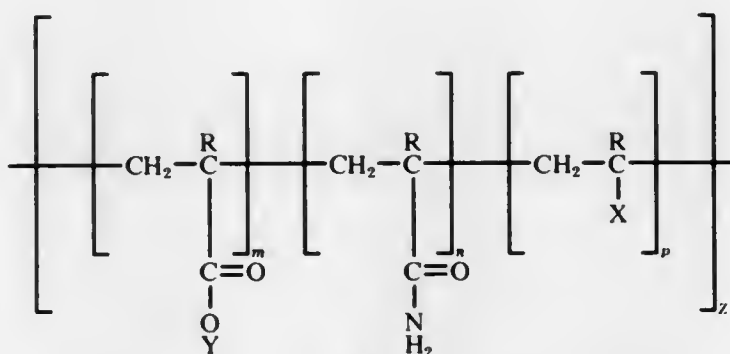
Filed Apr. 11, 1975, Ser. No. 567,325  
Int. Cl.<sup>2</sup> C08L 33/26

U.S. Cl. 260—29.6 E

2 Claims

1. A flocculant composition readily dispersible in water consisting essentially of,

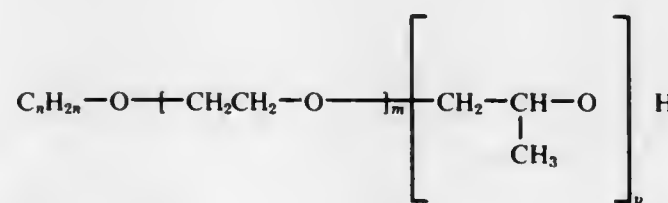
- up to 90% by weight of a polymer of the formula



wherein Y represents hydrogen, ammonium, and alkali metal, R represents hydrogen or a methyl group, X represents halogen, a lower alkoxy or acetoxyl group, a cyanide group, a dialkylaminoalkyl group or a quaternized dialkylaminoalkyl group, m is 0 to 50, n is 50 to 100, p is 0 to 10, the sum of n plus m plus p is 100, Z is at least 15,000, and m, n, and p represent percentages of the groups present;

- 0.1–5% by weight of a non-ionic surfactant having an HLB index below 10, selected from the group consisting of

- Polyethoxylated-propoxylated fatty alcohols of the formula,



where n is 12 to 20, m is 1 to 50 and p is 1 to 50, and  
2. Polypropylene oxide to which ethoxy groups are attached to form block copolymers, of the formula,

4,012,357

# RESINOUS COMPOSITIONS CONTAINING PLASTICIZERS COMPRISING HIGH MOLECULAR WEIGHT ESTERS OF C<sub>22+</sub> ALPHA-OLEFIN DERIVED ACIDS

Harold C. Foulks, Jr., Newport, Ky.; Herbert G. Rodenberg, and Harold E. Mains, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Division of Ser. No. 517,332, Oct. 23, 1974, Pat. No. 3,988,330. This application Aug. 6, 1975, Ser. No. 602,327  
Int. Cl.<sup>2</sup> C08K 5/09, 5/10

U.S. Cl. 260—31.2 R

7 Claims

1. A thermoplastic polyvinylchloride homopolymer or copolymer resin containing 0.1 to 5 parts per 100 parts resin of an internal-external lubricant ester derived from an aliphatic hydroxylic compound containing from 2 to 25 carbon atoms and 1 to 10 primary or secondary hydroxyl groups and a mixed straight-chain aliphatic monocarboxylic acid obtained by the ozonization of C<sub>22+</sub> α-olefins wherein at least 90% by weight of the olefins contain 22 or more carbon atoms, said mixed acid containing less than 30 % by weight acids having fewer than 21 carbon atoms, less than 20 % acids having greater than 35 carbon atoms and 55% by weight or more C<sub>21–35</sub> acids with the weight ratio of odd to even carbon content acids in the C<sub>21–35</sub> range being between 1.5:1 and 10:1.

4,012,358

# PIGMENTING FIBER GRADE POLYESTER

Cesar A. Cardenas, West Milford; John D. Bien, Livingston, both of N.J., and Salvatore Carangelo, Staten Island, N.Y., assignors to Inmont Corporation, New York, N.Y.

Filed Apr. 11, 1975, Ser. No. 567,305  
Int. Cl.<sup>2</sup> C08K 9/04

U.S. Cl. 260—40 R

4 Claims

1. A method of forming a concentrate mixture of pigment, polyethylene and fiber grade polyester comprising:

- mixing 50 to 75 parts of pigment with 50 to 25 parts of dry, particulate polyethylene having a melt index of 20 to 300,
- melting the polyethylene and continuing mixing for 10 to 20 minutes,
- cooling the mixture of pigment and polyethylene to solidify the polyethylene,
- converting the solidified mixture of pigment and polyethylene to particulate form,
- mixing 1 part of the particulate mixture of pigment and polyethylene with 1 to 4 parts of particulate fiber grade polyester,
- heating the mixture of pigment, polyethylene, and polyester to about 280° C., in a twin-screw extruder type of intensive mixer, and
- extruding the mixture of pigment, polyethylene and polyester in the extruder at a temperature no higher than about 280° C. until the mixture has a filterability of less than 18.5.

4,012,359

# ANTIBACTERIAL AGENTS FOR GRAM-NEGATIVE BACTERIA

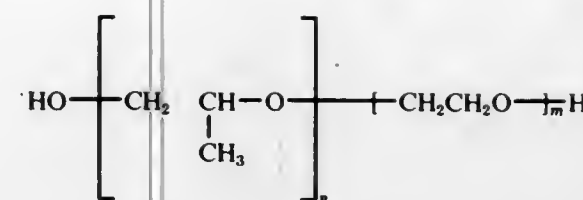
Saul Kaye, Evanston, Ill., and Robert L. Iverson, Northfield, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 313,404, Dec. 8, 1972, abandoned. This application June 13, 1974, Ser. No. 478,899  
Int. Cl.<sup>2</sup> C08K 5/34

U.S. Cl. 260—45.8 NE

9 Claims

1. In combination: a resinous material selected from the group consisting of polyvinyl chloride and polypropylene containing from about 0.1 part to about 1.5 parts of an antibacterial agent per 100 parts by weight of said material to protect the material against growth thereon of microorganisms including Gram-negative bacteria, said agent comprising a compound of the formula:



where n is 5 to 50 and m is 1 to 10

- soda ash in an amount equivalent to free carboxy groups, if any, in the said polymer;
- 1–5% by weight of chelant; and
- up to 70% by weight of a filler.

4,012,355

# COMPOSITION USEFUL IN PREVENTING ENVIRONMENTAL EROSION CONTAINING FILM FORMING ORGANIC POLYMER AND SILICONE

Kenneth H. Nimerick, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 427,609, Dec. 26, 1973, which is a continuation-in-part of Ser. No. 306,998, Nov. 16, 1972, abandoned. This application July 23, 1975, Ser. No. 598,524  
Int. Cl.<sup>2</sup> C08L 25/10

U.S. Cl. 260—29.7 NR

11 Claims

1. A composition suitable for use in protecting from environmental erosion, a surface of a pile or mass of finely divided particulate matter otherwise susceptible to erosion, which composition comprises: an aqueous-based suspension containing

- a film forming organic copolymer formed by the interpolymerization of, by weight, 36.5% styrene, 60% butadiene, 2% acrylic acid, and 1.5% maleic anhydride, and
- a silicone which forms a hydrophobic coating on a substrate,

said composition containing the copolymer and silicone in amounts sufficient to cooperatively render such a surface resistant to environmental erosion when said composition is applied thereto in an effective quantity.

4,012,356

# SUSPENSION-EMULSION INTERPOLYMER CONTAINING TRIS(2-ETHYLHEXYL) PHOSPHATE

Adam F. Kopacki, Westwood, N.J., and John H. Deatcher, Lake Peekskill, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

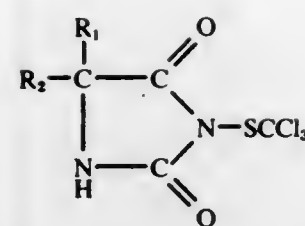
Filed Mar. 31, 1975, Ser. No. 563,438  
Int. Cl.<sup>2</sup> C08K 5/10, 5/43, 5/51; C08L 32/01

U.S. Cl. 260—30.6 R

7 Claims

1. In an acrylic rubber-containing suspension-emulsion interpolymer which contains a crosslinked acrylate component having a glass transition temperature of about 25° C. or less formed by emulsion polymerization, said component comprising from about 90 to about 99.8% of an aromatic or C<sub>2–8</sub> alkyl acrylate and from about 0.2 to about 10% by weight of a polyfunctional ethylenically unsaturated monomer and a polyvinyl chloride component formed by suspension polymerization, said polyvinyl chloride component comprising from about 40 to about 90% by weight of the crosslinked acrylate component, wherein the improvement comprises an effective amount of a tris(2-ethylhexyl)phosphate plasticizer.





in which both  $R_1$  and  $R_2$  are hydrogen, methyl, or ethyl and may be the same or different.

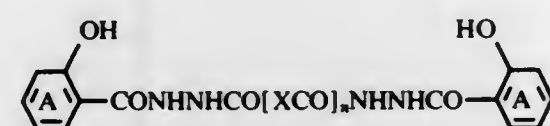
4,012,360

**BIS-SALICYLOYL-DICARBOXYLIC ACID DIHYDRAZIDES AS STABILIZERS FOR POLYOLEFINS**  
Kurt Schwarzenbach, Aesch; Helmut Mueller, Binningen, and Siegfried Rosenberger, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Continuation of Ser. No. 421,467, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 170,379, Aug. 9, 1971, abandoned. This application Aug. 6, 1975, Ser. No. 602,499  
Int. Cl.<sup>2</sup> C07C 103/26

U.S. Cl. 260—45.9 NC

9 Claims

1. A compound of the formula



wherein

X denotes a direct bond, alkylene of 1 to 8 carbon atoms, m-phenylene or p-phenylene;  
 $n$  denotes 0 or 1; and  
the rings A are each unsubstituted, or one or both rings A are substituted with an hydroxyl, a chlorine atom, an  $\alpha$ -methylbenzyl, an alkanoyloxy of 2 to 18 carbon atoms or an alkanoylamino of 2 to 18 carbon atoms; or with one or two alkyl groups each of 1 to 8 carbon atoms, or one or two alkoxy groups each of 1 to 18 carbon atoms.

4,012,361

**HEAT-STABLE POLYIMIDE RESINS FROM A BIS-IMIDE, A POLYAMINE AND AN ALAZINE**  
Michel Bargain, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Feb. 22, 1972, Ser. No. 228,232

Claims priority, application France, Feb. 24, 1971, 71.06289

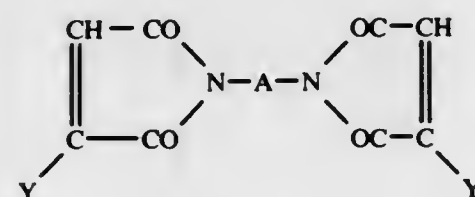
Int. Cl.<sup>2</sup> C08L 69/26, 73/10

U.S. Cl. 260—47 CZ

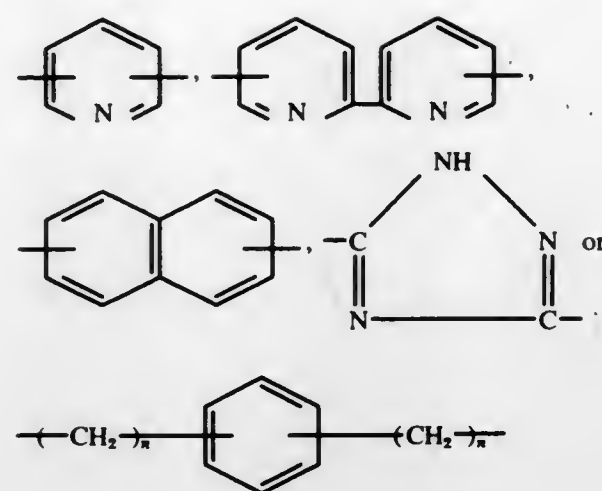
17 Claims

1. A heat-stable cured thermoset resin consisting essentially of a three-dimensional polyimide which is obtained by reacting at between about 50° and 350° C at least one reactant from each of the following three groups:

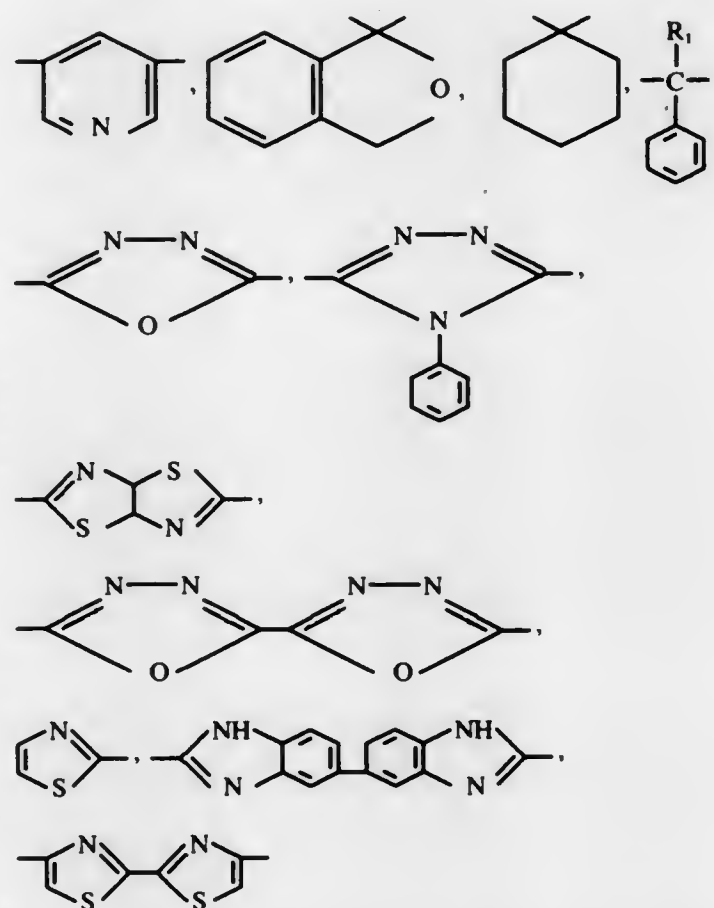
i. a bis-imide of the general formula



in which Y denotes H,  $CH_3$ , or Cl, and A represents a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of formulae:



wherein  $n$  represents an integer from 1 to 3 or a divalent radical with 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals bonded to one another by a simple valency bond or by  $-O-$ ,  $-S-$ , an alkylene group with 1 to 3 carbon atoms,  $-CO-$ ,  $-SO_2-$ ,  $-NR_1-$ ,  $-N=N-$ ,  $-CONH-$ ,  $-COO-$ ,  $-P(O)R_1-$ ,  $-CONH-X-NHCO-$ ,

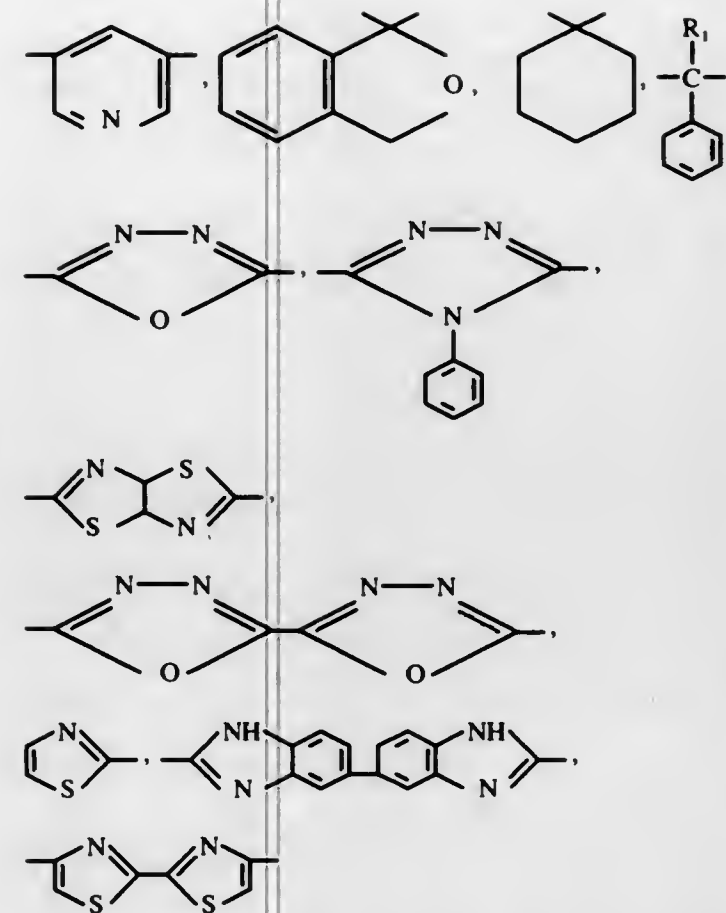


wherein  $R_1$  represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,

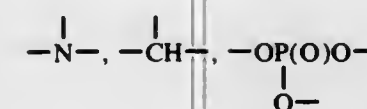
ii. a polyamine of the general formula:



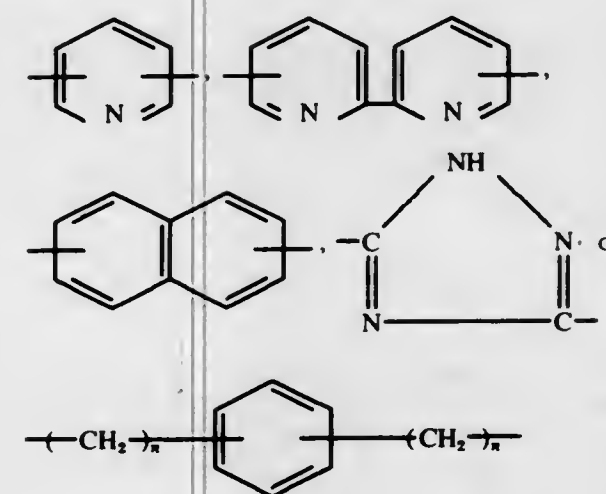
in which  $x$  represents an integer from 2 to 5 and R denotes an organic radical of valency  $x$  and selected from the group consisting of a 3 to 5 valent benzene, methyl benzene, naphthylene, pyridine or triazine radical, a 3 to 5 valent radical consisting of phenylene radicals bonded to one another by a simple valency bond or by  $-O-$ ,  $-S-$ , an alkylene group with 1 to 3 carbon atoms,  $-CO-$ ,  $-SO_2-$ ,  $-NR_1-$ ,  $-N=N-$ ,  $-CONH-$ ,  $-COO-$ ,  $-P(O)R_1-$ ,  $-CONH-X-NHCO-$ ,



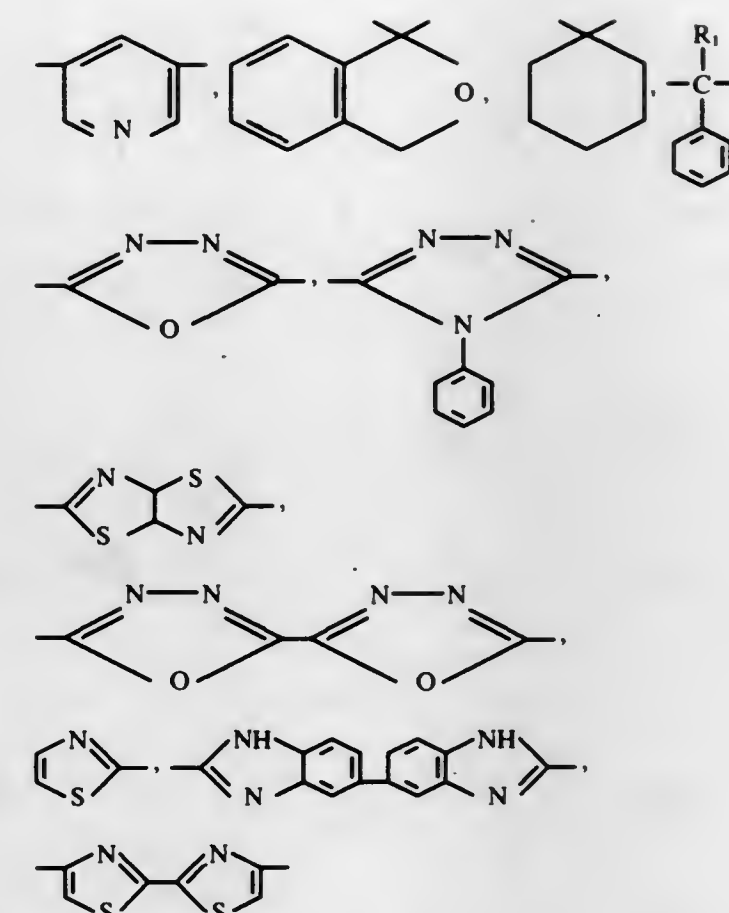
wherein  $R_1$  represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,



and  $-P(O)-$ , a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of the formulae:



wherein  $n$  represents an integer from 1 to 3 or a divalent radical with 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals bonded to one another by a simple valency bond or by  $-O-$ ,  $-S-$ , an alkylene group with 1 to 3 carbon atoms,  $-CO-$ ,  $-SO_2-$ ,  $-NR_1-$ ,  $-N=N-$ ,  $-CONH-$ ,  $-COO-$ ,  $-P(O)R_1-$ ,  $-CONH-X-NHCO-$ ,



wherein  $R_1$  represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or a phenyl or cyclohexyl radical, and

iii. an alazine of the general formula:



in which G represents a monovalent carbocyclic aromatic radical, in amounts such that if  $N_1$  represents the number of mols of bisimide employed,  $N_2$  represents the number of mols of polyamine employed and  $N_3$  represents the number of mols of alazine employed, the ratio

$$\frac{N_1}{\frac{2N_2}{x} + N_3}$$

is from 1.5 to 10,  $x$  being defined as above.

4,012,362

**POLYMERS CONTAINING 8-HYDROXYQUINOLINE GROUPS**

Günther Reiff, Rua Poul Harris, Brazil; Dieter Margotte, Krefeld-Bockum, Germany; Karstel Idel, Krefeld, Germany; Hugo Vernaleken, Krefeld-Bockum, Germany, and Dieter Freitag, Krefeld-Traar, Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 549,276, Feb. 12, 1975, abandoned. This application May 2, 1975, Ser. No. 573,837  
Claims priority, application Germany, Feb. 15, 1974, 2407307; Feb. 15, 1974, 2407306

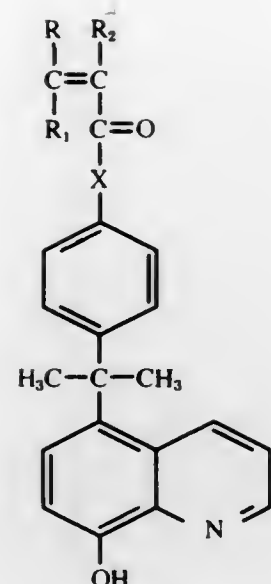
Int. Cl.<sup>2</sup> C08F 120/60

U.S. Cl. 260—47 UA

3 Claims

1. Polymers of number of average molecular weights of about 5,000 to 500,000, which comprise recurring polymerised units of a monomer of the formula I





wherein

X denotes O or NH;  
R denotes H, —COOH or —COOR<sub>3</sub>,  
R<sub>1</sub> denotes H or CH<sub>3</sub>,  
R<sub>2</sub> denotes H or CH<sub>3</sub> and  
R<sub>3</sub> denotes C<sub>1</sub>–C<sub>18</sub>-(linear or branched)-alkyl or cycloalkyl or contain these units in a copolymerised form.

4,012,363

#### COATING POWDERS ON THE BASIS OF THERMOPLASTIC POLYESTERS

Klaus Brüning, Bergisch-Gladbach; Karl-Günter Sturm, St. Augustin, and Siegfried Hahn, Siegburg-Kaldauen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Aug. 21, 1974, Ser. No. 499,250

Claims priority, application Germany, Sept. 15, 1973, 2346559

Int. Cl.<sup>2</sup> C08G 63/18

U.S. Cl. 260—75 R

13 Claims

1. A coating powder consisting essentially of a partially crystalline polyester, which partially crystalline polyester has a glass transition temperature between +20° and +50° C., as determined at the attenuation maximum in accordance with Deutsche Industrie Norm 53,445, a reduced viscosity ( $\eta_{red}$ ) of 0.7 to 1.0, measured in a 1 weight percent solution in a mixture of 60 parts by weight phenol and 40 parts by weight of 1,1,2,2-tetrachloroethane at 25° C. and a melting maximum, determined by a differential of thermoanalysis, of 170° to 190° C., said coating powder having a grain size of 60–300 microns and being in admixture with a leveling agent and a pigment, said partially crystalline polyester being derived from at least 60 mol percent terephthalic acid or its ester, in respect of its acid component, and at least 50 mol percent, in respect of its alcohol content, of 1,4-butanediol.

4,012,364

#### VINYL COPOLYMERS CROSS-LINKED WITH ALLYL DIGLYCOL CARBONATE

Elliott Farber, St. Louis Park, Minn., assignor to La Maur Inc., Minneapolis, Minn.

Filed May 19, 1975, Ser. No. 578,537

Int. Cl.<sup>2</sup> C08F 218/08, 218/14, 226/08

U.S. Cl. 260—77.5 D

16 Claims

1. Film-forming polymeric material comprising the addition free-radical polymerization product formed by polymerizing a monomeric mixture consisting essentially of, by weight percent: 1 to 20% of 1,1 dimethyl-1-(2-hydroxypropyl) amine methacrylimide; 8 to 45% of N-vinyl pyrrolidone; and 35 to 89% of vinyl acetate.

4,012,365

#### FIBER-FORMING POLYAMIDES FROM NAPHTHALENE-2,7-DICARBOXYLIC ACID AND ALIPHATIC DIAMINE

Keiichi Moriyama; Shoji Kawase, and Takeo Shima, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan  
Filed Oct. 15, 1974, Ser. No. 515,048

Claims priority, application Japan, Oct. 19, 1973, 48-116760

Int. Cl.<sup>2</sup> C08G 69/26

U.S. Cl. 260—78 R

11 Claims

1. A fiber-forming polyamide consisting essentially of the polymeric reaction product of:

- I. A first dicarboxylic acid selected from the group consisting of naphthalene-2,7-dicarboxylic acid and the amide-forming derivatives thereof;
- II. a first straight-chain aliphatic diamine containing 4 to 13 carbon atoms; and
- III. a copolymer component consisting essentially of at least one of:

A. a second dicarboxylic acid selected from at least one of the group consisting of aliphatic dicarboxylic acids, cyclo-aliphatic dicarboxylic acids, aromatic dicarboxylic acids other than the first dicarboxylic acid of component I, and the amide-forming derivatives thereof; and

B. a copolymer diamine component containing at least one of:

1. at least one second diamine other than those of the first diamine group of component II, and
2. at least one third aliphatic diamine having a straight-chain and containing 4 to 13 carbon atoms, other than that used as component II, with the provisos that the proportion of the amino group in the total reaction components is equimolar to that of the carboxyl group or the corresponding amide-forming group thereof, and the amounts of components I, II and III satisfy the following molar percentages:

$$\frac{l}{l+x} \times 100 \text{ is from } 50 \text{ to } 100 \text{ mol\%,} \quad (i)$$

$$\frac{m}{m+y+z} \times 100 \text{ is from } 50 \text{ to } 100 \text{ mol\%, and} \quad (ii)$$

$$\frac{x}{l+x} \times 100 + \frac{y}{m+y+z} \times 100 + \frac{z}{m+y+z} \times 100 \quad (iii)$$

is from 15 to 50 mol%,

where

l = amount in mols of component I,  
m = amount in mols of component II,  
x = amount in mols of component III (A),  
y = amount in mols of component III (B)(1), and  
z = amount in mols of component III (B)(2).

4,012,366

#### POLYMERS CONTAINING HYDROXAMIC ACID-O-SULFONYL GROUPS

Herbert Naarmann, Wattenheim, and Heinz Pohlemann, Limburgerhof, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 17, 1975, Ser. No. 632,642

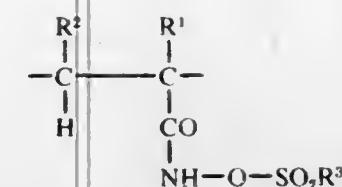
Claims priority, application Germany, Nov. 27, 1974, 2456007

Int. Cl.<sup>2</sup> C08G 75/00

U.S. Cl. 260—79.7

5 Claims

1. A polymer which contains structural units of the general formula



where R<sup>1</sup> is H or CH<sub>3</sub>, R<sup>2</sup> is H, COOR, COOM, CONHR or NH-OSO<sub>2</sub>-R<sup>3</sup>, where M is a metal cation and R is H, alkyl, cycloalkyl or aryl, and R<sup>3</sup> is alkyl, cycloalkyl or aryl.

4,012,367

#### ANTI-ULCER POLYPEPTIDES CONTAINING L-ASPARTIC ACID AND INTERMEDIATES THERETO

Robert H. Mazur, Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Feb. 5, 1976, Ser. No. 655,338

Int. Cl.<sup>2</sup> C07C 103/52; A61K 37/00

U.S. Cl. 260—112.5 R

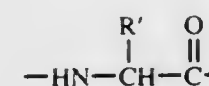
11 Claims

1. A compound of the formula



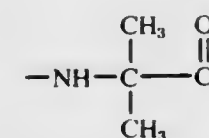
wherein

A is hydrogen, alkanoyl containing 2 to 6 carbon atoms, succinyl, t-butoxycarbonyl, benzyloxycarbonyl, D-pyroglyutamyl or L-pyroglyutamyl;  
Y is a radical of the formula



wherein

R' is an alkyl radical containing 1 to 6 carbon atoms or a methylcyclopentyl radical and the stereochemical configuration is D, or DL, or Y is a radical of the formula



R is hydrogen or an alkyl radical containing 1 to 6 carbon atoms; and pharmaceutically acceptable acid addition salts thereof; and the optically active amino acid Trp, Met and Asp residues are of the L-configuration.

4,012,368

#### SULFUR-CONTAINING CARBOXYLATES AS EP AGENTS

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 592,934, July 3, 1975, Pat. No. 3,970,568,

which is a continuation-in-part of Ser. No. 500,235, Sept. 9, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,070

Int. Cl.<sup>2</sup> C07G 17/00

U.S. Cl. 260—125

8 Claims

1. A composition comprising the reaction product of sulfur, sulfur monochloride or sulfur dichloride and an ester of an olefinic mono- or dicarboxylic acid which does not contain any allylic hydrogen atoms and mixtures of said reaction products.

4,012,369

#### MONOAZO CHROMIFEROUS COMPLEX DYE STUFFS DERIVED FROM NAPHTHYL-AZO-NAPHTHALENE, AND PROCESS FOR THEIR PREPARATION

Claude Marie Henri Emile Brouard, Scotteville les Rouen, and Paulette Gisele Ficht, Mont Saint Aignan, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Feb. 25, 1974, Ser. No. 445,185

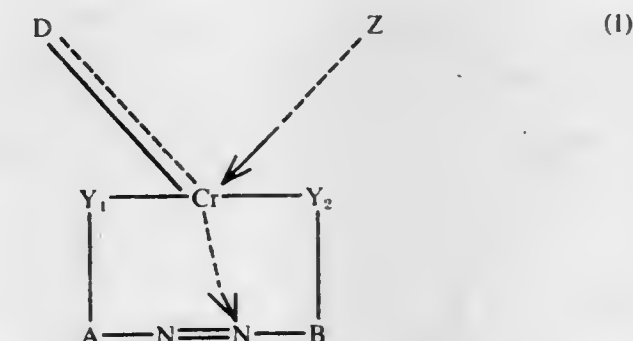
Claims priority, application France, Mar. 2, 1973, 73.07457

Int. Cl.<sup>2</sup> C09B 45/16; D06P 1/10, 3/24

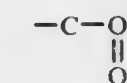
U.S. Cl. 260—146 R

7 Claims

1. Monoazo chromiferous dyestuff of the formula:



in which A and B each represent naphthyl, one of A and B carrying a sulphonic acid group, Y<sub>1</sub> represents —O— or



Y<sub>2</sub> represents —O— or



and Y<sub>1</sub> and Y<sub>2</sub> are each in a vicinal position with respect to the azo group, D is a β-diketonyl bidentate chelating agent and Z represents water, ammonia or pyridine.

4,012,370

#### MONO ARYL AZO-MONO-IMINOISINDOLINONE DYE STUFFS

Ernst Model, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,242

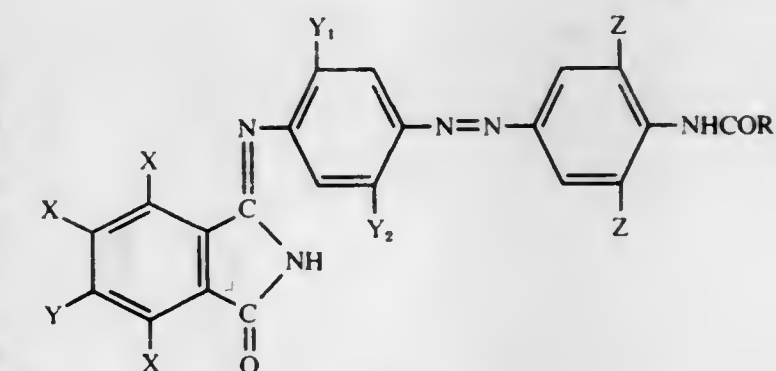
Claims priority, application Switzerland, Jan. 9, 1973, 223/73

Int. Cl.<sup>2</sup> C09B 43/00

U.S. Cl. 260—152

2 Claims

1. An iminoisindolinone dyestuff of the formula



wherein X is chloro or bromo, Y is chloro, bromo or methoxy, Y<sub>1</sub> is hydrogen, chloro, alkyl containing 1–4 carbon atoms or alkoxy containing 1–4 carbon atoms, Y<sub>2</sub> is alkyl containing



1-4 carbon atoms, alkoxy containing 1-4 carbon atoms, alkanoylamino containing 1-4 carbon atoms, benzoylamino, benzoylamino substituted by chloro, alkyl containing 1-4 carbon atoms, or alkoxy containing 1-4 carbon atoms, Z is chloro or methyl, and R is alkyl containing 1-4 carbon atoms, phenyl, or phenyl substituted by chloro, alkyl containing 1-4 carbon atoms, or alkoxy containing 1-4 carbon atoms, or alkoxycontaining 1-4 carbon atoms.

4,012,371

**BENZINALDAZOLYL-, QUINOLONYL-, OR PHENMORPHOLONYLAZO-3-CYANO-4-METHYL-1,2-[1',2']-BENZ-[4',5']-IMIDAZOLO-6-HYDROXYPYRIDINE COLORANTS**

Armand Rouéche, Bottmingen, and Francois L'Eplattenier, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,744

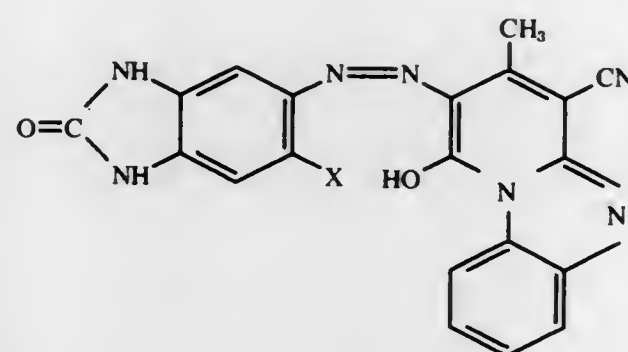
Claims priority, application Switzerland, Mar. 12, 1974, 3417/74

Int. Cl.<sup>2</sup> C09B 29/36; D06P 1/08

U.S. Cl. 260-155

1. Azo colorant of the formula

4 Claims



wherein X denotes H methyl or methoxy chloro.

4,012,372

**PHthalimidyl-AZO-TETRAHYDRO-QUINOLINE COMPOUNDS**

Max Allen Weaver, and Jean Carroll Fleischer, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 376,047, July 2, 1973, abandoned.

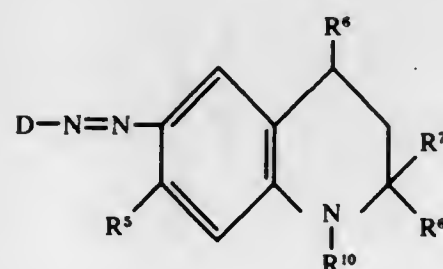
This application Apr. 2, 1975, Ser. No. 564,527

Int. Cl.<sup>2</sup> C09B 29/36

U.S. Cl. 260-155

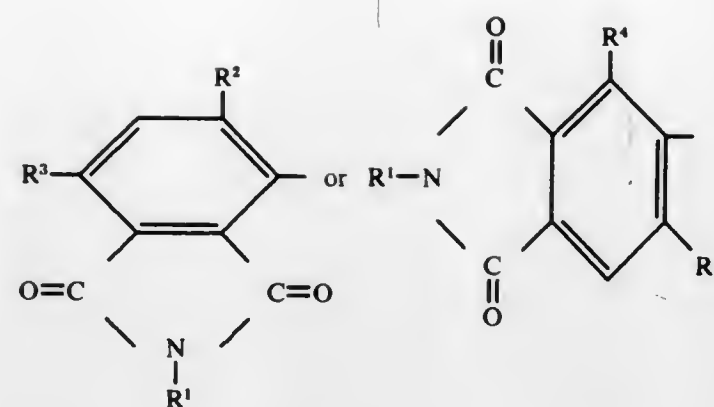
1. A disperse dye azo compound having the formula

8 Claims



wherein group

D is a phthalimidyl group having the formula



wherein R<sup>1</sup> is hydrogen, alkyl of 1-4 carbons, arylmethyl, cyclohexylmethyl, 2-cyanoethyl, 2-carbamoyl, aryl, cyclohexyl, or the group -Z-R<sup>17</sup> in which Z is ethylene, propylene, or trimethylene and R<sup>17</sup> is succinimido, glutarimido, phthalimido, hydroxy, alkanoyloxy of 1-4 carbons, 2-pyrrolidinone, or alkoxy of 1-4 carbons;

R<sup>2</sup> is hydrogen, alkyl of 1-4 carbons, chlorine, bromine, cyano, nitro, alkylsulfonyl of 1-4 carbons, arylsulfonyl, arylthio, arylalkylthio where the alkyl is of 1-4 carbons, cyclohexylthio, alkoxy of 1-4 carbons, aryloxy, 2-benzothiazolylthio, 2-thiazolylthio, 2-thiadiazolylthio, 2-oxadiazolylthio, 1,2,4-triazol-3-ylthio, or 2-pyrimidinylthio;

R<sup>3</sup> is hydrogen, chlorine, bromine or nitro;

R<sup>4</sup> is hydrogen, alkyl of 1-4 carbons, chlorine, bromine, cyano, nitro, alkylsulfonyl of 1-4 carbons, arylsulfonyl, arylthio, arylalkylthio where the alkyl is of 1-4 carbons, cyclohexylthio, alkoxy of 1-4 carbons, aryloxy, 2-benzothiazolylthio, 2-thiazolylthio, 2-thiadiazolylthio, 2-oxadiazolylthio, 1,2,4-triazol-3-ylthio, or 2-pyrimidinylthio;

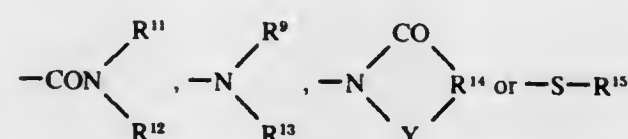
R<sup>5</sup> is hydrogen, methyl, chlorine, acetamido, benzamido, -NHCOCH<sub>2</sub>Cl, -NHCOCH<sub>2</sub>OH, -NHCOCH<sub>2</sub>OC<sub>2</sub>H<sub>5</sub>, -NHCOCH<sub>2</sub>OOCCH<sub>3</sub>;

R<sup>6</sup> is alkyl of 1-4 carbons or, when R<sup>7</sup> and R<sup>8</sup> each is methyl, R<sup>6</sup> is methyl;

R<sup>7</sup> and R<sup>8</sup> each is hydrogen or methyl;

R<sup>9</sup> is formyl, alkanoyl of 1-6 carbons, alkanoyl of 1-6 carbons substituted with chlorine, bromine, phenyl or phenyl substituted with alkyl of 1-4 carbons, chlorine, bromine, or alkoxy of 1-4 carbons, cyano, alkoxy of 1-6 carbons, phenoxy, benzyloxy, alkythio of 1-6 carbons, alkylsulfonyl of 1-6 carbons, or alkanoyloxy of 1-6 carbons;

R<sup>10</sup> is alkyl containing one to eight carbon atoms; cyclohexyl; cyclohexyl substituted with alkyl of 1-4 carbon atoms; or alkyl of 1-4 carbons substituted with hydroxy, lower alkoxy, aryl, aryloxy, cyclohexyl, cyano, alkanoyloxy of 1-4 carbons, alkoxy carbonyl of 1-4 carbons, alkoxy carbonyloxy of 1-4 carbons, aryloxy, alkyl-carbamoyloxy of 1-4 carbons, arylcarbamoyloxy, or a group having the formula



wherein

R<sup>11</sup> individually is hydrogen, alkyl of 1-4 carbons, phenyl or phenyl substituted with alkyl of 1-4 carbons, chlorine, bromine or alkoxy of 1-4 carbons,

R<sup>12</sup> individually is hydrogen or alkyl of 1-4 carbons, R<sup>11</sup> and R<sup>12</sup> collectively are -(CH<sub>2</sub>)<sub>3</sub>- or -CH<sub>2</sub>C(H<sub>2</sub>)OCH<sub>2</sub>CH<sub>2</sub>-,

R<sup>13</sup> is hydrogen, alkyl of 1-4 carbons, phenyl or phenyl substituted with alkyl of 1-4 carbons, chlorine, bromine or alkoxy of 1-4 carbons, or cyclohexyl,

R<sup>14</sup> is ethylene, propylene, trimethylene, o-cyclohexylene, or o-arylene, or when Y is -CO-, R<sup>14</sup> also can be -NHCH<sub>2</sub>-, -N(alkyl of 1-4 carbons)CH<sub>2</sub>-, -SC(H<sub>2</sub>)-, or -CH<sub>2</sub>OCH<sub>2</sub>-,

Y is -CH-, -CO-, or -SO-, and

R<sup>15</sup> is phenyl or phenyl substituted with alkyl of 1-4 carbons, chlorine, bromine, or alkoxy of 1-4 carbons, benzyl, cyclohexyl, 1,2,4-triazol-3-yl, or 2-benzothiazolyl, in which each aryl moiety of R<sup>1</sup>, R<sup>2</sup>, R<sup>4</sup>, R<sup>10</sup> and R<sup>14</sup>, is phenyl or phenyl mono- or disubstituted with alkyl of 1-4 carbons, alkoxy of 1-4 carbons, chlorine or bromine.

4,012,373

**PYRAZOLO[3',4'-2,3]PYRIDO[4,5-e]b-BENZO-1,5-DIAZEPINONES**

Theodor Denzel, Nurnberg; Hans Hoehn, Tegernheim, and Ernst Schulze, Regensburg, all of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

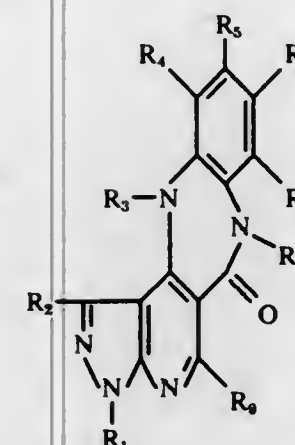
Filed Sept. 22, 1972, Ser. No. 291,503

Int. Cl.<sup>2</sup> C07D 471/14

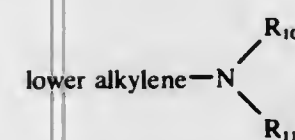
U.S. Cl. 260-239.3 P

1. A compound of the formula

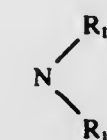
15 Claims



wherein R<sub>1</sub> is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl or C<sub>3</sub> to C<sub>6</sub> cyclo-lower alkyl; R<sub>2</sub> is hydrogen, lower alkyl or phenyl; R<sub>3</sub> and R<sub>8</sub> each is hydrogen, alkyl up to 10 carbon atoms, phenyl-lower alkyl, C<sub>3</sub> to C<sub>6</sub> cyclo-lower alkyl or



wherein R<sub>10</sub> and R<sub>11</sub> each is hydrogen, lower alkyl or hydroxy-lower alkyl or the



radical forms the heterocyclic pyrrolidino, piperidino, morpholino, thiamorpholino, (lower alkoxy)piperidino, (lower alkyl)piperidino, (lower alkyl)pyrrolidino, (lower alkoxy)pyrrolidino, (lower alkyl)morpholino, (lower alkoxy)morpholino, (lower alkyl)thiamorpholino or (lower alkoxy)thiamorpholino R<sub>4</sub>, R<sub>5</sub>, R<sub>6</sub> and R<sub>7</sub> each is hydrogen, halogen, lower alkyl or lower alkoxy; and R<sub>9</sub> is hydrogen, lower alkyl or phenyl; and physiologically acceptable acid addition salts and quaternary lower alkyl halide, lower alkyl sulfate, phenyl-lower alkyl halide, phenyl-lower alkyl sulfate, lower alkyl sulfonate and phenylsulfonate salts thereof.

4,012,374

**1-[[4-PHENYL-PIPERIDINYL (OR TETRAHYDROPYRIDINYL)]ALKYL]-2,6-PIPERIDINED-IONE AND ANALOGS**

Peter C. Wade, Pennington, N.J., and B. Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

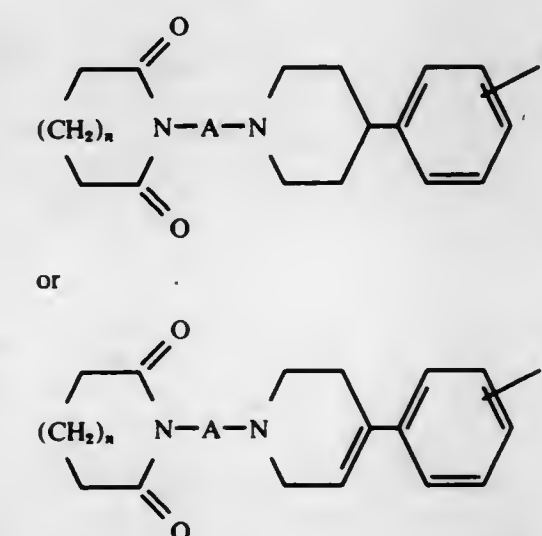
Filed Sept. 29, 1975, Ser. No. 617,473

Int. Cl.<sup>2</sup> C07D 401/06

U.S. Cl. 260-239.3 R

6 Claims

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein n is 0, 1, or 2; A is an alkylene group having 1 to 8 carbon atoms; and R<sub>1</sub> is hydrogen, halogen, alkyl, alkoxy, alkylthio, trifluoromethyl, nitro, amino or cyano; wherein the alkyl, alkoxy, and alkylthio groups have 1 to 4 carbon atoms.

4,012,375

**SILACYCLOPENTENYL-BIS-EPSILON-CAPROLACTAM**

James R. Hahn, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 29, 1975, Ser. No. 644,379

Int. Cl.<sup>2</sup> C07D 223/12

U.S. Cl. 260-239.3 R

1 Claim

1. Silacyclopentenyl-bis-epsilon-caprolactam.

4,012,376

**PHOTOSENSITIVE COLORANT MATERIALS**

Hal E. Wright, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

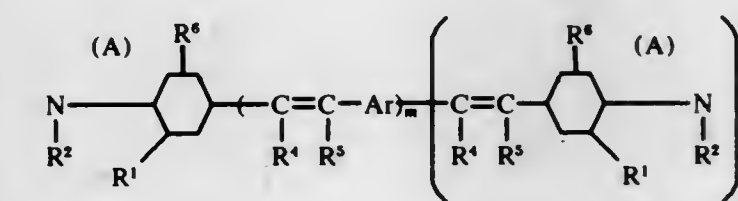
Filed Dec. 29, 1975, Ser. No. 645,067

Int. Cl.<sup>2</sup> C07D 401/10

U.S. Cl. 260-240 TC

4 Claims

1. An electrically photosensitive colorant having the formula:



wherein

n represents 0 or 1; m represents the integer 1 or 2;

Ar represents a substituted or unsubstituted aromatic ring group, free from any saturated N-heterocyclic ring group fused thereto, having 6 to 20 ring atoms in the aromatic ring;

A represents a substituted or unsubstituted alkylene group having 2 to 5 carbon atoms in the alkylene chain;



each of R<sup>1</sup> and R<sup>2</sup>, when taken together, represents a substituted or unsubstituted alkylene group having 2 to 5 carbon atoms in the alkylene chain;  
each of R<sup>1</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>6</sup>, when taken alone, represents hydrogen, nitro, cyano, halogen, alkoxy having 1 to 8 carbon atoms, substituted or unsubstituted alkyl having 1 to 8 carbon atoms in the alkyl group, substituted or unsubstituted phenyl, carboxy ester having 1 to 4 carbon atoms, or an amide having the formula:



wherein

R<sup>7</sup> represents hydrogen or substituted or unsubstituted phenyl or substituted or unsubstituted alkyl having 1 to 8 carbon atoms in the alkyl group; and  
R<sup>2</sup>, when taken alone, represents hydrogen, substituted or unsubstituted alkyl having 1 to 8 carbon atoms in the alkyl group, or substituted or unsubstituted aromatic ring group having 6 to 20 carbon ring atoms.

4,012,377

## OXADIAZOLE AND OXADIAZOLINE DERIVATIVES

John Anthony Claisse, North Harrow; Gordon Ian Gregory, Chalfont St. Peter, and William Kingston Warburton, Pinner, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation-in-part of Ser. No. 473,064, May 24, 1974, abandoned, which is a continuation of Ser. No. 219,873, Jan. 21, 1972, abandoned, which is a continuation-in-part of Ser.

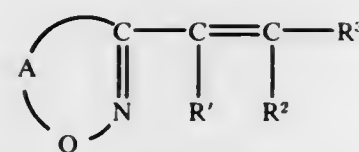
No. 59,029, July 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 715,947, March 26, 1968, abandoned. This application Mar. 7, 1975, Ser. No. 556,324

Int. Cl.<sup>2</sup> C07D 271/06

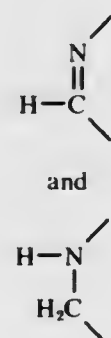
U.S. Cl. 260—240 D

9 Claims

1. A compound of the formula



in which A is selected from the group consisting of residues of formula



R<sup>1</sup> and R<sup>2</sup> are each selected from the group consisting of a hydrogen atom, a halogen atom and a methyl or ethyl group; and R<sup>3</sup> is selected from the group consisting of azidophenyl, C<sub>1-3</sub> alkylthio-phenyl, C<sub>1-3</sub> alkylsulphenyl-phenyl, C<sub>1-3</sub> alkylsulphonylphenyl, thiocynatphenyl and alkylthiothienyl.

4,012,378

## REACTIVE DYESTUFFS

Allen Crabtree, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 472,060, May 21, 1974, Pat. No. 3,951,974, which is a continuation-in-part of Ser. No. 323,359, Jan. 15, 1973, abandoned. This application Nov. 6, 1975, Ser. No. 629,607

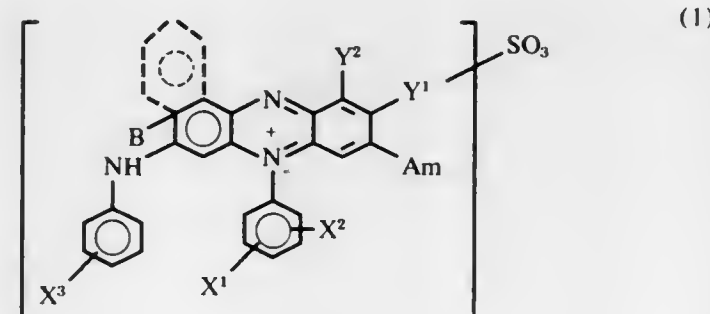
Claims priority, application United Kingdom, Feb. 11, 1972, 6499/72; Aug. 28, 1973, 40522/73; Mar. 20, 1974, 12294/74

Int. Cl.<sup>2</sup> C07D 251/44, 251/50

U.S. Cl. 260—240 B

2 Claims

1. A reactive dyestuff of the formula



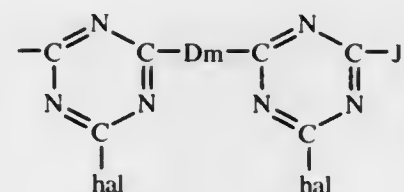
wherein AM is selected from the group consisting of anilino, di(lower alkyl)amino wherein each alkyl moiety has 1-4 carbon atoms, di(hydroxyethyl)amino, di(cyanoethyl) amino and N(alkyl)benzylamino wherein the alkyl moiety has 1-4 carbon atoms,

one of Y<sup>1</sup> and Y<sup>2</sup> is H or SO<sub>3</sub>H and the other is H or an alkyl or alkoxy group of 1-4 carbon atoms,

one of X<sup>1</sup> or X<sup>2</sup> is H or SO<sub>3</sub>H and the other is H, an alkyl or alkoxy group of 1-4 carbon atoms, Cl or CO<sub>2</sub>H,

X<sup>3</sup> is H, an alkyl group of 1-4 carbon atoms or SO<sub>3</sub>H, when the dotted fused ring is present B is absent and when the dotted fused ring is absent B is H or an alkyl or alkoxy group of 1-4 carbon atoms,

one of the phenylene ring substituted by X<sup>3</sup> and the Am group when it is anilino contains a NHQ group wherein Q is a cellulose reactive group of the triazine series having the formula:



wherein hal is chlorine or bromine and

J<sup>1</sup> is chlorine, bromine, amino, NHR<sup>5</sup>, NR<sup>5</sup>R<sup>6</sup> or OR<sup>5</sup>

wherein R<sup>5</sup> and R<sup>6</sup> are selected from alkyl having 1-4 carbon atoms; hydroxyalkyl having 1-4 carbon atoms; and sulfoalkyl having 1-4 carbon atoms; N-w-sulphomethylanilino, anilino or phenoxy, each having 0-2 substituents selected from SO<sub>3</sub>H, CH<sub>3</sub>, COOH, SO<sub>2</sub>CH<sub>2</sub>C-H<sub>2</sub>OSO<sub>3</sub>H, OCH<sub>3</sub> and Cl; naphthylamino substituted by 1-3 SO<sub>3</sub>H groups, or an aminophenazine group defined above by formula (1) with an NH group in place of NHQ and

Dm is the N,N'-di-radical of the mono- or di-sulphonic acid of diaminostilbene, and the dyestuff as a whole contains at least 2 SO<sub>3</sub>H groups.

4,012,379

## 7-ACETOACETAMIDOCEPHEM COMPOUNDS

Mitsuo Numata, Takatsuki; Masayoshi Yamaoka, Osaka; Yoshio Imashiro, Nishinomiya, and Isao Minamida, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Oct. 15, 1974, Ser. No. 514,991

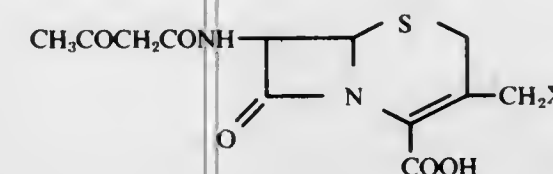
Claims priority, application Japan, Oct. 15, 1973, 48-115449

Int. Cl.<sup>2</sup> C07D 501/36

U.S. Cl. 260—243 C

18 Claims

1. A compound of the formula:



wherein X is a —SR group, R being a substituted or unsubstituted five-or-six-membered heterocyclic ring which contains at least one nitrogen atom that may be in the oxide form and which may contain in addition to said at least one nitrogen atom, one oxygen or sulfur atom, and the substituted ring being substituted by one or more substituents selected from the group consisting of alkyl, alkoxy, halogen, carboxyalkyl, carbamoylalkyl, alkoxyalkyl, N-alkylcarbamoylalkyl, alkylthioalkyl, N-alkylaminoalkyl, morpholinoalkyl, amino, sulfoalkylamino, acetylaminomethyl, propionylamino, N-alkylaminomethylcarbamoyl, mercapto, alkylthio, hydroxyalkylthio, alkylcarboxyalkylthio, carboxyalkylthio, alkoxyalkylthio, N-alkylaminocarbonylalkylthio, morpholinocarbonylalkylthio, N-alkylaminoalkylthio, sulfoalkylthio, alkoxyalkylthio and morpholino, wherein said alkyl and alkoxy groups are lower alkyl and lower alkoxy groups respectively, or a pharmaceutically acceptable salt or ester thereof.

4,012,380

## 7-ACYLAMINO-3-ACYL-2(OR 3)CEPHEMS

Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

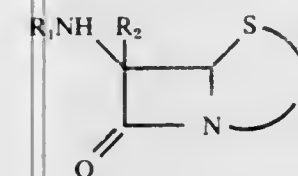
Filed Dec. 10, 1974, Ser. No. 531,264

Int. Cl.<sup>2</sup> C07D 501/24, 501/60

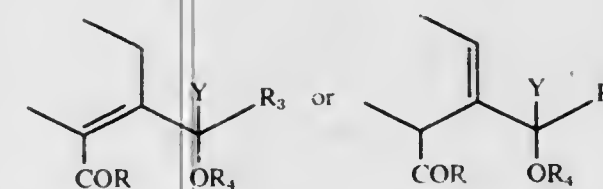
U.S. Cl. 260—243 C

15 Claims

1. The compound of the formula



wherein Z is a group of the formula

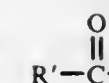


wherein R is a group of the formula —OR<sub>5</sub> wherein R<sub>5</sub> is hydrogen or a carboxylic acid protecting ester forming group;

R<sub>4</sub> taken together with Y forms a carbon-oxygen double bond; and

R<sub>3</sub> is C<sub>1-6</sub> alkyl, vinyl, allyl, ethynyl, benzyl, or phenyl; and

R<sub>1</sub> is an acyl group of the formula



wherein R' is

(a) C<sub>1-6</sub> alkyl, C<sub>3-7</sub> alkenyl, cyanomethyl, halo-methyl, 4-amino-4-carboxybutyl, 4-protected amino-4-protected carboxybutyl; or

(b) benzyloxy, 4-nitrobenzyloxy or 4-methoxybenzyloxy; or

(c) the group —R'' wherein R'' is 1,4-cyclohexadienyl, phenyl or substituted phenyl wherein the substituents are 1-3 halogens, hydroxy, nitro, cyano, trifluoromethyl, C<sub>1-4</sub> alkyl, C<sub>1-4</sub> alkoxy, carboxy, carboxymethyl, hydroxymethyl, aminomethyl or protected aminomethyl; or

(d) an arylalkyl group of the formula

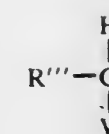


wherein R'' is as defined above,

Y is O or S, and

m is 0 or 1; or

(e) a substituted arylalkyl group of the formula



wherein R''' is R'' as defined above, 2-thienyl or 3-thienyl, W is hydroxy or protected hydroxy, carboxy or protected carboxy, amino or protected amino; or

(f) a heteroarylmethyl group of the formula



wherein R'''' is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl or 1-tetrazolyl; and

R<sub>2</sub> is hydrogen or methoxy; and when R<sub>5</sub> is hydrogen, the pharmaceutically acceptable non-toxic salts of the acids represented thereby.

4,012,381

## PROCESS FOR PREPARING CEPHALOSPORINS AND INTERMEDIATES

Maurizio Foglio; Giovanni Franceschi; Paolo Masi, and Antonino Suarato, all of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

Filed June 12, 1975, Ser. No. 586,376

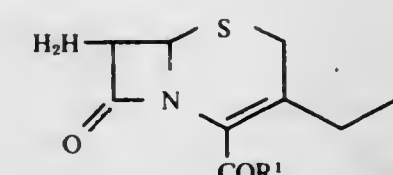
Claims priority, application Italy, June 12, 1974, 23887/74

Int. Cl.<sup>2</sup> C07D 501/18, 501/20

U.S. Cl. 260—243 C

2 Claims

1. A process for preparing derivatives of 7-amino-cephalosporanic acid and 7-aminodesacetoxycephalosporanic acid of structure

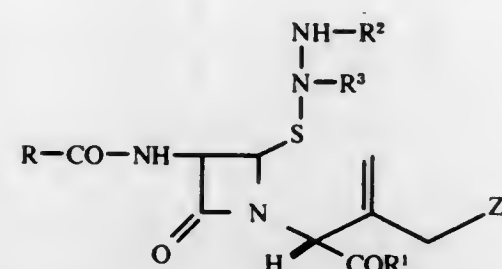


wherein R<sup>1</sup> is selected from the class consisting of hydroxyl, alkoxy having from 1 to 4 carbon atoms, trichloroethoxy, benzyloxy, p-methoxybenzyloxy, p-nitrobenzyloxy, benzhydryloxy, triphenylmethoxy, phenacyloxy, and p-halo-phenacyloxy;

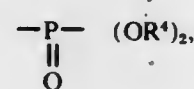
Z is selected from the class consisting of hydrogen —O—alkyl, —O—CO—alkyl, —Br, —I, —N<sub>3</sub>, —NH<sub>2</sub>, —O—



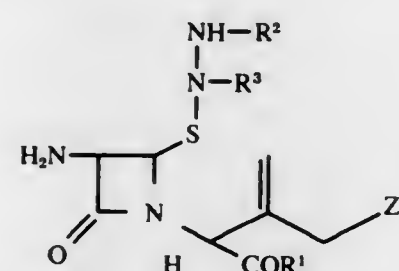
CO—CH<sub>3</sub>, O—CO—NH<sub>2</sub> and 2-mercapto-5-methyl-1,3,4-thiadiazole;  
starting from a 3-acylamino-2β-thiohydrazo-azetidinone of structure:



wherein R is selected from the class consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, cyano-methyl, thienylmethyl, naphthyl-methyl, phenyl-methyl, phenoxy-methyl, phenylisopropyl, phenoxy-isopropyl, pyridyl-4-thiomethyl, and tetrazolyl-1-methyl;  
R<sup>2</sup> and R<sup>3</sup> are the same or different and represent -CN, or the radical -COR<sup>4</sup>, -COOR<sup>4</sup>,



-CONHR<sup>4</sup>, where R<sub>4</sub> is a lower alkyl having from 1 to 4 carbon atoms or a benzyl group;  
wherein the compound (II') is reacted with phosphorus pentachloride or phosphorus oxychloride in the presence of pyridine, the corresponding imino chloride is reacted with a lower aliphatic alcohol having from 1 to 4 carbon atoms, the imino-ether so formed is hydrolyzed with water in an acid medium, and the resultant 3-amino-2β-thiohydrazoazetidinone of structure:



in which R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and Z have the meanings given heretofore,  
is reacted in a suitable solvent at a temperature between -100° and +120° C with an aluminum oxide or silicon oxide or with sodium, potassium or ammonium hydroxide, or a sodium, potassium or lithium alcoholate to finally give the desired compound (V) which is isolated and purified in known manner.

4,012,382

α-AMINO AND α-FORMYL-α-(p-ACYLOXYPHENYL) ACETAMIDOCEPHALOSPORANIC ACID DERIVATIVES  
Daniel Bouzard, 2, Rue de Centre, 95130 Franconville, France, and Abraham Weber, 55, Blvd. Sault, 75012 Paris, France  
Filed May 27, 1975, Ser. No. 581,054  
Claims priority, application United Kingdom, June 5, 1974, 24848/74

Int. Cl.<sup>2</sup> C07D 501/36

U.S. Cl. 260—243 C

1 Claim

1. The compound which is 7-D-α-amino-α-(p-acetoxyphenylacetamido)-3-[(1,2,3-triazol-5-yl)-thiomethyl]-3-cephem-4-carboxylic acid when substantially free of the L isomer.

4,012,383  
Δ<sup>2,3</sup>-1,4-MORPHOLINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF USEFUL IN PREPARATION OF ANTIBACTERIA AGENTS

Bernard R. Belleau, Westmount; Terrence W. Doyle, Candiac; Bing Yu Luh, and Terry T. Conway, both of Brossard, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

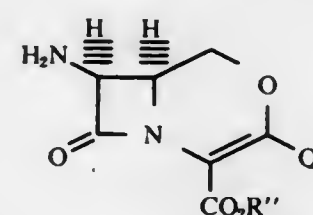
Filed Jan. 2, 1975, Ser. No. 538,271

Int. Cl.<sup>2</sup> C07D 265/00, 273/00, 295/00

U.S. Cl. 260—244 R

1. A compound of the formula

9 Claims



VIII

wherein Q is methyl and R'' is hydrogen or an easily cleavable ester carboxyl-protecting group, or carboxylic acid or acid addition salts thereof.

4,012,384

7-(N-METHYL-N-ALKYLAMINO)-1,3,5-TRIAZAADA-MANTANES

Arnold T. Nielsen, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

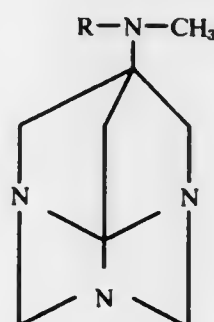
Filed July 28, 1975, Ser. No. 599,901

Int. Cl.<sup>2</sup> C07D 251/72

U.S. Cl. 260—248 NS

1. A compound represented by the formula:

2 Claims



wherein R is an alkyl selected from the group consisting of C<sub>2</sub>H<sub>5</sub>, C<sub>3</sub>H<sub>7</sub>, C<sub>4</sub>H<sub>9</sub>, C<sub>5</sub>H<sub>11</sub>, C<sub>6</sub>H<sub>13</sub>, and C<sub>7</sub>H<sub>15</sub>.

4,012,385

ANTIBACTERIAL QUINOXALINE 1,4-DIOXIDES  
John P. Dirlam, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

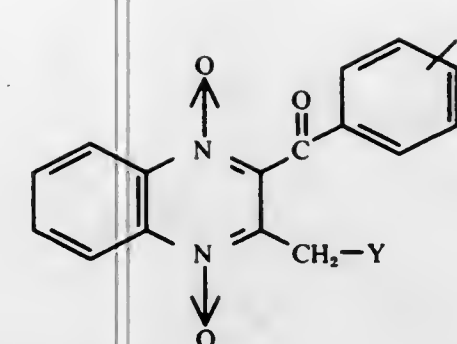
Filed Aug. 6, 1975, Ser. No. 602,480

Int. Cl.<sup>2</sup> C07D 241/52

U.S. Cl. 260—250 QN

1. A compound of the formula

9 Claims



wherein X is selected from the group consisting of hydrogen, hydroxy, nitro, fluoro, chloro, bromo, alkyl having from one to five carbon atoms and alkoxy having from one to five carbon atoms;

and Y is selected from the group consisting of hydroxy, formyloxy, alkanoyloxy having from two to six carbon atoms, alkanoylthio having from two to six carbon atoms, alkylthio having from one to five carbon atoms, alkylsulfinyl having from one to five carbon atoms and alkylsulfonyl having from one to five carbon atoms.

4,012,386

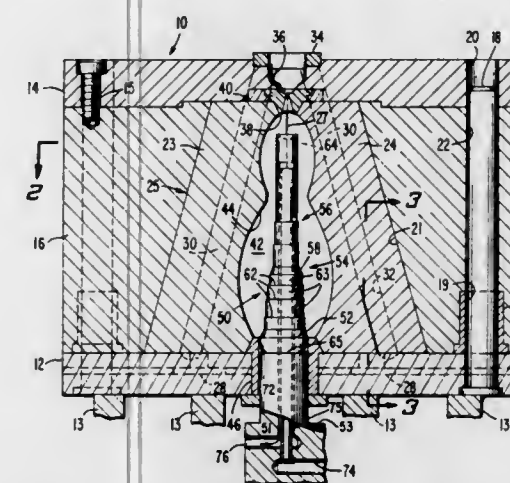
PROCESS FOR MAKING PLASTIC BOWLING PINS  
Charles C. Davis, Princeton, N.J., assignor to Stokes-Trenton, Inc., Trenton, N.J.

Continuation-in-part of Ser. No. 405,582, Oct. 11, 1973, abandoned. This application Sept. 24, 1975, Ser. No. 616,473

Int. Cl.<sup>2</sup> B29C 1/06; B29F 1/022

U.S. Cl. 264—250

5 Claims



1. A method of making a high impact plastic bowling pin as a two-part product having as one of its parts a hollow body formed open at one end and shaped wholly by a molding operation from a thermoplastic material in the polyolefin group that includes high density polyethylene, and having as its second part a base plug sealably closing said end of the body, that comprises the steps of injecting said material in a molten liquid state into a molding cavity the wall of which has a configuration corresponding closely to the external contouring and dimensions of the body of the finished pin; deflecting the injected material within the cavity transversely of the cavity in paths extending radially outwardly from the axis thereof, over the full circumference of the cavity; thereafter subjecting the injected material while it is still in a molten state to a compressive action until it becomes an integral, homogeneous, thick-walled mass of uniform high density over its entire area; cooling the molded body with the cavity to an extent effective to relieve the compressive force; separating the molding cavity from the body; and finally; applying said base plug in position sealably closing the open end of the body to provide the finished two part product, the side wall of the bowling pin varying in thickness and in external diameter, the step of compressing said material including varying the com-

pressive forces exerted against the injected material by applying, in every area of the molding cavity taken longitudinally thereof, a compressive force that is selected in relation to the wall thickness and diameter of the bowling pin body occurring in that area.

4,012,387

BENZO-[g]PYRIDO[2,1-b]QUINAZOLINONES  
Charles F. Schwender, Lebanon, and Brooks R. Sunday, Hackensack, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sept. 18, 1975, Ser. No. 614,399

Int. Cl.<sup>2</sup> C07D 471/04

U.S. Cl. 260—251 A

2 Claims

1. 6-oxo-6H-benzo[g]pyrido[2,1-b]quinazoline-3-carboxylic acid.  
2. 6-oxo-6H-benzo[g]pyrido[2,1-b]quinazoline-1-carboxylic acid.

4,012,388

HERBICIDAL 4-PYRIMIDINONES AND PYRIMIDINETHIONES

James Richard Beck, and Robert Peter Gajewski, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

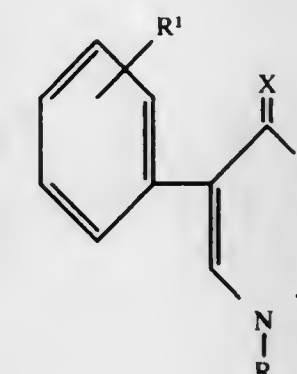
Filed Dec. 11, 1975, Ser. No. 639,526

Int. Cl.<sup>2</sup> C07D 239/22

U.S. Cl. 260—251 R

6 Claims

1. A compound of the formula



wherein

R represents C<sub>1</sub>-C<sub>3</sub> alkyl;R<sup>1</sup> represents bromo, chloro or trifluoromethyl;

X represents oxygen or sulfur.

4,012,389

2- OR 3-PHENYL 1,4-DISUBSTITUTED PHENYL PIPERAZINES

Hugo Zellner, deceased, late of Linz-Ebelsberg, Austria (by Gertrud Zellner, administratrix), assignor to Donau-Pharmazie Gesellschaft m.b.H., Linz, Austria

Division of Ser. No. 333,497, Feb. 20, 1973, Pat. No. 3,935,214, which is a continuation-in-part of Ser. No. 848,395, July 23, 1969, abandoned. This application Oct. 31, 1975, Ser. No. 627,690

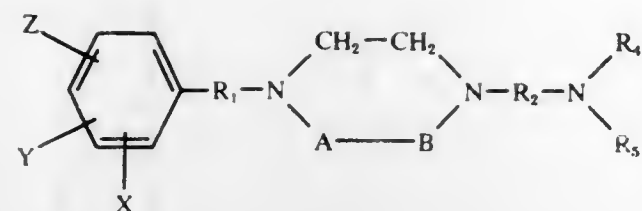
Claims priority, application Austria, July 26, 1968, 7306/68  
Int. Cl.<sup>2</sup> C07D 241/00, 401/06

U.S. Cl. 260—268 R

14 Claims

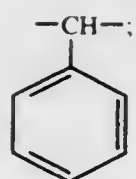
1. A 1,4-disubstituted phenyl piperazine compound of the formula





in which

X, Y, and Z are members selected from the group consisting of hydrogen, halogen, trifluoro lower alkyl, hydroxyl, lower alkoxy, and phenyl substituted lower alkoxy;  
 $R_1$  is lower alkyl with 1 to 3 carbon atoms;  
 $R_2$  is lower alkyl;  
 $R_4$  and  $R_5$  are members selected from the group consisting of lower alkyl and together with the nitrogen to which they are attached, form piperidino or pyrrolidino and one of the groups A and B is the methylene group of the formula  $-\text{CH}_2-$ , while the other one of the groups A and B is the phenyl substituted methylene group of the formula



or their pharmaceutically acceptable acid addition salts.

4,012,390

## VINBLASTINOIC ACID

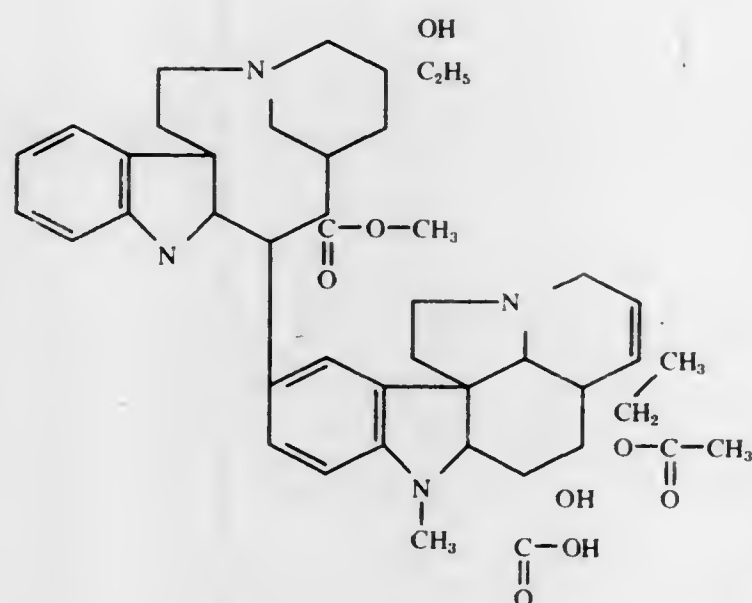
George J. Cullinan, Trafalgar, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 16, 1974, Ser. No. 515,134

Int. Cl.<sup>2</sup> C07D 519/04

U.S. Cl. 260—287 B

1. A compound of the formula



said compound being vinblastinoic acid.

4,012,391  
 11β-ALKYL-2-AZAESTRATRIENES AND INTERMEDIATES

Robert J. Chorvat, Arlington Heights, and Raphael Pappo, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

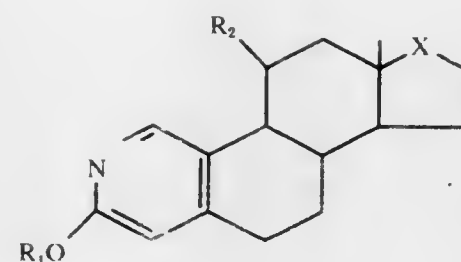
Continuation-in-part of Ser. No. 467,217, May 6, 1974. This application Jan. 22, 1975, Ser. No. 543,027

Int. Cl.<sup>2</sup> C07D 221/16

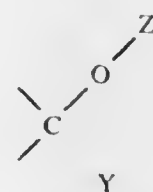
U.S. Cl. 260—289 AZ

1. A compound of the formula

14 Claims

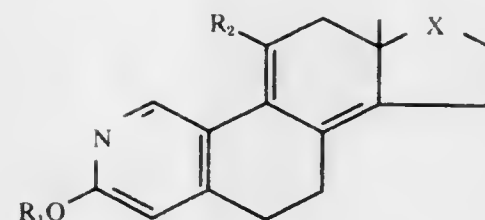


wherein  $R_1$  is a lower alkyl group having 1 to 7 carbon atoms inclusive or a cycloalkyl group having 4-8 carbon atoms inclusive,  $R_2$  is a lower alkyl group having 1 to 4 carbon atoms inclusive, and X is a carbonyl group or a group of the formula



1 Claim wherein Y is hydrogen, a lower alkyl group having 1 to 7 carbon atoms inclusive, a lower 1-alkynyl group having 2 to 7 carbon atoms inclusive or a propadienyl group and Z is hydrogen.

10. A compound of the formula



wherein  $R_1$  is a lower alkyl group having 1-7 carbon atoms inclusive or a cycloalkyl group having 4-8 carbon atoms inclusive,  $R_2$  is a lower alkyl group having 1-4 carbon atoms inclusive, X is a carbonyl or β-hydroxymethylene group and the dotted line represents an optionally doubly-bonded linkage.

4,012,392  
 2-BENZYL-4-PIPERIDONES USEFUL AS INTERMEDIATES IN THE PRODUCTION OF 6,7-BENZOMORPHAN DERIVATIVES

Antony Marie Akkerman, Amsterdam, Netherlands, and Paul Adriaan Jan Janssen, Vosselaar, Belgium, assignors to ACF Chemiefarma N.V., Maarssen, Netherlands

Division of Ser. No. 331,764, Feb. 12, 1973, Pat. No.

3,883,536, which is a division of Ser. No. 41,079, May 27, 1970, Pat. No. 3,764,606. This application Jan. 23, 1975, Ser. No. 543,352

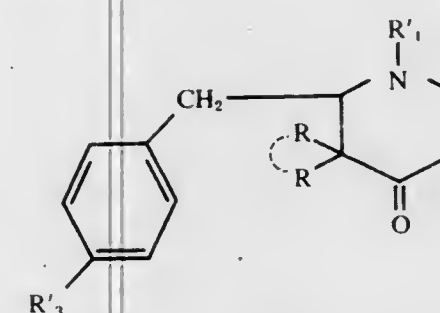
Claims priority, application Netherlands, June 4, 1969, 6908527; June 4, 1969, 6908528; June 4, 1969, 6908529

Int. Cl.<sup>2</sup> C07D 211/44, 221/20

U.S. Cl. 260—293.8

3 Claims

1. A compound selected from the group consisting of substituted 2-benzyl-4-piperidones having the formula



in which the substituents R, when taken separately, are methyl or ethyl, or, when taken together with the carbon atom to which they are bonded, form cyclopentyl or cyclohexyl,  $R'$  is selected from the class consisting of hydrogen atom, methyl and benzyl, and  $R''$  is selected from the class consisting of hydrogen atom, hydroxy and methoxy, and halide salts of said substituted 2-benzyl-4-piperidones.

2. A compound according to claim 1, in which each of said substituents R is a methyl group.

4,012,393

2-[5-(CYCLIC AMINO)ETHYL-10,11-DIHYDRO-5H-DIBENZO[a,d]-CYCLOHEPTEN-5-YL]-5-ALKYL-1,3,4-OXADIAZOLES AND CONGENERS

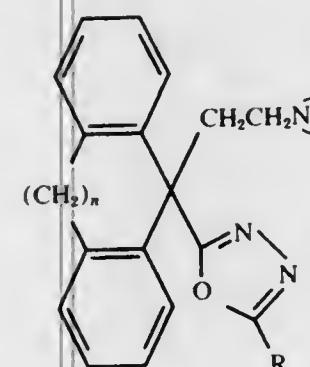
Charles S. Markos, Deerfield, and Chung H. Yen, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Mar. 22, 1976, Ser. No. 668,886

Int. Cl.<sup>2</sup> C07D 413/06

U.S. Cl. 260—293.54

1. A compound of the formula



wherein R is lower alkyl containing 1 to 6 carbon atoms; n is the integer 2 or 3; and -N- is a cyclic secondary amine residue selected from the group consisting of azabicycloalkyl containing 6 to 9 carbon atoms and having at least 5 atoms in each ring, pyrrolidino, piperidino and hexamethyleneimino.

4,012,394  
 INDOLE DERIVATIVES

Marcel Descamps, Crainhem, and Henri Inion, Wemmel, both of Belgium, assignors to Labaz, Paris, France

Division of Ser. No. 438,214, Jan. 31, 1974, Pat. No. 3,946,029. This application Aug. 4, 1975, Ser. No. 601,919

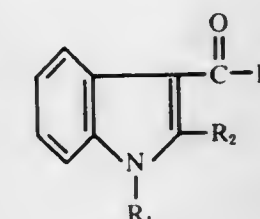
Claims priority, application United Kingdom, Feb. 16, 1973, 07866/73

Int. Cl.<sup>2</sup> C07D 401/06

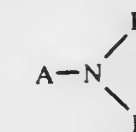
U.S. Cl. 260—293.61

3 Claims

1. An indole derivative represented by the formula:



and pharmaceutically acceptable acid addition salts thereof, wherein  $R_1$  represents



wherein

A represents an alkylene chain of from 2 to 6 carbon atoms and  $R_4$  and  $R_5$ , which may be the same or different, are each an alkyl group having from 1 to 5 carbon atoms, or  $R_4$  and  $R_5$  are joined together to form with the nitrogen atom a piperidino, pyrrolidino or morpholino group.  $R_2$  represents a branched or straight-chain alkyl group having from 1 to 4 carbon atoms, a phenyl group optionally substituted by a fluorine, chlorine, or bromine atom, or a methoxy or cyclohexyl group; and  $R_3$  represents a 2-pyridyl, 3-pyridyl or 4-pyridyl group.

4,012,395

PROCESS FOR PREPARING THIAZOLIDINONE ACETIC ACID DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter, and Karl-Otto Vollmer, Freiburg (Brsg), all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 553,715, Feb. 27, 1975, Pat. No. 3,971,794. This application Sept. 24, 1975, Ser. No. 616,233

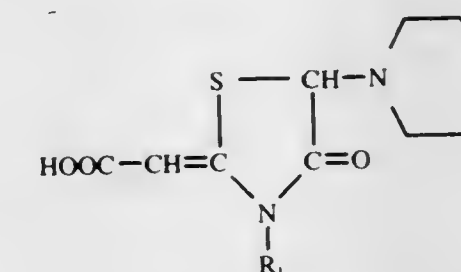
Claims priority, application Germany, Mar. 25, 1974, 2414345

Int. Cl.<sup>2</sup> C07D 295/12

U.S. Cl. 260—293.68

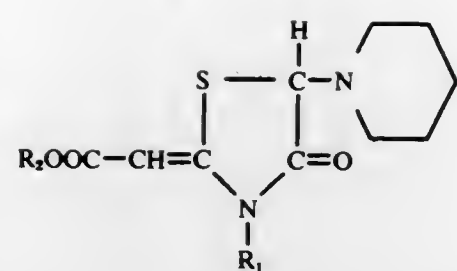
7 Claims

1. A process for the preparation of compounds of the formula:



wherein  $R_1$  is a lower alkyl of 1 to 4 carbon atoms, wherein a compound of the formula:





in which R<sub>1</sub> has the same meaning as above and R<sub>2</sub> is an alkyl radical containing 2 to 6 carbon atoms, is treated at a low temperature with an approximately 40% solution of hydrogen bromide in an organic acid of 1 to 5 carbons, whereafter the acid mixture is removed and the amino acid isolated.

II

4,012,397

## 2-BENZOYL-3-AMINO-PYRIDINES

Walter von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

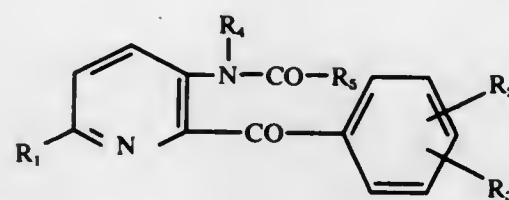
Continuation-in-part of Ser. No. 347,361, April 3, 1973, Pat. No. 3,875,176, Division of Ser. No. 497,750, Aug. 15, 1974, Pat. No. 3,969,361. This application Feb. 26, 1976, Ser. No. 661,817

Claims priority, application Austria, May 10, 1972, 4113/72 Int. Cl.<sup>2</sup> C07D 213/75

U.S. Cl. 260—295.5 A

19 Claims

1. A pyridine compound of the formula



where R<sub>1</sub> is halogen, R<sub>2</sub> is hydrogen, halogen, trifluoromethyl, hydroxy, lower alkyl or lower alkoxy, R<sub>3</sub> is hydrogen, halogen, hydroxy or lower alkyl, R<sub>4</sub> is hydrogen or lower alkyl and R<sub>5</sub> is lower alkyl, halomethyl having 1 to 3 halogen atoms all halogens being the same, lower alkenyl or hydroxymethyl, lower carbalkoxymethyl, alpha aminolower alkyl, alpha aminolower alkyl substituted with (1) carbophenoxy, (2) carbobenzyloxy, (3) lower alkanoyl or (4) lower alkyl or a pharmacologically acceptable salt thereof.

4,012,398

## QUATERNARY HALIDES OF MINK OIL AMIDES

Donald E. Conner, Clifton, and Arnold W. Fogel, Park Ridge, both of N.J., assignors to Van Dyk & Company, Incorporated, Belleville, N.J.

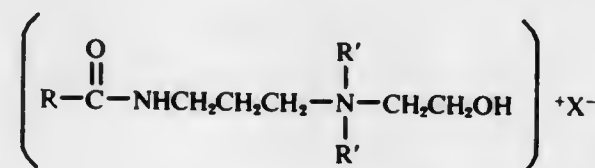
Filed Sept. 16, 1975, Ser. No. 613,965

Int. Cl.<sup>2</sup> C11C 3/00; A61K 7/06, 31/205, 31/16

U.S. Cl. 260—404.5

5 Claims

1. As novel compositions of matter, amido propyl dialkyl amino beta hydroxy ethyl ammonium halides of mink oil having the formula



wherein RCO is the mink oil fatty acid mixture, R' is an alkyl group of 1-2 carbon atoms, and X is a halide selected from the group consisting of chloride and bromide.

4,012,399

## TRANSITION METAL COMPLEXES WITH TRIVALENT PHOSPHORUS COMPOUNDS

Ingenuin Hechenbleikner, Park Ridge, N.J.; Thomas G. Kugele, Cincinnati, and John F. Hussar, Loveland, both of Ohio, assignors to Cincinnati Milacron Chemicals, Inc., Reading, Ohio

Division of Ser. No. 208,927, Dec. 16, 1971, Pat. No. 3,959,200, which is a division of Ser. No. 84,494, Oct. 29, 1970, Pat. No. 3,661,843. This application Nov. 4, 1975, Ser. No. 628,787

Int. Cl.<sup>2</sup> C07F 15/04

U.S. Cl. 260—439 R

26 Claims

1. A compound having one of the formulae

4,012,396  
PROCESSES AND INTERMEDIATES FOR CIS OR TRANS 2-OR 3-(1-ACYL-3-VINYL-4-PIPERIDINE)ACETIC OR PROPIONIC ACID ESTERS

Gunter Grethe, North Caldwell, and Milan Radoje Uskokovic, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

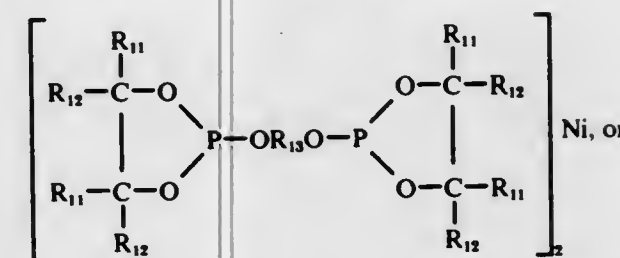
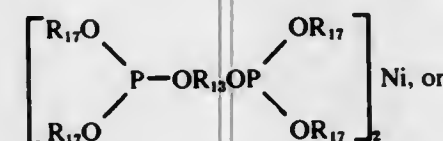
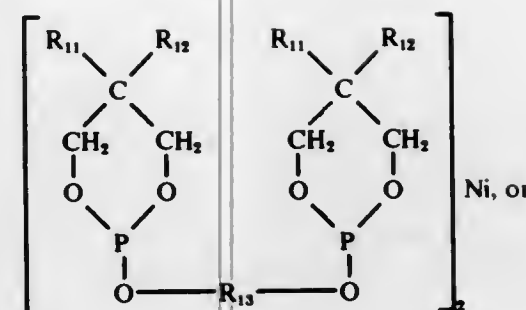
Continuation of Ser. No. 362,604, May 21, 1973, abandoned, which is a division of Ser. No. 100,370, Dec. 21, 1970, abandoned. This application May 23, 1975, Ser. No. 580,494 Int. Cl.<sup>2</sup> C07D 211/34

U.S. Cl. 260—293.77

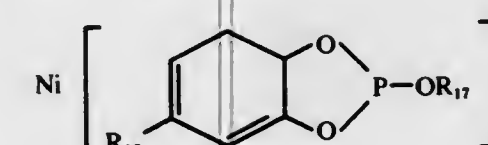
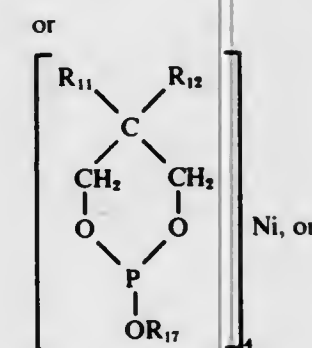
1 Claim

1. A process for the preparation of optically active cis or trans 2-(1-benzoyl-3-vinyl-4-piperidine)acetic acid or lower alkyl ester, antipode or racemate thereof or optically active cis or trans-3-(1-benzoyl-3-vinyl-4-piperidine)propionic acid or lower alkyl ester, antipode or racemate thereof which comprises the steps of:

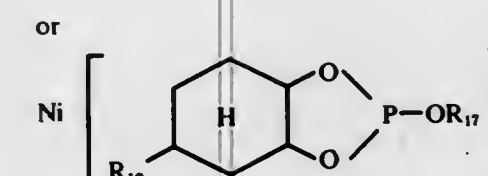
- treating the corresponding optically active cis or trans 2- or 3-(3-ethyl-4-piperidine)acetic or propionic acid lower alkyl ester, antipode or racemate thereof with a chlorinating agent;
- irradiating the product of step (a), i.e., optically active cis or trans 2- or 3-(1-chloro-3-ethyl-4-piperidine)acetic or propionic acid lower alkyl ester, antipode or racemate thereof;
- treating the product of step (b), i.e., optically active cis or trans 2- or 3-[3-(2-chloroethyl)-4-piperidine]acetic or propionic acid lower alkyl ester, antipode or racemate thereof, with benzoyl chloride;
- treating the product of step (c), i.e., optically active cis or trans 2- or 3-[1-benzoyl-3-(2-chloroethyl)-4-piperidine]acetic or propionic acid lower alkyl ester, antipode or racemate thereof, with an alkali metal hydroxide;
- treating the product of step (d), i.e., optically active cis or trans 2- or 3-[1-benzoyl-3-(2-chloroethyl)-4-piperidine]acetic or propionic acid, antipode or racemate thereof, with an alkali metal alkoxide; and
- esterifying the product of step (e), i.e., optically active cis or trans 2- or 3-(1-benzoyl-3-vinyl-4-piperidine)acetic or propionic acid, antipode or racemate thereof, with an alkanol, to yield the desired end product.



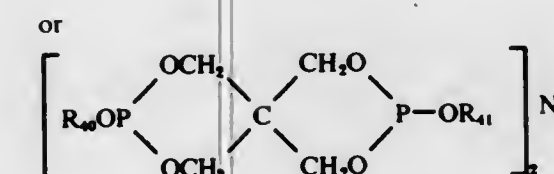
where R<sub>11</sub> and R<sub>12</sub> are hydrogen or lower alkyl, R<sub>13</sub> is lower alkylene of at least 2 carbon atoms or alkyleneoxyalkylene having at least 2 carbon atoms in each alkylene group and R<sub>17</sub> is hydrocarbyl or halo lower alkyl where the halogen has an atomic weight of 35 to 80,



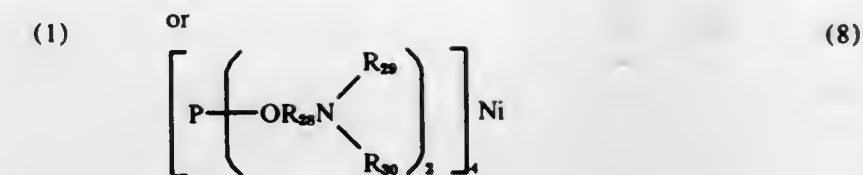
where R<sub>16</sub> is hydrogen or alkyl,



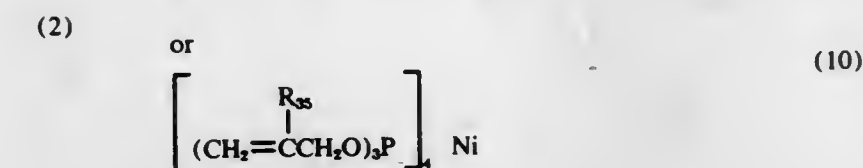
where R<sub>19</sub> is hydrogen or hydrocarbyl,



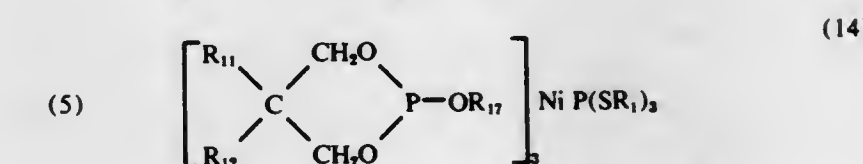
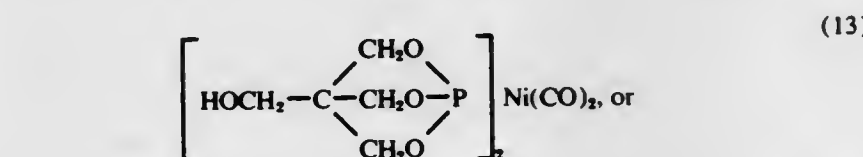
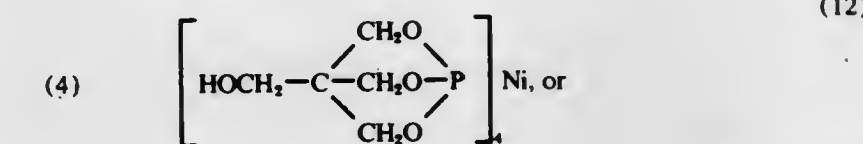
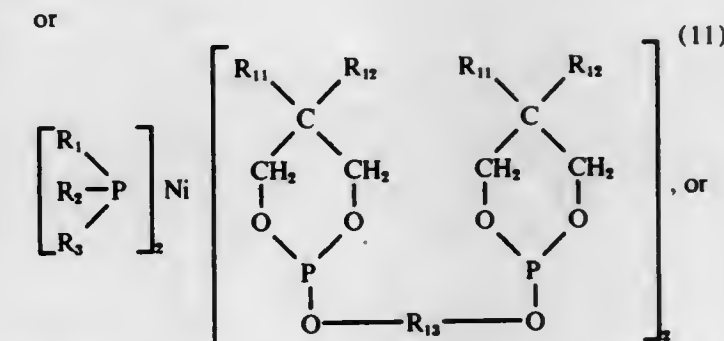
wherein R<sub>40</sub> and R<sub>41</sub> are hydrocarbyl or halo alkyl wherein the halogen has atomic weight of 35 to 80,



where R<sub>28</sub> is lower alkylene and R<sub>29</sub> and R<sub>30</sub> are lower alkyl, or (9) tris (trineopentyl phosphite) nickel monocarbonyl,



where R<sub>35</sub> is hydrogen or methyl,



where R<sub>1</sub> is hydrocarbyl.

4,012,400

## PREPARATION OF SULFONATES FROM SULTONES

John J. van Venrooy, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

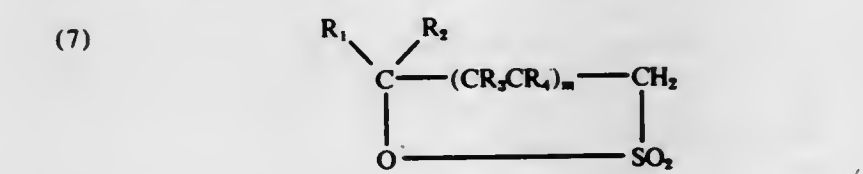
Filed Apr. 22, 1975, Ser. No. 570,931

Int. Cl.<sup>2</sup> C07F 5/06

U.S. Cl. 260—448 R

8 Claims

1. A process for the preparation of aluminum trialkyl sulfonates which comprises reacting a long chain trialkyl aluminum at a temperature between about 100° C. and about 250° C., with a sultone of the structure:



where R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> are hydrogen or lower alkyl and m is an integer of from 1 to 2.



4,012,401

## SOLVENT SOLUTIONS OF SILOXANE FLUIDS

Bela Prokai, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.  
 Division of Ser. No. 512,861, Oct. 7, 1974, Pat. No. 3,966,650, which is a continuation-in-part of Ser. No. 334,767, Feb. 22, 1973, abandoned. This application May 11, 1976, Ser. No. 685,139

Int. Cl.<sup>2</sup> C07F 7/10, 7/18

U.S. Cl. 260—448.2 N

7 Claims

1. A composition suitable for use in the production of high resilience polyether urethane foam consisting essentially of an organic solvent solution of a cyanoalkoxy-alkyl modified siloxane fluid having the average formula



wherein x has a value of 2 to 6 inclusive; y has a value of 0 to 6 inclusive; z has a value of 0 to 1 inclusive; R is a lower alkyl or phenyl radical; and X is a cyanoalkoxy-alkyl radical having the formula  $-(O)_n R' OR'' CN$  where n has a value of 0 or 1, R' is an alkylene radical having from 3 to 8 carbon atoms and R'' is an alkylene radical having from 2 to 4 carbon atoms said siloxane containing at least one of said cyanoalkoxy-alkyl radicals and having an average molecular weight in the range of about 400 to about 2000, said solution containing at least 5 parts by weight of said siloxane fluid per 95 parts by weight of said solvent.

4,012,402

## MODIFIED CYANOACRYLATE MONOMERS AND METHODS FOR PREPARATION

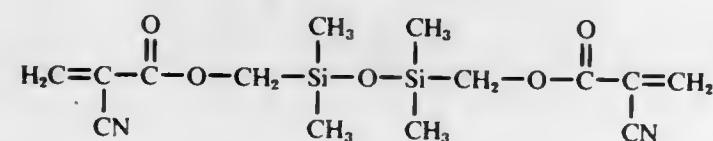
Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.  
 Continuation-in-part of Ser. No. 633,146, Nov. 18, 1975, which is a division of Ser. No. 512,276, Oct. 4, 1974, Pat. No. 3,975,422, which is a continuation-in-part of Ser. Nos. 308,375, Nov. 21, 1972, abandoned, and Ser. No. 308,376, Nov. 21, 1972, abandoned. This application June 23, 1976, Ser. No. 699,299

Int. Cl.<sup>2</sup> C07F 7/10

U.S. Cl. 260—448.2 N

1 Claim

1. A monomer composition of the formula



4,012,403

## SYNTHESIS OF MERCAPTO-SUBSTITUTED SILICON COMPOUNDS

Jeffrey Yick Pui Mui, Tarrytown, N.Y., assignor to Union Carbide Corporation, New York, N.Y.  
 Continuation-in-part of Ser. No. 611,676, Sept. 9, 1975, abandoned, which is a continuation of Ser. No. 216,728, Jan. 10, 1972, abandoned. This application Mar. 18, 1976, Ser. No. 667,987

Int. Cl.<sup>2</sup> C07F 7/18

U.S. Cl. 260—448.8 R

1 Claim

1. The process of reducing  $\beta$ -cyanoethyltrialkoxysilane to mercaptopropyltrialkoxysilane which comprises reacting said cyanoethyltrialkoxysilane at a temperature between about 50° C and about 300° C with sulfur and hydrogen in the ratio of at least 3 moles of hydrogen for each mole of the silane and at least one mole of sulfur for each mole of the silane, in the presence of about 0.001 to about 10 weight percent based on the weight of the silane, sulfur and hydrogen, of a sulfide or polysulfide of a transition metal consisting of cobalt, nickel, titanium, rhenium and molybdenum.

4,012,404

## PROCESS FOR PRODUCING HIGH-METHANE GAS

Helmut Liebgott, Bad Homburg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 317,033, Dec. 20, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,985

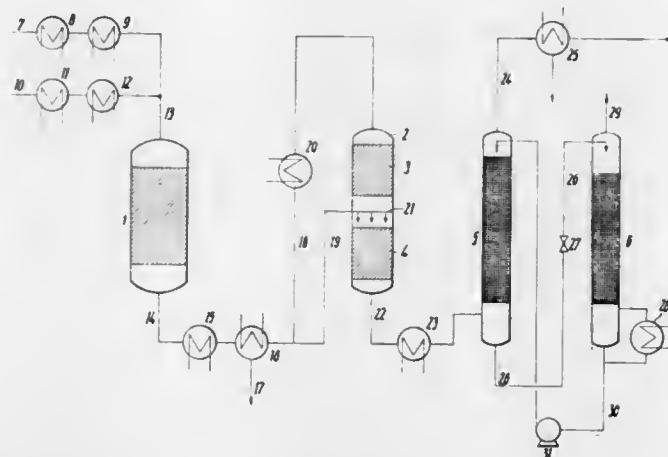
Claims priority, application Germany, Jan. 3, 1972, 2200004

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07C 27/06

U.S. Cl. 260—449 M

3 Claims



1. Process for producing high-methane gas which comprises:

- catalytically cracking liquid hydrocarbons with water vapor at elevated temperatures and pressures to produce a rich gas containing less than 15% hydrogen by volume;
- cooling the rich gas below its dew point to a temperature below 150°C thereby reducing the water vapor content thereof by condensation;
- separating condensed water from the rich gas;
- thereafter dividing the rich gas into two streams and feeding same to a hydrogenation zone containing two catalyst layers,
  - one of said streams being preheated to a temperature of at least 250°C and then being fed to the first catalyst layer of said zone, said one stream constituting 50–70% of the total rich gas,
  - the other of said streams being fed between the catalyst layers of said zone without preheating where it is mixed with the gas discharged from the first catalyst layer thereby cooling same and thereafter further reacting said mixture in the second catalyst layer thereby producing a product gas; and
- scrubbing the product gas leaving the hydrogenation zone to remove carbon dioxide.

4,012,405

## PRODUCTION OF ETHYL CHLOROTHIOFORMATE

Carlo G. Alesandrini, Jr., Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 28, 1975, Ser. No. 636,266

Int. Cl.<sup>2</sup> C07C 154/00

U.S. Cl. 260—455 R

14 Claims

1. A process for production of ethyl chlorothioformate comprising:

- contacting ethyl mercaptan with phosgene in a first continuous liquid phase reaction zone in the presence of a catalyst comprising activated carbon;
- removing a first reaction product from the first reaction zone;
- contacting the first reaction product with a catalyst comprising activated carbon in a second continuous liquid phase reaction zone; and

d. removing a second reaction product comprising ethyl chlorothioformate from the second reaction zone.

4,012,406

## PROCESS FOR THE PREPARATION OF DIARYL CARBONATES

Hans Josef Buysch, Krefeld-Bockum, and Heinrich Krimm, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 30, 1975, Ser. No. 618,057

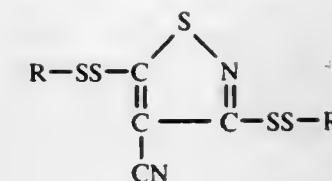
Claims priority, application Germany, Oct. 10, 1974, 2447348

Int. Cl.<sup>2</sup> C07C 68/02

U.S. Cl. 260—463

9 Claims

1. A process for the preparation of a diaryl carbonate by the reaction of an aromatic monohydroxy compound with phosgene under elimination of hydrogen chloride, wherein said reaction is carried out in the presence of a catalytic quantity of an aromatic heterocyclic basic nitrogen compound selected from the group consisting of pyridine, quinoxaline, imidazole, benzimidazole, pyrazole, triazole and benzotriazole, or a salt thereof, or an adduct thereof formed under the reaction conditions.



wherein:

R and R' = C<sub>1</sub> to C<sub>20</sub> alkyl and may be the same or different.

4,012,409

## N-(6-ETHYL-4-THIOCYANATO-2-BENZOTHAZOLYL)-5-NITROFURAMIDE

Robert J. Alaimo, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,620

Int. Cl.<sup>2</sup> C07D 419/00

U.S. Cl. 260—305

1 Claim

1. N-(6-ethyl-4-thiocyanato-2-benzothiazolyl)-5-nitrofuramide.

4,012,410

## 2-(4-METHOXYOXAZOLIDINONE-4-YL)THIAZOLIDINE T-BUTYL ESTERS

Charles W. Ashbrook, Greenwood; Gary V. Kaiser, and Gary A. Koppel, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

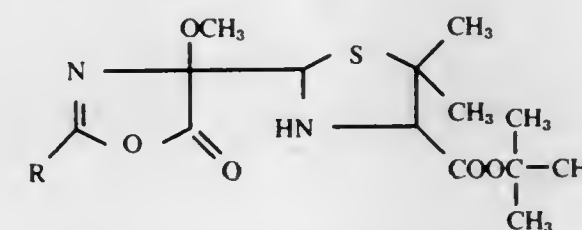
Division of Ser. No. 222,294, Jan. 31, 1972, abandoned. This application Apr. 14, 1975, Ser. No. 568,070

Int. Cl.<sup>2</sup> C07D 419/00

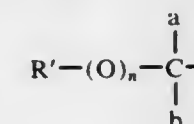
U.S. Cl. 260—306.7 C

2 Claims

1. The compound of the formula



wherein R is C<sub>1</sub>–C<sub>6</sub> alkyl, phenyl, halophenyl, C<sub>1</sub>–C<sub>4</sub> alkylphenyl, C<sub>1</sub>–C<sub>4</sub> alkoxyphenyl, or hydroxyphenyl, or a group of the formula



wherein

R' is  $\alpha$ -thienyl,  $\beta$ -thienyl,  $\alpha$ -furyl,  $\beta$ -furyl, phenyl, halo-phenyl, C<sub>1</sub>–C<sub>4</sub> alkylphenyl, C<sub>1</sub>–C<sub>4</sub> alkoxyphenyl or hydroxyphenyl,

n is 0 or 1,

a is hydrogen or C<sub>1</sub>–C<sub>3</sub> lower alkyl,

b is hydrogen, C<sub>1</sub>–C<sub>3</sub> lower alkyl, hydroxy, amino, 2,2,2-trichloroethoxycarbonylamino, benzyloxycarbonylamino, ethoxycarbonylamino, or t-butyloxycarbonylamino;

with the limitation that when n is 1, R' is phenyl or substituted phenyl and b is hydrogen or C<sub>1</sub>–C<sub>3</sub> lower alkyl.

4,012,408

## LUBRICATING OIL ADDITIVES

James A. White, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

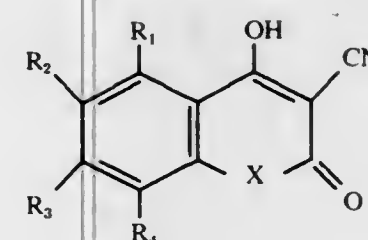
Division of Ser. No. 486,148, July 5, 1974, Pat. No. 3,896,050. This application Dec. 19, 1974, Ser. No. 534,390

Int. Cl.<sup>2</sup> C07D 375/02

U.S. Cl. 260—302 A

2 Claims

1. A compound of the formula



or a pharmaceutically acceptable, nontoxic salt thereof or hydrate thereof, wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are each hydrogen, halogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms or any two of the groups R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub> taken together with the carbon atoms to which they are joined complete a substituted or unsubstituted carbocyclic ring, and X is a bond, provided that the groups R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are not all simultaneously hydrogen atoms.

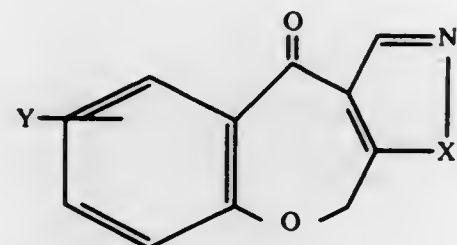


4,012,411

**HETEROCYCLIC ANNELED 1-BENZOXEPIN-5-ONES**  
Sylvester Klutchko, Hackettstown; John Shavel, Jr., Mendham, and Max Von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.  
Filed Mar. 3, 1975, Ser. No. 554,841  
Int. Cl.<sup>2</sup> C07D 498/04

U.S. Cl. 260—307 H

1. A compound of the formula:



wherein X is oxygen, and Y is hydrogen.

4,012,412

**2,5-DI-SUBSTITUTED 4-OXAZOLEALKANOIC ACID AND ESTERS**

Tsutomu Yamanaka; Toshihiro Kobayakawa, both of Fukuoka; Mitsuhiro Konishi, Oita, and Kuniki Ikeda, Fukuoka, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

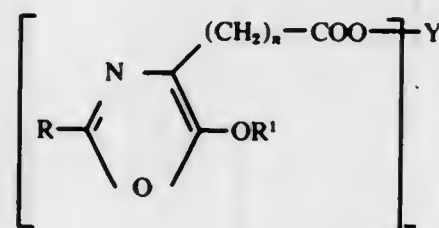
Filed Mar. 12, 1975, Ser. No. 557,692

Claims priority, application Japan, Mar. 13, 1974, 49-29548; Mar. 13, 1974, 49-29549; Mar. 13, 1974, 49-29550

Int. Cl.<sup>2</sup> C07D 263/42

U.S. Cl. 260—307 R

1. A compound of the formula:



wherein *m* represents an integer of 1 to 2; *R*<sup>1</sup> represents an alkyl group having 1 to 4 carbon atoms; *n* represents an integer of 1 to 2; *R* represents a mono- or di-substituted phenyl group (in which the substituents are selected from the group consisting of a halogen atom, a methyl group, a methoxy group, a nitro group, a trifluoromethyl group, a phenyl group, a halogen-substituted phenyl group, a phenoxy group and a halogen-substituted phenoxy group), a furyl group, a halogen-substituted furyl group, a thienyl group or, a halogen-substituted thienyl group, when *m* represents an integer of 1, *Y* represents an hydrogen atom, an alkyl group having 1 to 2 carbon atoms, or a benzyl group; and when *m* represents an integer of 2, *Y* represents a trimethylene group.

4,012,413  
**ORGANIC COMPOUNDS AND PROCESS**

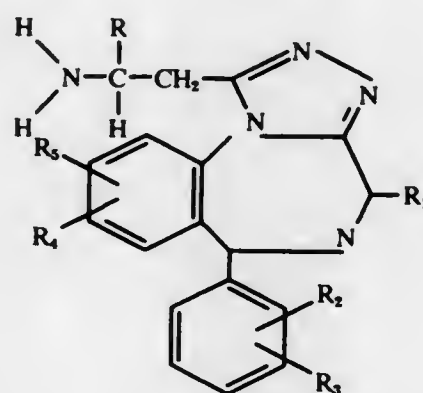
Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.  
Continuation of Ser. No. 361,348, May 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 138,827, April 28, 1971, Pat. No. 3,759,943. This application Feb. 14, 1975, Ser. No. 550,120

The portion of the term of this patent subsequent to Oct. 23, 1990, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 487/04

U.S. Cl. 260—308 R

1. A 1-(2-aminoalkyl)-6-phenyltriazolobenzodiazepine compound of the formula:



wherein *R* is hydrogen, methyl, or ethyl; wherein *R*<sub>1</sub> is hydrogen or methyl; wherein *R*<sub>2</sub>, *R*<sub>3</sub>, *R*<sub>4</sub> and *R*<sub>5</sub> are selected from the group consisting of hydrogen, alkyl of 1 to 3 carbon atoms, halogen, nitro, trifluoromethyl, and alkoxy, and alkylthio, in which the carbon chain moiety is of 1 to 3 carbon atoms, inclusive, and the pharmacologically acceptable acid addition salts thereof.

2. 1-[2-(dimethylamino)ethyl]-8-chloro-6-phenyl-4H-s-triazolo-[4,3-a][1,4]benzodiazepine.

4,012,414

**2-(5-PHENYL-2-FURYL)IMIDAZOLES**

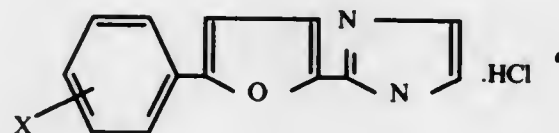
Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,295

Int. Cl.<sup>2</sup> C07D 405/04

U.S. Cl. 260—309

1. A compound of the formula:



wherein *X* represents hydrogen, 2-nitro, 4-nitro, 4-amino, and 4-acetyl.

4,012,415

**2-[5-(3,4-DIMETHOXYPHENYL)-2-FURYL]IMIDAZOLE HYDROCHLORIDE**

Stanford S. Pelosi, Jr., and Chia-Nien Yu, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,446

Int. Cl.<sup>2</sup> C07D 405/04

U.S. Cl. 260—309

1. The compound 2-[5-(3,4-dimethoxyphenyl)-2-furyl]imidazole hydrochloride.

4,012,416

**2-[5-(3-TRIFLUOROMETHYLPHENYL)-2-FURYL-IMIDAZOLE HYDROCHLORIDE**

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

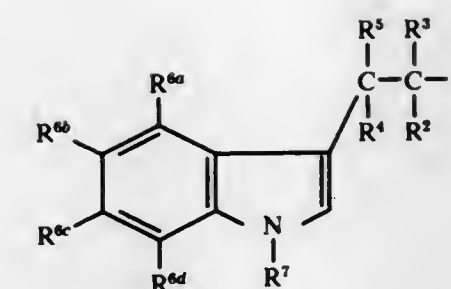
Filed Jan. 29, 1976, Ser. No. 653,442

Int. Cl.<sup>2</sup> C07D 405/04

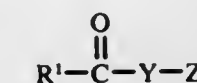
U.S. Cl. 260—309

1 Claim

1. The compound 2-[5-(3-trifluoromethylphenyl)-2-furyl]imidazole hydrochloride.



in which *R*<sup>2</sup>, *R*<sup>3</sup>, *R*<sup>4</sup>, *R*<sup>5</sup>, *R*<sup>6</sup>, *R*<sup>6a</sup>, *R*<sup>6b</sup>, *R*<sup>6c</sup>, *R*<sup>6d</sup>, and *R*<sup>7</sup> are as defined herein and *X*' is hydroxy or mercapto with a compound of formula



in which *R*<sup>1</sup>, *Y* and *Z* are as defined herein, in the presence of an acid catalyst.

4,012,418

**PROCESS FOR THE PREPARATION OF PYRROLIDONE-2**

Sijbrandus E. Schaafsma, Beek, and Leonardus H. Geurts, Sittard, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Sept. 23, 1975, Ser. No. 616,011

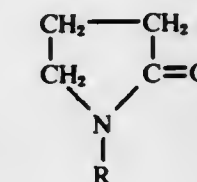
Claims priority, application Netherlands, Sept. 26, 1974, 7412694

Int. Cl.<sup>2</sup> C07D 207/26

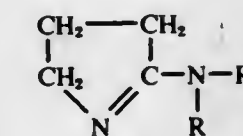
U.S. Cl. 260—326.5 FN

6 Claims

1. A process for the preparation of a pyrrolidone-2 compound of the formula:



wherein *R* is hydrogen or *C*<sub>1</sub> - *C*<sub>4</sub> alkyl, consisting of heating an aqueous solution of a 2-amino-Δ<sup>1</sup>-pyrroline of the formula:



or the tautomeric 2-imino-pyrrolidine, wherein *R* is hydrogen or, when using the tautomeric 2-imino-pyrrolidine, *R* is hydrogen or a *C*<sub>1</sub> - *C*<sub>4</sub> alkyl group, and *R*<sup>1</sup> is hydrogen, a *C*<sub>1</sub> - *C*<sub>4</sub> alkyl group or a *C*<sub>1</sub> - *C*<sub>3</sub> alkylcyano group, by heating at a temperature of 90° - 290° C.

4,012,419

**BISFLUORAN CHROMOGENIC COMPOUNDS, PREPARATION THEREOF, AND PRESSURE-SENSITIVE COPY SYSTEMS EMPLOYING SAME**

David N. Vincent, Glenview, and Cheng Hsiung Chang, Chicago, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 329,294, Feb. 5, 1973, Pat. No. 3,821,010.

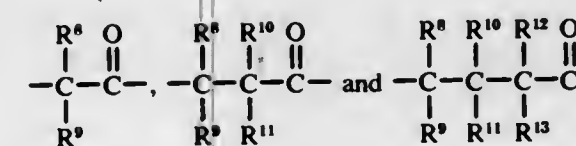
This application Jan. 2, 1974, Ser. No. 430,141

Int. Cl.<sup>2</sup> C07D 519/00

U.S. Cl. 260—335

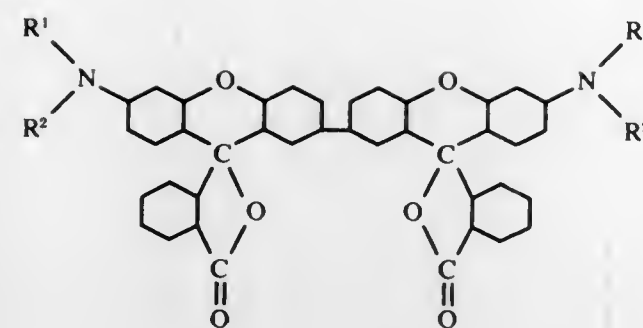
3 Claims

3. A chromogenic compound represented by the formula



in which each of *R*<sup>8</sup>, *R*<sup>9</sup>, *R*<sup>10</sup>, *R*<sup>11</sup>, *R*<sup>12</sup> and *R*<sup>13</sup> is hydrogen or lower alkyl, and *Z* is hydroxy or lower alkoxy comprising: reacting a compound of the formula IIa





wherein  $R^1$  and  $R^2$  each represent an alkyl group.

4,012,420

### 9,10-SECOESTRANE DERIVATIVES AND THEIR PRODUCTION

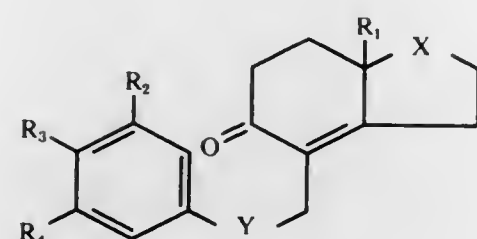
Ulrich Eder; Gregor Haffer; Jurgen Ruppert; Gerhard Sauer, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany. Continuation-in-part of Ser. No. 409,235, Oct. 24, 1973, Pat. No. 3,890,391. This application Apr. 21, 1975, Ser. No. 570,072.

Claims priority, application Germany, Oct. 25, 1972, 2253089.

Int. Cl.<sup>2</sup> C07D 317/46, 319/08

U.S. Cl. 260—340.7

1. A 9,10-secoestrane of the formula



wherein  $R_1$  is methyl or ethyl;  $R_4$  is a hydrogen atom, alkoxy of 1-4 carbon atoms or hydrocarbon carbonyloxy of 1-12 carbon atoms;  $R_2$  and  $R_3$  each are hydrogen or alkoxy of 1-4 carbon atoms;  $X$  is alkylendioxy-methylene of 5-6 ring members and wherein the alkylene group contains 2-6 carbon atoms; and  $Y$  is carbonyl or dialkoxy-methylene.

4,012,421

### ORGANOTIN MITICIDAL AND INSECTICIDAL COMPOUNDS

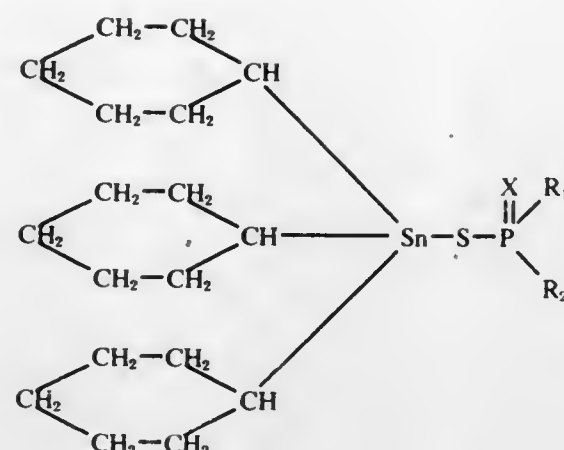
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 482,033, June 24, 1974, which is a division of Ser. No. 293,974, Oct. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 208,046, Dec. 10, 1971, abandoned. This application Dec. 29, 1975, Ser. No. 644,703.

Int. Cl.<sup>2</sup> C07D 317/00

U.S. Cl. 260—340.9

1. A composition of matter consisting of the formula



wherein  $R_1$  is lower alkyl and  $R_2$  is selected from the group consisting of furfuryloxy and alkylidioxolanealkoxy.

4,012,422

### PROCESS FOR THE CYCLIZATION OF ARYL (METHYLSULFINYL)-METHYL KETONES AND NOVEL COMPOUNDS PRODUCED THEREBY

David T. Connor, 15 Westminster Drive, Parsippany, N.J. 07054, and Maximilian Von Strandtmann, 47 Erie Ave., Rockaway, N.J. 07866.

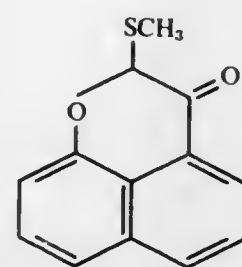
Division of Ser. No. 464,706, April 26, 1974, Pat. No. 3,920,699. This application Apr. 25, 1975, Ser. No. 571,890.

Int. Cl.<sup>2</sup> C07D 311/02

U.S. Cl. 260—345.2

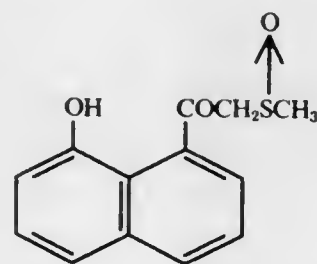
1 Claim

1. A process for preparing a compound of the formula III:



III

which comprises reacting a compound of the formula IV:



IV

with an equivalent amount of trifluoroacetic acid, in an inert solvent, at reflux temperature.

4,012,423

### PROCESS FOR THE PRODUCTION OF EPOXIDES

Arthur M. Brownstein, Wyckoff; John A. Jung, Somerset, and Robert Hansen, Belleville, all of N.J., assignors to Chem Systems, Inc., New York, N.Y.

Continuation of Ser. No. 444,836, Feb. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 348,970, April 9, 1973, abandoned. This application July 18, 1975, Ser. No. 597,037.

Int. Cl.<sup>2</sup> C07D 301/02

U.S. Cl. 260—348 R

16 Claims

1. In a process for the preparation of oxirane compounds which comprises the deacyloxylation of vicinal hydroxyesters derived from oxygen, an olefin, and a carboxylic acid, wherein

the olefin is ethylene, propylene, a butylene, a pentene, styrene, or alpha-methylstyrene, and the carboxylic acid is acetic, propionic, or butyric, the improvement which comprises performing said deacyloxylation reaction in the vapor phase at a temperature of from 250 to 600° C in the presence of a basic material having a pH of from 8 to 13 in a 0.1 molar aqueous solution.

4,012,424

### CRACKING OF MIXTURES CONTAINING HYDROXYESTERS

Martin B. Sherwin, Wayne, N.J., and Jimmy Peress, West Haven, Conn., assignors to Chem Systems Inc., New York, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,738

Int. Cl.<sup>2</sup> C07D 301/02

U.S. Cl. 260—348 R

7 Claims

1. In a process for preparing an oxirane compound from the alkylene glycol monoester of an olefin and a carboxylic acid, wherein the olefin is ethylene, propylene, a butylene, a pentene, styrene, or alpha-methylstyrene, and the carboxylic acid is acetic, propionic, or butyric, and wherein said alkylene glycol monoester is subjected to a cracking step in the vapor phase in the presence of a basic material, the improvement of: hydrolyzing a mixture containing a preponderance of alkylene glycol diester or esterifying a mixture containing a preponderance of alkylene glycol, thereby obtaining an effluent, said hydrolysis or esterification being performed so as to maximize the alkylene glycol monoester in such mixture and to achieve a mole fraction concentration thereof of at least 0.32 (based on the total amount of alkylene glycol diester, alkylene glycol monoester and alkylene glycol); and thereafter passing the effluent to the cracking step, without the prior separation of the alkylene glycol diester or the alkylene glycol from the alkylene glycol monoester.

4,012,425

### ETHYLENE OXIDE PROCESS

Robert P. Nielsen, Houston, Tex., and John H. La Rochelle, Baton Rouge, La., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 471,398, May 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,349, Dec. 21, 1972, abandoned, which is a

continuation-in-part of Ser. No. 216,188, Jan. 7, 1972, abandoned. This application Oct. 10, 1975, Ser. No. 621,269.

Int. Cl.<sup>2</sup> C07D 301/10

U.S. Cl. 260—348.5 R

29 Claims

1. In the process for the production of ethylene oxide wherein ethylene is contacted in vapor phase with an oxygen-containing gas at ethylene oxide forming conditions at an elevated temperature of from 210° to about 285° C in the presence of a fixed bed of a silver metal-containing catalyst, the improvement which comprises employing as said catalyst an article comprising a porous refractory support having deposited on its exterior and pore surfaces from about 2% by weight to about 20% by weight of silver and, coincidentally deposited with silver, a total of from about  $4.0 \times 10^{-5}$  gew per kilogram of total catalyst to about  $8.0 \times 10^{-3}$  gew per kilogram of total catalyst of alkali metal present in final form on the support in the form of an oxide in which said oxide consists of oxides of cesium or rubidium or mixtures thereof.

4,012,426

### PURIFICATION OF 1-NITROANTHRAQUINONE

Istvan Toth, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jan. 29, 1973, Ser. No. 327,621

Claims priority, application Switzerland, Feb. 1, 1972, 1499/72; Feb. 15, 1972, 2180/72; Aug. 22, 1972, 12403/72. Int. Cl. C09d 1/00

U.S. Cl. 260—369

13 Claims

1. A process for the purification of crude 1-nitroanthraquinone containing an impurity comprising dinitroanthraquinone which process comprises treating said crude 1-nitroanthraquinone with an alkali metal hydroxide or alkaline earth metal oxide or hydroxide or with an alkali metal or alkaline earth metal salt of an acid or acid reacting compound selected from the group consisting of carbonic acid, monohydrogen phosphates, nitrous acid, boric acid, formic acid, acetic acid, benzoic acid, ascorbic acid, citric acid, salicylic acid, phenol, p-nitrophenol, uric acid and aminophenylsulphonic acids at a temperature above room temperature and in the presence of a first solvent which is stable under the reaction conditions and in which the 1-nitroanthraquinone is soluble at the treatment temperature, whereby said impurity forms a reaction product whose solubility in said first solvent is different to that of the 1-nitroanthraquinone, separating the dissolved 1-nitroanthraquinone from the reaction product and recovering the purified 1-nitroanthraquinone from said first solvent, the base or basic hydrolysable salt being employed in an amount at least sufficient to react with said impurity.

4,012,427

### SUBSTITUTED PHENYL ESTERS OF PGE<sub>1</sub>-TYPE PROSTAGLANDINS

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

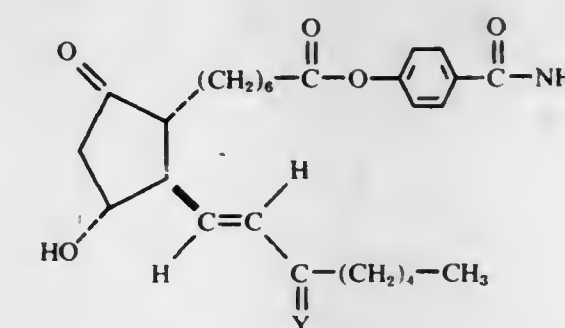
Division of Ser. No. 531,994, Dec. 12, 1974, which is a division of Ser. No. 431,599, Jan. 8, 1974, Pat. No. 3,968,140. This application Mar. 29, 1976, Ser. No. 671,229.

Int. Cl.<sup>2</sup> C07C 177/00

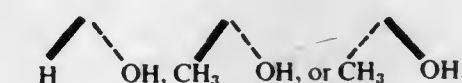
U.S. Cl. 260—389

8 Claims

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein  $Y$  is



5. An optically active compound of the formula:







4,012,434

## NEMATIC COMPOUNDS AND MIXTURES

Ralf Steinsträsser, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Germany

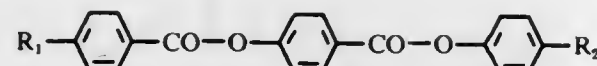
Division of Ser. No. 277,502, Aug. 3, 1972. This application Oct. 24, 1975, Ser. No. 625,550

Claims priority, application Germany, Aug. 7, 1971, 2139628

Int. Cl.<sup>2</sup> C07C 69/76

U.S. Cl. 260—473 R

I. A compound of the formula



wherein R<sub>1</sub> is straight-chain alkyl or straight-chain alkoxy of 1-7 carbon atoms or straight-chain alkanoyloxy of 2-7 carbon atoms, R<sub>2</sub> is straight-chain alkyl or straight-chain alkoxy of 1-7 carbon atoms.

4,012,435

## CARBAMATES

Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

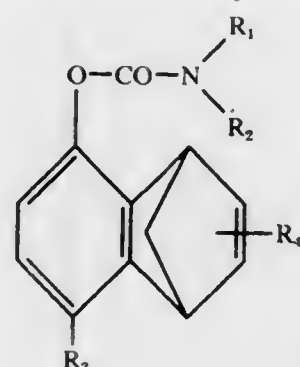
Filed Sept. 24, 1968, Ser. No. 762,144

Claims priority, application Switzerland, Sept. 25, 1967, 13375/67

Int. Cl.<sup>2</sup> C07C 125/06

U.S. Cl. 260—479 C

I. A carbamate of the general formula



in which R<sub>1</sub> represents a hydrogen atom or a lower alkyl group, R<sub>2</sub> represents a hydrogen atom, the methyl or acetyl group, R<sub>3</sub> represents a hydrogen atom, a lower alkoxy group or a carbamoyloxy group substituted by lower alkyl groups, R<sub>4</sub> represents a hydrogen atom or a methyl group, and in which the double bond in the 6,7-position may be hydrogenated.

4,012,436

## CARBAMOYL CHLORIDES

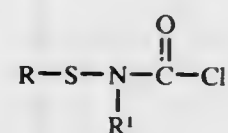
Joseph E. Moore, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 317,311, Dec. 21, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,215

Int. Cl.<sup>2</sup> C07C 161/00

U.S. Cl. 260—481 R

I. A compound of the formula



where R is haloalkyl having 1 to 3 carbon atoms, having 1 to 5 chlorine or bromine atoms and having one carboalkoxy

having 2 to 6 carbon atoms and R<sup>1</sup> is alkyl having 1 to 6 carbon atoms.

4,012,437

## METHOD OF PRODUCING BETAINES, MONOMERS AND POLYMERS CONTAINING BETAIN-YPE UNITS AND NOVEL AND USEFUL COPOLYMERS THEREBY OBTAINED

Norman Shachat, Levittown; Richard A. Haggard, Fort Washington, and Sheldon N. Lewis, Willow Grove, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 7, 1972, Ser. No. 224,268

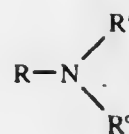
Int. Cl.<sup>2</sup> C07C 101/24, 65/54

U.S. Cl. 260—482 R

23 Claims

1. A method for producing a betaine-type product which comprises reacting, at a temperature of about 0° C. to about 100° C.,

1. acrylic acid with a tertiary amine of the formula



wherein R is (C<sub>1</sub>-C<sub>24</sub>) alkyl, allyl, benzyl, vinylbenzyl, hydroxyalkyl having 2 to 24 carbon atoms, (C<sub>1</sub>-C<sub>8</sub>)-alkyl substituted by an acryloxy, methacryloxy, acrylamido or methacrylamido, alkoxyalkyl having 3 to 24 carbon atoms, or a poly(alkoxy)alkyl group having 2 to 6 oxygen atoms and 2 to 3 carbon atoms in all except one of the terminal alkyl groups, the latter having 1 to 8 carbon atoms; R' is a (C<sub>1</sub>-C<sub>8</sub>) alkyl group; R'' is a (C<sub>1</sub>-C<sub>8</sub>) alkyl group, or R' and R'' may be joined together and form with the N atom of the tertiary amine, a ring selected from morpholino, thiomorpholino, N-alkylpiperidino, or piperazino or

2. acrylic acid with a polymer containing tertiary amine groups, of the formula above where R is (C<sub>1</sub>-C<sub>8</sub>) alkyl substituted by acryloxy, methacryloxy, acrylamido or methacrylamido, and R' and R'' are as defined above, or

3. acrylic acid with a mixture of a tertiary amine as defined in (2) and (b) a polymer of said tertiary amine, the molar ratio of acid to amine in the mixtures (1), (2), and (3) being from 0.1:1 to 10:1.

4,012,438

## POLYCARBOXYLIC ACID COMPOSITIONS

Joe B. Lavigne, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

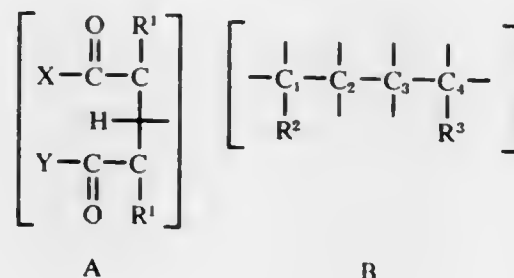
Continuation-in-part of Ser. No. 163,534, July 9, 1971, abandoned, which is a continuation-in-part of Ser. Nos. 835,735, June 23, 1969, abandoned, Ser. No. 835,736, June 23, 1969, abandoned, and Ser. No. 835,763, June 23, 1969, abandoned. This application Dec. 27, 1974, Ser. No. 537,051

Int. Cl.<sup>2</sup> C07C 55/24

U.S. Cl. 260—485 R

4 Claims

1. Alkyl or cycloalkyl tetracarboxylic acid compounds of the formula



4,012,440

## METHYLENE PHOSPHONATES OF OXYALKYLATED POLYALKYLENE POLYAMINES AND USES THEREFOR

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 90,837, Nov. 18, 1970, abandoned. This application Mar. 27, 1974, Ser. No. 455,344

Int. Cl.<sup>2</sup> C07F 9/34

U.S. Cl. 260—502.5

5 Claims

1. Methylene phosphonates of oxyethylated polyalkylene polyamines having at least three nitrogen atoms, said methylene phosphonates having nitrogen-bonded methylene phosphonate units of the formula —CH<sub>2</sub>PO(OM)<sub>2</sub>, M being alkali metal, alkaline earth metal, hydrogen, alkyl ammonium or ammonium, wherein at least 50% of the nitrogen-bonded hydrogens of the polyamine are replaced with the methylene phosphonate units and the remainder of the nitrogen-bonded hydrogens are oxyethylated.

wherein A and C are monovalent succinic acid groups having attachment to B a either of the two carbon atoms of A or C having unsatisfied valences and a hydrogen atom attached to the other unsatisfied carbon atom; and whereby B is a connecting alkane or cycloalkane group of 8 to 30 carbon atoms having 2 of the above-described monovalent groups A and C, which may be the same or different, attached at carbon atoms 1 and 2 or at carbon atoms 1 and 3; and optionally having carbon atom 1 and carbon atom 4 connected by a 1-8 carbon methylene bridge; the remainder of the unsatisfied carbon valences of said bivalent hydrocarbon group being attached to hydrogen atoms; and wherein R<sup>1</sup> is H and R<sup>2</sup> and R<sup>3</sup> are H or the same or different alkyl groups; X and Y are the same or different groups having the structure: —OR, in which R is alkyl group having from 1 to 8 carbon atoms

4,012,439

## CONTINUOUS PRODUCTION OF n-BUTYLACRYLATE FREE FROM DIBUTYLETHER

Heinz Erpenbach, Surth near Cologne; Klaus Gehrmann, Ertstadt-Lechenich; Herbert Joest, Ertstadt-Liblar, and Peter Zerres, Ertstadt-Friesheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 14, 1975, Ser. No. 622,263

Claims priority, application Germany, Oct. 19, 1974, 2449811

Int. Cl.<sup>2</sup> C07C 69/54

U.S. Cl. 260—486 R

1 Claim

1. In the process for making n-butylacrylate by reacting acrylic acid with n-butanol in liquid phase in contact with an acid cation exchanger as a catalyst, the improvement, which comprises continuously introducing into, and reacting in, a reaction zone acrylic acid and n-butanol in a molar ratio within the range 1:1 and 1:2.5, at temperatures within the range 80 and 130° C. under a pressure within the range 3 and 15 atmospheres gauge, and for reaction periods within the range 20 and 90 minutes, the reaction zone being filled with an acid cation exchanger; delivering the resulting esterification mixture to a first distillation zone, distilling off near the head of the first distillation zone a ternary mixture consisting of butylacrylate, butanol and water, condensing the mixture and separating it into an organic phase and an aqueous phase, recycling the bulk of the aqueous phase to the head of the first distillation zone and removing the aqueous phase balance portion; removing concentrated acrylic acid from the bottom portion of the first distillation zone, distilling off higher boiling fractions and recycling the acrylic acid to the reaction zone; delivering the organic phase recovered from distillate of the first distillation zone to a second distillation zone, distilling off near the head of the second distillation zone a ternary mixture consisting of butylacrylate, butanol and water, condensing the mixture and separating it into an organic phase and an aqueous phase, recycling the organic phase to the head of the second distillation zone and removing the aqueous phase; delivering base product obtained in the second distillation zone and consisting of butylacrylate and butanol to a third distillation zone, distilling off near the head of the third distillation zone a butanol/butylacrylate-azeotrope, condensing the azeotrope and recycling it to the reaction zone, and removing pure n-butylacrylate through the bottom portion of the third distillation zone.

4,012,441

## SULPHONIC DERIVATIVES HAVING THE STRUCTURE OF POLYOXAPOLYFLUOROALKANES

Enrico Pontoglio, Bollate (Milan); Ezio Strepparola, Treviglio (Bergamo), and Giancarlo Bernardi, Canzo (Como), all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed May 22, 1975, Ser. No. 579,943

Claims priority, application Italy, May 30, 1974, 23340/74

Int. Cl.<sup>2</sup> C07C 143/08

U.S. Cl. 260—513 R

3 Claims

1. An alkali polyoxapolyfluoroalkanesulphonate having the formula:



or a free acid thereof, in which the oxyperfluoroalkylene units —C<sub>2</sub>F<sub>4</sub>O— and —CF<sub>2</sub>O— are randomly distributed along the chain; m and n are integers whose sum is a number from 2 to 50; and the m/n ratio is between 0.2 and 1.5; A is a monovalent radical —CH<sub>2</sub>O—R—SO<sub>3</sub>M, wherein R is propylene or butylene, M is an alkali metal or hydrogen; and B is the same as A or —CH<sub>2</sub>OH.

4,012,442

## PROCESS FOR PREPARING M-CHLOROBENZENE SULPHONYL CHLORIDE

Heinz-Ulrich Blank, Odenthal-Globusch; Karlfried Wedemeyer, Cologne, both of, and Josef Ebersberger, deceased, late of Bergen, Germany (by Thea Ebersberger, heiress), assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 465,649, April 30, 1974, Pat. No. 3,897,321. This application Mar. 17, 1975, Ser. No. 559,272

Claims priority, application Germany, May 24, 1973, 2326414

Int. Cl.<sup>2</sup> C07C 143/70

U.S. Cl. 260—543 R

5 Claims

1. Process for preparing m-chlorobenzene sulphonyl chloride which comprises reacting benzene sulphonyl chloride with chlorine in the presence of a Friedel-Crafts catalyst at a temperature of from —20° to 180° C.



4,012,443

## INTEGRATED UREA-AMMONIA PROCESS

Andrea Bonetti, San Donato Milanese, Italy, assignor to Snam Progetti S.p.A., Milan, Italy

Filed June 12, 1975, Ser. No. 586,359

Claims priority, application Italy, June 12, 1974, 23895/74 Int. Cl.<sup>2</sup> C07C 126/00

U.S. Cl. 260—555 A

1 Claim

1. An integrated process for the synthesis of urea and ammonia comprising:

- feeding raw gases comprising N<sub>2</sub>, H<sub>2</sub> and CO<sub>2</sub> Ar, CH<sub>4</sub> and CO to a primary CO<sub>2</sub> absorption zone wherein said gases are contacted with a concentrated ammoniacal solution and said CO<sub>2</sub> is removed to form an ammonium carbamate solution which separates from said raw gases but still contains an amount of CO<sub>2</sub> and NH<sub>3</sub>, said concentrated ammoniacal solution having been obtained by absorbing with water the ammonia from the ammonia synthesis of step (n);
- feeding said ammonium carbamate solution thus obtained to a urea synthesis zone for transforming said ammonium carbamate into urea;
- forming said urea in said urea synthesis zone;
- discharging from said urea synthesis zone a solution comprising urea, non-transformed carbamate, water, and ammonia to a stripping zone maintained at the same pressure as that of said urea synthesis zone;
- obtaining from said stripping zone as the overhead products the decomposition products CO<sub>2</sub> and NH<sub>3</sub> of ammonium carbamate; then
- feeding said decomposition products back to said urea synthesis zone; and
- obtaining as the bottom product of said stripping zone in (e) an aqueous urea solution containing ammonia and non-transformed carbamate;
- feeding said aqueous urea solution to a first distillation stage at a lowered pressure;
- separating as overhead products of said first distillation stage water, NH<sub>3</sub> and CO<sub>2</sub>, which water, NH<sub>3</sub> and CO<sub>2</sub>, following condensation and rectification, are separated into:
  - a concentrated ammonium carbonate solution;
  - liquid ammonia; and
- obtaining as the bottom product of the distillation stage of (h) a urea solution;
- distilling said urea solution of (j) in a second distillation stage at a still lower pressure and thereby obtaining a substantially pure urea solution product;
- recovering as the overhead product of said second distillation stage after condensation a weakly concentrated ammoniacal solution of ammonium carbonate;
- feeding said concentrated ammonium carbonate solution to said primary CO<sub>2</sub> absorption zone;
- feeding said weakly concentrated ammoniacal solution of ammonium carbonate obtained in step (l) to a secondary CO<sub>2</sub> absorption zone so as to contact therein the raw gas stream comprising N<sub>2</sub>, H<sub>2</sub>, Ar, CH<sub>4</sub>, CO and unabsorbed CO<sub>2</sub> and NH<sub>3</sub> treated in step (a) and further synthesizing ammonia from said treated gas stream;
- feeding an ammonium carbonate solution obtained from the secondary CO<sub>2</sub> absorber to a condensation-rectification stage to which are added NH<sub>3</sub>, CO<sub>2</sub> and water obtained as the overhead products from said first distillation stage at said lowered pressure;
- obtaining from said condensation-rectification stage simultaneously
  - as the overhead product, liquid ammonia; and
  - as the bottom product, said concentrated ammonium carbonate solution;
- said liquid ammonia being recycled to said urea synthesis zone.

4,012,444

## 5-[1-HYDROXY-2-(1-METHYL-3-PHENYLPROPYL)AMINOETHYL] SALICYLAMIDE AND PHYSIOLOGICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Lawrence Henry Charles Lunts, and David Trevor Collin, both of London, England, assignors to Allen &amp; Hanburys Limited, London, England

Continuation of Ser. No. 50,979, June 29, 1970, abandoned.

This application Nov. 30, 1973, Ser. No. 420,547

Claims priority, application United Kingdom, July 8, 1969, 34379/69

Int. Cl.<sup>2</sup> C07C 103/26

U.S. Cl. 260—559 S

3 Claims

1. 5-[1-Hydroxy-2-(1-methyl-3-phenylpropyl)aminoethyl] salicylamide or a physiologically acceptable acid addition salt thereof.

4,012,445

## BETA-AMINO CARBONYL CATALYSTS FOR POLYURETHANE PREPARATION

David Charles Priest, Charlotte, N.C.; Michael Ray Sandner, Charleston, and David John Trecker, S. Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 463,247, April 23, 1974, Pat. No. 3,954,749, which is a division of Ser. No. 309,906, Nov. 27, 1972, Pat. No. 3,821,131. This application Feb. 23, 1976, Ser. No. 659,997

Int. Cl.<sup>2</sup> C07C 103/50

U.S. Cl. 260—561 A

2 Claims

1. 3-Diethylamino-N,N-dimethylpropionamide.

4,012,446

## CAPPED POLYMERS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 518,596, Oct. 29, 1974, Pat. No. 3,931,319. This application Apr. 17, 1975, Ser. No. 568,901

Int. Cl.<sup>2</sup> C07C 87/46

U.S. Cl. 260—567.6 P

4 Claims

1. A method of making a capped polymer which comprises (a) adding dropwise to a difunctional unsubstituted tertiary amine, a greater than molar equivalent of 1,4-dihalo-2-butene at a rate to maintain the resulting exothermic reaction at between about 60°–70° C, (b) heating the reaction mixture to a temperature immediately below the boiling point of the mixture for more than 2 hours, (c) cooling the mixture to about room temperature, (d) extracting, with a solvent, any unreacted 1,4-dihalo-2-butene from the resulting polyquaternary compound, and then (e) reacting the residue with an unsubstituted monoteritary amine at a temperature immediately below the boiling point of the mixture, said monoteritary amine having the formula N(R<sup>III</sup>)(R<sup>IV</sup>)(R<sup>V</sup>) where R<sup>III</sup>, R<sup>IV</sup> and R<sup>V</sup> are selected from the group consisting of (a) primary and secondary alkyls having 1 to 20 carbon atoms and (b) hydroxyethyl, and being in a quantity which is about equal to the molar equivalent of the halogen termini of the residue.

4,012,447

## HYDROPEROXY-DESOXYHUMULONES

Trudi Sigg-Grütter, Winterthur, and Jost Wild, Uster, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

Filed Aug. 22, 1975, Ser. No. 606,813

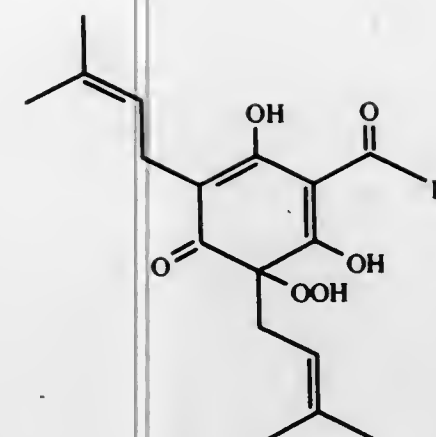
Claims priority, application Switzerland, Sept. 9, 1974, 12156/74

Int. Cl.<sup>2</sup> C07C 49/44

U.S. Cl. 260—586 D

4 Claims

1. Hydroperoxides of the formula:

wherein R represents a C<sub>1-6</sub> alkyl group.

4,012,448

## SYNTHESIS OF ADRIAMYCIN AND 7,9-EPIADRIAMYCIN

Thomas H. Smith, East Palo Alto; Allan N. Fujiwara, Sunnyvale; David W. Henry, Menlo Park, and William W. Lee, Palo Alto, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Jan. 15, 1976, Ser. No. 649,225

Int. Cl.<sup>2</sup> C07C 49/82

U.S. Cl. 260—591

1 Claim

1. The compound which is 4-methoxy-6,11-dihydroxy-7,8-dihydro-5,9 (10H),12-naphthacenetriene.

4,012,449

## PRODUCTION OF METHACROLEIN AND OXIDATION CATALYST USED THEREFOR

Yoshihisa Shikakura; Fumio Sakai, and Hitoshi Shimizu, all of Takasaki, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1975, Ser. No. 628,658

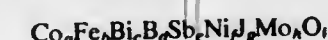
Claims priority, application Japan, Nov. 27, 1974, 49-135569

Int. Cl.<sup>2</sup> C07C 45/16; B01J 21/02; C07C 45/02

U.S. Cl. 260—603 R

7 Claims

1. An oxidation catalyst having the composition:



in which J represents at least one element selected from the group consisting of potassium, rubidium and cesium, and the subscripts a, b, c, d, e, f, g, h and i represent the numbers of cobalt, iron, bismuth, boron, antimony, nickel, J, molybdenum and oxygen atoms, respectively, with the proviso that the elements are present in a ratio so that when h is 12, a is 1 to 15, b 0.3 to 8, c 0.1 to 7, d 0.1 to 3, e 0.01 to 1, f 0 to 5, g greater than 0 but less than or equal to 1, and i is a number of 38 to 92 which number is determined by the total valences of the other elements.

4,012,450

## CATALYTIC REACTIONS

Geoffrey Colin Bond, London, England, assignor to Johnson Matthey &amp; Co., Limited, London, England

Division of Ser. No. 76,449, Sept. 29, 1970, abandoned. This application Apr. 4, 1975, Ser. No. 565,260

Claims priority, application United Kingdom, Oct. 1, 1969, 48277/69; Oct. 30, 1969, 53200/69; Nov. 14, 1969, 55883/69

Int. Cl.<sup>2</sup> C07C 45/08, 45/10

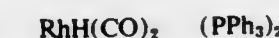
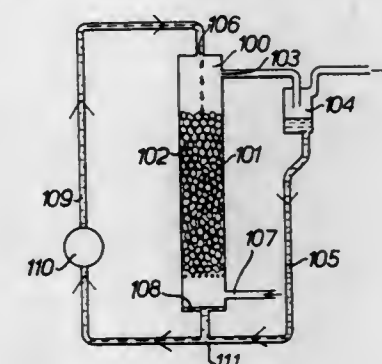
U.S. Cl. 260—604 HF

13 Claims

1. A process for the hydroformylation of an olefin, comprising passing a mixture of said olefin, hydrogen and carbon monoxide through a reaction zone where said mixture contacts a catalyst comprising a solid porous support having absorbed thereon a solution of a catalytic compound selected from the group consisting of



and

(III) where Ph is C<sub>6</sub>H<sub>5</sub>, in a solvent which is inert and essentially

involatile under the reaction conditions, maintaining an effective amount of said catalytic compound absorbed on said support by feeding additional solution into said zone counter-currently with respect to the passage of said mixture through said zone, collecting the gaseous reaction product after passage of the mixture through said catalyst and separating therefrom any solvent therein, collecting any catalyst solution fed to said zone which is not absorbed by said support and recycling the separated catalyst solution and solvent separated from said reaction product to said reaction zone for absorption on said porous support.

4,012,451

## PROCESS FOR THE SEPARATION OF 4,4'-DICHLORODIPHENYLSULFONE

Kichiji Enoki; Takeo Fukui; Takeo Yamamoto; Toshiro Okada, and Yoshiaki Miyazaki, all of Takaoka, Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Jan. 19, 1976, Ser. No. 650,158

Claims priority, application Japan, Jan. 31, 1975, 50-12433

Int. Cl.<sup>2</sup> C07C 147/06

U.S. Cl. 260—607 AR

11 Claims

1. A process for the separation of 4,4'-dichlorodiphenylsulfone from a reaction mixture containing said 4,4'-dichlorodiphenylsulfone and its isomers which comprises dissolving the reaction mixture in an organic solvent selected from the group consisting of trichloroethylene, tetrachloroethylene and mixture thereof and cooling the organic solution to precipitate 4,4'-dichlorodiphenylsulfone.

4,012,452

## OLEFIN HYDRATION PROCESS

Orville D. Frampton, Wyoming, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 425,437, Dec. 17, 1973, Pat. No. 3,917,721. This application July 9, 1975, Ser. No. 594,423

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C07C 29/04

U.S. Cl. 260—641

9 Claims

1. In a process for hydrating olefins to the corresponding alcohols by contacting the olefin and water vapor with a catalyst at elevated temperatures and pressures, the improvement which comprises employing as the catalyst, a preformed H<sub>3</sub>PO<sub>4</sub> impregnated, water vapor treated silica xerogel, wherein said xerogel has a particle size passing through 3 mesh and retained on 20 mesh, a bulk density of 0.38–0.48 g/cc, a pore volume of 0.80–2.2 ml/g, a BET surface area in the range of 200–500 m<sup>2</sup>/g and the following chemical composition in



terms of weight percent dry basis:  $\text{SiO}_2$  over 99%,  $\text{Fe}_2\text{O}_3$  0.01–0.03%;  $\text{Na}_2\text{O}$  0.02–0.09%; and  $\text{Al}_2\text{O}_3$  less than 0.4%, said xerogel having been contacted with water vapor at a temperature above  $100^\circ\text{C}$ . and less than  $200^\circ\text{C}$ ., a relative humidity of about 30–100%, and a total pressure of 20–1500 psig.

4,012,453

## PROCESS FOR THE PRODUCTION OF

## CHLOROFLUORINATED AROMATIC HYDROCARBONS

Henry R. Nychka, East Aurora, N.Y.; Morris B. Berenbaum, Summit, N.J.; Martin A. Robinson, East Amherst, and Richard E. Eibeck, Orchard Park, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 22, 1975, Ser. No. 642,873

Int. Cl.<sup>2</sup> C07C 25/18, 25/04, 25/13

U.S. Cl. 260–649 F

55 Claims

1. The process for the production of chlorofluorinated aromatic hydrocarbons by the oxychlorofluorination of aromatic hydrocarbons which comprises reacting a gaseous mixture of a starting material selected from an aromatic hydrocarbon and an aromatic hydrohalocarbon in which the halo atoms are selected from chloro and fluoro, or mixtures thereof, at least 0.10 mole oxygen in an oxygen-containing gas, at least 0.25 mole HCl or equivalent of  $\text{Cl}_2$  for each C–H bond and C=C bond desired to be reacted in the starting material, and HF, in the presence of a Deacon catalyst supported by a stable, inert metal salt carrier, with the weight percentage of cation in the Deacon catalyst ranging from about 0.6–20 based on the total cation content of the Deacon catalyst and metal salt carrier, at elevated temperatures and with a contact time of from about 0.1–20 seconds.

4,012,454

## IODINATION PROCESS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 15, 1975, Ser. No. 577,739

Int. Cl.<sup>2</sup> C07C 17/22

U.S. Cl. 260–650 R

5 Claims

1. A decarboxylation iodination process for substituting iodine atoms for silver carboxylate radicals which comprises reacting a composition consisting essentially of iodine and the silver salt of a carboxylic acid at a temperature of about  $100^\circ$  to  $270^\circ\text{C}$  in mole ratios of about 1.0 to 1.5 moles of iodine per mole equivalent of silver in said silver salt at a pressure from 1 to 100 atmospheres, wherein finely-divided said silver salt is added to said iodine under refluxing conditions, the said carboxylic acid being selected from the group of carboxylic acids consisting of isophthalic acid, 2,5-dibromoterephthalic acid, terephthalic acid and trimesic acid.

4,012,455

## UPGRADING REFINERY LIGHT OLEFINS WITH HYDROGEN CONTRIBUTOR

Hartley Owen, Belle Mead, and Paul B. Venuto, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,296

Int. Cl.<sup>2</sup> C07C 15/02

U.S. Cl. 260–668 R

1 Claim

1. A method for upgrading hydrocarbons which comprises converting a gas oil boiling range hydrocarbon material combined with methanol by contact with a ZSM-5 type zeolite and faujasite as a suspension in a first riser conversion zone at a temperature within the range of  $960^\circ\text{F}$  to about  $1200^\circ\text{F}$ , separating the product of said first riser conversion zone to recover a stream comprising  $\text{C}_2$ – $\text{C}_5$  olefins from higher boiling components comprising gasoline, heavy naphtha, light cycle oil and heavy cycle oil, converting  $\text{C}_2$ – $\text{C}_5$  light olefins combined with methanol by contact with a ZSM-5 type zeolite and faujasite catalyst as a suspension in a second riser conversion zone at a tem-

perature in the range of  $500^\circ$  to about  $900^\circ\text{F}$  and a contact time of 1 to 30 seconds, separating the products of said second conversion zone in the presence of the products from the first conversion zone, recycling separated light olefins and separated methanol to at least said second conversion zone.

4,012,456

METHOD FOR SEPARATION OF ISOBUTYLENE FROM  $\text{C}_4$  HYDROCARBON FRACTIONS

Donat Nikolaevich Chaplits, ulitsa Pervomaiskaya, 9, kv. 36, Yaroslavl, U.S.S.R.

Filed Nov. 19, 1974, Ser. No. 525,113

Int. Cl.<sup>2</sup> C07C 11/08

U.S. Cl. 260–677 A

2 Claims

1. A method for separating high-purity isobutylene from  $\text{C}_4$  hydrocarbon fractions which comprises treating said fractions with water at a temperature of from  $70^\circ$  to  $110^\circ\text{C}$ , under a pressure of from 16 to 23 atm., and a hydrocarbon fraction-to-water molar ratio being 1:5–20, in the presence of a polar solvent capable of dissolving both water and hydrocarbon in an amount of from 10 to 70% of the water weight and in the presence of an ion-exchange molded catalyst comprising a sulfonated styrene-divinylbenzene or di-isopropenylbenzene copolymer and a sulfonated thermoplastic material selected from the group consisting of sulfonated polyethylene, sulfonated polypropylene and sulfonated polyvinyl chloride, the sulfonated copolymer-to-sulfonated thermoplastic material weight ratio in said catalyst being equal to 1–4:1–2, respectively, whereby the isobutylene is converted to tert-butyl alcohol, followed by separating the hydrocarbon fraction from the tert-butyl alcohol solution, and thereafter dehydrating the tert-butyl alcohol to isobutylene at a temperature of from  $80^\circ$  to  $110^\circ\text{C}$ , under a pressure of 3 atm. maximum, and in the presence of said catalyst.

4,012,457

## THERMAL CRACKING METHOD FOR THE PRODUCTION OF ETHYLENE AND PROPYLENE IN A MOLTEN METAL BATH

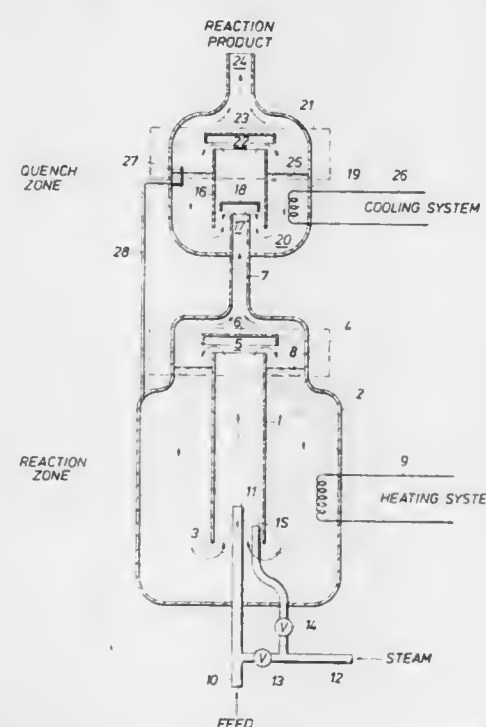
Larry D. Bredeson; Glenn R. McCullough, both of Houston, and Oran L. Wylie, Dallas, all of Tex., assignors to Shell Development Company, Houston, Tex.

Filed Oct. 6, 1975, Ser. No. 619,765

Int. Cl.<sup>2</sup> C07C 3/00, 5/00, 11/02

U.S. Cl. 260–683 R

7 Claims



1. In a process for the thermal cracking of hydrocarbons in

4,012,459

## ACRYLIC FIBER OF IMPROVED PROPERTIES

Kenji Takeya; Hiroshi Suzuki, and Noboru Yamawaki, all of Okayama, Japan, assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 15, 1973, Ser. No. 388,675

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C08L 67/06

U.S. Cl. 260–873

9 Claims

1. An acrylic fiber of improved hot-wet properties and improved elastic recovery which comprises a matrix of a fiber-forming acrylonitrile polymer containing at least 40 weight percent of acrylonitrile and any balance of one or more monomers copolymerizable therewith, said matrix forming from 50 to 99 weight percent of the total weight of fiber and continuously distributed within said matrix from about 1 to 50 weight percent based on the total weight of fiber of a polycarbonate of the formula



wherein R is the residue of an aliphatic or aromatic-aliphatic dihydroxy organic compound after esterification to form a polycarbonate and n is an integer sufficient to provide a molecular weight of at least about 18,000, said polycarbonate being present in the form of a plurality of fibrils of a diameter in the range of about 0.05 to 5 microns and a length to diameter ratio of at least 10.

4,012,460

## METHOD OF POLYMERIZING VINYL CHLORIDE WITH OLEFIN-ACRYLIC ESTER COPOLYMERS AND COMPOSITION THEREOF

Akio Takahashi, Amherst, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 251,100, May 8, 1972, abandoned. This application Feb. 24, 1975, Ser. No. 552,682

Int. Cl.<sup>2</sup> C08F 265/04; C08L 33/08

U.S. Cl. 260–878 R

13 Claims

1. In a process for the preparation of a polymer of a vinyl halide by a twostage bulk polymerization of a vinyl halide monomer wherein polymerization is carried out in a first stage, during which a reaction mixture is subjected to high speed agitation until about 3 percent to about 15 percent of said monomer have been converted to polymer, and in which said polymerization is completed in a second stage, during which said reaction mixture is subjected to low speed agitation until the reaction has been completed, the improvement comprising polymerizing said vinyl halide in the presence of 0.1 to about 6 percent by weight of a trunk polymer consisting essentially of an aliphatic olefinic-acrylic ester copolymer, based upon the weight of said monomer to produce a polymer having a graft copolymer disperse phase of about 0.1 to about 0.5 micron particle diameter and having a particle size of 10 to 50 microns average grain size.

4,012,461

## PROCESS FOR PREPARING POLYMER POWDERS

Robert A. van Brederode, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 6, 1975, Ser. No. 602,211

Int. Cl.<sup>2</sup> C08F 6/10, 255/02; C08J 3/12

U.S. Cl. 260–878 R

18 Claims

1. A process for preparing powders of thermoplastic polymers comprising dissolving 1 to 40 weight percent of thermoplastic polymer in a solvent of paraffin or cycloparaffin hydrocarbons having 5 to 12 carbon atoms at a temperature greater than  $100^\circ\text{C}$  up to about  $165^\circ\text{C}$  under autogenous conditions,

which a liquid or gaseous hydrocarbon feedstock selected from the group consisting of refinery gas, gasoline range material, naphthas, gas oils, residual oils, crude oils and mixtures thereof is introduced into a bath of molten metal in a reaction zone and in which gaseous reaction products comprising primarily ethylene and propylene are separated from the molten metal which is circulated back to the reaction zone, the improvement which comprises:

- heating said hydrocarbon feedstock to a temperature of between about  $1400^\circ\text{F}$  and  $1900^\circ\text{F}$  in a reaction zone containing a forced circulation riser and in the presence of a molten metal wherein said feedstock is injected into said forced circulation riser thereby providing circulation of the hydrocarbon feedstock/ molten metal mixture within the reaction zone;
- separating the resulting gaseous reaction products from the molten metal by gravity separation;
- circulating the molten metal to a reheat zone surrounding the forced circulation riser and then back to the reaction zone;
- routing the gaseous reaction products from said reaction zone through a transition zone to a quench zone containing a forced circulation riser, wherein the residence time of said gaseous reaction products in said transition zone is less than 0.2 seconds;
- cooling said gaseous reaction products to a temperature of between about  $800^\circ\text{F}$  and about  $1200^\circ\text{F}$  in said quench zone by contacting said gaseous reaction products with a cooler molten metal;
- separating the resulting gaseous reaction products from said cooler molten metal by gravity separation; and
- circulating the cooler molten metal to a heat removal zone and then back to said quench zone.

4,012,458

## EPOXY RESIN COMPOSITION COMPRISING A CYCLOPENTADIENE TYPE RESIN AND EPOXY HARDENER

Akira Wada, Kamakura, and Kazunobu Karino, Yokohama, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed June 23, 1975, Ser. No. 589,537

Claims priority, application Japan, June 25, 1974, 49-72489

Int. Cl.<sup>2</sup> C08G 45/04

U.S. Cl. 260–837 R

10 Claims

- An epoxy resin composition comprising 1. 5–80% by weight of a cyclopentadiene type resin having a hydroxyl value of 100–300 and a softening point of  $50^\circ$ – $170^\circ\text{C}$ , said resin consisting essentially of the reaction product of a cyclopentadiene monomer and a hydroxyl-containing monoolefinic monomer copolymerizable therewith and optionally a third monomer copolymerizable therewith by heat-polymerizing at a temperature of  $200^\circ$ – $300^\circ\text{C}$  a monomeric mixture containing at least 50% by weight of a cyclopentadiene monomer and less than 50% by weight of a hydroxyl-containing monoolefinic monomer copolymerizable therewith and less than 20% by weight of the total monomers of said third copolymerizable monomer,
- 95–20% by weight of an epoxy resin which has at least two epoxy groups in the molecule, and
- an effective amount of an epoxy resin hardener.



cooling said solution under autogenous conditions to a temperature less than 90° C, subjecting said solution during said cooling to high shear agitation to produce particulate polymer, said high shear agitation being characterized by turbine agitators in a vessel being 1/2 to 3/4 the diameter of the vessel operated at from 20 to 300 rpm's and being rotated with 0.5 to 10 horse power per 1000 gallons of material agitated, short of emulsification to produce particulate polymer, precipitating said thermoplastic polymer during said cooling and high shear agitation, recovering a slurry of polymer particles and solvent, atomizing said slurry into a vaporization zone, feeding a drying gas at a temperature in the range of 80 to 180° C into said vaporization zone and recovering particulate polymer product having a substantial amount of said solvent removed therefrom.

4,012,462

## HIGH IMPACT GRAFT COPOLYMERS

Sohan S. Chaudhary, Monroeville, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Filed May 15, 1975, Ser. No. 577,803

Int. Cl.<sup>2</sup> C08L 9/06

U.S. Cl. 260—880 R

7 Claims

1. In a process for making graft copolymers comprising dissolving a rubbery copolymer selected from the group consisting of conjugated 1,3-diene rubbers, styrene-diene copolymer rubbers, acrylonitrile-diene copolymer rubbers, ethylene-propylene-diene terpolymer rubbers, acrylatediene copolymer rubbers, and mixtures thereof, in polymerizable ethylenically unsaturated monomer liquid selected from the group consisting of monovinylaromatic hydrocarbons, unsaturated nitriles, acrylic monomers, and mixtures thereof, to form a rubber solution, partially polymerizing said rubber solution in mass to form a prepolymer, subsequently suspending the prepolymer with additional monomer liquid in aqueous medium, and polymerizing the suspension to complete conversion to form a graft copolymer, the improvement for obtaining the prepolymer comprising:

- polymerizing a first portion consisting of a 50 to 85 percent by weight of a total rubber solution by heating at a temperature of 70° to 130° C. in bulk to a conversion of 15 to 40 percent to form a prepolymer having an average rubber particle size of from 0.5 to 3.0 microns diameter; and
- adding a second portion consisting of a 15 to 50 percent by weight of a total rubber solution to the prepolymer system and mixing at a lower temperature under conditions to form a prepolymer having an average rubber particle size of from 1.0 to 4.0 microns diameter with a maximum size of 5 to 15 microns diameter; said rubber particle size prepared in step (b) being greater than that prepared in step (a); whereby said prepolymer has a broad distribution of rubber particle sizes having a range of between 3.8 and 11 microns.

4,012,463

## METHOD OF PREPARING STABLE CONDENSATION PRODUCTS USING A LEWIS ACID CATALYST AND PRODUCTS THEREOF

Edward N. Walsh, New City; Fred Jaffe, Ossining; Milton L. Honig, New York; Kyung S. Shim, Irvington, all of N.Y., and Mervin E. Brokke, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 473,471, May 18, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 665,840

Int. Cl.<sup>2</sup> C07F 9/08

U.S. Cl. 260—928

14 Claims

1. A process for forming a stabilized condensation product derived from condensing a  $\beta$ -haloalkyl ester of a pentavalent phosphorus acid with itself or with an alkyl ester of a penta-

lent phosphorus acid to form a condensation product which comprises heating the condensation product which has been or is being treated with an alkylene oxide to remove acidity and labile groups therefrom with a catalytically effective amount of a Lewis acid at a temperature sufficient to promote neutralization of labile groups in said product.

12. A product formed by the process of claim 1.

4,012,464

## S-(2-DIISOPROPYLAMINO-ETHYL)O-ETHYL METHYLPHOSPHONOTHIOATE STABILIZED WITH SOLUBLE CARBODIIMIDES

Lawrence C. Buckles, Kingsville, Md.; Stephen M. Lewis, deceased, late of Dugway Proving Ground, Utah, and Florence E. Lewis, heir, Long Beach, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 24, 1965, Ser. No. 491,074

Int. Cl.<sup>2</sup> C07F 9/165

U.S. Cl. 260—945

7 Claims

1. A composition consisting of S-(diisopropylamino ethyl)-O-ethyl methylphosphonothioate, and a stabilizing amount of a soluble carbodiimide selected from the group consisting of dicyclohexylcarbodiimide, diisopropylcarbodiimide, d-o-tolylcarbodiimide, bis(3-chloro-2-methyl-phenyl)carbodiimide, di(p-nitrophenyl)carbodiimide, di-p-tolylcarbodiimide, di(o-chlorophenyl)carbodiimide, di(o-methoxyphenyl)carbodiimide, and 1 cyclohexyl-3-(2-morpholinoethyl)carbodiimide.

4,012,465

## ALKYL AND CYCLOALKYL METHYLPHOSPHONOFUORIDOTHIOATES

Friedrick Wilhelm Hoffmann, and Ray Rei Irino, both of Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

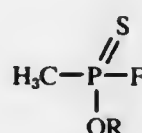
Filed Nov. 13, 1962, Ser. No. 237,407

Int. Cl.<sup>2</sup> C07F 9/20

U.S. Cl. 260—958

4 Claims

1. A compound having the structure represented by the formula:



in which R is selected from the group consisting of alkyl groups of 1-5 carbon atoms and cycloalkyl groups of 6-9 carbon atoms.

4,012,466

## PRODUCTION OF 5,5-BIS(HALOMETHYL)-1,3,2-DIOXA-PHOSPHORINANES

Richard H. S. Wang, and James G. Pacifici, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

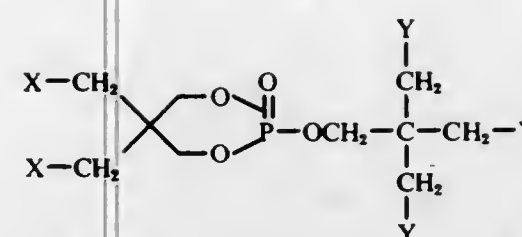
Filed Dec. 1, 1975, Ser. No. 636,390

Int. Cl.<sup>2</sup> C07F 9/09

U.S. Cl. 260—974

4 Claims

1. Process for the preparation of 5,5-bis(halomethyl)-1,3,2-dioxa-phosphorinanes having the formula



wherein X is chloro or bromo, and each Y is the same or different and represents chloro or bromo, which comprises reacting at least about 1.5 mole proportions of dichloroneopentyl glycol or dibromoneopentyl glycol with one mole proportions of phosphorous oxychloride or phosphorous oxybromide in the presence of a hydrogen chloride accepting reagent at a temperature of from about 40° to about 180° C.

4,012,467

## PROCESS FOR PREPARING AN ESTER OF THE N-METHYL-N-HYDROXYETHYLGUANIDINE

Elio Allievi, Via G. Macchi, 6, Cantu' (Como), Italy

Filed Oct. 30, 1975, Ser. No. 627,378

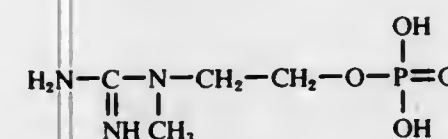
Claims priority, application Italy, Nov. 13, 1974, 29373/74

Int. Cl.<sup>2</sup> C07F 9/08

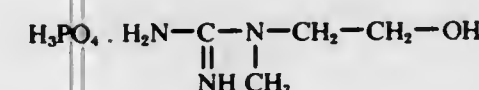
U.S. Cl. 260—978

4 Claims

1. Process for preparing the phosphoric ester of N-methyl-N-hydroxyethylguanidine of the formula



characterized in that the creatinol phosphate of the formula



is reacted with polyphosphoric acid in the molten state, under vacuum to eliminate the reaction water, and the obtained mass is poured into an organic solvent where the phosphoric ester of N-methyl-N-hydroxyethylguanidine is practically insoluble, whereas the rest of the reaction mixture is practically entirely soluble.

4,012,468

## INNER VENTURI TUBE FOR CARBURETOR

Kunio Kikuchi, Odawara, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

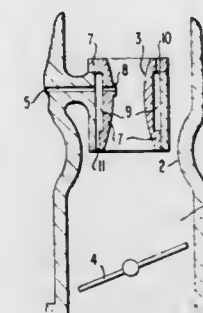
Filed Oct. 29, 1975, Ser. No. 626,893

Claims priority, application Japan, Oct. 31, 1974, 49-125922

Int. Cl.<sup>2</sup> F02M 7/02

U.S. Cl. 261—78 R

7 Claims



1. An inner venturi for a venturi type fixed carburetor comprising: an outer core member having a main fuel passage

extending through a wall thereof, an inner core member defining a fuel-air-mixture inner venturi passageway and having at least one main nozzle extending through a wall thereof and opening at one end thereof directly into said fuel-air-mixture venturi passageway, said inner core member being mounted within said outer core member and defining an elongated annular fuel well between the outer wall of said inner core member and the inner wall of said outer core member, said well extending substantially the fuel axial length of said core members, said at least one main nozzle opening into said fuel well, said inner and outer core members closing off said fuel well at the top and bottom thereof, and circumferentially spaced bleeder holes extending vertically through at least one of said core members at the top of said fuel well and small-diameter circumferentially spaced sub-nozzles extending vertically through at least one of said core members at the bottom thereof.

4,012,469

## VENTURI WET SCRUBBER

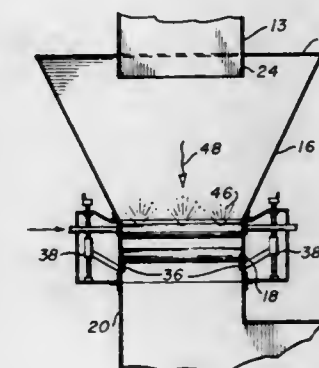
Joseph Itamar Accortt, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 22, 1975, Ser. No. 643,066

Int. Cl.<sup>2</sup> B01D 47/10

U.S. Cl. 261—117

1 Claim



1. A venturi type scrubber comprising in combination a housing having an inlet region, a throat region and an outlet region, said housing being adapted to have a stream of contaminated gas pass downwardly therethrough entering said inlet region and then traversing said throat region and passing out of said outlet region, said inlet region having side walls that converge towards said throat region, a first tray of rod members of circular cross-section extending across said throat region with these members being in parallel spaced relation, a second tray of similar rod members spaced from said first tray in the direction of gas flow and with the rod members of the second tray being disposed generally intermediate those of the first, at least a plurality of the rod members of said first tray being hollow to provide a passageway therethrough, openings extending through the wall of said passageway in the upstream direction relative to said gas flow for conveying fluid from the interior of the said passageway into said gas flow counter-current thereto, at least some of said openings being disposed close to the venturi walls so that fluid passing therefrom will impinge upon said venturi walls upstream of said first tray, means for introducing a washing liquid into said passageways at one end thereof including a sump for said liquid and a pump to convey liquid from said sump to said passageway, conduit means to convey said liquid from the other end of said passageway to said sump and pressure regulator means in said conduit means to regulate the pressure in said passageway.



4,012,470

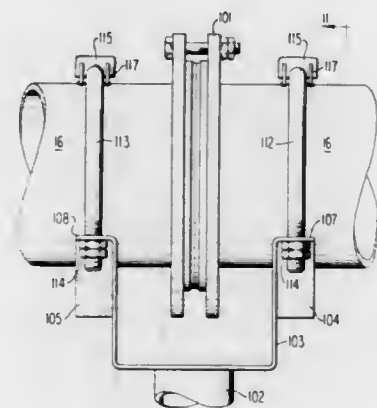
**SEWAGE TREATMENT AERATION SYSTEMS**  
Paul M. Thayer, Milwaukee, Wis., assignor to Water Pollution Control Corporation, Milwaukee, Wis.

Continuation of Ser. No. 342,586, March 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 168,685, Aug. 3, 1971, Pat. No. 3,902,676. This application June 27, 1975, Ser. No. 591,259

Int. Cl.<sup>2</sup> B01F 3/04

U.S. Cl. 261—122

9 Claims



1. In an aeration system including header means arranged in a tank on support means in generally horizontal relationship with diffusers spaced at longitudinal intervals along said header means, the improvement which comprises means to adjust the orientation of said diffusers with regard to said tank by rotating said header means, said improvement comprising: first connecting means secured to the outer surface of said header means and integral therewith; second connecting means on said support means; and rotation means, connected between said first and second connecting means, for rotating said header means about its longitudinal axis to thereby adjust the orientation of said diffusers.

4,012,471

**DISPOSABLE CONTAINER**

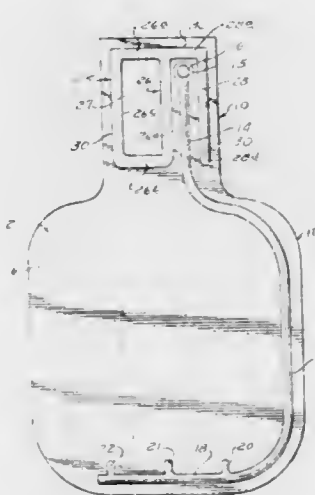
George E. Kunkle, Jr., 4947 N. 113th, Omaha, Nebr. 68164

Filed June 6, 1975, Ser. No. 584,578

Int. Cl.<sup>2</sup> A61M 15/00

U.S. Cl. 261—124

7 Claims



1. A container connectable to a coupling member having a groove formed in a wall of a recess in the coupling member, the container comprising: a first sheet of stiff thermoplastic material forming a first wall of the container, said first sheet having an inlet passage and an outlet passage extending therethrough; a protrusion on said first sheet, said protrusion extending exteriorly of the container and around the periphery of the outlet passage and about the inlet passage; a rib on said protrusion, said protrusion and said rib being of integral con-

struction and being deformable to disengageably secure the rib on the protrusion in the groove in the wall of the recess in the coupling member; sealing surfaces about said inlet passage and about said outlet passage, said rib when positioned in the recess in the coupling being adapted to urge each of said sealing surfaces into sealing relation with a surface on the coupling member; and a second sheet having flanges extending about the periphery thereof, said flanges being secured to said first sheet of stiff thermoplastic material such that said second sheet forms a second wall of the container.

4,012,472

**MEDICAL FLUIDS CONTAINER**

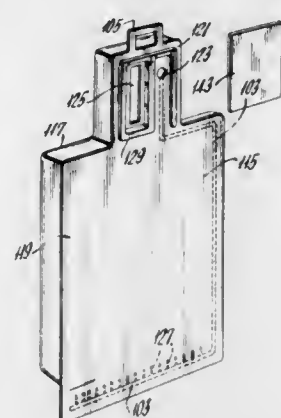
Joseph W. Lindsey, Salt Lake City, Utah, assignor to Arbrook, Inc., Arlington, Tex.

Filed July 17, 1975, Ser. No. 596,791

Int. Cl.<sup>2</sup> A61M 15/00

U.S. Cl. 261—124

28 Claims



1. A fluid reservoir for use in combination with a variety of medical devices including humidifier and nebulizer apparatus, comprising:

means for holding a quantity of fluid, said means having a flexible and collapsible configuration;  
means formed as an integral part of said holding means for providing passage to an end of the interior of said holding means from the other end thereof, said passage means having a flexible and collapsible configuration;  
means formed as an integral part of said holding means for providing access from without said holding means to said interior end passage means;  
means formed as an integral part of said holding means for providing access directly from without said holding means to the interior of said holding means; and  
means connected to said holding means for securing humidifier, nebulizer, and other housings to said holding means.

4,012,473

**NEBULIZER-HUMIDIFIER**

Joseph W. Lindsey, Salt Lake City, and Larry O. Murphy, Bountiful, both of Utah, assignors to Arbrook, Inc., Arlington, Tex.

Filed July 16, 1975, Ser. No. 596,556

Int. Cl.<sup>2</sup> A61M 15/00

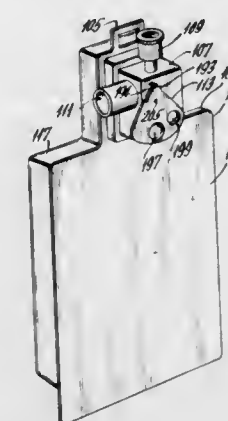
U.S. Cl. 261—142

18 Claims

1. A moisture contributing apparatus for medical oxygen breathing systems connectable intermediate an oxygen supply and a patient breathing apparatus, comprising:

a housing, connected to said oxygen supply and supportable thereby and connected to said patient breathing apparatus, said housing having a plurality of chambers including a first chamber containing a flow through heater, a second chamber containing a nozzle apparatus and an oxygen supply coupling connected thereto, a third exhaust chamber and a fourth transfer chamber, said third exhaust chamber including an air mix valve and an exhaust port, said air mix valve being operable to regulate an atmospheric portal into said third chamber;

a plastic bag suitable for holding a supply of water said bag having a first plastic side, a second plastic side, said first and second sides being joined together at their edges, and passageway means for accessing the interior of said bag,



said first side having a first and second openings therethrough and a mounting boss attached about said openings on the outside of said first side, said bag and said housing being attached together using said mounting boss.

4,012,474

**METHOD FOR PRODUCING BORON CARBIDE SPHERULES**

Harold G. Sowman, Maplewood, and James R. Johnson, White Bear Lake, both of Minn., assignors to General Atomic Company, San Diego, Calif.

Continuation-in-part of Ser. No. 295,825, July 17, 1963, abandoned, which is a division of Ser. No. 256,238, Feb. 15, 1963, Pat. No. 3,163,609, and Ser. No. 256,239, Feb. 5, 1963, abandoned, said Ser. No. 256,238, and Ser. No. 256,239, each is a division of Ser. No. 96,081, March 16, 1961, Pat. No. 3,129,188, which is a continuation-in-part of Ser. No. 838,445, Sept. 8, 1959, abandoned. This application Apr. 5, 1966, Ser. No. 540,197

Int. Cl.<sup>2</sup> B23C 23/00

U.S. Cl. 264—15

4 Claims

1. The method for producing solid spherules of a crystalline boron carbide which comprises the transformation to spherical shape of small irregularly shaped discrete particles of a material of the group consisting of boron carbide and compounds of boron which react with carbon on heating to form boron carbide, said discrete particles being isolated from one another by an isolating medium characterized by low bulk density, resiliency, lack of undesirable reactivity and, when said small irregularly shaped particles are other than boron carbide, by the presence of at least a sufficient amount of carbon to produce boron carbide in addition to the isolating medium, by subjecting said particles in the isolating medium to rapid heating in a non-reactive atmosphere for a sufficient time and at a sufficient intensity to effect formation of boron carbide by reaction with carbon when the particles are other than a carbide and to bring about fusion of the discrete small particles in the isolating medium thereby subjecting said discrete molten particles to the action of surface tension forces inherent in said molten particles and rendering them substantially spherical, and cooling the resultant discrete spherular particles to solidify them.

4,012,475

**METHOD FOR SECTIONING IN A MICROTOME AT LOW TEMPERATURE AND TRIMMING OF THE SPECIMEN TO BE SECTIONED**

Erik Lennart Kindel, Bandhagen, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

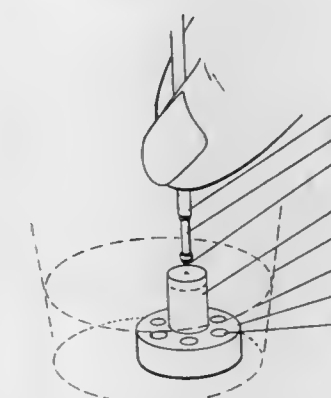
Filed Aug. 23, 1974, Ser. No. 499,899

Claims priority, application Sweden, Aug. 28, 1973, 7311638

Int. Cl.<sup>2</sup> B29B 3/00

U.S. Cl. 264—28

3 Claims



1. Method of preparing a specimen for sectioning by a microtome at low temperature comprising the steps of:  
a. bringing a specimen into contact with a rod;  
b. adhering the specimen to said rod;  
c. manipulating the rod to convey the adhered specimen into contact with a cooled block, said block being provided with a recess having the shape desired to be imparted to said specimen;  
d. and pressing at least a part of said specimen into said recess to freeze said part in said shape.

4,012,476

**MOLDING PROCESS FOR THE MANUFACTURE OF SHAPED CARBON ARTICLES**

Noriaki Mizuma, Tokyo, and Yukikazu Omura, Saitama, both of Japan, assignors to FMC Corporation, Philadelphia, Pa.

Filed July 3, 1972, Ser. No. 268,568

Int. Cl.<sup>2</sup> B29C 25/00; C01B 31/02, 31/04

U.S. Cl. 264—29.1

6 Claims

1. A method of forming shaped carbon products comprising forming a mixture consisting essentially of tar, pitch, finely-divided coke and microcrystalline cellulose in an amount sufficient to improve uniformity of distribution of the mixture under compression but less than 2.0% based on the weight of the combined tar, pitch and coke, and compressing the mixture into a shaped article.

4. The method of claim 1 wherein the shaped article is graphitized.

4,012,477

**METHOD FOR PRODUCING PLASTIC SHEET OR FILM STOCK**

Erich Beck, Worms, Germany; Albert C. Robbins, Alvin, and John C. Birdsall, Houston, both of Tex., assignors to Askco Engineering Corporation, Pasadena, Tex.

Division of Ser. No. 307,058, Nov. 16, 1972, Pat. No. 3,880,564. This application Apr. 11, 1975, Ser. No. 567,256

Int. Cl.<sup>2</sup> B29D 7/02; B29F 3/00

U.S. Cl. 264—176 R

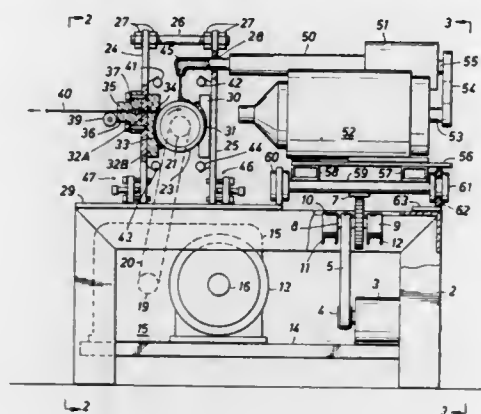
14 Claims

1. A method of producing a thermoplastic sheet material using a single rotating roll extruder rotating in one direction longitudinally between first and second supporting members each having concave confining surfaces, comprising,

depositing a thermoplastic resin in a first substantially semi-circular chamber tapering in the direction of roll rotation and formed by the peripheral surface of said extruder roll and said concave surface of said first supporting member,



accumulating plasticized resin in said first chamber for creating a first pressure therein against said surface of said roll extruder and said first supporting member, squeezing plasticized resin from said first chamber and into a second substantially semi-circular chamber formed by the peripheral surface of said extruder roll and said concave surface of said second supporting member and tapering in the direction of roll rotation into a slot-like extrusion orifice in said second supporting member,



accumulating an equal amount of plasticized resin in said second chamber for establishing and maintaining a second pressure therein against said surfaces of said roll extruder and said second supporting member equal to said first pressure, and squeezing plasticized resin from said second chamber into said extrusion orifice in said second supporting member while maintaining balancing and opposing pressures in said chambers and on said extruder roll and allowing said roll to float between said chambers.

4,012,478

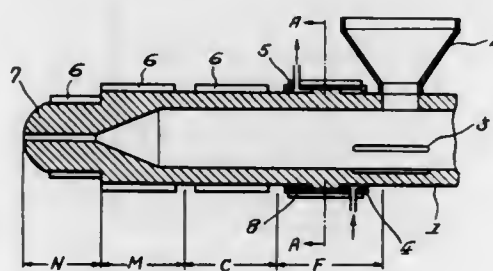
#### METHOD OF MAKING ANTI-FRICTION MEMBERS FROM LUBRICANT-IMPREGNATED POLYAMIDE SYNTHETIC RESIN MATERIALS

Masayuki Horikawa, Oiles Kogyo K.K. Kamataryo 1-28-5 Minami-Rokugo, Kamata, Tokyo; Yataro Takata, 5-402 Nihon Jutaku Kodan Takinoue-Danchi, 120 Takinoue, Naka, Yokohama, and Kikuo Sumiyoshi, Oiles Kogyo K.K. Bente Shataku 4-21-15 Sanno, Ohta, Tokyo, all of Japan  
Continuation-in-part of Ser. No. 36,950, May 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 694,495, Dec. 29, 1967, abandoned. This application June 4, 1973, Ser. No. 366,426

Int. Cl.<sup>2</sup> B29B 1/10, 3/02; B29F 3/02

U.S. Cl. 264-211

11 Claims



1. A method of making bearings or other anti-friction elements by plasticating a lubricant-contained polyamide comprising polyamide and about 2-12 wt. % of a mineral oil lubricant in relation to the total weight of the material uniformly dispersed therein which lubricant is in a liquid state at a normal room temperature, comprising the steps of uniformly mixing at room temperature a polyamide powder having a bulk factor of 2-5 so that an increased amount of lubricant may be added, said polyamide selected from the class consisting of nylon-6 having a melting point of from 215° to 220° C

and an average molecular weight of about 45,000, nylon-6-6 having a melting point of about 255° C and an average molecular weight of about 45,000, nylon-11 having a melting point of from 184° to 185° C and an average molecular weight of about 40,000 and nylon-12 having a melting point of 175° to 177° C at an average molecular weight of about 45,000, molding the resultant molding composition to article form under heat and pressure by use of a screw type injection or extrusion molding machine, controlling the temperature of the feed section of the machine to that of about 50-75 % of the crystalline melting point of the polyamide, the temperature of said feed section of said machine ranges from 80° to 150° plus or minus 3° C, said machine having a compression section, the temperature in said compression section ranging from 175 to 225 plus or minus 3° C, said machine having a metering section, the temperature in said metering section ranging from 192° to 265° plus or minus 3° C, said machine having a nozzle section, the temperature in said nozzle section ranging from 190° to 230° plus or minus 3° C so that an article is provided in which the lubricant oil is uniformly dispersed.

4,012,479

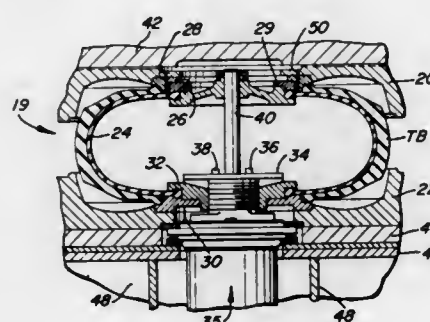
#### METHOD OF FORMING BELTED RADIAL TIRES FROM A CYLINDRICAL TIRE BAND

James Earl Britton, Akron; Joseph L. Grant, North Canton, and John Alan Welch, Cuyahoga Falls, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio  
Filed Nov. 3, 1975, Ser. No. 628,436

Int. Cl.<sup>2</sup> B29H 5/02, 17/14

U.S. Cl. 264-315

11 Claims



1. A method of forming a belted radial tire from a cylindrical radial green tire band of the type having biased corded belts adapted to pantograph and expand circumferentially as the tire band is shaped to be molded into a finished tire without S-ing of the radial cords of the carcass plies under the belts of the finished tire as may be caused by the pantograph action of the belts while the tire band is being expanded into finished shape, the steps comprising:

1. lowering a belted radial green tire band of generally cylindrical shape into a conventional tire molding press over the inflatable curing bladder until the lower bead of the tire band is seated in the lower bead seat of the press, then applying inflation pressure into the curing bladder to a first pressure level while partially closing the press;
2. continuing to apply inflation pressure to a greater second pressure level while continuing to close the press wherein said belts pantograph and circumferentially expand primarily through partially closing the press and applying pressure up to said second pressure level until said tire band has reached a generally circular U-shape;
3. holding the pressure to said second pressure level while the press is in partially open position for a sufficient time interval to retain the belts in expanded position while the carcass cords under the belts stretch to be disposed at substantially 0° with respect to the tire axis;
4. lowering the pressure from said second pressure level to about the same as said first pressure level to permit ready closure of the press about said tire band; and
5. fully closing said press and applying higher molding pressure and temperature to cure the tire band into a finished tire as usual.

4,012,480

#### ISOTOPIC ENRICHMENT OF URANIUM WITH RESPECT TO AN ISOTOPE

Pierre Delvalle, Juvisy sur Orge, France, assignor to Commissariat a l'Energie Atomique, Paris, France  
Filed Feb. 22, 1974, Ser. No. 444,932

Claims priority, application France, Feb. 27, 1973, 73.06881

Int. Cl.<sup>2</sup> C01G 43/00

U.S. Cl. 423-10

18 Claims

1. A process for producing, from a source of uranium containing at least two isotopes, a product containing uranium enriched with respect to said source in one of said isotopes, comprising the steps

providing from said source uranium in valence state III and uranium in valence state IV, uranium in at least one of said valence states being provided in a liquid phase, contacting for isotopic exchange said uranium III with said uranium IV, said contacting effectuating exchange of isotopes between uranium III and uranium IV to enrich the uranium IV in the lighter of said isotopes, and to enrich the uranium III in the heavier of said isotopes, while maintaining said uranium III free of contact with oxidizing conditions effective in oxidizing uranium III to uranium IV.

segregating the uranium IV resulting from said contacting from the uranium III resulting from said contacting.

4,012,481

#### PROCESS FOR THE SEPARATION OF PLATINUM GROUP METALS

John Baltz, Lakewood, and Enzo Coltrinari, Arvada, both of Colo., assignors to PGP Industries, Inc., Sante Fe Springs, Calif.

Filed Nov. 7, 1975, Ser. No. 629,879

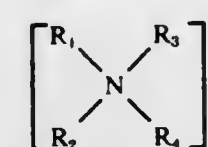
Int. Cl.<sup>2</sup> C01G 55/00

U.S. Cl. 423-22

13 Claims

1. A process for the separation and selective recovery of Rhodium, and/or Ruthenium and Iridium values from an aqueous acidic medium which comprises:

contacting the medium with an organic extraction reagent comprising a water immiscible solvent having dissolved therein an organically substituted quaternary ammonium compound having the structure



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are hydrocarbon groups, said compound being sufficiently soluble in said solvent to make a 1% solution and capable of forming complexes with Iridium and Ruthenium that are preferentially soluble in said solvent and whereby said contacting results in the formation of an organic extract phase and an aqueous raffinate phase, maintaining said medium at an emf between about -500 and -1000 mv during said contacting operation, separating said organic extract phase from said aqueous raffinate phase, contacting said organic extract phase with at least the stoichiometric quantity of an aqueous alkaline stripping agent required for neutralization of the organic extract phase, said contact resulting in the formation of an aqueous phase loaded with Iridium and Ruthenium and a stripped organic phase, and contacting said stripped organic phase and said loaded aqueous phase with a solution consisting of an acidified reducing agent which is at least the stoichiometric equivalent of said alkaline agent.

4,012,482

#### SCRUBBING OF AMMONIA FROM OXIME LIQUID ION EXCHANGE REAGENTS

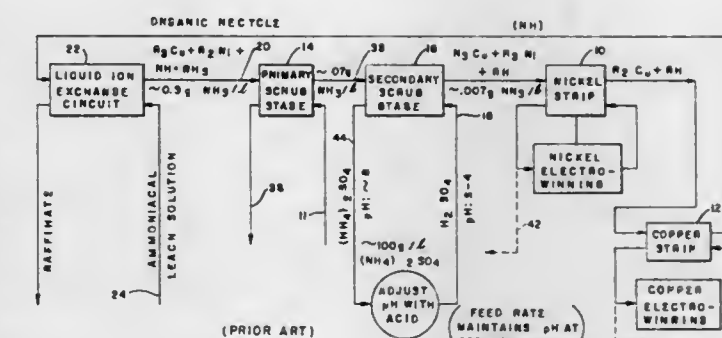
David L. Natwig, Brighton, Mass., and Roald R. Skarbo, Loken Verk, Norway, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed July 21, 1975, Ser. No. 597,550

Int. Cl.<sup>2</sup> C01G 3/00, 51/00, 53/00

U.S. Cl. 423-24

16 Claims



1. A method for scrubbing extracted ammonia from metal bearing oximes in processes in which oximes are utilized to extract metals from ammoniacal leach liquors by solvent extraction comprising contacting the oxime to be scrubbed with an aqueous scrub solution containing a soluble metal that the oxime to be scrubbed can extract, the amount of the metal in the scrub solution being equivalent to the amount of ammonia to be scrubbed from the oxime, said contacting of the oxime with the scrub solution containing the metal eliminating the pH rise of the aqueous scrub liquor associated with acid scrubbing of ammonia from oximes into which ammonia has been extracted.

13. A method for recovering metals from metal acid bleed streams containing metal values by utilizing said bleed streams as an aqueous scrub solution to scrub ammonia from metal bearing oximes containing extracted ammonia in processes in which leached metals are recovered from ammoniacal leach liquors by solvent extraction with oximes comprising the following steps:

- a. adjusting the pH of the bleed stream to serve as the aqueous scrub solution for the ammonia on the oxime to be scrubbed to a value at which the oxime to be scrubbed will extract metal values present in the bleed stream;
- b. contacting the oximes with the acid bleed stream containing metal values which will replace the ammonia on the oxime; and,
- c. maintaining the feed rate of the acid bleed stream so that the amount of extractable metal values and acid in the bleed stream is equivalent to the amount of ammonia to be scrubbed from the oxime,

said contacting of the oxime with the bleed stream scrubbing ammonia from the oxime and preventing the pH of the bleed stream scrub solution to drop to a value below which the oxime will not extract the metal from the bleed stream which replaces the ammonia on the oxime.

14. The method as set forth in claim 13 wherein the bleed stream contains a metal selected from the group consisting of nickel, cobalt and mixtures thereof and wherein said pH of the bleed stream to serve as the aqueous scrub solution for the ammonia is allowed to rise to a value of about 6.



4,012,483

## SEPARATION OF COBALT FROM NICKEL IN AMMONIACAL SOLUTIONS USING 8-HYDROXYQUINOLINES

William S. Kane, Wicomic, and Paul H. Cardwell, Zanoni, both of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Continuation of Ser. No. 453,297, March 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 279,901, Aug. 11, 1972, abandoned, which is a continuation of Ser. No. 40,730, May 26, 1970, abandoned. This application Nov. 17, 1975, Ser. No. 632,201  
Int. Cl.<sup>2</sup> C01G 51/00, 53/12, 3/00

U.S. Cl. 423—24

20 Claims

18. Method of obtaining cobalt value substantially free from nickel value from a pregnant aqueous ammoniacal solution, comprising dissolved nickel, cobalt and copper value, and containing sufficient dissolved ammonia to maintain the nickel and cobalt dissolved in the aqueous solution, the pregnant aqueous solution having a pH in the range of at least about 9, and comprising dissolved ammonium ion and chloride ion, representing an ammonium chloride concentration of at least about 20 grams/liter, the process comprising:

contacting the pregnant aqueous solution with an organic liquid ion exchange medium comprising an ion exchange agent selected from the group consisting of 7-hydrocarbon-substituted-8-hydroxyquinolines while maintaining the aqueous solution at a pH of at least about 9, to form an organic extract phase containing the cobalt value and the copper value and an aqueous phase depleted in cobalt and copper value; separating the organic extract phase from the aqueous phase; contacting the organic extract phase with a weakly acid aqueous solution containing sufficient amount of hydrogen ions to selectively exchange the copper from the organic phase, to form an aqueous phase containing the copper value and an organic phase depleted in copper value; and separating the aqueous phase from the organic phase; whereby cobalt is obtained in the organic phase.

4,012,484

## CHROMITE RECOVERY FROM CHROMITE-BEARING ORE

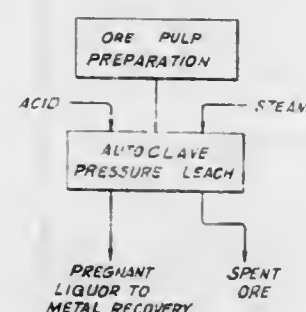
Guy W. Lussiez, Broomfield, Colo., assignor to Amax Inc., New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,423

Int. Cl.<sup>2</sup> C01G 37/14, 51/10, 53/10

U.S. Cl. 423—53

13 Claims



3. A method of extracting chromium from nickel and cobalt-containing lateritic ore having a size fraction of over 20 microns and ranging up to about 3 mesh while extracting said nickel and cobalt which comprises,

mixing with said ore an amount of an oxidizing agent selected from the group consisting of  $Mn^{++}$ ,  $MnO_4^{-1}$  and  $S_2O_8^{-2}$  at least stoichiometrically sufficient to oxidize chromium substantially to the hexavalent state, forming an aqueous slurry of said ore mixture with an acid solution containing 10 to 30 normal sulfuric acid with an acid to ore ratio by weight of about 5:1 to 25:1, and then subjecting said slurry to leaching at a temperature of about 150° C to 300° C and a pressure of about 70 psig to 1200 psig and thereby leach said chromium therefrom.

9. A method of extracting chromium from nickel and cobalt-containing lateritic ore while extracting said nickel and cobalt which comprises,

sizing said ore to provide a size fraction of fines below 20 microns in which substantial amounts of the chromium are acid-soluble in dilute sulfuric acid solution and also provide a coarse fraction falling within the range of over 20 microns and ranging up to about 3 mesh in which a substantial amount of chromium is insoluble in said dilute sulfuric acid,

mixing with said coarse fraction an amount of an oxidizing agent selected from the group consisting of  $Mn^{++}$ ,  $MnO_4^{-1}$  and  $S_2O_8^{-2}$  at least stoichiometrically sufficient to oxidize chromium substantially to the hexavalent state, forming an aqueous slurry of said coarse fraction mixture with an acid solution containing 10 to 30 normal sulfuric acid and having an acid to ore ratio by weight of at least 3:1,

subjecting said slurry to leaching at a temperature of about 150° C to 300° C at a pressure of about 70 psig to 1200 psig to leach said chromium therefrom, and form a pregnant solution containing said chromium and an insoluble residue,

separating said pregnant solution from said insoluble residue,

forming an aqueous pulp of said fines fraction,

mixing with said fines fraction an amount of an oxidizing agent selected from the group consisting of  $Mn^{++}$ ,  $MnO_4^{-1}$  and  $S_2O_8^{-2}$  sufficient to oxidize chromium to substantially the hexavalent state,

mixing said pregnant solution with said fines fraction pulp to dilute the acid content thereof to not more than 10 normal and provide an acid to ore ratio in said fines fraction of about 0.1 to 0.5 by weight,

and then subjecting said pulp of fines fraction to pressure leaching at an elevated pressure and temperature to extract said soluble chromium from said fines fraction,

thereby producing a final pregnant solution containing substantially said chromium extracted from both the fines fraction and said coarse fraction.

4,012,485

## PROCESS FOR TREATING EXHAUST GAS FROM INTERNAL COMBUSTION ENGINE OVER CATALYST COMPRISING NICKEL, RHODIUM, AND MONOLITHIC CERAMIC SUPPORT

Garbis H. Meguerian, Olympia Fields; Eugene H. Hirschberg, Park Forest, and Frederick W. Rakowsky, Naperville, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 336,256, Feb. 27, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,353

Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—213.5

26 Claims

1. A process for treating an exhaust gas from an internal combustion engine, which process comprises operating the engine under fuel-rich conditions so that the exhaust gas from the engine includes at least 0.8 volume percent carbon monoxide and the ratio of carbon monoxide to oxygen in the exhaust gas exceeds about 1; and passing the exhaust gas through a reduction zone maintained at a temperature of about 700° to about 1,800° F. so that nitrogen oxide gases in said exhaust gas react with the carbon monoxide and other reducing agents in said exhaust gas, said zone including a catalyst comprising a nickel component, a rhodium component, and a monolithic ceramic support for said nickel component and said rhodium component, said nickel component being present in an amount ranging from 2.5 to 12 wt.%, expressed as the metal and based on total catalyst weight, and comprising at least 75 wt.% of the total active metals present, and said rhodium component being present in an amount ranging from 0.01 to 0.8 wt.%, expressed as the metal and based on total catalyst weight, said catalyst being prepared by sequentially applying in the order specified hereinbelow to

said monolithic ceramic support first a solution containing a dissolved salt of nickel and second a solution containing a dissolved salt of rhodium, the application of each solution being followed by the removal of the diluent of that solution by drying to deposit on the support the salt of that solution and the calcination of the support with the salt of that solution thereon, said calcination being conducted in air at a temperature of about 1,000° to 1,500° F.

4,012,486

## PROCESS FOR REDUCING THE TOTAL SULFUR CONTENT OF CLAUD OFF-GASES

David M. Singleton, Seabrook, Tex., assignor to Shell Development Company, Houston, Tex.

Filed July 2, 1975, Ser. No. 592,447

Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—224

11 Claims

1. In a process for the oxidation of  $H_2S$  to  $SO_2$  in a gaseous stream containing  $H_2S$  wherein the gaseous stream is contacted with a stoichiometric excess of oxygen with respect to the  $H_2S$  at a temperature of from 150° to 450° C in the presence of a catalyst, the improvement wherein the catalytically active component of the catalyst consists of Bi.

4,012,487

PROCESS FOR THE REMOVAL OF  $SO_2$  FROM A STACK GASGeorge G. Merkl, 46 Sunset Court, Haworth, N.J. 07641  
Continuation-in-part of Ser. No. 346,772, April 2, 1973, which is a continuation-in-part of Ser. No. 86,364, Nov. 2, 1970, abandoned, and a continuation-in-part of Ser. No. 515,311, Oct. 16, 1974, abandoned, which is a continuation of Ser. No. 238,290, March 27, 1972, abandoned. This application July 22, 1975, Ser. No. 598,170Int. Cl.<sup>2</sup> C01B 17/00, 17/72; C09K 3/00

U.S. Cl. 423—242

29 Claims

1. A process for removing  $SO_2$  from an  $SO_2$ -containing gas which comprises:

contacting said  $SO_2$ -containing gas, in an absorption zone, with a liquid absorptive medium, to thereby absorb the  $SO_2$  of said  $SO_2$ -containing gas and produce an  $SO_2$ -enriched absorptive medium, said liquid absorptive medium being prepared by contacting, in an aqueous medium:

- activated aluminum comprising aluminum metal which has been permeated with a second metal selected from:
  - mercury;
  - indium;
  - gallium; and
  - indium/gallium alloys; and

b. a source of  $SO_2$ , whereby the aluminum of said activated aluminum erodes in said aqueous medium and reacts with the  $SO_2$  of said source of  $SO_2$  and hydrogen atoms liberated from the aqueous medium by said activated aluminum, to thereby from said absorptive medium.

4,012,488

## PROCESS FOR THE TREATMENT OF SULFUR AND NITROGEN OXIDES FORMED DURING POWER GENERATION

Jack Brocoff, Fullerton, Calif., assignor to Ralph M. Parsons Company, Pasadena, Calif.

Filed Mar. 13, 1974, Ser. No. 450,550

Int. Cl.<sup>2</sup> C01B 17/00, 17/16, 21/00; F23J 7/00

U.S. Cl. 423—244

15 Claims

1. A process for elimination of at least the oxides of sulfur and the oxides of nitrogen from flue gases formed in the combustion zone of the boiler of power generating apparatus which consumes sulfur bearing fossil fuels which comprises:

a. combusting the sulfur bearing fossil fuel in the combustion zone in presence of excess air to form a high temperature flue gas containing oxides of carbon, oxides of sulfur, oxides of nitrogen, water and uncombined oxygen;

b. combining an atomized hydrocarbon fuel with the high temperature flue gas to generate a hydrogen containing reducing gas in an amount at least sufficient to consume substantially all of the uncombined oxygen contained in the high temperature flue gas;

c. cooling the high temperature flue gas in said boiler to extract heat values therefrom;

d. catalytically converting at least the contained oxides of sulfur to hydrogen sulfide and the oxides of nitrogen to a nitrogen compound selected from the group consisting of nitrogen, ammonia and mixtures thereof by passing the cooled flue gas and a hydrogen containing reducing gas at temperatures of from about 300° F. to about 800° F through a catalytic conversion zone containing a catalyst capable of converting the oxides of sulfur to hydrogen sulfide and the oxides of nitrogen to nitrogen and ammonia;

e. extracting the formed hydrogen sulfide from the flue gas stream and venting the flue gas stream to the atmosphere.

4,012,489

## PROCESS FOR THE PREPARATION OF URANIUM DIOXIDE

George W. Watt, Austin, Tex., and Daniel W. Baugh, Jr., Baton Rouge, La., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed May 21, 1975, Ser. No. 579,494

Int. Cl.<sup>2</sup> C01G 43/02

U.S. Cl. 423—261

16 Claims

1. A process for the preparation of an actinide dioxide comprising the steps of:

a. reacting an actinide nitrate hexahydrate selected from the group consisting of uranyl nitrate hexahydrate, plutonyl nitrate hexahydrate and neptunyl nitrate hexahydrate with sodium dithionite to yield a sulfite containing reaction product of the corresponding actinide; and

b. heating the reaction product resulting from step (a) in the absence of an oxygen-containing atmosphere to obtain the actinide dioxide.

4,012,490

## REMOVING RADIOACTIVE NOBLE GASES FROM NUCLEAR PROCESS OFF-GASES

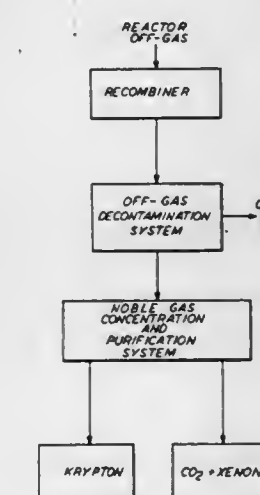
Antony Lofredo, Springfield, N.J., assignor to Airco, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 275,017, July 25, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,657

Int. Cl.<sup>2</sup> C01B 23/00; F25J 3/00; G21F 9/02

U.S. Cl. 423—262

19 Claims



19. In a process for removing radioactive krypton and xenon from a gaseous feed stream that consists mainly of air and radiolytic hydrogen and oxygen, the method which comprises:

a. initially removing radiolytic oxygen by catalytic reaction from the feed stream;



- b. directing the stream containing atmospheric oxygen and nitrogen through adsorber means for removing xenon and carbon dioxide therefrom;
- c. feeding the remainder of the stream including hydrogen, radioactive krypton and atmospheric oxygen and nitrogen to a first cryogenic distillation column for separating and liquefying the krypton and oxygen;
- d. combining said separated oxygen with hydrogen to form water and subsequently removing said water;
- e. feeding the separated krypton to a second cryogenic distillation column for concentrating the krypton therein;
- f. returning the effluent gas from the second column to the inlet of the first column for concentrating all the krypton within a closed loop;
- g. collecting the concentrated krypton from the second column for storage;
- h. eluting the xenon together with the carbon dioxide from the adsorber means by distillation effluent gas from one of said columns and separating the xenon and carbon dioxide from the effluent for storage; and
- i. returning the eluted gas to be reprocessed to prevent loss of radioactive gas.

4,012,491

## PHOSPHATE PROCESS

Douglas Oliver Hauge, Lafayette, Calif., assignor to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 190,511, Oct. 19, 1971, Pat. No. 3,919,395, which is a continuation-in-part of Ser. No. 90,542, Nov. 18, 1970, abandoned. This application Oct. 25, 1974, Ser. No. 518,128

Int. Cl.<sup>2</sup> C01B 15/16, 25/26, 25/16

U.S. Cl. 423—309

13 Claims

1. A process for the recovery of phosphate values by chemical leaching from a phosphatic-mineral-containing source material comprising the steps of:
  1. forming an aqueous leach acid mixture of sulfuric acid and a second acid selected from the group essentially consisting of hydrochloric acid and nitric acid, in approximate proportions of about  $\frac{3}{4}$  mole of the second acid, about  $1\frac{1}{2}$  mole sulfuric acid and about  $52\frac{1}{2}$  moles water;
  2. mixing the leach acid with crushed phosphatic-mineral-containing source in approximate proportions on the order of about 13.7–16.7 tons leach acid per ton of  $P_2O_5$  in the phosphorus-mineral-containing source;
  3. withdrawing a phosphoric acid leach liquor containing about 5–7%  $P_2O_5$ ;
  4. in a step-wise precipitation and concentration; raising the pH of the leach liquor to about 2–3 to precipitate impurities, and separating the impurities precipitated; and then raising the pH of the leach liquor to about 3–5 to precipitate calcium phosphate, and separating the precipitated calcium phosphate.

4,012,492

## SYNTHESIS OF ANHYDROUS METAL PERCHLORATES

Carl J. Schack, Chatsworth, and Donald Pilipovich, Agoura, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 10, 1975, Ser. No. 585,549

Int. Cl.<sup>2</sup> C01B 7/02, 11/00; C01G 23/00, 37/00, 31/00

U.S. Cl. 423—472

5 Claims

1. A method of preparing an anhydrous metal perchlorate which comprises admixing for at least 4 hours at a temperature from  $-45^\circ\text{C}$  to  $20^\circ\text{C}$  an anhydrous metal chloride selected from the class consisting of titanium tetrachloride, chromyl chloride, and vanadium oxytrichloride with chlorine perchlorate in a metal chloride-to-chlorine perchlorate mole ratio which is 1:4 if titanium tetrachloride is selected, or is 1:2 if chromyl chloride is selected, or is 1:3 if vanadium oxytrichloride is selected, and recovering said anhydrous metal perchlorate.

4,012,493

## PREPARATION OF METAL FLUORIDES

Gilbert S. Layne, and James O. Huml, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 000,445, Jan. 2, 1970, abandoned. This application June 23, 1972, Ser. No. 265,781 Int. Cl.<sup>2</sup> C01B 9/08; C01F 5/28; C22B 5/02; C01B 31/18

U.S. Cl. 423—489

12 Claims

1. A process for simultaneously preparing metal and metal fluoride products which comprises:
  - a. reacting in a reaction zone a molten mixture containing at least one metal oxide, at least one metal fluorinating agent selected from the group consisting of a fluoride of iron, lead or copper, and carbon, said reactants provided in an amount to establish a fluoride atom to oxygen atom ratio of the reactants ranging from about 0.1 to less than 2 times the valence of the cation of the metal fluorinating agent to produce a metal fluoride product containing the cation of the metal oxide reactant, elemental metal from the cation of said fluorinating agent, and a gaseous oxide of carbon, said fluorinating agent having a Gibbs Free Energy computed on an equivalent fluoride basis which is greater than the Gibbs Free Energy of the metal fluoride product, and
  - b. separating said reaction products from each other.

4,012,494

## DIRECT RADIOIMMUNOASSAY FOR ANTIGENS AND THEIR ANTIBODIES

Chung-Mei Ling, Highland Park, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 210,510, Dec. 21, 1971, Pat. No. 3,867,517. This application June 17, 1974, Ser. No.

480,180

Int. Cl.<sup>2</sup> G01N 33/00, 33/16; G21H 5/02

U.S. Cl. 424—1

11 Claims

1. A method for determining the presence of a hepatitis associated antigen or its antibody in an unknown sample utilizing direct radioimmunoassay comprising:
  - a. forming a solution of a hepatitis associated antigen or antibody;
  - b. affixing the antigen or antibody contained in said solution to a test apparatus;
  - c. incubating said test apparatus to affix said antigen or antibody to said test apparatus as a first layer;
  - d. washing said incubated affixed test apparatus to remove any unaffixed antigen or antibody;
  - e. placing said unknown sample in contact with said incubated and washed test apparatus;
  - f. including said unknown sample while in contact with said washed test apparatus to bond any of said antibody or antigen present in said unknown sample as a second layer to said antigen or antibody layer on said test apparatus, respectively;
  - g. washing said incubated test apparatus to remove any unbound antibody or antigen in said unknown sample;
  - h. contacting said washed test apparatus with said antigen or antibody labeled with a radioactive isotope;
  - i. incubating said washed test apparatus while in contact with said antigen or antibody labeled with a radioactive isotope so as to bond said radioactive form of said unknown antibody or antigen, respectively, bonded on said test apparatus and thereby produce a radioactively traced incubated coating as a third layer;
  - j. washing said radioactively traced incubated coating to remove any unbound radioactively-labeled antigen or antibody;
  - k. placing a control sample in contact with another incubated and washed test apparatus also prepared according to steps (a) through (d);
  - l. incubating said control sample while in contact with said coated test apparatus to bond any of said antibody or antigen present in said control sample as a second layer to

- said antibody or antigen layer on said test apparatus, respectively;
- m. washing said incubated test control apparatus to remove any unbound antibody or antigen in said control sample;
- n. contacting said washed test control apparatus with a form of said antigen or antibody labeled with a radioactive isotope;
- o. incubating said washed test control apparatus while in contact with said form of said antigen or antibody labeled with a radioactive isotope so as to bond said radioactive form to said coated antibody or antigen, respectively, bonded on said test apparatus and thereby produce a radioactivity traced incubated coating as a third layer;
- p. washing said radioactively traced incubated coating to remove any unbound radioactively-labeled antigen or antibody;
- q. counting radiation emitted from said radioactively traced incubation coating of step (j); and
- r. comparing the number of counts from said coating of step (j) with the number of counts from the control sample prepared by steps (k) to (p).

4,012,495

## 4-(POLYALKOXYPHENYL)-2-PYRROLIDONES

Ralph Schmiechen; Reinhard Horowski; Dieter Palenschat; Gert Paschelke; Helmut Wachtel, and Wolfgang Kehr, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Mar. 20, 1975, Ser. No. 560,193

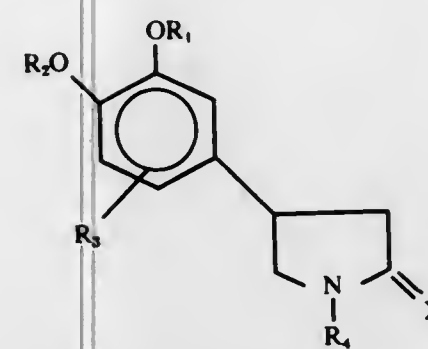
Claims priority, application Germany, Mar. 20, 1974, 2413935

Int. Cl. A61k 31/40

U.S. Cl. 424—274

58 Claims

1. A pharmaceutical composition for the treatment of neurological and psychic disorders responsive to chlorpromazine therapy and characterized by one or more of the symptoms of anxiety, hostility, aggression, withdrawal, hallucination, thought-disturbances, delusion and agitation, comprising, in admixture with a pharmaceutically acceptable carrier, an amount per dosage unit from 0.05–20 mg. effective to reduce the symptoms of such disorders, of a 4-(polyalkoxyphenyl)-2-pyrrolidone of the formula



wherein  $R_1$  and  $R_2$  each are hydrocarbon of up to 18 carbon atoms or alkyl of 1–5 carbon atoms substituted by one or more halogen atoms or by one hydroxy, carboxy, alkoxy of 1–5 carbon atoms, alkoxy-carbonyl of 1–5 carbon atoms in the alkoxy group, carboxamido, alkylcarboxamido, dialkylcarboxamido, carboxycyclicamido, amino, alkylamino, dialkyl or alkyleneimino, wherein alkyl in each instance is of 1–5 carbon atoms and wherein the nitrogen atom of the cyclicamido and alkyleneimino groups is a ring member of alkyleneimino of 4 to 7 members or  $R_1$  or  $R_2$  collectively are alkylene of 1–3 carbon atoms;  $R_3$  is a hydrogen atom or methoxy;  $R_4$  is a hydrogen atom, alkyl of 1–5 carbon atoms, phenyl, naphthyl, tolyl, xylyl or alkanoyl of 1–6 carbon atoms; and X is an oxygen atom or a sulfur atom.

4,012,496

## VAGINAL RING

Gisela Schöpflin; Gerhard Laudahn; Barbara Mühe; Heidemarie Hartmann, and Fred Windt, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

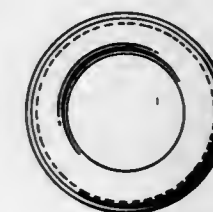
Filed Oct. 17, 1975, Ser. No. 623,487

Claims priority, application Germany, Oct. 18, 1974, 2450107; Aug. 21, 1975, 2537585

Int. Cl.<sup>2</sup> A61K 9/00

U.S. Cl. 424—15

13 Claims



1. A composite vaginal ring containing a safe and effective amount of a pharmaceutically active medicament, consisting essentially of:
  - a. a supporting, medicament-free vaginal ring consisting essentially of a physiologically acceptable synthetic resin selected from the group consisting of organopolysiloxane elastomers, polyamides, natural and synthetic rubber, polyesters, polytetrafluoroethylene and polyethylenes and having a continuous encircling pocket-like indentation along the outer edge of the annular surface along the central plane thereof adapted to mate with a corresponding smaller, medicament-containing outer encircling annular vaginal ring segment; and
  - b. a smaller, vaginal medicament-containing outer encircling annular vaginal ring adapted to mate with the continuous encircling pocket-like indentation in the modified annular surface of said supporting, medicament-free vaginal ring along the central plane thereof and consisting essentially of a safe and effective amount of a pharmaceutically active nonionic, lipophilic vaginal drug dissolved or uniformly suspended in as elastomeric, cross-linked LTV linear dimethylpolysiloxane resin.

4,012,497

## DRUG EXCIPIENT OF SILICONE RUBBER

Gisela Schöpflin, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Sept. 23, 1975, Ser. No. 616,001

Claims priority, application Germany, Sept. 24, 1974, 2445971

Int. Cl.<sup>2</sup> A61K 9/00

9 Claims

U.S. Cl. 424—22

1. A non-toxic sustained release pharmaceutical composition in the form of a shaped object having a Shore A hardness of 45–70, consisting essentially of a safe and pharmaceutically active amount of a nonionic lipophilic drug having a dissociation constant of less than  $10^{-7}$  and which is olefinically or acetylenically unsaturated and soluble in ether, chloroform or benzene, said drug being dissolved or uniformly suspended in a non-toxic vulcanized LTV linear dimethylpolysiloxane elastomer and said composition being prepared by reacting, at an elevated temperature and in contact with a catalytic amount



of a platinum-based vulcanization catalyst capable of catalyzing the reaction between silicon-linked hydrogen residues and silicon-linked vinyl residues a mixture of said drug and a vulcanizable composition consisting essentially of:

- a. a polydimethylsiloxane having vinyl groups on both ends;
- b. a copolymer consisting essentially of  $\text{SiO}_2$  units,  $(\text{CH}_3)_2\text{SiO}_{0.5}$  units, Vinyl  $(\text{CH}_3)_2\text{SiO}_{0.5}$  units; and
- c. a cross-linking Si-H component, consisting essentially of  $(\text{CH}_3)_3\text{SiO}_{0.5}$  units,  $(\text{CH}_3)_2\text{SiO}$  units and  $\text{CH}_3\text{HSiO}$  units.

4,012,498

**SUSTAINED RELEASE TABLET FORMULATIONS**

Saul S. Kornblum, Springfield, and Samuel B. Stoopak, West Caldwell, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 455,185, March 27, 1974, abandoned. This application Feb. 19, 1976, Ser. No. 655,838 Int. Cl.<sup>2</sup> A61K 9/22, 9/26

U.S. Cl. 424—22 12 Claims  
1. A three component sustained release medicament formulation comprising;

- a first component comprising phenobarbital and belladonna levoratory alkaloids incorporated into an immediate release portion;
- a second component comprising belladonna levoratory alkaloids incorporated into a separate basic pH affected controlled release matrix; with phenobarbital, microcrystalline cellulose, and calcium sulfate also incorporated into a separate control release vinyl acetate-vinyl alcohol copolymer resin matrix; and
- a third component comprising phenobarbital and belladonna levoratory alkaloids each incorporated into a separate control release vinyl acetate-vinyl alcohol copolymer resin matrix.

4,012,499

**CYCLIC SULPHUR COMPOUNDS**

Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Raleigh, N.C.

Continuation-in-part of Ser. No. 361,523, May 18, 1973, Pat. No. 3,905,989. This application June 12, 1975, Ser. No. 586,426

Claims priority, application United Kingdom, May 19, 1972, 23805/72; Sept. 6, 1972, 41429/72; May 4, 1973, 21174/73 Int. Cl.<sup>2</sup> A61K 9/14, 31/41

U.S. Cl. 424—46 27 Claims

1. A method for the treatment or prophylaxis of an allergic condition of a mammal comprising administration to the mammal of a therapeutically or prophylactically effective anti-allergic dose of a tricyclic compound selected from 3-(5-tetrazolyl) thioxanthone-10,10-dioxide, and pharmaceutically acceptable salt of said compound.

4,012,500

**METHOD AND COMPOSITION TO INHIBIT SYMPTOMS OF ALLERGY**

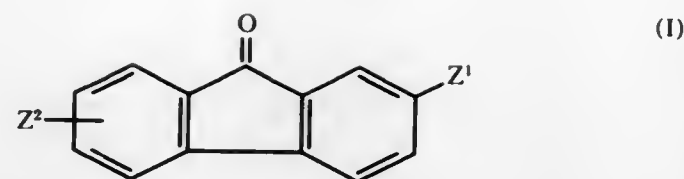
Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 394,423, Sept. 5, 1973, Pat. No. 3,939,173. This application Nov. 24, 1975, Ser. No. 634,450 Claims priority, application United Kingdom, Sept. 6, 1972, 41431/72; Feb. 20, 1973, 8200/73

Int. Cl.<sup>2</sup> A61K 9/14, 31/41

U.S. Cl. 424—46 30 Claims

1. A method of inhibiting the symptoms of asthma or allergic rhinitis in a mammal susceptible to asthma or allergic rhinitis, which comprises administering to said mammal a prophylactically effective non toxic amount of a compound of formula (1)



wherein  $Z^1$  and  $Z^2$  are each a 5-(1-R)tetrazolyl or a 5-(2-R)tetrazolyl in which R is hydrogen or alkyl having 1 to 6 carbon atoms or a pharmaceutically acceptable salt of said compound.

4,012,501

**HAIR-CARE COMPOSITION CONTAINING A THERMOPLASTIC POLYMER**

Elliott Farber, St. Louis Park, Minn., assignor to La Maur Inc., Minneapolis, Minn.

Filed May 8, 1975, Ser. No. 575,653

Int. Cl.<sup>2</sup> A61K 7/11

U.S. Cl. 424—47 23 Claims

1. In a hair-care composition comprising an ethanolic cosmetic vehicle and between about 1 and 20% by weight, based on the total weight of said composition, of film-forming thermoplastic resinous polymeric material distributed in said vehicle, the improvement wherein said polymeric material in dried condition is resistant to softening by humidity, is insoluble in water alone but is dispersible in water having a cosmetic pH, from an acid pH through an alkaline pH, is soluble in ethanol, and consists essentially of the addition free-radical polymerization product of, by weight percent: 1 to 20% of 1,1 dimethyl-1,2-hydroxypropyl amine methacrylimide; 8 to 45% of N-vinyl pyrrolidone; and 35 to 89% of vinyl acetate.

4,012,502

**SNAKE VENOM INHIBITOR MATERIAL AND METHOD OF PURIFICATION**

Van B. Philpot, Jr., P.O. Box 312, Houston, Miss. 38851

Continuation-in-part of Ser. No. 399,469, Sept. 21, 1973, abandoned, which is a continuation of Ser. No. 239,327, March 29, 1972, abandoned. This application Apr. 10, 1975, Ser. No. 566,995

Int. Cl.<sup>2</sup> A61K 35/14, 35/58

U.S. Cl. 424—98 8 Claims

1. A method of purifying snake blood serum to obtain an inhibitor of snake venom, said method consisting essentially of,

forming a precipitate in snake blood serum by reacting said serum, at a pH below about pH 3, with a quantity of a strong acid or inorganic salt pH lowering material reactive with protein material contained in said extract in an amount sufficient to form a precipitate, removing said precipitate from the thus treated serum, and removing traces of said pH lowering material that may remain in the supernatant liquid to obtain a liquid substantially free of antigenic protein material.

4,012,503

**COATING COMPOSITIONS USED TO CONTROL BARNACLES**

Aaron Freiman, Brooklyn, N.Y., assignor to M & T Chemicals Inc., Greenwich, Conn.

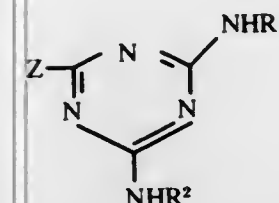
Continuation-in-part of Ser. No. 355,403, April 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 142,041, May 10, 1971, abandoned. This application June 11, 1975, Ser. No. 586,074

Int. Cl.<sup>2</sup> A01N 11/00

U.S. Cl. 424—145 2 Claims

1. A coating composition for inhibiting the development of barnacles on substrates exposed to a marine environment, said composition comprising 1) a carrier which in turn comprises

rosin and a film-forming vinyl polymer, 2) at least one pigment, 3) at least one organic liquid for dissolving and dispersing the solid components of said composition, and 4) an effective amount of toxicant composition consisting essentially of between 10 and 15%, based on the total weight of said composition, of tri-n-butyltin fluoride, between 5 and 10% by weight of zinc oxide and between 3 and 10% by weight of a triazine



selected from the group consisting of 2-ethylamino-4-isopropylamino-6-methylthio-s-triazine and 2-chloro-4-ethylamino-6-isopropylamino-s-triazine.

4,012,504

**IODINE MINERAL OIL SOLUTION FOR PREVENTING BOVINE MASTITIS**

Clyde S. Eckols, Kenedy, Tex., assignor to Velvet Chemical Co., Kenedy, Tex.

Continuation-in-part of Ser. No. 252,746, May 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 194,007, Oct. 29, 1971, abandoned. This application June 30, 1975, Ser. No. 591,940

Int. Cl.<sup>2</sup> A61K 33/18

U.S. Cl. 424—150 16 Claims

1. A process for treating cows to control the spread of bovine mastitis, prevent chapping and chafing of cow teats and aid the healing of teat cuts and abrasions comprising applying to the cow teats a composition consisting essentially of mineral oil containing 0.2 to 7% by weight iodine dissolved therein.

9. A teat dip for controlling the spread of bovine mastitis consisting essentially of mineral oil, about 0.2 to 7% by weight iodine dissolved in said oil, not less than 2 grams per gallon teat dip of polyoxyethylene cetyl ether, and at least sufficient water to dissolve said polyoxyethylene cetyl ether.

4,012,505

**ANALGESIC SUBSTANCE DERIVED FROM THE HELLEBORUS PLANT AND METHOD OF MAKING SAME**

Vasile Boici, Timisoara, Romania, assignor to Intreprinderea de Medicamente Terapia, Romania, Cluj-Napoca, Romania

Filed Nov. 26, 1975, Ser. No. 635,636

Int. Cl.<sup>2</sup> A61K 35/78

U.S. Cl. 424—195 3 Claims

1. A method of making a locally applicable analgesic composition which comprises the steps of:

- a. extracting stems and roots of the Helleborus species of one Ranunculaceae genus with alcohol in a ratio of the part of the plant material to 2-3 parts of the alcohol at about room temperature to form a raw extract;
- b. treating said raw extract with concentrated hydrochloric acid in a ratio of one part of the acid to 10 parts of the extract, thereby forming a precipitate therein;
- c. decoloring the filtrate resulting from the separation of the liquid from the precipitate formed in step (b) with active carbon and neutralizing the decolorized filtrate to a pH of about 6.5 to 7 with about 10% sodium hydroxide; and
- d. diluting the solution formed in step (c) with distilled water to bring the sodium chloride concentration thereof to a substantially isotonic concentration, thereby constituting of said solution, said composition.

4,012,506

**PYRIMIDYL THIO- AND DITHIO-PHOSPHORIC ACID ESTERS**

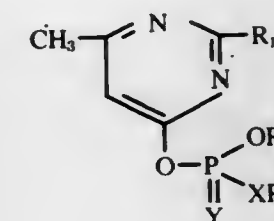
David E. Balke, Mobile, Ala., and Ward H. Oliver, La Place, La., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 3, 1975, Ser. No. 593,144

Int. Cl.<sup>2</sup> C07F 9/65; A01N 9/36

U.S. Cl. 424—200 12 Claims

1. A compound of the formula



wherein  
 $R_1$  represents a  $C_3$  to  $C_6$  cycloalkyl group,  
 $R_2$  and  $R_3$  each represents a  $C_1$  to  $C_3$  alkyl group, and  
 $X$  and  $Y$  each represent oxygen or sulfur.

4,012,507

**VAPOR PHASE PROCESS TO IMPART SMOLDER RESISTANCE TO COTTON BATTING AND OTHER CELLULOSIC MATERIALS**

Nestor B. Knoepfler; John P. Madacsi, both of New Orleans, and Julius P. Neumeyer, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 5, 1975, Ser. No. 555,487

Int. Cl.<sup>2</sup> C09K 3/28; C23C 13/04

U.S. Cl. 427—212 4 Claims

1. A process for imparting smolder resistance to a cellulosic material which process comprises contacting a cellulosic material having a water content of at least 0.1 percent with vapors of a system which consists of methanol, boric acid, methyl borate, and water having a boiling point of about 68°C and which reacts with the water present in the cellulosic substrate to form boric acid, maintaining the cellulosic material and vapors in contact between 1 and 120 minutes and temperatures at which the contact is conducted being maintained between 18° and 71° C so that the cellulosic material is rendered smolder resistant.

4,012,508

**TOPICAL COMPOSITION AND METHOD**

Verna M. Burton, 1223 Lincoln Road, Rte. 7, Allegan, Mich. 49010

Filed Feb. 3, 1975, Ser. No. 546,813

Int. Cl.<sup>2</sup> A61K 31/605, 31/56

U.S. Cl. 424—235 18 Claims

1. A composition for topical use in treatment of corns, warts, and athlete's foot, the composition comprising an effective amount of a cortical steroid intimately mixed with an effective amount of aspirin, and a carrier of oils, creams or jellies, wherein the relative proportion of aspirin is substantially greater than the portion of the cortical steroid in the composition.



4,012,509

## COMPOSITION OF MATTER AND PROCESS

Fred R. Frank, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 477,765, June 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 218,480, Jan. 17, 1972, Pat. No. 3,823,237, which is a continuation-in-part of Ser. No. 210,232, Dec. 20, 1971, abandoned. This application July 3, 1975, Ser. No. 592,821

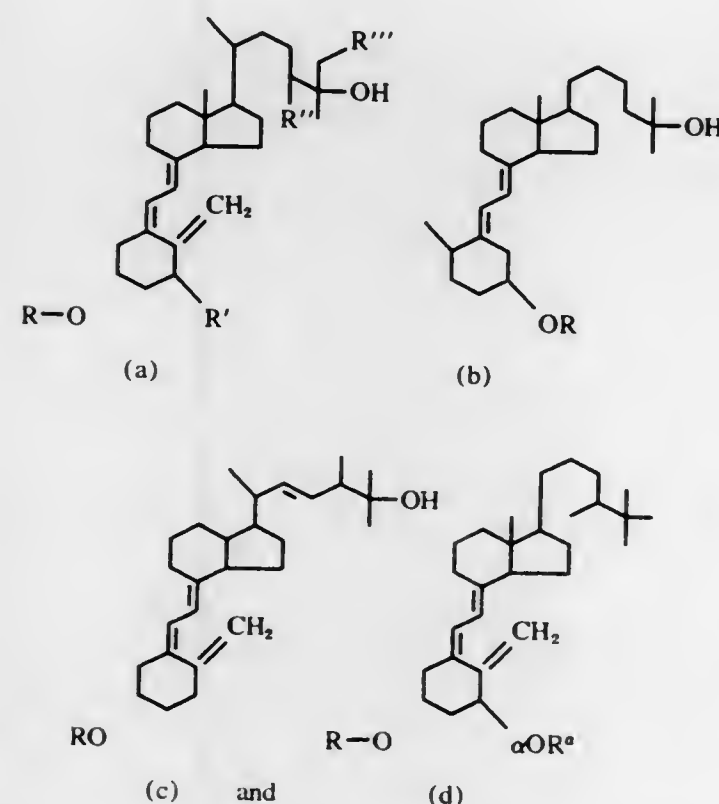
The portion of the term of this patent subsequent to July 9, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 31/59

U.S. Cl. 424-236

6 Claims

1. The method for increasing the thickness of egg shells from egg-laying hens which comprises administering to the laying hens an effective but non-toxic egg shell thickening amount of a compound selected from the group consisting of



where R=H or acyl where acyl is an acyl radical of normal or isomerized alkane carboxylic acid of from 2 to about 8 carbon atoms, inclusive, and R', R'', and R''' are hydrogen, hydroxyl or O-acyl wherein acyl is defined as above with the proviso that at least two of R', R'', and R''' must be hydrogen and that if R', R'' or R''' is hydroxyl, then R must be hydrogen and when R', R'' or R''' is O acyl, acyl defined as above, then R must be the same acyl, and R<sup>a</sup> is hydrogen or acyl, acyl as defined above, and when R<sup>a</sup> is hydrogen, R is hydrogen, and when R<sup>a</sup> is acyl, as defined above, R is the same acyl.

4,012,510

## NOVEL METHYLENE STEROIDS

Rudolf Wiechert; Klaus Kieslich, and Henning Koch, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Nov. 10, 1975, Ser. No. 630,627

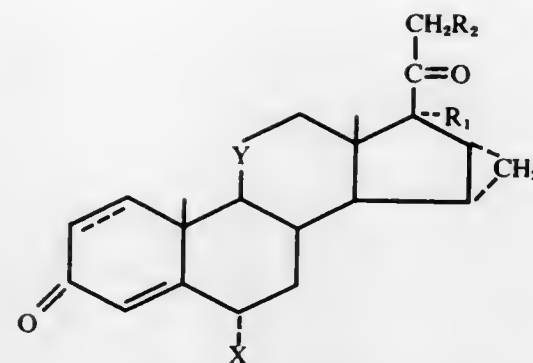
Claims priority, application Germany, Nov. 11, 1974, 2453823

Int. Cl.<sup>2</sup> A61K 31/56

U.S. Cl. 424-243

24 Claims

1. A methylene steroid of the formula



wherein X is H, F or CH<sub>3</sub>, or a methyl group; Y is  $\beta$ -hydroxymethylene or carbonyl; one of R<sub>1</sub> and R<sub>2</sub> is a hydrogen atom and, when R<sub>2</sub> is a hydrogen atom, R<sub>1</sub> is hydroxy or alkanoyloxy of 1 to 8 carbon atoms and, when R<sub>1</sub> is a hydrogen atom, R<sub>2</sub> is hydroxy or acyloxy, wherein acyl is the acyl radical of sulfuric or phosphoric acid or a physiologically acceptable carboxylic acid of 1-12 carbon atoms.

20. A pharmaceutical composition comprising an anti-inflammatorily effective concentration of at least one methylene steroid of claim 1 in admixture with a pharmaceutically acceptable carrier adapted for topical administration.

4,012,511

## OXAZINOINDOLE DERIVATIVES USEFUL AS ANTIDEPRESSANTS

Christopher A. Demerson, Montreal; Leslie G. Humber, Dollard des Ormeaux; George Santroch, Montreal; Thomas A. Dobson, Dollard des Ormeaux, and Ivo Jirkovsky, Montreal, all of Canada, assignors to Ayerst McKenna & Harrison Ltd., Montreal, Canada

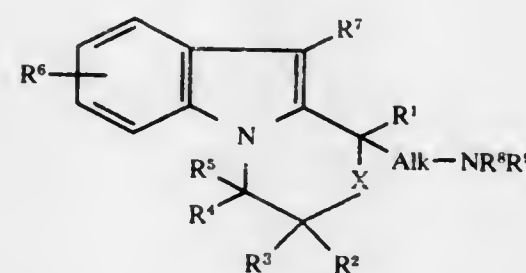
Continuation-in-part of Ser. No. 473,646, May 28, 1974, Pat. No. 3,962,236, and Ser. No. 226,287, Feb. 14, 1972, Pat. No. 3,833,575. This application July 7, 1975, Ser. No. 593,582

Int. Cl.<sup>2</sup> A01N 9/00, 9/22; C07D 265/00, 273/00

U.S. Cl. 424-248.4

31 Claims

1. A compound of formula



in which R<sup>1</sup> is lower alkyl or lower cycloalkyl; R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are the same or different selected from the group consisting of hydrogen and lower alkyl; R<sup>6</sup> is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo, R<sup>7</sup> is lower alkyl; X is oxy; and Alk-NR<sup>8</sup>R<sup>9</sup> is an amino(lower)alkyl radical in which Alk is an alkylene selected from the group consisting of CR<sup>10</sup>R<sup>11</sup>, CR<sup>10</sup>R<sup>12</sup>R<sup>13</sup>, CR<sup>10</sup>R<sup>11</sup>CR<sup>12</sup>R<sup>13</sup>CR<sup>14</sup>R<sup>15</sup> and CR<sup>10</sup>R<sup>11</sup>CR<sup>12</sup>R<sup>13</sup>CR<sup>14</sup>R<sup>15</sup>CR<sup>16</sup>R<sup>17</sup> in which R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup>, R<sup>16</sup> and R<sup>17</sup> are hydrogen or lower alkyl, and R<sup>8</sup> and R<sup>9</sup> are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R<sup>8</sup> and R<sup>9</sup> together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholine, piperazino, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl.

4,012,512

## ANIMAL FEEDS CONTAINING

## QUINOXALINE-DI-N-OXIDE DERIVATIVES

Peter J. Diel, Basel, and Wolfgang Schmid, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

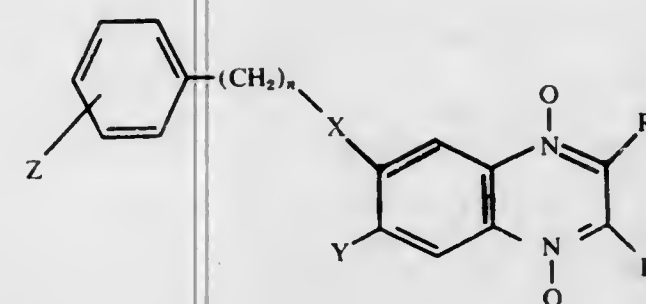
Division of Ser. No. 393,863, Sept. 4, 1973, Pat. No. 3,900,473. This application May 27, 1975, Ser. No. 580,854 Claims priority, application Switzerland, Sept. 5, 1972, 13032/72

Int. Cl.<sup>2</sup> A01N 9/00, 9/22

U.S. Cl. 424-250

11 Claims

1. An animal feed composition comprising, a growth promoting amount of, a compound of the formula



wherein

each of R<sub>1</sub> and R<sub>2</sub> is hydrogen, lower alkoxy, carbonylmethyl, lower alkyl, phenyl, benzoyl, lower alkanoyl, lower alkoxy, carbonyl, N,N-di-lower-alkylcarbamoyl, cyano or amino,

or R<sub>1</sub> and R<sub>2</sub> taken together is polymethylene having from 3 to 5 carbon atoms,

Y is hydrogen or halogen,

X is oxygen, sulphur, sulphinyl or sulphonyl,

Z is hydrogen, lower alkyl, trifluoromethyl, halogen or lower alkoxy, and

n is 0, 1 or 2 in a standard feed.

4,012,513

## INDOLE DERIVATIVES FOR PROVIDING ANALGESIC AND ANTI-INFLAMMATORY EFFECTS

George Richard Birchall, Victoria, Australia; Walter Hepworth, and Stephen Collyer Smith, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

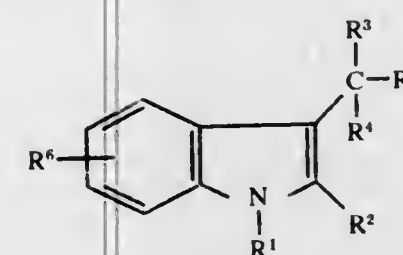
Continuation-in-part of Ser. No. 296,202, Oct. 10, 1972, Pat. No. 3,884,919. This application Dec. 23, 1974, Ser. No. 535,839

Claims priority, application United Kingdom, Nov. 3, 1971, 51086/71; Apr. 19, 1972, 18116/72; June 30, 1972, 30767/72 Int. Cl.<sup>2</sup> A61K 31/505

U.S. Cl. 424-251

8 Claims

1. A pharmaceutical composition for use in providing an analgesic or anti-inflammatory effect comprising an effective amount of a compound of the formula:



wherein R<sup>1</sup> is a quinazoliny radical or a quinazoliny radical bearing not more than two substituents selected from C<sub>1-5</sub>-alkyl, C<sub>1-5</sub>-alkoxy, C<sub>1-5</sub>-alkylthio, amino, halogen, trifluoromethyl, trichloromethyl and phenyl substituents, the quinazoliny radical being linked to the nitrogen atom of the indole nucleus through position 2 or 4 of the quinazoliny radical and its non-toxic salt.

radical; and R<sup>2</sup> stands for hydrogen or a C<sub>1-3</sub>-alkyl radical; and R<sup>3</sup> and R<sup>4</sup>, which may be the same or different, stand for hydrogen or a methyl radical; and R<sup>5</sup> is a radical of the formula -COR<sup>7</sup> wherein R<sup>7</sup> stands for a hydroxy, C<sub>1-5</sub>-alkoxy, benzyloxy, phenoxy, di-C<sub>1-5</sub>-alkylamino-C<sub>1-5</sub>-alkoxy, (C<sub>3-6</sub>-cycloalkyl)methoxy, amino, C<sub>1-5</sub>-alkylamino or di-C<sub>1-5</sub>-alkylamino and R<sup>6</sup> stands for hydrogen or a methylenedioxy or ethylenedioxy radical or not more than two substituents selected from C<sub>1-5</sub>-alkoxy, C<sub>1-5</sub>-alkyl, cycloalkyl of not more than 5 carbon atoms, and di-C<sub>1-5</sub>-alkylamino radicals and halogen atoms; or a pharmaceutically-acceptable salt thereof, and an inert pharmaceutically-acceptable carrier therefor.

4,012,514

## ARYL KETONES AND PRODUCTION THEREOF

Junki Katsube, Toyonaka; Masaru Nakao, Toyonaka; Kikuo Sasajima, Toyonaka; Isamu Maruyama; Masaharu Takayama, both of Minoo; Keiichi Ono, Nishinomiya; Shigenari Katayama, Takarazuka; Yoshihiro Tanaka, Takarazuka; Shigeo Inaba, Takarawaka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation-in-part of Ser. No. 316,026, Dec. 18, 1972, Pat. No. 3,922,266. This application July 29, 1975, Ser. No. 600,118

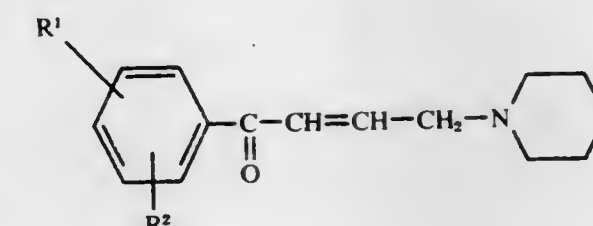
Claims priority, application Japan, Sept. 22, 1972, 47-95720; July 12, 1972, 47-70265; July 12, 1972, 47-70266; June 28, 1972, 47-65208

Int. Cl.<sup>2</sup> C07D 233/32

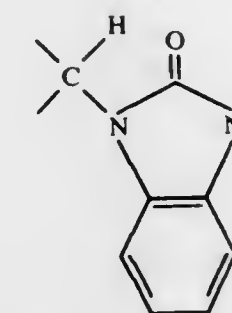
U.S. Cl. 424-267

6 Claims

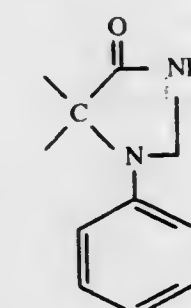
1. An olefinic aryl ketone of the formula:



wherein R<sup>1</sup> is fluorine, R<sup>2</sup> is hydrogen, and X is a group of the formula:



or





4,012,515

## ARYL KETONES AND PRODUCTION THEREOF

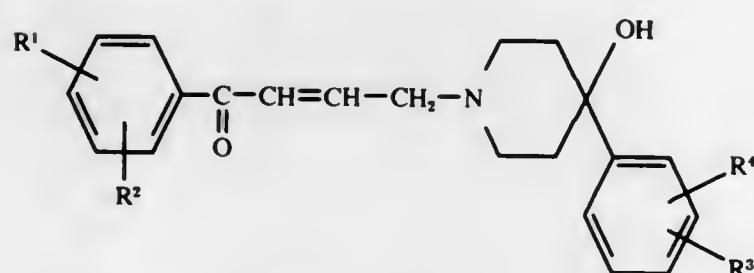
Junki Katsube; Masaru Nakao; Kikuo Sasajima, all of Toyonaka; Isamu Maruyama; Masaharu Takayama, both of Minoo; Keiichi Ono, Nishinomiya; Shigenari Katayama, Takarazuka; Yoshihiro Tanaka, Takarazuka; Shigeo Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation-in-part of Ser. No. 316,026, Dec. 18, 1972, Pat. No. 3,922,266. This application July 29, 1975, Ser. No. 600,119

Int. Cl.<sup>2</sup> C07D 211/52

U.S. Cl. 424-267

1. An olefinic aryl ketone of the formula:



wherein R<sup>1</sup> is fluorine, R<sup>2</sup> is hydrogen, and R<sup>3</sup> and R<sup>4</sup> are each hydrogen, halogen, C<sub>1-4</sub> alkyl or trifluoromethyl, and its non-toxic salt.

4,012,516

## PHARMACOLOGICALLY ACTIVE COMPOSITIONS

Lawrence George Garland, Biggin Hill; Michael John Follenfant, Croydon, and James Edward Tateson, Orpington, all of England, assignors to Burroughs Wellcome Co., Raleigh, N.C.

Filed Jan. 23, 1976, Ser. No. 651,903

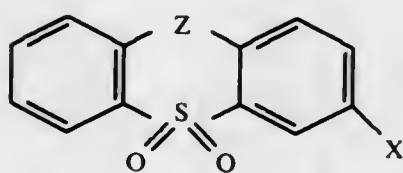
Claims priority, application United Kingdom, Jan. 24, 1975, 3140/75

Int. Cl.<sup>2</sup> A61K 31/38, 31/39, 31/41

U.S. Cl. 424-269

13 Claims

1. A synergistic pharmaceutical composition for use as an anti-allergic comprising a compound of formula (I)



wherein Z is oxygen or carbonyl and Z is carboxyl or 5-tetrazolyl or a pharmaceutically acceptable salt thereof, with a stimulant selected from salbutamol, terbutaline, fenoterol, trimetoquinol and carbuterol, or a pharmaceutically acceptable salt thereof, wherein the ratio by weight of the compound formula (I) or a pharmaceutically acceptable salt thereof to stimulant or a pharmaceutically acceptable salt thereof is in the range of 1:1 to 200:1.

4,012,517

## COMPOSITIONS AND TREATMENT

Michael John Follenfant, Croydon, England, assignor to Burroughs Wellcome Co., Raleigh, N.C.

Filed Jan. 23, 1976, Ser. No. 651,902

Claims priority, application United Kingdom, Jan. 24, 1975, 3141/75

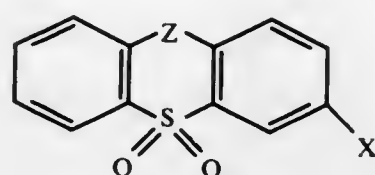
Int. Cl.<sup>2</sup> A61K 31/38, 31/39, 31/41

U.S. Cl. 424-269

9 Claims

1. A method for treating bronchoconstriction in a mammal by dilating the bronchi of the mammal comprising administration to a mammal having a bronchoconstriction of a non-toxic

effective bronchodilating amount of a compound of formula (I)



where Z is carbonyl or oxygen and X is 5-tetrazolyl or carboxyl, and pharmaceutically acceptable salts thereof.

4,012,518

## NITRO-β-LACTAM ANTIBIOTICS AND PROCESSES FOR THEIR PREPARATION AND USE

Wolfgang Krohn, Leverkusen; Karl Georg Metzger; Michael Preiss, both of Wuppertal, and Michael Walkowiak, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 8, 1975, Ser. No. 602,969

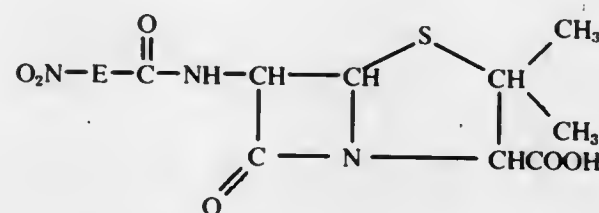
Claims priority, application Germany, Aug. 22, 1974, 2440268

Int. Cl.<sup>2</sup> C07D 499/46

U.S. Cl. 424-271

13 Claims

1. A compound selected from the group consisting of a penicillin of the formula:



and the pharmaceutically acceptable salts thereof wherein O<sub>2</sub>N-E is nitroalkyl of 1 to 6 carbon atoms.

4,012,519

## FUNGICIDAL 3-(N-ACYL-N-ARYLAMINO) LACTONES AND LACTAMS

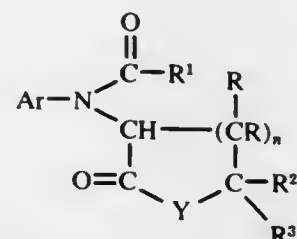
David Cheong King Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 548,660, Feb. 10, 1975, Pat. No. 3,933,860. This application Nov. 12, 1975, Ser. No. 631,351

Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 424-274

1. A compound of the formula



wherein Ar is phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; R is hydrogen or alkyl of 1 to 6 carbon atoms; R<sup>1</sup> is alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 3 carbon atoms and 1 to 5 of the same or different halogen selected from fluoro, chloro, or bromo, haloalkyl of 1 to 3 of the same or different halogens selected from fluoro, chloro or bromo, phenyl, or phenyl substituted with 1 to 3 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms,

4,012,522

## PESTICIDAL CYCLOPROPANE DERIVATIVES

Robert J. G. Searle, Rodmersham Green, near Sittingbourne, and Roger E. Woodall, Borden, near Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

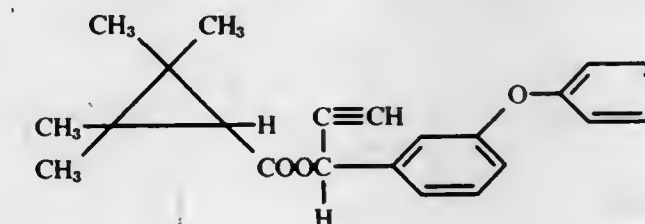
Division of Ser. No. 442,992, Feb. 2, 1974, Pat. No. 3,979,424. This application Sept. 9, 1975, Ser. No. 611,758

Int. Cl.<sup>2</sup> A01N 9/24

U.S. Cl. 424-305

2 Claims

1. A method of combating insect pests at a locus which comprises applying to the locus an insecticidally effective amount of a cyclopropane derivative of the formula



4,012,523

## HYPOLIPIDEMIC

2-(3,5-DI-TERT-BUTYL-4-HYDROXYPHENYL)-(THIO OR SULFONYL) ALKANOIC ACIDS AND DERIVATIVES

Eugene R. Wagner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

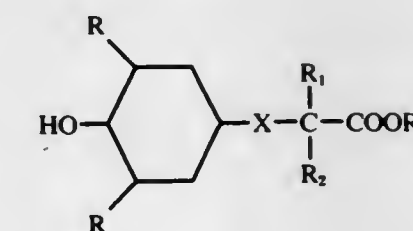
Continuation-in-part of Ser. No. 436,245, Jan. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 332,323, Feb. 14, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 526,434

Int. Cl.<sup>2</sup> A61K 31/19, 31/235; C07C 65/00, 149/40

U.S. Cl. 424-308

62 Claims

1. A compound of the formula:



wherein

each R represents a tert-butyl group;

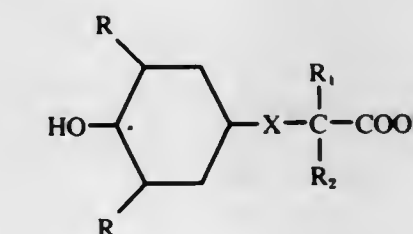
X represents S or SO<sub>2</sub>;

R<sub>1</sub> is hydrogen or methyl;

R<sub>2</sub> represents an alkyl group containing from 1 to about 6 carbon atoms;

R<sub>3</sub> represents hydrogen or an alkyl group containing from 1 to about 3 carbon atoms with the proviso that when X is S, R<sub>3</sub> is hydrogen, or the pharmaceutically-acceptable acid addition salts thereof,

31. A method for treating hyperlipidemia in the blood of a mammal which comprises internally administering to said mammal a hypolipidemic effective amount of a compound having the formula:



wherein

each R represents a tert-butyl group;

X represents sulfur or SO<sub>2</sub>;

R<sub>1</sub> is hydrogen or methyl;

alkoxy of 1 to 4 carbon atoms or nitro; R<sup>2</sup> is hydrogen or alkyl of 1 to 6 carbon atoms; R<sup>3</sup> is hydrogen or alkyl of 1 to 6 carbon atoms; n is 1 or 2; and Y is N-R<sup>4</sup> wherein R<sup>4</sup> is hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, phenyl or phenyl substituted with 1 to 3 of the same or different substituents selected from trifluoromethyl, trichloromethyl, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro.

6. A method for the control of fungi which comprises contacting said fungi or their habitats with a fungicidally effective amount of the compound of claim 1.

4,012,520

## COMPOSITION AND METHOD OF PRODUCING INFERTILITY IN MALE RODENTS

Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 386,536, Aug. 8, 1973, Pat. No. 3,930,012, which is a continuation of Ser. No. 93,383, Nov. 27, 1970, abandoned. This application Aug. 4, 1975, Ser. No. 601,487

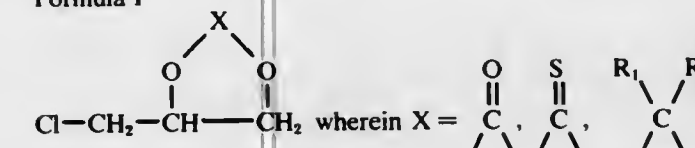
Int. Cl.<sup>2</sup> A01N 9/12

U.S. Cl. 424-278

4 Claims

1. A pharmaceutical preparation in the form of an oral ration for rodents consisting essentially of an effective amount for producing epididymal lesions and infertility in male rodents of the formula:

Formula I



and R<sub>1</sub> and R<sub>2</sub> are the same or different and are hydrogen, alkyl of from 1 to 17 carbon atoms, alkenyl of from 2 to 17 carbon atoms, phenyl, a 4-chloromethyl-2-thio-1,3-dioxolane for preventing impregnation of receptive sexually mature female rodents by the male counterparts thereof, compounded with an ingestible bulking agent acceptable to said rodents, said ration providing at least about 5 mg./kg. of male rodent body weight.

4,012,521

## FUNGICIDE

Karl Klehs, Lampertheim, and Ernst-Heinrich Pommer, Limburgerhof, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 6, 1970, Ser. No. 35,264

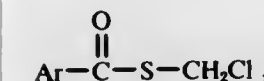
Claims priority, application Germany, May 6, 1969, 1923019

Int. Cl.<sup>2</sup> A01N 9/12, 9/24

U.S. Cl. 424-301

3 Claims

1. A process for controlling fungi which comprises applying to loci to be protected against fungus attack a fungicidally effective amount of a chloromethylaryl sulfide having the formula



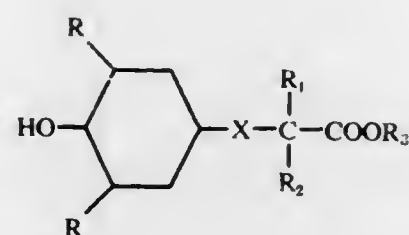
where Ar denotes one of naphthyl, phenyl and phenyl having 1 to 5 identical or different substituents selected from the group consisting of lower alkyl, hydroxy, lower alkoxy, phenoxy, pyridyloxy, halogen, halomethyl, nitro, lower alkylmercapto, lower alkenylmercapto, phenylmercapto, lower alkyl-sulfonyl, allylsulfonyl, phenylsulfonyl, dimethylamino, diethylamino, phenylamino, phenyl sulfamido, tolyl sulfamido; lower alkyl amidosulfonyl, acetyl, propionyl, benzoyl, naphthoyl and chloromethylthiocarbonyl radicals.



R<sub>2</sub> represents an alkyl group containing from 1 to about 6 carbon atoms;

R<sub>3</sub> represents hydrogen or an alkyl group containing from 1 to about 3 carbon atoms, or the pharmaceutically-acceptable acid addition salts thereof.

45. A method of treating hypertriglyceridemia in the blood of a mammal comprising internally administering to said mammal a hypotriglyceridically effective amount of a compound having the formula:



wherein

each R represents a tert-butyl group;

X is sulfur or SO<sub>2</sub>;

R<sub>1</sub> is hydrogen or methyl;

R<sub>2</sub> represents an alkyl group containing from 1 to about 6 carbon atoms;

R<sub>3</sub> represents hydrogen or an alkyl group containing from 1 to about 3 carbon atoms, or a pharmaceutically-acceptable acid addition salt thereof.

#### 4,012,524

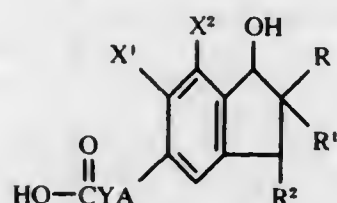
##### [1-HYDROXY-5-INDANYLOXY (OR THIO)]-ALKANOIC ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 492,944, July 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 405,965, Oct. 12, 1973, abandoned. This application June 10, 1975, Ser. No. 585,435

Int. Cl.<sup>2</sup> A61K 31/235, 31/19, 31/41; C07D 257/04  
U.S. Cl. 424-308

13. A method for the treatment of edema and hypertension in a patient which comprises administering thereto a unitary dosage of from 50 to 500 mg. of a compound of the formula:



wherein A is oxygen, R is lower alkyl, cycloalkyl having from 3 - 6 nuclear carbon atoms, phenyl and substituted phenyl wherein the substituent is halo or lower alkyl; R<sup>1</sup> is hydrogen, lower alkyl, phenyl, lower alkyl, phenyl, substituted phenyl wherein the substituent is lower alkyl or halo; or R and R<sup>1</sup> may be joined to form a cycloalkyl; R<sup>2</sup> is hydrogen, phenyl or lower alkyl or R<sup>1</sup> and R<sup>2</sup> taken together with the carbon atoms to which they are attached, is cycloalkyl; X<sup>1</sup> is hydrogen, methyl, or halo and X<sup>2</sup> is methyl or halo or X<sup>1</sup> and X<sup>2</sup> may be joined to form a hydrocarbylene chain containing 3 to 4 carbon atoms and Y is alkylene or haloalkylene containing a maximum of 4 carbon atoms, a non-toxic, pharmacologically acceptable salt thereof or a lower alkyl ester derivative thereof in a total daily dose of from 50 mg. to 2000 mg.

#### 4,012,525

##### NOVEL PROPOXYPHENE DOSAGE REGIMEN

Patrick J. Murphy, and Rodney C. Nickander, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 10, 1975, Ser. No. 621,263  
Int. Cl.<sup>2</sup> A61K 31/22

U.S. Cl. 424-311

2 Claims

1. The method of enhancing the analgesia produced in mammals by oral administration thereto of d-propoxyphene or a pharmaceutically-acceptable salt thereof which comprises administering during the initial period during which it is desired to produce analgesia, a loading dose of from 10-20 mg. of l-propoxyphene free base equivalent for each 5 mg. dose of d-propoxyphene free base equivalent administered or from 5-10 mg. of l-propoxyphene free base equivalent for each 10 mg. dose of d-propoxyphene free base equivalent administered and then continuing administration of d-propoxyphene alone at the same dose level as in the initial period.

#### 4,012,526

##### OXYMETHYLENE DI-CARBOXYLIC ACID ESTERS AS ANTI-FUNGAL AGENTS AND ANIMAL GROWTH PROMOTERS

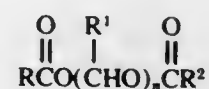
Daniel L. Kensler, Jr., Adel, Iowa; Gustave K. Kohn, Berkeley, Calif., and David D. Walgenbach, Brookings, S. Dak., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 468,629, May 9, 1974, Pat. No. 3,931,412, which is a continuation-in-part of Ser. No. 266,945, June 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,364, Sept. 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 871,940, Oct. 28, 1969, abandoned. This application July 21, 1975, Ser. No. 597,855

U.S. Cl. 424-313

10 Claims

1. A method for improving utilization of feed in animals which comprises orally administering to said animals a daily amount of about 0.04 mg to about 80 mg per kg of body weight of a di-ester of the formula



wherein R is alkyl of 1 to 6 carbon atoms or alkenyl of 2 to 6 carbon atoms, R<sup>2</sup> is alkyl of 1 to 6 carbon atoms, and R<sup>1</sup> is hydrogen, alkyl of 1 to 6 carbon atoms, chloroalkyl of 1 to 4 carbon atoms and 1 to 5 chloro groups, alkenyl of 2 to 6 carbon atoms, phenyl, or alkphenyl of 7 to 10 carbon atoms, and n is 1, 2 or 3.

#### 4,012,527

##### N,N-DIMETHYL-N'-PHENYLTHIOCARBAMYL FORMAMIDINE HYDROCHLORIDE AND ITS USE AS AN ANTI-INFLAMMATORY AGENT

Jack R. DeBaun, Sunnyvale; Ferenc M. Pallos, Walnut Creek, and Eugene G. Teach, El Cerrito, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sept. 15, 1975, Ser. No. 613,673  
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 31/17; C07C 127/15, 127/19  
U.S. Cl. 424-323

2 Claims

1. N,N-dimethyl-N'-phenylthiocarbamyl formamide hydrochloride.

#### 4,012,528

##### α-AMINOALKYL-3-(1,2-DIHYDROXYETHYL)-4-HYDROXY-BENZYL ALCOHOLS HAVING β-ADRENERGIC STIMULANT ACTIVITY

Timothy Yu-Wen Jen, Broomall, Pa.; Carl Kaiser, Haddon Heights, and Joe R. Wardell, Willingboro, both of N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

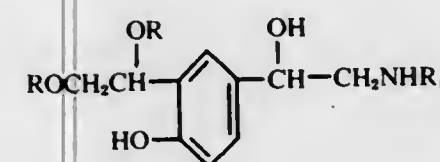
Continuation-in-part of Ser. No. 475,675, June 3, 1974, abandoned. This application June 13, 1975, Ser. No. 586,828  
Claims priority, application United Kingdom, May 5, 1975, 18669/75

Int. Cl.<sup>2</sup> A61K 31/135

U.S. Cl. 424-330

19 Claims

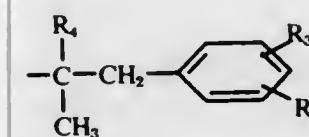
13. A method of producing β-adrenergic stimulant activity which comprises administering internally to animals in need thereof an amount sufficient to produce said activity of a chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound, wherein:

R is hydrogen or methyl, with both R's not being methyl at the same time;

R<sub>1</sub> is branched chain lower alkyl of from 3 to 5 carbon atoms, cycloalkyl or cycloalkylmethyl, the cycloalkyl moiety having from 3 to 6 carbon atoms, or



R<sub>2</sub> and R<sub>3</sub> are hydrogen, hydroxy, methoxy, or, taken together in adjacent position, methylenedioxy; and R<sub>4</sub> is hydrogen or methyl.

#### 4,012,529

##### CONTROL OF MARINE BORER ATTACK ON WOOD

John Dale Bultman, Washington, D.C.; Leonard Jurd, Berkeley, Calif., and Ruth D. Turner, Cambridge, Mass., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

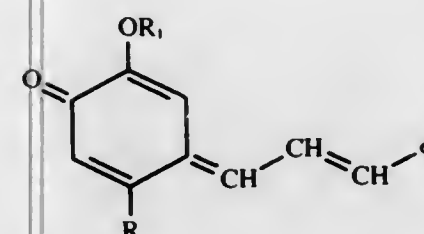
Filed Mar. 15, 1976, Ser. No. 667,056

Int. Cl.<sup>2</sup> A01N 9/02, 9/26; A61L 13/00; B27K 3/38

U.S. Cl. 424-331

8 Claims

1. A process for inhibiting the deterioration of wood due to attack by marine boring organisms, which comprises applying to the wood a compound of the structure



wherein R is lower alkyl and R<sub>1</sub> is selected from the group consisting of lower alkyl and hydrogen, in an amount sufficient to destroy the larvae of said marine boring organisms.

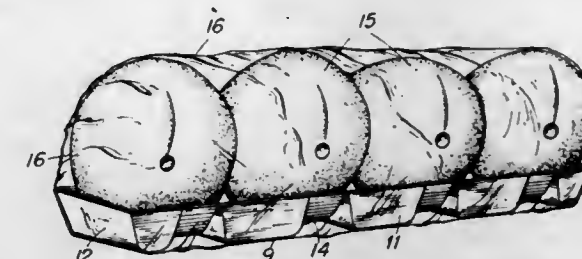
#### 4,012,530

##### PRODUCE TRAY

Morell J. Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 7, 1975, Ser. No. 593,615  
Int. Cl.<sup>2</sup> B65D 85/34, 65/16, 1/36  
U.S. Cl. 426-124

5 Claims



1. A tray packaging substantially globular produce comprising a single, continuous substantially planar bottom member joined integrally around its periphery to a continuous upstanding pair of side walls and pair of end walls; said bottom member being interrupted by a plurality of uniformly spaced concave ribs extending upwardly from said bottom member into said side walls and extending from side wall to side wall, thus forming saddle-like members whose concave profile defines an arc of a circle and each of which cradle substantially globular produce; said saddle-like members being aligned in a single row with planar sections of said bottom separating said saddle-like members; the width of each saddle-like member being between about 0.5 inch and about 1.5 inches and the space between adjacent saddle-like members being between about 1 inch and about 2 inches, said width being sufficient to cradle and support one article of produce when said produce is positioned on adjacent members.

#### 4,012,531

##### PROCESS FOR EXTRACTING ANTIOXYDANTS

Rinantonio Viani, Attalens, Switzerland, assignor to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,399  
Claims priority, application Switzerland, Oct. 26, 1973, 15150/73

Int. Cl.<sup>2</sup> A23L 1/28

U.S. Cl. 426-431

9 Claims

1. A process for extracting antioxidant substances from an organic plant material of the Labiate or Umbellifer family containing them, wherein the organic material is treated with an aqueous basic buffer solution with a pH value of from 7 to about 11.5, the insoluble fraction is separated and the soluble fraction containing the antioxidant substances is collected.

#### 4,012,532

##### METHOD FOR CONDITIONING FOOD STRANDS

Marvi D. Moore, Dallas, and David P. Fowler, Irving, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Dec. 13, 1972, Ser. No. 314,600  
Int. Cl.<sup>2</sup> A23L 1/16

U.S. Cl. 426-451

7 Claims

1. A process for conditioning strands of food material which comprises forming a dough of said food material, forming said dough into a plurality of strands, passing each said strand individually through a separate elongated, vertical zone of positive air pressure, all of said elongated, vertical zones being located in a larger zone of positive air pressure, the air in said larger zone being under greater pressure than the air outside of said larger zone, and thereafter cutting the said strands into pieces.



4,012,533

**MULTIPURPOSE WHIPPED DESSERT AND METHOD OF MANUFACTURING**

John J. Jonas, Winnetka, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Nov. 17, 1975, Ser. No. 632,858

Claims priority, application United Kingdom, Nov. 20, 1974, 50212/74

Int. Cl.<sup>2</sup> A23G 9/02, 9/04

U.S. Cl. 426—565

18 Claims

1. An aerated frozen dessert, comprising an aerated frozen foam formed by combining an aqueous fat emulsion and an aqueous protein emulsion, to provide a mixture having the aqueous fat emulsion and the aqueous protein emulsion present in the ratio of from about 65:35 to about 35:65 of the aqueous fat emulsion to the aqueous protein emulsion, whipping the mixture above the freezing point of the mixture and subsequently freezing the whipped mixture to provide the aerated frozen dessert, said dessert including between about 10 and about 32 percent by weight edible fat, between about 1.5 and about 7 percent by weight water soluble whippable protein, sweeteners, emulsifiers and gum stabilizers, said dessert having a fat churn out of between about 10 percent and about 30 percent, said dessert having an overrun between about 150 and 250 percent, said dessert, when frozen, being spoonable and having organoleptic properties similar to ice cream, said dessert, when thawed, having organoleptic properties of whipped topping, and being resistant to syneresis when held at room temperature for 6 hours, said dessert being freeze-thaw stable.

4,012,534

**PREPARATION OF PROCESS CHEESE**

Thomas P. Kichline, Chesterfield, and Allen H. Kranz, Florissant, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 411,609, Nov. 1, 1973, Pat. No. 3,957,679.

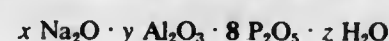
This application May 15, 1975, Ser. No. 577,812

Int. Cl.<sup>2</sup> A23C 19/00, 19/12

U.S. Cl. 426—582

4 Claims

1. A process cheese formulation containing cheese and, in an effective emulsifying amount, a sodium aluminum phosphate composition having an empirical formula



wherein  $x$  is a number higher than 15 up to and inclusive of 24,  $y$  is a number 1.0 and 3.9 inclusive, and  $z$  is a number between 0 and 50 inclusive.

4,012,535

**MOLASSES IMPREGNATED BAGASSE PITH ANIMAL FEED**

Richard J. Fiala, Decatur, Ill.; Thomas L. Scott, Raceland, La., and Kenneth N. Wright, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sept. 3, 1974, Ser. No. 502,470

Int. Cl.<sup>2</sup> A23K 1/02

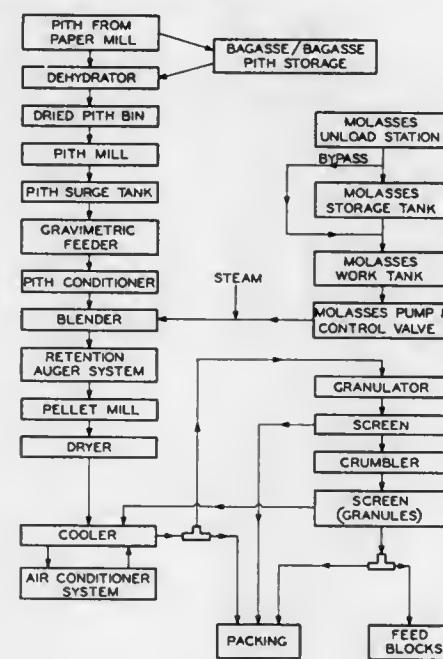
U.S. Cl. 426—658

22 Claims

1. A process for making a high molasses animal feed, having a bulk density of at least 20 pounds per cubic foot, containing at least 60% by weight dry solids basis molasses, the steps comprising:

- preconditioning a molasses absorptive carrier material to a moisture content of less than 5% by weight to obtain a maximum molasses absorption of at least 60% by weight dry solids molasses, based on the weight of the carrier, dry solids basis;
- intimately mixing said absorptive carrier material with a preheated, high brix liquid molasses containing no more than about 30% by weight water to obtain a molasses/carrier blend having a moisture content in the range of at least about 10% by weight of the molasses/carrier blend;

c. wet pelleting said molasses/carrier blend at a temperature in the range of 100°–130° F. in the absence of added steam to obtain moist, thoroughly blended discrete pellets having a substantially increased bulk density and a moisture content substantially unchanged from that of the molasses/carrier blend; and



d. thereafter drying said pellets to a moisture content below about 4% by weight said dry pellets containing at least 60% by weight dry solids basis molasses and having a bulk density of at least 20 pounds per cubic foot.

4,012,536

**ELECTRON BEAM RECORDING MEDIUM COMPRISING 1-METHYLVINYL METHYL KETONE**

Aaron William Levine, Kendall Park, and Michael Kaplan, Franklin Township, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 314,975, Dec. 14, 1972, abandoned. This application Aug. 14, 1975, Ser. No. 604,776

Int. Cl.<sup>2</sup> B05C 5/00; G03C 1/68

U.S. Cl. 427—43

7 Claims

1. An electron beam recording medium which comprises a support, an electrically conductive layer and an electron beam-sensitive film thereon, said film consisting essentially of a polymer of 1-methylvinyl methyl ketone.

4,012,537

**DE-ICING COMPOSITIONS CONTAINED IN ROAD SURFACE MATERIAL**

Robert Dubois, La Croix, Lutry, Switzerland, assignor to Plastiroute SA, Switzerland

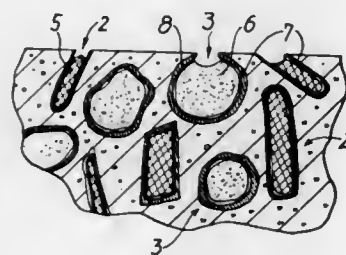
Filed June 7, 1974, Ser. No. 477,338

Claims priority, application Switzerland, June 13, 1973, 8506/73; May 14, 1974, 6553/74

Int. Cl.<sup>2</sup> C09K 3/18

U.S. Cl. 427—138

8 Claims



1. An asphalt or bituminous based road surfacing material having dispersed therein 2 to 7% by weight of an ice-preven-

4,012,540

**METHOD OF CONDITIONING FABRICS IN A CLOTHES DRYER**

Agnes R. McQueary, Cincinnati, Ohio, assignor to The Procter &amp; Gamble Company, Cincinnati, Ohio

Division of Ser. No. 347,605, April 3, 1973, Pat. No.

3,944,694. This application Nov. 10, 1975, Ser. No. 630,381

The portion of the term of this patent subsequent to Mar. 6,

1993, has been disclaimed.

Int. Cl.<sup>2</sup> B05D 3/12

U.S. Cl. 427—242

3 Claims

1. The method of conditioning fabrics in a laundry dryer which comprises commingling said fabrics in said dryer with a fabric-conditioning article comprising a flexible web substrate carrying a fabric-conditioning agent removable to fabrics by contact therewith, said fabric-conditioning article having slit openings sufficient in size and number as to permit at least 75% of the normal volume of air flow through said dryer when said article is used therein.

4,012,538

**METHOD OF FORMING COLOR IMAGES EMPLOYING DESENSITIZING AGENTS**

Akio Miyamoto, and Hiroharu Matsukawa, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minamishigara, Japan

Continuation of Ser. No. 425,902, Dec. 17, 1973, abandoned.

This application Mar. 31, 1975, Ser. No. 563,902

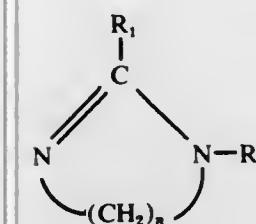
Claims priority, application Japan, Dec. 18, 1972, 47-126861

Int. Cl.<sup>2</sup> B41M 5/12, 5/18

U.S. Cl. 427—145

13 Claims

1. In a method of forming color images on a color recording material wherein said color images are formed by the reaction between a substantially colorless color former and a developer, the improvement which comprises desensitizing portions of the color recording material where the formation of color images is not required by applying to the developer in these portions before contact with the colorless color former a desensitizer composition containing at least one of an amidine represented by the general formula (I)



wherein  $R_1$  and  $R_2$  each represent an alkyl group having 1 to 8 carbon atoms,  $R_1$  and  $R_2$  can form a  $C_2$  to  $C_{11}$  ring which can be substituted by alkyl groups having 1 to 4 carbon atoms, and  $n$  represents 2 to 6, or an amidine derivative which is the reaction product of an amidine of the general formula (I) with a phenol, a carboxylic acid, carbonic acid or phosphoric acid whereby said desensitizer composition desensitizes portions of a recording material utilizing color formation by the contact between a substantially colorless color former and a developer where the formation of color images is not desired.

4,012,539

**METHOD OF APPLYING AND BONDING A BEARING LINING COMPRISING A MIXTURE OF AN ARYLENE SULPHIDE POLYMER AND A METALLIC OXIDE TO A BACKING MATERIAL**

Glyndwr John Davies, London, England, assignor to The Glacier Metal Company Limited, Wembley, England

Filed Aug. 14, 1975, Ser. No. 604,842

Claims priority, application United Kingdom, Aug. 21, 1974, 36669/74

Int. Cl.<sup>2</sup> B05D 3/02

U.S. Cl. 427—195

10 Claims

1. A method of applying and bonding a bearing lining comprising a mixture of arylene sulphide polymer and a metallic oxide to a backing in which uncured arylene sulphide is applied to the backing in powdered form with an oxide of copper, tin, lead, or manganese, also in powdered form, in the proportion of about 5–95 by weight of the arylene sulphide polymer, and is cured by heating at a temperature of at least 370° C. in the presence of oxygen substantially provided by said oxide.

4,012,541

**METHOD FOR WETTING HYDROPHOBIC DIAPHRAGMS FOR USE IN CHLOR-ALKALI CELLS**

Stanley T. Hirozawa, Birmingham, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 1, 1975, Ser. No. 618,446

Int. Cl.<sup>2</sup> B05D 1/18; C25B 13/08

U.S. Cl. 427—243

29 Claims

1. A method of preparing for use in a chlor-alkali cell a diaphragm of crystalline, highly expanded microporous polytetrafluoroethylene film, said method comprising the steps of immersing said diaphragm in a solution in a solvent selected from the group consisting of 2-propanol, n-propanol, ethanol and methanol, and containing an amount of an acetal-type nonionic surfactant effective to promote wetting of said diaphragm, rinsing said diaphragm in deionized water, immersing said diaphragm in an aqueous solution of an acetal-type nonionic surfactant under conditions of surfactant concentration and time effective to promote wetting of said diaphragm, and immersing said diaphragm in a solution of brine containing 100 to 200 grams per liter of sodium chloride and an amount effective to promote wetting of said diaphragm of acetal-type nonionic surfactant, for a period of time of at least three hours, and then installing said diaphragm in a chlor-alkali cell.

4,012,542

**RIGID THERMOSETTING LOAD BEARING COMPOSITIONS**

Stanley Oswitch, Chagrin Falls; Robert F. Golownia, Northfield, and Kevin K. Kipp, Solon, all of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 353,501, April 23, 1973, Pat. No.

3,914,200, which is a continuation-in-part of Ser. No. 221,430, Jan. 27, 1972, abandoned, which is a continuation-in-part of

Ser. No. 846,592, July 31, 1969, abandoned. This application

Mar. 12, 1975, Ser. No. 557,776

Int. Cl.<sup>2</sup> C08G 63/52; B05D 3/10

U.S. Cl. 427—302

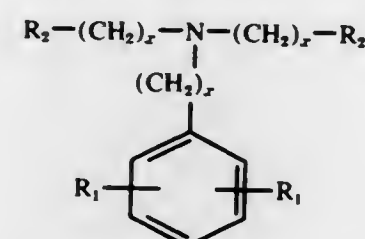
14 Claims

1. A process for forming at a selected time a polymerization reaction product from a pre-catalyzed polyester resin which normally undergoes substantially immediate polymerization due to the presence of such catalyst, comprising:

- adding to a liquid, curable, thermosetting, unsaturated polyester resin containing a sufficient amount of a peroxide catalyst normally adapted to catalyze further polymerization of said polyester resin, an excessive amount of an inhibitor of sufficiently more than 0.02% by weight of the resin to inhibit catalyzation of the polyester resin by said catalyst for a predetermined time following addition of said inhibitor, and
- at said selected time contacting said pre-catalyzed, inhibited polyester resin with an accelerator combination



consisting essentially of a metal soap in which the metal is capable of redox reaction and an aromatic, tertiary amine having the formula:



in which  $R_1$  represents hydrogen,  $CH_3$  or halogen;  $R_2$  represents alkyl up to 4 carbon atoms,  $R_3OH$  in which  $R_3$  represents alkylene up to 4 carbon atoms, or phenyl; and in which the  $R_1$ 's and the  $R_2$ 's may be the same or different and  $x$  is 0 or 1, said metal soap and amine being present in a weight ratio of about 1:10 to about 1:1, respectively, said accelerator combination being used in sufficient amount to overcome the inhibition of said inhibitor and permit catalyzation of the polyester resin by said peroxide catalyst to cure the resin within less than 1 hour.

## 4,012,543

**COATED PAPER AND METHOD OF MAKING SAME**  
Howard Lee Ranger, West Buxton; Mahlon Randall Kirk, South Windham, and Abbott Woodward Mosher, Gorham, all of Maine, assignors to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 39,849, May 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 836,592, June 25, 1969, abandoned. This application Aug. 8, 1974, Ser. No. 495,808

Int. Cl.<sup>2</sup> B44D 1/44

U.S. Cl. 427-361

24 Claims

1. A method for the preparation of a uniformly, densely coated paper substrate displaying excellent ink holdout properties, characterized by high bulk, increased brightness and opacity, and a gloss value of at least 50, which method essentially consists of:

- applying a coating of an aqueous top coating composition to at least one surface of a given fibrous cellulosic substrate;
- said fibrous cellulosic substrate having been prepared to resist penetration of the said aqueous top coating composition;
- said aqueous top coating composition having a total solids content of at least about 60 percent by weight, and said solids content thereof comprising a major proportion of a paper-coating grade pigment, a minor proportion of a thermoplastic binder and a minor amount of an anti-sticking agent; thence
- gloss-calendering, temporarily plasticizing and molding said coated substrate by conveying same through a nip formed between a heated polished drum and a resilient backing roll to at least partially coalesce the thermoplastic binder content of the said aqueous top coating composition;
- the temperature of said heated polished drum ranging from between about 82° to 150° C. and the pressure exerted on said coated substrate in said nip ranging from between about 400 to 800 pounds per lineal inch;
- the amount of water loss from the said top coating in that time interval between the application (i) thereof and the gloss-calendering and molding operation (iv) being less than that amount such as would effect substantial decrease in resultant high gloss;
- the temperature of the said coated substrate not being elevated to a value substantially above about 60° C. in the said time interval between the application (i) and the gloss-calendering and molding operation (iv);
- concomitantly, the water content of the said top coat-

ing, at the point of entry of the said coated substrate into the said nip, is such that, in the absence of the said minor proportion of anti-sticking agent, the substrate coating would stick to the surface of the said gloss-calendering, heated polished drum; and

ix. removing the thus coated and gloss-calendered fibrous cellulosic substrate from contact with the said heated polished drum and resilient backing roll as same emerges from the said nip formed therebetween;

x. whereby there is recovered a smooth, molded, polished, high gloss fibrous cellulosic substrate having the high bulk and density characteristics of lightly machine-calendered paper, albeit its said coating is itself dense, uniform and provides excellent ink holdout.

## 4,012,544

**DUST COLLECTION MAT AND METHOD OF MANUFACTURE**

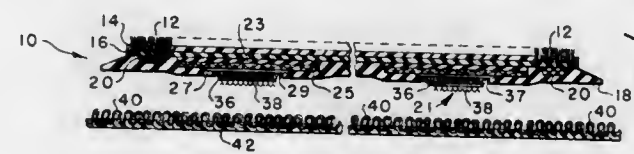
Ernest Levon Richards, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed June 12, 1975, Ser. No. 586,154

Int. Cl.<sup>2</sup> D03D 27/00; D04H 11/00

U.S. Cl. 428-95

2 Claims



2. A mat comprising: a sheet of textile material, a plurality of tufts of yarn connected thereto, a rubber backing material laminated to said sheet of textile material, a plurality of openings in said rubber backing material, a looped fabric located in said openings between said sheet of textile material and said rubber backing material and double hooked member having the hooks on one side engaging said looped fabric and the hooks on the other side adapted to engage a carpet-like material.

## 4,012,545

**TURF HAVING SOLIDIFIED PLASTICIZED SULFUR BACKING**

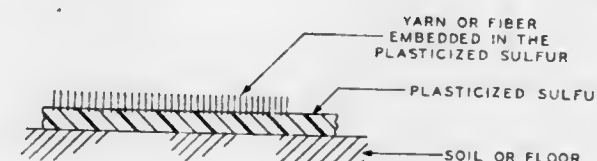
William G. Toland, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 474,457, May 29, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,500

Int. Cl.<sup>2</sup> D03D 27/00; D04H 11/00

U.S. Cl. 428-95

8 Claims



1. A manufacture comprising a plurality of fibers partially embedded in a solidified plasticized sulfur matrix with one end of the fibers extending outward from the matrix to form a turf or carpet-like surface.

## 4,012,546

**FLAME-RETARDANT CARPET**

Judd Leonard Schwartz, Chester, and Richard Eugene Mayer, Richmond, both of Va., assignors to Allied Chemical Corporation, N.J.

Filed Aug. 6, 1976, Ser. No. 712,287

Int. Cl.<sup>2</sup> D03D 27/00; D04H 11/00

U.S. Cl. 428-95

14 Claims

1. A flame-retardant pile carpet having a relatively pliable

primary backing and a tufted surface, said surface being comprised of fibers selected from the group consisting of polyester and polyamide fibers having incorporated therein from 0.05 to 15 percent by weight of a metal compound selected from the group consisting of antimony oxide and zinc borate, said fibers being bonded to said backing with a bonding substance comprising a latex material selected from the group consisting of vinyl chloride and vinylidene chloride polymers and copolymers, and a hydrate material selected from the group consisting of aluminum hydroxide and hydrated aluminum oxide, the ratio by weight of said latex material to said hydrate material being within the range 1:2 to 1:4.5.

## 4,012,547

**HIGH PERFORMANCE HOT MELT ADHESIVE BACKSIZING COMPOSITIONS AND CARPET MADE THEREWITH**

George Elmer Smedberg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 509,562, Sept. 26, 1974, Pat. No. 3,914,489. This application July 18, 1975, Ser. No.

597,140

Int. Cl.<sup>2</sup> D03D 27/00; D04H 11/00

U.S. Cl. 428-97

10 Claims

1. A composition having a tensile elongation of about 50 to 400 percent comprising

- about 3 to 15 weight percent ethylene/vinyl ester copolymer having a melt index of about 2 to 100, a copolymerized ethylene content of about 67 to 90 weight percent, a copolymerized vinyl ester content of about 10 to 33 weight percent, wherein the acid moiety of said vinyl ester contains 1-4 carbon atoms,
- about 15 to 40 weight percent of a hydrocarbon resin or a mixture of several hydrocarbon resins having a ring and ball softening point of about 50°-70° C. and a viscosity of 0.5 to 1.5 poise at 135° C.,
- 0 to about 3 weight percent of a low molecular weight ethylene homopolymer having a molecular weight of about 1500-4000, density of 0.91-0.96 g/cm.<sup>3</sup> and a melting point of about 220° F.-270° F.
- 0 to about 3 weight percent of a paraffin wax,
- 0 to 0.3 weight percent of an antioxidant, and
- about 40 to 75 percent filler.

3. A carpet comprised of a primary backing material stitched with closely spaced erect loops of yarn to form a tufted structure, the bottom surface of the tufted structure having as a tuft bonding backsize adhesive coating the composition of claim 1, said carpet having an average tuft bind of at least 10 pounds.

## 4,012,548

**HIGH STRENGTH COMPOSITE WOOD VENEER ARTICLES**

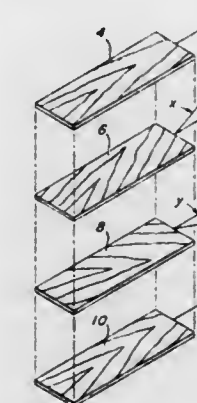
Barney Roberti, Mathews Road, Youngsville, Pa. 16371

Filed Apr. 6, 1976, Ser. No. 674,189

Int. Cl.<sup>2</sup> B32B 5/12

U.S. Cl. 428-106

16 Claims



1. A composite wood veneer article comprising

a lower layer of wood veneer having a grain orientation generally in a first direction,  
an upper layer of wood veneer having a grain orientation generally in said first direction,  
at least two layers of wood veneer interposed between said lower and said upper layers,  
at least one of said interposed layers having a grain orientation offset from said first direction by about 10° to 25°, none of said interposed layers having a grain orientation offset from said first direction by more than about 10° to 25°, adjacent layers of wood veneer being adhesively bonded in generally surface to surface relationship, and said composite article being substantially rigid.

## 4,012,549

**HIGH STRENGTH COMPOSITE STRUCTURE**

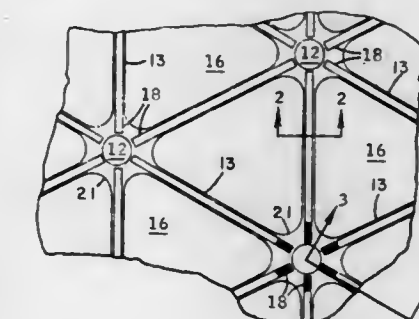
Paul Slysh, San Diego, Calif., assignor to General Dynamics Corporation, San Diego, Calif.

Filed Oct. 10, 1974, Ser. No. 513,661

Int. Cl.<sup>2</sup> B32B 3/12

U.S. Cl. 428-116

10 Claims



1. A composite structure comprising:  
a skin sheet;  
a uniform repeating triangular pattern of first upstanding ribs integral with said skin, across at least a portion of said skin;  
a circular node at each corner of each triangle surrounded by a circular second rib;  
each of said first and second ribs having a narrow first flange along the upper edge, lying substantially parallel to said skin and a narrow second flange formed by a thickened portion of said skin adjacent to said first and second ribs, whereby said first and second ribs have a substantially I-beam cross-section;  
a groove in the outer surface of each flange on said first ribs filled with a composite material strip comprising high-strength fibers embedded in a supporting matrix;  
said fibers being oriented substantially parallel to each other and to the supporting first rib, at least some of said fibers extending inwardly of said second rib at each node; and said fiber strips being tapered at each end to a lesser cross-sectioned fiber density.

## 4,012,550

**TIERED INTERLINING FOR GARMENTS**

Frank Gabriel Hollander, 77-14 113th St., Forest Hills, N.Y. 11375

Filed Nov. 14, 1975, Ser. No. 631,825

Int. Cl.<sup>2</sup> A41B 9/02

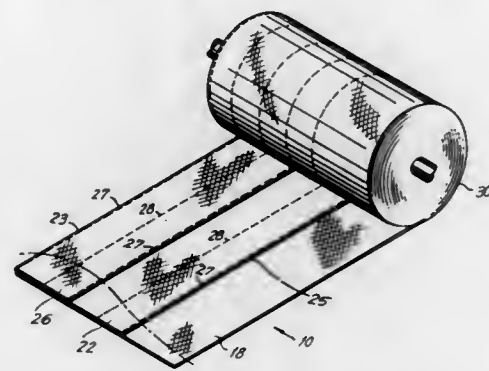
U.S. Cl. 428-190

3 Claims

1. A roll of shape holding garment interliner material comprising a base layer and a plurality of layers of successively shorter lengths from side to side of the base layer, said plurality to be disposed atop the base layer, the upper edges of all



layers being secured in registry, the lower edges thereof being successively spaced upwardly of the lower edge of the base



and of the next lower layer and secured thereto along the marginal side edge of each of said plurality of layers.

4,012,551

## COATED RAZOR BLADE

Herman Bogaty, Short Hills, N.J., and Anthony John Peleckis, Trumbull, Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 439,795, Feb. 5, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 615,012

Int. Cl.<sup>2</sup> B32B 3/02, 15/08

U.S. Cl. 428—192

14 Claims

1. A razor blade comprising at least one cutting edge, a first adherent continuous polytetrafluoroethylene coating on the cutting edge having a relatively low molecular weight between approximately 2,000 and 50,000, and a second adherent continuous polytetrafluoroethylene coating on said first coating comprising discrete particles of said second polytetrafluoroethylene coating having a relatively high molecular weight between approximately 50,000 and 10,000,000 sintered over said first coating to form microscopic raised portions of said second coating on said first coating along said cutting edge.

4,012,552

## DECORATIVE METAL FILM HEAT TRANSFER DECALCOMANIA

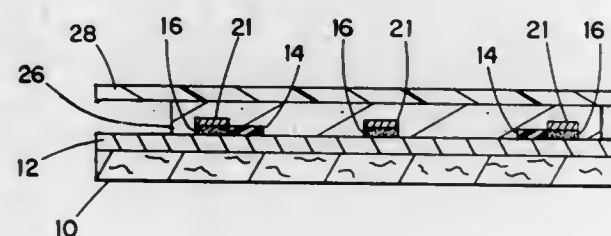
Tom J. Watts, Sherborn, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Mar. 10, 1975, Ser. No. 556,871

Int. Cl.<sup>2</sup> B44C 1/16; B41M 3/12

U.S. Cl. 428—200

5 Claims



1. A preprinted heat transfer decalcomania for decorating a receiving surface with both an ink design and a metal in a predetermined pattern, which comprises a temporary carrier having a smooth release surface, a printed ink design, a first dry, transparent adhesive printed in said predetermined pattern, a film of metal bonded to and commensurate in area to said first adhesive, and a second adhesive layer overlaying said ink design and metal pattern adapted upon application of heat and pressure to adhere the decalcomania to said receiving surface.

4,012,553

## RESINOUS REPAIR PAD

Lawrence M. Clemens, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn. Continuation-in-part of Ser. No. 493,677, Aug. 1, 1974, abandoned, which is a continuation of Ser. No. 249,055, May 1, 1972, abandoned. This application July 7, 1975, Ser. No. 593,216

Int. Cl.<sup>2</sup> B05D 3/06

U.S. Cl. 428—285

10 Claims

1. Method of making a stable exudation-resistant resin-impregnated adherent fibrous sheet material which when pressed against a receptive substrate and then exposed to actinic radiation will cure to a hard, non-tacky, solvent-resistant state and remain firmly adhered to said substrate, comprising impregnating a porous, fibrous mat with a radiation-curable sticky fluid resinous composition comprising unsaturated polyester, unsaturated liquid monomer copolymerizable therewith, and an acyloin photoinitiator, said resinous composition being present in an amount sufficient to provide the impregnated mat with a sticky surface, enclosing the impregnated mat between a transparent film and another protective supporting web, and then exposing the product to a non-reaction-sustaining amount of actinic radiation sufficient to gelatinize, but not to rigidify, the resinous composition wherein said composition remains in a stable condition substantially free of reaction-sustaining free radicals in which a portion of the composition swells, but does not dissolve when suspended for 18 hours in 1:1 acetone-toluene and in which it exhibits a decrease in penetration value of approximately one-half.

4,012,554

## SINGLE COATING RECORD SYSTEM-SOLVENT LOSS PRODUCES COLOR

Robert E. Miller; Robert W. Brown, and Paul S. Phillips, Jr., all of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

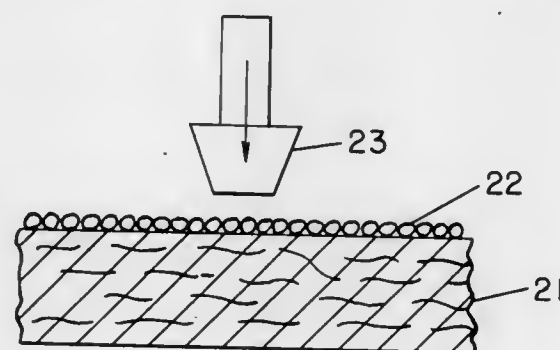
Division of Ser. No. 315,723, Dec. 15, 1972, abandoned, which is a division of Ser. No. 173,559, Aug. 20, 1971, abandoned.

This application Dec. 12, 1974, Ser. No. 531,932

Int. Cl.<sup>2</sup> B32B 5/16, 27/00

U.S. Cl. 428—327

6 Claims



1. In a record sheet material comprising a substrate sheet having adhesively bound on a surface a multiplicity of discrete, rupturable, microcapsules consisting essentially of capsule wall material and a liquid internal phase wherein said capsule wall material is organic polymeric film forming material and said internal phase is a substantially colorless ink which yields a distinctive marking color on exposure to color-developing conditions, wherein the improvement comprises an internal phase which is an equilibrium solution comprising a volatile organic solvent vehicle having dissolved therein colorless chromogenic material, color-developing reactant material, and the colored dye resulting from reaction between the chromogenic material and the color-developing reactant material.

4,012,555

## SELF-BONDING VARNISH FOR MAGNET WIRES COMPRISING A COMBINATION OF A POLYALKYLENETRIMELLITATE IMIDE AND A POLYALKYLENETRIMELLITATE ESTER IMIDE

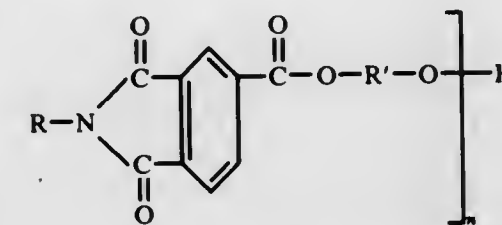
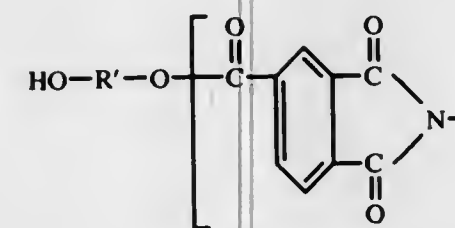
Robert G. Keske, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,713

Int. Cl.<sup>2</sup> B32B 15/08; C08G 78/16; C08L 79/08; H01B 3/30 U.S. Cl. 428—383

14 Claims

1. A composition comprising a polyalkylenetrimellitate imide and a polyalkylenetrimellitate ester imide having a weight ratio of from about 1:19 to 19:1 of the respective polymers wherein said polyalkylenetrimellitate ester imide has the structure



wherein each R and each R' is independently an alkylene group of 2-12 carbon atoms and n is a number sufficient to provide a polymer having an I.V. of at least 0.3 dl/g.

7. Magnet wire bearing a continuous self-bonding varnish top coat comprising the composition of claim 1.

13. The article of claim 7 wherein said magnet wire bears at least one enamel subbing layer selected from the group consisting of polyester, polyester imide, polyimide and polyamideimide.

4,012,556

## SELF-BONDING VARNISH FOR MAGNET WIRES COMPRISING A POLYALKYLENETRIMELLITATE ESTER IMIDE

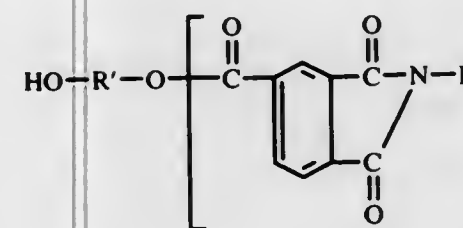
Robert G. Keske, and James R. Stephens, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,716

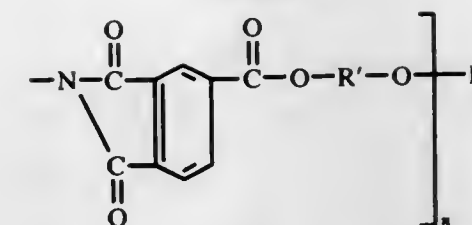
Int. Cl.<sup>2</sup> B32B 15/08; C07D 29/34; C08G 78/16; H01B 3/30 U.S. Cl. 428—383

11 Claims

1. Magnet wire bearing a continuous self-bonding varnish top coat comprising a poly(alkylenetrimellitate ester imide) having an I.V. of at least 0.3 dl/g of the structure



-continued



wherein each R and each R' is independently an alkylene group of 2-12 carbon atoms and n is a number sufficient to provide a polymer having an I.V. of at least 0.3 dl/g.

6. The article of claim 1, wherein said magnet wire bears at least one enamel subbing layer selected from the group consisting of a polyester, polyesterimide, polyimide and polyamideimide.

10. The article of claim 1 wherein the magnet wire is in a fabricated unbonded form.

11. The method of converting the article of claim 10 into a unitary structure, which comprises bonding the fabricated element at a temperature of 150°-300° C.

4,012,557

## NYLON-6 FILAMENT AND METHOD OF MANUFACTURE THEREOF

Jean-Philippe Cornelis, Clementinaaan 40, B-9000 Gent, Belgium

Continuation-in-part of Ser. No. 365,597, May 31, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,526

Claims priority, application France, June 2, 1972, 72.20021 Int. Cl.<sup>2</sup> D02G 3/02

U.S. Cl. 428—397

8 Claims

1. A method of manufacturing a synthetic filament from nylon-6 to permit yarn or fabric made therefrom to be highly pervious to ultraviolet rays consisting essentially of treating nylon-6 in powder form in an aqueous solution containing about 0.5% of an alkali-metal salt selected from the group consisting of potassium bromide and sodium bromide melt-spinning the so-treated nylon-6 by extrusion with intimate mixing through an oval-shaped orifice to form an oval-shaped extruded spun filament having a temperature of about 200° C, immediately cooling the spun filament to the Brill point thereof in order to avoid the formation of spherulites which are an obstacle to the passage of ultraviolet rays, dissolving the superficial shiny surface of the cooled filament by drawing said filament through a bath of saturated aqueous solution of copper lactate or formic acid, at a temperature of about 55° C, again cooling to the Brill point, thus providing an oval-shaped nylon-6 filament that is pervious to ultraviolet rays.

4,012,558

## PROCESS FOR THE MANUFACTURE OF FLAME-RESISTANT BOARDS, A FLAME-RETARDANT MIXTURE AND A FLAME-RETARDANT BONDING COMPOSITION CONTAINING THE SAME

Eliahu Wurman, Arad, Israel, assignor to Dead Sea Bromine Company Ltd., Beer-Sheva, Israel

Filed May 22, 1974, Ser. No. 472,105

Claims priority, application Israel, May 22, 1973, 42334 Int. Cl.<sup>2</sup> C09K 3/28; B27K 3/52

U.S. Cl. 428—411

14 Claims

1. A flame retardant mixture adapted for incorporation into the bonding agent used in the production of chipboard, plywood and the like consisting essentially of ammonium bromide, urea phosphate and hexamethylenetetraamine, said hexamethylenetetraamine being present in a sufficient amount to inhibit the rate of gelling of said bonding agent said ammonium bromide and urea phosphate being present in flame retarding amounts.



4,012,559

**RADIATION CURABLE COATING COMPOSITION AND PRECOATED METAL HAVING TOP COAT BASED ON THE SAME**

Shuji Fujioka; Junichi Fujikawa; Masao Takahashi, all of Otsu; Tadashi Tanaka, Yokohama; Akira Okamoto, Yokohama, and Nagaharu Ueno, Yokohama, all of Japan, assignors to Toray Industries, Inc and Nippon Steel Corporation, both of Tokyo, Japan

Filed Oct. 30, 1975, Ser. No. 627,467

Claims priority, application Japan, Oct. 31, 1974, 49-124870

Int. Cl.<sup>2</sup> C08F 2.54; C08L 31/00, 63/02; B32B 15/08

U.S. Cl. 428-463

6 Claims

1. A radiation curable coating composition, which comprises as essential ingredients:

- A. 100 parts by weight of an acrylic copolymer having a number average molecular weight of 15,000 to 800,000 and predominantly comprised of polymerized units of at least one acrylic ester selected from acrylic acid esters and alpha-substituted acrylic acid esters, and having a solubility parameter of from 9.1 to 10.8,
- B. 5 to 150 parts by weight of at least one polyfunctional compound having a molecular weight of not greater than 2,000 and at least two radical-polymerizable double bonds in the molecule, and;
- C. 0.2 to 15 parts by weight of at least one non-polymerizable and non-volatile organic compound having a molecular weight of not greater than 3,000 and having a solubility parameter of from 8.3 to 10.9.

6. A precoated metal material which comprises a metal substrate and a cured top coating bonded to said substrate directly or via a primer coating, said top coating being based on a radiation curable coating composition comprising as essential ingredients:

- A. 100 parts by weight of an acrylic copolymer having a number average molecular weight of 15,000 to 800,000 and predominantly comprised of polymerized units of at least one acrylic ester selected from acrylic acid esters and alpha-substituted acrylic acid esters, having a solubility parameter of from 9.1 to 10.8;
- B. 5 to 150 parts by weight of at least one polyfunctional compound having a molecular weight of not greater than 2,000 and at least two radical-polymerizable double bonds in the molecule, and
- C. 0.2 to 15 parts by weight of at least one non-polymerizable and non-volatile organic compound having a molecular weight of not greater than 3,000 having a solubility parameter of from 8.3 to 10.9.

4,012,560

**ARTICLES COATED WITH PRESSURE-SENSITIVE INTERPOLYMERS CONTAINING**

2-ACRYLAMIDO-2-METHYLPROPANESULFONIC ACID  
James C. Baatz, West Springfield, and Albert E. Corey, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 475,062, May 31, 1974, Pat. No. 3,931,087. This application Nov. 3, 1975, Ser. No. 628,005

Int. Cl.<sup>2</sup> C09H 7/02, 7/04; B32B 27/06

U.S. Cl. 428-474

8 Claims

1. An article of manufacture comprising a substrate coated on at least one side with a pressure-sensitive interpolymer comprising:

- A. from 0.1 to 1.5 weight percent of 2-acrylamido-2-methylpropanesulfonic acid, and
- B. at least one monomer selected from the group consisting of esters of acrylic acid and methacrylic acid containing from 6 to 20 carbon atoms, alone, or with
- C. a monomer selected from the group consisting of alpha-olefins containing from 2 to 10 carbon atoms, vinyl esters of alkanolic acids containing from 3 to 10 carbon atoms,

ethyl and methyl esters of acrylic and methacrylic acids, acrylonitrile, methacrylonitrile, styrene, vinyl toluene, and vinyl chloride,

wherein the interpolymer has a weight average molecular weight in the range 10,000 to 1,000,000 and a glass transition temperature in the range of -15° to -75° C.

4,012,561

**DECORATIVE LAMINATE WITH CARE OF NEWSPRINT AND WOOD PULP**

Joseph B. Doughty, Sullivan's Island, and Carl F. Schulerud, Charleston, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 328,260, Jan. 31, 1973, abandoned. This application June 2, 1975, Ser. No. 583,042

Int. Cl.<sup>2</sup> B32B 23/06

U.S. Cl. 428-531

3 Claims

1. A decorative laminate meeting N.E.M.A. standards for surface veneering having the following laminae combined in order of ascending superimposed relationship to form a unitary structure, (a) a core, (b) a decorative cellulose sheet impregnated with a melamine resin, and (c) a cellulose overlay sheet impregnated with a melamine resin, the improvement comprising,

forming said core from a multiplicity of core sheets, each of said core sheets consisting essentially of from 10 to 100% repulped newsprint and the remainder of said sheet being a pulp selected from the group consisting of pine pulp, hardwood pulp and mixtures thereof, and impregnating each of said core sheets with from 10 to 70% by weight of a phenolic resin.

4,012,562

**MODULAR ELECTRICAL ENERGY STORAGE DEVICE**

Richard C. Saunders, Simi, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

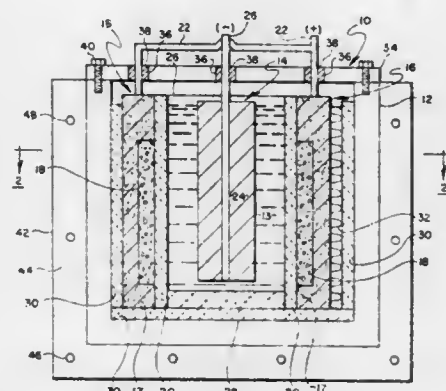
Continuation of Ser. No. 512,818, Oct. 7, 1974. This application Nov. 28, 1975, Ser. No. 635,825

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> H01M 4/36

U.S. Cl. 429-103

7 Claims



1. An electrical energy storage device comprising:  
a housing which contains device components including positive and negative electrode means positioned therein, ion-conductive molten salt electrolyte disposed between said positive and negative electrode means and in contact therewith, and a resilient carbonaceous body of at least partially compressed carbon or graphite fibers for resiliently urging at least selected device components in contact with one another and maintaining them in a substantially fixed position during operation of the device at elevated temperatures.

4,012,563

**SEALED LITHIUM-SODIUM ELECTROCHEMICAL CELL WITH SODIUM BETA-ALUMINA ELECTROLYTE**

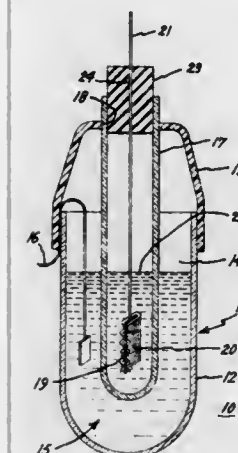
Gregory C. Farrington, Elnora, and Walter L. Roth, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,945

Int. Cl.<sup>2</sup> H01M 4/36

U.S. Cl. 429-104

6 Claims



1. A sealed lithium-sodium electrochemical cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium-sodium, lithium-sodium as an amalgam, and lithium-sodium in a non-aqueous electrolyte, the anode consisting of from 1.0 weight percent to 99.0 weight percent lithium and the balance being sodium, a cathode positioned within the casing, the cathode functioning with an anode selected from the class consisting of lithium-sodium, lithium-sodium as an amalgam, and lithium-sodium in a non-aqueous electrolyte, and a solid sodium beta-alumina ion-conductive electrolyte positioned within the casing between the anode and cathode and in contact with both the anode and cathode.

4,012,564

**ELECTROCHEMICAL CELLS HAVING AN ELECTROLYTIC SOLUTION COMPRISING A COVALENT INORGANIC OXYHALIDE SOLVENT**

James J. Auburn, Groton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 385,127, Aug. 2, 1973, Pat. No.

3,926,669, which is a continuation-in-part of Ser. Nos. 305,811, Nov. 13, 1972, abandoned, and Ser. No. 305,812, Nov. 13, 1972, abandoned. This application Sept. 26, 1975, Ser. No. 617,124

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> H01M 6/14

U.S. Cl. 429-194

19 Claims

1. An electrochemical cell consisting essentially of an oxidizable active anode material; a solid, non-consumable, electrically conducting, inert cathode current collector selected from the group consisting of the alkaline earth metals, the Group III A metals, the Group IV A metals, the Group V A metals, the transition metals, the rare earth metals, and semiconductors; said anode material being more electropositive than said cathode current collector and thus said anode material is oxidized during operation of said cell; and an electrolytic solution consisting essentially of a liquid, electrochemically reducible, covalent inorganic oxyhalide or thiohalide solvent and a solute dissolved therein, said inorganic solvent being free of sulfur dioxide; said inorganic solvent being electrochemically reduced upon the surface of said cathode current collector, whereby said inorganic solvent in conjunction with said oxidizable anode material serves as a source of electrical energy during operation of said cell.

4,012,565

**PHOTODEGRADABLE POLYOLEFIN COMPOSITION CONTAINING AN N-HALO HYDANTOIN**

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 582,507, May 30, 1975, Pat. No.

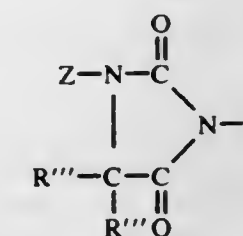
3,968,095, which is a division of Ser. No. 453,911, March 22, 1974, Pat. No. 3,932,352. This application Apr. 2, 1976, Ser. No. 672,908

Int. Cl.<sup>2</sup> C08J 3/20

U.S. Cl. 526-6

3 Claims

1. A photodegradable composition comprising a polyolefin and about from 0.1 to 10%, based on the weight of polyolefin, of an additive of the structure



wherein one of the Z's is chlorine, bromine, or iodine, and the other Z is hydrogen, chlorine, bromine, or iodine, and each R''' is hydrogen or a lower alkyl radical.

4,012,566

**METHOD FOR MODIFYING THE PROPERTIES OF RUBBERY POLYMERS OF CONJUGATED DIENES**

Robert P. Zelinski, Bartlesville, Okla., and Rudolph H. Gath, Eilenburgerweg, Germany, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 72,904, Sept. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 689,335, Dec. 11, 1967, abandoned. This application Mar. 10, 1975, Ser. No.

557,157

Int. Cl.<sup>2</sup> C08F 8/42

U.S. Cl. 526-48

33 Claims

1. A process to decrease the cold flow of a conjugated diene polymer wherein said conjugated diene polymer is a homopolymer or copolymer of a conjugated diene or of a conjugated diene with a monomer containing a vinylidene group, which process comprises contacting said conjugated diene polymer with a homogeneous olefin disproportionation catalyst, wherein said catalyst is an admixture of (a) an NO-containing transition metal complex represented by the formula  $[L_n(\text{NO})_m M_2 Z_d]$ , and (b) an aluminum-containing component,

wherein in said (a) L is a ligand; M is a transition metal selected from Group VIB, VIIB, and the iron and cobalt subgroups of Group VIII; Z is a halide, CN, SCN, OCN, or  $\text{SnCl}_3$ ; a and d are numbers 0 to 6; b is 1 or 2; c is 1 to 4; and x is a number indicative of the polymeric state of the complex; and

wherein said (b) aluminum-containing component is (1) represented by the formula  $\text{R}_n\text{AlX}_m$ ; (2) a mixture of (1) and a compound represented by the formula  $\text{R}_n\text{AlX}_m$ , wherein R is an aromatic or saturated aliphatic radical, including radicals substituted with halo groups or alkoxy groups, and having up to about 20 carbon atoms, X is halogen, n is 2 or 3, m is 0 or 1 and the sum of n and m is 3; or (3) a compound represented by the formula  $\text{R}_n\text{AlX}_m$ , wherein R, X, n and m are as defined herein, and wherein the ratio of (b):(a) and the conditions of said contacting including temperature, pressure, and time, are effective to decrease said cold flow of said conjugated diene polymer.



4,012,567

## TITANATE ESTER CURE OF UNSATURATED ELASTOMERS

Frederick C. Loveless, Cheshire, Conn., assignor to Uniroyal Inc., New York, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,712

Int. Cl.<sup>2</sup> C08F 8/43, 8/14

U.S. Cl. 526—48

14 Claims

1. A method of curing an unsaturated elastomer consisting essentially of mixing 100 parts by weight of the said elastomer with from 1 to 10 parts by weight of an organo titanate ester, the resulting mixture being substantially anhydrous and containing less than one mole of non-volatile organic hydroxy compound per mole of titanate ester, and exposing the resulting mixture to the atmosphere, whereby the unsaturated elastomer becomes cured by the action of the said organo titanate ester.

4,012,568

## ENZYME SEPARATION

Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England

Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.

This application Sept. 2, 1975, Ser. No. 609,419  
Claims priority, application United Kingdom, Feb. 11, 1971, 3469/71Int. Cl.<sup>2</sup> C08F 120/052

U.S. Cl. 526—50

9 Claims

1. A reactive matrix consisting essentially of nicotinamide adenine dinucleotide phosphate chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said nicotinamide adenine dinucleotide phosphate attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said nicotinamide adenine dinucleotide phosphate, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,569

## ENZYME SEPARATION

Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England

Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.

This application Sept. 2, 1975, Ser. No. 609,420  
Claims priority, application United Kingdom, Feb. 11, 1971, 3469/71Int. Cl.<sup>2</sup> C08F 120/052

U.S. Cl. 526—50

9 Claims

1. A reactive matrix consisting essentially of a reduced form of nicotinamide adenine dinucleotide phosphate chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said reduced form of nicotinamide adenine dinucleotide phosphate attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said reduced form of nicotinamide adenine dinucleotide phosphate, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,570

## ENZYME SEPARATION

Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England

Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.

This application Sept. 4, 1975, Ser. No. 610,151

Int. Cl.<sup>2</sup> C08F 120/052

U.S. Cl. 526—50

9 Claims

1. A reactive matrix consisting essentially of adenosine diphosphate ribose chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said adenosine diphosphate ribose attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said adenosine diphosphate ribose, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,571

## ENZYME SEPARATION

Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England

Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.

This application Sept. 4, 1975, Ser. No. 610,153

Claims priority, application United Kingdom, Feb. 11, 1971, 4469/71

Int. Cl.<sup>2</sup> C08F 120/052

U.S. Cl. 526—50

9 Claims

1. A reactive matrix consisting essentially of adenosine monophosphate chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said adenosine monophosphate attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said adenosine monophosphate, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,572

## ENZYME SEPARATION

Peter Duncan Goodearl Dean, 43 Redgate, Formby, Lancashire, and Christopher Robin Lowe, 'Fairlight', 238 Windsor Road, Maidenhead, Berkshire, both of England

Division of Ser. No. 469,221, May 13, 1974, which is a continuation of Ser. No. 224,528, Feb. 8, 1972, abandoned.

This application Sept. 4, 1975, Ser. No. 610,154

Claims priority, application United Kingdom, Feb. 11, 1971, 4469/71

Int. Cl.<sup>2</sup> C08F 120/052

U.S. Cl. 526—50

9 Claims

1. A reactive matrix consisting essentially of adenosine diphosphate chemically attached to a water insoluble organic polymeric support material, said reactive matrix being free from chemically attached enzymes, and said water insoluble organic polymeric support material containing said adenosine diphosphate attached thereto being capable of attracting enzymes in affinity chromatography which are attracted to said adenosine diphosphate, thereby making it possible to separate enzymes from other components of a liquid medium containing said enzymes as well as other enzymes.

4,012,573

## METHOD OF REMOVING HEAT FROM POLYMERIZATION REACTIONS OF MONOMERS IN THE GAS PHASE

Hans-Georg Trieschmann, Hambach; Karl-Heinz Ambil, Ludwigshafen; Wolfgang Rau, Heidelberg, and Karl Wisseroth, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 349,213, April 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 186,348, Oct. 4, 1971. This application Oct. 16, 1975, Ser. No. 623,019

Claims priority, application Germany, Oct. 9, 1970, 2049622

Int. Cl.<sup>2</sup> C08F 2/34, 10/00

U.S. Cl. 526—68

4 Claims

1. In an improved method of removing heat from the polymerization reactions of monomers in the gas phase in which gaseous or liquid monomer optionally together with an inert liquid heat-transfer agent is introduced into the polymerization zone, pulverulent polymer is removed therefrom and gaseous monomer or gaseous inert heat-transfer agent, is removed from said polymerization zone, liquefied by cooling under the pressure prevailing in the polymerization zone and reintroduced in the liquid state into the polymerization zone, the improvement which comprises:

- condensing and storing said monomer or heat-transfer agent outside the polymerization zone, while the temperature in the polymerization zone is kept constant by regulating the rate of reintroduction of the liquid monomer or heat-transfer agent into the polymerization zone;
- mixing the liquid monomer or liquid heat-transfer agent with the pulverulent polymer within said polymerization zone, said liquid monomer or said liquid heat-transfer agent coming in direct contact with said pulverulent polymer before said monomer or said heat-transfer agent vaporizes;
- controlling the rate of flow of the vaporized monomer or heat-transfer agent so that it does not exceed 10 cm/sec/;
- maintaining the pressure and temperature in the polymerization zone being at such a level that the vaporized monomer or heat-transfer agent remains in the gaseous state;
- stirring said pulverulent polymer in said polymerization zone with a stirrer having an output of from 10 to 35 watts/liter of pulverulent polymer; and
- the mean circulation time of the polymer particles in the polymerization zone is maintained at from 30 to 100 seconds.

4,012,574

## POLYMERIZATION PROCESS

Eric Jones, and John Walker, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 13, 1975, Ser. No. 540,702

Claims priority, application United Kingdom, Jan. 14, 1974, 1615/74

Int. Cl.<sup>2</sup> C08F 4/02, 10/02

U.S. Cl. 526—74

7 Claims

1. A process for the polymerization or copolymerization of olefins by dispersion polymerization of the said olefin or olefins in a non-polar liquid hydrocarbon diluent in the presence of a polymerization catalyst which comprises a transition metal composition which is the product of reacting a transition metal complex of general formula  $R_mMX_p$  with a substan-

tially inert material having a hydroxylic surface which is free of adsorbed water, wherein M is a metal of Groups IVA to VIA of the Periodic Table, R is a hydrocarbon or substituted hydrocarbon group, X is a monovalent ligand and m and p are integers, m having a value from 2 to the highest valency of the metal M, and p having a value from 0, to 2 less than the prevailing valency of M in the complex, and in the presence of a surface-active compound containing one or more terminal aliphatic perfluoro carbon groups containing at least three carbon atoms, selected from branched and straight chain perfluoro alkyl and perfluoro alkenyl groups and perfluoro alkyl chains, and one or more hydrophilic groups selected from oxyalkylene chains and carboxyl groups, the surface-active compound being present in a concentration in the range 0.05 to 25 ppm based on the volume of hydrocarbon diluent.

4,012,575

## HOMOPOLYMERS OF

## CIS-5-NORBORNENE-2,3-DICARBOXYLIC ANHYDRIDES

Norman G. Gaylord, New Providence, N.J., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 470,705, May 16, 1974, abandoned. This application Apr. 30, 1975, Ser. No. 573,194

Int. Cl.<sup>2</sup> C08F 134/00, 234/00

U.S. Cl. 526—271

9 Claims

1. A process for the preparation of homopolymers of cyclic adducts derived from maleic anhydride and a cyclic conjugated diene, said diene selected from the group consisting of cyclopentadiene and methyl cyclopentadiene which comprises heating said adduct at a temperature at which endo-exo isomerization does not occur during the reaction period, said temperature being not less than 50° C., and adding thereto a free radical precursor having a half life of no more than 2 hours.

4,012,576

## ANTIBIOTIC COMPLEX BU 2183

Hiroshi Kawaguchi, Tokyo; Koji Tomita, Kawasaki; Kei-ichi Fujisawa, Kamifukuoka, and Hiroshi Tsukiura, Mitaka, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

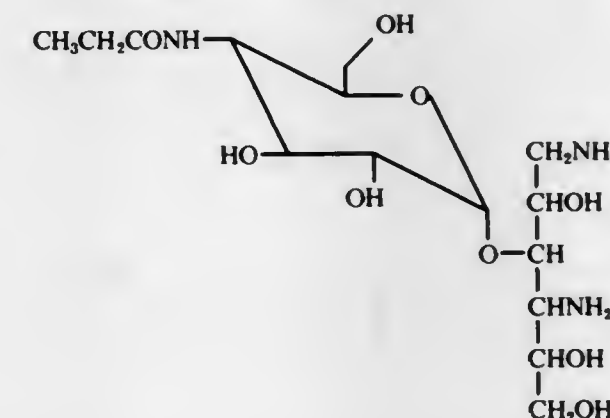
Continuation-in-part of Ser. No. 532,137, Dec. 12, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,391

Int. Cl.<sup>2</sup> A61K 35/00; C07H 15/22

U.S. Cl. 536—17

8 Claims

1. The antibiotic Bu-2183 A of the formula



or a pharmaceutically acceptable acid addition salt thereof.



## ELECTRICAL

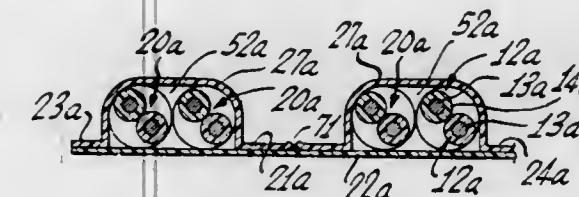
### 4,012,577 MULTIPLE TWISTED PAIR MULTI-CONDUCTOR LAMINATED CABLE

Roger J. Lang, Garden Grove, and Lawrence J. Bockhold, Whittier, both of Calif., assignors to Spectra-Strip Corporation, Garden Grove, Calif.

Filed Apr. 30, 1975, Ser. No. 573,350  
Int. Cl.<sup>2</sup> H01B 7/08

U.S. Cl. 174—27

10 Claims



1. A multi-conductor cable which comprises:
  - a first and second plastic film bonded together to form a) a plurality of spaced encapsulating ducts and b) nip areas extending laterally between and joining each of said encapsulating ducts;
  - a plurality of groups of round, insulated, conductor twisted pairs, each said group consisting of at least two twisted pairs of said round, insulated, conductors and each of said twisted pairs in each said group lying in side to side contiguous relationship with another of said twisted pairs in said group;
  - each of said spaced encapsulating ducts containing one of said groups of insulated round conductor twisted pairs, said encapsulating ducts and said nip areas coacting as alignment means for said groups of round insulated conductor twisted pairs; and
  - a plurality of longitudinally extending cavities, at least one cavity being formed within each of said encapsulating ducts and being defined by an overlying portion of each encapsulating duct and any two of said round insulated twisted conductor pairs contained within each said duct, each of said cavities providing a means for easy entry of a severing tool into each said duct.

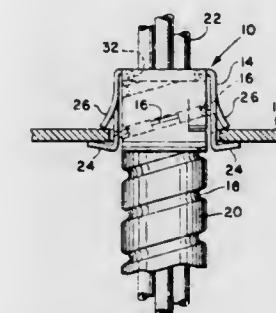
### 4,012,578 ONE PIECE CONNECTOR FOR FLEXIBLE CONDUIT

Thomas M. Moran, Cleveland, and Joseph H. Paskert, Lakewood, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Filed July 2, 1975, Ser. No. 592,587  
Int. Cl.<sup>2</sup> H02G 3/06

U.S. Cl. 174—51

29 Claims



20. A one-piece, self-retaining metal clip for use in connecting an electrical conduit having a helically grooved outer metal covering and electrical wires therein within a generally round aperture in a junction box or the like, said one-piece metal clip being adapted to extend through said aperture in a wall portion of said junction box, said one-piece metal clip comprising a body portion defined by generally flat walls for extending through said aperture in said junction box, said body portion having a first opening at one end thereof for receipt of said electrical wires and a second opening at the other end thereof for receipt of said electrical conduit, flange

means at said other end of said body portion for engaging the outer surface of said junction box, said flange means comprising deflectable portions which are attached to and extend transversely outwardly from the generally flat walls defining said body portion and which have surface portions for engagement with said outer surface of said junction box upon insertion of said one-piece metal clip into said aperture in said wall portion of said junction box, retaining arms formed in at least two of said walls defining said body portion, each of said retaining arms projecting outwardly for a portion of the axial length of said walls defining said body portion and being resiliently deflectable radially inwardly upon insertion of said body portion through said aperture in said junction box and springing outwardly upon passing through said aperture so as to engage the inner surface of said junction box, said retaining arms, in an undeformed position, being separated from said flange means by an axial distance less than the thickness of said wall portion of said junction box permitting said one-piece metal clip to be resiliently clamped to said junction box by said flange means and said retaining arms so as to positively electrically ground said one-piece metal clip to said junction box, at least two of said walls defining said body portion also having an inwardly extending tab formed therein, said tabs extending transversely toward the central axis of said body portion and having an inner elongated edge, said tabs being located at axially and circumferentially offset locations on said body portion permitting said inner elongated edges to be disposed along a helix of the same pitch as the helical groove in the metal covering to threadably connect said metal covering with said body portion, said tabs being spaced from said flange means toward said one end of said body portion causing said tabs to be disposed within said junction box when said electrical conduit is connected to said junction box, and collar means connected to said one end of said body portion to shield said electrical wires from engagement with any burrs which may be present on the outer end portion of said electrical conduit, said collar means including a rim portion disposable within said electrical conduit in a telescopic relationship with said outer end portion of said electrical conduit.

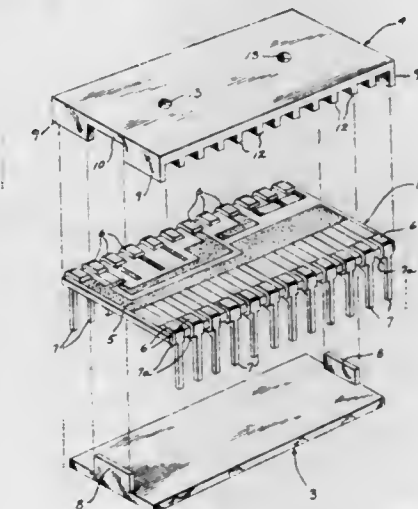
### 4,012,579 ENCAPSULATED MICROCIRCUIT PACKAGE AND METHOD FOR ASSEMBLY THEREOF

Donald J. Fox, Wauwatosa, and Thomas M. Schuster, Waukegan, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Feb. 21, 1975, Ser. No. 551,762  
Int. Cl.<sup>2</sup> H05K 5/00

U.S. Cl. 174—52 PE

15 Claims



1. An encapsulated microcircuit, comprising:
  - a housing having bottom and top cover portions, one of the cover portions having a projecting member thereon and the other cover portion having a recess therein which mates with the projecting member;
  - a substrate having a microcircuit thereon, a plurality of



terminals disposed on a side thereof, and an end abutting the projecting member and which is disposed between the bottom and top cover portions;  
means for bonding the substrate to the upper surface of the bottom cover portion; and  
a compound which is disposed between the top and bottom cover portions and encapsulates the microcircuit therebetween.

4,012,580

## ELECTRICAL WIRING BOX

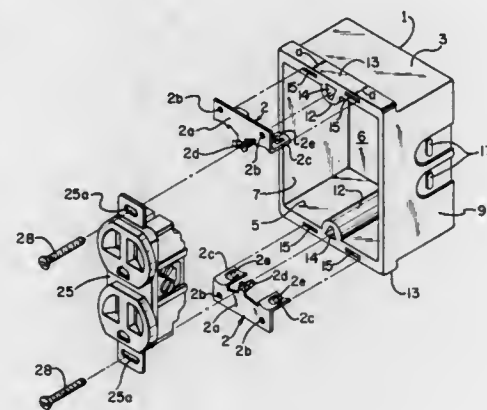
William O. Arnold, Parkersburg, W. Va., assignor to Union Insulating Company, Parkersburg, W. Va.

Filed Oct. 14, 1975, Ser. No. 621,688

Int. Cl.<sup>2</sup> H02G 3/08

U.S. Cl. 174-53

11 Claims



1. A box arrangement comprising:

a box including a plurality of walls arranged to define a space for receiving a device in said space, said box further including a mounting portion extending generally transversely from one of the walls of the box and having a first surface and a second surface and first and second openings spaced from each other with the second opening extending through the mounting portion from the first surface to the second surface, said second opening having a predetermined height in the direction of the mounting portion and being surrounded by the material of the mounting portion; and a mounting member comprising:

a screw-receiving section disposed within the first opening in the mounting portion, said screw-receiving section including a plurality of thread-engaging members disposed along the axis of the first opening and arranged to define a region therebetween for receiving a screw, said thread-engaging members including tabs directed toward the axis of the first opening and capable of being deflected by a screw when the screw is forced into the region between the thread-engaging members and of coming to rest in regions between threads of the screw when the screw has been completely inserted into the region between the thread-engaging members;

a unitary bowed locked element connected with the screw-receiving section and having a maximum height essentially equal to the height of the second opening in the mounting portion, said locking element being disposed within the second opening in the mounting portion with a point along its bowed surface abutting against an edge surface of the second opening; and

a projection extending outwardly from the bowed surface of the locking element at an acute angle and having a free end, said projection being outside of the second opening in the mounting portion with the free end thereof abutting angularly against the second surface of the mounting portion along a line generally transverse to the aforesaid one of the walls of the box following the insertion of the locking element into the second opening, said free end of the projection facing in a direction toward the first and second surfaces of the mounting portion.

4,012,581

## FRAME-TYPE DAMPING SPACER

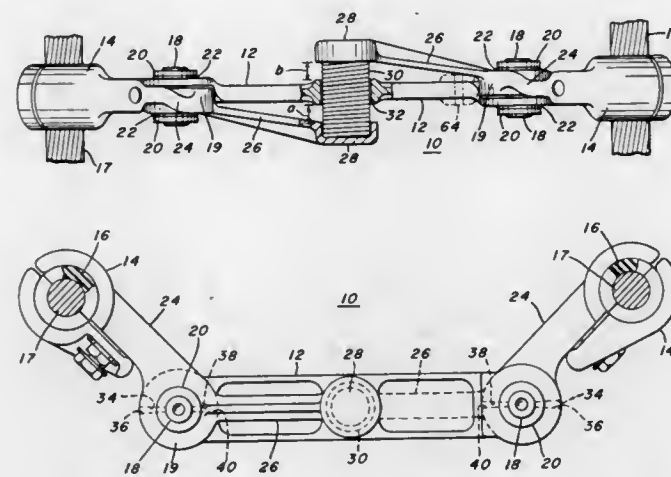
Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 5, 1976, Ser. No. 664,087

Int. Cl.<sup>2</sup> H02G 7/14, 7/12

U.S. Cl. 174-42

17 Claims



17. A damping spacer having a body member, a plurality of conductor clamping members and pivot means respectively pivotally attaching the clamping members to said body member at respective spaced locations thereon, with at least two of the clamping members having respective arm portions located opposite each other, and resilient damping means resiliently connecting the respective opposite arm portions together, the damping means having a longitudinal axis extending through the body member.

4,012,582

## DAMPING SPACERS FOR CONDUCTOR BUNDLES

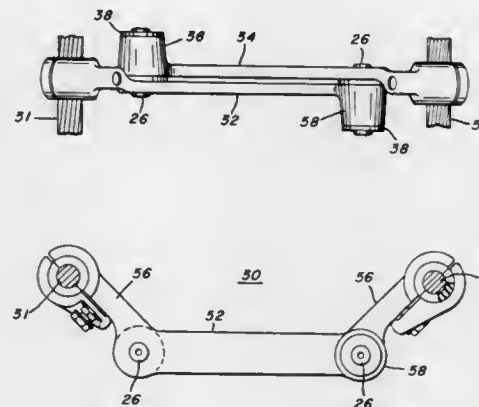
Ronald G. Hawkins, Massena, N.Y., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 626,975, Oct. 29, 1975, Pat. No. 3,971,881. This application Mar. 29, 1976, Ser. No. 671,360

Int. Cl.<sup>2</sup> H02G 7/14, 7/12

U.S. Cl. 174-42

3 Claims



1. A frameless damping spacer for spacing at least two, parallel, overhead conductors, the damping spacer comprising at least two, rigid, spacer arms and conductor clamping members, said clamping members being respectively located adjacent one end of each of the spacer arms, an integral housing provided adjacent the other end of each spacer arm, an opening provided in each arm near the clamping member, and an opening extending through each housing, said spacer arms

being disposed together such that the opening in the housing and the opening near the clamping member of one arm are respectively aligned with the opening near the clamping member and the opening provided in the housing of the other arm, rigid pins extending respectively through the aligned openings in the arms, and a damping mechanism located in the opening of at least one of the housings and mechanically associated with the housing and the pin associated therewith.

4,012,583

## PAY TV CONTROL SYSTEM

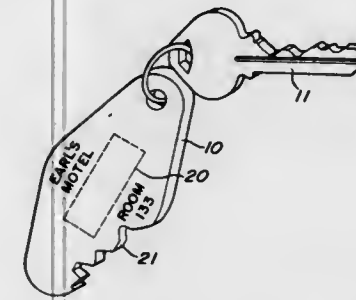
Dennis A. Kramer, Des Plaines, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1975, Ser. No. 555,010

Int. Cl.<sup>2</sup> H04N 1/44

U.S. Cl. 358-84

10 Claims



1. In a television receiving system wherein access to certain special channels is controlled, control apparatus comprising: activating means including mechanical key means and a validatable portion, said portion being adapted to being cancelled; and enabling means including circuitry for controlling access to the special channels, locking means adapted to be unlocked by the key means, sensing means for sensing the presence of a validated portion of the activating means, and cancellation means for cancelling the validation of the validatable portion of the activating means.

4,012,584

## APPARATUS FOR MAKING A SCREEN REPRODUCTION OF AN IMAGE

Richard M. Gascoigne, Esher, England, assignor to Crosfield Electronics Limited, London, England

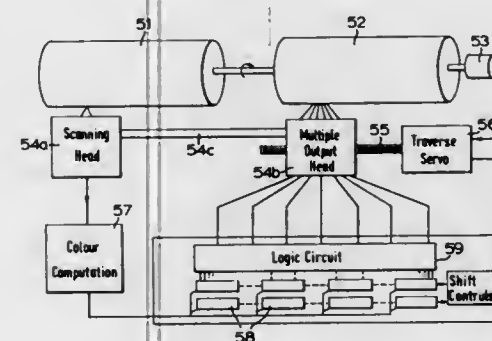
Filed Jan. 29, 1975, Ser. No. 545,179

Claims priority, application United Kingdom, Jan. 30, 1974, 4250/74

Int. Cl.<sup>2</sup> H04N 5/86; G11B 7/08

U.S. Cl. 358-302

8 Claims



1. Apparatus for making a screen reproduction of an image, including a row of light source elements for exposing, in combination, a line across a component screen area of a sheet or plate to be exposed, and an electronic screened-image signal generator operative under the effect of an image-representing signal to control the illumination of the light source elements, the screened-image signal generator comprising a pair of shift

register devices, each storage location in one shift register device having a corresponding storage location in the other shift register device, means for moving trains of logic signals along the two shift register devices in opposite directions, means responsive to an image-representing signal to vary the length of the trains of local signals in the shift register devices, means responsive to the coincidence of logic signals in corresponding storage locations in the two shift register devices to develop a screened-image signal for that pair of locations, means for achieving relative movement between the said light source elements on the one hand and the sheet or plate on the other hand along successive scan lines in a direction at an angle to the said line across the component screen area, in synchronism with the movement of the trains of logic signals along the two shift register devices, and means for applying resultant screened-image signals to the said light source elements during such relative movement whereby the component screen area of the sheet or plate is exposed scan line by scan line.

4,012,585

## INPUT AND OUTPUT FLYING SPOT SCANNING SYSTEM

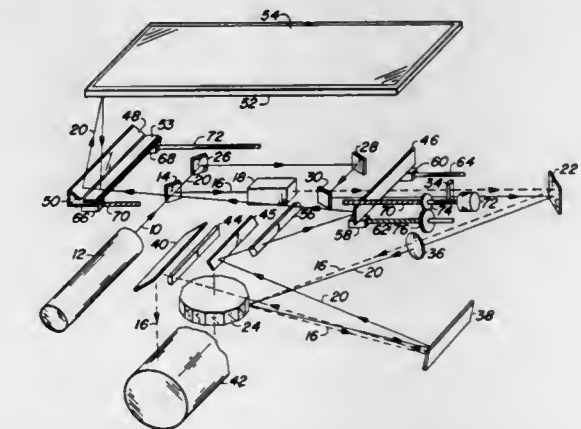
Philip L. Chen, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 3, 1975, Ser. No. 546,478

Int. Cl.<sup>2</sup> H04N 5/84, 3/08

U.S. Cl. 358-285

7 Claims



1. In a flying spot scanning system: an illumination source generating a collimated beam, a beam splitter in the path of the collimated beam permitting a portion of the collimated beam to pass therethrough and redirecting another portion of the collimated beam, a modulator located between said beam splitter and a rotatable polygon scanner in the path of one of said beam portions to modulate the same to provide a modulated beam, the other of said beam portions being an unmodulated beam, an imaging station, a reading station, means for directing each said beam along separate paths to said polygon and including a first cylinder lens and an imaging lens optically located between said polygon and said first cylinder lens, said first cylinder lens and said imaging lens being located in the path of each of said beams, said first cylinder lens being optically located between said beam splitter and said polygon, the width of each beam in the direction of scan at the polygon being substantially the same, said beams being aligned on said polygon in a direction parallel to the axis of rotation, said directing means directing said beams to said polygon along such paths that said beams will reflect from said polygon along separate paths, said imaging station being in the path of the modulated beam reflected from said polygon, a second cylinder lens being optically located between said polygon and said imaging station in the path of said modulated beam, said reading station being in the path of the unmodulated beam reflected from said polygon, a first mirror optically located between said polygon and said reading station, a second mirror optically located between said first mirror and said reading station, said first mirror being in the path of said scanned unmodulated beam, said first mirror reflecting said unmodu-



lated beam to said second mirror, said second mirror reflecting said unmodulated beam to said reading station, each of said mirrors extending across said reading station in the direction of beam scan whereby the unmodulated beam will be scanned across said document station in an X direction, means mounting said first and second mirrors for movement in a Y direction transverse to said X direction, means for simultaneously moving said second mirror in said Y direction across substantially the full length of said document station and for moving said first mirror in the same direction as said second mirror is moved a distance substantially less than the distance said second mirror is moved, the relative distance of and the relative rate of movement of said mirrors being such to maintain the unmodulated beam length between said polygon and said reading station substantially constant, and means for detecting reflection of said unmodulated beam from said reading station, a third cylinder lens optically located between said reading station and said polygon in the path of said scanned unmodulated beam, said first cylinder lens having its power plane in a plane generally perpendicular to the axis of rotation of said polygon, said second and third cylinder lenses each having its power plane in a plane generally parallel to the axis of rotation of said polygon and each being equally optically spaced from said imaging lens.

4,012,586

# DEVICE FOR THE AMPLITUDE MODULATION OF AN ELECTRICAL SIGNAL

Jan Roos, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

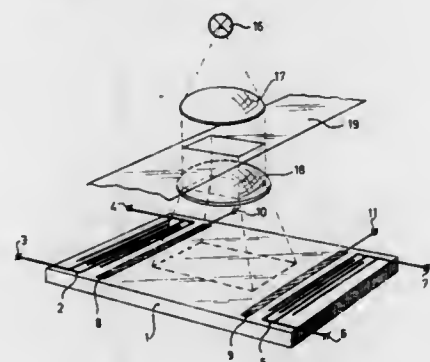
Filed Aug. 26, 1975, Ser. No. 607,771

Claims priority, application Netherlands, Sept. 2, 1974, 7411606

Int. Cl.<sup>2</sup> H04N 3/14

U.S. Cl. 358—285

14 Claims



1. A device for the amplitude-modulation of an electrical signal, comprising a wafer of a piezoelectric material, a first transducer coupled to the wafer for converting the electrical signal into a Bleustein-Gulyaev acoustic surface wave, a second transducer coupled to the wafer at a point spaced apart from the first transducer for converting surface waves into electric signals, free charge carriers being located within the range of influence of the electric field associated with the surface wave, the material on which the surface wave propagates being a semi-conductor material, and means for applying an electric drift field parallel to the direction of propagation of the surface wave, the drift field comprising at least two components, one component with a field strength at which the concentration of free charge carriers does not influence the gain or attenuation of the surface wave, and a pulsating component, which is either zero or has such a value that the gain or attenuation of the surface wave under the influence of the sum of the two components is dependent on the concentration of free charge carriers.

4,012,587

# SOLID STATE IMAGE SENSOR

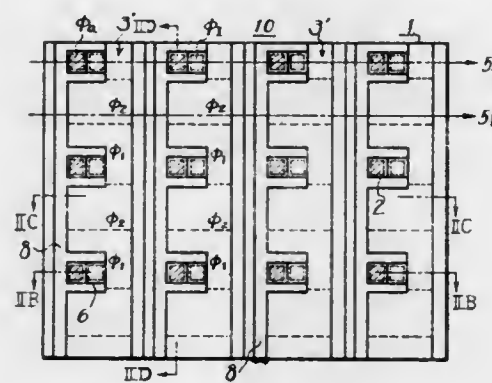
Shigeyuki Ochi, Machida; Seisuke Yamanaka, Mitaka, and Yasuo Kanou, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 26, 1976, Ser. No. 652,116

Claims priority, application Japan, Jan. 30, 1975, 50-12740 Int. Cl.<sup>2</sup> H04N 3/16

U.S. Cl. 358—213

10 Claims



1. A solid state image sensor employing charge transfer devices comprising:

- a plurality of image pickup portions aligned in two dimensions in areas of a semiconductor body, each image pickup portion having an image storing area and a transfer gate area;
- a plurality of vertical shift registers extending adjacent said image pickup portions in the vertical direction, each vertical shift register having a plurality of electrode sets having enlarged portions which lie between said image pickup portions relative to the vertical direction; and
- a horizontal register for receiving collected light information from said plurality of vertical shift registers in parallel and for supplying the light information in a serial form to an output.

4,012,588

# POSITION DETERMINING APPARATUS AND TRANSDUCER THEREFOR

Robert L. Davis, Prospect, and Joseph A. Howells, Danbury, both of Conn., assignors to Science Accessories Corporation, Southport, Conn.

Filed Aug. 29, 1975, Ser. No. 608,917

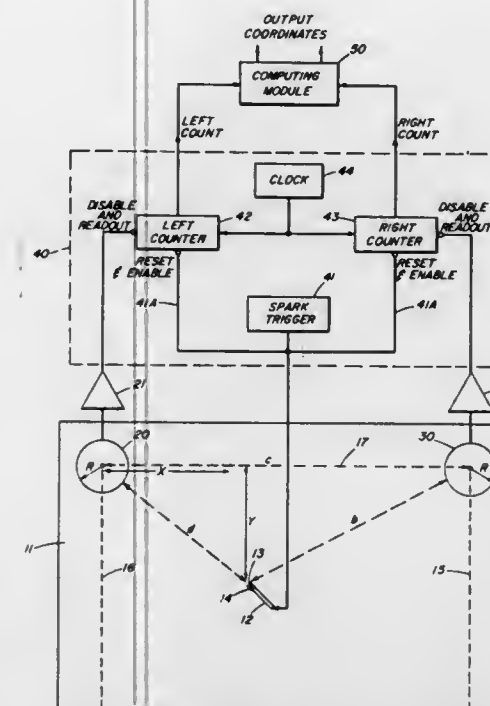
Int. Cl.<sup>2</sup> G08C 21/00

U.S. Cl. 178—18

12 Claims

1. Apparatus for determining the position of a movable element which is movable in a data space comprising: first and second spaced receivers, each of said receivers comprising a curved shell of piezoelectric material having a conductive coating thereon and resilient conductive means coupled across the inner and outer surfaces of said shell; source means for periodically generating sound waves for travel through air between said movable element and said first and second receivers; timing means coupled to said receivers and synchronized with the generation of said sound waves for measuring the

transit time of said sound waves between said source and said receivers; and



computing means for translating the measured transit times to coordinates of the movable element.

4,012,589

# SWITCHING ARRANGEMENT FOR TRANSMITTING DATA IN TIME DIVISION MULTIPLEX SYSTEMS

Konrad Reisinger, Zorneding, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

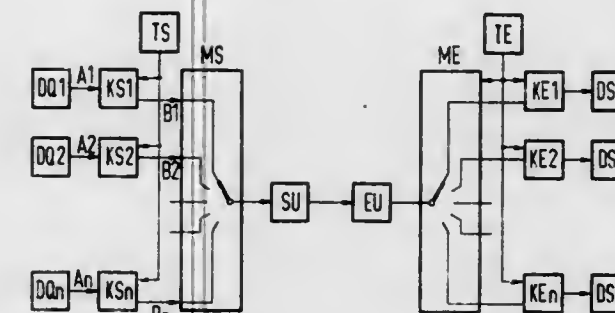
Filed Feb. 13, 1976, Ser. No. 658,120

Claims priority, application Germany, Mar. 20, 1975, 2512302

Int. Cl.<sup>2</sup> H04J 3/06

U.S. Cl. 178—50

3 Claims









4,012,597

## TRANSMISSION TRUNK MULTICHANNEL DISPATCH SYSTEM WITH PRIORITY QUEUING

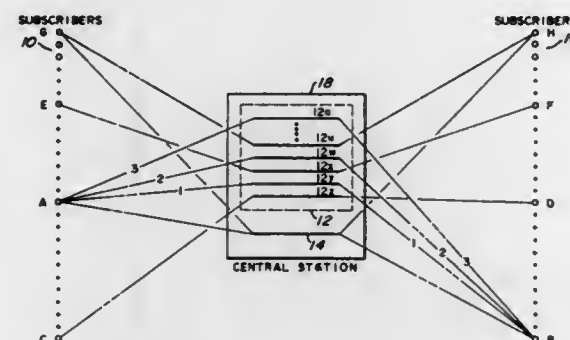
Charles Nelson Lynk, Jr., Arlington Heights, and James Joseph Mikulski, Deerfield, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 24, 1975, Ser. No. 634,962

Int. Cl.<sup>2</sup> H04Q 7/00

U.S. Cl. 179-41 A

40 Claims



1. Control apparatus in a communication system having a central control station for assigning a limited number of information channels to a plurality of remote stations, each of said remote stations communicating a message, comprising a plurality of individual transmissions, on its assigned channel, the apparatus comprising:

- each remote station having means to request a channel assignment from the central station;
- means responsive to an assigned channel signal to operate on said channel;
- means generating an end of transmission signal at the conclusion of each remote station transmission; and
- the central station having means to assign a channel to a requesting remote station; and
- means detecting the end of transmission signal from a remote station and truncating said remote station's channel assignment in response thereto.

4,012,598

## METHOD AND MEANS FOR PULSE RECEIVER SYNCHRONIZATION

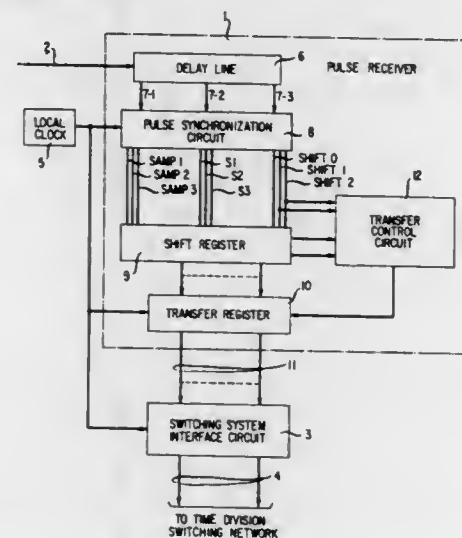
Paul Ronald Wiley, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 14, 1976, Ser. No. 649,045

Int. Cl.<sup>2</sup> H04L 7/08

U.S. Cl. 178-69.1

24 Claims



1. A method of synchronizing the reception of serial pulses of a pulse stream, comprising the steps of generating binary sequences representing multiple samples of received pulses,

using the sequences to control the selection of ones of the samples having a predetermined phase relationship to the pulse stream, analyzing successive sequences to determine when the pulses have drifted with respect to the selected samples, and compensating for the drift by controlling the selection of other prescribed ones of the samples.

4,012,599

## TELEPHONE COMMUNICATIONS SYSTEM FOR THE DEAF

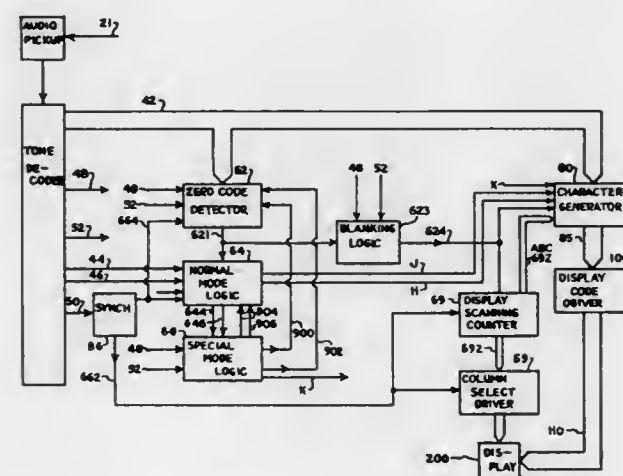
Jerome Charles Meyer, 1512 Ben Roe Ave., Los Altos, Calif. 94022

Filed July 29, 1975, Ser. No. 600,155

Int. Cl.<sup>2</sup> H04M 1/106

U.S. Cl. 179-84 VF

14 Claims



1. Apparatus for use in receiving messages transmitted by pushbutton tone signaling means having a plurality of alphabetic pushbutton and a plurality of non-alphabetic pushbuttons, the alphabetic pushbuttons each having a plurality of alphabetic character markings and the alphabetic and non-alphabetic pushbuttons each generating distinct tone signals in response to actuation of a selected pushbutton, comprising: decoding means coupled to receive the distinct tone signals for producing distinct electrical signals corresponding to actuation of the selected pushbutton; means coupled to receive the distinct electrical signals for producing an alphabetic character address signal in response to receiving a first signal corresponding to actuation of a non-alphabetic pushbutton followed by a second signal corresponding to actuation of an alphabetic pushbutton; and display means coupled to receive the alphabetic character address signal for producing a visual display of an alphabetic character corresponding to a character marking of the plurality of alphabetic character markings of the actuated alphabetic pushbutton, the character marking having a similar relative position within the plurality of alphabetic character markings of the actuated alphabetic pushbutton as compared to the relative position of the actuated non-alphabetic pushbutton with respect to positions of said plurality of non-alphabetic pushbuttons on the pushbutton tone signaling means.

4,012,600

## AUTOMATIC PUSHBUTTON DIAL SYSTEM FOR A SUBSCRIBER TELEPHONE

Walter D. Warren, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1975, Ser. No. 565,315

Int. Cl.<sup>2</sup> H04M 1/51

U.S. Cl. 179-90 B

6 Claims

1. A keyboard dial system for a telephone set comprising: a. a digit processor having at least one set of input terminals

4,012,602

## TOLL RESTRICTOR FOR TOUCH TYPE DIGIT SELECTOR

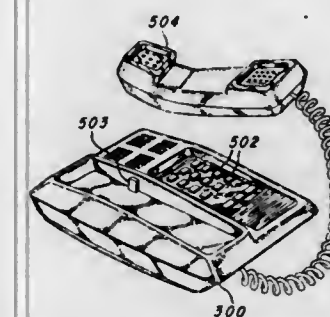
Joseph Monroe Jackson, Menlo Park, Calif., assignor to Litton Business Telephone Systems, Inc., Sunnyvale, Calif.

Filed Mar. 14, 1975, Ser. No. 558,302

Int. Cl.<sup>2</sup> H04M 1/66

U.S. Cl. 179-90 D

1 Claim



- b. a keyboard array having a plurality of keys selectively coupled to at least one of said input terminals and to a plurality of said output terminals for entering coded information into said digit processor in dependence upon the state of said keys; and
- c. signal generator means coupled to at least one output terminal of said digit processor for generating dial signals corresponding to keyed in digits.

4,012,601

## AUTOMATIC PUSHBUTTON DIAL ASSEMBLY FOR A SUBSCRIBER TELEPHONE

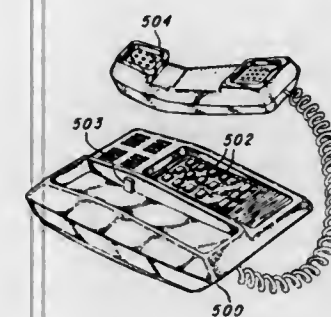
Engelbert W. Kehren, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1975, Ser. No. 565,302

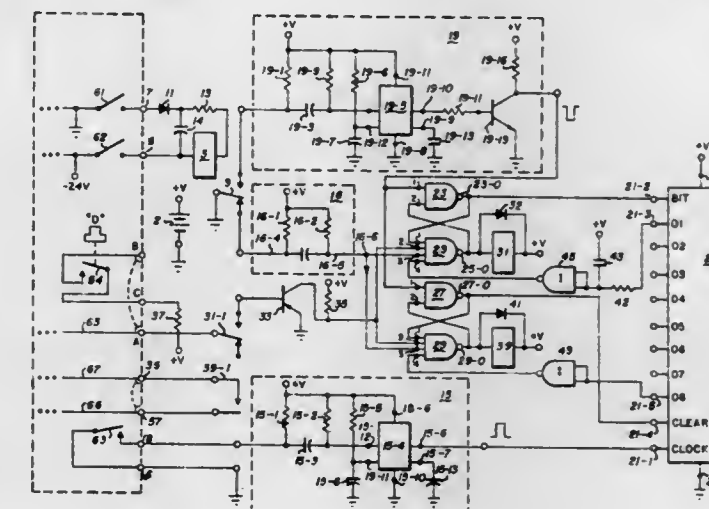
Int. Cl.<sup>2</sup> H04M 1/50, 1/42

U.S. Cl. 179-90 K

7 Claims



- 1. An automatic dial assembly for a telephone set comprising:
  - a. a bracket member having upper and lower major surfaces for mounting said automatic dial system in the telephone set;
  - b. a keyboard array having a plurality of keys, said array being mounted on the upper major surface of said bracket member and including a first set of terminal members selectively coupled to said array;
  - c. a circuit board mounted on the lower major surface of said bracket member, said circuit board including an integrated circuit digit processor having at least one set of input terminals and at least one set of output terminals, and signal generator means for generating dial signals mounted thereon, said circuit board including a second set of terminal members and a plurality of conductor members selectively coupling said second set of terminal members to the input terminals of said digit processor and selectively coupling at least one output terminal of said digit processor to said signal generator means; and
  - d. means selectively electrically coupling the first set of terminals on said keyboard array to the second set of terminals on said circuit board.



1. A toll call restrictor for a telephone substation of the type containing:

- a hookswitch, said hookswitch having an on-hook condition when said station is not in use and an off-hook condition when said station is in use;
- digit selecting means for sending of digit representative signals from station, said digit selecting means including a plurality of digit selecting switches, one of which is representative of the number 0, a common switch operable in response to operation of each digit selecting switch, and a contact means operable in response to that one of said digit selecting switches representative of the number 0, and an electrical circuit associated with said digit selecting means for enabling coupling of signals from said digit selecting means to a telephone line, the invention comprising:
  - an electronic shift register, said shift register having a clock input for receiving pulses to shift the position of an information bit contained within the register, a clear input for clearing any bit from the register, a bit input for receiving and inserting an information bit into the register, and a series of outputs including:
    - a first position output;
    - an *n*th position output, where *n* represents a number greater than two;
    - first and second Nand gate means, each of said Nand gate means having an output connected in circuit to an input of the other Nand gate to form a first Nand gate latch means, said latch means having a first and a second condition of latching;
    - and wherein said first Nand gate means contains two inputs and an output;
    - and wherein said second Nand gate means contains four inputs and an output;
    - and means connecting the output of said first Nand gate means to the first input of said second Nand gate means; means connecting the output of said second Nand gate means to the second input of said first Nand gate means to form said first Nand gate latch;
    - third and fourth Nand gate means, each of said Nand gate means having an output connected in circuit to an input of the other Nand gate means to form a second Nand gate latch means, said latch means having a first and a second condition of latching;
    - and wherein said third Nand gate means contains two inputs and an output;
    - and wherein said fourth Nand gate means contains four inputs and an output;



and means connecting the output of said third Nand gate means to the first input of said second Nand gate means and means connecting the output of said fourth Nand gate means to the second input of said third Nand gate means to form said second Nand gate latch;

first means coupled to said Nand gate latches for setting said first and said second Nand gate latch means from a first into a second condition in response to said hookswitch being placed into the off-hook condition and responsive to said hookswitch being placed in an on-hook condition for setting both said first and second Nand gate latch means to the first condition;

said first means comprising:

a first relay, said relay having a winding and a set of transfer contacts including, a break contact, a make contact and a transfer contact, said transfer contact normally being in contact with said break contact and responsive to energization of said winding for moving into contact with said make contact;

means for coupling said relay winding in circuit with said hookswitch means for energizing said winding when said hookswitch is in the off-hook condition;

first pulse means having an input coupled to said make contact and an output responsive to said contact between said transfer and said make contact for generating a pulse at an output;

second pulse means having an input coupled to said break contact and an output responsive to the restoration of contact between said transfer contact and said break contact upon de-energization of said relay winding for generating a pulse at an output;

second means connecting the output of said first Nand gate latch means to the bit input of said shift register for inserting an information bit in the first position of said register responsive to said first Nand gate latch means being in the second condition;

third means responsive to said second Nand gate latch means being in the second condition for enabling said electrical circuit of said digit selecting means and responsive to said second Nand gate latch means being in the first condition for disabling said electrical circuit of said digit selecting means;

fourth means coupled in circuit with said clock input for providing an input pulse to said clock input responsive to each operation of said common switch in said digit selecting means to thereby shift any bit in said shift register a corresponding number of positions, representative of a count of digits;

fifth means responsive to an output at said first output of said shift register for setting said first Nand gate latch means in the first condition;

said fifth means comprising further:

an inverter having an input and an output;

means coupling the inverter input in circuit with the first position output of said shift register;

means coupling the inverter output in circuit with said fourth input of said second Nand gate means;

sixth means coupled to said second Nand gate latch means and to said nth position output of said first register for setting said second Nand gate latch means into the first condition in response to an output at said nth position output of said shift register;

said sixth means comprising further:

an inverter having an input and an output;

means coupling the inverter input in circuit with said nth position output of said shift register;

means coupling the inverter output in circuit with the fourth input of said fourth Nand gate means;

seventh means coupled to the output of said second Nand gate latch means for providing a signal to said clear input of said shift register in response to said second Nand gate latch means being placed in the first condition, whereby said shift register is cleared;

said seventh means comprising further:

electrical lead means connected between said output of said third Nand gate means and said shift register clear input; eighth means responsive to a predetermined voltage at an input for setting both said first and second Nand gate latches to said respective first condition;

said eighth means comprising:

transistor switch means having an input and an output and electrical lead means connecting said input to a make contact of a second relay in a ninth means and electrical lead means connecting said transistor output for resetting said first and second Nand gate latches into the first condition;

ninth means responsive to said first Nand gate latch being in the second condition for coupling said first switch means input in circuit with said contact means associated with said "zero" switch while said first Nand gate latch means is in the second condition, whereby operation of said "0" digit selecting switch thereupon places a predetermined voltage at said contact means;

said ninth means comprising:

a second relay, said relay having a winding and a transfer contact and a make contact and responsive to energization of said winding for placing said transfer contact in contact with said make contact;

means connecting said winding of said relay means in circuit with the output of said first Nand gate latch, whereby when said Nand gate latch is in the second condition, said relay winding is energized;

electrical lead means coupling one of said relay contacts in circuit with said zero switch of said digit selecting means, whereby if zero is the first dialed digit, successive digits cannot be sent from the telephone set;

and wherein said first pulse means of said first means is coupled at an output to said Nand gate latches via electrical lead means connected to said first input of said first Nand gate means and to said first input of said third Nand gate means;

and wherein said second pulse means of said first means is coupled at an output to said Nand gate latches via electrical lead means connected to said third input of said second Nand gate means and to said third input of said fourth Nand gate means;

and wherein said electrical lead means connecting said transistor output of said eighth means to said Nand gate latches includes an electrical lead to a second input of said second Nand gate and an electrical lead to a second input of said fourth Nand gate;

and wherein said second means comprises further:

electrical lead means connected between said output of said first Nand gate means and said bit input of said shift register.

#### 4,012,603

##### ECHO SUPPRESSOR HAVING SELF-ADAPTIVE MEANS

Takashi Araseki, and Kazuo Ochiai, Tokyo, both of Japan,

assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 22, 1975, Ser. No. 606,791

Claims priority, application Japan, Aug. 27, 1974, 49-97533; Mar. 27, 1975, 50-37277

Int. Cl.<sup>2</sup> H04B 3/20

U.S. Cl. 179—170.6

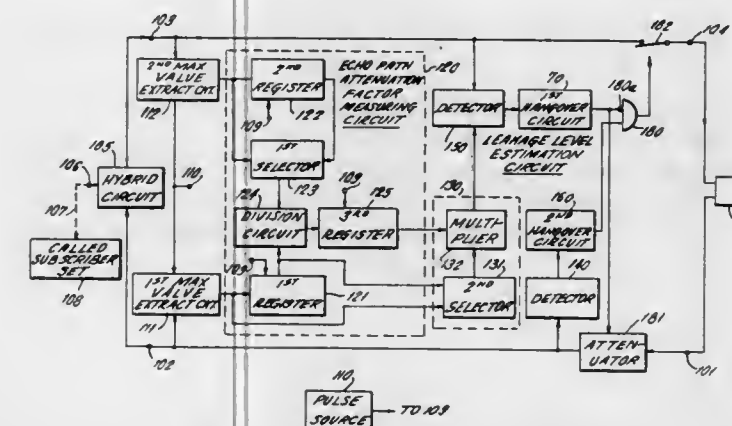
15 Claims

11. An echo suppressor for use in a communications network coupling a calling subscriber to a called subscriber comprising a four-wire circuit having an input path for incoming signals from the calling subscriber and an output path for outgoing signals from the called to the calling subscriber, a two-wire circuit coupled to the called subscriber; hybrid means coupled between said two-wire circuit and said four-wire circuit to provide impedance balance between said circuits; the improvement comprising:

first means coupled to said input and output paths for generating a first signal representing the ratio of the signal values in said paths, said values being obtained over

periods of time which are mutually different but are at least partially overlapping;

second means coupled to said input path and said first means for generating a product signal representing the product of the first signal and the signal in the incoming path and obtained at a point in time after the first signal is generated;



third means coupled to said second means and said output path for generating a control output when the signal in the output path is greater than said product signal; fourth means for disconnecting said output path when said control output is absent.

#### 4,012,604

##### MICROPHONE FOR THE TRANSMISSION OF BODY SOUNDS

Blasius Speidel, Hochmeisterstrasse 244, 7455 Jungingen, Germany

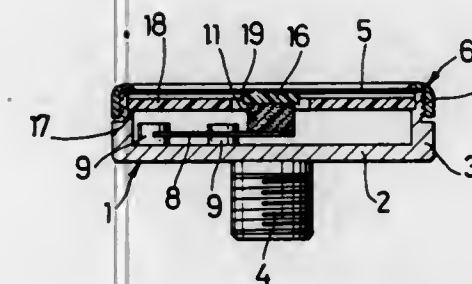
Filed June 17, 1975, Ser. No. 587,684

Claims priority, application Germany, June 18, 1974, 2429045

Int. Cl.<sup>2</sup> H04R 1/46, 7/22

U.S. Cl. 179—121 C

33 Claims



1. A microphone for the reception and conversion of low frequency sound, especially body sound signals, which can be used advantageously in conjunction with blood pressure measuring devices and the like, the microphone comprising in combination:

a cup-shaped microphone housing having a bottom and a generally tubular side wall with a rim defining an open upper end of the housing;

a circular membrane covering the open end of the housing and having a narrow peripheral edge portion clamped against the rim of the side wall;

a substantially flat flexural piezoelectric transducing wafer arranged inside the housing;

means for mounting the transducing wafer above the housing bottom, a distance from the membrane, and in substantially parallel alignment with the latter, the mounting means holding the transducing wafer in a cantilever fashion so as to allowing a portion thereof to flex freely in displacement alignment with the center of the membrane; and

a resiliently compressible transmitter body interposed between and engaging both the membrane and said flexing portion of the wafer, at least a portion of the transmitter body, including the extremity with which it is engaged

against the wafer, being of a cellular, foamed material suited for the transmission of low frequency sound vibrations.

#### 4,012,605 INPUT/OUTPUT TRANSDUCER WITH DAMPING ARRANGEMENT

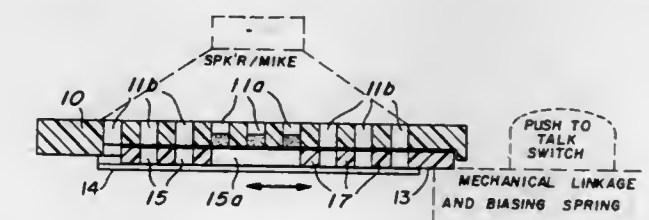
Leon Jasinski, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 21, 1976, Ser. No. 678,794

Int. Cl.<sup>2</sup> H04R 1/28

U.S. Cl. 179—180

16 Claims



1. An improved transducer arrangement operable in both input and output modes and adapted for use in apparatus having an enclosure with a plurality of apertures therein to permit the passage of sound waves therethrough, including in combination:

grille means having a plurality of openings and mounted on the enclosure adjacent the enclosure apertures and positioned in a first operational mode wherein said grille openings are aligned with respective ones of the enclosure apertures to permit the passage of sound waves therethrough when the transducer is in the output mode; control means for positioning said grille in a second operational mode so as to overlie a given number of the enclosure apertures when the transducer is in the input mode; damping means for restricting by a predetermined amount the passage of sound waves through the enclosure apertures not overlaid by said grille when in said second operational mode; and means for returning said grille to said first operational mode upon deactivation of said control means.

#### 4,012,606

##### PLURAL SWITCH SLIDING CAMS ACTUATED BY PREDETERMINED PROGRAM GROOVES ASSOCIATED WITH COMMON DRIVING MECHANISM

Philip Hutt, Milford, Conn., assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 7, 1975, Ser. No. 565,648

Int. Cl.<sup>2</sup> H01H 3/42, 21/84

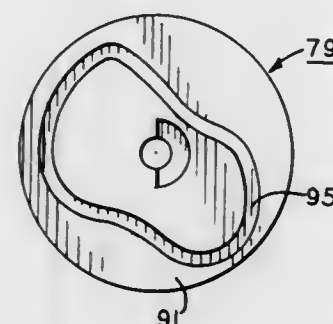
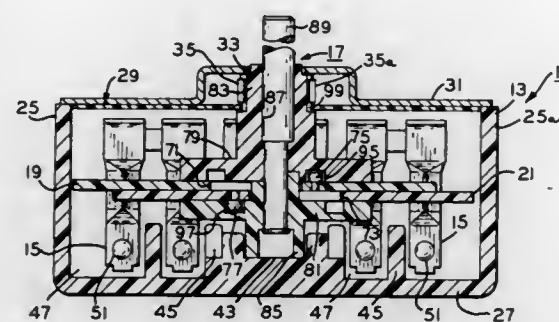
U.S. Cl. 200—18

37 Claims

1. An electrical switch comprising a casing having a plurality of means selectively operable for respectively completing a circuit through said casing, a pair of means disposed generally in overlaying relation in said casing and movable with respect to each other in a predetermined program for controlling the operation of said circuit completing means, and means rotat-



ably mounted in said casing for driving each of said controlling means in the predetermined program with respect to each



other so as to effect the selective operation of said circuit completing means.

4,012,607

#### MINIATURE TIMER

Dieter Graesslin, and Peter Schonhardt, both of Georgen, Black Forest, Germany, assignors to Dieter Graesslin Feinwerktechnik, Germany

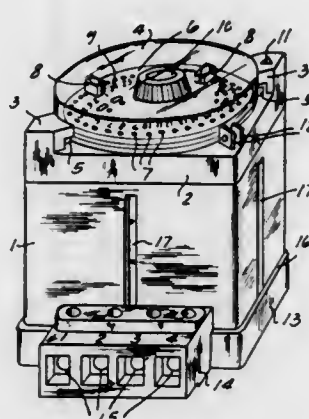
Filed Dec. 16, 1974, Ser. No. 533,228

Claims priority, application Germany, Dec. 17, 1973, 2362563

Int. Cl.<sup>2</sup> H01H 9/00, 43/00

U.S. Cl. 200—38 D

7 Claims



1. A miniature timing switch comprising an electrically-driven motor, a switchable electric contact for selectively connecting two conductor elements, a gear drive system connecting an output of said motor to drive a programmable actuator mechanism for selectively opening and closing said electric contact, and an insulating housing mounting and containing said motor, contact, conductor elements, gear system, and actuator mechanism, and segregating electrical components from mechanical components of the switch, wherein the housing comprises:

- a base plate;
- an annular, upstanding wall attached to said base plate about a periphery thereof;
- a dividing wall extending parallel to said base plate interiorly of said upstanding wall and spaced from said base plate to form a first, electrical chamber; and

a front plate attached to an end of said upstanding wall opposite said base plate and spaced from said dividing wall to form a second, mechanical chamber separated from said electrical chamber, said front plate carrying a portion of said programmable actuator mechanism adjacent an outer surface thereof.

4,012,608

#### MINIATURE SWITCH WITH SUBSTANTIAL WIPING ACTION

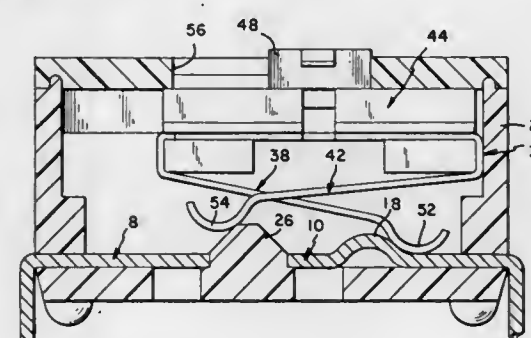
Joseph LaRue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 498,887, Aug. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 475,698, June 3, 1974, abandoned. This application Mar. 25, 1975, Ser. No. 561,815

Int. Cl.<sup>2</sup> H01H 15/08

U.S. Cl. 200—16 D

17 Claims



1. A switch, comprising:  
a housing of dielectric material,  
a pair of spaced terminals fixed on the housing,  
a slide element mounted in said housing and carrying a resiliently deflectable electrical contact,  
said slide element in a first position bridging said electrical contact across said terminals completing an electrical circuit therebetween,  
said slide element being movable to a second position disengaging said resilient electrical contact from one of said terminals to interrupt said electrical circuit,  
said housing having a portion thereof engaging said contact when said sliding element is in said second position to prevent chatter of said contact when subjected to vibration,  
said contact being divided into two separate portions,  
a diode, and  
means connecting said diode electrically between said portions of said contact.

4,012,609

#### CIRCUIT-INTERRUPTERS USING SPACED-APART BARS FOR CONDUCTOR-ASSEMBLIES

Charles M. Cleaveland, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 308,370, Nov. 21, 1972, abandoned.

This application Aug. 19, 1974, Ser. No. 498,499

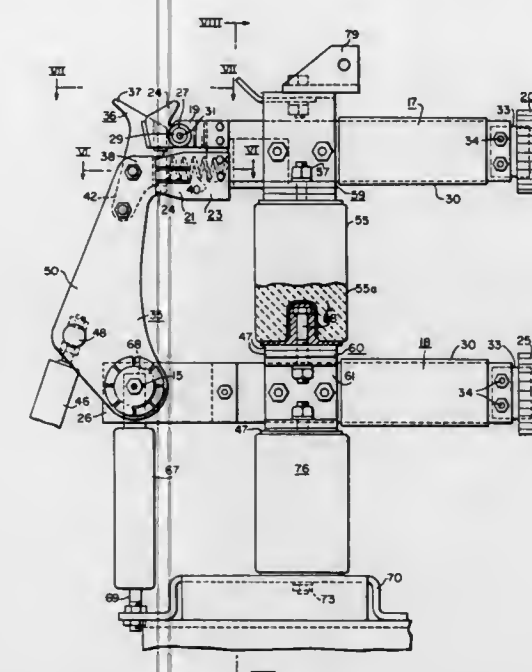
Int. Cl.<sup>2</sup> H01H 9/00; H02B 1/00; H01B 17/06

U.S. Cl. 200—50 AA

18 Claims

1. The combination in a circuit-breaker structure of a first stationary power-conductor assembly, stationary contact means fixedly secured adjacent one end of said first stationary power-conductor assembly, means defining a second stationary power-conductor assembly, insulating post means spacing said first and second stationary power-conductor assemblies apart and in generally parallel arrangement, movable bridging contact means pivotally supported adjacent one end of said second stationary power-conductor assembly, each of said first and second stationary power-conductor assemblies comprising two or more laterally spaced stationary rectangular power bus-bar elements commonly stationarily mounted relevant to one another, at least two of the two or more laterally-

spaced stationary rectangular power bus-bar elements of each power-conductor assembly extending substantially the entire axial length of its respective stationary power-conductor as-



sembly, and means for pivotally rotating said movable bridging contact means into contacting engagement with said stationary contact means for effecting closure of the electrical circuit through the circuit-interrupter.

4,012,610

#### DRAWOUT APPARATUS HAVING IMPROVED TRIP INTERLOCK

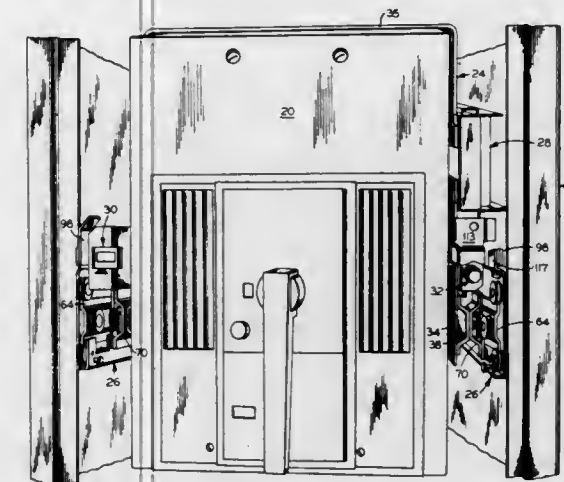
Eric Axel Ericson, Plainville, and Frederick Daniel Kauffhold, Forestville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,616

Int. Cl.<sup>2</sup> H01H 9/20; H02B 11/00

U.S. Cl. 200—50 AA

9 Claims



1. Drawout apparatus for racking a circuit breaker into and out of a compartment in an electrical enclosure, wherein the circuit breaker and the enclosure are equipped with mating primary and secondary disconnect contacts, said drawout apparatus comprising, in combination:

- A. a carriage mounting the circuit breaker;
- B. opposed rail assemblies mounted by said enclosure and supporting said carriage for movement between an extended position where the primary and secondary contacts are disengaged and an engaged position where the primary and secondary contacts are engaged;
- C. means defining a test position intermediate said extended and engaged positions where the primary contacts are disengaged and the secondary contacts are engaged, said carriage being manually movable on said rail assemblies between said extended and test positions;

D. a racking mechanism engaging said carriage to forcibly move said carriage between said test and engaged positions; and

E. a trip interlock including an actuator operatively coupled with a latch member of the circuit breaker and movable between a first, circuit breaker tripping-closure disabling position and a second, circuit breaker closure enabling position under the control of said racking mechanism, said racking mechanism positioning said actuator in said second position to enable closure of the circuit breaker incident with its movement of said carriage into said test and engaged positions, said racking mechanism positioning said actuator in said first position to initiate tripping of the circuit breaker incident with its initial movement of said carriage away from said test and engaged positions, and said racking mechanism maintaining said actuator in said first position to disable closure of the circuit breaker while said carriage is between said test and engaged position.

4,012,611

#### INERTIA SWITCH FOR ANTI-INTRUSION SENSING SYSTEMS

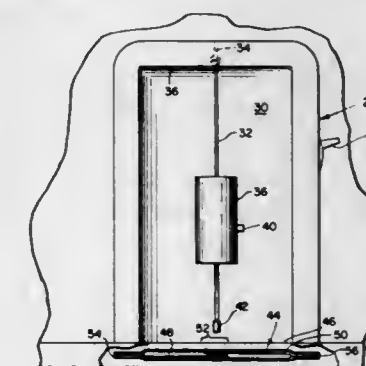
Christian C. Petersen, Westwood, Mass., assignor to Cega, Inc., Boston, Mass.

Filed Mar. 3, 1975, Ser. No. 554,717

Int. Cl.<sup>2</sup> H01H 35/14, 3/02; G08B 13/00

U.S. Cl. 200—61.45 R

10 Claims



1. An inertially responsive sensor for sensing an impact or motion generating phenomena imparted to a housing comprising:

- a body of predetermined mass;
- supporting means for flexibly supporting said body a selected distance from a given position upon said housing and configured to permit said body to move to attain a state of rest; and

switch means having at least two components including a magnetically actuable switching device and a magnet one of said components being fixedly mounted upon said housing, the other of said components being mounted upon said supporting means and movable therewith, said switching device being configured comprising at least two ferromagnetic material switch contact members which extend, from mutually spaced supportive locations to overlap within a region for mutual contact thereof, said region thereby exhibiting an enhanced quantity of said ferromagnetic material with respect to regions of said switching device immediately adjacent thereto, said magnet being mounted for asserting a magnetic influence of only one polar sense and with said switch device switch contact overlap region, said component mounting being arranged such that the magnetic attraction between said switch contact overlap region and said magnet effects a bias for said supporting means to move to attain a stable state of positional adjacency between said magnet and said region, said body attaining said state of rest in correspondence with said attainment of said stable state, induced relative movement between said components wherein said magnetic influence is asserted outwardly of



said region effecting a magnetic actuation of said switching device to provide a sensing output.

4,012,612

# SEAT BELT BUCKLE SWITCH ASSEMBLY HAVING SELF CLEANING CONTACTS

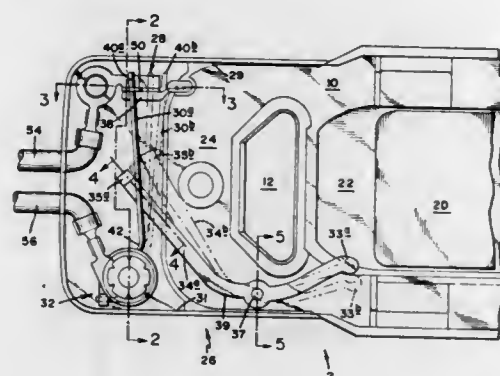
Yogendra Singh Loomba, Washington, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 6, 1975, Ser. No. 629,352

Int. Cl.<sup>2</sup> H01H 3/16, 1/60; A44B 19/00

U.S. Cl. 200—61.58 B

18 Claims



## 1. A buckle comprising:

- a housing defining a switch cavity and a tongue cavity;
- an electric switch disposed in said switch cavity, said electric switch including a stationary first contact member, a movable second contact member, a biasing means for said second contact member, and an actuation member;
- said stationary first contact member having a conductive portion and a non-conductive portion;
- said second contact member having an elongated shape, a movable contact end portion and a stationary mounting end portion;
- said electric switch having a closed position when said contact end portion of said second contact member is in contact with said conductive portion of said first contact member and an open position when said contact end portion of said second contact member is in contact with said non-conductive portion of said first contact member;
- said biasing means biasing said second contact member to said closed position of said electric switch;
- said actuation member having a tongue end, a switch end, and a pivot point between said tongue end and said switch end, said tongue end extending adjacent to said tongue cavity, said switch end engaging said second contact member, said actuation member pivotable on said pivot point to move said contact end portion of said second contact member from said closed position to said open position of said electric switch.

4,012,613

# INERTIAL SWITCH

Jack H. Watson, Los Angeles, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 78,189, Dec. 23, 1960. This application Oct. 18, 1963, Ser. No. 342,320

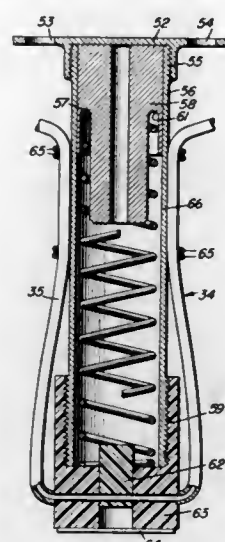
Int. Cl.<sup>2</sup> H01H 35/14

U.S. Cl. 200—61.08

2 Claims

1. An inertial switch comprising a cylinder, a cap secured to one end of said cylinder, said cap having a central bore therethrough running parallel to said cylinder and a transverse hole communicating with said bore a wire inserted in the hole in said cap; a shearing member mounted in the bore, having a hole in which said wire is inserted and having a portion extending into the interior of said cylinder; a coil spring located within said cylinder having one end contacting said cap; a base secured to the other end of said cylinder; and a piston contacting said spring and base and having an elongated central

portion; said spring being relatively long compared to the length required to stop the elongated portion of said piston from striking the portion of said shearing member extending



into the interior of said cylinder when the switch is dropped from a distance of 40 feet onto a steel plate, whereby said wire is broken when only a predetermined sufficient energy is imparted to said spring.

4,012,614

# HIGH-VOLTAGE CIRCUIT-INTERRUPTER HAVING A CLOSING RESISTANCE AND IMPROVED SHUNTING-RESISTANCE CONTACTS THEREFOR

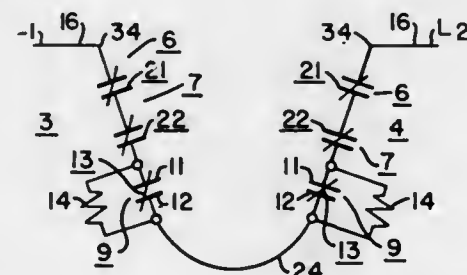
Hayes O. Dakin, Jr.; Lawrence A. Brunson, both of Irwin, Pa.; Frank L. Reese, deceased, late of Monroeville, Pa., and by Blanche C. Reese, executrix, Lansford, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 17, 1973, Ser. No. 425,670

Int. Cl.<sup>2</sup> A01H 33/16

U.S. Cl. 200—144 AP

12 Claims



1. A high-voltage circuit-interrupter of the type for eliminating high-voltage surges on the controlled line comprising, in combination:

- a. means defining a separable pair of main contacts including a movable main contact;
- b. an operator for effecting the opening and closing motions of said separable pair of main contacts;
- c. means defining a separable pair of resistance contacts including a movable resistance contact disposed in electrical series relationship with said separable pair of main contacts so that in the closed-circuit position of the circuit interrupter the line current passes serially through the two pairs of separable contacts;
- d. means defining a closing resistance connected electrically in shunt with said separable pair of resistance contacts so that when said separable pair of resistance contacts are closed the closing resistance is shorted out of the controlled circuit;
- a first biasing means for biasing said movable resistance contact to the closed-circuit position;
- a second biasing means for biasing said movable resistance contact to the open-circuit position;
- said operator including a movable activator member movable in the opening and closing directions and corre-

spondingly charging said first and second biasing means during such opening and closing movements;

a first latching means for retaining the movable resistance contact in the closed-circuit position;

a second latching means for retaining the movable resistance contact in the open-circuit position;

latch-releasing means responsive to movement of said movable activator member and functioning alternatively to release the first and second latching means at predetermined times during the opening and closing movements of said movable activator member;

and means effecting the closing of the separable pair of main contacts during the closing operation of the circuit interrupter prior in point of time to the closing of the separable pair of resistance contacts so that the closing resistance is connected serially into the controlled circuit during the closing operation and subsequently shorted out by the delayed closing of the separable resistance contacts, whereby high-voltage surges on the controlled line tend to be eliminated.

4,012,615

# LATCH FOR A CIRCUIT INTERRUPTER

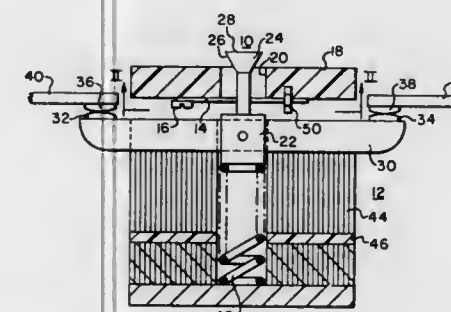
Howard R. Ryden, Forest Hills Borough; John A. Wafer, Monroeville, and Paul G. Slade, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 24, 1975, Ser. No. 598,618

Int. Cl.<sup>2</sup> H01H 3/12

U.S. Cl. 200—325

7 Claims



## 1. A latch comprising:

- a block having a bore therethrough;
- a wire member formed of a spring material, extending transverse across the bore through said block and having one end fixed with respect to said block;
- a movable member having a portion disposed for movement within the bore of said block comprising a tapered portion constructed for easy movement of said wire member and a latching surface constructed to be restrained by said wire member and being movable to a latched position wherein said latching surface is in contact with said wire member and an unlatched position wherein said latch surface is spaced from said wire member.

4,012,616

# METHOD FOR METAL BONDING

John W. Zelahy, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jan. 2, 1975, Ser. No. 538,158

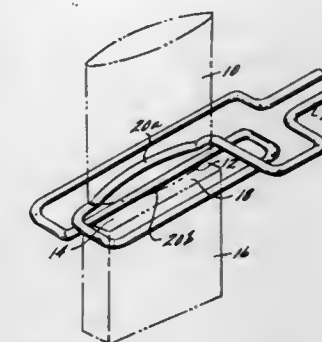
Int. Cl.<sup>2</sup> B23K 13/00

U.S. Cl. 219—9.5

5 Claims

1. An improved method for metallurgically bonding a plurality of metal components at cooperating interface portions of the components, comprising the steps of:
  - positioning the cooperating interface portions in spaced apart opposed relationship;
  - applying high frequency induction heating to the interface portions from within the space between them, the heating being controlled as a function of the heating rates of the metal of the components and the cross-sectional shapes of the cooperating interface portions of the components

to produce substantially uniform heating concurrently across the opposed interface portions to heat the portions to a temperature less than that which will detrimentally affect the metal of the components but at which metal upset can occur; and then



impacting the opposed portions together at a high energy rate with a force sufficient to upset each opposed portion and to expel metal from each component from between the impacting portions to produce a forged joint.

4,012,617

# POWER CONTROLLER FOR MICROWAVE MAGNETRON

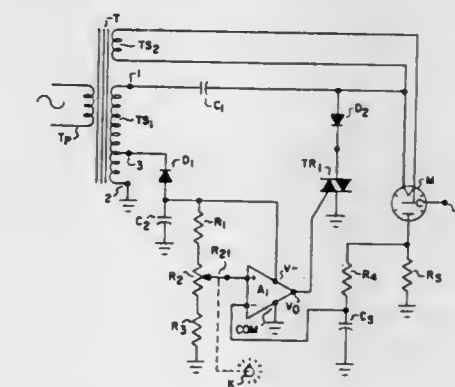
Robert Virgil Burke, and Thomas Eugene Hester, both of Fort Wayne, Ind., assignors to Litton Systems, Inc., Huntington, Ind.

Filed July 24, 1975, Ser. No. 598,864

Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 B

15 Claims



1. The combination in a microwave oven power supply comprising:

transformer means, said transformer means having a primary winding for connection to a source of AC and a secondary winding for providing a high voltage AC transformed from said primary across the secondary winding ends, said AC voltage having a generally cyclically varying sinusoidal waveform including a first one-half cycle in which the voltage level over a period of time, T, rises from zero to a maximum in one polarity direction and then reduces to zero followed by an alternate half cycle in which the voltage level over a time, T, rises from zero to a maximum in an opposite polarity direction and then reduces to zero;

capacitor means;

a magnetron, said magnetron having uni-directional current-carrying characteristics so as to conduct current only on one-half cycle of AC;

means connecting said secondary winding, said capacitor means and said magnetron in an electrical series circuit;

semiconductor controlled switch means of the type having a gate input and a pair of current-conducting main terminals, said switch means further being of the type having an electrically nonconductive state and responsive to application of a control voltage to its said gate input for substantially instantaneously, in a time substantially less



than T, switching into a current-conducting condition to pass current between said main terminals and responsive to the current between said main terminals reducing effectively to a level of zero and absent a control voltage at said gate input for substantially instantaneously, in a time substantially less than T, restoring to the electrically nonconductive state;

said semiconductor controlled switch means being connected in circuit essentially in series with said capacitor means and said secondary winding and essentially in shunt of said magnetron for conducting current in shunt of said magnetron responsive to the application of a control voltage to the gate input thereof;

current monitoring means, comprising resistor means connected in electrical series circuit with said magnetron, for providing an output signal representative of the magnetron current during said one-half cycle;

timing means coupled to said current monitoring means for providing a time varying signal that changes in level with lapse of time during the alternate half-cycle of AC and has an initial level representative of the current level in said magnetron during the preceding one-half cycle, whereby said time varying signal attains a predetermined level as a function of both the magnetron current level and lapse of time,

said timing means comprising: a resistor and a capacitor electrically connected in series circuit across said resistor of said current monitoring means, said circuit having a time constant,  $T_c$ , where  $T_c$  equals the product of the capacitance measured in farads and R is the value of resistance measured in ohms, with said  $T_c$  being less than  $\frac{1}{2} F$ , where F is the frequency of the AC supplied by said transformer;

control means coupled to said timing means responsive to the level of said time varying signal attaining a predetermined value during said alternate half cycle for thereupon providing a control voltage pulse to said gate input of said semiconductor controlled switch means, said control means comprising: comparator means, said comparator means having a reference input, an inverting input and an output; reference voltage source means; means connecting said reference voltage source means to said reference input of said comparator means; means connecting the output of said comparator means to the gate electrode of said semiconductor controlled switch means; and means coupling the voltage from said capacitor of said timing means to the inverting input of said comparator means.

4,012,618

# METHOD AND APPARATUS FOR THE SUCCESSIVE WELDING OF CONSECUTIVE CHAIN LINKS

Bruno Ebel; Günter Krumholz, and Paul Rahn, all of Cologne, Germany, assignors to Meyer, Roth & Pastor Maschinenfabrik GmbH, Cologne, Germany

Filed Feb. 25, 1975, Ser. No. 553,039

Claims priority, application Germany, Feb. 25, 1974, 2408971; Dec. 23, 1974, 2461252

Int. Cl.<sup>2</sup> B21L 3/00

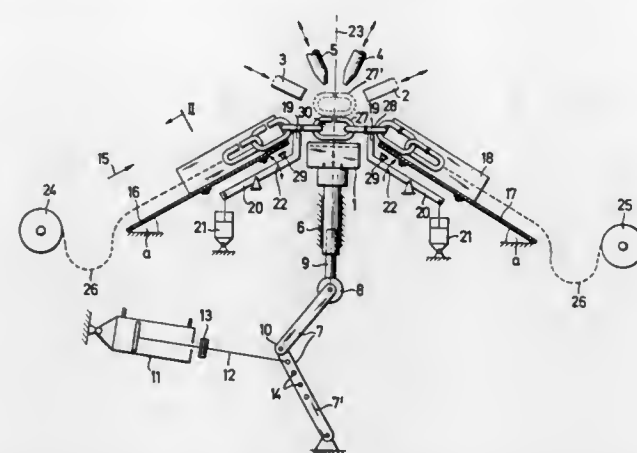
U.S. Cl. 219—52

4 Claims

1. A method for the successive welding of the joints of consecutive links forming a link chain, comprising the following steps:

- advancing the chain for bringing a link to be welded directly below a welding position;
- applying a tensioning force to said chain parallel to the direction of chain advance;
- during step (b), guiding the two links flanking the link to be welded into a common plane of alignment for effecting a setting of said link to be welded, by the tensioning force, into a plane disposed at 90° to said plane of alignment;
- raising said link to be welded into a welding position in a plane disposed at 90° to said plane of alignment;

- firmly maintaining in the welding position the link to be welded;
- welding the link in the welding position; and



- subsequent to step (f), lowering the just-welded link from the welding position.

4,012,619

# MACHINE FOR THE RESISTANCE BUTT WELDING OF PIPES BY FUSION

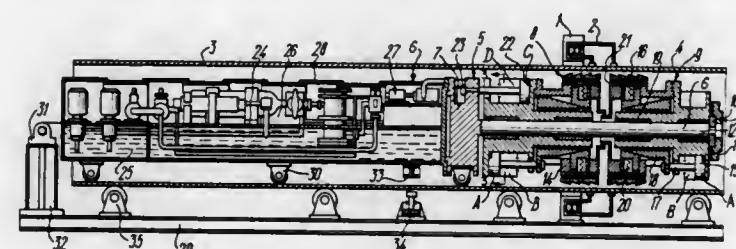
Viktor Senderovich Lifshits, Kavkazsky bulvar, 21, korpus 2, kv. 41, Moscow; Vladimir Nikitich Baranov, Elektrostal, prospekt Lenina, 30/13, kv. 16, Moskovskaya oblast; Leonid Pavlovich Shklyanov, Elektrostal, ulitsa Zhulyabina, 8, kv. 14, Moskovskaya oblast; Olimpiada Mikhailovna Brjukvina, Elektrostal, ulitsa Elagina, 14, kv. 85, Moskovskaya oblast; Tamila Iosifovna Osinskaya, Elektrostal, ulitsa Zhulyabina, 3, kv. 91, Moskovskaya oblast; Nikolai Makarovich Dergachev, Elektrostal, prospekt Juzhny, 17, korpus 1, kv. 178, Moskovskaya oblast; Arkady Alexeevich Pevnev, Elektrostal, ulitsa Oktyabrskaya, 13, kv. 44, Moskovskaya oblast; Georgy Nikolaevich Petrov, Izmailovsky bulvar, 34/32, kv. 8, Moscow; Oleg Sergeevich Papkov, Samarkandsky bulvar, 24, korpus 3, kv. 3, Moscow, and Vladimir Ivanovich Khomenko, ulitsa Miklukho-Maklaya, 33, korpus 2, kv. 372, Moscow, all of U.S.S.R.

Filed June 6, 1975, Ser. No. 584,494

Int. Cl.<sup>2</sup> B23K 11/04

U.S. Cl. 219—101

2 Claims



1. A machine for flash-butt welding of pipes, comprising: a welding transformer (1) with current leads (2), embracing the pipes to be welded (3,4) from the outside, said transformer being connected with the pipes by said leads in the course of the welding; a manipulator (5) for aligning and moving the pipes, disposed inside the pipes, and including a body (7) of said manipulator; a first aligning unit (8) mounted movably with respect to said body; a second aligning unit (9) mounted immovably with respect to said body and insulated electrically from the latter; clamps (16) for the pipes, disposed in radial slots of said aligning units; hydraulic cylinders (15) for actuating said clamps, arranged on bodies of said aligning units; means for moving the pipes in the course of the welding; hydraulic cylinders (22) for said moving means, whose bodies are immovably attached to said body of the movable aligning unit between said hydraulic cylinders of the clamps of one of the types to be welded; piston rods (23) of said hydraulic cylinders of the moving means, immovably attached to said body of the manipulator; a hydraulic system (27) for feeding

and controlling said hydraulic cylinders of the clamps and of the moving means; a rod (6) for moving said manipulator with respect to the pipes during auxiliary operations, said rod being immovably connected with said body of the manipulator; and a partition (24) dividing the bore of said rod longitudinally into two spaces, one space (25) for receiving a working fluid, the other space (26) accommodating the hydraulic system on said partition, for feeding and controlling actuators of said clamps as well as said moving means.

4,012,620

# ELECTRON BEAM SEAM FINDING DEVICE

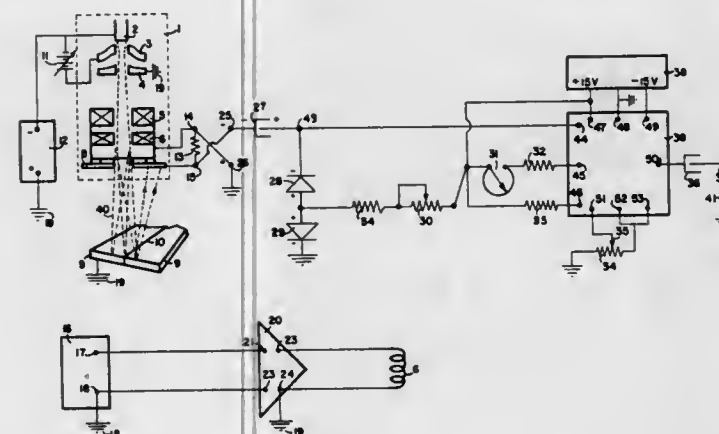
Peter Daniel Sciaky, Oak Lawn, Ill., assignor to Sciaky Bros., Inc., Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,091

Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219—121 EM

6 Claims



1. A method of determining the position of an electron beam with respect to the seam between two adjoining work pieces comprising the steps of directing the said beam towards the seam between the adjoining work pieces; oscillating the beam across the seam and work pieces to cause variations in the emanation of secondary electrons from the said work pieces; collecting secondary electrons thus produced; passing the said secondary electrons through a resistor so as to generate a varying voltage proportional to the instantaneous value of the secondary electrons collected; applying the said varying voltage to a wave form converter, converting the instantaneous values of said varying voltage, in said converter, to a fractional power of said instantaneous values of said voltage applying the output signal of the converter to one set of deflection plates of a cathode ray oscilloscope provided with two pairs of deflection plates at right angles to one another whose second set of deflection plates is synchronized with the periodic signal causing the oscillation of the beam across the seam and comparing the position of the peak of the said converted voltage with a preset reference.

4,012,621

# CONSUMABLE ELECTRODE FOR INITIATING SCARFING

Youtaro Uchida; Yoshihiko Asai, and Goro Miya, all of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan Division of Ser. No. 494,362, Aug. 2, 1974, Pat. No. 3,915,762.

This application June 24, 1975, Ser. No. 589,832

Claims priority, application Japan, Aug. 6, 1973, 48-88177; Aug. 6, 1973, 48-88176

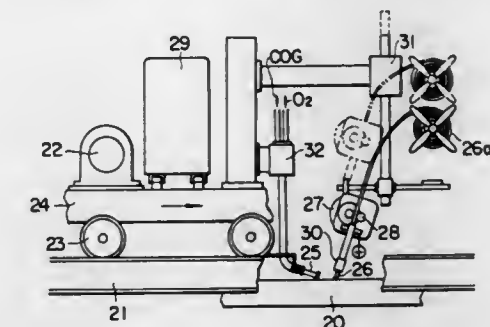
Int. Cl.<sup>2</sup> B23K 35/368

U.S. Cl. 219—146

4 Claims

1. A consumable electrode used for a scarfing initiation method, which consists essentially of a steel sheath filled up with a powdery mixture weighing more than 5% of the total

weight of said electrode, said powdery mixture consisting of a metallic oxygen source material in amounts of 5 to 50% by



weight and of a combustible material consisting mainly of iron powder as the remainder of the mixture.

4,012,622

# METHOD AND APPARATUS FOR COUNTING SMALL PARTS

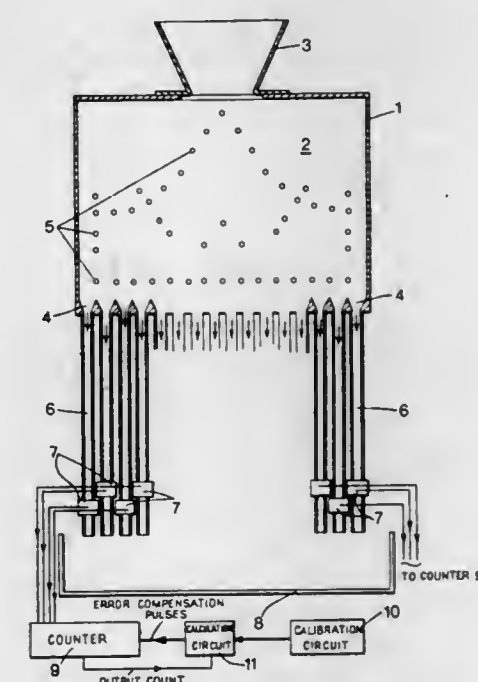
John T. Boys, Christchurch, New Zealand, assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Continuation-in-part of Ser. No. 352,764, April 19, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,601 Claims priority, application United Kingdom, Apr. 20, 1972, 18353/72

Int. Cl.<sup>2</sup> G06M 11/00

U.S. Cl. 235—92 PK

21 Claims



1. A method of counting small parts comprising feeding the parts in bulk to discharge a stream of parts into a separating region leading to a plurality of outlet channels, the separating region including distributing means for distributing the parts in a random manner over the outlet channels, whereby parts will pass through each outlet channel, counting the total uncorrected number of parts passing through each outlet channel, correcting for errors in the total uncorrected number of counting the number of parts passing through each outlet channel, wherein the correction is proportional to the square of the total uncorrected number of pieces counted and adding together the correction and the total uncorrected number of parts.



4,012,623

## COUNTING AND INDICATING SYSTEM

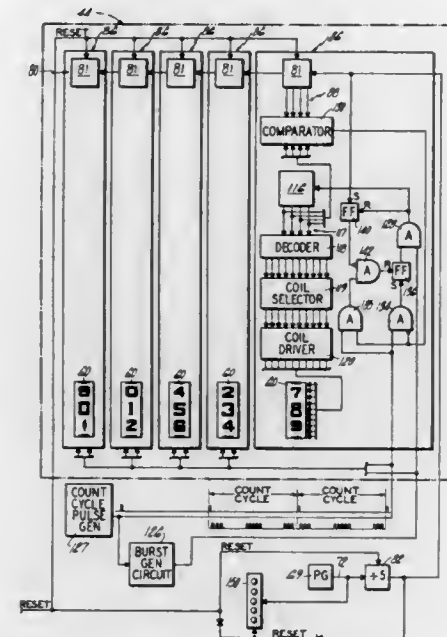
Donald Whiting Fleischer, Wethersfield, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed June 5, 1975, Ser. No. 584,216

Int. Cl.<sup>2</sup> B67D 5/06; G08B 28/00; G06M 1/10

U.S. Cl. 235-92 FL

31 Claims



1. In a resettable register for a fuel pump computer having a variator with a rotary volume shaft adapted to be driven by a fuel meter in accordance with the volume amount of fuel delivered, the variator being settable for establishing the unit volume price of the fuel and having a rotary cost output driven by the variator volume shaft in accordance with the unit volume price established by the variator setting; the resettable register comprising a register frame with a pair of spaced generally parallel side members, resettable volume and cost counter sections having oppositely facing pairs of volume and cost readout counters with parallel banks of coaxial counter wheels of increasing order mounted between the register side members, the volume readout counters being resettable mechanical readout counters, volume counter mechanical drive means adapted to be operatively connected to the rotary volume shaft of the variator to mechanically drive the mechanical volume counters to provide volume readouts of the volume amount of fuel delivered, cost counter drive means adapted to be operatively connected to the rotary cost output of the variator to drive the cost counters to provide cost readouts of the cost amount of fuel delivered, and register reset means for mechanically resetting the mechanical volume counters and for resetting the cost counter section between fuel deliveries; the improvement wherein each cost counter comprises a bank of counter wheel modules having a bank of said coaxial cost counter wheels of increasing order respectively, each of the counter wheel modules having electromagnetic wheel positioning means for the respective cost counter wheel adapted to be selectively energized for selectively angularly positioning the wheel, the electromagnetic wheel positioning means of each bank of counter wheel modules being selectively energizable for selectively angularly positioning the bank of cost counter wheels for providing a selected cost readout; wherein the cost counter drive means comprises pulse generator means and pulse generator operating means adapted to be operatively connected to the rotary cost output of the variator to operate the pulse generator means to generate an electrical pulse train with a pulse for each predetermined incremental cost amount of fuel delivered; wherein the resettable cost counter section comprises resettable primary electronic counter means connected to the pulse generator to be operated by the electrical pulse train to accumulate a cost count of the cost amount of fuel delivered, and electrical drive

means operated by the primary electronic counter means for selectively energizing the electromagnetic wheel positioning means for each cost counter wheel to position the coaxial cost counter wheels of each bank for providing a cost readout of the cost count accumulated in the primary electronic counter means; and wherein the register reset means is operable between fuel deliveries for resetting the cost counters by resetting the electronic counter means of the cost counter section.

4,012,624

## ELECTRIC PULSE COUNTER AND PLASTIC HOUSING THEREFOR

Andreas Haller, and Heiner Kundisch, both of VS-Schwenningen, Germany, assignors to Irion &amp; Vosseler, Germany

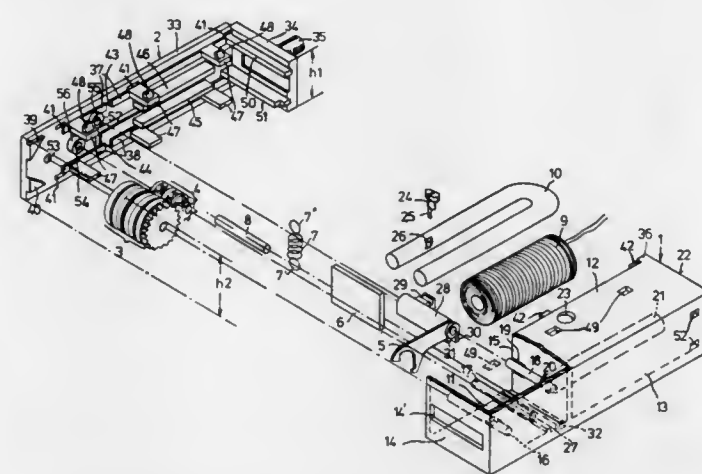
Filed Apr. 14, 1976, Ser. No. 676,647

Claims priority, application Germany, May 14, 1975, 2521372

Int. Cl.<sup>2</sup> G06M 1/02

U.S. Cl. 235-92 C

6 Claims



1. An electromagnetic pulse counting mechanism, comprising a rectangular block shaped housing having a first housing part with a top wall, bottom wall, front wall, and a first side wall, and having an intermediate partition wall spaced from said front wall and extending between said top and bottom walls, a second housing part comprising a second side wall and rear wall, said second housing part being interengageable with said first housing part to enclose the rear and side opposite to said first side wall of said first housing part of said housing; a coil receiving tube extending rearwardly from said partition wall toward said rear wall in said housing; an electromagnetic wound coil positioned over said receiving tube in axis alignment therewith; a U-shaped magnetic yoke having one first leg portion in said receiving tube and within said coil, and a second leg portion disposed in said housing alongside said coil; an armature pivotally supported on said bottom adjacent said coil, and said yoke; a cypher roll having a cypher roll shaft; an indexing mechanism for indexing said cypher roll having an indexing shaft, and journal means defined on said first and second side walls on the opposite side of said partition wall from said coil, for supporting said cypher roll shaft and said indexing mechanism shaft adjacent said armature for actuation of said indexing mechanism by said armature when said coil is excited; and a window defined in said front wall for the visual observation of aligned cyphers on said cypher roll therein.

4,012,625

## NON-LOGIC PRINTED WIRING BOARD TEST SYSTEM

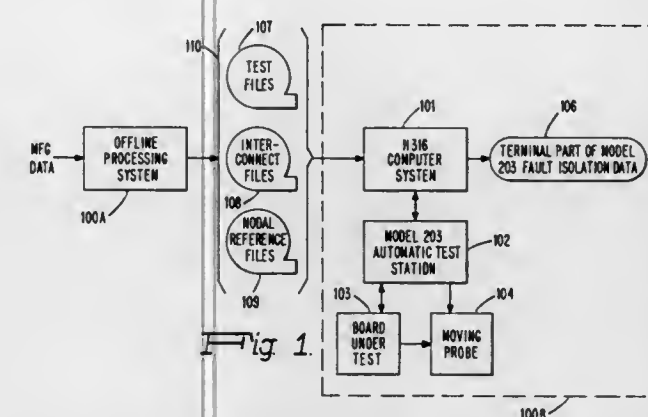
Russell H. Bowen, Seminole; Allen L. Clark, Odessa; David C. Davis, Clearwater; Walter E. Gilbert, Largo; Wayne L. Glover, Odessa; Richard J. Walsh, Brooksville, and Robert G. Wehling, Tampa, all of Fla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Sept. 5, 1975, Ser. No. 610,581

Int. Cl.<sup>2</sup> G01R 31/00

U.S. Cl. 235-153 AC

20 Claims



1. A fault analysis system for determining the location of a fault in a printed circuit board, comprised of a map of a plurality of electrical paths, each path having a plurality of electrode node contacts that has failed to pass any one of a series of predetermined analog or digital electrical tests, said failure caused by a fault in at least one of said electrical paths, said fault analysis system comprising:

- first means for automatically performing a plurality of electrical tests in a predetermined sequence on said printed circuit board;
- second means, coupled to be responsive to said first means for detecting a failure of any one of said predetermined series of electrical tests on said printed circuit board caused by said fault in at least one of said electrical paths; and
- third system means coupled to be responsive to said first and second system means for automatically determining the location of the fault on said failed printed circuit board, said third system means including path generating means coupled to be responsive to said second means and to map information signals indicative of the map of the electrical paths of the printed circuit board under test, said path generating means for automatically generating a plurality of path-signals indicative of at least one path within the failed printed circuit board under test wherein a fault is to be found and further including an automatically movable fault analysis probe, coupled for being responsive to the plurality of path-signals, for automatically and sequentially moving along said at least one path within said failed printed circuit board under test for making electrical contact with predetermined electrical node contacts on said at least one path on said printed circuit board under test.

4,012,626

## VERTICAL NAVIGATION CONTROL SYSTEM

Ronald J. Miller, Glendale, and Paul A. Rauschelbach, Phoenix, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 18, 1975, Ser. No. 569,340

Int. Cl.<sup>2</sup> G01C 21/20; B64C 19/00

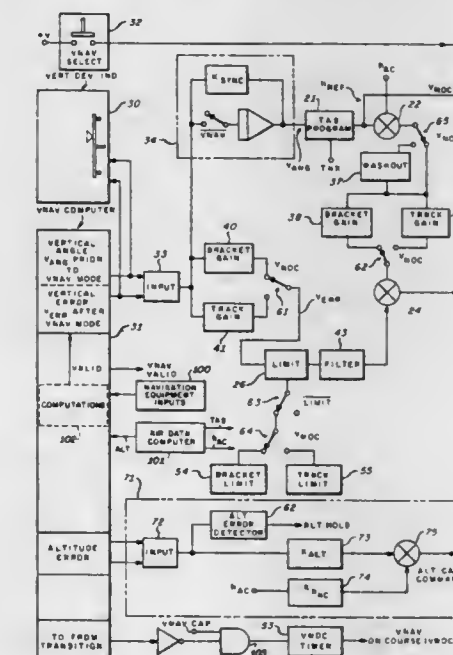
U.S. Cl. 235-150.26

7 Claims

1. Vertical navigation control apparatus for controlling an aircraft to maintain a predetermined vertical flight path angle from an existing barometric altitude to a desired barometric altitude, said desired barometric altitude being at a predetermined navigation waypoint horizontally offset from a reference VOR/TAC station transmitter, and having receiver appa-

ratus for providing in response to transmissions from said VOR/TAC station a DME signal indicative of the straight-line distance between the craft and said station and a TO/FROM signal indicating the presence of the craft in the vertical vicinity over said VOR/TAC station, air data apparatus for providing signals indicative of said existing aircraft barometric altitude and the rate of change of aircraft barometric altitude and means for providing a signal in accordance with said desired barometric altitude and the horizontal offset distance between said waypoint and said VOR/TAC station, said vertical navigation control apparatus comprising:

Computer means responsive to said DME signal, said horizontal offset distance signal, said existing aircraft barometric altitude signal and said desired barometric altitude signal for computing a flight path angle error signal indicative of the vertical displacement of the craft from said vertical flight path angle and wherein said flight path



angle error signal is subject to transient errors therein in the vicinity of said VOR/TAC station resulting from any difference between the barometric altitude of the craft and said DME signal, means responsive to said rate of change of aircraft barometric altitude signal for providing a system damping signal representing the vertical rate error of the aircraft from the vertical rate required to maintain said vertical flight path angle, means responsive to said flight path angle error signal and said damping signal for supplying a craft control signal from the algebraic sum thereof, and means independent of said damping signal and responsive to said TO/FROM signal for limiting said flight path angle error signal to a predetermined maximum amplitude when the aircraft is in the vicinity of said VOR/TAC station thereby reducing the response of the craft to said transient errors therein.

4,012,627

## DISTRIBUTION-FREE FILTER

Charles E. Antoniuk, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 29, 1975, Ser. No. 617,886

Int. Cl.<sup>2</sup> H03K 5/153; G06F 15/36

U.S. Cl. 235-152

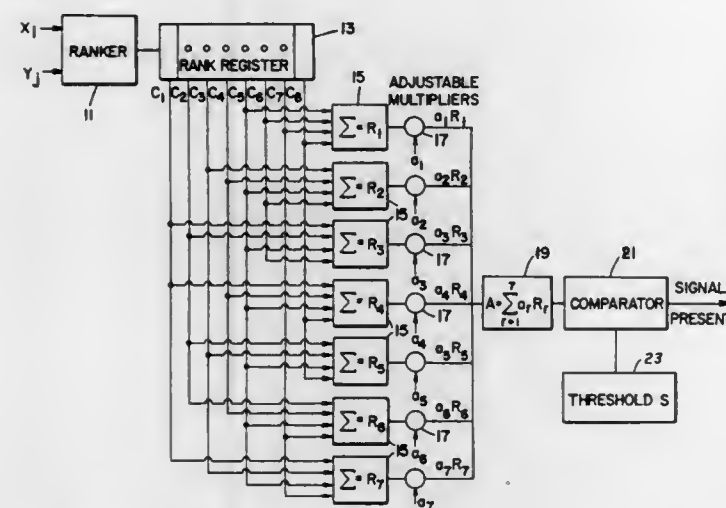
12 Claims

1. A system for detecting signals in a variable environment including noise which comprises:

- first means for receiving data representative of multiple observations of a pre-selected portion of said environment;
- second means for receiving data representative of presumed noise in said environment;



- c. ranking means having an input and an output to arrange said data in order of magnitude, then to produce sequentially at said output a series of signal, each signal having one of two discrete values, said values selected to indicate the source of said ranked datum;
- d. a register having an input and an output, said input adapted to receive said series of signals from said ranking means;
- e. a plurality of summing means, each of said summing means having a plurality of inputs and an output, the inputs of each of said summing means connected to the output of said register so that a complete orthogonal representation of the two-valued function stored in the register is achieved;



- f. a plurality of multipliers, each of said multipliers having an input and an output, said input connected to the output of one of said summing means, to multiply the output of said summing means by a pre-selected factor determined by the probable signal plus noise distribution;
- g. a main summer having at least one input terminal and an output terminal, said at least one input terminal being connected to the output of a multiplier;
- h. means for comparing the output of said main summer to a predetermined threshold value, whereby the presence or absence of signal in the input data corresponding to said pre-selected portion of the environment may be determined by said comparison.

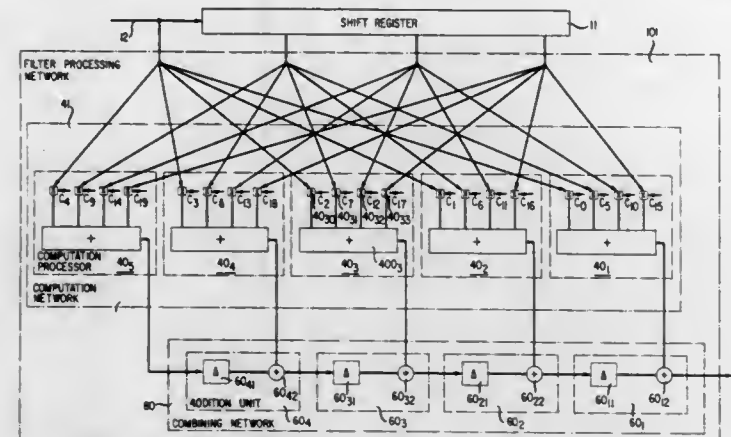
#### 4,012,628 FILTER WITH A REDUCED NUMBER OF SHIFT REGISTER TAPS

Allen Gersho, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Aug. 15, 1975, Ser. No. 605,073

Int. Cl.<sup>2</sup> G06F 7/38; H04B 3/04

U.S. Cl. 235—156

17 Claims



1. A digital filter responsive to a signal x, including a shift register of N stages which provides output signals at each stage of said shift register, which signals are representable by the expression  $D^i x$  where  $D^i x$  is the output signal of the  $i^{\text{th}}$  stage of said shift register, including a filter processing network

which, in turn, includes means for multiplying the output signals of said shift register by preselected filter constants, and including an output terminal responsive to a preselected output signal in said digital filter, characterized in that:

said filter processing network is responsive solely to said signal x and to the output signal of every  $m^{\text{th}}$  stage of said shift register to develop a network signal z characterized by the expression

$$z = \sum_{i=0}^{m-1} D^i \left[ \sum_{k=0}^{N/m-1} C_{mk+i} D^{mk} x \right]$$

where m is the prechosen integer constant greater than one,  $N/m'$  is the largest integer included in the fraction  $N/m$ , the  $C_{mk+i}$ 's are filter coefficients with  $C_j$  equal to zero for  $j > N$ , and  $D^i$  represents a delay of i units applied to the signal represented by the expression within the square brackets.

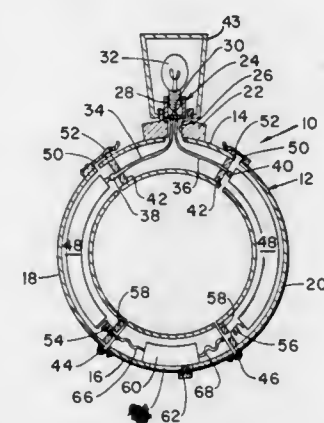
#### 4,012,629 FLASHLIGHT RING

Winston Simms, 128 Belmont Ave., Long Branch, N.J. 07740  
Filed Nov. 13, 1975, Ser. No. 631,644

Int. Cl.<sup>2</sup> F21V 33/00

U.S. Cl. 240—6.4 W

1 Claim



1. A flashlight finger ring device adapted to receive first and second elongated arcuate batteries and a lamp; said device comprising: a generally torodoidal hollow finger encircling member formed of arcuate front, rear, left and right sectors; said left and right sectors being hingedly joined at their rear ends to opposite ends of said rear sector for swinging movement; clasp means carried by the front ends of said left and right sectors for respectively engaging left and right ends of said front sector; said right and left sectors being adapted to respectively receive within their interiors said first and second batteries; first left and right contact means respectively carried by the rear ends of said left and right sectors for respectively electrically engaging rear ends of said first and second batteries; second left and right contact means respectively carried by the left and right ends of said front sector for respectively electrically engaging front ends of said first and second batteries; a lamp socket carried by said front sector for receiving said lamp; first conductor means within said front sector electrically connecting said lamp socket between said second left and right contact means; a switch means carried by said rear sector; and second conductor means electrically connecting said switch means between said first left and right contact means.

#### 4,012,630 LIGHTING FITTING

Richard Gareis, Ziegetsdorferstrasse, D-8400 Regensburg, Germany

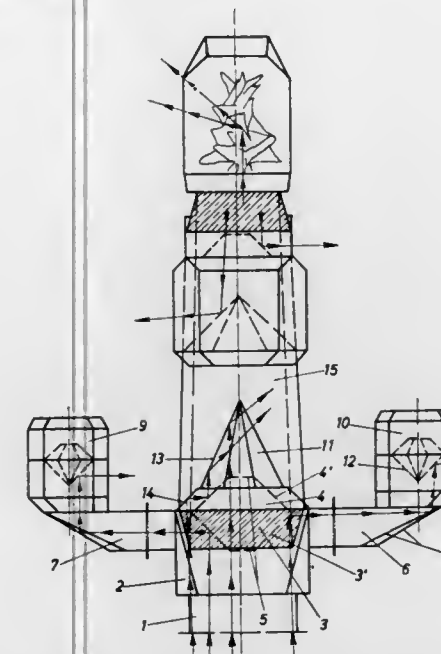
Filed Feb. 12, 1975, Ser. No. 549,154

Claims priority, application Germany, June 5, 1974, 2427182

Int. Cl.<sup>2</sup> A47G 33/16; F21P 1/02

U.S. Cl. 240—10 R

27 Claims



1. A lighting apparatus for use with a light source, comprising in combination:
- a first light conducting body operative to conduct the light from said light source by total internal reflection;
- at least one distributing element being made from light conducting material and having light reflecting surfaces and being disposed to receive the light conducted by said first body; and
- a second light conducting body operative to conduct light by total internal reflections and disposed to receive at least a portion of the light from said distributing element and being operative for radiating the light into the surroundings,
- said light reflecting surfaces defining a cavity inside said distributing element and light reflecting surfaces reflecting the light by total internal reflections with substantially none of the light leaving the light conducting material of said distributing element during said reflections.

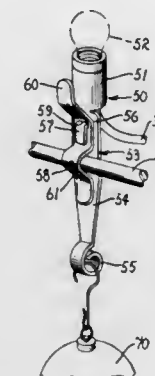
#### 4,012,631 TREE LIGHTING ASSEMBLY

James J. Creager, 12000 Tollhouse Road, Clovis, Calif. 93612  
Filed May 12, 1975, Ser. No. 576,438

Int. Cl.<sup>2</sup> A47G 33/10, 33/16

U.S. Cl. 240—10 T

1 Claim



1. A Christmas tree lighting assembly comprising:
- A. a central flexible insulated cable containing a pair of primary conductors and adapted to be wound about the trunk of a Christmas tree;

- B. a multiplicity of lateral cables adapted to be extended along limbs of the tree, having inner ends and outer ends and each having a pair of secondary conductors extending therethrough, the secondary conductors being individually connected to the primary conductors at the inner ends of the lateral cables and the lateral cables with the secondary conductors extending therethrough being branched adjacent to the outer ends thereof;
- C. a plurality of lights individually electrically connected in parallel to the secondary conductors of each lateral cable at the outer ends thereof;
- D. clips individually mounted on the lights releasably engageable with limbs of the tree to support the lights thereon; and
- E. means borne by each clip for the support of an ornament in depending relation thereon and which is of a substantially spiral configuration for purposes of appearance and the support of an ornament thereon.

#### 4,012,632

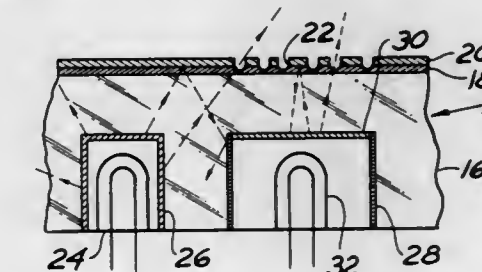
DISCRETE FUNCTION ADVISORY ILLUMINATION  
Franklin P. Stone, Shelton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 18, 1975, Ser. No. 641,975

Int. Cl.<sup>2</sup> G01D 11/28; G09F 13/04

U.S. Cl. 240—2.1

12 Claims



1. A display device comprising:
- a panel, said panel bearing a plurality of spatially displaced indicia, said panel passing light therethrough in the regions commensurate with said indicia and preventing the passage of light therethrough in other regions;
- means for back-lighting said panel indicia with light of a first color; and
- means for selectively back-lighting individual of said panel indicia with light of a second color, said second color light being of greater intensity than said first color light.

#### 4,012,633

WIDE DYNAMIC RANGE ANALOG SIGNAL OPTICAL COMMUNICATION SYSTEM

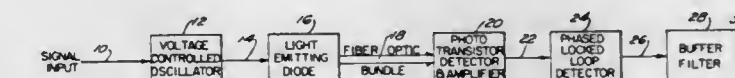
William P. Huntley, Old Lyme, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 5, 1975, Ser. No. 610,582

Int. Cl.<sup>2</sup> H04B 9/00

U.S. Cl. 250—199

6 Claims



1. A communication system for transmitting low level analog electrical signals over a wide dynamic range which comprises:
- a wave form generator for producing a preselected carrier frequency to be modulated by the input low level analog signals and thus forming an output of modulated electrical signals;
- light emitting diode means for converting the modulated electrical output of said waveform generator into a corresponding optical output, said light emitting diode being



connected so as to use the output of said waveform generator as the input thereof;

transmitting means for transmitting the optical output of said light emitting diode means, said transmitting means being so connected as to use the optical output of said light emitting diode means as an input at a first end thereof and giving an output at a second end thereof;

phototransistor means for converting the transmitted optical output of said light emitting diode into a corresponding modulated electrical output, said phototransistor means being so connected to said transmitting means as to use the output at the second end of the said transmitting means as an input thereof;

amplifying means for amplifying the modulated electrical output of said phototransistor means, said amplifying means being so connected to said phototransistor means as to use the modulated electrical output of said phototransistor means as an input thereof; and

a phase locked loop demodulating means for demodulating the output of said amplifying means to obtain a replica of the low level analog electrical signals to be transmitted, said demodulating means being so connected to said amplifying means as to use the output of said amplifying means as an input thereof.

4,012,634

## AUTOMATIC FOCUSING SYSTEM INCLUDING QUANTIZING MEANS

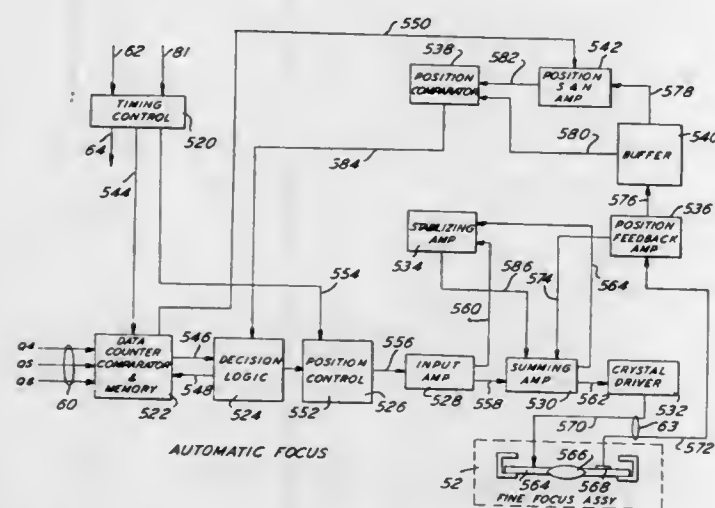
John C. Bouton, Doylestown; Melvin E. Partin, Newtown Square, both of Pa., and Robert C. Hülghman, Willingboro, N.J., assignors to Geometric Data Corporation, Wayne, Pa.

Filed Apr. 29, 1974, Ser. No. 465,390

Int. Cl.<sup>2</sup> G01J 1/20

U.S. Cl. 250—201

32 Claims



1. An automatic focusing system for an optical instrument, said system including a light source, said light source comprising a flying spot scanner, said light source directed through said instrument and means responsive to said light source for focusing said optical instrument on a predetermined object, said light source being directed at said predetermined object, said means responsive to said light source including light sensitive means for generating a signal corresponding to the brightness of said light at said light sensitive means, and quantization means responsive to said signal for providing a binary quantization of said signal.

4,012,635  
LIGHT BARRIER SYSTEM  
Arthur Walter, Denzlingen, and Jürgen Erdmann, Buchholz both of Germany, assignors to Erwin Sick Optik-Elektronik, Waldkirch, Germany

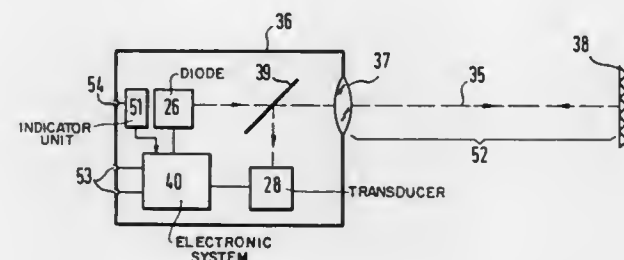
Filed Aug. 13, 1975, Ser. No. 604,215

Claims priority, application Germany, Oct. 24, 1974, 2450648

Int. Cl.<sup>2</sup> G01D 21/04

U.S. Cl. 250—221

17 Claims



1. A light barrier system comprising a pulsed light source, a light receiver comprising a photo-electric transducer and a pulse amplifier and adapted to receive the light beam transmitted by said pulsed light source over a predetermined path, an indicator unit connected to said light receiver for producing a signal when an obstacle is detected in said path, a rectifier fed by a supply voltage and having an output circuit, for supplying the light source, light receiver and indicator unit, a discharging capacitor in said output circuit of said rectifier and connected to said pulsed light source for periodically operating the same, said capacitor being charged in the intervals between the light pulses of said pulse light source, said capacitor being charged to a substantially lower voltage than said supply voltage and discharged by way of said pulsed light source, a charging resistor connected between said capacitor and said rectifier, a thyristor connected in series with said pulsed light source and in parallel with said capacitor, said thyristor being controlled by the voltage across said capacitor, said light receiver being connected to said rectifier in series with said resistor and with said pulsed light source, and a Zener diode connected in parallel to said pulse amplifier.

4,012,636

## SCANNING GAMMA CAMERA

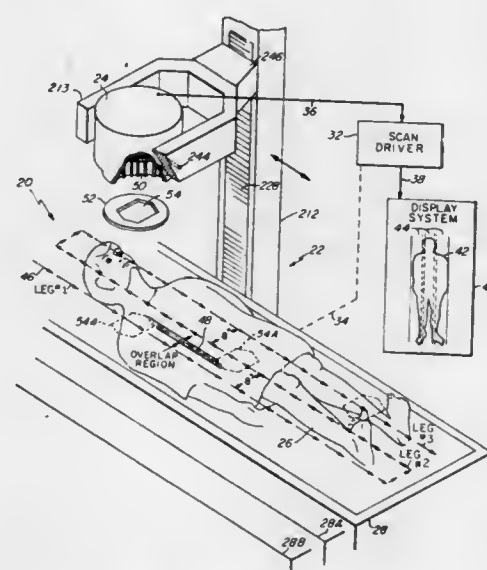
Lawrence W. Engdahl, Foxboro, Mass.; John F. Batter, Jr., Rochester, N.Y., and Karl J. Stout, Hudson, Mass., assignors to Raytheon Company, Lexington, Mass., a part interest

Filed Sept. 8, 1975, Ser. No. 611,045

Int. Cl.<sup>2</sup> G01T 1/20

U.S. Cl. 250—363 S

31 Claims



1. A radiographic imaging system comprising:

a camera positioned to face a radiating subject, said camera producing electrical impulses in response to quanta of radiation;

means coupled to said camera for inducing a relative motion between said subject and said camera, said relative motion following a prescribed scan format having one portion of said format partially overlapping a second portion of said format; and

means coupled to said camera for gradually tapering the amount of said electrical impulses provided by said camera for radiation received along the overlapping region between said one portion and said second portion of said scan format.

4,012,637

## RADIOGRAPHIC SCREEN WITH IMPROVED RESOLUTION

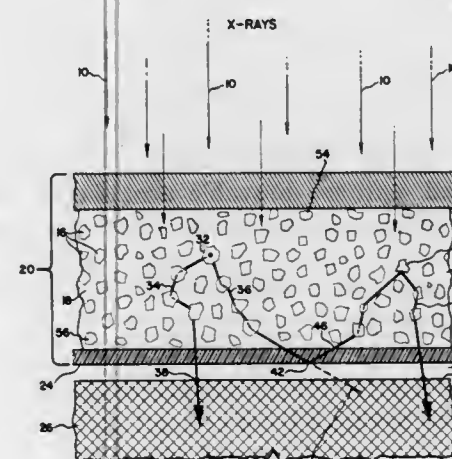
Robert K. Swank, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 5, 1975, Ser. No. 574,238

Int. Cl.<sup>2</sup> G03B 41/16

U.S. Cl. 250—475

4 Claims



1. In a radiographic intensifying screen and photographic film system of the type comprising a phosphor layer for absorbing x-radiation and re-emitting light, an overlayer on the phosphor layer for forming a smooth surface and a photographic film closely adjacent to the overlayer and having appreciable areas spaced therefrom by an air gap, the improvement comprising:

attenuating means positioned between said phosphor layer and said photographic film for continuously absorbing a portion of said light in substantial proportion to the linear distance said light travels through said attenuating means, so that light which is reflected back into said phosphor layer by the surface between said overlayer and said air gap is more highly attenuated relative to light of the same wavelength passing directly through said air gap to said film, whereby the intensity of such reflected light, which on further deviation reaches the film at laterally removed locations, is greatly reduced by multiple passages through said attenuating means, thereby suppressing adverse effects on the resolution and contrast of the film image.

4,012,638

## DENTAL X-RAY ALIGNMENT SYSTEM

Bruce R. Altschuler, 123 Thornell, San Antonio, Tex. 78235; Vincent A. Segreto, 638 Candleglo Drive, San Antonio, Tex. 78239, and Cecil E. Brown, Jr., 13203 Rhame Drive, Oxon-Hill, Md. 20022

Filed Mar. 9, 1976, Ser. No. 665,193

Int. Cl.<sup>2</sup> G01N 21/00

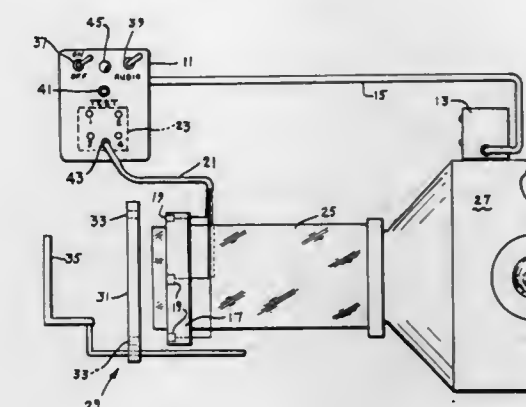
U.S. Cl. 250—491

5 Claims

1. An apparatus for the alignment of x-ray film with respect to an x-ray beam comprising:

a. a plurality of pairs of radiators and sensors surrounding the path of the x-ray beam;

b. a reflector positioned parallel to the x-ray film and integral therewith; and



c. means for detecting if the plurality of sensors receive equal reflected radiation indicating the alignment of the x-ray film with the x-ray beam.

4,012,639

## METHOD OF PRODUCING MINERAL BINDER AND APPARATUS EMBODYING SAME

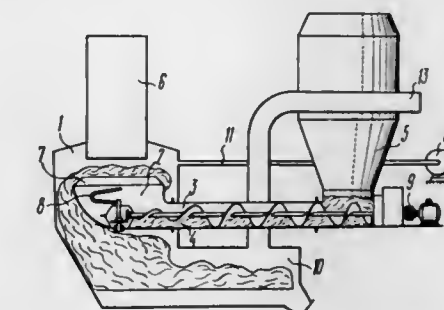
Robert Matveevich Besprozvanny, prospekt Yuria Gagarina, 28, kor. 3, kv. 72; Iosif Gershech Abramson, Varshavskaya ulitsa 22, kv. 16; Georgy Borisovich Egorov, Grazhdansky prospekt, 90, kor. 2, kv. 103; Rafail Manusovich Nudelman, Nevsky prospekt, 61, kv., and Jury Vasilievich Nikiforov, Zanevsky prospekt, 30, kv. 23, all of Leningrad, U.S.S.R.

Filed Sept. 15, 1975, Ser. No. 613,512

Int. Cl.<sup>2</sup> H01J 37/06

U.S. Cl. 250—492 B

7 Claims



1. A method of producing a mineral binder comprising, advancing along a path a preground stock of a mineral stock usable for producing a binder therefrom, discharging said mineral stock from said path for movement along a different path, just prior to discharging said mineral stock in a zone in which discharging is taking place, subjecting said mineral stock to irradiation with a beam of accelerated electrons flowing counter to the direction of flow of said mineral stock in said path, and applying said beam of accelerated electrons on said mineral stock in an area in said zone in which said mixing is taking place, while said mineral stock is travelling in a direction directly counter to the flow of said accelerated electrons.

4,012,640

## X-RAY GENERATOR

William B. McKnight, Huntsville, Ala.; Marian O. Scully, Tucson, Ariz., and William H. Louisell, Palos Verdes, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 30, 1973, Ser. No. 393,239

Int. Cl.<sup>2</sup> G21G 4/00

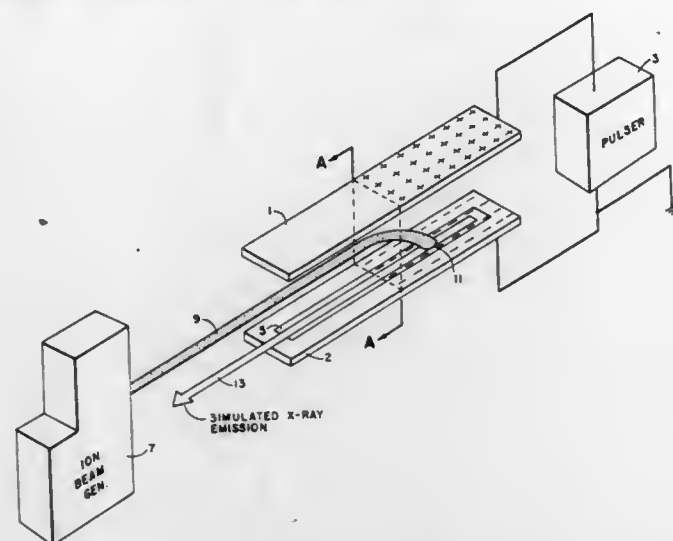
U.S. Cl. 250—493

2 Claims

1. A system comprising first means producing a beam of stripped nuclei; a thin hydrogen rich foil strip target means



having a length; and second means connected to the target means and positioned to the beam of stripped nuclei consist-



ing of  $\text{He}^{++}$  or  $\text{Li}^{+++}$  so as to cause said beam to intersect the target such that intersection of the beam and the target travels the length of said target at substantially the speed of light.

4,012,641

## PORTABLE PULSED SIGNAL GENERATOR

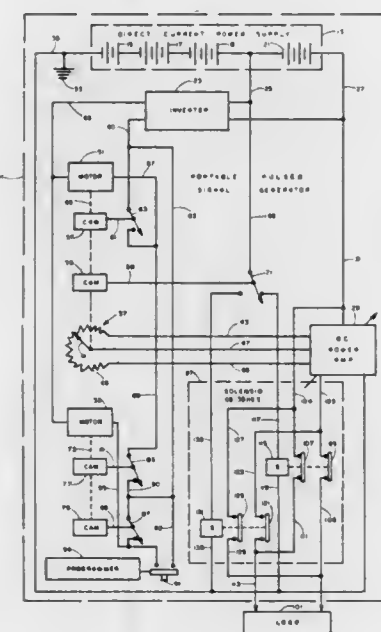
Millard S. Brickerd, Jr., and John A. Hudson, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1975, Ser. No. 637,996

Int. Cl.<sup>2</sup> H03K 3/00

U.S. Cl. 307-106

5 Claims



1. A portable pulsed signal generator, comprising in combination:

- a plurality of series connected batteries;
- an inverter, having a pair of inputs and a pair of outputs, with one of the inputs thereof connected to the negative terminal of one of the batteries of the aforesaid plurality of series connected batteries, and with other input thereof connected to the positive terminal of said one battery of the aforesaid plurality of series connected batteries;
- a first motor, having an input, an output, and a rotatable shaft, with the input thereof connected to one of the outputs of said inverter;
- an on-off switch, having a pair of terminals and means for effecting the timely electrical closure thereof, with one of the terminals thereof connected to the electrical output of said first motor, and with the other terminal thereof connected to the other output of said inverter;

- a first cam mounted on the shaft of said first motor for rotation therewith;
- a first cam follower disposed in slidable engagement with said first cam for timely movement thereby;
- a first switch having a fixed contact and a movable arm, with the fixed contact thereof electrically connected to said one terminal of the aforesaid on-off switch, and with the movable arm thereof mechanically connected to said first cam follower;
- a second cam mounted on the shaft of said first motor for rotation therewith;
- a second cam follower disposed in slidable engagement with said second cam for timely movement thereby;
- a second switch having a fixed contact and a movable arm, with the fixed contact thereof electrically connected to the movable arm of said first switch and to the other terminal of the aforesaid on-off switch;
- a second motor having an input, an output, and a rotatable shaft, with the input thereof connected to said one output of said inverter, and with the output thereof electrically connected to the movable arm of said second switch;
- a third cam mounted on the shaft of said second motor for rotation therewith;
- a third cam follower disposed in slidable engagement with said third cam for timely movement thereby;
- a third switch having a movable arm and two fixed contacts, with the movable arm thereof mechanically connected to said third cam follower in such manner as to be alternately closed with the fixed contacts thereof in response thereto, and with the movable arm thereof electrically connected to the negative terminal of the aforesaid one of said plurality of series connected batteries;
- a fourth cam mounted on the shaft of said second motor for rotation therewith;
- a fourth cam follower disposed in slidable engagement with said fourth cam for timely movement thereby;
- a fourth switch having a fixed contact and a movable arm, with the fixed contact thereof electrically connected to the output of said second motor, with the movable arm thereof electrically connected to said other output of the aforesaid inverter, and with the movable arm thereof mechanically connected to said fourth cam follower in such manner as to be opened and closed with the fixed contact thereof in response to timely movement of said fourth cam follower;
- a direct current power amplifier having a predetermined direct current voltage supply, a positive potential input, a negative potential input with respect to said positive potential input, a control input, and a positive potential output, the potential of which is more positive than that of said negative potential input and less positive than that of said positive potential input, with the positive potential input thereof connected to the positive terminal of said one battery of the aforesaid plurality of series connected batteries, and with the negative potential input connected to the negative of another of the batteries of said plurality of series connected batteries;
- a potentiometer having a fixed resistance and a movable arm in slidable engagement therewith, with the fixed resistance thereof connected across the aforesaid predetermined direct current voltage supply of said direct current power amplifier, with the movable arm thereof mechanically connected to the shaft of said second motor for rotation therewith, and with the movable arm thereof electrically connected to the aforesaid control input of said direct current power amplifier;
- a pair of output terminals;
- a first solenoid relay having first and second switches and a solenoid connected thereto for the simultaneous opening and closing thereof, with the first switch thereof connected between the positive potential output of said direct current power amplifier and one of said pair of output terminals, and with the second switch thereof connected between the positive terminal of said one battery

of the aforesaid plurality of series connected batteries and the other of said pair of output terminals, and with the solenoid thereof connected between one of the fixed contacts of the aforesaid third switch and the negative input of said direct current power amplifier;

a second solenoid relay having third and fourth switches and a solenoid connected thereto for the simultaneous opening and closing thereof, with the third switch thereof connected between the positive potential output of said direct current power amplifier and said other of said pair of output terminals, and with the fourth switch connected between the positive terminal of said one of the aforesaid plurality of series connected batteries and said one of said pair of output terminals, and with the solenoid thereof connected between the other of the fixed contacts of said third switch and the negative input of said direct current power amplifier.

4,012,642

## JOSEPHSON JUNCTION LOGIC ELEMENT

Pierre Léopold Guéret, Thalwil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 412,084, Nov. 2, 1973, Pat. No. 3,891,864.

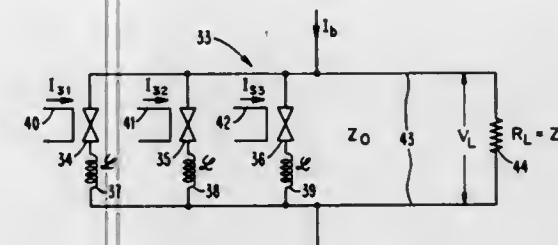
This application June 9, 1975, Ser. No. 585,160

Claims priority, application Switzerland, Nov. 17, 1972, 16755/72

Int. Cl.<sup>2</sup> H03K 19/195, 3/38

U.S. Cl. 307-212

21 Claims



1. A Josephson junction logic circuit comprising at least a pair of Josephson junction devices connected in parallel forming superconducting loops,
- a load shunting said devices,
- a source of current connected to said load and said devices, and
- means connected to each of said devices for suppressing circulating currents in said loops.

4,012,643

## NOISE ELIMINATION CIRCUIT

Hideki Miura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 21, 1975, Ser. No. 569,889

Claims priority, application Japan, Apr. 25, 1974, 49-46944

Int. Cl.<sup>2</sup> H03K 5/08

U.S. Cl. 307-237

7 Claims

1. A noise elimination circuit comprising:
- a semiconductor device comprising a first semiconductor region of one conductivity type,
- a second semiconductor region of the opposite conductivity type adjacent said first region with a first semiconductor junction therebetween,
- a third semiconductor region of the same conductivity type as said first region adjacent said second region with a second semiconductor junction therebetween, first, second and third terminals coupled to said first, second and third regions, respectively,
- a fourth terminal connected to said semiconductor device and having at least a portion thereof located adjacent to said first region at a position which is spaced from the said first terminal, and an insulating layer separating said fourth terminal from said first region,
- said first semiconductor region having a control region

immediately formed in the vicinity of said fourth terminal,

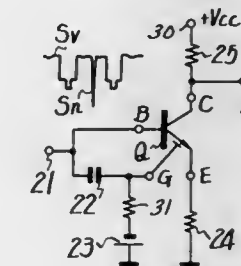
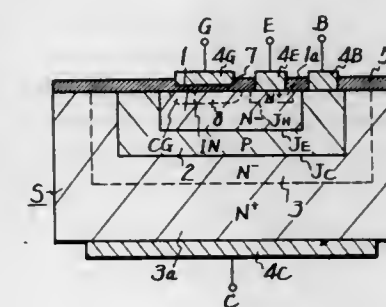
means for applying a signal which has an undesirable noise to said second and fourth terminals,

means for applying a bias to one of said first and fourth terminals,

said semiconductor device having an emitter grounded current amplification characteristic which varies due to linear changes in voltage between the first and fourth terminals from a predetermined low through a steeply rising segment to a predetermined high at a relatively constant level segment,

means for applying a power source to said semiconductor device,

means for deriving an output from one of said terminals, and



wherein said means for applying a signal with an undesirable noise characteristic comprises means for applying a video signal including a pedestal and a synchronizing portion, means for adjusting the level of said bias such that the entire desired video signal is at a level on the fourth terminal which causes the emitter grounded current amplification to be located at the relatively constant level segment immediately in the vicinity of the steeply rising segment, whereby noise signals which exceed the level of the desired video signal cause the emitter grounded current amplification to be located in the vicinity of the steeply rising segment and the predetermined low portion such that said noise is substantially eliminated at said output.

4,012,644

## BLOCKING OSCILLATOR DRIVER FOR A MICROWAVE LATCHING FERRITE DEVICE

Homer P. Blincoe, Tucker, Ga., assignor to Electromagnetic Sciences, Inc., Atlanta, Ga.

Filed Oct. 16, 1975, Ser. No. 623,007

Int. Cl.<sup>2</sup> H03K 3/30

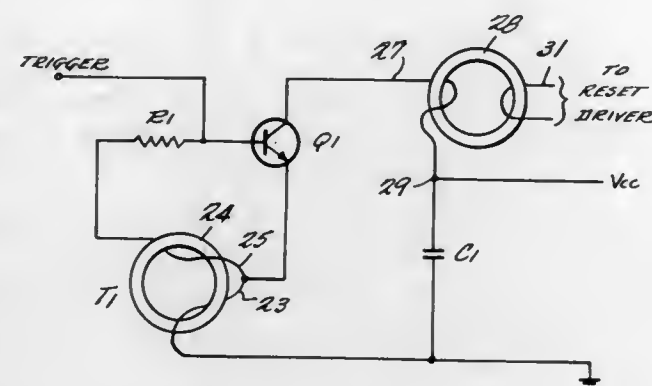
U.S. Cl. 307-275

7 Claims

1. In combination, a microwave latching ferrite device having a latch winding having first and second terminals and driving means for said ferrite device, said driving means comprising an emitter coupled blocking oscillator coupled between an input and said latch winding first and second terminals, said emitter coupled blocking oscillator comprising a switching transistor and a transformer having a toroidal core, a primary and a secondary winding, said primary winding coupled between the emitter of said switching transistor and said latch winding second terminal, and said secondary wind-



ing coupled between the emitter and base of said switching transistor, the collector of said switching transistor being coupled to said latch winding first terminal, said emitter coupled blocking oscillator generating a single latch pulse on said



latch winding in response to a trigger pulse on said input with said single latch pulse being rapidly cut off due to saturation of said transformer toroidal core, thereby substantially eliminating variations in the latch pulse due to storage time variations of the switching transistor.

#### 4,012,645 TIMING CIRCUIT

Ernest James Moorey, Ivybridge, England, assignor to M. L. Engineering (Plymouth) Limited, Plymouth, England

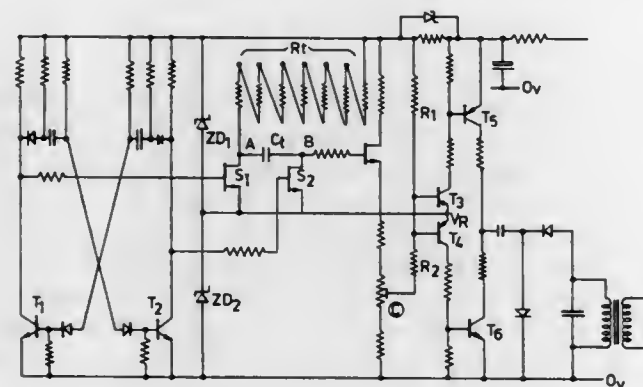
Filed Mar. 18, 1975, Ser. No. 559,469

Claims priority, application United Kingdom, Mar. 19, 1974, 12116/74

Int. Cl.<sup>2</sup> H03K 5/13

U.S. Cl. 307-293

5 Claims



1. A timing circuit comprising:

- a threshold device having an input point, and having first and second states, the threshold device being in its first state when the potential at the input point lies above a given voltage threshold and in its second state when the potential at said input point is below said given threshold, the threshold device being normally in its first state,
- a current source including a timing resistor connected to a source of charging voltage,
- a timing capacitor having a first side connected to said timing resistor and a second side connected to said input point,
- first and second switch devices connected to said first and second sides, respectively, of the timing capacitor and to a source of reference potential, said reference potential being above said threshold, and
- means for closing said first and second switch devices alternately to connect said first and second sides of the timing capacitor alternately to said source of reference potential thereby causing said timing capacitor to be charged cumulatively during successive closures of said second switch device, the potential at said input point of the threshold device changing progressively with each clo-

sure of said first switch device and falling below said given threshold only after a number of alternate closures of said first and second switch devices to cause the transition of the threshold device to a second state, while in the event of failure of the timing capacitor, the potential at said input point remains above said given threshold and the threshold device remains in its first state.

#### 4,012,646 POWERING SCHEME FOR JOSEPHSON LOGIC CIRCUITS WHICH ELIMINATES DISTURB SIGNALS

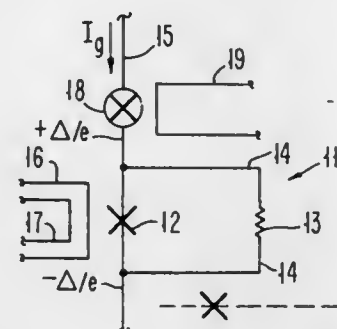
Frank Fu Fang, Yorktown Heights, and Dennis James Herrell, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1975, Ser. No. 591,997

Int. Cl.<sup>2</sup> H03K 3/38, 17/92, 19/195

U.S. Cl. 307-306

19 Claims



1. A Josephson junction circuit comprising at least a single latching Josephson junction adapted for switching from a zero voltage state to a finite voltage state, and means disposed in series with said junction for generating a pulse transient having an amplitude sufficient to reset said junction from the finite voltage state to the zero voltage state said means for generating and said junction having a total voltage drop equal to the voltage of said finite voltage state prior to and after resetting said junction.

#### 4,012,647 ULTRASONIC MOTORS AND CONVERTERS

Lewis Balamuth, Southampton; Arthur Kuris, Riverdale, and Manuel Karatjas, Glen Oaks, all of N.Y., assignors to Ultrasonic Systems, Inc., Farmingdale, N.Y.

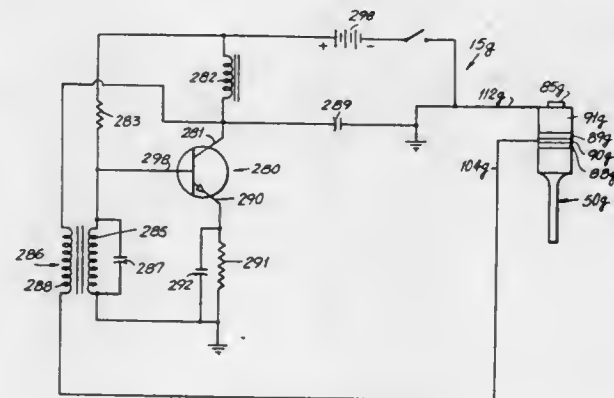
Continuation of Ser. No. 426,822, Jan. 31, 1974, abandoned.

This application Aug. 1, 1975, Ser. No. 601,046

Int. Cl.<sup>2</sup> H01L 41/08

U.S. Cl. 310-8.1

38 Claims



1. A driving circuit for driving an ultrasonic transducer having a piezoelectric element, said transducer being capable of vibration at a plurality of frequencies including a desired frequency, comprising:

- A. a power supply for producing a power signal;
- B. a reference voltage;
- C. a single transistor means having a conductive path coupled intermediate said power supply and a reference

voltage and further having a control terminal, a control signal applied to said control terminal controlling the conductivity of said conductive path and therefore controlling the application of said power signal to said piezoelectric element as a driving signal, said conductive path of said transistor means being coupled to said power supply at a junction terminal;

- D. transformer means having a primary winding and a secondary winding, said primary winding being electrically coupled intermediate said junction terminal and said piezoelectric element for detecting a detected signal representative at least of the frequency of said driving signal; and
- E. tuned circuit means tuned to said desired frequency and formed from inductor means, and capacitor means connected in parallel with said inductor means, said transformer means secondary winding defining said inductor means, said tuned circuit means being operatively coupled between said transistor means control terminal and said reference voltage for applying a control signal to said control terminal for controlling the conductivity of said conductive path at said desired frequency in response to said detected signal to produce said driving signal at said desired frequency.

#### 4,012,648 PROCESS FOR MANUFACTURING PIEZOELECTRIC RESONATORS AND RESONATORS RESULTING FROM SUCH PROCESS

Jean Engdahl, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services S.A., Bienne, Switzerland

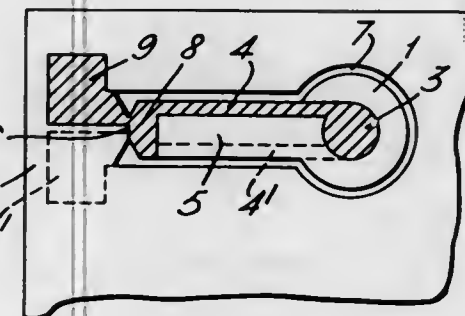
Filed Apr. 28, 1975, Ser. No. 571,954

Claims priority, application Switzerland, May 6, 1974, 6107/74

Int. Cl.<sup>2</sup> H01L 41/08

U.S. Cl. 310-8.2

12 Claims



1. A process for the manufacture of piezoelectric resonators operable in the thickness shear mode, said process comprising the steps of:

- blanking each said resonator and a single resonator support arm therefor from a plate of piezoelectric material as a single integral piece of said piezoelectric material, with said resonator being formed at one end of said support arm, said blanking step leaving each said resonator and its support arm in the plane of, but separated from, the plate from which it is blanked, except for a region of reduced cross section whereat the support arm remains attached to, but breakably detachable from the plate;
- applying electrodes to said resonators and conductors to said support arm; and
- breaking said resonators and their support arms from said plate at said region of reduced cross section, after applying said electrodes and conductors.

#### 4,012,649 PIEZOELECTRIC STRESS/STRAIN INTRUSION DETECTORS

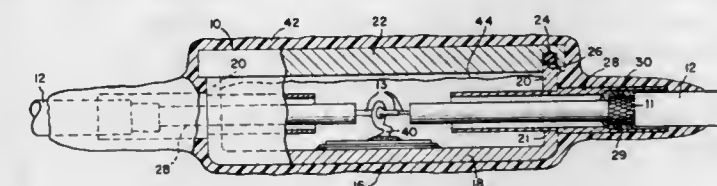
John C. Cook, Dallas, and James D. Kerr, Allen, both of Tex., assignors to Teledyne Industries, Inc., Dallas, Tex.

Filed Oct. 9, 1975, Ser. No. 621,110

Int. Cl.<sup>2</sup> H01L 41/04

U.S. Cl. 310-8.3

6 Claims



1. A detector suitable for use in an array to be buried below the surface of the earth and connected by coaxial cable means to circuitry to detect intrusions which apply downward pressures to said surface above the array, comprising:

- a. a metallic cup having an enclosing side wall portion open at one end and closed at the other end by a diaphragm portion, the side wall portions having one or more cable-receiving openings therethrough;
- b. cap means closing said open end of the cup;
- c. piezoelectric transducer disc means having oppositely poled electrodes and one of the electrodes of said disc means being conductively bonded to the diaphragm portion inside the cup for deformation of the disc means therewith when the diaphragm portion is flexed by said pressures;
- d. said cable means passing into the cup via a side wall opening, and the cable means having an outer conductor conductively coupled to the cup and having an inner conductor coupled to the other of said oppositely poled electrodes inside the cup;
- e. strain relief means comprising a hollow ferrule extending through each opening and fixed in the side wall of the cup and leading thereto, and the cable means passing through a ferrule and fixed thereto; and
- f. sealing means for sealing the cup and the portions of the cable means entering said ferrules against entry of moisture.

#### 4,012,650 DICED SUBSTRATE S.A.W. DEVICE FOR BULK WAVE ATTENUATION

Ronald George Pratt, Reigate; Richard Stevens, Copthorne, and Alojzy Karr, Shoreham-by-Sea, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,482

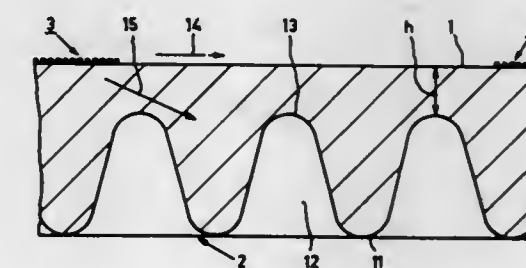
Claims priority, application United Kingdom, Sept. 4, 1973, 41479/73

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 13, 1976

Int. Cl.<sup>2</sup> H01L 41/04

U.S. Cl. 310-9.6

13 Claims



1. An acoustic surface-wave device comprising a body in the form of a wafer having a layer extending under a first major surface and made of a piezoelectric material, which first



major surface serves as a propagation surface for the acoustic surface waves, a transducer coupled to said first major surface for converting an electric signal into a surface wave or conversely, and a plurality of discrete recesses being formed in and distributed over at least a portion of the second major surface of the wafer, which recesses extend into the wafer to a distance from the first major surface such that propagation of the acoustic surface waves is substantially unaffected whereas propagation of bulk waves is significantly affected in an attenuating and/or scattering sense, the said recesses together with the surrounding intermediate areas being arranged in a configuration such that any straight line which joins any two edges of said second surface intersects at least one intermediate area.

4,012,651

# PERMANENT MAGNET FIELD MEANS FOR DYNAMO-ELECTRIC MACHINES

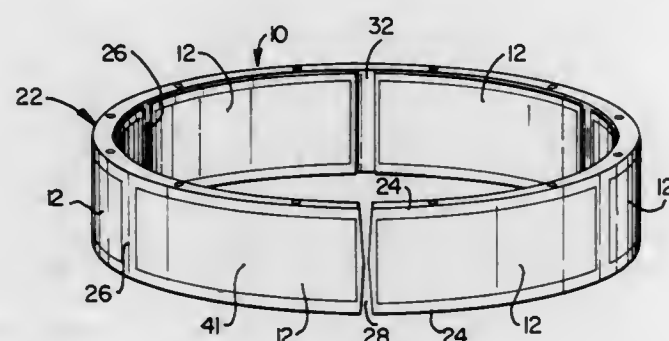
Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Dec. 20, 1974, Ser. No. 534,856

Int. Cl.<sup>2</sup> H02K 21/22

U.S. Cl. 310—153

6 Claims



1. A unitary self-sustaining magnet ring for use in a dynamo-electric machine and adapted to being secured to a surrounding supporting ring, said magnet ring comprising a non-magnetic annular carrier, and a plurality of arcuate magnets disposed in spaced end-to-end relationship relative to one another in an annular array and fixedly embedded in said carrier, said carrier being continuous along its full circumference except for having a single axially extending gap passing completely therethrough and which gap is located within the space between two of said magnets, said gap having a double wedge shape with minimum thickness near the axial center of said ring so as to accommodate a wedge driven into said gap from either side of said ring.

4,012,652

# UNIDIRECTIONAL SELF-STARTING ELECTRICAL MOTORS WITH SHADED POLES AND SHADED MAGNETIC SHUNT

John Derek Gilbert, Harlow, England, assignor to Electrical Remote Control Company, Ltd., England

Continuation-in-part of Ser. No. 402,399, Oct. 1, 1973, which is a continuation of Ser. No. 251,264, May 8, 1972, abandoned. This application Apr. 24, 1974, Ser. No. 463,506

Claims priority, application United Kingdom, Apr. 26, 1973, 19988/73

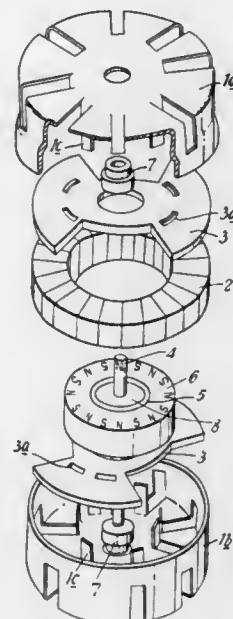
Int. Cl.<sup>2</sup> H02K 19/00

U.S. Cl. 310—162

32 Claims

1. A unidirectionally self-starting synchronously-operable motor comprising: a magnetically polarized rotor; and a stator with two parts each having a plurality of pole teeth wherein pole teeth of one stator part interdigitate with the pole teeth of the other stator part, shading means for shading some of said pole teeth so as to provide at least one group of shaded pole teeth and at least one group of unshaded pole teeth, with the groups so disposed around the stator that in proceeding around the stator a plurality of times there is encountered an alternate

sequence comprising a group of shaded pole teeth followed by a group of unshaded pole teeth, said at least one group of shaded pole teeth being angularly spaced in the direction of rotor rotation from a symmetrical position relative to said at least one group of unshaded pole teeth, the number  $n$  of stator pole teeth being an integer substantially equal to 360 divided by the mean pole pitch angle which exists within the majority of the pole sets within the groups, that number  $n$  being accommodated by virtue of the pole teeth at the trailing end of the at



least one group of shaded pole teeth and at the leading end of the at least one group of unshaded pole teeth having circumferential widths and angular displacements relative to the other pole teeth such that each pole tooth is accommodated between, and without contact with, its two adjacent pole teeth, the number of said groups being  $x$  such that the number of pole teeth in any of said groups being an integer in the range from  $n/x - 1$  to  $n/x + 1$ , and a shaded magnetic shunt added to at least one group of shaded pole teeth extending substantially from one of said stator parts towards the other.

4,012,653

# LOW NOISE ALTERNATING CURRENT DYNAMOELECTRO MACHINE

Masayuki Shigeta, Katsuta; Ken Ichiryu, Mito, and Masaki Miura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

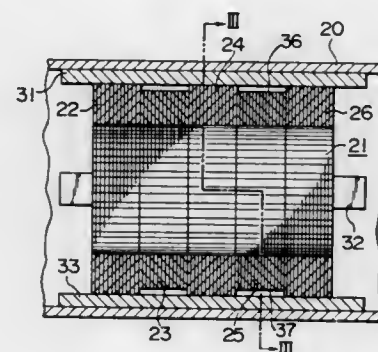
Filed Oct. 15, 1974, Ser. No. 514,924

Claims priority, application Japan, Oct. 17, 1973, 48-115896

Int. Cl.<sup>2</sup> H02K 1/06

U.S. Cl. 310—217

12 Claims



1. An AC dynamoelectro machine comprising at least one hollow and cylindrical magnetic core consisting of a stack of a plurality of ring laminations of magnetic material, said core

being axially divided into a plurality of blocks, each said block being supported at a plurality of positions on its surface parallel to the axis of the core, at least one of the supporting positions of a first one of adjacent two said blocks being arranged in different location to those of a second one of said adjacent two blocks along the circumference of the core, said first and second blocks being closely contacted with each other in the axial direction, said blocks being stacked with visco-elastic layers interposed therebetween.

4,012,654

# SINGLE-PHASE SYNCHRONOUS MACHINE

Mihailo Starcevic, Mellingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 314,576, Dec. 13, 1972, abandoned.

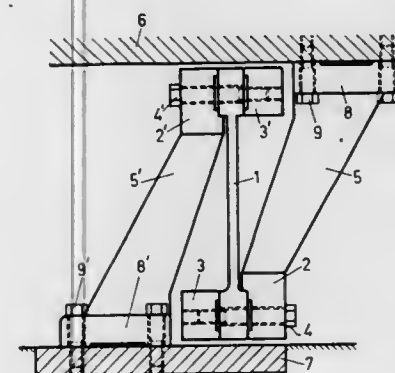
This application June 4, 1974, Ser. No. 476,221

Claims priority, application Switzerland, Dec. 24, 1971, 18902/71

Int. Cl.<sup>2</sup> H02K 1/12

U.S. Cl. 310—258

3 Claims



1. A support structure for the stator component of a synchronous electrical machine comprising a plurality of spring brackets interconnecting said stator and a base plate, each said spring bracket including one set of parallel spaced stiffening ribs projecting from the stator in the direction towards but terminating short of said base plate in a spring-connecting end and a second set of parallel spaced stiffening ribs projecting from said base plate in the direction towards but terminating short of said stator in a spring-connecting end, and leaf spring means extending in a direction radially of the stator axis and connected respectively at the opposite ends thereof to said spring-connecting ends of said first and second sets of stiffening ribs, said leaf spring means being statically stressed in tension only by the weight of the stator and being subjected to dynamic bending stresses in response to torsional vibrations occurring in the stator during operation of the machine and which are transmitted to said spring means through said stiffening ribs that lie in the plane of flexure of said spring means and also serve to stiffen the spring brackets in the radial and axial directions of said stator component.

4,012,655

# REFRACTORY METAL OXIDE REFLECTOR COATING ON LAMP ENVELOPE

Charles I. McVey, Shaker Heights, and O. Manuel Uy, Cleveland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 546,224, Feb. 3, 1975, which is a division of Ser. No. 404,178, Oct. 9, 1973, Pat. No. 3,879,625. This application Aug. 4, 1975, Ser. No. 601,859

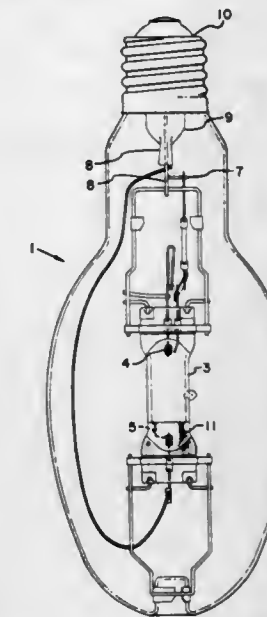
Int. Cl.<sup>2</sup> H01J 7/24

U.S. Cl. 313—27

10 Claims

1. A fused silica envelope having an optically reflective

coating of  $Al_2O_3$  particles adherent thereto by means of an adhesion layer consisting of colloidal aluminum oxide and



4,012,656

# X-RAY TUBE

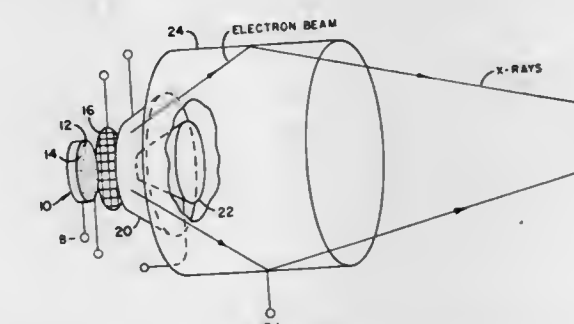
Ralph L. Norman, 3644 Marymont Drive NW., Huntsville, Ala. 35810; Jerry W. Hagood, 307 Mountain Gap Road SE., Huntsville, Ala. 35803, and Joe Shelton, 700 Tatom St. NW., Huntsville, Ala. 35805

Filed Dec. 9, 1974, Ser. No. 530,893

Int. Cl.<sup>2</sup> H01J 35/00

U.S. Cl. 313—55

5 Claims



1. In an x-ray tube for generating x-ray emission, the improvement comprising: a composite field-effect electron emitter having several million insulated emitting fibers per square centimeter of emitter surface with adjacent fibers being substantially in parallel and disposed for emitting an electron beam at prevailing ambient temperatures; a target anode disposed for electron bombardment by said emitter and for releasing x-ray in response to said electron bombardment; and a control grid disposed adjacent said emitter fibers between said emitter and said target anode for varying an electric field between said emitter and said anode and thereby control field-effect electron emission; said emitter being shaped in conjunction with the shape of said anode for stimulating directional x-radiation uniformly across the anode region of bombardment.



4,012,657

## SLIT-SCANNING IMAGE CONVERTER TUBE

Charles Loty, Limeil-Brevannes, France, assignor to Commissariat à l'Energie Atomique, Paris, France

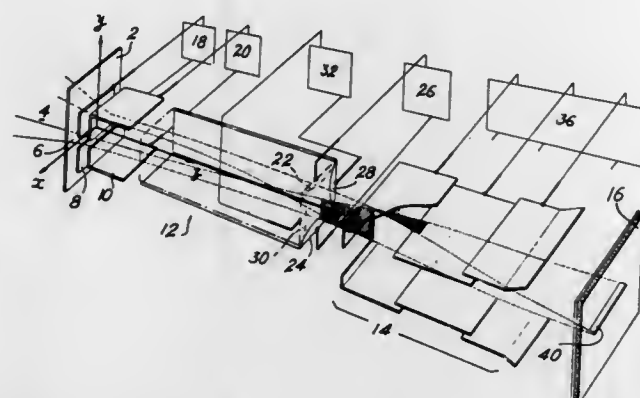
Filed Sept. 8, 1975, Ser. No. 611,198

Claims priority, application France, Sept. 13, 1974, 74.31136

Int. Cl.<sup>2</sup> H01J 39/04, 39/18

U.S. Cl. 313-99

9 Claims



1. A slit-scanning image converter tube for the observation of rapidly varying light phenomena by scanning on a screen the image of a line source of electrons, said tube being constituted by a photocathode which collects the light coming from a light phenomenon to be studied and emits an electron beam, at least one control electrode having a slit for defining said line source of electrons in cooperation with said photocathode and for gating said line source by means of an applied control potential, at least one accelerating electrode, said screen, an electron-optical system for deflecting and focusing the electron beam and located between the accelerating electrode and said screen, wherein according to the invention said electron-optical system comprises:

astigmatic electron-optical lens means for focusing an image of said line source having resolution in the longer dimension of said line source on said screen and having no line of focus for resolution in the shorter dimension of said line source in the vicinity of said screen;

unidimensional focusing and deflecting means for focusing and deflecting said beam in the direction, parallel to said screen, of the shorter dimension of said line source, said focusing and deflecting means being located between said astigmatic lens means and said screen and cooperating with said astigmatic lens means for focusing an image of said line source having resolution in the shorter dimensions of said line source on said screen during deflection of said image by application of deflection potential to said focusing and deflection means, without disturbance of an independently adjusted focus of said astigmatic lens means for resolution of the image of said line source in the longer dimension thereof.

4,012,658

## ELECTRIC LAMPS MOUNTED IN A FLANGED CAP

Arthur Samuel Vause, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed Nov. 26, 1975, Ser. No. 635,363

Claims priority, application United Kingdom, Nov. 28, 1974, 51636/74

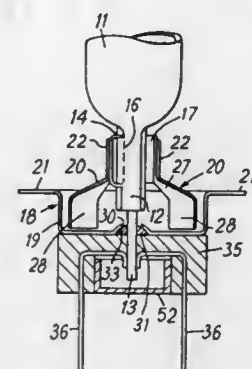
Int. Cl.<sup>2</sup> H01J 5/48, 5/50

U.S. Cl. 313-318

3 Claims

1. An electric lamp comprising an envelope containing a light source, said envelope having a press seal and supply leads entering the envelope through the press seal, said lamp further comprising a metal cap, said cap having an integral peripheral flange, a support mounting said envelope on said cap, said

support being attached to the press seal of the envelope, and current leads passing through openings in said cap and her-



metically sealed in said openings by electrically insulating material which insulates said leads from said cap.

4,012,659

## METHOD OF FLASHING TUNGSTEN FILAMENT

Edmund M. Passmore, Wilmington; George L. Duggan, Bedford; Warren A. Anderson, Danvers, and William M. Labadini, Salisbury, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 31, 1975, Ser. No. 645,486

Int. Cl.<sup>2</sup> H01J 1/16; H01K 1/14; H01J 19/10

U.S. Cl. 313-344

1 Claim



1. In an incandescent lamp tungsten wire coiled filament the ends of which are attached to lead-in support wires, the improvement which comprises the filament having a recrystallized structure that extends closer to the support wires than the breadth of each support wire.

4,012,660

## SIGNAL PLATE FOR AN ELECTRIC STORAGE TUBE OF HIGH WRITING SPEED

Reinhard Losehand; Wolfgang Welsch, and Werner Veith, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 130,880, April 5, 1971, abandoned.

This application Feb. 21, 1973, Ser. No. 334,361

Int. Cl.<sup>2</sup> H01J 29/41, 29/36

U.S. Cl. 313-391

2 Claims

1. An electron beam charge storage device comprising a target structure, means for generating and directing an electron beam over one face of said target, said target comprising a plurality of storage elements providing storage surfaces lying in a first plane and insulated from each other and capable of holding a charge in response to electron bombardment, support means for said storage elements provided on the opposite side of said first plane with respect to said means for generating said electron beam, said support means comprising a substrate comprising individual extending support pillars for

4,012,662

## COMMUNICATION SYSTEM BETWEEN A TRANSMITTER, RECEIVER STATION AND A MOBILE STATION UTILIZING UNIDIRECTIONAL AMPLIFIERS BETWEEN PARALLEL RADIATED TRANSMISSION LINES

David James Reginald Martin, Leatherhead, England, assignor to Coal Industry (Patents) Limited, London, England

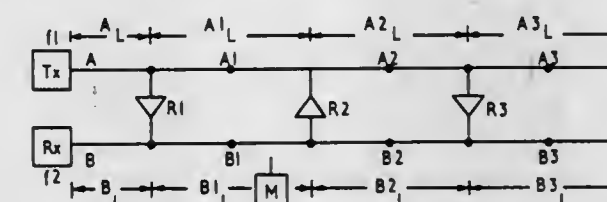
Filed Feb. 13, 1976, Ser. No. 657,879

Claims priority, application United Kingdom, Mar. 7, 1975, 09567/75

Int. Cl.<sup>2</sup> H04B 3/00

U.S. Cl. 325-28

5 Claims



lying in a second plane space from said first plane of storage surfaces, said collecting means on the opposite side of said first plane with respect to said means for generating an electron beam.

1. A telecommunication system of the kind in which signals can be transmitted from a base transmitter station to a mobile station and signals from the mobile station can be transmitted to the base receiver station through a radiating transmission line, comprising a pair of radiating transmission lines extending substantially parallel to each other, one of the lines being connected to a base transmitter station and the other of the lines being connected to a base receiver station, a plurality of uni-directional amplifier elements connected between the lines at spaced intervals, alternate ones of the amplifier elements being connected to conduct in the opposite direction to adjacent amplifier elements, and routing means connected in the transmission lines between connections of said amplifier elements for routing signals along the lines alternately whereby a signal originating from said base transmitter station or a mobile station in the vicinity of said transmission line is routed to travel along part of a first of the lines and then through a part of the second of the lines with the transfer between the lines being effected through one of the amplifier elements.

4,012,663

## LIGHTING CONTROL SYSTEM

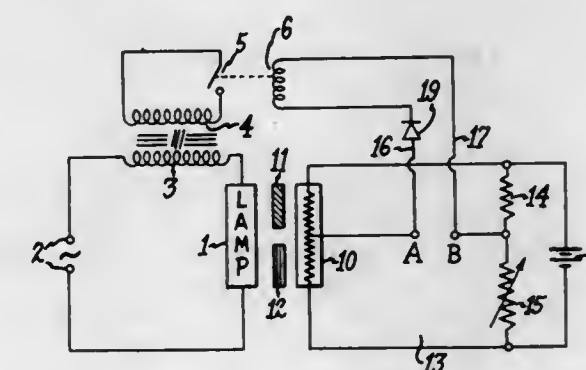
Trasimond A. Soileau, Flat Rock, N.C., assignor to General Electric Company, New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,860

Int. Cl.<sup>2</sup> H05B 37/00

U.S. Cl. 315-151

5 Claims



1. In a color television picture tube having a faceplate, a skirt extending from said faceplate, and an aperture mask, said aperture mask being situated within said tube behind said faceplate and supported by a four-sided frame, apparatus to compensate said tube for expansion of said aperture mask therein due to a temperature rise of said mask so as to maintain registration between apertures in said mask and predetermined regions on said faceplate, said apparatus comprising:

first and second temperature responsive means attaching said frame to the faceplate skirt at each of two points on said skirt situated such that each of said two points is located along a horizontal axis situated below the horizontal centerline of said frame and is coupled to an opposite one of the four sides of said frame below said axis, respectively, each of said temperature responsive means tending, for any given rise in temperature thereof during normal operation of said tube, to thrust the side of said frame to which it is respectively attached toward said faceplate by a predetermined distance; and third temperature responsive means attaching a third one of the four sides of said frame to said faceplate skirt at a third point on said skirt, said third temperature responsive means tending, when experiencing said given rise in temperature, to thrust said third one of the four sides of said frame towards said faceplate by a distance other than said predetermined distance.

1. Lighting control device comprising, in combination, a source of electrical power, gaseous discharge lamp means connected to said electrical power source for operation thereby, power control means comprising electrical ballast means connected between said electrical power source and said lamp means, said lamp means being subject to variation in the spectral composition of its illumination output, and illumination control means for compensating for said spectral variation, comprising a photocell exposed to the illumination from







4,012,669

**ELECTRONIC OVERLOAD DETECTING DEVICE**

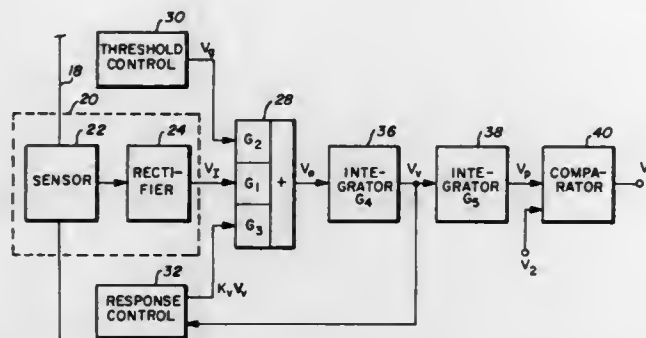
Peter C. Gelfand, Lebanon, and Clifford A. Mason, Hummels-town, both of Pa., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Aug. 29, 1975, Ser. No. 608,865

Int. Cl.<sup>2</sup> H02H 3/08

U.S. Cl. 361—97

8 Claims



1. A device for determining the occurrence of an electrical overload in an electrical system comprising:

- means for monitoring an electrical parameter in an electrical system and for generating an output signal representative of the instantaneous absolute value of the monitored electrical parameter;
- threshold control means for developing an electrical output signal of predetermined time-invariant value;
- adder means connected to receive the output signals from said monitoring means and from said threshold control means and to receive a feedback signal, said adder means being operative to generate an output signal representative of the summation of said three received signals;
- integrator means connected to receive said summation signal from said adder means and to generate an output signal representative of the integral of said summation signal;
- feedback means coupled between the output of said integrator means and the input to said adder means for feeding said integrated signal back to said adder means with a predetermined gain; and
- comparator means connected to receive the integrated signal from said integrator means and operative to generate an indicative overload signal whenever the magnitude of said integrated signal exceeds a second predetermined value.

4,012,670

**PROTECTING REINFORCED CONCRETE PIPE LINES FROM LIGHTNING DAMAGE**

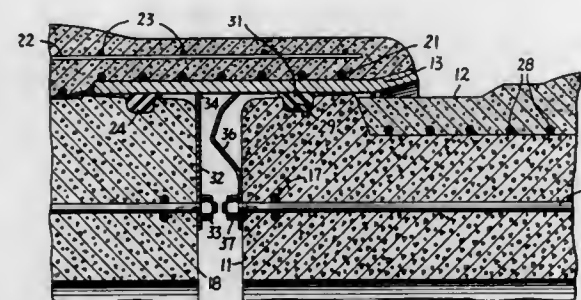
John A. Shaw, Sandton, South Africa, assignor to Interpace Corporation, Parsippany, N.J.

Filed May 12, 1975, Ser. No. 576,301

Int. Cl.<sup>2</sup> H02H 3/22

U.S. Cl. 361—117

3 Claims



1. A reinforced concrete pipe line comprising in combination:

- a plurality of pipe lengths each having a metallic bell ring at one end and a spigot at the other end thereof,

the bell ring of one of the pipe lengths adapted to receive the spigot of a next of the pipe lengths fitted therein, each of the pipe lengths having at least one metallic reinforcing member extending from a bell end in the vicinity of its bell ring to a spigot end in the vicinity of its spigot, a bell electrical lead joining the bell end of the reinforcing member of one of the pipe lengths to the metallic bell ring thereof, a spigot electrical lead connected to the spigot end of the reinforcing member of a next of the pipe lengths, the spigot electrical lead engageable into contact with the bell ring by said fitting into said bell ring by said spigot, each of the pipe lengths having a plurality of the metallic reinforcing members spaced peripherally thereabout, each of the metallic reinforcing members having one of the bell electrical leads and one of the spigot electrical leads each extending radially outward therefrom, each of the spigot electrical leads formed as a bow spring for improved contact into the bell ring.

4,012,671

**TRIGGER CIRCUIT**

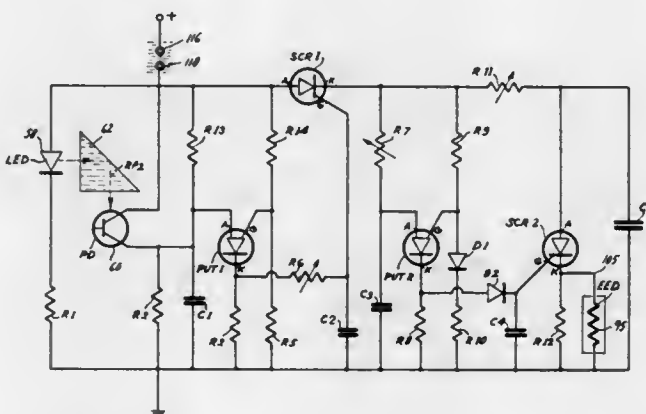
Peter Julian Vaice, Yorba Linda, Calif., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,924

Int. Cl.<sup>2</sup> F23Q 7/02

U.S. Cl. 361—249

2 Claims



1. A trigger circuit for generating an electric charge for exploding an explosive device, said trigger circuit comprising: radiation generating means for generating waves of radiation and for directing said waves in a first path, radiation responsive means, off-set from said first path, coupled for receiving said waves along a second path, off-set from said first path, said radiation responsive means having electrical characteristics which change from a first condition to a second condition in response to reception of said waves,

prism means positioned in said first path and having first reflection characteristics when in an air environment and having second reflection characteristics when in a liquid environment, said second reflection characteristics for converting said first path into said second path with respect to said generated waves,

a first timing circuit coupled to said radiation responsive means and driven by said radiation responsive means, for timing a first time interval, said first timing circuit including a first RC network,

first normally closed gate means coupled to and controlled by said first RC network for opening said first gate means upon said first timing circuit completing timing of said first time interval,

said first gate means coupled to a second RC network for forming a second timing circuit for timing a second time interval, and coupled to a third RC network for generating and storing an electric firing charge during timing of said second time interval,

second normally closed gate means coupled to and controlled by said second RC network for opening said sec-

ond gate means upon said second timing circuit completing timing of said second time interval, and said third RC network coupled to said second normally closed gate means, said second gate means for controlling application of said generated electric firing charge to said explosive device upon opening of said second gate means upon said second timing circuit completing timing of said second time interval.

4,012,672

**PLUG-IN MODULE FOR ELECTRONIC DEVICE HAVING COMPONENT FORMING A GUIDE FOR ALIGNING THE MODULE**

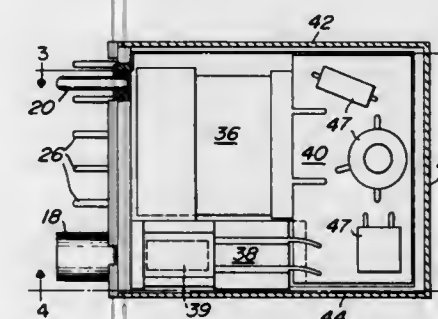
Larry V. Douglass, Coconut Creek; Jerome Leonard, Plantation, and Morris L. Minch, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 28, 1975, Ser. No. 563,418

Int. Cl.<sup>2</sup> H05K 5/02; H02B 1/10

U.S. Cl. 361—422

10 Claims



1. A plug-in module for an electronic device having a chassis with a socket for receiving the module, including in combination:

- a header having conductors extending therethrough, with portions of said conductors extending from said header and forming plug-in terminals,
- a substrate having electronic components thereon connected to said conductors, one of said components having a portion extending through said header and forming a guide to align the module with the socket on the chassis, and
- a housing housing said substrate with electronic components thereon.

4,012,673

**TIMING VALVE CONTROL SYSTEM**

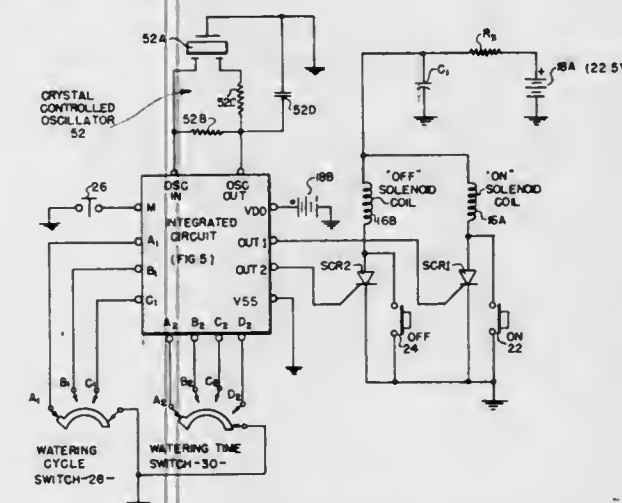
Myrl J. Saarem, and Dale C. Firebaugh, both of Carson City, Nev., assignors to Richdel, Inc., Carson City, Nev.

Filed Sept. 15, 1975, Ser. No. 613,078

Int. Cl.<sup>2</sup> H01H 47/18

U.S. Cl. 361—196

12 Claims



1. A control system including: electronic circuitry including first output terminal means and second output terminal means; first manually settable switching means connected to said electronic circuitry for causing said circuitry to produce a

first output pulse at said first output terminal means at spaced time intervals as established by the setting of said first manually settable switching means; second manually settable switching means connected to said electronic circuitry for causing said circuitry to produce a second output pulse at said second output terminal means a predetermined time after each of the first output pulses as established by the setting of said second manually settable switching means; said electronic circuitry including a first frequency divider counter, means including first decoder circuit means coupled to the first frequency divider counter and to the first manually settable switching means for providing said first output pulses at said first output terminal means and for applying a reset pulse to said first frequency divider counter; a second frequency divider counter; enabling circuit means connecting said first output terminal means to said second frequency divider counter to enable said second frequency divider counter when said first output pulse is produced at said first output terminal means; means including second decoder circuit means coupled to said second frequency divider counter and to said second manually settable switching means for producing said second output pulse at said second output terminal means and for applying a reset pulse to said second frequency divider counter; and an oscillator coupled to the first and second frequency divider counters for establishing a time base for the output pulses produced at the first and second output terminal means.

4,012,674

**DUAL MOTOR WEB MATERIAL TRANSPORT SYSTEM**

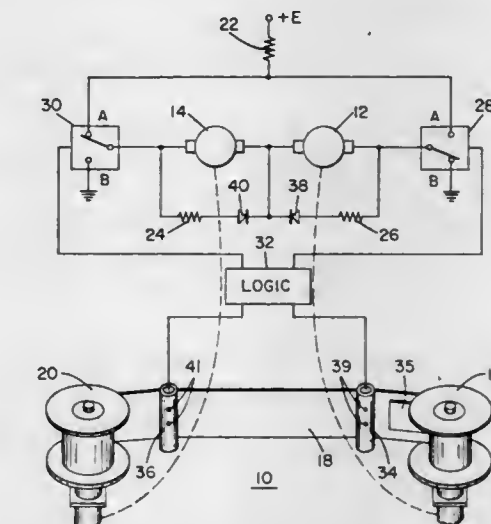
Merlin D. Spitsbergen, and James G. Hughes, both of Rochester, Mich., assignors to Computer Peripherals, Inc., Rochester, Mich.

Filed Apr. 7, 1975, Ser. No. 565,593

Int. Cl.<sup>2</sup> B65H 77/00

U.S. Cl. 318—7

24 Claims



1. A bidirectional web material transport system comprising:

- first and second electric motors electrically excited in series to rotate in the same direction, one of said motors being torque producing and the other speed determinative;
- first and second reels mechanically coupled to said first and second motors respectively for transferring web material therebetween;
- circuit means for applying excitation voltages to said motors;
- coupling means for coupling the back EMF of said first motor additively with the excitation voltage applied to said second motor to vary the total excitation voltage applied to said second motor in accordance with the instantaneous ratio of the radii of web material on said first and second reels and to maintain a greater total excitation voltage on said torque producing motor than on said speed determinative motor; and



switching means for reversing the excitation voltages applied to said first and second motors when a predetermined length of web material is transferred from one of said reels to the other of said reels such that said motors are caused to reverse their direction of rotation and such that the back EMF of said second motor is additively combined with the excitation voltage applied to said first motor in accordance with the instantaneous ratio of the radii of web material on said first and second reels, and such that the excitation voltage applied to said torque producing motor increases with increasing load and decreasing speed.

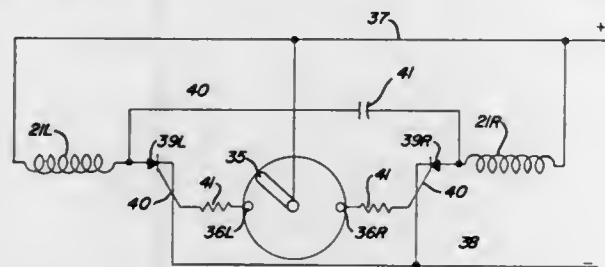
4,012,675

**SWITCHING SYSTEM FOR SOLENOID RECIPROCATOR**  
Everett E. Schulze, Jr., 1357 Helena, Apt. 100, Aurora, Colo. 80011

Filed Aug. 4, 1975, Ser. No. 601,540  
Int. Cl.<sup>2</sup> H02K 33/00

U.S. Cl. 318—37

7 Claims



1. In a solenoid reciprocator motor which includes a solenoid, a piston adapted to reciprocate into and out of the solenoid, direct current power means to power the solenoid and commutator means rotating in unison with the reciprocation of the piston to apply power to the solenoid at intervals such as to drive the piston in its reciprocatory movement, the improvement comprising:

- a power circuit to the solenoid having an S.C.R. rectifier at the negative side of the solenoid as a switch to turn the power circuit off and on;
- a trigger lead from the S.C.R. rectifier to a contact to close the S.C.R. rectifier to turn the power circuit on responsive to a positive pulse;
- a cutoff lead from the power circuit between the solenoid and the S.C.R. rectifier and to a second contact to open the S.C.R. rectifier to turn the power circuit off responsive to a positive pulse; and
- wherein said commutator means includes a rotatable arm connecting with the positive side of the power lead and rotatable responsive to reciprocation of the piston to engage the aforesaid contacts at selected cyclic intervals of the piston movement.

4,012,676

**DEVICE FOR DRIVING RECORDERS AND PRINTING CARRIAGES IN DATA RECORDERS**

Fritz Giebler, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 13, 1974, Ser. No. 442,215  
Claims priority, application Germany, Feb. 27, 1973, 2309750

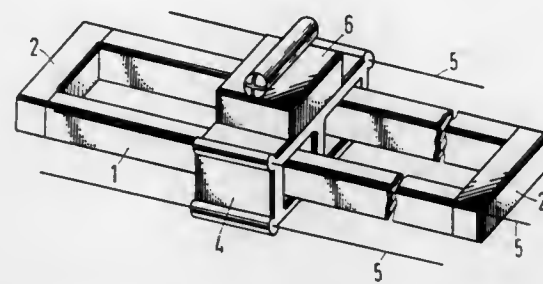
Int. Cl.<sup>2</sup> H04L 17/30

U.S. Cl. 318—135

5 Claims

1. In a device, particularly for the drive of recording or printing carriages in data recorders and the like, the combination of a linear motor, having a pair of elongated, transversely spaced ferro-magnetic rails defining a working air gap therebetween, and a current-carrying drive coil movably guided upon and encircling at least one of said rails, a magnet operatively magnetically bridging the space between said rails, with one pole thereof magnetically connected to an end portion of

one of such ferro-magnetic rails and the other pole thereof magnetically connected to an end portion of the other of said rails, the latter extending from their respective connected end portions parallel to one another in relatively closely spaced



relation whereby one of said rails is of one magnetic polarity and the other of said rails is of opposite magnetic polarity to produce a directional oriented field across said air gap throughout the effective operational length of said ferro-magnetic rails.

4,012,677

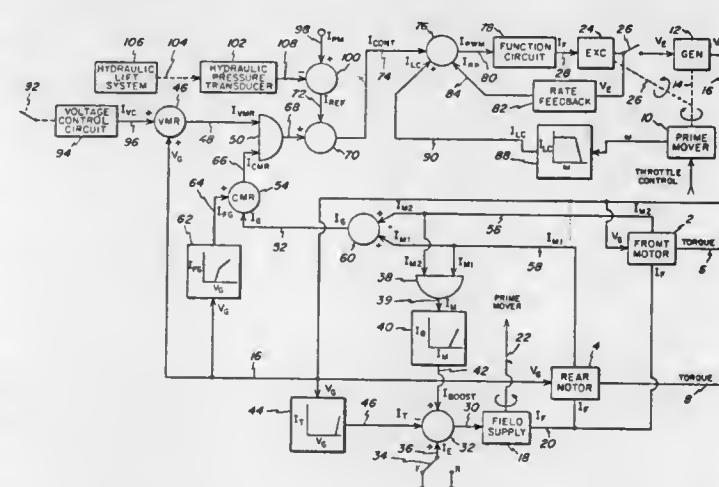
**SPEED CONTROL FOR ELECTRICALLY PROPELLED TRACTION VEHICLES**

Donald Hammond Rist, and Barry Jay Turley, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Feb. 27, 1975, Ser. No. 553,865  
Int. Cl.<sup>2</sup> B60L 11/02

U.S. Cl. 318—149

8 Claims



1. For use in an electrically propelled traction vehicle wherein a thermal prime mover drives electrical generating means supplying electrical energy to separately excited d-c traction motor means, a propulsion control system for controlling the excitation of the field of said generating means to limit the electrical output of said generating means responsive to the available output of said prime mover, said propulsion control system comprising:

- a source of voltage feedback signals representative of the actual voltage output of said generating means applied to said motor means;
- a source of current feedback signals representative of the actual current output of said generating means applied to said motor means;
- power signal means for combining said voltage and current feedback signals to generate power feedback signals;
- a source of reference signals;
- comparison means for comparing said voltage feedback signals with said reference signals and said power feedback signals with said reference signal to generate control signals adapted to modify the field excitation of said generating means to limit the output of said generating means within both a predetermined maximum horsepower limit and a given voltage limit which has a predetermined maximum value;

f. manually adjustable vehicle speed control means adapted to provide a voltage control signal having a magnitude representative of the setting of said speed control means;

g. speed control circuit means for coupling said voltage control signal in circuit with the means for comparing said voltage feedback and said reference signals to reduce the voltage output limit of said generating means below said predetermined maximum value as a function of the setting of said speed control means without modifying the maximum horsepower limit of the generating means.

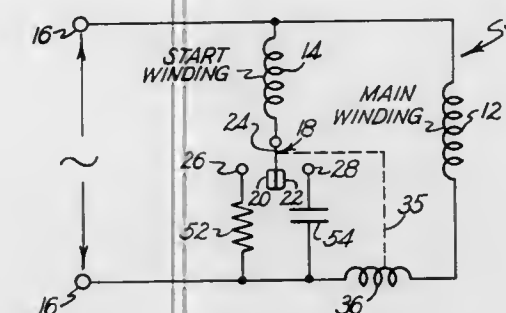
4,012,678

**STARTING CIRCUIT FOR SINGLE PHASE MOTOR**  
Robert F. Blaha, Dedham, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1975, Ser. No. 565,031  
Int. Cl.<sup>2</sup> H02P 1/44

U.S. Cl. 318—221 D

1 Claim



1. A starting and running circuit for a single phase alternating current induction motor having a main winding and a start winding comprising a start mode resistor adapted to be placed electrically in series with said start winding when energized, a run mode capacitor adapted to be placed electrically in series with said start winding when energized, switching means in series with said start winding to switch between and thereby energize and de-energize said start mode resistor and said run mode capacitor, and actuation means responsive to a motor condition to control said switching means.

4,012,679

**METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF SYNCHRONOUS MOTOR**

Yasuo Matsuda; Takeo Maeda; Kouzou Watanabe; Kazuo Honda; Hironori Okuda; Kunio Miyashita, all of Hitachi, and Yasuyuki Sugiura, Takahagi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 23, 1975, Ser. No. 543,306  
Claims priority, application Japan, Jan. 6, 1974, 49-14462; Feb. 8, 1974, 49-15497

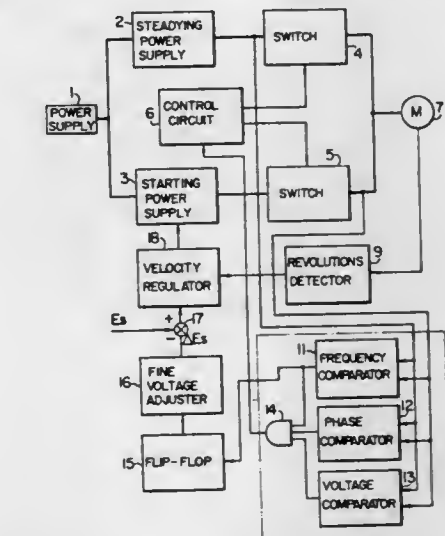
Int. Cl.<sup>2</sup> H02P 1/46

U.S. Cl. 318—167

6 Claims

1. In an apparatus for controlling the operation of a synchronous motor comprising a synchronous motor, a starting power supply connected to said synchronous motor through a first switching means, a steady power supply connected to said synchronous motor through a second switching means, and a control device for controlling the opening and closing of said first and second switching means; the improvement further comprising a frequency comparator circuit for comparing the frequency of said starting power supply with the frequency of said steady power supply and producing an output when the difference between said frequencies is not greater than a predetermined value, frequency changer means for reducing the frequency of said starting power supply when the frequency of said starting power supply exceeds a frequency level set higher than the frequency of said steady power supply and for increasing the frequency of said starting power supply when the frequency of said starting power supply is reduced below said frequency level set higher than the frequency of

said steady power supply, a phase comparator circuit for comparing the phase of said steady power supply with that of said starting power supply and producing an output when the difference between said phases is smaller than a predetermined value, a voltage comparator circuit for comparing the voltage of said steady power supply with that of said start-



ing power supply and producing an output when the difference between said voltage is smaller than a predetermined value, and an AND circuit for producing an output and applying said output to a control device when all of said frequency comparator circuit, said phase comparator circuit and said voltage comparator circuit produce outputs.

4,012,680

**FIELD BOOST ARRANGEMENT FOR SEPARATELY EXCITED D-C TRACTION MOTORS OF A VEHICLE PROPULSION SYSTEM**

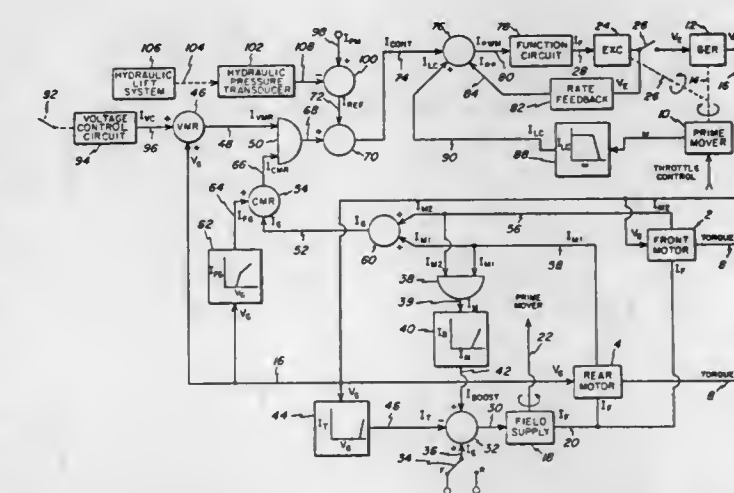
Norman Kingston Dickerson, Westfield, N.Y., and Barry Jay Turley, Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Feb. 27, 1975, Ser. No. 553,861

Int. Cl.<sup>2</sup> H02P 5/16

U.S. Cl. 318—338

11 Claims



1. In a propulsion system for traction vehicles using separately excited traction motor means comprising an armature and field winding means and wherein an electrical source provides to said armature an armature current whose magnitude can vary, means for supplying excitation to said field winding means comprising:

- a first field means to supply a substantially constant predetermined field excitation under normal operating conditions, said field excitation being of adequate magnitude such that the traction motor means is magnetically saturated so that variation of traction motor load produces only a small variation in back electromotive force;
- boost field means for supplying additional boost field excitation to increase the torque of said traction motor means;



- c. detecting means for sensing the magnitude of motor armature current; and  
 d. control means for activating said boost field excitation means solely responsive to said sensed magnitude of armature current exceeding a reference level corresponding to a predetermined high magnitude of armature current.

4,012,681

## BATTERY CONTROL SYSTEM FOR BATTERY OPERATED VEHICLES

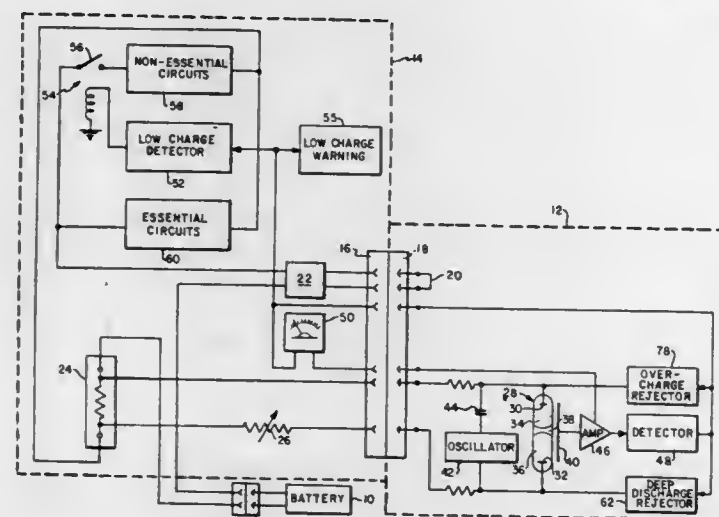
Eugene P. Finger, Brewster, and Edward M. Marwell, Mount Kisco, both of N.Y., assignors to Curtis Instruments, Inc., Mount Kisco, N.Y.

Filed Jan. 3, 1975, Ser. No. 538,466

Int. Cl.<sup>2</sup> H02J 7/00

U.S. Cl. 320-14

7 Claims



1. Apparatus for monitoring the state of charge of a battery during both its charge at a charging station and its discharge during use in a vehicle, said apparatus comprising:

- a. a module which is connectable to either said vehicle or said charging station;  
 b. an integrating device contained in said module;  
 c. means responsive to said integrating device for producing a signal which is proportional to the integral stored by said integrating device and is therefore a measure of the state of charge of said battery;  
 d. means for mounting the module on said vehicle and for supplying to said integrating device a first current which is a portion of the current flowing from said battery and is therefore a measure of its decrease in charge; and  
 e. means for mounting the module at said charging station and for supplying to the integrating device a resetting current which is a portion of the current flow to said battery.

4,012,682

## LOW KVA STATIC AC MOTOR DRIVE

Robert J. Carroll, Warren, and Walter K. O'Neil, Southfield, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 5, 1975, Ser. No. 547,150

Int. Cl.<sup>2</sup> H02M 7/00

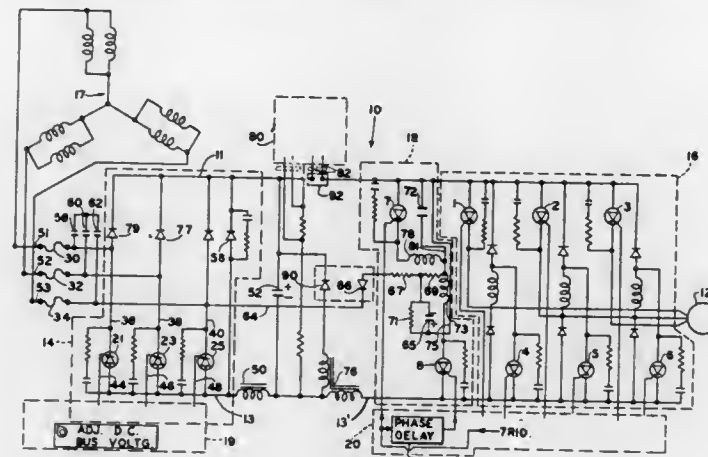
U.S. Cl. 321-5

26 Claims

1. A commutation circuit for a voltage controlled inverter that has dc input busses of nominal positive and negative polarity and inverter semiconductors periodically triggered into conduction and periodically commutated off by applying voltage of reverse polarity across the dc input busses to supply ac current to a load comprising:

- means connected with said dc input busses for supplying principal dc power of said nominal polarity thereto,  
 capacitance means for storing electrical energy for commutating off said inverter semiconductors,  
 auxiliary charging means connected with said capacitance

means for charging said capacitance means to voltage of a first polarity before commutation, said auxiliary charging means comprising at least one of said dc input busses, means connected with said capacitance means and responsive to a first control signal for resonantly reversing the polarity of voltage on said capacitance means,  
 switching means responsive to a second control signal to connect said capacitance means across said dc input busses after reversal of its polarity to apply reverse



polarity voltage across said dc input busses for commutation of said inverter semiconductors, and  
 control circuit means for providing said first and second control signals in synchronism with the periodic triggering of said inverter semiconductors including means for providing said second control signal later than said first control signal so as to allow time for resonantly reversing said voltage of said capacitance means before said capacitance means is connected across said dc input busses for commutation.

4,012,683

## METHOD AND APPARATUS FOR REDUCING INVERTER NO-LOAD LOSSES

Armand P. Ferro, and John P. Walden, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,419

Int. Cl.<sup>2</sup> H02M 7/515

U.S. Cl. 321-45 R

10 Claims



1. A method of reducing the no-load power losses of an inverter system including an inverter having a fall-back current limit during electrical short circuit conditions which is characterized by lower power losses than open circuit losses, said method comprising:

- removing the load from the output terminals of said inverter; and  
 applying an electrical short circuit to said output terminals to terminate normal inverter operation.

4,012,684

## VOLTAGE REGULATOR CIRCUIT WITH FET AND BIPOLAR TRANSISTORS

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,557

Int. Cl.<sup>2</sup> G05F 1/00

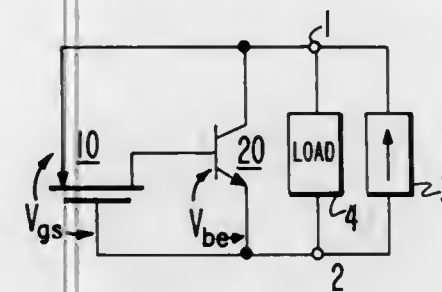
U.S. Cl. 323-8

9 Claims

1. A circuit for regulating the voltage across two terminals

between which an operating current flows comprising, in combination:

- a bipolar transistor having base, emitter and collector electrodes, a path between said emitter and collector electrodes, a junction between said base and emitter electrodes and a nominal base-emitter voltage,  $V_{be}$ , said emitter-to-collector path being connected between said terminals; and



a field effect transistor having source, drain and gate electrodes, a path between said source and drain electrodes and a threshold voltage,  $V_{th}$ , said threshold voltage and said base-emitter voltage being selected to satisfy the inequality  $V_{th} > V_{be}$ , said source-to-drain path being connected between the base and collector electrodes of said bipolar transistor in a sense to permit a flow of current in the forward direction through said base-emitter junction, and said gate electrode being connected to said emitter electrode.

4,012,685

## REGULATED POWER SUPPLY FOR VERY HIGH CURRENT WITH VOLTAGE AND CURRENT PROGRAMMABLE TO ZERO

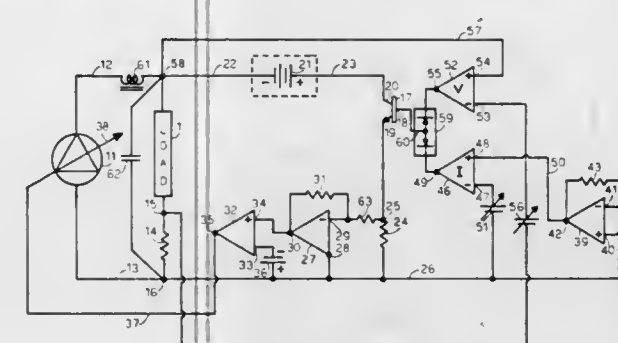
Sarkis Nercessian, Flushing, N.Y., assignor to Forbro Design Corporation, New York, N.Y.

Continuation of Ser. No. 343,792, March 22, 1973, abandoned. This application Mar. 14, 1974, Ser. No. 451,302

Int. Cl.<sup>2</sup> G05F 1/56

U.S. Cl. 323-20

1 Claim



1. In a regulated DC power supply, the combination of:  
 a source of DC current;  
 means for controlling said current;  
 a pair of load terminals connected through a first current sensing resistor and an inductor to said source;  
 a controllable impedance current sink, a source of DC voltage and a second current sensing resistor all connected in series across the series circuit comprising said load terminals and the first said current sensing resistor;  
 voltage and current feedback means gated to control said current sink for programming the current and voltage to said load terminals;  
 means for keeping the current in said sink constant from the maximum output voltage which the power supply is capable of supplying down to zero output voltage including degenerative feedback means connected between said second current sensing resistor and said means for controlling said current and including said source of DC voltage;

wherein said source of DC voltage is sufficient to provide said constant current to said sink at zero voltage across said load terminals.

4,012,686

## POWER SUPPLY FOR ILLUMINATED INSTRUMENT

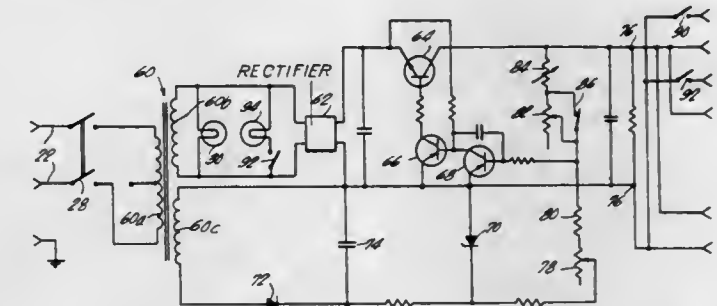
Helmut A. Heine, Herrsching, Germany, assignor to Optotechnik, GmbH, Herrsching Upper Bavaria, Germany and Proper Manufacturing Company, Inc., Long Island City, N.Y.

Filed Mar. 18, 1971, Ser. No. 125,488

Int. Cl.<sup>2</sup> A61B 1/06

U.S. Cl. 323-22 T

3 Claims



1. A power supply for illuminated medical diagnostic instruments comprising input terminals adapted to be connected to a source of alternating current, a rectifier communicating with said input terminals for rectifying said alternating current, output terminals adapted to be interconnected with one or more illuminated medical diagnostic instruments, and a control circuit communicating with said rectifier and said output terminals for variably regulating the voltage at said output terminals over a continuous normal operating range corresponding substantially to the normal operating range of the illuminating device of said instruments and for providing a discrete output voltage above said normal operating range to give extra illumination for brief periods.

4,012,687

## DRIVER AMPLIFIER FOR ADJUSTABLE HIGH VOLTAGE POWER SUPPLY

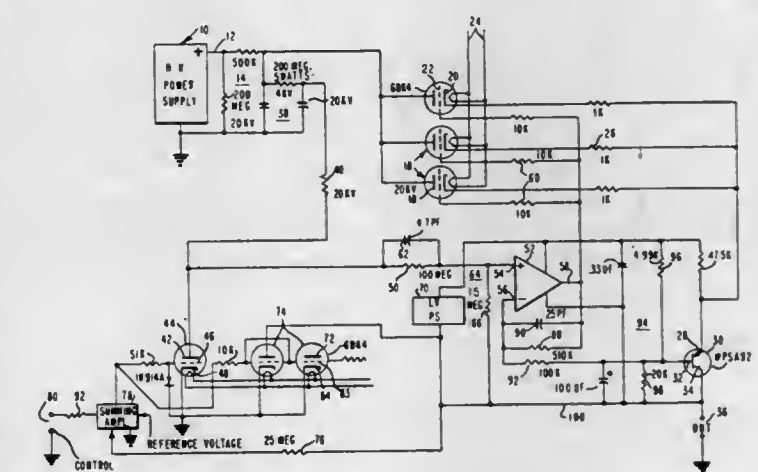
Elbert P. Carter, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 7, 1975, Ser. No. 602,758

Int. Cl.<sup>2</sup> G05F 1/52, 1/56

U.S. Cl. 323-22 V

8 Claims



1. In a high voltage direct current power supply having a source of direct current, high voltage adapted to provide an adjustable output voltage in response to an input control voltage from a source and an output circuit adapted to be connected to a load, an electron flow device, having a flow control electrode, connected in series between said output circuit and said source, and a control amplifier responsive to said control voltage for driving said control electrode, the improvement comprising:  
 a differential driver amplifier having a pair of inputs and an



output coupled to said control electrode and one of said inputs, means to apply a bias voltage to one of said inputs, a voltage divider network having a tap coupled to the other of said inputs, said divider network coupling the output of said control amplifier to said driver amplifier and said output circuit thereby to provide a low noise, constant voltage drop between the output of said control amplifier and said driver amplifier which permits low output voltages in said output circuit.

4,012,688

**RESISTIVE PAD WITH BRIDGING RESISTOR**

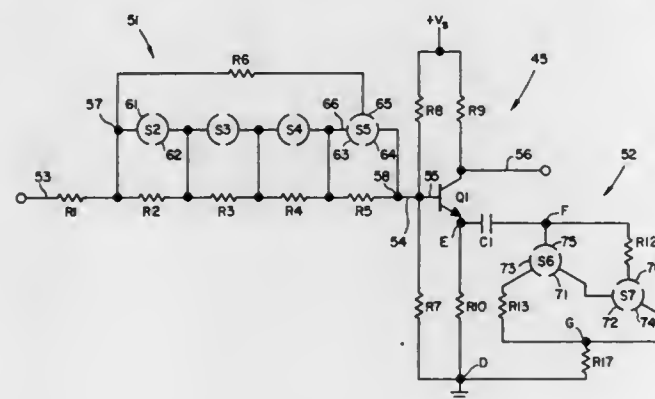
Tom L. Blackburn, San Jose, and Otto G. Wisotzky, San Francisco, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 28, 1975, Ser. No. 636,185

Int. Cl.<sup>2</sup> H02M 3/06

U.S. Cl. 323-79

10 Claims



1. A resistive pad having an attenuation between an input and an output terminal, measured with respect to a reference point, that is variable in discrete steps and having a net resistance between the input and output terminals, comprising:

- a plurality of resistors electrically connected in series between the input and output terminals;
- a shunt resistor electrically connected between a series resistor and the reference point;
- a plurality of switch means, each of which is electrically connected across an associated series resistor; each of said switch means being in one of two states, the state of a switch means being changed to selectively control whether an associated series resistor is short-circuited for varying the net series resistance and attenuation of the pad; and
- a bridging resistor electrically connected between one of said switch means and one terminal of one series resistor, said one terminal being spaced from said one switch means, said bridging resistor being bridged across series resistors including at least said one series resistor when said one switch means is closed to short-circuit the associated series resistor for further adjusting the value of the net resistance of the pad.

4,012,689

**RADIO FREQUENCY RESISTIVITY AND DIELECTRIC CONSTANT WELL LOGGING UTILIZING PHASE SHIFT MEASUREMENT**

Percy T. Cox; Richard A. Meador, and Larry W. Thompson, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,704

Int. Cl.<sup>2</sup> G01V 3/10, 3/18

U.S. Cl. 324-6

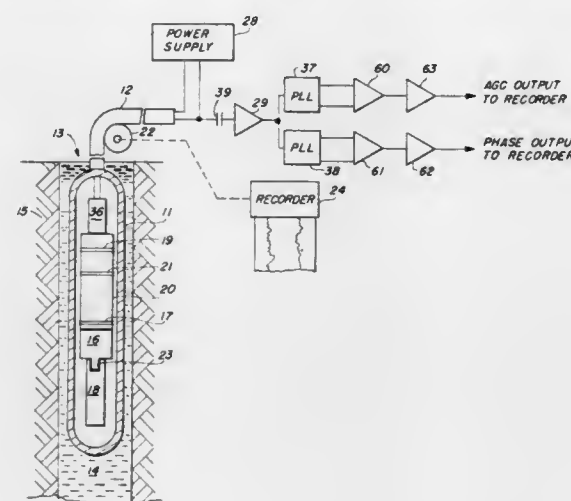
6 Claims

1. A method for logging well boreholes to obtain measurements functionally related to the resistivity and dielectric constant of earth materials in the vicinity thereof, comprising the steps of:

generating in a well borehole at a first location a radio frequency electromagnetic field in the frequency range from 10 to 60 megahertz;

detecting in the borehole at a second longitudinally spaced location from said first location the total electromagnetic field at said generated frequency and generating a first signal representative thereof;

detecting in the borehole at a third location longitudinally spaced from said first and second locations the total electromagnetic field at said generated signal frequency and generating a second signal representative thereof;



generating a third signal functionally related to the amplitude of the total electromagnetic field at least at one of said second or third locations as an indicator of the resistivity of the earth formations in the vicinity of the borehole;

generating from said first and second representative signals an indication of the relative phase shift of the total electromagnetic field at said generated frequency between said second and third locations; and combining said phase shift indication and said third signal indicative of formation resistivity to derive an indication of the dielectric constant of the earth formations in the vicinity of the borehole.

4,012,690

**DEVICE FOR SELECTIVELY DETECTING DIFFERENT KINDS AND SIZES OF METALS**

Solomon Heytow, 9535 Cozycroft, Chatsworth, Calif. 91311

Continuation-in-part of Ser. No. 435,454, Jan. 22, 1974,

abandoned. This application Apr. 29, 1975, Ser. No. 572,760

Int. Cl.<sup>2</sup> G01R 33/12

U.S. Cl. 324-41

21 Claims

1. A metal detecting station for detecting the movement of deliberately hidden ferrous or non-ferrous metal objects through said station comprising a transmitting coil and at least one receiving coil disposed in spaced relationship to each other, a signal generator connected to said transmitting coil for inducing an electromagnetic field in said at least one receiving coil, first means associated with said station for producing a fixed voltage output in said at least one receiving coil, second means in said station and associated with said first means in such a way that said second means operates only when said first means operates and induces a phase shift between the transmitting coil and said at least one receiving coil, said phase shift in a direction such that the metal-detecting station is sensitive to ferrous or non-ferrous metal objects passing through the station and sufficiently large to distort the electromagnetic field inside the metal-detecting station so that no likely combination of target-shape or target-orientation could pass through the station without disturbing the voltage in said receiving

coil, and means associated with the station and connected to said at least one receiving coil for providing an indication of

known parameters of incident laser output, thickness of bonding layers, and same types of layer materials.

4,012,692

**METHOD AND APPARATUS FOR DETERMINING THE CONCENTRATION OF ONE GASEOUS COMPONENT IN A MIXTURE OF GASES**

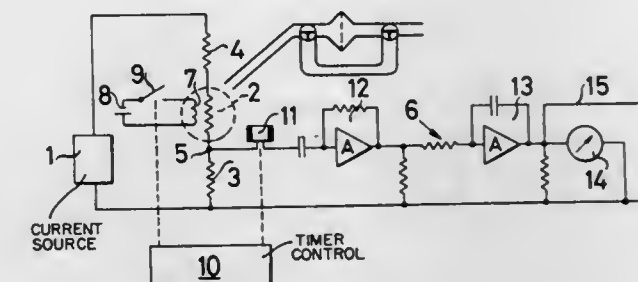
Hartmut Eicker, Bochum, Germany, assignor to Westfälische Bergwerkschafskasse, Bochum, Germany

Filed Sept. 12, 1974, Ser. No. 505,525

Int. Cl.<sup>2</sup> G01N 27/12, 27/14

U.S. Cl. 324-71 SN

18 Claims



1. A method for determining the concentration of carbon monoxide in a mixture of gases by the use of a metallic oxide semiconductor, the resistance of which changes upon exposure to gases including carbon monoxide, the exposure responsive resistance change of the metallic oxide semiconductor being temperature dependent and extending through a temperature range having an elevated temperature which regenerates the semiconductor of gases and a lower portion in which the greatest resistance change responsive to exposure to carbon monoxide occurs, said method comprising the steps of:

- applying a heating cycle to the metallic oxide semiconductor to raise the temperature of the semiconductor to an elevated temperature to regenerate the semiconductor, and to reduce the temperature to the lower portion of the temperature range;
- exposing the metallic oxide semiconductor at such reduced temperature as to the mixture of gases; and ascertaining the rate of change with respect to time in electrical resistance of the metallic oxide semiconductor produced by the exposure and thereby the concentration of the carbon monoxide component of the mixture of gases.

4,012,693

**PRINTED CIRCUIT BOARD TESTING**

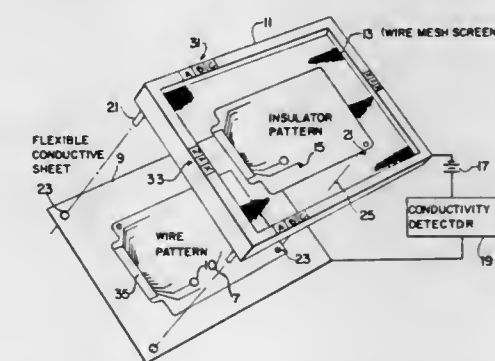
Donald F. Sullivan, 115 Cambridge Road, King of Prussia, Pa. 19406

Filed July 16, 1975, Ser. No. 596,303

Int. Cl.<sup>2</sup> G01R 31/02, 31/08

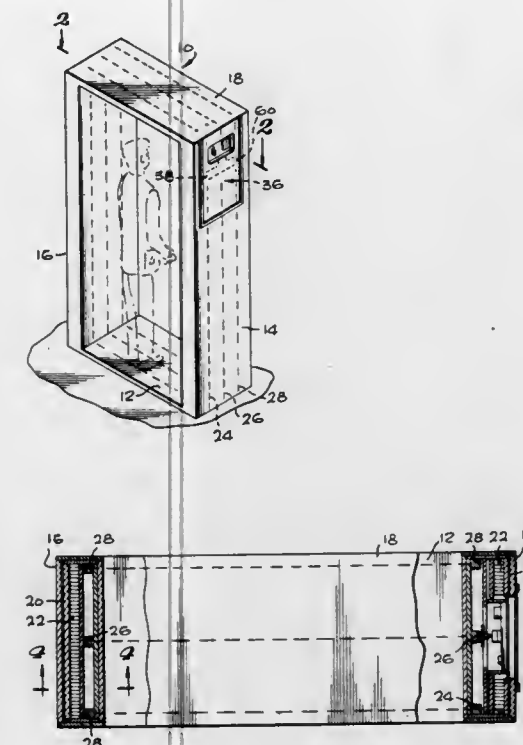
U.S. Cl. 324-73 PC

15 Claims



1. A method of determining thermal constants of bonding layers of an infrared sensor that includes different layers of material which comprises:

- securing said sensor onto a heat sink;
- heating said sensor by a laser output source for a set time period;
- subsequent to heating said sensor immediately measuring and recording the electrical resistance of said sensor;
- continue measuring and recording the electrical resistance for a set period of time to establish a thermal profile of each layer of said sensor; and
- comparing said thermal profile with thermal profiles of



any voltage change in said at least one receiving coil caused by the passage of a metal object through the station.

4,012,691

**DETERMINATION OF THERMAL IMPEDANCES OF BONDING LAYERS IN INFRARED PHOTOCONDUCTORS**

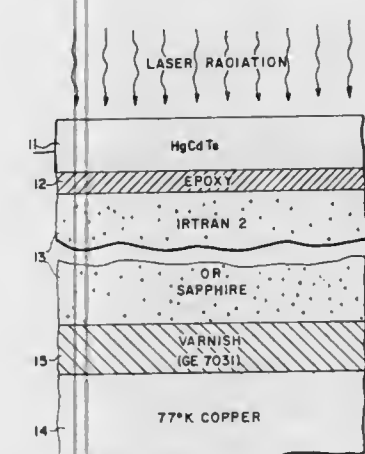
Filbert J. Bartoli, Upper Marlboro, Md.; Leon Esterowitz, Springfield; Roger E. Allen, Alexandria, both of Va., and Melvin R. Krueger, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1976, Ser. No. 674,999

Int. Cl.<sup>2</sup> G01R 27/02

U.S. Cl. 324-65 R

4 Claims



7. Test equipment for locating wiring defects on a printed circuit wiring board having a conductive wire pattern affixed to an insulating board, comprising in combination, a test jig with a mirror image of the wiring pattern on said



board defined by insulating materials located in place of the conductive patterns and with conducting patterns located in place of the insulating portions, means placing in registration said test jig and said wiring board, means contacting in registration at least a portion of the test jig with a corresponding portion of the wiring board, and means sensing conductivity between the test jig and wiring board while in contact.

4,012,694

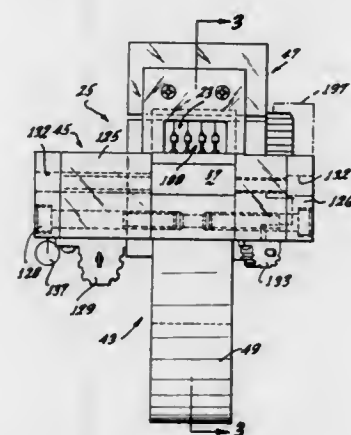
## LIGHT DEFLECTION APPARATUS

Winfield Sample, Sierra Madre, and Robert L. Cheney, Arcadia, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 3, 1975, Ser. No. 628,159

Int. Cl.<sup>2</sup> G01R 13/38

U.S. Cl. 324-97



1. A light deflection mechanism responsive to a plurality of energizing signals to provide on display means a plurality of traces each representative to the characteristics of an associated one of the energizing signals, the mechanism comprising:

- a first structural member having portions defining a plurality of first apertures;
- a second structural member disposed relative to the first structural member and having portions defining a plurality of second apertures each extending in alignment with an associated one of the first apertures in the first structural member;
- means for maintaining the first and second structural members in a spaced relationship;
- a plurality of light deflectors each extending through an associated one of the first apertures of the first structural member and an associated one of the second apertures in the second structural member;
- first means for engaging the light deflectors on the side of the first apertures opposite the light deflectors;
- second means for engaging the light deflectors on the side of the second aperture opposite the light deflectors;
- the second means cooperating with the first means to provide the deflectors with a tensile stress between the first structural member and the second structural member; and

each of the light deflectors including a mirror providing a reflected light beam and a coil responsive to the associated energizing signal to deflect the coil and the mirror so that the reflected light beam provides the associated trace representative of the characteristics of the associated energizing signal.

# 4,012,695 METHOD AND APPARATUS FOR QUALITY CONTROL OF SEMICONDUCTOR DEVICES AND INTEGRATED CIRCUITS

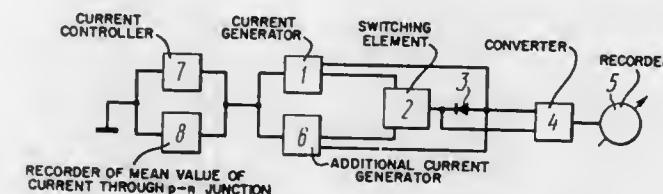
Evgenia Iosifovna Model, Moskovskaya ulitsa, 12, kv. 50, Khimki, Moskovskoi oblasti; Anna Sergeevna Savina, Gospitalny val, 3, korpus 3, kv. 44; Jury Lvovich Nurov, ulitsa Chaikovskogo, 18, kv. 84, both of Moscow; Alexandr Nikolaevich Piorunsky, Orshanskaya ulitsa, 4, kv. 59; Boris Efimovich Fedorov, Leninsky prospekt, 34, kv. 368, both of Moscow, and Vladimir Mikhailovich Ivanov, Samarkandsky bulvar, 6, korpus 2, kv. 150, Moscow, all of U.S.S.R.

Filed Apr. 5, 1974, Ser. No. 458,398

Int. Cl.<sup>2</sup> G01R 31/22

U.S. Cl. 324-158 D

16 Claims



22 Claims  
1. A method for quality control of semiconductor devices and integrated circuits having at least one p-n junction, comprising using as a criterion of quality a coefficient  $m$  of deviation of the actual current-voltage characteristic from the ideal one lying in the range of  $m_{min}$  to  $m_{max}$ , wherein  $m_{min}$  is 1, while  $m_{max}$  is 2; passing a current through the p-n junction in the forward direction in the range defined by the relationship

$$I/U \quad 4\Phi_T < I < \frac{\Phi_T}{R_0}$$

wherein

$U$  is voltage drop across the p-n junction;

$\Phi$  is thermal potential equal to  $kT/q$ ;

$R_0$  is resistance in the base circuit of the p-n junction including the external resistance;

measuring the voltage amplitudes across the p-n junction caused by the passage of said current, said voltage increments being proportional to said coefficient  $m$  of deviation of the actual current-voltage characteristic obtained when passing said current through the p-n junction from the ideal characteristic.

# 4,012,696 MULTIPLE RATE DIGITAL COMMAND DETECTION SYSTEM WITH RANGE CLEAN-UP CAPABILITY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; James R. Lesh, and Stanley A. Butman, both of Pasadena, Calif.

Filed Feb. 17, 1976, Ser. No. 658,449

Int. Cl.<sup>2</sup> H04B 7/14

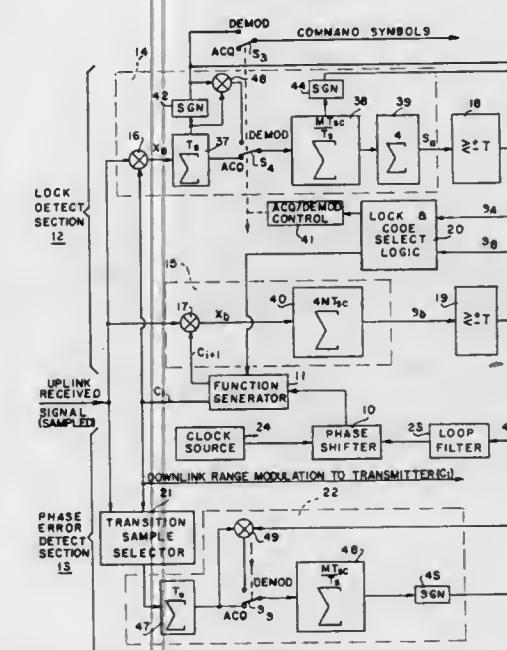
U.S. Cl. 325-4

19 Claims

1. In a  $\mu$ -type ranging system which uses a sequence of composite ranging code signals transmitted by a station to a receiver having a cleanup loop that generates a synchronous reference code signal for each ranging code signal received in sequence, each reference code signal being retransmitted as a replica of each sequential ranging code signal received, a system for detecting command symbols phase modulated onto a composite ranging code signal at a command symbol rate coherently related to the symbol rate of the ranging code signal being transmitted at the time by the station, thus using the ranging code signal as a data subcarrier, thereby providing multirate data communication without dedicating a separate uplink channel, comprising

lock detection means for correlating said received code

signal with said reference code signal, and in response to correlation values produced, detecting when the inverse phase of said ranging code signal is being received, a phase error detection means for producing an error signal proportional to the phase difference between a received ranging code and said reference code, correcting means responsive to said phase error signal for so correcting the phase of said reference code as to phase lock the reference code signal to the received code signal, switching means responsive to said correcting means for switching said lock detection means and said phase error



detection means to a demodulating mode of operation upon detecting said inverse phase, said demodulating mode including in said lock detection means an arrangement of means for detecting command symbols at the symbol rate of said reference code by accumulating correlation values for each symbol rate period,  $T_s$ , and deriving the sign of each correlation sum as a detected command symbol, and

means in said phase error detection means responsive to said detected command symbols for compensating detected phase error command symbol modulation on said received code signal period.

# 4,012,697 CLOCK SIGNAL EXTRACTION DURING PLAYBACK OF A SELF-CLOCKING DIGITAL RECORDING

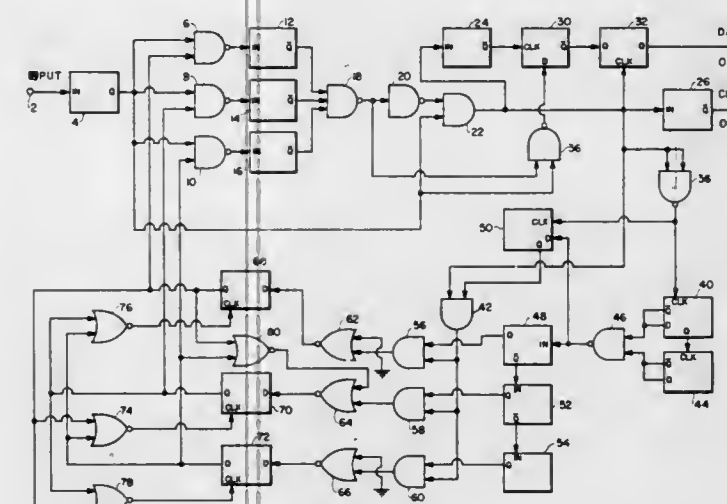
Dale O. Ballinger, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 30, 1975, Ser. No. 591,342

Int. Cl.<sup>2</sup> H03K 1/17, 17/00, 5/13

U.S. Cl. 328-63

10 Claims



1. A signal gating circuit comprising:  
a first signal gating means having a first and a second input circuit and an output circuit,

a first plurality of signal generating means arranged to generate a plurality of differing duration output signals, a second signal gating means having a plurality of signal gating circuits equal in number to said plurality of signal generating means with each of said signal gating circuits having a first and a second input and an output circuit connected to a one of said signal generating means,

an input terminal, first circuit means connecting said input terminal to said first input of each of said signal gating circuits, second circuit means connecting said input terminal to said second input circuit of said first signal gating means, output terminal means, third circuit means connecting said output circuit of said first signal gating means to said output terminal, fourth circuit means connecting an output of each of said signal generating means to said first input of said first signal gating means,

a second plurality of signal generating means arranged to generate a sequence of differing time period output signals in response to an input control signal applied thereto, fifth circuit means arranged to apply an output signal from said output circuit of said first signal gating means as a control signal to said second plurality of signal generating means,

comparator means connected to said output circuit of said first signal gating means and to said second plurality of signal generating means for comparing the time of occurrence of an output signal from said output circuit of said first signal gating means with each of said differing time period signals from said second plurality of signal generating means and for producing an output signal representative of a match between said output signal from said output circuit of first signal gating means and said differing time period signals, and

third signal gating means arranged to apply said output signal from said comparator means to said second input of a selected one of said second signal gating means as determined by the match between the signals compared by said comparator means to control an output signal from a respective one of said first plurality of signal generating means for application to said first input of said first signal gating means.

10. A method of gating a signal including the steps of comparing the time of occurrence of the signal with each of a plurality of differing period signals, producing an output signal corresponding to a match between the compared signals, applying the output signal to a respective one of a plurality of signal generating means to produce a corresponding duration output signal and applying the signal to be gated and said lastmentioned output signal to a gate circuit to control the gating of the signal to be gated through said gate circuit.

# 4,012,698 DEVICE FOR OBTAINING A JITTERSTABLE SYNCHRONIZATION OF A COUNTER

Stig Erik Karlsson, Vallingby, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 20, 1975, Ser. No. 623,772

Claims priority, application Sweden, Nov. 6, 1974, 74139296

Int. Cl.<sup>2</sup> H03K 1/17, 5/13; H04L 7/00

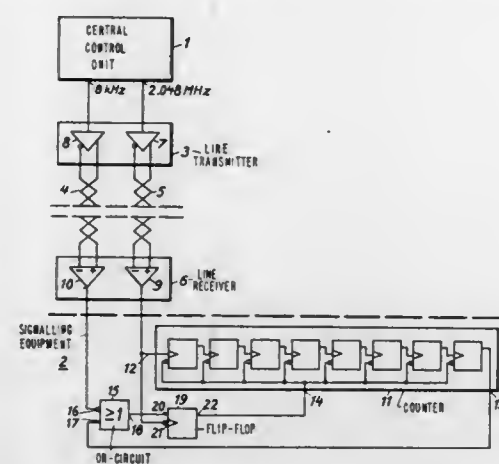
U.S. Cl. 328-63

3 Claims

1. In a system having a control unit transmitting bit timing pulses and frame timing pulses, and a counter having a clock input for receiving the bit timing pulses from the control unit, an output for transmitting regenerated frame timing pulses, and a reset input, a device for jitterstable synchronizing the counter to the control unit comprising: a phase comparator means having a first input for receiving the frame timing pulses from the control unit, a second input connected to the output of the counter, and an output for transmitting an output signal if, and only if, a lag of the leading edge or a lead of



the trailing edge occurs for the frame timing pulses regenerated by the counter relative to the frame timing pulses transmitted from the control unit; and a memory means having a signal input connected to the output of said phase comparator



means, a clock input for receiving the bit timing pulses and reacting on an edge opposite to the edge on which the clock input of the counter is arranged to react, and an output connected to the reset input of the counter to reset the latter when an output signal is emitted from the phase comparator means.

4,012,699

# AMPLIFYING CHARACTERISTICS OF A CAVITY-ENCLOSED NONLINEAR MEDIUM

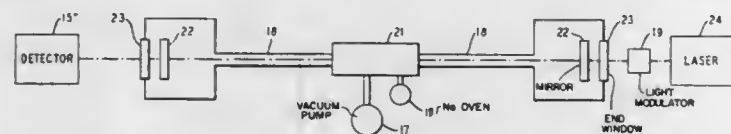
Hyatt McDonald Gibbs, Warren; Samuel Leverte McCall, Jr., Gillette, and Thirumalai Nallan Chakravarthy Venkatesan, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1975, Ser. No. 563,122

Int. Cl.<sup>2</sup> H01S 3/10; G02F 1/28

U.S. Cl. 330-4.3

43 Claims



1. A method of amplifying variations in an optical signal of a given wavelength comprising introducing light of the given wavelength into a cavity formed by at least two surfaces that reflect light of the given wavelength, and which surfaces are separated at least in part by a positive-temperature nonlinear medium fixing the cavity and medium characteristics such that the dispersive properties of the medium dominate or are equal to the absorptive properties of the medium at the given wavelength and such that there is a single valued relationship between the intensities of the incident and transmitted signals which exhibits gain, and extracting the amplified signal from said cavity.

4,012,700

# CAPACITIVE ADJUSTING DEVICE FOR A QUARTZ CRYSTAL OSCILLATOR

René Besson, Neuchâtel, Switzerland, assignor to Ebauches S.A., Neuchâtel, Switzerland

Filed Feb. 4, 1976, Ser. No. 655,240

Claims priority, application Switzerland, Feb. 28, 1975, 2545/75

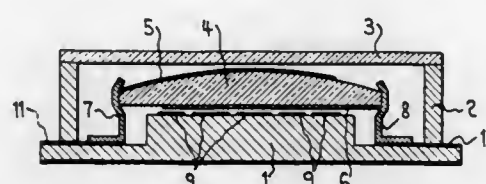
Int. Cl.<sup>2</sup> H03B 5/32

U.S. Cl. 331-116 R

3 Claims

1. A capacitive device for adjusting the frequency of a quartz crystal oscillator, comprising a quartz crystal, an assembly of plane capacitors having a common electrode constituted by a metallisation layer of the quartz crystal, the other

electrodes of the capacitor being provided by several metallised strips disposed on a base member forming part of a casing containing the quartz crystal and opposite the metallisation layer of the quartz crystal, the metallised strips extending externally of the casing along tracks which are selectively connectable to earth in order to adjust the frequency of the oscillator.



4,012,701

# HARTLEY OSCILLATOR

Takashi Sugimoto, and Kazumasa Noyori, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

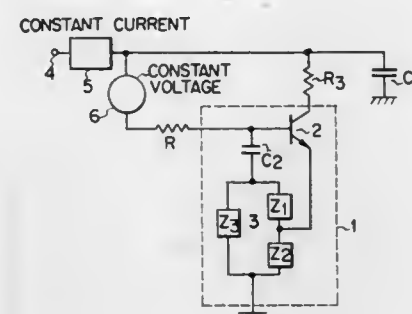
Filed Mar. 2, 1976, Ser. No. 663,154

Claims priority, application Japan, Mar. 5, 1975, 50-26038

Int. Cl.<sup>2</sup> H03B 5/12

U.S. Cl. 331-117 R

3 Claims



1. A Hartley oscillator comprises:

- a basic Hartley oscillation circuit including a semiconductor active element, a tank circuit coupled to the semiconductor active element and including a plurality of impedance elements and a grounded one terminal, and a coupling capacitor coupled between the control electrode of the active element and the other end of the tank circuit;
- a first constant direct current source for supplying a constant current to said active element through a direct current supply terminal of said active element;
- a feedback loop coupled to the output terminal of said first constant direct current source and adapted to cause a potential variation on the direct current supply terminal of said active element to be fed back to said control electrode; and
- a capacitor having a grounded end and the other end coupled to the output of the first constant current source.

4,012,702

# CHIME GENERATING CIRCUIT

Vernon F. Weber, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 22, 1975, Ser. No. 642,968

Int. Cl.<sup>2</sup> H03B 25/00

U.S. Cl. 331-76

5 Claims

1. A harmonic rich tone generating means comprising: a frequency generating means having an output and operated to produce an alternating current at said output; and a harmonic generating means, including a transformer having a primary and an output winding, a rectifier bridge circuit connected in series with said primary winding between said output and a ground potential, said bridge circuit including another recti-

4,012,704

# ACTIVE AMPLITUDE EQUALIZERS

John Mortimer Rollett, London, England, assignor to The Post Office, London, England

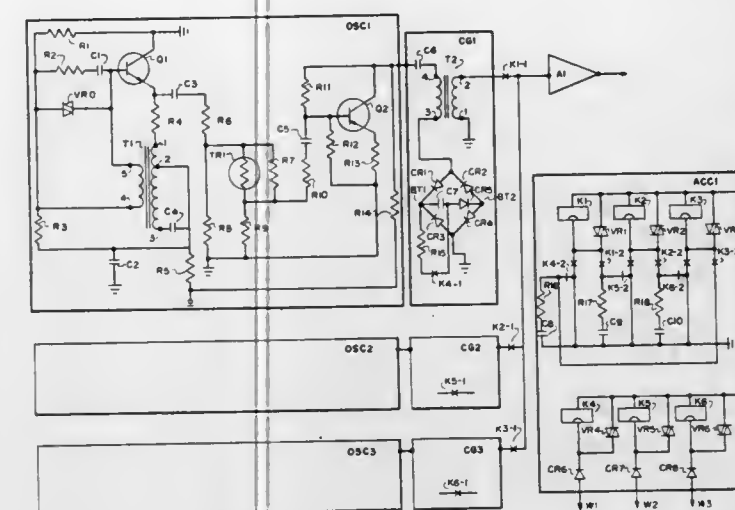
Filed Mar. 22, 1976, Ser. No. 668,988

Claims priority, application United Kingdom, Mar. 24, 1975, 12269/75

Int. Cl.<sup>2</sup> H03H 7/16, 7/44

U.S. Cl. 333-28 R

7 Claims



tial, whereby said tone of said frequency generating means is distorted and available at said transformer output winding.

4,012,703

# TRANSMISSION LINE PULSE TRANSFORMERS

John Walter Chamberlayne, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

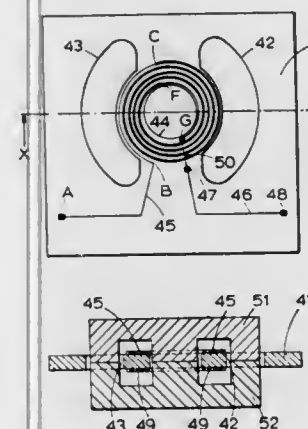
Filed Nov. 12, 1975, Ser. No. 631,059

Claims priority, application United Kingdom, Nov. 29, 1974, 51763

Int. Cl.<sup>2</sup> H03H 7/00

U.S. Cl. 333-24 R

7 Claims



1. A transmission line pulse transformer comprising a bifilar winding formed by at least two turns of each of a pair of conductors, which conductors are maintained at a fixed distance from each other throughout their length, wherein the cross-sectional area of each conductor is increased from a first value to a second value at a first point between one third and two thirds of the distance around the first turn of the winding and is decreased from the second value to the first value at a second point between one third and two thirds of the distance around the last turn of the winding; said values being so chosen that the relationship between the characteristic impedance  $Z_0$  of each of the pair portions having the said first value and the characteristic impedance  $Z_1$  of the intervening pair portion having said second value is given by:

$$Z_1 = Z_0 \frac{(1-k)/(1+k)}{k}$$

where

$k = C_m / C_i$   $C_m$  = the mutual capacitance between pair turns, and  $C_i$  = the self-capacitance of the pair.

1. An active amplitude equalizer network having two differential input operational amplifiers each having a inverting input, a non-inverting input and an output, a first input terminal, a first output terminal and a reference terminal, a first, a second, a third and a fourth junction point, said first junction point being connected to said input terminal by a first resistance and being connected to said reference terminal by a second resistance, said second junction point being connected to the input terminal by a third resistance and being connected to the output of the first differential amplifier by a fourth resistance, said third junction point being connected to the output of the first differential amplifier by a first pre-determinable resistance element and being connected to the output of the second differential amplifier by a first capacitance, said fourth junction point being connected to said first junction point by a second pre-determinable resistance element and being connected to the output of the second differential amplifier by a fifth resistance, and a second capacitance connected between the fourth junction point and the first input terminal, wherein the non-inverting input of the first differential amplifier is connected to the fourth junction point, and the non-inverting input of the second differential amplifier is connected to the second junction point, and a first pole of a first selectable switch means is connected to the inverting input of the first differential amplifier, a first pole of a second selectable switch means is connected to the inverting input of the second differential amplifier, a second and a third pole of said first selectable switch means are connected to said third junction point, a fourth pole of said first selectable switch means is connected to said second junction point, a second pole of said second selectable switch means is connected to said fourth junction point and a third and a fourth pole of said second selectable switch means are connected to said third junction point, the arrangement being that said first and second selectable switch means are ganged to operate in synchronism the first pole of either switch being connectable at any one time to one only of the second, third and fourth poles of the same switch, the arrangement being further such that the first and second amplifier form part of a gyrator in a resonant circuit having a variable resonant frequency and which is connected to an input network consisting of said first and said second resistances said second pre-determinable resistance element and said second capacitance, the ratio of resistance of said first and said second resistance being selectable so as to control the attenuation at said resonant frequency and the Q-factor of the network, the output from said network being derived from the output of said first differential amplifier.



4,012,705

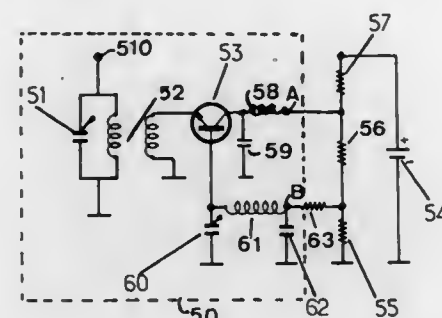
## HIGH INPUT LEVEL MICROWAVE CIRCUIT

Julien Prevot, Paris Cedex, France, assignor to Societe Lignes Telegraphiques et Telephoniques, Paris, France  
Filed Nov. 4, 1975, Ser. No. 628,845

Claims priority, application France, Nov. 29, 1974, 74.39166

Int. Cl.<sup>2</sup> H03H 7/10, 7/14; H01P 7/02, 3/08  
U.S. Cl. 333-70 R

8 Claims



1. An active high level microwave resonant circuit with relative bandwidth smaller than  $10^{-2}$  comprising: a resonant circuit tuned to the operating frequency  $f_0$  and including a capacitor and an inductor, said inductor being the secondary winding of a coupling transformer with a low coupling coefficient; a transistorized amplifying stage having an emitter input circuit including an inductor which is the primary winding of said coupling transformer; an auxiliary resonant circuit connected to the base of said transistorized stage and tuned to  $f_1$  different from  $f_0$ ; an output collector circuit; and means for biasing the electrodes of said transistorized stage; said frequency  $f_1$  and said bias voltage values being selected so that the equivalent negative resistance  $R^-$  seen at said emitter input is a maximum at  $f_0$ .

4,012,706

## SHEET-WOUND TRANSFORMER COILS

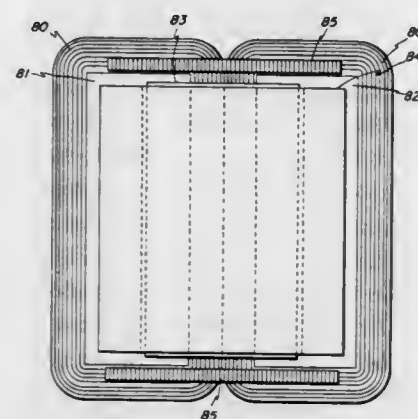
Willem F. Westendorp, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,613

Int. Cl.<sup>2</sup> H01F 15/04

U.S. Cl. 336-84

2 Claims



1. An electrical transformer comprising: at least one conductive sheet overlaid by insulation; a closed loop magnetic core, said conductive sheet being wound continuously in a plurality of turns about said core; and a plurality of axially-oriented planar strips of low magnetic reluctance electrically insulated from each other and directed from said closed loop magnetic core substantially perpendicular to the plane of said closed loop magnetic core, said strips being situated closely adjacent at least one substantially entire axial edge of said turns and

carrying a large radial component of the magnetic flux leakage field established by current flow through said conductive sheet.

4,012,707

## FUSIBLE ELEMENT FOR ELECTRICAL APPARATUS

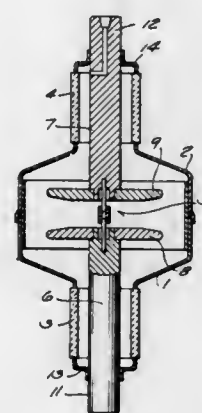
James R. Marek, and Michael J. Zunick, both of South Milwaukee, Wis., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Aug. 27, 1975, Ser. No. 608,037

Int. Cl.<sup>2</sup> H01H 61/00

U.S. Cl. 337-27

10 Claims



1. In an electrical interrupter having spaced electrodes supported by support rods and a fusible element bridging said spaced electrodes, and wherein said fusible element is subjected to elevated temperatures as a result of overload current conditions and fuses to open the circuit between said electrodes, the improvement of means in the area of said fusible element for controlling the transfer of heat between said fusible element and said support rods, said means concentrating the heat generated by current in said fusible element to a defined portion of said fusible element and operative to attribute preselected time-current fusion characteristics to said electrical interrupter.

4,012,708

## OIL IMMERSIBLE CURRENT LIMITING FUSE ASSEMBLY

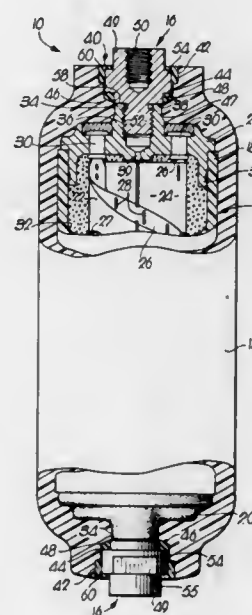
Melvin B. Goe, Jr., Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Dec. 11, 1975, Ser. No. 639,859

Int. Cl.<sup>2</sup> H01H 85/02

U.S. Cl. 337-205

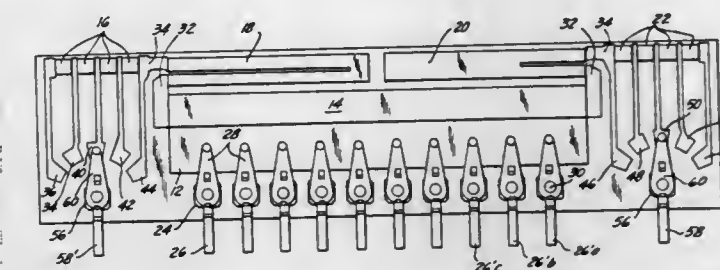
11 Claims



1. A current limiting fuse adapted for immersion in a fluid, said fuse comprising: an elongate, tubular, insulative housing;

a pair of end fittings respectively attached to the opposed ends of said housing for enclosing the latter; an elongate fusible element within said housing and adapted to sever under the influence of a fault current of predetermined magnitude for interrupting said fault current; a unitary, insulative casing sealingly encapsulating said housing and end caps in order to render said fuse fluid-submersible, said casing being configured to present a terminal-receiving bore in at least one end thereof extending through the casing and communicating with a respective end fitting, the walls defining said bore being configured to present a continuous seal-supporting surface; a resilient, compressible sealing member seated on said seal-supporting surface; an electrically conductive first terminal disposed within said terminal-receiving bore and including structure in engagement with the proximal sealing member within said bore; means biasing said terminal in a direction for compressing the sealing member against the corresponding seal-supporting surface; a second terminal at the remaining end of said fuse; and means electrically connecting said first and second terminals to said fusible element in order to define a current path through said fuse.

material disposed on said first zone, a plurality of output members mounted on said substrate in spaced relation, a wiper member of each output member in contact with said high resistance material and movable thereon through a limited path, first and second termination means, first and second



trimmer resistance means between said first termination means and said second termination means respectively, means for applying a voltage potential between said first and second termination means and means for taking an output voltage between one of said termination means and one of said output members.

4,012,709

## COBALT-MAGNESIUM MONOXIDE ALLOY CERAMIC PARTIAL PRESSURE OF OXYGEN SENSOR

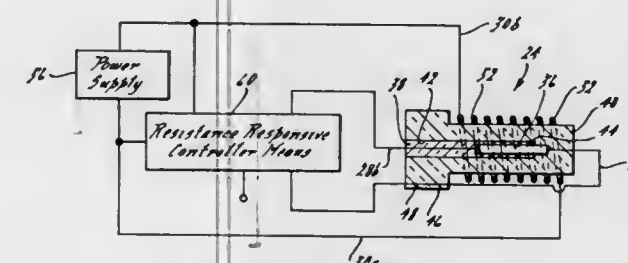
Eleftherios M. Logothetis, Birmingham, and Kwansuh Park, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 12, 1976, Ser. No. 648,342

Int. Cl.<sup>2</sup> G01N 27/12

U.S. Cl. 338-34

5 Claims



1. In a partial pressure of oxygen sensor of the type having a ceramic sensor member with an electrical characteristic which varies in response to variations in the partial pressure of oxygen, a ceramic sensing member formed of an alloy of a 3d<sup>n</sup> transition metal monoxide and an alkaline earth monoxide wherein the ceramic material satisfies the formula



where A is a 3d<sup>n</sup> transition metal, B is an alkaline earth and x has a value less than about 0.95 and more than about 0.10.

4,012,710

## MULTIPLE OUTPUT POTENTIOMETER NETWORK

Frank L. Ward, Kensington, and Victor J. Carbonneau, Exeter, both of N.H., assignors to Clarostat Mfg. Co., Inc., Dover, N.H.

Filed May 6, 1976, Ser. No. 683,729

Int. Cl.<sup>2</sup> H01C 10/16

U.S. Cl. 338-128

2 Claims

1. A multiple output potentiometer network having a plurality of variable outputs including in combination a nonelectrical conducting substrate, a thin layer of high resistance material disposed upon said substrate, first and second zones of said high resistance material, a thin layer of low resistance

4,012,711

## PROCESS AND APPARATUS FOR RECORDING ACOUSTICAL HOLOGRAMS

Dietlind Pekau, Taufkirchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

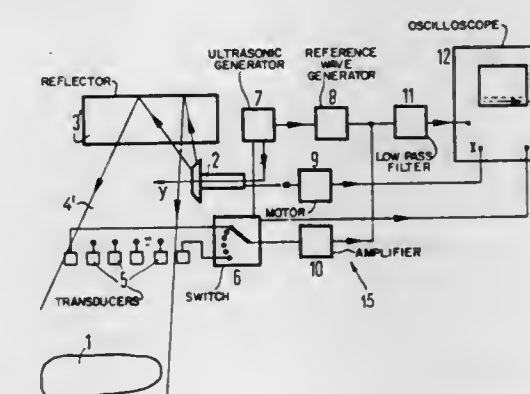
Filed Oct. 17, 1974, Ser. No. 515,532

Claims priority, application Germany, Oct. 19, 1973, 2352672

Int. Cl.<sup>2</sup> G01S 9/66

U.S. Cl. 340-1 R

9 Claims



1. In an apparatus for recording acoustical holograms comprising first means for generating and transmitting ultrasonic sound and including at least one ultrasonic transmitting transducer, second means for receiving the sonic signal and transforming it into an electrical signal and including at least one sound receiving transducer, means for adding a reference signal to the electrical signal to form a combined signal and means for recording the combined signal on a recording medium as a hologram, the improvement comprising each ultrasonic transmitting transducer having a directional characteristic, means for mounting the transducer of one of said first and second means for rotation about at least one axis, a reflector surrounding the mounted transducer and having a parabolic cross section taken on a plane extending perpendicular to said one axis, and another of said first and second means having a plurality of stationary transducers.











4,012,722

**HIGH SPEED MODULAR MASK GENERATOR**

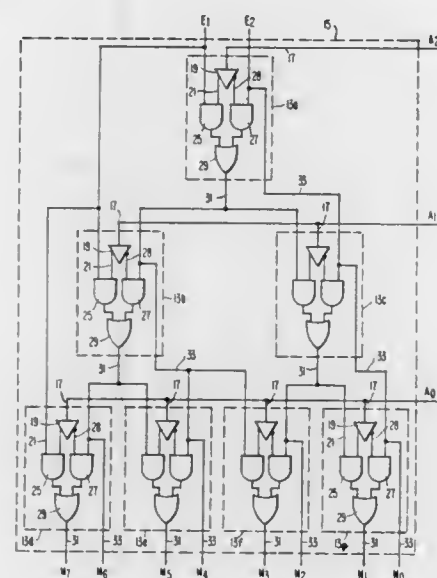
Daniel Danko Gajski, Philadelphia, and Bhachandra Ramchandra Tulpule, Frazer, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 20, 1975, Ser. No. 618,269

Int. Cl.<sup>2</sup> G06F 7/00

U.S. Cl. 340—172.5

8 Claims



1. A mask generator module comprising:
  - a plurality of address lines for receiving a numerical representation;
  - a first control line for receiving a first binary level control signal;
  - a second control line for receiving a second binary level control signal;
  - a plurality of ordered output masking lines; and
  - logic means for forcing all lines in said plurality of ordered output masking lines to a specific binary level when both said first and said second control lines are receiving said specific binary level and for conveying a particular binary level on solely a contiguous set of output masking lines starting with the first output line in said plurality of ordered output masking lines when said first and second control lines are receiving complementary binary levels and said plurality of address lines is receiving a numerical representation, said contiguous set being in number equal to said numerical representation being received on said plurality of address lines.

4,012,723

**MAGNETIC BUBBLE MEMORY PACKAGING**

ARRANGEMENT AND ITS METHOD OF FABRICATION  
James G. Harper, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

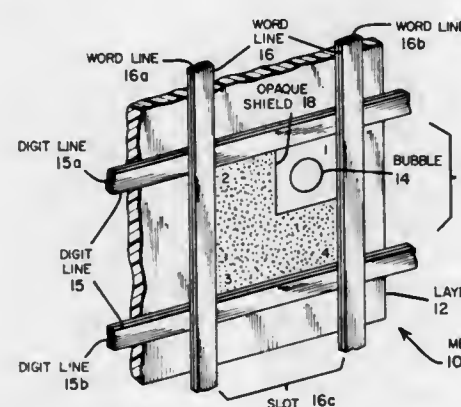
Filed May 29, 1975, Ser. No. 581,605

Int. Cl.<sup>2</sup> G11C 19/08

U.S. Cl. 340—174 TF

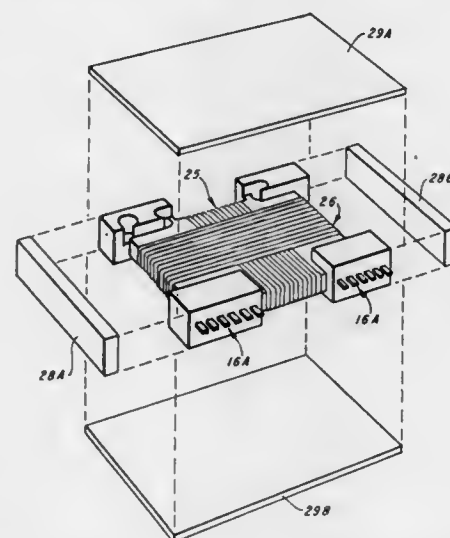
24 Claims

1. A package assembly for a magnetic bubble domain chip, said package assembly comprising:
  - a. a metal lead frame having a plurality of selectively positioned electrical conductors and a chip receiving region adjacent to corresponding ends of said plurality of electrical conductors;
  - b. a magnetic bubble domain chip mounted on said chip receiving region of said metal lead frame and having a plurality of magnetic bubble domain functions associated therewith;
  - c. a plurality of electrical contacts on said chip for said magnetic bubble domain functions to enable selective actuation thereof;



1. In a bubble memory system including a planar layer of a

- d. means electrically interconnecting at least some of said electrical contacts on said chip with respective electrical conductors of said lead frame;
- e. a body of insulating material encapsulating said chip and said lead frame, the other ends of said electrical conductors extending outwardly of said insulating body and terminating in connector pins;
- f. means for providing a selectively energizable in-plane magnetic field for said chip including first and second field coil means respectively encircling said insulating body and arranged in orthogonal relation to each other;
- g. permanent magnet means mounted on opposite ends of said insulating body in spaced relation to said first and second field coil means; and



- h. magnetic field spreader members of magnetic material mounted on opposite major surfaces of said insulating body in spaced relation to said first and second field coil means, said magnetic field spreader members respectively engaging said permanent magnet means and defining therewith a magnetic enclosure for said encapsulated magnetic bubble domain chip; wherein
- i. said body of insulating material has enlarged spacer portions extending beyond the dimensions of said first and second field coil means with said permanent magnet means and said magnetic field spreader members abutting said enlarged spacer portions of said insulating body in respective spaced relation to said first and second field coil means.

4,012,724

**METHOD OF IMPROVING THE OPERATION OF A SINGLE WALL DOMAIN MEMORY SYSTEM**

Marlin Marshall Hanson; Ernest James Torok, and Roger Edward Lund, all of St. Paul, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,178

Int. Cl.<sup>2</sup> G11C 11/14

U.S. Cl. 340—174 TF

4 Claims

magnetizable material in which single wall domains or bubbles may be sustained and moved between first, second, third and fourth stable positions in a memory area in said layer, which stable positions are associated with intersecting first and second inductively coupled striplines, by drive current signals that are coupled to said layer by said striplines, the method of preventing said bubbles from escaping from the magnetomotive effect of said drive current signals to transfer said bubbles between said first, second, third and fourth stable positions or from sticking in either said first, second, third or fourth stable positions, comprising:

- forming a slot in each of said first and second intersecting striplines in the area of said intersection for forming a memory area that is defined by said intersecting slots;
- forming magnetic layers of a relatively high retentivity upon each of said first and second striplines in said memory area;
- establishing the magnetization in the magnetic layers of a relatively high retentivity which are formed upon each of said first and second striplines, in opposing directions oriented across their respective slots for magnetically repelling said bubble away from said first and second striplines and into said memory area.

4,012,725

**PROGRAMMABLE CALCULATOR**

Richard M. Spangler; Eugene V. Burmeister; Frank E. Cada; Wayne F. Covington; Chris J. Christopher; Myles A. Judd; Freddie W. Wenninger; Robert E. Watson, and Kent W. Simcoe, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

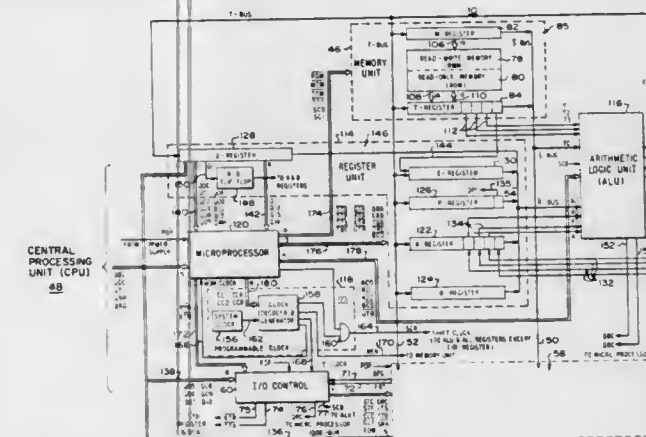
Continuation of Ser. No. 269,899, July 7, 1972, abandoned.

This application May 30, 1974, Ser. No. 469,727

Int. Cl.<sup>2</sup> G06F 15/40, 15/02, 3/14, 7/38

U.S. Cl. 340—172.5

41 Claims



1. Electronic data processing apparatus comprising:
  - keyboard input means for entering lines of one or more alphameric characters each into said electronic data processing apparatus;
  - first memory means for storing lines of one or more alphameric characters each;
  - second memory means, coupled to said keyboard input means and first memory means, for temporarily storing each line of one or more alphameric characters being entered into said electronic data processing apparatus from said keyboard input means or recalled from said first memory means;
  - said keyboard input means including store control means for causing a line of one or more alphameric characters then stored in said second memory means to be stored in said first memory means and including recall control means for causing a designated line of one or more alphameric characters stored in said first memory means to be recalled to said second memory means;
  - first logic means, coupled to said keyboard input means, first memory means, and second memory means, for transferring a line of one or more alphameric characters then stored in said second memory means to said first

memory means in response to actuation of said store control means and for transferring a designated line of one or more alphameric characters from said first memory means to said second memory means in response to actuation of said recall control means;

display means, coupled to said second memory means, for visually displaying a line of one or more alphameric characters then stored in said second memory means;

said display means including means for visually displaying a cursor for designating any character position of the displayed line of one or more alphameric characters;

said keyboard input means including cursor control means for controlling the position of said cursor; and

second logic means, coupled to said keyboard input means, second memory means, and display means, for positioning said cursor to designate any character position of the displayed line of one or more alphameric characters in response to actuation of said cursor control means.

4,012,726

**MAGNETIC BUBBLE REPLICATOR**

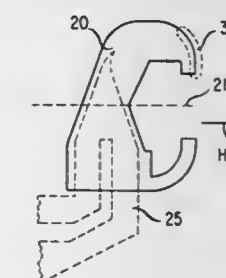
Peter Istvan Bonyhard, Edison, and James Lanson Smith, Bedminster, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1975, Ser. No. 643,679

Int. Cl.<sup>2</sup> G11C 11/14, 19/08

U.S. Cl. 340—174 TF

11 Claims



1. A magnetic bubble memory comprising a layer of material in which magnetic bubbles can be moved, a pattern of elements for defining in said layer first and second channels along which bubbles move in response to a magnetic field reorienting in the plane of said layer, said first path including a turn element and having a long axis, an electrical conductor coupling said turn element at an angle with respect to said axis, said element having a geometry to provide an elongated flux path when said field is aligned at said angle.

4,012,727

**ALARM CONTROL SYSTEM**

Benedetto Grossi, Stanford, and Ignas Budrys, Bethel, both of Conn., assignors to General Signal Corporation, Rochester, N.Y.

Filed May 21, 1975, Ser. No. 579,335

Int. Cl.<sup>2</sup> G08B 25/00

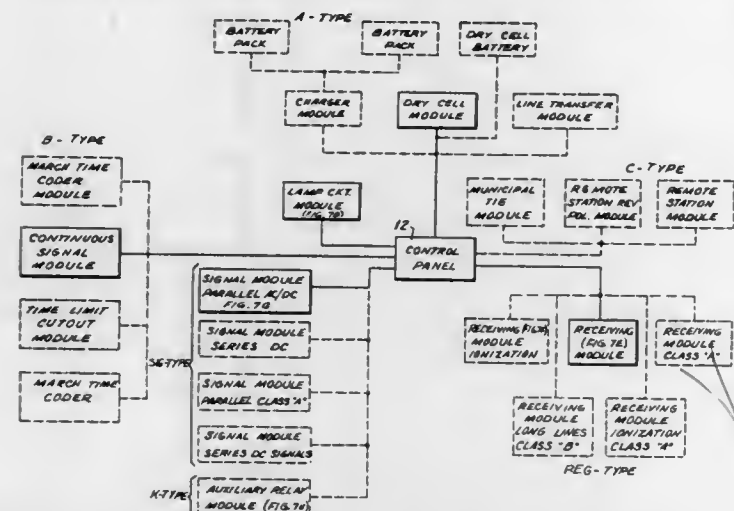
U.S. Cl. 340—213 R

14 Claims

1. An alarm control system, comprising
  - a control panel;
  - at least one alarm responding circuit having connected therein a plurality of alarm responding or initiating stations remotely located from said control panel for responding to an alarm condition;
  - at least one alarm indicating circuit having connected therein a plurality of alarm indicating stations remotely located from said control panel;
  - a common control circuit strip mounted on said control panel and having a plurality of kinds of common control circuit modules, including signal current and power supply control circuits, adapted to be connected to said common control circuit strip;
  - a functional circuit strip mounted on said control panel, and



a plurality of kinds of functional circuit modules including at least receiving and signalling modules; means for receiving said receiving and signalling modules in discrete connector areas on said functional circuit strip, including means for connecting terminals in common between all said connector areas and means for intercon-



necting said receiving and signalling modules through said strip selectively to each other and to said alarm initiating circuit and to said alarm indicating circuit respectively such that a receiving module can be substituted for a signalling module in a same given discrete connector area on said functional circuit strip.

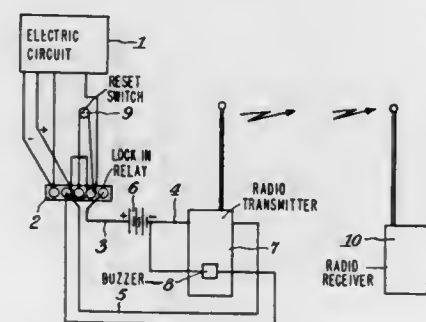
4,012,728

## BACK UP ALARM SYSTEM

Eugene W. Fowler, Venice, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest  
Filed Mar. 31, 1975, Ser. No. 563,631  
Int. Cl.<sup>2</sup> B60R 25/10

U.S. Cl. 340-224

3 Claims



1. A back up alarm system for a burglar alarm system utilizing an electric circuit having electrical conductors for operating a burglar alarm under predetermined circumstances, said back up alarm system comprising

relay means electrically connected to the electric circuit of a burglar alarm system having electrical conductors; a source of electrical energy; a radio transmitter for transmitting radio signals; and electrically conductive leads electrically connecting the relay means, the source of electrical energy and the radio transmitter in a back up circuit with the burglar alarm circuit in a manner whereby the relay means is energized by the electric circuit of the burglar alarm system and maintains the relay means normally open as long as the burglar alarm system is in operative condition and when an electrical conductor of the burglar alarm circuit is cut the relay means is deenergized and closes the back up circuit to actuate the transmitter to transmit radio signals indicating that an electrical conductor of the burglar alarm circuit has been cut, said burglar alarm circuit and said back up circuit constituting different circuits.

4,012,729

## MULTI-ELEMENT IONIZATION CHAMBER

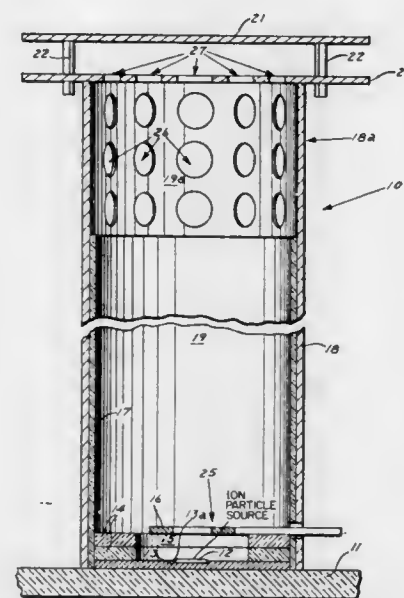
Stephen Weaver, Lakewood; Lyman L. Blackwell, Boulder, and Paul A. Staby, Denver, all of Colo., assignors to Statitrol Corporation, Lakewood, Colo.

Filed June 19, 1975, Ser. No. 588,153

Int. Cl.<sup>2</sup> G08B 17/10

U.S. Cl. 340-237 S

16 Claims



1. An aerosol detection device, comprising: structure defining intercommunicating first and second substantially cylindrical ion chambers, each of said chambers having a longitudinal axis and first and second ends, the second end of said first ion chamber being in communication with the first end of said second ion chamber and the longitudinal axis of said ion chambers being substantially aligned to define a common axis, the effective volume of said first ion chamber being substantially smaller than the effective volume of said second ion chamber; a first electrode having a center axis positioned at the first end of said first ion chamber, said first electrodes being in the shape of a disc and extending substantially perpendicularly to the common axis of said ion chambers with its center axis substantially aligned with said common axis; a second electrode positioned within said ion chambers substantially at the intercommunication of the second end of said first ion chamber with the first end of said second ion chamber; said second electrode being in the form of a ring to define an aperture in its center and having a center axis, the center axis of said ring being substantially aligned with the common axis of said ion chambers;

a third electrode positioned at the second end of said second ion chamber; particle source means for substantially simultaneously emitting charged particles into said first and second ion chambers, said particle source means being a single source and having an axis of radiation along which emitted charged particles are radiated, said single particle source being in said first ion chamber adjacent said first electrode with its axis of radiation substantially aligned with the common axis of said ion chambers whereby to introduce charged particles into said first ion chamber and therethrough through the aperture defined by said second electrode into said second ion chamber;

means for establishing a single ion current flow of said charged particles third electrodes serially through said ion chambers, said means being operable to establish under clear air conditions a first voltage gradient in said first ion chamber between said first and second electrodes and a second voltage gradient in said second ion chamber between said second and third electrodes, said first voltage gradient being substantially higher than said second voltage gradient to render the electrical resistance characteristic of said first ion chamber to said ion current flow

therethrough relative to said second ion chamber substantially insensitive to the presence or absence of smoke aerosols and the like; and means for connecting said second ion chamber in communication with atmosphere to be monitored so that smoke aerosols and the like therein enter said second ion chamber, the electrical resistance characteristic, of said second ion chamber to said ion current flow, increasing as the result of the entry of smoke aerosols and the like therein whereby to cause a change in the voltage on said second electrodes indicative of the presence of smoke aerosols and the like in the atmosphere being monitored.

4,012,730

## DOPPLER DETECTION DEVICE WITH INTEGRATOR SAMPLING MEANS TO INHIBIT FALSE ALARMS

David Nicholls, 56 Glen Road, Glen Waverley, Victoria, Australia

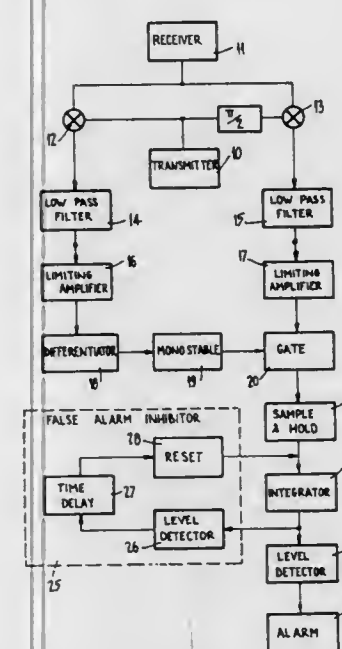
Filed Mar. 25, 1975, Ser. No. 561,890

Claims priority, application Australia, Mar. 25, 1974, 7032/74

Int. Cl.<sup>2</sup> G08B 13/18

U.S. Cl. 340-258 A

7 Claims



1. A security device comprising a Doppler principle detection device, means for generating an output signal from a Doppler shift signal developed by the detection device, an integrator for integrating the output signal, an alarm adapted to be activated when the output of the integrator reaches a predetermined threshold level, and a false alarm inhibitor including means for sampling the integrator output and for resetting the integrator if the integrator output does not reach said predetermined threshold level within a predetermined time, said inhibitor acting after said integrator output has reached a predetermined signal level which is lower than said predetermined threshold level.

4,012,731

## BURGLAR ALARM SYSTEM

Anna Grace Solomon, 3611 Kalsman Drive, Los Angeles, Calif. 90016

Filed Jan. 5, 1976, Ser. No. 646,831

Int. Cl.<sup>2</sup> G08B 13/08

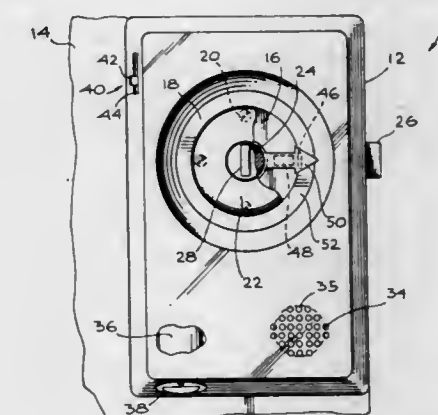
U.S. Cl. 340-274 R

8 Claims

1. An improved burglar alarm system for mounting about the rotatable shaft of a doorknob attached to a door, said system comprising in combination:

a housing for mounting to the door over the doorknob with the shaft extending outwardly from the housing through an opening in the housing;

an electrical circuit disposed in said housing and including



a magnet for mounting on said shaft for rotation therewith opposite and closely adjacent said predetermined position to open the normally closed magnet-responsive switch only when said shaft is in a resting unrotated position and to free the magnet-responsive switch to close the circuit when the doorknob and shaft are rotated in either direction out of the resting position.

4,012,732

## SECURITY DEVICE

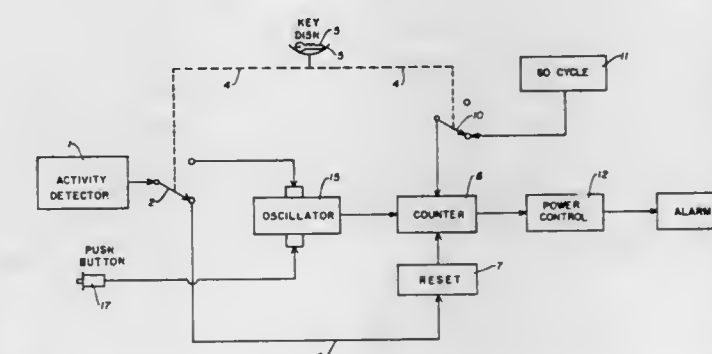
Kennan C. Herrick, 2160 Mastlands Drive, Oakland, Calif. 94611

Filed Mar. 19, 1976, Ser. No. 668,604

Int. Cl.<sup>2</sup> G08B 21/00, 13/00

U.S. Cl. 340-279

8 Claims



1. A security device comprising:

- a alarm,
- a clock adapted to actuate said alarm when a predetermined time period has elapsed,
- a human physical activity sensor adapted to reset said clock to the beginning of said predetermined time period when human activity is sensed, and
- means for sensing an inanimate object in contact therewith, said means adapted in the absence of said inanimate object to prevent actuation of said alarm when said predetermined time period has elapsed.

4,012,733

## DISTRIBUTION POWER LINE COMMUNICATION SYSTEM INCLUDING A MESSENGER WIRE COMMUNICATIONS LINK

Ian A. Whyte, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 16, 1975, Ser. No. 622,915

Int. Cl.<sup>2</sup> H04M 11/04

U.S. Cl. 340-310 A

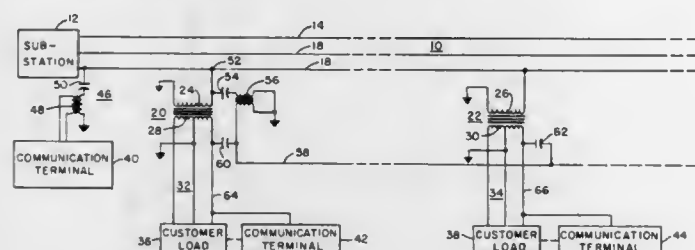
1 Claim

1. A distribution power line carrier communication system



transmitting carrier signals to electrical customer load locations served by a distribution power line system carried on support poles, said communication system comprising:

- a primary line conductor of said distribution system transmitting said carried signals and carried by said support poles;
- a plurality of secondary line conductors of said distribution system carried by predetermined ones of said support poles for connection to said customer load locations;
- at least one distribution transformer connected between the primary and secondary distribution line conductors;
- a cable supporting messenger wire having a high resistance and being suspended between said predetermined ones of said support poles;



frequency responsive impedance means connected between said messenger wire and ground potential, said impedance means having a high impedance at the carrier signal frequencies and a low impedance at the power line frequency;

first signal coupling circuit means connected between said primary line conductor and said messenger wire for transmitting carrier signals therebetween and around said one distribution transformer; and

second signal coupling circuit means connected between said messenger wire and said plurality of secondary line conductors for transmission of said carrier signals between said messenger wire and said customer load locations.

4,012,734

## SYNCHRONOUS POWER COMMUNICATING

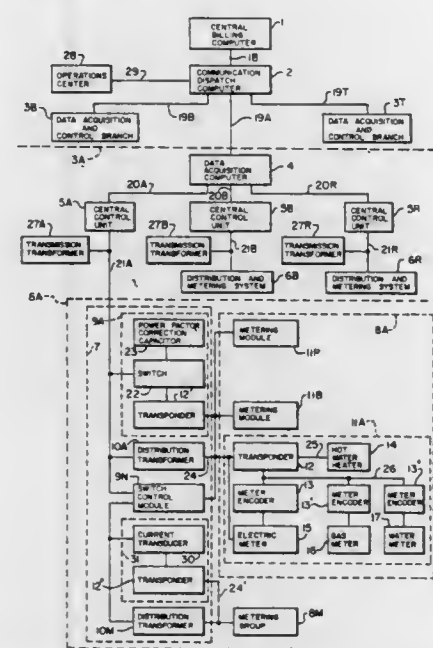
Neil H. Jagoda, Framingham; Klaus Kubierschky, North Reading, and Adrian G. Roy, Jr., Kingston, all of Mass., assignors to American Science & Engineering, Inc., Cambridge, Mass. Continuation of Ser. No. 535,352, Dec. 23, 1974, abandoned.

This application Feb. 9, 1976, Ser. No. 656,521

Int. Cl.<sup>2</sup> H04M 11/04

U.S. Cl. 340-310 A

21 Claims



1. Synchronous power communicating apparatus for communication between a central station and remote stations over power lines that may also carry electrical power at power frequency comprising,

a source of a carrier signal of frequency that is a harmonic of half said power frequency at said central and remote stations in the frequency range between 500 and 30 kHz for carrying digital data,

a source of a digital data signal at said central and remote stations,

means for establishing synchronism between each digital data signal and the electrical power frequency carried by said power lines,

means for modulating a carrier signal with each digital data signal,

means for coupling the modulated carrier signal to said power lines to transmit the modulated carrier signal over the power lines to a receiving means at each location including demodulating means for demodulating the modulated carrier signal to recover the digital data signal carried by the modulated carrier,

means at each location coupling the modulated carrier signal from the power lines to said demodulating means, means for synchronizing the demodulating means with the electrical power carried by said power lines for demodulating the modulated carrier signal received at the receiving station to recover the digital data carried by the modulated carrier signal,

the source of a digital data signal at said central location including means for providing a digital signal designating both a particular remote location to transmit a digital data signal to said central location and the data bit rate for transmission thereof that is a subharmonic of or the same as said power frequency,

and means at each remote location responsive to reception of a digital control signal from said central location designating that remote location for transmission of a digital data signal to said central location for transmitting a digital data signal to said central location at the control designated data bit rate that is a subharmonic of or the same as said power frequency.

4,012,735

## DUAL MODE PATTERN GENERATOR

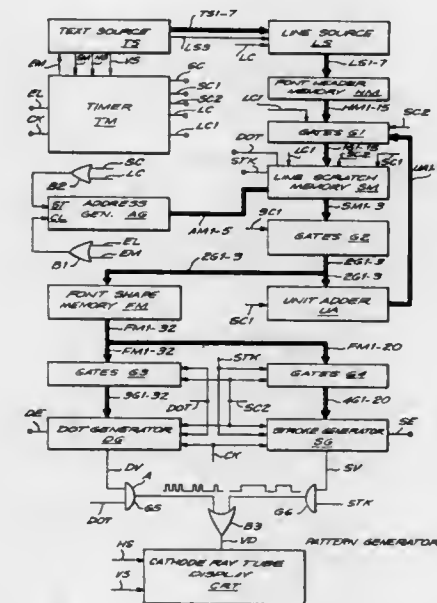
James M. Keane, Neconset, N.Y., assignor to Systems Resources Corporation, Plainview, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,648

Int. Cl.<sup>2</sup> G06F 3/14

U.S. Cl. 340-324 AD

2 Claims



1. In a display system, the method of representing the characters of a font by representing some of the characters of the font by matrix arrays of dots wherein each row of the matrix is stored as a combination of bits in one-to-one correspondence with the presence of dots in the row of the matrix and

representing other characters of the font by sets of strokes disposed on a group of parallel lines wherein the length of each stroke is stored as a number in the form of a coded combination of bits.

4,012,736

## RADAR SPEEDOMETER

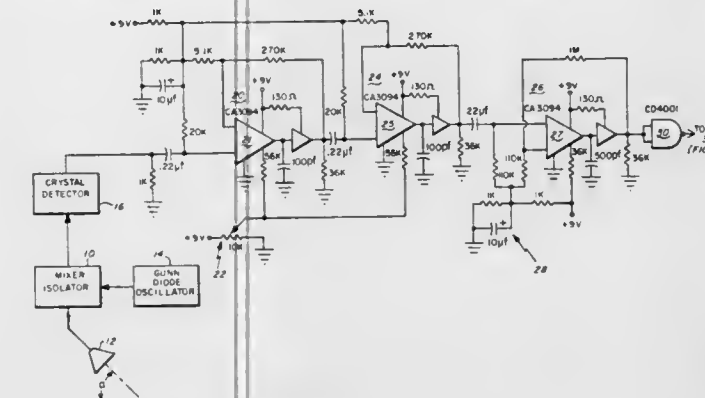
James H. Angwin, Merrimack, N.H., assignor to Merlin A. Pierson, Newton, Mass.

Filed Dec. 11, 1974, Ser. No. 531,807

Int. Cl.<sup>2</sup> G01S 9/44

U.S. Cl. 343-8

14 Claims



1. An electronic radar speedometer for measuring the speed of a vehicle comprising;

means including antenna means for providing a cyclic signal the frequency of which relates to the velocity of the vehicle relative to ground;

means responsive to said cyclic signal for sensing the duty cycle of said signal and for passing said cyclic signal substantially only when said signal has a duty cycle which lies within a predetermined range from a first preselected duty cycle to a second preselected duty cycle, said range being substantially centered about a 50% duty cycle, means responsive to said passed cyclic signal for counting the cycles thereof,

and means responsive to said counting means for providing a reading corresponding to vehicle speed.

4,012,737

## PSEUDONOISE GUIDANCE SYSTEM WITH SPILLOVER REJECTION

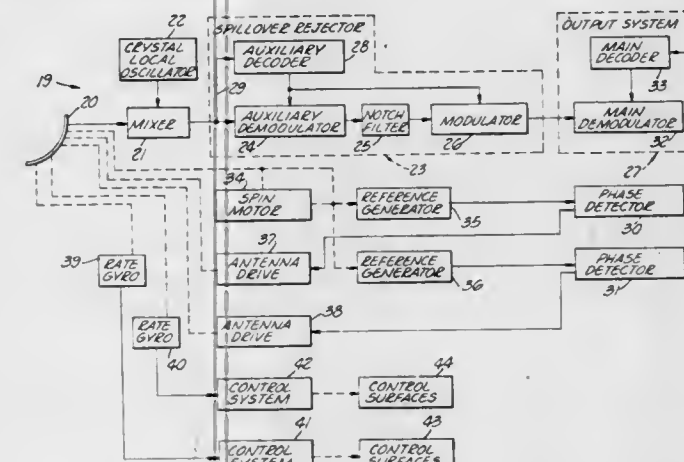
Richard Roland Waer, and Ernest Isaac Rensin, both of Northridge, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 670,730, Sept. 26, 1967, abandoned. This application Oct. 19, 1970, Ser. No. 81,815

Int. Cl.<sup>2</sup> G01S 9/02

U.S. Cl. 343-17.5

19 Claims



1. In a continuous wave pseudonoise guidance system having a transmitter source of an alternating signal, a transmitter

modulator connected from said source to a transmitting antenna, and a transmitter code generator to operate said transmitter modulator in a manner to code said signal, a receiver comprising:

- a receiving antenna;
- a main demodulator;
- a main code generator to operate said main demodulator in a manner to reconstruct an alternating signal from a reflected wave corresponding to the output of said transmitter source;
- a main feedback circuit for synchronizing the output of said main code generator with the code of an incoming wave reflected from a distant target;
- an auxiliary demodulator connected from said receiving antenna;
- a notch filter located at the center of the transmission band and connected from said auxiliary demodulator;
- a receiver modulator connected from said notch filter to said main demodulator;
- an auxiliary code generator to operate both said auxiliary demodulator and said receiver modulator in a manner to pass coded waves reflected from distant targets to said main demodulator without considerable distortion while reconstructing coded spillover waves received directly from said transmitter or by reflection from objects near to said transmitter or receiver, said notch filter heavily attenuating reconstructed spillover waves while passing unreconstructed waves reflected from distant targets without considerable attenuation; and
- an auxiliary feedback circuit to synchronize the output of said auxiliary code generator with the code of a spillover wave, said auxiliary feedback circuit being substantially insensitive to the code of a wave reflected from a distant target due to the low signal strength thereof, all of said code generators being constructed to produce the same code, but shifted in phase.

4,012,738

## COMBINED LAYERS IN A MICROWAVE RADIATION ABSORBER

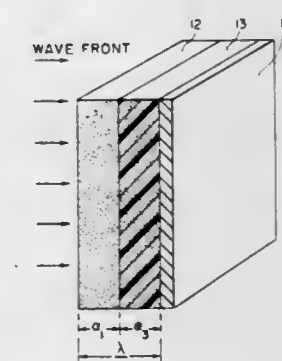
Rufus W. Wright, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1961, Ser. No. 86,256

Int. Cl.<sup>2</sup> H01Q 17/00

U.S. Cl. 343-18 A

18 Claims



1. Combined layers in a microwave radiation absorber comprising a layer of dielectric material of relatively high dielectric constant and a layer of magnetic material having a relatively high coefficient of magnetic permeability, said layers of dielectric material and magnetic material being in substantially parallel arrangement to one another and adapted to be positioned in a high electric field region and in a high magnetic field region of a radiation reflecting surface, respectively, said layer of magnetic material being adapted to be positioned in said high magnetic field region between said layer of dielectric material and said reflecting surface, said layer of dielectric material having a front surface with respect to the wave front of incident radiation, said front surface being



at a distance from said reflecting surface approximately an odd multiple of a quarter wavelength of microwave radiation as measured within said combined layers.

4,012,739

# INSTRUMENT LANDING SYSTEM (ILS) WITH SIMPLIFIED TRANSMITTER

Günter Höfgen, and Werner Poschadel, both of Kornwestheim, Germany, assignors to International Standard Electric Corporation, New York, N.Y.

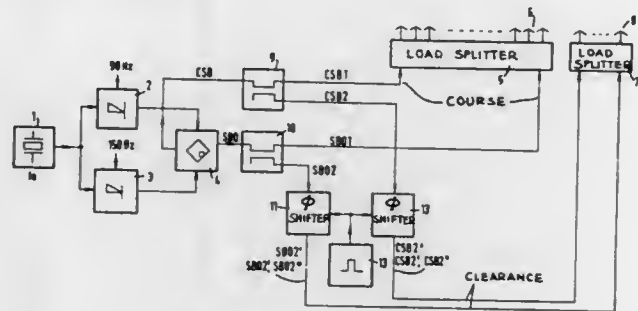
Filed Feb. 19, 1976, Ser. No. 659,409

Claims priority, application Germany, Apr. 27, 1975, 2508539

Int. Cl.<sup>2</sup> G01S 1/16, 1/18; H02M 5/16

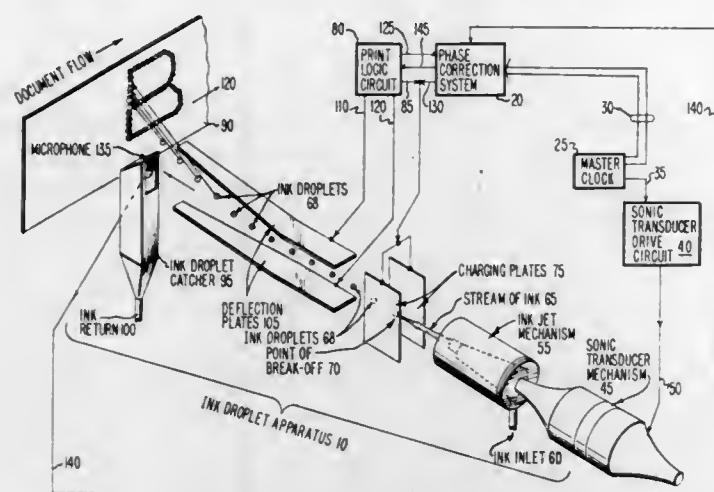
U.S. Cl. 343—108 R

6 Claims





provides the largest quantitative measure of droplet charge, and for controlling the charging of droplets in



timed relation to the transducing of droplets with a phase relationship corresponding to the tested phase time providing maximum droplet charge.

4,012,746

# APPARATUS FOR RECORDING VARIABLE MEASUREMENT QUANTITIES THAT CAN BE TRANSLATED INTO ELECTRICAL CURRENT OR VOLTAGE VARIATIONS

Gerd Kuligowski, and Konrad Von Hessberg, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

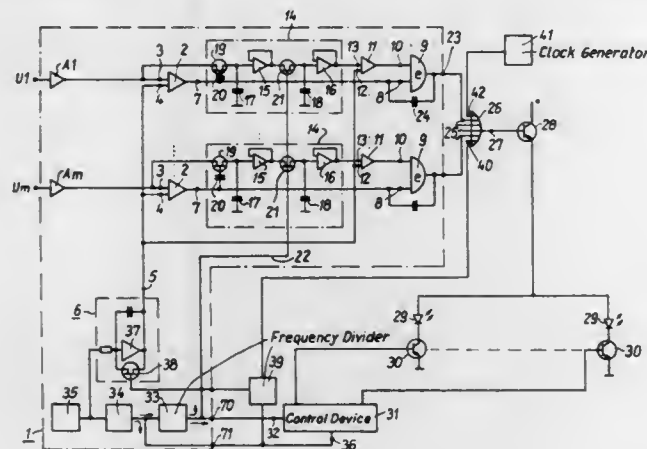
Filed Jan. 27, 1975, Ser. No. 545,344

Claims priority, application Germany, Jan. 29, 1974, 2404550

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976  
Int. Cl.<sup>2</sup> G01D 9/28, 9/42

U.S. Cl. 346—35

8 Claims



1. Apparatus for use in controlling the operation of a row of light-emitting components, said components being arranged transversely to the direction of motion of a light sensitive record carrier and being used to optically record thereon variable measurement quantities that can be translated into varying electrical signals, comprising:

- an amplitude discriminator arrangement for causing said components to emit light onto said record carrier for given values of said quantities including:
- a periodically operating integration arrangement having an input and an output;
- a voltage reference source connected to said input, and
- a number of comparators, each comparator having a first input connected to the output of said integration arrangement and a second input to which one of said electrical signals are applied, each of said comparators further having an output;
- an OR logic circuit having a plurality of inputs connected to corresponding ones of said outputs of said comparators;

a first electronic switch having a control terminal coupled to the output of said OR logic circuit;  
an auxiliary circuit including said first electronic switch and a first number of further electronic switches, said first electronic switch being arranged in series with said further electronic switches and with said components;  
a cyclically operating control device for actuating said further switches; and,  
frequency means for controlling the periodic operation of said integration arrangement and for actuating said control device to begin operation anew with each start of the period of operation of said integration arrangement.

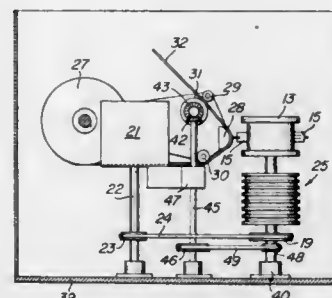
4,012,747

# DOUBLE REVOLVING STYLUS ON CONTINUOUS BELT

Reed Albert Newmeyer, Midvale, Utah, assignor to Sperry Rand Corporation, New York, N.Y.  
Filed Dec. 10, 1975, Ser. No. 639,570  
Int. Cl.<sup>2</sup> G01D 15/24

U.S. Cl. 346—139 A

8 Claims



1. A stylus carriage, comprising in combination;  
an endless belt made of insulating material having a plurality of conductive paths disposed on the inner surface of said belt parallel to each other and to the direction of travel of said belt,  
each of said conductive paths comprising a strip of conductive material so spaced on said belt as to be electrically insulated from one another,  
a plurality of stylus,  
each of said stylus secured to said belt for travel therewith and comprising a plurality of conductive wires formed into a writing tip at one end and electrically connected at the other end to respective ones of said conductive paths,  
drive means for continuously driving said belt,  
said drive means comprising first and second spool means with said belt extended between said first and second spool means,  
motor means,  
pulley means connecting said motor means to said first spool means for rotating said first spool means to drive said belt,  
said second spool means mounted for free rotation,  
circuit means for establishing conductive paths to each of said stylus comprising,  
a plurality of conductive paths disposed about the outer surface of said first spool in electrical contact with said conductive paths on said belt,  
slip ring assembly means connected to said shaft means for rotation by said motor means,  
said slip ring assembly means having conductive paths disposed about its outer periphery,  
first means electrically interconnecting said conductive paths of said slip ring assembly means to respective ones of said conductive paths of said first spool means.

4,012,748

# CAMERA DEVICE FOR OBTAINING A SPLIT IMAGE

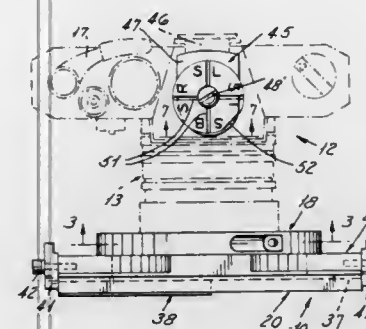
Savarian F. Lemanski, 109 Taylor Ave., Detroit, Mich. 48202

Filed May 15, 1975, Ser. No. 577,683

Int. Cl.<sup>2</sup> G03B 1/00

U.S. Cl. 354—122

6 Claims



1. A split image device comprising an adaptor member to be fixedly applied forwardly of the lens housing of a camera in a position to intercept transmission of a photographic image, a mask mount on said adaptor member, said mask mount having means to adjustably receive a lens mask member, a lens mask member slidably mounted on the mask mount, said lens mask member being shaped so that it obscures a predetermined, substantial area portion of the lens area therebehind to thus prevent a substantial exposure through the lens area portion thus obscured, said lens mask member being slidable diametrically across the camera lens into and out of different masking positions, said mask mount being rotatably mounted on said adaptor member, and yieldable detent means between said mask mount and said adaptor member to releasably hold the mask mount in different rotatively indexed adjustment settings thereof relative to the lens.

4,012,749

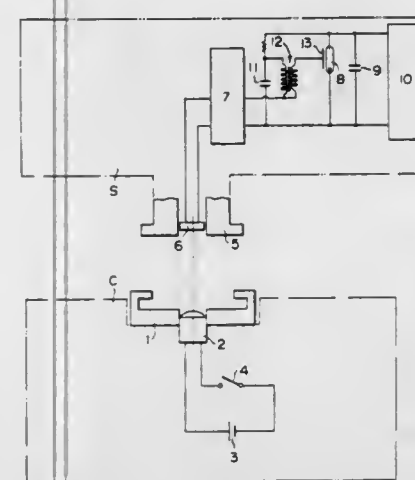
# STROBO FLASH LIGHT DEVICE FOR CAMERAS

Saburo Numata, Urawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan  
Filed Sept. 29, 1975, Ser. No. 617,635  
Claims priority, application Japan, Sept. 30, 1974, 49-111599

Int. Cl.<sup>2</sup> G03B 15/03, 15/05

U.S. Cl. 354—145

8 Claims



1. A strobo flash light device energized upon release of a shutter in a camera comprising in combination:  
an electric source provided in a camera body,  
a shutter mechanism provided in the camera body,  
a switch connected with said electric source closed upon release of said shutter mechanism,  
a light emitting means connected with said source and said switch for emitting light when said switch is closed,  
an accessory shoe provided on the camera body having means for transmitting the light emitted by said light emitting means,

a strobo flash light tube provided in a strobo flash light unit casing,  
a strobo flash light tube energizing circuit provided in said casing and connected with said tube, said strobo flash light energizing circuit including a trigger circuit for triggering said tube,  
a photodetecting means provided in said casing for detecting light impinging thereon,  
a foot fixed to said casing to be inserted into said accessory shoe for supporting said casing, said foot having means for transmitting the light emitted by said light emitting means to said photodetecting means when said foot is inserted into said accessory shoe, and  
a switching circuit connected between said photodetecting means and said trigger circuit for closing said trigger circuit when a signal which indicates that the photodetecting means has received light emitted by said light emitting means is given thereto.

4,012,750

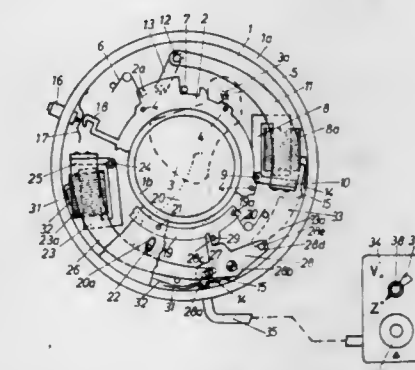
# CAMERA SHUTTER WITH DIAPHRAGM AND ELECTRO-MAGNETIC DRIVE FOR DIAPHRAGM

Waldemar T. Rentschler, Calmbach, Black Forest, Germany, assignor to Prontor-Werk Alfred Gauthier GmbH, Wildbad, Black Forest, Germany  
Continuation of Ser. No. 516,850, Oct. 21, 1974, abandoned, which is a continuation of Ser. No. 306,320, Nov. 13, 1972, abandoned. This application May 28, 1975, Ser. No. 581,529  
Claims priority, application Germany, Nov. 11, 1971, 2156034

Int. Cl.<sup>2</sup> G03B 9/00, 9/08, 9/02

U.S. Cl. 354—232

6 Claims



1. Camera shutter assembly which comprises:  
shutter means having actuatable shutter segments for effecting shutter operation,  
shutter drive means including first electromagnetic means having an armature operatively arranged for actuating the shutter segments,  
diaphragm means having diaphragm aperture forming blades operatively arranged for actuation between an adjustable predetermined less than full size aperture operative setting position and a full size aperture position,  
return spring means normally biasing the diaphragm blades to the adjustable predetermined operative setting position, and  
diaphragm drive means including second electromagnetic means having an armature and independently adjustable mechanical intermediate members operatively arranged for forwardly actuating the diaphragm blades against the biasing force of the return spring means from such adjustable predetermined operative setting position to full size aperture position, said diaphragm means being returnable after such actuating to the adjustable predetermined operative setting position under the biasing force of the return spring means,  
the independently adjustable mechanical intermediate members being operatively interposed between the second electromagnetic means and the diaphragm means for adjustment independently of the second electromagnetic



means to vary the predetermined size of the aperture of the operative setting position.

4,012,751

# PHOTOGRAPHIC CAMERA WITH ELECTROMAGNETIC ACTUATOR OF THE SHUTTER SEGMENTS

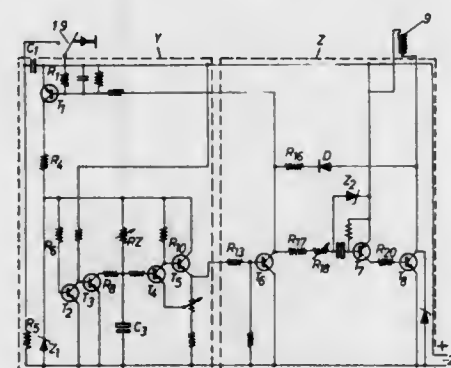
Winfried Espig, Calmbach, Germany, assignor to Prontor-Werk Alfred Gauthier GmbH, Postfach, Germany  
Continuation of Ser. No. 511,901, Oct. 3, 1974, abandoned, which is a continuation of Ser. No. 335,585, Feb. 26, 1973, abandoned, which is a continuation of Ser. No. 141,784, May 10, 1971, abandoned. This application May 29, 1975, Ser. No. 582,067

Claims priority, application Germany, May 8, 1970, 2022532

Int. Cl.<sup>2</sup> G03B 9/08

U.S. Cl. 354—234

4 Claims



1. Photographic camera shutter comprising a segmented shutter system movable to open position for a determined shutter time interval and then back to closed position; electromagnetic actuator means operatively arranged to actuate said shutter system and having an electromagnet winding energizable at an initial maximum high magnitude constant voltage sufficient for moving said shutter system to open position and immediately thereafter energizable at a sustaining substantially lower magnitude constant voltage sufficient for maintaining said shutter system in said open position during the remainder of the determined shutter time interval that said winding is energized and in turn said shutter system remains open and thereby preventing voltage overload of said winding during said remainder of said shutter time interval; electronic time setting means for controlling the shutter time interval during which said winding is energized and in turn said shutter system remains open; and energizable circuit means for said time setting means and said winding and including an electronic switch circuit electrically coupled with said time setting means for providing in regulated time duration sequence the initial high constant voltage and immediately thereafter the sustaining lower constant voltage for energizing said winding within the determined shutter time interval controlled by said time setting means.

4,012,752

# SLIT SHUTTER FOR A CAMERA

Waldemar T. Rentschler, and Walter Holzapfel, both of Calmbach, Black Forest, Germany, assignors to Prontor-Werk Alfred Gauthier GmbH, Wildbad, Black Forest, Germany  
Continuation of Ser. No. 416,220, Nov. 15, 1973, abandoned, which is a continuation of Ser. No. 573,839, May 2, 1975, abandoned. This application Jan. 15, 1976, Ser. No. 649,396

Claims priority, application Germany, Nov. 15, 1972, 2255835

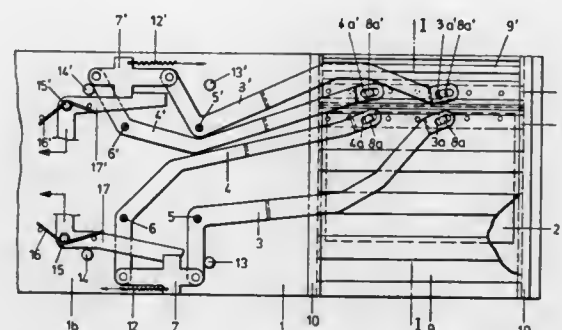
Int. Cl.<sup>2</sup> G03B 9/32

U.S. Cl. 354—242

6 Claims

1. Slit shutter for a photographic camera, comprising a base

plate, a camera image window defined in said base plate and having opposed edges, a first cover system having a folding blind curtain for uncovering the image window for photographic exposure and a second cover system having a folding blind curtain adapted to function after the first cover system with a controlled time delay for again covering the image window, means to fix each blind curtain at one end thereof to a corresponding opposed edge of the image window, a rigid



rail means connected at the other end of each blind curtain, said rail means together defining the corresponding edges of the associated slit of the cover system slit shutter, and means for positive displacement of the rail means along a substantially straight line including a pair of corresponding lever-containing parallel linkages pivotally supported on the base plate and having the ends of each linkage positioned displaceably for forming the corresponding edges of the slit of the cover system slit shutter.

4,012,753

# FILM PROCESSOR

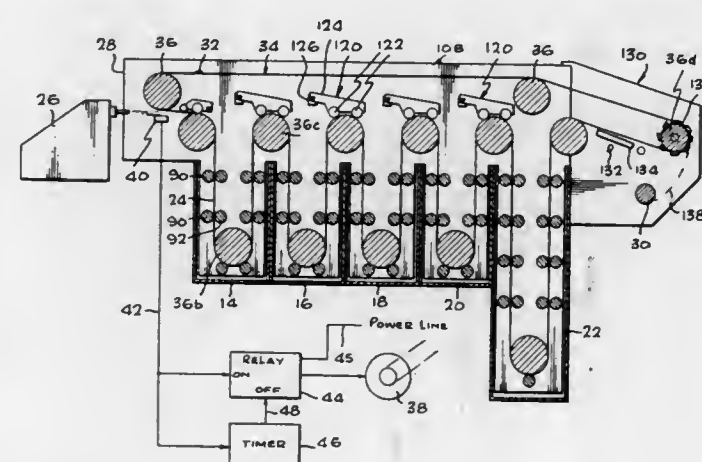
Gunter Schmidt, Malibu, Calif., assignor to Cubic Production, Inc., Chula Vista, Calif.

Filed May 2, 1975, Ser. No. 574,002

Int. Cl.<sup>2</sup> G03D 17/00, 3/02

U.S. Cl. 354—316

9 Claims



1. A film processor comprising: a frame; at least one processing tank mounted on said frame, for holding a processing chemical; means for immersing film in said tank; drain means for receiving fluid from said processing tank; controllable means for moving a predetermined volume of fluid from said processing tank to said drain means, to lower the level of fluid in said processing tank; and level restoring means including means for holding a replenishing container and means which are responsive to and which operates shortly after said controllable means lowers the level of fluid, for flowing fluid from the replenishing container to the processing tank in an amount that restores the level of fluid in the processing tank to a predetermined level.

4,012,754

# PHOTOGRAPHIC CAMERA

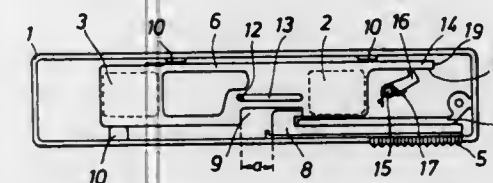
Heinz Waaske, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany  
Filed Mar. 8, 1976, Ser. No. 664,430

Claims priority, application Germany, Mar. 14, 1975, 2511153

Int. Cl.<sup>2</sup> G03B 1/00

U.S. Cl. 354—212

10 Claims



1. A photographic camera having film transport means, a rectilinearly moved slider for driving said film transport means, and a cover plate operable by means of said slider, said plate having a closed position covering viewfinder and lens openings and having an open position which clears said openings, characterized by the fact that said slider (5) and cover plate (6) are coupled with one another with limited relative movement between them, and that an auxiliary drive (15, 16, 17) is provided for the displacement of the cover plate into its said open position.

4,012,755

# ELECTRICAL FILM REWINDING DEVICE

Akihiro Arai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

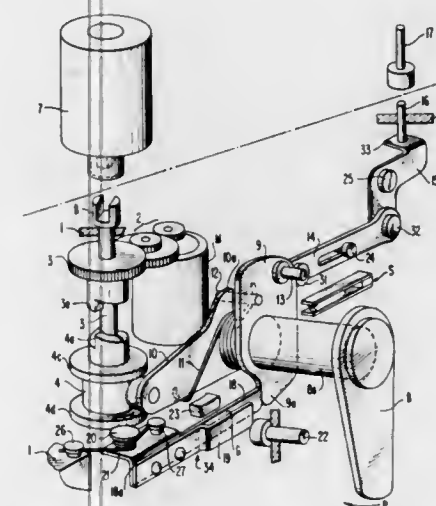
Filed June 2, 1975, Ser. No. 583,030

Claims priority, application Japan, June 5, 1974, 49-63687

Int. Cl.<sup>2</sup> G03B 1/00

U.S. Cl. 354—214

7 Claims



1. An electrically driven film rewinding device for detachable engagement with a camera for effecting film wind up within said camera, said camera carrying a rotatable film support reel upon which film is rewound during rewind device engagement, said device comprising:

a body;  
a camera film rewind drive shaft rotatably mounted within said body and axially movable between an extend position in engagement with the camera mounted film reel and a retracted, nonengaged position when said rewinding device is attached to said camera;  
a rewind drive shaft drive motor within said body, clutch means for operatively connecting said drive motor to said rewind drive shaft for effecting shaft rotation, an operating shaft rotatably mounted on said body, a rewind operating lever mounted on said operating shaft for rotation about the operating shaft axis,

a clutch operating and shaft rewind engaging lever resiliently mounted on said operating shaft and rotatable therewith, said rewind operating lever being rotatable from a first position where said shaft is uncoupled from said reel, said motor is disengaged, said clutch means is disengaged, through a second position to a third position wherein said clutch means is in engagement and said rewind drive shaft is projected into coupling relationship with said film support reel,

normally open switch means mounted within said body and being closed in response to rotation of said rewind operating lever from said first position to at least said third position for energizing said motor to rewind said film, and wherein said camera includes a displaceable film take up releasing member shiftable from a normally film locked position to a film released position, and said rewinding device further includes mechanical interlock means responsive to rotation of said rewind operating lever from said first position to said second position to shift said film take up release member from locked position to released position prior to said rewind operating lever effecting clutch engagement and rewind drive shaft connection with said film support reel when said rewind device is attached to said camera.

4,012,756

# METHOD OF INHIBITING HILLOCK FORMATION IN FILMS AND FILM THEREBY AND MULTILAYER STRUCTURE THEREWITH

Praveen Chaudhari; Francois M. d'Heurle, and Amitava Gangulee, all of Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

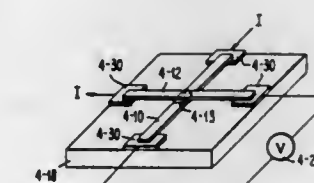
Continuation of Ser. No. 889,100, Dec. 30, 1969, abandoned.

This application Jan. 27, 1975, Ser. No. 544,462

Int. Cl.<sup>2</sup> H01L 27/12

U.S. Cl. 357—5

7 Claims



1. A tunnel device exhibiting Josephson tunnelling current, comprising:

a base first film electrode comprised of a first lead superconducting material and a substantially homogeneous distribution of alloying additions present throughout said superconducting material selected from the group of elements consisting of gold and silver in the range of approximately 7 to 10 percent by weight of said superconducting material;  
a tunnel barrier in contact with said first superconducting material comprised of an oxide and being sufficiently thin that Josephson current can tunnel therethrough; and  
a counter second film electrode in contact with said tunnel barrier comprised of a second lead superconducting material.



**4,012,757**  
**CONTACTLESS RANDOM-ACCESS MEMORY CELL AND CELL PAIR**

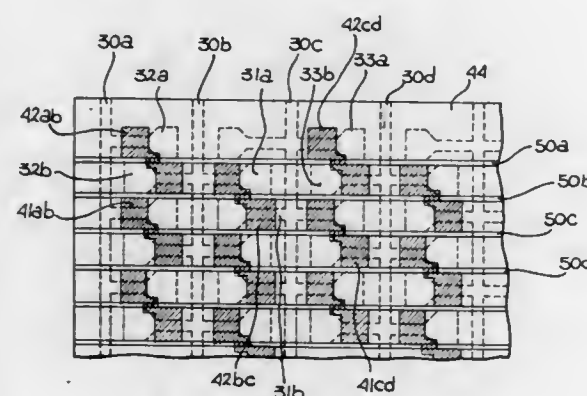
James T. Koo, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed May 5, 1975, Ser. No. 575,034

Int. Cl.<sup>2</sup> H01L 27/10

U.S. Cl. 357—24

4 Claims



1. An integrated circuit memory formed in a semiconductor substrate having a multiplicity of memory cell pairs, each memory cell pair coupled to one of a plurality of word select lines of said memory and each memory pair coupled to two of a plurality of sense lines of said memory, each of said memory cell pairs comprises:

- a first conductive means disposed in said semiconductor substrate for forming a first sense line of said memory and a first region in said memory cell pair;
  - a second conductive means disposed in said semiconductor substrate for forming a second sense line of said memory and a second region in said memory cell pair;
  - a conductive gate means insulatively disposed at least in part above a first and second transmission region in said semiconductor substrate, said gate means for controlling electrical current flowing in said first and second transmission regions and having a single electrical contact region, said first transmission region being substantially contiguous and electrically coupled to said first conductive means and said second transmission region being substantially contiguous and electrically coupled to said second conductive means; and
  - a conductive capacitive means insulatively disposed at least in part above a first and second capacitor region in said semiconductor substrate, said capacitive means operable for storing electrical charge and for inducing said first and second capacitor region into a conductive state, said first capacitor region being substantially contiguous and electrically coupled to said first transmission and said second capacitor region being substantially contiguous and electrically coupled to said second transmission region, wherein:
- said first and second conductive means are diffusion regions disposed in said semiconductor substrate in substantially parallel channels;
- said first transmission and first capacitor regions form a first finger-like projection substantially perpendicular to said first conductive means; and
- said second transmission and second capacitor regions form a second finger-like projection substantially perpendicular to said second conductive means, said first and second finger-like projections forming an interdigitated pattern between said first and second conductive means.

**4,012,758**  
**BULK CHANNEL CHARGE TRANSFER DEVICE WITH BIAS CHARGE**

Leonard Jan Maria Esser, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

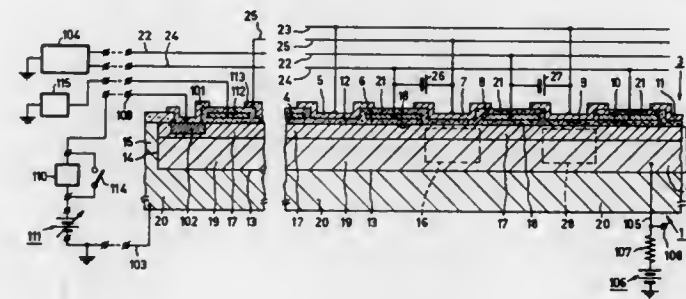
Continuation of Ser. No. 452,714, March 20, 1974, abandoned. This application Oct. 2, 1975, Ser. No. 618,928 Claims priority, application Netherlands, Dec. 3, 1973, 7316495

The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> H01L 29/78; G11C 19/28

U.S. Cl. 357—24

4 Claims



1. A bulk-channel charge transfer device comprising an elongated semiconductor channel of one-type conductivity, means for isolating the semiconductor channel, means to locally introduce into the semiconductor channel information in the form of signal-modulated quantities of majority charge carriers and means to read-out said information elsewhere in the channel, said semiconductor channel having a thickness measured perpendicularly to a cooperating electrode system and a doping concentration and being maintained at a potential such that it can be fully depleted throughout its thickness in the absence of externally-introduced free charge carriers, a cooperating electrode system comprising plural electrodes separated by a barrier layer from the semiconductor channel and located at least at one side of the semiconductor channel and responsive to the application of potentials thereto to capacitively generate electric fields in the semiconductor channel for storing charge carriers at spaced sites within the channel below its surface and for transporting the charge carriers through the channel below its surface in the longitudinal direction toward the read-out means, said semiconductor channel forming a double layer comprising upper layer portions at the surface and adjoining lower layer portions both of the same one-type conductivity, said upper layer portions forming a continuous surface layer extending under all of the electrodes, said upper surface layer having a one-type dopant concentration greater than ten times of said lower layer portions and having a thickness of the double layer such that during application of the electrodes of charge storage potentials large packets of charge carriers present are mainly stored in said upper surface layer, and during application to the electrodes of charge transfer potentials the last charge fractions of the packets are mainly transferred through said lower layer portions, and means for improving transfer efficiency including means to introduce into the semiconductor channel a constant quantity of majority charge carriers independent of the signal magnitude as a constant background quantity.

**4,012,759**  
**BULK CHANNEL CHARGE TRANSFER DEVICE**  
 Leonard Jan Maria Esser, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
 Continuation of Ser. No. 450,996, March 14, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,538  
 Claims priority, application Netherlands, Mar. 19, 1973, 7303778

Int. Cl.<sup>2</sup> H01L 29/78; G11C 19/28

U.S. Cl. 357—24

16 Claims

13. A bulk-channel charge transfer device comprising an

elongated semiconductor channel of one-type conductivity, means for isolating the semiconductor channel, means to locally introduce into the semiconductor channel information in the form of majority charge carriers and means to read-out said information elsewhere in the channel, said semiconductor channel having a thickness measured perpendicularly to a cooperating electrode system and a doping concentration and being maintained at a potential such that it is fully depleted throughout its thickness in the absence of locally-introduced free charge carriers, and a cooperating electrode system comprising plural electrodes separated by a barrier layer from the semiconductor channel and located at least at one side of the semiconductor channel and responsive to the application of potentials thereto to capacitively generate electric fields in the semiconductor channel for storing charge carriers at spaced sites within the channel below its surface and for transporting the charge carriers through the channel below its surface in

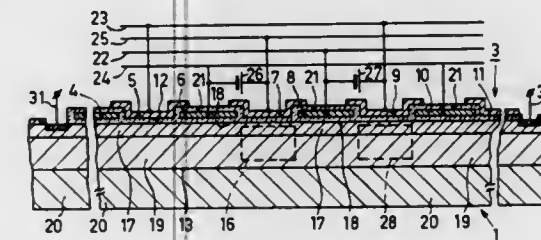
smaller than that of said first layer, said first and said second layers being intimately in contact with each other through epitaxial growth and with substantial lattice match to form a heterojunction, said second layer having a surface opposite said heterojunction with zero or negative electron affinity for emission of electrons, a first electrode connectable to said first layer, and a second electrode connectable to said second layer with the distance between said second electrode and said heterojunction being more than the diffusion length of electrons, and means for applying a potential to said electrodes to bias said heterojunction and cause said first layer to generate electrons which are subsequently injected into said second layer and without substantially any recombination and emitted from said surface of said second layer,

wherein the impurity concentration of said second layer gradually decreases from said heterojunction to said surface opposite said heterojunction.

**4,012,761**  
**SELF-PROTECTED SEMICONDUCTOR DEVICE**  
 Armand P. Ferro, Schenectady, and Victor A. K. Temple, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.  
 Filed Apr. 19, 1976, Ser. No. 677,876  
 Int. Cl.<sup>2</sup> H01L 29/74

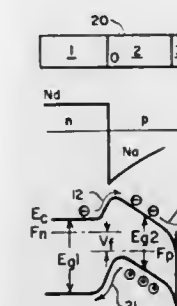
U.S. Cl. 357—38

14 Claims



the longitudinal direction toward the read-out means, said semiconductor channel forming a double layer comprising upper layer portions at the surface and adjoining lower layer portions both of the same one-type conductivity, said upper layer portions occupying at least substantial portions of the surface area under the storage electrode portions closer to the read-out means in the transport direction, said upper layer portions each having a one-type dopant concentration greater than ten times that of said lower layer portions and each having a thickness less than one-half the thickness of the double-layer such that during application to the electrodes of charge storage potentials, large packets of charge carriers present are mainly stored in said upper layer portions, and during application to the electrodes of charge transfer potentials, the last charge fractions of the packets are mainly transferred through said lower layer portions, said upper layer portions being fully depleted during normal operation in the absence of locally introduced free charge carriers.

**4,012,760**  
**SEMICONDUCTOR COLD ELECTRON EMISSION DEVICE**  
 Katsuo Hara, Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan  
 Division of Ser. No. 451,754, March 18, 1974, Pat. No. 3,972,060. This application Mar. 22, 1976, Ser. No. 669,237  
 Int. Cl.<sup>2</sup> H01L 27/14  
 U.S. Cl. 357—30  
 3 Claims



1. A cold emission semiconductor device comprising a first layer of GaAlP, and of several hundred Angstroms thickness and of n-type conductivity; a second layer of GaAlP of p-type conductivity and of a thickness less than the diffusion length of electrons, and whose effective forbidden band gap is

**4,012,762**  
**SEMICONDUCTOR FIELD EFFECT DEVICE HAVING OXYGEN ENRICHED POLYCRYSTALLINE SILICON**  
 Motoaki Abe, Hiratsuka, and Teruaki Aoki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
 Filed June 16, 1975, Ser. No. 587,153  
 Claims priority, application Japan, June 24, 1974, 49-72078  
 Int. Cl.<sup>2</sup> H01L 29/34

U.S. Cl. 357—52

7 Claims

1. A metal insulator semiconductor field effect transistor structure comprising.

- a. a substrate of semiconductor material of one conductivity type having one major surface,
- b. source and drain region of another conductivity type produced in said substrate,
- c. gate insulating layer and gate electrode disposed between said source and drain region on said major surface,







- d. plastic encapsulation means for enclosing and holding in alignment said metallic lead members, said mounting portion and said semiconductor chip, a surface of said plastic encapsulation means being planarly coincident with said second surface of said mounting portion such that said second surface of said mounting portion is exposed; and
- e. a metallic heat sink having a recess transverse to said longitudinal axis, said recess adapted to receive said plastic encapsulation means wherein said surface of said plastic encapsulation means is insulatively joined to the surfaces of said recess with said groups of metallic lead members extending beyond the sides of said metallic heat sink.

4,012,769

## HEAT SINK WITH PARALLEL FLAT FACES

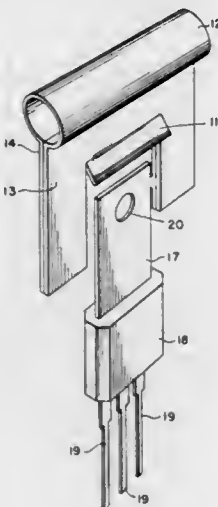
Steven F. Edwards, and James D. Pritchett, both of Dallas, Tex., assignors to Thermalloy Incorporated, Dallas, Tex.

Filed Aug. 4, 1975, Ser. No. 601,920

Int. Cl.<sup>2</sup> H01L 23/02, 23/28; E28F 7/00; H01B 7/24

U.S. Cl. 357—81

7 Claims



1. Unitary heat sink apparatus comprising a substantially cylindrical body of thermally conductive material having a pair of mutually opposed substantially flat members extending radially outwardly from said cylindrical body, the opposed faces of said radially extending members being resiliently urged into mutual contact by the substantially cylindrical body, each of said opposed faces having a notch therein, said notches lying in register and defining an open-ended space for receiving the body of a semiconductor encapsulation device having a central body with leads extending from one end of said body and a thermal conductor tab extending from the opposite end of said body when said thermal conductor tab is grippingly held between said opposed faces, the sides of said flat members defining said notches extending along opposite sides of said central body to retain said central body within said notches and to act as fins extending into the surrounding environment, at least one of said flat members having the edge thereof at the base of said notch flared outwardly from the opposed flat member.

4,012,770

## COOLING A HEAT-PRODUCING ELECTRICAL OR ELECTRONIC COMPONENT

Milton F. Pravda, and Walter B. Bienert, both of Baltimore, Md., assignors to Dynatherm Corporation, Cockeysville, Md.

Filed Sept. 28, 1972, Ser. No. 293,005

Int. Cl.<sup>2</sup> H01L 23/42; F28D 15/00

U.S. Cl. 357—82

12 Claims

1. Apparatus for cooling a heat-producing power semiconductor comprising a pair of enclosed vapor chambers each having a depth of approximately the same order of magnitude

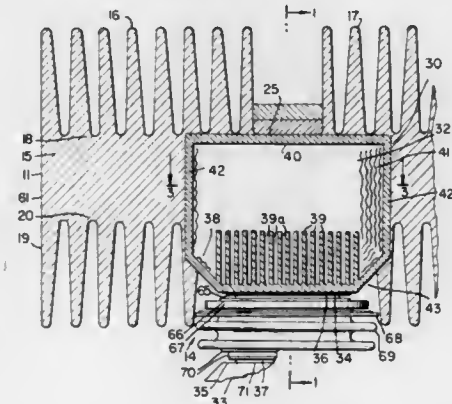
as the depth of the semiconductor, each chamber having a wall which is in tight mating contact with one face of a pair of opposed faces of said semiconductor, said tight mating contact being provided by clamping means holding the vapor chambers to the semiconductor, said chambers and semiconductor being enclosed in a cabinet,

a layer of low melting point metal between each said wall and face and forming an interface therebetween which is effective to pass electric current and heat thereacross, said metal being solid at ambient conditions but having a metal point sufficiently low that the passage of heat through the interface is enough to melt the metal and to form a liquified metal interface,

a vaporizable agent in each chamber for absorbing heat passing through the interface from the semiconductor and thereby becoming vaporized, means in each chamber comprising an opening in a side thereof for removing resulting vapors therefrom,

a plurality of spaced fins extending from the inner surface of said wall for a substantial distance at least part of the way across said chamber, said fins being elongated and closely spaced and having capillary means in contact therewith which impart to the fins a wicking action, said capillary means being saturable by said agent in liquefied state, and the diameter of each chamber being greater than its depth to insure effective wicking action,

an electrically and thermally conductive tube connected to said opening of each chamber and extending out of said cabinet for transferring vapors away from said chambers,



said tube being distinct from said chamber, an electric lead connected to each tube adjacent the chamber to help establish an electric circuit incorporating said chambers and semiconductors, said tubes being otherwise electrically and thermally insulated, and capillary means in each tube,

vapor cooling means beyond said cabinet connected to each tube for abstracting heat from said vapors, thereby serving to condense the vapors with the concomitant production of heat of condensation,

a finned heat sink in heat exchange relation with each said vapor cooling means for dissipating said abstracted heat and said heat of condensation,

a liner of an electrically insulating, thermally conducting material between each said vapor cooling means and said heat sink whereby the latter is electrically non-conducting but thermally conducting,

and said condensed vapors being transferrable by the capillary means in said tubes from said vapor cooling means back to said vapor chambers and being transferrable by the capillary means in the chambers to an area adjacent each interface where they may be re-vaporized and again made effective to absorb heat from said interface.

7. A heat sink for cooling a heat-producing electrical or electronic component comprising a pair of enclosed vapor chambers having a depth of approximately the same order of magnitude as the depth of the component, each chamber having an electrically and thermally conductive wall which is in tight mating contact with a face of said component, clamp-

ing means for holding the chambers and component in said tight mating contact, said mating contact forming an interface which is effective to pass electric current and heat thereacross in a direction substantially normal to said interface, a plurality of closely spaced elongated fins extending from the inner surface of said wall for a substantial distance at least part of the way across said chamber, said fins having capillary means in contact therewith which impart to the fins a capillary or wicking action, a second capillary means in the chamber occupying the chamber volume not occupied by the fins, a vaporizable agent in the chamber occupying the space between fins and effective to absorb heat from the component across the interface, thereby becoming vaporized,

the diameter of said chamber being greater than its depth to insure effective wicking action,

vapor cooling means in thermal contact with each chamber and disposed externally thereof for abstracting heat from said vapors, thereby serving to condense the vapors with the concomitant production of heat of condensation, said vapor cooling means comprising a web in said heat sink having a recess in which said vapor chamber is tightly disposed in a state of compression, said chamber having electrically conductive walls for passing current from the interface to said web, an electrical lead attached to each said web for introducing current to, and removing current from, said heat sink,

and means for dissipating heat from said vapor cooling means comprising fins on upper and lower sides of said web which extend in a direction substantially normal to end faces of said web.

4,012,771

## APPARATUS FOR RECORDING AND/OR REPRODUCING COLOR VIDEO SIGNALS

Yoshio Ishigaki, Tokyo; Takao Tsuchiya, Fujisawa, and Tsutomu Niimura, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

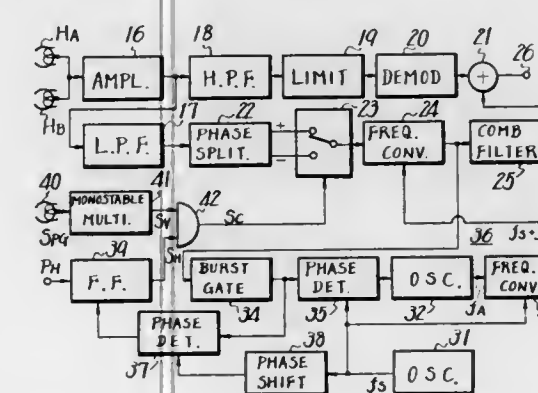
Continuation-in-part of Ser. No. 544,831, Jan. 28, 1975, abandoned. This application Jan. 23, 1976, Ser. No. 651,791

Claims priority, application Japan, Feb. 5, 1974, 49-14746

Int. Cl.<sup>2</sup> H04N 5/79

U.S. Cl. 358—4

28 Claims



1. In an apparatus for reproducing video signals having luminance and chrominance signal components and comprised of field intervals and line intervals which are recorded in respective areas of successive parallel tracks on a record medium with said chrominance signal components of video signals recorded in next adjacent tracks having different first and second carriers; the combination of rotational transducer means for scanning along said tracks one at a time so as to reproduce the video signals recorded in each of said tracks along with cross-talk signals from the tracks next adjacent thereto, pulse signal generating means for producing pulse signals indicating the rotational positioning of said transducer means, means for separating said chrominance signal components from the luminance signal components in the reproduced signals, means for extracting horizontal synchronizing signals from said reproduced signals, signal processing means for providing the separated chrominance signal components

of video signals reproduced from each of said tracks with a common carrier and for eliminating from the resultant chrominance signal components the chrominance signal components of the cross-talk signals on the basis of said different first and second carriers with which the chrominance signal components are recorded in the tracks which are next adjacent to each other, phase detecting means for detecting phase reversals of said common carrier of said resultant chrominance signal components, and means for controlling said signal processing means in response to said pulse signals, said horizontal synchronizing signals and said phase detecting means so as to maintain continuity of the phase of said common carrier of the resultant chrominance signal components.

4,012,772

## CONVERSION OF COLOR TELEVISION SIGNALS TO OR FROM INTERLACED FORM

John Philip Chambers, and Derek Thomas Wright, both of Copthorne, England, assignors to The Marconi Company Limited and Standard Telephone & Cables Limited, both of London, England

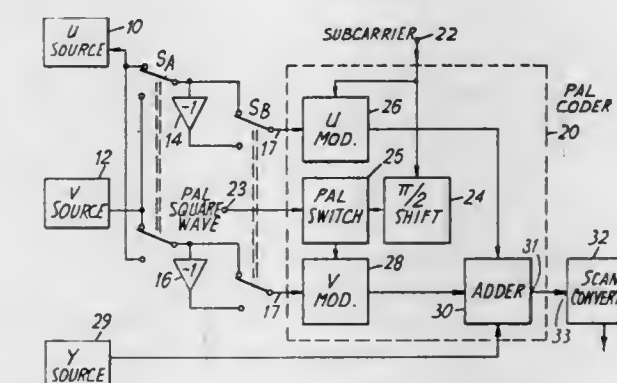
Filed Sept. 9, 1975, Ser. No. 611,673

Claims priority, application United Kingdom, Sept. 13, 1974, 40114/74

Int. Cl.<sup>2</sup> H04N 9/42

U.S. Cl. 358—11

6 Claims



1. The combination comprising: scan conversion apparatus for the conversion of color television signals from sequential to interlace form or from interlace to sequential form or from one interlace form to another; and

a PAL or NTSC color encoder connected to said conversion apparatus and having inputs for receiving color signals and subcarrier signals and modulation means connected to said inputs for quadrature modulating two received color signals onto said subcarrier signal;

wherein the output of said encoder is connected to the input of said conversion apparatus, and there being further included controllable phase shift means connected to one or more of the inputs of said encoder, which means is adapted to vary the phase of the modulated color subcarrier for each line of received color signals by substantially an integral number of quarter cycles in dependence upon the line number, such that the output of said conversion apparatus provides an encoded output signal with the color subcarrier in PAL or NTSC format.

4,012,773

## COLOR TELEVISION PICTURE TUBES WITH IMPROVED IMPLOSION PROTECTION SYSTEM

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 17, 1975, Ser. No. 632,559

Int. Cl.<sup>2</sup> H04N 5/65

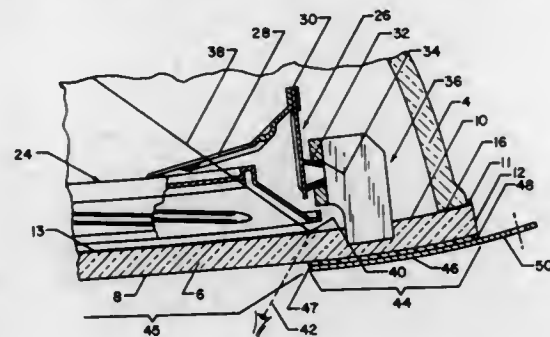
U.S. Cl. 358—245

4 Claims

1. A rectangular, shadow mask type color television picture tube including a glass tube with a flangeless curved faceplate



which has a concave rear surface with a phosphor screen deposited on a central portion thereof, and shadow mask suspension elements located on said rear surface in each peripheral corner region of said faceplate, said glass bulb also having a funnel which mates with said concave rear surface of said faceplate to define a sealing interface, said faceplate having a convex front surface with a rectangular central area through which television pictures are viewed and a relatively wide peripheral non-viewing area surrounding said central viewing area and overlying said elements, said tube being



characterized by having a low cost facebond implosion protection system comprising a high-tensile strength frame having a curvature corresponding to the curvature of said front surface of said faceplate and having substantially the same rectangular shape and size thereof, said frame having a substantially rectangular central window at least as large as said viewing area of said faceplate front surface but not extending over said suspension elements, said frame being firmly bonded to said peripheral non-viewing area of said front surface so as to environ said viewing area thereof and hold together glass fragments of a fractured faceplate.

4,012,774

#### DROP-OUT RESPONSIVE COLOR VIDEO REPRODUCING APPARATUS

Yasunobu Kuniyoshi, Tokyo; Hisaaki Narahara, Musashino, and Takao Tsuchiya, Fujisawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

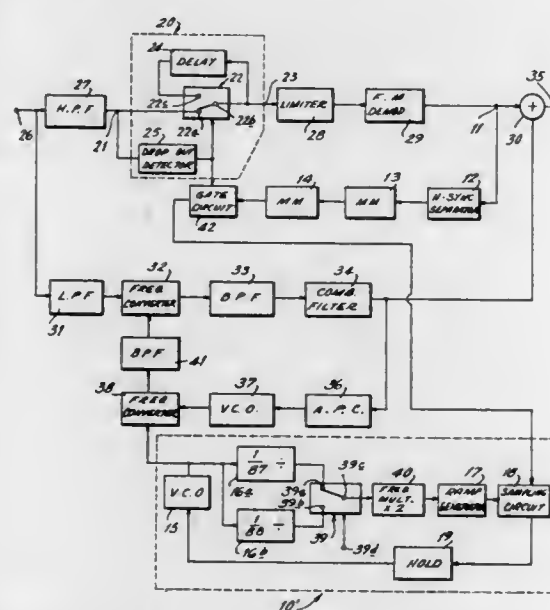
Filed Feb. 18, 1976, Ser. No. 659,009

Claims priority, application Japan, Feb. 20, 1975, 50-21264

Int. Cl.<sup>2</sup> H04N 5/76

U.S. Cl. 358—8

15 Claims



1. An apparatus for processing reproduced color video signals which are composed of a frequency-modulated luminance component containing synchronizing pulse signals and a frequency-converted chrominance component having a carrier frequency substantially lower than a standard frequency therefor, said apparatus comprising:

drop-out compensating means responsive to a drop-out in said luminance component for inserting, in the interval of

said drop-out, an earlier occurring portion of said luminance component;

means for separating the synchronizing pulse signals from the luminance component following the compensation of the latter by said drop-out compensating means; and

frequency-reconverting means including a frequency converter receiving said chrominance component, means for generating a frequency-reconverting signal which is applied to said frequency-reconverting means for causing the latter to restore the carrier frequency of said chrominance component to said standard frequency thereof, means for controlling the frequency of said frequency-reconverting signal in response to said separated synchronizing pulse signals, and means responsive to a drop-out in said luminance component for maintaining the frequency of said frequency-reconverting signal at a previously determined value during said drop-out.

4,012,775

#### SYSTEM FOR STABILIZING CATHODE RAY TUBE OPERATION

Clyde Smith, North Salem, N.Y., assignor to Thomson CSF Laboratories, Inc., Stamford, Conn.

Filed Apr. 28, 1975, Ser. No. 572,169

Int. Cl.<sup>2</sup> H04N 9/12

U.S. Cl. 358—29

20 Claims

11. In a video display apparatus which includes a cathode ray tube having a plurality of electron guns and means for applying a plurality of television video signals representative of color picture information to said electron guns; a system for balancing the color screen temperature of said cathode ray tube, comprising:

means for generating first and second test signals during the vertical blanking intervals of said television video signal;

means for applying said first and second test signals to said electron guns during first and second portions, respectively, of said vertical blanking intervals;

means for sampling the beam current of each electron gun during said first and second portions and for generating first and second correction signals, respectively, for each electron gun in accordance with the sampled values; and

means for applying said first and second correction signals to their respective electron guns so as to balance the screen color temperature of said cathode ray tube.

4,012,776

#### LUMINESCENT SCREEN LASER SCANNING TECHNIQUE

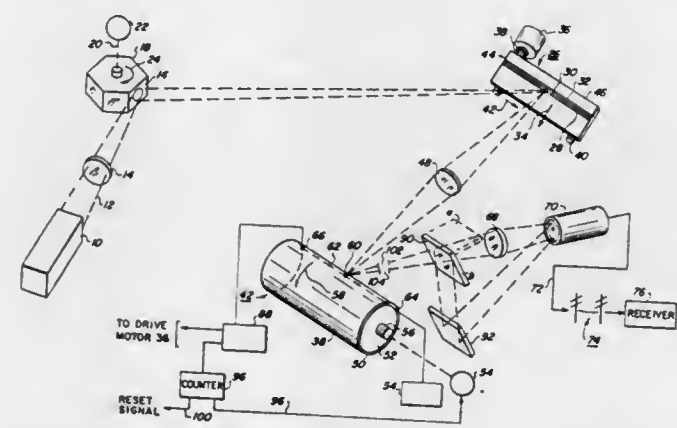
Peter Mrdjen, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 589,106, June 23, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,313

Int. Cl.<sup>2</sup> H04N 9/10, 9/14

U.S. Cl. 358—75

42 Claims



1. Apparatus for scanning an original document with light of at least two colors, said original document comprising a plurality of elemental lines, comprising:

laser means for providing a laser beam of a first color,

means for supporting an original document at a first location,

means for providing light of at least two colors comprising first means for generating light of a second color when irradiated by said laser beam, and second means for generating light of a third color when irradiated by said laser beam,

rotatable scanning means positioned to direct said laser beam to said light providing means, said scanning means changing the direction of said laser beam during the rotation thereof in order to move said laser beam along a scan line at said light providing means,

means for focusing the light generated by scanning said first and second light generating means as a scanning spot on said original document, and

means for moving said rotatable scanning means and said supporting means in a manner whereby each elemental line on said original document is scanned at least by light of said second and third colors.

4,012,777

#### RECORD CARRIER AND DEVICE FOR PLAYING BACK SAME

Frederik Ate de Jonge, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 547,993, Feb. 7, 1975, abandoned.

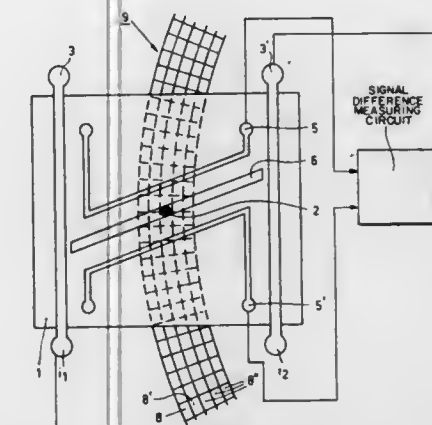
This application Dec. 15, 1975, Ser. No. 640,485

Claims priority, application Netherlands, Feb. 28, 1974, 7402690

Int. Cl.<sup>2</sup> G11B 5/02, 21/02, 5/12

U.S. Cl. 360—77

8 Claims



1. A recording device comprising a magnetic converter element cooperating with magnetic tracks on a magnetizable record carrier, wherein the converter element comprises a sheet of magnetizable material having an easy axis of magnetization normal to the plane of the sheet, which sheet comprises a single-walled magnetic domain, means on said sheet for detecting variations of the size of the magnetic domain caused by variations in the field pattern of the record carrier, means on said sheet for detecting a shift of said magnetic domain with respect to said tracks, and means for correcting the position of the domain in the sheet with respect to said tracks.

4,012,778

#### LINEAR ACTUATOR

James L. Johnson, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,206

Int. Cl.<sup>2</sup> G11B 21/08, 5/55; F16H 27/04

U.S. Cl. 360—78

19 Claims

16. In a disk drive including a support frame, a magnetic recording disk mounted to said support frame for rotation about its axis, and at least one electromagnetic head mounted to a carriage and positionable relative to said magnetic recording disk by movement of said carriage along a predefined path, an improved linear actuator for selectively moving said car-

riage relative to said support frame along said predefined linear path, said improved linear actuator comprising:

a drive shaft having a cylindrical surface;

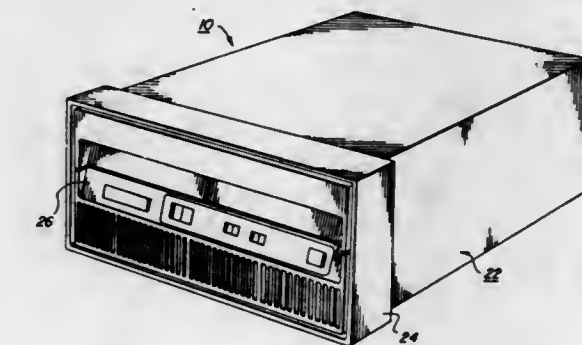
means for rotatably mounting said drive shaft to said frame for rotation of said drive shaft about the axis of said cylindrical surface;

means coupled to said drive shaft for rotating said drive shaft about said axis;

said carriage which forms part of a head carriage assembly, the remainder of said assembly being mounted to said carriage and including said at least one electromagnetic head and a roller;

means for mounting said roller to said carriage with said roller being rotatable about a first axis and pivotable about a second axis perpendicular to said first axis;

means for mounting said carriage to said support frame with



said carriage and thus said assembly being movable relative to said support frame along said predefined linear path, and with said roller being in frictional engagement with the cylindrical surface of said drive shaft whereby said roller is caused to rotate about said first axis by rotation of said drive shaft when said first axis is parallel to the axis of the drive shaft and is additionally caused to move along said predefined linear path during rotation of said drive shaft when said first axis is oblique to the axis of said drive shaft, the center of mass of said assembly lying along a line parallel to the axis of the drive shaft and substantially intersecting or at least closely adjacent the nip between said roller and said cylindrical surface; and

means for controllably pivoting said roller about said second axis to control movement of said roller and thus said carriage and said assembly along said predefined linear path during rotation of said drive shaft.

4,012,779

#### LINEAR ACTUATOR

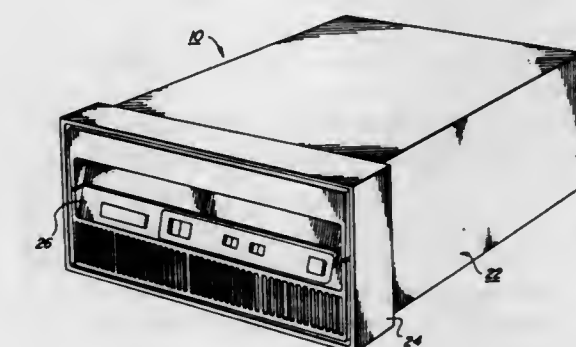
Russell K. Brunner, Santa Clara, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,332

Int. Cl.<sup>2</sup> G11B 21/08, 5/55; F16H 27/04

U.S. Cl. 360—78

4 Claims



3. In a disk drive including a support frame, a magnetic recording disk mounted to said support frame for rotation about its axis, and at least one electromagnetic head mounted



to a carriage and positionable relative to said magnetic recording disk by movement of said carriage along a predefined path, an improved linear actuator for selectively moving said carriage relative to said support frame along said predefined linear path, said improved linear actuator comprising:

- a drive shaft having a cylindrical surface;
- means for rotatably mounting said drive shaft to said frame for rotation of said drive shaft about the axis of said cylindrical surface;
- means coupled to said drive shaft for rotating said drive shaft about said axis;
- a roller having peripheral surface of convex cross-sectional configuration;
- means for mounting said roller to said carriage with said roller being rotatable about a first axis and pivotable about a second axis perpendicular to said first axis;
- means for mounting said carriage to said support frame with said carriage being movable relative to said support frame along said predefined linear path and with said roller being in frictional engagement with the cylindrical surface of said drive shaft whereby said roller is caused to rotate about said first axis by rotation of said drive shaft when said first axis is parallel to the axis of the drive shaft and is additionally caused to move along said predefined linear path during rotation of said drive shaft when said first axis is oblique to the axis of said drive shaft; and
- means for controllably pivoting said roller about said second axis to control movement of said roller and thus said carriage along said predefined linear path during rotation of said drive shaft.

4,012,780

## LINEAR ACTUATOR

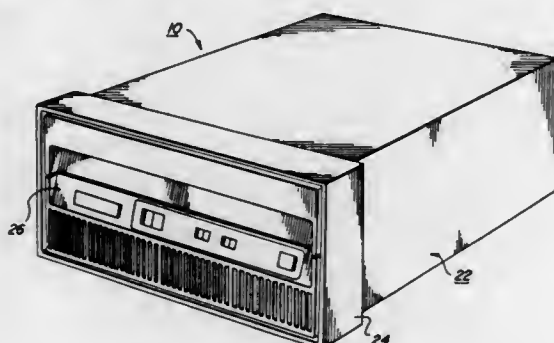
James L. Johnson, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,205

Int. Cl.<sup>2</sup> G11B 21/08, 5/55

U.S. Cl. 360-78

7 Claims



1. A linear actuator for selectively moving a carriage relative to a support frame along a predefined linear path, comprising:

- a drive shaft having a cylindrical surface;
- means for rotatably mounting said drive shaft to said frame for rotation of said drive shaft about the axis of said cylindrical surface;
- means coupled to said drive shaft for rotating said drive shaft about said axis;
- a carriage to be driven along said predefined linear path between an inactive position and at least one active position;
- a roller;
- means for mounting said roller to said carriage with said roller being rotatable about a first axis and pivotable about a second axis perpendicular to said first axis;
- means for mounting said carriage to said support frame with said carriage being movable relative to said support frame along said predefined linear path between said inactive and at least one active position and with said roller being in frictional engagement with the cylindrical surface of

said drive shaft whereby said roller is caused to rotate about said first axis by rotation of said drive shaft when said first axis is parallel to the axis of the drive shaft and is additionally caused to move along said predefined linear path during rotation of said drive shaft when said first axis is oblique to the axis of the drive shaft, said means for mounting said carriage to said support frame including means for biasing said roller against said cylindrical surface with a first level of force when said carriage is at said at least one active position and with a second level of force when said carriage is at said inactive position; and

means for controllably pivoting said roller about said second axis to control movement of said roller and thus said carriage along said predefined linear path during rotation of said drive shaft.

4,012,781

## MAGNETORESISTIVE READ HEAD ASSEMBLY FOR SERVO OPERATION

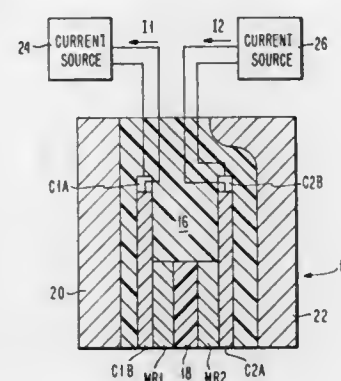
Charles Chia-Hsiung Lin, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,693

Int. Cl.<sup>2</sup> G11B 5/30, 5/22, 21/10

U.S. Cl. 360-113

9 Claims



1. A head assembly for sensing magnetically recorded information from a medium and operable to provide servo information, said assembly comprising:

- a plurality of magnetoresistive elements spaced from each other with each sensing a different portion of the same magnetic recorded information;
- a first conductor means electrically connected to each element at alternating ends;
- a second conductor means electrically connected to each element such that the outer edge of each second conductor means is on a dividing line defining the centerline or the track boundary of the magnetic flux transitions sensed by one element and its adjacent element such that essentially no dead band remains therebetween;
- means for applying a current to each of said first and second conductor means; and
- biasing means for providing a magnetic operating bias for said elements at least between said first and second conductor means for sensing the magnetically recorded information.

4,012,782

## READ-ONLY INTEGRATED MAGNETIC HEAD

Jean-Pierre Lazzari, Montfort L'Amaury, France, assignor to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Aug. 12, 1975, Ser. No. 604,058

Claims priority, application France, June 19, 1975, 75.19167

Int. Cl.<sup>2</sup> G11B 5/20, 5/14

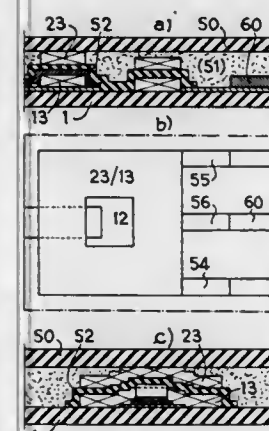
U.S. Cl. 360-123

17 Claims

1. A read-only integrated magnetic head device subject to spurious electro-magnetic fields which are generated exter-

nally to the head by neighboring electro-magnetic field sources comprising:

- a non-magnetic sub-strate having front and rear edges;
- first and second flat-conductor winding coils of substantially identical dimensioning and coverage supported on said sub-strate;
- output leads extending from said first and second flat conductor winding coils to the said rear edge of said sub-strate;
- a pair of magnetic pole-piece layers spaced apart at front edges thereof to define a magnetic gap at said front edge



of said sub-strate and having a part of said first flat conductor winding coil inserted between them;

means decoupling said second flat conductor winding coil from any magnetic field generated by said pair of pole-piece layers and said first flat conductor winding coil;

means for eliminating from the readout current any component due to spurious electro-magnetic fields by opposing the electrical current generated in said second flat conductor winding coil by external spurious electro-magnetic fields by the current component identically generated in said first flat conductor winding coil by the same external spurious electro-magnetic fields.

4,012,783

## MAGNETIC HEAD

Naohiro Hanaoka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

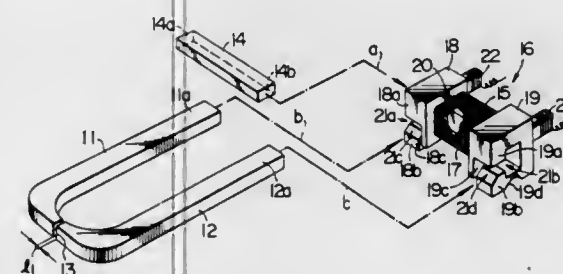
Filed Jan. 14, 1976, Ser. No. 648,919

Claims priority, application Japan, Jan. 20, 1975, 50-8573; Jan. 24, 1975, 50-10291

Int. Cl.<sup>2</sup> G11B 5/12

U.S. Cl. 360-125

4 Claims



1. A magnetic head comprising a pair of core pieces having a spacer interposed therebetween to define a gap, a yoke interconnecting the ends of the core pieces which are remote from the gap, a bobbin having a pair of flanges at its opposite ends which are adapted to maintain portions of the core pieces and the yoke which are to be bonded together in abutting engagement when they are engaged with the flanges, and a coil disposed on the bobbin intermediate the flanges.

# 4,012,784 VOICE LOGGING RECORDER INCLUDING DECKS DEDICATED FOR BOTH LOGGING AND RECALL OPERATIONS

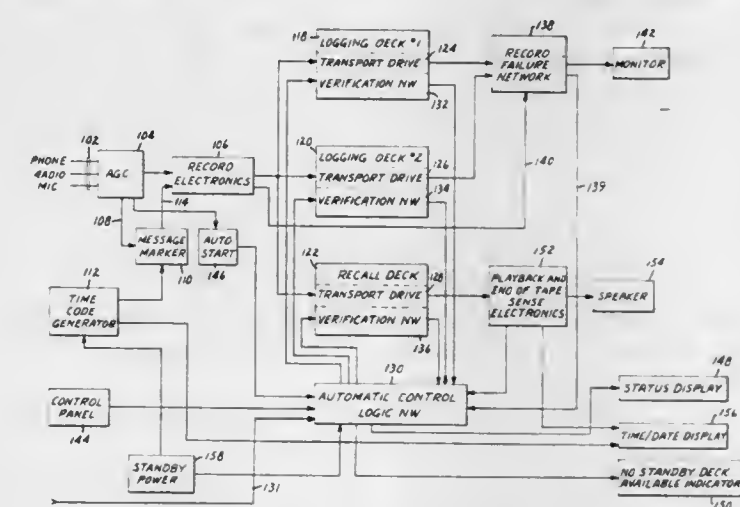
Robert L. Murphy, Oxnard, and Dan J. Argento, Thousand Oaks, both of Calif., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Nov. 28, 1975, Ser. No. 635,871

Int. Cl.<sup>2</sup> G11B 15/02, 27/30

U.S. Cl. 360-5

13 Claims



1. A voice logging recorder comprising

a logging deck including means for recording voice data onto magnetic recording tape passing therethrough,

a recall tape deck including means for recording or playing said voice data while recording on the other deck to enable on-line recall of voice data without interruption of the recording of voice data onto the tape of the logging deck,

means enabling intermittent actuation of the decks in response to an input signal associated with the beginning of a message containing the voice data to log the voice data onto tape of each deck,

means for recording on the tape of the recall deck a predetermined signal pulse upon the actuation of the decks in response to a said input signal, and

means for sensing each recorded signal pulse to locate the beginning of each recorded message during fast rewind of the tape in the recall deck.

4,012,785

## MAGNETIC RECORDING PLAYBACK CIRCUIT

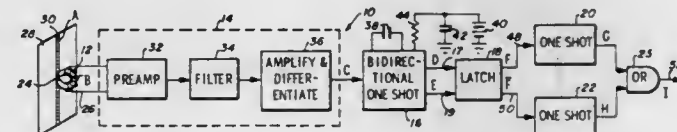
David L. MacDougall, Jr., San Jose, Calif., assignor to Shugart Associates, Inc., Sunnyvale, Calif.

Filed Feb. 13, 1976, Ser. No. 657,714

Int. Cl.<sup>2</sup> G11B 5/00

U.S. Cl. 360-43

10 Claims

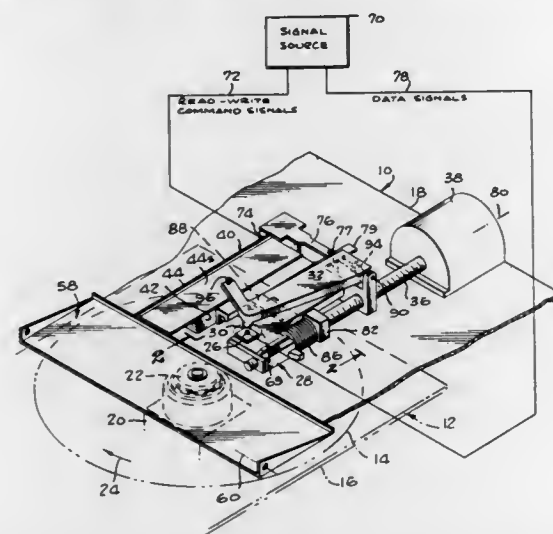








a data transfer head mounted on said head carriage at a location spaced from the axis of said screw;  
 a second carriage threadably engaged with said lead screw independently of said head carriage;  
 means for pivoting said head carriage about said lead screw by a fraction of a turn, including spring means for urging the head carriage to pivot in a first direction to move said head against said data disk position, and selectively actu-



able electrical means for opposing said spring means to pivot said head carriage in a second direction to move the head away from the disk position;  
 said spring means coupling said head and second carriages for urging them to rotate in opposite directions; and  
 means for preventing rotation of said second carriage beyond a predetermined position under the force of said spring means.

4,012,792

#### MAGNETIC HEAD DRUM CONFIGURATION HAVING A FRICTION REDUCING HELICAL STEP

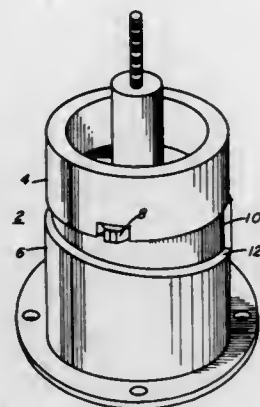
Richard M. Bloom, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,557

Int. Cl.<sup>2</sup> G11B 15/64, 5/60; B65H 17/32

U.S. Cl. 360-130

9 Claims



1. An assembly for use in scanning a magnetic tape comprising:

a first drum section having attached thereto at least one magnetic head and being journaled for rotation about an axis to define trajectory for said head(s), said first drum section having a predetermined diameter about said axis;  
 a second drum section which is adjacent to and coaxial with the first drum section and includes means for maintaining such section fixed relative to said axis; and  
 means for directing such a tape along a preselected tape wrap path which extends over said first and second drum sections, said path extending over at least a portion of the trajectory of said head(s),  
 said second drum section having a reduced diameter relative to said first drum section along that portion of the preselected tape wrap path which extends over such second drum section.

4,012,793

#### MULTIORIENTED COMPOSITE-SURFACE TAPE GUIDE FOR USE IN A CASSETTE

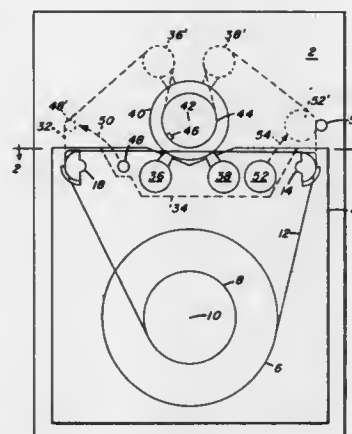
Douglass L. Blanding, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1975, Ser. No. 607,002

Int. Cl.<sup>2</sup> G11B 23/04, 15/66, 5/52

U.S. Cl. 360-130

9 Claims



1. For use in a tape cassette of the type having first and second rotatable reels, the cassette being useful with a helical scan recorder, the cassette having a window out of which tape may be withdrawn and helically wrapped around a recording drum, the cassette further having at least one guide post disposed in the path of travel of the tape as it passes from one of the reels to the other, the improvement wherein the post comprises:

first and second contiguous guiding surfaces, said first surface being part of a cylinder and said second surface being part of a cone, said post being so oriented that the tape rides in guiding contact with said cylindrical part whether or not the tape is withdrawn out of the cassette window, and said second surface being so oriented on the post that the tape rides in guiding contact with said conical part only when the tape is not withdrawn out of the cassette window.

## DESIGN PATENTS

GRANTED MARCH 15, 1977

### ERRATA

For CLASS	See PATENT NO.
006-141	243,658
008-319	243,661
008-350	243,662
015-138	243,664
015-068	243,686
016-065	243,687
019-088	243,688
022-027	243,689
023-018	243,690
023-055	243,691
023-055	243,692
023-055	243,693
023-072	243,694
013-024	243,698
013-031	243,699
014-040	243,700
027-042	243,702
064-011 B	243,701
024-029	243,705
015-029	243,708
015-005	243,714
024-049	243,715
028-050	243,719
028-051	243,720



# DESIGNS

MARCH 15, 1977

## 243,641 PANTYHOSE

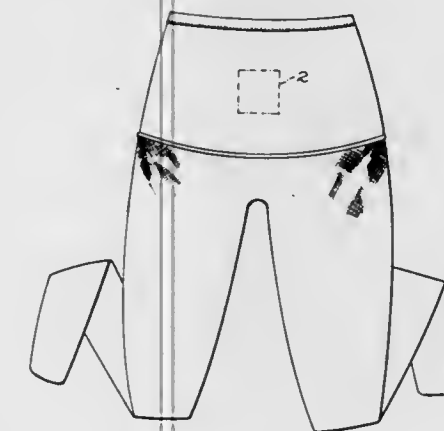
Teresita Alvarez, New York, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 7, 1975, Ser. No. 548,168

Term of patent 14 years

Int. Cl. D02-04

U.S. Cl. D2-6



## 243,643 STOCKING

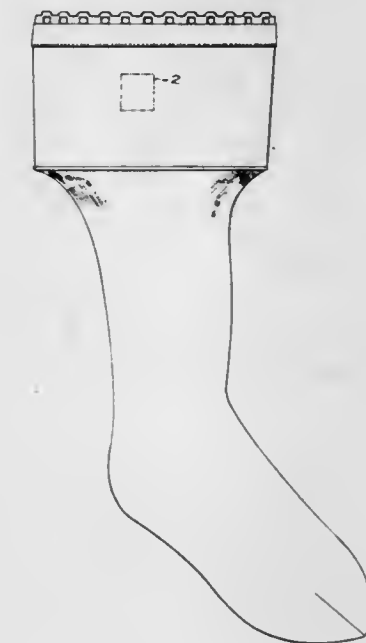
Teresita Alvarez, New York, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 7, 1975, Ser. No. 548,169

Term of patent 14 years

Int. Cl. D02-04

U.S. Cl. D2-337



## 243,642 REMOVABLE INSOLE CUSHION

John L. Voorhees, 13053 N. 33 Place, Phoenix, Ariz. 85029

Filed June 13, 1974, Ser. No. 479,114

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-318



## 243,644 NECKTIE

Charles Mack Brown, 625 Sawyer St., San Francisco, Calif. 94134

Filed Apr. 2, 1975, Ser. No. 564,264

Term of patent 14 years

Int. Cl. D2-05

U.S. Cl. D2-351





243,645

**RUG CAROUSEL**

John A. Slack, Dalton, Ga., assignor to World Carpets, Alexander N. Schoenfeld, Roslyn Heights, N.Y., assignor to Dalton, Ga.

Filed Apr. 22, 1975, Ser. No. 570,361

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-25



243,647

**MERCHANDISE DISPLAY MODULE**

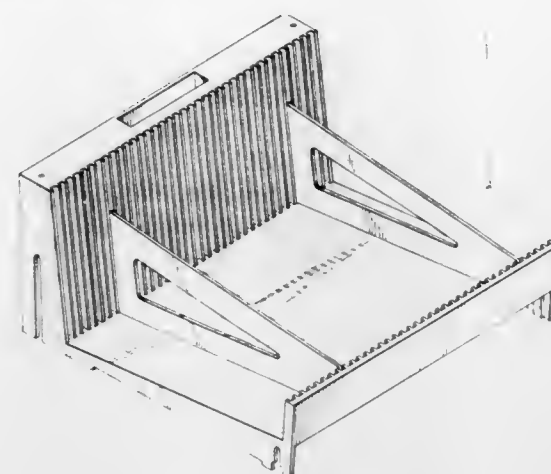
Alexander N. Schoenfeld, Roslyn Heights, N.Y., assignor to Trans-World Display Corporation, New York, N.Y.

Filed Aug. 21, 1975, Ser. No. 606,685

Term of patent 14 years

Int. Cl. D20-02

U.S. Cl. D6-188



243,648

**CONTAINER TO HOLD BEVERAGE BOTTLES AND GLASSES**

Federico Conroy, Reina Victoria 860, Quito, Ecuador

Filed Apr. 23, 1975, Ser. No. 570,816

Term of patent 14 years

Int. Cl. D7-06

U.S. Cl. D7-71



243,646

**DISPLAY STAND FOR NECKLACES OR THE LIKE**

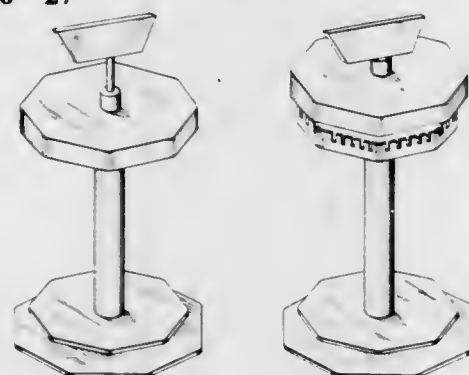
George W. Nolan, Seekonk, Mass., assignor to Richton International Corporation

Filed Mar. 29, 1976, Ser. No. 671,508

Term of patent 14 years

Int. Cl. D20-02

U.S. Cl. D6-27



243,649

**COOKING RACK FOR USE IN MICROWAVE OVENS OR THE LIKE**

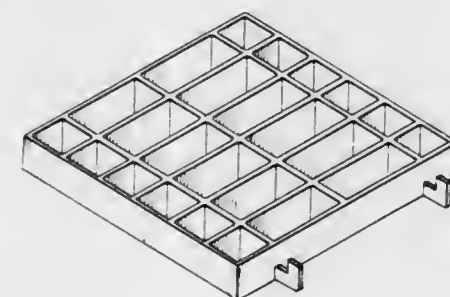
Lloyd H. Carbary, 27635 Edward, Roseville, Mich. 48066

Filed July 3, 1975, Ser. No. 592,825

Term of patent 14 years

Int. Cl. D7-02; D6-04

U.S. Cl. D7-129



243,650

**KITCHEN SCISSORS**

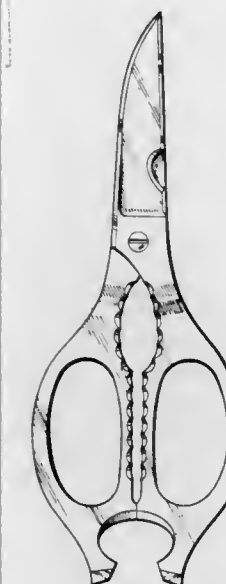
Toru Hayashi, Seki, Japan, assignor to Hayashi Cutlery Co., Ltd., Seki, Japan

Filed Feb. 26, 1975, Ser. No. 553,319

Term of patent 14 years

Int. Cl. D8-03

U.S. Cl. D8-55



243,652

**CORDLESS ELECTRIC TOOL**

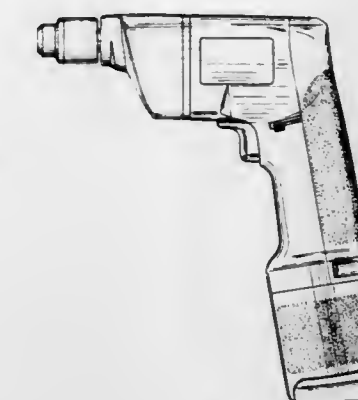
Donald William Zurwelle, Lutherville; Lee Webber Ramstrom, Kingsville, and Stanley Alan Markle, Lutherville, all of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed July 31, 1975, Ser. No. 600,262

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. 8-68



243,653

**WALL PLATE-MARGIN AND FILIGREE**

Leonard Fine, Brooklyn, N.Y., assignor to General Electric Company, N.Y.

Filed Oct. 20, 1975, Ser. No. 624,086

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-353



243,651

**DRESSMAKER'S SHEARS**

Toru Hayashi, Seki, Japan, assignor to Hayashi Cutlery Co., Ltd., Seki, Japan

Filed Feb. 26, 1975, Ser. No. 553,237

Term of patent 14 years

Int. Cl. D8-03

U.S. Cl. D8-57



243,654

**PORTABLE CORD HOLDER**

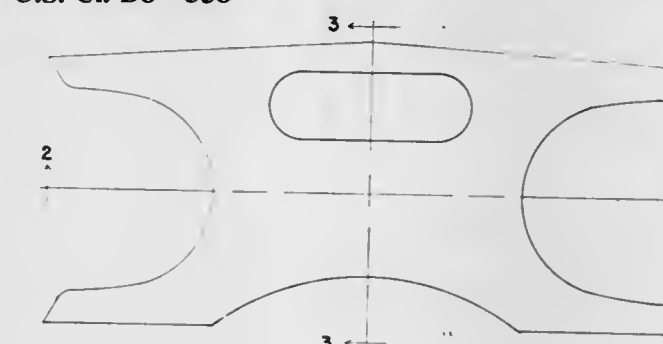
Thomas J. Burgoyne, 143 Canal St., Brattleboro, Vt. 05301

Filed May 11, 1976, Ser. No. 685,311

Term of patent 14 years

Int. Cl. D8-99

U.S. Cl. D8-358





243,655

## ADAPTOR PLATE

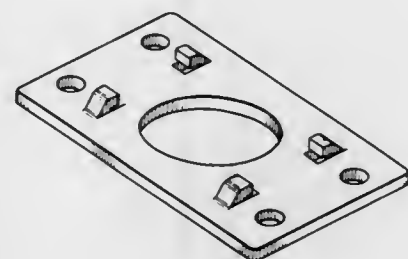
Stephen Matousek, Chagrin Falls, and Ulrich H. Koch, Bainbridge Township, both of Ohio, assignors to Whitey Research Tool Co.

Filed May 19, 1975, Ser. No. 578,757

Term of patent 14 years

Int. Cl. D8-08

U.S. Cl. D8-354



243,658

## DISPLAY STAND FOR RINGS

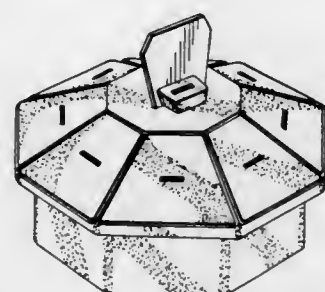
David Schneider, 31 Vista del Golfo, Long Beach, Calif. 90803

Filed Mar. 17, 1976, Ser. No. 667,647

Term of patent 14 years

Int. Cl. D20-02

U.S. Cl. D6-141



243,656

## BOTTLE OR SIMILAR ARTICLE

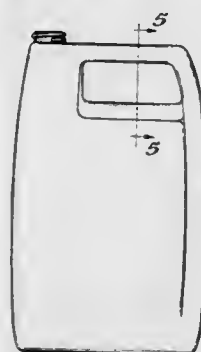
Wayne Robert Hutter, and John Andrew Miller, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1975, Ser. No. 608,862

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-53



243,659

## BOTTLE

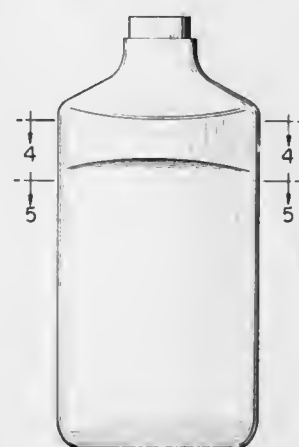
James E. Plummer, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Oct. 1, 1975, Ser. No. 618,310

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-167



243,657

## BOTTLE

Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Oct. 1, 1975, Ser. No. 618,296

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-129



243,660

## BOTTLE

Ira Howard Levy, New York, N.Y., assignor to Estee Lauder, Inc., New York, N.Y.

Filed Nov. 14, 1975, Ser. No. 632,022

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-168



243,661

## PULL

Hubert Dolnar, Pierrefonds, Canada, assignor to Unican Security Systems, Ltd., Quebec, Canada

Filed Feb. 25, 1976, Ser. No. 661,173

Term of patent 14 years

Int. Cl. D8-06

U.S. Cl. D8-319



243,664

## INDEX RING FOR A MACHINE TOOL

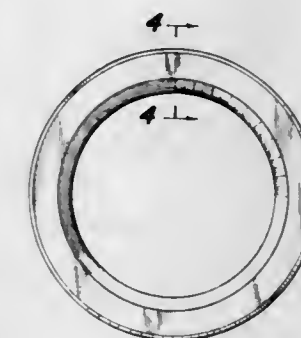
Garnet R. Lyon, Elmira, N.Y., assignor to Hardinge Brothers, Inc.

Filed Nov. 10, 1975, Ser. No. 630,622

Term of patent 14 years

Int. Cl. D15-09

U.S. Cl. D15-138



243,662

## BACKING PLATE FOR DOOR AND DRAWER PULLS AND THE LIKE

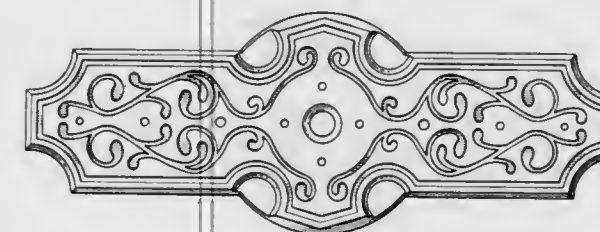
David F. James, Redondo Beach, Calif., assignor to Norris Industries, Inc., Los Angeles, Calif.

Filed Mar. 29, 1976, Ser. No. 671,125

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-350



243,663

## BOX BLANK

Vernard S. Booth, Albany, Ga., assignor to Olinkraft, Inc., West Monroe, La.

Filed Oct. 8, 1975, Ser. No. 620,901

Term of patent 14 years

Int. Cl. D9-03

U.S. Cl. D9-245



243,665

## COMBINED WRISTWATCH AND BRACELET

Frederic Laurent, Montmollin, Switzerland, assignor to Timex Corporation, Waterbury, Conn.

Filed Oct. 29, 1975, Ser. No. 626,804

Term of patent 14 years

Int. Cl. D11-01

U.S. Cl. D11-12





243,666  
RING

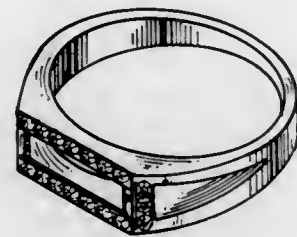
Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier, William Lee Webster, 2249 Yorkshire, Decatur, Ill. 62526 Inc., New York, N.Y.

Filed Oct. 6, 1975, Ser. No. 620,066

Term of patent 14 years

Int. Cl. D11-01

U.S. Cl. D11-34



243,667  
AIRPLANE

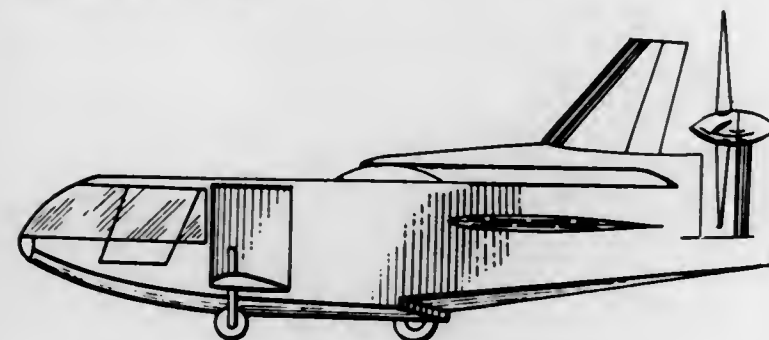
Kenneth L. Bunyard, 45 Olive Drive, Hialeah, Fla. 33010

Filed Dec. 29, 1975, Ser. No. 644,760

Term of patent 14 years

Int. Cl. D12-07

U.S. Cl. D12-78



243,668  
AUTOMOBILE

Katsusuke Komuro, Chofu, and Shinya Iwakura, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

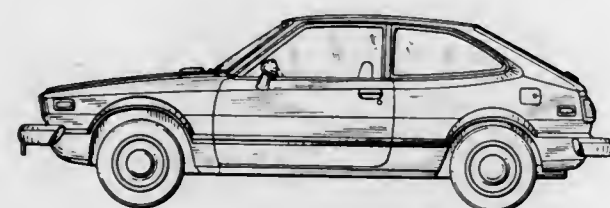
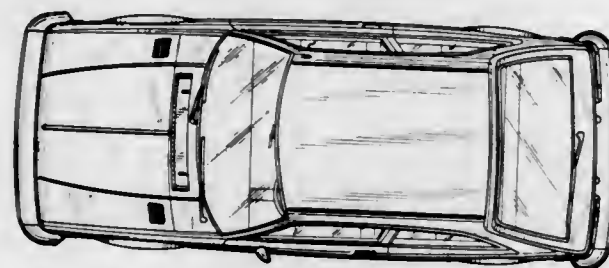
Filed Dec. 22, 1975, Ser. No. 643,841

Claims priority, application Japan, June 30, 1975, 50-27521

Term of patent 14 years

Int. Cl. D12-08

U.S. Cl. D12-91



243,669  
MOBILE WELDING MACHINE

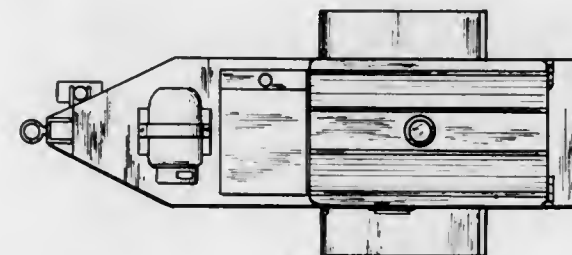
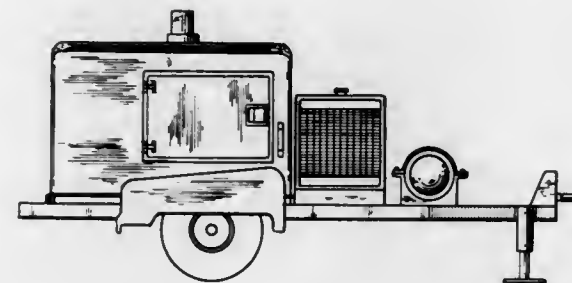
William Lee Webster, 2249 Yorkshire, Decatur, Ill. 62526

Filed Aug. 1, 1975, Ser. No. 601,221

Term of patent 14 years

Int. Cl. D12-10

U.S. Cl. D12-101



243,670  
BICYCLE STEERING POST

Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated

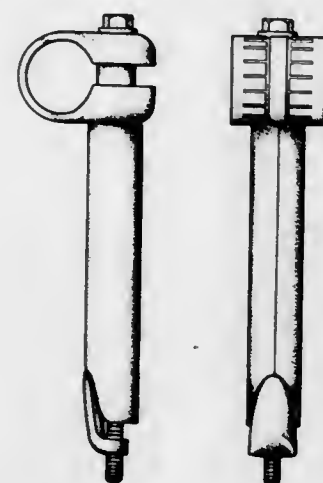
Filed Aug. 13, 1971, Ser. No. 171,789

The portion of the term of this patent subsequent to July 3, 1987, has been disclaimed.

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-118



243,671  
BICYCLE STEERING POST

Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated

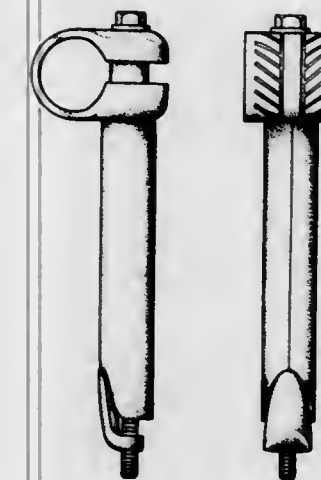
Filed Aug. 13, 1971, Ser. No. 171,791

The portion of the term of this patent subsequent to July 25, 1986, has been disclaimed.

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-118



243,673  
HOOD ORNAMENT

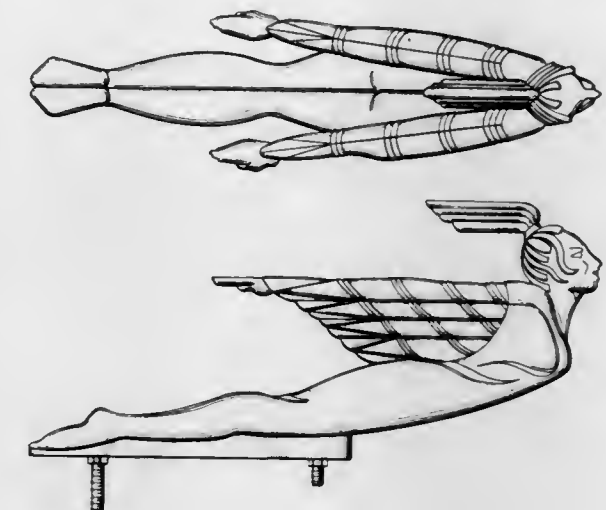
Norvel P. West, 7022 S. Shore Drive, Chicago, Ill. 60649

Filed Dec. 31, 1975, Ser. No. 645,711

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-200



243,674

EXTRUDED SIDE RAIL FOR A WINDOW

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

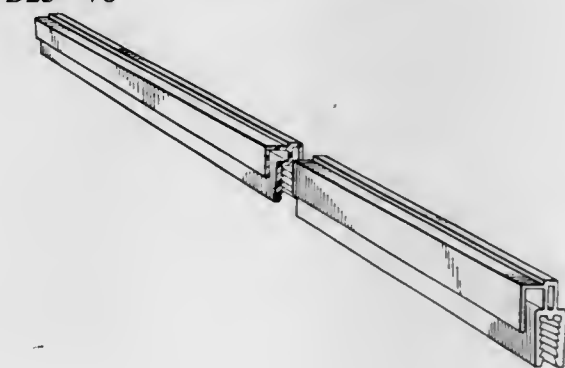
Filed June 24, 1974, Ser. No. 482,768

Claims priority, application Canada, Dec. 28, 1973, 45528

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-76



243,672  
BICYCLE STEERING POST

Carlton P. Pawsat, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated

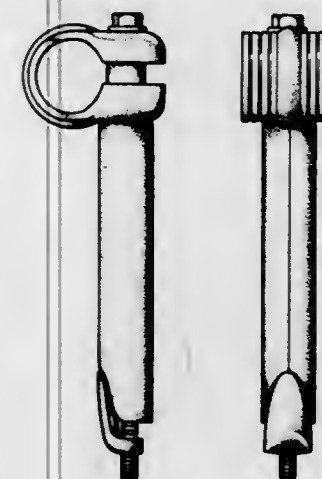
Filed Aug. 13, 1971, Ser. No. 171,793

The portion of the term of this patent subsequent to July 25, 1986, has been disclaimed.

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-118



243,675

EXTRUDED SIDE RAIL FOR A WINDOW

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

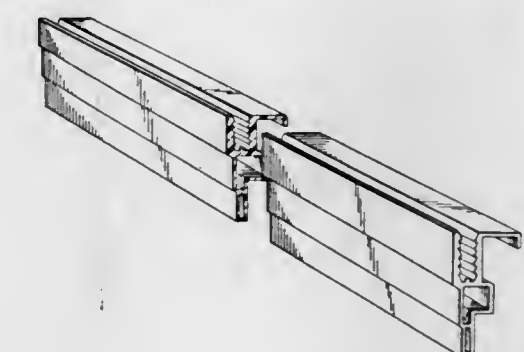
Filed June 24, 1974, Ser. No. 482,769

Claims priority, application Canada, Dec. 28, 1973, 45527

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-76





243,676

**EXTRUDED SILL TRACK INSERT FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

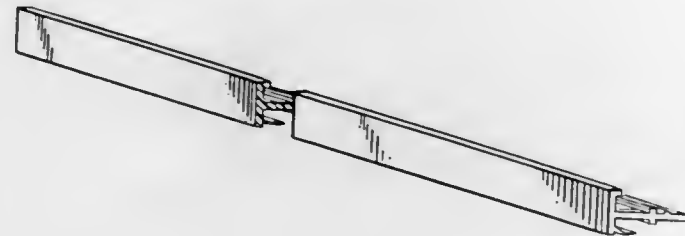
Filed June 24, 1974, Ser. No. 482,770

Claims priority, application Canada, Dec. 28, 1973, 45526

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D13-6



243,677

**EXTRUDED SILL TRACK FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

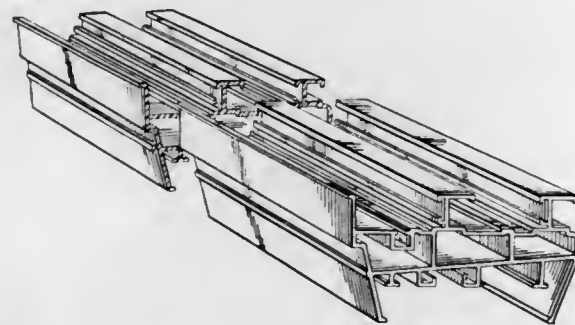
Filed June 24, 1974, Ser. No. 482,771

Claims priority, application Canada, Dec. 28, 1973, 45523

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-74



243,678

**EXTRUDED SILL TRACK FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

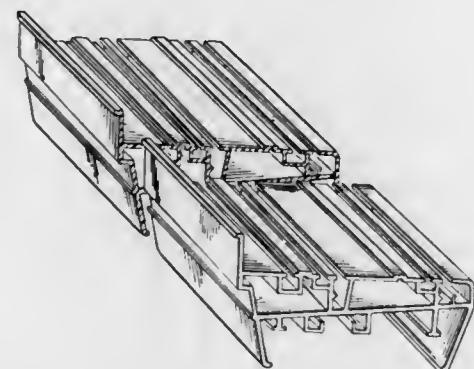
Filed June 24, 1974, Ser. No. 482,772

Claims priority, application Canada, Dec. 28, 1973, 45517

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-74



243,679

**EXTRUDED SILL TRACK FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

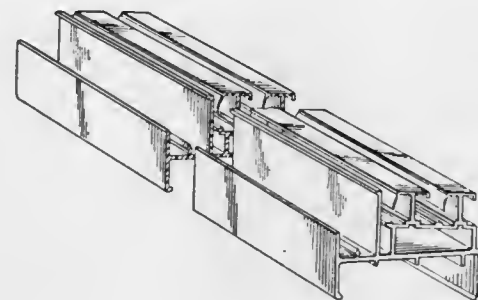
Filed June 24, 1974, Ser. No. 482,773

Claims priority, application Canada, Dec. 28, 1973, 45525

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-74



243,680

**EXTRUDED SILL TRACK FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

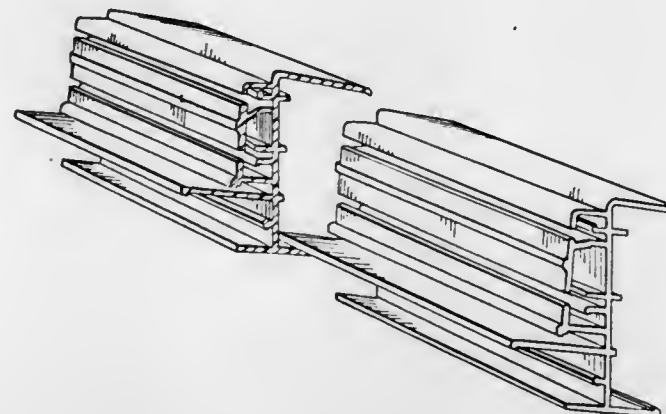
Filed June 24, 1974, Ser. No. 482,774

Claims priority, application Canada, Dec. 28, 1973, 45524

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-74



243,681

**EXTRUDED SIDE RAIL FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

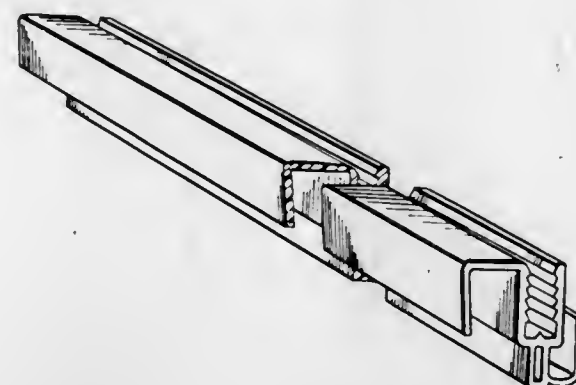
Filed June 24, 1974, Ser. No. 482,775

Claims priority, application Canada, Dec. 28, 1973, 45529

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-76



243,682

**EXTRUDED SILL TRACK INSERT FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

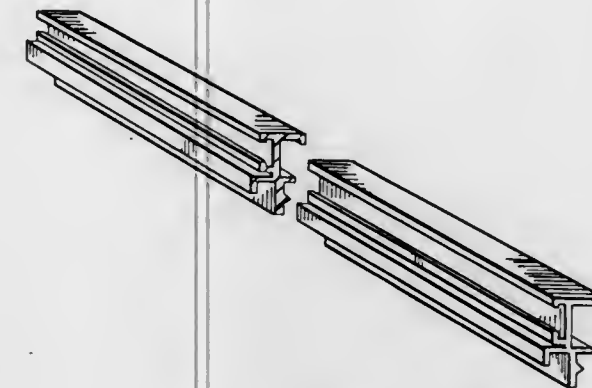
Filed June 24, 1974, Ser. No. 482,777

Claims priority, application Canada, Dec. 28, 1973, 45522

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-74



243,683

**EXTRUDED SIDE RAIL FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

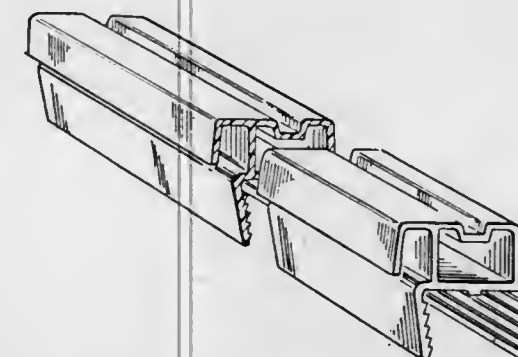
Filed June 24, 1974, Ser. No. 482,778

Claims priority, application Canada, Dec. 28, 1973, 45520

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-76



243,684

**EXTRUDED SIDE RAIL FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

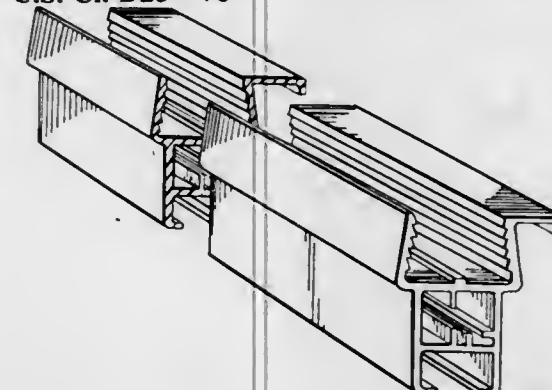
Filed June 24, 1974, Ser. No. 482,779

Claims priority, application Canada, Dec. 28, 1973, 45521

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-76



243,685

**EXTRUDED SIDE RAIL FOR A WINDOW**

Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada

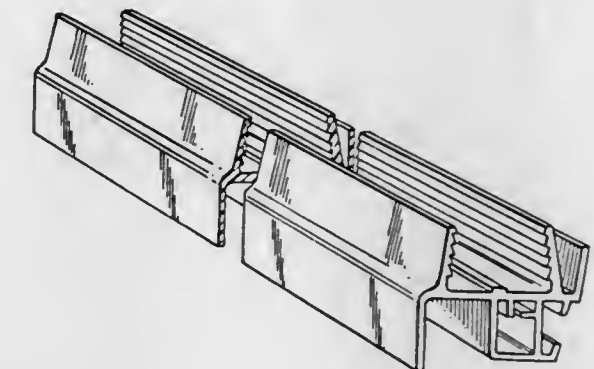
Filed June 24, 1974, Ser. No. 482,780

Claims priority, application Canada, Dec. 28, 1973, 45519

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-76



243,686

**SEWING MACHINE**

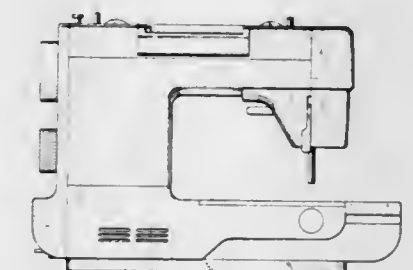
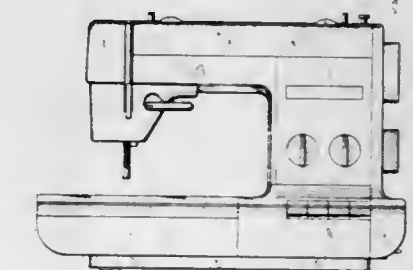
Kazuo Ito, Seiwa-Ryo, 37 Hakuryu-cho, 1-chome, Mizuho, Nagoya, Aichi, Japan

Filed June 19, 1975, Ser. No. 588,616

Term of patent 14 years

Int. Cl. D15-06

U.S. Cl. D15-68





243,687

## PAIR OF SPECTACLES

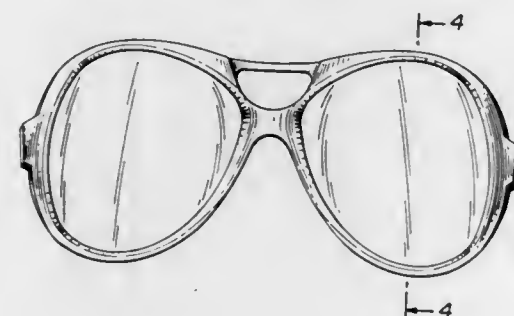
Richard W. Canavan, III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 8, 1975, Ser. No. 638,488

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-65



243,689

## BOTTLE-SHAPED FISHING LURE

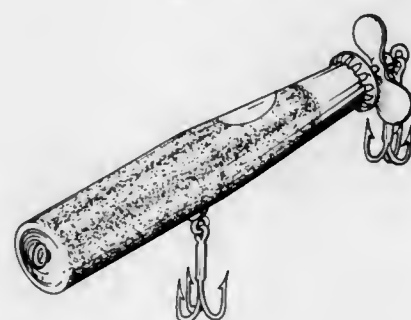
Benjamin W. Price, P.O. Drawer 16875, Jacksonville, Fla. 32216

Filed Mar. 15, 1976, Ser. No. 666,922

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-27



243,688

## COMBINED CLIPBOARD AND TIMER

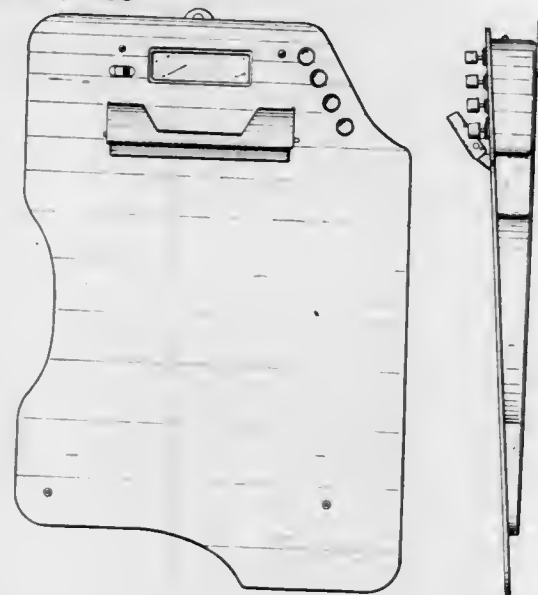
George Keyko, Westfield, N.J., and Robert H. Esslinger, Wilton, Conn., assignors to Quartz Timing Corporation, Long Island City, N.Y.

Filed June 30, 1975, Ser. No. 588,439

Term of patent 14 years

Int. Cl. D19-02

U.S. Cl. D19-88



243,690

## BATTERY-POWERED PUMP

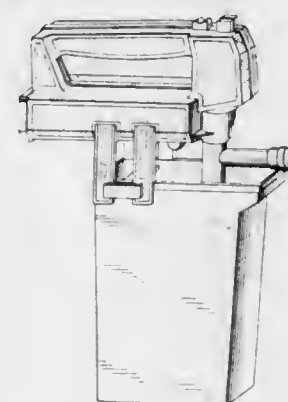
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed Aug. 22, 1975, Ser. No. 606,776

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-18



243,691

## BATHING POOL

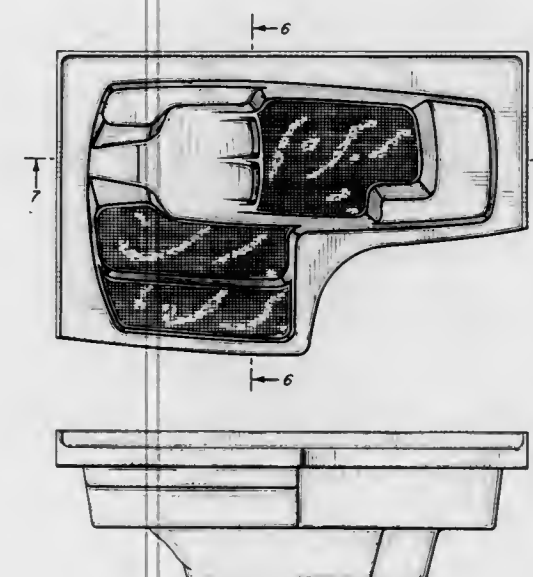
George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc., North Hollywood, Calif.

Filed May 28, 1976, Ser. No. 690,987

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-55



243,693

## BATH TUB

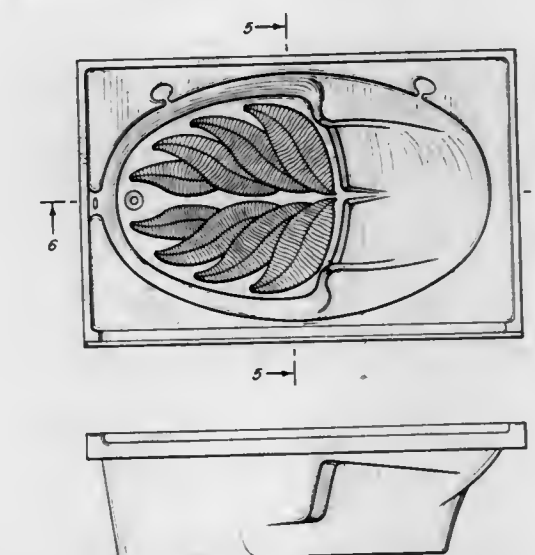
George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc., North Hollywood, Calif.

Filed May 28, 1976, Ser. No. 691,036

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-55



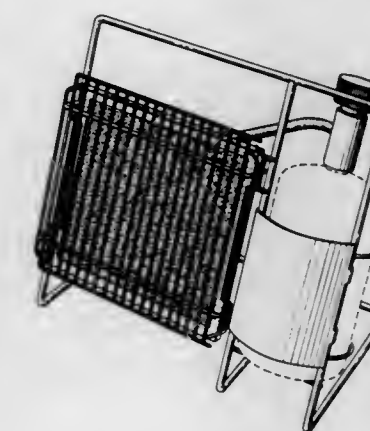
243,694

## PORTABLE CATALYTIC HEATER

Ernest L. Faulkner, Independence, Kans., assignor to Bruest Industries, Inc., Independence, Kans.

Filed July 16, 1975, Ser. No. 596,278

U.S. Cl. D23-72



243,692

## SOAKING TUB

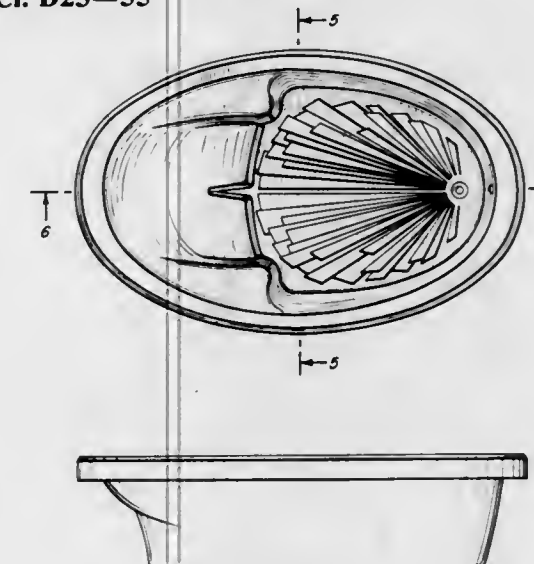
George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc., North Hollywood, Calif.

Filed May 28, 1976, Ser. No. 690,988

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-55



243,695

## METAL ROOFING TILE

Andries Stephanus Roux, 7, Da Gama St., Eastleigh, Edenvale, Transvaal Province, South Africa

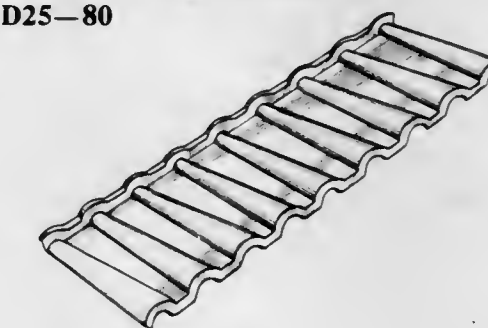
Filed May 2, 1975, Ser. No. 574,091

Claims priority, application South Africa, Dec. 30, 1974, 74/1238

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-80





243,696  
BUILDING

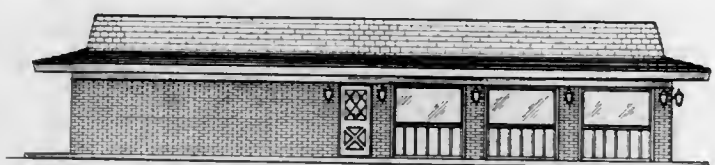
Jack R. Butz, Tulsa, Okla., assignor to Ken's Pizza Parlors, Inc.

Filed Mar. 27, 1975, Ser. No. 562,557

Term of patent 14 years

Int. Cl. D25-03

U.S. Cl. D25-25



243,697  
RETAINING WALL STRETCHER

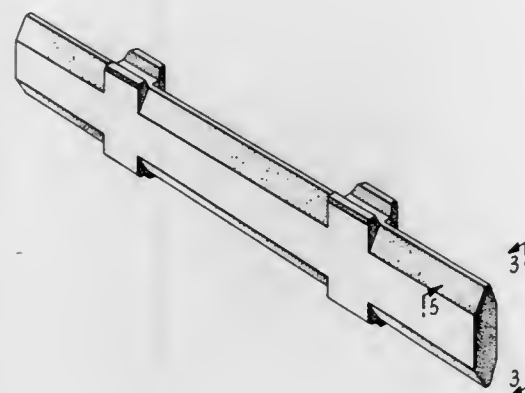
William K. Hilfiker, Eureka, Calif., assignor to Hilfiker Pipe Co., Eureka, Calif.

Filed May 2, 1975, Ser. No. 573,975

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-77



243,699  
COMBINED POWER OUTLET AND METER SUPPORT BOX

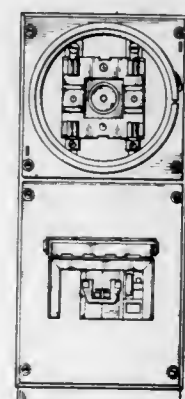
Merle A. Plummer, North Hollywood, Calif., assignor to Myers Electric Products, Inc., Montebello, Calif.

Filed July 18, 1975, Ser. No. 597,307

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-31



243,700  
KEY SET DEVICE FOR ENCODING DATA

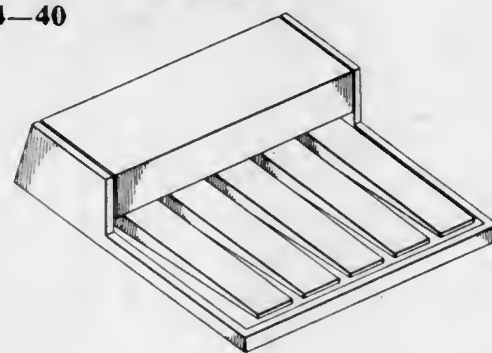
Carl J. Clement, Mountain View, and Fred H. Stengel, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1974, Ser. No. 533,353

Term of patent 14 years

Int. Cl. D14-02

U.S. Cl. D14-40



243,698  
COMBINED ELECTRICAL CONNECTOR AND ADAPTER PLUG THEREFOR

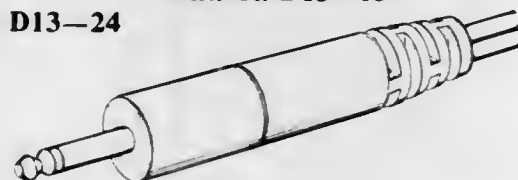
James J. Gietzen, 75 Parnell Drive, Smithtown, N.Y. 11787

Filed Oct. 16, 1975, Ser. No. 622,831

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-24



243,701  
ELECTRONIC CALCULATING MACHINE

Matafumi Ikeda, Osaka, Japan, assignor to Sharp Kabushiki Kaisha

Filed July 30, 1975, Ser. No. 600,441

Claims priority, application Japan, Jan. 31, 1975, 50-4385

Term of patent 14 years

Int. Cl. D18-01

U.S. Cl. D64-118



243,703  
AQUARIUM

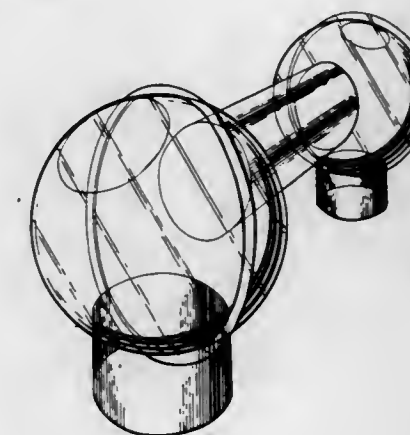
Tyrone Gamble, 771 Catona Park North, New York, N.Y. 10561

Filed Apr. 28, 1976, Ser. No. 681,340

Term of patent 14 years

Int. Cl. D30-02

U.S. Cl. D30-8



243,704  
EAR TAG

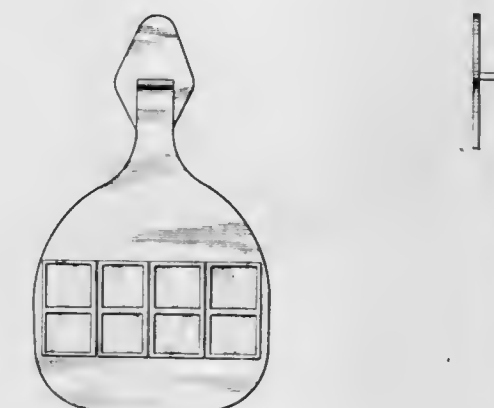
Antonio M. Cavazos, 22406 Greenbrook, Houston, Tex. 77090

Filed Dec. 23, 1974, Ser. No. 535,300

Term of patent 3½ years

Int. Cl. D30-08

U.S. Cl. D30-43



243,702  
BUTANE DISPOSABLE LIGHTER

Robert P. Sherman, 1200 Park Ave., Murfreesboro, Tenn. 37130

Filed May 28, 1974, Ser. No. 473,411

Term of patent 14 years

Int. Cl. D27-05

U.S. Cl. D27-42



243,705  
TISSUE CULTURE FLASK

George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation

Filed Apr. 1, 1976, Ser. No. 672,763

Term of patent 14 years

Int. Cl. D24-04

U.S. Cl. D24-29





243,706

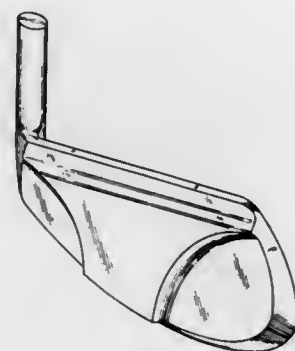
## GOLF CLUB HEAD

Marshall D. Hall, 2075 Hammock Place, Sarasota, Fla. 33580  
Filed May 29, 1975, Ser. No. 581,815

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-5 GH



243,707

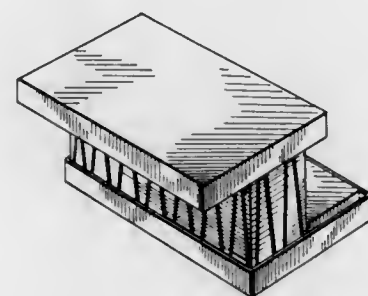
SIMULATED TABLE TOP STAGE FOR  
PERFORMING MAGIC TRICKS OR THE LIKE

Robert L. Brass, 4 Norwood Lane, Westport, Conn. 06880  
Filed Nov. 21, 1975, Ser. No. 634,127

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-15 R



243,708

## CULTIVATOR TINE

Cornelis van der Lely, 7, Bruschenrain, ZUG, Switzerland, and  
Ary van der Lely, 10, Weverskade, Maasland, Netherlands  
Filed Sept. 22, 1975, Ser. No. 615,678

Claims priority, application Belgium, Mar. 20, 1975,  
5016901

Term of patent 14 years

Int. Cl. D15-03

U.S. Cl. D15-29



243,709

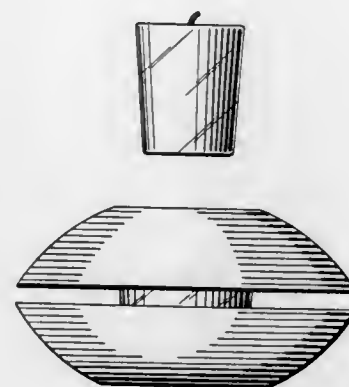
## COMBINED CANDLE AND HOLDER THEREFOR

Richard C. Moore, 527 SW. Pamona, Portland, Oreg. 97219  
Filed July 16, 1975, Ser. No. 596,280

Term of patent 14 years

Int. Cl. D26-01

U.S. Cl. D48-2



243,710

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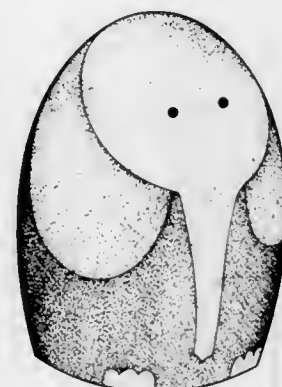
Frank Angeles, Hacienda de Xalpa 7., Bosque de Echegaray  
Edo. de Mexico, Mexico

Filed Jan. 5, 1976, Ser. No. 647,257

Term of patent 14 years

Int. Cl. D26-05; D21-01

U.S. Cl. D48-20 B



243,711

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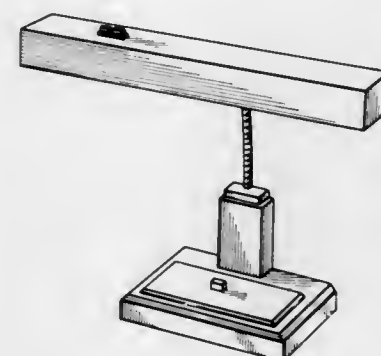
Howard S. Haft, Chicago, Ill., assignor to Art Specialty Com-  
pany

Filed Oct. 3, 1975, Ser. No. 619,221

Term of patent 14 years

Int. Cl. D26-05

U.S. Cl. D48-20 F



243,712

AUTOMATIC MAILING MACHINE FOR MOISTENING,  
SEALING AND STAMPING ENVELOPES

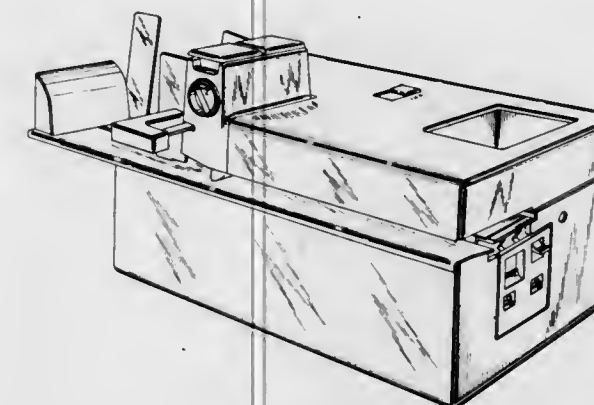
John Charles Morris; Elmer J. Stoltz, both of Castro Valley,  
and Richard A. Nyquist, Menlo Park, all of Calif., assignors  
to The Singer Company

Filed Nov. 8, 1974, Ser. No. 528,196

Term of patent 14 years

Int. Cl. D15-99

U.S. Cl. D64-11 R



243,713

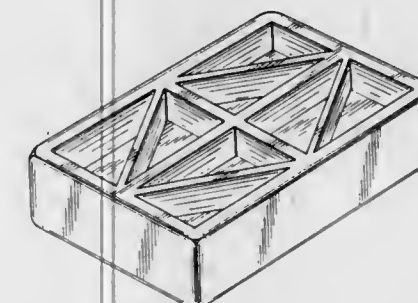
## SOAP BAR

David Jon Morrison, 1402 S. 78th St., Omaha, Nebr. 68127  
Filed Sept. 2, 1975, Ser. No. 609,408

Term of patent 14 years

Int. Cl. D28-02

U.S. Cl. D73-1 A



243,714

TRANSMISSION FLUID TRANSFER AND COVER PLATE  
FOR MOTORCYCLE ENGINES

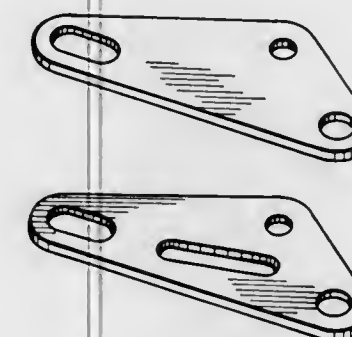
Gilbert W. Younger, 2627 Merced Ave., El Monte, Calif.  
91733

Filed Mar. 3, 1975, Ser. No. 554,672

Term of patent 14 years

Int. Cl. D15-01

U.S. Cl. D15-5



243,715

RETAINING AND PROTECTIVE DEVICE FOR  
INTRAVENOUS INFUSION MEANS

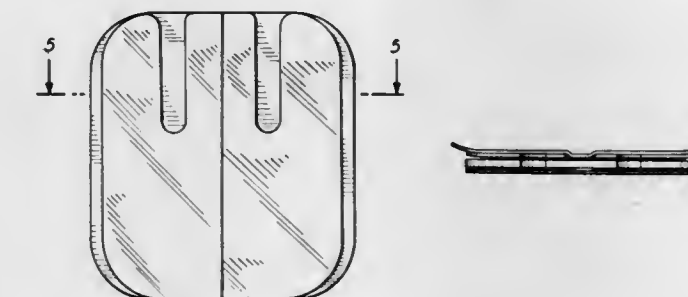
Edward J. Trimmell, Cincinnati, Ohio, assignor to Litton Busi-  
ness Systems, Inc.

Filed May 6, 1975, Ser. No. 575,006

Term of patent 14 years

Int. Cl. D24-04

U.S. Cl. D83-1 R



243,716

## GREAT TOE PROSTHESIS

Daniel H. Treace, Germantown, Tenn.; Lowell S. Weil, Des  
Plaines, and Stephen D. Smith, Chicago, both of Ill., assign-  
ors to Richards Manufacturing Company, Memphis, Tenn.

Filed July 24, 1975, Ser. No. 598,649

Term of patent 14 years

Int. Cl. D24-03

U.S. Cl. D83-1 E



243,717

## PHYSIOLOGICAL MONITORING DEVICE HOUSING

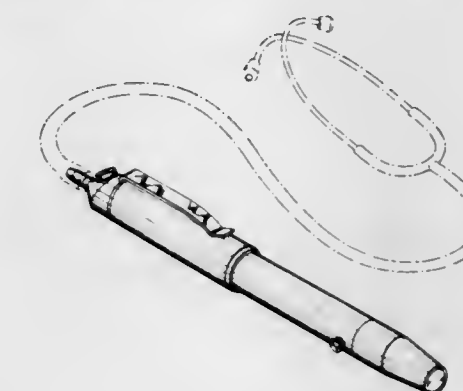
K. William Edmark, Seattle; David B. Smith, Mercer Island,  
and Louis D. Pheil, Redmond, all of Wash., assignors to  
Physio Control Corporation, Redmond, Wash.

Filed Aug. 18, 1975, Ser. No. 605,440

Term of patent 14 years

Int. Cl. D24-02; D10-99

U.S. Cl. D83-1 F





243,718

## ILLUMINATED CONTACT LENS KIT

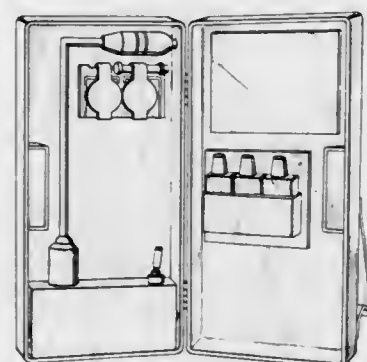
J. Robert Bren, 1429 N. Hayworth Ave., Apt. A, Los Angeles, Calif. 90046

Filed June 30, 1975, Ser. No. 591,901

Term of patent 14 years

Int. Cl. D3-02

U.S. Cl. D87-9



243,719

## DRY SHAVER OR SIMILAR ARTICLE

Klaas Tiemen Oord, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

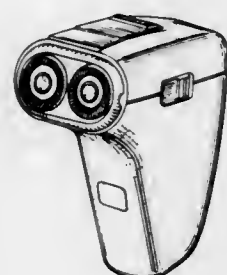
Filed May 1, 1975, Ser. No. 573,473

Claims priority, application Switzerland, Nov. 6, 1974, 59771/74

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-50



243,720

## ELECTRIC SHAVER

Yozo Yajima, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Japan

Filed June 19, 1975, Ser. No. 588,196

Claims priority, application Japan, Dec. 19, 1974, 49-44566

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-51



## LIST OF PATENTEEES

TO WHOM

## PATENTS WERE ISSUED ON THE 15TH DAY OF MARCH, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. B. Chance Company: *See*—  
Goe, Melvin B., Jr., 4,012,708.
- A. E. Staley Manufacturing Company: *See*—  
Fiala, Richard J.; Scott, Thomas L.; and Wright, Kenneth N., 4,012,535.
- A. Monforts Maschinenfabrik: *See*—  
Pabst, Manfred; and van Wersch, Kurt, 4,011,623.
- A/S Jac. Engelbrecht: *See*—  
Lehmann, Gerhard Karl, 4,011,666.
- Abbott Laboratories: *See*—  
Ling, Chung-Mei, 4,012,494.
- Abe, Motoaki; and Aoki, Teruaki, to Sony Corporation. Semiconductor field effect device having oxygen enriched polycrystalline silicon. 4,012,762, Cl. 357-52.000.
- Abegg, Jean-Louis; and Gayet, Claire, to Societe Anonyme dite: L'O-real. Process for permanently waving hair using a self-heating neutralizing composition containing a water-soluble sulfite, metabisulfite or bisulfite and H<sub>2</sub>O<sub>2</sub>. 4,011,878, Cl. 132-7.000.
- Ablov, Vladimir Itskhok-Nukhimovich: *See*—  
Fedorchenko, Ivan Mikhailovich; Pugin, Vasily Sergeevich; Ablov, Vladimir Itskhok-Nukhimovich; Fridman, July Yakovlevich; and Goldberg, Mikhail Shaeovich, 4,011,877.
- Abramson, Iosif Gershevich: *See*—  
Besprozvanny, Robert Matveevich; Abramson, Iosif Gershevich; Egorov, Georgy Borisovich; Nudelman, Rafail Manusovich; and Nikiforov, Jury Vasilievich, 4,012,639.
- Abu Aktiebolag: *See*—  
Moosberg, Borje Sigurd, 4,011,774.
- Accortt, Joseph Itamar, to Combustion Engineering, Inc. Venturi wet scrubber. 4,012,469, Cl. 261-117.000.
- Accurate Lock and Hardware Co.: *See*—  
Salvatore, Ronald M., 4,012,066.
- ACF Chemiefarma N.V.: *See*—  
Akkerman, Antony Marie; and Janssen, Paul Adriaan Jan, 4,012,392.
- Ach, Julie Ann, to Mattel, Inc. Toy backdrop display for simulating one or more rooms of a doll house. 4,011,682, Cl. 46-21.000.
- Adams, James E.; and Dir, Gary A., to Xerox Corporation. Direct current liquid crystal display with highly reflecting dielectric mirror. 4,012,119, Cl. 350-160.0LC.
- Adams, Sally Lee; Martin, Fred David; and Cook, Michael M., to Calgon Corporation. Method of using cementing composition having improved flow properties. 4,011,909, Cl. 166-293.000.
- Aerojet-General Corporation: *See*—  
Rosenberg, Sanders D.; and Vanderwall, Eugene M., 4,011,730.
- Affiliated Hospital Products, Inc.: *See*—  
Mitchell, Larry D.; and Mason, Edward M., 4,012,031.
- Agway, Inc.: *See*—  
Martin, Rodney O.; and Whitman, John C., 4,011,618.
- Ahlen, Karl Gustav, to S.R.M. Hydromekanik Aktiebolag. Transmission including a hydrodynamic torque converter. 4,011,775, Cl. 74-732.000.
- Airco, Inc.: *See*—  
Lofredo, Antony, 4,012,490.
- Marancik, William G., 4,011,982.
- Aisin Seiki Kabushiki Kaisha: *See*—  
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- Aizawa, Tatsuo: *See*—  
Washio, Takaji; and Aizawa, Tatsuo, 4,012,138.
- Washio, Takaji; Sasaki, Koichi; and Aizawa, Tatsuo, 4,012,139.
- Aikai Timfoldgyar es Aluminiumkoho: *See*—  
Somosi, Istvan; Toth, Bela; Boros, Jozsef; and Vitez, Janos, 4,012,298.
- Akkerman, Antony Marie; and Janssen, Paul Adriaan Jan, to ACF Chemiefarma N.V. 2-Benzyl-4-piperidones useful as intermediates in the production of 6,7-benzomorphan derivatives. 4,012,392, Cl. 260-293.800.
- Akro Corporation, The: *See*—  
Savage, Sidney; and Ham, Thomas J., 4,011,946.
- Aktiebolaget SAMEFA: *See*—  
Horvallius, Torgny William, 4,011,659.
- Akzona Incorporated: *See*—  
Stapp, Hans, 4,012,249.
- Alaimo, Robert J., to Morton-Norwich Products, Inc. N-(6-Ethyl-4-thiocyanato-2-benzothiazolyl)-5-nitrofuramide. 4,012,409, Cl. 260-305.000.
- Alcan Research and Development Limited: *See*—  
Byrne, Henry James; Sood, Raman Radha; and Stokes, David Michael, 4,012,202.
- Alco Standard Corporation: *See*—  
Vegh, Elmer S.; Castle, William F.; Hadbavny, Leonard P.; Klier, Donald F.; and Schwerzler, David S., 4,011,805.
- Alesandrini, Carlo G., Jr., to Stauffer Chemical Company. Production of ethyl chlorothioformate. 4,012,405, Cl. 260-455.00R.
- Alexander, Harvey C.; and Hudson, Ray E. Downhole valve for paraffin control. 4,011,906, Cl. 166-105.000.
- Alfa-Laval AB: *See*—  
Nordegren, Sven-Ake; and Norton, Douglas J., 4,011,838.
- All-Shield Enclosures, Inc.: *See*—  
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- Allan Tackle Manufacturing Co., Inc.: *See*—  
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- Allegheny Ludlum Industries, Inc.: *See*—  
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- Allen-Bradley Company: *See*—  
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- Allen & Hanburys Limited: *See*—  
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- Allen, Roger E.: *See*—  
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- Allied Chemical Corporation: *See*—  
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- Nychka, Henry R.; Berenbaum, Morris B.; Robinson, Martin A.; and Eibeck, Richard E., 4,012,453.
- Schwartz, Judd Leonard; and Mayer, Richard Eugene, 4,012,546.
- Allievi, Elio. Process for preparing an ester of the N-methyl-N-hydroxyethylguanidine. 4,012,467, Cl. 260-978.000.
- Allis-Chalmers Corporation: *See*—  
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- Nelson, John P., 4,011,767.
- Almeida, June Dalziel: *See*—  
Finter, Norman Boyne; Bishop, Leonard William Jerome; and Almeida, June Dalziel, 4,012,198.
- Altschuler, Bruce R.; Segreto, Vincent A.; and Brown, Cecil E., Jr. Dental X-ray alignment system. 4,012,638, Cl. 250-491.000.
- Aluminum Company of America: *See*—  
Hawkins, Ronald G., 4,011,649.
- Hawkins, Ronald G., 4,012,581.
- Hawkins, Ronald G., 4,012,582.
- Amaray International Corporation: *See*—  
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- Amax Inc.: *See*—  
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- Ambil, Karl-Heinz: *See*—  
Trieschmann, Hans-Georg; Ambil, Karl-Heinz; Rau, Wolfgang; and Wisseroth, Karl, 4,012,573.
- Amchem Products, Inc.: *See*—  
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- American Broadcasting Companies, Inc.: *See*—  
Lazarus, Jonathan D., 4,012,132.
- American Color & Chemical Corporation: *See*—  
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- American Cyanamid Company: *See*—  
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- Ebel, Robert Henry, 4,012,339.
- Orshitzer, Philip; and Macander, Antoni, 4,012,341.
- Takeya, Kenji; Suzuki, Hiroshi; and Yamawaki, Noboru, 4,012,459.
- American Home Products Corporation: *See*—  
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- Sarantakis, Dimitrios, 4,012,345.
- American Optical Corporation: *See*—  
Krohn, David A.; Deeg, Emil W.; and Graf, Robert E., 4,012,131.
- American Science & Engineering, Inc.: *See*—  
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- American Thermo-Seal, Inc.: *See*—  
Tabata, John D.; Cantillo, Enrique; and Tabata, Frank M., 4,012,269.
- Ametek, Inc.: *See*—  
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- AMP Incorporated: *See*—  
Cobaugh, Robert Franklin; and Graeff, Norwood Claude, 4,012,107.
- Lockard, Joseph LaRue, 4,012,608.
- Anderson, Charles W., to Chromalloy American Corporation. Tool shank mounting assembly. 4,011,915, Cl. 172-265.000.
- Anderson, Frank R.; and Castro, Albert J., to Westates Space-Era Products, Inc. Ribbon inking machine. 4,011,830, Cl. 118-60.000.
- Anderson, Warren A.: *See*—  
Passmore, Edmund M.; Duggan, George L.; Anderson, Warren A.; and Labadini, William M., 4,012,659.



Andersson, Einar: See—  
Sjoholm, Soren; and Andersson, Einar, 4,012,275.  
Andersson, Lennart Valentin, to Sjumek, Sjukvardsmekanik HB. Gas mixing valve. 4,011,890, Cl. 137-625.400.  
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Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. Uniform thermal migration utilizing noncentro-symmetric and secondary sample rotation. 4,012,236, Cl. 148-1.500.  
Antoniak, Charles E., to United States of America, Navy. Distribution-free filter. 4,012,627, Cl. 235-152.000.  
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Abe, Motoaki; and Aoki, Teruaki, 4,012,762.  
Apodaca, Edward L. Litter tongs. 4,012,068, Cl. 294-33.000.  
Applied Power Inc.: See—  
Knutson, Dale A.; and Patel, Kishor J., 4,011,891.  
Weiss, Arnold A.; Motl, Daniel M.; and Johnston, Eugene D., 4,011,751.  
Apterman, Vladilen Nikolaevich: See—  
Dunaevsky, Vladimir Izrailevich; Krikly, Nikolai Mikhailovich; Kotelevets, Eduard Sergeevich; Apterman, Vladilen Nikolaevich; Oginsky, Mikhail Ilich; Pliskanovsky, Stanislav Tikhonovich; and Kaushansky, Boris Ioinovich, 4,012,028.  
Arai, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical film rewinding device. 4,012,755, Cl. 354-214.000.  
Araseki, Takashi; and Ochiai, Kazuo, to Nippon Electric Company, Ltd. Echo suppressor having self-adaptive means. 4,012,603, Cl. 179-170.600.  
Arbrook, Inc.: See—  
Lindsey, Joseph W., 4,012,472.  
Lindsey, Joseph W.; and Murphy, Larry O., 4,012,473.  
ARCO Polymers, Inc.: See—  
Chaudhary, Sohan S., 4,012,462.  
Argade, Shyam Dattatreya: See—  
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Argento, Dan J.: See—  
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Aritaki, Hirakazu: See—  
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Armstrong Cork Company: See—  
Nute, Ernest B., Jr., 4,011,707.  
Arnim, Lawrence E.; and Arnim, Lawrence E., Jr. Anti-pollution unit for attachment on smoke stacks, and the method of reducing smoke stack pollution. 4,012,208, Cl. 55-223.000.  
Arnim, Lawrence E., Jr.: See—  
Arnim, Lawrence E.; and Arnim, Lawrence E., Jr., 4,012,208.  
Arnold, William O., to Union Insulating Company. Electrical wiring box. 4,012,580, Cl. 174-53.000.  
Arntzen, Arne-Johann, to Dragerwerk Aktiengesellschaft. Diver's pressure chamber system. 4,011,867, Cl. 128-204.000.  
Arthur D. Little, Inc.: See—  
Haggerty, John S.; Menashi, Wilson P.; and Wenckus, Joseph F., 4,012,213.  
Arturo Salice SpA: See—  
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Artzt, Peter: See—  
Egbers, Gerhard; and Artzt, Peter, 4,011,712.  
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Asai, Yoshihiko: See—  
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Ashbrook, Charles W.; Kaiser, Gary V.; and Koppel, Gary A., to Eli Lilly and Company. 2-(4-Methoxyoxazolidinone-4-yl)thiazolidine t-butyl esters. 4,012,410, Cl. 260-306.70C.  
Ashley, Eugene, to General Electric Company. Liquid propellant weapon system. 4,011,817, Cl. 102-38.000.  
Asko Engineering Corporation: See—  
Beck, Erich; Robbins, Albert C.; and Birdsall, John C., 4,012,477.  
Askew, Herbert Frank: See—  
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Associated Portland Cement Manufacturers Limited, The: See—  
Murray, Ransom James; and Brown, Arthur William, 4,012,264.  
Atkinson, Wallace E., to Long Manufacturing Co., Inc. Combination lawn and garden implement. 4,011,612, Cl. 7-14.550.  
Atom Chemical Paint Co., Ltd.: See—  
Mizuno, Makoto; Nishiumi, Yoshio; and Nagasaka, Yukio, 4,011,993.  
Auborn, James J., to GTE Laboratories Incorporated. Electrochemical cells having an electrolytic solution comprising a covalent inorganic oxyhalide solvent. 4,012,564, Cl. 429-194.000.  
Aubrey Manufacturing, Incorporated: See—  
Pfaffinger, Leonard G., 4,011,803.  
Augat, Inc.: See—  
Doucet, Leonard A.; and Grubb, Richard M., 4,012,095.  
Augustine, Coleman M., Jr.: See—  
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AutoChem Instrument Aktiebolag: See—  
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Automatic Breathing Apparatus Co., Inc.: See—  
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Avco Corporation: See—  
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Avid Corporation: See—  
French, Alan; and Torrey, George Winthrop, 4,011,925.  
Ayerst McKenna & Harrison Ltd.: See—  
Demerson, Christopher A.; Humber, Leslie G.; Santroch, George; Dobson, Thomas A.; and Jirkovsky, Ivo, 4,012,511.  
Baatz, James C.; and Corey, Albert E., to Monsanto Company. Articles coated with pressure-sensitive interpolymers containing 2-acrylamido-2-methylpropanesulfonic acid. 4,012,560, Cl. 428-474.000.  
Baatz, Wilfried, to FloScan Instrument Company, Inc. Device for bypassing flow rate pulsations around a flow rate transducer. 4,011,757, Cl. 73-229.000.  
Babunovic, Momir, to Barry-Wehmler Company. Separator apparatus. 4,012,323, Cl. 210-232.000.  
Bach, Horst-Werner: See—  
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Bachmann, William V. Annular piston engine with afterburner and power turbine. 4,011,725, Cl. 60-624.000.  
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: See—  
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Bailey, Walter A.: See—  
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Baker, Don R., to Stauffer Chemical Company. Organotin miticidal and insecticidal compounds. 4,012,421, Cl. 260-340.900.  
Balamuth, Lewis; Kuris, Arthur; and Karatjas, Manuel, to Ultrasonic Systems, Inc. Ultrasonic motors and converters. 4,012,647, Cl. 310-8.100.  
Balke, David E.; and Oliver, Ward H., to Ciba-Geigy Corporation. Pyrimidyl thio- and dithio-phosphoric acid esters. 4,012,506, Cl. 424-200.000.  
Balko, Edward Nicholas; Schmitt, William Francis; and Argade, Shyam Dattatreya, to BASF Wyandotte Corporation. Mercury recovery and recycle process. 4,012,297, Cl. 204-99.000.  
Ball Corporation: See—  
Johnson, Russell W., 4,012,741.  
Ball, William Henderson; and Ishimitsu, Kichio Keith, to Boeing Company, The. Variable camber inlet for supersonic aircraft. 4,012,013, Cl. 244-53.00B.  
Ballinger, Dale O., to Honeywell Inc. Clock signal extraction during playback of a self-clocking digital recording. 4,012,697, Cl. 328-63.000.  
Baltz, John; and Coltrinari, Enzo, to PGP Industries, Inc. Process for the separation of platinum group metals. 4,012,481, Cl. 423-22.000.  
Bambara, John D.; and Knaus, Dennis, to Packaging Industries, Inc. Method of making shipping bag. 4,011,798, Cl. 93-35.00R.  
Banks, Bruce A., to United States of America, General Counsel-Code GP. Anode for ion thruster. 4,011,719, Cl. 60-202.000.  
Baranov, Vladimir Nikitich: See—  
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Barbier, Maurice, to Societe Nationale des Petroles d'Aquitaine. Device for producing mechanical waves. 4,011,924, Cl. 181-121.000.  
Bargain, Michel, to Rhone-Poulenc S.A. Heat-stable polyimide resins from a bis-imide, a polyamine and an alazine. 4,012,361, Cl. 260-47.0CZ.  
Barnard, John K.: See—  
Clark, David C.; and Barnard, John K., 4,012,310.  
Barnes, Gene A., to Eaton Corporation. Fluid flow control. 4,011,894, Cl. 138-46.000.  
Barrett, William G.: See—  
Law, Wendell A.; Barrett, William G.; Priebe, Norman F.; and Wise, Harry D., 4,012,719.  
Young, Clarence R.; Law, Wendell A.; Barrett, William G.; Priebe, Norman F.; and Wise, Harry D., 4,012,718.  
Barry-Wehmler Company: See—  
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Barthe, Henry P.; and Schroeder, John S., to Schroeder Brothers Corporation. Impact tool. 4,011,795, Cl. 91-286.000.  
Bartoli, Filbert J.; Esterowitz, Leon; Allen, Roger E.; and Krue, Melvin R., to United States of America, Navy. Determination of thermal impedances of bonding layers in infrared photoconductors. 4,012,691, Cl. 324-65.00R.  
BASF Aktiengesellschaft: See—  
Naarmann, Herbert; and Pohlemann, Heinz, 4,012,366.  
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BASF Wyandotte Corporation: See—  
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Batchelor, John Frederick: See—  
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Hodson, Harold Francis; and Batchelor, John Frederick, 4,012,500.  
Battelle Memorial Institute: See—  
Courvoisier, Guy, 4,012,057.  
Goldberger, William M.; and Faulkner, Bobby P., 4,012,314.  
Rybacki, Edmund F.; Wheeler, Kenneth Ray; Hulbert, Lewis E.; Karagianes, Manuel Tom; and Hassler, Craig R., 4,011,602.  
Batter, John F., Jr.: See—  
Engdahl, Lawrence W.; Batter, John F., Jr.; and Stout, Karl J., 4,012,636.  
Baugh, Daniel W., Jr.: See—  
Watt, George W.; and Baugh, Daniel W., Jr., 4,012,489.  
Baumgartner, Franklin W.; and Murphy, John Michael, to Baumgartner, Franklin W., a part interest. Wind driven power generator. 4,012,163, Cl. 415-2.000.  
Bayer Aktiengesellschaft: See—  
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Buysch, Hans Josef; and Krimm, Heinrich, 4,012,406.  
Krohn, Wolfgang; Metzger, Karl Georg; Preiss, Michael; and Walkowiak, Michael, 4,012,518.  
Reiff, Gunther; Margotte, Dieter; Idel, Karstel; Vernaleken, Hugo; and Freitag, Dieter, 4,012,362.  
BBC Brown Boveri & Company Limited: See—  
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Beaudoin, Gordon L.; Giardini, Dante S.; and Meitzler, Allen H., to Ford Motor Company. Exhaust gas sensor probe method of manufacture. 4,011,654, Cl. 29-612.000.  
Beaudoin, Gordon L.; Giardini, Dante S.; and Meitzler, Allen H., to Ford Motor Company. Exhaust gas sensor probe method of manufacture. 4,011,655, Cl. 29-612.000.  
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Beck, Erich; Robbins, Albert C.; and Birdsall, John C., to Asko Engineering Corporation. Method for producing plastic sheet or film stock. 4,012,477, Cl. 264-176.00R.  
Beck, James Richard, to Eli Lilly and Company. Herbicidal use of  $\beta$ -aminoatropinonitriles. 4,012,224, Cl. 71-105.000.  
Beck, James Richard; and Gajewski, Robert Peter, to Eli Lilly and Company. Herbicidal 4-pyrimidinones and pyrimidinethiones. 4,012,388, Cl. 260-251.00R.  
Becker, James H.; and Wysocki, Joseph J., to Xerox Corporation. Texture transformations in optically negative liquid crystals. 4,012,118, Cl. 350-160.0LC.  
Becker, James H.; and Wysocki, Joseph J., to Xerox Corporation. Texture transformations in optically negative liquid crystals. 4,012,121, Cl. 350-160.0LC.  
Beckman Instruments, Inc.: See—  
Jerrold-Jones, Paul; and Krull, Irwin H., 4,012,308.  
Pederson, Victor M.; and Wright, Herschel E., 4,011,972.  
Beecham Group Limited: See—  
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Behrens, Rudolf Adolf, to American Cyanamid Company. Rubber vulcanization accelerator composition. 4,012,332, Cl. 252-182.000.  
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Bell Industries, Inc.: See—  
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Bell, Robert, to Lawrence Peska Associates, Inc., a part interest. Adjustable floatation belt. 4,011,614, Cl. 9-337.000.  
Bell Telephone Laboratories, Incorporated: See—  
Bonyhard, Peter Istvan; and Smith, James Lanson, 4,012,726.  
Gersho, Allen, 4,012,628.  
Gibbs, Hyatt McDonald; McCall, Samuel Leverte, Jr.; and Venkatesan, Thirumalai Nallan Chakravarthy, 4,012,699.  
Hinrichsen, Robert Alfred; and Plewes, John Travis, 4,012,240.  
Klein, Theodore Harold, 4,012,267.  
Wiley, Paul Ronald, 4,012,598.  
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., to Bristol-Myers Company.  $\Delta^2$ -1,4-morpholine-2-carboxylic acids and derivatives thereof useful in preparation of antibacterial agents. 4,012,383, Cl. 260-244.00R.  
Bendtsen, Randall R., to Caterpillar Tractor Co. Folding ejector linkage for material handling machinery. 4,011,957, Cl. 214-82.000.  
Bengtsson, Sigurd Walter. Hinge means for a pivotable window. 4,011,628, Cl. 16-140.000.  
Bentley, Clarence. Flow control valve. 4,011,893, Cl. 138-43.000.  
Berenbaum, Morris B.: See—  
Nychka, Henry R.; Berenbaum, Morris B.; Robinson, Martin A.; and Eibeck, Richard E., 4,012,453.  
Berg, Gudbrand Gunnarson. Apparatus for cutting an elongate member of arbitrary length into shorter sections of predetermined lengths. 4,011,779, Cl. 83-71.000.  
Berkowitz, Murray; and Woodier, George H., to Curtiss-Wright Corporation. Rotary compressor with labyrinth sealing. 4,012,180, Cl. 418-141.000.  
Bernardi, Giancarlo: See—  
Pontoglio, Enrico; Strepparola, Ezio; and Bernardi, Giancarlo, 4,012,441.

Berry, Homer E., to Superior Concrete Accessories, Inc. Key-joint forming divider strip and screed for use with concrete slabs. 4,012,159, Cl. 404-68.000.  
Bertoniere, Noelle R.; Rowland, Stanley P.; and Roberts, Earl J., to United States of America, Agriculture. Durable-press properties in cotton containing fabrics via polymeric N-methylol reagents. 4,011,613, Cl. 8-191.000.  
Besprozvanny, Robert Matveevich; Abramson, Isosif Gershevich; Egorov, Georgy Borisovich; Nudelman, Rafail Manusovich; and Nikiforov, Jury Vasilievich. Method of producing mineral binder and apparatus embodying same. 4,012,639, Cl. 250-492.00B.  
Besson, Rene, to Ebauches S.A. Capacitive adjusting device for a quartz crystal oscillator. 4,012,700, Cl. 331-116.00R.  
Best, James F.: See—  
O'Reilly, Bernard M.; and Best, James F., 4,012,074.  
O'Reilly, Bernard M.; and Best, James F., 4,012,075.  
Bethlen, Farkas, to G. D. Searle & Co. Hospital trolleys. 4,011,609, Cl. 5-81.00B.  
Bettenhausen, Larry A.; Casey, James H.; and Luhman, Robert A., to Minnesota Mining and Manufacturing Company. Tape handling apparatus. 4,011,977, Cl. 226-88.000.  
Beutler, Eden E. Distributor assembly for a vehicle. 4,011,851, Cl. 123-146.50A.  
Beyer, Eduard: See—  
Koch, Peter; and Beyer, Eduard, 4,011,902.  
Bianchetta, Donald L.; and Field, Jesse L., Jr., to Caterpillar Tractor Co. Synchronized vehicle fluid drive system. 4,011,920, Cl. 180-6.480.  
Bichel, Darwin Carl: See—  
Mott, Roger Eugene; and Bichel, Darwin Carl, 4,011,709.  
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Cardenas, Cesar A.; Bien, John D.; and Carangelo, Salvatore, 4,012,358.  
Bienert, Walter B.: See—  
Pravda, Milton F.; and Bienert, Walter B., 4,012,770.  
Birchall, George Richard; Hepworth, Walter; and Smith, Stephen Collyer, to Imperial Chemical Industries Limited. Indole derivatives for providing analgesic and anti-inflammatory effects. 4,012,513, Cl. 424-251.000.  
Birdsall, John C.: See—  
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Bishop, Leonard William Jerome: See—  
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Proett, Mark Anton, 4,011,624.  
Black, Geoffrey Donald, to Medishield Corporation Limited, The. Respiratory signalling device. 4,011,828, Cl. 116-70.000.  
Blackburn, Tom L.; and Wisotzky, Otto G., to GTE Automatic Electric Laboratories Incorporated. Resistive pad with bridging resistor. 4,012,688, Cl. 323-79.000.  
Blackwell, Lyman L.: See—  
Weaver, Stephen; Blackwell, Lyman L.; and Staby, Paul A., 4,012,729.  
Blaha, Robert F., to Texas Instruments Incorporated. Starting circuit for single phase motor. 4,012,678, Cl. 318-221.00D.  
Blanding, Douglass L., to Eastman Kodak Company. Yieldable, coaxially-driven tape wrapping guides for use in a helical tape recorder. 4,012,788, Cl. 360-85.000.  
Blanding, Douglass L., to Eastman Kodak Company. Multioriented composite-surface tape guide for use in a cassette. 4,012,793, Cl. 360-130.000.  
Blank, Heinz-Ulrich; Wedemeyer, Karlfried; and Ebersberger, Josef, deceased (by Ebersberger, Thea, heiress), to Bayer Aktiengesellschaft. Process for preparing M-chlorobenzene sulphonyl chloride. 4,012,442, Cl. 260-543.00R.  
Blasingame, Steve J. Invertible pocketed target for a disc throwing game. 4,012,042, Cl. 273-95.00R.  
Bleiman, Lewis William, to Pertec Computer Corporation. Disk drive apparatus. 4,012,791, Cl. 360-99.000.  
Blincoe, Homer P., to Electromagnetic Sciences, Inc. Blocking oscillator driver for a microwave latching ferrite device. 4,012,644, Cl. 307-275.000.  
Bliss & Laughlin Ind., Inc.: See—  
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Bloom, Richard M., to Eastman Kodak Company. Magnetic head drum configuration having a friction reducing helical step. 4,012,792, Cl. 360-130.000.  
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Bode, Robert G., to Custom Accessories, Inc. Splash guard. 4,012,053, Cl. 280-154.50R.  
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Ball, William Henderson; and Ishimitsu, Kichio Keith, 4,012,013.  
Bogaty, Herman; and Peleckis, Anthony John, to Warner-Lambert Company. Coated razor blade. 4,012,551, Cl. 428-192.000.  
Boici, Vasile, to Intreprinderea de Medicamente Terapia, Romania. Analgesic substance derived from the Helleborus plant and method of making same. 4,012,505, Cl. 424-195.000.



- Bolander, Lawanda Charleen. Magnifying attachment for telephone buttons and the like. 4,012,127, Cl. 350-243.000.
- Bommaraju, Tilak V.: *See—*
- Stephens, Donald E.; and Bommaraju, Tilak V., 4,012,296.
- Bond, Geoffrey Colin, to Johnson Matthey & Co., Limited. Catalytic reactions. 4,012,450, Cl. 260-604.0HF.
- Bond, Walter L.; Kompfner, Rudolf; and Lemons, Ross A., to Leland Stanford Junior University. The Board of Trustees of. Method and apparatus for acoustic and optical scanning of an object. 4,011,748, Cl. 73-67.600.
- Bonetti, Andrea, to Snam Progetti S.p.A. Integrated urea-ammonia process. 4,012,443, Cl. 260-555.00A.
- Bonyhard, Peter Istvan; and Smith, James Lanson, to Bell Telephone Laboratories, Incorporated. Magnetic bubble replicator. 4,012,726, Cl. 340-174.0TF.
- Boothe, Jerry Emile; and Martin, Fred David, to Calgon Corporation. Thickened alcohol well treating compositions. 4,012,327, Cl. 252-8.55R.
- Bordenave, Joseph Heber; and Falls, Robert, to Cincinnati Butchers' Supply Company, The. Method and means for stabilizing and positioning a trolley hanger relative to a conveyor rail. 4,011,820, Cl. 104-97.000.
- Borg-Warner Corporation: *See—*
- Calabretta, Peter Trent, 4,012,183.
- Gaylord, Norman G., 4,012,575.
- Millard, Gregory Stephen Truscott, 4,011,905.
- Boros, Jozsef: *See—*
- Somosi, Istvan; Toth, Bela; Boros, Jozsef; and Vitez, Janos, 4,012,298.
- Bos, Jules; and Von Der Kall, Gunter, to U.S. Philips Corporation. Method of and device for grinding grooves. 4,011,692, Cl. 51-323.000.
- Botros, Raouf, to American Color & Chemical Corporation. Bisazomethine dyes for metal-modified polyolefins. 4,012,193, Cl. 8-42.00D.
- Bouillie, Remy A.; and Lamouler, Pierre. Measuring method and equipment for locating a break in an optical cable. 4,012,149, Cl. 356-237.000.
- Bourne, Edmund Alexander; and Fitzgerald, James Gerard, to National Research Development Corporation. First aid equipment. 4,011,945, Cl. 206-223.000.
- Bouteille, Daniel: *See—*
- Petrinaux, Eric; Lameyre, Felix; and Bouteille, Daniel, 4,011,883.
- Bouton, John C.; Partin, Melvin E.; and Highman, Robert C., to Geometric Data Corporation. Automatic focusing system including quantizing means. 4,012,634, Cl. 250-201.000.
- Bouzard, Daniel; and Weber, Abraham.  $\alpha$ -Amino and  $\alpha$ -formyl- $\alpha$ -(p-acyloxyphenyl)acetamidocyclohexanecarboxylic acid derivatives. 4,012,382, Cl. 260-243.00C.
- Bowen, Russell H.; Clark, Allen L.; Davis, David C.; Gilbert, Walter E.; Glover, Wayne L.; Walsh, Richard J.; and Wehling, Robert G., to Honeywell Information Systems, Inc. Non-logic printed wiring board test system. 4,012,625, Cl. 235-153.0AC.
- Boyd, William A.; and Britt, Richard T. Plant injection method and apparatus. 4,011,685, Cl. 47-57.500.
- Boyer, Richard J. Bracket for small animal feeder. 4,011,951, Cl. 211-71.000.
- Boys, John T., to Standard Pressed Steel Co. Method and apparatus for counting small parts. 4,012,622, Cl. 235-92.0PK.
- Braber, Robert J.; and Weber, Paul L., to Lehig Press, Inc., The. Package construction for opening only by a predetermined procedure. 4,011,949, Cl. 260-532.000.
- Bradbury, John Albert Avery; and Kendall, Matthew Giles, to Imperial Chemical Industries Limited. Fibre masses. 4,011,651, Cl. 29-424.000.
- Bradshaw, James E.: *See—*
- Pedersen, Norman E.; and Bradshaw, James E., 4,011,755.
- Braithwaite, John Colin; and Edwards, John Lawton, to British Gas Corporation. Pipe cleaning apparatus. 4,011,690, Cl. 51-8.00R.
- Brandtjen, Sheldon J., to Northwest Engineering Company. Apron attitude adjustment for loading and conveying machines. 4,011,937, Cl. 198-517.000.
- Branning, Peter: *See—*
- Kaynor, Margaret; Branning, Peter; and Nolan, Bruce, 4,011,824.
- Brantley, Lott W.; and Lawson, Billy D., to United States of America, National Aeronautics and Space Administration. Mount for continuously orienting a collector dish in a system adapted to perform both diurnal and seasonal solar tracking. 4,011,854, Cl. 126-270.000.
- Braun Aktiengesellschaft: *See—*
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- Goldberg, Mikhail Shaeovich. Mouthpiece for smoking tobacco. 4,011,877, Cl. 131-187.000.
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- Greene, William Henry. Bag container. 4,011,983, Cl. 229-14,0BE.
- Greer, Thomas Marion; to Du Pont de Nemours, E. I., and Company. Method and system for controlling web speed. 4,011,976, Cl. 226-8,000.
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- Guilbaud, Antoine L.; and Spector, George. Welding mask window door automatic operation. 4,011,594, Cl. 2-8,000.
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- Haller, Andreas; and Kundisch, Heiner, to Irion & Vosseler. Electric pulse counter and plastic housing therefor. 4,012,624, Cl. 235-92,00C.
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- Hargis, Ivan Glen; and Livigni, Russell Anthony, to General Tire & Rubber Company, The. Alkaline earth metal organometallic compounds, their preparation by metallation and catalysts comprising same. 4,012,336, Cl. 252-431,00R.
- Harper, Henry J. Adjustable seat-back mechanism. 4,012,158, Cl. 403-107,000.
- Harper, James G., to Texas Instruments Incorporated. Magnetic bubble memory packaging arrangement and its method of fabrication. 4,012,723, Cl. 340-174,0TF.
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- Johnson & Johnson: *See—*  
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- Mayer, Warren C.; and Skistimas, Donald V., 4,012,281.
- Johnson, Manuel D. Fishing lure, 4,011,681, Cl. 43-42.110.
- Johnson Matthey & Co., Limited: *See—*  
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- Johnson Products Company, Inc.: *See—*  
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- Johnson, Robert W.: *See—*  
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- Johnson, Russell W., to Ball Corporation. Microstrip antenna structure, 4,012,741, Cl. 343-700.0MS.
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- Jonas, John J., to Kraft, Inc. Multipurpose whipped dessert and method of manufacturing, 4,012,533, Cl. 426-565.000.
- Jones, Eric; and Walker, John, to Imperial Chemical Industries Limited. Polymerization process, 4,012,574, Cl. 526-74.000.
- Jones, Gary E.; Hart, Dean H.; and Brunka, Rueben R., to Caterpillar Tractor Co. Cab mounting device, 4,012,071, Cl. 296-35.00R.
- Jones, Jeffrey A., to Chanslor-Western Oil and Development Company. Emulsion treaters, 4,012,207, Cl. 55-174.000.
- Jones, Robert L., to Parker-Hannifin Corporation. Cryogenic pressure regulator, 4,011,734, Cl. 62-132.000.
- Josephs, Walter. Method for reclaiming variegated wastes, 4,012,219, Cl. 71-9.000.
- Judd, Myles A.: *See—*  
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- Julian Lecha, Manuel. Machine for printing different colors simultaneously by the offset method, 4,011,812, Cl. 101-176.000.
- Jung, John A.: *See—*  
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- Jurd, Leonard: *See—*  
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- Jurgens, Rainer, to Christensen, Inc. Stabilizer for drill strings, 4,011,918, Cl. 175-325.000.
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- Kagiwada, Reynold S.; and Hall, David B., to TRW Inc. Guided wave acousto-optic device, 4,012,120, Cl. 350-161.00W.
- Kain, Arthur F. Suspension idler, 4,011,938, Cl. 198-824.000.
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- Kaiser, Gary V.: *See—*  
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- Kaiser Resources Ltd.: *See—*  
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- Kalata, Theodore J.: *See—*  
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- Kane, William S.; and Cardwell, Paul H., to Deepsea Ventures, Inc. Separation of cobalt from nickel in ammoniacal solutions using 8-hydroxyquinolines, 4,012,483, Cl. 423-24.000.

- Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*  
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- Kanou, Yasuo: *See—*  
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- Kao Soap Co., Ltd.: *See—*  
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- Kaplan, Michael: *See—*  
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- Karagianes, Manuel Tom: *See—*  
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- Karatjas, Manuel: *See—*  
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- Karino, Kazunobu: *See—*  
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- Karl Mengele & Sohne: *See—*  
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- Karlsson, Frans Harry; and Faxen, Per Torsten, to Hykon-Patent Aktiebolag. Flushing and refilling apparatuses, 4,011,605, Cl. 4-41.000.
- Karlsson, Stig Erik, to Telefonaktiebolaget L M Ericsson. Device for obtaining a jitterstable synchronization of a counter, 4,012,698, Cl. 328-63.000.
- Karr, Alojzy: *See—*  
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- Kartnagen-Schertler, Manfred K. Schertler & Co.: *See—*  
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- Kasuga, Yoshiaki: *See—*  
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- Katayama, Shigenari: *See—*  
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- Katsumata, Takuma: *See—*  
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- Kaufhold, Frederick Daniel: *See—*  
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- Kaufman, Martin H.; and Stang, Peter L., to United States of America, Navy. High density impulse solid propellant, 4,012,244, Cl. 149-19.300.
- Kaushansky, Boris Iosifovich: *See—*  
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- Kawaguchi, Hiroshi; Tomita, Koji; Fujisawa, Kei-ichi; and Tsukiura, Hiroshi, to Bristol-Myers Company. Antibiotic complex Bu 2183, 4,012,576, Cl. 536-17.000.
- Kawai, Atsushi: *See—*  
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- Kawase, Shoji: *See—*  
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- Kaye, Saul; and Iverson, Robert L., to Ferro Corporation. Antibacterial agents for Gram-negative bacteria, 4,012,359, Cl. 260-45.8NE.
- Kaynor, Margaret; Branning, Peter; and Nolan, Bruce, to Florida Sailing Systems, Inc. Competition sailing jacket, 4,011,824, Cl. 114-270.000.
- Keane, James M., to Systems Resources Corporation. Dual mode pattern generator, 4,012,735, Cl. 340-324.0AD.
- Kehr, Wolfgang: *See—*  
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- Kehren, Engelbert W., to Texas Instruments Incorporated. Automatic pushbutton dial assembly for a subscriber telephone, 4,012,601, Cl. 179-90.00K.
- Keil, John G.; and Coleman, Michael G., to Motorola, Inc. Method of fabricating multicolor light displays utilizing etch and refill techniques, 4,012,243, Cl. 148-175.000.
- Keith, Jay, to Milliken Research Corporation. Yarn entanglement nozzle, 4,011,640, Cl. 28-1.400.
- Kellenbenz, Rolf: *See—*  
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- Kellner, Kurt: *See—*  
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- Kennecott Copper Corporation: *See—*  
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- Kennedy, Carroll W. Teeth cleaning device, 4,011,616, Cl. 15-21.00R.
- Kensler, Daniel L., Jr.; Kohn, Gustave K.; and Walgenbach, David D., to Chevron Research Company. Oxymethylene di-carboxylic acid esters as anti-fungal agents and animal growth promoters, 4,012,526, Cl. 424-313.000.
- Kermel, Louis, to C. G. Doris. Device for laying submarine pipelines, 4,011,729, Cl. 61-112.000.
- Kern, Jack L., to Xerox Corporation. Ribbon drive means, 4,011,933, Cl. 197-151.000.
- Kerr, James D.: *See—*  
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- Keske, Robert G., to Standard Oil Company (Indiana). Self-bonding varnish for magnet wires comprising a combination of a polyalkylenetrimellitate imide and a polyalkylenetrimellitate ester imide, 4,012,555, Cl. 428-383.000.
- Keske, Robert G.; and Stephens, James R., to Standard Oil Company (Indiana). Self-bonding varnish for magnet wires comprising a polyalkylenetrimellitate ester imide, 4,012,556, Cl. 428-383.000.
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- Kessler, Kurt: *See—*  
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- Kichline, Thomas P.; and Kranz, Allen H., to Monsanto Company. Preparation of process cheese, 4,012,534, Cl. 426-582.000.
- Kiehls, Karl; and Pommer, Ernst-Heinrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Fungicide, 4,012,521, Cl. 424-301.000.
- Kieslich, Klaus: *See—*  
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- Kikuchi, Kunio, to Mikuni Kogyo Kabushiki Kaisha. Inner venturi tube for carburetor, 4,012,468, Cl. 261-78.00R.
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- Kimura, Yosiaki. Apparatus for making feed stuff containing bagasse, protein and yeast, 4,011,806, Cl. 99-485.000.
- Kindel, Erik Lennart, to LKB-Produkter AB. Method for sectioning in a microtome at low temperature and trimming of the specimen to be sectioned, 4,012,475, Cl. 264-28.000.
- King, Thomas J.: *See—*  
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- Kinser, Vernon. Score keeping units, 4,012,037, Cl. 273-1.0ES.
- Kipp, Kevin K.: *See—*  
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- Kirby, William Everett; and Seymour, David Jackson, to Wharton Shipping Corporation. Swash plate, 4,011,825, Cl. 114-260.000.
- Kirk, Glenn E.; and Medesha, Alfred L., to Motorola, Inc. Semiconductor package, 4,012,768, Cl. 357-72.000.
- Kirk, Mahlon Randall: *See—*  
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- Kirkpatrick, Melvin D.: *See—*  
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- Kirschner, Thomas J., Jr., to Thiokol Corporation. Gas generator or rocket motor with selective discrete time vs. output profiles, 4,011,720, Cl. 60-254.000.
- Kitano, Yoshio; and Katsumata, Takuma. Jacketed roller for synthetic yarn spinning apparatus, 4,011,641, Cl. 28-71.300.
- Kiwaki, Hisakatsu; and Okubo, Hiroshi, to Hitachi, Ltd. Car signaling system, 4,012,019, Cl. 246-34.00R.
- Klein, Carlton, to New York Flameproofing Company, Inc. Multiple-line soffit system, 4,011,696, Cl. 52-39.000.
- Klein, Fritz F.; and Morse, Oliver C., III, to Automatic Breathing Apparatus Co., Inc. Electronically controlled pulmonary ventilator, 4,011,866, Cl. 128-145.800.
- Klein, Raymond J., to Dialoc Corporation of America. Lock device, 4,011,742, Cl. 70-305.000.
- Klein, Theodore Harold, to Bell Telephone Laboratories, Incorpo-



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- Klier, Donald F.: See—  
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- Klimas, Joachim, to Netzsch-Mohnpumpen-GmbH. Spray-tube coupling for washing machines. 4,011,997, Cl. 239-556.000.
- Klockner-Werke AG: See—  
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- Kluppel, Heinz-Eugen: See—  
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- Klutchko, Sylvester; Shavel, John, Jr.; and Von Strandmann, Max, to Warner-Lambert Company. Heterocyclic annelated 1-benzoxepin-5-ones. 4,012,411, Cl. 260-307.00H.
- Knaus, Dennis: See—  
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- Knoepfler, Nestor B.; Madacs, John P.; and Neumeyer, Julius P., to United States of America, Agriculture. Vapor phase process to impart smolder resistance to cotton batting and other cellulosic materials. 4,012,507, Cl. 427-212.000.
- Knox, Hugh Stewart Geddes. Cable spinning. 4,012,001, Cl. 242-54.00R.
- Knox, Kenneth L., Sr. Fuel vaporizer for internal combustion engines. 4,011,850, Cl. 123-141.000.
- Knutson, Dale A.; and Patel, Kishor J., to Applied Power Inc. Proportional flow control valve. 4,011,891, Cl. 137-625.620.
- Kobayakawa, Toshihiro: See—  
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- Kobel, George B.: See—  
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- Koch, Henning: See—  
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- Koch, Peter; and Beyer, Eduard, to Gebrueder Buehler AG. Device for pressure casting. 4,011,902, Cl. 164-314.000.
- Kodama, Masayuki; and Uchiyama, Shintaro, to Fuji Jukogyo Kabushiki Kaisha. Transmission. 4,011,776, Cl. 74-789.000.
- Kodis, Robert D., to Di/An Controls, Inc. Multiple document printing system. 4,011,811, Cl. 101-93.070.
- Koehler, Waldemar: See—  
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- Kohler-Feuerle, Sigrid, heiress: See—  
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- Kokusai Denshin Denwa Kabushiki Kaisha: See—  
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- Koleske, Otto, to Wilson Manufacturing Corporation. Clip. 4,011,639, Cl. 24-255.00H.
- Komine, Yoshio, to Canon Kabushiki Kaisha. Motion picture camera. 4,012,135, Cl. 352-72.000.
- Komiya, Osamu, to Olympus Optical Co., Ltd. Electrical apparatus for treating affected part in a coeloma. 4,011,872, Cl. 128-303.140.
- Kompfner, Rudolf: See—  
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- Konishi, Mitsuhiro: See—  
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- Konishiroku Photo Industry Co., Ltd.: See—  
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- Koo, James T., to Intel Corporation. Contactless random-access memory cell and cell pair. 4,012,757, Cl. 357-24.000.
- Kopacki, Adam F.; and Deatcher, John H., to Stauffer Chemical Company. Suspension-emulsion interpolymer containing tris(2-ethylhexyl) phosphate. 4,012,356, Cl. 260-30.60R.
- Koppel, Gary A.: See—  
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- Koubek, Edward, to United States of America, Navy. Oxidation of refractory organics in aqueous waste streams by hydrogen peroxide and ultraviolet light. 4,012,321, Cl. 210-63.00R.
- Kowalski, Slawomir, to Marotta Scientific Controls, Inc. Three port non-interflow poppet valve. 4,011,892, Cl. 137-625.660.
- Kraft, Dennis W., to Bunker Ramo Corporation. Water activation and pressure equalization of electrochemical batteries. 4,012,234, Cl. 429-48.000.
- Kraft, Inc.: See—  
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- Kraftwerk Union Aktiengesellschaft: See—  
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- Kraig, Alfred Henry, to United Technologies Corporation. Fan structure. 4,012,165, Cl. 415-145.000.
- Kramer, Dennis A., to Motorola, Inc. Pay TV control system. 4,012,583, Cl. 358-84.000.
- Kranz, Allen H.: See—  
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- Kratsios, George: See—  
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- Kraus, Friedrich. Bather's cap and method of making the same. 4,011,597, Cl. 2-68.000.
- Krause, Klaus; and Ilgmeier, Ludwig, to Kraftwerk Union Aktiengesellschaft. Connecting device. 4,012,157, Cl. 403-20.000.
- Krause, William F., Jr., to Otis Engineering Corporation. Burner nozzle assembly. 4,011,995, Cl. 239-404.000.
- Krekow, Gerhard: See—  
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- Krenzer, John, to Velsicol Chemical Corporation. Thiadiazolylimidazolidinones herbicides. 4,012,223, Cl. 71-90.000.
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- Krohn, Wolfgang; Metzger, Karl Georg; Preiss, Michael; and Walkowiak, Michael, to Bayer Aktiengesellschaft. Nitro- $\beta$ -lactam antibiotics and processes for their preparation and use. 4,012,518, Cl. 424-271.000.
- Krol, John E.: See—  
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- Krueger, William Henry: See—  
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- Kruer, Melvin R.: See—  
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- Kruger, Wolfgang; and Hanser, Hagen. Device for fastening a wheel disc on a shaft. 4,011,737, Cl. 64-9.00A.
- Krull, Irwin H.: See—  
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- Kruse, Claus A., to McGill Manufacturing Company, Inc. Shaft mounted bearing for withdrawal over burrs on shaft. 4,012,086, Cl. 308-236.000.
- Ksioszk, Leo P. Self-cleaning animal kennel. 4,011,837, Cl. 119-1.000.
- Kubierschky, Klaus: See—  
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- Kubik, Richard S. Wheel balancing apparatus. 4,011,762, Cl. 73-484.000.
- Kuckens, Alexander; and Kohl, Horst, to DAGMA GmbH & Co. Apparatus and process for carbonating liquids. 4,011,733, Cl. 62-59.000.
- Kugele, Thomas G.: See—  
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- Kuhne, Ulrich: See—  
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- Kuligowski, Gerd; and Von Hessberg, Konrad, to Siemens Aktiengesellschaft. Apparatus for recording variable measurement quantities that can be translated into electrical current or voltage variations. 4,012,746, Cl. 346-35.000.

- Kumazawa, Shoji: See—  
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- Kunderman, Fred Kurt, to Dresser Industries, Inc. Shaft support means. 4,012,085, Cl. 308-26.000.
- Kundisch, Heiner: See—  
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- Neal, Archie; and Moore, Paul, to Love Company. Chisel plow mount. 4,011,916, Cl. 172-710.000.
- Neal, Jerry L., to Cosco, Inc. Table. 4,011,821, Cl. 108-156.000.
- Neal, Lloyd D.; and Northrup, Allan R., to Amaray International Corporation. Hinged storage container for tape cartridge with self-aligning walls. 4,011,940, Cl. 206-1.500.
- Nelligan, William B., to Schlumberger Technology Corporation. System for telemetering well logging data. 4,012,712, Cl. 340-18.0CM.
- Nelson Industries, Inc.: See—
- Goplen, Gary Dennis, 4,011,922.



Nelson, John A., to Xerox Corporation. Multiple modular sorter system. 4,012,034, Cl. 271-173.000.

Nelson, John A., to Xerox Corporation. Sorter control system. 4,012,035, Cl. 271-173.000.

Nelson, John P., to Allis-Chalmers Corporation. Axially adjustable mounting for a belt idler. 4,011,767, Cl. 74-242.15R.

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Nelson, Norman A., to Upjohn Company. The. Process for preparing 5-oxa PGF<sub>2</sub> type compounds. 4,012,431, Cl. 260-468.00D.

Nercessian, Sarkis, to Forbro Design Corporation. Regulated power supply for very high current with voltage and current programmable to zero. 4,012,685, Cl. 323-20.000.

Netzsch-Mohnpumpen-GmbH: See—

Klimas, Joachim, 4,011,997.

Neumeyer, Julius P.: See—

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Neville Chemical Company: See—

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New York Flameproofing Company, Inc.: See—

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Newcomb Audio Products Co.: See—

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Newland, Gordon C.: See—

Wang, Richard H. S.; Pacifici, James G.; and Newland, Gordon C., 4,012,302.

Newmeyer, Reed Albert, to Sperry Rand Corporation. Double revolving stylus on continuous belt. 4,012,747, Cl. 346-139.00A.

Nichiro Kogyo Company, Ltd.: See—

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Nicholls, David. Doppler detection device with integrator sampling means to inhibit false alarms. 4,012,730, Cl. 340-258.00A.

Nickander, Rodney C.: See—

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Nickey, George A.: See—

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Nicklas, William H.: See—

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Nicolet, Marc A.: See—

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Nielsen, Arnold T., to United States of America, Navy. 7-(N-Methyl-N-alkylamino)-1,3,5-triazadantanes. 4,012,384, Cl. 260-248.0NS.

Nielsen, Robert P.; and La Rochelle, John H., to Shell Oil Company. Ethylene oxide process. 4,012,425, Cl. 260-348.50R.

Niimura, Tsutomu: See—

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Nikiforov, Yuri Vasilievich: See—

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Nikles, Erwin, to Ciba-Geigy AG. Carbamates. 4,012,435, Cl. 260-479.00C.

Nilon Bros.: See—

Nilon, John W.; and King, Thomas J., 4,011,896.

Nilon, John W.; and King, Thomas J., to Nilon Bros. Apparatus for rapidly dispensing beer into open cups. 4,011,896, Cl. 141-82.000.

Nimerick, Kenneth H., to Dow Chemical Company. The. Composition useful in preventing environmental erosion containing film forming organic polymer and silicone. 4,012,355, Cl. 260-29.7NR.

Nippon Electric Company, Ltd.: See—

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Nippon Kayaku Kabushiki Kaisha: See—

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Nippon Soda Company Limited: See—

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Nishiumi, Yoshio: See—

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Nivens, Robert V.; Williams, Billy J.; Toole, Irvin, Jr.; and Fenton, Elliott C., to Continental Oil Company. Method for transporting sweet and sour hydrocarbon fluids in a pipeline. 4,011,882, Cl. 137-15.000.

Noack, Manfred G., to Olin Corporation. Catalyzed hydrazine compound corrosion inhibiting composition and use. 4,012,195, Cl. 21-2.70R.

Noble, Melvin Lee, to United Technologies Corporation. Turbomachinery vane or blade with cooled platforms. 4,012,167, Cl. 416-97.00A.

Noji, Kichizo: See—

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Nolex Corporation: See—

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Nolin, Roger J., to TRE Corporation. Lock cylinder with dual drivers. 4,011,741, Cl. 70-107.000.

Nomura, Toshio: See—

Hirosawa, Yoshiaki; Nomura, Toshio; and Iiyama, Masahiko, 4,011,844.

Nordgren, Sven-Ake; and Norton, Douglas J., to Alfa-Laval AB. Electronic milker. 4,011,838, Cl. 119-14.080.

Norman, Ralph L.; Hagood, Jerry W.; and Shelton, Joe. X-ray tube. 4,012,656, Cl. 313-55.000.

Norprint Limited: See—

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Northrop Corporation: See—

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Nudelman, Rafail Manusovich: See—

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Numata, Saburo, to Fuji Photo Optical Co., Ltd. Strobe flash light device for cameras. 4,012,749, Cl. 354-145.000.

Nurov, Yuri Lvovich: See—

Model, Evgenia Iosifovna; Savina, Anna Sergeevna; Nurov, Yuri Lvovich; Piorunsky, Alexandr Nikolaevich; Fedorov, Boris Efimovich; and Ivanov, Vladimir Mikhailovich, 4,012,695.

Nute, Ernest B., Jr., to Armstrong Cork Company. Cross tee end joint for suspended ceiling system. 4,011,707, Cl. 52-664.000.

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Nychka, Henry R.; Berenbaum, Morris B.; Robinson, Martin A.; and Eibeck, Richard E., to Allied Chemical Corporation. Process for the production of chlorofluorinated aromatic hydrocarbons. 4,012,453, Cl. 260-649.00F.

O.K. Partnership: See—

O'Brien, Richard C., deceased, 4,011,986.

O'Brien, Elva R., executrix: See—

O'Brien, Richard C., deceased, 4,011,986.

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Oda, Osamu: See—

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Parker, Jimmy L. Paving machine with enclosed material compartment. 4,012,160, Cl. 404-84.000.

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Parrish, John C., II. Conveying and stacking apparatus. 4,012,033, Cl. 271-64.000.

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- Pekau, Dietlind, to Siemens Aktiengesellschaft. Process and apparatus for recording acoustical holograms. 4,012,711, Cl. 340-1.00R.
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- Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 2-(5-Phenyl-2-furyl)imidazoles. 4,012,414, Cl. 260-309.000.
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- Maxson, Orvin G.; and Peterson, Marvin L., 4,011,615.
- Peterson, Robert S.; and Cook, John W., to Westinghouse Electric Corporation. Stand speed reference circuit for a continuous tandem rolling mill. 4,011,743, Cl. 72-12.000.
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- Petro-Tex Chemical Corporation: See—
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- Shikakura, Yoshihisa; Sakai, Fumio; and Shimizu, Hitoshi, to Nippon Kayaku Kabushiki Kaisha. Production of methacrolein and oxidation catalyst used therefor. 4,012,449, Cl. 260-603.00R.
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- Simson, Walter A. Combined advertising insert and mailing envelope. 4,011,985, Cl. 229-68.00R.
- Singer, Malcolm Scott, to Chevron Research Company. Herbicidal 1-alkanoyloxy-haloethyl urea. 4,012,225, Cl. 71-106.000.
- Singleton, David M., to Shell Development Company. Process for reducing the total sulfur content of Claus off-gases. 4,012,486, Cl. 423-224.000.
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- Smith, Clyde, to Thomson CSF Laboratories, Inc. System for stabilizing cathode ray tube operation. 4,012,775, Cl. 358-29.000.
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**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS**

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 402,929	3,991,251	Feb. 3, 1976	Sep. 9, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977	B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976	B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976	B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977	B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976	B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977	B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976	B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976	B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977	B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976	B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976



# CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 452,944	4,009,773	Mar. 30, 1976	Nov. 30, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976	B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976	B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976	B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977	B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976	B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976	B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977	B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976	B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977	B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976	B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976	B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976	B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976	B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976	B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976	B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977	B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976	B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976	B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976	B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977	B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976	B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976	B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976	B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976	B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977	B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976	B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976	B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976	B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976	B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976	B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976

# CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977	B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977	B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977	B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976	B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976	B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976	B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 470,798	3,987,480	Mar. 20, 1976	Oct. 19, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976



PI 42 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 497,293	4,011,412	Mar. 30, 1976	Mar. 30, 1977	B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976	B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977	B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976	B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977	B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976	B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976	B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976	B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976	B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976	B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976	B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976	B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976	B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976	B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976	B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976	B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976	B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976	B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976	B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977	B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977	B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976	B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977	B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976	B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976	B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976	B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976	B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976	B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976	B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976	B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976	B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976	B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976	B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976	B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977	B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976	B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976	B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977	B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976	B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 504,777	3,997,564	Feb. 24, 1976	Dec. 14, 1976	B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976	B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976	B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977	B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976	B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976	B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976	B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976	B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976	B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976	B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976	B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976	B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976	B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977	B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977	B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977	B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976	B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977	B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976	B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976	B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976	B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976	B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976	B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976	B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976	B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 519,488	3,992,481	Feb. 17, 1976	Nov. 16, 1976	B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976	B 528,297	4,001,133	Mar. 16, 1976	Jan. 4, 1977
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976	B 528,303	3,991,028	Feb. 10, 1976	Nov. 9, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977	B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976	B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976	B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976	B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976	B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976	B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976	B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977	B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977	B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976	B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976	B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976	B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976	B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976	B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976	B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976	B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977	B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976	B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976	B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976	B 530,873	4,000,016	Feb. 17, 1976	Jan. 4, 1977
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976	B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976	B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977	B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977	B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976	B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976	B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976	B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976	B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976	B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976	B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976	B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976	B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976	B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976	B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976	B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976	B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976	B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976	B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976	B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976	B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976	B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977	B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976	B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976	B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976	B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976	B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 522,354	3,984,595	Jan. 20, 1976	Oct. 12, 1976	B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977	B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 523,885	3,981,400	Feb. 17, 1976	Sep. 21, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976



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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976	B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976	B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976	B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976	B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976	B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976	B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977	B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976	B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976	B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976	B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977	B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976	B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977	B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976	B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976	B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976	B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976	B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976	B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976	B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976	B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976	B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976	B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976	B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976	B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976	B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976	B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976	B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976	B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976	B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977	B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976	B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976	B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976	B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976	B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976	B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977	B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976	B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976	B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976	B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976	B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976	B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976	B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976	B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976	B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976	B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976	B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976	B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976	B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977	B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977	B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977	B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976	B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976	B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977	B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977	B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976	B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976	B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976	B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976	B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976	B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976	B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977

**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED**

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976				



# LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF MARCH, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, to CPC International Inc. Process for the enzymatic isomerization of dextrose to levulose. Re. 29,152, Cl. 195-31.00F.
- Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix: *See—* Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, Re. 29,152.
- Cory, Robert P., deceased: *See—* Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, Re. 29,152.
- CPC International Inc.: *See—* Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, Re. 29,152.
- Heady, Robert E.: *See—* Armbruster, Frederick C.; Heady, Robert E.; Cory, Robert P., deceased; and Cory, Cynthia S., a/k/a Cynthia S. Timmerman, executrix, Re. 29,152.
- McCaleb, Stanley B., to Sun Oil Company. Repulsing clays on drill bits. Re. 29,151, Cl. 175-57.000.
- Monsanto Company: *See—* Phillips, Wendell Gary, Re. 29,153.
- Phillips, Wendell Gary, to Monsanto Company. Certain N-phenacyl pyridinium halides. Re. 29,153, Cl. 260-294.900.
- Regency Electronics, Inc.: *See—* Schonegg, Louis E., Re. 29,154.
- Schonegg, Louis E., to Regency Electronics, Inc. Transceiver channel selector. Re. 29,154, Cl. 325-18.000.
- Sun Oil Company: *See—* McCaleb, Stanley B., Re. 29,151.

# LIST OF DESIGN PATENTEEES

- Alvarez, Teresita, to Burlington Industries, Inc. Pantyhose. 243,641, 3-15-77, Cl. D2-6.000.
- Alvarez, Teresita, to Burlington Industries, Inc. Stocking. 243,643, 3-15-77, Cl. D2-337.000.
- American Optical Corporation: *See—* Canavan, Richard W., III, 243,687.
- Angeles, Frank. Lamp. 243,710, 3-15-77, Cl. D48-20.00B.
- Art Specialty Company: *See—* Haft, Howard S., 243,711.
- Black and Decker Manufacturing Company, The: *See—* Zurwelle, Donald William; Ramstrom, Lee Webber; and Markle, Stanley Alan, 243,652.
- Booth, Vernard S., to Olinkraft, Inc. Box blank. 243,663, 3-15-77, Cl. D9-245.000.
- Brass, Robert L. Simulated table top stage for use in performing magic tricks or the like. 243,707, 3-15-77, Cl. D34-15.00R.
- Bren, J. Robert. Illuminated contact lens kit. 243,718, 3-15-77, Cl. D87-9.000.
- Brown, Charles Mack. Necktie. 243,644, 3-15-77, Cl. D2-351.000.
- Bruest Industries, Inc.: *See—* Faulkner, Ernest L., 243,694.
- Bunyard, Kenneth L. Airplane. 243,667, 3-15-77, Cl. D12-78.000.
- Burgoyne, Thomas J. Portable cord holder. 243,654, 3-15-77, Cl. D8-358.000.
- Burlington Industries, Inc.: *See—* Alvarez, Teresita, 243,641.
- Alvarez, Teresita, 243,643.
- Butz, Jack R., to Ken's Pizza Parlors, Inc. Building. 243,696, 3-15-77, Cl. D25-25.000.
- Canavan, Richard W., III, to American Optical Corporation. Pair of spectacles. 243,687, 3-15-77, Cl. D16-65.000.
- Carbary, Lloyd H. Cooking rack for use in microwave ovens or the like. 243,649, 3-15-77, Cl. D7-129.000.
- Cartier, Inc.: *See—* Durante, Alfred Joseph, 243,666.
- Cavazos, Antonio M. Ear tag. 243,704, 3-15-77, Cl. D30-43.000.
- Clement, Carl J., and Stengel, Fred H., to Xerox Corporation. Key set device for encoding data. 243,700, 3-15-77, Cl. D14-40.000.
- Conroy, Federico. Container to hold beverage bottles and glasses. 243,648, 3-15-77, Cl. D7-71.000.
- Dallaire, Raymond. Extruded side rail for a window. 243,674, 3-15-77, Cl. D25-76.000.
- Dallaire, Raymond. Extruded side rail for a window. 243,675, 3-15-77, Cl. D25-76.000.
- Dallaire, Raymond. Extruded sill track insert for a window. 243,676, 3-15-77, Cl. D13-6.000.
- Dallaire, Raymond. Extruded sill track for a window. 243,677, 3-15-77, Cl. D25-74.000.
- Dallaire, Raymond. Extruded sill track for a window. 243,678, 3-15-77, Cl. D25-74.000.
- Dallaire, Raymond. Extruded sill track for a window. 243,679, 3-15-77, Cl. D25-74.000.
- Dallaire, Raymond. Extruded sill track for a window. 243,680, 3-15-77, Cl. D25-74.000.
- Dallaire, Raymond. Extruded side rail for a window. 243,681, 3-15-77, Cl. D25-76.000.
- Dallaire, Raymond. Extruded sill track insert for a window. 243,682, 3-15-77, Cl. D25-74.000.
- Dallaire, Raymond. Extruded side rail for a window. 243,683, 3-15-77, Cl. D25-76.000.
- Dallaire, Raymond. Extruded side rail for a window. 243,684, 3-15-77, Cl. D25-76.000.
- Dallaire, Raymond. Extruded side rail for a window. 243,685, 3-15-77, Cl. D25-76.000.
- Data Packaging Corporation: *See—* Lyman, George F., 243,705.
- Dimensionetix, Inc.: *See—* Gruber, George S., 243,691.
- Gruber, George S., 243,692.
- Gruber, George S., 243,693.
- Dolnar, Hubert, to Unican Security Systems, Ltd. Pull. 243,661, 3-15-77, Cl. D8-319.000.
- Dow Chemical Company, The: *See—* Hutter, Wayne Robert; and Miller, John Andrew, 243,656.
- Doyel, John S. Battery-powered pump. 243,690, 3-15-77, Cl. D23-18.000.
- Durante, Alfred Joseph, to Cartier, Inc. Ring. 243,666, 3-15-77, Cl. D11-34.000.
- Edmark, K. William; Smith, David B.; and Pheil, Louis D., to Physio Control Corporation. Physiological monitoring device housing. 243,717, 3-15-77, Cl. D83-1.00F.
- Esslinger, Robert H.: *See—* Keyko, George; and Esslinger, Robert H., 243,688.
- Estee Lauder, Inc.: *See—* Levy, Ira Howard, 243,660.
- Faulkner, Ernest L., to Bruest Industries, Inc. Portable catalytic heater. 243,694, 3-15-77, Cl. D23-72.000.
- Fine, Leonard, to General Electric Company. Wall plate-margin and filigree. 243,653, 3-15-77, Cl. D8-353.000.
- Gamble, Tyrone. Aquarium. 243,703, 3-15-77, Cl. D30-8.000.
- General Electric Company: *See—* Fine, Leonard, 243,653.
- Gietzen, James J. Combined electrical connector and adapter plug therefor. 243,698, 3-15-77, Cl. D13-24.000.
- Gruber, George S., to Dimensionetix, Inc. Bathing pool. 243,691, 3-15-77, Cl. D23-55.000.
- Gruber, George S., to Dimensionetix, Inc. Soaking tub. 243,692, 3-15-77, Cl. D23-55.000.
- Gruber, George S., to Dimensionetix, Inc. Bath tub. 243,693, 3-15-77, Cl. D23-55.000.
- Haft, Howard S., to Art Specialty Company. Lamp. 243,711, 3-15-77, Cl. D48-20.00F.
- Hall, Marshall D. Golf club head. 243,706, 3-15-77, Cl. D34-5.0GH.
- Hardinge Brothers, Inc.: *See—* Lyon, Garnet R., 243,664.
- Hayashi Cutlery Co., Ltd.: *See—* Hayashi, Toru, 243,650.
- Hayashi, Toru, 243,651.
- Hayashi, Toru, to Hayashi Cutlery Co., Ltd. Kitchen scissors. 243,650, 3-15-77, Cl. D8-55.000.
- Hayashi, Toru, to Hayashi Cutlery Co., Ltd. Dressmaker's shears. 243,651, 3-15-77, Cl. D8-57.000.
- Hilfiker Pipe Co.: *See—* Hilfiker, William K., 243,697.
- Hilfiker, William K., to Hilfiker Pipe Co. Retaining wall stretcher. 243,697, 3-15-77, Cl. D25-77.000.



Quartz Timing Corporation: *See—*  
     Keyko, George; and Esslinger, Robert H., 243,688.  
 Ramstrom, Lee Webber: *See—*  
     Zurwelle, Donald William; Ramstrom, Lee Webber; and Markle,  
     Stanley Alan, 243,652.  
 Richards Manufacturing Company: *See—*  
     Tracea, Daniel H.; Weil, Lowell S.; and Smith, Stephen D.,  
     243,716.  
 Richton International Corporation: *See—*  
     Nolan, George W., 243,646.  
 Roux, Andries Stephanus. Metal roofing tile. 243,695, 3-15-77, Cl.  
     D25-80.000.  
 Schneider, David. Display stand for rings. 243,658, 3-15-77, Cl. D6-  
     141.000.  
 Schoenfeld, Alexander N., to Trans-World Display Corporation. Mer-  
     chandise display module. 243,647, 3-15-77, Cl. D6-188.000.  
 Sharp Kabushiki Kaisha: *See—*  
     Ikeda, Mafafumi, 243,701.  
 Sherman, Robert P. Butane disposable lighter. 243,702, 3-15-77, Cl.  
     D27-42.000.  
 Singer Company, The: *See—*  
     Morris, John Charles; Stoltz, Elmer J.; and Nyquist, Richard A.,  
     243,712.  
 Slack, John A., to World Carpets. Rug carousel. 243,645, 3-15-77, Cl.  
     D6-25.000.  
 Smith, David B.: *See—*  
     Edmark, K. William; Smith, David B.; and Pheil, Louis D.,  
     243,717.  
 Smith, Stephen D.: *See—*  
     Tracea, Daniel H.; Weil, Lowell S.; and Smith, Stephen D.,  
     243,716.  
 Stengel, Fred H.: *See—*  
     Clement, Carl J.; and Stengel, Fred H., 243,700.  
 Stoltz, Elmer J.: *See—*  
     Morris, John Charles; Stoltz, Elmer J.; and Nyquist, Richard A.,  
     243,712.  
 Strand, Gordon A., to Owens-Illinois, Inc. Bottle. 243,657, 3-15-77, Cl.  
     D9-129.000.  
 Timex Corporation: *See—*  
     Laurent, Frederic, 243,665.  
 Trans-World Display Corporation: *See—*  
     Schoenfeld, Alexander N., 243,647.  
 Tracea, Daniel H.; Weil, Lowell S.; and Smith, Stephen D., to Richards  
     Manufacturing Company. Great toe prosthesis. 243,716, 3-15-77,  
     Cl. D83-1.00E.  
 Trimnell, Edward J., to Litton Business Systems, Inc. Retaining and  
     protective device for intravenous infusion means. 243,715, 3-15-77,  
     Cl. D83-1.00R.  
 Unican Security Systems, Ltd.: *See—*  
     Dolnar, Hubert, 243,661.  
 U.S. Philips Corporation: *See—*  
     Oord, Klaas Tiemen, 243,719.  
 van der Lely, Ary: *See—*  
     van der Lely, Cornelis; and van der Lely, Ary, 243,708.  
 van der Lely, Cornelis; and van der Lely, Ary. Cultivator tine. 243,708,  
     3-15-77, Cl. D15-29.000.  
 Voorhees, John L. Removable insole cushion. 243,642, 3-15-77, Cl. D2-  
     318.000.  
 Wald Manufacturing Company, Incorporated: *See—*  
     Humlong, Robert F., 243,670.  
     Humlong, Robert F., 243,671.  
     Pawsat, Carlton P., 243,672.  
 Webster, William Lee. Mobile welding machine. 243,669, 3-15-77, Cl.  
     D12-101.000.  
 Weil, Lowell S.: *See—*  
     Tracea, Daniel H.; Weil, Lowell S.; and Smith, Stephen D.,  
     243,716.  
 West, Norvel P. Hood ornament. 243,673, 3-15-77, Cl. D12-200.000.  
 Whitey Research Tool Co.: *See—*  
     Matousek, Stephen; and Koch, Ulrich H., 243,655.  
 World Carpets: *See—*  
     Slack, John A., 243,645.  
 Xerox Corporation: *See—*  
     Clement, Carl J.; and Stengel, Fred H., 243,700.  
 Yajima, Yozo, to Kabushiki Kaisha Hattori Tokeiten. Electric shaver.  
     243,720, 3-15-77, Cl. D28-51.000.  
 Younger, Gilbert W. Transmission fluid transfer and cover plate for  
     motorcycle engines. 243,714, 3-15-77, Cl. D15-5.000.  
 Zurwelle, Donald William; Ramstrom, Lee Webber; and Markle,  
     Stanley Alan, to Black and Decker Manufacturing Company, The.  
     Cordless electric tool. 243,652, 3-15-77, Cl. 8-68.000.

## ISSUED MARCH 15, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2		4,011,644	745	4,011,705	67.6	4,011,748	114.1	4,012,260	CLASS 126		
8	4,011,594	191.2	4,011,645	CLASS 53		67.7	4,011,750	CLASS 98		270	
16	4,011,596	264	4,012,204	187	4,011,708	71.6	4,011,749	40 D	4,011,801	4,011,854	
68	4,011,597	267	4,011,648	CLASS 55		122	4,011,751	115 K	4,011,802	4,011,855	
	4,011,598	421 R	4,011,649			189	4,011,752		4,011,803	4,011,856	
116	4,011,599	424	4,011,650	34	4,012,206	194 A	4,011,753	CLASS 99		271	
183	4,011,600	455 R	4,011,651	174	4,012,207		4,011,755	CLASS 128			
436	4,011,595	571	4,011,652	223	4,012,208	194 VS	4,011,754	421 H	4,011,804	2 C	
CLASS 3		612	4,011,653	240	4,012,209	204	4,011,756	467	4,011,805	2.05 M	
1.5	4,011,601	750	4,011,654	479	4,012,210	229	4,011,757	485	4,011,806	2.06 E	
1.9	4,011,602	818	4,011,655	485	4,012,211	393	4,011,758	CLASS 100		58	
1.91	4,011,603	CLASS 30		10.4	4,011,709	407 R	4,011,759	2	4,011,807	92 BA	
CLASS 4		30	4,011,656	341	4,011,710	421.5 R	4,011,760	26	4,011,808	140 N	
34	4,011,604	337	4,011,657	CLASS 56		462	4,011,761	48	4,011,809	142.3	
41	4,011,605	CLASS 32		58.89	4,011,712	484	4,011,762	229 A	4,011,810	145.8	
112	4,011,606	40 R	4,011,658	CLASS 57		CLASS 74		CLASS 101		204	
172.12	4,011,607	CLASS 33		23 BA	4,011,713	100 R	4,011,763	93.07	4,011,811	218 P	
213	4,011,608	203	4,011,659	28 R	4,011,714	193	4,011,765	176	4,011,812	276	
CLASS 5		379	4,011,660	CLASS 58		234	4,011,766	288	4,011,813	284	
81 B	4,011,609	CLASS 34		39.28 R	4,011,716	242.15 R	4,011,767	CLASS 102		303.14	
90	4,011,610	12	4,011,661	85	4,011,715	479	4,011,768	20	4,011,815	326	
361 B	4,011,611	90	4,011,662	CLASS 59		499	4,011,769	27 R	4,011,816	362	
CLASS 7		155	4,011,663	39.28 R	4,011,716	501 R	4,011,770	38	4,011,817	418	
14.55	4,011,612	CLASS 35		202	4,011,717	522	4,011,771	56 R	4,011,818	109 R	
CLASS 8		7 R	4,011,671	254	4,011,719	552	4,011,772	70.2 P	4,011,819	187	
34	4,012,192	9 B	4,011,664	445	4,011,720	606 R	4,011,774	CLASS 104		7	
42 D	4,012,193	66	4,011,665	465	4,011,721	732	4,011,775	97	4,011,820	9	
142	4,012,194	CLASS 36		486	4,011,722	789	4,011,776	CLASS 106			
191	4,011,613	59 C	4,011,666	567	4,011,723	CLASS 75		15 R	4,012,261	75	
CLASS 9		77 R	4,011,667	624	4,011,725	38	4,012,226	38.22	4,012,262	4,012,233	
337	4,011,614	CLASS 37		16	4,011,726	122	4,012,227	52	4,012,263	CLASS 135	
71.1	4,011,615	43 R	4,011,668	72.4	4,011,727	134 C	4,012,228	89	4,012,264	1 C	4,011,880
CLASS 15		126 AD	4,011,669	86	4,011,728	171	4,012,229	122	4,012,265	20 M	4,011,881
21 R	4,011,616	126 R	4,011,670	112	4,011,729	212	4,012,230	288 B	4,012,231	CLASS 137	
88	4,011,617	CLASS 40		16.2	4,011,672	186	4,011,778	308 B	4,012,232	15	4,011,882
93 R	4,011,618	23 A	4,011,673	23 A	4,011,673	3	4,011,777	CLASS 108		110	4,011,883
97 R	4,011,619	39	4,011,674	1	4,011,730	71	4,011,779	156	4,011,821	202	4,011,884
104.06 A	4,011,620	143	4,011,676	2	4,011,731	167	4,011,780	CLASS 110		267	4,011,885
104.1 R	4,011,625	209	4,011,675	28	4,012,212	387	4,011,781	28 R	4,011,822	492.5	4,011,886
104.92	4,011,621	CLASS 42		55	4,011,732	471.3	4,011,782	CLASS 112		608	4,011,887
248 A	4,011,622	70 F	4,011,678	59	4,011,733	846	4,011,783	80	4,011,823	612.1	4,011,888
306 A	4,011,623	CLASS 43		132	4,011,734	CLASS 84		CLASS 114		614.11	4,011,889
344	4,011,624	15	4,011,679	186	4,011,735	1.01	4,011,784	65 A	4,011,826	625.4	4,011,890
CLASS 16		24	4,011,680	260	4,011,736	CLASS 85		222	4,011,827	625.62	4,011,891
129	4,011,626	42.11	4,011,681	CLASS 64		10 R	4,011,785	260	4,011,827	625.66	4,011,892
140	4,011,628	CLASS 44		9 A	4,011,737	74	4,011,786	270	4,011,828	CLASS 138	
CLASS 17		7 C	4,012,205	CLASS 65		76	4,011,787	280	4,011,824	43	4,011,893
17	4,011,629	CLASS 46		13	4,012,213	CLASS 89		CLASS 116		46	4,011,894
21	4,011,630	21	4,011,682	34	4,012,214	33 C	4,011,788	70	4,011,828	384 B	4,011,895
CLASS 19		25	4,011,683	66	4,012,215	41 EA	4,011,789	121	4,011,829	CLASS 141	
100	4,011,631	77	4,011,684	99 A	4,012,216	47	4,011,794	60	4,011,830	82	4,011,896
CLASS 21		CLASS 47		102	4,012,217	162	4,011,790	CLASS 118		207	4,011,897
2.7 R	4,012,195	55	4,011,677	135	4,012,218	CLASS 90		301	4,011,831	CLASS 148	
CLASS 23		57.5	4,011,685	CLASS 66		11 D	4,011,791	323	4,011,832	1.5	4,012,235
230 A	4,012,197	CLASS 49		14	4,011,738	11 R	4,011,792	652	4,011,835	4,012,236	
230 B	4,012,196	68	4,011,686	CLASS 68		12.5	4,011,793	653	4,011,834	2	4,012,237
253 A	4,012,199	70	4,011,687	181 R	4,011,739	CLASS 91		CLASS 119		6	4,012,238
253 R	4,012,198	139	4,011,688	CLASS 70		286	4,011,795	1	4,011,836	6.3	4,012,239
259	4,012,200	CLASS 51		58	4,011,740	488	4,011,796	14.08	4,011,837	11.5 C	4,012,240
277 C	4,012,202	5 D	4,011,689	107	4,011,741	CLASS 92		172	4,011,838	4,012,242	
277 R	4,012,201	8 R	4,011,690	305	4,011,742	186	4,011,797	301	4,011,839	175	4,012,243
282	4,012,203	314	4,011,691	CLASS 71		CLASS 93		301	4,011,839	CLASS 149	
CLASS 24		323	4,011,692	9	4,012,219	35 R	4,011,798	32 B	4,011,840	19.3	4,012,244
16 PB	4,011,633	354	4,011,693	11	4,012,220	53 SD	4,011,799	61 R	4,011,841	19.4	4,012,245
16 R	4,011,632	CLASS 52		66	4,012,221	59 MT	4,011,800	119 A	4,011,842	47	4,012,246
70 SK	4,011,634	1	4,011,694	88	4,012,222	CLASS 96		CLASS 123		CLASS 150	
73 MF	4,011,635	8	4,011,695	90	4,012,223	1 PE	4,012,251	119 E	4,011,843	35	4,011,898
137 R	4,011,636	39	4,011,696	105	4,012,224	1 PC	4,012,252	119 F	4,011,844	CLASS 152	
224 SS	4,011,637	90	4,011,697	106	4,012,225	1 PS	4,012,250	134	4,011,847	361 R	4,011,899
255 H	4,011,639	98	4,011,698	CLASS 72		1.5	4,012,253	136	4,011,848	CLASS 156	
CLASS 28		115	4,011,699	12	4,011,743	35.1	4,012,256	141	4,011,850	4,012,247	
1.4	4,011,640	235	4,011,700	57	4,011,744	36.4	4,012,257	146.5 A	4,011,851	71	4,012,248
71.3	4,011,641	275	4,011,701	CLASS 73		55	4,012,258	188 S	4,011,852	167	4,012,249
CLASS 29		387	4,011,702	23	4,011,745	56.5	4,012,259	198 E	4,011,849	173	4,012,250
25.16	4,011,642	618	4,011,703	32 R	4,011,746	CLASS 97		CLASS 124		178	4,012,251
159 B	4,011,643	664	4,011,704	67.5 R	4,011,747	CLASS 98		87	4,011,853	200	4,012,252



## CLASSIFICATION OF PATENTS

251	4,012,269	CLASS 192	118.62	4,012,009	293.68	4,012,395	215	4,012,036
306	4,012,270	113 B	4,011,930	129.8	4,012,396	293.77	CLASS 273	
423	4,012,271	CLASS 194		199	4,012,011	293.8	1 ES	4,012,037
429	4,012,272	4 C	4,011,931	CLASS 244		294.9	1 M	4,012,038
490	4,012,273			1 R	4,012,012	295.5 A	61 D	4,012,041
502	4,012,274	CLASS 195		53 B	4,012,013	302 A	72 R	4,012,039
515	4,012,275	31 F	Re.29,152	83 F	4,012,014	306.7 C	85 A	4,012,040
558	4,012,276	66 R	4,012,283	97	4,012,015	307 H	95 R	4,012,042
571	4,012,277	80 R	4,012,284	153 A	4,012,016	307 R	106.5 C	4,012,043
		103.5 R	4,012,285	165	4,012,017	308 R	130 E	4,012,044
			4,012,286	CLASS 219		309	134 B	4,012,045
30	4,012,278		4,012,287	9.5	4,012,616		134 C	4,012,046
		CLASS 159	4,012,288	10.55 B	4,012,617			
188	4,011,900	139		52	4,012,618	326.5 FN	CLASS 274	
		CLASS 162		101	4,012,619	326.5 SA	10 R	4,012,047
13	4,012,279	82	4,011,932	121 EM	4,012,620	335	39 R	4,012,048
65	4,012,280	151	4,011,933	146	4,012,621	340.7	CLASS 277	
127	4,012,281	154	4,011,934	CLASS 220		340.9	27	4,012,049
		CLASS 198		9 LG	4,011,963	345.2	CLASS 280	
4	4,011,901	365	4,011,935	69	4,011,964	348 R	11.38	4,012,050
314	4,011,902	517	4,011,936	CLASS 221		348.5 R	47.19	4,012,051
		CLASS 165		40	4,011,965	389	47.37 R	4,012,052
27	4,011,903	824	4,011,938	CLASS 222		404.5	154.5 R	4,012,053
108	4,011,904	840	4,011,939	55	4,011,966	439 R	239	4,012,054
175	4,011,905			70	4,011,967	448 R	276	4,012,055
		CLASS 166		107	4,011,968	448.2 N	477	4,012,056
105	4,011,906	16 D	4,012,608	199	4,012,633		605	4,012,057
241	4,011,907	18	4,012,606	201	4,012,634	448.8 R	9 M	4,012,058
273	4,011,908	38 D	4,012,607	221	4,012,635	449 M	18	4,012,059
293	4,011,909	50 AA	4,012,609	363 S	4,012,636	455 R	93	4,012,060
		61.08	4,012,610	475	4,012,637	463	133 A	4,012,061
		61.45 R	4,012,611	491	4,012,638	465 G	CLASS 285	
29	4,011,911	61.58 B	4,012,612	492 B	4,012,639	465 R	18	4,012,058
		144 AP	4,012,614	493	4,012,640	468 D	93	4,012,060
		325	4,012,615	CLASS 252			133 A	4,012,061
101	4,011,912	CLASS 203		8.5 P	4,012,329	468 H	25	4,012,062
		51	4,012,289	8.55 R	4,012,327	470	CLASS 291	
42	4,011,913	CLASS 204		8.8	4,012,326	471 C	CLASS 292	
126	4,011,914	1 T	4,012,290	33.6	4,012,330	473 R	57	4,012,063
265	4,011,915	2	4,012,291	48.2	4,012,331	479 C	169.18	4,012,064
710	4,011,916	9	4,012,292	182	4,012,332	481 R	288	4,012,065
		43 G	4,012,293	316	4,012,333	482 R	341.13	4,012,066
27	4,012,577	105 R	4,012,298	321	4,012,334	485 R	CLASS 294	
42	4,012,581	141.5	4,012,299	419	4,012,335	486 R	19 R	4,012,067
51	4,012,582	157.1 H	4,012,300	431 R	4,012,336	502.5	33	4,012,068
52 PE	4,012,579	157.1 R	4,012,301	439	4,012,337	513 R	70	4,012,069
53	4,012,580	159.12	4,012,302	461	4,012,338	543 R	CLASS 296	
		159.17	4,012,303	463	4,012,339	555 A	27	4,012,070
57	4,011,917	159.24	4,012,304	465	4,012,340	559 S	35 R	4,012,071
325	4,011,918	162 R	4,012,305	548	4,012,341	561 A	CLASS 297	
		163 R	4,012,306	558 R	4,012,328	567.6 P	219	4,012,072
87	4,012,282	192 E	4,012,307	CLASS 260		586 D	389	4,012,073
		195 F	4,012,308	2.5 B	4,012,342	591	434	4,012,075
CLASS 178		297 W	4,012,309	2.5 FP	4,012,343	603 R	CLASS 299	
18	4,012,588	305	4,012,310	4 R	4,012,344	604 HF	17	4,012,076
50	4,012,589			8	4,012,345	607 AR	76	4,012,077
58 R	4,012,590	CLASS 206		17 A	4,012,346	649 F	CLASS 301	
69.1	4,012,591	1.5	4,011,940	27 R	4,012,347	650 R	37 TP	4,012,078
71 R	4,012,593	5.1	4,011,941	28.5 R	4,012,348	668 R	6 C	4,012,079
		44 R	4,011,943	29.2 TN	4,012,349	677 A	114	4,012,080
		45.14	4,011,942	29.3	4,012,350	683 R	115	4,012,081
CLASS 179		223	4,011,945	29.6 BM	4,012,352	688 R	116	4,012,082
2 DP	4,012,594	284	4,011,946	29.6 E	4,012,354	695 R	CLASS 303	
15 AS	4,012,595	285	4,011,947	29.6 NR	4,012,355	700 MS	CLASS 304	
41 A	4,012,596	286	4,011,948	29.6 R	4,012,356	700 MS	CLASS 305	
		532	4,011,949	29.7 NR	4,012,357	700 MS	CLASS 306	
		557	4,011,944	30.6 R	4,012,358	700 MS	CLASS 307	
84 VF	4,012,599	CLASS 208		31.2 R	4,012,359	700 MS	CLASS 308	
90 B	4,012,600	8	4,012,311	40 R	4,012,360	700 MS	CLASS 309	
90 D	4,012,602	11	4,011,990	45.8 NE	4,012,361	700 MS	CLASS 310	
90 K	4,012,601	15	4,011,991	47 UA	4,012,362	700 MS	CLASS 311	
121 C	4,012,604	135	4,011,992	75 R	4,012,363	700 MS	CLASS 312	
170.6	4,012,603	15	4,011,993	77.5 D	4,012,364	700 MS	CLASS 313	
180	4,012,605	214	4,011,994	78 R	4,012,365	700 MS	CLASS 314	
		253	4,012,315	79.7	4,012,366	700 MS	CLASS 315	
		CLASS 209		112.5 R	4,012,367	700 MS	CLASS 316	
		10	4,012,316	125	4,012,368	700 MS	CLASS 317	
		73	4,011,950	146 R	4,012,369	700 MS	CLASS 318	
		CLASS 210		152	4,012,370	700 MS	CLASS 319	
		24	4,012,317	155	4,012,371	700 MS	CLASS 320	
57	4,011,922	2.1	4,012,632	239.3 P	4,012,372	700 MS	CLASS 321	
114	4,011,923	6.4 W	4,012,629	239.3 R	4,012,373	700 MS	CLASS 322	
121	4,011,924	10 R	4,012,630	239.3 R	4,012,374	700 MS	CLASS 323	
131	4,011,925	10 T	4,012,631	239.3 R	4,012,375	700 MS	CLASS 324	
		45	4,012,320	239.3 R	4,012,376	700 MS	CLASS 325	
		63 R	4,012,321	239.3 R	4,012,377	700 MS	CLASS 326	
		86	4,012,322	239.3 R	4,012,378	700 MS	CLASS 327	
		232	4,012,323	239.3 R	4,012,379	700 MS	CLASS 328	
		500 M	4,012,324	239.3 R	4,012,380	700 MS	CLASS 329	
107	4,011,926	516	4,012,325	239.3 R	4,012,381	700 MS	CLASS 330	
		CLASS 211		239.3 R	4,012,382	700 MS	CLASS 331	
26	4,011,927	54 R	4,012,001	239.3 R	4,012,383	700 MS	CLASS 332	
		10	4,012,002	239.3 R	4,012,384	700 MS	CLASS 333	
		13	4,011,952	239.3 R	4,012,385	700 MS	CLASS 334	
		14	4,011,953	239.3 R	4,012,386	700 MS	CLASS 335	
		71	4,011,951	239.3 R	4,012,387	700 MS	CLASS 336	
		CLASS 212		239.3 R	4,012,388	700 MS	CLASS 337	
268	4,011,929	3	4,011,955	239.3 R	4,012,389	700 MS	CLASS 338	
				239.3 R	4,012,390	700 MS	CLASS 339	
				239.3 R	4,012,391	700 MS	CLASS 340	
				239.3 R	4,012,392	700 MS	CLASS 341	
				239.3 R	4,012,393	700 MS	CLASS 342	
				239.3 R	4,012,394	700 MS	CLASS 343	
				239.3 R	4,012,395	700 MS	CLASS 344	
				239.3 R	4,012,396	700 MS	CLASS 345	
				239.3 R	4,012,397	700 MS	CLASS 346	
				239.3 R	4,012,398	700 MS	CLASS 347	
				239.3 R	4,012,399	700 MS	CLASS 348	
				239.3 R	4,012,400	700 MS	CLASS 349	
				239.3 R	4,012,401	700 MS	CLASS 350	
				239.3 R	4,012,402	700 MS	CLASS 351	
				239.3 R	4,012,403	700 MS	CLASS 352	
				239.3 R	4,012,404	700 MS	CLASS 353	
				239.3 R	4,012,405	700 MS	CLASS 354	
				239.3 R	4,012,406	700 MS	CLASS 355	
				239.3 R	4,012,407	700 MS	CLASS 356	
				239.3 R	4,012,408	700 MS	CLASS 357	
				239.3 R	4,012,409	700 MS	CLASS 358	
				239.3 R	4,012,410	700 MS	CLASS 359	
				239.3 R	4,012,411	700 MS	CLASS 360	
				239.3 R	4,012,412	700 MS	CLASS 361	
				239.3 R	4,012,413	700 MS	CLASS 362	
				239.3 R	4,012,414	700 MS	CLASS 363	
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				239.3 R	4,012,416	700 MS	CLASS 365	
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				239.3 R	4,012,418	700 MS	CLASS 367	
				239.3 R	4,012,419	700 MS	CLASS 368	
				239.3 R	4,012,420	700 MS	CLASS 369	
				239.3 R	4,012,421	700 MS	CLASS 370	
				239.3 R	4,012,422	700 MS	CLASS 371	
				239.3 R	4,012,423	700 MS	CLASS 372	
				239.3 R	4,012,424	700 MS	CLASS 373	
				239.3 R	4,012,425	700 MS	CLASS 374	
				239.3 R	4,012,426	700 MS	CLASS 375	
				239.3 R	4,012,427	700 MS	CLASS 376	
				239.3 R	4,012,428	700 MS	CLASS 377	
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				239.3 R	4,012,431	700 MS	CLASS 380	
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				239.3 R	4,012,433	700 MS	CLASS 382	
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				239.3 R				



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4,011,596	4,012,018	4,012,527	4,011,962	4,012,544	4,012,533
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	4,012,433		4,012,715		4,012,281		4,012,236		4,012,578		4,012,060
21 :	4,011,889		4,012,745		4,012,295		4,012,250		4,012,616		4,012,061
	4,012,210		4,012,748		4,012,311		4,012,251		4,012,655		4,012,092
	4,012,357	27 :	4,011,648		4,012,315		4,012,252		4,012,716		4,012,118
22 :	4,011,613		4,011,721		4,012,324		4,012,255	40 :	4,011,615		4,012,121
	4,012,016		4,011,751		4,012,326		4,012,260		4,011,677		4,012,164
	4,012,337		4,011,796		4,012,332		4,012,293		4,011,907		4,012,208
23 :	4,012,507		4,011,862		4,012,342		4,012,296		4,012,289		4,012,238
	4,012,543		4,011,951		4,012,344		4,012,301		4,012,355		4,012,254
24 :	4,011,624		4,011,977		4,012,347		4,012,303		4,012,566		4,012,328
	4,011,720		4,011,983		4,012,356		4,012,325	42 :	4,011,636		4,012,335
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	4,011,819		4,012,091		4,012,374		4,012,341		4,011,701		4,012,425
	4,012,068		4,012,102		4,012,386		4,012,376		4,011,707		4,012,457
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25 :	4,012,770		4,012,553		4,012,422		4,012,453		4,011,833		4,012,585
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	4,011,708	29 :	Re.29,153		4,012,455		4,012,503		4,011,897		4,012,638
	4,011,732		4,011,599		4,012,487		4,012,530		4,011,898		4,012,649
	4,011,745		4,011,681		4,012,490		4,012,550		4,011,904		4,012,689
	4,011,755		4,011,766		4,012,498		4,012,563		4,011,909		4,012,723
	4,011,758		4,011,767		4,012,536		4,012,581		4,011,949		4,012,769
	4,011,798		4,011,899		4,012,551		4,012,582	49 :	4,012,064		4,012,472
	4,011,811		4,011,967		4,012,575		4,012,637		4,012,094		4,012,473
	4,011,901		4,011,989		4,012,628		4,012,646		4,012,107		4,012,718
	4,011,973		4,011,999		4,012,629		4,012,647		4,012,170		4,012,719
	4,011,975		4,012,014		4,012,668		4,012,661		4,012,183		4,012,747
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	4,012,232		4,012,291	35 :	4,012,230		4,012,706	51 :	4,012,310		4,011,612
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	4,012,288		4,012,440		4,011,601		4,012,720		4,012,327		4,011,687
	4,012,482		4,012,534		4,011,607		4,012,735		4,012,333		4,011,726
	4,012,552		4,012,708		4,011,618		4,012,756		4,012,345		4,011,763
	4,012,560	30 :	4,011,882		4,011,649		4,012,761		4,012,351		4,011,793
	4,012,564	31 :	4,011,914		4,011,663		4,012,767		4,012,352		4,012,123
	4,012,611		4,011,990		4,011,665		4,012,775		4,012,400		4,012,151
	4,012,636		4,012,266		4,011,680		4,012,788		4,012,437		4,012,483
	4,012,651		4,012,471		4,011,688		4,012,789		4,012,446		4,012,546
	4,012,659		4,012,596		4,011,696		4,012,792		4,012,462		4,012,721
	4,012,678	32 :	4,011,804		4,011,736		4,012,793		4,012,524		4,012,738
26 :	4,012,734		4,011,850		4,011,743	37 :	4,011,625		4,012,528	53 :	4,011,679
	4,011,610		4,012,673		4,011,781		4,011,792		4,012,548		4,011,694
	4,011,635	33 :	4,011,697		4,011,831		4,011,976		4,012,608		4,011,752
	4,011,643		4,012,023		4,011,834		4,012,009		4,012,609		4,011,757
	4,011,644		4,012,592		4,011,835		4,012,133		4,012,614		4,011,814
	4,011,645		4,012,710		4,011,845		4,012,177		4,012,615		4,011,916
	4,011,654		4,012,736		4,011,847		4,012,445		4,012,634		4,011,958
	4,011,655	34 :	4,011,598		4,011,863		4,012,663		4,012,669		4,012,013
	4,011,723		4,011,664		4,011,870	39 :	4,011,602		4,012,677		4,012,065
	4,011,725		4,011,839		4,011,879		4,011,603		4,012,693		4,012,105
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	4,011,772		4,011,919		4,011,927		4,011,709		4,012,733		4,012,160
	4,011,773		4,011,928		4,011,929		4,011,719	44 :	4,011,925		4,012,199
	4,011,800		4,011,941		4,011,947		4,011,728		4,012,173	54 :	4,011,704
	4,011,843		4,011,974		4,011,952		4,011,783	45 :	4,011,640		4,012,580
	4,011,848		4,011,982		4,011,953		4,011,805		4,012,156	55 :	4,011,660
	4,011,903		4,012,005		4,011,968		4,011,861		4,012,561		4,011,689
	4,011,963		4,012,044		4,011,985		4,011,887		4,011,846		4,011,715
	4,012,043		4,012,046		4,011,994		4,011,946	47 :	4,012,209		4,011,768
	4,012,150		4,012,113		4,012,010		4,011,986		4,012,302		4,011,837
	4,012,162		4,012,211		4,012,034		4,012,058		4,012,372		4,011,891
	4,012,297		4,012,116		4,012,035		4,012,078		4,012,466		4,011,913
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	4,012,427		4,012,179		4,012,085		4,012,221		4,011,626		4,011,942
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	4,012,493		4,012,187		4,012,100		4,012,263		4,011,815		4,012,000
	4,012,508		4,012,188		4,012,106		4,012,271		4,011,886		4,012,027
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# PATENT AND TRADEMARK OFFICE NOTICES

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This notice is supplemental to the Notice of July 9, 1976, entitled "Public Search Room for Patents" that was published in the OFFICIAL GAZETTE on August 3, 1976 (949 O.G. 2).

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Although these supplemental regulations may cause some inconvenience, it is believed that with the cooperation and understanding of the public, a more efficient and reliable examination system within the Patent Examining Groups will result.

A copy of the following "Regulations for Users of the Patent Examining Group Facilities," will be posted in each of the Patent Examining Groups and the Public Search Room for Patents:

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WILLIAM FELDMAN,  
Deputy Assistant Commissioner for Patents.

## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,844,127, C. Steiner, FLUID PRESSURE TORQUE CONVERTER; 2,844,128, same, filed Apr. 17, 1975, United States Court of Claims (District of Columbia), Doc. 123-75, *Flo-Tork, Inc. v. United States and Hydra Power Inc.* Case dismissed with prejudice under Rule 102(a) (1) (iii). Agreement between plaintiff and the third-party defendant has rendered this litigation moot, Nov. 2, 1976.

2,844,128. (See 2,844,127.)

2,998,258, A. A. Ambrose, ADAPTER FOR LATHE CHUCK AND THE LIKE, filed June 30, 1976, D.C., E.D. Mich. (Detroit), Doc. 76-71374, *True Grip, Inc. v. Sturdy Broaching Service, Inc.*

3,071,856, I. W. Fischbein, RAZOR BLADE AND METHOD OF MAKING SAME; 3,518,110, same, filed Nov. 4, 1976, D.C. Del. (Wilmington) Doc. 76-375, *Societe Bic, S.A. and Bic Pen Corporation v. Gillette Company.*

3,407,685, E. D. Prince, GROOVED TIEBAR ASSEMBLY FOR DIECASTING MACHINES AND THE LIKE, filed June 15, 1973, D.C., W.D. Mich. (Grand Rapids), Doc. G145-73, *Prince Corporation v. B & T Machinery Company (Ex-Cello Corporation)*, and *Edgar D. Prince*. Defendant has infringed upon said patent by making and selling die casting machines embodying apparatus falling within scope of the claims of said patent, Oct. 27, 1976.

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3,452,895, K. U. Kalkowski, UTENSIL FOR PREVENTING SPRAYING WITH FRYING PANS, COOKING POTS OR THE LIKE, filed Mar. 25, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c743, *Kurt Ulrich Kalkowski v. Ronco, Inc.* Judgment, the Court finds for the defendant and against the plaintiff on the complaint and finds in favor of the counter-defendant on the counterclaim. The Court finds the patent invalid, Oct. 27, 1976.

3,486,495, H. W. Allen, ARCHERY BOW WITH DRAW FORCE MULTIPLYING ATTACHMENTS, filed Oct. 26, 1976, D.C. Utah (Salt Lake City), Doc. NC-76-53, *Allen Archery, Inc. v. Browning Manufacturing Company and Browning Arms Company.*

3,518,110. (See 3,071,856.)

3,537,146, J. E. Caveney, INTEGRAL ONE-PIECE CABLE TIE; 3,660,869, Caveney and Moody, ONE-PIECE CABLE TIE; 3,906,593, same, INTEGRAL CABLE TIE, filed Oct. 29, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4012, *Panduit Corp. v. All States Plastic Mfg. Co.*

3,560,869, Foulkes and Bender, ECHO SUPPRESSOR, filed Nov. 1, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4040, *Wescor, Inc. v. Tellabs, Inc.*

3,583,385, F. W. Beller, CAMPSTOVE WITH ADJUSTABLE AND PIVOTABLE GRILL, filed Nov. 4, 1976, D.C., W.D. Mich. (Grand Rapids), Doc. K76-566Ca, *Belson Manufacturing Company, Inc. v. Quality Industries, Inc.*

3,630,066, F. L. Chisum, APPARATUS FOR RETURNING VEHICLE BODY AND FRAME COMPONENTS TO THEIR ORIGINAL LOCATIONS DURING REPAIR AND SERVICING OF VEHICLES; 3,888,100, F. L. Chisum, AUTO BODY AND FRAME STRAIGHTENING DEVICES, filed Mar. 26, 1976, D.C. Minn. (Minneapolis), Doc. 4-76-C 134, *Square Liner 360, Inc. v. Finis Lavell Chisum and Chisum Products Company, Inc.*

3,660,869. (See 3,537,146.)

3,711,806, R. W. Flentage, POWER RACK; Re. 28,499, same, filed Oct. 3, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c3312, *A. F. Dormeyer Manufacturing Co., Inc. v. Coils, Inc.* Defendant is hereby permanently restrained and enjoined from directly or indirectly infringing said patent and said reissue patent. The counterclaim asserted by defendant in its answer to the complaint be and hereby is dismissed with prejudice, Oct. 22, 1976.

3,805,819, B. E. Etter, METHOD AND MEANS OF APPLYING ADDITIVES TO INDUSTRIAL GAS; 3,870,069, same; 3,924,648, same; 3,982,883, same, METHOD OF FLAME CUTTING, filed Oct. 29, 1976, D.C., N.D. Ga. (Atlanta), Doc. C76-1812A, *Flamex Distributors, Inc. v. O. M. Taylor et al.*

3,829,348, Spiegel and Miller, DECORATING THREE-DIMENSIONAL OBJECTS, filed Nov. 4, 1976, D.C., E.D. Pa. (Philadelphia), Doc. 76-3438, *Gilbreth International Corporation v. Gaudio Brothers, Inc. and S. S. Kresge Company.*

3,836,767, M. L. Lasker, LIGHTING FIXTURES, filed Nov. 5, 1976, D.C. Del. (Wilmington), Doc. 76,381, *Wylain, Inc. v. Walter Kidde Consumer Durables.*

3,859,565, L. A. Henningsen, FIRE PUMP CONTROL APPARATUS, filed June 20, 1975, D.C.N.J. (Newark), Doc. 75-1087, *Firetrol, Inc. v. Lexington Control, Inc.* Stipulation and order of dismissal, Oct. 29, 1976.

3,870,069. (See 3,805,819.)

3,888,100. (See 3,630,066.)

3,906,593. (See 3,537,146.)

3,924,648. (See 3,805,819.)

3,963,895, J. M. Hennlon, DEVICE FOR EFFECTING THE GUIDING AND OSCILLATION MOVEMENTS OF A WELDING HEAD EQUIPPED WITH AN ELECTRODE-CARRIER NOZZLE, filed June 15, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c2201, *National Presto Ind. v. Scovill Mfg. Co. et al.* Above cause of action is hereby dismissed without prejudice, Nov. 4, 1976.

3,982,883. (See 3,805,819.)

Re. 28,499. (See 3,711,806.)

3,379,617, Andrews and Keller, MEANS FOR SUPPORTING FUEL ELEMENTS IN A NUCLEAR REACTOR; 3,379,618, E. Frisch, FUEL ARRANGEMENT FOR A NUCLEAR REACTOR, filed Jan. 30, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c270,

*Westinghouse Electric Corporation v. General Electric Company.* Second counterclaim and all claims are dismissed with prejudice, with each party to bear its own costs, Nov. 9, 1976.

3,379,618. (See 3,379,617.)

3,605,368, G. Zakim, COMPOSITE LAMINATE PANEL CONSTRUCTION, filed Feb. 3, 1975, D.C.N.J. (Camden), Doc. C-75-0178, *Gerald Zakim v. Formigilli Corporation.* It is hereby stipulated and agreed by and between the respective parties hereto, that the complaint and counterclaim be dismissed with prejudice, Nov. 3, 1976.

3,675,247, J. Ferrell, METHOD FOR FABRICATING PANTY HOSE, filed Nov. 14, 1975, D.C., W.D.N.C. (Statesville), Doc. ST-C-75-53, *Tights Inc. v. Burlington Industries Inc.* Stipulation of dismissal, Oct. 26, 1976.

3,675,247, J. Ferrell, METHOD FOR FABRICATING PANTY HOSE; Re. 26,350, E. Rice, COMBINATION STOCKINGS AND PANTY, filed Mar. 21, 1975, D.C., W.D.N.C. (Statesville), Doc. C-C-75-78, *Tights Inc. v. Brevoni Hosiery Corp. (formerly Schulte & Dieckhoff Inc.)*. Stipulation of dismissal, Oct. 29, 1976.

3,721,968, G. Gee, MAGNETIC PICKUP, filed July 21, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75-2067, *Electro Corporation v. Transducer Systems Inc. and Burton F. Drill.* It is hereby ordered, defendants, their officers, agents, servants, employees are hereby permanently enjoined from infringing Gee patent. Plaintiff is granted final judgment for damages against defendants. This judgment is entered without trial, by consent of both parties, Nov. 8, 1976.

3,925,751, Bateman and Muller, GLIDE SLOPE WARNING SYSTEM; 3,934,221, same, TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL CONDITIONING; 3,936,796, C. Bateman, AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT; 3,946,358, same; 3,947,808, same, EXCESSIVE DESCENT RATE WARNING SYSTEM FOR AIRCRAFT; 3,947,810, Bateman and Muller, NEGATIVE CLIMB RATE AFTER TAKE-OFF WARNING SYSTEM WITH PREDETERMINED LOSS OF ALTITUDE INHIBIT; 3,958,219, same, TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL CONDITIONING, filed Nov. 8, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4123, *Sundstrand Data Control Inc. v. Collins Radio Company.*

3,925,751, Bateman and Muller, GLIDE SLOPE WARNING SYSTEM; 3,934,221, same, TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL CONDITIONING; 3,936,796, C. Bateman, AIRCRAFT GROUND PROXIMITY WARNING INSTRUMENT; 3,946,358, same; 3,947,808, same, EXCESSIVE DESCENT RATE WARNING SYSTEM FOR AIRCRAFT; 3,947,809, same, BELOW GLIDE SLOPE ADVISORY WARNING SYSTEM FOR AIRCRAFT; 3,947,810, Bateman and Muller, NEGATIVE CLIMB RATE AFTER TAKE-OFF WARNING SYSTEM WITH PREDETERMINED LOSS OF ALTITUDE INHIBIT; 3,958,219, same, TERRAIN CLOSURE WARNING SYSTEM WITH ALTITUDE RATE SIGNAL CONDITIONING, filed Nov. 8, 1976, D.C., S.D. Fla. (Miami), Doc. F1-76-6485-C-JE, *Sundstrand Data Control Inc. v. Northwest Airlines Inc., Bendix Corporation and Delta Airlines Inc.*

3,934,221. (See 3,925,751.)

3,926,796. (See 3,925,751.)

3,946,358. (See 3,925,751.)

3,947,808. (See 3,925,751.)

3,947,809. (See 3,925,751.)

3,947,810. (See 3,925,751.)

3,958,219. (See 3,925,751.)

Re. 25,360. (See 3,675,247.)

Re. 26,538, J. Bott, LUGGAGE RACK; Re. 26,539, same, filed Oct. 28, 1976, D.C., E.D. Mich. (Detroit), Doc. 76-72254, *John A. Bott v. Eastland Imports Inc. and George Byers Sons Imports.*

Re. 26,539. (See Re. 26,538.)

## Erratum

Under Patent Suits, in the OFFICIAL GAZETTE of July 22, 1975, volume 936, page 1168, the entire paragraph beginning with 3,749,974 should be deleted.



# PATENT NOTICES

## Certificates of Correction for the Week of Mar. 22, 1977

Re. 29,060	3,957,494	3,986,055	3,994,324
Re. 29,063	3,960,042	3,986,161	3,994,387
Re. 29,067	3,962,287	3,987,184	3,994,392
3,391,420	3,965,210	3,987,185	3,994,732
3,406,894	3,967,546	3,987,368	3,994,798
3,500,215	3,970,367	3,987,412	3,995,078
3,629,686	3,972,065	3,987,688	3,995,088
3,644,153	3,973,128	3,988,337	3,995,231
3,661,189	3,974,176	3,988,597	3,995,392
3,724,779	3,974,242	3,988,657	3,995,531
3,751,677	3,975,976	3,988,748	3,995,668
3,759,727	3,976,399	3,988,875	3,995,841
3,791,825	3,977,310	3,988,966	3,995,929
3,865,807	3,977,957	3,989,139	3,996,037
3,872,058	3,978,485	3,989,348	3,996,075
3,877,952	3,979,433	3,989,410	3,997,008
3,892,109	3,980,791	3,990,055	3,997,014
3,897,463	3,981,686	3,990,377	3,997,288
3,911,334	3,981,846	3,990,478	3,997,352
3,914,380	3,982,381	3,990,507	3,997,485
3,916,019	3,982,419	3,990,529	3,997,548
3,918,210	3,982,705	3,990,603	3,997,570
3,920,912	3,983,315	3,990,816	3,997,584
3,925,056	3,983,319	3,990,829	3,997,608
3,926,659	3,984,278	3,990,890	3,997,681
3,928,403	3,984,312	3,990,897	3,997,687
3,931,363	3,984,398	3,991,031	3,997,974
3,933,602	3,984,419	3,991,307	3,998,008
3,937,981	3,984,454	3,991,579	3,998,272
3,940,269	3,984,474	3,991,658	3,998,479
3,944,189	3,984,777	3,991,849	3,998,615
3,945,985	3,984,814	3,992,229	3,998,623
3,946,729	3,985,028	3,992,329	3,998,746
3,948,665	3,985,095	3,992,425	3,999,121
3,948,705	3,985,125	3,992,439	3,999,582
3,948,795	3,985,151	3,992,493	3,999,636
3,948,847	3,985,368	3,992,696	3,999,701
3,950,333	3,985,437	3,992,763	3,999,855
3,950,353	3,985,656	3,992,827	4,000,058
3,952,172	3,985,664	3,992,915	4,000,149
3,952,437	3,985,756	3,993,348	4,000,302
3,953,428	3,985,908	3,993,891	4,000,535
3,955,037	3,985,973	3,994,285	

## Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 2,948,928, H. Ebneth and H. Falk, PROCESS FOR MANUFACTURING FOAMED POLYURETHANE ARTICLES, Interference No. 95,554, decided Oct. 19, 1976, claims 1 and 2.

Patent No. 3,397,793, R. W. MacDonnell, PLEATED FILTER, Interference No. 99,154, decided Dec. 7, 1976, claims 1-5.

Patent No. 3,497,320, W. E. Blackburn, D. A. Hamilton, L. A. Inners and G. C. Reid, AUTOMATED CHEMICAL ANALYZER, Interference No. 97,825, decided Sept. 23, 1976, claims 29-37, 40, 42, 43, 45, 48, 52-55, 59, 68, 70, 71, 74 and 101-105.

Patent No. 3,497,320, W. E. Blackburn, D. A. Hamilton, L. A. Inners and G. C. Reid, AUTOMATED CHEMICAL ANALYZER, Interference No. 97,827, decided Sept. 23, 1976, claims 67 and 115.

Patent No. 3,504,376, T. F. Bednar, G. C. Reid and A. T. Yahiro, AUTOMATED CHEMICAL ANALYZER, Interference No. 97,829, decided Sept. 23, 1976, claims 112, 113, 114, 115, 116, 117, 118 and 119.

Patent No. 3,504,376, T. F. Bednar, G. C. Reid and A. T. Yahiro, AUTOMATED CHEMICAL ANALYZER, Interference No. 97,826, decided Sept. 23, 1976, claims 56-60, 62-64, 66, 68, 69, 71, 72, 107, 108, 131, 133-136 and 139-141.

Patent No. 3,577,426, C. K. McGill and G. W. Campbell, Jr., 4-(4-TETRAHYDROPYRANYL) PYRIDINES, Interference No. 99,001, decided Nov. 18, 1976, claim 2.

Patent No. 3,616,269, D. Aelony and W. J. McKillip, METHOD FOR THE PURIFICATION OF MALONONITRILE BY THE ADDITION OF CYCLOPENTADIENE FOLLOWED BY DISTILLATION, Interference No. 98,508, decided Oct. 22, 1976, claims 1, 2, 3, 4 and 5.

Patent No. 3,619,483, W. K. Boots and W. D. Murphy, CONTINUOUS ELECTRONIC FILM SCANNER, Interference No. 98,537, decided July 22, 1976, claims 1, 2, 3 and 8.

Patent No. 3,676,580, J. H. Beck, INTERROGATED TRANSPONDER SYSTEM, Interference No. 98,853, decided Sept. 15, 1976, claims 13 and 14.

Patent No. 3,676,921, E. Kool, SEMICONDUCTOR DEVICE COMPRISING AN INSULATED GATE FIELD EFFECT TRANSISTOR AND METHOD OF MANUFACTURING THE SAME, Interference No. 98,572, decided Oct. 9, 1976, claims 1-8.

Patent No. 3,783,659, G. F. Rossi, BICYCLE SECURING APPARATUS, Interference No. 98,753, decided Oct. 8, 1976, claims 1, 2 and 3.

Patent No. 3,810,992, J. J. Menn, ANTHELMINTIC BISTHIOUREIDO BENZENE DERIVATIVE, Interference No. 99,307, decided Nov. 15, 1976, claim 1.

Patent No. 3,828,109, E. S. Morez, CHORUS GENERATOR FOR ELECTRONIC MUSICAL INSTRUMENT, Interference No. 99,240, decided Dec. 20, 1976, claims 1 and 9.

Patent No. 3,840,881, K. Kolzumi, F. Yonal, M. Yamauchi and Y. Utamura, LIGHT EXPOSURE APPARATUS FOR FORMATION OF STRIPED PHOSPHOR SCREENS OF COLOR PICTURE TUBES, Interference No. 99,342, decided Dec. 20, 1976, claims 1, 2, 3, 5, 6 and 8.

Patent No. 3,876,598, D. S. Brackman, PHOTODEGRADABLE POLYVINYL CHLORIDE COMPOSITIONS CONTAINING A FERROCENE PRODEGRADANT, Interference No. 99,356, decided Dec. 23, 1976, claims 1 and 2.

Patent No. 3,892,811, Y. G. Chang and P. S. Bailey, ORGANIC PEROXIDES AND METHOD THEREFOR, Interference No. 99,226, decided Nov. 4, 1976, claims 1 and 2.

Patent No. 3,936,302, Y. Takami, K. Fukuda and E. Yamazaki, METHOD FOR MANUFACTURING FLUORESCENT SCREENS FOR USE IN COLOUR PICTURE TUBES, Interference No. 99,328, decided Dec. 15, 1976, claims 1 and 3.

## Disclaimer and Dedication

3,444,704.—Gus T. Smith, Paducah, Ky. THROAT PLATE. Patent dated May 20, 1969. Disclaimer and dedication filed Jan. 25, 1977, by the assignee, Marvel Specialty Co., Inc.

Hereby enters this disclaimer and dedicates to the Public all claims of said patent.

## Disclaimers

Re. 26,096.—Frederick A. Lambach, Omaha, Nebr. FISHING FLOAT. Patent dated Oct. 11, 1966. Disclaimer filed July 23, 1976, by the assignee, Plastilite Corporation.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,237,149.—Warren H. West, Seabrook Beach, N.H. ELECTRIC CONNECTOR. Patent dated Feb. 22, 1966. Disclaimer filed Jan. 17, 1977, by the assignee, Cambridge Thermionic Corporation.

Hereby enters this disclaimer to claims 1-3 of said patent.

MARCH 22, 1977

U.S. PATENT AND TRADEMARK OFFICE

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3,293,405.—Raphael J. Costanzo, Bridgeport, Conn. ELECTRICALLY HEATED FOOTWEAR. Patent dated Dec. 20, 1966. Disclaimer filed Jan. 17, 1977, by the inventor. Hereby enters this disclaimer to claims 1 through 4 of said patent.

3,652,376.—Jame G. Bowden III, Weston, Mass. MULTIPLY PRESS PACKING FOR THE IMPRESSION MEMBER IN A LETTER PRESS. Patent dated Mar. 28, 1972. Disclaimer filed Feb. 7, 1977, by the assignee, W. R. Grace & Co.

Hereby enters this disclaimer to all claims of said patent.

3,855,613.—Louis Sebastian Napoli, Hamilton Square, and Raymond Harkless Dean, Lawrenceville, N.J. A SOLID STATE SWITCH USING AN IMPROVED JUNCTION FIELD EFFECT TRANSISTOR. Patent dated Dec. 17, 1974. Disclaimer filed Jan. 21, 1977, by the assignee, RCA Corporation.

Hereby enters this disclaimer to claim 3 of said patent.

3,876,598.—Derek Samuel Brackman, Stanmore, England. PHOTODEGRADABLE POLYVINYL CHLORIDE COMPOSITIONS CONTAINING A FERROCENE PRODEGRADANT. Patent dated Apr. 8, 1975. Disclaimer filed Sept. 23, 1976, by the assignee, Imperial Chemical Industries Limited.

Hereby enters this disclaimer to claims 1-4 of said patent.

3,884,671.—James A. Albright, St. Louis, Mich., and Kenneth P. Dorschner, Vienna, Va. HERBICIDAL N-HALOACYL (2-ALKYLATED) OXAZOLIDINES. Patent dated May 20, 1975. Disclaimer filed Jan. 21, 1977, by the assignee, SCM Corporation.

Hereby enters this disclaimer to claim 3 of said patent.

3,947,516.—Klaus Hunger, Kelkheim, Taunus, and Theodor Papenfuhs, Frankfurt/Main, Germany. NOVEL AROMATIC ALDEHYDES AND PROCESS FOR PREPARING THEM. Patent dated Mar. 30, 1976. Disclaimer filed Jan. 25, 1977, by the assignee, Hoechst Aktiengesellschaft.

Hereby enters this disclaimer to claims 1 to 6 of said patent.

3,982,023.—Bernard J. Bahoshy, Mahopac, and Robert E. Klose, West Nyack, N.Y., and Harold A. Nordstrom, Reading, Mass. CHEWING GUMS OF LONGER LASTING SWEETNESS AND FLAVOR. Patent dated Sept. 21, 1976. Disclaimer filed Jan. 10, 1977, by the assignee, General Foods Corporation.

The term of this patent subsequent to Mar. 10, 1993 has been disclaimed.



## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 26, 1977

### PATENT EXAMINING GROUPS

Actual  
Filing Date  
of Oldest  
New Case  
Awaiting  
Action

#### CHEMICAL EXAMINING GROUPS

GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director.....	7-2-76
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director.....	6-22-76
Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director.....	2-18-76
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director.....	4-22-76
Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director.....	3-1-76
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	

#### ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director.....	10-15-75
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director.....	1-12-76
Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director.....	1-9-76
Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director.....	9-7-76
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director.....	4-2-76
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGNS, GROUP 290—C. D. QUARFORTH, Director.....	9-10-75
Industrial Arts; Household, Personal and Fine Arts.	

#### MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director.....	3-26-76
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director.....	8-2-76
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director.....	5-3-76
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director.....	4-2-76
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director.....	7-22-76
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	

Expiration of patents: The patents within the range of numbers indicated below expire during March 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,926,352 to 2,931,037, inclusive  
Plant Patents..... Numbers 1,919 to 1,925, inclusive

## REISSUES

MARCH 22, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,155

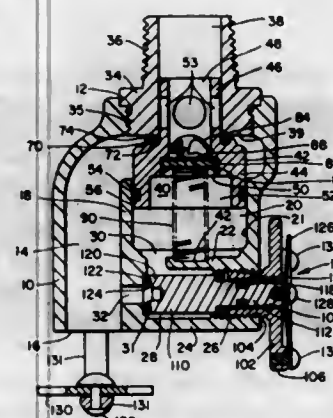
### ON-OFF SPRINKLER

James W. Mears, Warwick, and William J. O'Brien, Barrington, both of R.I., assignors to Grinnell Fire Protection Systems Company, Inc., Providence, R.I.  
Original No. 3,757,866, dated Sept. 11, 1973, Ser. No. 196,641, Nov. 8, 1971. Application for reissue Sept. 3, 1975, Ser. No. 610,013

Int. Cl.<sup>2</sup> A62C 37/08

U.S. Cl. 169—37

7 Claims



1. A water sprinkler device for a fire protection system coupled to a pressurized fluid supply line; comprising in combination:

a sprinkler body having an annular inlet portion adapted for coupling to said fluid supply line;  
means providing an inner wall for dividing said sprinkler body into a first bifurcation, having an outlet portion that defines a main fluid flow passageway between said inlet portion and said outlet portion, and a second bifurcation that defines a control chamber;

a deflector mounted adjacent said outlet portion to deflect fluid flow therethrough;

means providing a valve seating surface abutting said inlet portion at the junction of said bifurcations;

a main valve disposed in a direction downstream from said seating surface and having a valve seat mounted in opposed relation to said seating surface so as to oppose fluid pressure from said inlet portion that tends to cause said valve seat to separate from said seating surface to open said valve;

said main valve being slideable into said control chamber for controlling fluid flow through said main passageway while maintaining said control chamber blocked to fluid flow from said outlet portion;

an aperture formed substantially centrally in said main valve to define a control passageway that couples fluid from said inlet portion to said control chamber;

said main valve exhibiting a first surface area disposed toward said control chamber that is greater than a second surface area disposed toward said inlet portion to provide a greater main valve closing pressure than opening pressure;

means providing an outlet port from said control chamber to release fluid pressure therefrom to open said main valve;

pilot valve means having a valve member mounted to control fluid flow through said outlet port and including a bimetallic disc centrally connected to said valve member, and

means for securing the peripheral edges of said bimetallic disc against movement relative to said sprinkler body so as to flex said disc in a manner to resiliently bias said

valve member to close said outlet port, said disc responding to temperature rise to snap to an opposite flexure to open said outlet port to release fluid from said control chamber to open said main valve.

Re. 29,156

### FUEL BY-PRODUCTS OF MUNICIPAL REFUSE

Paul G. Marsh, Hamilton, Ohio, assignor to Black Clawson Fibreclaim, Inc., New York, N.Y.

Original No. 3,830,636, dated Aug. 20, 1974, Ser. No. 203,295, Nov. 30, 1971. Continuation-in-part of Ser. No. 94,084, Dec. 1, 1970, Pat. No. 3,736,223, which is a continuation-in-part of Ser. No. 14,431, Feb. 26, 1970, abandoned, and a continuation-in-part of Ser. No. 99,554, Dec. 18, 1970, Pat. No. 3,714,038. Application for reissue Jan. 27, 1976, Ser. No. 652,756

The portion of the term of this patent subsequent to Jan. 30, 1990, has been disclaimed.

Int. Cl.<sup>2</sup> C10L 5/00; F23G 3/00, 5/00

U.S. Cl. 44—1 D

10 Claims

11. As a new product, a particulate mixture consisting essentially of organic constituents of municipal refuse substantially free of inorganic materials, and prepared by a process comprising the steps of:

1. depositing solid waste materials including relatively frangible and infrangible organic and inorganic solids and a liquid medium in a treatment vessel,
2. subjecting said solids in the presence of said liquid medium in said treatment vessel to forces of sufficient intensity to reduce said relatively frangible organic and inorganic solids to particles of less than a predetermined maximum size forming a mixture with said liquid medium,
3. removing from said treatment vessel in slurry form a portion of said liquid medium and such of said organic and inorganic particles as pass through perforations sized to pass only particles of less than said predetermined maximum size,
4. removing said relatively infrangible solids from said treatment vessel separately from said slurry,
5. removing from said slurry the inorganic constituents thereof,
6. accumulating a substantial volume of the resulting slurry of said organic solids and liquid medium to assure the homogeneity thereof, and
7. removing from said accumulated slurry a substantial portion of said liquid medium to leave said particulate mixture, the major component material of said mixture being cellulose fibers, the particles in said mixture being of less than a predetermined maximum particle size, and said mixture having the following additional characteristics on a volumetric unit basis:
  - a. substantial homogeneity of component materials;
  - b. substantial uniformity from the standpoint of distribution of particle sizes;
  - c. substantially uniform moisture content; and
  - d. substantially uniform fuel value.



Re. 29,157

**HIGH TEMPERATURE RESISTANT  
POLYCHLOROPRENE ADHESIVE RESIN**

Kenneth C. Petersen, Scotia, and Thomas M. Galkiewicz, Schenectady, both of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Original No. 3,617,591, dated Nov. 2, 1971, Ser. No. 46,545, June 15, 1970. Continuation-in-part of Ser. No. 873,059, Oct. 31, 1969, abandoned. Application for reissue July 10, 1972, Ser. No. 270,026

Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 260—25

13 Claims

20. An adhesive composition comprising a polymer of chloroprene and the thermoplastic heat reaction product of a zinc compound selected from the group consisting of zinc carbonate, zinc borate, basic zinc carbonate, zinc salicylate and zinc phosphate, and an alkaline condensed alkyl or aryl substituted phenol-formaldehyde resin made by condensing formaldehyde and the phenol in a molar ratio of from 0.395:1 to 1.29:1.

Re. 29,158

**TIMER BLADE ARRANGEMENT**

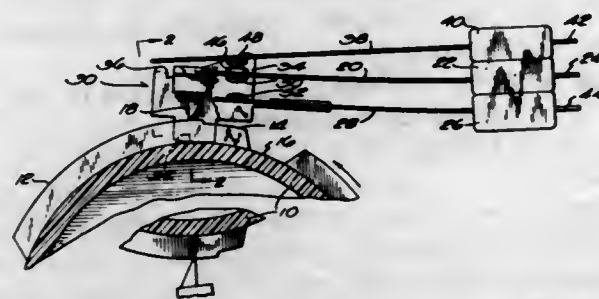
Roger J. Cartier, Hoffman Estates; George Obermann, Niles, and John Willigman, Elk Grove Village, all of Ill., assignors to The Singer Company, New York, N.Y.

Original No. 3,752,944, dated Aug. 14, 1973, Ser. No. 194,184, Nov. 1, 1971. Application for reissue Feb. 10, 1975, Ser. No. 548,201

Int. Cl.<sup>2</sup> H01H 3/42

U.S. Cl. 200—38 B

17 Claims



1. A timer including a program member rotatable about an axis and provided with spaced cams, a switch fixed relative to the program member for actuation by a cam, said switch including two blades the free ends of which are biased towards the program member, a follower molded on one of the blades engaging a cam whereby the cam actuates said one blade relative to the other,

follower means molded on the second blade engaging the program member to reference the second blade relative to the program member and to constrain the second blade against lateral movement.

Re. 29,159

**VERTICAL RECORD CARD ADAPTER FOR RECORD  
TAPE MACHINE**

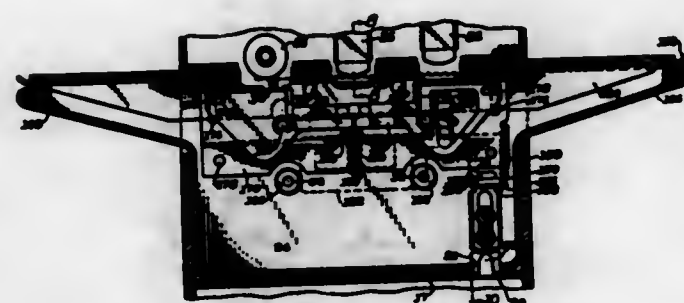
George F. Krtous, Chicago, and Carl G. Schreyer, Highland Park, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Original No. 3,584,882, dated June 15, 1971, Ser. No. 837,383, June 30, 1969. Application for reissue Feb. 25, 1972, Ser. No. 229,594

Int. Cl.<sup>2</sup> G11B 5/00

U.S. Cl. 360—88

18 Claims



1. An adapter for enabling a sound recorder-reproducing machine, having a deck surface which defines a cassette receiving station and also having means for driving the record tape in a cassette mounted thereon into intelligence transfer association with an electromagnetic transducer adjacent said driving means, to handle a record card having parallel tracks of magnetic recording medium, said adapter comprising: a casing, mountable to said cassette receiving station, having a track forming a substantially linear path for guiding a record card mounted therein; means associated with said casing for selectively transversely adjusting a record card mounted in said casing track between a first condition in which a first recording track is registered with said transducer and a second condition in which a second recording track is registered with said transducer; said casing track, when said casing is mounted on said machine, being aligned with said drive means and said transducer and having openings therein for receiving said drive means and said transducer permitting said drive means to move a record card in said casing track in an operative association with said transducer.

**PLANT PATENTS**

GRANTED MARCH 22, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,023

**GOLDEN BOSTON FERN**

Robert O. Miller, P.O. Box 120, Smith River, Calif. 95567

Filed Mar. 10, 1976, Ser. No. 665,811

Int. Cl.<sup>2</sup> A01H 9/00

U.S. Cl. Plt.—88

1 Claim

1. A new and distinct variety of Boston fern having the characteristics of Boston fern but differing in that it is yellow to golden color, and has a growth rate approximately 60 percent that of Boston fern.

4,025

**ROSE PLANT**

Marilyn R. Lemrow, Farmingville, N.Y., assignor to F. Harmon Saville, Rowley, Mass.

Filed Apr. 22, 1976, Ser. No. 679,146

Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—9

1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by recurrent flowers of rose pink coloring aging to a lighter lavender pink coloring with cream colored center and reverse marking highlighting the open bloom; in large conically shaped clusters of about 7 to 12 blooms per cluster on a vigorous but compact growing plant with abundant foliage and few thorns.

4,024

**PLUM PLANT**

Ronald Paul, 5485 E. Heaton, Fresno, Calif. 93727

Filed Dec. 10, 1975, Ser. No. 639,261

Int. Cl.<sup>2</sup> A01H 5/03

U.S. Cl. Plt.—38

1 Claim

1. A new and distinct variety of plum substantially as illustrated and described, which is generally similar to the Casselman plum but is distinguishable therefrom primarily by its



## PATENTS

GRANTED MARCH 22, 1977

### ERRATA

For CLASS	See PATENT NO.
403-408.....	4,012,884
403-408.....	4,012,885
350-096 C.....	4,013,000
250-343.....	4,013,260
250-453.....	4,013,261
250-492 A.....	4,013,262
252-415.....	4,013,546
526-245.....	4,013,627
424-263.....	4,013,659
428-412.....	4,013,696
423-575.....	4,013,780
423-579.....	4,013,781
423-613.....	4,013,782
423-622.....	4,013,783
423-490.....	4,013,796
536-064.....	4,013,820
536-088.....	4,013,821
358-263.....	4,013,827
358-133.....	4,013,828
358-299.....	4,013,829
358-128.....	4,013,830
358-299.....	4,013,831
358-212.....	4,013,832
358-111.....	4,013,833
358-166.....	4,013,834
340-199.....	4,013,911
361-049.....	4,013,924
361-018.....	4,013,925
361-115.....	4,013,926
361-119.....	4,013,927
361-380.....	4,013,928
361-357.....	4,013,929
361-172.....	4,013,930
361-187.....	4,013,931
329-104.....	4,013,967



## PATENTS

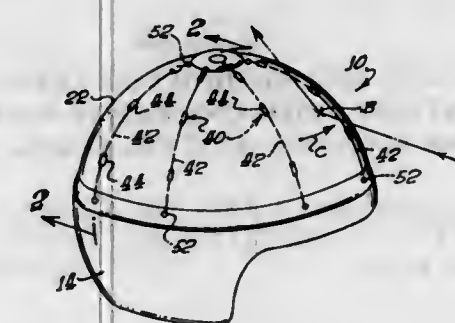
GRANTED MARCH 22, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this issue. These entries will be in numerical order by document publication number.

### GENERAL AND MECHANICAL

**4,012,794**  
**IMPACT-ABSORBING HELMET**  
 Tetsuo Nomiyama, 1526 Century, Santa Ana, Calif. 92703  
 Filed Aug. 13, 1975, Ser. No. 604,358  
 Int. Cl.<sup>2</sup> A42B 1/08  
 U.S. Cl. 2—411

7 Claims



1. An impact-absorbing helmet comprising:
  - an inner, substantially-stationary, shell member;
  - a base member integrally formed as the lower, protective portion of said helmet;
  - an outer shell member rotatably supported on said inner shell and superposed thereover, said outer shell having an annular free edge;
  - means for attaching said outer shell to said inner shell about the central, vertical axis of said helmet;
  - pivot means disposed between said outer and inner shells in alignment with said vertical axis, whereby said outer shell freely rotates about said inner shell;
  - bearing means interdisposed between said outer and inner shells;
- wherein said bearing means includes:
  - a first bearing means disposed between said outer and inner shell members, and annularly positioned about said attaching and pivot means; and
  - a second bearing means disposed between said outer and inner shell members, wherein said second bearing means comprises a plurality of bearing units equally spaced apart in a side-to-side relation to each other, and wherein each bearing unit is arranged perpendicular to said base member; and
  - means to stabilize the rotational movement of said outer shell with respect to said inner shell, said means being formed between said outer shell and said base member.

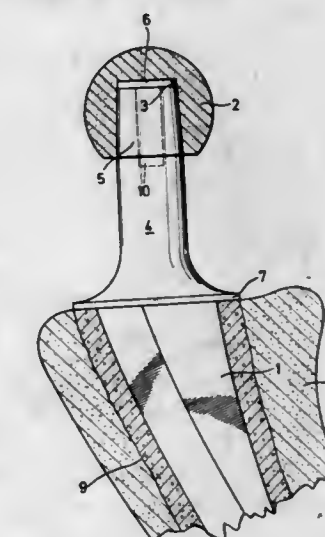
**4,012,795**  
**ARTIFICIAL HEAD ASSEMBLY FOR AN ARTICULATED JOINT BETWEEN TWO BONES**  
 Erhard Dörre, Plochingen, Germany; Manfred Semlitsch, and Otto Frey, both of Winterthur, Switzerland, assignors to Feldmühle Anlagen- und Produktionsgesellschaft mit beschränkter Haftung, Germany  
 Filed Oct. 29, 1975, Ser. No. 626,733  
 Claims priority, application Germany, Oct. 29, 1974, 2451275  
 Int. Cl.<sup>2</sup> A61F 1/24

U.S. Cl. 3—1.91

9 Claims

1. An artificial head assembly for an articulated joint between two bones comprising:
  - a. an elongated pin member having a conically tapering longitudinal end portion of metallic material; and
  - b. a head portion of ceramic material having a substantially spherical, convex engagement face and formed with a blind bore conically tapering inward of said head portion at an apex angle substantially identical with the apex angle of said tapering end portion.
1. said ceramic material and said metallic material directly engaging each other in a conically tapering inter-

- face extending over more than one half of the axial length of said bore,
2. said head portion being fixedly fastened to said pin member by said engaged materials,

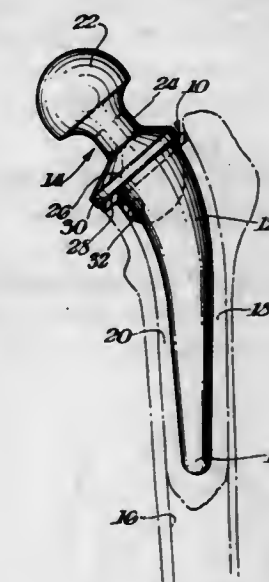


3. one of said materials having a surface layer contiguously adjacent said interface and a main portion separated from said interface by said surface layer,
4. the resistance to deformation of said surface layer being smaller than the resistance to deformation of said main portion.

**4,012,796**  
**INTERPOSITIONING COLLAR FOR PROSTHETIC BONE INSERT**  
 Sidney Weisman, West Caldwell, and Robert F. Cotter, Sparta, both of N.J., assignors to Howmedica, Inc., New York, N.Y.  
 Filed Sept. 24, 1975, Ser. No. 616,297  
 Int. Cl.<sup>2</sup> A61F 1/24

U.S. Cl. 3—1.91

10 Claims



1. An interpositioning collar for disposition between a metal prosthetic bone implant having a stem and adjacent portions of the bone comprising a substantially flat collar element having a substantially central hole adjacent the inner periphery of the collar through which the stem of the metal implant is inserted, a substantially short flange depending adjacent the inner periphery of the collar for disposition between the adjacent portions of the stem and bone, the interpositioning collar being resilient and having a relatively low modulus of elasticity for firmly wedging the metal implant within the bone and absorbing shocks therebetween, the collar element is substan-



tially elongated in plan view, and the flange is substantially U-shape with an open end, and the open end being disposed adjacent one of the ends of the collar element.

4,012,797

**SITTING-SQUATTING WATER CLOSET**

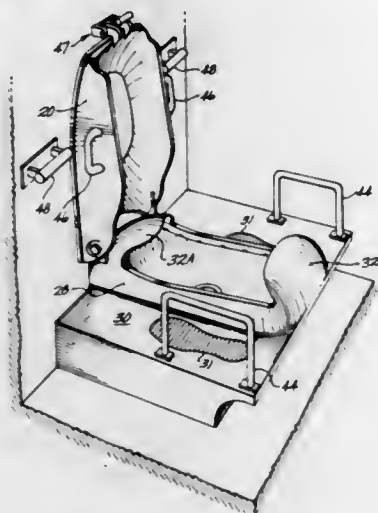
Bjorn R. Kristoffersen, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 3, 1976, Ser. No. 663,587

Int. Cl.<sup>2</sup> E03D 11/00

U.S. Cl. 4-10

22 Claims



1. A dual function water closet for use in either the sitting or the squatting position, comprising: a fixed lower section and a movable upper section foldable thereon; said lower section comprising a closet bowl being elongated in a fore and aft direction; said upper section comprising a toilet set hinged to the aft portion of the closet bowl and being in abutment sealing relationship with the sides of the elongated closet bowl when moved to the down position for use in the sitting position; a footrest fixed to each side of the closet bowl for support of the user in the squat position; said closet bowl having the level of its interior bottom surface below the horizontal plane of the side footrests; a urine spray shield at the forward end of the closet bowl; and said urine spray shield having an outer upper surface which nestles under the forward undersurface of the toilet seat for deflecting the urine of the user into the body of the closet bowl when the user is facing in the forward direction.

4,012,798

**PORTABLE EMERGENCY EYE WASH FOUNTAIN**

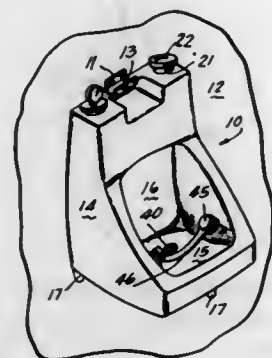
John R. Liautaud, 1537 Churchill Road, Schaumburg, Ill. 60172

Filed Sept. 29, 1975, Ser. No. 617,837

Int. Cl.<sup>2</sup> A47K 3/18; A61H 35/00

U.S. Cl. 4-166

13 Claims



1. An emergency safety eye wash fountain comprising spray nozzle means positioned at a location for spraying the eyes of a worker and comprising:  
a portable, unitary housing;

said housing having wall means defining an unpressurized liquid reservoir in said housing;  
said nozzle means being located in said wall means in immediate fluid communication with said reservoir;  
said reservoir being located gravitationally above said nozzle means; and  
quick-release valve means for opening said nozzle means for instantaneous initiation of a continuing, drenching flow of eye wash liquid from said reservoir.

4,012,799

**APPARATUS AND METHOD FOR TRANSFERRING A PATIENT FROM ONE BED TO ANOTHER**

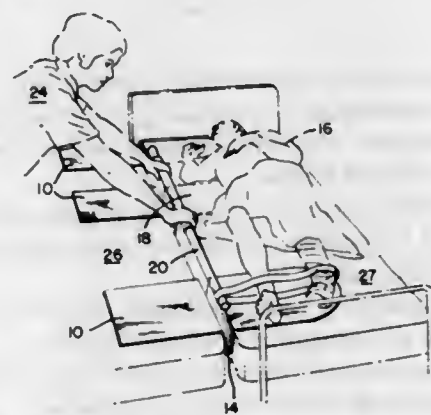
Gaery Davis Rutherford, 4522 SW. Holgate, Seattle, Wash. 98116

Filed June 9, 1975, Ser. No. 585,104

Int. Cl.<sup>2</sup> E03D 11/10

U.S. Cl. 5-81 R

10 Claims



1. An apparatus for transferring a patient from one bed to another, comprising:  
an elongated bar having a length greater than half the height of said patient; and  
a plurality of sled boards spaced apart along the length of said patient adjacent said bar, each of said boards including a planar support surface having a length sufficient to extend from one side of said patient to the other side of said patient with one end of said support surface terminating in a releasable bar securing portion curving upwardly and then toward said support surface, the curve of said securing portion being adapted to conform to the periphery of said bar such that when the support surfaces of said boards are placed beneath said patient and said securing portions are engaged by said bar, forces exerted on said bar away from said patient simultaneously slide said boards from one bed to another.

4,012,800

**BEDS**

Harry Mitchell, 3 Laurel Ave., Euxton, near Chorley, Lancashire, and William Augustine May, 640 Preston Road, Clayton-le-Woods, Chorley, Lancashire, both of England

Filed July 15, 1975, Ser. No. 596,128

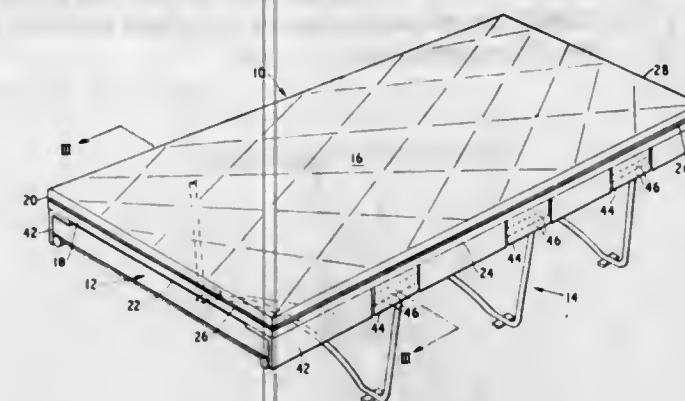
Int. Cl.<sup>2</sup> A47C 19/00; A47G 9/00

U.S. Cl. 5-187

18 Claims

1. A bed comprising a rectangular cover assembly including two superimposed sheets of material joined or securable together at one end and along the adjacent two sides thereof to form a bag which is open at the opposite end thereof, a resilient mattress on which said cover assembly is positioned, a frame on which said mattress is supported, and fastening means connected between said cover assembly and said frame, said fastening means at least partially enclosing said

mattress and being maintained in tension at least partially by the resilience of said mattress to resist relative movement



between said cover assembly and said mattress and between said mattress and said frame.

4,012,801

**BOX SPRING ASSEMBLY**

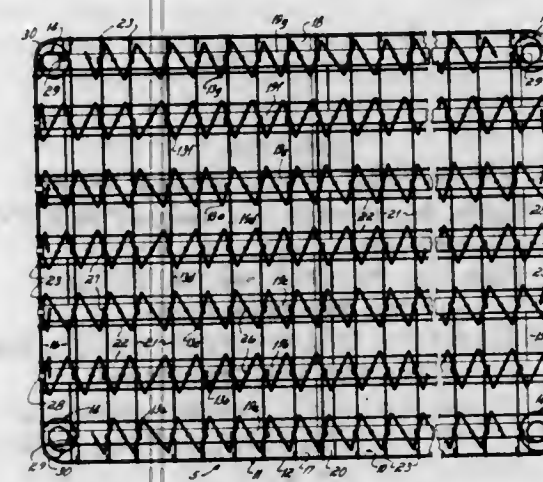
John Thomas King, Sarcoux; Blondie Butler, Carthage, both of Mo., and Francis R. Struewing, deceased, late of Carthage, Mo. (by Barbara C. Struewing, administratrix), assignors to Leggett & Platt Incorporated, Carthage, Mo.

Filed Oct. 10, 1975, Ser. No. 621,497

Int. Cl.<sup>2</sup> A47C 23/02

U.S. Cl. 5-247

13 Claims



1. A box spring assembly for use in supporting a bed mattress, said assembly comprising  
a rectangular base frame located in the bottom plane of said box spring assembly,  
a plurality of slats extending between two opposite sides of said base frame,  
a rectangular border wire generally overlying said base frame, said border wire being located in a plane spaced from but parallel to the plane of said base frame,  
a grid of wires located in the plane of said border wire and defining the top plane of said box spring assembly, said grid comprising a plurality of longitudinal and transverse wires welded together at their intersections and secured at their opposite ends to said border wire, and  
a plurality of parallel spiral spring wires extending between opposite sides of said base frame, said spiral spring wires being secured at the bottom to said slats and at the top to said wire grid.

4,012,802

**MATTRESS FOUNDATION**

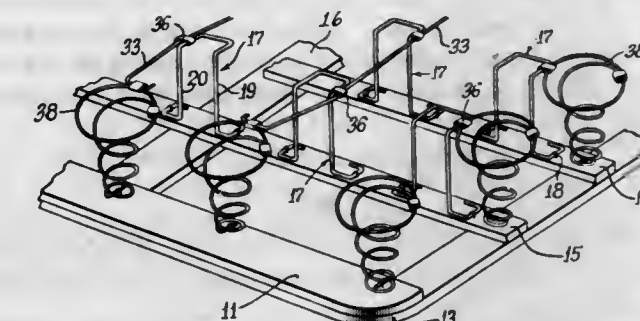
Ronald G. Hutchinson, Naperville, and Paul J. Dillon, Frankfort, both of Ill., assignors to Simmons Company, Atlanta, Ga.

Filed Nov. 28, 1975, Ser. No. 636,090

Int. Cl.<sup>2</sup> A47C 23/00, 23/02

U.S. Cl. 5-247

11 Claims



1. A foundation in the nature of a bedspring for supporting a mattress, comprising  
a base;  
a plurality of spaced support members each comprising a continuous length of wire bent to provide two spaced, straight, and parallel columns of equal height, an integral foot for each column defining a plane perpendicular to its column, and  
an integral connection between the tops of the columns providing at the top of each column a length of supporting wire parallel to the plane of said feet;  
tie wires extending between and secured to the spaced support members at their tops to assemble them into a mutually bracing, planar, rectangular supporting grid parallel to and spaced above the base;  
a row of springs substantially the height of said columns secured to the base along each of its side edges and flanking the assembly of said support members; and  
an overlying deck member coextensive with and supported by said assembly of wire support members and said flanking rows of springs, and serving to distribute localized loads applied to said foundation by an overlying mattress; said foundation being substantially rigid and unyielding to normal bedding loads in the area of its upper surface overlying said support members but resiliently deflectable under concentrated load along the edges of said surface overlying said springs.

4,012,803

**MULTIHEADED RADIAL TYPE NUT TAPPER**

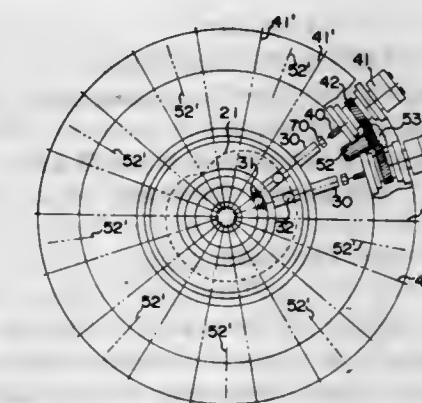
Yuan Ho Lee, 85 Jen Ho Road, Tainan, China /Taiwan

Filed Dec. 29, 1975, Ser. No. 644,941

Int. Cl.<sup>2</sup> B23G 1/08, 1/20

U.S. Cl. 10-132

5 Claims



1. A multiheaded radial type nut tapper comprising:  
a driving shaft adapted to be driven in rotary motion;  
a cam provided on said driving shaft;



a plurality of push rods disposed radially about said cam and adapted to be driven by said cam in reciprocating motion thereby;  
means for feeding nut blanks to a position in front of each of said push rods;  
a plurality of tap driving shafts disposed radially about the driving shaft, each having its respective rotational axis aligned with an axis of one of said push rods; and  
a plurality of bent taps adapted for rotation with said tap driving shafts, one bent tap being provided within each tap driving shaft so that tapped nuts may be produced from nut blanks successively fed onto said bent taps by said push rods as said drive shaft and said tap driving shafts are rotated.

4,012,804

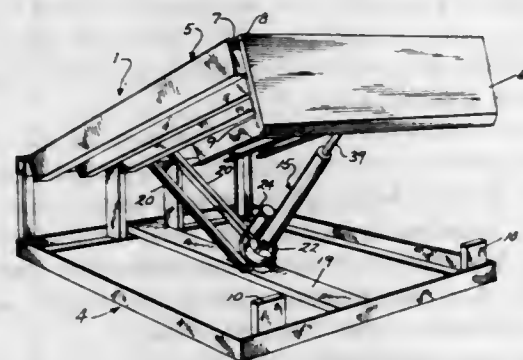
**ELECTROMECHANICALLY OPERATED DOCKBOARD**  
John C. Catlett, Milwaukee, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

Filed June 24, 1976, Ser. No. 699,469

Int. Cl.<sup>2</sup> E01D 1/00

U.S. Cl. 14-71.3

18 Claims



1. In a dockboard construction to be associated with a loading dock, a supporting structure mounted on the dock, a ramp structure hinged at its rear end to the supporting structure and disposed to pivot from a generally horizontal cross traffic position to an upwardly inclined position, a drive unit interconnecting the supporting structure and the ramp structure for pivoting the ramp from the cross traffic position to the upwardly inclined position, said drive unit including a screw member and a nut member connected with the screw member, a first of said members being connected to the supporting structure and the second of said members being connected to said ramp structure, and a motor operably connected to the drive unit and being capable of being driven in one direction by a power source to effect relative movement between said nut member and said screw member to thereby move the ramp from the horizontal position to the upwardly inclined position, and said motor being driven in the reverse direction as the ramp structure descends by gravity from the inclined position toward the horizontal position to provide a dynamic braking action to control the descent of the ramp structure.

4,012,805

**CARPET SHAMPOOER**

Helmut Schneider, Mainz, Germany, assignor to Werner & Mertz GmbH, Mainz, Germany

Filed Apr. 28, 1976, Ser. No. 681,213

Claims priority, application Germany, Apr. 29, 1975, 2518941

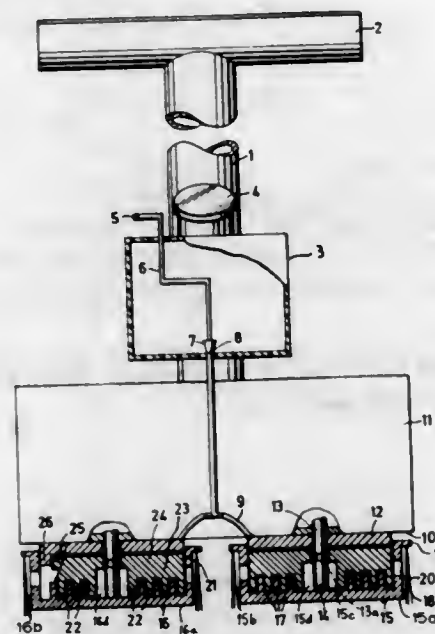
Int. Cl.<sup>2</sup> A47L 11/34

U.S. Cl. 15-50 R

14 Claims

1. A carpet shampooer of the type in which at least one rotating brush engages the carpet and is formed with upwardly open cup enclosing a foam-generating device, the improvement wherein said foam-generating device comprises:  
an array of upwardly projecting elements formed on the bottom of said cup for entraining a shampooing liquid and foam generated therefrom upon rotation of said brush;

a nonrotating body received in said cup and formed with downwardly extending baffle elements, said baffle elements including:  
lower baffle surfaces cooperating with said upwardly projecting elements to agitate said liquid and produce a foam therefrom, and



upper baffle surfaces for directing a dry foam generated in said cup and rising therein outwardly, said cup being formed with an opening for discharging said dry foam; and  
retaining means engaging said body for preventing rotation thereof while guiding said body floating in said cup so that said body rests upon said cup at least under its weight, said body being received with play in said cup.

4,012,806

**KNOB WITH DEFORMABLE WEB**

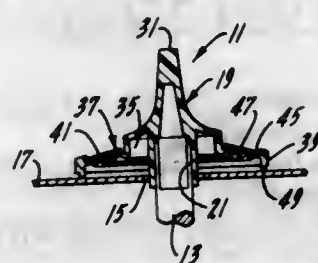
Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigolett Company, Decatur, Ill.

Filed Apr. 30, 1975, Ser. No. 573,260

Int. Cl.<sup>2</sup> E05B 1/00

U.S. Cl. 16-121

10 Claims



1. A knob for mounting on the end of shaft, said knob including:  
a hub having an operating handle portion and a shaft receiving socket,  
a web extending from said hub and terminating in a rim, said web being sufficiently deformable to permit said operating handle portion and said shaft receiving socket to be moved axially relative to said rim, and  
an annular dial supported cantileverly on said rim and extending over substantially all of said deformable web.

4,012,807

**VEHICLE BODY HOOD HINGE**

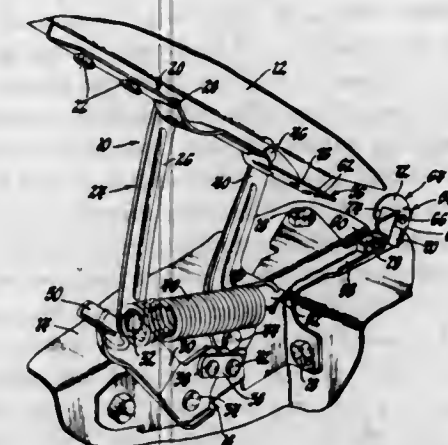
Otto Andrew Kern, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 6, 1975, Ser. No. 619,613

Int. Cl.<sup>2</sup> E05D 1/00

U.S. Cl. 16-128.1

3 Claims



1. A vehicle body hood hinge comprising a body hinge member adapted to be mounted on a vehicle body adjacent the rear end of a forward engine compartment thereof, a hood hinge member adapted to be mounted on the rear end of a hood for closing the upper side of the engine compartment, means connecting the body and hood hinge members for movement relative to each other between hood open and closed positions, the hood hinge member including a generally planar flange defining a rearwardly opening slot and having an aperture formed therein adjacent said slot, the body hinge member including a generally planar flange oriented in a generally vertical plane and defining a forwardly opening notch, and a lock arm pivotally mounted on the body hinge member and including a striker end and a pawl end, movement of the hinge members to closed position moving the hood hinge flange to a generally horizontal orientation and the flanges into an interreceived relationship wherein the notch receives the hood hinge flange, the slot receives the body hinge flange, and the aperture receives the pawl end only in the event of an impact causing the hood hinge flange to pivot the striker end rearwardly and the pawl end downwardly into the aperture, thereby limiting forced vertical, lateral, and rearward movement of the rear end of the hood with respect to the vehicle body.

4,012,808

**CONTINUOUS METHOD AND APPARATUS FOR MARINATING POULTRY**

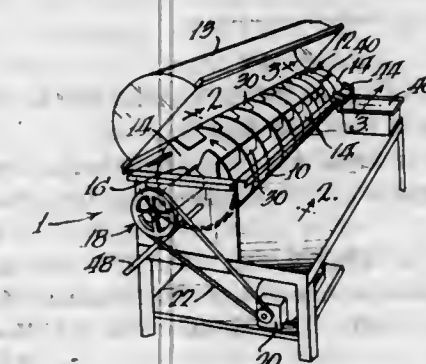
William K. Strong, Solvang, Calif., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Oct. 15, 1974, Ser. No. 514,669

Int. Cl.<sup>2</sup> A22C 21/00

U.S. Cl. 17-1 R

7 Claims



1. A continuous marinator assembly comprising an elongate trough and a continuous screw conveyor in said trough, said

screw conveyor having a central hub and a plurality of flights spirally secured to said hub, a plurality of lifting vanes and at least one lifting vane positioned between each adjacent pair of flights and extending inwardly and rearwardly with respect to the direction of rotation of said screw conveyor from the peripheral edges of said flights to lift and to drop poultry pieces disposed between said flights, discharge vanes at one end of said screw conveyor for lifting poultry pieces upwardly, said discharge vanes extending inwardly from the periphery of at least one pair of adjacent flights and inclining forwardly in a direction opposite from the direction at which the lifting vanes are inclined, a discharge chute at one end of said trough adjacent the end of the screw conveyor mounting the discharge vanes for receiving poultry lifted by the discharge vanes, and in which said lifting vanes extend rearwardly at an angle of from about 45 to about 60 degrees from a plane including the outer edges of the vanes and the axis of said hub, the peripheral edges of said flights and said lifting vanes being positioned closely adjacent said trough whereby neither the flights nor said lifting vanes are likely to cut into poultry pieces disposed in said marinator assembly.

4,012,809

**METHOD AND APPARATUS FOR ATTACHING THE FREE END OF A WITHDRAWING TAPE TO A TAMPON ROLL**

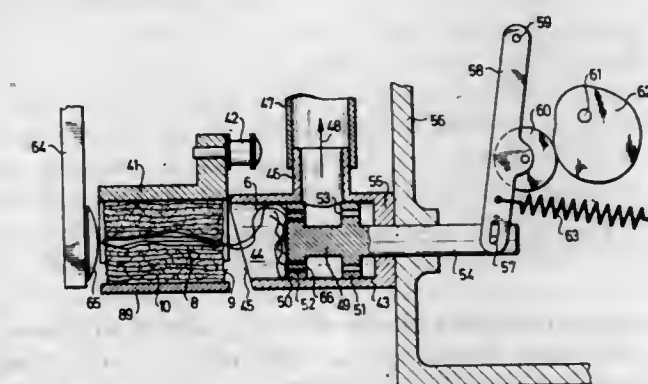
Niels Warneke, Metzkausen, and Wolfgang Johst, Gevelsberg, both of Germany, assignors to Dr. Carl Hahn GmbH, Dusseldorf, Germany

Division of Ser. No. 408,215, Oct. 19, 1973, Pat. No. 3,946,463. This application Apr. 25, 1975, Ser. No. 571,454  
Claims priority, application Germany, Oct. 30, 1972, 2253180

Int. Cl.<sup>2</sup> A61L 15/00

U.S. Cl. 19-144.5

5 Claims



1. In an apparatus for winding a batting strip into a tampon roll wherein one end of a withdrawing tape is joined to said batting strip and the other end of said tape is free, and wherein said apparatus comprises a rotatable, forked winding mandrel having fork tines, said mandrel adapted to be positioned adjacent to the longitudinal side of said batting strip which bears the free end of the withdrawing tape with said fork tines straddling said longitudinal side whereby said strip is wound into said roll by rotating said mandrel about an axis perpendicular to said longitudinal side of said strip, the improvement wherein said mandrel is provided with an axial bore therethrough having a first open end adapted to be positioned adjacent to said longitudinal side and a second open end in flow communication with a source of vacuum whereby said free end of said withdrawing tape may be aspirated into said bore when winding said strip.



4,012,810

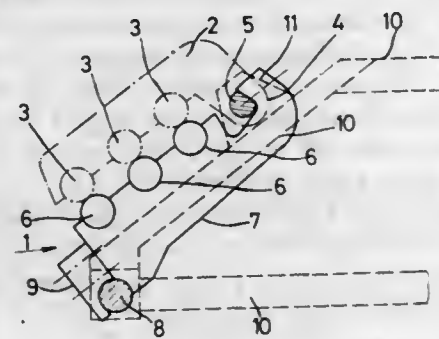
## DRAWING SYSTEM ARRANGEMENT FOR SPINNING MACHINES

Hans Stahlecker, Sussen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany  
Filed Apr. 25, 1975, Ser. No. 571,852

Claims priority, application Germany, May 9, 1974, 2422422

Int. Cl.<sup>2</sup> D01H 5/56

U.S. Cl. 19-294



1. A drawing system for spinning machines which include a machine frame, the drawing system including top rollers and bottom rollers, arm means for carrying and loading the top rollers, a carrying rod connected to said arm means, at least two dies arranged on and connected with said carrying rod for supporting the bottom rollers, a die carrier arranged on the machine frame in a supporting relationship with said dies, said carrying rod having a length which is at least twice the distance between two adjacent dies arranged on the carrying rod, and means for directly attaching said carrying rod to the machine frame such that a surface portion of the carrying rod directly engages a surface portion of the machine frame.

4,012,811

## MOLDED PLASTIC CLAMP

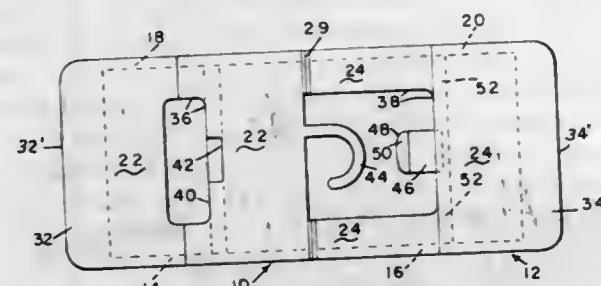
Joseph Mazzaferro, 325 Hamilton St., Leominster, Mass. 01453

Filed Jan. 21, 1976, Ser. No. 651,058

Int. Cl.<sup>2</sup> A44B 21/00

U.S. Cl. 24-84 H

3 Claims



1. A one-piece molded clamp having a pair of articulated clamping elements of rectangular configuration, each of said elements having a pair of parallel opposite sides, one end edge along which the element is integrally joined to a corresponding edge of the other clamping element and a free end edge opposite and parallel to said one end edge which contacts a corresponding free end edge of the other clamping element when the clamp is closed to provide an article grip, each of said clamping elements also having a pair of inclined flat portions defining outer faces joined to each other along a transverse ridge line intermediate said one end edge and said free end edge and a pair of triangular parallel side flanges bordering the opposite sides of and normal to the clamping element, each of said triangular flanges having a pair of side edges which form the side edges along one side of said inclined flat portions and which form an apex on said ridge line and a base edge extending between said one end edge and said free end edge of the element on which it is formed, flexible hinge means joining said clamping elements along their one end edge for swinging one of said clamping elements relative to the

other about said one end edge thereof from an open position wherein said elements extend outwardly from each other in opposite directions with the base edges of said flanges lying in a common plane to a closed position wherein said base edges of said flanges on the same side of the clamping element abut each other, a separate aperture formed in each of said clamping elements, the aperture in one of said clamping elements being formed between the ridge line and the one end edge thereof and the other clamping element having a supporting hook integral therewith and extending from said one end edge thereof into the aperture of said one clamping element when said element is open and which when the clamp is closed extends outwardly therefrom in a substantially medial plane between the clamping elements, the aperture in the other clamping element being spaced from said one end thereof, a latch integral with one of the clamping elements and a latch keeper integral with the other clamping element for holding the clamp in closed position with an article therebetween, said latch comprising an angular tongue extending from said one clamping element toward the aperture in the other clamping element and said latch keeper comprising an edge of the aperture in the other clamping element, said angular tongue having an undercut thereon for snapping past said latch keeper and being retained thereby.

9 Claims

4,012,812

## DOUBLE LOCK TUFTING BUTTON

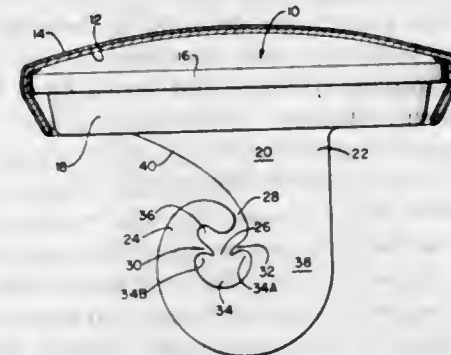
Stanley D. Black, Malden, Mass., assignor to Wade Industries, Inc., Malden, Mass.

Filed Mar. 11, 1976, Ser. No. 665,962

Int. Cl.<sup>2</sup> A44B 1/22, 1/18

U.S. Cl. 24-90 B

6 Claims



1. Tufting button comprising, a collet with a base disc and twine loop hook with first and second series array twine locks therein, the first lock being comprising a hook edge opposing a low stem portion of the hook and the second lock comprising symmetrically arranged opposing lips defining a locking opening therebetween overlying a cavity with symmetrically arranged return recesses under the lips on both sides of the locking opening, the device further comprising a return recess between the locks opposing the second lock opening, the arrangement providing one way twine locking movement whereby the twine can first contact a portion of the stem near the base disc, then go through said first lock and then go through said second lock in one continuous forward motion.

4,012,813

## ANTI-THEFT FASTENING DEVICE AND TOOL FOR RELEASING SAME

Henry J. Martens, Lynnfield, and Jan Vandebult, Topsfield, both of Mass., assignors to I. D. Engineering, Inc., Peabody, Mass.

Division of Ser. No. 519,270, Oct. 30, 1974, Pat. No. 3,911,534. This application Apr. 14, 1975, Ser. No. 568,150

Int. Cl.<sup>2</sup> A44B 9/00; E05B 47/00; B66C 11/04; H01H 47/00

U.S. Cl. 24-150 R

5 Claims

1. A detaching tool adapted to release a fastening device forming part of a separate and independent tag assembly for tagging articles, comprising:

4,012,815

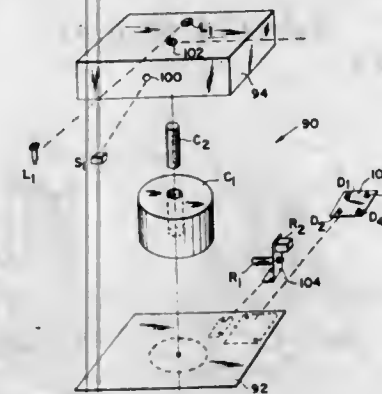
## APPARATUS FOR ABRADING FABRICS

Jose Benzaquen, Caseros, Buenos Aires, Argentina, assignor to Benzaquen, Sociedad Anonima, Industrial, Comercial, Inmobiliaria y Financiera, Buenos Aires, Argentina  
Continuation-in-part of Ser. No. 311,261, Dec. 1, 1972, Pat. No. 3,872,557. This application Feb. 5, 1975, Ser. No. 547,178

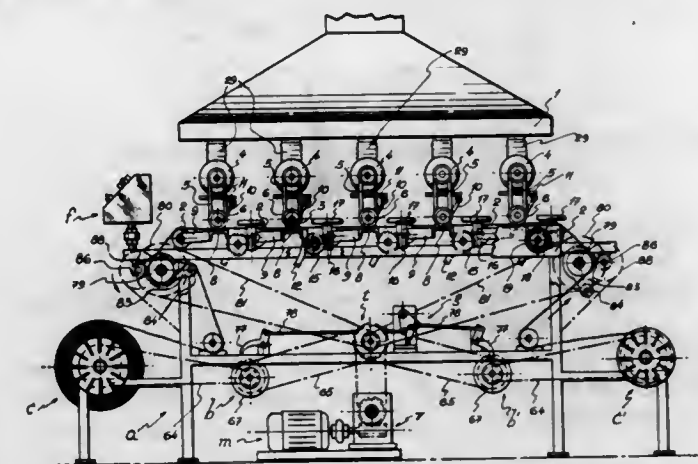
Int. Cl.<sup>2</sup> D06C 11/00

U.S. Cl. 26-28

20 Claims



coil, said circuit means including a rectifying bridge and overload protection means for interrupting the circuit to said magnetic coil when said switch means has been closed a predetermined period of time, whereby when said fastening device is positioned adjacent said detaching tool and said switch means is closed, said magnetic coil is activated for releasing said fastening device.



1. Apparatus for continuously conditioning fabric including means for moving the fabric through the apparatus with substantially negligible longitudinal tension, said means comprising rotating roll means at opposite ends of said apparatus, and means for varying the frictional contact between said roll means and the fabric so that such contact is greater at one end of the apparatus than at the other depending upon the direction of travel of the fabric through the apparatus, guide means for guiding said moving fabric through the apparatus, at least one fabric abrasion cylinder positioned transversely to the direction of movement of the fabric through the apparatus, drive means for rotating said cylinder about an axis transverse to the direction of movement of the fabric, and oscillating means for oscillating said cylinder in a direction transverse to the direction of movement of the fabric, said oscillating means oscillating said cylinder in response to the rotation thereof.

19. Apparatus for continuously conditioning fabric including means for moving the fabric through the apparatus, said means comprising rotating roll means at opposite ends of said apparatus, means for varying the frictional contact between said roll means and the fabric so that such contact is greater at one end of the apparatus than at the other depending upon the direction of travel of the fabric through the apparatus, guide means for guiding said moving fabric through the apparatus, at least one fabric abrasion cylinder positioned transversely to the direction of movement of the fabric through the apparatus, drive means for rotating said cylinder about an axis transverse to the direction of movement of the fabric, and oscillating means for oscillating said cylinder in a direction transverse to the direction of movement of the fabric, said oscillating means oscillating said cylinder in response to the rotation thereof.

4,012,816

## METHOD AND APPARATUS FOR PROCESSING THERMOPLASTIC YARN

Charles S. Hatcher, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 405,520, Oct. 11, 1973, abandoned. This application June 2, 1975, Ser. No. 583,318

Int. Cl.<sup>2</sup> D02G 1/20, 1/12

U.S. Cl. 28-1.3

24 Claims

20. Apparatus for processing thermoplastic yarn comprising heating means for heating a yarn; texturing means for texturing the heated yarn to produce a yarn plug, said yarn plug having an end from which the textured yarn is pulled; temperature control means for maintaining the temperature of the heating means at or above a first set point;

4,012,814  
HOSE CLAMP BODY

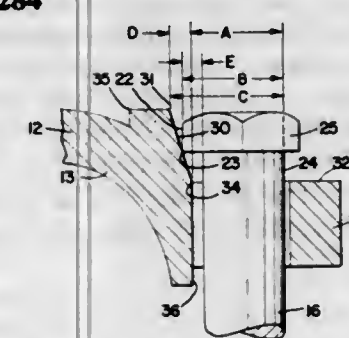
Paul D. Yoder, Wilkoughby, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 19, 1975, Ser. No. 642,476

Int. Cl.<sup>2</sup> B65D 63/00

U.S. Cl. 24-284

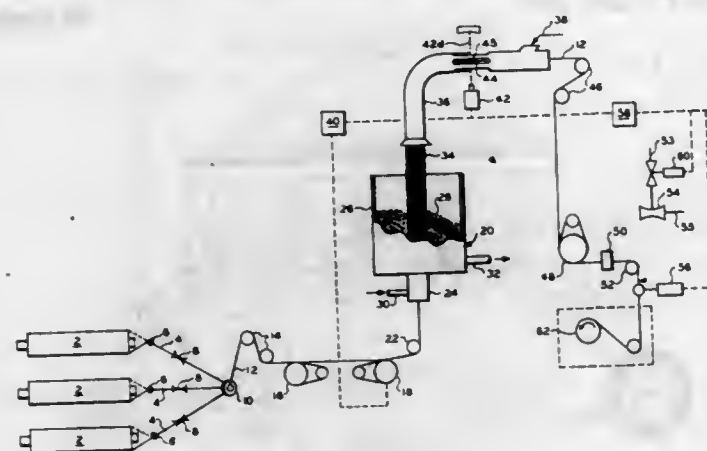
4 Claims



1. In combination, a hose clamp body having a surface thereon for gripping a hose and having a bolt opening there-through and a first surface generally transverse to the axis of said opening, a bolt having a shank extending through said opening and having a head opposed to said first surface, said head having at least one flat side surface, said body having a second flat surface intersecting said first surface and extending from such intersection to an upper edge, said second body surface extending away from said first surface at an acute angle with respect to the longitudinal axis of said opening, the transverse distance when the shank is against the wall of the opening at a location opposite said second surface between the longitudinal axis of the bolt and said flat side surface being greater than the transverse distance between the longitudinal axis of the bolt and said intersection and lesser than the transverse distance between said longitudinal axis of the bolt and said upper edge whereby said second surface engages said bolt head side surface and wedges said shank against the wall of said opening at said location before said bolt head can engage said first transverse surface and said bolt is prevented from turning relative to said body by said engagement.



monitoring means for monitoring the end of said yarn plug, the end of said yarn plug oscillating with respect to a predetermined point;  
timing means for timing the interval for the end of said yarn plug to oscillate with respect to said predetermined point; and



means for changing the set point of the temperature control means from the first set point to a second set point if the interval for the end of said yarn plug to oscillate with respect to said predetermined point is equal to or longer than a fixed time period.

4,012,817

## METHOD OF MAKING A CAPACITOR

Karl-Heinz Preissinger, Taufkirchen, and Ulrich Wehnelt, Starnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

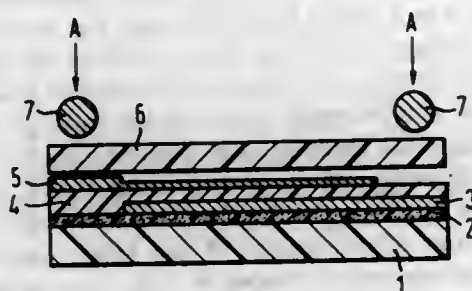
Filed June 26, 1975, Ser. No. 590,432

Claims priority, application Germany, June 27, 1974, 2431044

Int. Cl.<sup>2</sup> H01G 4/18, 7/00

U.S. Cl. 29—25.42

3 Claims



1. A method for producing a layer type capacitor comprising the steps of  
coating an adhesion-imparting layer in a dissolved state onto a first covering foil,  
applying a first conductive layer with pores therein into the exposed surface of said adhesion-imparting layer, coating the exposed surface of the first conductive layer with a dielectric lacquer solution having a solvent therein, said adhesion-imparting layer being soluble in said solvent, allowing the solvent to penetrate through the pores of the first conductive layer to activate the adhesion layer, and applying a second conductive layer on said dielectric, applying a second covering foil and contacting said conductive layers on opposite sides by pressing heated leads at least at one point through said covering foil and the respective of said layers into said first covering foil.

4,012,818  
BORING MILL AND MILLING DEVICE WITH A TOOL MAGAZINE

Jürgen R. K. Dornblüth, Gerd Engel, both of Rheidt, and Heinrich Klassen, Viersen, all of Germany, assignors to Scharmann & Co., Rheidt, Germany

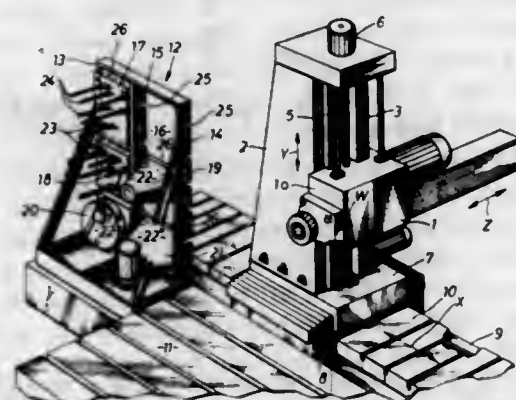
Filed Nov. 14, 1974, Ser. No. 523,811

Claims priority, application Germany, Nov. 14, 1973, 2356799

Int. Cl.<sup>2</sup> B23Q 3/157

U.S. Cl. 29—26 A

13 Claims



1. A horizontal boring mill and milling device, which includes in combination: a horizontally displaceable stand, a tool carrier supported by and vertically movable on said stand for exchangeably receiving and supporting a tool for performing machining operations, a tool magazine comprising means for holding tools and tool sets in a position substantially parallel to their intended position in said tool carrier, and means for moving said stand relative to said magazine, said tool magazine being arranged laterally of and in a plane in front of said tool carrier and within the region of movement of said tool carrier, said tools and tool sets having supporting flange means for connecting to said tool carrier, said tool carrier being provided with means for picking up and receiving tools and tool sets from said magazine, clamping means on said tool carrier for positioning and clamping said flange means on said tool carrier, said flange means and said magazine having interengageable complementary formations including projections on one and substantially vertically extending slots in the other, said projections entering said slots when said flange means is positioned on said magazine, said tool carrier lowering said flange means with said projections in said slots so that said projections engage in said slots to retain said flange means on said magazine.

4,012,819

## CYLINDRICAL ABRADING TOOL

Karl Willinger, Vienna, Austria, assignor to Firma Hans Ehgartner, Vienna, Austria

Continuation-in-part of Ser. No. 511,619, Oct. 3, 1974, Pat. No. 3,927,447. This application Sept. 8, 1975, Ser. No. 611,263

Claims priority, application Austria, May 10, 1974, 3890/74; Sept. 6, 1974, 7209/74

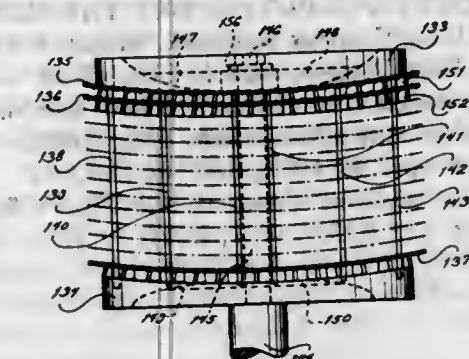
Int. Cl.<sup>2</sup> B23D 7/100

U.S. Cl. 29—79

7 Claims

1. An abrading tool comprising a cylindrical hollow body with a pair of coaxial apertured end disks, a multiplicity of tiers of annular cutting blades of sheet metal between said disks centered on the disk axis and provided with toothed outer edges projecting beyond the peripheries of said disks, mounting means holding said cutting elements sandwiched between said disks, and lugs integral with said cutting blades separating adjacent tiers with formation of a multiplicity of

generally radial passages communicating with the disk apertures for the circulation of cooling air through said body, said



lugs lying in substantially radial planes perpendicular to a plane transverse to said axis.

4,012,820

## CIRCULAR SAW HAVING TEETH WITH AN IMPROVED METAL BREAKING GEOMETRY

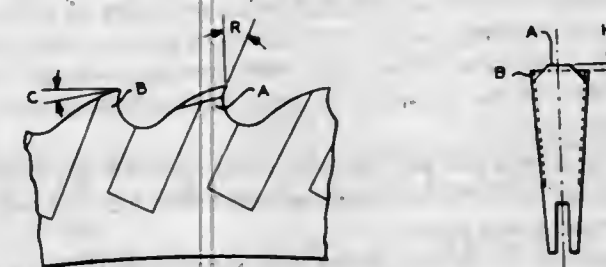
Robert H. Nowak, Mentor, Ohio, assignor to The Motch & Merryweather Machinery Company, Cleveland, Ohio

Filed June 16, 1975, Ser. No. 587,504

Int. Cl.<sup>2</sup> B26D 1/12, 1/00; B23D 57/00

U.S. Cl. 29—103 R

7 Claims



1. A circular saw having teeth with an improved metal cutting geometry comprising:  
a circular saw blade body; and,  
a plurality of saw teeth means attached to said saw blade body and separated one from another by gullet means, said saw teeth means including a plurality of higher and lower teeth arranged in a triple-chip like manner, said teeth means including at least a leading face and a first and a second side face, said saw teeth means further including a continuously curved working surface located on the upper portion of said leading face of said saw teeth means, said continuously curved working surface having two edge portions where said continuously curved working surface meets said first and second side faces and a central portion intermediate said two edge portions and advanced forward of said two edge portions.

4,012,821

## ROLL SECTION AND MANUFACTURE OF SLEEVED ROLLER THEREWITH

Donavon L. Feaster, Mattapoisett, Mass., assignor to Mount Hope Machinery Company, Incorporated, Taunton, Mass.

Filed July 11, 1975, Ser. No. 595,090

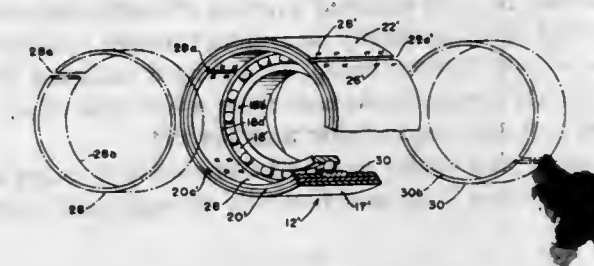
Int. Cl.<sup>2</sup> B21B 13/02

U.S. Cl. 29—116 R

14 Claims

1. A roll section having a cylindrical spool and anti-friction rotational bearing means seated within the bore thereof, said roll section having the improvement comprising  
A. at least first and second concentric and contiguous conjoined cylindrical members, the outer surface of said second member forming the spool outer surface,  
B. bearing-locking means securing the bearing means within the inner surface of said first member, and

C. a non-overlapping seam axially extending along the length of each cylindrical member, said seams of said first



and second members being rotationally balanced relative to one another.

4,012,822

## SYSTEM FOR SEALING AND REPAIRING LEAKS IN RUPTURED CONTAINERS

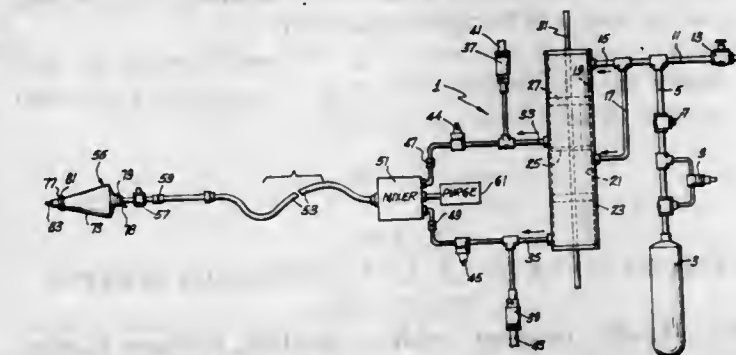
John J. Vrolyk, Simi, and Robert W. Melvold, Northridge, both of Calif., assignors to The United States of America as represented by the Administrator of the Environmental Protection Agency, Washington, D.C.

Filed May 29, 1975, Ser. No. 582,049

Int. Cl.<sup>2</sup> B32B 35/00

U.S. Cl. 29—700

11 Claims



1. A system for sealing and repairing a rupture in a container, wherein the system comprises, in combination:  
a. storage means for storing a sealant material,  
b. displacement means for expelling the sealant material from the storage means,  
c. an open-celled sponge body for inserting into the rupture, and  
d. conduit means providing communication between the storage means and the sponge body for conveying the expelled sealant material into the sponge body to thereby seal and repair the rupture.

4,012,823

## METHOD OF MAKING ARTIFICIAL INTRAOCULAR LENSES

William Richards, Medway, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 8, 1975, Ser. No. 638,489

Int. Cl.<sup>2</sup> B23P 17/00

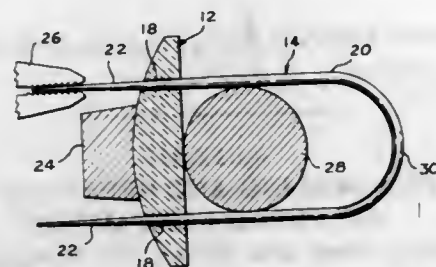
8 Claims

U.S. Cl. 29—418

1. The method of securing iris clips to lenses of pseudophakoi wherein the iris clips are formed of wire and anchoring holes are provided in the lenses for receiving ends of the wires, said method comprising the steps of:  
providing a wire having a substantially uniform preselected diametral size at least throughout a selected portion of its length to be secured to a lens, said selected portion having a first free end;  
forming a hole in said lens of an appreciably smaller diametral size than the diametral size of said selected portion of said wire, the differential of diametral sizes of said hole and portion of said wire being sufficient to prevent accidental detachment of lens and wire following forceful interfitting thereof;



reducing the diametral size of a section of said selected portion of said wire adjacent said first free end to at least the diametral size of said hole to produce an integral leader on said selected portion of said wire, said leader being easily manually insertable through said hole in said lens and further being of a length adapted to extend entirely through said hole from a first side of said lens to an opposite second side and beyond; directing said leader into and completely through said hole in said lens from said first side through said second side;



gripping said leader and forcing said portion of said wire of said preselected diametral size and said lens relative to one another into interference interfitted relationship, a substantial portion of said leader adjacent said second side of said lens becoming exposed; and cutting away and discarding an exposed portion of said leader then forcefully retracting the remaining exposed portion of said leader into said hole.

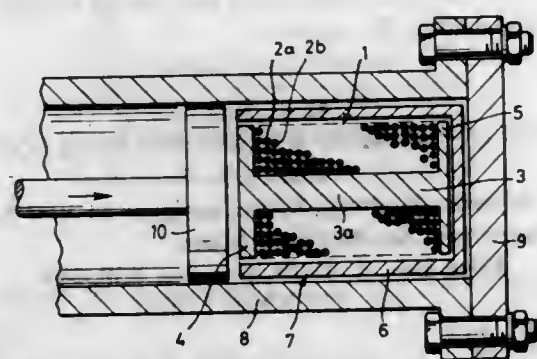
4,012,824

# REINFORCED ARTICLE AND METHOD OF MAKING THE SAME

Walther Dawidl, Illingen; Gottfried Barthels, Cologne; Gustav Brühn, Opladen; Max Kittendorf, Cologne; Manfred Röper, Leichlingen; Heinz Scheuten, Bensberg-Immekeppel, and Oswald Schwerdtfeger, Cologne, all of Germany, assignors to Felten & Guillaume Kabelwerke AG, Cologne, Germany. Continuation-in-part of Ser. No. 476,287, June 4, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,467. Claims priority, application Germany, June 6, 1973, 2328774.

Int. Cl.<sup>2</sup> B23P 17/00; B29H 9/02

U.S. Cl. 29—419 R



57. A method of making reinforced articles, comprising the steps of forming a primary blank member by overlaying at least one portion of a supporting member with uncoated reinforcing elements, said supporting member being composed at least in part of matrix-forming material for said elements; forming a secondary blank member by juxtaposing said primary blank member with another member which at least partially surrounds said initial blank member and which is composed at least in part of matrix-forming material; and applying pressure to said secondary blank member so as to form at least one reinforced article having a desired configuration.

4,012,825

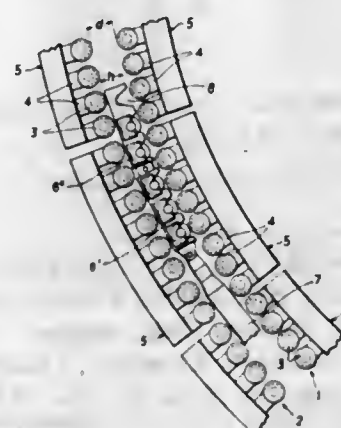
# METHOD OF EXCHANGING SUPPORTING OR DRIVING ROLLERS IN A CONTINUOUS CASTING PLANT AND APPARATUS FOR CARRYING OUT THE METHOD

Fritz Gränitz, Linz; Gunther Robiczek, Traun; Fridolin Jabkowski, and Franz Stöger, both of Linz, all of Austria, assignors to Vereinigte Österreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria. Filed Apr. 26, 1976, Ser. No. 680,199.

Claims priority, application Austria, Apr. 30, 1975, 3322/75. Int. Cl.<sup>2</sup> B23P 19/04; B22D 11/12.

U.S. Cl. 29—427

11 Claims



1. In a method of exchanging rollers in a plant for continuously casting strands, in which plant a plurality of rollers is arranged in bearing places and define opposite roller paths located at a distance from each other corresponding to the cross-section of the strand to be cast, the improvement comprising the steps of

releasing a roller to be removed from its bearing place, moving said roller to be removed into the space between the opposite roller paths, transporting the roller to be removed longitudinally between the roller paths away from its bearing place, transporting a roller to be installed longitudinally between the opposite roller paths toward a free bearing place, and inserting the roller to be installed in the free bearing place.

4,012,826

# BOLT TIGHTENING APPARATUS AND METHOD

Fred Stansfield, Oldham, England, assignor to Doncasters Moorside Limited, Oldham, England.

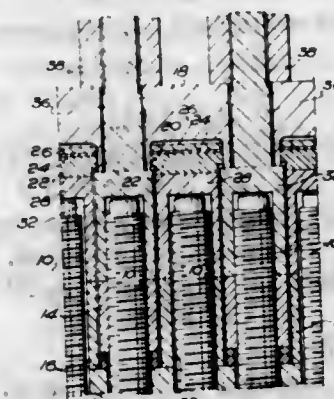
Filed May 19, 1976, Ser. No. 687,946.

Claims priority, application United Kingdom, Mar. 18, 1976, 11006/76.

Int. Cl.<sup>2</sup> B23P 11/02; B25B 29/02; E21B 19/00.

U.S. Cl. 29—446

5 Claims



1. A method of pre-tensioning a series of screwthreaded fasteners comprising an even number of such fasteners arranged on a common pitch circle, the method including the steps of applying a tension to alternate fasteners of the series of fasteners by means of a ring member supported above the

remaining fasteners and by means of a plurality of piston and cylinder arrangements associated with said ring member and acting against respective spacer members surrounding said remaining fasteners tightening the nuts on the tensioned alternate fasteners to retain tension on said alternate fasteners, subsequently repositioning the ring member so that it can be supported above the already tightened fasteners and applying a tension to said remaining fasteners by means of said ring member and the piston and cylinder assemblies associated with said ring member, and tightening the nuts on the tensioned remaining fasteners to retain the tension on said remaining fasteners.

2. Apparatus for tensioning a plurality of screwthreaded fasteners, wherein the improvement comprises:

- a plurality of screwthreaded fasteners arranged on a common pitch circle and comprising an even number of such fasteners;
- first means coacting with each one of alternate fasteners for applying a tensile force to each of said alternate fasteners;
- a ring member coacting with said first means and supported above the remaining fasteners to exert tensile forces on said alternate fasteners;
- second means for maintaining said ring member in such coacting relation with said first means;
- abutment means overlying respective remaining fasteners and disposed to support said ring member above said remaining fasteners; and
- third means coacting with said ring member and with said abutment means and creating forces in said ring member that coact with said first means and thereby exert tensile forces in said alternate fasteners.

4,012,827

# METHOD FOR MOLDING COMPOSITE ARTICLES

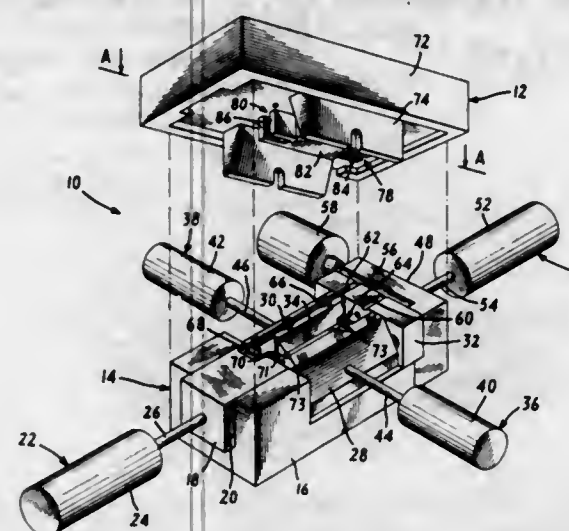
Gilbert Lawrence Abrams, 113 Helene Road, Valley Cottage, N.Y. 10989.

Filed June 9, 1975, Ser. No. 584,828.

Int. Cl.<sup>2</sup> B29F 1/14.

U.S. Cl. 29—453

7 Claims



1. A method of forming a composite thick article from molded thin walled elements comprising the steps of injecting a molding material into a mold apparatus having at least two chambers with a separation therebetween, one of said chambers being in registration with the other said chambers, filling the chambers with said molding material to form a thin walled molded element in each of said chambers, providing during the formation of said elements, a plurality of projecting mating parts spaced from each other on each of said elements, the mating parts on one element extending outwardly toward and in registration with the mating parts on the other of said elements, removing the separation between said chambers to provide one chamber in unobstructed registration with the other of said chambers, while the elements are still in said

chambers, driving said one element in substantially one direction toward said other element while still within said mold apparatus to join said mating parts thereby to form said composite article, and thereafter removing said composite article from said mold apparatus.

4,012,828

# METHOD OF FASTENER ASSEMBLY FOR PRELOADING A JOINT

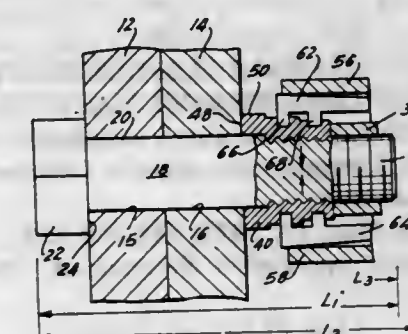
Warren F. Dahl, Philadelphia, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Division of Ser. No. 345,106, March 26, 1973, Pat. No. 3,920,338, which is a continuation-in-part of Ser. No. 285,906, Sept. 1, 1972, Pat. No. 3,803,793, which is a continuation of Ser. No. 28,377, April 14, 1970, abandoned. This application July 25, 1975, Ser. No. 599,279.

Int. Cl.<sup>2</sup> B21D 39/00; B23P 11/00.

U.S. Cl. 29—517

4 Claims



1. A method for assembling a joint assembly comprising a plurality of workpieces to be joined having substantially aligned openings therethrough and a fastener assembly including a fastener member having a head and a shank portion extending through said openings with the head adapted to engage the outer surface of one of said workpieces, and a free end of said shank portion projecting beyond the free surface of another one of said workpieces, the projecting part of said shank portion including an irregular surface configuration to provide a locking surface and to cooperate with a selectively reusable removably positioned abutment means, comprising the steps of:

placing a deformable collar member having an initially smooth surfaced internal bore about said projecting end of said shank portion so that one end of said collar member is adjacent the free surface of said another workpiece and the other end of said collar member is formed to initially bear on said abutment means;

snugging the joint assembly together to eliminate free play by advancing said abutment means on said free end of said shank portion so that said collar member bears on the free surface of said another workpiece and said abutment means initially bears on said other end of said collar member;

deforming said collar member radially inwardly toward said shank portion while said abutment means bears on said other end of said collar member, causing material of said collar member to extend radially inwardly into interlocking engagement with said irregular surface configuration and to extend axially against both said free surface of said another workpiece and said abutment means, axially elongating said collar member and said shank portion and preloading said joint assembly; and removing said abutment means from said free end of said shank portion, whereby the interlocking engagement between said collar member and said irregular surface configuration maintains preload in said joint assembly.



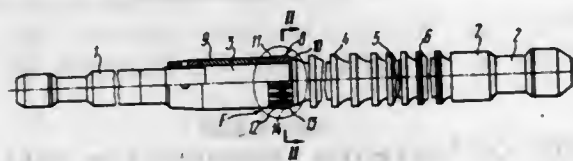
4,012,829

## SHAPING-AND-CUTTING BROACH

Jury Ivanovich Dvorov, Yaroslavlskoe Shosse, 8, korpus 2, kv. 614, and Vladislav Evgenievich Orlov, ulitsa Molostovyykh, 1, korpus 2, kv. 157, both of Moscow, U.S.S.R.  
Filed Mar. 5, 1976, Ser. No. 664,069  
Int. Cl.<sup>2</sup> B26D 1/00

U.S. Cl. 29-567

6 Claims



1. A shaping-and-cutting broach comprising: cutting teeth, each having a continuous cutting edge; gauging teeth; a shaping element located before said cutting teeth and provided with projections on the external surface which interacts with the machined surface in the course of broaching; said projections whose height is essentially greater than the total feed of said cutting teeth.

4,012,830

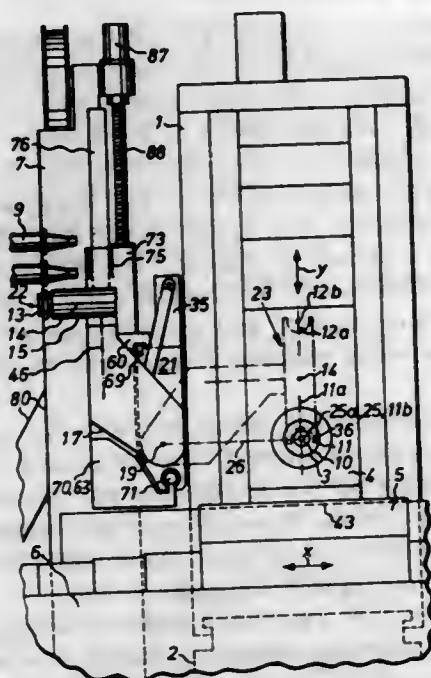
## TOOL CHANGER FOR HORIZONTAL DRILLING-MILLING MACHINES

Norbert Ewertowski, Dietzenbach-Steinberg, Germany, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland  
Filed Mar. 17, 1975, Ser. No. 559,220  
Claims priority, application Switzerland, Mar. 22, 1974, 4008/74

Int. Cl.<sup>2</sup> B23Q 3/157

U.S. Cl. 29-568

4 Claims



1. A horizontal drilling-milling machine comprising:

1. a machine frame;
2. a tool spindle horizontally mounted on said machine frame;
3. a magazine arranged adjacent said machine frame, said magazine having a plurality of tools arranged horizontally in said magazine and extending at right angles to said tool spindle, said tools being retrievable from said magazine and insertable in the tool spindle in a direction parallel to said tool spindle;
4. guide tracks arranged adjacent the magazine and parallel to said tool spindle;
5. a gripper carriage displaceably mounted for movement upon the guide tracks in a direction parallel to the tool spindle;

6. a tool changer means mounted on said gripper carriage for moving a tool from the magazine to the tool spindle and for moving a tool from the tool spindle to the magazine, said tool changer means comprising:
  - a. a gripper rocker mounted on said gripper carriage and swingable about a first axis parallel to said tool spindle;
  - b. means connected to said gripper rocker for swinging said gripper rocker about said first axis;
  - c. a gripper arm mounted on said gripper rocker and swingable about a second axis extending in spaced relationship from and at right angles to said first axis;
  - d. means connected to said gripper arm for swinging said gripper arm about said second axis;
  - e. a gripper vane mounted on said gripper arm, swingable about a third axis extending at right angles to said second axis, said gripper vane having tool gripping clamps mounted thereon;
  - f. means connected to said gripper vane for swinging said gripper vane about said third axis from a first position to a second position such that said gripper clamps are selectively positioned adjacent a tool in said magazine and adjacent said tool spindle;
7. cylinder and piston means for displacing said gripper carriage in different positions upon the guide tracks including:
  - a. a first cylinder secured to the gripper carriage for effecting tool change, said first cylinder having therein a first displaceable piston;
  - b. a second cylinder operatively connected with the guide tracks for displacing the gripper carriage during a work cycle, said second cylinder having therein a second displaceable piston;
  - c. a piston rod interconnecting said pistons with one another.

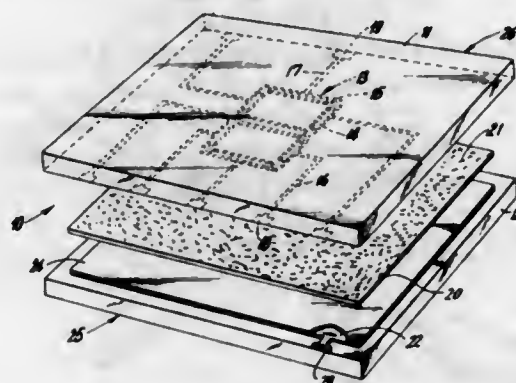
4,012,831

## ELECTROCHROMIC DISPLAY ELEMENT AND PROCESS

Marshall Leibowitz, Englewood, N.J., assignor to Timex Corporation, Waterbury, Conn.  
Division of Ser. No. 615,013, Sept. 19, 1975, Pat. No. 3,975,086. This application Apr. 23, 1976, Ser. No. 679,618  
Int. Cl.<sup>2</sup> B01J 17/00

U.S. Cl. 29-570

2 Claims



1. The process of making an electrochromic display which comprises the steps of:
- providing a first substrate having transparent front electrodes and an electrochromic layer thereon;
  - providing a second substrate having a rear electrode;
  - providing an electroreactive layer for the rear electrode by:
    - a. heating an electrochromic material to a temperature ranging from 250° to 1,000° C.
    - b. passing hydrogen gas over the surface of the oxidized electrochromic material to impart hydrogen into the material;
  - filling the space between the substrates with an electrolyte;
  - and,
  - sealing the first and second substrates together with an adhesive.

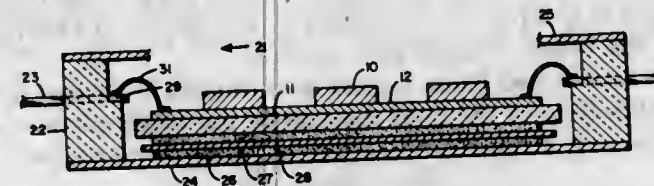
4,012,832

## METHOD FOR NON-DESTRUCTIVE REMOVAL OF SEMICONDUCTOR DEVICES

John Reed Crane, Minnetonka, Minn., assignor to Sperry Rand Corporation, New York, N.Y.  
Filed Mar. 12, 1976, Ser. No. 666,522  
Int. Cl.<sup>2</sup> B01J 17/00

U.S. Cl. 29-575

10 Claims



1. The method of bonding semiconductor devices to a substrate or base to enable their non-destructive removal and replacement, comprising the steps of:
- providing a substrate having a conductive target pad thereon;
  - applying a first conductive plastic layer over said conductive target pad;
  - applying a conductive alloy chip over said first conductive plastic layer;
  - applying a second conductive plastic layer over said conductive alloy chip;
  - applying a semiconductor device over said second conductive plastic layer;
  - curing said first and said second conductive plastic layer at a temperature below the melting point of said conductive alloy chip to provide a semiconductive device conductively bonded to said conductive target pad on said substrate.

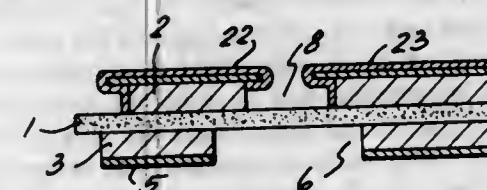
4,012,833

## METHOD OF MAKING DISPLAY STRUCTURE HAVING LIGHT EMITTING DIODES

Katsuhiko Akiyama, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan  
Division of Ser. No. 535,173, Dec. 23, 1974, Pat. No. 3,936,694. This application Nov. 7, 1975, Ser. No. 629,756  
Claims priority, application Japan, Dec. 28, 1973, 48-3360; Nov. 21, 1974, 49-134643  
Int. Cl.<sup>2</sup> B01J 17/00

U.S. Cl. 29-591

10 Claims



1. A method of making a light emitting diode display device having positive and negative electrodes comprising the steps of:
- a. forming a first conductive metal layer on one surface of a substrate of insulating material;
  - b. forming a second conductive metal layer covering the other surface of said substrate;
  - c. forming a thin metal conductive layer on the surface of said second metal layer;
  - d. etching an opening through each of said metal layers, the openings being aligned with respect to each other;
  - e. the width of the opening in said second metal layer being narrower than the width of the opening in said first metal layer and the width of the opening in said thin metal layer being narrower than the width of the opening in said second metal layer;
  - f. the over hanging portions of said thin metal layer providing eaves extending partly over said second opening;

- g. mounting the light emitting diode in said pair of aligned openings with its pn junction perpendicular to said substrate, so as to bend down said eaves into said second opening; and
- h. soldering said positive and negative electrodes with said eaves, respectively.

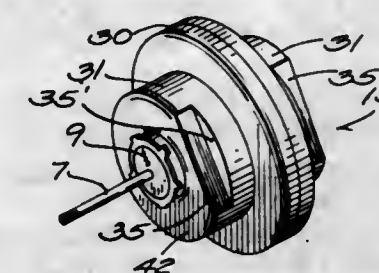
4,012,834

## METHOD OF AND APPARATUS FOR AUTOMATIC PRODUCTION OF ARMATURES

Arnold P. LeVasseur, Lakeville, Minn., assignor to Possis Corporation, Minneapolis, Minn.  
Division of Ser. No. 607,048, Aug. 22, 1975, Pat. No. 3,980,184, which is a division of Ser. No. 477,549, June 7, 1974, Pat. No. 3,920,129. This application Apr. 2, 1976, Ser. No. 672,867  
Int. Cl.<sup>2</sup> H02K 15/02

U.S. Cl. 29-597

11 Claims



1. In apparatus for presenting articles which consist of assemblies of a number of components including a shaft upon which the other components are mounted, to a work station at which power actuated mechanism performs an operation upon the articles, the performance of which requires that the articles be presented to said mechanism in predetermined orientation with respect thereto, said apparatus including a plurality of identical carriers each having a cavity to receive one of said articles, and a circular periphery on which the carrier rolls with its axis horizontal down an inclined track to the work station, the improvement comprising:

- A. rotation interrupting means on each carrier spaced from its axis of rotation and by which the carrier can be held in a predetermined position of rotation;
- B. locating means on each carrier to engage said articles upon insertion thereof into its cavity and to establish the same in predetermined orientation with respect to the rotation interrupting means on the carrier;
- C. holding means at the work station cooperable with said rotation interrupting means on the carriers to hold the carriers in a position of rotation in which the articles therein are in said predetermined orientation with respect to the power actuated mechanism at the work station;
- D. an automatic assembling machine having instrumentalities to receive the individual components of said assembly and in progressive stages assemble the same into said articles with the shafts thereof vertical;
- E. transfer means operable to grip and present the carriers one at a time and with their axes of rotation vertical, to a receiving station adjacent to said assembling machine;
- F. means to remove said assembled articles from the assembling machine and insert them into the carriers as the latter are presented to said receiving station; and
- G. transfer means to grip the thus loaded carriers and deposit them on said track with their axes horizontal.



4,012,835

**METHOD OF FORMING A DUAL IN-LINE PACKAGE**  
Charles W. Wallick, York, Pa., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

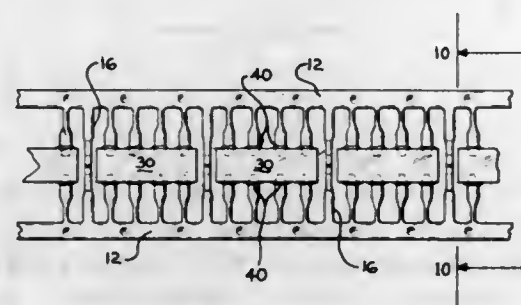
Filed Sept. 17, 1974, Ser. No. 506,760

Disclosure was also published under second Trial Voluntary  
Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> H01L 21/28

U.S. Cl. 29—591

7 Claims



1. The method of forming a dual in-line package from a unitary lead frame having spaced parallel carrier strips with groups of leads extending toward each other from the strips and rungs joining the strips between opposed groups of leads and a circuit module having opposed contact surfaces comprising the steps of:

- Freely positioning a circuit module between adjacent rungs on the lead frame with the contact surfaces of the module adjacent the ends of the leads on the carrier strips;
- Moving the carrier strips toward the circuit module to foreshorten the adjacent rungs and seat the ends of the leads on both carrier strips against the contact surfaces on the circuit module, and then;
- Forming bonded electrical connections between the lead ends and the contact surfaces on the circuit module.

4,012,836

**CARTON KNIFE**

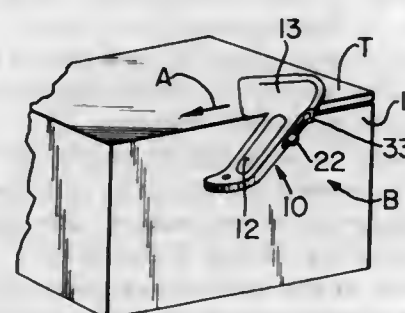
Richard I. Baer, Monson, and Kenneth M. Bellivue, Granby, both of Mass., assignors to Safe-T-Cut Incorporated, Palmer, Mass.

Filed May 30, 1975, Ser. No. 582,230

Int. Cl.<sup>2</sup> B26B 1/08, 5/00

U.S. Cl. 30—2

4 Claims



1. Carton knife comprising:  
means defining a hand holdable handle member with an extended length and an extended length hole therein with a forward opening,  
means defining a blade carrier for moving along the length of said hole,  
means for moving the carrier between and locking it in any one of a plurality of discrete positions along the length of said internal hole,  
the said blade carrier means carrying a blade in position to extend forwardly through said hole forward opening in several of said plurality of positions and to be completely recessed within said hole in at least one of said positions,

the said hole and blade carrier further comprising cooperating guide means for rigidly mounting said blade and providing a smooth longitudinal passage track for said blade carrier within said hole, the forward part of the hole having a roof to prevent expansion of the carrier to a locking position,  
the said handle further comprising external guide means for bearing against two sides of a carton to define a uniform location of cut of a carton close to the edge of one of said sides at a depth of cut defined by the degree of extension of this blade through said opening,  
and wherein said blade carrier is of flexible U-shaped form with a base of the U at the rear of the blade carrier and mounting means for the blade in front of the carrier.

4,012,837

**DRY SHAVERS**

Enzo Ascoli, Lausanne, Switzerland, assignor to The Gillette Company, Boston, Mass.

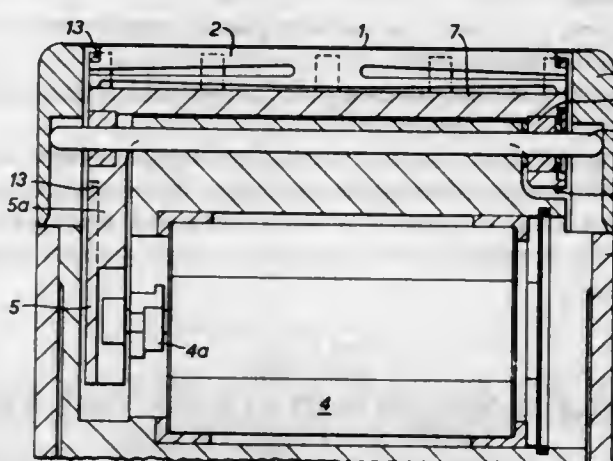
Filed June 23, 1975, Ser. No. 589,209

Claims priority, application United Kingdom, July 23, 1974, 32448/74

Int. Cl.<sup>2</sup> B26B 19/04, 19/12

U.S. Cl. 30—43.9

11 Claims



1. In an electric shaver having a shaving foil which is removable from the shaver and a movable inner cutter cooperating therewith, wherein the inner cutter comprises a cutter body having slots therein and a plurality of cutter blades mounted in the slots, the improvement wherein each cutter blade comprises integrally formed first and second parts lying in a single plane, the first part having a cutting edge and the second part being resiliently deformable relative to the first part in the plane of the blade and being pressed against the cutter body to be deformed towards the cutting edge by assembly of the inner cutter beneath the shaving foil to resiliently urge the cutting edge of the first part of the cutter blade into engagement with the foil and the cutter body is provided with retaining means engaging the first part for retaining the blades in the slots when the shaving foil is removed from the shaver.

4,012,838

**METHOD FOR PRODUCING ARTIFICIAL DENTURES**

Joseph D. Abdenour, Grosse Pointe, Mich., assignor to American Denture Corporation, Scottsdale, Ariz.

Filed Jan. 30, 1975, Ser. No. 545,305

Int. Cl.<sup>2</sup> A61C 13/00

U.S. Cl. 32—2

3 Claims

1. A method for producing a denture comprising: forming a generally U-shaped assembly of prosthetic teeth, bonding said U-shaped assembly of teeth into a generally U-shaped hard base structure; providing a terminus of said hard base structure disposed a short distance rearwardly of the incisor areas of said assembly of prosthetic teeth; bonding a soft deflectably formable layer onto said hard U-shaped base; inserting said hard U-shaped base and deflectably formable layer into a patient's mouth and finger forming said deflectably formable

4,012,841

**DEVICE FOR FIXING A DENTAL DRILL INTO A ROTOR**  
David Mosimann, Chemin des Grillons 13-15, Bienne, Switzerland

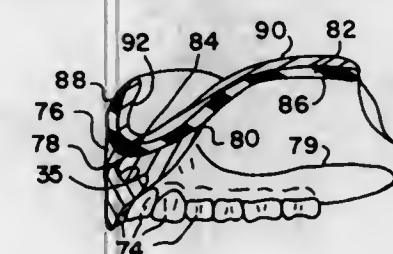
Filed Sept. 23, 1975, Ser. No. 616,023

Claims priority, application Switzerland, Sept. 30, 1974, 013157/74

Int. Cl.<sup>2</sup> A61C 1/10

U.S. Cl. 32—27

4 Claims



gum area of the mouth, thereby forming a fitted denture module; then making a first impression model of one side of said fitted denture module; then making a second impression model of the opposite side of said fitted denture module; then removing the impressionable material and soft deflectably formed layer from the hard U-shaped base assembly of prosthetic teeth; then casting uncured denture base resin in a formable form between said second impression model and with said first impression model with the U-shaped hard base structure imbedded therein; and allowing said uncured denture base resin to cure in bonded relationship to said hard base structure to form said denture.

4,012,839

**METHOD AND COMPOSITION FOR TREATING TEETH**

William H. Hill, St. Paul, Minn., assignor to Peter Strong & Company, Inc., Portchester, N.Y.

Filed Nov. 26, 1973, Ser. No. 418,997

Int. Cl.<sup>2</sup> A61K 5/02

U.S. Cl. 32—15

16 Claims

1. A method for treating mammalian dental tissue comprising the step of applying a bactericidal amount of a complex salt of silver thiocyanate in an orally acceptable form to said tissue.

4,012,840

**ADHESIVE PIT AND FISSURE SEALANT**

Mitsuharu Takeuchi, No. 26-19, 2-chome, Ichikawa, Ichikawa, Chiba, and Akira Otsuki, 833-22, Umadateba, Arakawaoki-cho, Tasuchiura, Ibaragi, both of Japan

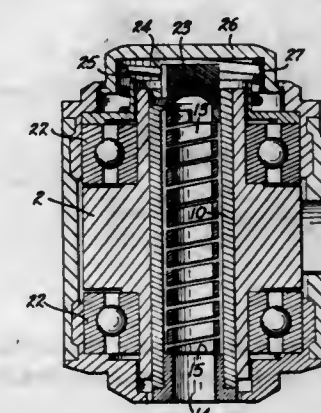
Division of Ser. No. 508,733, Sept. 24, 1974, abandoned. This application Feb. 12, 1976, Ser. No. 657,585

Int. Cl.<sup>2</sup> A61K 5/02

U.S. Cl. 32—15

1 Claim

1. A method for preventing teeth from decaying by sealing pits and fissures of sound teeth, which comprises: coating the surface of teeth with a mixture of a first material comprising a lower alkyl  $\alpha$ -cyanoacrylate and ultra-microfine particles of silicon dioxide and a second material comprising a di-loweralkylformamide and then applying a third material of N,N-dimethyl-p-toluidine, N,N-dimethylaniline or N,N-diethylaniline onto the coated surface.



1. In a dental handpiece having a rotor provided with an axial bore therein:  
a helical spring in said bore, of an outer diameter slightly less than the diameter of said bore and having an inner diameter slightly less than that of the shank of a drill to be frictionally held and driven thereby;  
driving means drivingly connecting one end of said spring to said rotor;  
release means for selectively axially compressing said spring to thereby radially expand the same to release the shank of a drill therein;  
said driving means comprising a top abutment member at one end of said spring having a notch drivingly receiving an end of said spring but permitting relative axial movement therebetween; and  
said release means including an annular bottom abutment fixed in said bore and engaging the other end of said spring and an opening through said top abutment member for insertion of a tool to engage a drill frictionally held in said spring and thereby axially compress said spring against said annular abutment.

4,012,842

**DENTAL TREATMENT METHOD AND APPARATUS**  
Jaroslav Vit, Belle Mead, N.J., assignor to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 312,507, Dec. 6, 1972, Pat. No. 3,863,628, which is a continuation-in-part of Ser. No.

301,071, Oct. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 301,074, Oct. 26, 1972, abandoned. This application Nov. 19, 1974, Ser. No. 525,258  
Claims priority, application United Kingdom, June 12, 1972, 27445/72; Aug. 24, 1972, 39588/72; Aug. 24, 1972, 39589/72; Aug. 24, 1972, 39590/72; Sept. 5, 1972, 41194/72

Int. Cl.<sup>2</sup> A61H 09/00; A61K 07/16

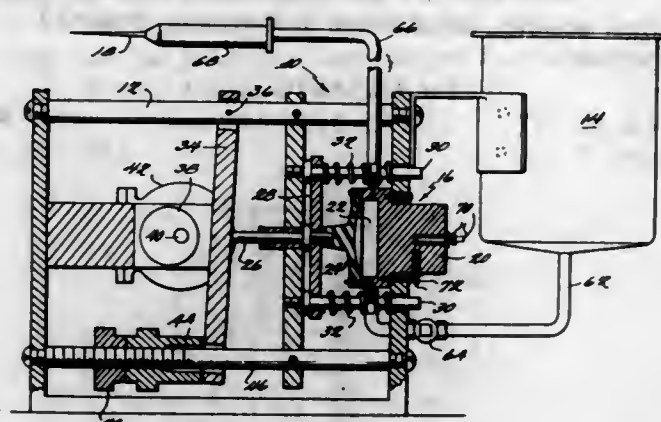
U.S. Cl. 32—58

11 Claims

1. The method of removal of dental debris including plaque or caries which includes supplying liquid to a chamber having a movable wall whereby the size of the chamber can be changed, forcing the liquid out the chamber as a pulsating high velocity jet stream and applying said stream to the plaque or caries of a tooth, causing said pulsations by changing the size of the chamber by cyclically first rapidly increasing the pressure on the movable wall to reduce the size of the chamber, then at the same rate and for the same period of time decreasing the pressure on the movable wall to again change the size of the chamber and then employing a motionless period in the cycle of no change in pressure wherein the volume of the chamber remains constant, said pulsations



being such that in each cycle the difference between the highest and lowest pressure applied to the dental debris, and the respective periods for which the dental debris in under



highest pressure and lowest pressure cause the dental debris to be mechanically stressed and then completely relaxed during a motionless period of substantially nil application of pressure to the teeth.

4,012,843

#### CONCAVE DIFFRACTION GRATING AND A MANUFACTURING METHOD THEREOF

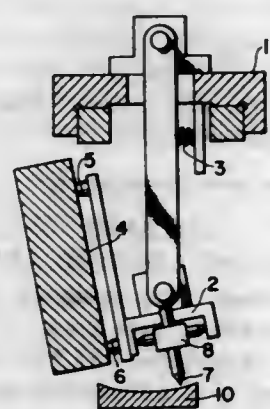
Tatsuo Harada, Fuchu; Shigeo Moriyama, Kokubunji; Toshiaki Kita, Tokyo, and Hidenori Yamaguchi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan  
Division of Ser. No. 463,799, May 24, 1974, abandoned. This application Dec. 9, 1974, Ser. No. 531,156

Claims priority, application Japan, Apr. 25, 1973, 48-46175

Int. Cl.<sup>2</sup> B43L 13/24

U.S. Cl. 33-19 A

7 Claims



1. A method of manufacturing a concave diffraction grating comprising the steps of:

- providing a grating blank having a concave spherical surface;
- positioning a ruling tool in a first plane intersecting said concave spherical surface and perpendicular to a line passing through the center of curvature of said concave spherical surface and a point at which the image of the first-order diffracted light of a predetermined wavelength  $\lambda_0$  is formed stigmatically when said light emanates from the center of curvature of said concave spherical surface; and
- passing said ruling tool back-and-forth across said concave spherical surface in a plurality of spaced-apart planes, each of said planes being parallel to said first plane and parallel to one another, and each of said planes intersecting said concave spherical surface, to thereby form a plurality of grating grooves in said concave spherical surface.

4,012,844

#### SIGHTING DEVICES FOR FIREARMS

Paul E. Tellie, St.-Etienne, France, assignor to Etat Francais, Paris, France

Filed May 20, 1974, Ser. No. 471,681

Claims priority, application France, June 1, 1973, 73.19955

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> F41G 1/02

U.S. Cl. 33-252

11 Claims



1. A firearm comprising a rear sight and a front sight, each of said rear sight and said front sight being mounted on an associated support having a fixed position with respect to the firearm, means for adjusting each of said sights, said adjusting means for one of said sights comprising a flexible, substantially vertically extending metal flat blade having a first end fastened to said support of said one sight and a second end firmly connected to said one sight, said one sight being an extension of said second end of said blade, and control means for varying the distance between an area of said blade and said support of said one sight so that the varying of this distance causes a displacement of the one sight.

4,012,845

#### DEHYDRATION PROCESS

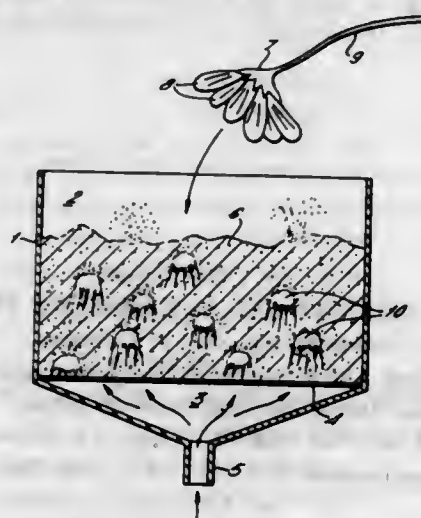
Francis John Judge, Rushden, and Joseph Morris Stubbs, Bedford, both of England, assignors to N.V. Internationale Octrooi Maatschappij "Octropa", Rotterdam, Netherlands  
Filed Dec. 8, 1975, Ser. No. 638,258

Claims priority, application United Kingdom, Dec. 16, 1974, 54268/74

Int. Cl.<sup>2</sup> F26B 3/00, 5/16

U.S. Cl. 34-9

9 Claims



1. A process for the dehydration of a delicate object such as plant material, which process involves the steps of:

- inducing relative motion between particles in a bed of dry particulate material selected from fine sand, silica gel and ion exchange resins;
- immersing said delicate object in said bed while maintaining said relative motion at least in a zone which encompasses said delicate object; and
- causing said relative motion to cease, so causing said

particulate material to hold said delicate object in a constant conformation while dehydration of said delicate object is effected.

4,012,846

#### APPARATUS FOR CONCENTRATING LIQUID-SOLID MIXTURE

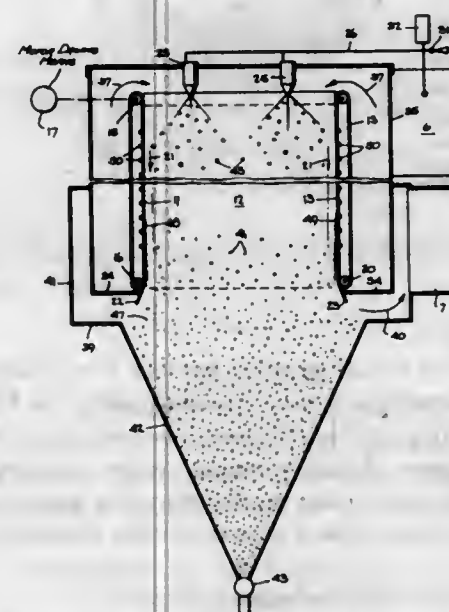
Rene N. Silva, 555 Cliff St., Ridgewood, N.J. 07450

Filed July 28, 1975, Ser. No. 599,331

Int. Cl.<sup>2</sup> F26B 17/00

U.S. Cl. 34-57 R

15 Claims



1. Apparatus for separating liquid from a liquid-solid mixture which comprises a liquid having a solid therein, said apparatus comprising a first tube with a substantially peripherally continuous wall, solids scraping means engaging said wall for removing solids deposited on said wall, mounting means movably mounting one of said wall and said scraping means, driving means connected to said one of said wall and said scraping means for moving said one thereof, said tube having a first end and a second end spaced from said first end, spraying means at said first end of said tube for spraying said mixture in finely divided form into said tube and toward said second end, heated gas supplying means at one end of said first tube for supplying a flow of heated gas to the interior of said first tube at said one end and into contact with the sprayed mixture whereby said gas flows from said one end of said first tube to the other end thereof and mixes with said sprayed mixture, gas removal means at said other end of said first tube for removing said gas from said tube at said other end thereof as it reaches said other end, and solids receiving means at said second end of said first tube for receiving solids from within said first tube and solids removed from said wall by said scraping means.

4,012,847

#### SOLVENT RECOVERY SYSTEM

Burton Rand, Norristown, Pa., assignor to Autosonics Inc., Norristown, Pa.

Filed Nov. 24, 1975, Ser. No. 634,400

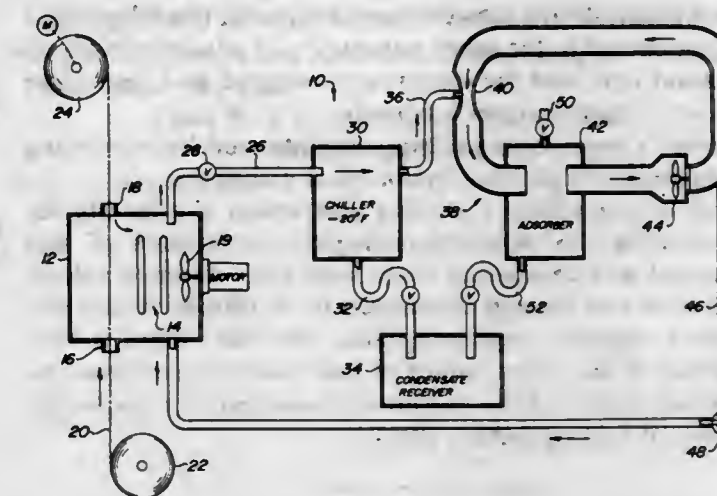
Int. Cl.<sup>2</sup> F26B 21/06

U.S. Cl. 34-75

12 Claims

1. A solvent recovery system comprising a housing defining a process chamber, said chamber having an inlet and an outlet and confining solvent vaporized from a work product as the product moves through the chamber, means for recovering vaporized solvent from said chamber in two stages, a chiller for removing a portion of said vaporized solvent and constituting the first stage, said chiller having an inlet communicating with said chamber, an air circulation system communication

with an outlet of said chiller, said air circulation system including an adsorber which is the second stage for recovery of vaporized solvent, and means for causing air and vaporized



solvent to flow from said housing to said chiller and then to said air circulation system with the rate of flow from said housing to said chiller being at least 5 cfm but substantially less than the flow rate of said air circulation system.

4,012,848

#### AUDIO-VISUAL TEACHING MACHINE FOR SPEEDY TRAINING AND AN INSTRUCTION CENTER ON THE BASIS THEREOF

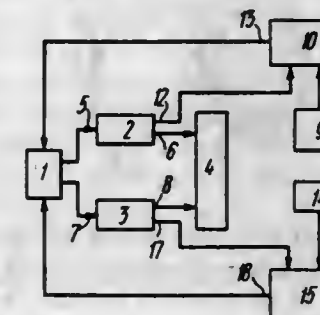
Elza Samullovna Diamant, Profsojuznaya ulitsa, 87, korpus 3, kv. 79; Sergei Viktorovich Kiselev, ulitsa Novatorov, 42, korpus 1, kv. 32; Vladimir Leonidovich Monin, ulitsa Metalurgov, 22/22, kv. 69; Vyacheslav Vyacheslavovich Petrusinsky, ulitsa Malaya Jushumskaya 8, korpus 2, kv. 51, and Vladimir Mikhailovich Pronin, ulitsa Chernyshevskogo, 21/25, kv. 3, all of Moscow, U.S.S.R.

Filed Feb. 19, 1976, Ser. No. 659,202

Int. Cl.<sup>2</sup> G09B 5/06

U.S. Cl. 35-8 A

38 Claims



1. An audio-visual teaching machine for speedy training, comprising:

- an operator's console intended for switching various units and tutoring programs in a required sequence;
- an educational information unit designed for playing back pre-recorded lesson information, instructions and service signals, with the input thereof connected to a respective output of said operator's console;
- a student's performance control unit which is a facility for playing back signals to control said student's psychophysiological condition and his performance, with the input thereof connected to a respective output of said operator's console; an audio-visual display unit for presenting aural and visual signals to the student, respective inputs of which connect one output of said educational information unit and one output of said student's performance control unit;
- an answer registering unit designed for registering the student's answers to educational information signals;
- a comparator unit which compares the number of the stu-



dent's answers to a certain amount of lesson material with the reference number of answers and generates a signal indicating a required number of reviews of said amount of educational material, wherein one input is connected to an output of said answer registering unit, the other input is connected to the other output of said educational information unit, and the output is connected to a respective input of said operator's console;

a student's response registering unit intended for registering said student's psychophysiological responses;

a student's condition checking unit which is a facility for evaluating the psychophysiological parameters of said student and comparing them with the reference values, wherein one input is connected to an output of said student's response registering unit, the other input is connected to the other output of said student's performance control unit, and the output is connected to a respective input of said operator's console.

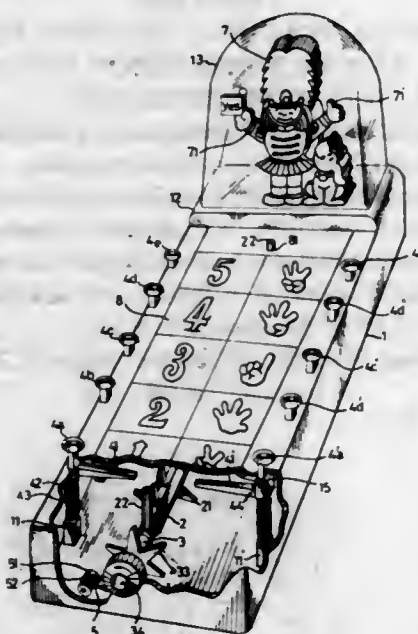
4,012,849

## EDUCATIONAL QUIZ AND ANSWER TOY

Hsing-Ching Liu, and Lan-dih Liu, both of 3F, No. 213, Chuong Ching N. Road, Taipei, China /Taiwan  
Filed Sept. 18, 1975, Ser. No. 614,519  
Int. Cl.<sup>2</sup> G09B 3/06

U.S. Cl. 35-9 R

9 Claims



1. An educational toy comprising an elongated base portion, a cylinder extending longitudinally of the base portion having a plurality of protrusions around its outer periphery extending outwardly in different radial directions, a shaft retained inside said cylinder having a front end and a rear end extending from said cylinder and means permitting it to slide with respect to said cylinder and to rotate together therewith, at least one upwardly extending setting guide member on said cylinder, a first series and a second series of a plurality of push rods longitudinally spaced along said base portion having transverse lever arms extending over the said protrusions on said cylinder, each rod being surrounded by a compressible spring at a section between its lever arm and the bottom of the base portion, a changeable quiz and answer combination card having at least one setting hole for engagement with said at least one guide member for setting the card in place on the said base portion and said cylinder in a position such that said protrusions are in a predetermined arrangement related to said lever arms and card, said card having a plurality of questions associated with said first series of push rods and corresponding answers associated with said second series of push rods but in different order, and indicating means operatively connected with said shaft, whereby only when said first and second series of push rods are sequentially and alternately pushed to match the questions with the correct answers will the lever arms act on said protrusions to rotate said cylinder

and shaft sufficiently to cause said indicator to give an indication that all answers are correct.

4,012,850

## RADIOGRAPHIC CAMERA SIMULATOR

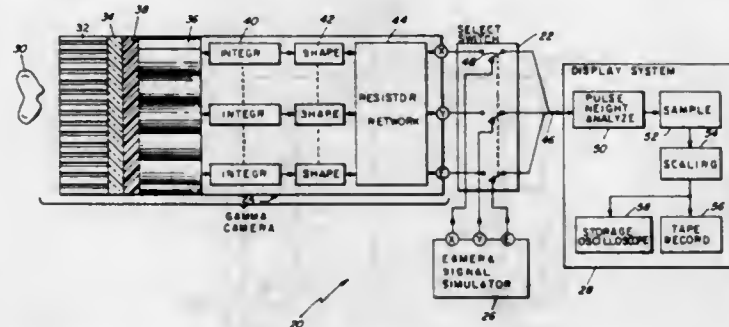
James A. Keith, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed July 14, 1975, Ser. No. 595,950

Int. Cl.<sup>2</sup> G09B 25/00

U.S. Cl. 35-10

8 Claims



6. A simulator of a radiographic camera comprising:  
means for generating a train of pulses having the frequency distribution of a train of radioactive events as provided by a train of pulses of said camera; means coupled to said pulse train generator for modulating the amplitude of a train of said pulses with a monotonically increasing waveform;  
a gate coupled to said modulating means;  
means coupled to said pulse train generator for generating random numbers in response to occurrences of pulses of said pulse train; and  
means coupled between said gate and said random number generating means for operating said gate to pass pulses of said modulated pulse train when a first number of said random number generating means and a second number of said random number generating means are in accordance with a prescribed relationship, said gate operating means including means for providing said prescribed relationship, said first number and said second number of said random number generating means being location coordinates of a radioactive event.

4,012,851

## UNIVERSAL PLANISPHERE COMPLETE GUIDANCE AND COMPUTER SYSTEM

William A. Eisenhauer, Van Wert, Ohio  
Division of Ser. No. 268,646, July 3, 1972, Pat. No. 3,858,334, which is a continuation-in-part of Ser. No. 500, Jan. 5, 1970, Pat. No. 3,678,710, which is a continuation of Ser. No.

600,920, Dec. 12, 1966, abandoned, which is a continuation-in-part of Ser. No. 369,958, May 25, 1964, Pat. No. 3,290,799, which is a continuation-in-part of Ser. No. 271,658, April 9, 1963, Pat. No. 3,251,143, which is a continuation-in-part of Ser. No. 851,648, Nov. 9, 1959, Pat. No. 3,088,228. This application Jan. 6, 1975, Ser. No. 538,579. The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> G09B 29/00

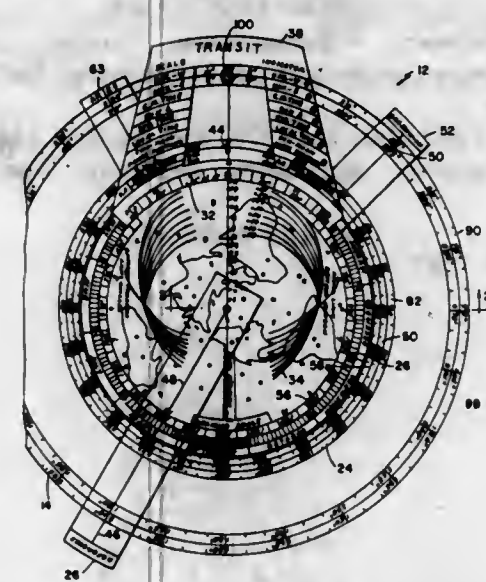
U.S. Cl. 35-44

4 Claims

1. A planisphere comprising a plurality of concentric dials of progressively smaller diameter, a sky map on the smallest diameter dial having an Aries indicator portion extending radially therefrom, a Greenwich indicator dial having a Greenwich indicator portion extending radially therefrom positioned concentric with and adjacent the smallest diameter dial, a reference rule extending radially outwardly of the planisphere over the Greenwich indicator dial and plurality of dials, a sky mask dial positioned over and concentric with the

Greenwich indicator dial having a transit scale indicator portion extending therefrom and means securing all the dials and

generated for the recorded quantity of "correct" and "incorrect" signals.



reference rule together centrally of the dials for rotation relative to each other.

4,012,852

## TEACHING APPARATUS

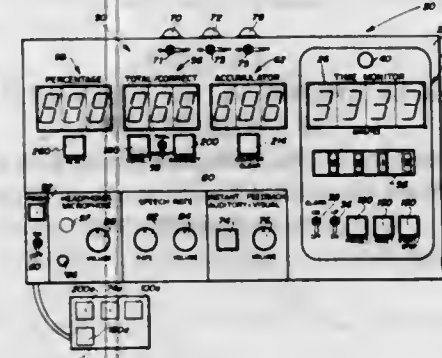
Vida M. Journot, 5913 Quality Hill, Smithfield, Tex. 76080; Charles R. Deyo, and Jack B. Hunnicutt, both of Fort Worth, Tex., assignors to said Journot, by said Deyo and Hunnicutt, Tex.

Filed Mar. 25, 1975, Ser. No. 561,916

Int. Cl.<sup>2</sup> G09B 5/06

U.S. Cl. 35-48 R

5 Claims



1. Apparatus for recording the performance of a student who is responding to a test environment including a first counter recording a quantity of "correct" signals, a second counter recording the quantity of "correct" and "incorrect" signals, the "correct" and "incorrect" signals being generated by an operator in response to a student's answer, and further including a quantity display for selectively displaying a quantity of "correct" signals from the first counter or the quantity of "correct" and "incorrect" signals from the second counter, the improvement comprising:

first circuit means responsive to the quantity of "correct" and "incorrect" signals of the second counter and generating a signal varying in frequency with the recorded quantity,  
second circuit means responsive to the quantity of "correct" signals in the first counter and generating a signal varying in frequency with the recorded quantity,  
third circuit means responsive to the signals varying in frequency of said first and second circuit means to generate a percentage signal varying with the percentage of "correct" signals generated for the recorded quantity of "correct" and "incorrect" signals, and  
percentage display means responsive to the percentage signal for indicating the percentage of "correct" signals

4,012,853

## FOREPART INSOLE RING SHOE CONSTRUCTION

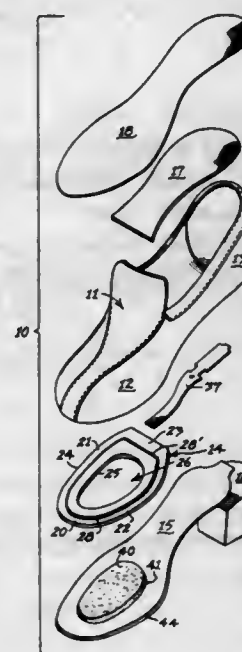
Newton C. Turner, Jr., Nashville, Tenn., assignor to Genesco, Inc., Nashville, Tenn.

Filed May 20, 1976, Ser. No. 688,227

Int. Cl.<sup>2</sup> A43B 13/18

U.S. Cl. 36-17 R

6 Claims



1. A shoe comprising:  
a. an upper having an forepart margin and a backpart margin,  
b. a full-length outsole member having a forepart portion and a backpart portion joined by a ball area, and an outer edge,  
c. a forepart insole ring member between said upper and the forepart portion of said outsole member,  
d. said ring member having front and side outer edges coterminous with the outer edge of the forepart portion of said outsole member, and an inner edge,  
e. said ring member further comprising a rear portion extending transversely between said upper and said outsole member, said rear portion having an outer rear edge terminating in the ball area of said outsole member,  
f. means securing said ring member to the forepart margin of said upper,  
g. means securing the forepart portion and ball area of said outsole member to said ring member and the backpart portion of said outsole member to the backpart margin of said upper, and  
h. a raised portion on the forepart portion of said outsole member fitting within the inner edge of said ring member.

4,012,854

## INFLATABLE SHOE

Steven P. Berend, 19 Pettit Drive, Dix Hills, N.Y. 11746, and Carmelo Giardina, 48 Hathaway Road, Wilmington, Mass. 01887

Filed Feb. 17, 1976, Ser. No. 658,483

Int. Cl.<sup>2</sup> A43B 13/20

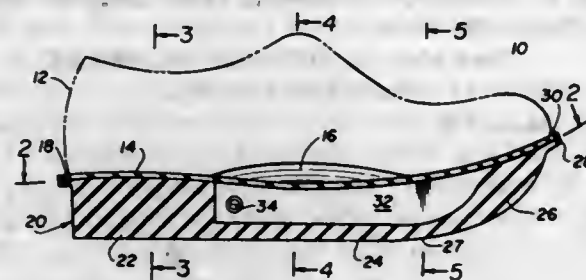
U.S. Cl. 36-29

20 Claims

1. A shoe comprising, in combination:  
an upper having a mid-sole integral therewith;  
a bottom sole secured to said mid-sole, said bottom sole being substantially flat over the bottom surface thereof that extends between the heel and the metatarsal region of said shoe, said bottom sole extending upwardly over



the bottom surface thereof that is forward of the metatarsal region of said shoe;  
and an air chamber located beneath said mid-sole, the extremities of said air chamber being positioned intermediate the heel portion and the metatarsal region of said shoe;



said mid-sole and said bottom sole each include marginal mating rims along which said mid-sole and said bottom sole are secured to each other;  
said mid-sole and said bottom sole are secured to each other along said marginal, mating rims by at least one row of stitches.

4,012,855

## ANTI-SKID FOOTWEAR

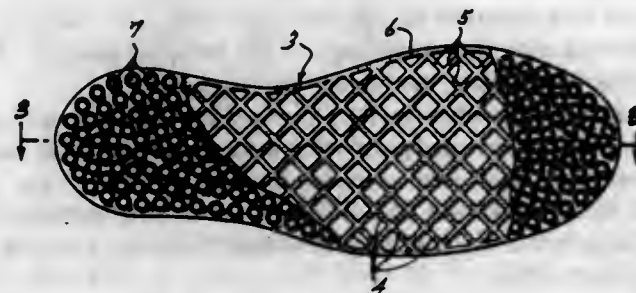
Denys Gardner, 1529 Acton Blvd., Acton Vale, Canada

Filed Oct. 28, 1975, Ser. No. 626,025

Int. Cl.<sup>2</sup> A43B 13/20, 23/28

U.S. Cl. 36-29

1 Claim



1. An anti-skid footwear comprising an outsole of resilient and flexible rubber sponge material and of substantially uniform thickness throughout so that it will yield under the weight of a wearer, said outsole defining a flat outer face and a flat inner face and having cavities opening at the inner face and extending in the outsole short of the outer face, the bottom of said cavities and said outer face defining a thin outer wall, and partitions of substantially uniform thickness separating said cavities from one another in laterally spaced-apart relationship across the outsole, said cavities and partitions evenly distributed across the entire extent of said outsole, the periphery of said outsole having a continuous side wall of a thickness substantially equal to the thickness of said partitions; an insole adhered to the inner face of the outsole and closing said cavities, and evenly distributed discrete protuberances integrally formed on the outer face of the outsole for tractive engagement of the outsole on a supporting surface, said outer wall yielding and flexing to conform to irregularities of said supporting surface under the weight of a wearer of said footwear.

4,012,856

## GRAB OR GRAB BUCKET AND METHOD OF OPERATING SAME

Wilhelm Schwarz, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Germany

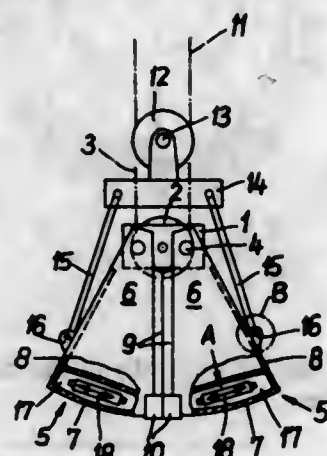
Filed Mar. 26, 1975, Ser. No. 562,234

Claims priority, application Germany, Apr. 1, 1974, 2415664

Int. Cl.<sup>2</sup> B66C 3/02

U.S. Cl. 37-187

8 Claims



1. A method of actuating a grab bucket with two grab bucket sections for pourable material by use of plural vibrators recessed in the bottom of the bucket, which includes the steps of: during the closing of said bucket sections subjecting at least one of said two bucket sections at the closing edges thereof to vibrator oscillations with the amplitudes thereof directed in the direction of the closing movement of at least said one bucket section.

4,012,857

## MEANS FOR INCORPORATING MULTIPLE FIRST DAYS OF ISSUE STAMPS

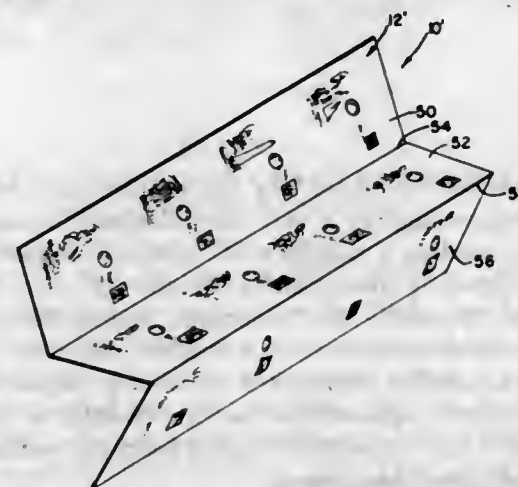
John Leskovec, Jr., 79 Morningglade Drive, Elmira, N.Y. 14905

Filed Dec. 17, 1975, Ser. No. 641,680

Int. Cl.<sup>2</sup> A41C 3/00

U.S. Cl. 40-2 B

8 Claims



1. A means for displaying first day covers comprising:  
a unitary backing sheet sectioned into a plurality of adjacent portions;  
a complete set of first day covers including a plurality of units with each unit being located in one of said portions and including a postal stamp permanently affixed to said backing sheet, a post office cancellation mark partly on said stamp and partly on said backing sheet, the words "first day of issue", and a postmark indicating where said stamp was issued, each of said units representing one unit of said complete set of first day covers;  
said backing sheet being continuous and uninterrupted throughout the length thereof so that said plurality of first day covers are all mounted on the same sheet.

4,012,858

## PRESENT CARD

Eric Robert James McGregor, "Gwern Hwylkyn", Bodfari, Clwyd, England

Filed July 25, 1975, Ser. No. 598,947

Int. Cl.<sup>2</sup> G09F 1/12

U.S. Cl. 40-152

1 Claim



1. A greeting card picture framing kit comprising: a first substantially rectangular element having a tongue pivotally attached to each edge thereof, the tongue being adapted to be folded so as to overlie the planar face of the element, a second substantially rectangular element having a tongue pivotally attached to an edge thereof and of a size equal to one of the tongues on the first rectangular element whereby the rectangular elements can be juxtaposed with the two tongues superposed, means for removably adhering said two juxtaposed tongues the second element adapted to be removed from the first element so as to leave four tongues unobstructed along the edges of the first element, molded corner pieces each having an external U shaped cross section, the corner pieces being adapted to serve as internal corner pieces for any two folded over contiguous tongues, thereby providing a self contained picture frame.

4,012,859

## MECHANISM FOR FIREARMS

Lennart Johan Ivar Johansson, Eskilstuna; Eric Vilhelm Wallberg, Vallingby, and Bjorn Weine Lindqvist, Eskilstuna, all of Sweden, assignors to Forenade Fabriksverken, Eskilstuna, Sweden

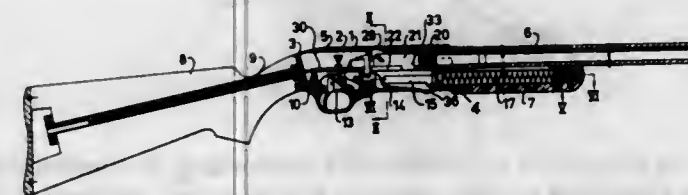
Filed Apr. 21, 1975, Ser. No. 569,801

Claims priority, application Sweden, Apr. 23, 1974, 7405471

Int. Cl.<sup>2</sup> F41C 11/00

U.S. Cl. 42-75 C

5 Claims



1. A firearm mechanism comprising, in combination, an upwardly closed and downwardly open breech-block housing substantially U-shaped in cross-section and having two end walls arranged for mounting a stock and a barrel respectively to said housing, a breech-block arranged to be guidably moved reciprocally in said housing by propelling and repelling means, a lower mounting for closing said breech-block housing and having upstanding side walls for supporting a trigger mechanism and cartridge feeding means and which, after insertion from below into a closing position, projects into said breech-block housing, said breech-block housing formed as a composite construction, comprising a preferably precision-cast inner housing part having two end portions constituting said housing end walls and a relatively thin, intermediate portion extending only in an upper portion of said housing

between said end portions and an outer casing part of thin sheet metal formed by pressing and extending throughout the full height of said housing, said inner housing part being covered by and fixedly connected in close contact by brazing or the like with said outer casing part so as to stiffen said outer casing part.

4,012,860

## ADJUSTABLE RIFLE REST

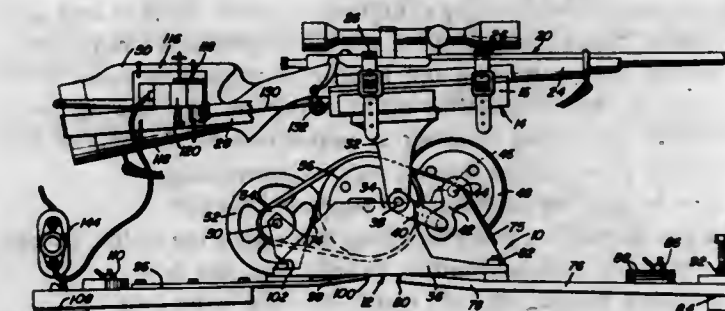
Arnold J. Auger, 636 Zener, Pocatello, Idaho 83201

Filed May 28, 1975, Ser. No. 581,689

Int. Cl.<sup>2</sup> F41C 29/00

U.S. Cl. 42-94

11 Claims



1. A long gun rest comprising an upper elongated generally horizontal support member including first means for removably stationarily supporting a long gun therefrom with said long gun extending longitudinally of said support member, a lower base, second means supporting said support member from said base for oscillation about a generally horizontal axis extending transversely of said support member and spaced below said first means, and third means operatively connected between said base and said support member for infinite angular adjustment of said support member relative to said base about said axis throughout at least a limited sector of adjustment, said third means including rotary actuating means therefor supported from said base and drivingly connected to said support member for angular displacement of the latter through a drive mechanism including a numerically high drive ratio.

4,012,861

## FISHING POLE HOLDER

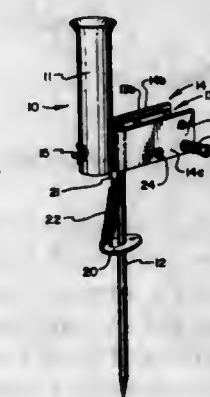
Walter L. Gellatly, 350-35th St., Ogden, Utah 84403

Filed Dec. 22, 1975, Ser. No. 642,690

Int. Cl.<sup>2</sup> A01K 97/10

U.S. Cl. 43-15

1 Claim



1. A fishing pole holder comprising  
an elongate spike;  
a generally U-shaped pivot support bracket fixed to an upper end of said spike with the legs of said bracket cantilevered therefrom;  
an elongate, tubular fishing pole handle receiving member having an open handle receiving end;  
a generally U-shaped detent bracket bolted to said fishing pole handle receiving member with the legs of said



bracket cantilevered therefrom and straddling the legs of the pivot support bracket;

means pivotally connecting the legs of the detent bracket to the legs of the pivot support bracket whereby the detent bracket will pivot with respect to the pivot support bracket;

spring means biasing the tubular handle receiving member such that the detent bracket pivots in one direction with respect to the pivot support bracket to a released position, said spring means comprising

a spring securement collar slidably surrounding and projecting from the spike, a coil spring, means for attaching one end of said coil spring to the end of said spring securement collar, and means for attaching the other end of the spring to the detent bracket;

detent means for locking said pivot support bracket and said detent bracket together in a cocked position wherein the spring means biasing the handle receiving member is in tension, but releasable upon a tug on the fishing pole handle receiving member in opposition to the bias of the spring means, said detent means comprising

a hole in a leg of the pivot support bracket;

a pin carried by and extending through a leg of the detent bracket and adapted to extend into the hole;

a spring biasing the pin out from said hole; and

cooperating limit means on the detent bracket and the pivot support bracket to limit the amount of pivoting of the detent support bracket relative to the pivot support bracket, said cooperating limit means comprising an arcuate slot in a leg of the support bracket and a detent member projecting from a leg of the detent bracket and into said slot whereby said detent member will move in the arcuate slot during pivoting of the detent support bracket relative to the pivot support bracket.

4,012,862

## ARTIFICIAL FISHING LURE AND SPINNER

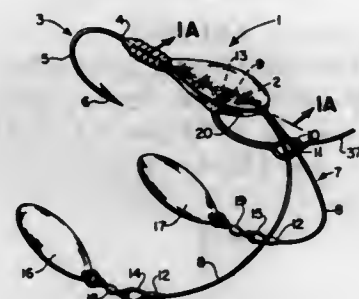
Eugene Dubois, 1057 Sunshine, Baker, La. 70714

Filed Apr. 14, 1975, Ser. No. 567,526

Int. Cl.<sup>2</sup> A01K 85/00

U.S. Cl. 43—42.06

8 Claims



1. An artificial fishing lure which comprises:
  - a. a body means;
  - b. a hook means having a shank section, bend section and barbed point section, said shank section attached to one end of said body means whereby said barbed point section is directed back toward said body means; and
  - c. a guard means constructed from a single metal wire and having a spinner wire section, a loop section and a connecting section attached to said body means wherein said spinner wire section passes through said loop section and curves back toward said barbed point section.

4,012,863

## DOWNRIGGER RELEASE

John Lori, 14145-138th Ave., Grand Haven, Mich. 49417

Filed Mar. 12, 1976, Ser. No. 666,189

Int. Cl.<sup>2</sup> A01K 95/00

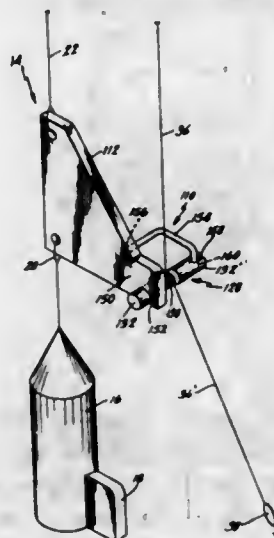
U.S. Cl. 43—43.12

18 Claims

1. Apparatus for releasably supporting a fishing line with

respect to a downrigger line assembly including a suspension line and a weight, said release apparatus comprising:

a support member adapted for mounting on said downrigger line assembly, said support member having an extending portion forming a socket, said socket opening downwardly toward the weighted end of said suspension line; a fitting having end portions at least one of which is adapted to be received in said socket; and



means on said fitting adapted to receive a fishing line, said means being positioned generally between the ends of said fitting, said one end of said fitting being normally held in said socket with maintenance of a force on the fishing line, said fitting releasing from said socket with relaxation of said force.

4,012,864

## TOY MOVIE STICK

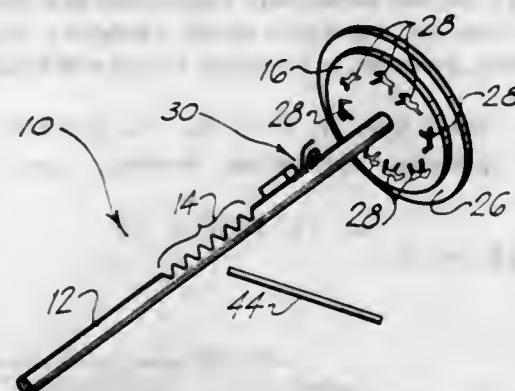
D. Barry Lister, 667 Douglas St., Kamloops, British Columbia, Canada

Filed Jan. 19, 1976, Ser. No. 650,378

Int. Cl.<sup>2</sup> A63H 33/22

U.S. Cl. 46—47

4 Claims



1. A hand-held toy movie stick comprising in combination:
  - an elongated rod-like element having a row of substantially identically configured longitudinally-aligned notches formed along at least one surface thereof;
  - a first disc element rotatably mounted at one end of said rod-like element and provided with a plurality of circumferentially spaced apertures defining in sequence a series of related animated representations;
  - a second planar screen element having a light-reflective surface mounted at said one end of said rod-like element coaxially with and longitudinally spaced outwardly from said first disc element;
  - means mounted on said rod-like element adapted to selectively project a beam of artificial illumination therealong and through the apertured section of said first disc element in alignment therewith and onto said second planar element for reflection therefrom;
  - and a rubbing member adapted to be stroked across and in

contact with said row of notches of the rod-like element to thereby impart selected rotational movement to said first disc element.

4,012,865

## TOY AIRPLANE OF FOLDABLE SHEET MATERIAL AND LAUNCHING MEANS FOR AND METHOD OF MAKING SAME

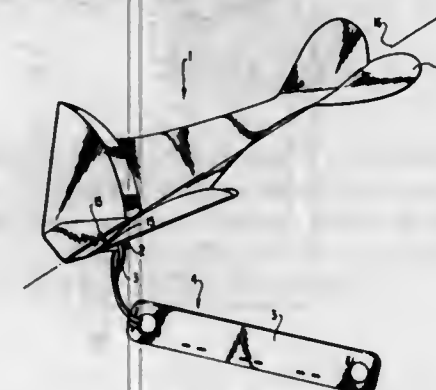
Irvin L. Fields, 708 Center Ave., Holly Hill, Fla. 32017

Division of Ser. No. 374,327, June 28, 1973, Pat. No. 3,885,343, which is a continuation-in-part of Ser. No. 277,237, Aug. 2, 1972, Pat. No. 3,768,198. This application Mar. 21, 1975, Ser. No. 560,688

Int. Cl.<sup>2</sup> A63H 27/14

U.S. Cl. 46—79

15 Claims



1. A toy airplane comprising: a plurality of sheets of normally flat sheet material folded into an airplane configuration having a body section and a wing section, both of said body section and said wing section being substantially symmetrically disposed with respect to a longitudinal airplane axis, said body section and wing section being constructed so as to fly through the air upon being released in the air above a predetermined starting velocity, wherein a first of said sheets includes a slot through which a portion of a second of said sheets protrudes in the assembled condition of the airplane.

4,012,866

## METHOD OF ROOT STOCK PROPAGATION

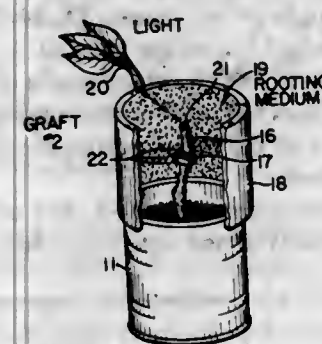
William Henley Brokaw, 9462 Telephone Road, Ventura, Calif. 93003

Filed Mar. 1, 1976, Ser. No. 662,519

Int. Cl.<sup>2</sup> A01G 1/06

U.S. Cl. 47—6

4 Claims



1. A method of root stock propagation of avocados which includes the steps of:
  - a. providing a metal collar having sufficient width along the axial direction of the collar to provide a relatively large smooth inside surface area;
  - b. positioning said collar loosely about a root stock grown from a bud grafted to an avocado seedling wherein the bud is from a clone and is selected from a species of avocado trees having desired characteristics including immunity to certain diseases and desired growth characteristics; and
  - c. Controlling the growth for a given time after which the

seedling, root stock and collar may be transplanted as a body, the root stock growing to a size inside the collar causing the collar to gradually constrict the flow of nutrients to said seedling and promote rooting of the root stock while gradually killing the seedling so that the seedling finally disintegrates and there is left a properly rooted avocado plant, having said desired characteristics.

4,012,867

## GROWTH OF PLANTS

David Lindsay Guy Lainchbury, Surbiton, and John Edward Preedy, Croydon, both of England, assignors to The British Petroleum Company Limited, London, England

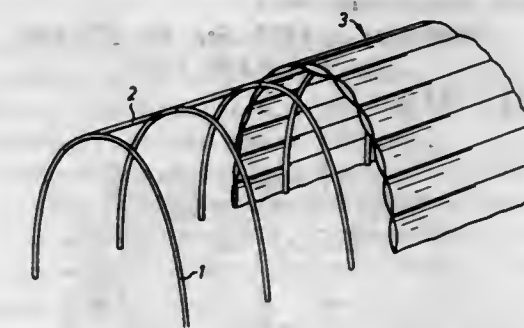
Filed Apr. 8, 1976, Ser. No. 675,168

Claims priority, application United Kingdom, Apr. 9, 1975, 14546/75

Int. Cl.<sup>2</sup> A01G 9/00

U.S. Cl. 47—17

19 Claims



1. A closed structure for enclosing plants which comprises an outer light transmitting wall relatively impermeable to carbon dioxide and an inner light transmitting wall relatively permeable to carbon dioxide and gas-admitting means for introducing between the inner and outer walls, carbon dioxide gas.

4,012,868

## PREHUNG DOOR ASSEMBLY

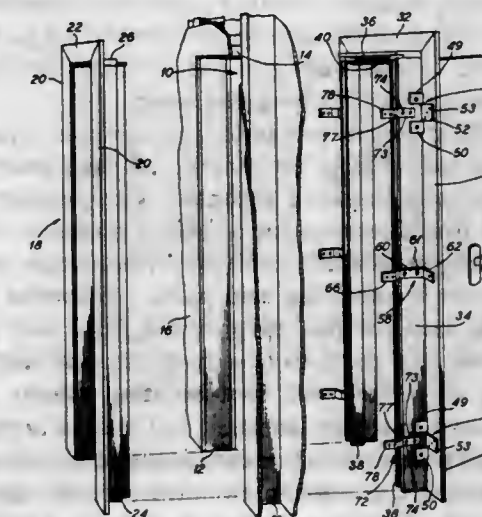
Julian Andraskiewicz, 540 Hawthorne, Elmhurst, Ill. 60126

Filed Feb. 13, 1975, Ser. No. 549,508

Int. Cl.<sup>2</sup> E06B 1/10

U.S. Cl. 49—380

11 Claims



1. A split jamb door assembly for mounting in a door opening and for engaging matching split jambs, including spaced matching side jamb parts, a top jamb connecting the spaced side jamb parts, a door connected by a plurality of spaced split hinge assemblies to one of the side jamb parts, each split hinge assembly having a uniplanar plate member fastened to the door, said uniplanar plate member joined to a hinge pivot, and each split hinge assembly having a split plate member joined



to said pivoted hinge, each split plate member having a stud plate part normal to the door fastened uniplanar plate member when said split hinge assembly is in closed position, said stud plate part having a plurality of mounting apertures for fastening the stud plate part to the front of a wall stud, and said split member further having an adjoining jamb plate part fastened to a side door jamb part and extending normally to said stud plate part.

4,012,869

## RECIPROCAL FINISHING APPARATUS

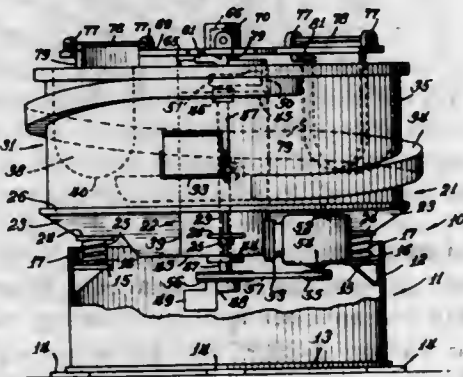
Gunter W. Belz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Filed May 2, 1975, Ser. No. 573,906

Int. Cl.<sup>2</sup> B24B 31/06

U.S. Cl. 51-163.2

13 Claims



1. A finishing machine suitable for finishing the surfaces of a plurality of parts with finishing material while maintaining said parts isolated from each other to prevent damage to said parts as a result of collision therebetween, and then separating finished parts, said finishing machine comprising:

1. a finishing chamber,
2. means for imparting movement to said finishing chamber to cause the parts contained therein to be finished by interaction with said finishing material,
3. part-isolating means defining at least one compartment in said finishing chamber arranged to contain a part or parts therein and to maintain said part or parts isolated from other parts in said finishing chamber,
4. reciprocating means comprising (a) means arranged for moving or permitting movement of said part-isolating means and said finishing chamber with respect to each other in a first direction for a limited distance while said part-isolating means are arranged in positions intermediate said parts for isolating said parts, (b) means arranged for moving said part-isolating means from said positions intermediate said parts to new positions not intermediate said parts to permit said part-isolating means and said parts to move past one another, (c) means arranged for moving said part-isolating means and said finishing chamber with respect to each other in a second direction in reverse relationship to said first direction, and (d) means arranged for returning said part-isolating means to positions which are intermediate said parts,
5. part-separating means operatively associated with said finishing chamber for separating finished parts from finishing material in a separating zone, and
6. said part-separating means, said finishing chamber, and said part-isolating means being arranged with respect to each other so as to permit individual separation of the part or parts isolated in a compartment defined by said part-isolating means when said compartment is in said separation zone.

4,012,870

## APPARATUS FOR MEASURING AND CHANGING VIBRATION FREQUENCY OF METAL B

Michel G. Berniere, 4 Allee des Hauts-Dimanches, 78430 Louveciennes, and Didier M. Beaudet, 86 rue Elias Howe, 94100 Saint-Maur des Fosses, both of France

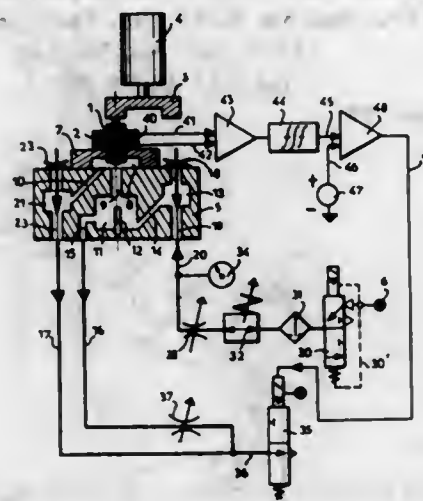
Filed June 25, 1975, Ser. No. 590,034

Claims priority, application France, July 3, 1974, 74.23143; Apr. 4, 1975, 75.10602

Int. Cl.<sup>2</sup> B24B 49/10

U.S. Cl. 51-165 R

14 Claims



1. An apparatus for measuring the natural vibration frequency of a ferromagnetic metal bar comprising a vertical insulating cylinder (2); pneumatic means to freely suspend the bar at the center of the cylinder (2) including a compressed air source (6) of constant adjustable output in pressure, a distribution block (5) connected to the lower part of the insulating cylinder (2), a connecting element (7) formed with an inner cavity (8), a central air inlet nozzle (9) connected to the compressed air source, the lower end of the insulating cylinder (2) and the upper end of the central air inlet nozzle (9) opening directly into the cavity, the cavity (8) being situated in the extension of the insulating cylinder (2) and connected to the compressed air source by said central nozzle, and at least one lateral exhaust nozzle (10, 50) in pneumatic communication with cavity (8) the pressure within the cavity defining the equilibrium position of the bar; vibration application means (53, 54, 55; 57, 58; 3, 4) acting on the bar (1) to cause the bar to vibrate; a solenoid (40) which establishes a constant magnetic field, the terminals (41, 42) of the solenoid having the vibration frequency of the bar superimposed thereon for the detection thereof; and a selective amplifier (43, 44) connected to the terminals (41, 42) of the solenoid (40).

4,012,871

## MODULAR HOUSING UNITS

Tito Livio Martins Netto, and Ludgero Raul Barbeta, both of Sao Paulo, Brazil, assignors to Acacia Engenharia Industria E Comercio, Sao Paulo, Brazil

Filed Dec. 1, 1972, Ser. No. 311,100

Claims priority, application Brazil, Dec. 1, 1971, 000071

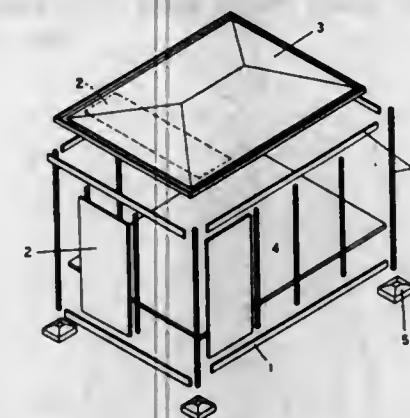
Int. Cl.<sup>2</sup> E04B 1/348

U.S. Cl. 52-79.4

6 Claims

1. In a housing construction to be inhabited by human beings, a plurality of modular housing units to be assembled together to provide a housing construction of a desired size and configuration having a desired number of rooms, each of said modular units having a peripheral floor means and a

peripheral roof means for connecting a pair of said modular units to each other with one of the modular units situated over the other of the modular units, each of said modular units including a floor means surrounded by a peripheral floor means and a roof means surrounded by said peripheral roof



means, and said peripheral roof means extending to an elevation at least as high as the highest elevation of said roof means surrounded thereby, said roof means which is surrounded by said peripheral roof means being at least in part pitched downwardly toward said peripheral roof means.

4,012,872

## GEODESIC DOME-LIKE PANELS

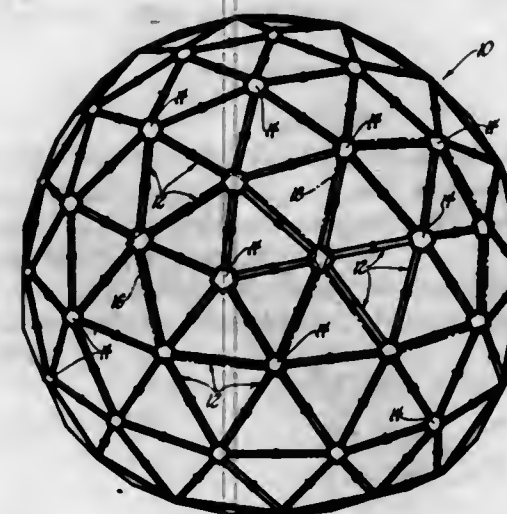
Roger Mitchell Stolpin, 1629 Ohio Ave., Flint, Mich. 48506

Filed May 11, 1976, Ser. No. 685,239

Int. Cl.<sup>2</sup> E04B 1/32

U.S. Cl. 52-81

13 Claims



1. A geodesic dome-like structure comprising: a plurality of triangular panels having sides of substantially equal length extending between vertices thereof so as to form generally equilateral triangular shapes; each of said triangular panels including a plurality of elongated rods extending along each side thereof in spaced relationship to each other; the rods associated with each side of each panel having opposite ends secured to the rod ends of the rods extending along the other sides of the associated panel; a plurality of generally planar hinge plates fixed to the rods in a longitudinally spaced relationship along each side of each panel with the planes of the plates oriented perpendicular to the elongated direction of the rods; pintles pivotally interconnecting the hinge plates of the triangular panels with the hinge plates of adjacent triangular panels; and said pintles being located intermediate the spaced rods of the panel sides pivotally connected thereby so that the panels pivot relative to each other about axes located outwardly from the panel sides.

4,012,873  
PROTECTIVE CAP FOR UNDERFLOOR ACCESS HOUSING

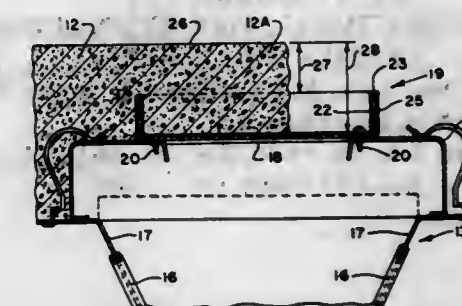
Robert G. Lindner, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed May 12, 1976, Ser. No. 685,682

Int. Cl.<sup>2</sup> E04F 17/08, 19/08; H02G 3/28

U.S. Cl. 52-99

3 Claims



1. A wire distributing floor structure comprising: a metal cellular subfloor presenting plural parallel cells, an overlying layer of concrete presenting an upper surface, a cell opening in at least one of said cells, void forming means enclosing said cell opening and presenting an outlet opening below said upper surface, a protective cap covering said outlet opening to protect the same from said concrete, said protective cap comprising a base secured to said void forming means, and an upstanding perimeter wall having an upper perimeter edge spaced below said upper surface of said concrete, and a release coating provided on those surfaces of said protective cap juxtaposed with said concrete to prevent bonding of said concrete to said protective cap, thereby to facilitate breakout and removal of the overlying layer of concrete to expose said protective cap for removal.

4,012,874

## PROTECTIVE COVER ASSEMBLY FOR UNDERFLOOR ACCESS HOUSING

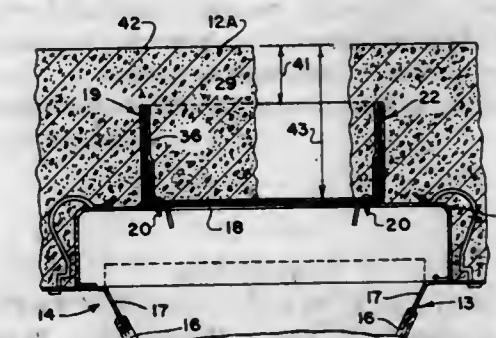
Darryl Keefer Brogan, Bethel Park; Paul Leon Haskins, Aliquippa, and Robert George Lindner, Sewickley, all of Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed May 12, 1976, Ser. No. 685,683

Int. Cl.<sup>2</sup> E04F 17/08, 19/08; H02G 3/28

U.S. Cl. 52-99

10 Claims



1. A wire distributing floor structure comprising: a metal cellular subfloor presenting plural parallel cells, an overlying layer of concrete presenting an upper surface, a cell opening in at least one of said cells, void forming means enclosing said cell opening and presenting an outlet opening below said upper surface, a protective cover assembly covering said outlet opening to protect the same from said concrete, said protective cover assembly comprising a cap having a base secured to said void forming means and an upstanding perimeter wall, and a fence-like vertical extension detachably connected to said cap and having an upper perimeter edge spaced below said upper surface of said concrete, and a release coating provided on those surfaces of said protec-



tive cover assembly juxtaposed with said concrete to prevent bonding of said concrete to said protective cap, thereby to facilitate breakout and removal of the overlying layer of concrete to expose said protective cover assembly for removal.

4,012,875

# OVERHEAD STRUCTURAL, FIRE EXTINGUISHING AND VENTILATING SYSTEM

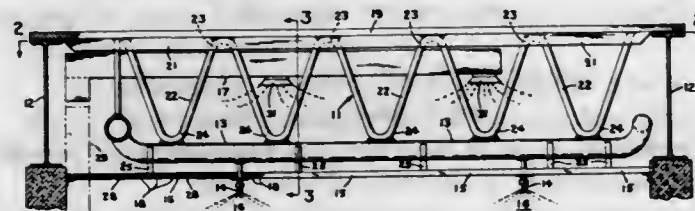
Morti Hirsch, New York, N.Y., assignor to Active Fire Sprinkler Corporation, Brooklyn, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,311

Int. Cl.<sup>2</sup> E04B 1/92, 5/48

U.S. Cl. 52-168

1 Claim



1. An overhead structural fire extinguisher and ventilating system for use in building construction and comprising in combination:

- a pair of spaced longitudinally extending girders,
- a plurality of longitudinally extending spaced parallel steel joists each spanning between the girders,
- each of the joists having an upper chord and a tubular lower chord with web members laced therebetween,
- a ceiling below and depending from the lower chord to form an upper enclosure for a room,
- means for circulating water through the tubular lower chord,
- fire sprinkler nozzles operatively connected to the lower chord and penetrating through the ceiling to the room,
- the fire sprinkler nozzles activated by heat,
- ventilating air ducts positioned between the joists and connected to a source of ventilating air,
- the ceiling provided with openings whereby the ventilating air passes from the ventilating air ducts in noncontact heat exchange relationship with the water in the lower chord and through the ceiling to the room,
- the web members comprising a tube with a generally serpentine configuration having upper bends welded to the upper chord and lower bends welded to the lower chord,
- the lower chords terminating in ports,
- pipes joining at least some of the ports in flow communication.

4,012,876

# HALF-LOG WALL CONSTRUCTION

George B. Grubbs, P.O. Box 1, Pinola, Miss. 39149

Filed Mar. 3, 1976, Ser. No. 663,349

Int. Cl.<sup>2</sup> E04B 1/10

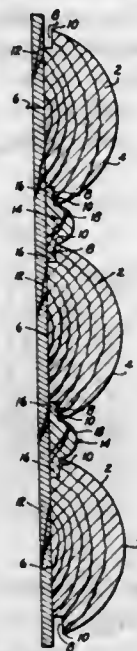
U.S. Cl. 52-233

2 Claims

1. In a building wall construction having generally semi cylindrical log members arranged in side-by-side relation with their curved surfaces outwardly and with flat inner surfaces secured to a supporting structure, the improvement comprising:

- said log members being rabbeted along the longitudinal edges of their flat inner surfaces; and
- filler strips extending longitudinally between adjacent log members, said filler strips having flange portions substantially filling said rabbets and having longitudinally extending central beads projecting outwardly in tight abutment with adjacent edges of adjacent log members said beads

being of generally semi cylindrical shape and opposite sides thereof at the juncture between said beads and



flange portions tightly abutting acute-angled edge portions of said log members with substantially line contact.

4,012,877

# PREFABRICATED INSULATING STRUCTURE FOR INSULATING A CORNER IN A FURNACE

Carlisle O. Byrd, Jr., Houston, Tex., assignor to J. T. Thorpe Company

Continuation-in-part of Ser. Nos. 475,439, June 3, 1974, Pat.

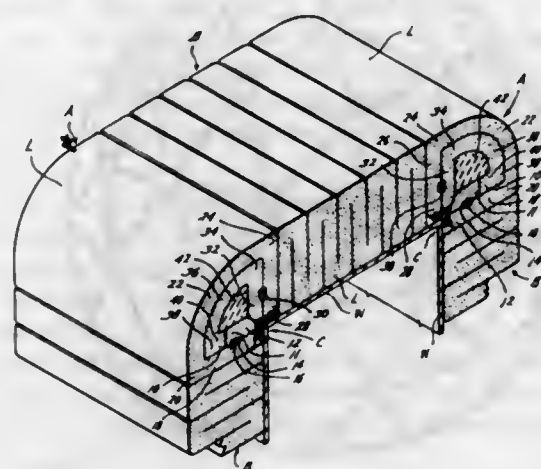
No. 3,952,470, and Ser. No. 603,391, Aug. 11, 1975. This

application Apr. 2, 1976, Ser. No. 672,993

Int. Cl.<sup>2</sup> E04B 1/80

U.S. Cl. 52-275

12 Claims



1. An insulating structure for insulating a corner between two walls in a furnace, comprising:

- a. a folded insulating blanket of fiber insulating material, said folded blanket including:
  - 1. a curved inner surface portion exposed to the interior of the furnace;
  - 2. a first side surface portion extending from said curved inner surface portion to a fold formed in said blanket for placement adjacent a first one of the two furnace walls at the corner;
  - 3. a second side surface portion extending from an opposite end of said curved inner surface portion from said first side surface portion to a fold formed in said blanket for placement adjacent the second of two furnace walls at the corner; and
- b. means for attaching said insulating blanket to the furnace walls at the corner.

4,012,878

# UNITARY WALL MEMBER GUARD

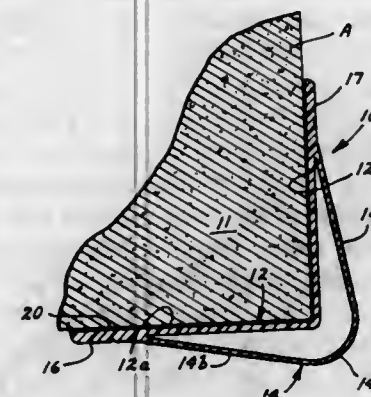
Robert T. Ellingson, Burnsville, Minn., assignor to Astro Plastics, Inc., Rosemount, Minn.

Filed Apr. 14, 1976, Ser. No. 677,042

Int. Cl.<sup>2</sup> E04B 5/00; E04F 13/06; E04B 7/00; E04F 19/02

U.S. Cl. 52-288

4 Claims



1. A unitarily formed wall member guard structure, comprising a separated body portion formed of resilient deformable material, said body portion having an underlying and an overlying layer, said layers having common side edge portions at either side of said body portion, said overlying layer diverging from the underlying layer at an acute angle from each of said common side edge portions defining a space therebetween of increasing separation, said underlying layer having a smooth unbroken underlying surface conforming to an underlying wall surface, and said overlying layer deformably yielding under impact to insulate said underlying layer and underlying wall surface from the effect of said impact.

4,012,879

# SUPPORTING DEVICE FOR HEAT-INSULATING PANELS

Michel Aubert, Manosque, and Guy Lemerrier, Le Puy Ste. Reparde, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

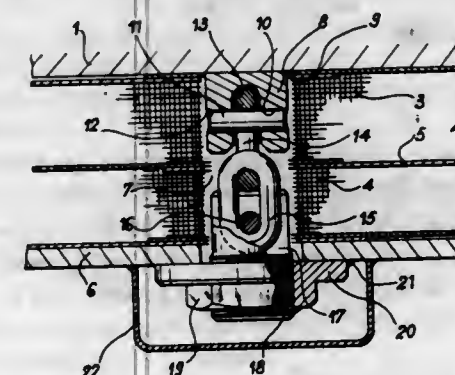
Filed June 10, 1976, Ser. No. 694,583

Claims priority, application France, June 16, 1975, 75.18768

Int. Cl.<sup>2</sup> E04B 1/38, 2/28

U.S. Cl. 52-508

6 Claims



1. A supporting device for heat-insulating panels to be placed opposite to a wall to be protected, especially the vault roof of a fast reactor, wherein said device comprises a first yoke rigidly fixed to the wall to be protected and adapted to carry a first cross-pin around which is mounted a first link of a supporting element, said link being capable of moving with respect to said first cross-pin, and a second yoke joined to a bearing wall, the heat-insulating panels being applied against

said bearing wall and so arranged as to extend parallel to the wall to be protected, said second yoke being supported by means of a second cross-pin by the last link of the supporting element, said last link being free with respect to said second cross-pin.

4,012,880

# PARTITION SYSTEM

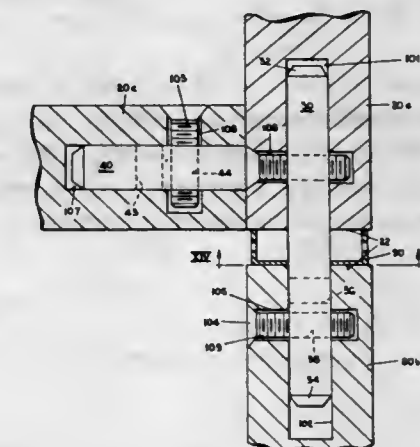
Charles F. Logie, Spring Lake, Mich., assignor to American Store Equipment Corporation, Muskegon, Mich.

Filed Apr. 28, 1976, Ser. No. 681,262

Int. Cl.<sup>2</sup> E04B 1/48

U.S. Cl. 52-585

24 Claims



1. A partition system for joining a panel element to another panel element, wall, or the like comprising a first panel element having a receiving aperture extending into one surface thereof; at least one of a second panel element or wall; connecting pin means for connecting said panel to the said one of said second panel element or wall; securing means for securing said pin means to at least one of said second panel element or wall; said pin means extending into said receiving aperture in said first panel element, having a longitudinal axis, and including a pair of pin apertures spaced apart along said pin axis, said pin apertures being located in that portion of said connecting pin means which extends into said receiving aperture in said first panel element; a securing aperture extending through another surface of said first panel element and communicating with said receiving aperture in said first panel element; a fastener extending through said securing aperture and secured to said pin means in one of said two pin apertures in said pin means; said other pin aperture in said pin means adapted to receive said fastener therein through said securing aperture when a third element is secured between said one surface of said first panel element and the said one of said second panel or wall.

4,012,881

# ARCHITECTURAL MODULAR ELEMENTS FOR FORMING AND/OR COMPLETING MONUMENTS OR LIKE WORKS OF ART

Elio Martiradonna, via Stoppani 25, 20129 Milan, Italy

Filed Dec. 6, 1974, Ser. No. 530,408

Claims priority, application Italy, Dec. 14, 1973, 36146/73[U]

Int. Cl.<sup>2</sup> E04C 1/12; E04B 1/02

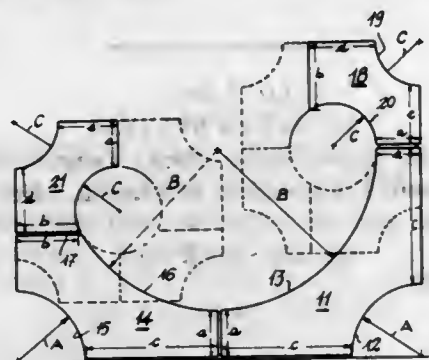
U.S. Cl. 52-604

6 Claims

1. A combination comprised of: a plurality of modular structural elements each comprising a block having a substantial extent in three dimensions and defined by a plurality of mutually perpendicular planar surfaces intersecting at right angles to defining modular lengths edges of said block, and at least one concave cylindrical surface segment having a longitudinal axis of modular length and positioned with the longitudinal axis parallel to respective ones of the modular length block edges and intersecting a perpendicular pair of said planar surfaces to define a concave cylindrical edge portion of



said block; adjacent ones of said modular structural elements being positioned with adjacent respective planar surfaces thereof coextensive and with the respective modular length edges bounding the adjacent coextensive planar surfaces posi-



tioned so that the respective concave cylindrical edge portions of the adjacent blocks are adjacent and smoothly merge with one another jointly defining a smoothly curved concave surface having a non-constant radius of curvature.

4,012,882

## STRUCTURAL BUILDING PANELS

Ivan Bertram Juriss; Roger Douglas Hay; Andrew Culross Goodfellow; Thomas Townson, and Keith Eric Hay, all of Auckland, New Zealand, assignors to Industrialised Building Systems Limited, Auckland, New Zealand

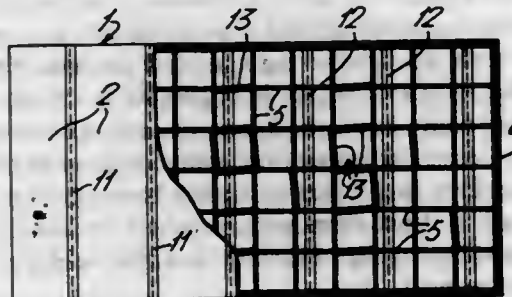
Filed Apr. 19, 1973, Ser. No. 352,749

Claims priority, application New Zealand, Apr. 19, 1972, 166928; Nov. 22, 1972, 169085

Int. Cl.<sup>2</sup> E04C 2/36; E04B 2/10

U.S. Cl. 52-615

8 Claims



1. A structural building panel serving for the whole floor or roof of at least one room, comprising a pair of continuous skins and a core, said skins including a plurality of sheets of suitable material bonded edge to edge, said core including a plurality of strips of suitable material positioned such that the edges of each strip are fixed one to each skin, said strips being arranged in two sets, with each strip in each set being substantially parallel with each other and each set being arranged to lie at a suitable angle to the other set, the strips of each set having a notch extending to one-half the depth of the strip at the points of intersection with the strips of the other set, the weakness of the panel due to said notches being overcome by spacing the strips in each set relative to the depth of each strip at a minimum ratio of 2:1, the weakness of the panel due to the tendency of the strips to buckle being overcome by spacing the strips in each set relative to the thickness of each strip at a maximum ratio of 60:1, and the weakness of the panel due to the tendency of the skin to buckle being overcome by spacing the strips in each set relative to the thickness of the skin at a maximum ratio of 60:1.

4,012,883  
DEVICE FOR SECURING A BEAM TO SHEET PILING  
Ludwig Müller, 44-46 Heinrich-Heine Strasse, 3550 Marburg, Lahn, Germany

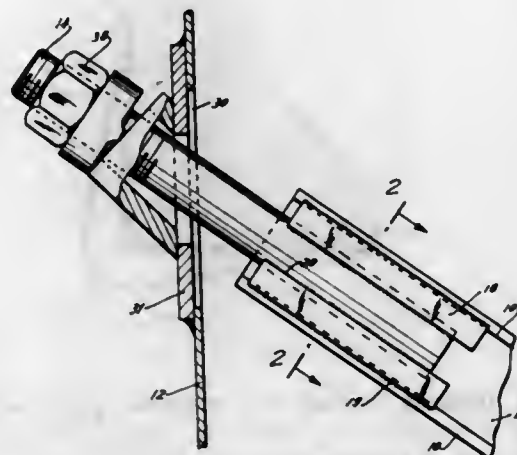
Filed July 8, 1975, Ser. No. 594,027

Claims priority, application Germany, July 10, 1974, 7423433

Int. Cl.<sup>2</sup> E04B 1/343; E02D 5/00

U.S. Cl. 52-729

5 Claims



1. A fastening device on a double-T beam to be driven into the ground and then to be secured at its head end to a sheet piling, said device comprising:  
a double-T beam having a web and two cross arms;  
an anchor bolt having at one end a lengthwise elongate slot fitting the thickness of the web of the beam, said bolt being inserted at its slotted end upon said web, the length of the anchor bolt being such that it protrudes from the respective end of the beam;  
welding joints securing the anchor bolt in said inserted position to the web;  
bracing bars inwardly extending from wall portions of each of the cross bars of said beam, one end of each of said bracing bars being welded to the respective cross bars and the other end to said anchor bolt; and  
fastening means for securing said anchor bolt to a sheet piling.

4,012,884

## PRESTRESSED CONNECTION AND FASTENER THEREFOR

Paul V. Pagel, Fullerton, Calif., assignor to Kaynar Mfg. Co., Inc., Fullerton, Calif.

Continuation of Ser. No. 182,535, Sept. 21, 1971, abandoned.

This application Sept. 24, 1975, Ser. No. 616,131

Int. Cl.<sup>2</sup> F16B 5/02

U.S. Cl. 403-408

11 Claims



1. A bolted connection comprising a plurality of members formed of a metal having a first degree of hardness and each having a bolt receiving bore formed at a basic nominal diameter, the members being disposed to align the bores thereof;  
a bolt received in said aligned bores and formed of a metal having a degree of hardness greater than said first degree and being in the configuration of an elongated element having a head integrally formed with a shank extending therefrom and terminating in a fastening portion opposite

the head, said shank being in the general form of a right circular cylinder of a diameter substantially equal to said basic nominal diameter, the shank having uniformly circumferentially spaced arcuate corrugations axially extending between the head and fastening portion, the corrugations forming a continuously arcuate surface and having respective alternately circumferentially spaced crests and roots all radially spaced from the basic nominal diameter at substantially the same distance and providing an interference fit between said shank and the metal surrounding the bores in said members, the number of said crests divided by the nominal circumference of said bolt resulting in a number in the range of 14 to 32, the radius of said bolt divided by the radius of said arcuate corrugation resulting in a number within the range of 2 to 5, said bolt being a force fit in said aligned bores and so proportioned to the bores that a driven insertion of said shank into the bores will effect radial compression of said surrounding metal to a degree sufficient to cause controlled plastic flow of said metal radially and circumferentially of the bolt and to bring the metal into close contact with the shank for minimizing stress corrosion of the bolted connection; and  
a cooperating fastening member secured to said fastening portion of the bolt to tension the bolt and clamp the members together.

4,012,885

## REVERSE TAPER FASTENER SYSTEM

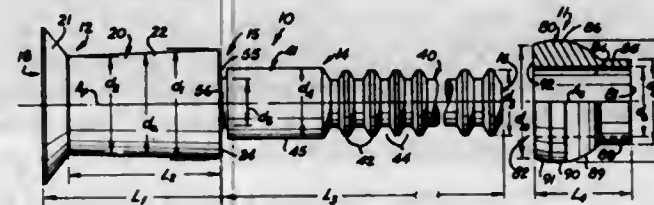
John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342

Filed Mar. 3, 1975, Ser. No. 554,762

Int. Cl.<sup>2</sup> F16B 5/00

U.S. Cl. 403-408

28 Claims



1. A fastener for connecting work pieces with aligned holes therethrough comprising:  
an elongate bearing section adapted to extend through the holes, said bearing section having a leading end, a trailing end and a central axis, and said bearing section defining an exterior bearing surface thereon concentric about said central axis and tapering inwardly along said bearing section from a prescribed leading major bearing diameter adjacent the leading end of said bearing section larger than the diameter of the holes in the work pieces to a prescribed trailing minor bearing diameter trailing said leading major diameter and smaller than said first prescribed diameter;  
an enlarged head integral with the trailing end of said bearing section;  
an engagement section integral with the leading end of said bearing section having a major outside engagement diameter smaller than said leading major bearing diameter, said bearing section further defining an annular leading face on the leading end of said bearing section about said engagement section and oriented generally normal to the central axis of said fastener;  
a pintail coaxially arranged about said central axis and operatively connected to the leading end of said bearing section, said pintail adapted to be engaged to install said bearing section in the holes; and  
an expansion collet removably and operatively associated with and leading said bearing section, said expansion collet defining an expansion surface thereon concentric about said central axis, said expansion surface having a leading minor expansion diameter at least as small as the

diameter of the holes and a trailing major expansion diameter at least as large as said leading major bearing diameter of said bearing section, said expansion collet defining an annular driven face on the trailing end thereof oriented generally normal to said central axis and engaged by said leading face of said bearing section to force said expansion collet through the holes.

4,012,886

## BAG PUSH-OFF IN-FEED METHOD

Thomas Charles Harris, Monroe, and Doyle Rayford Hudson, West Monroe, both of La., assignors to Olinkraft, Inc., West Monroe, La.

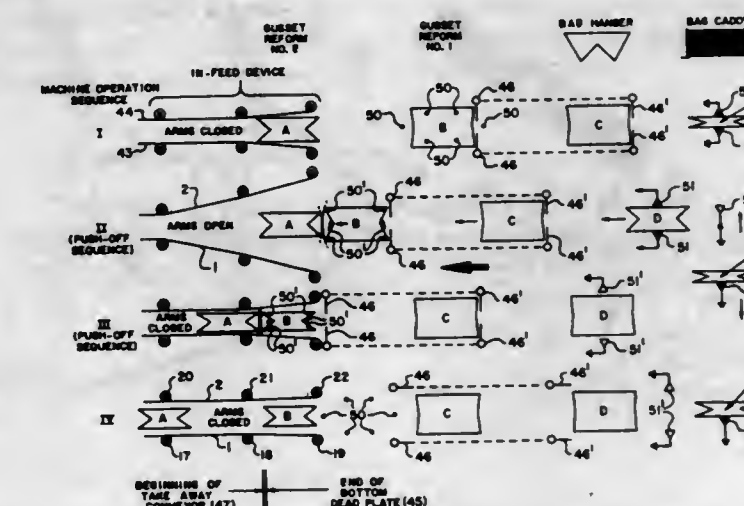
Continuation-in-part of Ser. No. 408,310, Oct. 23, 1973, Pat. No. 3,875,726. This application Dec. 17, 1974, Ser. No. 533,492

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> B65B 7/06, 43/00

U.S. Cl. 53-38

10 Claims



1. The method of feeding non-rigid wall bags loaded with loose granular solid materials and having gusseted tops, which have been initially but not finally closed, on a one-by-one in-line basis into a machine wherein the bag tops are comprised of facing sheets of flat, flexible, non-rigid material which need to be properly aligned for further processing, such as for example the top of a bag being finally closed, comprising the following steps:

- providing a bag handling machine including an in-feed device for the bags having an entry portion comprising two opposed members mounted on opposite sides of the center-line of the machine forming the throat of the in-feed device and located at the level of the bag tops, and a pusher conveying system associated with said in-feed device;
- individually conveying each bag loaded with said granular solid material through an initial portion of the machine by means of a first pushing element of said pusher conveying system, while maintaining the bag free of contact with an adjacent loaded bag; but then conveying each bag loaded with said granular solid material to the entry portion of the in-feed device by pushing said non-rigid wall bag at its rear by means of a second pushing element of said pusher conveying system while the bag is in face-to-face pushing engagement along its front side with the rear side of a preceding bag, the bag being pushed by the pushing element at its rear side, thereby being constrained at its front side by the preceding bag by means of said pushing engagement; whereby any tendency of said load of granular solid material to shift within the bag and open the initially closed gusseted top is reduced;
- subsequently pushing off said non-rigid wall bag located at the entry portion of the in-feed device into the throat of said in-feed device, with said opposed members contacting the bag top under compression, by means of a follow-



ing bag contacting the rear side of the bag in face to face engagement and moving said following bag forward, and hence the preceding bag, by said second pusher element; d. individually conveying the pushed-off bag with its rear side out of contact with the following bag with the top under compression through the in-feed device to the next processing station of the machine; and e. cyclically repeating steps "b"-"d" for the following bags in-line with the preceding ones.

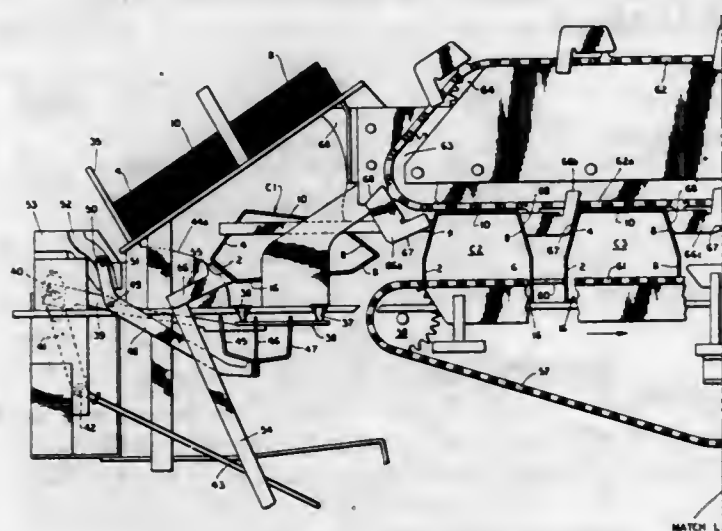
#### 4,012,887 PACKAGING MACHINE

Rodney K. Calvert, Dunwoody, and Dale K. Scott, Jonesboro, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jan. 19, 1976, Ser. No. 650,175  
Int. Cl.<sup>2</sup> B65B 5/10, 43/24

U.S. Cl. 53-48

9 Claims



1. A packaging machine for setting up, loading, and closing the end flaps of collapsed sleeve type bottle containers having top walls which are more narrow than their bottom walls and having inwardly tapered sloping upper side wall panels, said machine comprising a hopper in which collapsed containers are disposed, means for withdrawing said containers in sequence from said hopper, means for initiating setting up of the containers, container advancing means including endless elements and spaced flight bars thereon for engaging the lower part of the trailing side wall of each of the containers in sequence and for moving the containers while disposed transversely along a preselected path in a rearwardly tilted condition and alongside loading and end flap closing stations, means for loading articles through at least one end of the containers, means for closing the container end flaps, and wherein the improvement comprises an upper endless element having a working reach movable above and along said preselected path, and a plurality of shaper blocks fixedly mounted in spaced relation on said upper endless element and respectively interposed between adjacent containers, each of said shaper blocks having a leading part which extends toward said upper endless element a greater distance than the trailing part thereof and each shaper block being engageable with at least a part of the sloping upper side wall panel of a preceding container in coordination with movement onto the working reach of said upper endless element to advance the rearwardly tilted upper part thereof relative to the lower part thereof and each shaper block also being engageable with at least a part of a succeeding container and being configured so as to cause the container side walls to define in cross section parts of a trapezoidal configuration.

2. A machine for loading a group of articles through an open end of a sleeve type container having open end flaps foldably joined to adjacent end edges of the container top, bottom and side walls, said machine comprising means for advancing the container along a predetermined path with the

container disposed astride and in transverse relation to said path, means for advancing a group of articles alongside said path of movement and adjacent an open end of the container, and wherein the improvement comprises an oscillatable loading arm disposed alongside said path and having an article engaging part mounting means for said loading arm arranged to move said article engaging part in a direction transverse to the path of movement of the container and of the group of articles and simultaneously movable in the direction of movement of the container and articles and engageable with the group of articles to cause the articles to move into the open ended container while the container and articles are moved continuously, said mounting means including fixed pivot means and a pivot link pivotally mounted at one end on said fixed pivot and pivotally interconnected at the other end with said loading arm at a part thereof remote from said article engaging part.

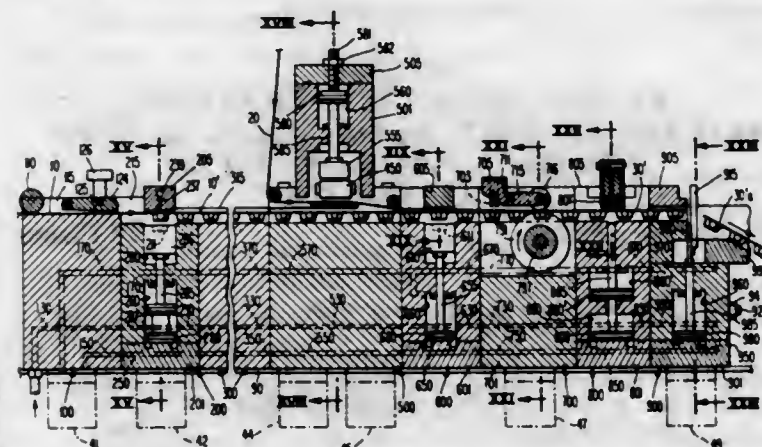
#### 4,012,888 PACKAGING APPARATUS FOR FORMING, FILLING AND SEALING RECEPTACLES

Matthew Nichols, Norristown, Pa., assignor to Packaging Coordinators, Inc., Philadelphia, Pa.

Filed July 31, 1975, Ser. No. 600,837  
Int. Cl.<sup>2</sup> B65B 5/02, 11/52, 61/26

U.S. Cl. 53-131

14 Claims



1. In a blister-packaging machine wherein packaging material is treated at a succession of fluid-actuated stations arranged in-line and along which the packaging material is transported, including treatment means at the respective stations, including means for transporting the packaging material from station to station intermittently and wherein the respective treatment means are programmed to treat the packaging material at dwell times in such intermittent transporting, and including conduit means for supplying actuating fluid to one of the stations, the improvement comprising a base for supporting the treatment stations in mutual alignment, the respective stations upstanding from the base and having material-supporting surfaces at a given height, abutting one another in sequence in the transport direction, and having registering bores therein for flow of actuating fluid directly from station to abutting station, beginning with the station to which the fluid is supplied by the conduit means, valve means for controlling the supply of actuating fluid to the respective treatment means, and programming means for timing such control valve actuation, to form a striplike succession of blister packages.

#### 4,012,889 PACKAGING MACHINE

Yun-Hoon Chung, Rossford, Ohio, assignor to International Automated Machines, Inc., Perrysburg, Ohio

Filed Dec. 8, 1975, Ser. No. 638,902

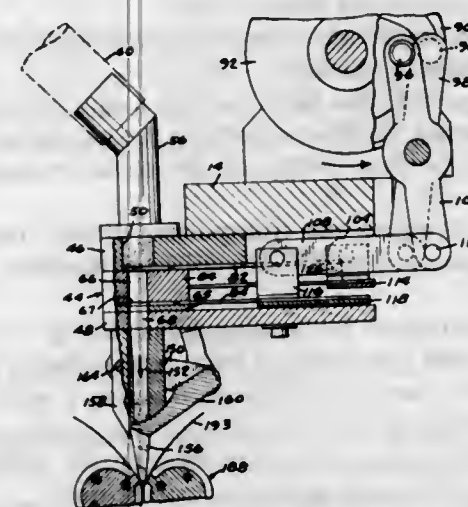
Int. Cl.<sup>2</sup> B65B 1/02, 9/02

U.S. Cl. 53-183

8 Claims

8. In a packaging machine of the type wherein product to be packaged is discharged into a metering cavity and then dispensed into an envelope formed to enclose the dispensed

product, the combination comprising a plate member on the machine having a plurality of vertically extending cavities therein arranged in a horizontally extending row, said cavities having an inlet adjacent their upper ends and an outlet adjacent their lower ends, a blade at the outlet of each cavity reciprocable in a horizontal plane to open and close said outlet, a blade at the inlet of each cavity reciprocable in a horizontal plane to open and close said inlet, means for alternately reciprocating said blades such that the inlets of the cavities are first opened to fill the cavity with product to a level above the inlets, the inlets are then closed to trap a metered charge of said product in each cavity, the outlets are



then opened to discharge by gravity the metered charge of the product and the outlets are then closed, and including an additional cavity in said plate member extending downwardly therethrough, a vertically extending feed auger having its lower end positioned at the upper end of said additional cavity, means for feeding product to the auger so that when the auger is rotated the product is discharged into said cavity and means for rotating the auger through a predetermined angular extent in timed relation with the opening of the outlets of said first-mentioned cavities whereby to discharge a metered amount of product into said additional cavity upon each actuation of the auger.

#### 4,012,890 MACHINE FOR ENVELOPING ARTICLES WITH PLASTICS FILM

Everhard Bauer, Hudeweg 2, 4700 Paderborn, Germany

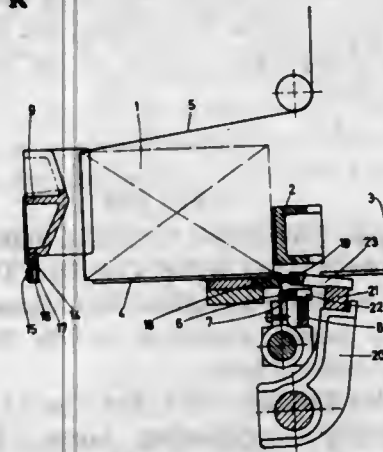
Filed Oct. 20, 1975, Ser. No. 624,013

Claims priority, application Germany, Oct. 23, 1974, 2450373

Int. Cl.<sup>2</sup> B65B 11/16

U.S. Cl. 53-198 R

6 Claims



1. A machine for enveloping successive articles with plastics film unwound from a supply roll thereof, comprising means defining a horizontal displacement path for each article, means for holding fast the leading end of said film at a holding station beneath said displacement path whereby an upright portion of said film extends through said displacement path, a pusher member for moving said article up to and beyond said

upright film portion while said leading end is being held, whereby a loop of said film becomes partially slung about said article while additional film is pulled from said supply roll, a beam movable downwardly towards said holding means at said holding station to complete said loop in a lowered position by engaging the film with its end and bringing an intermediate film portion into juxtaposition with said leading film end while pulling a still further length of said film from said supply roll, a stationary welding bar disposed beneath said displacement path and above said holding means at said holding station, a backing bar carried by said movable beam at one side for cooperating with said welding bar to join the ends of said loop, a percussion knife for severing said loop from said intermediate film portion at a severing station, said holding means being formed by said percussion knife and by a pivotable clamping lever operable to engage one side of said knife with said leading film end clamped therebetween, means for disengaging said clamping lever from said knife, means for moving said knife from said holding station to a position opposite said severing station, means for impelling said knife and said disengaged clamping lever to said severing station whereby said loop is severed, means for re-engaging said clamping lever with said knife side at said severing station to hold a new leading end of film, and means for returning said knife and reengaged clamping lever to said holding station.

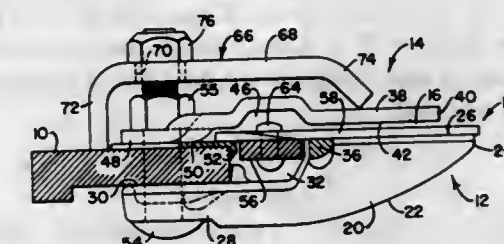
#### 4,012,891 MOWING APPARATUS ADJUSTMENT MEANS

Wilfred Lee Roy Steuerwald, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 25, 1976, Ser. No. 661,352  
Int. Cl.<sup>2</sup> A01D 55/06

U.S. Cl. 56-305

11 Claims



1. In a cutting apparatus of the reciprocating sickle type adapted for cutting standing vegetation and having an elongated frame member generally transverse to the direction of cutting apparatus travel, a plurality of sickle guards having finger portions extending forward from the frame member and cutting edges, fastening means rigidly securing the guards to the frame member, and an elongated reciprocating sickle bar assembly including a plurality of knife sections with angled forwardly converging cutting edges and upper and lower surfaces, each cutting edge intersecting with a cutting edge on the adjacent section at a rearward vertex and registering with the cutting edges of the guards as the sickle bar assembly reciprocates, the combination therewith of an improved holddown means for maintaining the knife sections of the sickle bar assembly in cutting relationship with the guards, and comprising:

a plurality of somewhat resilient holddown plates having rear and forward portions, the rear portions being rigidly secured to said frame member by said fastening means and the forward portions extending over the sickle bar assembly and guards, each forward portion being substantially parallel to and closely adjacent to the upper surfaces of said knife sections and vertically above a finger portion of a guard so as to confine the sickle bar assembly in a cutting relationship with the guards; and adjustable bias means, supported by the frame member and structurally separate from but operatively engaging the



holddown plates for selectively biasing the forward portions of the holddown plates downward relative to the rear portions so as to change the distance between said forward portions and the cutting edges of the guards.

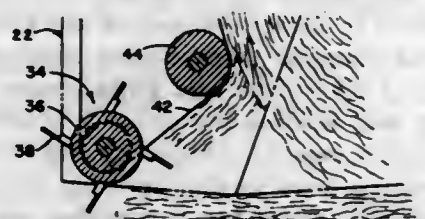
4,012,892

## GROUND-ROLLED CYLINDRICAL BALER

Gust Soteropoulos, and Gerald Franklyn Meiers, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.  
Filed Aug. 20, 1975, Ser. No. 605,987  
Int. Cl.<sup>2</sup> A01D 39/00

U.S. Cl. 56-341

13 Claims



1. A machine for removing crop material from the ground and rolling it into cylindrical bales comprising: a mobile frame having opposite sides; a pickup means mounted on the frame between the opposite sides and including an axially transverse rotary element mounted on a lower rearward portion of the frame adjacent the ground and having generally radially extending pickup elements operatively associated therewith for moving forwardly and upwardly about the axis of the rotary element to engage and elevate crop material lying on the ground; and conveyor means operative to engage crop material elevated by the pickup means and roll it along the ground into a spiral, axially transverse, generally cylindrical bale and including a first roller means, adjacently forward and above and parallel to the rotary element and operative to support the rear of the bale as it is rolled along the ground after it is partially formed and maintain the bale out of engagement with the pickup element.

4,012,893

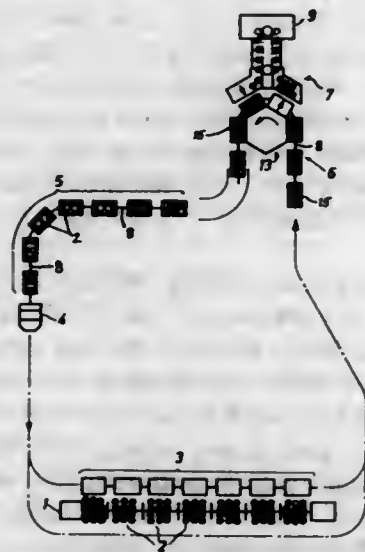
## METHOD OF LOADING TRANSPORTING TROLLEYS WITH FULL CANS OR THE LIKE AND SUPPLYING FULL CANS TO SPINNING MACHINES FED WITH FIBER SLIVER AND APPARATUS FOR IMPLEMENTING THE METHOD

Kurt Weber, Elgg, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland  
Filed Dec. 8, 1975, Ser. No. 638,921  
Claims priority, application Switzerland, Dec. 24, 1974, 17269/74

Int. Cl.<sup>2</sup> D01H 9/00

U.S. Cl. 57-34 R

8 Claims



1. A method of loading transporting trolleys with full cans

by means of a can loading device and transporting the full cans to a spinning machine fed with fiber slivers and transporting empty cans to the can loading device comprising the steps of:

1. transporting empty cans which have been placed upon transporting trolleys interconnected to form a transporting trolley train from a spinning machine fed with fiber sliver to a can loading device;
  2. transporting the empty cans from at least one of the transporting trolleys to a can take-up station;
  3. engaging the empty cans at the can take-up station by means of a revolving can transporting device;
  4. transporting the empty cans by means of the revolving can transporting device to a spinning preparatory machine delivering fiber sliver;
  5. filling the empty cans with fiber sliver at the spinning preparatory machine;
  6. transporting the filled cans to a can output station;
  7. displacing the filled cans from the can output station onto a transporting trolley of the same transporting trolley train; and
  8. then bringing the transporting trolley train in a train configuration back to the spinning machine fed with fiber sliver.
3. An apparatus for loading transporting trolleys with full cans at a first location and transporting them from the first location to a second location containing a spinning machine fed with fiber slivers and transporting empty cans from the spinning machine to the first location for refilling the cans with fiber sliver, said apparatus comprising:
- A. a spinning preparatory machine for producing fiber sliver arranged at the first location;
  - B. a spinning machine fed with fiber sliver arranged at the second location;
  - C. a can loading station arranged at said first location; said can loading station comprising:
    - a. shifting means for bringing can transporting trolleys interconnected into a train and provided with empty cans thereon into a desired position for transfer of the empty cans to a can take-up station;
    - b. means defining a can take-up station located in a position for receiving empty cans transferred from a transporting trolley to said can take-up station;
    - c. said shifting means including first pusher means for transferring empty cans to the can take-up station;
    - d. a movable can transporting device for engaging empty cans at the can take-up station and for delivering the empty cans to the spinning preparatory machine for loading the empty cans with fiber sliver;
    - e. means defining a can output station;
    - f. said movable can transporting device delivering the cans filled with fiber sliver at the spinning preparatory machine to the can output station; and
    - g. said can output station including means defining second pusher means for moving the full cans onto an empty transporting trolley of the same transporting trolley train.

4,012,894

## CONDUCTOR TWISTING SYSTEM FOR TWISTING A RUNNING WIRE CONDUCTOR

Hisateru Akachi; Hideo Miyajima, and Mitsuro Yaguchi, all of Sagami-hara, Japan, assignors to Oki Densen Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 21, 1975, Ser. No. 551,852

Claims priority, application Japan, Feb. 26, 1974, 49-23130; Sept. 30, 1974, 49-113206

Int. Cl.<sup>2</sup> H01B 13/04

U.S. Cl. 57-34 AT

23 Claims

18. A wire conductor twisting apparatus comprising a feed reel for a wire conductor, a take-up reel for said conductor, a pair of rolls disposed between the reels for imparting twist to the wire conductor passing there through, said rolls rotating in opposite direction with the same peripheral velocity along

axes forming an angle therebetween to permit rectilinear passage of the wire conductor therebetween in rotation, a stress releasing means disposed downstream of the feed reel and upstream of said rolls for releasing internal stress developed in the wire conductor fed from the feed reel, a revolving



means for revolving said stress releasing means in the same direction and speed as the wire conductor, and a rotation arrestor disposed downstream of said rolls for arresting the rotation of the wire conductor, said arrestor being intermittently operable.

4,012,895

## FALSE-TWISTING ARRANGEMENT FOR SYNTHETIC YARNS

Edgar Muschelknautz, Leverkusen; Hans Lenz, Dormagen-Hackenbroich, and Heiko Herold, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 10, 1974, Ser. No. 487,078

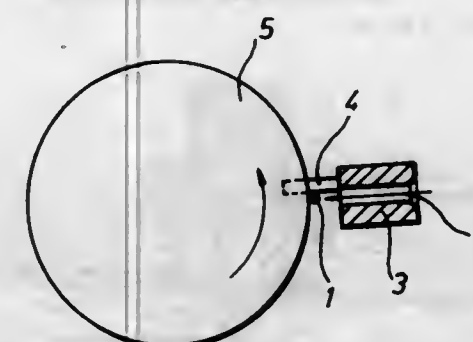
Claims priority, application Germany, July 24, 1973, 2337527

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> D02G 1/02

U.S. Cl. 57-77.4

7 Claims



1. An apparatus suitable for false twisting of synthetic yarn comprising means for twisting of the yarn comprising a movably mounted edge over which the yarn can be drawn for the twisting thereof, take-off means for drawing the yarn over the moving edge of the twisting means, a yarn guide for preventing entrainment of the yarn by the moving edge, the improvement which comprises means for directing a jet of gas or liquid onto the yarn to press the yarn against the moving edge during the twisting thereof.

4,012,896

## YARN FALSE TWISTER

Melvyn Robert Flachbach, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 445,718, Feb. 25, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,873

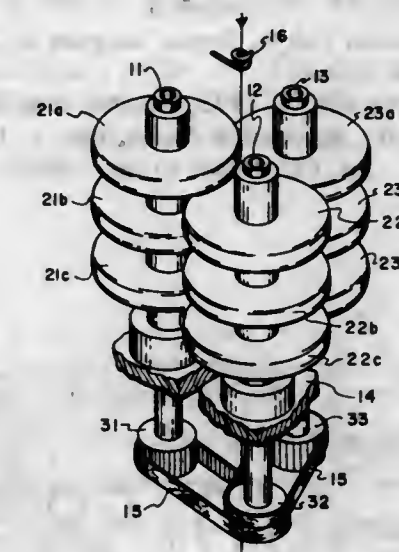
Int. Cl.<sup>2</sup> D02G 1/04; D01H 7/92

U.S. Cl. 57-77.4

22 Claims

1. In a friction false twist device of the disc type, mounted on three shaft members, the improvement comprising a disc member having an inorganic yarn-engaging surface on the

outer periphery thereof, said surface having a hardness greater than 975 on the Knoop<sub>100</sub> scale and a surface texture of more



than 75 and less than 400 peaks of at least 50 microinches in height per linear inch.

4,012,897

## METHOD AND APPARATUS FOR TWISTING YARNS

Junshiro Ogura, Tokyo, Japan, assignor to Ogura Jewel Industry Co., Ltd., Tokyo, Japan

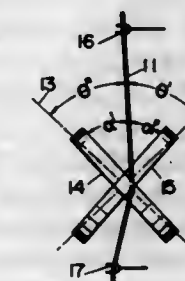
Filed Feb. 27, 1975, Ser. No. 553,819

Claims priority, application Japan, Mar. 2, 1974, 49-23768

Int. Cl.<sup>2</sup> D02G 1/08

U.S. Cl. 57-77.4

2 Claims



1. A method of twisting yarns, comprising the steps of passing a yarn to be crimped through a pair of oppositely rotating twisting discs in contact with circumferential faces thereof, said twisting discs being disposed in small gap relation with each other, said gap being smaller than the yarn diameter, for pressingly gripping said yarn therebetween and rotating about the respective rotational axes which are non-parallel to each other and inclined at a predetermined angle in opposite directions relative to the length of input yarn to have the respective circumferential faces turned toward a yarn gripping position from opposite sides thereof, rotating said twisting discs at slightly different circumferential speeds, and urging said yarn toward said yarn gripping position.

2. An apparatus for twisting yarns, comprising a pair of oppositely rotatable twisting discs disposed in small gap relation with each other for pressingly gripping between the circumferential faces thereof a yarn to be crimped, said gap being smaller than the diameter of the yarn, and rotatable about the respective rotational axes which are non-parallel to each other and inclined at a predetermined angle in opposite directions relative to the length of input yarn to have the respective circumferential faces turned toward a yarn gripping position from opposite sides thereof, said twisting discs being driven to rotate at slightly different circumferential speeds, and guide means for urging said yarn toward said yarn gripping position.



4,012,898

**ROTARY INDICATING PLATE TYPE DIGITAL DISPLAY DEVICE**

Keiichi Yoshizawa, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

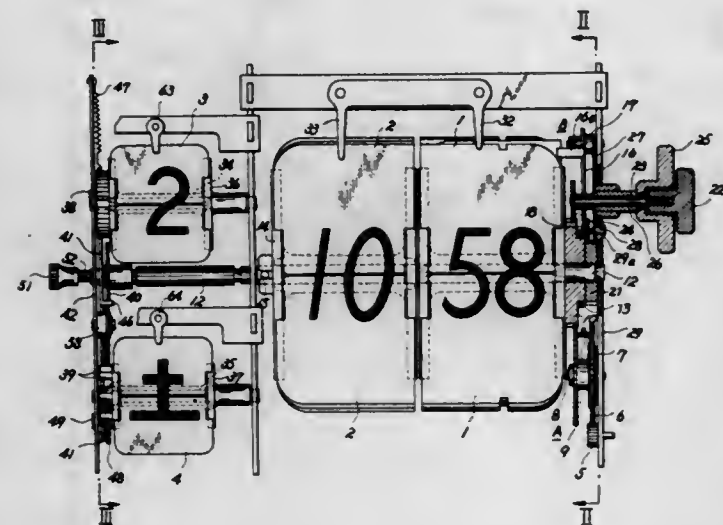
Filed Feb. 4, 1975, Ser. No. 546,898

Claims priority, application Japan, Feb. 4, 1974, 49-14273

Int. Cl.<sup>2</sup> G04B 45/00, 19/00

U.S. Cl. 58—2

4 Claims



1. In a rotary plate-type digital display device for displaying the time in hours and minutes in digital form: a rotary minute drum; a set of minute-indicating plates containing minute time indicia and disposed around the periphery of said minute drum and being pivotable thereon so that angular movement of said minute drum in the forward direction causes said minute-indicating plates to successively pivot and turn over to thereby successively display the minute increment of time; a rotary hour drum disposed alongside said minute drum; a set of hour-indicating plates containing hour time indicia and disposed around the periphery of said hour drum and being pivotable thereon so that angular movement of said hour drum in the forward direction causes said hour-indicating plates to successively pivot and turn over to thereby successively display the hour increment of time; and drive means for continuously rotating said minute drum in the forward direction to effect successive turning over of said minute-indicating plates at one minute intervals and for intermittently rotating said hour drum in the forward direction to effect successive turning over of said hour-indicating plates at one hour intervals, said drive means comprising a rotatable drum shaft having said minute drum rotatably mounted thereon and having said hour drum fixedly mounted thereon, means for rotationally and continuously driving said minute drum about said drum shaft to individually turn over said minute-indicating plates at successive one minute intervals, and means responsive to the turning over of the 59th minute-indicating plate to effect angular movement of said drum shaft to accordingly advance said hour drum one increment in the forward direction to thereby turn over the next hour-indicating plate synchronously with the turning over of said 59th minute-indicating plate.

4,012,899

**MICRO MOTOR FOR A TIMEPIECE**

Eiichi Matsuura, Chiba, and Nobuo Tsukada, Tokyo, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Apr. 9, 1975, Ser. No. 566,348

Claims priority, application Japan, Apr. 9, 1974, 49-40344; Apr. 23, 1974, 49-45789

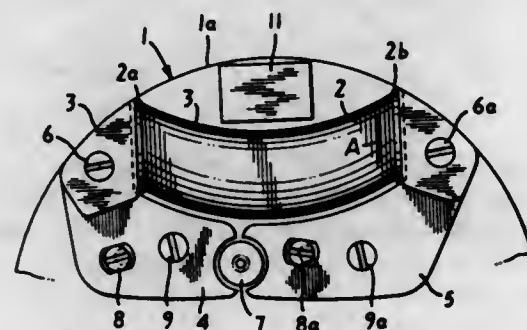
Int. Cl.<sup>2</sup> G04C 3/00

U.S. Cl. 58—23 D

3 Claims

1. In a timepiece having a timepiece movement having an outwardly curved frame portion: a micro motor comprising a curved magnetic core mounted on the timepiece movement

frame portion at the periphery thereof and being curved inwardly in a direction opposite to the outward curvature of said frame portion to define a space between the outwardly curved frame portion and inwardly curved magnetic core, a coil winding wound on said curved magnetic core, a stator comprised of stator pieces each connected at one end to a respective end portion of said curved magnetic core to define therewith a magnetic flux path and having their other ends spaced



apart and configured so as to form an opening therebetween, said stator pieces having curved portions extending at least partly along the curvature of said curved magnetic core on the side opposite that which defines said space, and a rotor rotatably disposed in said opening; and at least one timepiece component mounted on said timepiece movement within said space thereby conserving space and providing a compact construction.

4,012,900

**SETTING MEANS FOR ESTIMATED TIME OF ARRIVAL CLOCK HANDS**

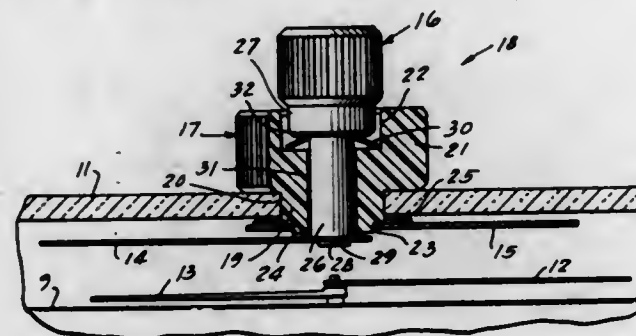
Wayne Jay Enright, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 12, 1976, Ser. No. 648,536

Int. Cl.<sup>2</sup> G04B 19/28, 47/06

U.S. Cl. 58—126 D

7 Claims



1. A method for setting estimated time of arrival (ETA) minute and hour hands comprising steps of:  
a. rotating an ETA hour hand knob less than one-half revolution to set an ETA hour hand; and  
b. rotating a minute hand knob less than one-half revolution to set an ETA minute hand without disturbing the ETA hour hand setting.

4,012,901

**DAMAGE-RESISTANT MECHANICAL METRONOME**

Henry Ware Jones, III, New Haven, Conn., assignor to Franz Manufacturing Co., Inc., New Haven, Conn.

Filed Sept. 25, 1975, Ser. No. 616,833

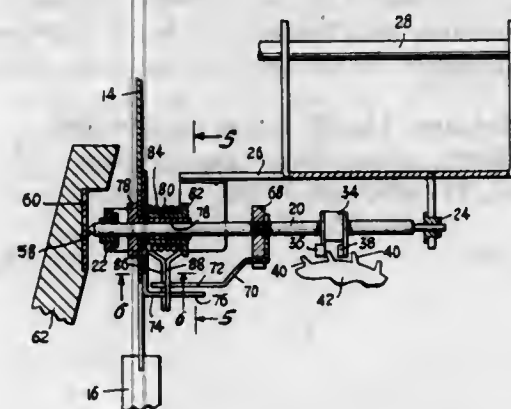
Int. Cl.<sup>2</sup> G04F 5/02

U.S. Cl. 58—130 R

6 Claims

1. A metronome, comprising in combination:  
a. a shaft part,  
b. a pendulum part carried by the shaft part and adapted to undergo reciprocating movement about the axis of the shaft part,  
c. yieldable drive means connecting said parts to effect

concurrent movement thereof, said drive means including manually engageable, settable means for reducing limp in



the successive half cycles of the reciprocating pendulum, and  
d. powered means for oscillating the shaft part.

4,012,902

**METHOD OF OPERATING A GAS TURBINE COMBUSTOR HAVING AN INDEPENDENT AIRSTREAM TO REMOVE HEAT FROM THE PRIMARY COMBUSTION ZONE**

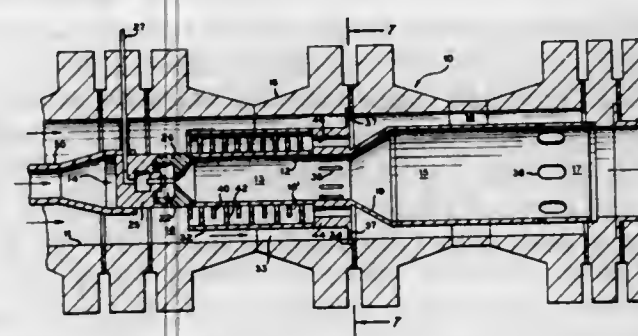
Robert M. Schirmer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 456,180, March 29, 1974, Pat. No. 3,939,653. This application Nov. 18, 1975, Ser. No. 633,051

Int. Cl.<sup>2</sup> F02C 3/00

U.S. Cl. 60—39.02

15 Claims



1. A method for burning a fuel in a combustor, which method comprises:  
introducing a first stream of air into a primary combustion zone of said combustor;  
introducing a fuel into said primary combustion zone;  
burning said fuel;  
introducing a portion of a second stream of air, maintained separate from said first stream of air, into a second zone of said combustor located downstream from said primary combustion zone;  
passing a third stream of air, maintained separate from said first and second streams of air, in a downstream direction over and in heat exchange with an outer wall of said primary combustion zone so as to remove heat from the interior of said primary combustion zone and heat said air;  
introducing said thus-heated third stream of air into a third zone of said combustor located downstream from said second zone; and  
combining another portion of said second stream of air with said heated third stream of air prior to the introduction of said third stream of air into said third zone.

4,012,903

**INTERNAL COMBUSTION ENGINE**

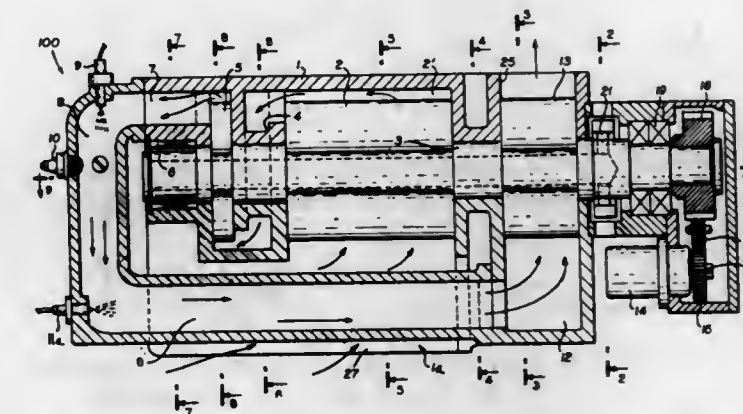
Frank E. Riedl, 208 N. Terrace Ave., Mount Vernon, N.Y. 10550

Continuation-in-part of Ser. No. 274,790, July 24, 1972, abandoned. This application Oct. 2, 1974, Ser. No. 511,430

Int. Cl.<sup>2</sup> F02B 53/00

U.S. Cl. 60—39.45

13 Claims



1. An internal combustion engine comprising:  
A. A housing having an air inlet opening formed therein;  
B. A first set of rotatably mounted interengaging air intake and compression rotor wheels disposed within a chamber in said housing and in communication with the air inlet;  
C. A second set of rotatably mounted interengaging compression and metering rotor wheels disposed in another chamber within said housing;  
D. A passage defined by said housing and connecting said first set of air intake and compression rotor wheels to said second set of compression and metering rotor wheels;  
E. A combustion chamber defined by said housing;  
F. A passage defined by said housing and connecting said combustion chamber with said second set of compression and metering rotor wheels, whereby said second set of compression and metering rotor wheels delivers compressed air to said combustion chamber;  
G. Means for supplying fuel to said combustion chamber and for initiating combustion of said fuel therein;  
H. A third set of rotatably mounted interengaging output rotor wheels disposed in a chamber in said housing in communication with said combustion chamber, wherein combustion gases from said combustion chamber pass through and drive said output rotor wheels, said output rotor wheels having a substantially larger working area than the working area of the second set of compression and metering rotors so that the combustion gases drive the output rotor wheels rather than drive the compression and metering rotor wheels;  
I. Means connecting said output rotor wheels with said first set of air intake and compression rotor wheels and said second set of compression and metering rotor wheels whereby said first set of air intake and compression wheels and said second set of compression and metering rotor wheels are driven by said output rotor wheels; and  
J. An outlet opening defined in said housing and communicating with said output rotor wheels for exhausting the combustion gases,  
wherein said first set of air intake and compression rotor wheels have a substantially larger working area than either said second set of compression and metering rotor wheels or said output rotor wheels, whereby a large volume of air is intaken into the internal combustion engine, compressed, and delivered to the combustion chamber.



4,012,904

## GAS TURBINE BURNER

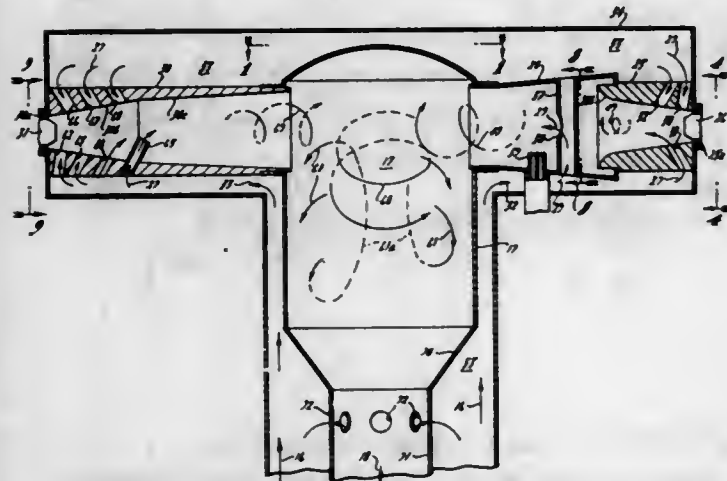
Thomas Dushane Nogle, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed July 17, 1975, Ser. No. 596,700

Int. Cl.<sup>2</sup> F02C 7/22

U.S. Cl. 60—39.65

19 Claims



1. In combination, a combustion system for minimizing localized concentrations of fuel and regions of high temperature combustion in lean combustible fuel-air mixtures for a gas turbine engine comprising first stage supply means for supplying first stage fuel and air at predetermined temperatures and rates to effect a lean preheated combustible first stage mixture when thoroughly mixed, first stage premixing means for receiving and thoroughly mixing said first stage fuel and air, a first stage combustion chamber for receiving the first stage fuel and air mixture from said premixing means, igniter means for igniting said mixture in said combustion chamber, second stage supply means for supplying second stage fuel and air at predetermined temperatures and rates to effect a lean preheated mixture when thoroughly mixed that is comparatively cool with respect to the combustion products from said combustion chamber, second stage premixing means for receiving and thoroughly mixing said second stage fuel and air mixture, a second stage combustion chamber for receiving the combustion products from said first stage combustion chamber and also for receiving and burning therein said thoroughly mixed second stage fuel and air mixture, said second stage combustion chamber having upstream and downstream ends and a circular section transverse to the direction between said ends, said first and second stage supply means comprising a source of preheated air and a plurality of air ports in communication with said preheated air and extending angularly through the walls of said first and second stage premixing means to discharge said preheated air thereinto and to effect said thorough mixing of said fuel and preheated air within the corresponding premixing means, means for igniting said second stage mixture and for appreciably inhibiting the rate of NO<sub>x</sub> formation in said combustion products by quenching the temperature thereof comprising means for comingling said second stage mixture with said combustion products, the last named means comprising means for discharging said second stage mixture and combustion products into said second stage combustion chamber adjacent said upstream end and generally tangentially to the circular section of said second stage combustion chamber to impart a swirl to gas flow in the latter chamber.

4,012,905

## EXHAUST CLEANING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Kenji Masaki, Yokohama; Hatuo Nagaiishi; Mitinobu Konno, both of Yokosuka, and Yoshio Ookubo, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

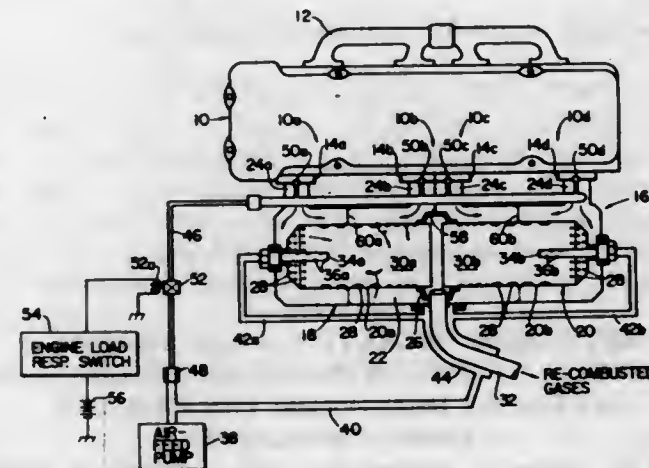
Filed Aug. 12, 1974, Ser. No. 496,889

Claims priority, application Japan, Aug. 17, 1973, 48-92287; Aug. 17, 1973, 48-92288

Int. Cl.<sup>2</sup> F01N 3/14

U.S. Cl. 60—286

37 Claims



1. An exhaust cleaning system for use with an automotive multiple-cylinder internal combustion engine including first and second groups of engine cylinders which are to be fired alternately to each other, which system comprises a thermal reactor comprising an outer elongate hollow structure formed with a first group of exhaust inlet ports communicating with the exhaust ports of said first group of engine cylinders and a second group of exhaust inlet ports communicating with the exhaust ports of said second group of engine cylinders; an inner elongate hollow structure which is positioned within said outer elongate hollow structure for forming an elongate space between the outer and inner elongate hollow structures and which is formed with a plurality of openings providing communication between said space and the interior of said inner elongate hollow structure, said interior of the inner elongate hollow structure constituting a re-combustion chamber of the thermal reactor; at least one air-injection nozzle opening in the vicinity of one longitudinal end of said re-combustion chamber and in close proximity to an axis of the inner elongate hollow structure, said first group of exhaust inlet ports being open in the neighbourhood of the longitudinal end portion of the inner elongate hollow structure adjacent said one longitudinal end of the re-combustion chamber; an outlet duct leading from said re-combustion chamber for discharging recombusted gases from the re-combustion chamber; air-supply means for feeding air to said air-injection nozzle; and guide means for guiding a stream of exhaust gases from each of said first group of exhaust inlet ports toward said longitudinal end portion of said inner elongate hollow structure and a stream of exhaust gases from each of said second group of exhaust inlet ports toward an intermediate longitudinal portion of said inner elongate hollow structure.

4,012,906

## OVERHEAT PREVENTING SYSTEM FOR EXHAUST GAS PURIFIER OF VEHICLES

Tadashi Hattori, Nishio; Takamichi Nakase, Gamagori; Hideo Tsubouchi, and Toshiharu Iwata, both of Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

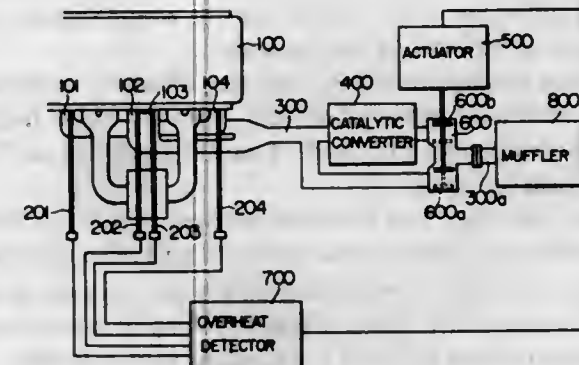
Filed June 20, 1973, Ser. No. 371,880

Claims priority, application Japan, June 26, 1972, 47-63896; July 26, 1972, 47-75399; July 26, 1972, 47-75400; July 26, 1972, 47-75401; July 31, 1972, 47-77155

Int. Cl.<sup>2</sup> F01N 3/15; F02B 75/10

U.S. Cl. 60—277

5 Claims



1. An overheat prevention system for an exhaust gas purifier in an internal combustion engine having a plurality of engine exhaust ports comprising:

- a temperature detector inserted in the vicinity of each of the engine exhaust ports for detecting the temperature in the vicinity of the engine exhaust ports and for producing an output signal representing the detected temperature;
- an overheat detector means connected to receive the output signals of said temperature detectors,
- said overheat detector means including a memory circuit for storing the output of said temperature detector for a predetermined period of time,
- a circuit for detecting the amount of temperature drop in the vicinity of the engine exhaust ports, said detecting circuit being connected to said memory circuit and to said temperature detector for comparing an output of said memory circuit with an output of said temperature detector, and
- a decision circuit means connected to said temperature drop detecting circuit for producing a misfire signal when the difference between the output of said temperature detector and said memory circuit exceeds a predetermined level; and
- means responsive to the misfire signal from said overheat detector for preventing unburned gases produced in the exhaust gases of the engine due to the failure to fire from flowing into an exhaust gas purifier.

4,012,907

## EXHAUST APPARATUS

William James Crayton, Portreana, Scotland, assignor to Thomas Buchanan, Canada, a part interest

Filed Sept. 24, 1975, Ser. No. 616,367

Claims priority, application Canada, June 9, 1975, 228897

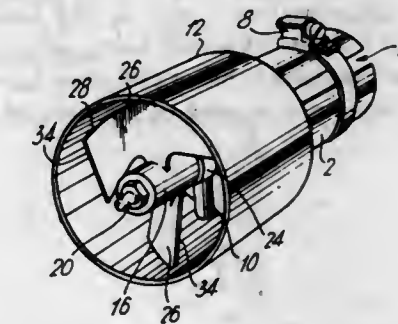
Int. Cl.<sup>2</sup> F02B 35/00; F01N 3/02

U.S. Cl. 60—315

6 Claims

1. Device for securement to or incorporating into the exhaust assembly of an internal combustion engine comprising a generally tubular housing open at both ends to enable passage of exhaust gases and a flow of air therethrough, an axle co-axially positioned within the housing on a laterally extending support member, a hub having a longitudinal axis rotatably mounted on the axle, and solely two, opposed, radially extending blades secured to the hub, the blades being obliquely angled with respect to the longitudinal axis of the hub with at least the forward portion of each blade being angled in a plane in the range of 70° to 75°, the forward and rearward portions

of each blade extending inwardly providing pointed projections between the forward edge and the forward inner edge, and the rearward edge and the rearward inner edge of the



blade, respectively, the forward edges, and the rearward edges, each defining at said projection an angle in the range of 62° to 72°.

4,012,908

## TORQUE CONVERTER HAVING ADJUSTABLY MOVABLE STATOR VANE SECTIONS

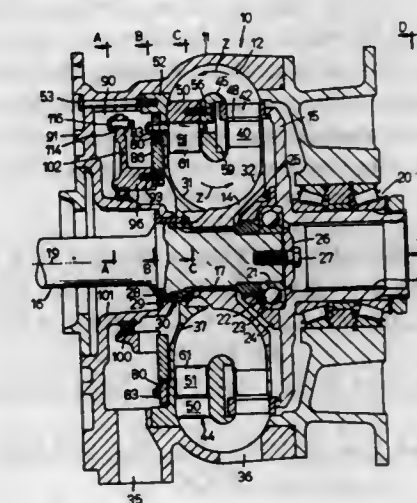
Marvin W. Dundore, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Jan. 30, 1976, Ser. No. 654,046

Int. Cl.<sup>2</sup> F16D 33/04

U.S. Cl. 60—354

8 Claims



1. In a torque converter:

- a housing, a bladed impeller, a bladed turbine, and a stator including a plurality of stator blades, each pair of adjacent stator blades defining a passage through which fluid is circulated from said turbine blades to said impeller blades, each said stator blade having a forward portion and a relatively movable rear portion, said rear portion being adjustably movable to regulate fluid flow through said torque converter to thereby control the power output of said torque converter;
- and means for effecting simultaneous movement of said movable rear portions of said stator blades to positions wherein each said passage can be fully open, partially closed or fully closed.

4,012,909

## HAMMER

George A. Hibbard, R.D. No. 2, Claremont, N.H. 03743  
Division of Ser. No. 478,289, June 11, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 636,006

Int. Cl.<sup>2</sup> F15B 1/02, 15/18

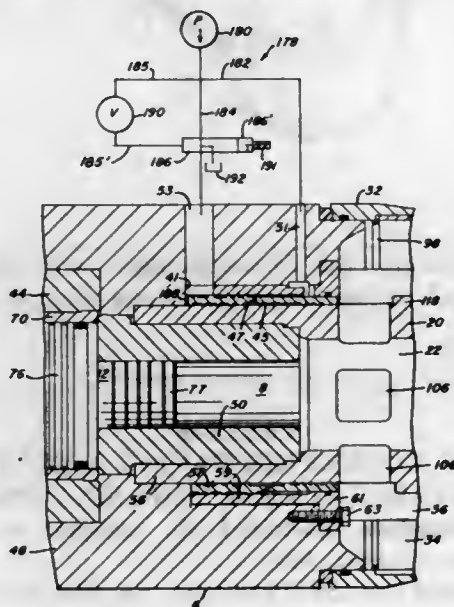
U.S. Cl. 60—371

5 Claims

1. A fluid operative impacting assembly comprising: an elongated body member having a bore extending longitudinally therein; hammer piston axially movable within said bore



to form two axially spaced variable volume chambers therein; an exhaust chamber carried by said body member; valved passageway means in said body member to control fluid communication between one of said variable volume chambers and said exhaust chamber; said one of said variable volume chambers and said exhaust chamber being adapted to receive hydraulic fluid therein; said exhaust chamber having a volume greater than the maximum volume of said one of said variable



volume chambers; and pump means communicating with said exhaust chamber for removing hydraulic fluid from said exhaust chamber during said axial movement of said hammer piston at a rate sufficient to allow discharge of hydraulic fluid from said one of said variable volume chambers into said exhaust chamber while maintaining minimum back pressure therein when said one of said variable volume chambers is in fluid communication with said exhaust chamber.

4,012,910

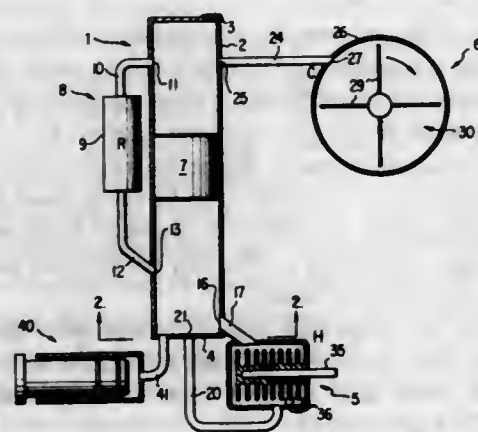
# **THERMALLY DRIVEN PISTON APPARATUS HAVING AN ANGLED CYLINDER BYPASS DIRECTING FLUID INTO A THERMAL LAG HEATING CHAMBER BEYOND THE BYPASS**

Mark Schuman, 101 G St., SW., No. 516, Washington, D.C. 20024

Filed July 3, 1975, Ser. No. 592,895  
Int. Cl.<sup>2</sup> F02G 1/04

U.S. Cl. 60—520

61 Claims



1. An energy converter utilizing a compressible fluid comprising:  
a cylinder constructed so as to facilitate a substantially cyclical oscillation of a free piston therewithin and along the cylinder axis, said cylinder having a side wall formed to be closely adjacent a side-wall of said piston and forming a loose sliding seal therewith so as to facilitate development of a differential fluid pressure across said piston during said oscillation;  
means for heating fluid flowing into one end of said cylinder;

means for feeding cool fluid into the other end of said cylinder, whereby said cylinder has a hot end and a cold end, and said piston oscillates between and separates said hot and cold ends of said cylinder;  
means including said fluid heating means and said cool fluid feeding means for sustaining said piston oscillation;  
a cylinder bypass connecting said hot end with said cold end, said bypass bypassing a portion, and only a portion, of the axial length of said cylinder, and communicating with said hot end of said cylinder via a hot bypass conduit and communicating with said cold end of said cylinder via a cold bypass conduit;  
said hot bypass conduit communicating with said hot end of said cylinder via a hot bypass port in said cylinder side-wall in said hot end of said cylinder;  
said heating means including a heating chamber communicating with said hot end of said cylinder via a heating chamber inlet port in a wall of said cylinder in said hot end of said cylinder;  
said piston during a first coasting portion of the oscillatory cycle forcing cold fluid from said cold end of said cylinder into said hot end of said cylinder via said bypass as said piston coasts within said bypassed portion of said cylinder in a direction toward said cold end of said cylinder;  
a regenerator in said bypass, said forced cold fluid serving to cool said regenerator and being warmed by said regenerator as said fluid is being forced through said bypass toward said hot end of said cylinder;  
said hot bypass conduit, said hot bypass port, said heating chamber, and said chamber inlet port all being configured, disposed, and oriented with respect to each other and to said cylinder so that, during said first coasting portion of said cycle, most of said warmed fluid forced through said bypass into said hot end of said cylinder via said hot bypass port: (a) enters said hot end of said cylinder in a substantially defined stream, (b) flows in said substantially defined stream into said heating chamber via said heating chamber inlet port, and (c) is heated by and within said heating chamber; and  
means for facilitating a reversal of motion of said piston back toward said hot end of said cylinder so as to commence a second coasting portion of said oscillatory cycle, said piston during said second coasting portion of said cycle forcing hot fluid from said hot end of said cylinder into said cold end of said cylinder via said bypass as said piston coasts within said bypassed portion of said cylinder in a direction toward said hot end of said cylinder, said forced hot fluid warming said regenerator and being cooled thereby;  
said side-wall of said piston blocking said hot bypass port so as to commence a hot rebound portion of said cycle following said second coasting portion of said cycle and prior to the first coasting portion of the next cycle of said piston oscillation, said heating chamber communicating with said hot end of said cylinder during a substantial segment of said hot rebound portion of said cycle;  
said piston during said hot rebound portion of said cycle compressing fluid within said hot end of said cylinder and within said heating chamber;  
said compressed fluid acting as a compressible fluid spring so as to cause said piston to rebound away from said hot end of said cylinder, and said heating chamber heating said compressed fluid during said hot rebound portion of said cycle so as to augment said spring action such that the kinetic energy of said piston as it rebounds away from said hot end of said cylinder is augmented, thereby providing energy for sustaining said piston oscillation;  
whereby a cyclical variation in fluid pressure and temperature is produced within said cylinder, said variation being utilizable for driving a load.

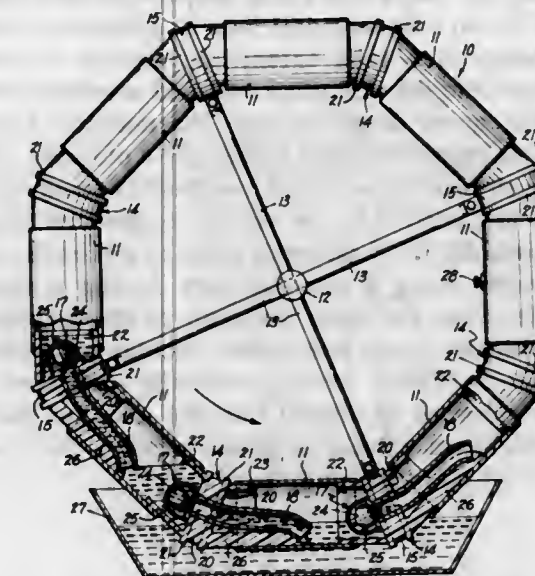
4,012,911

# **ENGINE POWERED BY LOW BOILING LIQUID**

Arnold G. Gulko, 1835 Arcola Ave., Silver Spring, Md. 20902  
Filed Mar. 23, 1976, Ser. No. 669,614

Int. Cl.<sup>2</sup> F03G 3/02

U.S. Cl. 60—531



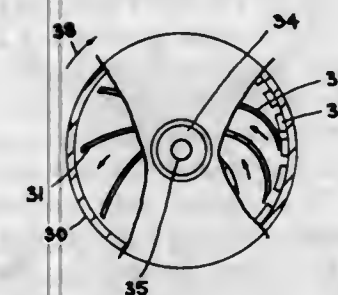
1. An engine adapted to operate upon partial immersion in a heated liquid comprising, a circular train of tubular compartments sealed to interconnectors which join adjacent leading and trailing compartments, some of said compartments containing low boiling liquid for powering said engine and said circular train being tied to a central axle so that rotation of said train will rotate said axle, said interconnectors having an opening and a tube extending forwardly into the leading compartment, and valve means permitting rearward movement through said tube while preventing forward movement through said tube.

4,012,912  
TURBINE

Michael Eskell, 7994-41 Locke Lee, Houston, Tex. 77042  
Continuation-in-part of Ser. No. 566,373, April 9, 1975, Pat. No. 3,949,557. This application Jan. 22, 1976, Ser. No. 651,441

Int. Cl.<sup>2</sup> F01K 25/02

U.S. Cl. 60—682



1. In a power generating turbine, wherein a working fluid is accelerated and pressurized within a rotating rotor first outwardly extending passages, and wherein a working fluid is expanded within a rotating rotor inwardly extending second passages, with the first and the second passages being connected at their outward ends by a passage means to allow said working fluid to flow outwardly within the first passage and through said passage means and inwardly within the second passage, the improvement comprising:  
a. a curved inwardly extending second passage, for the generation of thrust and torque on said rotating rotor, with the curvature of said curved inwardly extending passage being backward and away from the direction of rotation.

4,012,913

# **FRICTION ROCK STABILIZERS**

James J. Scott, Lecom Star Rte., Rolla, Mo. 65401  
Filed Oct. 3, 1975, Ser. No. 619,214  
Int. Cl.<sup>2</sup> E21D 21/00, 20/00

7 Claims U.S. Cl. 61—45 B

13 Claims



1. A friction stabilizer for installation in a structure such as a roof or side wall of a mine shaft or other underground opening for anchoring the structure, said stabilizer comprising a generally annular body having longitudinally extending portions which overlap circumferentially of said body, said body being of dimension predetermined to be substantially larger than the diameter of the bore in which it is to be inserted such that insertion of said body in such bore causes substantial circumferential compression of said body, said overlapping portions of said body being relatively movable circumferentially of said body to permit such substantial circumferential compression of said body, the stabilizer being free of structure precluding said substantial circumferential compression of said body, and said body being of material permitting its said substantial compression during its said insertion and, after such insertion, causing the body outer circumference to frictionally engage the wall of the bore for frictionally anchoring the structure and wherein said body is defined by inner and outer circumferential walls formed of a single thickness of said material, which inner and outer walls, in cross-section, are of common annular configuration; said inner and outer walls each having a prescribed, common discontinuity which extends, uniformly, fully longitudinally of said body; and said discontinuities of said inner and outer walls are spaced apart, one from the other thereof, circumferentially of said body.

4,012,914

# **MINE ROOF SUPPORT**

Karl Heinz Wehner, Castrop-Rauxel, Germany, assignor to Klockner-Werke AG, Duisburg, Germany  
Filed Jan. 22, 1976, Ser. No. 651,469  
Claims priority, application Germany, Apr. 22, 1975, 2517732

Int. Cl.<sup>2</sup> E21D 15/44

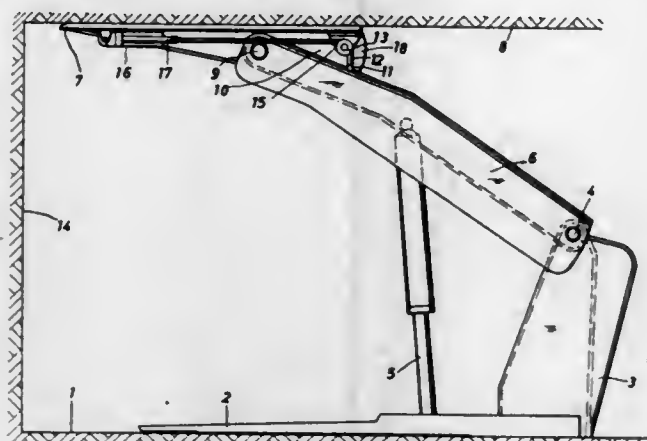
U.S. Cl. 61—45 D

10 Claims

1. A mine roof support, for use in a mine gallery of underground excavation having a floor, a roof and a mine face, comprising a support member adapted to rest on the floor of a mine gallery and having a front end to be directed towards the mine face and a rear end; a first shield fixed to and projecting upwardly from said rear end of said support member; a second shield having an upper and a lower end and being pivotally connected to said lower end to the upper end of said first shield and extending inclined with respect to the latter towards the mine face, said second shield having an upper surface facing the roof of the mine gallery; expandable and collapsible prop means pivotally attached at opposite ends to said support member and said second shield between opposite



ends of the latter; a cap having a top face adapted to engage the roof of the mine gallery and a bottom face, said cap being pivotally attached intermediate its ends to said upper end of said second shield and having a front end directed toward the mine face and a rear end so as to form a wedge-shaped free space between the portion of the bottom face of the cap located rearwardly of the point of its attachment to said second shield and the upper surface of the latter; and means for preventing entrance of loose rock material into said space,



including a tear resistant flexible web connected at one end to said upper surface of said second shield, guide means connected to said cap in the region of the rear end of the latter, said web extending over said guide means along the bottom face of the cap toward the front end of the latter, and means for maintaining the web under tension, including at least one cylinder and piston means mounted in the region of said front end of said cap and having a piston rod connected to the other end of said web.

4,012,915

# DRIVING TIPS FOR FORMING CAST-IN-PLACE CASELESS CONCRETE PILES

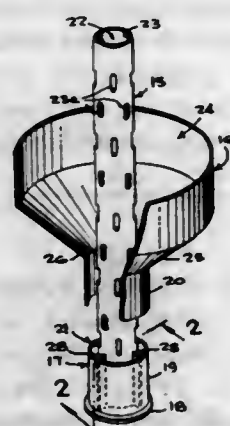
Luis Poma, San Salvador, El Salvador, assignor to Interpile USA, Inc., New Orleans, La.

Filed July 18, 1975, Ser. No. 597,090

Int. Cl.<sup>2</sup> E02D 5/72

U.S. Cl. 61-53

7 Claims



1. A driving tip member for use with a vertically elongated hollow driving mandrel to be driven into the earth by pile driving equipment and thereby produce a vertically elongated pile-forming hole for forming a cast-in-place caseless pile of fill material or the like which is introduced in flowable condition into the hole and sets upon curing, and wherein the driving mandrel is an elongated tubular cylinder having an annular cylindrical tube wall surrounding an axial bore therethrough and terminating in a lower end portion of predetermined outer diameter, the diameter of the mandrel being sufficiently smaller than the diameter of the pile-forming hole to be formed to provide both an outer annular surrounding space about the mandrel and an inner cylindrical space within the mandrel into which gravity flow of the fill material down-

wardly about and within the mandrel will occur, the driving tip member comprising a rigid lower leading end plate of substantially planiform configuration and circular cross-section of a diameter corresponding to the desired pile diameter and larger than the outer diameter of the mandrel lower end portion to be releasably assembled therewith, and a plurality of laterally spaced mandrel interfittng centering guide members carried by the end plate and rising perpendicularly from the end plate to fit into the mandrel bore in concentric relation over a predetermined axial extent and thereby center and releasably assemble the end plate with the mandrel solely by interfittng the guide members into the mandrel bore, the centering guide members being formed of a plurality of more than two like straight parallel rod members of small diameter assembled to and carried by the end plate, said rod members extending upwardly from said end plate at circumferentially spaced locations along a circular path having a diameter slightly smaller than the inner diameter of the mandrel and concentric with the center axis of the circular end plate providing radially outwardly facing, vertically elongated abutment surface portions to interfit into the mandrel bore and inwardly confront in closely adjacent relation the inwardly facing surface of said tube wall.

4,012,916

# APPARATUS FOR CONSTRUCTING UNDERGROUND TUNNELS

Hans Jütte, Dortmund Brechten; Adolf Folk, Munich; Siegmund H. F. L. M. Babendererde, Bad Vilbel, and Reinhard E. J. Bokemeyer, Offenbach, all of Germany, assignors to Gewerkschaft Eichenhütte Westfalen, Wethmar near Lunen and Hochtief AG, Frankfurt, both of Germany

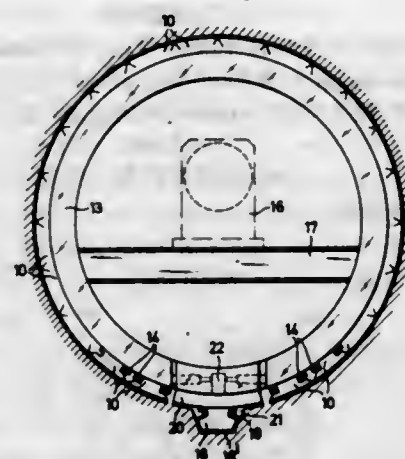
Filed Dec. 10, 1975, Ser. No. 639,518

Claims priority, application Germany, Dec. 23, 1974, 2461241

Int. Cl.<sup>2</sup> E01G 3/02

U.S. Cl. 61-85

3 Claims



1. In an underground tunneling apparatus of the type comprising a drive shield composed of a plurality of elongate members arranged side-by-side in a parallel configuration and generally around the axis of said tunnel, a frame for supporting and guiding said members for longitudinal displacement, a drifting floor cutter movable with the drive shield and operable to cut a channel in the floor in said tunnel, and means for causing relative displacement between said drive shield and said drifting floor cutter, the improvement comprising: a guide provided on the frame and slidably contacting and guiding the floor cutter for movement in relation to the drive shield and parallel to the longitudinal axis of the tunnel; pivoting means for defining a vertical pivot axis about which said floor cutter can be rotated; and rotating means for rotating said floor cutter about said vertical pivot axis to effect steering of said drive shield.

4,012,917

# BRIDGE BEAM TOWER ERECTION METHODS AND APPARATUS

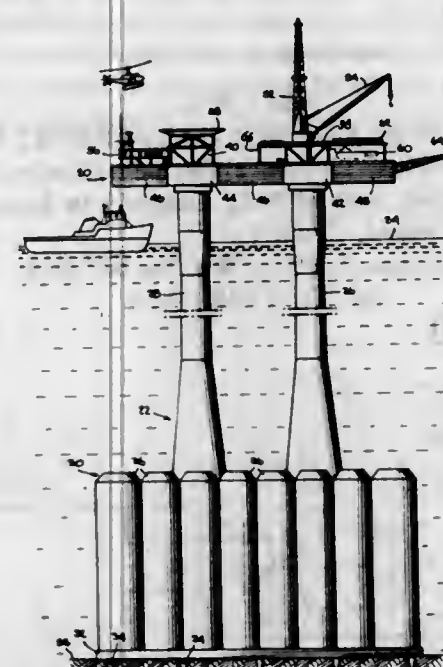
George J. Gendron, Houston, Tex., assignor to Raymond International Inc., Houston, Tex.

Filed Oct. 6, 1975, Ser. No. 620,253

Int. Cl.<sup>2</sup> B63B 35/44

U.S. Cl. 61-91

27 Claims



1. A method of erecting an offshore tower, said method comprising the steps of positioning a template, having a plurality of spaced apart vertical legs, on a sea floor so that said vertical legs extend up above the sea level, said template being provided with at least one open framework bridge beam connected to and extending between the upper ends of said vertical legs, floating a platform out to the thus positioned template and locating the platform so that it is adjacent the template legs and is under and in alignment with said bridge beam, thereafter interconnecting jacking units, comprising jacking leg means and jacking mechanism means and operative to undergo longitudinal movement with respect to said jacking leg means, between said bridge beam and the thus located platform so that one of said means is connected to said bridge beam and the other of said means is connected to said platform and operating said jacking mechanisms means to raise said platform clear of the water.

4,012,918

# SUBMARINE CABLE LAYING SYSTEM

Kinya Suzuki; Kenji Mori, both of Tokyo; Yasuo Takeuchi; Masao Torii, both of Yokohama; Hiroji Takahashi, and Ryozo Yamauchi, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo; Sumitomo Electric Industries, Ltd., Osaka and Nippon Electric Company, Ltd., Tokyo, all of Japan

Filed July 3, 1975, Ser. No. 593,134

Claims priority, application Japan, Oct. 2, 1974, 49-114236

Int. Cl.<sup>2</sup> E02F 5/14; G05B 11/16; G05D 3/04, 15/01

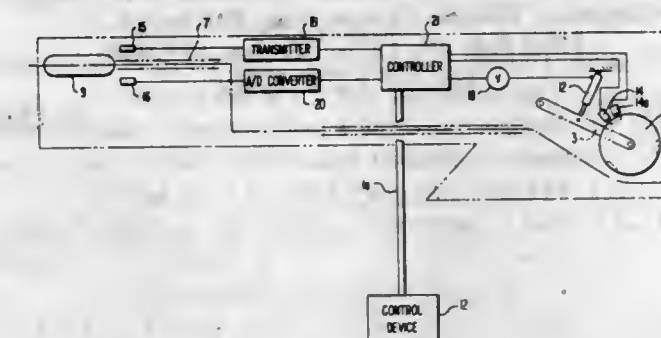
U.S. Cl. 61-107

8 Claims

1. In a submarine cable laying system comprising a cable laying device towed along the sea-bottom by a cable laying ship and a controlling device on the cable laying ship, said cable laying device comprising a cable depressing wheel and a mechanism responsive to said controlling device for elevating and lowering said cable depressing wheel, the improvement comprising:

first detecting means on said cable laying device for detecting the passage of repeaters and the like under said cable depressing wheel and producing a first signal, second detecting means on said cable laying device for detecting the length of a part of the cable having been laid by said cable laying device after detection of the passage

of a repeater and the like by said first detecting means and producing a second signal, and control circuit means connected to receive said first and



second signals for generating control signals to said controlling device to cause the automatic elevation and lowering of said cable depressing wheel each time a repeater and the like passes under said cable depressing wheel.

4,012,919

# METHOD FOR RAPIDLY LAYING A PIPELINE IN DEEP WATER BY AN ANCHORED LAYING MEANS, AND THE RELATIVE DEVICES

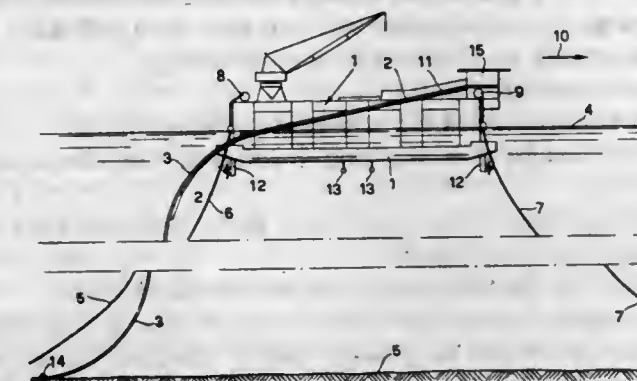
Giovanni Rosa, San Donato Milanese; Claudio Morelli, Bologna; Pasquale Brando, San Donato Milanese, and Giuseppe Daghetti, Segrate (Milan), all of Italy, assignors to Saipem S.p.A., Milan, Italy

Filed Sept. 29, 1975, Ser. No. 617,734

Int. Cl.<sup>2</sup> F16L 1/00

U.S. Cl. 61-108

2 Claims



1. The method of rapidly laying a pipeline in a deep body of water by floating laying means having a bow and a stern and provided with a launching ramp, winches mounted on the bow and stern, respectively, of the laying means, cables extending from the laying means to anchors at the bottom of the body of water and adapted to hold the laying means in a selected position and windable on their associated winches to rapidly move the laying means longitudinally to a new position in the laying direction for a distance equal to the length of a piece of pipe to be added to the pipeline, and variable blade-variable speed azimuth propulsors mounted on the bottom of the laying means, wherein the improvement comprises, counteracting the central elastic force which induces an oscillatory motion in the floating laying means when it is moved to a new position by automatically measuring the forces to which the laying means is subjected as it is moved to that new position, and feeding the values so obtained to a computer programmed to regulate the forces exerted by the respective winches on their associated cables and the thrust exerted by the azimuth propulsors so as to rapidly dampen the amplitude of said oscillatory motion.

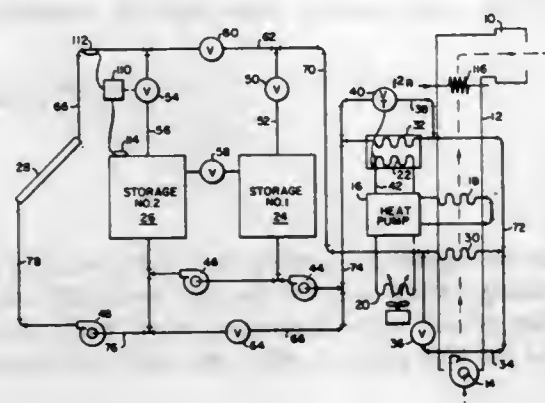


# 4,012,920 HEATING AND COOLING SYSTEM WITH HEAT PUMP AND STORAGE

Herbert S. Kirschbaum, Wilkins Township, Pa., assignor to  
Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed Feb. 18, 1976, Ser. No. 658,946  
Int. Cl.<sup>2</sup> F25B 27/00

U.S. Cl. 62-2

16 Claims



## 1. A heating and cooling system including:

a heat exchange fluid;  
first storage means for said heat exchange fluid;  
air passage means through which air to heat and cool the served space is passed;  
a heat pump having a refrigerant compressor, a first refrigerant coil in said air passage means, a second refrigerant coil in heat exchange relation with outdoor air, a third refrigerant coil for exchanging heat with said fluid, and refrigerant line means connecting said compressor to said three coils;

valve means in said refrigerant line means for connecting any one of said three coils to operate as either an evaporator or a condenser and for connecting either one of the other two coils to operate as a condenser or evaporator, respectively, so that heat can be exchanged in any combination between air in said passage means, outdoor air, and said storage fluid.

## 10. A heating and cooling system including:

a heat exchanger fluid;  
a first storage means for said heat exchange fluid;  
pump means for pumping fluid to and from said first storage means;

air passage means through which air to heat and cool the served space is passed

a fluid-to-air heat exchanger in said air passageway;  
a heat pump having a refrigerant compressor, a first refrigerant coil in said air passage means, a second refrigerant coil in heat exchange relation with outdoor air, a third refrigerant coil for exchanging heat with said fluid, and refrigerant line means connecting said compressor to said three coils;

a fluid-to-refrigerant heat exchanger incorporating said third refrigerant coil;

fluid line means connecting said first storage means, said pump means, and said two heat exchangers, said fluid line means including valve-controlled bypass lines around both of said heat exchangers;

means to control the flow fluid between said first storage means and said heat exchangers in accordance with temperature conditions and the operating mode of said heat pump;

valve means in said refrigerant line means for connecting any one of said three coils to operate as either an evaporator or a condenser and for connecting either one of the other two coils to operate as a condenser or evaporator, respectively;

said refrigerant line valve means having operating positions during a cooling season under one load condition in which said first coil functions as an evaporator and said second coil as a condenser, under a second load condition

in which said third coil functions as an evaporator to cool said storage fluid and said second coil as a condenser, under a third load condition in which said first coil functions as an evaporator and said third coil as a condenser to transfer heat from the served space to the storage fluid, and under a fourth load condition in which said third coil functions as an evaporator and said second coil as a condenser to transfer heat from said storage fluid to the outdoor air.

# 4,012,921 REFRIGERATION AND HOT GAS DEFROST SYSTEM

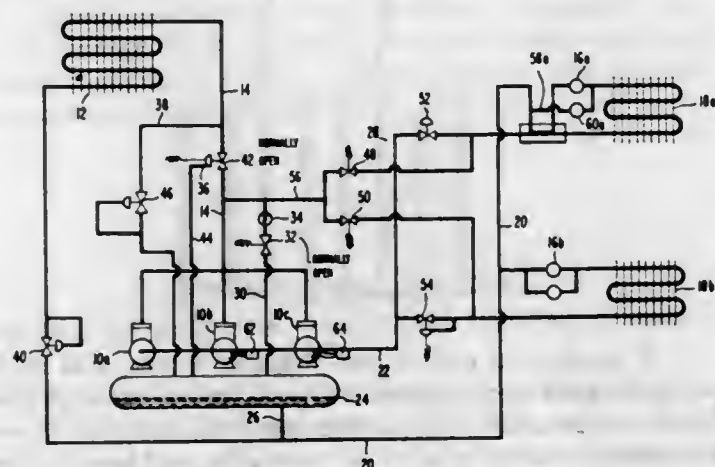
Benjamin R. Willits, Lawrenceville, and Charles W. Klossman, Burlington, both of N.J., assignors to Emhart Industries, Inc., Hartford, Conn.

Filed Jan. 7, 1976, Ser. No. 647,016

Int. Cl.<sup>2</sup> F25B 39/04

U.S. Cl. 62-151

14 Claims



## 1. A refrigeration and hot gas defrost system comprising:

a. a compressor means for compressing gaseous refrigerant;  
b. a condenser means for condensing hot gaseous refrigerant received from said compressor means;

c. a discharge line communicating the output of said compressor means to said condenser means;

d. a plurality of expansion valves;

e. a plurality of evaporator means associated with each of said expansion valves;

f. a liquid line for passing the liquid refrigerant from the output of said condenser means to said expansion valves and said evaporator means;

g. a return line connecting said evaporator means to the input of said compressor means;

h. receiver means for holding a sufficient amount of refrigerant to assure efficient operation of the system;

i. a bypass line providing refrigerant flow between said liquid line and said receiver means;

j. defrost means for selectively passing hot refrigerant gases through at least one of said evaporator means to defrost the same; and

k. a balancing line responsive to a pressure within said receiver greater than within said discharge line to provide fluid flow communication therebetween to equalize refrigerant pressure between said receiver and said discharge line.

# 4,012,922 AIR COOLING EQUIPMENT FOR COOLING CONTAINERS

Georg Falensky, Hamburg, Germany, assignor to Grunzweig & Hartmann und Glasfaser AG, Ludwigshafen, Germany

Filed Aug. 11, 1975, Ser. No. 603,890

Claims priority, application Germany, Nov. 29, 1974, 2456477

Int. Cl.<sup>2</sup> B63B 25/26

U.S. Cl. 62-240

6 Claims

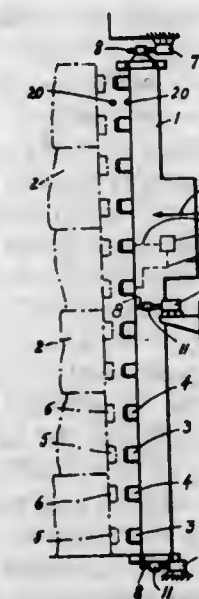
1. An air-cooling arrangement for cooling a single stack of

containers in a hold of a ship wherein each container includes at least two connecting fittings on one side thereof to permit entry of cooling air and exit of exhaust air, said arrangement comprising:

a. a vertically disposed column,

b. means mounting said column for movement along a horizontal path,

c. a plurality of connecting mouthpieces fixedly arranged along and projecting from one side of said column, each of said mouthpieces including a flexible sealing ring for pressing against a connecting fitting of a container to create a tight seal,



d. a plurality of ducts arranged within said column for directing cooling air and exhaust air through respective of said connecting mouthpieces, and

e. means for displacing said column towards and away from a single stack of containers along said horizontal path,

f. whereby said mouthpieces may simultaneously be pressed against all of said connecting fittings of all of said containers in a stack to circulate cooling air through said containers when said column is moved towards said stack and disconnected from said fittings when said column is moved away from said stack.

# 4,012,923 VIBRATION DAMPING COUPLING

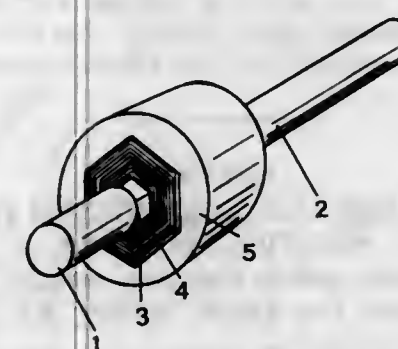
Bengt Lundgren, Ulricehamn, Sweden, assignor to SKF Nova A.B., Goteborg, Sweden

Filed Nov. 6, 1975, Ser. No. 629,300

Int. Cl. F16d 3/17

U.S. Cl. 64-11 R

10 Claims



1. A coupling for transmitting torque between at least a pair of rotatable members, said members having spaced apart, complementary peripheral surface portions of non-circular cross section, coupling means comprised of elastomer and metal layers and consisting of at least two sections in abutting side by side relation, one surface portion of said coupling means abutting the peripheral surface portion of one of said members and another surface portion of said coupling means abutting the peripheral surface portion of said other member

whereby rotation of one member effects through said coupling means rotation of said other member.

# 4,012,924 CONSTANT VELOCITY UNIVERSAL JOINT AND BALL RETAINER CAGE THEREFOR

Werner Krude, Neunkirchen, Germany, assignor to Lohr & Bromkamp GmbH, Offenbach (Main), Germany

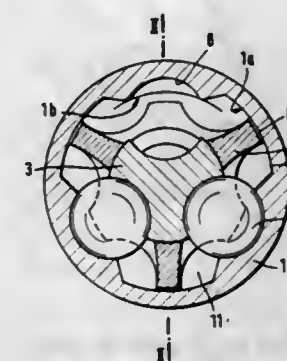
Filed July 1, 1975, Ser. No. 592,238

Claims priority, application Germany, July 11, 1974, 2433320

Int. Cl. F16d 3/30

U.S. Cl. 64-21

6 Claims



1. A constant velocity universal joint comprising an outer joint element having a bore therethrough and a plurality of grooves in the surface of said bore, an inner joint element within said bore and having a plurality of grooves in its outer surface corresponding in number to and opposed from said outer joint element grooves to define pairs of opposed grooves, a plurality of balls between said joint elements with each ball being in a pair of opposed grooves, a cage between said joint elements and having a plurality of radial openings therein to retain said balls in a plane which is perpendicular to the axis of the cage and which bisects the angle between the joint elements, said cage having a first spherical surface on its outer face and a second spherical surface on its inner face, means on the inner face of said outer joint element coacting with said cage first spherical surface for guiding said cage with respect to said outer joint element, said inner joint element having convex spherical outer surface means for coacting with said cage second spherical surface, the centers of said first and second cage spherical surfaces being equidistant on opposite sides of said ball plane, said cage first spherical surface comprising at least three circumferentially spaced guide ridges thereon each positioned between a pair of balls and the diameter of said cage first spherical surface and said guide ridges being greater than the smallest diameter of said bore within said outer joint element, said outer joint element bore having a plurality of second grooves therein corresponding in number and spacing to said guide ridges and each second groove being between two ball grooves, said second grooves having a diameter corresponding to the diameter of said cage first spherical surface so that said cage is guided by coaction of its said guide ridges in said second grooves.

# 4,012,925 CONSTANT VELOCITY TORQUE TRANSMITTING JOINT

Werner Krude, Neunkirchen, Germany, assignor to Lohr & Bromkamp GmbH, Offenbach, Main, Germany

Filed Dec. 11, 1975, Ser. No. 639,752

Claims priority, application Germany, Dec. 23, 1974, 2461289

Int. Cl.<sup>2</sup> F16D 3/30

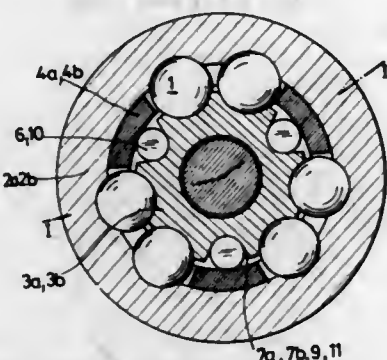
U.S. Cl. 64-21

5 Claims

1. A constant velocity torque transmitting joint comprising an outer joint element having a bore therethrough and a plurality of grooves in the surface of said bore, an inner joint



element within said bore and having a plurality of grooves in its outer surface corresponding in number to said outer joint element grooves to define pairs of opposed grooves, a plurality of balls between said joint elements with each ball being in a pair of opposed grooves, a cage between said joint elements and having a plurality of openings therein to retain said balls in a plane which is perpendicular to the axis of the cage and which bisects the angle between the joint elements, said cage having a first spherical surface on its outer face and a second spherical surface on its inner face, means on the inner face of said outer joint element co-acting with said cage first spherical



surface for guiding said cage with respect to said outer joint element, alignment control means on said inner joint element supporting and guiding said cage second spherical surface, the centers of said first and second cage spherical surfaces being equidistant on opposite sides of said ball plane, there being a plurality of circumferentially spaced recesses in said inner joint element between the grooves therein, said alignment control means comprising a plurality of control elements within said plurality of spaced recesses, the centers of said control elements and the center of said cage second spherical surface being located in a common plane.

4,012,926

## CAM CARRIAGE IN DUAL-BED HAND KNITTING MACHINE

Fuji Kolke, 2006-143 Aza-Sakane Oaza-Minami, Tempaku-cho, Showa, Nagoya, Aichi, Japan

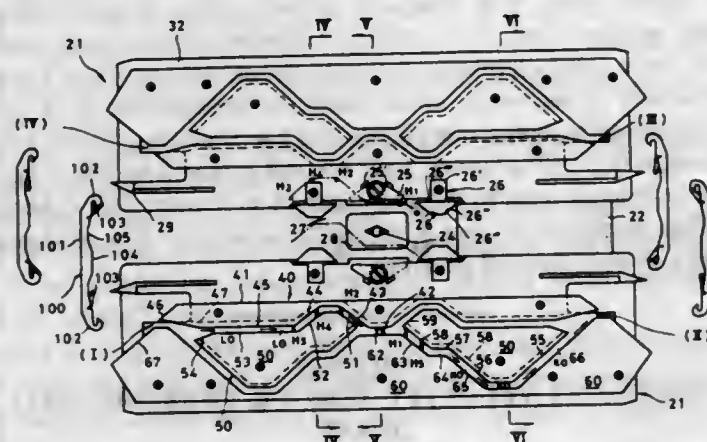
Filed May 19, 1976, Ser. No. 687,864

Claims priority, application Japan, June 24, 1975, 50-78239; June 24, 1975, 50-78240; June 24, 1975, 50-78369[U]; June 24, 1975, 50-78241

Int. Cl.<sup>2</sup> D04B 7/06

U.S. Cl. 66-63

8 Claims



1. A hand knitting machine for pearl knitting comprising two needle beds arranged oppositely and spacedly in a horizontal plane, each of said beds having a plurality of vertical needle grooves, and a manually actuatable cam carriage having a yarn feeder at the center thereof either transversely or vertically and two cam arrangement base members to be transversely reciprocated astride and along said two beds, each of said base members having on the reverse side thereof

two passages defined by a plurality of cam plates and extending along the transverse length thereof symmetrically in respect of said central yarn feeder, so that when actuating said carriage a plurality of double hook latch needles arranged respectively in said needle grooves are successively subjected to vertically forward and rearward movement along the respective needle groove according to engagement of every latch cleared hook on one side of the needle directly with any of said passages, whereby every opposite side hook may be subjected to knitting operation on the opposite needle bed and beneath the opposite cam arrangement base member, wherein the improvement lies in the cam carriage comprising:

four needle latch passages arranged symmetrical either transversely or vertically in respect of said central yarn feeder, each having an entrance, a forwardly inwardly slanted part for advancing the needle to cause "latch-over" movement, a rearwardly inwardly slanted part for retracting the needle, a central part so located that when the passage cam engaging hook of the needle lies therein the opposite hook of which concerned latch is cleared may face just at the yarn feeder for receiving yarn, a rearwardly outwardly slanted part for further retracting the needle to cause "knock-over" movement, a forwardly outwardly slanted part for advancing the needle, and an exit symmetrically positioned in relation to said entrance, said exit being to be an entrance of the other passage arranged symmetrically on the same cam arrangement base member so as to have said central part commonly and for the needles each to pass therethrough when actuating the carriage in the opposite direction;

four pairs of symmetrically arranged guide members, each provided at the outermost end of said cam arrangement base member and having inwardly convergent guide faces therebetween so as to bring the passage cam engaging hook of the needle eventually not in the vertically correct position in the concerned needle groove correctly to said passage entrance;

four symmetrically arranged members for clearing the needle latch on the passage cam engaging hook side, each having a transversely outwardly pointed portion and provided at the concerned passage entrance so as to clear the eventually closed latch; and

two symmetrically arranged pivoted arm members, each pivoted between said yarn feeder and said yarn receiving central part of the passage so as to be freely angularly moved by substantially 180° between the two positions in either of which the inner side of the transversely elongated arm is substantially parallel to the carriage travel direction, whereby when said arm member is in its operative position in which the arm member extends in the direction opposite to the carriage travel, the inner side of said arm member abuts on the knitting operation hook so as to correctly guide the passage cam engaging hook from the central yarn receiving passage part into the rearwardly outwardly slanted passage part for retracting the needle and causing the "knock-over" movement.

4,012,927

## LOOP TRANSFERRING CAM SYSTEM FOR FLAT KNITTING MACHINES

Gottfried Kühnert, Aalen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Sept. 9, 1975, Ser. No. 611,757

Claims priority, application Germany, Sept. 10, 1974, 2443231

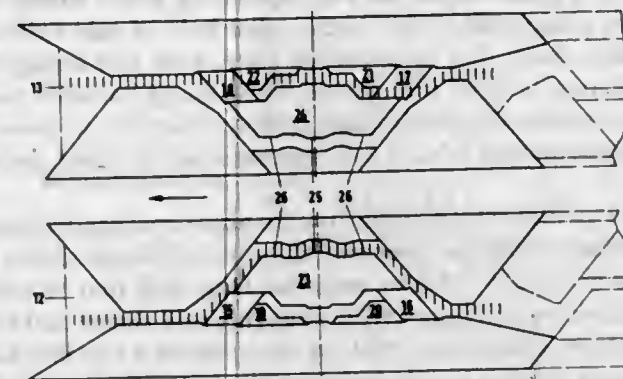
Int. Cl.<sup>2</sup> D04B 7/00, 15/36, 35/00

U.S. Cl. 66-78

4 Claims

1. In a flat knitting machine having opposed needle beds including a plurality of latch-type needles having rigid loop expanders secured thereto and a carriage traversible along said beds including cam means for knitting and for transferring loops from the needles of one needle bed to the needles

of the other needle bed during the traverse of the carriage, said cam means comprising a pair of cam sets on the carriage cooperable with the needles of each needle bed respectively, each of said cam sets including a transfer cam having a higher nose for expanding the loops and a following lower nose for transferring the loops, the improvements comprising each cam set including a transfer cam having at least three noses which are consecutive in the direction of traverse of the carriage and having depressions of equal depth between adjacent noses, said transfer cam including spaced a complementary opposed



cam for camming the needles into each depression, said three noses including at least one higher nose followed by at least one lower nose for opposite directions of traverse by said carriage and receiving cams adapted to lift the receiving needles associated with said transfer cam in the opposite cam set for both directions of traverse by said carriage whereby the lower nose following said higher nose for each direction of traverse is adapted to lift the needles from which loops are to be transferred high enough for the closed latches of the needles which are to receive the loops to be opened by the loops as they slide over the receiving needles.

4,012,928

## CYLINDER RETENTION MECHANISM

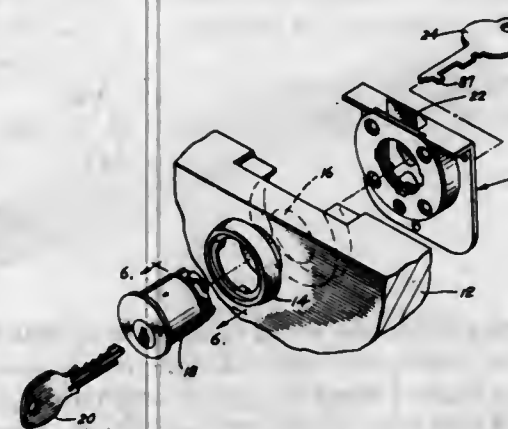
Robert L. Dauenbaugh, Rockford, Ill., assignor to Keystone Consolidated Industries, Peoria, Ill.

Filed Feb. 27, 1976, Ser. No. 662,153

Int. Cl.<sup>2</sup> E05B 65/44, 9/06

U.S. Cl. 70-81

10 Claims



1. In a lock device of the type including a housing and a removable cylinder, said housing including a bolt slidable between a projected position and a retracted position, said housing also including an opening for receipt of part of the lock cylinder, said lock cylinder including a member for drivingly engaging the bolt when said lock cylinder is retained with said housing, the improvement of means for retaining the lock cylinder in the housing comprising, in combination:

a retainer ring extending at least partially, circumferentially about the opening;

means including a shifter mounted in the housing engageable with the ring for rotating said ring between a first locked position and a second unlocked position;

one of said cylinder and said ring including at least one projecting tab; and

the other of said cylinder and said ring including at least one channel for receipt of said tab whenever said cylinder is in the locked position whereby said ring and said cylinder may be rotated relative to each other to unlock said cylinder from said housing.

4,012,929

## LATCH CONSTRUCTION WITH IMPROVED ANTI-VIOLATION FEATURES

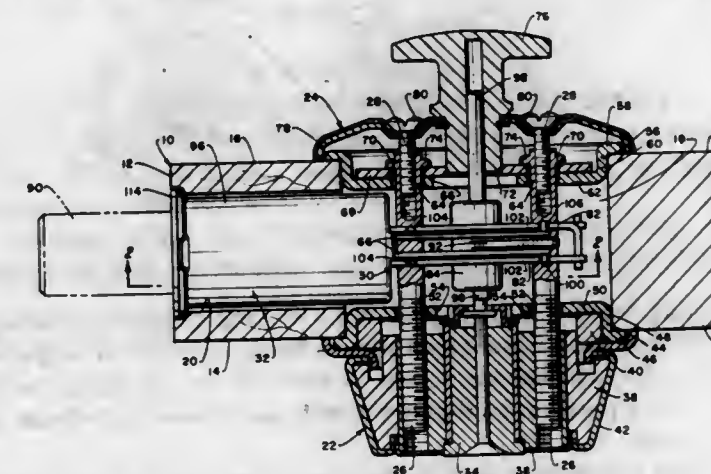
Paul G. Solovietz, Tustin, Calif., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed May 19, 1976, Ser. No. 687,989

Int. Cl.<sup>2</sup> E05B 9/04; E05C 1/06

U.S. Cl. 70-134

18 Claims



1. In a latch construction of the type for mounting in doors and the like with a bolt extendable from a door edge, a latch driving mechanism mounted within the door operably connected to said bolt movable for moving said bolt between extended and retracted positions, an exterior operator assembly projecting outwardly from an exterior door face at a transverse opening through the door including a lock frame mounting a lock cylinder telescoped by a surrounding annular cover inwardly abutting said exterior door face around said door opening, an interior operator assembly projecting outwardly from an interior door face at said door opening including an interior operator and an annular cover inwardly abutting said interior door face around said door opening, said lock cylinder of said exterior operator assembly and interior operator of said interior operator assembly being operably connected to said latch driving mechanism for selectively moving said latch driving mechanism, and fastening means engaged between said lock frame of said exterior operator assembly and said interior operator assembly retaining assembly of said exterior and interior operator assemblies with said latch driving mechanism and said door; the improvements comprising: said interior operator assembly further including a separate interior reinforcing plate transversely spanning said door opening and edge abutting said interior door face; said fastening means including primary fasteners operably engaged with said interior reinforcing plate securing said lock frame of said exterior operator assembly directly to said interior reinforcing plate, secondary fasteners directly engaged with ends of said primary fasteners and operably engaged with both said interior operator and said cover of said interior operator assembly securing said interior operator and said cover directly to said primary fasteners.

4,012,930

## LOCKS

Everett H. Benson, Rte. 1 Box 429, Eagle Creek, Oreg. 97022

Filed Oct. 24, 1975, Ser. No. 625,511

Int. Cl.<sup>2</sup> E05B 71/00; B62H 5/00

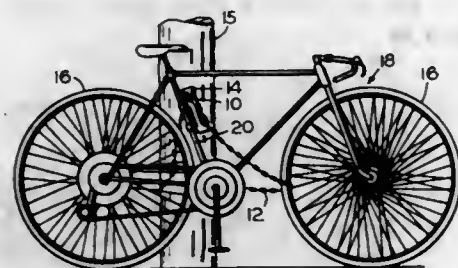
U.S. Cl. 70-234

4 Claims

1. In an improved lock, a chain having links of a predetermined width and a predetermined thickness,



a tubular container open at one end and having a pair of slots extending from said end a predetermined distance and of a width sufficient to permit the links to be moved edgewise thereinto and sufficiently narrow to prevent the links adjacent to links in the slots from moving through the slots,  
a cap adapted to fit over the open end portion of the container to close the open ends of the slots to trap the links in the slots,  
means on one end of said tubular cylinder providing keeper means and at least one circumferentially displaced groove.



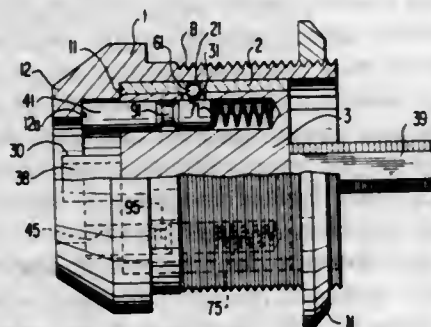
lock means on the cap having a locking member turnable on operation of said lock means from a position in alignment with said keeper means to lock the cap to the container, to a position in alignment with said groove to release said cap,  
said cap having stop means projecting into at least one of said slots to preclude turning of the cap relative to the container, and  
an anchoring member non-rotatably engaging said lock means and said stop means to preclude rotation of said lock means relative to said tubular container, the container serving to receive the chain and store it when the chain is not used for securing purposes.

#### 4,012,931 TUMBLER LOCK

Kouichi Harunari, Kagoshima, Japan, assignor to Kokusan Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Jan. 13, 1976, Ser. No. 648,705  
Int. Cl.<sup>2</sup> E05B 27/08

U.S. Cl. 70-363

4 Claims



1. A tumbler lock, comprising:  
a hollow cylinder casing,  
a sleeve concentrically received within said casing and secured thereto,  
a cylinder member rotatably supported within said sleeve and coaxial therewith,  
the improvement comprising:  
a first tumbler mechanisms including a plurality of circumferentially spaced holes at a common axial position within at least the inner peripheral surface of said sleeve,  
a corresponding number of radially extending, circumferentially spaced holes of somewhat larger diameter at positions within said cylinder member corresponding to the holes of said sleeve,

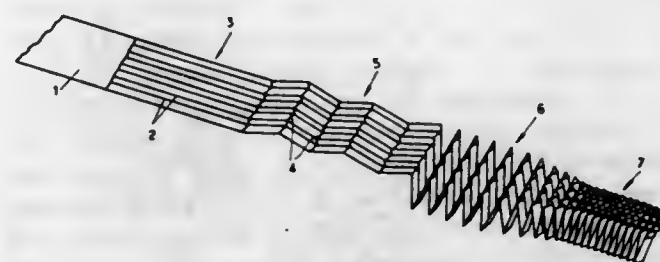
bottomed holes extending longitudinally within said cylinder parallel to its axis from one end thereof and intersecting said radially extending holes within said cylinder;  
a biasing spring in the bottom of, each bottomed hole within said cylinder member,  
a tumbler pin slidably mounted within a corresponding bottomed hole, said tumbler pins being formed with an annular groove at different axial positions,  
a ball of a diameter less than the diameter of the radially extending holes within said cylinder member but greater than the diameter of the corresponding holes within the sleeve positioned within each radial hole of said cylinder member such that in a normal state, said ball engages a respective hole of said sleeve while being partially positioned within the hole of said cylinder member to prevent relative rotation of said cylinder member and said sleeve, and  
a plurality of second tumbler mechanisms arranged coaxial within said cylinder member at radial positions closer to the axis of said cylinder member than said first tumbler mechanisms and operatively engaging said sleeve and said cylinder member such that, by insertion of a key into said lock and turning it, said balls are aligned with the annular grooves of said tumbler pins of said first tumbler mechanism and are disengaged from the holes of said sleeve and said second tumbler mechanisms are shifted axially to a position to release said cylinder member with respect to said sleeve to permit relative rotation between said cylinder member and said sleeve.

#### 4,012,932 MACHINE FOR MANUFACTURING HERRINGBONE-PLEATED STRUCTURES

Lucien Victor Gewiss, Vernon, France, assignor to Marc Wood S.A., Paris, France  
Filed June 5, 1975, Ser. No. 584,125  
Claims priority, application France, June 6, 1974, 74.19523  
Int. Cl.<sup>2</sup> B21D 5/16

U.S. Cl. 72-187

17 Claims



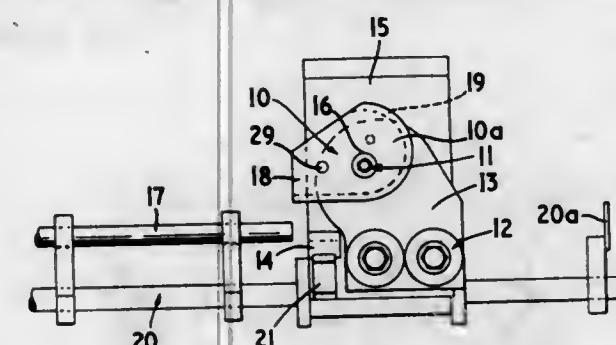
1. A machine for manufacturing herringbone-pleated structures from flat sheet material and comprising alternating transverse folds located along ridge lines which are parallel to each other and which are connected together by alternating longitudinal folds, said machine comprising:  
a pair of endless forming assemblies each supporting folding elements engagable with opposite sides of at least one strip of sheet material, said folding elements being positioned and shaped to establish a roughed-out shape of the transversely and longitudinally folded structure to be formed and movable continuously to advance the roughed-out shape in a downstream direction;  
means for continuously feeding at least one strip of sheet material to said forming assemblies, said feeding means being positioned upstream from said forming assemblies; and  
bunching means positioned downstream from said forming assemblies for transversely and longitudinally tightening up the folds of the roughed-out shape to form the final herringbone-pleated structure.

4,012,933  
BENDING MACHINES  
John Brian Porter, Newton Abbot, England, assignor to Russell Bowen Systems Ltd., Newton Abbot, England  
Filed Sept. 4, 1975, Ser. No. 610,229  
Claims priority, application United Kingdom, Sept. 11, 1974, 39612/74

U.S. Cl. 72-217

Int. Cl.<sup>2</sup> B21D 7/024

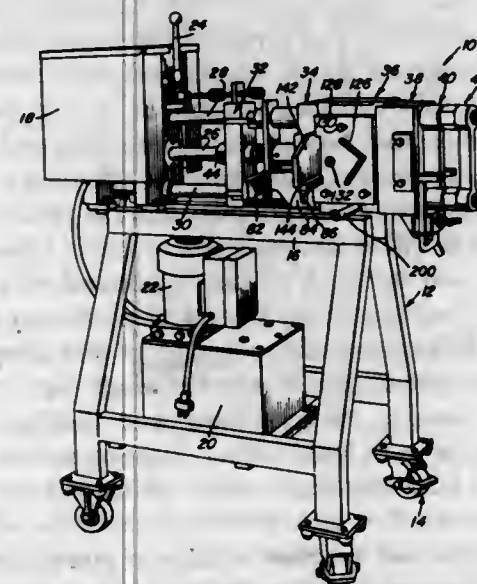
16 Claims



1. A bending unit comprising:  
a. a former device;  
b. bending means disposed on a rotatably mounted bending arm means;  
c. a clamp member;  
d. means for rotating the bending arm means about a fixed axis;  
e. carrier shaft means disposed coaxially with said fixed axis; and  
f. means connecting the former device to the carrier shaft to move the former device between an open position and a bending position;  
g. in the open position said former device being spaced apart from the bending means by an amount sufficient to allow movement of a workpiece therebetween;  
h. in the bending position said former device being effective to thrust a workpiece against the bending means and clamp member.

4,012,934  
MULTIPURPOSE METAL WORKING MACHINE  
Guthrie B. Stone, Honeoye, and William F. Holmes, Springwater, both of N.Y., assignors to Springwater Mfg. Co., Inc., Honeoye, N.Y.  
Filed Sept. 14, 1973, Ser. No. 397,572  
Int. Cl.<sup>2</sup> B21D 43/28; B21K 27/06; B26D 5/08  
U.S. Cl. 72-324

15 Claims



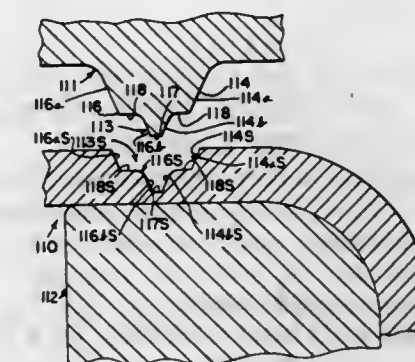
1. A work deforming machine comprising a frame, a plurality of separate slide members, elongated guide means mounted by the frame for establishing a path of movement along which said slide members are reciprocable, tool means

response to relative movement of the slide members for performing different operations, power operated means connected to one of said slide members for imparting reciprocal movement thereto, and lock means for selectively interconnecting the slide members with each other or with the frame to perform said different operations in response to reciprocation of said one of the slide members by the power operated means, each of said different operations being performed at spaced locations along said path of movement, at least one of said tool means including cooperating tool members mounted on adjacent ones of the slide members, at least one of said tool means including cooperating tool members mounted for selective movement on one of the slide members, one of said tool members being actuated by another of the slide members adjacent thereto.

4,012,935  
SCORE AND TOOL FOR FORMING THE SCORE  
Albert J. Holk, Jr., Frankfort, and Jerry D. Hawkins, Country Club Hills, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.  
Division of Ser. No. 370,903, June 18, 1973, Pat. No. 3,898,944. This application Apr. 11, 1975, Ser. No. 567,351  
Int. Cl.<sup>2</sup> B21D 51/38

U.S. Cl. 72-325

10 Claims



1. A scoring punch for forming a score in a metal sheet, said scoring punch comprising a punch member having a base, a rib projecting from an intermediate portion of said base with said base having inoperative flat surfaces on opposite sides of said rib, said rib having a bottom wall, opposing side walls inclined directly from said base toward said bottom wall, and at least one of said side walls having a ledge intermediate the length thereof and spaced from said bottom wall and said base, said one side wall being in sloping relation to said base both above and below said ledge.

4,012,936  
METHOD AND DEVICE FOR BENDING PIPES  
Enrico Sebastiani, Milan, Italy, assignor to Tag Vertrieb A.G., Zurich, Switzerland  
Filed Dec. 17, 1975, Ser. No. 641,580  
Claims priority, application Italy, Dec. 20, 1974, 30863/74  
Int. Cl.<sup>2</sup> B21D 7/06

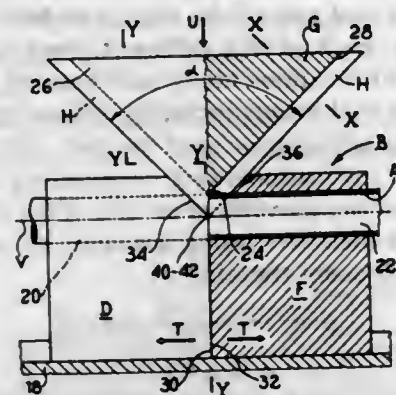
U.S. Cl. 72-369

4 Claims

1. A method for forming a bend having a substantially zero inner radius of curvature in a pipe, said method comprising: providing a straight length of pipe having a longitudinal axis and a predetermined cross-sectional configuration transverse to said axis, said length of pipe having a portion longitudinally thereof to be deformed into a bend; applying a force, in a direction transverse to said axis, to a first section of said portion to be deformed, and physically shifting said first section in said direction; applying a force in said direction to second sections of said portion to be deformed on immediate opposite longitudinal sides of said first section, and physically shifting said second sections in said direction while further shifting said first section; and



continuing to apply a force to successive additional sections of said portion to be deformed on opposite longitudinal sides of said first section, and successively physically shifting said additional sections in said direction while further shifting previously shifted sections;



all of said sections being shifted solely in said direction and parallel to each other; whereby there is formed in said portion to be deformed a bend having a substantially zero inner radius of curvature.

#### 4,012,938 DEVICE FOR INSERTING OR REMOVING A HOT BLANK IN A DROP HAMMER

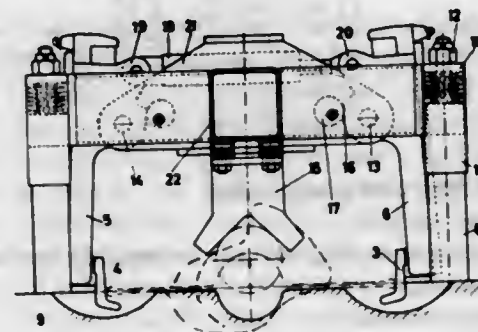
Karl Ivar Brändström, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed May 21, 1975, Ser. No. 579,634

Claims priority, application Sweden, June 7, 1974, 7407506  
Int. Cl.<sup>2</sup> B21D 43/10, 45/06

U.S. Cl. 72-422

9 Claims



1. A device adapted to coact with the flash on a hot blank for manipulating said blank relative to a forging tool in a drop hammer, said forging tool comprising a lower die member, said device comprising two pairs of gripping jaws carried by a unit connected to a rotatable tongs arm, said jaws being operative to coact with said blank via recesses provided in said forging tool, each of said recesses having a smoothly curved, cup-shaped interior configuration dimensioned to receive one of said gripping jaws during movement of said tongs arm, each of said recesses being located in said forging tool at a position spaced inwardly from the outer edges of said tool at a location below at least a portion of the flash formed on said blank when said blank is forged in said forging tool, a counter-holder positioned to engage said lower die member of said forging tool adjacent an edge of each of said recesses, said gripping jaws and said counter-holder being mounted on said unit for insertion over said blank by movement of said tongs arm, a gripping claw supported by each of said gripping jaws respectively for selectively engaging said flash, each of said gripping claws being spaced from and vertically displaceable relative to said counter-holder, means for moving said tongs arm to insert said claws into said cup-shaped recesses in said tool while positioning said counter-holder over said forging tool adjacent said edges of said recesses, and means for effecting a selective vertical displacement of said gripping claws in relation to said counter-holder to effect simultaneous coaction between said gripping claws and the flash on said blank and between said counter-holder and said lower die member thereby to break loose a forged blank from said tool, each of said gripping jaws including an elongated slidable member which supports one of said gripping claws at its lower end, said slidable member being displaceable in its longitudinal direction relative to said gripping jaw, at least one single-action lifting jack and at least one spring connected to said slidable member for selectively displacing said slidable member relative to said jaw, the gripping jaws in the respective pairs of gripping jaws being pivotally supported on two parallel shafts, and a hydraulic piston connected to the upper parts of said jaws for controlling movement of said jaws about said shafts to move said claws toward and away from one another.

#### 4,012,937 WORK TRANSFER AND DRIVE DEVICE IN A TRANSFER PRESS

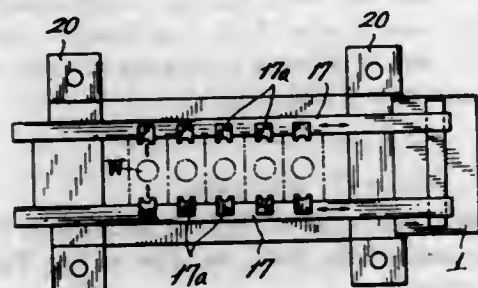
Shozo Imanishi, Sagami-hara, Japan, assignor to Aida Engineering Ltd., Kanagawa, Japan

Filed Mar. 23, 1976, Ser. No. 669,650

Claims priority, application Japan, Apr. 5, 1975, 50-40789  
Int. Cl.<sup>2</sup> B21D 43/00

U.S. Cl. 72-419

3 Claims



1. A work transfer and drive device in a transfer press comprising a stationary shaft supported in the framework of said press, an actuator gear rotatably supported on said stationary shaft to be driven by a prime mover through intermediary drive shaft of said press, a sun gear integrally mounted on said stationary shaft in coaxial relationship to said actuator gear, a planetary gear fixedly secured to an eccentric shaft on said actuator gear in meshing with said sun gear, an eccentric pin integral with said eccentric shaft, a rotary member rotatably mounted on said stationary shaft and having a radial groove formed therein for slidably receiving said eccentric pin, said rotary member having a second eccentric pin, a first slidable member guided by a stationary guide bar parallel to feed bars of said transfer press for operatively receiving said second eccentric pin and a second slidable member operatively connected to one of feed bars and to said first slidable member.

#### 4,012,939 LOCATION DETECTING DEVICES AND METHODS

Alan Thomas Joseph Hayward, Glasgow, Scotland, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

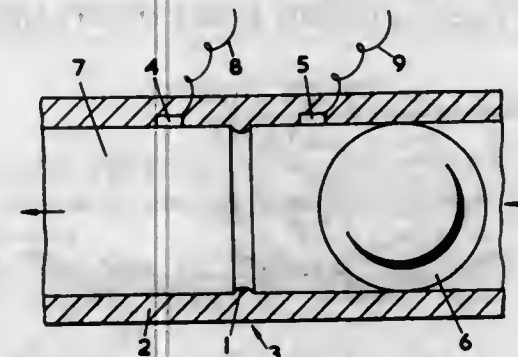
Filed June 10, 1975, Ser. No. 585,520

Claims priority, application United Kingdom, June 12, 1974, 26171/74

Int. Cl.<sup>2</sup> G01F 25/00; G01L 9/12

U.S. Cl. 73-3

10 Claims



1. A detection device for sensing the presence of a passing discrete body transported longitudinally through a closely fitting pipeline by fluid flow, comprising an inwardly extending annular region of constricted cross-section formed within the pipeline, said region having an internal peripheral surface which is of smaller transverse cross-section than, and momentarily engageable with, an external peripheral surface of the passing discrete body, thereby to impede momentarily said fluid flow, and to cause a continuous build-up of upstream fluid pressure until said upstream fluid pressure is of sufficient magnitude to force said discrete body through said region, at least one of said two peripheral surfaces being resilient; and detection means in the internal surface of said pipeline and adjacent said region, adapted for detecting a momentary variation in a local, mensurable parameter, said momentary variation being consequent upon the momentary engagement between said two peripheral surfaces.

#### 4,012,940 CONFORMAL PRESSURE TRANSDUCER

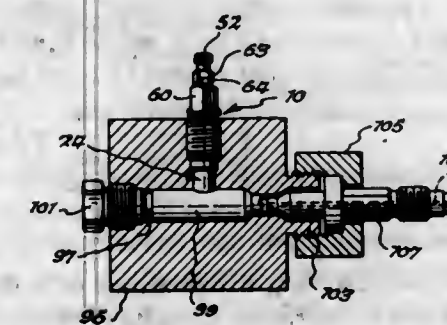
Nicholas D. Change, West Seneca, and Michael T. Riggs, Batavia, both of N.Y., assignors to PCB Piezotronics, Inc., Depew, N.Y.

Division of Ser. No. 521,687, Nov. 7, 1974, Pat. No. 3,960,018, which is a division of Ser. No. 381,700, July 23, 1973, Pat. No. 3,886,792, which is a continuation-in-part of Ser. No. 234,017, March 13, 1972, abandoned. This application Apr. 19, 1976, Ser. No. 678,216

Int. Cl.<sup>2</sup> G01L 9/06, 27/00

U.S. Cl. 73-4 R

1 Claim



1. In combination with a transducer for converting pressure changes into electrical signals wherein the pressure changes act on one surface of a relatively thin wall comprising a housing, piston means on one end of said housing and having a contoured end surface conforming to the other surface of said wall opposite the surface on which said pressure changes act,

piezoelectric means within said housing and mechanically connected to said piston means, and electrical path defining means for connecting said piezoelectric means to means for deriving an electrical signal, whereby when said contoured end surface of said piston means firmly contacts and conforms to the other surface of said wall, pressure applied through said wall to said contoured end surface deforms said piezoelectric means to generate an electrical output signal proportional to the applied pressure wherein said pressure changes occur within a tube which is closed at one end and opened at the other and wherein said contoured end surface of said piston means is concave so as to conform to the outer surface of the tube; calibration fixture means comprising a body having a chamber for holding said tube, means in said body for positioning said transducer so that said contoured end surface of said piston means firmly contacts and conforms to the outer surface of said tube, and means communicating with said chamber for introducing a known calibration pressure into said tube through the open end thereof.

#### 4,012,941 METHOD OF AND APPARATUS FOR MEASURING THE AMPLITUDE OF OSCILLATION OF THE BALANCE OF A TIMEPIECE MOVEMENT

Erich Jucker, Yvan Greiner, both of La Chaux-de-Fonds, and André Lehmann, Peseux, all of Switzerland, assignors to Portescap, La Chaux-de-Fonds, Switzerland

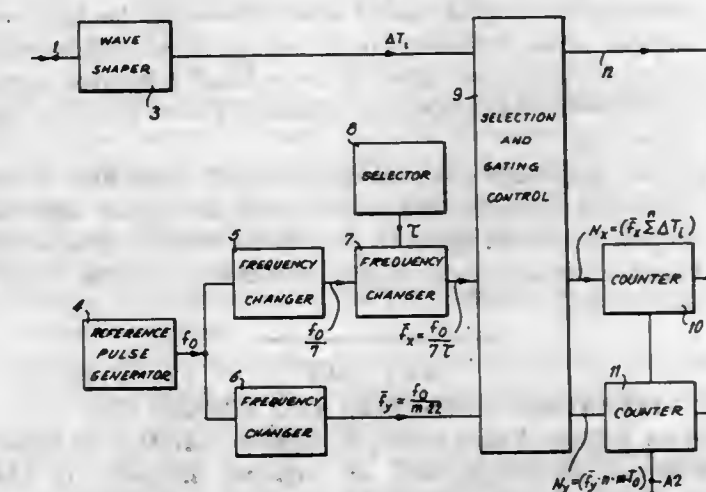
Filed Jan. 13, 1976, Ser. No. 648,817

Claims priority, application Switzerland, Jan. 14, 1975, 407/75

Int. Cl.<sup>2</sup> G04D 7/12

U.S. Cl. 73-6

18 Claims



1. A method of measuring the amplitude of oscillation of the balance of a timepiece movement having an escapement adapted for disengagement and engagement, successively, the balance having a predetermined angle of lift, comprising the steps of measuring the time intervals between successive disengagement and engagement, measuring the duration of vibration of said balance; counting the number of pulses of a first frequency produced during at least one of said measured time intervals; counting the number of pulses of a second frequency produced during at least one of said vibration durations, said first and second frequencies exhibiting a predetermined relationship relative to each other; and dividing the number of said pulses of said second frequency by the number of pulses of said first frequency, whereby the quotient is equal to said amplitude.



4,012,942

**BORDERLINE SPARK KNOCK DETECTOR**

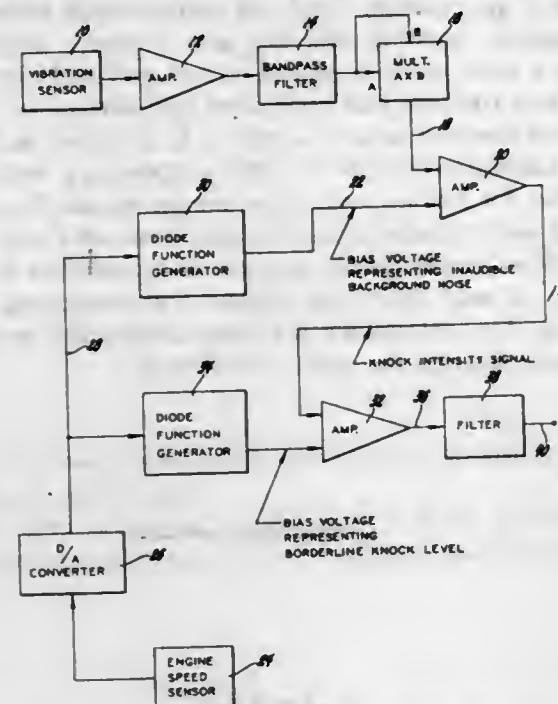
John L. Harned, Grosse Point Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 17, 1976, Ser. No. 686,643

Int. Cl.<sup>2</sup> G01L 23/22

U.S. Cl. 73—35

3 Claims



2. A borderline knock detector for a spark ignition internal combustion engine comprising means for sensing engine vibrations arising from engine knock and engine background noise and for providing a corresponding electrical vibration signal, means effective to produce a first reference signal in response to engine speed simulating engine inaudible background noise, a first amplitude discrimination circuit responsive to the difference between the electrical vibration signal and the first reference signal to provide a knock intensity signal, means effective to produce a second reference signal in response to engine speed and simulating background audible noise including both engine noise and vehicle noise, whereby the value of the second reference signal corresponds to the borderline audible knock level for that speed, and a second amplitude discrimination circuit responsive to the difference between the knock intensity signal and the second reference signal to provide an output signal when knock intensity exceeds the borderline audible knock level.

4,012,943

**MEASURING METHOD AND APPARATUS**

Frederick William Frank Goffe, Broughton, and Donald James Pilkington, Kettering, both of England, assignors to The Shoe &amp; Allied Trades Research Association, England

Filed Oct. 10, 1975, Ser. No. 621,553

Claims priority, application United Kingdom, Oct. 10, 1974, 44032/74

Int. Cl.<sup>2</sup> G01B 13/20, 13/04

U.S. Cl. 73—37.7

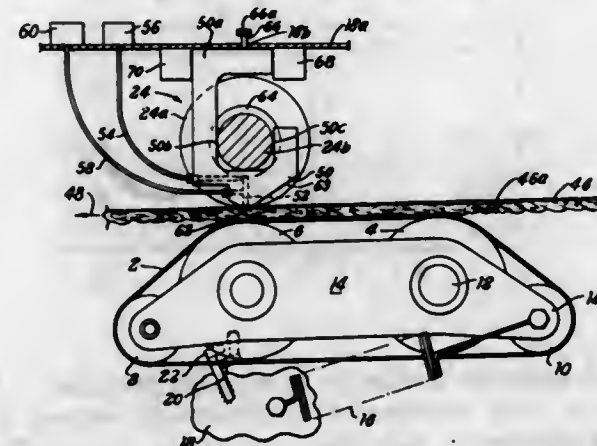
13 Claims

1. Apparatus for measuring the area of irregularly shaped, flexible workpieces comprising: a plurality of nozzles arranged in a row, each said nozzle having an orifice for the passage of a fluid therethrough; supporting means extending along said row of nozzles and in opposed relationship to said orifices, said supporting means being operative to support said workpiece in engagement with those of said nozzles which are aligned with said workpiece and to cause said workpiece to close the orifices of said aligned nozzles when in engagement with said workpiece;

mounting means mounting said nozzles for movement independently of each other towards and away from said supporting means, said nozzles being biased towards said supporting means, and said supporting means being constructed and arranged so as not to close the orifices of any of said nozzles not aligned and in engagement with said workpiece;

conveying means for conveying said workpiece while supported by said supporting means in engagement with said nozzles past said nozzles in a direction transverse to said row of nozzles and transverse to the direction of said movement of said nozzles;

means for supplying pressure to each of said nozzles;



a plurality of pressure sensors connected, respectively, to each of said nozzles, each said pressure sensor being responsive to pressure within the nozzle to which it is connected, and operable to assume a first state while the orifice of each said connected nozzle is not closed by engagement with said workpiece and a second state while said orifice is closed by engagement with said workpiece; and counting means operable to repeatedly count the number of said sensors in said second state while said workpiece is conveyed past said nozzles, whereby a measure of the area of said workpiece will be obtained upon completion of the conveying of said workpiece past said nozzles.

4,012,944

**ELECTRONIC FLUID PIPELINE LEAK DETECTOR AND METHOD**

Morris T. Covington, and Steven M. Griffin, both of Houston, Tex., assignors to Shafter Valve Company, Mansfield, Ohio

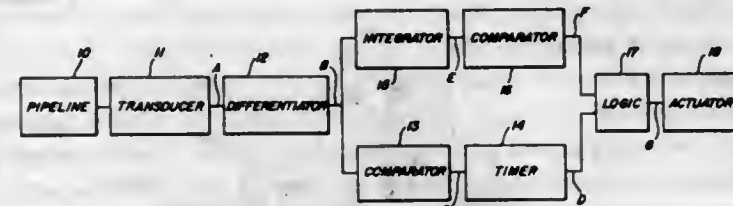
Filed Dec. 9, 1974, Ser. No. 530,709

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> G01M 3/08

U.S. Cl. 73—40.5 R

10 Claims



1. A system for detecting irregularities in a fluid carrying pipeline or the like comprising: transducer means monitoring a characteristic of the fluid in the pipeline and providing an output signal proportional thereto; differentiator means receiving the output signal of said transducer means and providing an output signal proportional to the rate of change of said characteristic with respect to time; first comparator means receiving the output signal of said differentiator means, comparing that output signal with a preselected rate of change of said characteristic with respect to time and providing an out-

put signal when the output signal of said differentiator means exceeds said preselected rate of change; timing means receiving the output signal of said first comparator and providing an output signal after a predetermined time delay; integrator means receiving the output signal of said differentiator means and providing an output signal proportional to the total change of said characteristic; second comparator means receiving the output of said integrator means, comparing that output signal with a preselected total change of said characteristic and providing an output signal when the output of said integrator means exceeds said preselected total change; said output signal of said timing means and said output signal of said second comparator being indicative of an irregularity in the fluid pipeline of sufficient size to warrant correction.

4,012,945

**MEANS FOR TESTING CONTAINERS FOR LEAKAGE**  
Gunnar Magnus Bergstrand, Stangholmsbacken 56, Skarholmen, Sweden

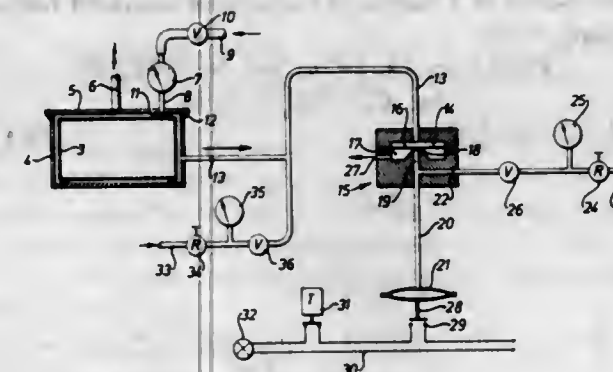
Filed Sept. 24, 1975, Ser. No. 616,310

Claims priority, application Sweden, Sept. 25, 1974, 7412067

Int. Cl.<sup>2</sup> G01M 3/32

U.S. Cl. 73—49.2

6 Claims



6. Apparatus for detecting a change of fluid pressure in a closed space, said apparatus comprising: fluid pressure sensitive means for responding within a predetermined period of time to a predetermined change in fluid pressure indicative of an unacceptable rate of leakage; conduit means for communicating said closed space with said fluid pressure sensitive means; and fluid pressure modifying means for applying a controlled additional change in fluid pressure to said fluid pressure sensitive means and for thereby reducing the time necessary for response to said predetermined change in fluid pressure.

4,012,946

**ULTRASONIC WELD INSPECTION SYSTEM**

John A. Patsey, Penn Hills Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1976, Ser. No. 667,770

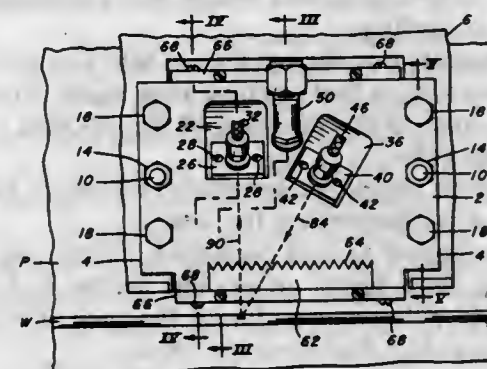
Int. Cl.<sup>2</sup> G01M 29/04

U.S. Cl. 73—67.7

11 Claims

1. A method of ultrasonic inspection for flaws in a longitudinal weld of a pipe or a weld joining plates wherein a beam of ultrasonic energy is directed into the material against a flaw which results in part of the energy scattering away from the flaw and in which part of the energy may reflect away from the flaw in a beam comprising the steps of: directing a beam of ultrasonic energy from a first transducer located on one side of the weld through a surface of the material joined by the weld into a predetermined region at the weld and receiving, with a second transducer located on the same side of the weld as the first transducer, a portion of the ultrasonic energy scattered away from the flaw along a

path which at the same time avoids receiving ultrasonic energy which may have reflected away from the flaw in a



beam and which extends from the predetermined region through the surface of the material.

4,012,947

**METHOD AND APPARATUS FOR TESTING BATTERY CONNECTOR WELDS**

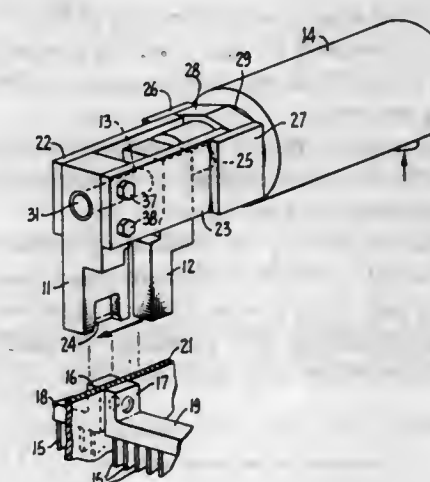
Ernest G. Tieg, Bragato Road, Belmont, Calif. 94002

Filed Apr. 10, 1974, Ser. No. 459,568

Int. Cl.<sup>2</sup> G01M 3/24

U.S. Cl. 73—101

7 Claims



1. A method for non-destructive testing of the weld strength of leak-proof welded through-the-wall battery connections of the type having a pair of upstanding flat plate-like projections on opposite sides of the battery partition with portions deformed into and welded within an opening in the partition, comprising the steps of: engaging an edge of one of the flat plate-like projections by an anvil member; engaging an opposite edge of the second of the flat plate-like projections on the opposite side of said battery partition by a pressure member and applying pressure to said anvil member and pressure member in opposite directions generally parallel to the partition for testing the weld strength of said connection.

4,012,948

**FUEL CONSUMPTION MEASURING DEVICE**

Akira Kuno, Nagoya; Yoshio Shinoda, Okazaki, and Hiroshi Arai, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed June 6, 1975, Ser. No. 584,497

Claims priority, application Japan, June 10, 1974, 49-65788

Int. Cl.<sup>2</sup> G01M 15/00

U.S. Cl. 73—113

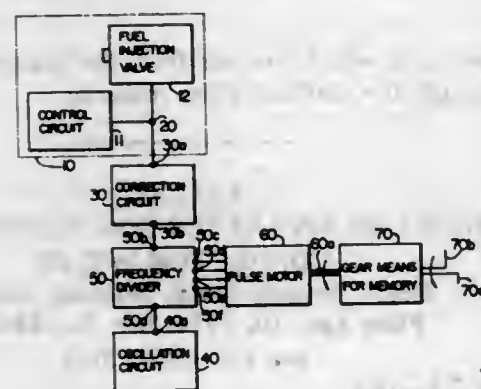
4 Claims

1. A fuel consumption measuring device for use in combination with a fuel injection system of the type in which the opening and closing of a fuel injection valve for intermittently



injecting fuel to an internal combustion engine is controlled in accordance with fuel injection time signals to thereby control the amount of fuel fed to said engine, said combustion measuring device comprising:

- means responsive to the opening of said fuel injection valve for generating a fuel opening time signal having a pulse width equal to the duration of the opening of said fuel injection valve;
- an oscillation circuit for generating reference pulse signals having a predetermined frequency;
- means connected to said oscillation circuit and said valve opening time signal generating means for gating said reference pulse signals during the time duration of the opening of said fuel injection valve;



- means for dividing said gated reference pulses,
- a pulse motor connected to said dividing means, said pulse motor being rotatable in steps in response to the output of said dividing means;
- a unit fuel consumption pointer operatively coupled to said pulse motor for cyclicly rotating to indicate consumption of said predetermined fuel quantity,
- a total fuel amount pointer for indicating either the remanent fuel amount or the fuel consumption amount, and
- means coupling said total fuel amount pointer to said pulse motor for maintaining the position of said total fuel amount pointer when said fuel injection system is not operative.

4,012,949

## MILES PER GALLON COMPUTER SYSTEM MEANS

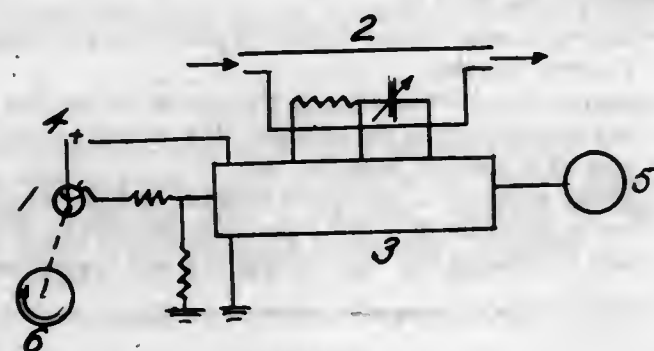
Walter J. Lanz, 82 Grant Ave., East Rockaway, N.Y. 11518

Filed Mar. 22, 1976, Ser. No. 669,149

Int. Cl.<sup>2</sup> G01F 9/00

U.S. Cl. 73-114

3 Claims



1. A new computer system means which provides accurate capability for both multiplication and division of two variable quantities and for presenting the result continually on a display indicator, comprising:

- a first transducer means for converting one variable quantity into an output of a series of a series of electrical pulses varying in frequency;
- a second transducer means for converting a second variable quantity into a varying output combination of electrical capacitance and resistance;
- a computer means, technically termed a "monostable re-

triggerable multivibrator," which, being connected electrically to the outputs of the said first and second transducers, receives pulses from the first transducer and capacitance-resistance information from the second transducer, and provides an output series of pulses constant in amplitude, varying in frequency identically with the frequency of the pulses supplied by the first transducer, and varying in width in proportion to the variation of the capacitance-resistance information supplied by the second transducer, the resulting output voltage averaged with respect to time, being the arithmetical product of pulse amplitude, pulse frequency and pulse width;

a regulated d.c. voltage source connected to the said computer which provides energy for its operation and establishes the magnitude of the constant amplitude of the computer output pulses;

an indicator means electrically connected to the computer output, whose dynamic damping causes it to respond to the average voltage of the computer output.

4,012,950

## METHOD OF AND APPARATUS FOR ACOUSTIC IMAGING

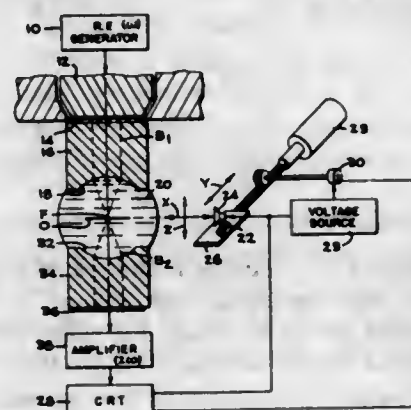
Rudolf Kompfner, Stanford; Marvin Chodorow, Menlo Park, and Ross A. Lemons, Mountain View, all of Calif., assignors to The Board of Trustees of the Leland Stanford University, Stanford, Calif.

Filed Dec. 12, 1974, Ser. No. 531,902

Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73-67.5 R

38 Claims



1. The method of acoustic imaging an object which comprises the steps of generating an acoustic beam at a predetermined frequency, focusing the acoustic beam at a predetermined focal point located in proximity to the object to be imaged whereby the focused acoustic energy impinges on the object, detecting acoustic energy resultant from such impingement with the object at a different frequency, and converting the detected acoustic energy to an output electric signal.

4,012,951

## ACOUSTIC EXAMINATION METHODS AND APPARATUS

Lawrence W. Kessler, 418 Warren Road, Glenview, Ill. 60025

Filed Mar. 8, 1976, Ser. No. 664,650

Int. Cl.<sup>2</sup> G01N 29/04

U.S. Cl. 73-67.6

29 Claims

1. In an acoustic imaging system for developing a visual image representative of the acoustic properties of an object, of the kind comprising:

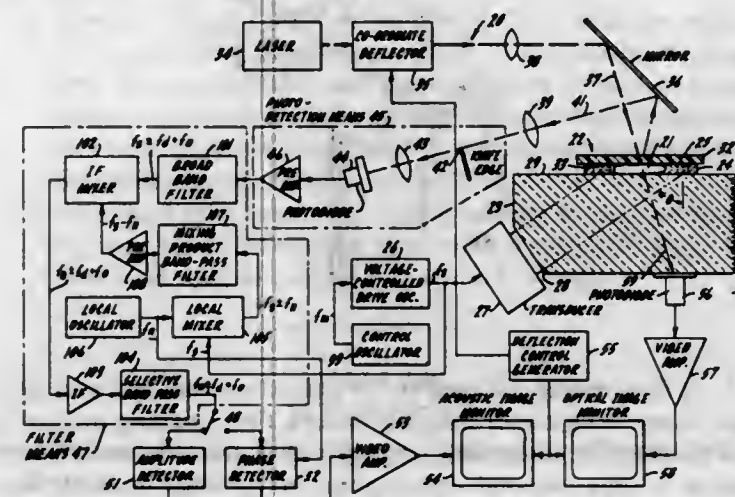
- an elastically deformable and at least partially light-reflective surface coupled to the object;
- insonification means for insonifying the object with acoustic waves of predetermined frequency  $f_0$  to develop a ripple pattern at the interface surface which is characteristic of the acoustic properties of the object;
- scanning means for scanning a high-energy small-diameter light beam across the interface surface;
- photodetection means for detecting the portion of the light

beam reflected from the interface surface to develop an initial electrical signal;

filter means for filtering the initial electrical signal to eliminate sidebands having undesired phase reversals and develop an image signal;

and imaging means utilizing the image signal to develop a visual image representative of the acoustic properties of the object;

the improvement comprising:



sonic modulating means, included in the insonification means, for continuously modulating the insonification frequency  $f_0$  at a rate which is asynchronous relative to any scanning frequency employed in the scanning means; and filter modulation means, included in the filter means and coupled to the insonification means, for continuously varying the effective center frequency of the filter means in synchronism with the modulation of the insonification frequency  $f_0$ ;

thereby minimizing acoustic speckle effects in the visual image.

4,012,952

## ULTRASONIC SYSTEM

Jacques Dory, Meaux, France, assignor to Realization Ultrasoniques, France

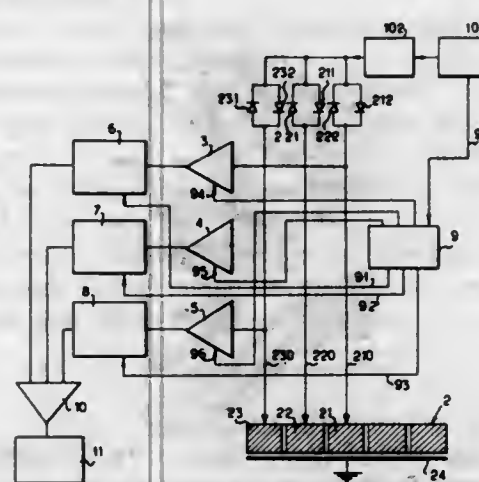
Filed Nov. 21, 1974, Ser. No. 525,751

Claims priority, application France, Nov. 22, 1973, 73.41921

Int. Cl.<sup>2</sup> G01N 29/00

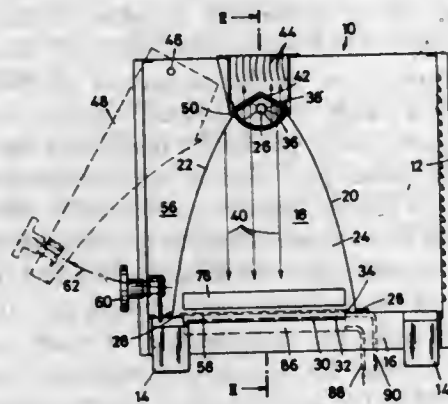
U.S. Cl. 73-67.7

5 Claims



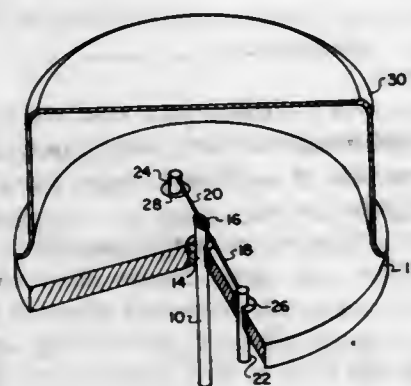


already known as such, are placed on an essentially horizontal support (32, 86, 92) and that the sample room located above the support is composed by an oblong reflector channel (18) of parabolic section, of which the extremities are shut off by



front walls (24) of parabolic contour; and the side walls (20, 22) of the reflector channel (18), being parabolic in operational condition, are made of elastic ductile sheet-metal, which assumes the parabolic shape when applied to the parabolic contour of the front walls (24).

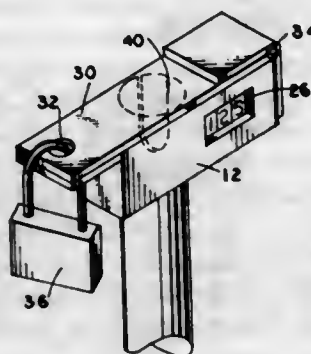
**4,012,955**  
**APPARATUS FOR MEASURING THE INCIDENT POWER OF LIGHT IN FIBER OPTICS**  
Pedro Americo Szente, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.  
Filed Jan. 19, 1976, Ser. No. 650,404  
Int. Cl.<sup>2</sup> G01K 17/00  
U.S. Cl. 73—190 EW 9 Claims



1. An apparatus for measuring the incident power of light from a fiber optic light conductor comprising:  
a first fiber optic light conductor for receiving light;  
a measurement thermistor which has first and second electrical leads and which is bonded to an end of the first fiber optic light conductor with an optically transparent bonding agent;  
a second fiber optic light conductor which receives no light;  
a reference thermistor which has first and second electrical leads and which is bonded to an end of the second fiber optic light conductor; and  
electrical connection means for providing electrical connection to the measurement and reference thermistors and adapted to be connected to metering apparatus to provide an indication of the incident power of the light transmitted through the first fiber optic light conductor to the measurement thermistor, the electrical connection means including electrically conductive terminals to which the first and second leads of the measurement and reference thermistors are attached.

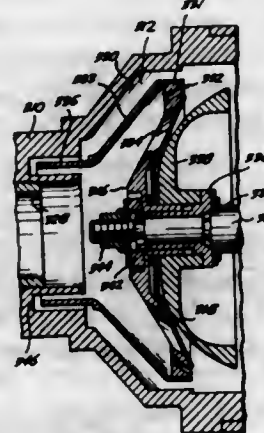
**4,012,956**  
**FLOW METER**

Eugene Carignan, Pawtucket, R.I., assignor to Lawrence Peska Associates, Inc., New York, N.Y.  
Filed Apr. 28, 1976, Ser. No. 681,071  
Int. Cl.<sup>2</sup> G01F 15/18  
U.S. Cl. 73—201 3 Claims



1. A flow meter adapted to be placed on the butt end of a pipe comprising meter housing means, first opening means in said housing for threadably engaging thread means on the butt end of a pipe, second opening means in said housing, the longitudinal axis of which is substantially transverse to the longitudinal axis of said first opening, a door means operably secured to the top of said housing and extending over said first opening, lock means for locking said door over said first opening and to said housing, flow meter means removably insertable in said housing through said door and into said first opening whereby said housing is threadably securable to the butt end of a threaded pipe, the end of said pipe having a U-shaped cutout for receiving said meter and when the meter is placed in said housing and in said pipe, fluid flow in said pipe may be measured, and said hinged door may be locked to prevent removal of said meter from the pipe and to seal the butt end of the pipe.

**4,012,957**  
**SHROUDED FLOWMETER TURBINE AND IMPROVED FLUID FLOWMETER USING THE SAME**  
William E. Chiles, Woodinville; LeRoy E. Vetsch, Lynnwood, and Jack V. Peterson, Seattle, all of Wash., assignors to Eldec Corporation, Lynnwood, Wash.  
Filed Apr. 27, 1976, Ser. No. 680,856  
Int. Cl.<sup>2</sup> G01F 1/10  
U.S. Cl. 73—231 R 11 Claims

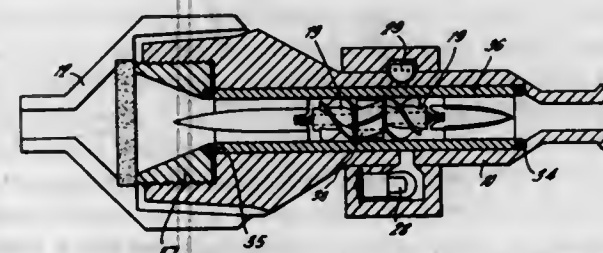


1. An improved fluid flowmeter comprising:  
a. housing means defining therein a fluid measurement chamber and further including fluid inlet means and fluid outlet means situated, respectively, at opposite ends of said fluid measurement chamber for admitting fluid into and removing fluid from said fluid measurement chamber, said fluid inlet means thereby defining an inlet opening having a predetermined cross-sectional area;  
b. a fluid reaction means mounted within said fluid measurement chamber for rotation about an axis of revolution

tion substantially aligned with said inlet opening and spaced apart from said inlet opening in the direction of fluid flow through said fluid measurement chamber, said fluid reaction means having a cross-sectional area in a direction transverse to the direction of fluid flow which is greater than said predetermined cross-sectional area of said inlet opening, said fluid reaction means further including a plurality of fluid reaction surfaces located radially outward of said axis of revolution for imparting rotational movement to said fluid reaction means;  
c. shroud means rotatable with said fluid reaction means and comprising a hollow member of revolution having a first end coupled to said fluid reaction means at points radially outward of said plurality of fluid reaction surfaces and tapering from said first end to a second end located in proximity to said inlet opening, and  
d. said fluid inlet means including sealing means surrounding said inlet opening for providing a rotatable fluid seal with said second end of said shroud means.

**4,012,958**  
**FLOWMETER**

Lionel Ivor Taylor, Copythorne House, Copythorne, Southampton, England  
Filed Dec. 9, 1975, Ser. No. 639,115  
Int. Cl.<sup>2</sup> G01F 1/10  
U.S. Cl. 73—231 R 3 Claims



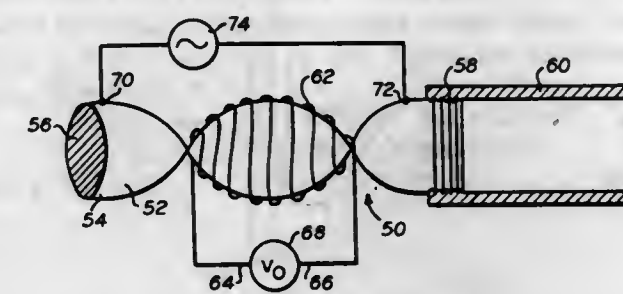
1. A fluid flowmeter, particularly for use with a specified fuel for measuring the rate of flow thereof to an engine, said flowmeter including a tube with an inlet and outlet for connection with the fuel pipe-line, a rotor mounted for rotation within the tube by bearing assemblies, the rotor including helical vanes extending along its length and substantially filling the cross-section of the bore of the tube, a light source and a photo-responsive device disposed on opposed sides of the tube whereby a light beam is cyclically interrupted by the vanes of the rotor to produce an output signal having a component of frequency proportional to the rate of rotation of the rotor, characterized by:

- a body surrounding and supporting said tube over substantially its whole length,
- said tube being of a transparent glass,
- the light-source and photo-responsive device being positioned in relation to the tube so that, with the specified fuel, the tube acts in the manner of an optical bi-convex lens to converge the light beam,
- said body including apertures for passage of the light,
- said body being integral with means carrying the light source and photo-responsive means.

**4,012,959**  
**PRESSURE GAUGE AND FLOW METER**  
Ivan J. Garshelis, 61 Oleander Way, Clark, N.J. 07066  
Division of Ser. No. 488,209, July 12, 1974, Pat. No. 3,961,297. This application Oct. 22, 1975, Ser. No. 624,524  
Int. Cl.<sup>2</sup> G01L 9/10; G01F 1/58  
U.S. Cl. 73—398 R 2 Claims

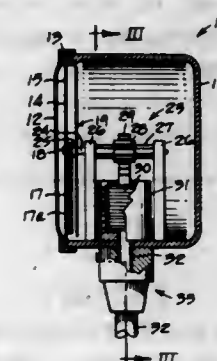
1. A pressure gauge comprising a current conductive rod which exhibits magnetic anisotropy in other than a purely circular or longitudinal direction, a conductive coil wound about said rod, and means for applying an alternating current through said rod of sufficient magnitude to produce a helical

magnetization of said rod in a given direction during one half cycle of said current and for reversing the direction of said helical magnetization during the next half cycle of said current, whereby to produce a change in the linkage of axial flux in said rod with said conductive coil to cause an AC output signal at the terminal thereof, wherein the rod is magnetostrictive and the anisotropy results from the rod being twisted, and



said rod is a hollow tube that is rotationally asymmetrical and twisted about its longitudinal axis, and further comprising means for closing one end of said tube and means for connecting the other of said tube to a pressure line, whereby as pressure in said line increases, said tube will be untwisted to increase helical anisotropy and the magnitude of said AC output signal.

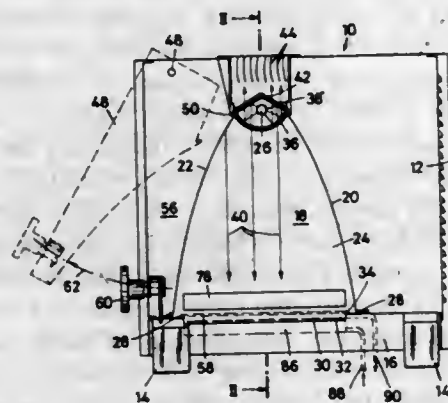
**4,012,960**  
**PRESSURE GAUGE WITH EXPANSIBLE BELLOWS**  
Gail G. Barbee, Montgomery, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.  
Filed Aug. 25, 1975, Ser. No. 607,523  
Int. Cl.<sup>2</sup> G01L 7/06  
U.S. Cl. 73—410 11 Claims



1. A gauge comprising a case, pressure inlet means secured on said case for communicating a variable pressure level thereto, expansible and contractible bellows means communicating internally with said pressure inlet means for expanding or contracting in response to said variable pressure level, indicating means movably mounted on said case comprising a color wheel rotatably mounted on said case and having color indicia thereon, means connecting said bellows means to said indicating means for moving said indicating means in response to expansion and contraction of said bellows means upon variance of said pressure level, including a pinion rotatably mounted on said case and having said color wheel connected thereto for rotation therewith and a reciprocal rack meshing with said pinion and secured to said bellows means, and guide means for guiding reciprocal movements of said rack, including a roller rotatably mounted on said case and engaging said rack.

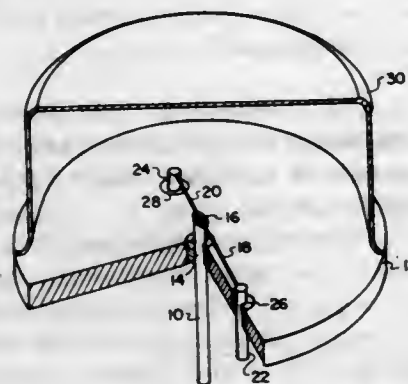


already known as such, are placed on an essentially horizontal support (32, 86, 92) and that the sample room located above the support is composed by an oblong reflector channel (18) of parabolic section, of which the extremities are shut off by



front walls (24) of parabolic contour; and the side walls (20, 22) of the reflector channel (18), being parabolic in operational condition, are made of elastic ductile sheet-metal, which assumes the parabolic shape when applied to the parabolic contour of the front walls (24).

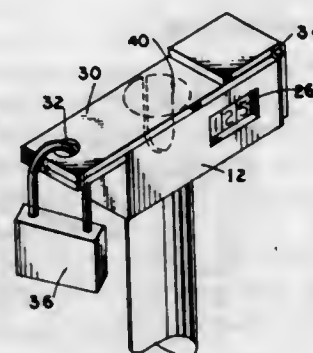
**4,012,955**  
**APPARATUS FOR MEASURING THE INCIDENT POWER OF LIGHT IN FIBER OPTICS**  
Pedro Americo Szente, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.  
Filed Jan. 19, 1976, Ser. No. 650,404  
Int. Cl.<sup>2</sup> G01K 17/00  
U.S. Cl. 73—190 EW 9 Claims



1. An apparatus for measuring the incident power of light from a fiber optic light conductor comprising:  
a first fiber optic light conductor for receiving light;  
a measurement thermistor which has first and second electrical leads and which is bonded to an end of the first fiber optic light conductor with an optically transparent bonding agent;  
a second fiber optic light conductor which receives no light;  
a reference thermistor which has first and second electrical leads and which is bonded to an end of the second fiber optic light conductor; and  
electrical connection means for providing electrical connection to the measurement and reference thermistors and adapted to be connected to metering apparatus to provide an indication of the incident power of the light transmitted through the first fiber optic light conductor to the measurement thermistor, the electrical connection means including electrically conductive terminals to which the first and second leads of the measurement and reference thermistors are attached.

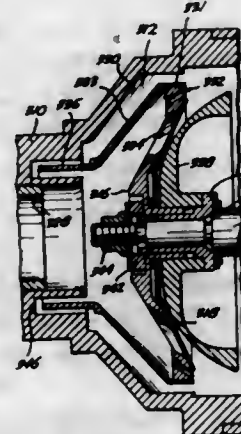
**4,012,956**  
**FLOW METER**

Eugene Carignan, Pawtucket, R.I., assignor to Lawrence Peska Associates, Inc., New York, N.Y.  
Filed Apr. 28, 1976, Ser. No. 681,071  
Int. Cl.<sup>2</sup> G01F 15/18  
U.S. Cl. 73—201 3 Claims



1. A flow meter adapted to be placed on the butt end of a pipe comprising meter housing means, first opening means in said housing for threadably engaging thread means on the butt end of a pipe, second opening means in said housing, the longitudinal axis of which is substantially transverse to the longitudinal axis of said first opening, a door means operably secured to the top of said housing and extending over said first opening, lock means for locking said door over said first opening and to said housing, flow meter means removably insertable in said housing through said door and into said first opening whereby said housing is threadably securable to the butt end of a threaded pipe, the end of said pipe having a U-shaped cutout for receiving said meter and when the meter is placed in said housing and in said pipe, fluid flow in said pipe may be measured, and said hinged door may be locked to prevent removal of said meter from the pipe and to seal the butt end of the pipe.

**4,012,957**  
**SHROUDED FLOWMETER TURBINE AND IMPROVED FLUID FLOWMETER USING THE SAME**  
William E. Chiles, Woodinville; LeRoy E. Vetsch, Lynnwood, and Jack V. Peterson, Seattle, all of Wash., assignors to Eldec Corporation, Lynnwood, Wash.  
Filed Apr. 27, 1976, Ser. No. 680,856  
Int. Cl.<sup>2</sup> G01F 1/10  
U.S. Cl. 73—231 R 11 Claims

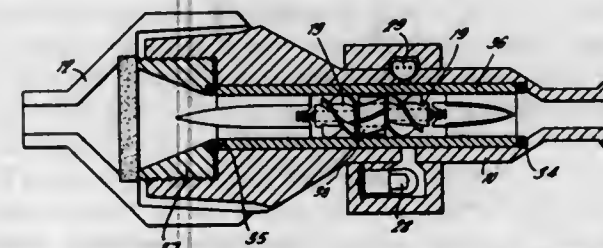


1. An improved fluid flowmeter comprising:  
a. housing means defining therein a fluid measurement chamber and further including fluid inlet means and fluid outlet means situated, respectively, at opposite ends of said fluid measurement chamber for admitting fluid into and removing fluid from said fluid measurement chamber, said fluid inlet means thereby defining an inlet opening having a predetermined cross-sectional area;  
b. a fluid reaction means mounted within said fluid measurement chamber for rotation about an axis of revolution

tion substantially aligned with said inlet opening and spaced apart from said inlet opening in the direction of fluid flow through said fluid measurement chamber, said fluid reaction means having a cross-sectional area in a direction transverse to the direction of fluid flow which is greater than said predetermined cross-sectional area of said inlet opening, said fluid reaction means further including a plurality of fluid reaction surfaces located radially outward of said axis of revolution for imparting rotational movement to said fluid reaction means;  
c. shroud means rotatable with said fluid reaction means and comprising a hollow member of revolution having a first end coupled to said fluid reaction means at points radially outward of said plurality of fluid reaction surfaces and tapering from said first end to a second end located in proximity to said inlet opening, and  
d. said fluid inlet means including sealing means surrounding said inlet opening for providing a rotatable fluid seal with said second end of said shroud means.

**4,012,958**  
**FLOWMETER**

Lionel Ivor Taylor, Copythorne House, Copythorne, Southampton, England  
Filed Dec. 9, 1975, Ser. No. 639,115  
Int. Cl.<sup>2</sup> G01F 1/10  
U.S. Cl. 73—231 R 3 Claims



1. A fluid flowmeter, particularly for use with a specified fuel for measuring the rate of flow thereof to an engine, said flowmeter including a tube with an inlet and outlet for connection with the fuel pipe-line, a rotor mounted for rotation within the tube by bearing assemblies, the rotor including helical vanes extending along its length and substantially filling the cross-section of the bore of the tube, a light source and a photo-responsive device disposed on opposite sides of the tube whereby a light beam is cyclically interrupted by the vanes of the rotor to produce an output signal having a component of frequency proportional to the rate of rotation of the rotor, characterized by:

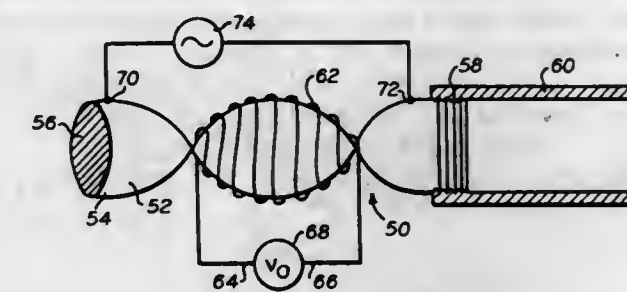
- a body surrounding and supporting said tube over substantially its whole length,
- said tube being of a transparent glass,
- the light-source and photo-responsive device being positioned in relation to the tube so that, with the specified fuel, the tube acts in the manner of an optical bi-convex lens to converge the light beam,
- said body including apertures for passage of the light,
- said body being integral with means carrying the light source and photo-responsive means.

**4,012,959**  
**PRESSURE GAUGE AND FLOW METER**

Ivan J. Garshelis, 61 Oleander Way, Clark, N.J. 07066  
Division of Ser. No. 488,209, July 12, 1974, Pat. No. 3,961,297. This application Oct. 22, 1975, Ser. No. 624,524  
Int. Cl.<sup>2</sup> G01L 9/10; G01F 1/58  
U.S. Cl. 73—398 R 2 Claims

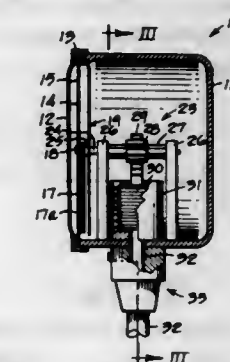
1. A pressure gauge comprising a current conductive rod which exhibits magnetic anisotropy in other than a purely circular or longitudinal direction, a conductive coil wound about said rod, and means for applying an alternating current through said rod of sufficient magnitude to produce a helical

magnetization of said rod in a given direction during one half cycle of said current and for reversing the direction of said helical magnetization during the next half cycle of said current, whereby to produce a change in the linkage of axial flux in said rod with said conductive coil to cause an AC output signal at the terminal thereof, wherein the rod is magnetostrictive and the anisotropy results from the rod being twisted, and



said rod is a hollow tube that is rotationally asymmetrical and twisted about its longitudinal axis, and further comprising means for closing one end of said tube and means for connecting the other of said tube to a pressure line, whereby as pressure in said line increases, said tube will be untwisted to increase helical anisotropy and the magnitude of said AC output signal.

**4,012,960**  
**PRESSURE GAUGE WITH EXPANSIBLE BELLOWS**  
Gail G. Barbee, Montgomery, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.  
Filed Aug. 25, 1975, Ser. No. 607,523  
Int. Cl.<sup>2</sup> G01L 7/06  
U.S. Cl. 73—410 11 Claims



1. A gauge comprising a case, pressure inlet means secured on said case for communicating a variable pressure level thereto, expansible and contractible bellows means communicating internally with said pressure inlet means for expanding or contracting in response to said variable pressure level, indicating means movably mounted on said case comprising a color wheel rotatably mounted on said case and having color indicia thereon, means connecting said bellows means to said indicating means for moving said indicating means in response to expansion and contraction of said bellows means upon variance of said pressure level, including a pinion rotatably mounted on said case and having said color wheel connected thereto for rotation therewith and a reciprocal rack meshing with said pinion and secured to said bellows means, and guide means for guiding reciprocal movements of said rack, including a roller rotatably mounted on said case and engaging said rack.



4,012,961

**PULLEY AND SUPPORT COMBINATION**

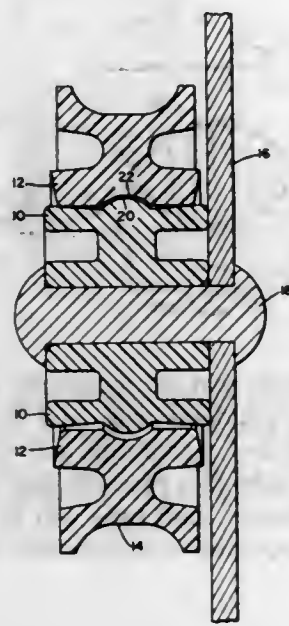
John Kent Cameron, Warwick, R.I., assignor to Kenney Manufacturing Company, Warwick, R.I.

Filed Jan. 15, 1976, Ser. No. 649,370

Int. Cl.<sup>2</sup> F16H 55/48, 55/36; B21D 53/26; R21K 1/28

U.S. Cl. 74-230.7

6 Claims



1. A self centering pulley comprising a generally cylindrical female outer race member of molded semi-elastic, semi-rigid plastic material having a waxy, low friction surface; a generally cylindrical male inner race member molded of like plastic material, said plastic material being sufficiently resilient with respect to the structural dimensions of said inner and outer race members to permit said inner race member to be forced into said outer race member by a snap fit, said inner race member extending axially beyond said outer race member in each direction, said inner race member being inversely tapered and contacting said outer race member only at substantial points of contact across its axial length toward the outer edges of said outer race member when the inner and outer race member are centered; and means for limiting axial relative motion between said members.

4,012,962

**ENDLESS POWER TRANSMISSION BELT STRUCTURE**

David G. Ballou, Ozark; Clinton L. Bishop, Springfield, and Toby K. Pope, Willard, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 490,828, July 22, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,235

Int. Cl.<sup>2</sup> F16G 5/16; B29H 7/22

U.S. Cl. 74-233

11 Claims



1. An endless power transmission belt structure comprising a thermoplastic polyester elastomer having an oriented crystalline structure about substantially its entire endless path, said crystalline structure being oriented only along said endless path.

4,012,963

**CLUTCH MECHANISM FOR ROTARY TILLERS AND THE LIKE**

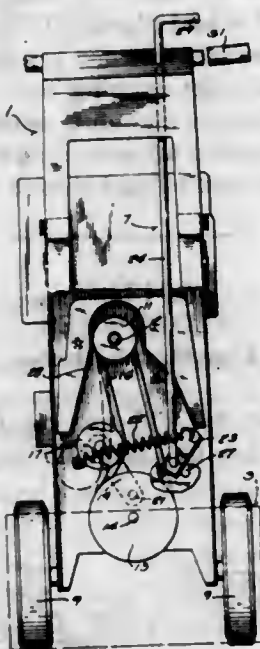
Edward W. Enters, Fredonia, and Mark J. Itle, Sheboygan, both of Wis., assignors to Gilson Bros. Co., Plymouth, Wis.

Filed Feb. 23, 1976, Ser. No. 660,129

Int. Cl.<sup>2</sup> F16H 7/10

U.S. Cl. 74-242.15 R

7 Claims



1. In apparatus of the type described having a frame, an engine, an assembly to be rotated by said engine, and clutch means for selectively transmitting motion from said engine to said assembly, and characterized in that said clutch means comprises,

a drive sheave connected to and driven by said engine, a driven sheave spaced from said drive sheave and connected to said assembly,

flexible belt means extending between and normally loosely engaging said drive and driven sheaves in a manner such that said belt means does not transmit motion between said drive and driven sheaves,

an idler sheave,

first bracket means pivotally mounted in a housing portion of said rotating assembly and connected to and supporting said idler sheave for pivotal movement toward and away from said belt at a point intermediate said drive and driven sheaves,

second bracket means spaced from said first bracket means and pivotally mounted relative to said drive and driven sheaves,

means connecting said first and second bracket means for transmitting pivotal movement therebetween,

control means connected to said second bracket means and operative to pivot said second bracket means,

said idler sheave biased toward a normal position wherein said idler sheave is out of operative tensioning engagement with said belt and said belt will be slack relative to said drive and driven sheaves,

and said control means operative to selectively pivot said second bracket means in a direction which is transmitted through said connecting means to said first bracket means and pivots said idler sheave toward said belt to tighten said belt on said drive and driven sheaves to transmit rotary motion therebetween.

4,012,964

**INTERMITTENT ROTARY MECHANISM**

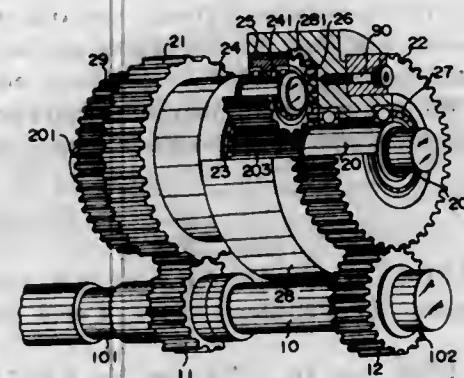
Yuan Ho Lee, 85, Jen Ho Road, Tainan, China /Taiwan

Filed Feb. 14, 1975, Ser. No. 550,002

Int. Cl.<sup>2</sup> F16H 55/04

U.S. Cl. 74-435

11 Claims



1. A high-speed intermittent rotary mechanism comprising: a driving shaft, a driven shaft,

means coaxing with said driving shaft and said driven shaft for intermittently rotating said driven shaft in an intermittent rotary manner having a predetermined pitch and an intermittent dwell-and-movement motion, said rotating means including a revolving wheel train connected by two pairs of gears, each pair having an equal center-to-center distance between said driving shaft and said driven shaft, at least one of said two pairs of gears being cam gears, said gears being structurally adapted and related to cause the revolving wheel train to produce a differential speed through a variation in the meshing distances of said pair of gears from either of said shafts, thereby to provide an intermittent rotary movement of a predetermined pitch from the intermittent dwell-and-movement motion of the driven shaft.

4,012,965

**GOVERNOR OR SIMILAR AUTO SPEED CONTROL**

Adam E. Stupak, 3117 Detroit Ave., Cleveland, Ohio 44113

Filed May 7, 1975, Ser. No. 575,186

Int. Cl.<sup>2</sup> G05G 1/14

U.S. Cl. 74-513

3 Claims



1. A governor or similar speed control device for a vehicle having a gas feed control foot pedal and comprising a frame means for engagement with a foot pedal, a clamp means to secure said frame means to a foot pedal, an adjustable length control member depending from said frame means a variable distance to limit depression of the foot pedal, said frame means has a dependent leg having a longitudinally directed slot therein, said control member has a longitudinally directed slot therein, a lock means extends through said slots which are aligned when said control member and said leg are superimposed to secure them together but to enable adjustment of their relative axial positions, and

means on said dependent leg and control member align them longitudinally and retain them in slidable adjustable length engagement.

4,012,966

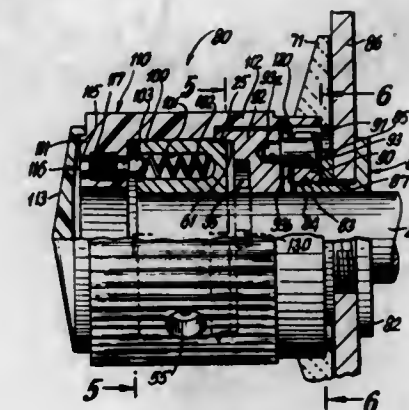
**KNOB AND CONTROL SHAFT ASSEMBLY WITH BRAKE**  
Lester Lieberman, Kings Point, and Ralph Oddo, Dix Hills, both of N.Y., assignors to Jan Hardware Manufacturing, Inc., New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,465

Int. Cl.<sup>2</sup> A61B 5/12; F16D 67/02

U.S. Cl. 74-553

36 Claims



1. A knob control shaft assembly comprising a control shaft, a ring insert surrounding said shaft, means to fix said ring insert to said shaft, a knob body surrounding said ring insert and slidably mounted thereon, means to connect said knob body to said ring insert for rotation together therewith, and spring means for sliding said knob body longitudinally forwardly relative to said ring insert, and ball means interposed between said spring means and knob body, said knob body having means partially receiving the ball means, to allow said knob to rotate relative to said ring insert when a turning torque imposed on said body is sufficient to cause said ball means to compress the spring means, to allow turning of the knob body without turning the ring insert, releasable means to lock the shaft against rotation, and means controlled by sliding movement of the knob relative to the shaft for controlling said lock means.

4,012,967

**ADJUSTABLE DRIVE ROD SYSTEM**

William H. Warren, 729 S. Main St., Centerville, Mass. 02632

Filed Aug. 22, 1974, Ser. No. 499,535

Int. Cl.<sup>2</sup> G05J 1/00

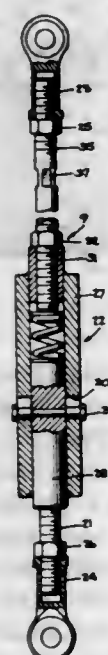
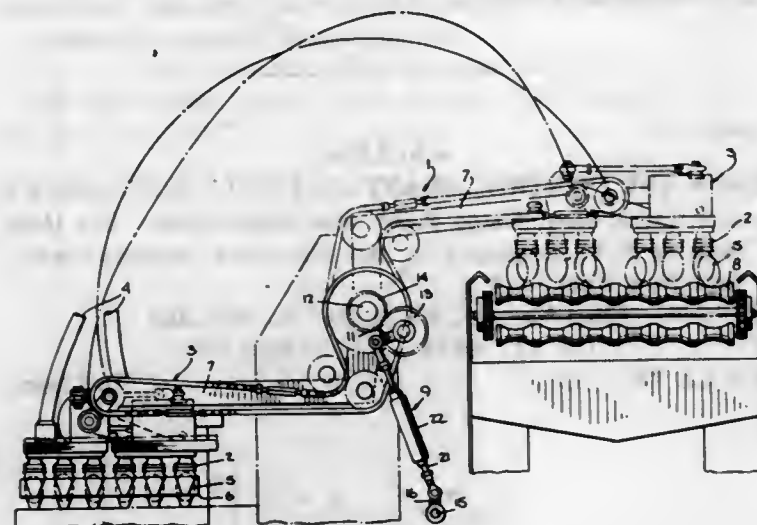
U.S. Cl. 74-586

1 Claim

1. In an egg transfer machine for transferring eggs from egg trays to a conveyor: means for supporting one or more egg trays on an egg transfer table; an egg transfer head movably mounted on said machine and including means for simultaneously engaging eggs in the uppermost tray; a driving means; a drive rod operatively coupling said driving means and said transfer head; and adjusting means on said drive rod for limiting the maximum force exerted by said transfer head while said drive rod is moving said head toward said trays and being inoperative while said drive rod is moving said head toward said conveyor comprising means for movably connecting two spaced portions of said rod including a resilient member

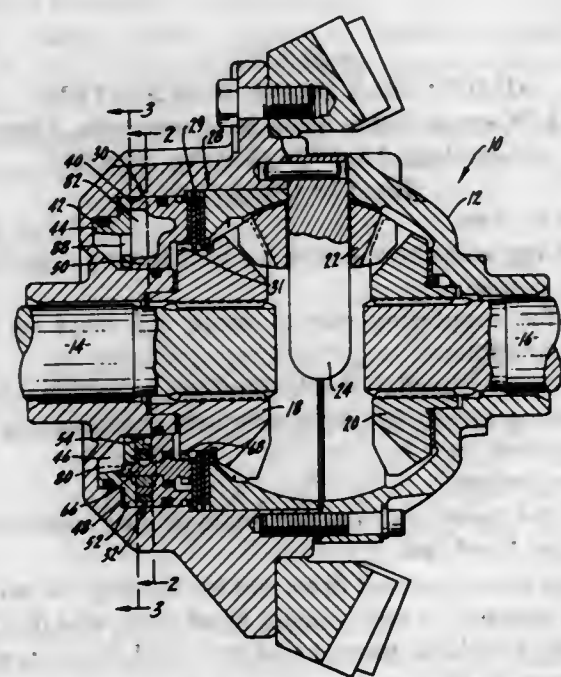


urging said portions apart and thread means for adjusting the spring force without changing the rod length; and



second thread means for adjusting the rod length without changing the spring force.

**4,012,968**  
**SPEED-SENSITIVE DIFFERENTIAL MECHANISM**  
Donald W. Kelbel, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.  
Filed Dec. 23, 1974, Ser. No. 535,596  
Int. Cl.<sup>2</sup> F16H 1/44; F16D 25/00  
U.S. Cl. 74-711 8 Claims



1. A limited slip differential comprising a casing adapted to be rotatably driven, gearing rotatably supported in said casing

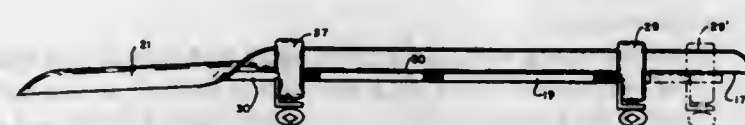
and adapted for connection with a pair of relatively rotatable output members, friction clutch means associated with said gearing and said casing and actuable to frictionally resist relative rotation between one of said output members and said casing, an actuator in operative association with said clutch means and mounted in said casing, fluid energy generating means within said actuator adapted to create fluid pressure in response to relative rotation between said one output member and said casing, said fluid pressure being applied to said actuator to actuate said friction clutch means wherein said generating means has an input means driven by said one output member and said input means is carried by said actuator.

**4,012,969**  
**ADJUSTABLE CHAINSAW FILE GUIDE AND HOLDER**  
Elof Granberg, 21 Privateer Drive, Corte Madera, Calif. 94925

Filed Nov. 10, 1975, Ser. No. 630,734  
Int. Cl.<sup>2</sup> B23D 63/12

U.S. Cl. 76-36

5 Claims

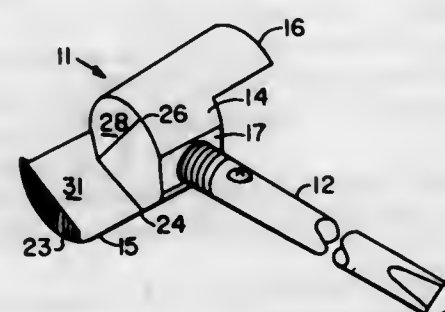


1. An adjustable chainsaw file guide and holder comprising an elongated frame having two generally flat guide surfaces angled to intersect in a V-shape, and at least two adjustable clamping members each having a unitary sliding element with a shaped opening formed to at least partially closely surround the guide surfaces of said elongated frame for slidably engaging same at any point therealong, said clamping member also including means for securing different diameter chainsaw files at any point along the length thereof and positively centering same relative to the vertex of said intersecting guide surfaces.

**4,012,970**  
**METHOD OF FORMING A WOOD BORING TOOL**  
Doran M. Hintz, Rte. 1, Box 230-L, and Lief H. Steinberger, Rte. 1, Box 231-A, both of Oroville, Calif. 95965  
Filed Apr. 19, 1976, Ser. No. 678,165  
Int. Cl.<sup>2</sup> B21K 5/02

U.S. Cl. 76-102

3 Claims

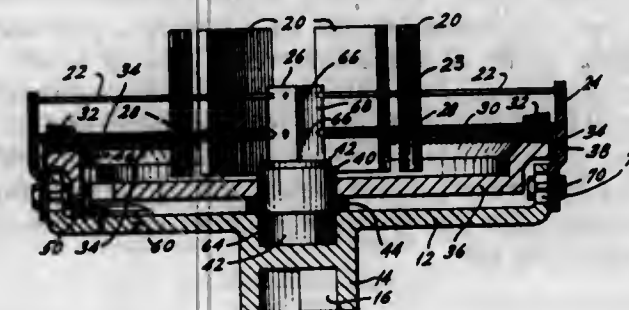


1. The method of forming a wood boring tool comprising the steps of providing a short blank of cylindrical tool steel bar stock, drilling an opening along a diameter of the cylindrical bar stock at its approximate mid-length, turning the opposite ends of the blank to a desired radius about the axis of the opening, machining away the opposite ends of the blank to form two oppositely directed radially extending arms having smooth lifting surfaces lying on chords of the cylinder which are oppositely directed and extend at approximately 30° from the axis of the opening, and facing the lower edges of the surfaces to provide oppositely directed cutting edges tangential to the opening.

**4,012,971**  
**ADJUSTABLE WRENCH MECHANISM**  
Craig H. Zeyher, 660 Clinton Ave., Haddonfield, N.J. 08033  
Filed June 30, 1975, Ser. No. 591,439  
Int. Cl.<sup>2</sup> B25B 13/16

U.S. Cl. 81-170

4 Claims

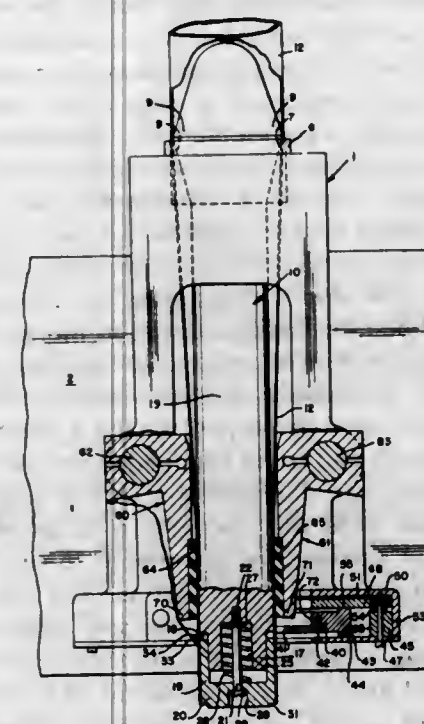


1. Wrench mechanism comprising: a casing; bracket means adjustably secured to the casing; gear means mounted for rotational movement within said casing; a series of threaded bars disposed in radial array within said casing each of which is journaled at one of its ends in said adjustable bracket means and at its opposite end in support structure carried by said casing; a gear drive secured to one end of each of said bars for rotation therewith and held in driving engagement with said gear means by said bracket means; a plurality of work-engaging elements formed cooperatively to serve as either an internal or external wrench and each of which is threadably engaged by individual ones of said threaded bars; and restraining means contacting each of said work-engaging elements to prevent rotational movement thereof whereby rotation of said gear means causes translational movement of said work-engaging elements along the radial paths defined by said threaded bars.

**4,012,972**  
**BAND APPLYING APPARATUS**  
Harold B. Rice, Walnut Creek, Calif., assignor to John Burton Machine Corporation, Rodeo, Calif.  
Filed May 30, 1975, Ser. No. 582,379  
Int. Cl.<sup>2</sup> B23B 3/04, 5/14; B65B 7/28

U.S. Cl. 82-70.2

11 Claims



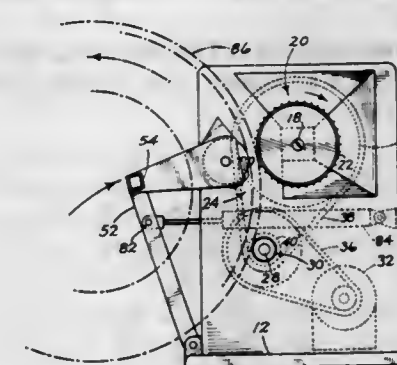
1. In a device for cutting bands from one end of an elongated length of tubular material, a housing, an elongated cylindrical mandrel supported in said housing and adapted to be received within said material,

a casing carried by said housing, a rotor supported for orbital movement within said casing and provided with a circular radially inwardly directed cutting edge in surrounding relationship to said mandrel for cutting said material, said casing being provided with an end wall in a plane at right angles to the axis of said mandrel and extending across the upper side of said rotor, said end wall being free for movement by gravity into engagement with the upper side of said rotor to prevent shifting of the latter.

**4,012,973**  
**TIRE CUTTING APPARATUS**  
Myron D. Tupper, Sandy, Oreg., assignor to Tiregon, Inc., Portland, Oreg.  
Filed Sept. 22, 1975, Ser. No. 615,550  
Int. Cl.<sup>2</sup> B23B 3/04, 5/14; B29H 21/08

U.S. Cl. 82-82

8 Claims



1. Apparatus for cutting tire casings comprising a frame and crown support means on said frame for supporting one side of the crown in a tire casing in a cutting station in the apparatus, said crown support means accommodating movement of the crown through said cutting station while supported by said support means, guide means opposite said crown support means adapted to hold said crown against said support means while the crown moves through said cutting station, a cutter knife assembly adjacent said guide means, including a knife mounted for movement of an end thereof beyond said guide means and into the crown, and biasing means urging said movement of the cutter knife beyond said guide means, a movable mounting having said guide means and said cutter knife assembly jointly mounted thereon which is adapted to shift the guide means and knife assembly away from said crown support means, said mounting also mounting a deflector adapted for insertion between the side walls of a tire casing with such insertion producing deflection of the side walls away from each other as a preliminary to placing the inside of the crown against said guide means.

**4,012,974**  
**APPARATUS FOR CUTTING GLASS**  
Heinz-Josef Reinmold, Herzogenrath, Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France  
Filed July 25, 1975, Ser. No. 598,989  
Claims priority, application France, Aug. 6, 1974, 74.27224  
Int. Cl.<sup>2</sup> B26D 3/08

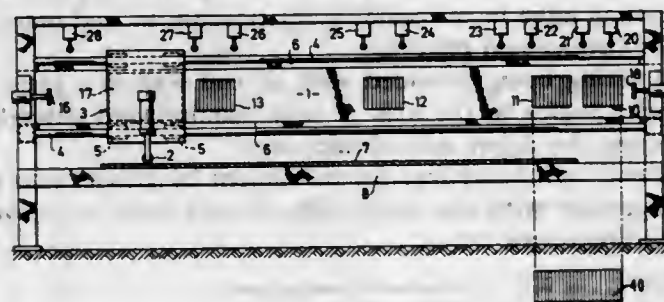
U.S. Cl. 83-6

8 Claims

1. Apparatus for producing cutting lines on strips or sheets of glass comprising a carriage, a cutting tool attached to said carriage for movement therewith, guide means for guiding said carriage along a predetermined path of travel, and linear motor means for producing movement of said carriage along said path of travel comprising an armature mounted on said carriage and a plurality of short inductor windings discontinu-



ously spaced along the path of travel of said carriage, the spacing between two or more successive inductor windings



being greater than the length of the respective windings along the path of travel.

4,012,975

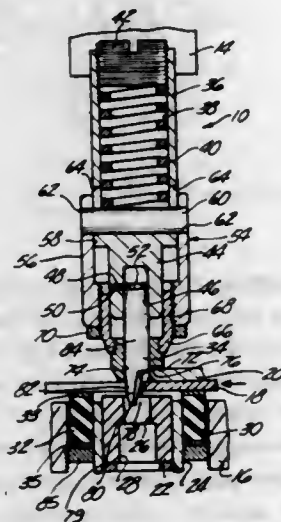
### HIGH SPEED PUNCHING APPARATUS AND TOOL THEREFOR

Barry Grant LaLone, 268 W. Clarkston Road, Lake Orion, Mich. 48035

Filed July 31, 1975, Ser. No. 600,636  
Int. Cl.<sup>2</sup> B26D 7/18; B23D 27/00

U.S. Cl. 83-140

25 Claims



1. In high speed punching apparatus for rapidly, progressively cutting small portions of material from a workpiece along a preselected line and including a support table, a die button supported on the support table, the die button having a die opening and reciprocating apparatus for providing high speed reciprocating motion relative to the support table, the improvement comprising a punching tool assembly adapted to be reciprocated by the reciprocating apparatus, said punching tool assembly including an elongated punching tool adapted to be received within the die opening for reciprocal motion therein, said punching tool providing a shearing action of the workpiece on a downward, cutting stroke and being retracted from the workpiece on an upward, retracting stroke, said punching tool having an elongated shank of a straight cylindrical shape, a cutting surface formed proximate one end, said cutting surface extending for only a portion of the cross section of said shank and being defined by a notch in said shank, said cutting surface having a radially extending surface, said notch having axially extending surface defining an oblique angle with said radially extending surface and connected therewith by a connecting radius whereby said cutting surface, and said axially extending surface of said notch with said connecting radius inhibit hangup of chips on said cutting surface, said shank of said punching tool being generally of the same diameter as the die opening, said punching tool having a tip portion extending generally from a position intermediate said cutting surface and the end of said punching tool, said tip portion having an outer, frusto conical shape of a sufficient length such that said tip portion when located in said die opening can define a clearance relation with the confronting surface of the die opening whereby rubbing, frictional engage-

ment of said shank of said punching tool and the die opening is minimized, tool holding means for removably holding said punching tool and adapted to be held by the reciprocating apparatus, and tool stripping means operatively connected with said tool holding means for stripping the workpiece from said tool on said retracting stroke, said stripping means including stock engaging means for engaging the workpiece during said cutting stroke, and spring means operatively connected with said tool holding means for normally urging said stock engaging means at a predetermined preload axially in the downward direction whereby said stock engaging means strips the workpiece away from said punching tool on said retracting stroke, and load adjustment means selectively adjustable for varying said predetermined preload to vary the stripping force to accommodate differences in materials and the condition of said punching tool.

4,012,976

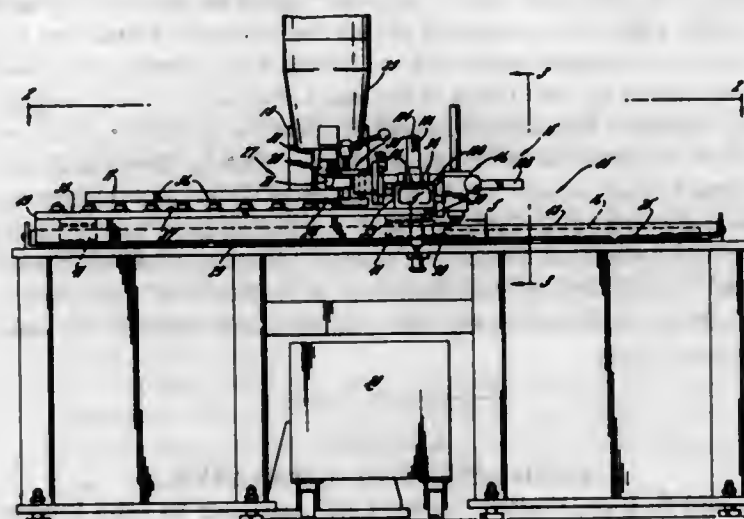
### PUNCH PRESS FOR DUPLICATING WORKPIECES

Theodore F. Brolund, Rockford, Ill., assignor to W. A. Whitney Corporation, Rockford, Ill.

Filed Apr. 23, 1975, Ser. No. 570,762  
Int. Cl.<sup>2</sup> B26F 1/02

U.S. Cl. 83-146

9 Claims



1. A punch press for producing duplicate piece parts one at a time from a plurality of workpiece blanks; said press including an upright frame, an actuator mounted on said frame, a fixed tool element mounted on said frame and spaced from said actuator, a movable tool element connected to said actuator and movable thereby toward and away from said fixed tool element, a stripper connected to said frame adjacent said movable tool element, a worktable with a top having a punching area located around said fixed tool element and a duplicating area disposed to one side of said punching area, a movable bed slidably mounted on said table above said top for movement across said tip in only an x direction within said punching area and over said duplicating area, a carriage slidably mounted on said bed for bodily movement therewith in said x direction and for movement relative to said bed only in a y direction thereby to produce x, y movement relative to said table top, a first formed piece part having a pattern of holes formed therethrough and being clamped removably to the top of said table within said duplicating area in a predetermined position from said fixed tool element, a reciprocable stylus connected to said carriage for movement toward and away from engagement with said piece part and for x and y movement with said carriage and bed across said duplicating area, a workpiece blank, a clamp secured to said carriage and including upper and lower jaws movable relative to each other to fasten said blank to said carriage, said blank extending from said carriage, into said punching area and being positioned with respect to said stylus so that, as said carriage is moved to position said stylus over the different holes in said piece part, said blank is located in corresponding positions relative to said fixed and movable tool elements, a lower tip mounted on said stylus and shaped to center within each of the holes in said

piece part for a predetermined range of hole sized so as to locate and lock said carriage, bed and blank accurately in said corresponding positions for punching a hole pattern in said blank substantially identical to the hole pattern in said piece part, and means mounting said jaws on said carriage for vertical movement with said blank as the latter is stripped from said movable tool element by said stripper, said means comprising a support mountable on said carriage, a cap connected to said support and extending outwardly therefrom in a generally horizontal direction above said jaws, a first pair of spaced guide rods connected between said cap and said lower jaw with said guide rods extending vertically and slidably through said support so said cap and said lower jaw are mounted for vertical movement together with respect to said support, a second and similar pair of spaced guide rods connected vertically between said cap and said lower jaw and spaced from said support, said upper jaw being slidably mounted on said second pair of guide rods between said cap and said lower jaw, and means for moving said upper jaw on second pair of guide rods toward and away from said lower jaw to clamp and release said workpiece blank.

4,012,978

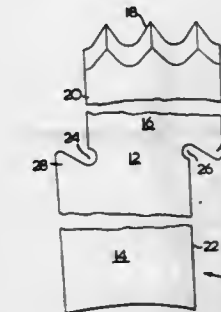
### DIE CUTTING RULE

Jacques de Lanauze, 6421 Goncourt Ave., Ville d'Anjou, Quebec H1K 3X7, Canada

Filed Sept. 15, 1975, Ser. No. 613,560  
Int. Cl.<sup>2</sup> B26F 1/38

U.S. Cl. 83-669

1 Claim



1. A cutting rule segment adapted for interconnection with other like segments to form a cutting rule for mounting in a rotary die cutter, said rule segment comprising a body portion having a lower section for insertion in a slot in the rotary die cutter and an integral upper section having cutting teeth thereon;

marginal side edges on the body portion; a notch in each of said marginal side edges of the body portion whereby the notched marginal side edges present the lower section of the segment being offset with respect to the upper section on the notches sides;

the notch on one marginal side edge comprising an upwardly directed lip and a downwardly directed socket to engage and receive a downwardly directed lip and upwardly directed socket on the other marginal side edge of an adjacent segment whereby the notches on each segment engage and interlock with mating notches on adjacent rule segments to provide a substantially rigid unitary cutting rule.

4,012,977

### APPARATUS FOR CONTROLLING MOVEMENT OF STAMPING DEVICE

Ludwig Regenbrecht, Gevelsberg, Germany, assignor to Rolf Peddinghaus, Gevelsberg, Germany

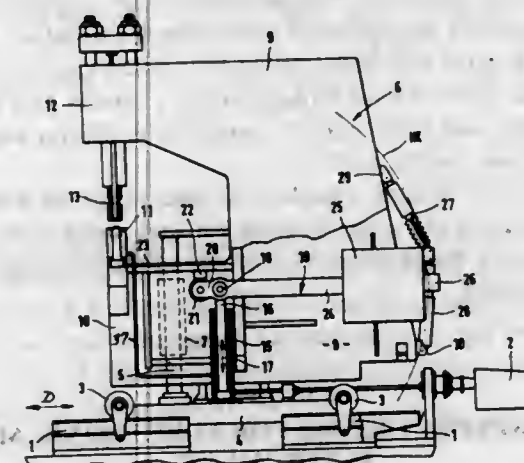
Filed Mar. 12, 1976, Ser. No. 666,210

Claims priority, application Germany, Mar. 13, 1975, 2511012

Int. Cl.<sup>2</sup> B26D 5/12

U.S. Cl. 83-368

4 Claims



1. A stamping device comprising a vertically guided frame assembly including a matrix and an aligned opposed punching die positioned to punch holes in a member disposed therebetween, means supporting said frame assembly in a balanced position to permit ready movement of the member to be punched relative to said matrix and die, said means including a balancing weight disposed on one end of a lever and a frame contacting and supported on the other end of said lever, said lever being pivotally connected intermediate its ends to motor means for controlling reciprocal movement thereof, sensor means responsive to the position of said member for controlling the operation of said motor means whereby the frame will be moved linearly until said sensor means engage said member at which time linear movement of the frame is halted and the die is actuated to punch a hole in said member.

4,012,979

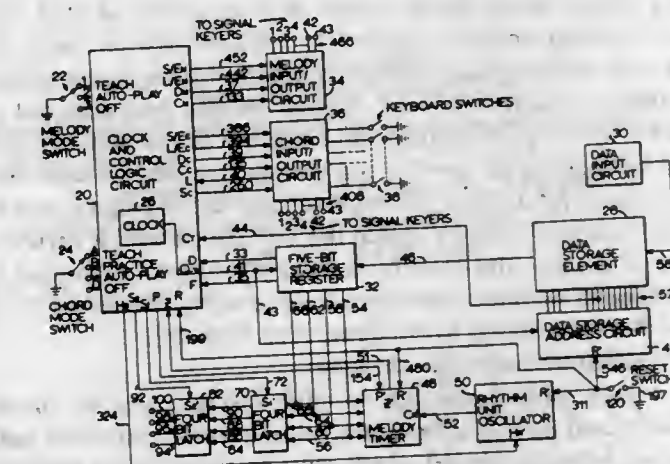
### MUSIC TEACHING APPARATUS

Henry Wemekamp, Willowdale, Canada, assignor to Computeacher Limited, Toronto, Canada

Filed Mar. 3, 1975, Ser. No. 554,873  
Int. Cl.<sup>2</sup> G09B 15/08; G10H 1/00

U.S. Cl. 84-1.01

10 Claims



1. Apparatus for teaching a student to play a musical instrument comprising:

- programmable data storage means for storing a plurality of predetermined data words, said data words containing elements which are indicative of predetermined musical notes to be played, said data words being stored at known locations in said data storage means,
- controllable logic means coupled to said data storage means for selecting predetermined data words and reading out said selected data words from said data storage means in response to a control signal,
- means for sensing the notes which have been played,



- d. means coupled to said sensing means for generating said control signal after said notes have correctly been played, and
- e. display means coupled to said logic means for indicating visually the notes corresponding to the respective read-out data words.

4,012,980

# CONTROL CIRCUITRY FOR A VOLTAGE-CONTROLLED TYPE ELECTRONIC MUSICAL INSTRUMENT

Tutomu Suzuki, Maisaka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

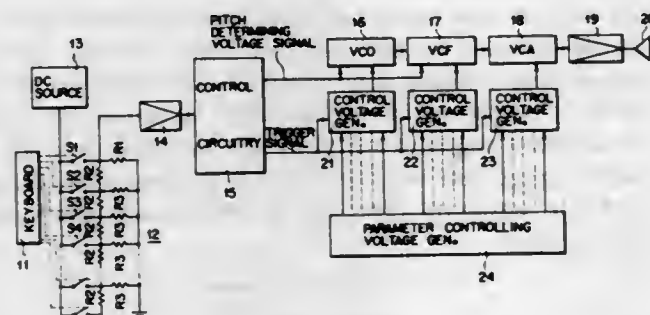
Filed Nov. 26, 1975, Ser. No. 635,376

Claims priority, application Japan, Nov. 27, 1974, 49-143582

Int. Cl.<sup>2</sup> G10H 1/00, 5/02

U.S. Cl. 84—1.01

9 Claims



1. In an electronic musical instrument comprising a keyboard having a plurality of keys; voltage divider circuit means coupled to said keyboard and adapted to provide a first signal which has a voltage value corresponding to a depressed key; control circuitry coupled to said voltage divider circuit means and providing a second signal indicative of the depression of the key and a third signal which is a function of said first signal; a storage means coupled to said control circuitry for storing said third signal; voltage-controlled tone signal generating means coupled to said storage means and adapted to produce a tone signal corresponding to the depressed key; and control voltage signal generating means coupled to said control circuitry and adapted to receive said second signal and to produce a control voltage signal the voltage of which varies as a function of time, the control voltage signal being coupled to said voltage-controlled tone signal generating means so as to control the tone signal to be generated thereby;

said control circuitry comprising:

- a first gate means coupled to said voltage divider circuit means and having a first control electrode, said first gate means being rendered conductive in response to application of a first gate signal to said first control electrode;
- a second gate means coupled between said first gate means and said storage means and having a second control electrode, said second gate means being rendered conductive in response to application of a second gate signal to said second control electrode; and
- circuit means coupled to said voltage divider circuit means and responsive to voltage variation at the output of said voltage divider circuit means so as to provide the second signal for said control voltage generating means and the first and second gate signals for said first and second gate means, respectively.

## 4,012,981 ELECTRONIC MUSICAL INSTRUMENT PROVIDED WITH A WAVEFORM CONVERTER FOR CHANGING A SAWTOOTH WAVE TONE SIGNAL INTO A RECTANGULAR WAVE TONE SIGNAL

Yasuo Nagahama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

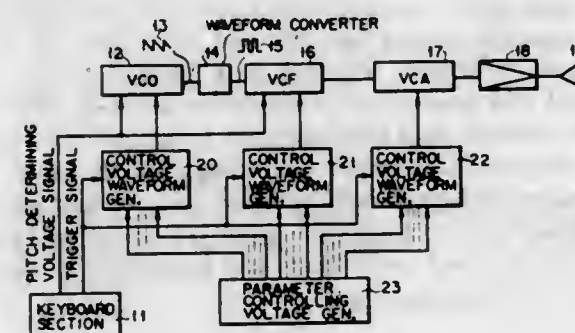
Filed Oct. 7, 1975, Ser. No. 620,308

Claims priority, application Japan, Oct. 9, 1974, 49-115630

Int. Cl.<sup>2</sup> G10H 1/00, 5/00

U.S. Cl. 84—1.01

14 Claims



1. An electronic musical instrument comprising sawtooth wave tone signal generating means, wave-form-converting means for receiving a sawtooth wave tone signal from said sawtooth wave tone signal generating means and converting the sawtooth wave tone signal into a rectangular wave tone signal, tone coloring filter means coupled to said waveform converting means, and musical sound-reproducing means coupled to said tone coloring filter means,

said waveform converting means comprising:

circuit means including an input coupled to said sawtooth wave tone signal generating means, an output coupled to said tone coloring filter means, a first bipolar transistor having base, collector and emitter electrodes, said base and collector electrodes being respectively coupled to said input and output for switching an output voltage level at said output from a first to a second voltage level when an input voltage at said input exceeds a given threshold voltage, first and second power supply terminals, and collector and emitter resistors for coupling said collector and emitter electrodes of said first bipolar transistor to said first and second power supply terminals respectively, said emitter and collector resistors having so large a total resistance value that when the input voltage at said input of said circuit means exceeds said threshold voltage, said first bipolar transistor is driven into saturation from cutoff; and

variable bias means coupled to said input of said circuit means to apply a bias voltage on said input of said circuit means for varying the duty factor of the rectangular wave tone signal.

4,012,982

## PERCUSSION PROCESSOR FOR ELECTRONIC MUSICAL INSTRUMENT

James S. Southard, Union, Mich., assignor to C.G. Conn, Ltd., Elkhart, Ind.

Continuation of Ser. No. 562,174, March 26, 1975, abandoned. This application Mar. 19, 1976, Ser. No. 668,617

Int. Cl.<sup>2</sup> G10H 1/00, 5/00

U.S. Cl. 84—1.01

5 Claims

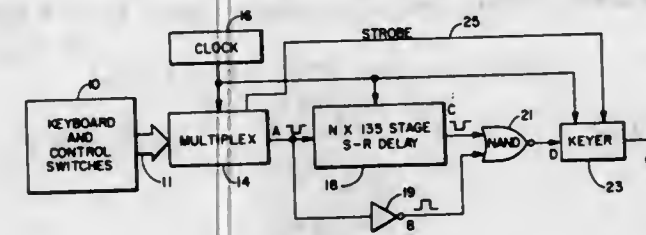
1. In an electronic musical instrument, wherein information representative of the actuation of selected switches corresponding to associated notes of the musical scale is furnished by a multiplex circuit in the form of a time-division multiplexed signal including a cyclically repeating sequence of time slots associated respectively with such switches, and in which a pulse in a time slot is indicative of the actuation of the switch associated with that time slot, a processing circuit including in combination:

first and second signal channels;

delay circuit means in said first signal channel having a delay period equal to N sequences of time slots, where N is a positive integer;

inverter circuit means in one of said signal channels;

means for supplying said multiplexed signal to the inputs of said first and second signal channels;



coincidence gate means with first and second inputs, the first input coupled with the output of said first signal channel and the second input coupled with the output of said second signal channel, for passing pulses in time slots of said time-division multiplexed signal only when a pre-determined relationship of the signals applied to the first and second inputs thereof exists.

4,012,983

## ACOUSTICAL REFLECTOR FOR WIND INSTRUMENTS

Thomas L. Ploeger, 38457 James Drive, Mount Clemens, Mich. 48043

Filed Sept. 9, 1975, Ser. No. 611,700

Int. Cl.<sup>2</sup> G10D 9/06

U.S. Cl. 84—400

9 Claims



1. In an acoustical reflector of the type having a panel with an acoustically reflective surface and bracket means on said panel including a clamp adapted to be mounted on the rim of the bell of a wind instrument for supporting said panel generally in front of the bell, improved structure wherein said bracket means comprises,

a rod connected with said panel by means including an articulating joint,

said clamp having means forming a socket which supports a portion of said rod,

said socket being so oriented that when said clamp is mounted on the rim of the bell of an instrument with which said reflector is adapted to be used when the axis of said rod is generally parallel to the axis of the instrument bell,

said rod portion being axially movable relative to said socket through a distance sufficient to facilitate locating said panel axially clear of the bell of the instrument when said panel is positioned in axial alignment with the bell,

said rod portion being rotatable relative to said socket for swinging said panel about said rod axis when said panel is so located and positioned,

and means effective to secure said rod against axial and rotatable movement relative to said socket.

## 4,012,984 BLIND RIVET ASSEMBLY WITH LOCKING COLLAR ON RIVET STEM

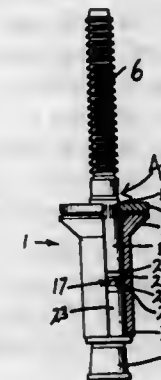
Josip Matuschek, Newport Beach, Calif., assignor to Textron, Inc.

Filed June 19, 1975, Ser. No. 588,286

Int. Cl.<sup>2</sup> F16B 13/04

U.S. Cl. 85—70

8 Claims



1. In a blind rivet assembly a tubular rivet sleeve having a preformed head at one end and an expandable sleeve tail on the other end thereof, a stem extended through said sleeve and said head, a tail former at the tail end of the stem adjacent said sleeve tail for expanding said tail, a pulling portion on the pulling end of the stem adapted to be engaged by a tool for pulling the stem, a plug portion of the stem adjacent said tail former, a locking groove in the stem adjacent said plug portion, the portion of the stem between said locking groove and said pulling portion being of smaller diameter than the interior diameter of said sleeve and head, the improvement of,

a locking collar around said stem initially completely inside said sleeve spaced from said preformed head,

a locking head on said locking collar initially held in said locking groove whereby said locking collar moves with said stem through said sleeve,

said rivet head having a recess at the inner periphery of the rivet head,

said locking collar being of such material as to be bulged outwardly into said head recess when obstructed from further movement with said rivet stem.

## 4,012,985 MULTIPLE LAUNCHER

Arnold Ingemar Magnusson, Bergfinksvägen 2, S-140 32 Grodinge, Sweden

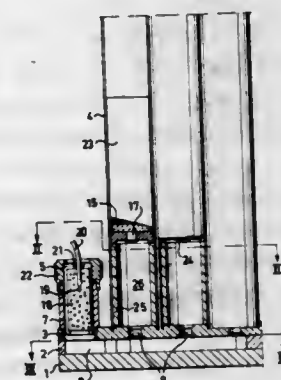
Filed Feb. 26, 1975, Ser. No. 553,409

Claims priority, application Norway, Feb. 27, 1974, 740676

Int. Cl.<sup>2</sup> F41F 3/04

U.S. Cl. 89—1.818

3 Claims



1. Apparatus for launching a plurality of projectiles, comprising

a. a cavity having bottom, side and top wall portions;



- b. a receptacle in communication with the cavity for receiving a cartridge providing on its explosion a gas pressure in the cavity;
- c. a plurality of barrels for receiving projectiles, the barrels being mounted on the top wall portion of the cavity in proximity to one another, at least one of the barrels having an elevation which differs from the elevation of at least one other barrel;
- d. a plurality of channels extending through the top wall portion, each channel connecting one of the barrels with the cavity and forming flow paths for said gas pressure from the cavity to the barrels for propelling said projectiles out of the barrels, at least one of the channels having a cross-sectional area which differs from the cross-sectional area of at least one other channel;
- e. the cross-sectional area of each of the channels being substantially smaller than that of the respective barrel associated therewith, thereby causing the gas flow from the cavity into each barrel to reach critical velocity during at least part of the launching course.

4,012,986

# VARIABLE-ELEVATION FIELD GUNS FOR MORTAR AND CANNON APPLICATIONS

Raimond Germershausen, Kaarst, and Wilfried Becker, Duesseldorf, both of Germany, assignors to Rheinmetall G.m.b.H., Duesseldorf, Germany

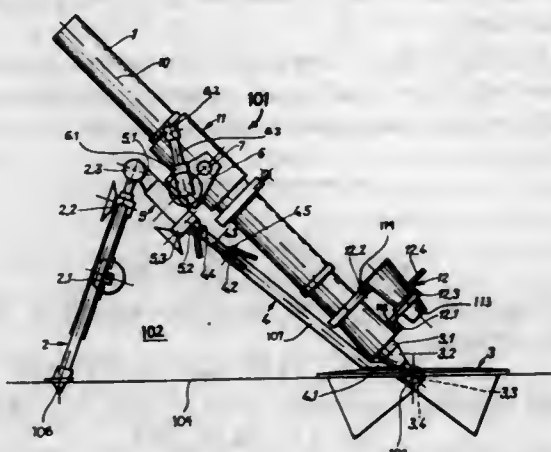
Filed June 9, 1976, Ser. No. 694,235

Claims priority, application Germany, July 19, 1975, 2532354

Int. Cl.<sup>2</sup> F41F 21/12

U.S. Cl. 89-17

8 Claims



1. In a field gun having an elongated barrel adjustable between a relatively high elevation angle for use as a mortar and a relatively low elevation angle for use as a cannon, barrel support means coaxial with and surrounding an intermediate portion of the barrel, means supported at first and second spaced base points for adjustably positioning the barrel support means between the high and low elevation angles, mortar breech means affixed to the positioning means and associated with the first base point for removably engaging the rear end of the barrel in firing relation when the barrel is at its upper elevation angle, and cannon breech means interchangeable with the mortar breech means and pivotally carried at a rear portion of the barrel for oscillation in a plane containing the barrel axis between a first forward inoperative position out of engagement with the rear end of the barrel and a second rear operative position engaged in firing relation with the rear end of the barrel when the barrel is at its lower elevation angle.

4,012,987

# DUAL COMBUSTION MISSILE SYSTEM

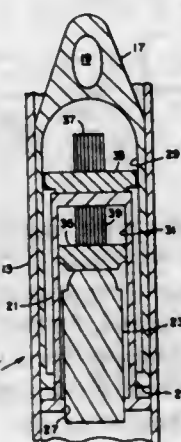
John E. Burkhalter, and Richard H. Sforzini, both of Auburn, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 3, 1975, Ser. No. 610,027

Int. Cl.<sup>2</sup> F41F 3/02, 15/00

U.S. Cl. 89-1.701

4 Claims



1. A missile system comprising: a tubular launcher for directing a missile in a trajectory; and a missile disposed for enclosure in said launcher and operation in said trajectory and provided with an ogival projectile and a housing with respective rearend stops, a slug and pairs of pistons and propellant grains disposed for simultaneous ignition; said projectile and housing including respective combustion chambers with said pistons slidable to retain said propellant grains therein, said housing and slug respectively engaging said pistons, said projectile disposed for propulsion in the trajectory and said slug rearwardly responsive to the simultaneous ignition to control recoil of said launcher.

4,012,988

# MECHANICAL FLY-AWAY LATCHING MECHANISM

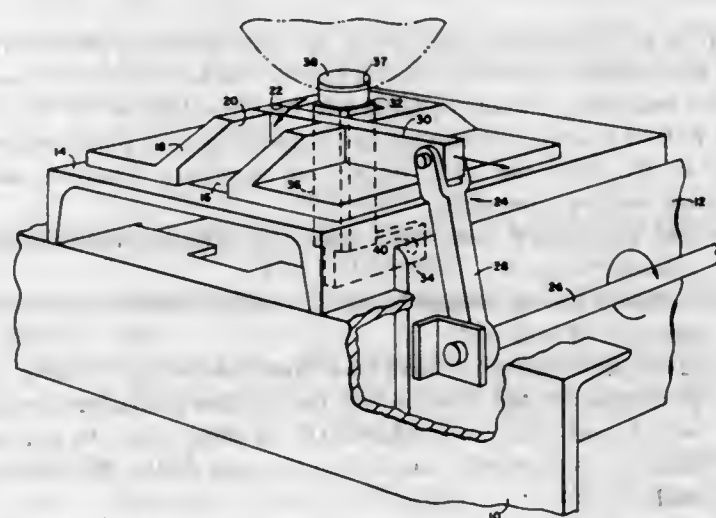
Frederick W. Knight, Orlando, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 7, 1976, Ser. No. 693,254

Int. Cl.<sup>2</sup> F41F 3/04

U.S. Cl. 89-1.806

3 Claims



1. A latching mechanism for releasably engaging a missile socket to prevent missile movement against transportation and handling loads comprising: a freely pivoted L-shaped restraint pin; said pin being provided with a circular end for engaging the missile socket; a slidable bar for holding said restraint pin in its engaged position and means for controlling movement of said bar to a disengaged position whereby said

restraint pin can pivot out of said socket responsive to ignition of the missile motor.

4,012,989

# INERTIAL FREE-SIGHT SYSTEM

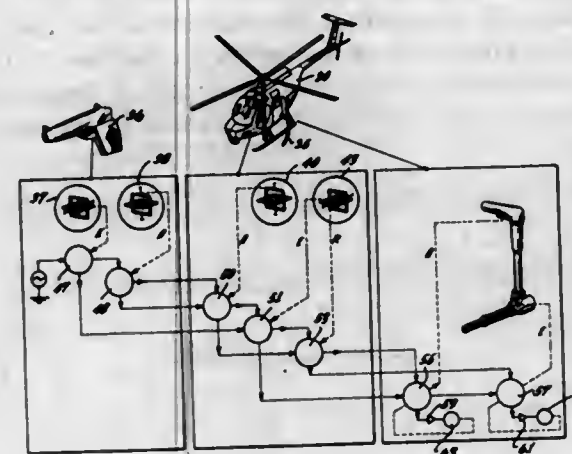
Robert G. Hunt, Encino, and Theodore B. Edwards, Santa Ana, both of Calif., assignors to Summa Corporation, Las Vegas, Nev.

Filed Apr. 21, 1975, Ser. No. 569,926

Int. Cl.<sup>2</sup> F41G 3/10

U.S. Cl. 89-41 EA

11 Claims



9. An inertial hand-held sight system for slaving the axis of craft mounted armament means in parallel relation to a sighting device comprising: a free independently movable sighting device adapted to be positioned on a line of sight to a target, first and second inertial sensor means one of which provides information regarding the orientation of the craft, the other of which provides information regarding orientation of the sighting device, and means to compare the information regarding craft orientation with the information regarding sighting device orientation to provide control information for maintaining the axis of said armament aligned with the axis of said sighting device independently of any changing orientation of the craft.

4,012,990

# DEVICE FOR TRIMMING AND BEVELLING GEAR TEETH

Andre Wagner, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, France

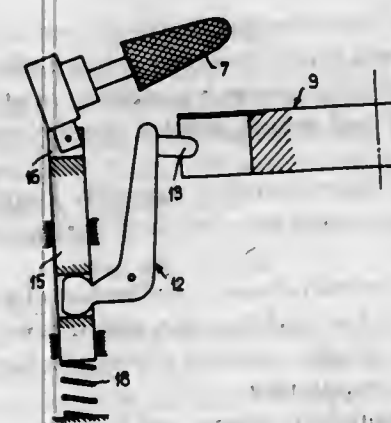
Filed Nov. 25, 1975, Ser. No. 635,038

Claims priority, application France, Nov. 28, 1974, 74.39023

Int. Cl.<sup>2</sup> B23F 19/10

U.S. Cl. 90-1.4

9 Claims



1. A device for removing the burrs from, and bevelling, gear teeth, comprising means for rotatably driving the gear to be treated, a first milling head mounted on a movable support, a

milling cutter mounted for rotation in said milling head, a finger-shaped follower having a bearing surface to engage the periphery of the gear and to penetrate the space between adjacent gear teeth, whereby rotation of said gear imparts radial movement of said follower conforming to the peripheral outline of the gear, a bell-crank lever mounted on a pivot rigidly having a first arm connected to said follower, and a second arm rigid with said first arm and having means engaging a slide for movement therewith, said slide movable within a fixed guide, said slide having means engaging said movable support to move said milling head and said milling cutter transverse to said gear so that said milling cutter operates on said gear teeth.

4,012,991

# KEY DECODING AND DUPLICATING APPARATUS AND METHOD

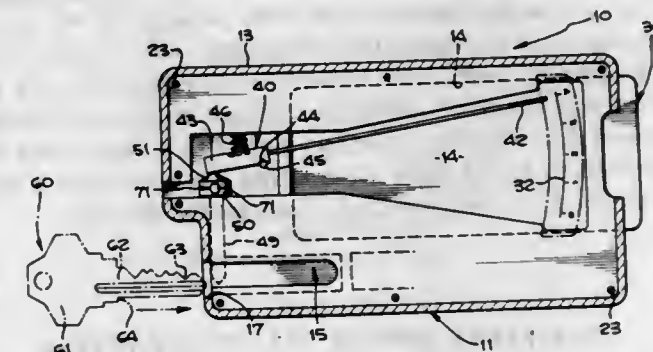
Tim M. Uyeda, South San Gabriel, Calif., assignor to Klaus W. Gartner, La Palma, Calif.

Filed June 2, 1975, Ser. No. 582,639

Int. Cl.<sup>2</sup> B23C 1/16; B23F 23/08; B21K 13/00

U.S. Cl. 90-13.05

8 Claims



1. In a method for decoding and duplicating a key wherein said key includes a shank portion having a plurality of spaced transverse notches of differing depths, the notches of said key being coded to predetermined coded depth, said method comprising the steps of: inserting coded indicia bearing means into a housing, said indicia bearing means including thereon corresponding to a sequential index related to a predetermined coded depth of the notches of said key; inserting a key having a shank portion with notches of the same predetermined coded depth as said coded indicia bearing means into said housing until one of said notches in the shank portion of said key engages indicating means movably on said housing and moving said indicating means across said sequential index of said coded indicia bearing means until said indicating means indicates the coded depth of the notch engaged by said indicating means; recording the coded depths of each of said transverse notches on said key inserted into said housing; locating a blank key of appropriate type on apparatus for duplicating a decoded key at a predetermined location thereon; locating a coded indicia bearing card having the same indicia thereon as said first-mentioned coded indicia bearing means on said apparatus in a position to be observed; and causing an indicator to move relative to said card in response to the depth of cut to be produced on said blank key by an associated key cutting means; and visually comparing the location of said indicator with selected ones of said indicia on said card corresponding to the code for cutting the key to determine a desired depth of cut for a notch being cut in said key blank by said cutting means.

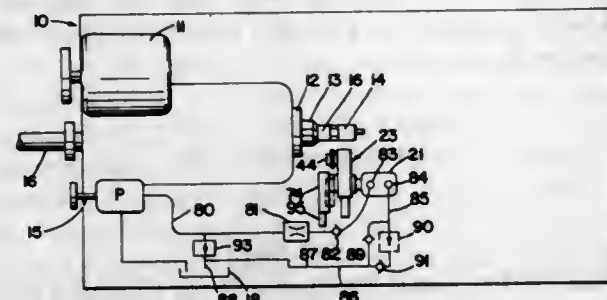


# 4,012,992 HYDRAULICALLY OPERATED ATTACHMENT FOR MACHINE TOOLS

Donald E. Smrekar, Burlington; Peter Bilan, Burlington, and James Hamilton, Campbellford, all of Canada, assignors to Parker-Hannifin Corporation, Cleveland, Ohio  
Filed Nov. 12, 1975, Ser. No. 631,039  
Int. Cl.<sup>2</sup> B23C 7/02

U.S. Cl. 90—15 R

10 Claims



1. In combination, a machine tool having means for supporting and rotating a work piece and having a slide movable toward said work piece, a hydraulic pump, means for driving the pump, a closed housing mounted on the slide for movement therewith, a rotary hydraulic motor separate of the housing but fixedly attached thereto for movement therewith and having a fluid connection with said pump so as to be driven by fluid discharged by the pump, said motor having a rotary output shaft, said housing enclosing a set of intermeshed gears, one of said gears being connected to said output shaft for rotation thereby, another of said gears being connected to a tool shaft for rotating the same, and a cutting tool secured to said tool shaft for rotation thereby.

4,012,993

# AUXILIARY POWER STEERING SYSTEM

Erich Jablonsky, Boeblingen, Rems, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

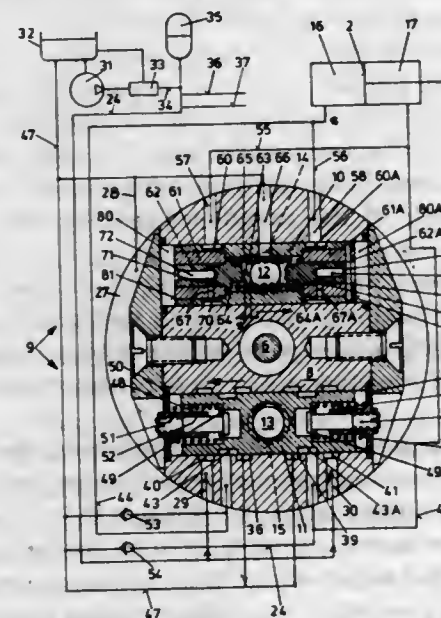
Continuation-in-part of Ser. No. 357,603, May 7, 1973, Pat. No. 3,927,604, which is a continuation-in-part of Ser. No. 266,053, June 26, 1972, Pat. No. 3,855,904. This application Sept. 22, 1975, Ser. No. 615,169

Claims priority, application Germany, Oct. 12, 1974, 2448702

Int. Cl.<sup>2</sup> F15B 9/10

U.S. Cl. 91—371

6 Claims



1. In combination with a source of pressurized fluid for a vehicle having a pump (31), a low pressure fluid reservoir (32) and an accumulator (35) within which a high storage pressure is developed and a manually operable auxiliary

power steering system having a servomotor (2) displaceable under control of a steering spindle (7) engageable with a control valve assembly (11) which is displaceable, against the bias of centering spring means (48 and 48A) from a neutral position in which flow of pressurized fluid from the source to the servomotor is blocked, to operating positions in which the servomotor is connected to the accumulator and the reservoir; reaction force generating means for yieldably resisting displacement of the steering spindle, comprising a valve body (8) enclosing a pair of opposing reaction chambers (80 and 80A), a reaction piston assembly (10) movably mounted in the valve body and exposed to opposing pressures in said reaction chambers, and spring biased force limiting means (62 and 62A) movably mounted in the reaction piston assembly for connecting either one of the reaction chambers to the reservoir to limit the reaction force generated in response to displacement of the reaction piston assembly by the steering spindle.

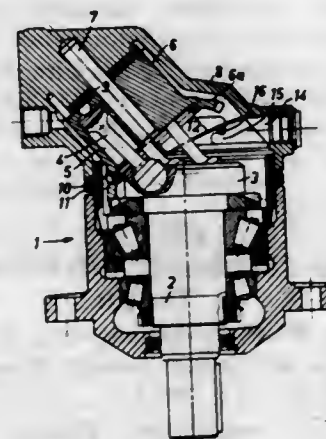
4,012,994

# AXIAL BEARING DEVICE FOR THE CYLINDER BARREL IN AN AXIAL PISTON MACHINE

Sten Axel Torby Malmros, Trollhattan, Sweden, assignor to Volvo Flygmotor Aktiebolag, Trollhattan, Sweden  
Filed May 5, 1975, Ser. No. 574,668  
Int. Cl.<sup>2</sup> F01B 3/00, 13/04

U.S. Cl. 91—499

3 Claims



1. An axial piston pump of the bent-axis type comprising: a rotatable shaft, a drive disk, at least one piston having a ball-shaped end supported on said disk and axially movable in a cylindrical bore formed in a cylinder barrel which is inclined relative to the axis of said shaft and which rotates synchronously with said shaft, said cylinder barrel being rotationally journaled in a housing which is open at a first end thereof adjacent to said drive disk, a raceway at an end of said cylinder barrel which is adjacent said first end of said housing, said raceway being radially outwardly of said cylindrical bores in said barrel for receiving a bearing ring, means for resiliently urging said cylinder barrel against a valve disk at the other end of said housing, said urging means comprising an elongated leaf spring whose one end is fixed at a predetermined position on the interior of said housing and whose other end engages said bearing ring.

# 4,012,995 ASSEMBLIES WHICH COMPRISE AXIALLY SLIDABLE PISTONS/SPOOLS

Philip Butterworth, Cockermouth, England, assignor to Butterworth Hydraulic Developments Limited, London, England

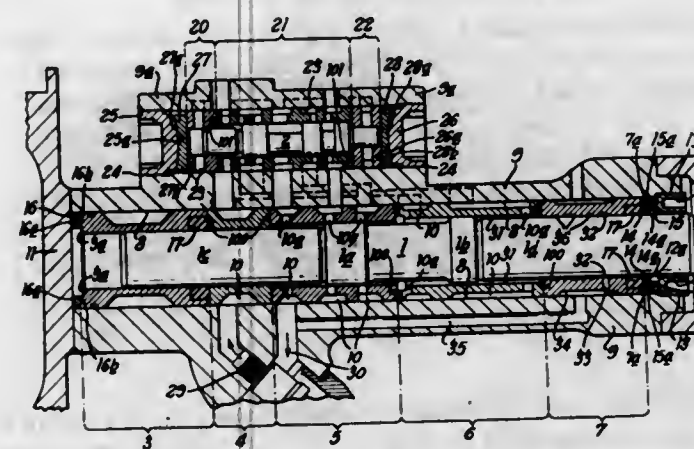
Filed Apr. 30, 1975, Ser. No. 573,047

Claims priority, application United Kingdom, May 6, 1974, 19749/74

Int. Cl.<sup>2</sup> F16J 11/04

U.S. Cl. 92—152

2 Claims



1. An assembly which comprises a piston slidable in a piston cylinder in which the piston cylinder is at least partly defined by at least two substantially annular piston cylinder blocks which are received axially within a substantially complementary cylindrical bore of a housing of the assembly, said cylindrical blocks forming an axially extending array with adjacent end faces of adjacent cylindrical blocks in substantially face-to-face abutment; retaining means at each axial end of the array of cylinder blocks and axially retaining said blocks in the bore of the housing; each retaining means comprising a retaining component on the housing, the retaining component of at least one retaining means being axially adjustable to apply pressure axially to the cylinder blocks in the array and there-through to the retaining component at the other end of the array, and wherein each retaining means further comprises substantially complementary slidably engaging part spherical surfaces which are substantially coaxial with the bore and through which said axial pressure is applied between the retaining components and the cylinder blocks, at least one of the part spherical surfaces of each retaining means being carried by a member disposed axially between the retaining component and the cylinder block which are adjacent to that member, each said member being capable of radial displacement relative to the axis of the bore to accommodate for slight axial misalignment between the retaining components and the cylinder blocks and alleviate axially off-set pressure which may otherwise be applied from the retaining components to the cylinder blocks.

4,012,996

# APPARATUS FOR FOLDING AND COMPRESSION OF CORRUGATED CONTAINER BLANKS

Walter J. Stolkin, Chicago; William A. Riley, Woodridge, both of Ill., and Henry J. Sejda, Munster, Ind., assignors to Stolar Corporation, Chicago, Ill.

Filed May 9, 1975, Ser. No. 576,095

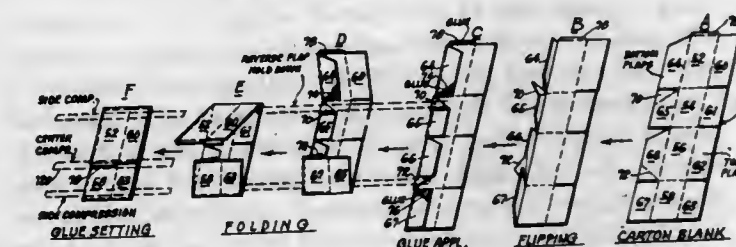
Int. Cl.<sup>2</sup> B31B 1/58

U.S. Cl. 93—36.3

10 Claims

1. Apparatus for processing container blanks to which adhesive has been selectively applied, said blanks having inner and outer side panels and top and bottom flaps attached to each of said panels, comprising: first means receiving said blanks for folding the outer side panels over onto the inner panels to join the outer side panels together along an adhesive bearing portion; second means receiving the folded blanks from said first

means for compressing the inner and outer side panels against each other to permit the adhesive to set for permanently securing said outer panels one to the other. third means for compressing said blank at predetermined locations to spread the applied adhesive thereover and to



permit said adhesive to set, said third means including compression rollers disposed above and below the folded blank cooperating to compress the blank therebetween to spread the adhesive over the surface area of the blank subjected to said rollers.

4,012,997

# METHOD FOR FORMING A LIQUID-TIGHT FLAT TOP CONTAINER

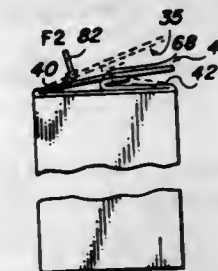
George L. Bachner, and Jerry G. Bachner, both of Barrington, Ill., assignors to Nimco Corporation, Crystal Lake, Ill.

Division of Ser. No. 488,852, July 15, 1974. This application Aug. 6, 1975, Ser. No. 602,286

Int. Cl.<sup>2</sup> B31B 1/26

U.S. Cl. 93—36.8

2 Claims



1. A method for forming a flat top closure for a conventional paper carton, said conventional paper carton comprising four substantially rectangular wall panels having a bottom closure forming a liquid-tight tubular container wherein the method comprises the steps of: cutting a blank of foldable sheet material for forming a conventional tubular container with substantially a gable top pattern; scoring the blank of foldable sheet material with a conventional gable top fold pattern; scoring the blank of foldable sheet material with a top fold score line running across and parallel to the top edges of one of the conventional rectangular roof panels and across the two triangular fold-in tabs immediately adjacent to said one of the conventional rectangular roof panels; forming the blank of foldable material into a conventional gable top container with sloping roof panels, and mated sealing tabs extending vertically from the slanting roof panels with said top fold score line appearing on said one of the conventional rectangular roof panels; folding said one of the conventional rectangular roof panels of said conventional gable top container inward along said top fold score line; heating the thermo-plastic surfaces of one of the conventional rectangular roof panels and said mated sealing tabs; forcing said top fold score line downward and toward the other roof panel of said conventional gable top container until the other roof panel lies in a plane substantially perpendicular to the four substantially rectangular wall panels above said one of the conventional rectangular roof panels;



pressing said other roof panel and said mated sealing tabs downward until said other roof panel and said mated sealing tabs lie in contact with said one of the conventional rectangular roof panels in a plane substantially perpendicular to the four substantially rectangular wall panels above said one of the roof panels;

holding at least one of said mated sealing tabs in contact with said one of the conventional rectangular roof panels until their heated thermo-plastic surfaces cool forming a bond between the thermo-plastic surfaces of at least one of said mated sealing tabs and said one of the roof panels thereby holding said other roof panel and said mated sealing tabs in a plane substantially perpendicular to the four substantially rectangular wall panels above said one of the conventional rectangular roof panels resulting in a flat liquid-tight top closure.

4,012,998

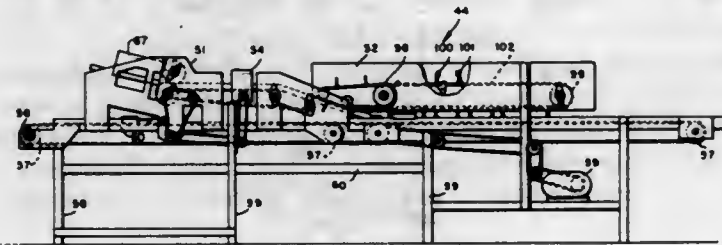
**CARTON SEALING METHOD AND APPARATUS**

Ralph K. Daugherty, and Lynn D. Crawford, both of San Jose, Calif., assignors to Genevieve I. Hanscom and Genevieve I. Hanscom, Robert M. Magnuson & Lois J. Thomson, Trustees of the Estate of Roy M. Magnuson, all of, Calif., part interest to each

Filed Sept. 17, 1975, Ser. No. 614,351  
Int. Cl.<sup>2</sup> B31B 17/02

U.S. Cl. 93—39 R

9 Claims



1. A method for sealing a lid onto a tray to form a carton wherein the tray comprises a multi-sided container with an open top and the lid comprises a center panel having pairs of side and end flaps adapted to bend down along the tray sides, said method comprising:

- conveying the tray along a preselected path;
- feeding a tray blank along a path elevated above the tray preselected path and positioning said lid blank above the tray such that the center panel thereof coincides with the tray outline;
- treating one surface of each lid blank side panel prior to positioning the lid blank over the tray so the surface will stick to the tray;
- folding the panel extending in the direction the lid blank and tray are being moved down along the adjacent tray side and holding said panel in said position so as to position the lid blank center and precisely over the tray; and
- folding the remaining lid blank side panels down along the adjacent sides of the tray.

4,012,999

**APPARATUS FOR FORMING TRAYS**

Lynn D. Crawford, San Jose, Calif., assignor to Genevieve I. Hanscom and Genevieve I. Hanscom, Robert M. Magnuson and Lois J. Thomson, Trustees of the Estate of Roy M. Magnuson, all of, Calif., part interest to each

Filed Sept. 17, 1975, Ser. No. 614,433  
Int. Cl.<sup>2</sup> B31B 1/44

U.S. Cl. 93—51.1

11 Claims

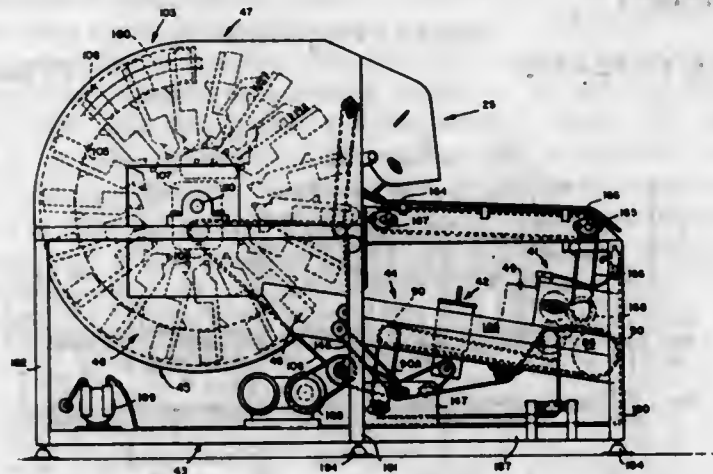
1. A tray forming apparatus for forming a tray from a blank having a bottom panel and side forming panels with a fold line therebetween, said apparatus comprising, in combination:

- a plurality of mandrel assemblies having a forming head about which the blank can be folded to form the tray;
- a die assembly to cause folding of the blank about the forming head with passage of each mandrel assembly there-through;

a stripping head mounted in each mandrel assembly for movement relative to the forming head to remove the formed tray from the forming head;

means to position a blank onto each forming head;

means to effect relative movement between the die assembly and each forming head to move the forming heads through the die assembly in succession to form the blank about each forming head;



means to cause movement of the stripping head relative to the forming head to strip the formed tray therefrom and clamp the formed tray between the stripping head and the next adjacent mandrel assembly; and

means to remove the formed tray from the mandrel assembly.

4,013,000

**OPTICAL CROSSBAR SWITCHING NETWORK**

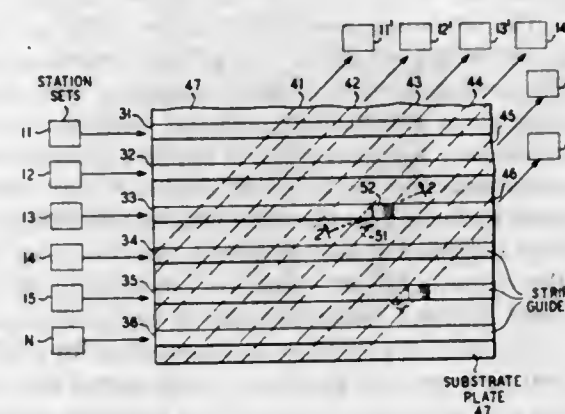
Herwig Werner Kogelnik, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 20, 1975, Ser. No. 633,719

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96 C

7 Claims



1. An optical switching network of the type employing a plurality of optical crosspoints to provide connections in an NxN network of optical waveguide communication channels, characterized in that a first plurality N of the optical waveguide channels are parallel to each other and define a first plane, a second plurality N of optical waveguide channels are parallel to each other and define a second plane which is parallel to said first plane, said waveguide channels in said first plane crossing over said waveguide channels in said second plane without intersection, each region of closest approach of one waveguide channel from said first plurality N of waveguide channels to a second waveguide channel in said second plurality N of waveguide channels defining a proposed switching crosspoint, and further characterized by including at each of the proposed switching crosspoints a first beam-to-guide (grating-type) coupler to couple the modulated optical energy from said one waveguide channel of the first plurality of waveguide channels, and laterally disposed therefrom in a direction chosen to define the optical communication path between

waveguide channels a second beam-to-guide coupler to couple the energy from the first coupler into said second waveguide channel of the second plurality of waveguide channels, each of said first and second couplers being controllable between noncoupling and coupling conditions with respect to its related waveguide channel.

4,013,001

**FRUIT TREATING APPARATUS**

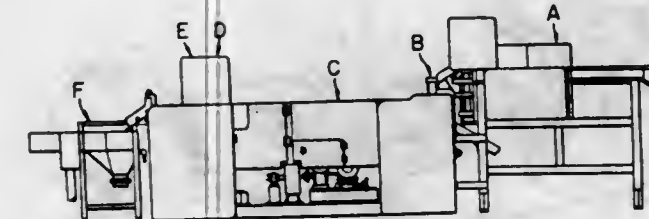
Sato Yasuhiro, Sendai; Sato Toshio, Izumi; Kawasaki Shuichi, Kawasaki; Takaishi Toshio, Izumi; Okuyama Sadao, Sendai, and Yamanashi Norio, Shizuoka, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed July 3, 1974, Ser. No. 485,556

Claims priority, application Japan, July 6, 1973, 48-80349  
Int. Cl.<sup>2</sup> A23N 4/12; A47J 25/00; A23N 4/24

U.S. Cl. 99—550

27 Claims



1. A fruit slivering and pitting device in which fruit is transported along a path to a first station where the fruit is slivered and then transported to a second station where the fruit is pitted comprising a main frame, a slivering mechanism having an upper cutter and a lower cutter movable towards each other to a slivering position to sliver a fruit therebetween, means mounting said upper and lower cutter for vertical movement toward and away from each other in a direction transverse to the direction of travel of the fruit, said slivering mechanism mounted on said main frame at said first station in the path of travel of the fruit, and a pitting mechanism having an upper rotary cutter and a lower rotary cutter movable towards each other to a cutting position to put a fruit therebetween, said means mounting said upper and lower cutters for vertical movement toward and away from each other in a direction parallel with the movement of said upper and lower cutters of said slivering mechanism, said pitting mechanism mounted on said main frame downstream of said slivering mechanism at said second station in the path of travel of the fruit, whereby the flesh of the fruit is slivered at said first station, and the pit is removed from said slivered fruit at said second station.

4,013,002

**PROCESS AND APPARATUS FOR ACTUATING THE RAM WEIGHT COMPENSATION MECHANISM OF A PRESS**

Franz Schneider, and Burkhard Schumann, both of Goppingen, Germany, assignors to L. Schuler GmbH, Germany

Filed Mar. 24, 1975, Ser. No. 561,165

Claims priority, application Germany, Mar. 26, 1974, 2414409

Disclosure was also published under second Trial Voluntary Patent Program on Mar. 30, 1976

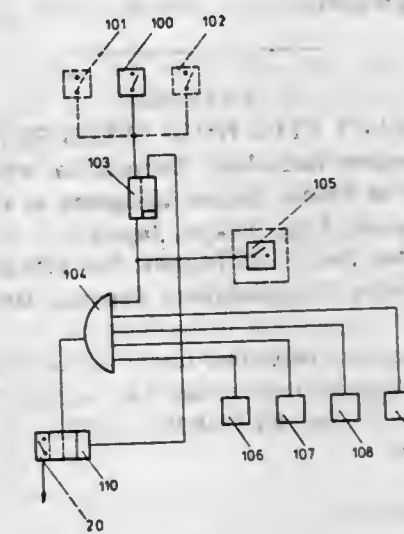
Int. Cl.<sup>2</sup> B30B 13/00

U.S. Cl. 100—35

21 Claims

1. A process for the positive actuation of a weight compensating mechanism for a ram of a press comprising the steps of detecting at least one condition indicative of the changing of a tool set of the press, preventing working operation of the

press in response to the detection of a condition indicative of the changing of a tool set, and subsequently initiating opera-



tion of the weight compensating mechanism for the ram of the press.

4,013,003

**PRESS WITH TOGGLE JOINT DRIVE MECHANISMS**

Kurt Finsterwalder, Goppingen, and Günter Riedisser, Eisligen, both of Germany, assignors to L. Schuler GmbH, Germany

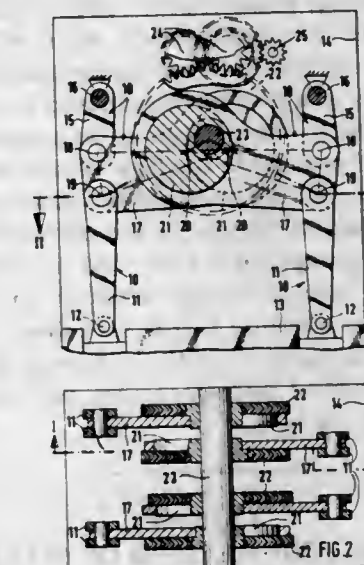
Filed Jan. 19, 1976, Ser. No. 650,065

Claims priority, application Germany, Jan. 17, 1975, 2501748

Int. Cl.<sup>2</sup> B30B 1/14

U.S. Cl. 100—285

11 Claims



1. Press comprising:

- press frame means,
- a press ram guidably supported at said press frame means,
- a plurality of toggle joint drive mechanisms, each of said toggle joint drive mechanisms including a drive member, a first link member, and a second link member, said first link member having one portion thereof pivotally connected to a ram coupling point of said press ram and another portion thereof pivotally connected to a first coupling point of said drive member, said second link member having one portion thereof pivotally connected to a frame coupling point of said press frame means and a second portion thereof pivotally connected to a second coupling point of said drive member at a position spaced from and facing said first coupling point,
- and rotatable drive means for applying driving forces to said drive members,
- wherein each drive member is an acute-angled triangular guide member having the acute angle corner thereof



connected to said drive means for movement therewith, and wherein said first and second coupling points are at respective corners of said guide member other than said acute angle corner.

4,013,004

## INK MIST TYPE HIGH SPEED PRINTER

Akinori Watanabe, Katsuhide Tanoshima, and Matsusaburo Noguchi, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Dec. 3, 1974, Ser. No. 529,214

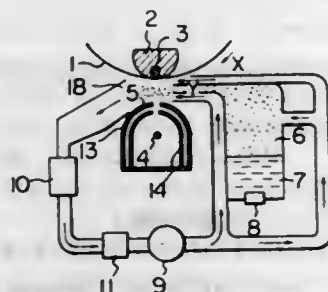
Claims priority, application Japan, Dec. 10, 1973, 48-136885

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 20, 1976

Int. Cl.<sup>2</sup> G03G 15/04

U.S. Cl. 101-1

3 Claims



1. An ink mist type printer for use in printing information on a printing medium, comprising means for generating an ion stream including a pair of spaced electrodes to which a high voltage is applied; means positioned between said electrodes for modulating said ion stream including an electrically controlled aperture board having a plurality of apertures therein, said apertures being positioned in at least one aligned row through which the ion stream passes and is modulated, means for supplying an ink mist between said aperture board and one of said electrodes whereby the modulated ion stream charges the mist according to the pattern to be printed on a printing medium arranged parallel to the flow of said ink mist between said one electrode and the aperture board whereby characters are printed on said medium by the attraction to said one electrode of the charged ink mist; and a conductive corona discharge shield board located between the other of said electrodes and said aperture board, said shield board having a narrow slit formed therein located generally in parallel alignment with the other of said electrodes and the row of apertures in said aperture board.

4,013,005

## PRINT WHEEL AND METHOD OF MAKING SAME

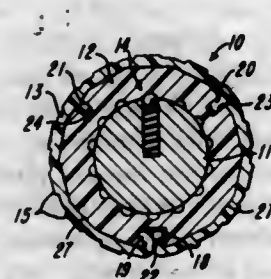
Jack D. Keefe, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sept. 18, 1973, Ser. No. 398,519

Int. Cl.<sup>2</sup> B41J 1/22

U.S. Cl. 101-110

15 Claims



1. Method of making a print wheel, comprising the steps of: molding an elongated, unitary, printing band composed of polymeric material and having complementary lugs at its

marginal ends, providing a generally annular base having an undercut recess open at the periphery of the base by a gap which is narrower than the combined thickness of the lugs and open at a side of the base and with the length of the band about the periphery of the base being less than the peripheral extent of the base, bringing the band at least partially around the base under tension, and inserting the complementary lugs through the open side into the undercut recess so that the band is maintained on the base under tension.

4,013,006

## ROLL-FED SHEET PRINTING APPARATUS

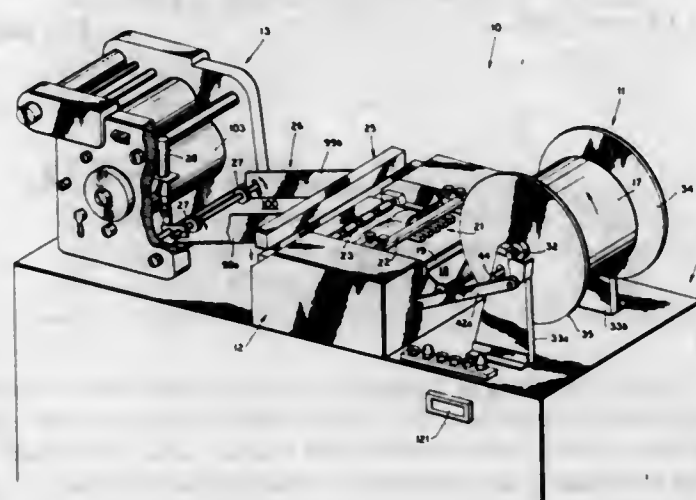
Dale F. Burrell, and Alan Strihafka, both of Kennesaw, Ga., assignors to Burrellco, Inc., Kennesaw, Ga.

Filed July 9, 1975, Ser. No. 594,496

Int. Cl.<sup>2</sup> B41F 13/56

U.S. Cl. 101-227

2 Claims



1. Apparatus for providing printed sheets from a continuous web of printing stock, comprising: support means to receive and dispense a continuous web of printing stock; means operative to receive the continuous web of stock from said support means and selectively operative to withdraw a length of said stock from the continuous web; means responsive to the passage of stock withdrawn from the continuous web to provide a first signal condition indicating that a certain length of stock has been withdrawn from the continuous web; stock cutting means positioned in operative relation to said stock withdrawn from the continuous web and operative in response to said first signal condition to cut said certain length of stock from the web to furnish a separate sheet of said stock; means operative to provide a second signal condition indicating that said stock cutting means has operated; printing means positioned to serially receive said separate sheet cut from the continuous web by said cutting means and operative in response to said second signal condition to perform a printing operation on said separate sheet; said means responsive to the passage of withdrawn stock being operative to measure the length of stock withdrawn from the continuous web and to provide said first signal condition when the measured length corresponds to a previously determined length for said separate sheet; said means responsive to the passage of withdrawn stock comprising pulse generating means operative to generate a pulse signal in response to passage of each increment of withdrawn web, said increment of length being less than said previously determined length for said separate sheet; counting means operative to maintain a pulse count signal condition in response to said pulse signals from said pulse generating means; and comparator means responsive to said pulse count signal condition and to a present reference count signal condition to provide said first signal condition when the pulse

count corresponding to said pulse count signal condition is equal to said reference count signal.

4,013,007

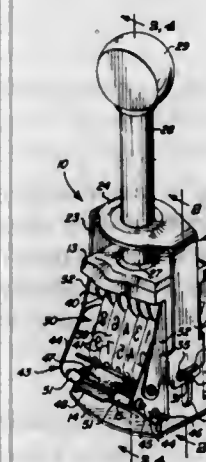
## SELF-INKING HAND STAMP

Harold M. Flynn, 5138 E. Taylor St., Phoenix, Ariz. 85008  
Filed Sept. 17, 1975, Ser. No. 614,257

Int. Cl.<sup>2</sup> B41K 1/42

U.S. Cl. 101-333

4 Claims



1. A hand stamp assembly comprising an upright body frame having matched elongated slots including a base to be thrustingly engaged with an object to be imprinted, a printing frame, a printing unit within the body frame and operatively coupled with said printing frame by means of connecting means from the printing unit to the printing frame riding in said slots, said printing unit having character-carrying means movable to shift different printing characters thereon into printing position facing toward said base, and means normally biasing the printing frame and thereby the printing unit into a retracted position on the body frame away from said base and from which position the printing frame can be moved in opposition to the biasing means to drive the printing characters into imprinting engagement with an object against which the base is thrustingly engaged, including: said printing frame having a pair of spaced side bars, said bars each having a matching control cam slot therein, each cam slot having a matching shoulder lateral to the longitudinal axis of each cam slot, the shoulders stopping the travel of the printing unit away from the object, each of the shoulders comprising a portion of the periphery of each cam slot, said connecting means being operatively engaged in said cam slots and said elongated slots to effect swinging of the printing unit between a position wherein an inking pad is in inking contact with the printing characters at a position laterally of the longitudinal axis of said body frame to a clearance position in said printing frame to permit movement of the printing frame and the printing unit in opposition to said biasing means and relative to said body frame to effect imprinting by the inked printing characters upon an object against which the base is thrust, and means mounted on said base at the end which engages the object to be imprinted for causing the imprinting to occur at an acute angle to the longitudinal axis of the hand stamp assembly, said means comprising pads mounted on said base wherein the thickness of the pads on one side of said base are greater than the thickness of the pads on the other side of the base.

4,013,008  
METHODS AND SOLUTIONS FOR IMPROVEMENT OF OFFSET PRINTING

Dorvin Brown, 2925 Sinbad Trail, Farmers Branch, Tex. 75234

Filed Mar. 17, 1975, Ser. No. 558,667  
Int. Cl.<sup>2</sup> B41N 3/08; B41M 1/02

U.S. Cl. 101-451

3 Claims

1. A method of offset printing with a metal printing plate of the kind which is susceptible to corrosion and which tends to accumulate dirt in the non-image regions thereof, comprising dampening the surface of said plate in the non-image regions thereof with an aqueous polyphosphate solution containing polyphosphate in an amount at least equal to about 0.6 g/l prior to inking said plate and taking an impression therefrom, in which the aqueous polyphosphate solution consists essentially of a concentrate consisting essentially of:

	Volume Per Cent
Sodium tripolyphosphate	4.3
Sodium hexametaphosphate	21.5
Aminomethylenephosphonate	0.8
Water	73.4

diluted to a use concentration between about 0.6 g/l and about 3 g/l.

4,013,009

## ILLUMINATING PROJECTILES AND PYROTECHNIC DEVICES

Pierre M. R. Claude; Robert E. Gencey; Jean-Paul Mottry, and Rene H. Cayre, all of Bourges, France, assignors to Etat Français, France

Filed Feb. 7, 1975, Ser. No. 547,931

Claims priority, application France, Feb. 8, 1974, 74.04213  
Int. Cl.<sup>2</sup> F42B 13/40

U.S. Cl. 102-35.6

13 Claims



1. An illuminating projectile adapted to be launched by a rifled-tube unit, comprising:

- a body;
- a container releaseably connected to said body;
- a first ejection charge means for disconnecting said container from said body after a predetermined period of time, said container being subjected to rotational and translational movement after being disconnected from said body;
- a small parachute, connected to said container, for braking the translational movement of said container;
- first means, connected to and acting on said container, for reducing the rotational speed of said container;
- an illuminating flare releaseably connected to said container;
- a second ejection charge means for disconnecting said illuminating flare from said container after a predetermined period of time, said illuminating flare being subjected to residual rotational and translational movement after being disconnected from said container;
- a large parachute, connected to said illuminating flare, for braking the residual translational movement of said illuminating flare; and



i. second means, connected to and acting on said illuminating flare, for reducing the residual rotational speed of said illuminating flare.

4,013,010

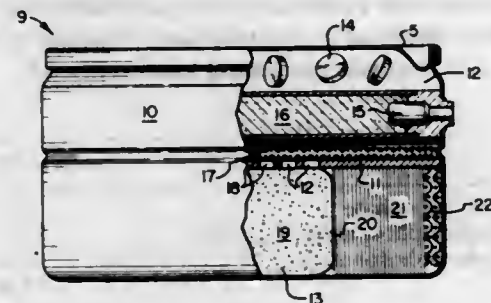
**GAS GENERATOR WITH EXPANDABLE CARTRIDGE**  
Fred E. Schneider, North Ogden; Philip R. Dykstra, and Carver G. Kennedy, both of Brigham City, all of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Nov. 4, 1974, Ser. No. 520,577

Int. Cl.<sup>2</sup> F42B 3/04

U.S. Cl. 102—39

6 Claims



1. A gas generator comprising: a housing comprising two half shells forming a box-like structure with orifices therein, and a plurality of orificed, hollow cylinders inside said structure, the ends of the cylinders being closed by the half shells; and expandable cartridge in each of the cylinders comprising an easily-rupturable, hermetically-sealed container; a perforated partition dividing the container into first and second chambers; gas generant material in the first chamber; an ignition means contiguous with the gas generant material; gas cooling means adjacent the inner wall of the second chamber of the container; and pH neutralizing material between the cooling means and the perforations of the partition, so that gases from the burning gas generant material passing through the perforations in the partition must pass through the pH neutralizing material—the housing closely supporting the container on all sides except for the orifice sites in the surrounding cylinder, which are adjacent the cooling means, whereby gases passing through the cooling means may rupture the container only at the orifices.

4,013,011

**THROWING DEVICE FOR GRENADES**

Andre Gabriels, Genk, Belgium, assignor to Fabrique Nationale Herstal S.A., Herstal-lez-Liege, Belgium

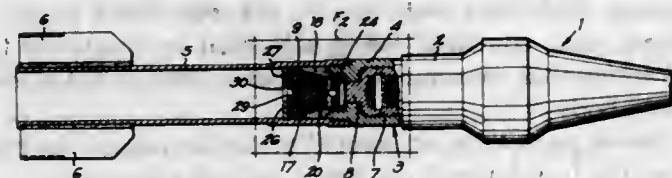
Filed Aug. 27, 1975, Ser. No. 608,396

Claims priority, application Belgium, Apr. 8, 1975, 54254

Int. Cl.<sup>2</sup> F42B 11/42

U.S. Cl. 102—65.2

8 Claims



1. A device for firing a grenade or the like from a weapon such as a gun, comprising: a tubular casing affixed to the rear of the grenade; abutment means on the inner wall of said tubular casing; a bullet trap in said tubular casing between said abutment means and said grenade, said bullet trap comprising a hard mass under the form of a truncated revolution body and a substantially rigid metal bearing disc adjoining at one side thereof, the large base of said hard mass, the other side of said bearing disc engaging said abutment means, the small base of said hard mass being supported by a portion of the body of said grenade.

4,013,012

**ELECTRONIC SAFE ARMING AND FUZING SYSTEM**

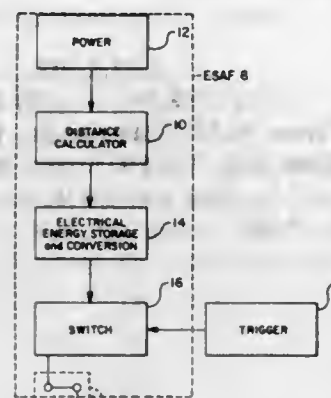
Louis Robert Giattino, Hollister, Calif., assignor to Altus Corporation, Cupertino, Calif.

Filed Nov. 18, 1974, Ser. No. 524,558

Int. Cl.<sup>2</sup> F42C 15/40

U.S. Cl. 102—70.2 R

6 Claims



1. A system for arming a warhead of a missile after said missile has reached a predetermined distance from a launch vehicle and detonating said warhead upon the occurrence of a triggering event, said apparatus comprising:

an exploding bridge wire imbedded in the explosive of said warhead;

a first system branch comprising:

first accelerometer means for detecting a predetermined acceleration force and closing a first switch upon experiencing said acceleration force;

voltage regulator means electrically connected to said first accelerometer means such that electric energy is supplied to said regulator means when said switch is closed;

energy conversion means connected to said regulator means for converting a relatively low direct current voltage to a relatively high direct current voltage;

capacitor means connected to the output of said converter means for storing electrical energy;

switch means connected between said energy storage means and said exploding bridge wire for allowing said stored energy to pass through said exploding bridge wire upon the occurrence of said triggering event;

a second system branch comprising:

second accelerometer means for generating an output signal upon detecting said predetermined acceleration force;

electronic timer means connected to said second accelerometer, said timer means being adapted to generate an output signal a predetermined time period after receiving the output signal from said second accelerometer means; and

means interconnecting said timer means and said first system branch for preventing energy from reaching said capacitor means prior to the receipt of the output signal from said timer means.

4,013,013

**ORDNANCE FUZE TIME DELAY MECHANISM**

Dale M. Davis, Freeport, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 12, 1975, Ser. No. 631,279

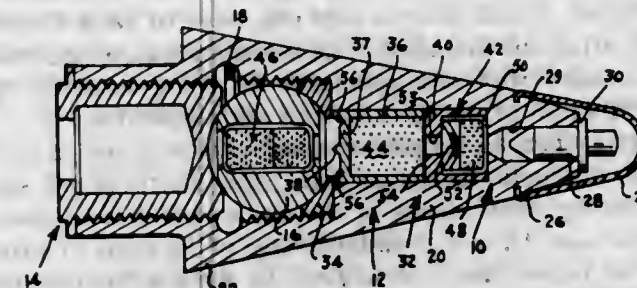
Int. Cl.<sup>2</sup> F42C 9/10

U.S. Cl. 102—72

8 Claims

1. In a fuze having a body and a detonator assembly the improvement therein being a fuze delay mechanism comprising a first housing in operative relationship with said detonator assembly, a propellant having a predetermined burning rate located within said first housing, a second housing located adjacent said first housing, a primer having a predetermined

burning-rate located within said second housing, means operatively connected to said primer for initiating an ignition of said primer, said second housing containing an aperture therein adjacent said first housing, means located between said aperture and said first housing for separating said first housing and said second housing, said separating means capable of being ruptured at a predetermined time after the ignition of said primer and said first housing having a shear disc on the end



opposite said separating means, said shear disc being capable of shearing when acted upon by a predetermined pressure build-up within said housings, whereby the ignition of said primer causes a subsequent ignition of said propellant thereby increasing the pressure within said housings to said predetermined level and said increase in pressure causes the shearing of said shear disc and subsequent detonation of said detonator assembly at a predetermined time delay after the initial ignition of said primer takes place.

4,013,014

**CIRCUIT ARRANGEMENT FOR A TRACK-BOUND PROPULSION VEHICLE**

Joachim Holtz, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

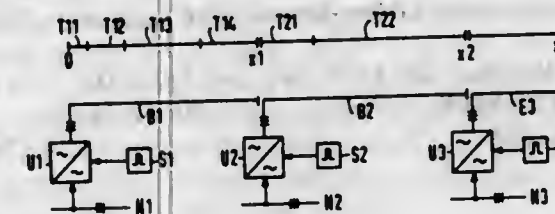
Filed Sept. 3, 1975, Ser. No. 610,054

Claims priority, application Germany, Sept. 18, 1974, 2444679

Int. Cl.<sup>2</sup> H02P 7/46

U.S. Cl. 104—148 LM

7 Claims



1. A circuit arrangement for use with a trackbound propulsion vehicle which is supplied by a linear synchronous motor having an exciter which is disposed as a co-movable translator on said vehicle, said circuit arrangement including:

a traveling field winding disposed along the roadbed followed by said vehicle, said winding forming a stator for said motor and having an acceleration span which includes a number of acceleration sections;

a number of converters each of which supplies one of said acceleration sections with an ac voltage of variable frequency and amplitude; and

at least one of said acceleration sections including:

a number of interconnected subsections through which the same current from the converter supplying said one acceleration section flows, each of said subsections having a number of poles and phases and a number of transversal conductors per pole and phase which is inversely proportional to a predetermined velocity of said vehicle in that subsection.

4,013,015

**COUPLING AND BRAKING DEVICE FOR TOW PIN DRIVEN FLOOR TRUCKS**

Hans-Georg Fromme, Stuttgart, and Günter Böttner, Wolfschlügen, both of Germany, assignors to Thyssen Aufzuege GmbH., Stuttgart, Germany

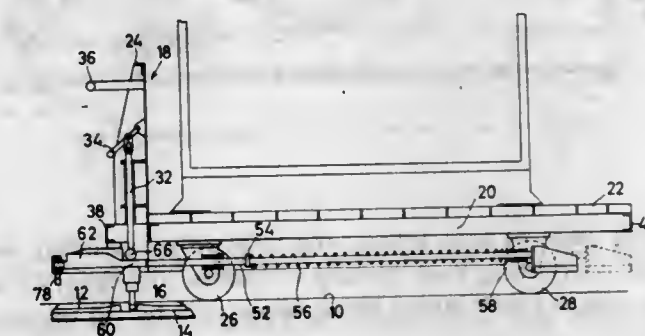
Filed Aug. 25, 1975, Ser. No. 607,554

Claims priority, application Germany, Aug. 24, 1974, 2440681

Int. Cl.<sup>2</sup> B61B 13/00

U.S. Cl. 104—172 BT

19 Claims



1. Coupling and braking device for rail supported transportation equipment, especially tow cars, which are guided along a floor groove by means of drive rods arranged at their front end and which are entrained by an underfloor tow chain, each car having rigid front and rear fenders and a substantially horizontally guided front fender movable with a movement component oriented at an angle to the travel direction, whereby the movable fender reaches forwardly beyond the rigid front fender and, when running up against a stop barrier or against a standing car, disengages the drive rod from the drive chain by means of a connecting mechanism moving against a return spring, while simultaneously displacing a latching device from a forward, passive position into a rearward activated operating position, the latching device being displaced into its activated operating position as a result of its attachment to the connecting mechanism, the device of the invention being characterized in that a spring loaded return means is provided as part of the mechanical connection between the forward movable fender (44) and the latching device (72; 118) and that the rearwardly arranged latching device (72; 118) is so arranged that, when it is in its activated operating position, it blocks the motion component, oriented at an angle to the travel direction, which results from the return force acting on the movable front fender (44) and connecting mechanism (52; 102) of the succeeding car which has run up against this car.

4,013,016

**RAILROAD CAR TRUCK SUSPENSION SYSTEM**

Elwood H. Willets, 102 S. Penataquit Ave., Bay Shore, N.Y. 11706

Filed June 12, 1975, Ser. No. 586,244

Int. Cl.<sup>2</sup> B61F 3/00

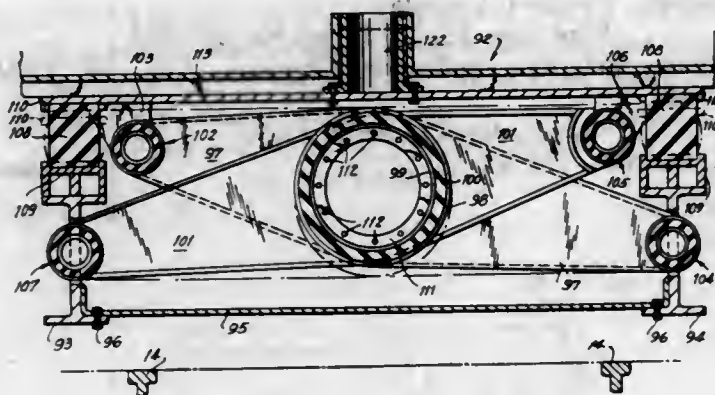
U.S. Cl. 105—199 R

3 Claims

1. A vehicle suspension system for use in conjunction with a railroad car, or the like, comprising, in combination: a truck assembly having side frames disposed longitudinally with respect to a car body supported thereby, said car body being pivotally supported by the truck assembly, and resilient means cooperative with the truck assembly for preserving substantially uniform parallelism as between the car body and the riding surfaces upon which the truck assembly is carried, said resilient means comprising a crossed lever assembly interconnecting sprung and unsprung elements of said car whereby parallelism of these elements is operatively preserved throughout the load range of the suspension system, said crossed lever assembly comprising a hollow hub assembly integral with crossed levers, the hollow hub assembly including concentrically disposed component hubs located at a common intersec-



ton of the crossed levers, radially adjacent surfaces of said hubs being bondedly interconnected by an elastomeric collar, said elastomeric collar being operationally stressed in torsional shear in resistance to load deflection of outwardly



extending ends of said levers, the upwardly extending ends hingedly supporting said sprung elements, downwardly extending ends of said levers being supported by said unsprung elements.

4,013,017

## REMOTE RAILWAY CONTAINER LOCKING SYSTEM

Hiroshi Toyota, Tokyo; Toshio Yamazaki, Omiya, and Takashi Iketani, Yono, all of Japan, assignors to Japanese National Railways, Tokyo, Japan

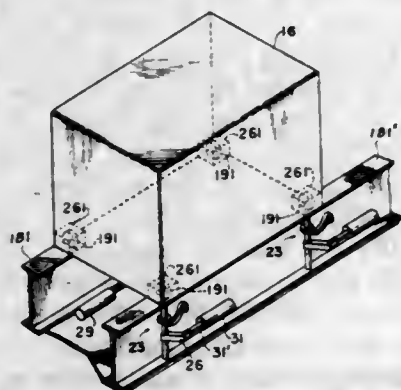
Filed Mar. 25, 1975, Ser. No. 562,037

Claims priority, application Japan, Apr. 10, 1974, 49-39911

Int. Cl.<sup>2</sup> B61D 17/00, 49/00; B65J 1/22; H01R 33/00

U.S. Cl. 105-366 C

8 Claims



1. A system for issuing instructional signals to individual cars of a train for causing actuation of a means of said individual car, said system comprising:

a plurality of instructional signal lines extending in an array parallel to each other through each car in a direction parallel to the direction of travel of the car, the number of said lines being at least as great as the number of cars in the train;

a plurality of feedback lines extending in an array parallel to each other through each car in a direction parallel to the direction of travel of the car, the number of lines being at least as great as the number of cars in the train;

two pluralities of terminals at each end of each car corresponding in number to the number of instructional signal lines and the number of feedback lines, respectively, and the terminals in each plurality corresponding in position to the positions of the respective lines in the respective arrays of lines, the one ends of the lines being connected to the terminals at one end of each car in positional correspondence with said lines, and the other ends of the lines in each car being connected to terminals offset by one from the terminals in positional correspondence with the respective lines and the other end of the line on one edge of each array extending across the array and being connected to the terminal in positional correspondence

with the line on the other edge of the array, and connections between the terminals in adjacent cars; instructional signal receiving relay means in each car coupled to the line on said one edge of each instructional signal line array, and an apparatus in each car coupled to said instructional signal receiving relay means for operation in response to energization of said instructional signal receiving relay means; and order fulfilled signal transmitting relay means in each car coupled to said line on said one edge of each feedback line array and including relay actuating means operatively associated with said apparatus for being actuated upon completion of the operation of said apparatus; whereby when an instructional signal is supplied to one of said instructional signal lines, the instructional signal receiving relay means in the car in which said instructional signal line is at said one edge of the array of instructional signal lines is energized to actuate the apparatus and upon completion of the operation of the apparatus the actuation of the order fulfilled signal transmitting relay means transmits an order fulfilled signal through the feedback line at said one edge of the array of feedback lines in said car.

5. A system as claimed in claim 1 further comprising at least one energizing line for energizing the apparatus, said energizing line extending through all of the cars in series, and further relay means in each car coupled to said energizing line, and a normally open contact of the instructional signal receiving relay means connected between the further relay means and the energizing line.

7. A system as claimed in claim 5 in which said apparatus comprises means for locking of containers to a railway car, including a plurality of container fastening bars which are raised to raise a locking head into a corresponding recess in a container and then turned to lock the head into the recess, there being at least one set of fastening bars on each car for each size container carried on the car, each car having a number of energizing lines and further relay means corresponding to the number of types of containers which can be carried on a car, and said further relay means being operatively associated with said means for locking of containers for raising the fastening bars.

4,013,018

## PNEUMATIC SHIPPING ENCLOSURES

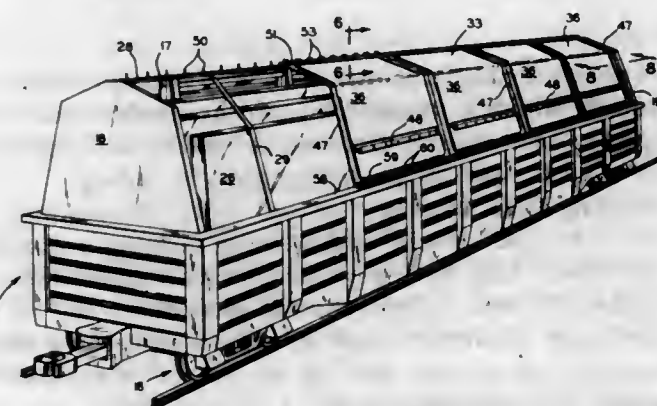
Ralph C. Hansen, Toledo, and Ray P. Miles, Macedonia, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Jan. 20, 1975, Ser. No. 542,461

Int. Cl.<sup>2</sup> B60P 7/04, 7/10, 7/16; B61D 45/00

U.S. Cl. 105-468

4 Claims



1. The combination: with a goods supporting structure including a goods supporting framework mounted on a vehicle; of a protective cover comprising two flexible sheets arranged in face to face relation and sealed together in selected areas to form substantially flat sealed marginal portions, upper and lower inflatable compartments within said marginal portions and between said sheets, an elongated sealed area sepa-

rating said compartments and about which sealed separating area said compartments can be swung into and out of angular relationship with one another, means for securing the upper of said marginal portions of said cover to said framework to permit said compartments to be swung into angular relationship and to extend over and into covering relationship to goods supported on said framework, and means for securing the lower of said marginal portions of said cover to one side of said vehicle; and a similar cover with means for securing its upper marginal portion to said framework in overlapping relation to the upper marginal portion of said first mentioned cover and for securing its lower marginal portion to said vehicle at the opposite side thereof from said first mentioned cover.

4,013,019

## DRIVE FOR TILTABLE X-RAY TABLE

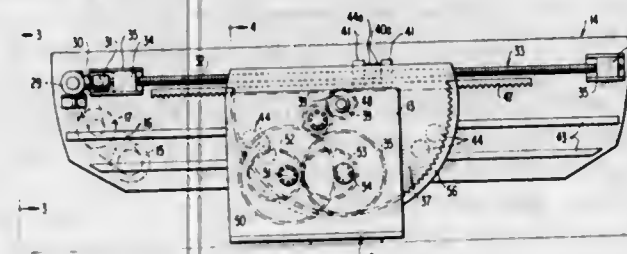
William Charles Horsey, Towson, Md., assignor to CGR Medical Corporation, Baltimore, Md.

Filed Nov. 25, 1975, Ser. No. 635,049

Int. Cl.<sup>2</sup> A47F 5/12

U.S. Cl. 108-5

11 Claims



1. An X-ray examination table comprising a relatively stationary pedestal and a movable patient supporting table body having a rotational axis, means supporting the table body on said pedestal and allowing the table body to move translationally and rotationally relative thereto, a primary power drive means connected with the table body to produce translational movement thereof, and a variable ratio gear train connected with the table body to move it with increasing angular velocity around said rotational axis of the table body during said translational movement of the table body by said primary power drive means, said table body carrying a driver means for said variable ratio gear train to power the gear train during said translational movement of the table body, said variable ratio gear train including a pair of engaging elliptical gears, and said elliptical gears having their major elliptical axes coinciding when the table body is in a level attitude, whereby rotational movement of the table body toward an upright attitude increases from a minimum angular velocity to a maximum angular velocity by operation of said gear train during said translational movement of the table body.

4,013,020

## FLEXURE-COMPENSATING DEVICE FOR FLEXIBLE PALLETES SUPPORTING VERY HEAVY LOADS

Alexander Schoeller, deceased, late of Munich-Solln, Germany, and by Christina von Podewils-Schoeller, heiress, CH-7524 Zuoz, Switzerland

Continuation-in-part of Ser. No. 265,195, June 22, 1972, abandoned. This application Apr. 23, 1974, Ser. No. 463,261

Int. Cl.<sup>2</sup> B65D 19/44

U.S. Cl. 108-51.1

1 Claim

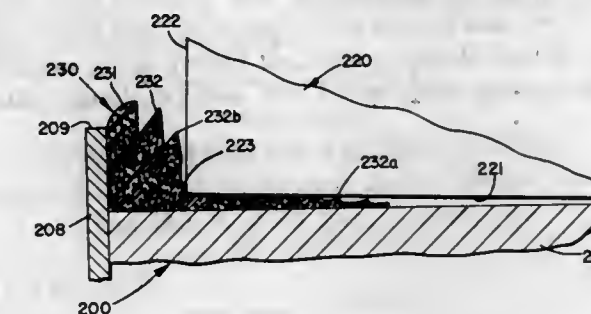
1. A flexure compensating device for a flexible pallet supporting a very heavy load and having a load-supporting surface with marginal zones thereon, comprising projections providing both vertical compensation for downward deformation of said pallet and lateral resistance to sideways movement of said heavy load, said projections being:

A. disposed along said marginal zones and tending to cause tilting of said load toward the center of said pallet in

absence of said downward deformation and substantially vertical alignment in presence of said downward deformation of said pallet; and

B. in the form of a plurality of sidewardly disposed ledges and edge-adjointed ramps which:

1. incline inwardly and downwardly to meet said load-supporting surface; and



2. are parallel and adjoining in each of said marginal zones,

said ramps having a sufficiently steep slope that each of said ramps can engage an outward edge of said very heavy load and offer lateral resistance to sideways sliding of said load, at least partially by forcing said outward edge to move uphill during said downward deformation.

4,013,021

## PLASTICS MATERIAL PALLET

Rudolf Steinlein, Almbachstrasse 8, 8 Munich 25, Germany; Alexander Schoeller, deceased, late of Munich-Solln, Germany, and by Christina Schoeller, administratrix, Chesa Balaster, 7524 Zuoz (Engadin), Switzerland

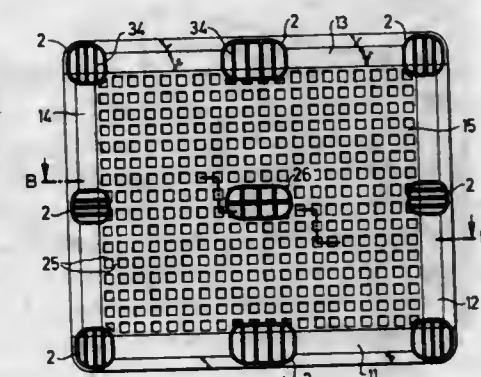
Filed Jan. 20, 1975, Ser. No. 542,238

Claims priority, application Germany, Jan. 24, 1974, 2403374

Int. Cl.<sup>2</sup> B65D 19/32

U.S. Cl. 108-51.1

9 Claims



1. A pallet made of plastics materials and comprising: A. a load-bearing rigid frame having two longer sides, two shorter sides, and four corners;

B. a rigid deck insert which is fitted into and attached to said rigid frame;

C. a central supporting leg which is attached to said rigid deck insert at the center thereof; and

D. eight supporting legs which are attached to the four corners of said rigid frame and to the four sides thereof, midway between two of said corners, each of said eight supporting legs comprising:

1. a smoothly curved outer surface which is vertically disposed,

2. a horizontally disposed supporting rib which is disposed within and rigidly attached to said smoothly curved outer surface,

3. a plurality of vertically disposed supporting ribs which are disposed within and rigidly attached to said smoothly curved outer surface and to said horizontally disposed supporting rib, and



4. said smoothly curved outer surfaces and said vertically disposed supporting ribs attached to said rigid frame in a manner to provide a smooth connection therebetween, four of said eight supporting legs being disposed at said four corners and having said vertically disposed supporting ribs aligned with said two shorter sides, two of said supporting legs being disposed midway of said longer sides and having said vertically disposed supporting ribs aligned with said two shorter sides, and two of said supporting legs being disposed midway of said shorter sides and having said vertically disposed supporting ribs aligned with said two longer sides.

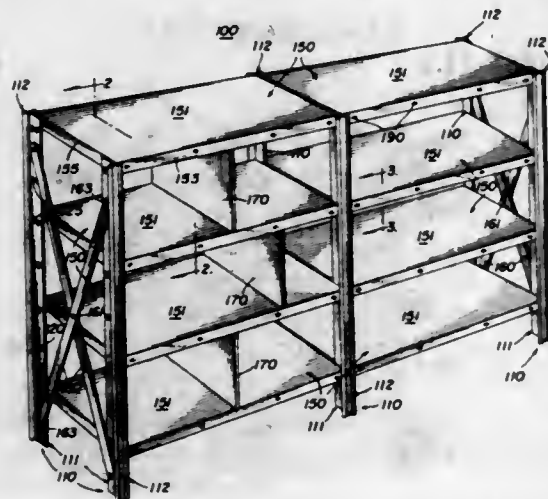
4,013,022

## SHELVING APPARATUS

Florian A. Walter, and Edward C. Stewart, both of Aurora, Ill., assignors to Lyon Metal Products Incorporated, Aurora, Ill.  
Filed Dec. 2, 1971, Ser. No. 203,973  
Int. Cl. A47 29/02

U.S. Cl. 108—114

22 Claims



1. Shelving structure comprising a pair of upstanding spaced-apart support posts, each of said support posts including two generally rectangular interconnected parallel plates disposed in back-to-back relationship; one of said rectangular plates extending transversely a predetermined distance beyond the adjacent side edge of the other of said rectangular plates and cooperating therewith to define an attachment recess, said support posts being disposed in use with the rectangular plates of one post being respectively substantially coplanar with the rectangular plates of the other of said posts, a closure panel extending between said posts with the opposite ends of said panel respectively disposed in said attachment recesses in overlapping parallel relationship with said one rectangular plate and in edge-to-edge abutting relationship with said other of said rectangular plates thereby to facilitate attachment of said panel to said support posts, and a shelf mounted on said support posts.

4,013,023

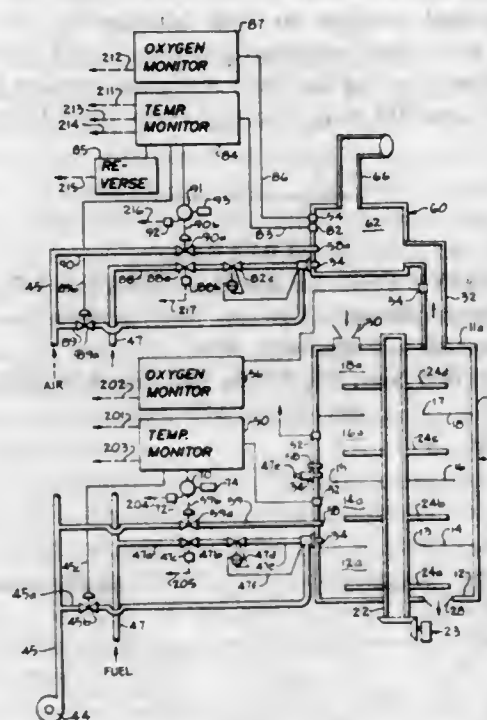
## INCINERATION METHOD AND SYSTEM

Luis A. Lombana, and Jose G. Campos, both of Belmont, Calif., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Dec. 29, 1975, Ser. No. 645,063  
Int. Cl. F23G 5/12

U.S. Cl. 110—8 A

23 Claims



1. A method of incinerating partially dewatered sewage sludge containing organic wastes in a multiple hearth furnace equipped with an afterburner connected to receive gases and vapors from the furnace, said method comprising the following steps:

- introducing the wastes into the multiple hearth furnace and moving the same downwardly therethrough by rabbling;
- pyrolyzing the wastes in the furnace in an oxygen deficient atmosphere and regulating that atmosphere to only partially complete the oxidation of substances which are pyrolyzed from the wastes;
- conveying the partially oxidized products of pyrolysis in the medium of gases and vapors from the furnace to the afterburner; and
- introducing sufficient air into the afterburner to complete the oxidation of the partially oxidized substances carried by the gases and vapors from the furnace.

13. A system for incinerating partially dewatered sewage sludge containing organic wastes comprising:

- a multiple hearth furnace inclusive of means for admitting the wastes into said furnace and means for moving the wastes downwardly through said furnace by rabbling;
- first burner means connected in communication with said furnace for introducing air and fuel thereinto for pyrolyzing the wastes;
- means connected to said first burner means to control the action thereof so that atmosphere within said furnace is deficient in oxygen and the organic substances which are pyrolyzed from the organic wastes are only partially oxidized;
- an afterburner connected to said furnace to receive the partially oxidized products of pyrolysis in the medium of gases and vapors from said furnace;
- second burner means connected in communication with said afterburner for introducing air and fuel thereinto for combustion; and
- afterburner control means connected to said second burner means to control the introduction of air and fuel into said afterburner to complete the oxidation of the partially oxidized substances carried by the gases and vapors from the furnace.

4,013,024

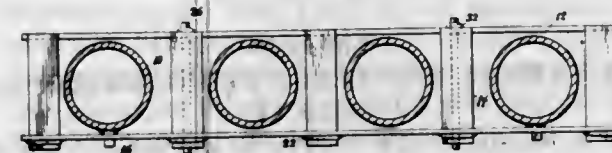
## SLOTTED BAND TYPE SPACER FOR HIGH TEMPERATURE SUPERHEATER TUBES

Edward L. Kochev, Jr., Colebrook, and Edward A. Hatch, Granby, both of Conn., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,036  
Int. Cl. F23M 9/10; F22B 37/24

U.S. Cl. 110—98 R

1 Claim



1. A band type spacer adapted to maintain a predetermined distance between spaced tubes, a housing, a bank of essentially parallel tubes in said housing, a first elongate strip member adjacent one side of said tube bank having spaced tabs formed uniformly at one side thereof and adapted to (that) extend laterally between tubes, a second strip member normal to said tabs confronting the opposite side of said tube bank and having a plurality of slots therein parallel to the longitudinal axis of said strip members spaced to receive the ends of the lateral tabs, a weldment on the outboard side of said second strip member connecting each tab thereto, openings in the first and second elongate strip members on opposite sides of the bank of parallel tubes, a tie rod traversing aligned openings to connect said strips into an integral assembly, weldments on the outboard sides of the first and second strip members adapted to bond the ends of the tie rods thereto, and support legs bonded to the surface of spaced tubes in said tube bank adapted to provide a support surface subjacent one of the lateral strips for the spacer assembly.

4,013,025

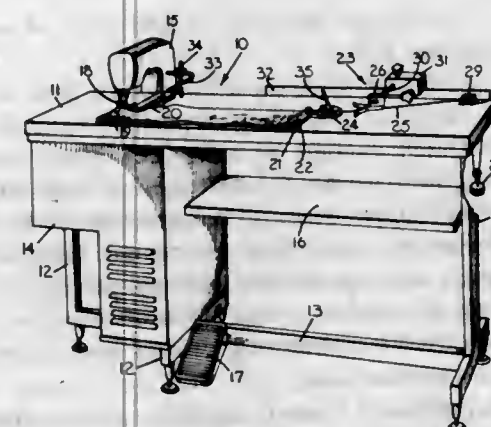
## FABRIC TENSIONING DEVICE FOR SEWING AND ASSEMBLY UNITS

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Oct. 9, 1975, Ser. No. 621,217  
Claims priority, application Italy, Feb. 27, 1975, 20684/75  
Int. Cl. D05B 21/00

U.S. Cl. 112—121.15

5 Claims



1. A workpiece gripping device for a sewing and assembly unit for holding and tensioning pieces of cloth being advanced on the unit's work surface while forming pants and the like in which the sewing and assembly unit includes the usual sewing and advancement elements, said gripping device comprising:

- a gripping means defining a sliding block (36) supported for unrestricted directional movement on the work surface having a pivotal jaw member for holding the ends of the pieces of cloth most remote from the sewing and advancing elements;
- control means operatively connected to said jaw member

for moving the latter between positions for gripping and releasing the cloth;

- retaining means connected to said gripping means having a biasing means for applying a braking force to said gripping means and maintaining tension on the cloth as it is moved along the work surface; and
- actuating means carried on the work surface for engaging said control means to effect movement of said jaw member to that position for releasing the cloth and returning said gripping means to its initial position under the influence of said biasing means.

4,013,026

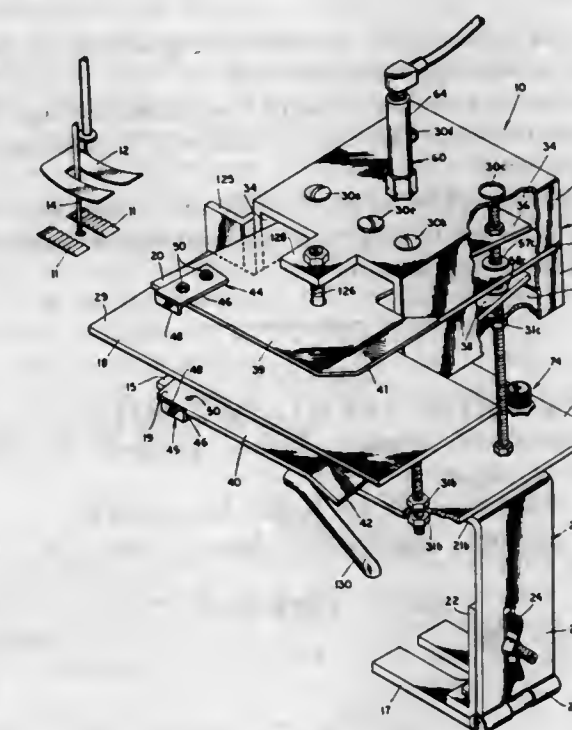
## SEWING MACHINE FEEDER SYSTEM

W. Richard Hall, 4261 Smithsonia Drive, Tucker, Ga. 30084  
Filed July 7, 1975, Ser. No. 593,700

Int. Cl. D05B 35/10

U.S. Cl. 112—153

6 Claims



1. In combination, a sewing machine including a reciprocable needle or the like to connect together plies of material and a material feeding means for pulling plies of material along a path through the needle, and a material guide means positioned on the infeed side of the reciprocable needle of the sewing machine comprising a stationary guide means, first clamping means for urging the lower ply of material to be pulled into and sewn by the sewing machine upwardly against said stationary guide means, second clamping means for urging the upper ply of material to be pulled into and sewn by the sewing machine downwardly against said stationary guide means, first fluid powered ram means arranged to urge said first clamping means toward said stationary guide means and against the lower ply of material and second fluid powered ram means arranged to urge said second clamping means toward said stationary guide means and against the upper ply of material, and means for supplying pressurized fluid at varying pressures to said first and second ram means to vary the forces with which said first and second clamping means are urged against said stationary guide means.

4,013,027

## DUAL SEWING HEAD SERGING MACHINE

David R. Cash, Louisville, Ky., assignor to James Cash Machine Co., Louisville, Ky.

Filed Apr. 1, 1976, Ser. No. 672,668  
Int. Cl. D05B 25/00

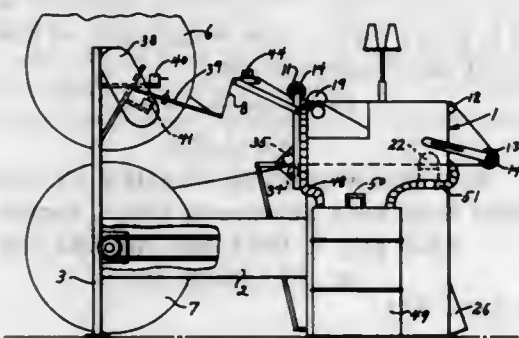
U.S. Cl. 112—155

3 Claims

1. A dual sewing head serging machine for serging the opposite edges of an elongate strip employed in the manufacture of mattresses and other products, comprising:



- A. a turn member;  
 B. means for directing the strip in one direction along a 1st run of a given path extending to one side of said turn member and withdrawing it from the opposite side thereof along a 2nd run of said given path extending in the opposite direction, said path having  
 1. a 1st sewing section in the 1st run of said one direction, and



2. a 2nd substantially parallel sewing section in the 2nd run of said opposite direction;  
 C. a 1st serging sewing head of one hand type operatively mounted to serge one edge of said strip in said 1st sewing section; and  
 D. a 2nd serging sewing hand of the same hand type operatively mounted to serge the opposite edge of said strip in said 2nd sewing section.

4,013,028

## IMPARTING OSCILLATING MOTION

Saburo Murakami, Osaka, Japan, assignor to Wataru Shimokawa, Japan

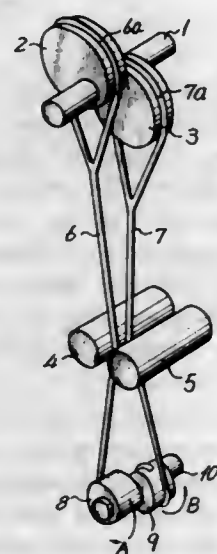
Filed Nov. 20, 1975, Ser. No. 633,878

Claims priority, application Japan, Nov. 29, 1974, 49-136318

Int. Cl.<sup>2</sup> D05B 69/00

U.S. Cl. 112-220

4 Claims



1. Apparatus, for imparting an oscillating motion to a driven shaft from a drive shaft rotating continuously in one direction, comprising:

- i. first and second cranks mounted on said drive shaft at 180° opposed positions
- ii. first and second inextensible links each having a first end and a second end and a flexible portion, said first link being coupled at its first end to said first crank, said second link being coupled at its first end to said second crank
- iii. first and second winding bodies mounted on said driven shaft, the second end of the first link being secured to said first winding body and being wound round said first winding body in one direction about the axis of rotation of the driven shaft for a length greater than the throw of said first crank, the second end of the second link being se-

cured to said second winding body and being wound round said second winding body in the opposite direction about the axis of rotation of the driven shaft for a length greater than the throw of said second crank

- iv. guide means disposed between said cranks and said wrapping bodies, said guide means having opposed spaced surfaces defining an opening in which said flexible portion of each link is positioned such that both links move through said opening.

4,013,029

## WATER VESSEL PROPELLED BY MOTORIZED LAND VEHICLE

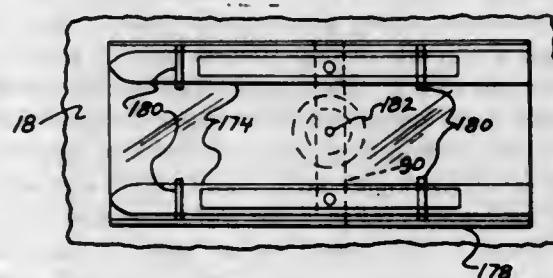
Howard A. Rhody, 9312 S. Torrey, Grand Blanc, Mich. 48439  
 Division of Ser. No. 174,057, Aug. 23, 1971, Pat. No. 3,826,216. This application May 23, 1974, Ser. No. 472,591

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> B60F 3/00

U.S. Cl. 114-255

1 Claim



1. A water vessel adapted to be propelled by a snowmobile, said water vessel comprising:

- a snowmobile having a frame supported by a pair of transversely spaced skis and a rotatably mounted endless drive belt, said drive belt being driven by power generating means of said snowmobile, said skis being operable for rotational movement about a vertical axis to steer said snowmobile;
- a pair of pontoons of a length exceeding the length of said snowmobile;
- a deck extending the full length of said pontoons, said deck having a forward end and a rear end;
- means connecting said deck to said pontoons to maintain said pontoons in a spaced, parallel relationship;
- a propeller rotatably carried by said vessel at the rear end of said deck;
- a rudder carried at the rear end of said deck of said vessel for steering the same;
- means for mounting said snowmobile on said deck, said mounting means comprising a pair of spaced, parallel rollers rotatably carried by said deck along axes transversely disposed to the fore-aft axis of said vessel; said pair of rollers supporting and being rotatable by a second endless drive belt, said first mentioned drive belt being supported by said second belt and adapted to rotate said second belt as said snowmobile is driven; and linkage means operatively connecting one of said rollers to said propeller to rotate same;
- said mounting means further comprising a plate mounted on the forward end of said deck for rotational movement about a vertical axis with respect to both said deck and said pontoons, said skis of said snowmobile being received on said plate and releasably held thereon; and means connecting said rotating plate to said rudder whereby said rudder is rotated in response to the rotational movement of the plate as said snowmobile skis are rotated;
- means connecting said snowmobile skis to said plate for preventing both lateral and forward movement of said snowmobile with respect to said deck;
- the endless drive belt of the snowmobile being of a greater length than the second endless drive belt rotating the pair

of rollers causing the endless drive belt to overhang the rollers for an even distribution of weight;  
 the endless drive belt of the snowmobile and the second drive belt rotating the rollers being arranged tautly between their respective carrying wheels and rollers; and  
 a shaft adapted for rotational movement about an axis transversely disposed with respect to the fore-aft axis of said water vessel, the outer end of said shaft being of an L-shaped configuration and extending beyond the outer contour of said pontoons, said support wheels being mounted on the end of the legs of said L-shaped shaft, said shaft being rotatable in such a manner as to position said support wheels in said lowered and raised positions, and means for selectively locking said support wheels in the raised and lowered positions.

4,013,031

## APPARATUS TO CONTROL JIB

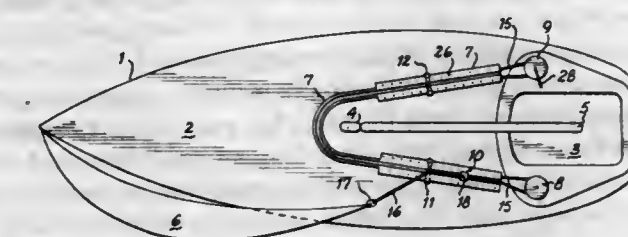
Anthony V. L. Viviano, 141 Athol Ave., Oakland, Calif. 94606

Filed Mar. 4, 1976, Ser. No. 663,930

Int. Cl.<sup>2</sup> B63H 9/10

U.S. Cl. 114-204

4 Claims



1. A linearly, internally sectioned, slotted traveller-track apparatus with linear, horizontal, perforated extrusions, affixed to a sailboat, such that when viewed from above, said traveller-track can be seen to describe an inverted U-shaped arc, one leg of which begins in the aft, port side area of a sailboat, runs forward along the port side of the sailboat in the general direction of the bow, curves forward around the port side of the mast of said sailboat and forward of the mast in a sweeping arc which runs in a starboard direction toward the starboard side of the sailboat, and which then turns aft from forward of the mast and continues aft around the starboard side of the mast forming the other leg of the U which continues aft along the starboard side of the sailboat in the general direction of the stern, terminating in the aft starboard area of the sailboat, such that said traveller-track's extrusions parallel only each side of that portion of the length of the traveller-track that lies aft of the mast.

4,013,030

## SUPPORT FOR LNG SHIP TANKS

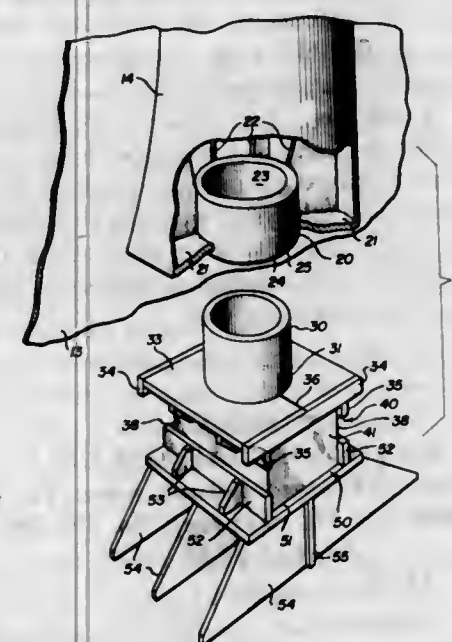
Donald Claude Stafford, Hinsdale, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Feb. 26, 1976, Ser. No. 661,776

Int. Cl.<sup>2</sup> B63B 25/16

U.S. Cl. 114-74 A

14 Claims



13. In a ship having a spherical tank having a support system located about the equator section of the tank, the support system comprising a plurality of essentially identical composite supporting units spaced around the circular horizontal section, with each said supporting unit being joined to the tank and to a base, each supporting unit having a vertical key with radial contact faces located between and in slidable contact with a pair of opposing vertical faces of a keyway, each supporting unit having a vertical coupling comprising a sleeve joined stationary to the tank and with a cylindrical element located rotatably in the sleeve about a vertical axis during assembly of the support system, and with the bottom face of each sleeve machined flat to be in about the same horizontal plane, the vertical key being joined to the cylindrical element and the vertical keyway being joined to the base; and with a marking for the coincident radius of the sleeve and the tank, and a marking on the radius of the cylindrical element parallel to the keyway and the key, in alignment with each other.

4,013,032

## OCEAN GOING PUSH-TOWING COMBINATION

Robert A. Bludworth, P.O. Box 12424, Houston, Tex. 77017

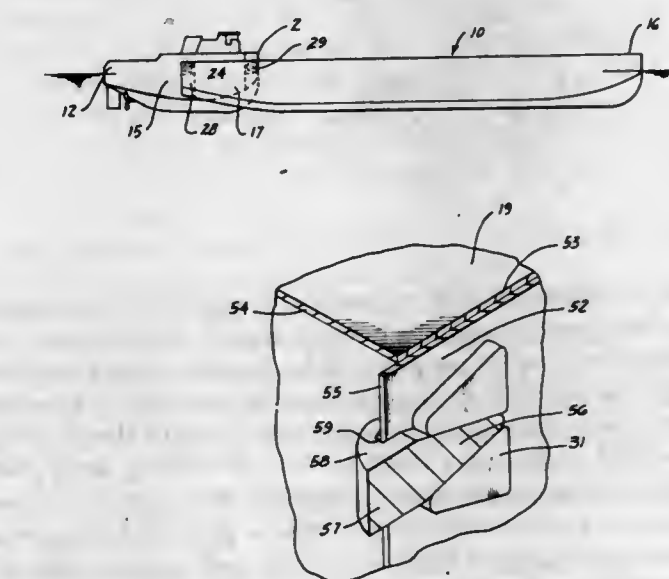
Continuation of Ser. No. 208,604, Dec. 16, 1971, abandoned.

This application Dec. 8, 1975, Ser. No. 638,542

Int. Cl.<sup>2</sup> B63B 21/00

U.S. Cl. 114-248 R

7 Claims



1. A marine transportation combination comprising a first vessel having a bow and sides and a second vessel having a notch at one end for receiving at least a portion of said first vessel, said notch having a pair of oppositely disposed wings and being open at the top and bottom, at least a portion of said first vessel being receivable in said notch between said wings, at least three individual locking means for rigidly coupling said first vessel to said second vessel, each of said locking means providing substantially point interengagement of said first and second vessels, one of said locking means comprising struc-



ture on one side of said first vessel interengageable with structure on the wing of said notch adjacent said one side of said first vessel, a second of said locking means comprising structure on the other side of said first vessel interengageable with structure on the other wing of said notch adjacent said other side of said first vessel, a third of said locking means comprising structure on the bow of said first vessel, interengageable with structure on said second vessel located generally centrally of said notch, all of said locking means having a conformation so as to permit substantially instantaneous engagement or disengagement thereof, thereby providing substantially instantaneous mating and unmating of said first and second vessels, and means for preventing spreading of said wings of said notch once said first vessel and said second vessel are in the mated position, said means for preventing spreading comprising a first structural formation on said one side of said first vessel, a second structural formation on said other side of said first vessel, a third structural formation on one of said wings closely adjacent the stern portion thereof and a fourth structural formation on the other of said wings closely adjacent the stern portion thereof, said first and second structural formations engaging said third and fourth structural formations, respectively, when said locking means interengage and said first and second vessels are mated, said structural formations being disengageable by relative movement of said first and second vessels away from one another, said structural formations being rigid and preventing any substantial lateral outward movement of said wings when said first and second vessels are mated.

4,013,033

## WEED GUARD FOR TROLLING MOTORS

Stephen G. Porter, and Theodore J. Adams, both of 249 NE.

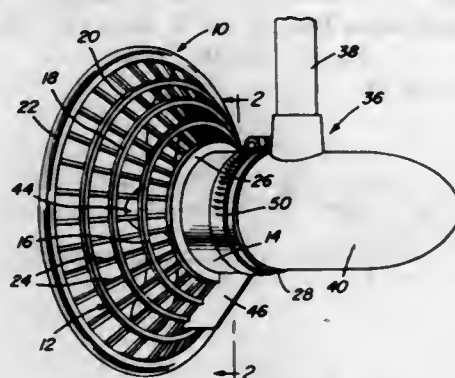
32nd St., Fort Lauderdale, Fla. 33334

Filed Jan. 28, 1976, Ser. No. 653,272

Int. Cl.<sup>2</sup> B63H 5/16

U.S. Cl. 115-42

10 Claims



1. In combination with an outboard motor of the type including a depending support portion provided with a horizontally elongated marine propeller drive housing at its lower end portion, said depending support portion positioned between forwardly and rearwardly projecting portions of the housing, said housing including a front to rear extending shaft journaled therein having a marine propeller mounted on its rear end, a weed guard comprising a hollow generally horizontal truncated cone-shaped body provided with axially and circumferentially spaced water passages formed therethrough, said body being constructed of light weight, stiff but somewhat flexible material, the minor diameter end of said body including an integral endwise outwardly projecting cylindrical extension snugly telescoped over the rearwardly projecting portion of said housing closely forward of said propeller and with said cone-shaped body disposed entirely rearward of said depending support portion, and clamp means clamping said extension about said housing with the center axis of said body at least generally coinciding with the center axis of said housing and the major diameter end of said body loosely enclosing said marine propeller, the slant height angle of the body relative to its center axis being between 35° and 60°.

4,013,034

## STEERING CONTROL DEVICE

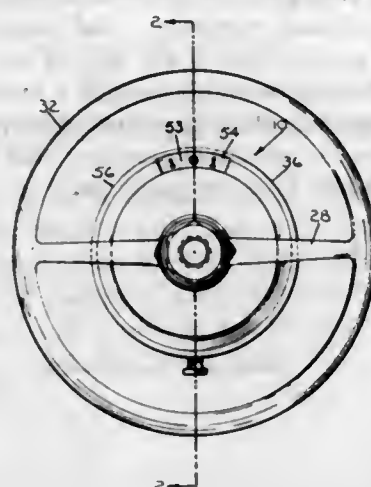
George A. Cantley, Akron, and John E. Litzell, Hudson, both of Ohio, assignors to Incom International Inc., Pittsburgh, Pa.

Filed Mar. 10, 1975, Ser. No. 556,687

Int. Cl.<sup>2</sup> B60Q 1/42; B63H 25/36

U.S. Cl. 116-31

10 Claims



1. A steering control device comprising a shaft connected to a steering wheel and connected at a remote end to turning means for operative attachment to a steering system, said shaft rotatably mounted on a housing a pinion gear means mounted on said shaft to rotate therewith, said housing including adjacent the steering wheel a hub member, with a hole therethrough for rotatable passage of said shaft, the hub member having a flexible extension, an indicator disc rotatably mounted on said flexible axial extension coaxial with said shaft, an idler gear rotatably mounted on an extension parallel to the shaft on said disc, said pinion gear meshing with and driving said idler gear about a ring gear means connected to the housing hub outward of and surrounding the pinion gear and meshing with said idler gear whereby the pinion gear turns the idler gear and drives the idler gear about the ring gear means in response to the rotation of said shaft, said idler gear thereby driving said indicator disc.

4,013,035

## BALLOON SIGNAL ASSEMBLY

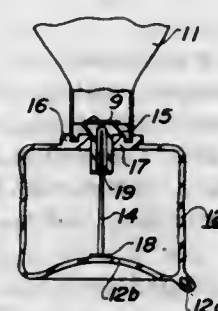
Saul Z. Kopeika, 310 Concord Road, Aston, Pa. 19014

Filed July 18, 1975, Ser. No. 596,987

Int. Cl.<sup>2</sup> B64B 1/52

U.S. Cl. 116-124 B

13 Claims



1. A signal assembly comprising:  
a. an inflatable means capable of retaining a lighter-than-air gas,  
b. a container of said gas under pressure, said container being connected to said inflatable means and including a manually yieldable and resilient wall portion,  
c. seal means connected to said container for preventing release of said gas from said container into said inflatable means, and  
d. means in proximity to said wall portion and to said seal for breaking said seal upon inward manual pressure on

said wall portion whereby gas flows into said inflatable means through said broken seal, said (d) means including a pointed rigid portion which is brought into piercing contact with said seal means when said inward pressure is exerted upon said wall portion and said wall portion withdraws said pointed portion from contact with said seal means when no inward pressure is exerted on said wall portion.

4,013,036

## TIME SWITCH DEVICE FOR X-RAY DIAGNOSTIC APPARATUS

Ulrich Grassme, Nuremberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin &amp; Munich, Germany

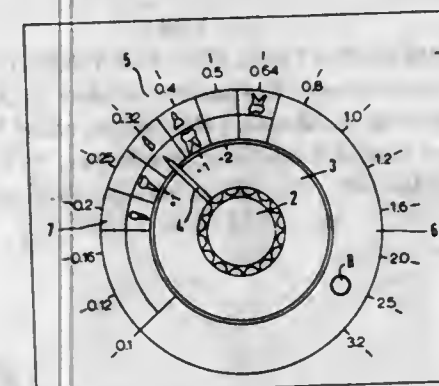
Filed Nov. 13, 1975, Ser. No. 631,612

Claims priority, application Germany, Dec. 23, 1974, 2461263

Int. Cl.<sup>2</sup> G09F 9/00

U.S. Cl. 116-129 T

6 Claims



1. In a time switch device for X-ray diagnostic apparatus, particularly for the preparation of tooth exposures; including a knob for the setting of the exposure periods; and a scale carrier having a time scale thereon being associated with said knob, the improvement comprising: a symbol carrier being associated with said knob and being displaceable in the setting direction of said knob relative to said knob and to said time scale; and symbols of the objects to be X-rayed being provided on said symbol carrier at such a spacing relative to each other whereby, upon setting one said symbol to the exposure period associated therewith, the other symbols will be located opposite their respectively associated exposure periods on the time scale.

4,013,037

## APPARATUS FOR CONTROLLABLY APPLYING LIQUIDS TO A MOVING SURFACE

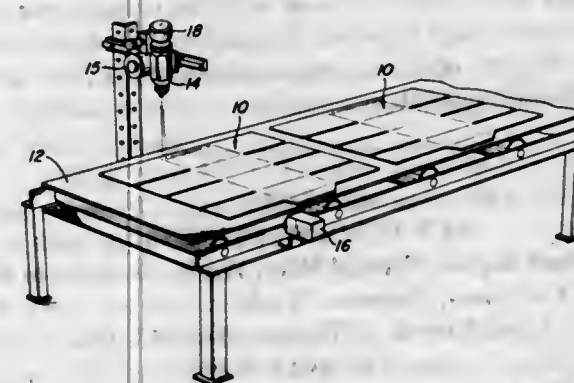
Walter B. Warning, Sr., Chicago, and Walter B. Warning, Jr., Schaumburg, both of Ill., assignors to Airprint Systems, Inc., Elk Grove Village, Ill.

Filed Mar. 27, 1975, Ser. No. 562,679

Int. Cl.<sup>2</sup> B05C 5/00, 11/10

U.S. Cl. 118-2

4 Claims



1. Apparatus for applying a liquid in a predetermined pattern to a traveling surface, comprising a spray head having a liquid spray orifice,

means mounting said head so that said surface travels past said orifice and is sprayed with liquid exiting said head through said orifice,

a pulse generator for producing an electric pulse for each predetermined increment of movement of said surface, means responsive to the rate of said pulses for providing an electric signal having a voltage proportional to the rate of said pulses, a needle valve reciprocally mounted in said head for movement between a forward position closing said orifice and an adjustable rearward position wherein said needle is at least partially withdrawn from said orifice, a motor means mounted to said head and having a rotor for adjusting said rearward position in proportion to said electric signal, means responsive to a first number of said pulses for moving said needle valve into said rearward position, and means responsive to a second and subsequent number of said pulses for returning said needle valve to said forward position.

4,013,038

## APPARATUS FOR CONTROLLING THE TEMPERATURE OF A LIQUID BODY

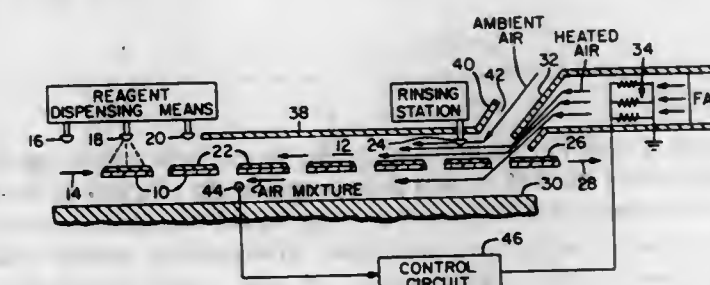
Charles H. Rogers, Kevin J. Sullivan, and Miles E. Vance, all of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed July 21, 1975, Ser. No. 597,323

Int. Cl.<sup>2</sup> B05C 5/00

U.S. Cl. 118-5

16 Claims



1. An apparatus for staining a biological specimen disposed on the surface of a microscope slide comprising means for supporting said slide so that said biological specimen is disposed upon the upper surface thereof, means for dispensing a plurality of staining reagents on said upper surface of said slide to form a film of said reagents on said specimen, the surface of said film being exposed to a given atmosphere, a dry thermal conductor exposed to said given atmosphere, a wick exposed to said given atmosphere, means for applying to said wick a liquid having evaporative properties similar to those of said reagent film, a temperature sensing element in thermal contact with said dry thermal conductor and said wet wick for providing an electrical output determined by the temperature of said element, heating means for increasing the temperature of said reagent film, and control means responsive to the electrical output from said temperature sensing element for controlling the heat energy output of said heating means.

4,013,039

## WET PROCESSING PH CONTROL

Fabian Kubilius, Poughkeepsie; Gary Frank Pavlovic, Beacon, and Jerome Woolf, Newburgh, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,777

Int. Cl.<sup>2</sup> B05C 11/10

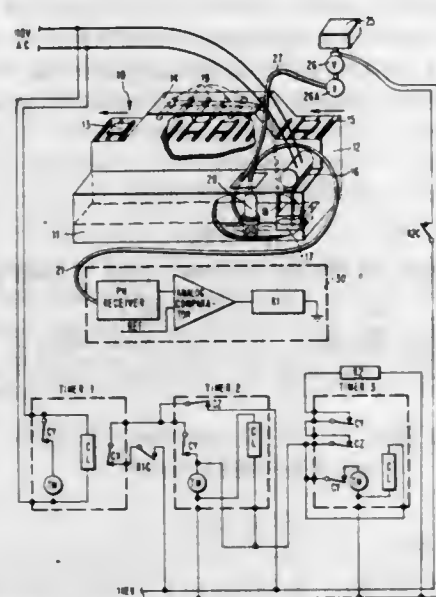
U.S. Cl. 118-7

9 Claims

1. A wet processing station in which control of the PH of the



processor liquid is mandatory within predetermined limits, said processor comprising: a tank having means to subject product to a bath of processing liquid; a PH monitoring probe in said tank; a pump in said tank for mixing processing liquid therein, said pump having a processing liquid intake and a discharge, said intake being positioned closely adjacent said probe so that liquid being mixed in said tank by said pump will flow across said probe; a liquid concentrate holder for holding a liquid concentrate capable of increasing the PH of the processing liquid, and liquid carrying means connecting said holder to said probe, said liquid carrying means having an outlet positioned to discharge said liquid concentrate directly onto said probe; probe monitoring means responsive to the



output of said PH monitoring probe to provide a first signal output when the PH of said processing liquid reaches at least a predetermined lower limit; process liquid concentrate control means coupled to said liquid concentrate holder and responsive to said signal output of said probe monitoring means to apply a predetermined dose of said liquid concentrate to said probe; timer means to interrupt the first signal output of said probe monitoring means for a predetermined period of time upon said dose of liquid concentrate being applied to said probe to insure mixing of the processing liquid within said tank prior to said probe monitoring means being effective to add another dose of liquid concentrate to said tank.

4,013,040

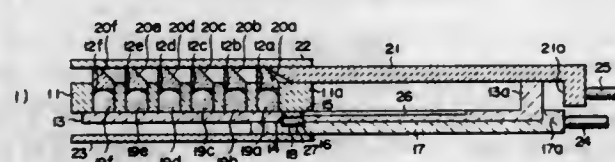
#### APPARATUS FOR EPITAXIALLY GROWING A LAMINATE SEMICONDUCTOR LAYER IN LIQUID PHASE

Yoshiji Horikoshi, Tokyo, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan  
Filed Dec. 11, 1975, Ser. No. 639,713  
Claims priority, application Japan, Dec. 20, 1974, 49-145599

Int. Cl.<sup>2</sup> B05C 3/09

U.S. Cl. 118—415

8 Claims



1. An apparatus for epitaxially growing a laminate semiconductor layer in liquid phase, which comprises a substrate holder bored with a depression; a solution receptacle-holding

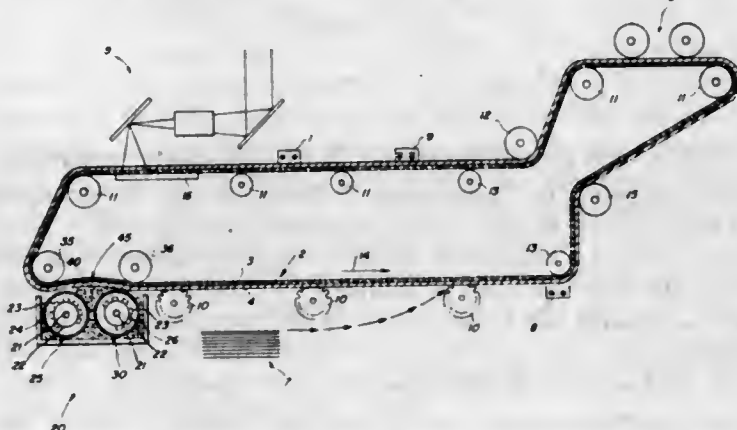
plate closely mounted on the substrate holder so as to slide thereon and provided with a solution receptacle having an inlet port and outlet port and being open at the bottom; a solution tank holder closely mounted on the solution receptacle-holding plate and providing with a plurality of solution tanks, each being open at the top and bottom for communication with the inlet port of the solution receptacle; and pressurizing means for causing the solution of each solution tank to flow into the solution receptacle, wherein the solution receptacle-holding plate and substrate holder are made to slide relative to each other to bring the solution of each solution tank, solution receptacle and substrate depression into alignment through the inlet port of the solution receptacle; and the solution of the solution tank is forced by the pressurizing means into the solution receptacle and substrate depression so as to expel the unnecessary portion of the preceding solution already retained in the solution receptacle and substrate depression for interchange between the preceding and succeeding solutions.

4,013,041

SELF-COMPENSATING PHOTOCONDUCTOR WEB  
Timothy G. Armstrong, Rochester; Arthur S. Kroll, Spencerport, and Frank A. Shuster, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Filed Oct. 24, 1975, Ser. No. 625,427  
Int. Cl.<sup>2</sup> G03G 15/08

U.S. Cl. 118—656

8 Claims



1. In electrographic apparatus of the type including a flexible web having an imaging side, a developer applicator, including at least one generally cylindrical member, and drive and guide means for controlling movement of said web around an endless path past said applicator, the improvement wherein:

said drive and guide means are constructed and located along said endless path in a manner such that said web is in a non-tensioned condition during its passage over said applicator; and

a portion of said guide means includes rotatable guide rollers spaced apart, in a direction generally parallel to said path, a distance which is between about 1.38 and 2 times the sum of the radii of said developer applicator members plus any spacing between said applicator members and located with respect to said developer applicator so that the center point between said rollers is located substantially directly opposite, across said endless path, the center of said applicator.

4,013,042

#### NET TENDING SYSTEM

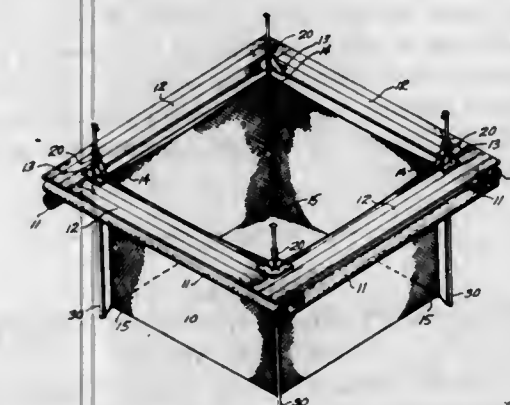
Lester Donald Ingold, Federal Way, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.  
Filed June 2, 1975, Ser. No. 583,078  
Int. Cl.<sup>2</sup> A01K 63/00

U.S. Cl. 119—3

9 Claims

1. A means for defining a fixed volume of water in which marine life is confined within a larger volume and below the surface of said water, comprising:

a flexible enclosure means suitable for the care and propagation of marine life including side walls and a bottom wall formed from flexible porous materials allowing said water to pass through said walls;  
a plurality of supporting members extending vertically above and below said water surface,  
said supporting members being spaced horizontally from one another to expand and fixedly support the flexible enclosure means to substantially its maximum volume;  
upper connector means extending from the upper portion of said supporting members to the uppermost portion of said enclosure side walls to position the uppermost portion of said enclosure above surface;  
lower connector means extending from the lower portion of said supporting members to the lowermost portion of said enclosure to position the bottom wall a distance below said surface and to define the maximum volume of said enclosure; and  
a supporting frame, above and adjacent to said water surface, to which the supporting members are adjustably attached wherein said supporting frame supports the



weight of the volume defining means and permits adjustments of its volume.

7. A method of transferring marine life from a first enclosure, attached to a supporting frame which supports said first enclosure so that the uppermost portion of the enclosure is just sufficiently above a water surface to contain said marine life, to a second enclosure without the loss of said marine life to the water outside of said enclosure, comprising the steps of:  
reducing the volume beneath the water surface within said first enclosure by raising said first enclosure while the marine life remains in the reduced volume defined by the enclosure below said surface;  
positioning said second enclosure beneath the raised first enclosure with the uppermost boundaries of said second enclosure located above said water surface and attached to said supporting frame; and  
lowering a portion of the uppermost boundaries of the first enclosure below said water surface but within the uppermost boundaries of said second enclosure thereby permitting said marine life to flow out of said enclosure into said second enclosure.

4,013,043

#### MILKING APPARATUS

Patrick William Kirwan, Kilnagrange, Kilmacthomas, County Waterford, Ireland

Filed May 27, 1975, Ser. No. 580,811

Claims priority, application Ireland, May 27, 1974, 1119/74; Nov. 8, 1974, 2298/74

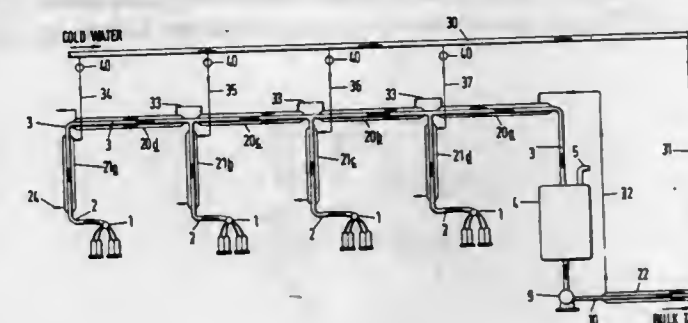
Int. Cl.<sup>2</sup> A01J 5/04

U.S. Cl. 119—14.09

6 Claims

1. Milking apparatus comprising a milk line for conveying milk from a plurality of teat-cup clusters to a receiving vessel, comprising a milk conduit, means for separately attaching each of a plurality of teat-cup clusters to said conduit at spaced points along said conduit for flow of milk in one direction through said conduit, a water-jacket surrounding said

conduit, means to introduce relatively cold water into said jacket for flow of water through said jacket in a direction opposite to said one direction, means for withdrawing from said water-jacket relatively warm water heated by the milk in



the milk conduit, a dropper line connected to each of a plurality of said connecting means for connecting a said connecting means to a teat-cup cluster, and a water-jacket about each said dropper line.

4,013,044

#### REARING UNITS

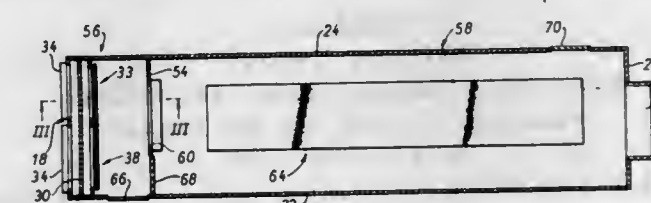
John Charles Michael Shaw, Saltfleetby-St-Peter, England, assignor to Spotmanor Limited, Lincolnshire, England  
Filed Feb. 26, 1975, Ser. No. 553,190

Claims priority, application United Kingdom, Feb. 28, 1974, 09207/74

Int. Cl.<sup>2</sup> A01K 1/00

U.S. Cl. 119—16

16 Claims



1. A rearing unit for farm animals comprising a substantially rectangular body having a pair of spaced side walls, bottom and top walls extending between said side walls and a pair of end walls extending between said side, bottom and top walls at opposite ends thereof and having at least one cage mounted therein for containing said animals, power-operated air exhaust means mounted in one of said end walls for withdrawing air from the unit and air inlet means provided at the opposite of said end walls through which air may be drawn into said unit by said power-operated air exhaust means, said at least one cage being located in said unit between said air inlet means and said one end wall and said air inlet means including a first panel spaced interiorly from said opposite end wall isolating the space therebetween and a second panel spaced interiorly from said first panel isolating the space therebetween, said end wall, first panel and second panel each having an aperture therein, said apertures being arranged out of horizontal alignment to provide a substantially U-shaped path through said inlet means to restrict the flow of air there-through into said at least one cage and control the volume of air withdrawn from said unit by said power-operated air exhaust means.

4,013,045

#### TWIN FURNACE INDUSTRIAL BOILER

William Hunter Pollock, East Granby, Conn., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Apr. 28, 1976, Ser. No. 680,839

Int. Cl.<sup>2</sup> F22B 31/04

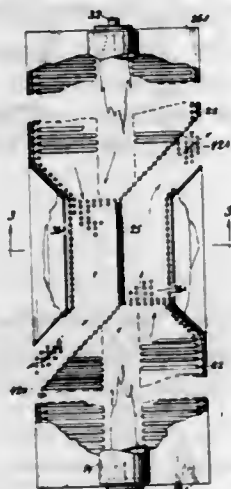
U.S. Cl. 122—240 R

6 Claims

1. A shop assembled boiler comprising an upper drum that extends horizontally to form a ridge along the apex of an



A-type boiler, a pair of lower drums positioned under the upper drum and spaced apart to comprise a base for said boiler, a plurality of tubular members connecting the lower drums with the upper drum to provide side walls enclosing a furnace cavity having a hopper bottom on opposite sides of an elongate throat, an end wall at each end of the boiler adapted



to enclose the furnace cavity, a central tube bank intermediate opposite end walls adapted to absorb heat generated in the furnace cavity, and fuel burning apparatus in each end wall arranged to exhaust hot gases oppositely therefrom into the interior of said furnace cavity and over the bank of boiler tubes therebetween.

4,013,046

## ROTARY ENGINE

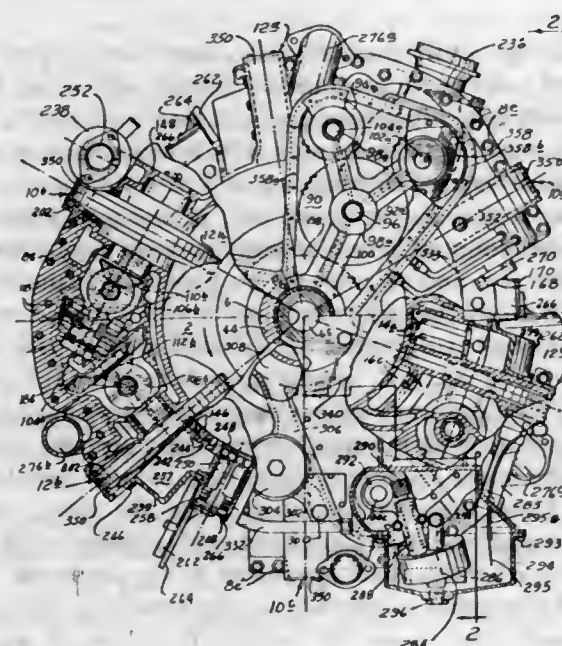
Gail W. Kemp, 9622 Vinewood, Dallas, Tex. 75228

Filed Jan. 27, 1975, Ser. No. 544,427

Int. Cl.<sup>2</sup> F02B 53/00

U.S. Cl. 123-8.27

44 Claims



1. A rotary engine comprising: a hollow housing, the inner wall of which defines a portion of a torus shaped gas working space; a rotor rotatably mounted in the hollow housing having a truncated hyperboloid shape and which defines the interior wall of the torus shaped gas working space; seal means between said housing and said rotor; a piston extending outwardly from said rotor with the tip of said piston sealingly and slideably engaging the outer torus wall; a shaft rotatably supported in the housing and being secured to said rotor; a compression-expansion valve; means rotatably securing said compression-expansion valve in said housing, said compression-expansion valve extending into the torus shaped gas working space and rotatably engaging the rotor and pistons, said com-

pression-expansion valve having a notch formed on the outer periphery thereof to allow the piston to pass through the notch; seal means on said compression-expansion valve urged into sealing engagement with said rotor; a combustion chamber in said compression-expansion valve with compression ports and expansion ports formed through the wall of said compression-expansion valve communicating with the combustion chamber and arranged to alternately communicate with the interior of the torus shaped gas working space upon rotation of said compression-expansion valve; a divider valve spaced from said compression-expansion valve arranged to form intake and exhaust sections in the torus shaped gas working space, said divider valve rotatably and sealingly engaging the rotor and pistons, said divider valve having a notch formed in the outer periphery thereof to allow the piston to pass thereby upon rotation thereagainst; drive means to cause the rotation of the compression-expansion valve and divider valve with relation to the rotor to cause the notches of the respective compression-expansion valve and divider valve to be aligned with the pistons when same are passing thereby; intake valve means provided in the inner wall of the housing communicating with the intake space of the torus shaped gas working space located adjacent the divider valve; exhaust ports provided in the inner wall of the housing located adjacent to and on the opposite side of the divider valve from the intake valve means; means to deliver fuel to the combustion chamber; and means to initiate combustion of fuel in said combustion chamber.

4,013,047

## ENGINE WITH COMBUSTION WALL TEMPERATURE CONTROL MEANS

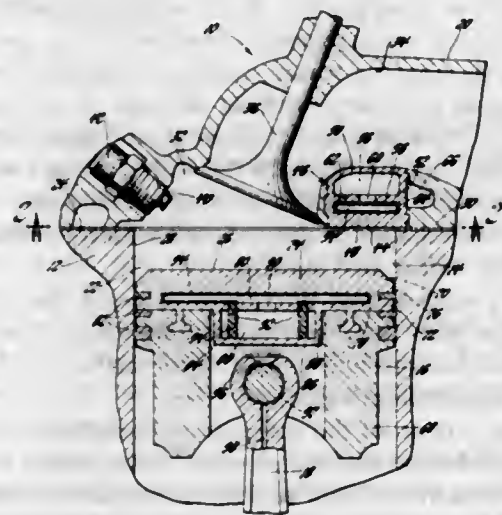
John L. Harned, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 12, 1975, Ser. No. 640,027

Int. Cl.<sup>2</sup> F01P 9/02

U.S. Cl. 123-41.2

8 Claims



1. A component of an internal combustion engine having a combustion chamber, said component including a portion having first and second heat conducting walls, said first wall bordering a portion of said engine combustion chamber and said second wall bordering a fluid chamber containing in operation a fluid capable of carrying away heat, said component portion defining a sealed cavity between said first and second walls, a third wall dividing said cavity into vaporizing and condensing sections adjacent said first and second walls respectively, said third wall having separate vapor and condensate flow openings therethrough connecting said sections, a charge of vaporizable fluid coolant in said sealed cavity having a volume in the liquid state not greater than the volume of said vaporizing section, and means comprising a predetermined charge of inert gas pressurizing said cavity to establish the vaporizing temperature of said fluid coolant under operating conditions in a predetermined range such that said first

wall will reach a temperature high enough to encourage combustion of air-fuel mixtures adjacent thereto in such combustion chamber before substantial vaporization cooling of said first wall begins and such cooling will reach its maximum before said first wall temperature becomes excessively high.

4,013,048

## BOURKE TYPE ENGINE

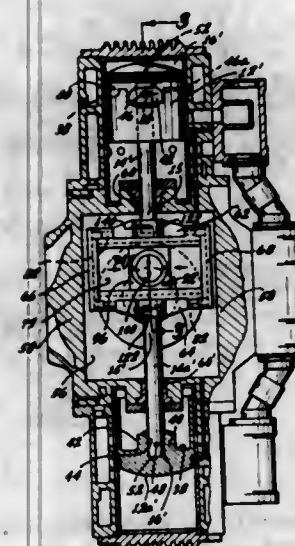
Daniel M. Reitz, 19024 Leadwell St., Los Angeles, Calif. 91335

Filed Dec. 12, 1975, Ser. No. 640,183

Int. Cl.<sup>2</sup> F02B 75/28

U.S. Cl. 123-56 BC

7 Claims



1. In an internal combustion engine having at least two cylinders disposed coaxially and oppositely so that the free ends of piston rods extending from pistons reciprocable in said cylinders, may be connected by a yoke in coaxial alignment with each other and with the cylinders to reciprocate concurrently as a unit, said yoke having means rotatably to engage a rotating crank by which the force developed by reciprocation of the pistons is converted to rotating driving motion, the improvement which comprises:

a cylindrical recess in the underside of each piston head, said recess being defined in part by a cylindrical wall coaxial with the piston head and extending outwardly therefrom for a predetermined distance, the inside diameter of said cylindrical wall being slightly greater than the outside diameter of the piston rod insertable in said recess, one end of said piston rod being insertable in said recess to abut the piston head, and means to retain said piston rod end in said cylindrical recess while still allowing for sufficient deviation from the common axis to prevent wear in a particular area between each piston and the surrounding wall of the cylinder in which it reciprocates upon such reciprocation during operation of the engine.

4,013,049

## MANIFOLD APPARATUS FOR MULTI-CYLINDER MOTORCYCLE ENGINES

Michael H. Dilgard, 13435 N. 31st Drive, Phoenix, Ariz. 85029, and James W. Melr, 3001 W. Las Palmaritas, Phoenix, Ariz. 85021

Filed Aug. 28, 1975, Ser. No. 608,749

Int. Cl.<sup>2</sup> F02B 75/18

U.S. Cl. 123-52 M

9 Claims

1. In an internal combustion engine having a cylinder block and a carburetor spaced apart from the cylinder block, manifold apparatus extending between the carburetor and the cylinder block, comprising, in combination:

flange means, including

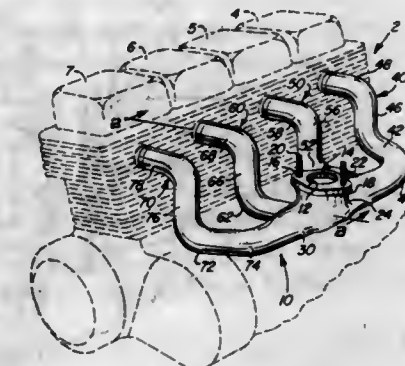
a flange to which the carburetor is secured, and

an aperture extending through the flange through which fuel and air flows from the carburetor;

chamber means disposed beneath the flange means for receiving the fuel and air flow from the carburetor;

header means connected to and communicating with the chamber means and extending to the cylinder block and including

a first portion connected to the chamber means and extending generally horizontally outwardly from the chamber means,



a second portion connected to the first portion and extending generally vertically from the first portion to above the flange, and

a third portion connected to the second portion and extending generally horizontally above the flange and to the cylinder block.

4,013,050

## IGNITION SYSTEM FOR A MULTIFUELED ENGINE

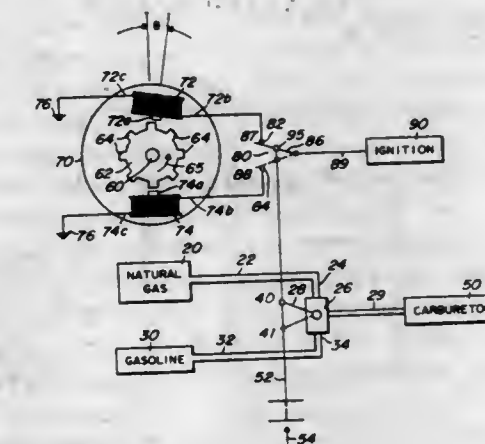
Melvin Arthur Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1975, Ser. No. 554,281

Int. Cl.<sup>2</sup> F02P 5/04

U.S. Cl. 123-117 R

8 Claims



1. In the ignition system of an engine adapted to burn any one of a plurality of fuels means for automatically setting the static ignition timing to a predetermined one of several values responsive to the selection of the particular fuel to be burned.

4,013,051

## AUTOMOTIVE CRANKCASE EMISSION CONTROL SYSTEM

Ross M. Parcels, 2666 Mark Lane, West Linn, Oreg. 97068

Filed July 8, 1974, Ser. No. 486,496

Int. Cl.<sup>2</sup> F02M 25/06

U.S. Cl. 123-119 B

2 Claims

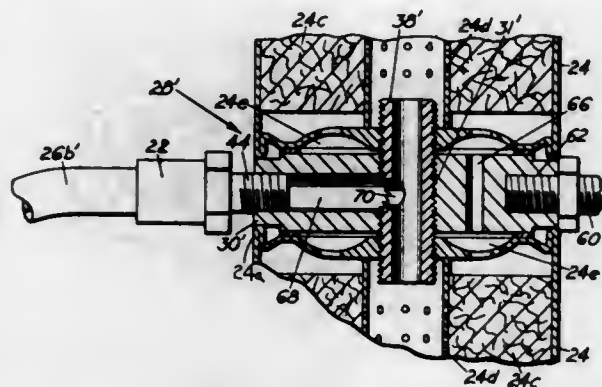
1. A filter for use in an emission control system of vehicles of the type having a crankcase, fuel intake means including a fuel mixing device, a valve cover, a conduit extending from the valve cover to the fuel intake means ahead of the fuel mixing device to direct crankcase fumes to the fuel intake, and a pollution control valve in the conduit, said filter comprising

a. a disc-like body member having opposite face surfaces,

b. means on said body member arranged to secure it to a vehicle,



- c. a stud member threadedly supported axially in said body member and projecting beyond one face surface thereof;  
 d. a spin-on type filter having inlet and outlet portions and also having a threaded bore engageable by said stud member to provide removable mounting of said filter on said body member.



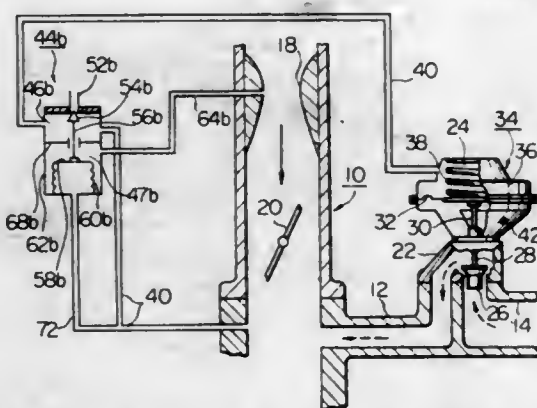
- e. inlet means in said body member arranged to connect a conduit which extends from a valve cover into said inlet portion of said filter;  
 f. and outlet means in said body member arranged to connect a conduit from the outlet portion of said filter to a pollution control valve.

4,013,052

**EXHAUST GAS RECIRCULATION CONTROL DEVICE**  
 Kenji Masaki, and Shuya Nambu, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan  
 Division of Ser. No. 391,533, Aug. 27, 1973, Pat. No. 3,896,777. This application May 1, 1975, Ser. No. 573,620  
 Claims priority, application Japan, Aug. 31, 1972, 47-86711  
 Int. Cl.<sup>2</sup> F02M 25/06

U.S. Cl. 123-119 A

2 Claims



1. In an exhaust gas recirculation system having a recirculation conduit to recirculate a portion of exhaust gases from the exhaust system of an internal combustion engine to the intake system thereof having a carburetor; a vacuum actuated exhaust gas flow metering valve normally closing the recirculation conduit; a diaphragm device operatively connected to the metering valve and a vacuum conduit connecting the spring loaded side of the diaphragm device to the intake manifold for actuation of the diaphragm device by the intake manifold vacuum to operate the metering valve.

a modulating device comprising a casing having a chamber, partition means dividing said chamber into a first compartment and a second compartment, said first compartment forming part of said vacuum conduit, means defining a bleed port opening to said first compartment, a valve to control air flow rate through said bleed port, a bellows in said second compartment, one end of said bellows being operatively connected to said valve, an opposite end of said bellows being securely fixed to said casing, a first conduit means connecting said compartment to the venturi of said carburetor and a second con-

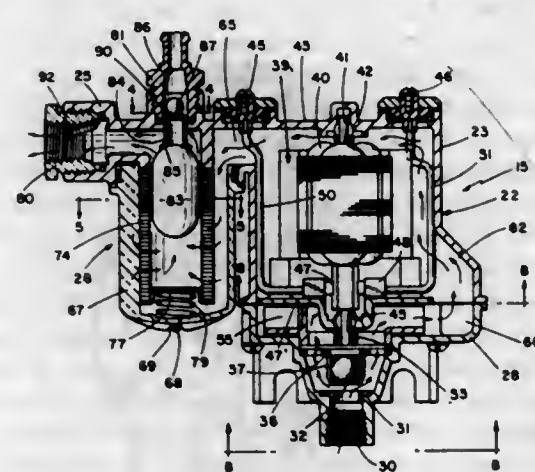
duit means connecting the interior of said bellows to said intake manifold.

4,013,053  
FUEL PUMP

Henry T. Dinkelkamp, Mount Prospect; Bryce W. Carus, Grayslake, and Robert J. Norman, Elmhurst, all of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.  
 Filed May 2, 1975, Ser. No. 573,810  
 Int. Cl.<sup>2</sup> F02M 39/00

U.S. Cl. 123-136

5 Claims



1. A fuel pump assembly, comprising: housing means, motor means connected in said housing means, inlet means in the bottom of said housing means beneath said motor means, a centrifugal pump in said housing means between said motor means and said inlet means, said housing means defining a float bowl, said centrifugal pump having an outlet connected to said float bowl so that the pump delivers fuel to said float bowl, a vacuum fitting at the upper end of said float bowl and having a vacuum fitting valve seat, a float valve member movable in said float bowl and engageable with said valve seat to prevent flow of fuel to said source of vacuum, an outlet passage in said float bowl adapted to be connected to a carburetor, said float bowl having a filter cartridge therein and said float valve member being slidable in said filter cartridge.

4,013,054

**FUEL VAPOR DISPOSAL MEANS WITH CLOSED CONTROL OF AIR FUEL RATIO**

Richard L. Baksley, and Louis J. Faix, both of Washington, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 575,344, May 7, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,541  
 Int. Cl.<sup>2</sup> F02M 59/00, 13/06

U.S. Cl. 123-136

1 Claim

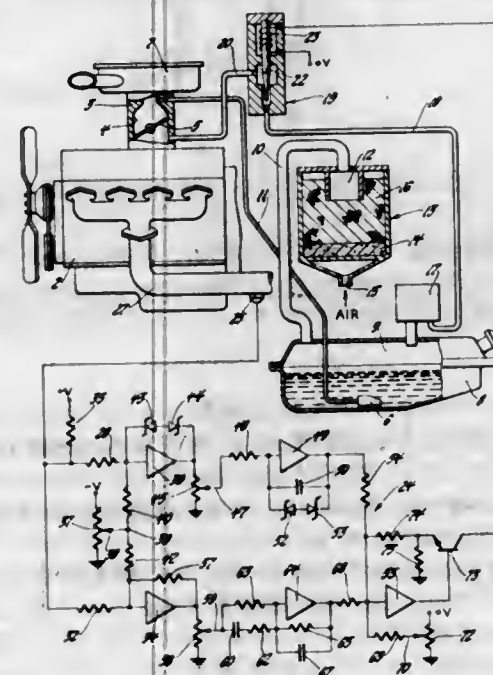
1. In combination with an internal combustion engine having an air-fuel induction passage and an exhaust passage and wherein the combustion products in the exhaust passage are determined in part by the air-fuel ratio in the induction passage:

means comprising a liquid fuel supply reservoir and a fuel vapor space in communication therewith, said fuel vapor space including a fuel vapor storage element effective to store fuel vapor evaporating from the liquid fuel supply reservoir and thus prevent its escape to the atmosphere and means communicating the fuel vapor storage element to the atmosphere when the pressure in the fuel vapor storage element falls below atmospheric to allow the influx of atmospheric air through the fuel vapor storage element to flush stored fuel vapor therefrom into said fuel vapor space;

a carburetor effective to meter predetermined amounts of liquid fuel from the reservoir to the induction passage to form the air-fuel mixture therein;

a sensor in the exhaust passage responsive to the constitu-

ents therein and effective to generate a signal therefrom indicative of the air-fuel ratio in the induction passage relative to a predetermined air-fuel ratio; and means responsive to the sensor effective to communicate the fuel vapor space to the lower than atmospheric pressure of the induction passage and flow fuel vapor from the fuel vapor space and fuel vapor storage element to the induction passage to augment the liquid fuel supplied to the air-fuel mixture, said last means modulating the



amount of flow in sense to increase the fuel content in the air-fuel mixture when the sensor indicates an air-fuel ratio leaner than the predetermined air-fuel ratio and to decrease the fuel content in the air-fuel mixture when the sensor indicates an air-fuel ratio richer than the predetermined air-fuel ratio, whereby the engine tends to operate at the predetermined air-fuel ratio and the vapor stored in said fuel vapor storage element is supplied to the engine for combustion without upsetting the predetermined air-fuel ratio.

4,013,055

**INJECTION PUMP FOR AIR-COMPRESSING INJECTION-TYPE INTERNAL COMBUSTION ENGINE**  
 Helmut Sommer, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed May 2, 1975, Ser. No. 574,011

Claims priority, application Germany, May 4, 1974, 2421668

Int. Cl.<sup>2</sup> F02F 3/28

U.S. Cl. 123-139 AR

17 Claims



1. In an injection pump for an air-compressing injection-type internal combustion engine, said injection pump comprising at least one pump structure including cylinder means and piston means, said piston means having control edge means for controlling fuel feed during rotation of said piston means

in said cylinder means, the improvement comprising said control edge means controlling the content of exhaust gas pollutants of said engine by controlling the feed beginning of the fuel in a predetermined manner, wherein said control edge means delays at a constant amount the feed beginning over a range of engine loads from idling rotational speeds to a predetermined engine load of 75% of full load as compared to the feed beginning at full engine load, said control edge means advancing feed beginning rectilinearly from said predetermined engine load to the feed beginning at full load.

4,013,056

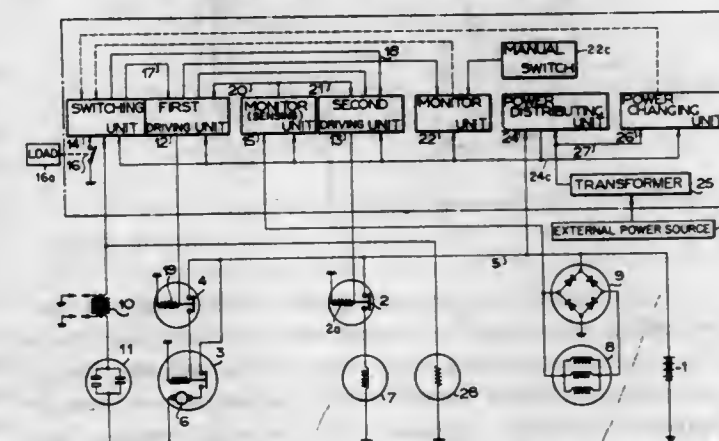
**AUTOMATIC CONTROL SYSTEM FOR A GASOLINE-POWERED COMBUSTION ENGINE**  
 Yasuhito Yamaki, Tokyo, and Kunio Aiage, Gyoda, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,432

Int. Cl.<sup>2</sup> F02N 17/00

U.S. Cl. 123-179 BG

9 Claims



1. An automatic control system for a gasoline-powered internal combustion engine for driving a load, the engine having ignition means, a starter motor and a carburetor provided with a throttle valve, comprising in combination:  
 first sensing means for sensing varying operating conditions of the load and producing an input signal in response to a given operating condition of the load;  
 second sensing means for sensing engine speed and producing a speed discriminator signal when the engine speed reaches a predetermined value;  
 first actuating means connected to the starter motor and operable to energize the starter motor for starting the engine;  
 second actuating means connected to the throttle valve and operable for actuating the throttle valve;  
 switching means connected at its input to said first sensing means and at its output to the ignition means, said switching means being responsive to said input signal and producing an operating signal in response thereto for energizing the ignition means;  
 first driving means connected at its input to said switching means and to said second sensing means and at its output to said first actuating means, said first driving means being responsive to said operating signal from said switching means and producing a first output signal in response thereto for energizing said first actuating means thereby to energize the starter motor, and further responsive to said speed discriminator signal for cutting off said first output signal in response thereto for de-energizing said first actuating means thereby to de-energize the starter motor when the engine speed reaches the predetermined value; and  
 second driving means connected at its input to said switching means and at its output to said second actuating means, said second driving means including means for producing a second output signal for a predetermined time, interval in response to said operating signal; said second actuating means for closing the throttle valve in



the presence of said second output signal so that enriched air-fuel mixture is supplied to the engine to initiate the starting of the engine, and for opening the throttle valve to a predetermined opening degree in the absence of said second output signal, so that the engine is allowed to continuously operate to drive the load in the presence of said input signal.

#### 4,013,057 PISTON ASSEMBLY

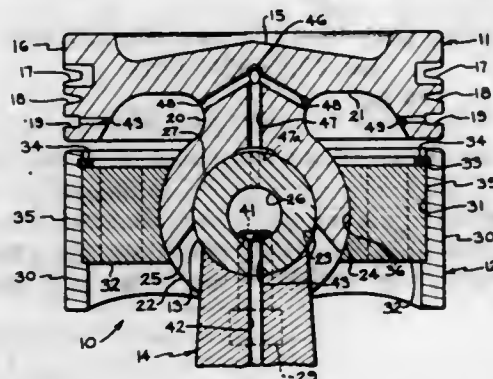
William D. Guenther, Hagerstown, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed May 14, 1975, Ser. No. 577,562

Int. Cl.<sup>2</sup> F02F 3/00

U.S. Cl. 123—193 P

4 Claims



1. A piston assembly comprising, in combination, a connecting rod, an elongated cylindrical wrist pin attached to an end of said connecting rod, said wrist pin having an external journal surface, a piston head having an upper surface for forming one wall of an expansion chamber and having a bearing member extending substantially across a lower surface, said bearing member having an interior bearing surface engaging the journal surface of said wrist pin substantially along its entire length and having an exterior journal surface concentric with said interior bearing surface, said bearing member and said wrist pin cooperating to permit rotation between said connecting rod and said piston head, a piston skirt, and thrust bearing means attaching said skirt to said external journal surface of said bearing member for rotational movement between said piston head and said piston skirt.

#### 4,013,058

#### RECIPROCATING PISTON ENGINE CONSTRUCTION, PARTICULARLY MULTI-PART CYLINDER AND CRANKSHAFT CONNECTION ARRANGEMENT

Reinhard Häfner, Kissing; Karl Wojik, and Gerhard Schlenker, both of Augsburg, all of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg AG, Augsburg, Germany

Filed Nov. 7, 1974, Ser. No. 521,695

Claims priority, application Germany, Nov. 27, 1973, 2358954

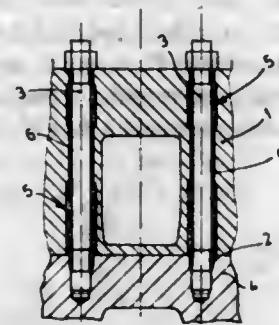
Int. Cl.<sup>2</sup> F02F 1/00; F16B 35/00

U.S. Cl. 123—195 AC

18 Claims

1. Reciprocating piston engine having a multi-part cylinder-crankshaft construction comprising at least two separate dynamically loaded structural machine elements (1, 4) fitted together at a common junction surface (2); at least two tension bolts (3, 13, 21) passing into aligned bores formed in the machine elements and connecting said machine elements together, and means to dampen vibration and high frequency oscillations without interfering with permitted low frequency excursions in the tension bolts upon dynamic loading during operation of the engine comprising a cylindrical gap (6, 17, 23) formed in at least one of the machine elements surrounding the bolt (3, 13, 21)

throughout at least a portion of its length to provide a cylindrical chamber extending over said at least portion of the length of the bolt;



a liquid damping substance entirely filling said chamber; and means (30) providing a continuous supply of said liquid substance to compensate for leakage losses thereof.

#### 4,013,059

#### FACTORY-BUILT FIREPLACE WITH FLUSH HEARTH INSTALLATION

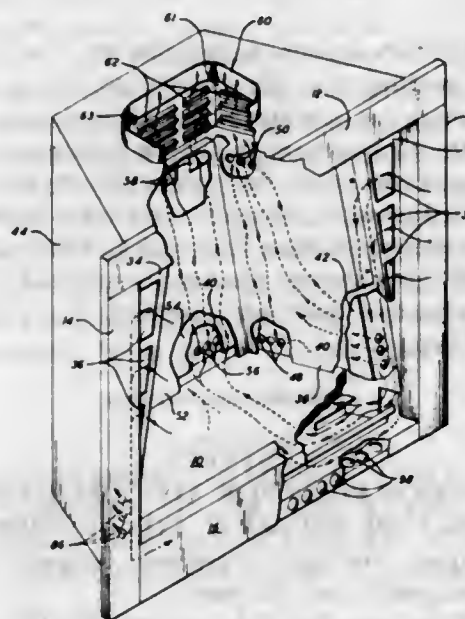
George M. Andrews, Syracuse, N.Y., assignor to Vega Industries, Inc., Syracuse, N.Y.

Filed July 7, 1975, Ser. No. 593,799

Int. Cl.<sup>2</sup> F24B 1/18

U.S. Cl. 126—120

10 Claims



1. A factory-built fireplace having an exterior surface defined by an outside shell for installation in a structure with zero clearance between said outside shell and combustible materials of said structure, said fireplace comprising, in combination:

- a combustion chamber having an open front and a hearth floor;
- a wall having exterior and interior surfaces and defining one side of the open front of said combustion chamber;
- means, including at least a portion of the interior surface of said wall, defining an air flow passage having upper and lower ends;
- said wall having an opening for flow of air into said air flow passage at said upper end thereof;
- means supporting said hearth floor to define a space thereunder;
- inlet means through which said air flow passage communicates at said lower end thereof with the space under said hearth floor; and
- outlet means defining a path for flow of air out of the space under said hearth floor in a location remote from said inlet means, the relative sizes and locations of said inlet and outlet means, said air passage and said wall

opening being such that sufficient cooling air is provided solely by the air entering said wall opening.

#### 4,013,060

#### ROTARY GRATE

Johannes Josef Martin, Leopoldstrasse 248, 8 Munich 40, Germany

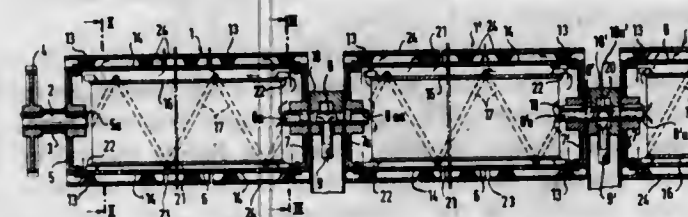
Filed Aug. 6, 1975, Ser. No. 602,399

Claims priority, application Germany, Aug. 9, 1974, 2438448

Int. Cl.<sup>2</sup> F23H 1/02

U.S. Cl. 126—163 R

21 Claims



1. In a grate for solid fuels in uncombusted and/or at least partially combusted state, a combination comprising a rotor assembly including at least one rotor unit including a fuel-contacting hollow drum-shaped shell having openings for introduction of air into fuel from within said shell and a hollow core mounted in said shell and having an apertured cylindrical wall defining with said shell at least one compartment; means for rotating said shell and said core to thereby advance the fuel which contacts said shell; means for admitting air into said core, at least at one axial end of said wall, so that the thus admitted air enters said compartment by way of the apertures in said wall and leaves said shell by way of said openings; and an open-ended hollow drum received with clearance in the interior of said core, said core being rotatable with respect to said drum and the outer diameter of said drum being less than the inner diameter of said cylindrical wall.

#### 4,013,061

#### IGNITION SYSTEM FOR CHEMICAL HEATERS

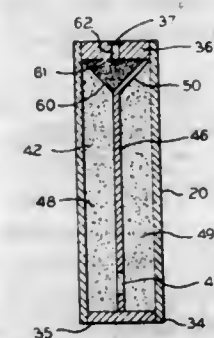
John H. Trumble, Elm Grove; Thomas C. Ehlert, Wauwatosa, and Akos Szekely, Colgate, all of Wis., assignors to Thermology, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 545,206, Jan. 29, 1975, abandoned. This application Mar. 26, 1975, Ser. No. 562,352

Int. Cl.<sup>2</sup> F24J 1/02

U.S. Cl. 126—263

8 Claims



1. A heating unit consisting essentially of: a hollow hermetically sealed thermo-conductive container, a quantity of a reactive chemical mixture disposed within and substantially filling said container, said chemical mixture consisting essentially of 0.75–1.25 parts-by-weight aluminum, approximately 1.5–3.5 parts-by-weight of an iron oxide and additionally comprises 0.25–2.50 parts-by-weight of an inert finely divided material, a cone-shaped quantity of a chemical ignition mixture consisting of aluminum and a material selected from the group consisting of  $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ , disposed within said container, said quantity having a base portion and an apex, said base portion being disposed adjacent an inter-

ior surface of said container least the apex being embedded in said reactive mixture, ignition means for igniting the base portion of said ignition mixture.

#### 4,013,062

#### SOLAR HEAT ABSORBER

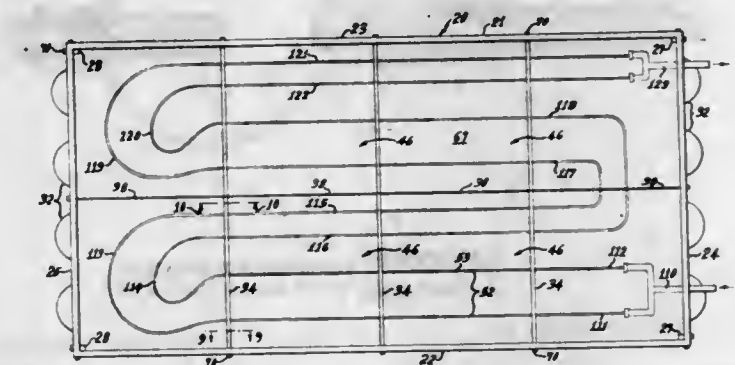
Gary W. Laird, P.O. Box 9013, 3231 Trout River Blvd., Jacksonville, Fla. 32208

Filed Aug. 20, 1975, Ser. No. 606,188

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126—271

30 Claims



1. A solar heat absorber comprising a closed box frame having an open top and a transparent cover therefor, a plurality of heat collecting plates supported by said frame beneath said cover, fluid passage means attached to said plates for removing the heat collected by said plates, compartmental means within said box frame for forming a plurality of dead air spaces and for separating respective said plates between said frame and said cover, said fluid passage means including:

- an inlet tube section communicating with a fluid inlet downwardly of one of said dead air spaces and passing through said one dead air spaces into another of said dead air spaces juxtaposed to said one dead air space,
- an outlet tube section passing from said juxtaposed dead air space into said one dead air space and communicating outwardly of said one dead air space, and
- a bent tube section coupling said inlet tube section and said outlet tube section in said juxtaposed dead air space whereby hotter fluid within said outlet tube section is reintroduced into said one dead air space for transference of some of the heat thereof into said one dead air space and thence into said cooler fluid within said inlet tube section therewithin before passing outwardly of said outlet tube section.

#### 4,013,063

#### IMPLANT FOR REVERSIBLY PREVENTING CONCEPTION

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Continuation-in-part of Ser. No. 513,292, Oct. 9, 1974. This application Apr. 14, 1975, Ser. No. 568,138

Int. Cl.<sup>2</sup> A61B 19/00

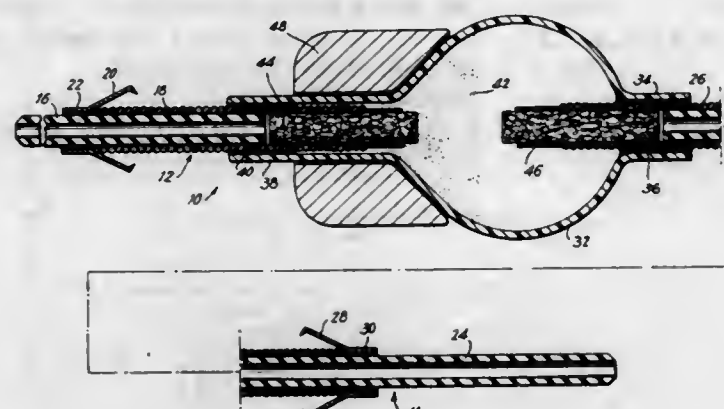
U.S. Cl. 128—1 R

15 Claims

1. In an implant for reversibly preventing conception, a pair of elongated open-ended tubular means spaced from each other and respectively having inner ends directed toward and outer ends directed away from each other, an intermediate housing means fluid-tightly connected with said pair of tubular means at the regions of said inner ends thereof for defining between said pair of tubular means a space with which both of said tubular means communicate and through which fluid can flow between said pair of tubular means, said housing means having in its interior a particulate means made up of a plurality of fine particles of a material which responds to magnetic forces, said housing means accommodating said particulate means in said housing means for movement between a conception-preventing position in a path of fluid flow between



said pair of tubular means and a conception-enabling position out of the path of flow between said pair of tubular means through the interior of said housing means, each of said tubular means carrying at its inner end region a barrier means for permitting fluid to flow through said inner end region of each tubular means while preventing the particles from flowing in any appreciable numbers therethrough, and a permanent magnet means located adjacent said housing means for attracting said particles to said conception-preventing position with a magnetic force urging said particles against each other



sufficiently to form from said particles a body having a density sufficiently great to prevent sperm from flowing through said body in numbers sufficient for conception while still permitting fluid in which sperm are normally suspended to flow past the particles, whereby a fluid which normally carries sperm will flow through both of the tubular means while sperm will be retained by said particles when they are in said conception-preventing position, while when the particles are in said conception-enabling position, free flow of fluid with sperm therein is provided when conception is desired.

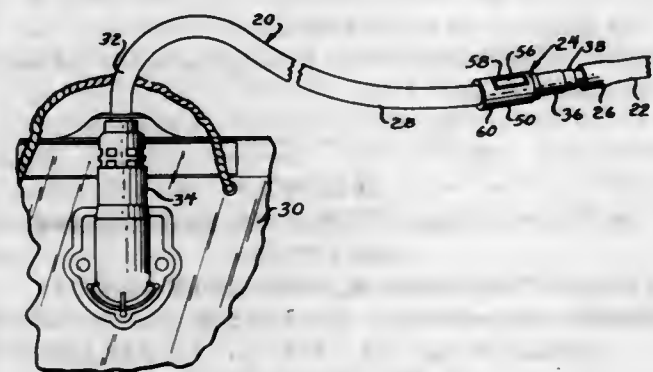
4,013,064

**PORT MEANS FOR A LIQUID TRANSPORT SYSTEM**  
Bhupendra C. Patel, Elgin, and Frank K. Villari, Oak Park, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed June 26, 1975, Ser. No. 590,787  
Int. Cl.<sup>2</sup> A61B 10/00; A61M 25/00

U.S. Cl. 128-2 F

14 Claims



- I. Port means for a liquid transport system, comprising:
  - a relatively rigid body member having an inner surface defining a sidewall of a liquid transport lumen, and an opening extending through a side of the body member and communicating between the lumen and the outside of the body member;
  - a flexible closure member having a plug received in the opening of the body member, said plug having an inner surface defining a sidewall of the liquid transport lumen, and said closure member having an outer surface defining a location for receiving a needle to penetrate the plug and establish communication with the liquid transport lumen by a tip of the needle;
  - means for securing the closure member to the body member

with the plug received in said opening, the securing means comprising a flexible band of the closure member extending around an outer surface of the body member; and

a liquid drainage tube secured to one end of the body member and having a lumen in communication with the lumen of the body member, with one end of said band covering the end portion of the tube secured to the body member.

12. Port means for a liquid transport system, comprising: a relatively rigid body member having an inner surface defining a sidewall of a liquid transport lumen, an opening extending through a side of the body member and communicating between the liquid transport lumen and the outside of the body member, and a cutout defining a ledge adjacent said opening;

a flexible closure member having a plug received in the opening of the body member, said plug having an inner surface defining a sidewall of the liquid transport lumen, and said closure member having a flange extending at least partially peripherally around the plug adjacent an outer portion of the closure member, with said flange being located on said ledge of the body member, and an outer portion having an outer surface defining a location for receiving a needle to penetrate the plug and establish communication with the liquid transport lumen by a tip of the needle; and

means for securing the closure member to the body member with the plug received in said opening, the securing means comprising a retaining member extending around and covering at least a portion of said flange, said retaining member having a rim including an inwardly directed outer portion defining an opening to receive the outer portion of the closure member, said rim having a side portion depending from the outer rim portion, with the outer and side portions of the rim defining a recess to receive the closure member flange, and with the rim side portion being secured to the body member to retain the closure member in place with the closure member flange located intermediate the rim and body member ledge in the rim recess and with the closure member outer portion projecting into the rim opening.

4,013,065

**MOISTURE DERMATOMETER**

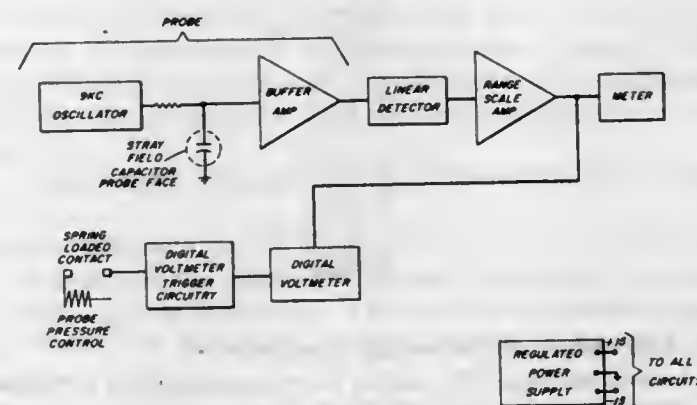
Melvin Copeland, Nanuet, and William Peter Konazewski, South Spring Valley, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 23, 1976, Ser. No. 660,591

Int. Cl.<sup>2</sup> A61B 5/05

U.S. Cl. 128-2 R

6 Claims



I. A device for measuring moisture in a moist substrate which comprises, a stray field capacitor for making contact with said substrate, means to provide an oscillating signal to said stray field capacitor, and means to detect and read a modified signal produced by said stray field capacitor in contact with said moist substrate, said stray field capacitor comprising yieldable means to urge it against the skin under pressure, said means further comprising means to trigger said read means at a predetermined pressure.

4,013,066

**PROCESSES FOR MENSTRUAL CYCLE PHASE DETERMINATION**

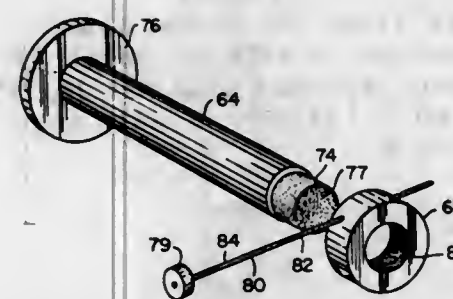
Samuel R. Schuster, Wellesley, Mass., assignor to Ovutime, Inc.

Continuation-in-part of Ser. No. 472,611, May 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 300,187, Oct. 24, 1972, abandoned. This application Nov. 7, 1975, Ser. No. 629,700

Int. Cl.<sup>2</sup> A61B 10/00; G01N 33/16

U.S. Cl. 128-2 R

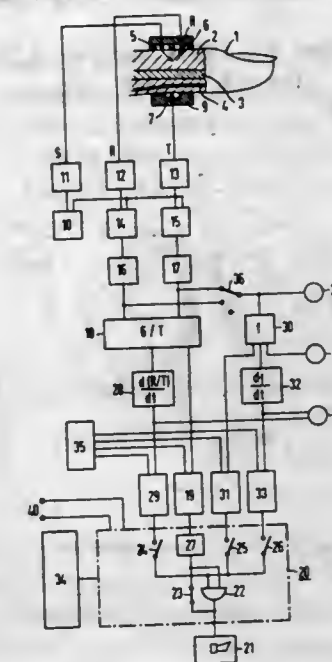
6 Claims



I. A method for determining menstrual cycle phase comprising the steps of:

- a. inserting a probe having an inner bearing element at a working end into a cavity for obtaining a viscous mucus sample, said inner bearing element carrying said mucus sample;
- b. removing said probe from the cavity;
- c. placing said inner bearing element within an outer bearing element;
- d. constraining said inner bearing element within said outer bearing element for relative movement therebetween;
- e. biasing said probe for indicating menstrual cycle phase by relative movement between said inner bearing element and said outer bearing element, said probe biased with sufficient force to cause relative movement between said inner bearing element and said outer bearing element when the viscosity of said mucus sample is low and with insufficient force to cause relative movement between said inner bearing element and said outer bearing element when the viscosity of said mucus sample is high.

fall below said boundary values, said signals from said pickup means comprising simultaneous transmissive and reflective



4,013,068  
**ELECTROENCEPHALOGRAPHIC ACTIVATED CONTROL SYSTEM**

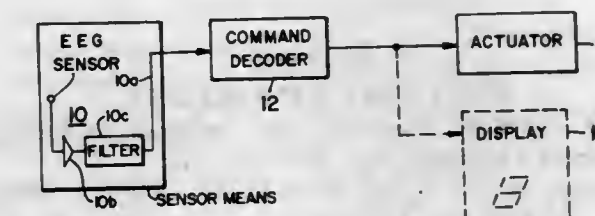
Wayne L. Settle, 1311 33rd Ave., and Lowell G. Funston, 1309 33rd Ave., both of San Francisco, Calif. 94122

Filed Oct. 15, 1974, Ser. No. 514,539

Int. Cl.<sup>2</sup> A61B 5/04

U.S. Cl. 128-2.1 B

18 Claims



4,013,067

**WARNING APPARATUS FOR INDICATING A THREAT OF IMPENDING SHOCK**

Heinz Kresse, Erlangen, and Helmut Reichenberger, Brand, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed May 22, 1975, Ser. No. 579,801

Claims priority, application Germany, June 26, 1974, 2430788

Int. Cl.<sup>2</sup> A61B 5/02

U.S. Cl. 128-2.05 R

8 Claims

I. In a warning apparatus for indicating the threat of impending shock in a patient, including photoelectric pulse pickup means adapted to be applied to the skin of said patient and comprising at least one light transmitter and at least two light receivers, said light transmitter comprising substantially a light source, said light receivers converting incident light into corresponding electrical signals, said receivers comprising combined reflection and transmission receivers; signal comparison means having at least one threshold discriminator set to predetermined critical threshold values corresponding to upper and lower boundary values and being operatively connected to said pulse pickup means for comparing simultaneously signals obtained from a reflection and transmission measurement with said boundary values and to generate an output signal; and alarm means responsive to said output signal for initiating an alarm when the signals compared by said comparison means with said boundary values exceed or

I. An electroencephalographic acutated control system responsive to a plurality of different commands voluntarily encoded on EEG signals in a predetermined serial digital encoding system wherein each command corresponds to a different predetermined number of waves voluntarily generated in a predetermined frequency range of electroencephalographic activity comprising: EEG sensor means for detecting EEG signals including at least the signals comprising said encoded commands, filter means for selecting signals within said predetermined frequency range from the detected EEG signals, command decoder means responsive to the filtered EEG signals for decoding each of said plurality of different commands including counter means for counting the number of waves of said filtered EEG signals to generate digital signals representative of the number of waves of and corresponding to a digital representation of the encoded-command and actuator means responsive to said digital signals of said counter means for controlling apparatus adapted to accomplish each of said commands in response thereto.

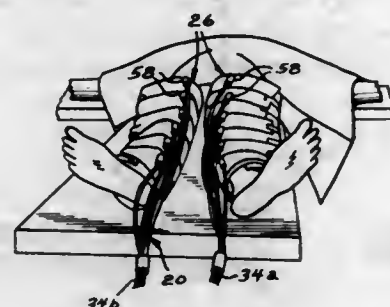


4,013,069

**SEQUENTIAL INTERMITTENT COMPRESSION DEVICE**  
James H. Hasty, Cary, Ill., assignor to The Kendall Company, Boston, Mass.Filed Oct. 28, 1975, Ser. No. 625,990  
Int. Cl.<sup>2</sup> A61H 1/00

U.S. Cl. 128-24 R

41 Claims



1. A device for applying compressive pressures against a patient's limb from a source of pressurized fluid, comprising: an elongated pressure sleeve for enclosing a length of the patient's limb, said sleeve having a plurality of separate fluid pressure chambers progressively arranged longitudinally along the sleeve from a lower portion of the limb to an upper portion of the limb proximal the patient's heart relative said lower portion;

means for intermittently forming a plurality of fluid pressure pulses from said source in a timed sequence during periodic compression cycles;

means for connecting different pressure pulses of said sequence to separate chambers in the sleeve in an arrangement with later pulses in said sequence being connected to more upwardly located chambers in the sleeve and with each of the pulses being continuously applied to the sleeve after formation by the forming means for the duration of the compression cycle to apply a compressive pressure gradient against the patient's limb by the sleeve which decreases from the lower to upper limb portions; and

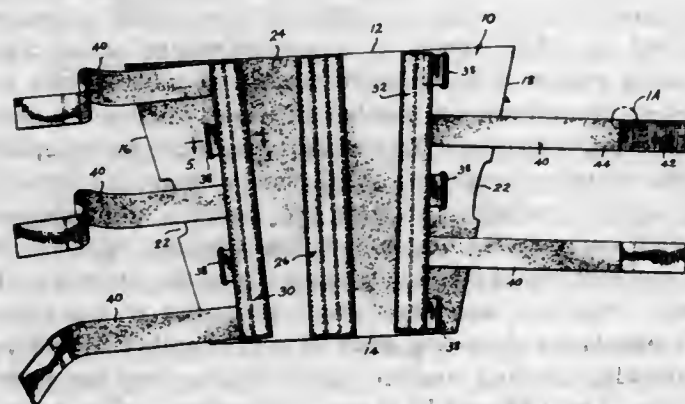
means for intermittently connecting the chambers to an exhaust means during periodic decompression cycles between said compression cycles.

4,013,070

**BODY PART IMMOBILIZER**Marlin R. Harroff, Bourbon, Ind., assignor to Orthopedic Equipment Company, Inc., Bourbon, Ind.  
Continuation-in-part of Ser. No. 540,505, Jan. 13, 1975, Pat. No. 3,935,858. This application Jan. 27, 1976, Ser. No. 652,751Int. Cl.<sup>2</sup> A61F 3/00

U.S. Cl. 128-80 C

11 Claims



1. An immobilizer for a body part of a patient comprising a flexible cover means having in planar orientation upper and lower edges and opposite side edges; said cover means including an outer surface formed of loop means, rigidifying means,

said rigidifying means including hook means for detachable and adjustable securement to said cover means at the loop means thereof, and means for securing said cover means about said body part, said rigidifying means being adjustably secured to said cover means adjacent one said cover means side edge with the hook means of the rigidifying means interlocking with the loop means of the cover means for positioning along said body part when said cover means is applied to the patient.

4,013,071

**FASTENERS PARTICULARLY USEFUL AS ORTHOPEDIC SCREWS**

Lior Rosenberg, 4 Ophir St., Tel Aviv, Israel

Filed Nov. 11, 1975, Ser. No. 631,137

Claims priority, application Israel, Nov. 11, 1974, 46030

Int. Cl.<sup>2</sup> A61B 17/18; A61F 5/04

U.S. Cl. 128-92 B

4 Claims



1. A fastener particularly useful in orthopedic surgery, comprising: an external fastening member having a shank formed with a head at one end, external spiral threads, an internal bore extending axially through the head and at least partly through the shank towards its opposite end, internal threads adjacent to its head and a plurality of side slits formed radially through said opposite end of the shank to said bore to provide a plurality of outwardly expansible tips at said opposite end; an internal spreading member receivable within said bore and being formed with a head and external threads in the same direction as the external threads of the external fastening member; and an insert removably received between the heads of the fastening and spreading members such that when the insert is in position between the two heads and engages them on its opposite faces, the spreading member may be rotated to transmit its rotation to the fastening member in the threading direction, and when the insert is removed, the spreading member may be further rotated to cause it to move axially within the bore of the fastening member and thereby to spread its tips outwardly.

4,013,072

**DRIP CHAMBER FOR INTRAVENOUS ADMINISTRATION**

Thurman S. Jess, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 3, 1975, Ser. No. 628,275

Int. Cl.<sup>2</sup> A61M 5/16

U.S. Cl. 128-214 C

4 Claims

1. In a drip chamber for use in intravenous administration of liquids, comprising an elongated, flexible, transparent hollow housing chamber defining an inlet at one end thereof and an outlet at the other end, said drip chamber being free of venting means, to permit pumping thereof for obtaining and maintaining a constant liquid level therein; hydrophilic filter means positioned adjacent the outlet port, said hydrophilic filter means defining a pore size sufficient to permit the passage of

4,013,074

**IMPLANTABLE MEDICATION DISPENSING DEVICE**  
George G. Siposs, 2855 Velasco Lane, Costa Mesa, Calif. 92626

Continuation-in-part of Ser. No. 481,886, June 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 362,411, May 21, 1973, abandoned. This application Apr. 6, 1976, Ser. No. 674,107

Int. Cl.<sup>2</sup> A61M 7/00, 5/00

U.S. Cl. 128-260

8 Claims



liquid and to prevent the passage of gas, when wetted, under normal conditions of use, said hydrophilic filter means defining a tubular filter structure positioned generally coaxially with said hollow chamber and spaced from the walls thereof, said tubular filter means defining an open end facing the inlet end of said elongated chamber and a closed end facing the outlet end of said elongated hollow chamber, and an annular

sealing member adjacent said open end of the tubular filter for sealing the annular space between said tubular filter member and the chamber wall; whereby liquid passing through said tubular filter member enters into the bore thereof and passes through said tubular filter to the exterior thereof in the space between said filter and the chamber wall, and thereafter said filtered liquid passes through said outlet port.

4,013,073

**DISPENSING DEVICE**

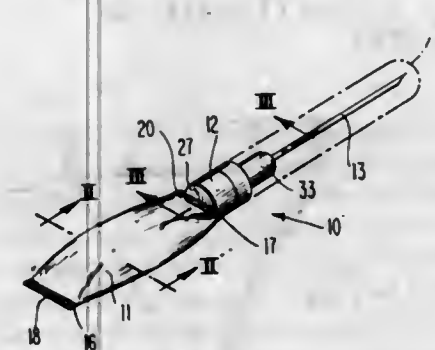
James Robert Cunningham, 2010 Virginia Lane, Philadelphia, Pa. 19401

Filed May 14, 1975, Ser. No. 577,322

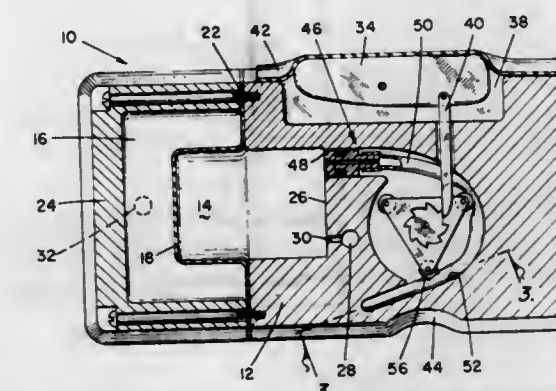
Int. Cl.<sup>2</sup> A61M 5/00

U.S. Cl. 128-216

2 Claims



1. A disposable syringe comprising a collapsible container for containing medicine or the like therein, needle carrier means secured to the container at a discharge end thereof, means closing the container at said end, said needle carrier means including needle means normally being disposed out of communication with the interior of said container but being movably disposed for communicating with the interior of said container for dispensing medicine or the like therefrom, said container being of sufficiently flexible construction to facilitate flattening thereof upon dispensing from the container, said discharge end of said container, at its location of securement to said needle carrier means being free of any non-flattenable zone that would inhibit complete discharge from the container at that end, inhibit complete said discharge/end of said container including flaps outwardly of said container end closure, said flaps being in secured engagement with an adjacent end of said needle carrier means outwardly of said end closure.



1. An implantable insulin medication-dispensing device comprising:

a substantially rigid body having a top directed toward the skin and having a bottom directed toward subcutaneous tissue when implanted and having opposed sides;

a chamber in said body having a movable diaphragm member therein to separate said chamber into an insulin reservoir and gas chamber;

a refill port in the top of said body connected to said medication reservoir, said refill chamber having resilient plug to permit transcutaneous hypodermic injection of liquid insulin medication from the exterior of the device through said refill port into said reservoir;

a chamber port in the top of said body connected to said chamber, said chamber having a resilient plug to permit transcutaneous hypodermic injection of gas from the exterior of the device through said port into said gas chamber to control gas pressure in said chamber and to measure gas pressure in said chamber;

an insulin medication-dispensing pump connected to said medication volume of said reservoir to cause periodic flow of liquid insulin medication out of said reservoir when said device is actuated, said insulin medication-dispensing pump having a pump chamber having an inlet and an outlet such that actuation of said pump causes flow of liquid insulin, an outlet check valve at the outlet termination of said pump chamber outlet directed out of said bottom so that insulin discharge from said outlet check valve discharges insulin out of said medication-dispensing device directly to subcutaneous body tissue to prevent draining of the pump or pump outlet between pumping periods and prevent body tissue from growing into said dispensing pump outlet; and

actuation means connected to said pump for discharging medication from said insulin dispensing device, said actuation means being a manually accessible thruster so positioned on one of said sides of said body that said thruster can be transcutaneously manually actuated by transcutaneously manually grasping said opposed sides and actuating said thruster for actuating said pump for dispensing insulin into the body upon physiological demand, said insulin reservoir, said gas chamber, said refill port, said chamber port, said medication-dispensing port, and said manually accessible thruster all being mounted in said substantially rigid body so that actuation of said pump to discharge medication does not cause reduction in external volume of said substantially rigid body as a result of reduction in insulin volume in said reservoir.



4,013,075

**INHALERS AND INSUFFLATORS HAVING A CUTTING MEANS**

Salvatore Cocozza, Milan, Italy, assignor to I.S.F. S.p.A., Milan, Italy

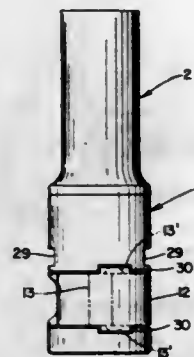
Filed July 15, 1975, Ser. No. 596,176

Claims priority, application Italy, July 15, 1975, 25163/74

Int. Cl.<sup>2</sup> A61M 15/06, 15/08

U.S. Cl. 128—266

24 Claims



1. A device for the administration of a powdered substance contained in a capsule, comprising:

A. a generally tubular body having a transverse recess intermediate its ends;

B. a carrier member which is pivotally mounted in said transverse recess for pivotal movement, transversely to the axis of said tubular body, out of and into said transverse recess and having a cylindrical bore co-axial with said body for holding said capsule; and

C. cutting means for opening said capsule in order to release the contents cleanly and completely, comprising a pair of cutting blades, each having a circular aperture and being fixedly mounted in said recess at each end of the bore in said carrier member with the centres of the apertures coinciding with the axis of said bore, the arrangement being such that upon pivoting the carrier member containing said capsule into said recess from a position outwardly therefrom, the ends of said capsule are severed by said blades to form an opened capsule and expose the contents of said capsule to the adjacent cavities of said tubular body.

4,013,076

**ASPIRATOR JAR**

George Puderbaugh, Manlius; Thomas S. Myers, Sherrill; Robert W. Pike, Syracuse, and Robert B. Atley, Sherrill, all of N.Y., assignors to Diemolding Corporation, Canastota, N.Y.

Continuation-in-part of Ser. No. 587,613, June 17, 1975, abandoned. This application Oct. 24, 1975, Ser. No. 625,770

Int. Cl.<sup>2</sup> A61M 1/00

U.S. Cl. 128—276

1 Claim

1. An aspirator jar for receiving and holding fluids comprising:

a container having a closed bottom, a substantially cylindrical sidewall, and an open mouth portion defined by an annular, outwardly flared beaded rim formed at the top edge of said sidewall;

a lid for said container adapted to engage the rim of said container and having means adapted to engage said rim to provide an airtight seal between the lid and the container;

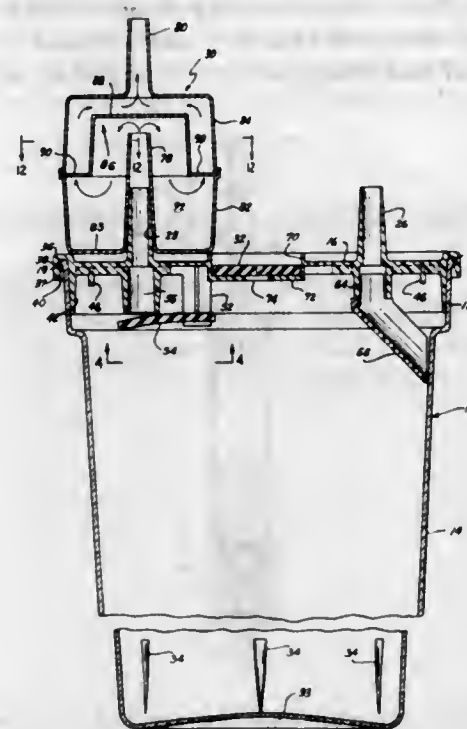
a pressure relief valve in an aperture in said lid communicating with the interior of said jar;

said pressure relief valve comprising a slitted deformable disk placed over said aperture in said lid with said slit generally lying along the diameter of said aperture;

a generally tubular inlet port and associated inlet chamber in said lid for admitting fluid to the interior of said container;

a deflector chute attached to said inlet chamber for directing said fluid against said sidewall;

a generally tubular outlet port and outlet chamber in said lid for use in withdrawing air from the interior of said container, whereby a negative pressure may be developed within the container; and



an overflow valve assembly secured to said outlet chamber, said valve assembly including a float responsive to the level of fluid in said container for opening and closing said outlet chamber.

4,013,077

**COLLECTING DEVICE**

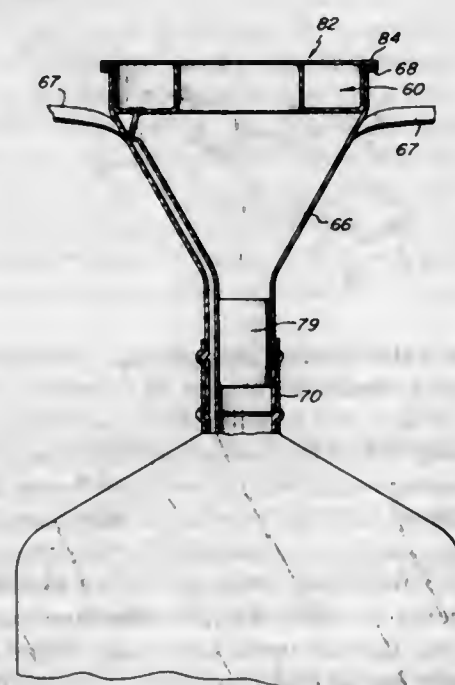
Michael C. Ritota, Newark, and L. Phillip Mancini, Bricktown, both of N.J., assignors to M.E.D.S. Corporation, Newark, N.J.

Continuation-in-part of Ser. No. 508,158, Sept. 23, 1974, Pat. No. 3,938,521, which is a continuation-in-part of Ser. No. 265,343, June 22, 1972, abandoned. This application Feb. 6, 1976, Ser. No. 655,698

Int. Cl.<sup>2</sup> A61F 5/44

U.S. Cl. 128—295

11 Claims



1. A urine-collecting device for use in the continuous collection of urine from a male penis, comprising

a. an inflatable collar for attachment to a penis, so that upon its inflation, said collar is firmly anchored to said penis said inflatable collar including a first annular member

having an inner and outer diameter and a second annular member having an inner and outer diameter, said second annular member being substantially U-shaped in configuration upon its inflation, said inner diameter of said first annular member and said inner diameter of said second annular member being sealingly attached, and said outer diameter of said first annular member and said outer diameter of said second annular member being sealingly attached, thus forming said closed annular space therebetween, said sealingly attached outer diameters of said first annular member and said second annular member forming the outer diameter of said inflatable collar,

b. an elongated tubular member sealingly attached to said outer diameter of said inflatable collar,

c. collecting means associated with the end of said elongated tubular member remote from said inflatable collar for collection of urine discharged from said penis, and

d. means for inflating said collar.

4,013,078

**INTERVERTEBRAL PROTECTOR MEANS**

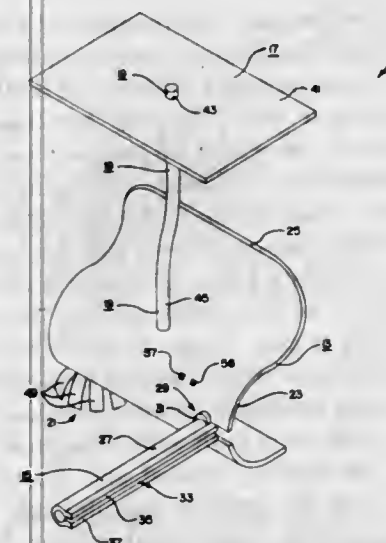
James R. Feild, 2254 N. Parkway, Memphis, Tenn. 38112

Continuation-in-part of Ser. No. 526,686, Nov. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 518,523, Oct. 29, 1974, abandoned. This application Oct. 7, 1975, Ser. No. 620,419

Int. Cl.<sup>2</sup> A61B 19/00

U.S. Cl. 128—303 R

28 Claims



1. Protector means for use following intervertebral and intravertebral and intraspinal surgery at a surgical site on a patient to prevent postoperative adhesions from binding the patient's spinal nerves, said protector means comprising bi-compatible shield means for providing an intervening barrier between portions of the patient's dura and spinal nerve roots and the patient's spinal canal structures adjacent the surgical site to prevent development of postoperative adhesions therebetween.

4,013,079

**MEDICAL DILATOR**

Hans-Joachim Lindemann, Oderfelder Str. 6, 2 Hamburg 13, and Peter P. Wiest, Gotha-Allee 19, 1 Berlin 19, both of Germany

Filed Nov. 11, 1975, Ser. No. 630,819

Claims priority, application Germany, Nov. 13, 1974, 2454351

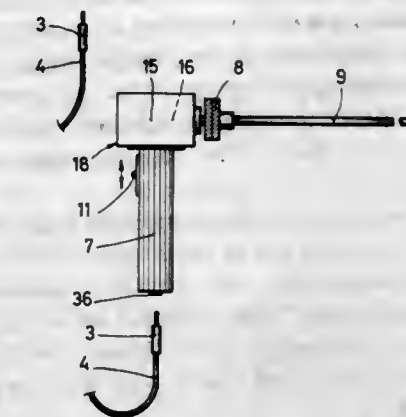
Int. Cl.<sup>2</sup> A61M 29/00

U.S. Cl. 128—341

18 Claims

1. A medical dilator particularly for dilating the cervical canal of the uterus comprising, in combination, a housing; a rigid elongated rod-shaped probe connected at one end to said housing and having a free end; a profiled head section on said probe and located on the free end of said probe; and means confined entirely within said housing for applying vibrations

transversely to the longitudinal axis of said probe, said probe and said profiled head section being free of said means con-



fined entirely within said housing, said probe having a substantially smaller cross-section than said housing so as to be of such size as to enable dilation of the cervical canal.

4,013,080

**CANNULA CONNECTOR AND DIRECTION INDICATOR MEANS FOR INJECTION SYSTEM**

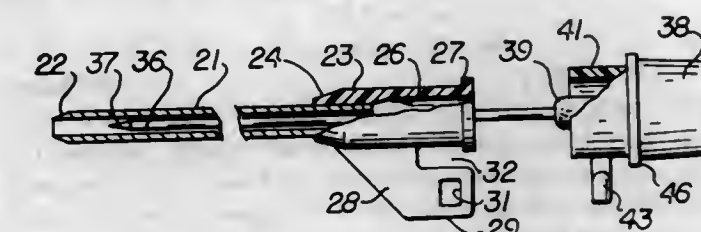
Edward C. Froning, 215 N. San Mateo Drive, San Mateo, Calif. 94401

Continuation-in-part of Ser. No. 511,655, Oct. 3, 1974, Pat. No. 3,941,127. This application June 5, 1975, Ser. No. 584,103

Int. Cl.<sup>2</sup> A61B 17/34

U.S. Cl. 128—347

10 Claims



1. A cannula comprising a lumen having a central longitudinal bore, a hub on the proximal end of said lumen, a vane extending outward of said bore parallel to said bore formed with an aperture having an axis transverse to said bore, said axis not intersecting said bore.

4,013,081

**PEDIATRIC CARDIAC PACER SYSTEM**

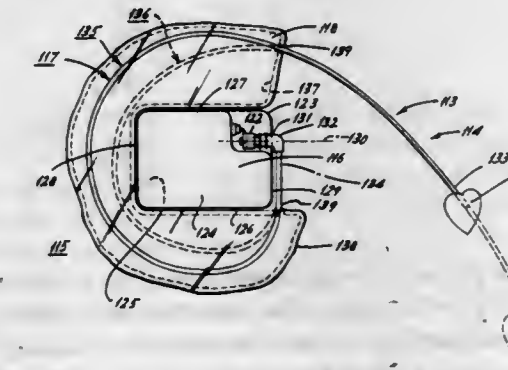
Steve A. Kolenik, Leechburg, Pa., assignor to ARCO Medical Products Company, Leechburg, Pa.

Filed Apr. 19, 1976, Ser. No. 678,265

Int. Cl.<sup>2</sup> A61N 1/36

U.S. Cl. 128—419 P

8 Claims



1. In a cardiac pacer system having the combination of a lead, an electrode at the distal end, said electrode being



adapted to contact a signal receiving zone of a heart, a plug at the proximal end of said lead, said plug fitting into a well of a socket in a cardiac pacer, a cardiac pacer, said cardiac pacer containing at least one electrochemical cell as a voltage source said cardiac pacer containing a circuitry unit comprising solid state electronic components, said socket of said pacer accommodating said plug at the proximal end of said lead delivering the output of the circuitry unit to said signal receiving zone of a heart, the improvement which consists essentially of:

plug positioning means directing said lead as a flat spiral around said cardiac pacer, said spiral initially being larger than required by the safe bending radius of the lead, whereby such spiral may contract to a relatively smaller spiral to accommodate to the greater distance between said cardiac pacer and said signal receiving zone as the body grows;

a bag having internal surfaces resistant to tissue growth, said bag permitting said contraction of said spiral because at least a significant portion of said spiral is within said bag; means restricting movement of said cardiac pacer after implantation while permitting said contraction of the spiral portion of said lead; and said pacer and lead having dimensions adapted to permit implantation of said cardiac pacer as a pediatric pacer.

4,013,082

## TOBACCO EXPANSION PROCESS

William E. Rosen, 2055 Wisteria Lane, Lafayette Hill, Pa. 19444

Continuation of Ser. No. 292,183, Sept. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 279,851, Aug. 11, 1972, Pat. No. 3,889,689. This application Feb. 12, 1975, Ser. No. 549,226

Int. Cl.<sup>2</sup> A24B 3/18

U.S. Cl. 131-140 P

9 Claims

1. The method of treating tobacco which comprises distributing on the tobacco a liquid solution containing catalase and a liquid solution containing hydrogen peroxide and surrounding the tobacco with an atmosphere of negative pressure after the catalase and hydrogen peroxide have permeated the interstices of the tobacco and begin to react to cause expansion of the tobacco cells under negative pressure.

4,013,083

## HAIR DRYER

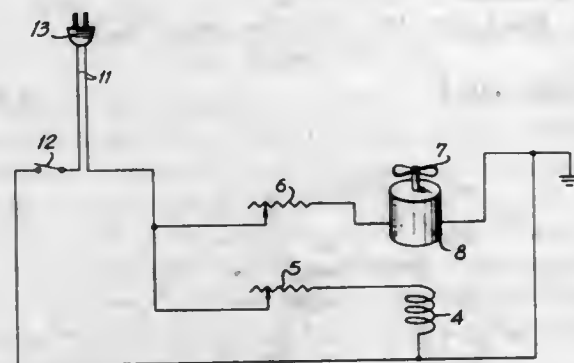
Edward Helbling, 726 E. 10th St., Brooklyn, N.Y. 11230

Continuation of Ser. No. 457,128, April 1, 1974, Pat. No. 3,911,934. This application Oct. 8, 1975, Ser. No. 620,788

Int. Cl.<sup>2</sup> A45D 20/00

U.S. Cl. 132-9

3 Claims



1. In a hair-grooming implement including a housing, impeller means in said housing for creating an airflow, heating means for said airflow in said housing in cascade with said impeller means, a hollow body with at least one outlet, and a conduit extending from said housing to said body for conveying a flow of hot air to said outlet, the combination therewith of first control means for variably energizing said heater

means, second control means for variably energizing said impeller means, manual operating means coupled with one of said control means for adjusting same independently of the other of said control means, and link means for selectively coupling said other of said control means with said operating means for simultaneous adjustment of both said control means to vary the energization of said heater means and said impeller means in the same sense.

4,013,084

## MAGNA COMB

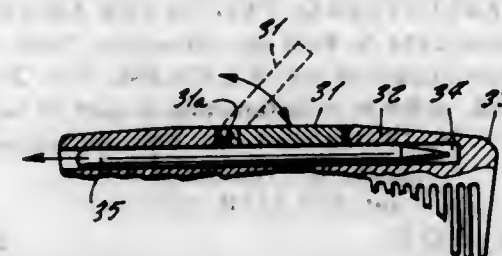
Joseph Guida, 287 Sycamore Lane, South Hauppauge, N.Y. 11722

Filed Feb. 6, 1976, Ser. No. 655,828

Int. Cl.<sup>2</sup> A45D 24/00

U.S. Cl. 132-11 R

1 Claim



1. In a magna-comb, the combination of a comb body made of a plastic material, said comb body including a longitudinally extending backbone having a plurality of teeth along one edge thereof formed in a row, and said backbone supporting a permanent magnet therein, said magnet being pivotally attached to said backbone by means of a transverse pin through one end of said magnet, said magnet being pivotable outwardly from within said backbone, said backbone including a longitudinally extending opening slidably receiving a writing implement such as a ball point pen or pencil, said writing implement having a case made of steel, said magnet being pivotable against a side of said writing implement, said magnet being positioned so that when pivoted into said backbone then one side of said magnet is flush with a longitudinal side edge of said backbone for holding against any exterior steel surface and at a same time an opposite parallel side of said magnet engages a side of said steel cased writing implement, said opposite side in said pivoted position being aligned accordingly with a side of said opening, said writing implement being longer than said magnet, so that opposite ends of said writing implement prevent transverse shift of said writing implement, so that said writing implement thus retains said magnet in said position within said backbone.

4,013,085

## DENTAL CLEANING MEANS AND METHOD OF MANUFACTURE THEREFOR

Charles E. Wright, 3167 Bayview Ave., Willowdale, Ontario, Canada (M2K 1G2)

Continuation of Ser. No. 489,134, July 17, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,197

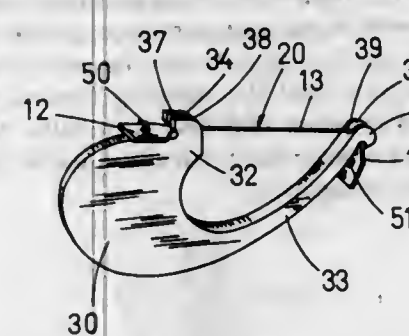
Int. Cl.<sup>2</sup> A61C 15/00

U.S. Cl. 132-89

3 Claims

1. Dental cleaning means comprising an elongated strip of polymeric material, said strip having terminal portions removably securable to a holder and connected by a flat unitary flexible elongated intermediate member integral therewith, said intermediate member being of reduced width and thickness compared to said terminal portions for insertion between the teeth for tooth cleaning purposes, said flexible elongated

intermediate member being of substantially linearly molecularly oriented polymeric material and said terminal portions



being of substantially molecularly unoriented polymeric material.

4,013,086

## COMBING DEVICE

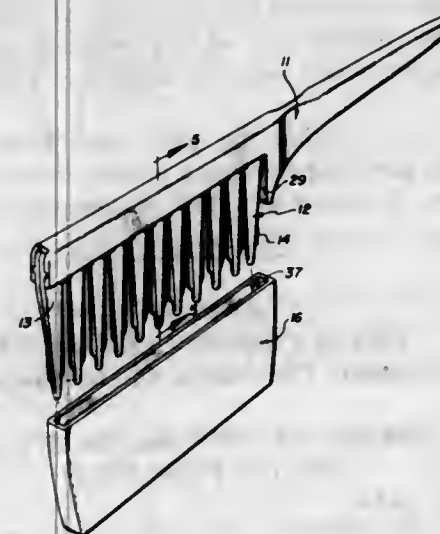
John F. Chmela, 1106 Beechwood Drive, Mount Prospect, Ill. 60056

Filed Oct. 14, 1975, Ser. No. 621,657

Int. Cl.<sup>2</sup> A45D 24/16

U.S. Cl. 132-110

28 Claims



1. A combing device for conditioning hair as the combing device is combed through the hair comprising, in combination: a comb having a plurality of teeth, said comb being separable along the longitudinal axis thereof so as to be formed by a pair of complementary comb members of a substantially like construction, an insert of an absorbent sheet material removably retained between said pair of complementary comb members, said insert being substantially coextensive in length with the length of said teeth and extending laterally from the sides of the respective ones of said plurality of teeth, said insert further being discontinuous between adjacent pairs of said plurality of teeth so as to permit said combing device to be combed through the hair and to provide wiping surfaces between adjacent pairs of said plurality of teeth for engaging and thereby conditioning the hair as the combing device is combed through the hair, and means for releasably securing said pair of complementary comb members together with said insert therebetween.

4,013,087

## DISPOSAL OF LIQUID EFFLUENT FROM SEWAGE TREATMENT PLANTS

Belah N. Hanna, Honolulu, Hawaii, assignor to Hanna Enterprises, Inc., Kailua, Hawaii

Filed Mar. 10, 1975, Ser. No. 556,928

Int. Cl.<sup>2</sup> E03F 5/00

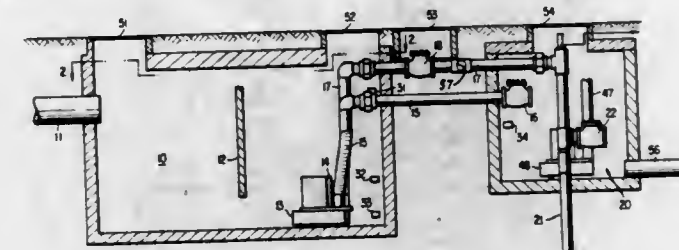
U.S. Cl. 137-110

17 Claims

7. A system for the injection of the liquid effluent from a

sewage treatment plant into a disposal well, comprising a first tank for accumulating said effluent, a second tank, means for feeding effluent from said first tank to said second tank, a well casing for said disposal well having an opening in said second tank, means for reverse pumping said well, additional pumping means for pumping effluent from said first tank directly into said well casing, and means responsive to the level of effluent in said first tank for controlling the feeding means and additional pumping means.

15. In a system for the injection of liquid effluent from a sewage treatment facility into a disposal well in a porous



stratum of the earth, a tank for receiving said effluent, a well casing for said well, means for conducting said effluent from said tank into said casing whereby said effluent is caused to flow down said casing into said well and there to be dispersed in the earth, means for reverse pumping said well and casing with said effluent up and out of said casing including means for feeding gas under pressure into said well to cause a reverse flow including said solid material up and out of said casing, and means inhibiting flow between said casing and tank during said reverse pumping of said well.

4,013,088

## VALVE STRUCTURE

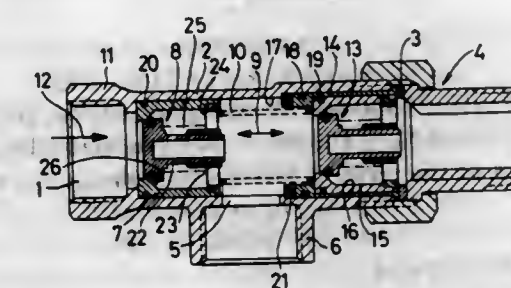
Eberhard Gocke, and Rudolf Vollmer, both of Mosbach, Germany, assignors to Braukmann Armaturen AG, Rothrist, Switzerland

Filed May 19, 1975, Ser. No. 579,009

Int. Cl.<sup>2</sup> F16K 45/00

U.S. Cl. 137-116

7 Claims



1. A valve structure having a body with an inlet, an outlet and an intermediate by-pass aperture, first and second check valve housings in said body and located respectively before and after said by-pass aperture in relation to the direction of flow, said second valve housing being sealingly secured to said body and said first check valve housing being sealingly but slidably engaged with said body and movable under flow pressure towards said second valve housing to close said by-pass aperture and a first spring bearing said first check valve towards said inlet, said check valve closing through individual springs, said first spring being weaker than said individual springs.



4,013,089

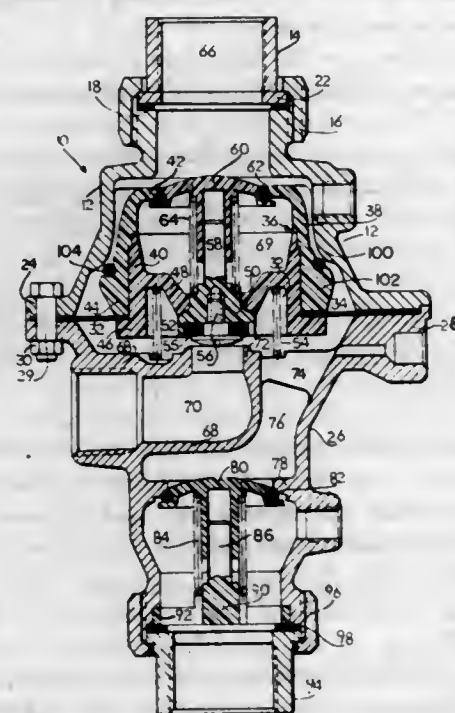
## BACK FLOW PREVENTER VALVE

Heinz Werner Braukmann, Willowdale, Canada, assignor to Braukmann Armaturen AG, Rothrist, Switzerland  
Filed Sept. 17, 1975, Ser. No. 614,246

Int. Cl.<sup>2</sup> E03C 1/10

U.S. Cl. 137-218

4 Claims



1. A backflow preventer valve having an inlet and an outlet comprising a hollow valve body, an annular resilient membrane in said valve body, the outer portion of said membrane being secured to said valve body, a rigid annular wall member securing the inward portion of said resilient membrane, said annular wall being spaced from said valve body, an inlet valve sealing against said rigid annular wall, an outlet valve downstream of said resilient membrane, vent means in said valve body intermediate of said resilient membrane and said outlet valve, said rigid annular wall member being adapted to close off said vent means on flow from said inlet to said outlet, a spring biasing said rigid annular wall member against said resilient membrane towards said inlet and spaced apart sealing means of said rigid annular wall and said valve body upstream of said resilient membrane, one of said sealing means being resilient, said sealing means engaging on failure of said membrane due to the biasing action of said spring whereby said vent means remains open to receive any flow from said inlet or backflow from said outlet.

4,013,090

## GATE VALVE ROTATING DISC

Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73108  
Filed Nov. 10, 1975, Ser. No. 630,554

The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> F16K 43/00

U.S. Cl. 137-329.05

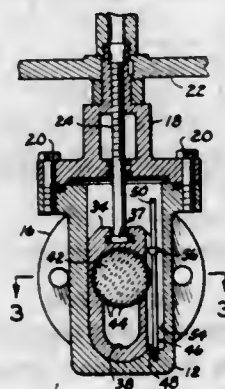
3 Claims

1. In a gate valve having a body provided with a flow passageway and having a disc receiving guide slot transversely intersecting the passageway, a valve stem having one end portion axially movable within the disc slot toward and away from the axis of the passageway by a gate wheel rotatable in opposing directions and having a pair of disc seat rings formed from material having a Rockwell scale C hardness of at least forty disposed, respectively, on the upstream and downstream sides of the disc slot coaxial with respect to the flow passageway and defining confronting seat ring surfaces respectively disposed in the planes forming the upstream and downstream sides of the slot, the improvement comprising:

a metallic disc slidable within the disc slot,

said disc having a head portion removably secured to said

one end portion of said valve stem for moving said disc and opening and closing the flow passageway.  
said disc having a transverse opening, at least equal in area to the transverse cross sectional area of the flow passageway, in its end portion opposite said disc head portion and having a transverse aperture between its head portion and the opening coaxial with the flow passageway when said disc is in valve closed position and being at least diametrically equal to the diameter of the flow passageway;



a plug formed of material having a Rockwell scale C hardness of at least forty freely received by the disc aperture and slidably interposed between said disc seat rings for coaxially registering and sealing with said disc seat ring on the downstream side of the slot and closing the flow passageway when said disc is moved to a closed position; and,

ratchet means within the gate valve body for angularly rotating said plug through a predetermined arc each time said disc is moved to a flow passageway closed position.

4,013,091

## FLOAT-CONTROLLED VALVE

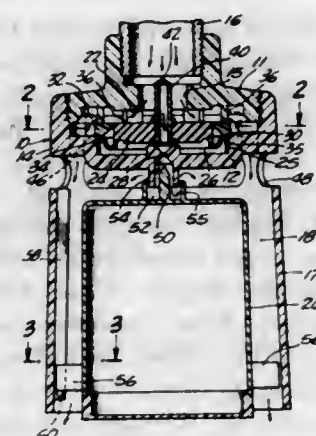
George D. Hudson, 120 Hobbs Circle, Santa Paula, Calif. 93060

Filed Apr. 28, 1975, Ser. No. 572,194

Int. Cl.<sup>2</sup> F16K 31/18

U.S. Cl. 137-414

9 Claims



1. In a float valve for replenishing a body of liquid from a pressurized liquid source in response to drop in the level of the liquid body, wherein a control chamber is in communication with the pressurized source and has a movable wall to exert pressure to close a main valve to cut off the source from the liquid body and a pilot valve operated by a float controls the bleeder port in a fixed wall of the control chamber, and wherein a hood extending downward from said fixed wall of the control chamber forms a float chamber enclosing the float, the improvement comprising:

said fixed wall of the control chamber and said hood being formed in one piece thereby necessitating assembly of the float through the bottom of the hood; and

means inside the hood to limit downward movement of the

float relative to the hood, said means to limit downward movement of the float comprising cooperative stop means on the float and the hood respectively, said stop means being yieldable to permit the float to be forced past the stop means in the assembly of the float valve.

4,013,092

## TWIST-LOCK VALVE IMPROVEMENT

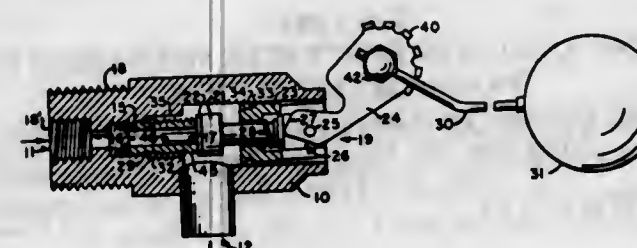
Abraham Isadore Reitman, 10407 Byron Ave., Oakland, Calif. 94603

Filed Apr. 12, 1972, Ser. No. 243,512

Int. Cl.<sup>2</sup> F16K 31/20

U.S. Cl. 137-426

5 Claims



1. A valve comprising means defining a valve body member having an inlet and an outlet, means defining an orifice in said valve body having an inlet port and an outlet port, said inlet and outlet ports respectively in communication with said inlet and outlet of said valve body member, means for opening and closing said orifice disposed proximate one port of said orifice comprising a valve actuating assembly,

means for connecting said valve actuating assembly to said valve member comprising means defining a slot in said valve body member having a longitudinal portion and a circumferential portion, and means defining a pin connected to said actuating assembly and having ends protruding from said actuating assembly adapted to engage said circumferential portion of said slot by passing along said longitudinal portion of said slot to lock in said circumferential portion by rotation of said actuation assembly about the longitudinal axis of said valve body member and remain longitudinally immovable in said slot during operation of said valve.

said valve actuating assembly comprising

an actuating assembly bracket,

a plunger disposed in said actuating assembly bracket having one end disposed proximate one port of said orifice and adapted to engage one port of said orifice and maintain a sealed relation thereto,

a plunger actuating arm disposed proximate the end of said plunger distal said orifice port, said actuating arm pivotally connected to said actuating assembly bracket by said pin and adapted to engage and actuate said plunger, an operating arm connected to said plunger actuating said arm distal said plunger,

a spring biased against said plunger and said actuating assembly bracket adapted to bias said plunger away from said orifice and against said plunger actuating arm, and means disposed on said plunger actuating arm for making fixed incremental adjustments in angular relationship between said plunger actuating arm and said operating arm.

4,013,093

## HYDRAULIC VALVES

Carlo Pensa, Como, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

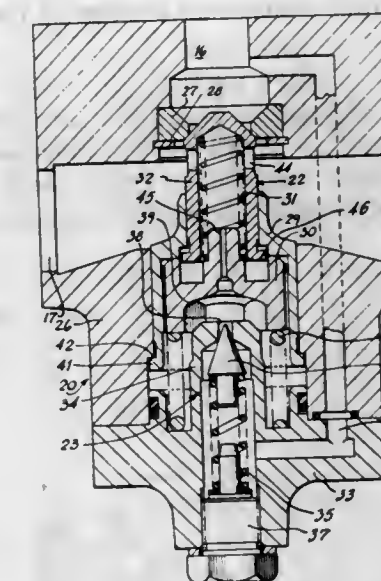
Filed Nov. 14, 1975, Ser. No. 632,131

Claims priority, application United Kingdom, Nov. 18, 1974, 49872/74

Int. Cl.<sup>2</sup> F16K 7/10

U.S. Cl. 137-491

9 Claims



1. A valve comprising a body, wall means defining a first and second conduit in said body, a valve member operable to control flow of fluid between said conduits and movable between a first position wherein said conduits are hydraulically disconnected and a second position wherein said conduits are hydraulically connected, a first element on said valve member, surface means on said element to react with fluid pressure in said conduits to bias said valve member toward said second position, a second element on said valve member and resilient biasing means operative to urge apart said first and second elements, stop means for limiting relative movement between said first and second elements, wall means defining a chamber, a restrictive passage between said first conduit and said chamber, fluid pressure in said chamber biasing said valve member toward said first position, and relief valve means operable to allow fluid to flow from said chamber upon attainment of a predetermined pressure therein.

4,013,094

## 4-WAY VALVE FOR SEPARATING OF TWO LIQUID-SUPPLY LINES, ESPECIALLY IN DAIRIES AND SIMILAR PLANTS

Erkki Pietari Niskanen, Kissanpellontie 13, 00700 Helsinki 70, Finland

Filed Sept. 24, 1975, Ser. No. 616,216

Claims priority, application Finland, Oct. 23, 1974, 3104/74

Int. Cl.<sup>2</sup> F16K 11/16

U.S. Cl. 137-597

4 Claims

1. A four-way valve for selectively connecting two liquid supply lines separately to a container for conducting a liquid into and out from said container, comprising a valve housing which defines:

four valve chambers;

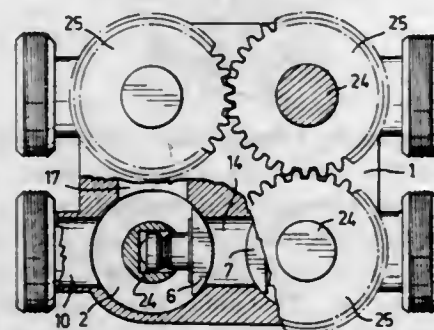
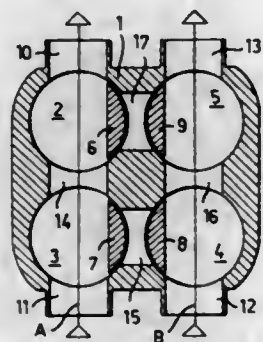
four internal connection passages whereby each of said valve chambers is connected to two others of said valve chambers, each valve chamber being connected by said internal passages to only two others of said valve chambers; and

four external connection passages communicating with said four valve chambers respectively and providing two inlets to the valve and two outlets therefrom,

and the valve further comprising four rotary slide members fitted in the valve chambers respectively and cooperating with the valve housing so that each slide member is capable of



closing off selectively either of the internal connection passages connected to the valve chamber in which it is fitted while leaving open both the other such internal connection passage and the external connection passage communicating with the valve chamber, said four rotary slide members being operatively coupled to each other so that in a first operational position of the rotary slide members a first internal connection passage is closed at both ends by first and second slide members respectively, a second internal connection passage is closed at both ends by third and fourth slide members respectively, a third internal connection passage is open and con-



nects first and second of the external connection passages together, and the fourth internal connection passage is open and connects the third and fourth external connection passages together, whereas in a second operational position of the slide members the third internal connection passage is closed at both ends by the first and third slide members respectively, the fourth internal connection passage is closed at both ends by the second and fourth slide members respectively, the first internal connection passage is open and connects the first and third external connection passages together, and the second internal connection passage is open and connects the second and fourth external connection passages together.

#### 4,013,095 REGULATOR DEVICE FOR CONTROLLING THE FLOW OF A LIQUID

Reinhard Kurz, Hauptstrasse 6, 6369 Nidderau 3, Germany  
Continuation-in-part of Ser. No. 390,226, Aug. 21, 1973, Pat. No. 3,906,978. This application Feb. 3, 1975, Ser. No. 546,772  
Claims priority, application Germany, Aug. 22, 1972, 2241215; Feb. 5, 1974, 2405303

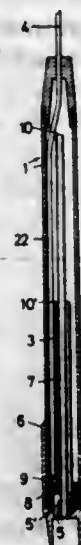
Int. Cl.<sup>2</sup> A01G 25/00

U.S. Cl. 137—599

7 Claims

1. A regulator device for controllably supplying a liquid to a suction means which comprises an enclosed chamber, an outflow conduit extending into said chamber to deliver liquid therefrom to said suction means, a plurality of inflow conduits extending within said chamber, and adjustable gate means operable to selectively block and unblock at least one of said inflow conduits to direct liquid outside the chamber to flow into the chamber through a corresponding inflow conduit, said outflow conduit having an inlet below a liquid level location in said chamber, each of said inflow conduits having an outlet at a different height above said liquid level location in said cham-

ber, the outlet height of each inflow conduit corresponding to the magnitude of the suction pressure required to draw liquid



from the chamber through the outflow conduit when liquid flows into the chamber through that inflow conduit.

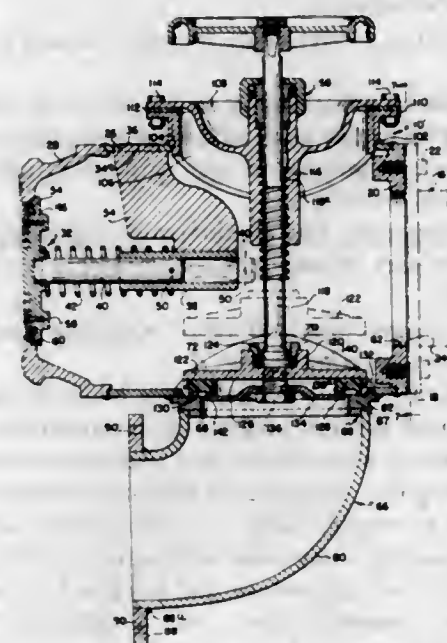
#### 4,013,096 LOADING AND UNLOADING VALVE MECHANISM FOR TRANSPORTATION TANK

Joseph H. DeFrees, 505 Liberty St., Warren, Pa. 16365  
Filed Nov. 28, 1975, Ser. No. 635,809

Int. Cl.<sup>2</sup> F16K 19/00

U.S. Cl. 137—612.1

11 Claims



1. A fabricated adapter valve for use in loading and unloading a transportation storage tank comprising, a hollow body portion, a coupling portion secured to one end of the body portion in liquid-tight relation, said coupling portion having a liquid inlet opening therein, said coupling portion being adapted for coupling to a compatible loading coupler of a liquid loading station for the tank, a coupling flange secured in liquid-tight relation to the other end of said body portion adapted for coupling to a liquid flow conduit to the tank, said flange defining a liquid exit opening therein for flow of liquid through said valve, said body portion having a liquid exit opening formed therein, an outlet assembly secured to said body portion at said liquid exit opening therein adapted for unloading liquid from the tank, said outlet assembly including a transition fitting having a base wall portion with a port therethrough, said fitting being secured in liquid-tight relation to said body portion at said liquid exit opening therein, said port communicating said outlet assembly with the interior of

said body portion, said transition fitting comprising a ring-like member in plan having arcuate side walls which reach a maximum height adjacent one transverse axis of said ring-like member and projecting outwardly from said base wall portion thereof and which diminish to substantially zero height adjacent another transverse axis of said ring-like member disposed generally perpendicular to the first mentioned axis, said body portion being of generally cylindrical tubular configuration, said port of said fitting being generally axially aligned with the axial center of said exit opening in said body portion, weld means securing said transition fitting to the exterior of said body portion in said liquid-tight relation, said transition fitting including locator lugs for positioning said fitting in said exit opening of said body portion for attachment of said fitting to said body portion, and wherein said locator lugs include opposed vertically elongated lugs disposed on the interior of said side walls at the first mentioned transverse axis coacting in locating relation with the periphery of said exit opening in said body portion, and including other opposed lugs on said fitting projecting outwardly from said base wall portion at said other transverse axis, the last mentioned lugs being adapted for locating coaction with the periphery of said exit opening in said body portion, said locator lugs being disposed interiorly of said transition fitting and in non-interfering relation to said port thereof.

#### 4,013,097 APPARATUS AND METHOD FOR DAMMING A PIPELINE

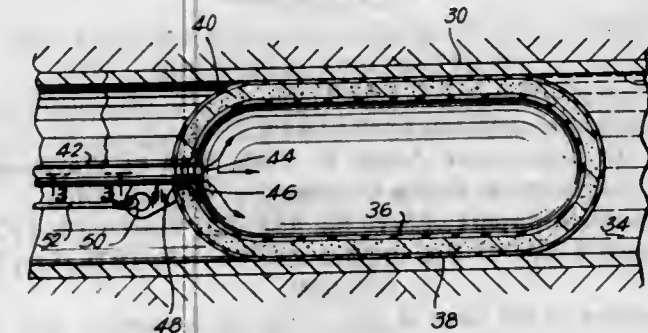
Anthony Louis Calandra, 5809 Betty Drive, Savannah, Ga. 31406  
Continuation of Ser. No. 484,211, June 28, 1974, abandoned.

This application Oct. 10, 1975, Ser. No. 621,535

Int. Cl.<sup>2</sup> F16L 55/12

U.S. Cl. 138—93

2 Claims



1. A puncture-resistant apparatus for temporarily damming, in its expanded configuration, the flow of fluid through a conduit of predetermined size to permit repairs to be made downstream of said apparatus, and being adapted to be passed into and out of said conduit in a collapsed condition, comprising the elements of: (a) a flexible, expandable outer bag having an ellipsoidal shape in its expanded configuration, the distance between elongate sides thereof being equal to or greater than the interior diameter of said conduit of predetermined size, said outer bag being formed of rubber or polymeric material and being adapted to flexibly conform to and seal tightly against a length of the interior surface of said conduit; (b) an inner, inflatable bladder having an ellipsoidal shape in its expanded configuration, the distance between elongate sides thereof being less than the interior diameter of said conduit of predetermined size, said inner inflatable bladder being substantially concentrically disposed within said outer bag so as to create an annular space between said bladder and bag and being formed of rubber or polymeric material; (c) a pressure transmitting liquid in the said annular space defined between said outer bag and inner bladder, said pressure transmitting liquid consisting essentially of water and a viscosity increasing agent; (d) an umbilical tube attached to said bladder adapted to convey pressurizing air to and from said bladder, said umbilical tube comprising a length of flexible tubing communicating at one end with said bladder and including valve means at the end remote from said bladder for controlling passage of pressurizing air; and (e) a lanyard for

pulling the apparatus from said conduit of predetermined size, said lanyard being connected at one end thereof to said outer bag and extending along said umbilical tube to the end thereof remote from said bag.

#### 4,013,098 INLET PIPE

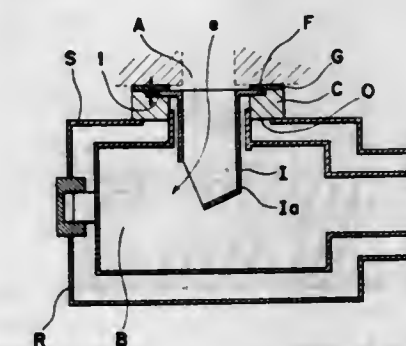
Tomoo Tadokoro, and Masayuki Kawata, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan  
Filed May 19, 1975, Ser. No. 579,076

Claims priority, application Japan, May 22, 1974, 49-59099[U]

Int. Cl.<sup>2</sup> F16L 23/00; F01N 3/10

U.S. Cl. 138—106

14 Claims



1. In a combination of an inlet pipe connecting an exhaust outlet of an internal combustion engine, said exhaust outlet having a substantially flat, planar surface there surrounding, to an inlet of a thermal reactor which purifies the exhaust gases from said engine by thorough combustion of said exhaust gases therein, said inlet also having a substantially flat, planar surface there surrounding, an improved inlet pipe comprising: a pipe member extending from said exhaust outlet of said engine into said thermal reactor through said inlet thereto; and

support means connected to said pipe member, positioned between and at least partially contacting said surface surrounding said exhaust outlet and said surface surrounding said inlet to said thermal reactor, for supporting said pipe member extended into said thermal reactor, said support means defining a circumferential support area in alignment with corresponding portions of said exhaust outlet surface and said inlet surface; said circumferential support area including a plurality of areas of reduced surface contact with said corresponding surface surrounding said inlet to said thermal reactor, whereby the surface area of said support means contacting said surface surrounding said inlet to said thermal reactor is reduced and the heat conducted from said support means to said exhaust outlet and said thermal reactor is reduced.

10. In a combination of an inlet pipe connecting an exhaust outlet of an internal combustion engine, said exhaust outlet having a substantially flat, planar surface there surrounding, to an inlet of a thermal reactor which purifies the exhaust gases from said engine by thorough combustion of said exhaust gases therein, said inlet also having a substantially flat, planar surface there surrounding, an improved inlet pipe comprising: a pipe member extending from said exhaust outlet of said engine into said thermal reactor through said inlet thereto; and support means connected to said pipe member, positioned between and contacting said surface surrounding said exhaust outlet and said surface surrounding said inlet to said thermal reactor, for supporting said pipe member extended into said thermal reactor, said support means having a plurality of openings therethrough.



4,013,099

**SHEATHED TUBULAR STICK**

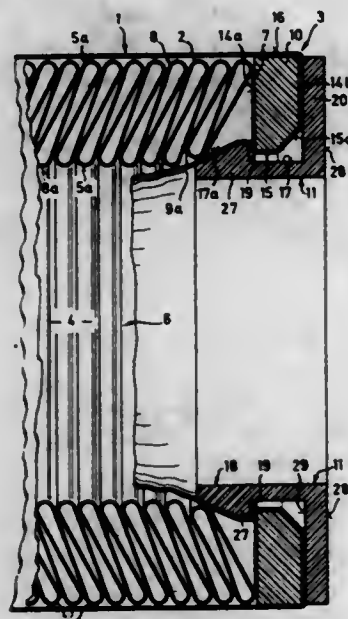
Günter Gerigk, Oberursel; Klaus-Jürgen Bittner, and Armin Küstner, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed June 12, 1975, Ser. No. 586,224

Claims priority, application Germany, Mar. 12, 1975, 2510637

Int. Cl.<sup>2</sup> F16L 11/00

U.S. Cl. 138-109



1. In a sheathed, hollow, cylindrical stick composed of a flexible tube folded by longitudinal shirring, the improvement comprising a cylindrical, flexible jacket means enveloping said stick and projecting over the ends thereof, parts of the projecting portions touching end walls of said stick with their inner sides, annular disc means on said projecting portions, and said projecting portions being inverted outwardly around said disc means in a manner such that the inner walls, the end surfaces and the outer walls of said disc means are tightly covered, and said inverted portions being parallel to said jacket means and close to the exterior thereof.

4,013,100

**FLEXIBLE ELONGATED MEMBER COMPRISING A REINFORCING ARMOURING**

Jean Thiery, Le Pecq; Michel Chatard, Chatou; Gerard Bonavent, Rueil-Malmaison, and Michel Huvey, Bougival, all of France, assignors to Institut Français du Pétrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activités Pétrolières Elf, France

Filed Nov. 27, 1973, Ser. No. 419,350

Claims priority, application France, Dec. 8, 1972, 72.43796; May 16, 1973, 73.17841

The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> F16L 11/10, 11/12, 11/16

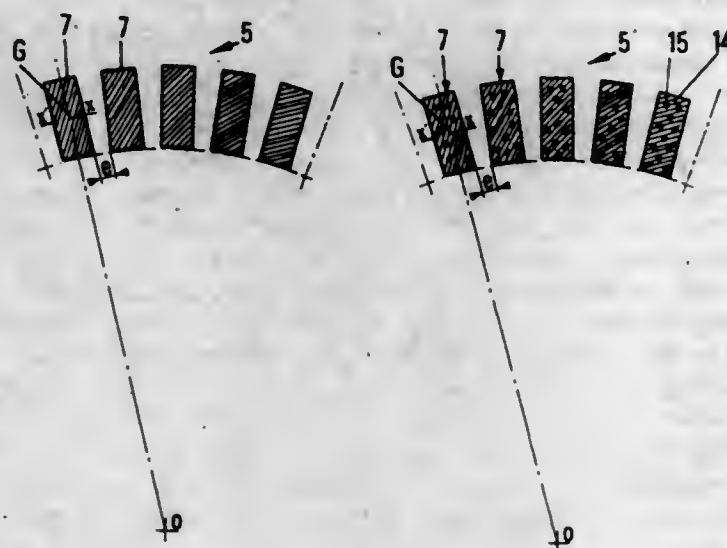
U.S. Cl. 138-129

28 Claims

1. A flexible elongated member, having an axis of elongation and a substantially circular cross-section, including a reinforcing armouring capable of withstanding tractive and bending stresses applied to said elongated member, said armouring comprising at least one layer of elongated profiled metal rods, said metal rods being preformed to constitute helical windings having adjacent convolutions inclined with respect to said axis of elongation by an angle at most equal to 40°, each of said profiled rods having a configuration with a cross-section, said cross-section of said rod having a static centre of gravity and a moment of inertia with respect to a transverse axis of said cross-section of said profiled rods through said centre of gravity, said moment of inertia relative

to said transverse axis of said cross-section being a maximum relative to all other axes passing through said centre of gravity, and each of said profiled rods being positioned on said flexible elongated member with said circular cross-section of said

15 Claims



elongated member having a radial direction passing through said centre of gravity of said cross-section of said rod perpendicular to said transverse axis, said adjacent convolutions being freely movable with respect to one another.

4,013,101

**HOSE CONSTRUCTION**

Arthur D. Logan, and James B. Rush, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 452,471, March 18, 1974, Pat. No. 3,921,674. This application Nov. 18, 1975, Ser. No.

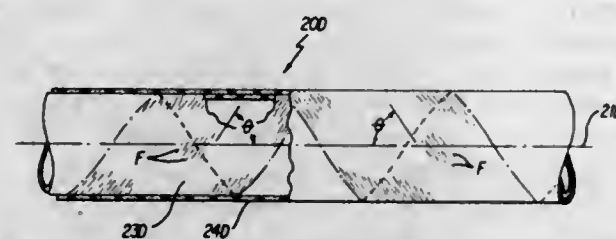
633,060

The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> F16L 11/08

U.S. Cl. 138-130

12 Claims



1. A hose construction having a fixed reference axis which extends in a curved path and comprising, a first layer portion made primarily of an elastomeric matrix material having randomly distributed elongated fibers embedded therein in substantially parallel relation, all of said fibers of said first layer portion extending in a helical pattern about said axis at a particular angle relative thereto, and a second layer portion bonded to said first layer portion as an integral part thereof, said second layer portion being made primarily of an elastomeric matrix material having randomly distributed elongated fibers embedded therein substantially in parallel relation, all of said fibers of said second layer portion also extending in a helical pattern about said axis at a particular angle relative thereto although in a direction opposite from the helical pattern of the fibers of said first layer portion, said fibers serving as the main reinforcement means for said hose construction.

4,013,102

**COMPOSITE TUBING**

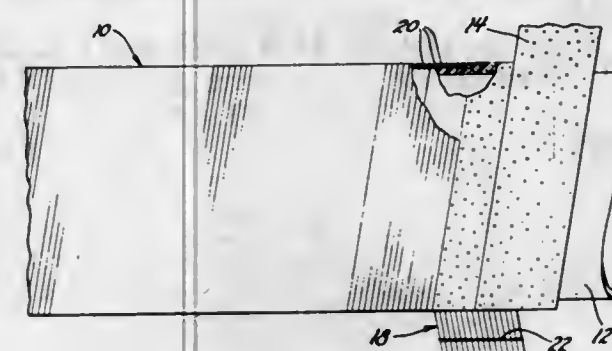
John Z. DeLorean, Bloomfield Hills, and Chauncey L. Dirks, Metamora, both of Mich., assignors to John Z. DeLorean Corporation, Bloomfield Hills, Mich.

Filed Jan. 30, 1975, Ser. No. 545,683

Int. Cl.<sup>2</sup> F16L 59/00

U.S. Cl. 138-144

4 Claims



1. A composite rigid tubular structure comprising a rigidified tubular core member, a substantially compressed initially open-cell resilient foam material helically wrapped about said core element, a layer of reinforcing elements helically wrapped about said foam material, and a thermoset resinous matrix filling the compressed open-cells of said foam material and encapsulating said reinforcing elements.

4,013,103

**TRIAxIAL WEAVING MACHINE WITH HEDDLE TRANSFER AND METHOD**

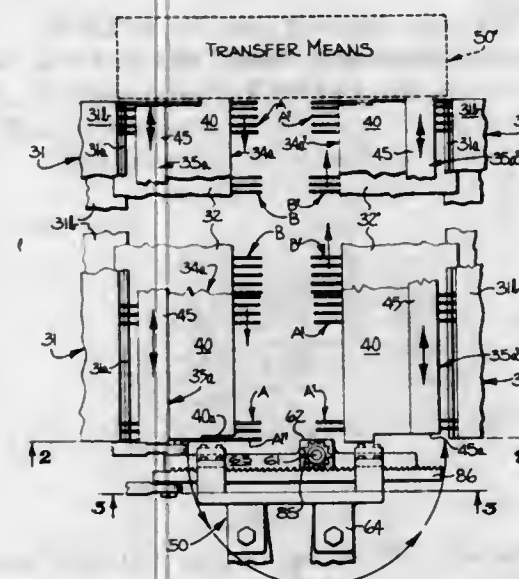
Karol Kukczycki, Parsippany, N.J., and Burns Darsie, Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Aug. 11, 1975, Ser. No. 603,756

Int. Cl.<sup>2</sup> D03C 13/00

U.S. Cl. 139-11

31 Claims



1. A weaving machine for making triaxial fabrics comprising a plurality of elongate heddles arranged in weftwise rows for guiding respective warp strands, warp strand supply means remote from said rows of heddles for directing warp strands thereto, means for longitudinally moving said heddles for forming the warp strands guided thereby into warp sheds, means for inserting wefts through warp sheds formed by the longitudinal movement of said heddles, means for shifting said heddles weftwise, and heddle transfer mechanism for engagingly receiving a heddle and for moving the same from one end of one row to the adjacent end of another row.

4,013,104

**DISPENSER FOR SHORTENING OR THE LIKE**

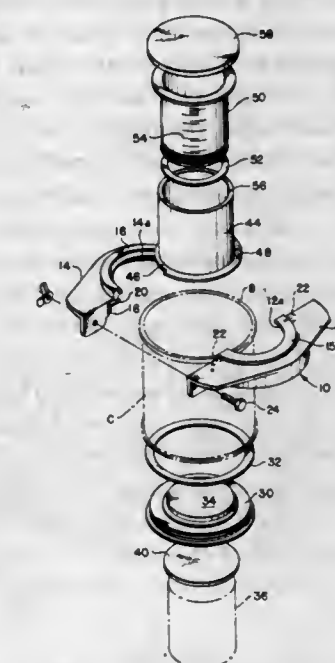
Ronald R. Sexton, Soldotna, Alaska, assignor to Daniel B. Sexton, Soldotna, Alaska, a part interest

Filed May 17, 1976, Ser. No. 686,921

Int. Cl.<sup>2</sup> B65B 3/10; B67D 5/64

U.S. Cl. 141-18

12 Claims



9. A dispenser for standard cans of vegetable shortening or the like of a semi-solid extrudible consistency, comprising, pusher means centrally positioned on the can and having a central opening, pusher members extending laterally on the pusher means for pushing the can forcibly downward, a push plate sealingly fitted within the bottom of the can for movement axially within the can, cylinder means removably coupled to the pusher means for receiving shortening extruded by the push plate out of said central opening, plunger means slidably mounted within said cylinder means for upward movement an amount corresponding to the amount of shortening extruded, and base means of a transverse width less than said can but of a height greater than said can and seated against said push plate whereby downward pushing on said can against said base means moves said push plate upwardly relative to the can for extruding the shortening.

4,013,105

**SPILLED FUEL DIVERTER FOR SMALL ENGINES**

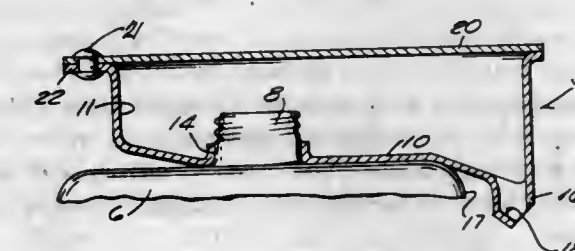
Arvo Foster Uuskallio, Colgate, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed June 9, 1975, Ser. No. 585,064

Int. Cl.<sup>2</sup> B65B 3/04, 39/00

U.S. Cl. 141-86

3 Claims



1. In combination:

- A. an internal combustion engine having parts with exposed surfaces that become highly heated when the engine is in operation;
- B. a fuel tank mounted on the body of the engine adjacent to its said exposed surfaces, said fuel tank having an upstanding filler neck on its top wall;



C. a collecting pan surrounding the filler neck and overlying the top of the fuel tank to catch fuel that spills alongside the filler neck during filling of the tank, said collecting pan

1. having a bottom wall with a hole therein through which the filler neck projects, said bottom wall having an upwardly projecting side wall extending entirely therearound,
2. having a portion which projects a substantial distance beyond a side of the tank that is remote from said exposed surfaces of said parts of the engine, and
3. having, in its said portion, an outlet spout which projects downwardly from its bottom wall and which is spaced outwardly from said side of the tank, said outlet spout having at its bottom a deflector wall that slants downwardly and away from said side of the tank, the edge of said deflector wall being the bottommost part of the spout, so that the spilled fuel that is caught in the collecting pan and that runs down the interior of said spout leaves the same in a stream that is directed outwardly away from said exposed surfaces of the engine or drips off of said edge of said deflector wall; and

D. means coacting with the filler neck of the fuel tank to hold the collecting pan in place on the fuel tank, said last named means comprising an upstranding flange integral with the bottom wall of the collecting pan and rising from the edge of the hole therein, said flange tightly gripping the filler neck.

4,013,106

## FLYWHEEL TREE FELLER AND BUNCHER

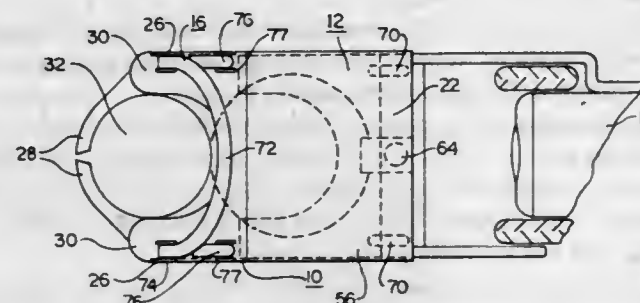
Alva Z. Albright, 2909 Monroe Hwy., Pineville, La. 71360

Filed Oct. 17, 1974, Ser. No. 515,767

Int. Cl.<sup>2</sup> A01G 23/08

U.S. Cl. 144—34 R

6 Claims



1. In tree harvesting apparatus, a flywheel tree feller and buncher comprising in combination:
  - a. a hollow base with forwardly extending arms defining an open forward end in said base;
  - b. a slide plate defining a similar forward opening in size to that in said base, said plate being adapted to slidably engage in said hollow base and between said arms;
  - c. a saw bar sprocket means mounted for rotation around an inner stationary race by balls mounted circumferentially therebetween to constitute a ball bearing with races in concentric rotational engagement, said inner race being fixed to said slide plate and eccentric with said slide plate's forward opening for projecting forwardly therebeyond;
  - d. combination saw and drive chain means adapted to engage said saw bar sprocket means for driving it in rotation with flywheel momentum to cut a tree when said slide plate slides forwardly for said forward openings in the base and slide plate to coincide;
  - e. buncher means fixed to said base to extend vertically thereabove with grapples for engaging and disengaging trees before and after cutting; and
  - f. hydraulic power means for operating said slide plate, saw and drive chain means, and said buncher means.

4,013,107

## SAW BLADE AND FRET-SAW COMBINATION AND METHOD FOR USE THEREOF

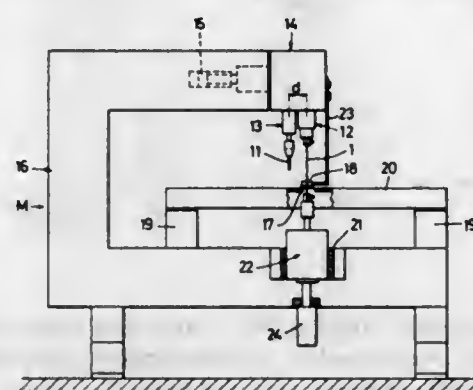
Ferdinand Steiger, and Werner Wahlen, both of Bern, Switzerland, assignors to Mapatex Establishment, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 511,771, Oct. 3, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,634 Claims priority, application Switzerland, Oct. 12, 1973, 14551/73

Int. Cl.<sup>2</sup> B27B 33/02

U.S. Cl. 144—35 R

6 Claims



1. A saw blade in combination with a fret-saw; said fret-saw having means for clamping said blade substantially at its ends, said saw blade consisting essentially of two connected longitudinal sections having parallel sides of differing widths with each of said sections being toothed at the same one of said sides, the toothings for each of said sections being of substantially the same depths, the fret-saw further including means for selecting the cutting portion of said blade so that only one of said sections is cutting at any particular moment.

4,013,108

## APPARATUS FOR CUTTING VARIOUS MATERIALS

Jean Guillerm, Saint Maur, and Jacques Fondronnier, Creteil, both of France, assignors to Centre Technique du Bois, Paris, France

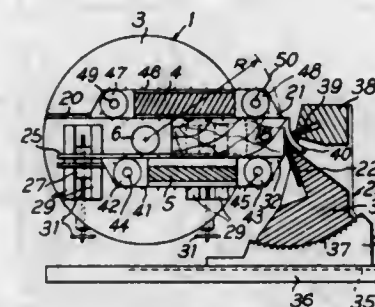
Filed Sept. 29, 1975, Ser. No. 617,835

Claims priority, application France, Oct. 8, 1974, 74.33860

Int. Cl.<sup>2</sup> B27L 5/00

U.S. Cl. 144—175

6 Claims



1. An apparatus for cutting various materials and more particularly pieces of wood with a view to obtaining thin products of various thicknesses, comprising two pieces of equipment, on the one hand a cutting tool comprising a knife and a pressure bar, and on the other a support for receiving the material to be cut, said latter piece of equipment being mounted so as to pivot about a geometrical axis spaced from the cutting edge of the knife by a distance corresponding with the constant cutting radius selected and connected to a drive unit which gives to it a rotational movement in accordance with an amplitude at least equal to the angular opening of the material to be cut, the equipment supporting the material being also provided with a feed device operable to move the material towards the knife as a function of the thickness of the

products to be cut, wherein this material supporting equipment is mounted from the cutting tool towards the geometrical pivoting axis the feed device of the supporting equipment being directed radially and the device having means for regulating the distance between the geometrical axis and the cutting edge.

4,013,109

## DISPOSABLE CONTAINER FOR SURGICAL INSTRUMENTS

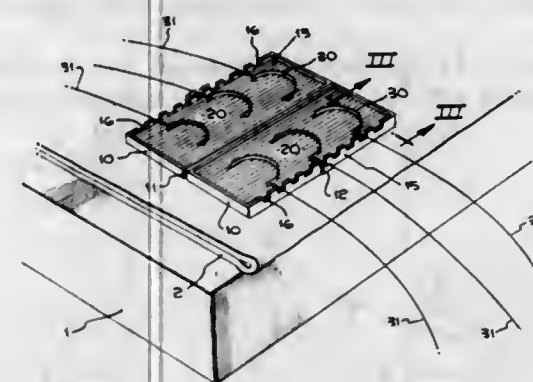
Dan Sandel, 17000 Cotter Place, Encino, Calif. 91316

Filed Aug. 22, 1975, Ser. No. 606,792

Int. Cl.<sup>2</sup> A61L 17/02

U.S. Cl. 150—52 R

7 Claims



1. In a hinged sterilizable disposable container for magnetizable instruments having relatively large upper and lower portions connected by sides of a relatively narrow dimension, the improvement comprising:
  - non-deformable case means for retaining said instruments entirely therewithin, said case means having upper and lower interior surfaces bounded by peripheral side wall means for enclosing the interior of said case means in a lateral direction when said upper and lower portions are hinged against each other, whereby any tendencies for said instruments to protrude through and therefrom are eliminated; and magnetic means attached to said lower interior surface of said case means for retaining any magnetizable instruments placed thereon.

4,013,110

## LOCKING THREAD

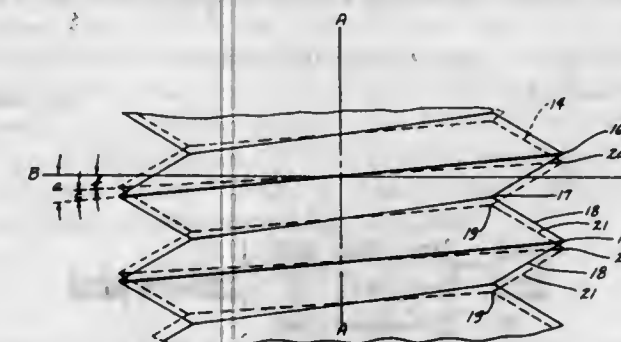
Myron E. Darling, Webster City, Iowa, assignor to BJD Industries, Inc., Minneapolis, Minn.

Filed June 12, 1975, Ser. No. 586,184

Int. Cl.<sup>2</sup> F16B 39/22

U.S. Cl. 151—14 R

9 Claims



1. A locking thread comprising:
  - a first member having a helical thread formation comprising a plurality of convolutions about the outer periphery thereof, said thread formation having a crest and a root portion, said helical thread formation being formed about a longitudinal axis;
  - a second member having an opening therein, said opening having a helical thread formation comprising a plurality of convolutions about the inner periphery thereof formed about said longitudinal axis, said thread formation of said second member having a crest and a root portion;

one of said thread formations having a first helix angle which, in an unstressed condition, is substantially constant throughout at least one thread convolution; the other of said thread formations having a helix angle which, in an unstressed condition, is substantially constant throughout at least one thread convolution and which differs from the first helix angle by a magnitude of between 39 and 85 percent of said first helix angle; and said helix angles being defined by the angle between a straight line projecting substantially along a portion of the crest of the respective thread formation and a plane which is perpendicular to said longitudinal axis; and, whereby said first member is adapted to be received in said opening of the second member thereby causing said thread formations to be in engagement.

4,013,111

## PNEUMATIC TIRE WITH REDUCED RATE OF INFLATION LOSS UPON BEING PUNCTURED

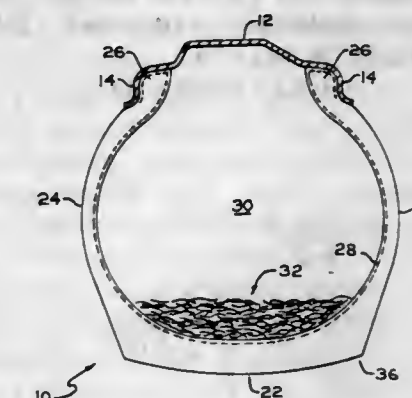
Joe Allen Powell, Norton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 15, 1975, Ser. No. 640,745

Int. Cl.<sup>2</sup> B60C 21/08

U.S. Cl. 152—347

10 Claims



1. In a pneumatic tire having a casing, an annular, inner inflation chamber defined in part by said casing and means within said chamber to retard the rate of inflation loss upon puncture, the improvement wherein said means consists essentially of micro-cellular, discrete, loose fibers of synthetic, organic polymer composition, each of the fibers characterized by:
  - a. a plurality of closed, gas-filled cells;
  - b. substantially all of its polymer being present as thin, cellular walls, and
  - c. a density no greater than about 6 lb./cu. ft. (0.09 g./cc.), said fibers occupying from 0.5% to 10% of the inflation chamber's volume.

4,013,112

## ANCHOR PLATE TIRE HAVING A SUB-LUG EQUIPPED ANCHOR PLATE

Aleksandar Vidakovic, Libertyville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 2, 1975, Ser. No. 609,472

Int. Cl.<sup>2</sup> B60C 27/20; B62D 55/28

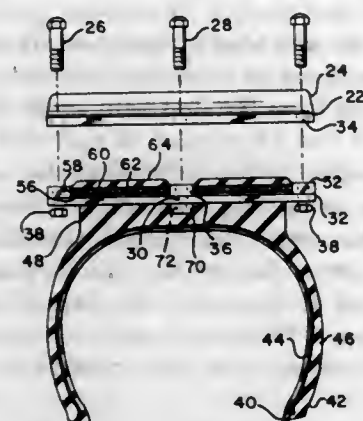
U.S. Cl. 152—182

3 Claims

2. In combination with a unitized pneumatic tire having a carcass portion, a set of apertured anchor plates, and anchor plies, all formed, molded and cured as a unitized assembly, and a set of apertured traction plates for attaching to said anchor plates with bolts, the improvement comprising:
  - a sub-lug having a set of tapped apertures welded to the carcass contacting side of said anchor plate midway between the extreme ends of said anchor plate such that



attaching bolts passing through said traction plate and said anchor plate may be threadably engaged with the



tapped apertures of said sub-lug whereby said traction plate will be secured to said anchor plate.

4,013,113

## FOLDABLE ROLLING SHUTTERS

Paul Frei, Elgg, Switzerland, assignor to Griesser AG, Switzerland

Continuation of Ser. No. 592,902, July 3, 1975, abandoned.

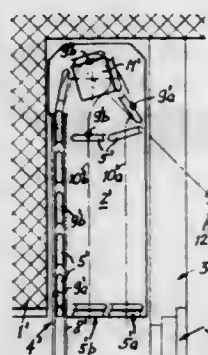
This application June 28, 1976, Ser. No. 700,338

Claims priority, application Switzerland, July 3, 1974, 9097/74; Apr. 16, 1975, 4833/75

Int. Cl.<sup>2</sup> E06B 9/26

U.S. Cl. 160—36

15 Claims



1. In a foldable rolling shutter including a curtain formed of elongated bars hinged to one another at longitudinal edges and guided at their ends in laterally spaced guide grooves, the improvement comprising, in combination, means, in an upper reversing zone, about which the rolling bar curtain is trained for direction reversal during raising and lowering; means forming a recess behind and below the reversing zone; and means effecting folding of the bar curtain within said recess under the weight of the curtain during raising of the curtain; said folding effecting means and said recess forming means conjointly guiding said bars to form at least one vertical pile of said hinged bars superposed in horizontal orientation in said recess.

4,013,114

## ARTICULATED NETTING, PARTICULARLY FOR SHUTTERING

Klaus Karl-Heinz Goebel, 4, rue Leopold, 4650 Herve, Belgium

Continuation of Ser. No. 508,692, Sept. 23, 1974, abandoned.

This application July 26, 1976, Ser. No. 708,687

Claims priority, application Belgium, Sept. 25, 1973, 44318

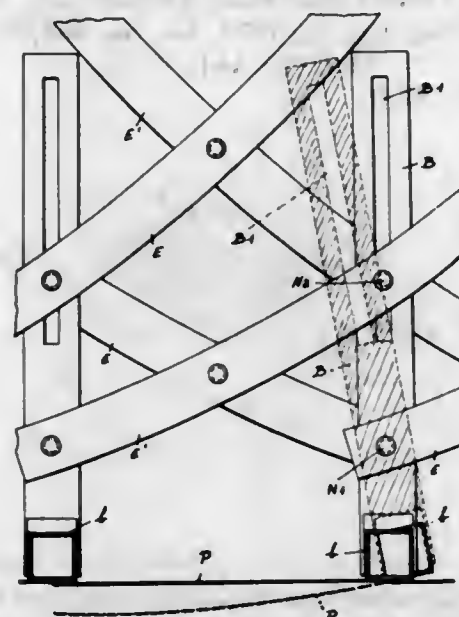
Int. Cl.<sup>2</sup> A47H 1/00; E04H 12/18

U.S. Cl. 160—330

1 Claim

1. A lattice structure for shuttering comprising: an annulus composed of two arrays of mutually crossing bars, each bar being in the form of a circular arc of the

same predetermined radius of curvature, said bars having centers of curvature disposed at equal distances from one another along the circumference of an imaginary circle of the same radius, the bars of one array being curved in a direction opposite to that of the bars of the other array, pivots articulating the bars of both arrays at their crossover points, each of the pivots forming an articulation node, the articulation nodes being disposed along concentric circles and radii extending from the center of said concentric circles.



a plurality of relatively movable panels mounted on said bars along the outer periphery of the structure at respective articulation nodes,  
a respective support bar for each of said panels pivotally connected to the respective articulation node and extending along a respective radius from said center of said concentric circles,  
each of said bars being provided with a slot, and  
an arcuate further part of the lattice structure at said outer periphery and having a pivot received in the respective slot.

4,013,115

## METHOD OF DIE CASTING HIGH MELTING POINT METAL

Roland George Ronald Sellors, Codsall, and Raymond Cooksey, Willenhall, both of England, assignors to G.K.N. Group Services Limited, Smethwick, England

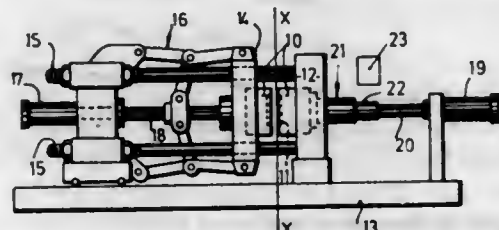
Filed Feb. 20, 1975, Ser. No. 551,436

Claims priority, application United Kingdom, Feb. 27, 1974, 8795/74

Int. Cl.<sup>2</sup> B22D 17/30

U.S. Cl. 164—51

10 Claims



1. A method of die casting high melting point metal comprising the steps of introducing a solid charge into an electric induction furnace positioned above the receiving station of a shot duct which communicates with a die cavity defined between separable repeatedly useable dies; applying in a first stage of melting a minimum of 60% to a maximum of about 95—96% of the total heat input to the charge at a relatively high rate to partly melt the charge and subsequently, in a second stage of melting, starting prior to complete melting of the

charge, applying a reduced heat input ranging between a minimum of about 4—5% and a maximum of 40% of said total heat input to the charge at a reduced rate sufficient to maintain a small amount of turbulence in the molten metal insuring mixing of the charge and uniform temperature, the sum of said heat inputs being such as to insure an acceptable amount of super heat on pouring; causing the contents of the furnace to be discharged into the shot duct when the charge is completely molten and transferring the molten metal along the shot duct to introduce the molten metal into the die cavity under pressure.

4,013,116

## DIE-CASTING MACHINE

Guido Perrella, 205 Edgehill Road, Westmount, Quebec, Canada

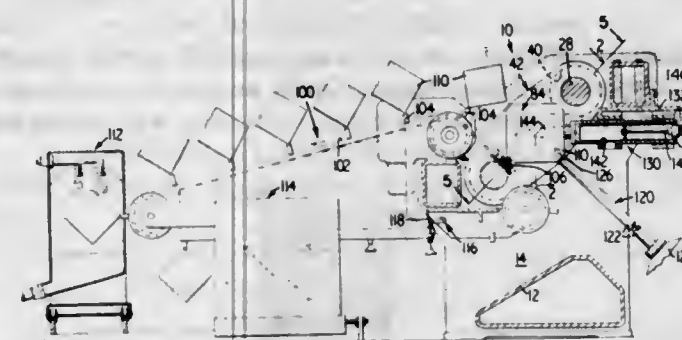
Continuation of Ser. No. 406,073, Oct. 12, 1973, abandoned.

This application Nov. 10, 1975, Ser. No. 630,388

Int. Cl.<sup>2</sup> B22D 11/126, 17/26

U.S. Cl. 164—262

6 Claims



1. A die-casting machine comprising a frame; a pair of spaced, parallel piston shafts mounted in said frame; a first pair of spaced, parallel cylinder assemblies mounted on one end of said pair of piston shafts; said first pair of assemblies supporting a mold half which is disposed therebetween, a second pair of spaced parallel cylinder assemblies mounted on the other ends of said pair of piston shafts and supporting a second mold half which is disposed therebetween, said parallel cylinder assemblies of said first pair being symmetrically opposed to the parallel cylinder assemblies of said second pair; each of said cylinder assemblies of the two pairs thereof comprising (a) a stationary piston secured to one of the piston shafts on the frame and being coaxial therewith (b) said shaft extending across to a connection with an opposed piston of the other pair; and (c) a cylinder mounted on the piston and shaft for reciprocal movement thereon in response to incompressible fluid injected therein on either side of said piston; whereby injection of fluid into the cylinders at the crown ends of the pistons forces the cylinders and mold halves together and injection of the fluid at the skirt ends of the pistons forces the cylinders and mold halves apart; the terminal force from opening the cylinders being taken by the piston shafts; said piston shafts being spaced by a distance which permits a casting formed by the mold to be removed from the mold along a path which is perpendicular to the shafts.

4,013,117

## MULTI-START INVOLUTE REGENERATOR MATRIX DISK AND METHOD OF ASSEMBLING SAME

Nikolaus Kopetzki, Sterling Heights, and Petro Mykolenko, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 6, 1976, Ser. No. 655,726

Int. Cl.<sup>2</sup> F28D 19/00

U.S. Cl. 165—10

6 Claims

1. A regenerator matrix structure including a central hub mandrel, a plurality of matrix elements, each said matrix element having one end thereof in abutment against said hub mandrel and being spirally wound in involute configuration

about said hub mandrel, each of said matrix elements including in series a chevron strip and a separator strip extending along one side of the chevron strip and, a pair of pinch rings encircling said hub mandrel on opposite sides thereof with each of said pinch rings being embedded into the edges of said matrix elements whereby to wedge said matrix elements against said hub mandrel, said matrix elements, said pinch rings and said hub mandrel being further bonded together into a rigid elastic structure integral with said hub mandrel.

3. A method of assembling a multi-start involute regenerator matrix disk having a hub mandrel means and a plurality of matrix elements, said method including the steps of providing a magnetic field on the peripheral surface of said hub mandrel, feeding matrix elements into endwise abutment against the



outer peripheral surface of said hub mandrel means to be retained magnetically thereto, said matrix elements being positioned in parallel spaced apart relationship to each other about the outer peripheral surface of said hub mandrel means, mechanically securing said matrix elements to said hub mandrel means by pressing annular pinch rings into the edges of said matrix elements on opposite sides of said hub mandrel means, concentrically and radially outward thereof and closely adjacent thereto to effect wedging of said matrix elements against the outer peripheral surface of said hub mandrel means, removing the magnetic field from said hub mandrel means, spirally wrapping said matrix elements about said hub mandrel means in an involute configuration and then bonding said matrix elements together into a rigid elastic structure.

4,013,118

## CONTROL OF HEATING AND COOLING AVAILABLE FROM CENTRAL SOURCES TO A MULTI-ZONE TEMPERATURE CONTROLLED SPACE

Darrel E. Zimmer, North Park, and Paul H. Brace, Rockford, both of Ill., assignors to Barber-Colman Company, Rockford, Ill.

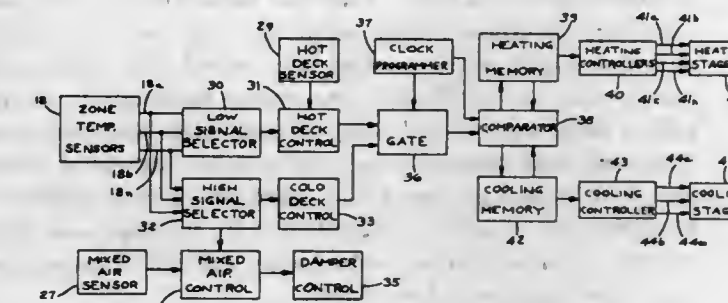
Division of Ser. No. 470,567, May 16, 1974, Pat. No.

3,933,197. This application Nov. 19, 1975, Ser. No. 633,432

Int. Cl.<sup>2</sup> F24F 3/00

U.S. Cl. 165—22

10 Claims



1. In a system for automatically controlling the amount of heating and cooling available from a central location to a plurality of temperature controlled zones having different heating and cooling demands, in combination means for providing signals representative of the heating and cooling demands of the zones, a gate alternately passing said heating and cooling demand signals to provide a signal demand signal, a comparator providing heating and cooling references and comparing said single demand signal with said heating and



cooling references in synchronism with the passage of said heating and cooling demand signals by the gate, a heating controller controlling the amount of heating available in response to the result of said heating signal comparison, and a cooling controller controlling the amount of cooling available in response to the result of said cooling signal comparison.

4,013,119

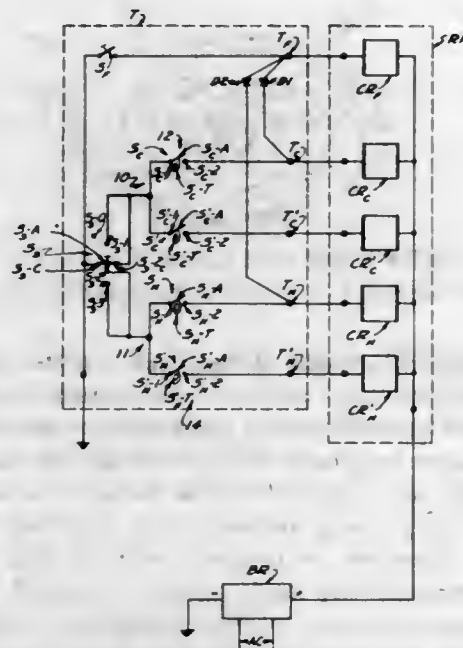
## AIR CONDITIONER CONTROL SYSTEM

Preston A. Wallace, 6000 Park Ave. 6F, Atlanta, Ga. 30342  
Filed Dec. 15, 1975, Ser. No. 640,833

Int. Cl.<sup>2</sup> G05D 23/19

U.S. Cl. 165-27

4 Claims



1. A control system for controlling the operation of an air conditioning system having a heating mode capability, a cooling mode capability, and a common air distribution fan motor comprising:

- a thermostatically operated heat switch;
- a thermostatically operated cool switch;
- a common fan motor control relay for operating the system fan motor;
- a cool control relay for operating the system in the cool mode, the coil of said cool control relay connected to said cool switch to energize said cool control relay upon closure of said cool switch;
- a heat control relay for operating the system in the heat mode; the coil of said heat control relay connected to said heat switch to energize said heat control relay upon closure of said heat switch; and,
- a diode network connecting the coil of said fan control relay to said cool switch and to said heat switch to energize said common fan control relay when said heat switch is closed and to energize said common fan control relay when said cool switch is closed while preventing feedback from the coil of said heat control relay through said cool switch so that said heat control relay will not be energized when said cool switch is closed and while preventing feedback from the coil of said cool control relay through said heat switch so that said cool control relay will not be energized when said heat switch is closed.

4,013,120

## AIR CONDITIONER

Martin Rheinheimer, 190 Wentworth, Glencoe, Ill. 60022

Continuation of Ser. No. 435,286, Jan. 21, 1974, abandoned.

This application Aug. 20, 1975, Ser. No. 606,174

Int. Cl.<sup>2</sup> F25B 29/00; F24H 9/08

U.S. Cl. 165-48

3 Claims

1. An improved self contained air conditioning unit for heating and cooling the air in at least one room of an apart-

ment building, small office building, townhouse or the like and adapted for heating and cooling the air in a room adjacent to the one room wherein independent temperature control is desired for heating and cooling the air and wherein the exterior building wall of the one room comprises floor to ceiling glass or windows except for a vertically elongated, generally rectangular, relatively narrow opening which is disposed adjacent to and along the side of the glass or windows, and which extends vertically from adjacent to the floor to adjacent to the ceiling in the one room, the improved air conditioning unit comprising:

a vertically elongated, generally rectangular cabinet including a vertically elongated, relatively narrow outside facing end wall, a vertically elongated, relatively narrow inside facing end wall, relatively narrow top and bottom walls, and two relatively wide side walls, with at least a portion of the cabinet adapted to be disposed in the opening in the exterior building wall such that the outside facing end wall of the cabinet is in communication with the exterior of the building and is substantially flush with the exterior surface of the exterior building wall, with the distance between the outside facing and inside facing end walls being greater than the thickness of the exterior building wall so that the inside facing end wall of the cabinet is disposed within the one room and is spaced from the interior surface of the exterior building wall and so that a



substantial portion of at least one of the side walls of the cabinet is disposed within the one room and projects inwardly from the interior surface of the exterior building wall, and with the top and bottom walls of the cabinet being adjacent to the ceiling and floor of the one room; a generally vertical wall extending between the side walls of the cabinet and dividing the cabinet into an outside compartment and an inside compartment, with the generally vertical wall preventing air communication between the inside and outside compartment; an outside fresh air opening mounted in the outside facing end wall of the cabinet so as to permit fresh air communication between the outside compartment and the exterior of the building with the outside fresh air opening extending substantially the entire vertical length of the outside facing end wall;

a return register opening mounted in the substantial portion of one of the side walls of the cabinet and adjacent to the bottom wall of the cabinet so as to permit return air from the interior of the room ingress to the inside compartment;

a supply register opening mounted in the substantial portion of one of the side walls of the cabinet and adjacent to the top wall of the cabinet so as to permit conditioned air egress from the inside compartment to the interior of the one room, with the return register opening, the supply

register opening and the inside compartment being arranged such that air will flow from the return register opening, through the inside compartment and out the supply register opening along a predetermined, generally vertical air path; means for cooling the air flowing along the predetermined air path and disposed entirely within the cabinet, the cooling means including interconnected compressor means, evaporator means and condenser means, with the evaporator means being disposed in the inside compartment in the predetermined air path and the condenser means being disposed in the outside compartment adjacent to the outside fresh air opening; and air blower means mounted in the inside compartment for drawing air into the inside compartment through the return register opening and blowing the air along the predetermined path, across the evaporator means and out of the inside compartment through the supply register opening.

4,013,121

## STEAM GENERATOR, TUBE-BUNDLE CENTERING ARRANGEMENT

Wolfgang Berger, Erlangen, and Hans Rottger, Weiher, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 15, 1974, Ser. No. 488,836

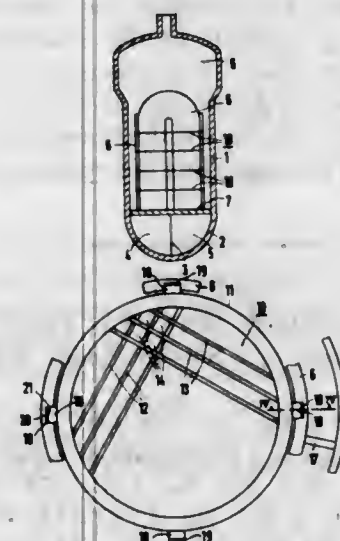
Claims priority, application Germany, July 25, 1973, 2337791

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> F28F 9/00

U.S. Cl. 165-162

4 Claims



1. A steam generator having a tube sheet, a heat-exchanger tube bundle having ends mounted in said tube sheet and extending from said tube sheet, a cylindrical wall surrounding said tube bundle, at least one tube bundle tube spacer grid having a ring encircling said bundle inside of said cylindrical wall, and means for connecting said ring to said wall; wherein the improvement comprises said means being in the form of keys and keyways extending radially with respect to said ring and wall and relatively sliding longitudinally with respect to said tube bundle and wall when said ring and said wall thermally move relative to each other, while locking said ring non-rotatively relative to said wall.

4,013,122

## DIVER'S GAS HEATER

Richard William Long, 760 Wakefield Court, San Diego, Calif. 92020

Filed May 5, 1975, Ser. No. 574,253

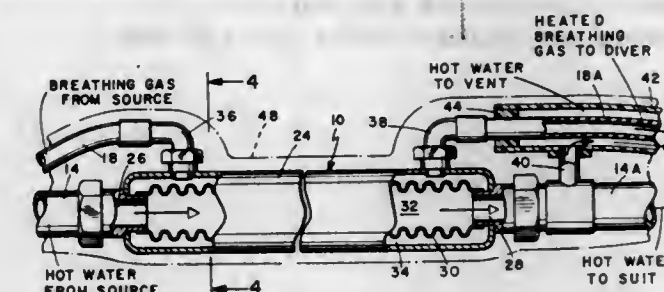
Int. Cl.<sup>2</sup> F28D 7/10

U.S. Cl. 165-154

5 Claims

1. A breathing gas heater for use with a hot water heated diver's suit, comprising:

a hot water heated diver's suit, an elongated tubular casing having a water inlet at one end with means for connection to a source of hot water, and a water outlet at the other end with means for connection to a diver's suit, an inner heat conducting tube fixed in said casing between said inlet and outlet and defining a central water conducting channel and an outer gas conducting annulus, a gas inlet in said casing adjacent said water inlet, opening into said annulus and having means for connection to a source of breathing gas,



a gas outlet in said casing adjacent said water outlet, opening from said annulus and having diver's suit connection means for connection to the diver's suit, said diver's suit connection means comprises a gas extension hose attached to said gas outlet and extending to the diver's suit, a jacket surrounding and coextensive with said extension hose, and means for conducting hot water from the heater unit into said jacket.

4,013,123

## HYDRAULICALLY ACTUATED WIRE LINE APPARATUS

Neal L. Mitchell, Taft, Calif., assignor to Chevron Research Company, San Francisco, Calif.

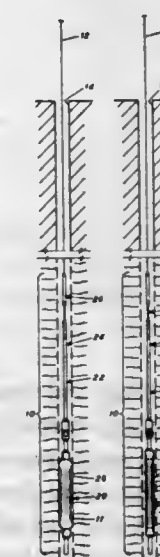
Division of Ser. No. 510,260, Sept. 30, 1974. This application May 8, 1975, Ser. No. 575,761

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> E21B 47/00, 47/10

U.S. Cl. 166-250

1 Claim



1. The method of obtaining impression information from a well comprising: flowing a noncompressible liquid through an orifice, running into a well a wire line packer having an impression sleeve connected to the outside of an inflatable sleeve of said packer, lowering said inflatable packer down said well before the



elapse of a predetermined time as determined by flow of said liquid through said orifice to position the impression sleeve at a predetermined depth in said well, inflating said inflatable sleeve of said packer in response to said flow of liquid through said orifice to press said impression sleeve against the wall of said well, maintaining said inflatable sleeve in inflated condition for a predetermined time while continuing to flow said liquid through said orifice, then in response to said flow of said liquid deflating the inflatable sleeve of said packer to remove said impression sleeve from said well wall, and removing said inflatable packer from said well.

4,013,124

# METHOD FOR OBTAINING INFORMATION FROM A WELL BY USE OF A GAS OPERATED HYDRAULICALLY ACTUATED WIRE LINE PACKER

Stanley O. Hutchison, Bakersfield, and Neal L. Mitchell, Taft, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

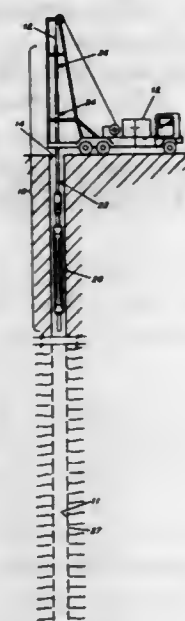
Division of Ser. No. 510,264, Sept. 30, 1974. This application May 8, 1975, Ser. No. 575,776

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 20, 1976

Int. Cl.<sup>2</sup> E21B 47/00, 47/10

U.S. Cl. 166—250

1 Claim



1. The method of obtaining impression information from a well comprising activating an operating gas and causing said operating gas to flow a noncompressible liquid through an orifice, running into a well a wire line packer having an impression sleeve connected to the outside of an inflatable sleeve of said packer, lowering said inflatable packer down said well before the elapse of a predetermined time as determined by flow of said liquid through said orifice to position the impression sleeve at a predetermined depth in said well, inflating said inflatable sleeve of said packer in response to said flow of liquid through said orifice to press said impression sleeve against the wall of said well, maintaining said inflatable sleeve in inflated condition for a predetermined time while continuing to flow said liquid through said orifice, then in response to said flow of said liquid deflating the inflatable sleeve of said packer to remove said impression sleeve from said well wall and removing said inflatable packer from said well.

## 4,013,125 FLOODING WITH MICELLAR DISPERSIONS CONTAINING PETROLEUM SULFONATES OBTAINED BY SULFONATING WHOLE OR TOPPED CRUDE OIL

Mark A. Plummer; Donald E. Schroeder, Jr., and Wayne O. Roszelle, all of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

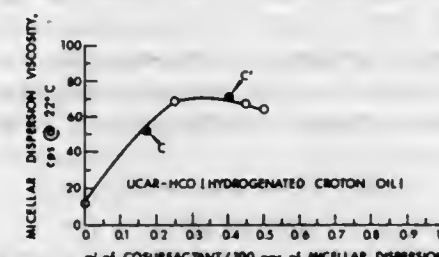
Filed Mar. 27, 1975, Ser. No. 562,519

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 166—273

14 Claims



\*VISCOSITY vs. COSURFACTANT ADDITION FOR MICELLAR DISPERSION USED IN EXAMPLE II.\*

1. In a process of recovering hydrocarbon from a subterranean formation having at least one injection means in fluid communication with at least one production means and wherein a micellar dispersion comprised of water, hydrocarbon, cosurfactant, electrolyte and petroleum sulfonate obtained by sulfonating whole or topped crude oil is injected into the formation and displaced toward the production means to recover hydrocarbon therethrough, the improvement comprising incorporating amounts of the cosurfactant into the micellar dispersion in excess of the amounts required to cause the micellar dispersion to go through a maximum viscosity and to establish a desired viscosity for the flooding of the subterranean formation, and then injecting the micellar dispersion into the formation.

4,013,126

# HORSESHOE MANUFACTURE

Dudley W. C. Spencer, 619 Shipley Road, Wilmington, Del. 19801

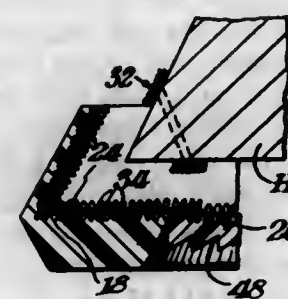
Continuation-in-part of Ser. No. 426,446, Dec. 20, 1973, Pat. No. 3,917,000, which is a continuation-in-part of Ser. No. 71,121, Sept. 10, 1970, Pat. No. 3,664,428, and Ser. No. 252,546, May 12, 1972, Pat. No. 3,782,473. This application Sept. 18, 1975, Ser. No. 614,766

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> A01L 3/00

U.S. Cl. 168—4

11 Claims



1. A horseshoe assembly comprising a shoe element, said shoe element having a body member with a lower wear surface and an upper securing surface, said shoe element being generally U-shaped to conform to the shape of a hoof, adhesive means on said shoe element, hoof-threading means for being threaded through holes in a hoof of a horse, said hoof-threading means including an elongated strand made of a flexible

lace-type material for being in direct contact with said adhesive means to thereby secure said assembly to the hoof, and said strand being formed of an open material having a substantial number of exposed air spaces whereby the adhesive means may flow into said air spaces for intimate securement of said assembly to the hoof.

4,013,127

# FIRE EXTINGUISHER PACKAGE FOR WASTE RECEPTACLE

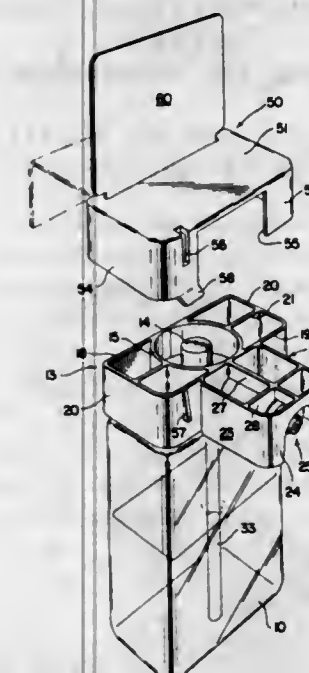
Kenneth S. Tenney, and Michael A. Roby, both of Winchester, Va., assignors to Rubbermaid Commercial Products, Inc., Winchester, Va.

Filed Jan. 22, 1975, Ser. No. 543,022

Int. Cl.<sup>2</sup> A62C 35/10

U.S. Cl. 169—57

10 Claims



1. A fire extinguisher assembly adapted for attachment to the upper rim of a waste receptacle comprising, a see-through plastic container for fire extinguisher liquid, a shroud member surrounding one end of the container and sealing the container, a heat-activated valve mounted in said shroud laterally of the container and normally closing said container for discharging extinguisher liquid therefrom at a predetermined temperature and in a predetermined direction, and means for releasably attaching said container to the upper rim of a waste receptacle, said plastic container adapted to soften and perforate at a temperature slightly greater than that required to open the valve.

4,013,128

# MODULAR FIRE PROTECTION SYSTEM

Robert F. Davis, Framingham, Mass., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Apr. 19, 1976, Ser. No. 677,916

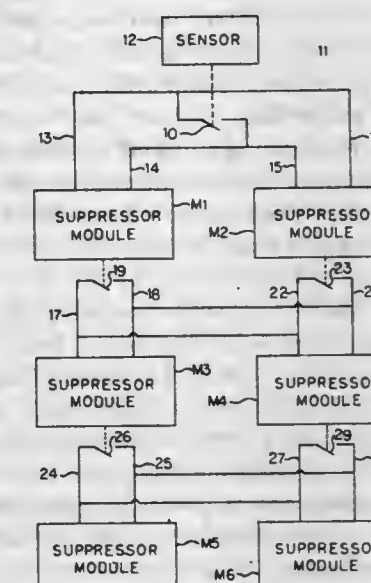
Int. Cl.<sup>2</sup> A62C 37/04, 35/08

U.S. Cl. 169—61

10 Claims

1. An electrical protection system comprising: a plurality of suppressor modules, each of said modules comprising a plurality of suppressor units activatable to suppress an abnormal condition; an activator associated with each of said units and energizable by a given level of electrical current flow to induce activation thereof; series circuit means connecting said activators in series, and an initiator circuit activatable to induce said given level of electrical current flow to said activators; detector means for sensing the abnormal condition and activating said initiator circuits in a first plurality of said modules in response thereto; and

response means for activating said initiator circuits in another plurality of said modules in response to activation



of said initiator circuits in any of said first plurality of modules.

4,013,129

# RIPPER FOR ATTACHMENT TO TRACTOR

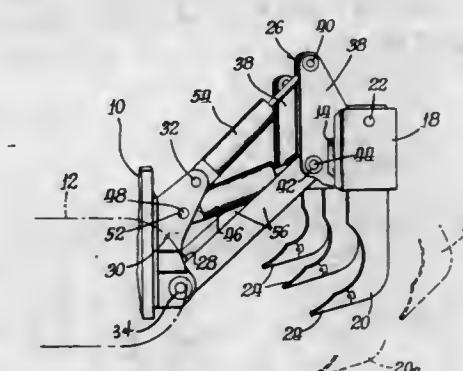
John R. Wilkinson, Arlington Heights, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 24, 1975, Ser. No. 616,457

Int. Cl.<sup>2</sup> A01B 13/08, 63/102

U.S. Cl. 172—464

5 Claims



1. Means for supporting shanked ripper means from a tractor, so as to rip with remotely-adjustable pitch and depth actuation, said means comprising: mounting clevis means and towers for attachment to the rear of the tractor; a shank holding, horizontal tool beam spaced rearwardly from said mounting clevis means and tower and having at least a central shank holder, and provided at the front thereof with inner clevis means integral with the central shank holder of the tool beam, which clevis means includes a pivot spaced just forwardly of said tool beam, said tool beam also being provided with vertically disposed, outer beam brackets, said brackets each having an upper pivot outwardly and upwardly offset from said beam-shank-holder clevis means and a lower pivot outwardly offset from, and together with, said pivot of said beam-shank-holder clevis means mutually defining a coaxis, said coaxis being spaced just forwardly of said tool beam; said mounting clevis means being in spaced alignment with the beam-shank-holder clevis means forwardly of the tool beam;



means for operatively directly connecting the tool beam to the rear of the tractor comprising hydraulic depth actuator means in direct alignment with the tool beam in the space in which said mounting and beam-shank-holder clevis means are in alignment and connected in said space at one end thereof to said beam-shank-holder clevis means at said coaxis and at the other end thereof to said mounting clevis means and effective for both foreshortenable and extensible motion, and immobility at fixed lengths corresponding to fixed ripping depths; said coaxis defining the pitch axis of the tool beam whereat the connected-on depth actuator means with its aforesaid motion introduces depth load in direct line into the tool beam; said mounting towers having upper pivots outwardly and upwardly offset from said mounting clevis means and in spaced alignment with the beam bracket upper pivots, and having lower pivots in spaced alignment with the beam bracket lower pivots, and spaced apart in directions from said mounting clevis means rendering said mounting clevis means medially offset and also offset upwardly from said tower lower pivots at a height at least a major part of the vertical distance from the height of the tower lower pivots to the height of the tower upper pivots; a pair of hydraulic pitch actuators between the upper pivots of the respective mounting towers and beam brackets effectively connected for foreshortenable and extensible movement conjointly, and immobility at fixed lengths corresponding to fixed ripping pitches; and fixed-predetermined-length link means operatively directly connecting the tool beam to the rear of the tractor comprising a pair of draft links between the lower pivots of the respective mounting towers and beam brackets.

4,013,130

## RIPPER TIP ASSEMBLY

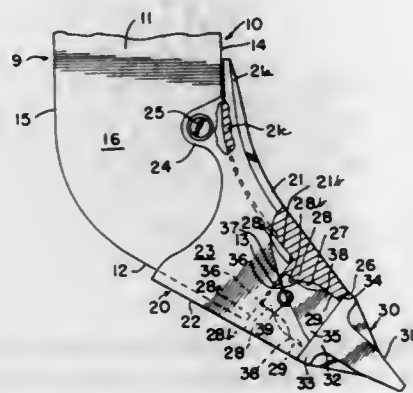
Leon A. Wirt, Joliet, and Kenneth A. Rhoads, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 4, 1974, Ser. No. 520,241

Int. Cl.<sup>2</sup> A01B 23/02; E02F 9/28

U.S. Cl. 172-719

30 Claims



1. In an earthworking apparatus, a ripper assembly comprising, in combination:

- a first element comprising a ripper shank which has an upper portion and a tapered, forwardly projecting lower end portion which has front and rear faces and side faces, said lower end portion having a first transverse surface providing a blunt lower extremity;
- a second element comprising a detachable hollow shin protector which has front and rear walls and side walls which closely embrace and reinforce the tapered lower end portion of the shank, said second element having a lower end portion with a second transverse surface adjacent said first transverse surface;
- a third element comprising a one-piece detachable ripper tip which includes a forward ripper portion, a ripper tip base immediately adjacent the lower end of the shin protector forward of the blunt extremity of the shank, said base having an external flange providing a peripheral

shoulder with a generally planar upper surface the perimeter of which substantially matches the perimeter of said lower end of the shin protector, and a mounting stub which is substantially rectangular in cross section and extends rearwardly from said base and is smaller in cross section than the base, said mounting stub being provided with a longitudinal forward external control surface and a longitudinal rearward external control surface each of which abuts a mating internal surface of at least one of said first and second elements of the combination to position the ripper tip and transmit ripping forces from the tip into the shank and the shin protector; means detachably securing the shin protector to the shank; and means detachably positioning the ripper tip with reference to the shank and the shin protector.

4,013,131

## WALKING TYPE AGRICULTURAL IMPLEMENT WITH HARNESS

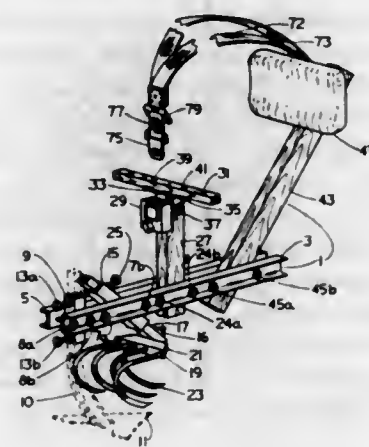
Bernard C. Armstrong, 535 Westmoreland, Jackson, Tenn. 38301

Filed Sept. 9, 1975, Ser. No. 611,671

Int. Cl.<sup>2</sup> A01B 3/02

U.S. Cl. 172-370

8 Claims



1. An agricultural implement of the walking type comprising:

an elongated body member, said member receiving a downwardly extending cultivating member attached thereto at one end thereof said cultivating member including a support means extending downwardly from said body member and supporting at least one blade element adjacent the bottom end thereof, wherein said blade element includes a surface tapered to a point forming a cutting edge for loosening or breaking up soil, an upwardly extending body support assembly also received by said member and attached thereto at the opposed end thereof, and a handle means attached to and received by said member, said handle means being positioned between said cultivating member and said body support member intermediate the length of said member, harness means attached at one end thereof to said body support member and at the other end thereof to said handle means, said harness means including a belt, said belt being provided with means for hitching an operator therein.

4,013,132

## DEVICE FOR SUPPORTING BULLDOZER BLADE

Kunihiko Matsuzawa, Sagami, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1975, Ser. No. 645,453

Claims priority, application Japan, Jan. 6, 1975, 50-18; July 21, 1975, 50-88413

Int. Cl.<sup>2</sup> E02F 3/76

U.S. Cl. 172-804

4 Claims

1. A device for supporting a blade on a bulldozer, comprising:

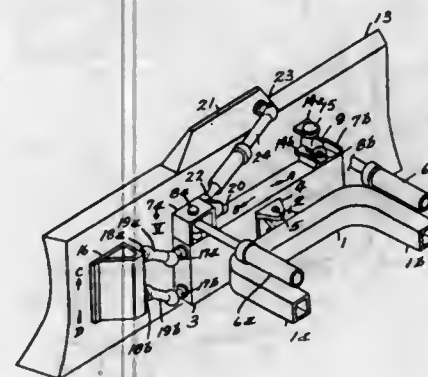
a subframe adapted to be supported by a frame of the bulldozer for limited pivotal movement relative to the frame, about a vertical axis;

first hydraulic cylinder means securable to the bulldozer and secured to the subframe for causing said pivotal movement of the subframe;

a blade disposed in front of the subframe;

universal joint means connecting one side of the subframe to one side of the blade;

a pair of linking means each having spherical joints on each



end thereof, one of the linking means connecting an upper portion of another end of the subframe to an upper portion of another end of the blade and the other of the linking means connecting a lower portion of the other end of the subframe to a lower portion of the other end of the blade, for permitting limited movement of the blade relative to the subframe; and

second hydraulic cylinder means connected to the subframe and the blade for causing the blade to move substantially in the vertical direction pivotally about the universal joint means.

4,013,133

## APPARATUS WITH A MOTOR-DRIVEN MATERIAL REMOVING TOOL, ESPECIALLY FOR CUTTING CONCRETE, STONE OR THE LIKE

Hans Bieri, Toedistrasse 9, 8330 Pfaffikon, Switzerland

Continuation of Ser. No. 462,801, April 22, 1974, abandoned.

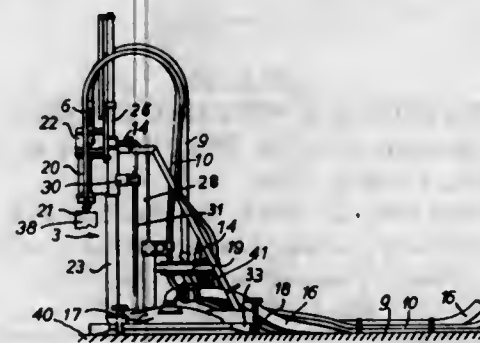
This application Aug. 7, 1975, Ser. No. 602,633

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> B23B 45/04, 45/14; E21C 11/00

U.S. Cl. 173-32

4 Claims



1. An apparatus for cutting concrete, stone or the like, comprising a transportable tool group including power driven tool means, a transportable reduced pressure and control group, and a transportable power drive group, said transportable tool group being adapted for the temporary attachment of said power driven tool means to work surface of any inclination including the horizontal and the vertical, said three groups being spaced apart, interconnectable and disconnectable from each other, said transportable tool group (3) comprising a rigid suction bell having a rim, a bearing surface on said rim adapted to face said work surface, a vacuum connection opening in said bell for evacuation of said bell, tool holding means for holding said power driven tool means, means for affixing said tool holding means in a rigid manner to said bell,

said tool holding means comprising means for holding said power driven tool means laterally adjacent only one side of said bell, elastic sealing means on said bearing surface for sealingly engaging said work surface, and at least three supporting means rigidly affixed to said suction bell and extending beyond said bearing surface in a direction to space said bearing surface from said work surface whereby the deformation of said sealing means is precisely limited during the entire duration of said evacuation, said transportable tool group further including a drive motor (22) for driving said power driven tool means, and a feed advance unit (26) for said power driven tool means, said transportable reduced pressure producing and control group (2) including reduced pressure producing means (39) and control means (29, 34) for controlling the power supplied to said drive motor (22) and to said feed advance unit (26), and flexible as well as disconnectable fluid lines including pressure line means connectable to said motor and further including suction line means connectable to said suction bell for evacuating the latter, said transportable power drive group (1) comprising at least one motor and at least one pressure pump driven by said motor, at least two pressure lines and at least one electric cable for connecting the power drive group to said reduced pressure producing and control group, whereby said tool group is separately transportable from said reduced pressure producing and control group and also separately transportable from said power drive group.

4,013,134

## PORTABLE EARTH BORING MACHINE WITH STEERING HEAD

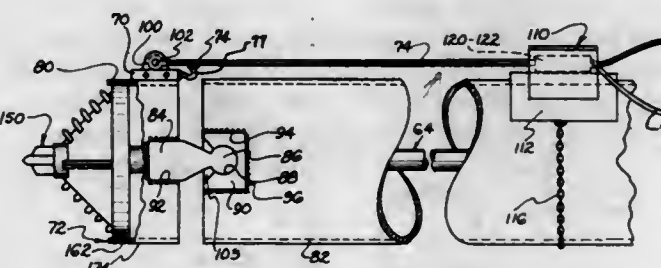
Albert R. Richmond, West Salem, and William S. Appleman, Ashland, both of Ohio, assignors to The Richmond Manufacturing Company, Ashland, Ohio

Filed May 20, 1974, Ser. No. 471,440

Int. Cl.<sup>2</sup> E21B 7/06

U.S. Cl. 175-73

14 Claims



1. In an earth boring apparatus of the type that forms horizontal holes and pushes sections of casing into said holes, the combination of casing means including a lead casing section including a first longitudinal axis; a second casing section rearwardly adjacent to said lead casing section and including a longitudinal axis normally aligned with said first longitudinal axis; auger means mounted co-axially within said casing sections for removing earth in the path of movement of the casing sections; pivot means connecting said lead casing section to said second casing section; actuating means connected to said lead casing section for varying the angle of said first longitudinal axis of said lead casing section relative to said second longitudinal axis of said second casing section, said angle variation of said lead casing section being affected independently with respect to said auger means, said actuating means comprising an actuating rod extending along the walls of said casing sections and including an inner end connected to said lead casing section and an outer end; and a motor connected to said outer end of said actuating rod for extending and retracting said rod.



4,013,135

# **APPARATUS FOR SUPPORTING AND WEIGHING PATIENTS IN A SITTING POSITION**

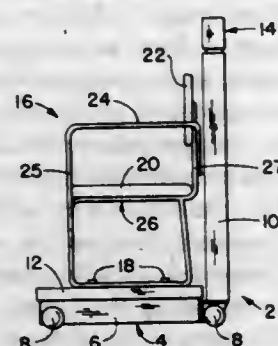
Raymond O. Kechely, 2635 Tamalpais Drive, Pinole, Calif. 94564

Filed Dec. 29, 1975, Ser. No. 644,397

Int. Cl.<sup>2</sup> G01G 19/52, 19/00; B60N 1/06

U.S. Cl. 177-144

9 Claims



1. Apparatus for weighing a patient in a sitting position comprising a scale, a chair attached to the scale, an arm rest mounted to the chair for supporting the patient, and means for pivotally moving the arm rest between a closed position and an open position about a substantially upright axis through approximately 180°

4,013,136

# **BATTERY MOUNT**

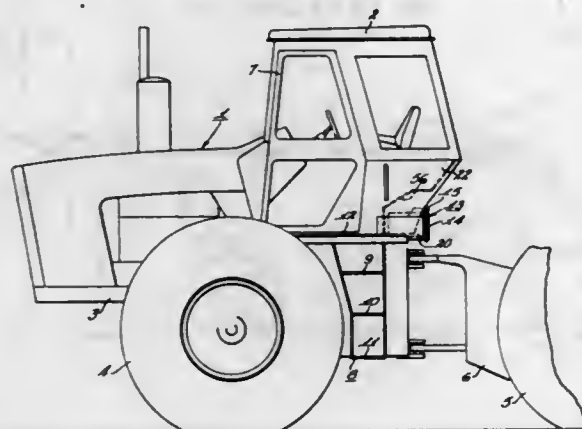
James R. Fear, Greenfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 10, 1975, Ser. No. 630,742

Int. Cl.<sup>2</sup> B60R 18/02

U.S. Cl. 180-68.5

10 Claims



1. A battery servicing device including pivotal battery mount for use on a vehicle comprising, a vehicle chassis, a cab mounted on said vehicle chassis, said cab defining a recessed portion on its lower rear side, a battery tray for supporting at least one battery, pivotal support means defining a vertical pivotal axis on one side of said chassis to the rear of said cab including a bracket mounted on said vehicle pivotally supporting said battery tray in the recessed portion across said cab in the operating position and permitting pivotal movement to a position extending laterally from said cab for servicing, a tray support mounted on said vehicle in spaced relation to said pivotal support means for support of a portion of said battery tray in its operating position, a latch connected between said tray support and said battery tray for latching said tray in the operating position, retainer means on said tray for retaining batteries on said tray, a cab access ladder on said one side of said chassis for gaining access to said cab and for servicing said battery when said battery is pivoted to the said one side of said cab.

4,013,137

# **ENGINE AIR INTAKE SYSTEM**

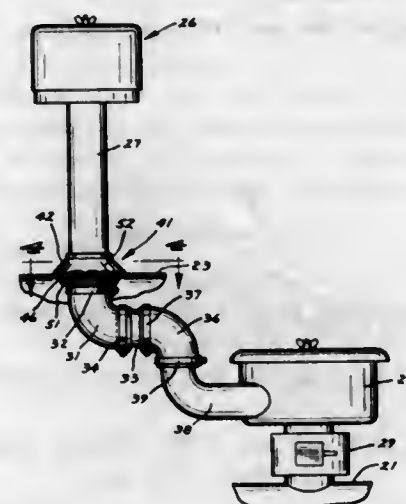
Ross K. Petersen, 2974 W. River Road, Minneapolis, Minn. 55406

Filed Apr. 25, 1975, Ser. No. 571,584

Int. Cl.<sup>2</sup> B62D 25/00

U.S. Cl. 180-69 R

6 Claims



1. An air cleaning structure for use with a vehicle having a hood with an opening and an internal combustion engine having an air intake manifold comprising: an air cleaner connected to the air intake manifold to provide clean air for the engine, a generally upright tubular stack extended through the opening in the hood, said stack having an upper end above the hood and a lower end below the hood, an air pre-cleaner mounted on the upper end of the stack operable to separate particulate matter from the air and direct clean air into the stack, tubular means secured to the lower end of the stack and the air cleaner connecting the stack to the air cleaner, mount means securing the stack to the hood, said mount means including a generally rectangular and flat first plate located above the hood, said first plate having a hole for accommodating the stack whereby the first plate is located around the stack, means securing the first plate to the stack to fix the position of the first plate on the stack, a generally rectangular and flat second plate located below the hood, said second plate having a hole for accommodating the stack whereby the second plate is located around the stack, and fastening means connecting the corner portions of the first plate with the corner portions of the second plate and the plates to the hood thereby mounting the stack in a fixed position on the hood.

4,013,138

# **EMERGENCY STEERING SYSTEM**

James R. McBurnett, Corinth, Miss., assignor to Tyrone Hydraulics, Inc., Corinth, Miss.

Filed Nov. 22, 1974, Ser. No. 526,279

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

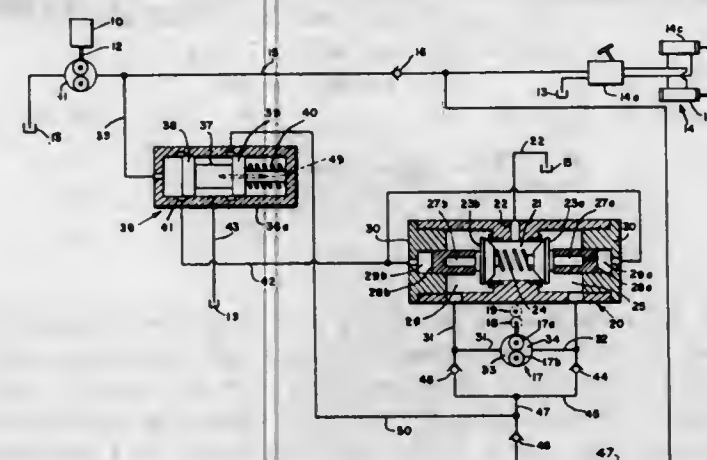
Int. Cl.<sup>2</sup> B62D 5/06

U.S. Cl. 180-133

9 Claims

1. An emergency control system for use in a reversibly operable vehicle having a hydraulically operated steering system, including reservoir means for a supply of operating fluid for said steering system and a first pump adapted to be operated by the vehicle prime mover for supplying the steering system with operating fluid when the prime mover is in operation, said emergency control system comprising: a second pump adapted to be reversibly operated according to the direction of operation of the vehicle, first and second chambers at opposite sides of said second pump serving alternately as suction and discharge chambers according to the direction of operation of said second pump, valve means for interconnecting said reservoir with said chambers comprising first and second passageways for supply of fluid from said reservoir

means to said first and second chambers respectively, a valve member in each of said passageways, said valve members each being movable between a position in which flow from the reservoir to its chamber is blocked and a position in which flow is permitted, control means responsive to operation of said first pump for holding said valve members in the flow



blocking position so that no operating fluid is delivered to the second pump when the first pump is operating, said control means being operative to open the valve member blocking flow to the chamber serving as suction chamber when the first pump is not in operation and the vehicle is in motion whereby operating fluid is delivered by said second pump to said steering system when the first pump is not operating.

4,013,139

# **VEHICLE BUMPER ASSEMBLY**

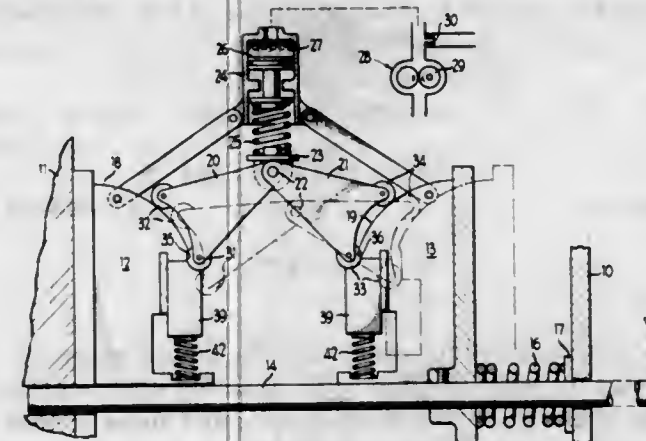
James Hrebicek, 2327 S. 61st Ave., Cicero, Ill. 60650

Filed Aug. 7, 1975, Ser. No. 602,632

Int. Cl.<sup>2</sup> B60R 19/02

U.S. Cl. 180-108

3 Claims



1. A vehicle bumper assembly comprising an abutment on the exterior of the vehicle, a support on the vehicle for slidably holding the abutment on the vehicle, and continuously operable means for moving said support relative to the vehicle to change the location of the abutment relative to the vehicle, said means comprising fluid pressure means, a pump for pressuring the liquid pressure means, means driving the pump in timed relation to the speed of the vehicle to vary the pressure of the fluid in accordance with the speed of the vehicle, and releasable means intermediate the fluid pressure means and support for transmitting the movement of the fluid pressure means to the support.

4,013,140

# **SAFETY EQUIPMENT**

Jacques Pradon, 19 avenue de la Tourelle, Saint-Maur-Des-Fosses, France

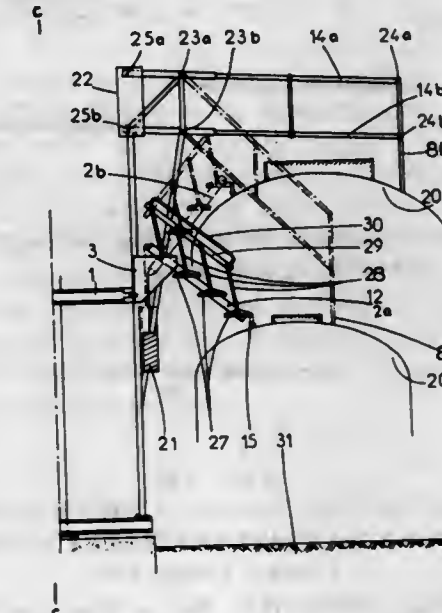
Filed Oct. 30, 1975, Ser. No. 627,036

Claims priority, application France, Oct. 31, 1974, 74.36513; Sept. 30, 1975, 75.29935

Int. Cl.<sup>2</sup> E06C 5/36, 7/18

U.S. Cl. 182-1

12 Claims



1. Safety equipment for a station providing access to the tops of vehicles of different heights, the equipment comprising:

- a platform alongside which a vehicle is to be located;
- support means on said platform;
- access means;
- means for articulating said access means on said platform, said access means comprising a pivotal assembly movable between an inoperative position away from the vehicle and an operative position in which it bears on that side of the vehicle closest to said platform;
- a first protective system comprising first protective panel means; and
- means for articulating said first panel means on said platform and comprising arm means articulated to said first panel means and to said support means on said platform, said first panel means being movable between an inoperative position away from said vehicle and an operative position in which it bears on that side of the vehicle remote from said platform.

4,013,141

# **MEANS FOR LUBRICATING A MECHANISM DISPOSED WITHIN A ROTATING SHAFT**

Freeman D. James, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Oct. 16, 1975, Ser. No. 622,980

Int. Cl.<sup>2</sup> F01M 11/00, 11/02, 11/06

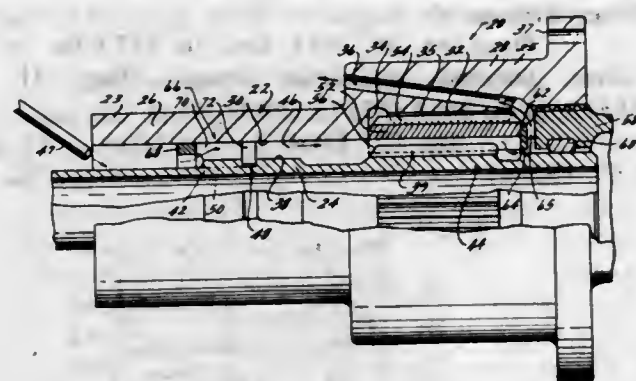
U.S. Cl. 184-6.11

4 Claims

1. In a machine having a first hollow cylindrical rotatable shaft the combination comprising: means for introducing lubricant onto the interior surface of said shaft at the upstream end thereof; a device requiring lubrication disposed downstream of the upstream end of said rotatable shaft adjacent said interior surface, at least a portion of said device being spaced radially inward of said interior surface; annular dam means disposed downstream of said device, said dam means extending radially inward of the bore of said shaft;



a second annular dam means disposed at the upstream end of said shaft in a first position in sealing engagement with



said interior surface for impeding the migration of lubricant in an upstream direction.

4,013,142

# ELEVATOR SYSTEM HAVING A DRIVE SHEAVE WITH RIGID BUT CIRCUMFERENTIALLY COMPLIANT CABLE GROOVES

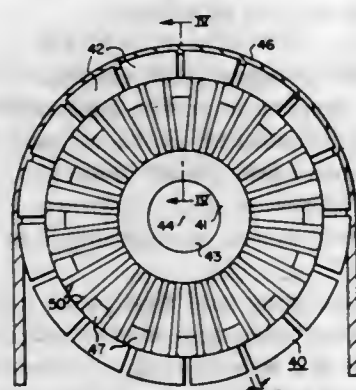
Arthur C. Hagg, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1975, Ser. No. 620,442

Int. Cl.<sup>2</sup> B66B 11/08

U.S. Cl. 187-20

11 Claims



1. An elevator system, comprising:  
an elevator car,  
a counterweight,  
a drive sheave including a hub portion rotatable about a drive axis, a plurality of metallic sector members, and means mounting said plurality of sector members on said hub portion in circumferentially spaced relation, said plurality of circumferentially spaced sector members defining at least one metallic cable groove about the drive axis,

means for driving said drive sheave about the drive axis, and a cable interconnecting said elevator car and said counterweight while disposed about said drive sheave in the at least one cable groove.

said means which mounts the plurality of sector members on the hub portion of said drive sheave being selected to provide a circumferential compliance per sector member in a preferred range between a first value equal to the product of the maximum sliding displacement of the cable and the number of sector members in contact with the cable divided by the difference in the tension forces in the cable on opposite sides of the drive sheave, and a second value equal to about 1/10th of said first value, allowing predetermined circumferential deflection of each sector member responsive to changes in the length of the cable as it passes over the drive sheave.

4,013,143

# BRAKE LINING WEAR INDICATOR

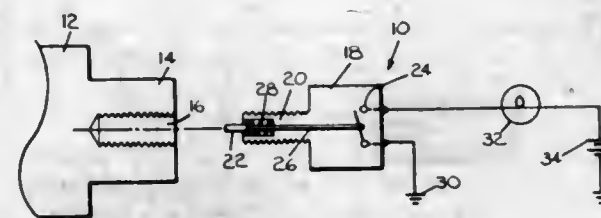
John Emil Juhasz, Lake Orion, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 5, 1976, Ser. No. 683,476

Int. Cl.<sup>2</sup> F16D 66/02

U.S. Cl. 188-1 A

9 Claims



1. An indicator for indicating a predetermined amount of wear of a brake lining comprising slack adjusting means operatively connected to an arrangement of brake shoes for automatically compensating for the wear occurring to the brake lining on the brake shoes, said automatic slack adjusting means including a rotatable shaft means which rotatively moves in response to the wear of said lining on said brake shoe, a worm shaft having a threaded bore at one end thereof to receive a threaded member, electrical switching means disposed in said threaded member being operated by a plunger mechanism, said threaded member being restrained from rotation with respect to said rotatable shaft means by clamping means, said plunger being actuated by contacting a portion of the threaded bore of said worm shaft as said threaded member moves linearly with respect to said rotatable shaft means to activate said switch means to energize an indicating means electrically connected to said switch means and an electrical power means.

4,013,144

# CALIPER BRAKE FOR CYCLES AND THE LIKE

René Lauzier, Ruy, France, assignor to Angenieux-CLB S.A., St-Etienne, France

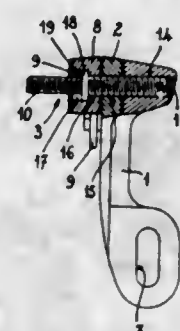
Filed June 29, 1976, Ser. No. 700,780

Claims priority, application France, July 11, 1975, 75.22632

Int. Cl.<sup>2</sup> B62L 1/10

U.S. Cl. 188-24

14 Claims



1. A caliper brake for cycles and the like, comprising:  
a bridge member adapted to be mounted upon a cycle;  
a pair of arm members pivotally mounted about at least one axis fixed relative to said bridge member for swinging movement in opposite senses;  
cable actuating means connected to said arm members for swinging same in said opposite senses;  
respective brake shoes on said arm members displaceable against a wheel upon swinging movement of said arm members in said opposite senses; and  
a shaft being coincident with said at least one axis and being secured to said bridge member said shaft having a threaded portion, one of said arm members being formed with an internally threaded bore of the same diameter as said threaded portion and screwed onto the latter with axial clearance from another of said members permitting rotation of said one of said arm members about said shaft

with slight axial displacement of said one of said arm members.

4,013,145

# VEHICLE HILL HOLDER

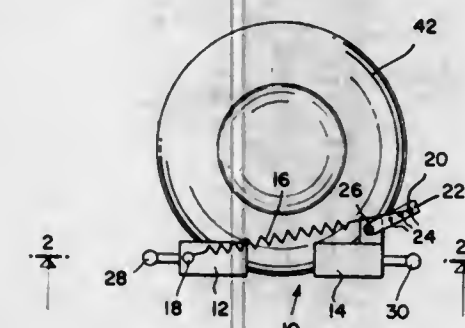
Frank D. Mumm, Rancho Cordova, Calif., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,082

Int. Cl.<sup>2</sup> B60T 3/00

U.S. Cl. 188-32

4 Claims



1. A wheel chock comprising first block means and second block means opposable to one another, first resilient means pivotally secured to one side of said first block to swing in the direction of said second block and second resilient means pivotally secured to the side of said first block opposite said first resilient means to swing in the direction of said second block, lever means pivotally mounted on fulcrum means secured to said second block, said lever being movable toward the base of said second block to increase the tension on said first and second resilient means when said first and second resilient means are attached to said lever, means for detachably securing said first and second resilient means to said lever said resilient means being pivotally secured to said blocks through pivot means, said pivot means lying in a pivot plane above the base of said blocks, and said fulcrum lies in a fulcrum plane above said pivot so that when said lever is depressed downwardly in an arc below said fulcrum, said lever is biased by said resilient means in a downward direction toward the base of said second block.

4,013,146

# DISC BRAKE COOLING STRUCTURE

Hans Gebhardt, and Franz Prah, both of Munich, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

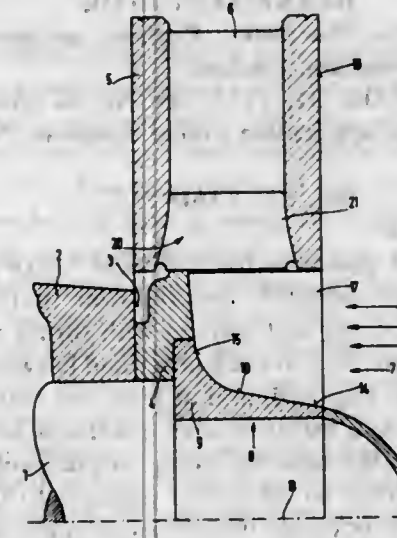
Filed Dec. 5, 1975, Ser. No. 638,064

Claims priority, application Germany, Dec. 18, 1974, 2459859

Int. Cl.<sup>2</sup> F16D 65/84

U.S. Cl. 188-71.6

4 Claims



1. A brake disc for a railway vehicle disc brake operable in

both directions of rotation and comprising a friction ring mounted on the end of a wheel hub to define an open space radially inwardly of said friction ring, a plurality of radial ribs attached to said friction ring to define cooling air ducts, a radial impeller disposed radially inwardly of said friction ring within the peripheral edge portion of said open space, said impeller having an axially directed intake and a radially directed outlet into said ducts and comprising a supporting ring having a substantially axially extending flow surface, radially oriented blades having radial inner edges positioned upon said supporting ring flow surface, said blades projecting axially in the direction of the intake of said impeller toward a friction surface on the side of said friction ring away from said wheel hub, the edges of said blades in the outlet direction extending in front of said radial air ducts, said supporting ring flow surface having a concave curved configuration with the portion of said curved surface at said intake being substantially axial and the portion of said curved surface at said outlet being substantially radial, and a cap having an outer convex curved surface and an end mounted over the opening enclosed by said supporting ring, the outer surface of said cap having a smooth transition to the axial intake portion of said curved surface of said supporting ring flow surface.

4,013,147

# SEGMENTED FRICTION DISC FOR BRAKES

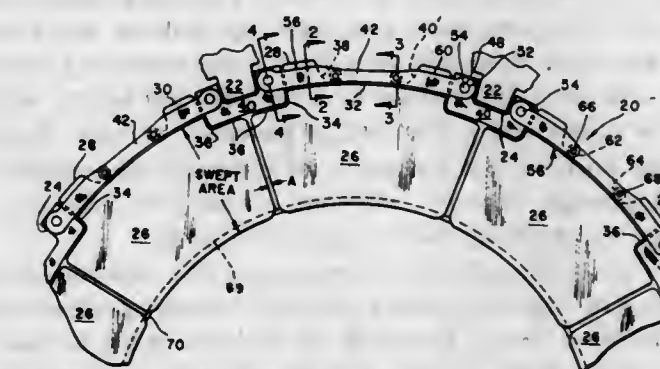
Bruce W. Anderson, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Sept. 2, 1975, Ser. No. 609,770

Int. Cl.<sup>2</sup> F16D 65/12

U.S. Cl. 188-218 XL

4 Claims



1. A friction disc comprising:  
a plurality of arcuate segments arranged in end to end formation to define in part a substantially continuous annular friction member having opposite frictionally swept friction surfaces; and  
an annular retaining ring including circumferentially spaced apart drive means positioned radially outwardly from said annular friction member;  
each of said segments having circumferentially spaced apart projections extending radially outwardly from said annular friction member slidably connected to said annular retaining ring for limited circumferential movement relative thereto in the plane of said annular friction member; said annular retaining ring including axially spaced apart first and second plate members positioned radially outwardly from said annular friction member;  
said segment projections extending radially outwardly between the plate members and having circumferentially extending recesses for receiving said plate members such that said segments depend therefrom;  
said first and second plate members being fixedly secured at opposite end portions to adjacent drive means.



4,013,148

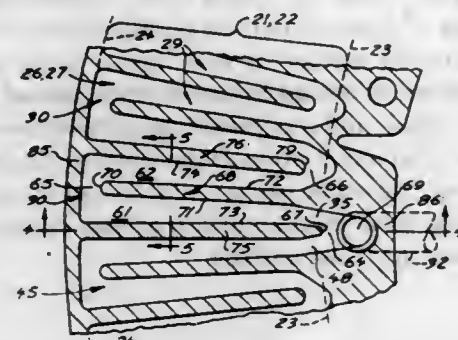
**INTERNALLY LIQUID COOLED DISC BRAKE**  
Jacob Kobelt, 6100 Oak St., Vancouver, British Columbia,  
Canada (V6M 2W2)

Filed Jan. 9, 1976, Ser. No. 647,753

Int. Cl.<sup>2</sup> F16D 65/853

U.S. Cl. 188—264 D

5 Claims



1. An internally liquid cooled disc for use in a disc brake assembly, the disc having an outer peripheral portion and being mounted on a brake shaft for rotation therewith, the peripheral portion having braking faces on opposite sides thereof adapted to be swept by brake pads of the brake assembly, and cooling passage means positioned adjacent and between the braking faces to conduct a cooling liquid there-through to remove heat generated by braking, the cooling passage means being generally zig-zag and extending between inner and outer limits of the braking faces and having an inlet and an outlet and a plurality of generally radially disposed passage portions and a plurality of generally tangentially disposed passage portions, portions of the disc adjacent the passage means being further characterized by:

- a generally radially disposed partition separating each pair of adjacent radially disposed passage portions, each partition having generally parallel side walls to that the radially disposed passage have outwardly diverging radial side walls so as to eliminate relatively thick portions of disc material between portions of the radially disposed passages to reduce formation of excessively hot areas on the braking faces,
  - a tangentially disposed passage portion extending across one end of each radially disposed partition to interconnect adjacent radially disposed passage portions, the generally tangentially disposed passage portions being adjacent the inner and outer limits of the braking faces and being shorter than the radially disposed passage portions,
  - spaced opposed web portions extending between adjacent partitions of the disc, the web portions having outer surfaces serving as portions of the braking faces and inner surfaces defining in part the radially disposed passage portions, the webs and partitions having generally similar thicknesses so as to reduce formation of excessively hot areas;
- the assembly further including:
- a rotary seal cooperating with the disc and connecting the inlet of the cooling passage means to a supply of cooling liquid.

4,013,149

**EXTENDER FOR INCREASING THE TRAVEL OF  
MOTORCYCLE SHOCK ABSORBERS**

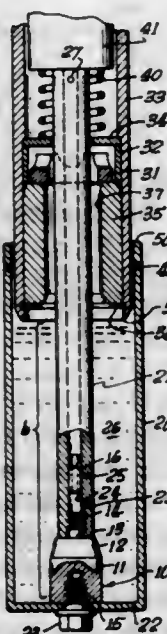
Brian K. Fabre, 9447 Haines Canyon Road, Tujunga, Calif.  
91352, and John S. Vander Laan, III, 11509 S. Bexley  
Drive, Whittier, Calif. 90606

Continuation-in-part of Ser. No. 527,068, Nov. 25, 1974, Pat.  
No. 3,912,054. This application Sept. 22, 1975, Ser. No.  
615,287

Int. Cl.<sup>2</sup> F16F 9/54

U.S. Cl. 188—281

6 Claims



1. In a shock absorber of the type having a cylindrical oil-containing slider having a bottom end, a damper rod affixed to the bottom end of the slider, a fork tube having a lower end within said slider, and vertically movable with respect to the slider, a piston affixed in the lower end of the fork tube, the improvement which comprises:

- a fork extender inside said slider and affixed at its lower end to the bottom end of the slider and positioned at the central axis of the slider, said fork extender having an exterior cylindrical body portion along its lower end, an exterior frusto-conical area above the cylindrical body portion decreasing in outside diameter upwardly along the extender, said frusto-conical area having an outside dimension small enough so that it can pass into the lower end of the piston to provide extreme damping near the point of maximum compression, and means for affixing in axial alignment the fork extender to the damper rod.

4,013,150

**MECHANICALLY AND HYDRAULICALLY OPERATED  
BRAKE ACTUATOR**

Norman Crabtree, Worcester, England, assignor to Girling  
Limited, Birmingham, England

Filed Oct. 31, 1975, Ser. No. 627,839

Claims priority, application United Kingdom, Nov. 15, 1974,  
49435/74

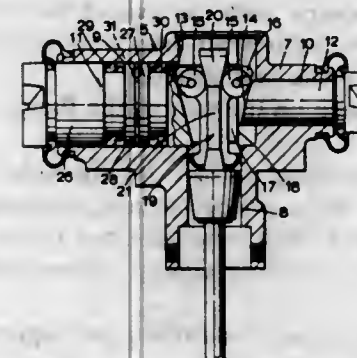
Int. Cl.<sup>2</sup> F16D 51/22

U.S. Cl. 188—326

4 Claims

1. An actuator assembly for a vehicle brake comprising a housing, a wedge member, two follower members slidably guided in said housing and formed with thrust receiving surfaces which are inclined to each other and between which said wedge member is disposed, and at least one roller interposed between each of said thrust receiving surfaces and said wedge member, said wedge member being displaceable from a retracted position into an advanced position to urge said follower members in opposite directions to apply friction members into braking engagement with a rotor, wherein one of said follower members comprises a pair of axially arranged innermost and outermost hydraulic pistons working in a common

bore in said housing, said outermost piston having an outer face for engagement with one of said friction members and an inner face, and said innermost piston being provided with the said thrust receiving surface for the said one follower member and having an outer face for engagement with said inner face of said outermost piston, and a stop surface, spaced axially from said outer face in an inward direction, and said housing is provided with a supply port communicating with a pressure space defined in said common bore between said inner face of



said outermost piston and said outer face of said innermost piston, which said faces abut when said wedge member is displaced from said retracted position, and with an abutment face with which said stop surface on said innermost piston is engageable when said wedge member is in said retracted position whereby said pressure space can be pressurised through said supply port to urge said outermost piston away from said innermost piston which is relatively stationary to apply one of the friction members into braking engagement with the rotor.

4,013,151

**CLUTCH AND BACK PEDAL BRAKE**

Anthony William Hillyer, Loughborough, England, assignor to  
Raleigh Industries Limited, Nottingham, England

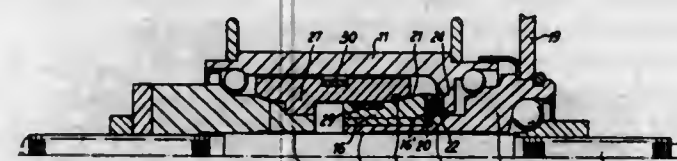
Continuation of Ser. No. 387,255, Aug. 10, 1973, abandoned,  
which is a continuation of Ser. No. 206,330, Dec. 9, 1971,  
abandoned. This application Feb. 11, 1975, Ser. No. 548,925

Claims priority, application United Kingdom, Dec. 8, 1970,  
58153/70

Int. Cl.<sup>2</sup> B60K 29/02

U.S. Cl. 192—6 R

1 Claim



1. A back-pedal brake hub for a bicycle or the like comprising a spindle, a shell mounted on ball bearings in ball races for rotation about said spindle, sprocket-and-driver means mounted at one end of said hub and supported for rotation by ball bearings in a ball race disposed between said sprocket-and-driver means and said spindle, the driver portion of said means having a screw-threaded portion extending axially within said shell, brake means within said shell and comprising cooperating sections with one section being non-rotatably connected with said spindle and another section being connected with said shell, clutch means mounted on said screw-threaded portion of said driver portion for longitudinal movement relative thereto in one axial direction or the other responsive to the direction of rotation of said driver portion, first abutment means fixed to said clutch means, means on said one section of said brake means and one end of said clutch means for urging said cooperating sections of said brake means together without axial loading of said ball races supporting said shell upon axial movement of said clutch means in a direction

corresponding with a back-pedalling operation of the sprocket portion of said sprocket-and-driver means to effect braking of said shell relative to said spindle, said clutch member having ratchet-shaped teeth at the other end thereof, complementary ratchet-shaped teeth being provided on a drive transmission rib integrally connected with said shell, both sets of teeth having one side disposed radially of said spindle in a plane disposed axially of said spindle and the other side disposed at an acute angle thereto, said teeth being adapted to have their said one side brought into engagement upon axial movement of said clutch means in a direction corresponding to a forward operation of said sprocket portion, and a second abutment means carried by said sprocket-and-driver means for engaging said first abutment means so as to prevent said clutch member from imparting an axial load to said ball races supporting said shell when said teeth are engaged.

4,013,152

**MECHANICAL CLUTCH FOR CYCLIC MACHINES**

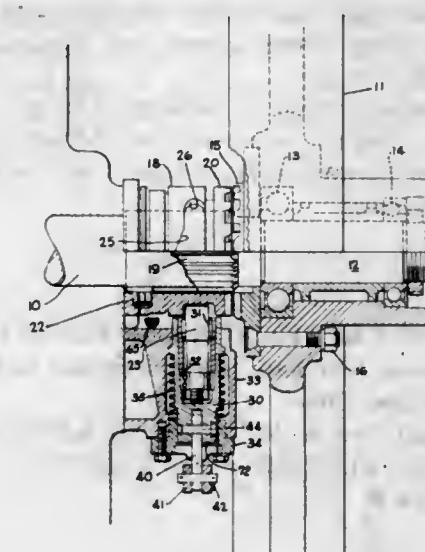
Clarence O. Jones, Jr., Eggertsville, N.Y., assignor to Niagara  
Machine & Tool Works, Buffalo, N.Y.

Filed Jan. 9, 1976, Ser. No. 647,893

Int. Cl.<sup>2</sup> F16D 11/04

U.S. Cl. 192—24

4 Claims



1. A single revolution clutch mechanism comprising a main shaft, a driving member rotatable on said shaft, a coupling member rotatable with said shaft and axially movable to engage and disengage said driving member and said shaft, a throwout member movable to a coupling-disengaging position, an actuating member releasably connected to said throwout member and selectively operable to move said throwout member away from said coupling-disengaging position for producing driving engagement between said driving member and said shaft, means for detaching said actuating member from said throwout member at the end of a cycle of revolution if the throwout member has not moved to coupling-disengaging position, and a latch rendered operative by detachment of said actuating member from said throwout member to prevent further operation of said actuating member until the condition causing said detachment has been corrected.



4,013,153

## CLUTCH HUB FOR TRANSMISSION

Hideki Morino, Nagoya; Isao Tsuzuki, Kariya, and Kenji Koshino, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

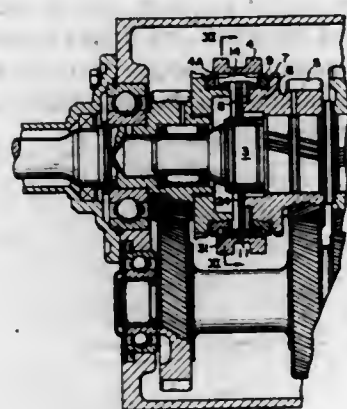
Filed Aug. 15, 1975, Ser. No. 605,118

Claims priority, application Japan, Sept. 6, 1974, 49-103129; Sept. 6, 1974, 49-103130

Int. Cl.<sup>2</sup> F16D 23/10, 13/60

U.S. Cl. 192—53 F

8 Claims



1. A transmission comprising:  
an output shaft;  
a driven gear mounted on said output shaft for rotation relative to said shaft, said driven gear having meshing splines on its outer peripheral face;  
a clutch hub having splines on the outer periphery thereof and fitted on said output shaft;  
and a hub sleeve axially slidable relative to said output shaft and having splines engageable with said clutch hub splines provided on the outer periphery of said clutch hub and also with said gear splines of said driven gear;  
said clutch hub comprising a pair of annular cylindrical elements each having an end-wall at an end thereof, said end walls being firmly joined and aligned axially with each other;  
each said element being press-formed from a metal sheet blank and being provided with, in addition to said splines on its outer peripheral face, splines on the inner peripheral face thereof.

4,013,154

## MOUNTING NUT RETENTION FOR FLUID COUPLINGS

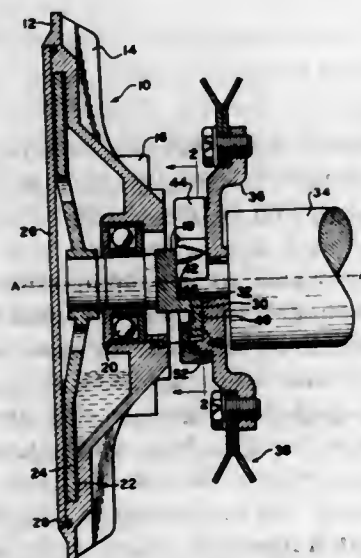
Richard J. Brown, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 6, 1975, Ser. No. 629,426

Int. Cl.<sup>2</sup> F16D 35/00; F16B 7/18

U.S. Cl. 192—58 B

5 Claims



1. A mounting for connecting a viscous fan coupling with a mounting shaft that is rotatable about an axis, the coupling

having a housing member defining a reservoir containing fluid, a rotor member located within the reservoir and operative with the fluid to rotate with the housing member about an axis, an input shaft having an axis coaxial with the axis of the members and secured to one of the members to rotate the one member, and the other member being adapted to support a fan, the mounting comprising:

- A. a radially extending surface on the mounting shaft perpendicular to the axis of the mounting shaft;
- B. at least one annular thread on the mounting shaft substantially concentric with the axis of the mounting shaft;
- C. a flange on the input shaft extending radially outwardly from the axis of the input shaft;
- D. a contact surface on the side of the flange closest to the one member;
- E. a radially extending surface on the side of the flange opposite from the contact surface, perpendicular to the axis of the input shaft, and adapted to be matingly engaged with the radially extending surface on the mounting shaft;
- F. an annular nut loosely encircling the input shaft, the nut having a surface adapted to engage the contact surface; and
- G. at least one annular thread on the nut substantially concentric with the axis of the input shaft and threadably engageable with the thread on the mounting shaft to move the mounting shaft toward the flange and force the perpendicular radially extending surfaces into tight frictional mating engagement with one another whereby torque may be transferred from the mounting shaft to the input shaft during rotation of the mounting shaft.

4,013,155

## SINGLE LEVER CONTROL UNIT WITH THROTTLE LEVER

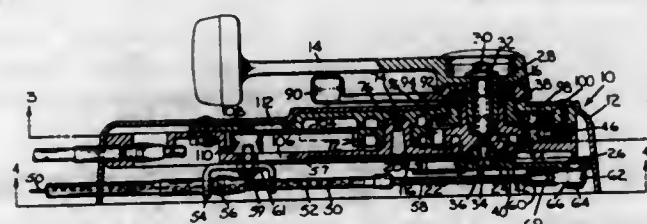
Roger Fred Olsen, Cuyahoga Falls, Ohio, assignor to Incom International Inc., Pittsburgh, Pa.

Filed Mar. 3, 1975, Ser. No. 555,022

Int. Cl.<sup>2</sup> B60K 41/00, 41/02

U.S. Cl. 192—.096

12 Claims



1. A single lever control for controlling engine, said control having a housing, a throttle actuating arm and a clutch actuating arm operatively connected thereto for rotation only during the first portion of rotation of the throttle actuating arm, said arms adapted for connection to the cores of push-pull cables for opening and closing the throttle and operating the clutch of said engine, the improvement comprising a warm-up auxiliary throttle lever operatively attached to a bracket means slidably mounted on said housing, said bracket means attached to the throttle cable conduit to move the cable conduit relative to said throttle cable core thereby adjusting throttle setting of said engine, interlocking means including an interengaging means carried by said bracket means, said interengaging means when engaging the outer surface of said throttle actuating arm prohibits the movement of said auxiliary throttle lever when said single lever is moved generally away from its neutral position and said interengaging means when disposed a certain distance within a slot in said throttle actuating arm prohibits movement of said single lever when said single lever is moved generally to its neutral position.

4,013,156

## CENTRIFUGAL CLUTCH

Romeo Milošević, Koper, Yugoslavia, assignor to Tovarna motornih vozil TOMOS, Koper, Yugoslavia

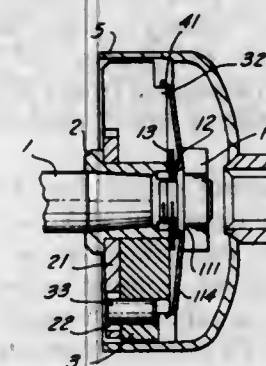
Filed July 29, 1974, Ser. No. 492,872

Claims priority, application Yugoslavia, July 30, 1973, 2061/73

Int. Cl.<sup>2</sup> F16D 43/24

U.S. Cl. 192—105 BA

1 Claim



1. A centrifugal clutch comprising:  
a driving member;  
a hub mounted upon said driving member and rotatable thereby, said hub being formed with a plurality of annularly spaced radially extending arms;  
a respective engaging segment radially displaceably carried by each of said arms, said segments each being formed on one axial side with a radial groove slidably receiving the respective arm and, on the opposite axial side with an arc-segmental shoulder formed with a narrow bevel;  
an annular cup spring mounted on said driving member and having a frustoconical central portion of a large apex angle and a continuous axial periphery formed as a frustocone of smaller apex angle slidably engaging the bevels of all of said segments and urging same radially inwardly and axially against the respective arms;  
clamping means engaging the inner periphery of said spring and securing same to said driving member;  
a drum surrounding said segments and engaged thereby upon rotation of said driving member and said hub at an annular velocity sufficient to displace said segments outwardly against the force of said spring and the friction force between said arms and said segment, each of said arms being formed with a respective radial slot and each of said segments is provided with a plug extending slidably into the respective slot and limiting radial displacement of the respective segment along the respective arm;  
a disk retained by said clamping means against said hub and forms a radial guide surface for said opposite sides of said segments; and  
a prestressing washer interposed between said disk and said inner periphery of said cup spring to impart a predetermined prestress defined by the thickness of the washer to said cup spring.

4,013,157

## BONUS PLAY MACHINE

John A. Britz, Palatine, and Richard M. Weissman, Chicago, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed July 30, 1975, Ser. No. 600,309

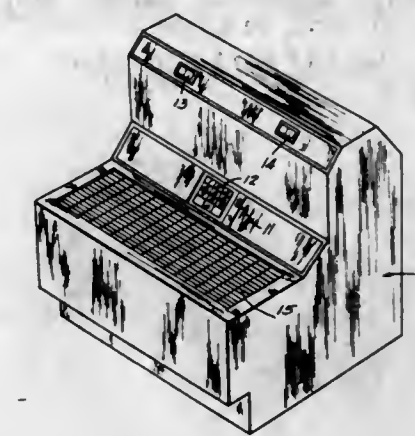
Int. Cl.<sup>2</sup> G11B 19/08

U.S. Cl. 194—1 N

12 Claims

1. A bonus play arrangement for a currency operated machine including:  
a currency receiving switch actuated by currency deposited in said machine;  
a credit circuit connected to said currency receiving switch and giving a fixed credit when the deposit of a first fixed currency amount is made;

a random event generator controlled by deposit of currency in said currency receiving switch and having a plurality of output conditions;  
a bonus indicator connected to said random event generator to indicate a bonus condition upon the deposit of a first fixed currency amount; and



enabling means connecting said credit circuit to said random generator upon the deposit of a second fixed currency amount to give a fixed credit that can not be lost plus bonus credit if the random event generator is in a bonus credit condition, said bonus credit being given in addition to the accumulated fixed credit that has been purchased by said first and second fixed currency amounts.

4,013,158

## ELECTROGRAPHIC SEGMENT ELECTRODE CLAMPING ASSEMBLY

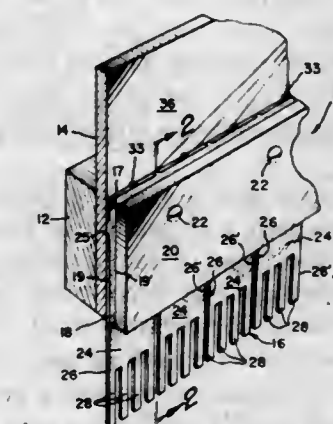
Robert F. Strange, Round Rock, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,029

Int. Cl.<sup>2</sup> B41J 1/28; G01D 15/06

U.S. Cl. 197—1 R

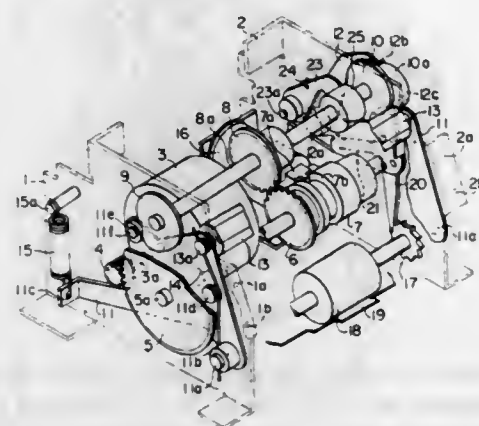
12 Claims



1. An electrographic printer segment electrode clamping assembly for use with electrographic printer stylus electrodes, comprising:  
support means for mounting to the electrographic printer;  
a segment electrode driver board carried by the support means;  
an array of segment electrodes in electrical engagement with the driver board and disposable to engage stylus electrodes in an electrographic printing apparatus;  
compressible means disposed on the array of segment electrodes opposite the driver board; and  
clamping means for exerting a compressive force between the compressible means and the support means to deform the compressible means and thereby secure the alignment of the array of segment electrodes with respect to the support means mountable to the electrographic printer.



**4,013,159**  
**PRINTER HAVING A LIMITED MOVEMENT PLATEN**  
**AND/OR PRINTING HEAD AND INDEPENDENT**  
**SUPPORTS THEREFOR**  
 Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan  
 Filed May 21, 1975, Ser. No. 579,425  
 Claims priority, application Japan, May 30, 1974, 49-60270; May 30, 1974, 49-60271  
 Int. Cl.<sup>2</sup> B41J 3/20, 13/03  
 U.S. Cl. 197—1 R 5 Claims



1. In a printer having a frame, a printing head and a platen, either one of said printing head and said platen being fixedly secured to said frame while the other is movably mounted on said frame by movable supporting means so as to move toward and away from said one of said printing head and said platen for the printing operation on a sheet held therebetween the improvement wherein said movable supporting means comprises:

a pair of supporting members each movably mounting said other of said printing head and said platen on said frame independently from each other at positions spaced from each other and about an axis parallel to the longitudinal axis of said other of said printing head and said platen; each of said supporting members is biased by resilient means independently from each other so as to urge said other of said printing head and said platen toward said one of said printing head and said platen about said longitudinal axis and in a direction perpendicular to said longitudinal axis thereby insuring parallel relationship between said printing head and said platen when moved in said direction and about said axis into abutting relationship to each other;

means mounted upon said supporting members and operatively interconnected with additional means operatively formed with either one of said printing head and said platen, for controlling and limiting the range of rotation of said other one of said printing head and said platen; said additional means for controlling and limiting the range of rotation of said platen comprises a peripheral groove formed in a shaft fixedly supporting said platen; and said means comprises a spring mounted on said frame with its one end supported stationarily on said frame while the other end is engaged in said peripheral groove in said shaft.

2. A thermal printer adapted to be operated by a printing demand generated therein for a printing operation and to issue a printing completion signal upon completion of the printing operation, said printer comprising:

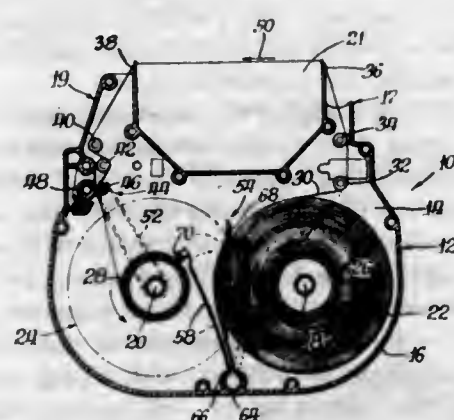
a driving motor,  
 a single revolution shaft driven by said driving motor through a single revolution clutch which is adapted to be rotated through a single revolution when actuated so that said shaft is rotated by one revolution each time said single revolution clutch is actuated,  
 a clutch magnet for actuating said single revolution clutch,  
 a control circuit for controlling the energization of said driving motor and said clutch magnet,

a thermal printing head and a platen, said thermal printing head and said platen being normally urged in abutting relationship to each other for the printing operation, separating means operatively coupled with said single revolution shaft for releasing said abutting relationship between said thermal head and said platen so as to separate the same from each other during the time said single revolution shaft is being rotated through a single revolution,

a paper feeding means operatively coupled with said single revolution shaft for feeding a paper held between said thermal head and said platen after said thermal head and said platen are held separated from each other while said single revolution shaft is being rotated through a single revolution, and

means within said control circuit for (1) energizing said driving motor simultaneously with the issuance of said printing demand in said printer so as to speed up said driving motor while the printing operation is being effected, (2) energizing said clutch magnet simultaneously with the issuance of a printing completion signal so as to actuate said clutch for actuating said separating means and said paper feeding means in succession after the speed of said motor reaches its constant speed, and (3) deenergizing said motor after completion of the actuation of said separating means and said paper feeding means.

**4,013,160**  
**RIBBON TENSIONING DEVICE FOR RIBBON**  
**CARTRIDGE**  
 Paul S. Colecchi, and Cezary Kotecki, both of Des Plaines, Ill., assignors to A. B. Dick Company, Chicago, Ill.  
 Filed Oct. 14, 1975, Ser. No. 621,686  
 Int. Cl.<sup>2</sup> B41J 33/52, 33/12  
 U.S. Cl. 197—151 7 Claims

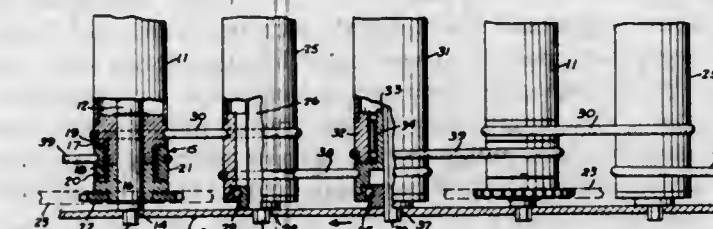


1. In a single pass ribbon cartridge for use in a typewriter, printer and the like, comprising a housing having mounted therein a ribbon supply spool and a takeup spool, a length of ribbon mounted on said supply spool and extending therefrom along a predetermined path out of and back into said housing to said takeup spool and a ribbon driving assembly, said driving assembly being drivable incrementally to transfer said ribbon from said supply spool to said takeup spool, the improvement comprising:

a ribbon tensioning device for providing a substantially uniform tension to said ribbon as it is transferred between said supply and takeup spools, said tensioning device including first and second arms coupled at first ends to each other to form a base, said device being mounted at said base for pivotal movement adjacent said ribbon spools, said arms being biased in opposing directions with the free ends of said arms being predeterminedly spaced and each engaging the ribbon wound about a respective one of said ribbon spools to exert a predetermined pressure thereagainst, said tensioning device being pivoted about said base as the ribbon diameters of said supply and takeup spools decrease and increase, respectively, during transfer of said ribbon from said supply to said takeup

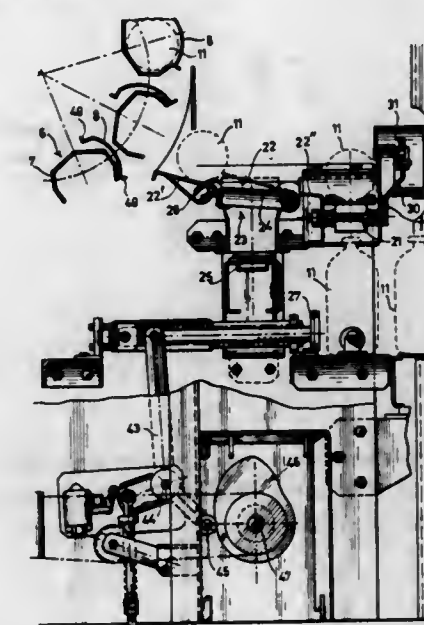
spool and said tensioning device further including means to create a predetermined differential in frictional coupling between the free end of a first one of said arms and the ribbon wound about said supply spool and the free end of the second one of said arms and the ribbon wound about said takeup spool, the frictional coupling between the free end of said first arm and ribbon wound about said supply spool being substantially greater than the frictional coupling between the free end of said second arm and the ribbon wound about said takeup spool, whereby a substantially uniform tension is maintained on said ribbon with a minimum of spilling and breakage thereof during transfer from said supply to said takeup spool.

**4,013,161**  
**ACCUMULATING ROLLER CONVEYOR**  
 Walter T. Nelson, Frederick, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.  
 Filed Feb. 3, 1976, Ser. No. 654,991  
 Int. Cl.<sup>2</sup> B65G 13/07  
 U.S. Cl. 198—781 7 Claims



1. In an accumulating roller conveyor, the combination comprising  
 a frame,  
 a plurality of longitudinally spaced transversely extending drive rollers rotatably mounted on said frame,  
 drive means extending longitudinally of said frame, and a spring clutch interposed between each said drive roller and said drive means,  
 a driven roller rotatably mounted on said frame upstream of each said drive roller,  
 means interconnecting said rollers such that when said drive roller is rotated, said driven roller is rotated,  
 a sensing roller rotatably mounted on said frame upstream and adjacent each said driven roller,  
 a one-way clutch on each said sensing roller,  
 means interconnecting said driven roller and said one-way clutch such that when said driven roller is rotated, said sensing roller is rotated,  
 and means interconnecting said sensing roller and the drive roller upstream therefrom such that when a downstream sensing roller is stopped from rotating by the presence of an article thereon, the spring clutch of the drive roller upstream therefrom will be disengaged to stop the drive roller and, in turn, stop the driven roller upstream therefrom, and when a succeeding article engages the previously interrupted article, the upstream sensing roller will stop initiating a sequence to interrupt the drive and driven rollers further upstream, and when the first mentioned package is released, the sensing roller thereunder is permitted to rotate so that the spring clutches and one-way clutches are successively engaged upstream.

**4,013,162**  
**INSTALLATION FOR THE THERMAL TREATMENT OF**  
**OBJECTS**  
 Jort Boer, Oostzaan, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands  
 Continuation-in-part of Ser. No. 410,399, Oct. 29, 1973, abandoned. This application July 1, 1975, Ser. No. 592,210  
 Claims priority, application Netherlands, Oct. 27, 1972, 7214631  
 Int. Cl.<sup>2</sup> B65G 47/24  
 U.S. Cl. 198—409 5 Claims



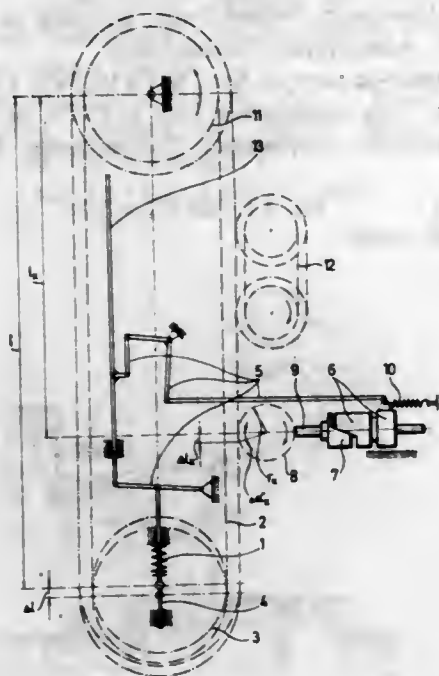
1. An installation of the front loader type for the thermal treatment of objects, such as pasteurizing or sterilizing food-stuff or medicine, packed in glass or plastic, the combination of means defining a treatment space and an endless conveyor describing a path within said space, said conveyor having a plurality of carriers for the objects to be treated, each carrier comprising a C-shaped cross section and with a lengthwise extending movable cover, each carrier being internally provided with equidistant cross partition walls to define a number of compartments, a loading station at which the objects are loaded on said carrier a discharge station to discharge the objects being treated, said discharge station comprising at least one oscillating L-shaped catching element on which the bottom and one side of an object being treated bear, said catching element being parallel to the carriers while receiving said articles, said discharge station further comprising means for defining a transitory path for the discharged treated objects thereby bridging a gap between the compartments in the carrier to said catching element, said catching element having a pivot axis which extends in substantial alignment with said transitory path.

**4,013,163**  
**PHASE ADJUSTMENT APPARATUS**  
 Ottó Gaál, Budapest, Hungary, assignor to Egyesült Izzolampa Es. Villamossági Resvény tarsasag, Budapest, Hungary  
 Filed Nov. 17, 1975, Ser. No. 632,295  
 Int. Cl.<sup>2</sup> B65G 37/00 5 Claims

1. A device for maintaining the relative phase shift between an endless conveying element and at least one rotary work table comprising at least one fixedly journaled drive wheel, a tensioning wheel, and a resiliently loaded, displaceable and guided bearing for the tensioning wheel for the endless conveying element, process tools attached to said endless conveying element at equal spacing along its length, means for driving said at least one rotary table synchronously with the said endless conveying element, the drive means including a drive shaft for the said at least one rotary table, at least one shaft coupling for said drive shaft consisting of an axially fixed sleeve and an axially movable sleeve, complementary helicoidal



dal bearing surfaces with a predetermined pitch of thread on said fixed and movable sleeves, and a transmission with a



predetermined transmission ratio connecting the displaceably guided bearing of the tensioning wheel and the axially movable sleeve of the shaft coupling.

4,013,164

**WORKPIECE CARRIER ASSEMBLY**

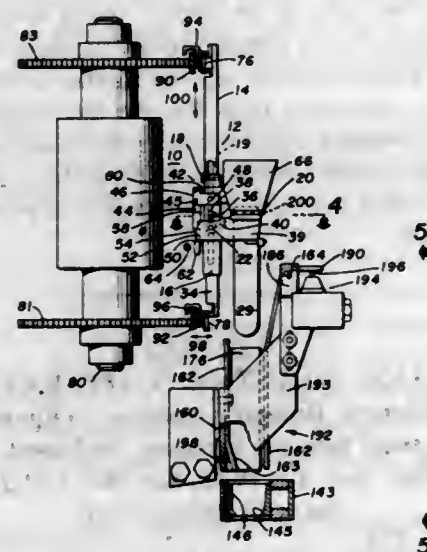
Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 536,416, Dec. 26, 1974, Pat. No. 3,937,315, which is a division of Ser. No. 480,604, June 19, 1974, Pat. No. 3,985,251, which is a division of Ser. No. 424,866, Dec. 14, 1973, Pat. No. 3,880,301. This application July 24, 1975, Ser. No. 598,563

Int. Cl.<sup>2</sup> B65G 17/32

U.S. Cl. 198—655

3 Claims



1. An integral workpiece carrier assembly comprising:
  - A. post means;
  - B. pivotal holder means associated with the post means including arms for supporting the workpiece;
  - C. a trip mechanism mounted with and biasing the arms to a workpiece release position;
  - D. means for cooperating with nearby position-changing means for returning said holder means to a workpiece-engaging attitude; and
  - E. a funnel mounted to said holder means above the arms for guiding the workpiece into engagement with the arms.

4,013,165

**CONVEYORS**

Anthony Harry Bush, Ascot, England, assignor to A. H. B. Services (Engineers) Limited, England

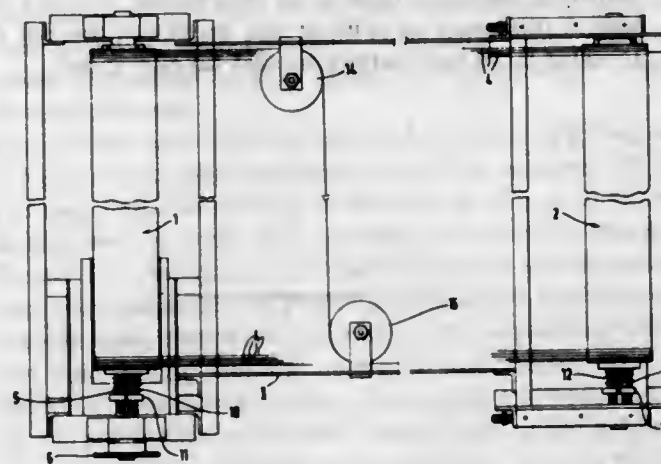
Filed June 5, 1975, Ser. No. 584,213

Claims priority, application United Kingdom, June 5, 1974, 25015/74

Int. Cl.<sup>2</sup> B65G 15/10

U.S. Cl. 198—817

7 Claims



1. A conveyor comprising:
  - first and second spaced-apart roller assemblies, each roller assembly including an equal number of coaxial pulleys, each of the pulleys in each said assembly being mounted so as to be capable of independent rotation at a speed differing from that of any other of the remaining pulleys of the respective said assembly;
  - an endless wire wrapped around said roller assemblies to form upper and lower flights therebetween, each flight comprising parallel spaced-apart lengths of said wire, said wire extending between said assemblies in a manner such that a wire length extends from a given pulley in said first assembly to a pulley in said second assembly next adjacent a pulley thereof corresponding to and aligned with said given pulley in said first assembly, as viewed from one end of said assemblies;
  - guide means for directing said wire from the last pulley in one of said assemblies to the first pulley in the other of said assemblies, as viewed from said one end of said assemblies; and
  - drive means operatively connecting all of the pulleys of one of said assemblies for causing movement of said endless wire along said assemblies by rotation of said pulleys of said one assembly at relatively different speeds.

4,013,166

**HYDRAULIC DRIVEN PULLEY FOR CONVEYORS**

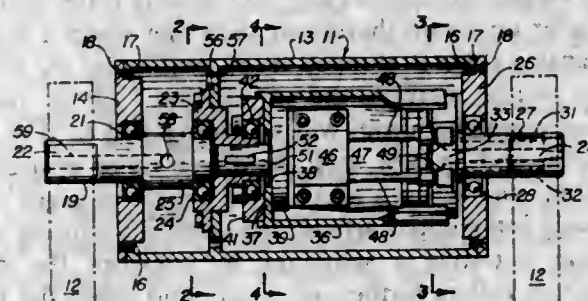
Andrew A. Weady, Los Gatos, and Jerome T. Denz, Tiburon, both of Calif., assignors to Hydraulic Drives, Inc., Burlingame, Calif.

Filed Nov. 10, 1975, Ser. No. 630,367

Int. Cl.<sup>2</sup> B65G 23/08

U.S. Cl. 198—835

3 Claims



1. A conveyor pulley comprising a cylindrical shell for a

conveyor belt, a first and a second shaft adapted to be stationarily held in support means, first and second means for rotatably mounting said shell relative to said first and second shafts, respectively, a fluid motor located entirely within said shell and having a motor shaft and a manifold having fluid intake and outlet ports, a drive member fixed to said motor shaft and to said shell whereby rotation of said motor shaft turns said shell, a stationary motor support entirely within said shell in which said motor is mounted, said drive member being rotatable relative to said motor support, said second shaft formed with first and second longitudinal ducts, conduit means connecting said first and second ducts with said fluid intake and outlet ports, said motor support comprising a trough-like U-shaped member in which said motor is fitted, said U-shaped member having a bearing cap at a first end through which said drive member and said motor shaft extend and a second end fixed to said U-shaped member through which said second shaft extends, the inner end of said second shaft being supported by said second end, said U-shaped member having an internal first flange at the inner end, said first flange being formed with a slot longer than said first shaft, said motor being supported by said U-shaped member, the inner end of said motor having a second flange fitting tightly against one surface of said first flange, said bearing cap fitting tightly against the surface of said first flange opposite said second flange, said slot providing an opening through which the shaft of said motor may be inserted during installation of said motor.

4,013,167

**CONVEYOR SUPPORT STRUCTURE**

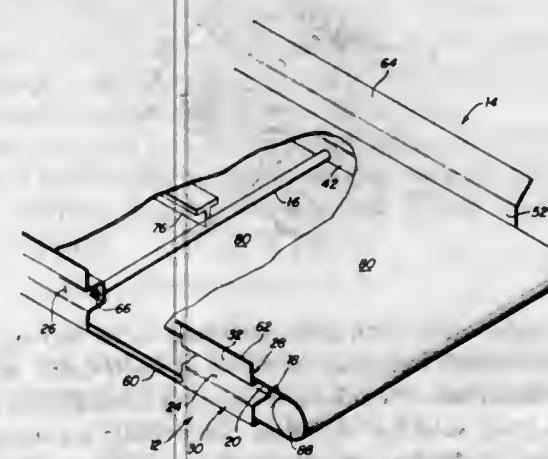
Ronald D. Bourgeois, Waltham, Mass., assignor to Custom Fabricators, Inc., Waltham, Mass.

Filed May 21, 1975, Ser. No. 579,320

Int. Cl.<sup>2</sup> B65G 15/60

U.S. Cl. 198—861

3 Claims



1. A conveyor system support structure comprising:
  - first and second monolithic, longitudinally corrugated side support members;
  - transverse support means, including at least one transverse support member for interconnecting said side support members, each said transverse support member including fastening means at each end for engaging with said side support members;
  - each said side support member including at least one positive and one negative corrugation, each said positive corrugation including an inwardly disposed element and interconnection elements in common with adjacent negative corrugations, and each said negative corrugation including an outwardly disposed element and interconnection elements in common with adjacent positive corrugations; and
  - a tension adjustment mechanism including a corrugated plate for snugly nesting in, and being slidably guided by said corrugations of a said side support member, a reference member fixed to said side support member, and means interconnecting said reference member and plate for adjusting the distance therebetween.

4,013,168

**SHIPPING CONTAINER**

Robert A. Bamberg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Dec. 22, 1975, Ser. No. 643,450

Int. Cl.<sup>2</sup> B65D 19/20

U.S. Cl. 206—386

17 Claims



1. A combination pallet/shipping container, comprising:
  - a. a pallet;
  - b. a shipping container positioned on top of said pallet;
    1. said container having formed on one end thereof a plurality of flaps;
  - c. a flat sheet having edges and corner portions and positioned between said pallet and said container for forming the bottom of said container, said corner portions of said flat sheet being exposed on the outside of said container;
    1. at least two of said flaps being folded inwardly into the interior of said container and lying on top of said flat sheet;
    2. the remaining of said flaps being folded inwardly over the edges of said sheet and lying under said flat sheet between said pallet and said flat sheet; and
  - d. means for fastening the exposed corner portions of said sheet to said pallet.

4,013,169

**MAGNET RING CONFIGURATION AND DISC CARTRIDGE INCLUDING MAGNET RING CONFIGURATION**

George T. Cheney, Manchester, N.H., assignor to Nashua Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 328,933, Feb. 2, 1975, abandoned, and a continuation-in-part of Ser. No. 489,916, July 19, 1974, Pat. No. 3,917,068, and a continuation-in-part of Ser. No. 515,822, Oct. 18, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 637,844

Int. Cl.<sup>2</sup> B65D 85/30, 45/00

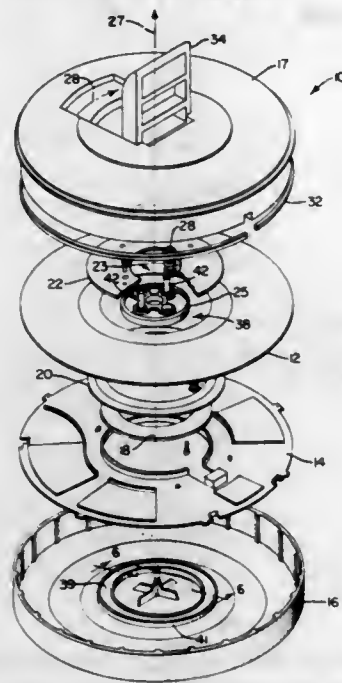
U.S. Cl. 206—444

5 Claims

1. A disc cartridge of the type which includes a memory disc covered by two covers, a top and a bottom cover, and a draw plate of a type which has post apertures through which posts are secured to the draw plate and a pair of posts for engagement with a handle assembly on one cover and which draws the memory disc toward one cover when the handle is rotated, wherein the improvement comprises said draw plate having a pair of warp reducing apertures, each of said warp reducing apertures and the post apertures being located an equal distance from the center of the circular draw plate and each warp



reducing aperture being along an inner circumference of said circular draw plate at a distance of 90° of arc from a post aperture also located along said inner circumference, the bottom of the posts having a coarse knurl formed thereon which friction fits directly into a post aperture formed in the material from which the draw plate is fabricated, the direct



fitting of said posts into the draw plate enabling the posts to be flexed to facilitate the alignment of the posts with the handle assembly and wherein the bottom cover of the cartridge includes a ring magnet positioned on the inside thereof, said ring magnet making magnetic contact with an armature plate which is connected to said top cover to maintain said cartridge in a closed position.

4,013,170

## SHIPPING CONTAINER

Karl Hutterer, Neugermaring, Germany, assignor to Dornier System GmbH, Friedrichshafen, Germany

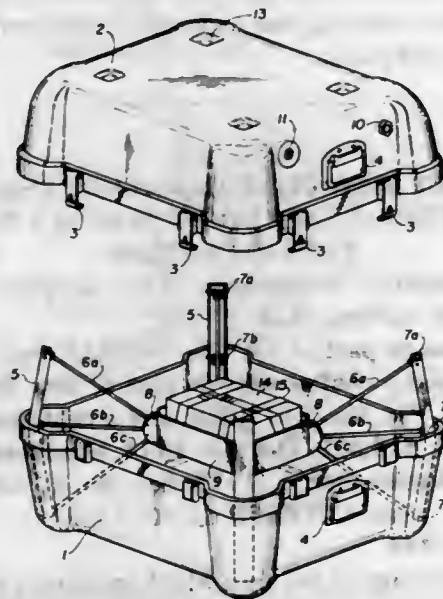
Filed Jan. 12, 1976, Ser. No. 648,260

Claims priority, application Germany, Jan. 18, 1975, 2501913

Int. Cl.<sup>2</sup> B65D 81/10, 85/30

U.S. Cl. 206—521

10 Claims



1. A shipping container comprising:
  - a. a shell including a plurality of parts and connecting means for releasably connecting said parts,
    1. the connected parts of the said shell bounding a cavity;
  - b. a plurality of elongated, rigid base members mounted on said shell in said cavity in spaced relationship;
  - c. a set of three elongated, resilient tension elements associated with each base member,

1. each tension element having first and second longitudinally terminal portions;
  - a. three first fastening means longitudinally spaced on each base member and respectively fastening the first longitudinally terminal portions of the associated tension elements to the base member,
    1. one of said three first fastening means being interposed between the other two first fastening means,
  2. the tension elements fastened to said base member by said other two first fastening means being more resilient than the tension element fastened to said base member by said one first fastening means;
- e. second fastening means fastening the second longitudinally terminal portions of said tension elements associated with each base member to each other; and
- f. attaching means for attaching said second fastening means to a load suspended in said cavity by said tension elements,
  1. said associated tension elements converging from said first toward said second fastening means.

4,013,171

## CARD SELECTOR

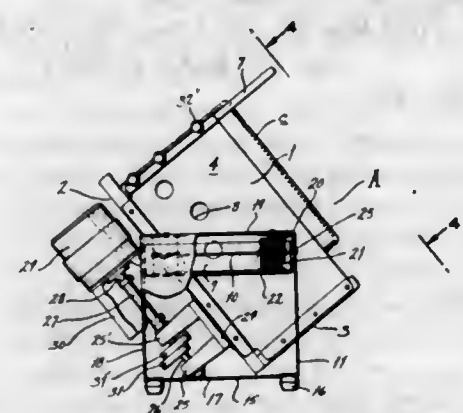
Albert William Ferrin, Defiance, Mo., and John G. Callos, Youngstown, Ohio, assignors to A. W. Ferrin, Beatrice Ferrin, Donald H. Stephen, Trustees of the Lectrolog Company, Defiance, Mo.

Filed Jan. 2, 1976, Ser. No. 646,396

Int. Cl.<sup>2</sup> B07C 5/12

U.S. Cl. 209—80.5

3 Claims



1. In combination with data receiving cards having perforations adjacent the marginal portions of such cards and preselected perforations of each card opening through the adjacent margin, a card selector machine comprising a casing, a card assemblage cradle having a rear wall, a lower end wall, and parallel side walls, said cradle being open at the front end and upper end thereof, means resiliently mounting said cradle upon said casing in an attitude wherein its major axis is at an angle of less than 90° to the vertical whereby said rear wall inclines downwardly and forwardly and said lower end wall inclines upwardly and forwardly, means located within said casing and rearwardly of said cradle rear wall effecting vibrational movement of said cradle, the side walls of said cradle being of greater length than that of the data receiving cards, said cradle side walls having opposed edge portions at the ends thereof remote from said lower end wall, said rear wall projecting beyond the opposed edge portions of said cradle side walls, means suspending an assemblage of data receiving cards within said cradle from said cradle side wall opposed side edge portions wherein the upper ends of said cards within such assemblage are mutually aligned and project above said side edge portions, the rearward edges of said cards of said assemblage being restingly supported by said cradle rear wall, said card suspending means being engageable within predetermined aligned perforations in the upper margins of the cards of the received assemblage whereby upon vibration of said cradle cards in which all of the engaged perforations open through the adjacent margin will lose contact with the sus-

pending means and descend toward the lower end of said cradle for retention thereby together with said rear wall for collection pending facile removal.

4,013,172

## FILE CARD HOLDER

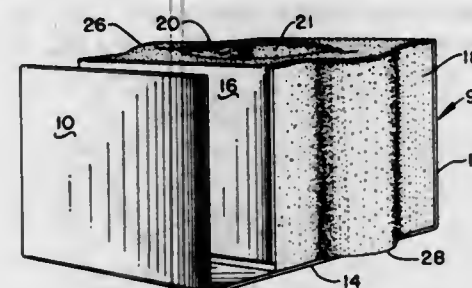
Dave O. Foreman, 707 SE. Avenue A, Andrews, Tex. 79714

Filed July 10, 1975, Ser. No. 594,699

Int. Cl.<sup>2</sup> B42F 7/10

U.S. Cl. 211—51

4 Claims



1. A file card holder within which there can be stored a plurality of cards of varying thickness and any length comprising:
  - an upwardly opening, U-shaped support member having a forward and a rearward wall surface; a body of deformable material having a forward wall surface which can be yieldably moved toward a rearward wall surface; and a plate member;
  - means attaching said plate member to said forward wall surface of said body;
  - means attaching said rearward wall surface of said body to said rearward wall surface of said support member such that said plate member is resiliently urged toward said forward wall surface of said support member;
  - said body of deformable material is made of a foamed plastic which is apertured to provide an upwardly opening, card receiving opening therein; whereby:
  - said plate member can be yieldably urged away from said forward wall of said support member, thereby providing a card receiving space therebetween, within which cards may be stored.

4,013,173

## STAND INCLUDING MOVEABLE SUPPORTS FOR ACCOMMODATING ARTICLES OF DIFFERENT HEIGHTS AND DEPTHS

Willem Snijders, Tilburg, Netherlands, assignor to Snijders

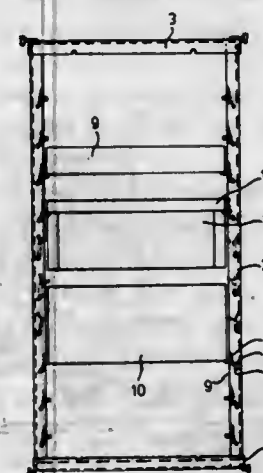
Metaalwarenfabriek B.V., Tilburg, Netherlands

Filed Feb. 24, 1975, Ser. No. 552,009

Int. Cl.<sup>2</sup> A47F 3/14

U.S. Cl. 211—126

6 Claims



1. A stand adapted to receive articles comprising: a frame;

a plurality of support means adapted to support said articles and attached to said frame means, said support means including a tapered portion where said support means first makes contact with an inserted article, said tapered portion being such that when viewed in the direction of insertion of an article it gradually increases in width; a pivotal shaft associated with said support means for displacing said support means transversely to the direction of insertion of an article into said stand, said pivotal shaft extending parallel to the direction of insertion of an article into said stand, and being pivotally received in the frame of said stand; and, stop means for limiting the rotation of said support means, wherein said support means tends to return to its original starting position after an article is removed from said stand.

4,013,174

## SWING DRIVE WITH AUTOMATIC SHUT-DOWN CONTROL

James G. Morrow, Sr., and David J. Pech, both of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.

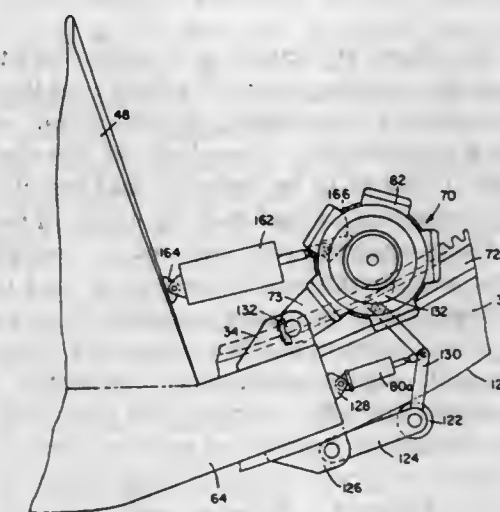
Continuation-in-part of Ser. No. 522,787, Nov. 11, 1974, Pat. No. 3,949,881. This application Oct. 22, 1975, Ser. No. 624,765

The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> B66C 23/86

U.S. Cl. 212—68

5 Claims



1. A swing drive assembly for a load handling device having upper works rotatable about a central pivot and supported by rollers on a roller path disposed substantially concentrically with said pivot, comprising, in combination, a frame element mounted on said upper works and extending outwardly therefrom to adjacent said roller path, means defining a ring gear secured to one peripheral edge of said roller path, mounting means on said frame element for journalling a pinion gear for normal engagement with said ring gear and for moving said pinion gear toward and away from said ring gear, a guide flange mounted on said roller path concentric with said ring gear, a guide roller supported by said frame element and journaled for engagement with said flange, means including a reversible hydraulic motor for driving said pinion against said ring gear so as to swing said upper works about said pivot, first actuator means including a hydraulic actuator for urging said pinion toward said ring gear and said roller into engagement with said flange so as to maintain substantially constant backlash between said pinion and ring gear regardless of eccentricities in said roller path, hydraulic pump means for selectively pressurizing said motor and for constantly pressurizing said first actuator during normal swing drive operation, and means for bypassing the flow of hydraulic fluid around said motor and second actuator means including a compression spring for



urging said pinion toward said ring gear and said roller into engagement with said flange when said pump means is shut down.

4,013,175

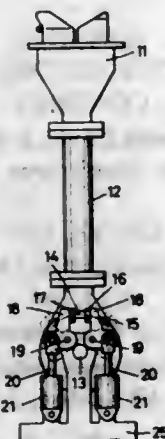
# DEVICE FOR CONTROLLING THE RETURN OF A CENTRAL COUPLING FOR RAIL VEHICLES TO ITS CENTRAL POSITION

Willi Klein, Remscheid; Henning Rocholl, Radevormwald, and Reinhard Naydowski, Remscheid, all of Germany, assignors to Bergische Stahl-Industrie, Remscheid, Germany  
Filed Sept. 23, 1975, Ser. No. 615,843  
Claims priority, application Germany, Sept. 24, 1974, 2445460

Int. Cl.<sup>2</sup> B61G 7/12

U.S. Cl. 213—20

15 Claims



1. A device for adjustably returning to central position in a horizontal plane the coupling head of central couplings, especially for automatically connecting individual rail vehicles, which includes in combination: a coupling rod, housing means for mounting on a vehicle to be coupled, said coupling head being pivotally connected to said housing means through the intervention of said coupling rod, cam means movable in a horizontal plane and operatively connected to said coupling rod, two adjustable abutment means respectively arranged on opposite sides of said cam means for cooperation therewith, and power operable means operatively connected to said abutment means and operable to move said abutment means along said horizontal plane from a first position corresponding to the central horizontal position of said coupling rod in which said cam means is clamped in between said abutment means to a second position in which said coupling rod occupies the position of its maximum lateral horizontal deviation from said first and thereby said central position, and vice versa, dish-shaped means having said cam means arranged thereon and being directly connected to said coupling rod, and a cushion of rubber material, said cam means being arranged on said dish-shaped means, and said dish-shaped means being frictionally connected to said coupling rod through said cushion, a sliding member and guiding means for guiding said sliding member, one end of said intermediate lever means being pivotally connected to said sliding member, and said sliding member being rigidly connected to said piston rod.

4,013,176

# UNITARY WORK CHANGER FOR A MACHINING CENTER

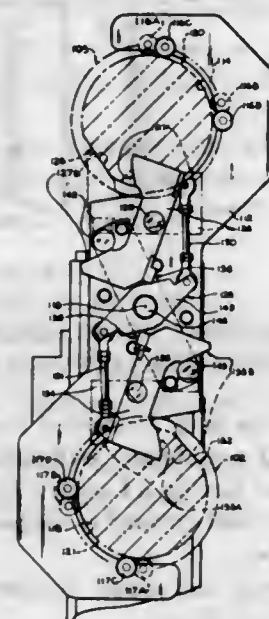
Earl R. Lohnes, Milwaukee, and John J. Schachte, Wauwatosa, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.  
Continuation of Ser. No. 12,057, Feb. 17, 1970, abandoned.  
This application Dec. 4, 1972, Ser. No. 311,851  
Int. Cl.<sup>2</sup> B25J 3/00

U.S. Cl. 214—1 BD

3 Claims

1. In a machine tool having a frame; a member receiving operating support and a member re-

ceiving storage support carried in spaced apart positions by said frame; a member gripping transfer arm pivotally movable from parked position to effect a bodily interchange of members between said supports; first power control means operative to pivot said transfer arm from said parked position into gripping engagement with the members respectively carried by said supports; second power control means operative to pivot said transfer arm in a transfer movement to bodily interchange the positions of the members gripped thereby between said



supports to again be received in said supports in interchanged positions; third power control means operative to pivot said transfer arm to parked position; and, velocity control means connected to be selectively actuated by movement of said transfer arm and connected to effect gradual acceleration and gradual deceleration of said transfer arm as well as to regulate its uniform velocity between the acceleration and deceleration periods to control each of its three cycles of movement including approach, transfer and return movements.

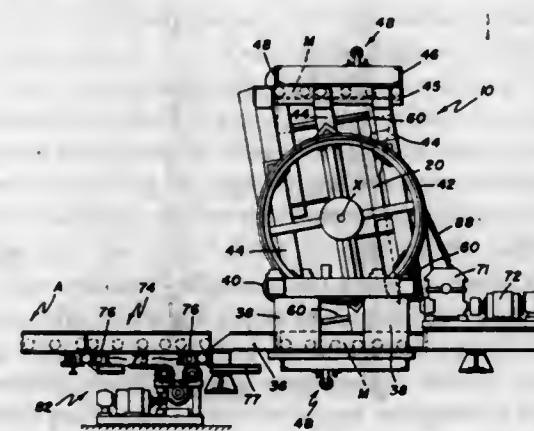
4,013,177  
COIL INVERTER

Roger Kinnicutt, Jr., and William J. Hill, both of Holden, Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed June 2, 1975, Ser. No. 582,612  
Int. Cl.<sup>2</sup> B65G 7/00

U.S. Cl. 214—1 Q

5 Claims



1. Apparatus for inverting a cylindrical coil, comprising: a stationary housing; a cradle mounted on said housing for

rotation about a turning axis, said cradle having opposed roller table modules on opposite sides of said turning axis; first and second pallets, each having a generally U-shaped base with upstanding support members against which a coil is inclined when carried on the pallet base; clamping means for clamping said first pallet with a coil carried thereon to one of said roller table modules and for clamping said second pallet to the other of said roller table modules, the coil thus being confined radially by the support members of both said first and second pallets; holding means on said cradle for axially confining the coil; and, means for rotating said cradle about said turning axis to invert the coil, whereupon when said holding means is released, the coil will be received on said second pallet.

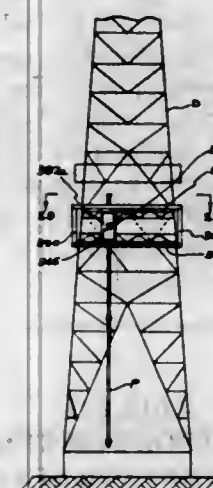
4,013,178  
PIPE RACKER

Cicero C. Brown, deceased, late of Houston, Tex., and by Joe R. Brown, executor, P.O. Box 19236, Houston, Tex. 77024  
Filed Jan. 17, 1975, Ser. No. 541,709

Int. Cl.<sup>2</sup> E21B 19/00

U.S. Cl. 214—2.5

24 Claims



1. A pipe manipulating system comprising:

- generally tubular housing means;
- arm means mounted in and constrained by said housing means, and longitudinally extendable and retractable with respect to said housing means;
- pipe gripping means mounted on, and movable with, said arm means;
- slip means included in said pipe gripping means;
- first power means comprising fluid pressure means to advance and retract said slip means to selectively engage and support, or release, said pipe;
- mounting means supporting said housing means, and providing substantially vertical and substantially horizontal mobility to said housing means and to said arm means;
- second power means to longitudinally extend and retract said arm means with respect to said housing means;
- third power means to provide substantially vertical locomotion to said housing means and to said arm means; and
- fourth power means to provide substantially horizontal locomotion to said housing means and to said arm means.

4,013,179

# APPARATUS FOR GROUPING COOKIES PRIOR TO PACKAGING

René Fluck, Neuhausen am Rheinfall, Switzerland, assignor to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

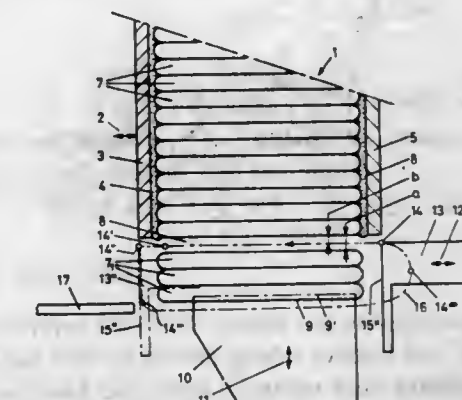
Filed Sept. 18, 1975, Ser. No. 614,594

Claims priority, application Switzerland, Sept. 18, 1974, 12664/74

Int. Cl.<sup>2</sup> B65G 59/06

U.S. Cl. 214—8.5 K

2 Claims



1. In apparatus for forming a succession of fragile flat objects into groups and including a supply shaft having a vertical outlet portion presenting an outlet end at its bottom, with a stack of such objects being disposed in the vertical outlet portion of the shaft, a clamping device associated with the shaft and movable between the clamping position in which it holds objects in the shaft and a release position in which it permits such objects to descend in the shaft, a depository member disposed below the outlet end of the shaft to receive objects leaving the outlet end, and a pusher member movable both transversely and parallel to the longitudinal direction of the vertical outlet portion of the shaft for bringing objects leaving the outlet end of the shaft when the clamping device is in its release position to the depository member, the improvement wherein: said depository member is mounted for movement parallel to the longitudinal direction of said vertical outlet portion of said shaft, between a raised position and a lowered position; and said pusher member is mounted for movement in a manner to bring objects to said depository member when said depository member is in its raised position and to push such objects away from said depository member when said depository member is in its lowered position.

4,013,180

# DEVICE FOR THE REMOVAL OF BULK MATERIAL FROM BULK MATERIAL DUMPS

Günter Piontek, Drevenack; Heinz Firlay, Bochum, and Heinz Westheider, Oberhausen, all of Germany, assignors to Deutsche Babcock & Wilcox Aktiengesellschaft, Oberhausen, Germany

Filed May 16, 1975, Ser. No. 578,348

Claims priority, application Germany, May 16, 1974, 2423715; Mar. 12, 1975, 2510665

Int. Cl.<sup>2</sup> B65G 65/28

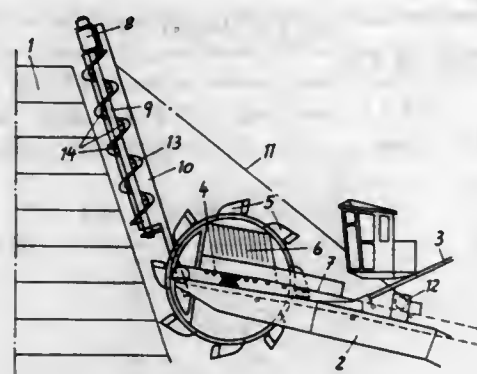
U.S. Cl. 214—10

9 Claims

1. A device for removal of bulk materials from bulk material storage sites comprising, in combination, pickup means; breakup means adaptable to the inclination of the bulk material storage site, said breakup means comprising a rotatable shaft roller having blades inclined with respect to the longitudinal axis of the shaft roller and comprising conveying elements, said pickup means comprising bucket wheel means with diameter smaller than the height of said storage site, said breakup means being in front of said bucket wheel means and extending from the cutting surface of said bucket wheel means; said breakup means operating cooperatively with said



bucket wheel means and conveying bulk material to the front of the buckets of said bucket wheel means; boom means for carrying said bucket wheel means, said breakup means being mounted on said boom means, said breakup means contacting said storage site above said bucket wheel means, whereby said breakup means is in contact with the storage site prior to contact of the bucket wheel means with said storage site, said inclined blades removing a cut section from said storage site



and conveying throwlessly the material in said section in front of the buckets of said bucket wheel means so that said bucket wheel means picks up bulk material from the base portion of said storage site and from the portion lying above the base portion, said breakup means removing a cut section from the storage site in the form of broken material, said broken material being carried downward along the axis of said shaft roller to the front of the buckets of said bucket wheel means.

4,013,181

## LOAD-COMPACTING VEHICLE

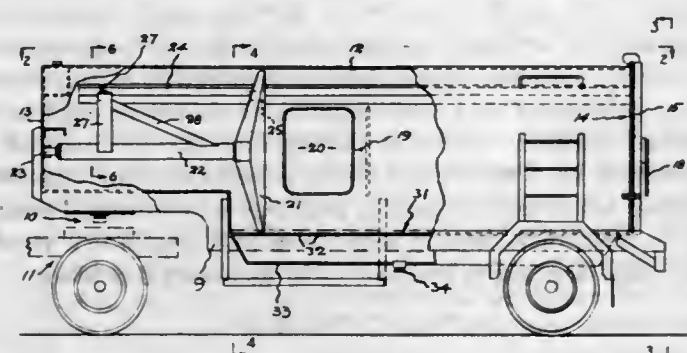
Raymond Neils Johnson, 6/307 Bondi Road, Bondi, New South Wales, Australia

Filed June 23, 1975, Ser. No. 589,549

Int. Cl.<sup>2</sup> B60P 1/00

U.S. Cl. 214-82

6 Claims



1. A load-compacting vehicle which includes plunger mounting means comprising:  
a pair of parallel rails which extend longitudinally within the vehicle barrel adjacent the top thereof and for substantially the full length thereof;  
first runner elements on said plunger by which it is mounted on said rails for load-compressing movement longitudinally of said barrel;  
an outrigger structure fixed on the ram device on which said plunger is mounted, and  
second runner elements on said outrigger structure which ride said rails and are spaced, axially of said barrel, from said first runner elements,  
said outrigger structure having a triangular frame spaced from said plunger and having a first apex portion fixed to a cylinder forming part of said ram device and second and third apex portions at which said second runner elements are respectively located; and a pair of diagonal struts having trailing ends fixed to said cylinder adjacent said plunger and leading ends joined to said triangular frame adjacent said second and third apex portions.

4,013,182

## DETACHABLE COUPLING SYSTEM

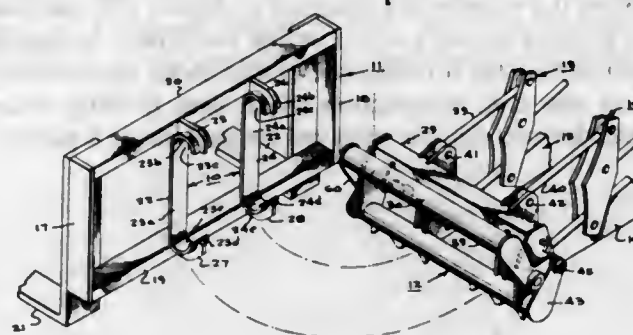
Samuel S. Pratt, Core, W. Va., and Peter N. Lalos, Gaithersburg, Md., assignors to Rockland, Inc., Wintergarden, Fla.

Filed Apr. 21, 1975, Ser. No. 569,684

Int. Cl.<sup>2</sup> E02F 3/81

U.S. Cl. 214-145 A

15 Claims



2. A system for detachably coupling an attachment to a prime mover provided with a mounting means and an actuating means comprising a female device mountable on said attachment and a collapsible male assembly mountable on said mounting means on said prime mover, cooperatively engagable with said female device, said male assembly being operatively connectable to said actuating means and movable thereby between a collapsed, inoperative condition and an extended, operative condition operatively engageable with said female device in coupling relation when said male assembly is positioned adjacent said female device in registry therewith, the male assembly comprising a collapsible mechanical linkage including components cooperatively engagable with said female device in coupling relation when the male assembly is in said extended, operative condition, and means mounted on said male assembly for selectively locking said collapsible linkage in said extended, operative condition including a fluid actuating piston and cylinder assembly mounted on a component of said collapsible linkage and having a piston thereof adapted to extend and be inserted through a pair of registered openings in a pair of components of said collapsible linkage when said collapsible linkage is in the extended, operative condition.

4,013,183

## APPARATUS AND METHOD FOR STACKING BRICKS IN PREPARATION FOR STRAPPING

William F. Milholen, Siler City, and Cletus E. Lineberry, Staley, both of N.C., assignors to Forrest Paschal Machinery Co., Siler City, N.C.

Division of Ser. No. 469,649, May 14, 1974, Pat. No.

3,924,756. This application June 25, 1975, Ser. No. 590,260

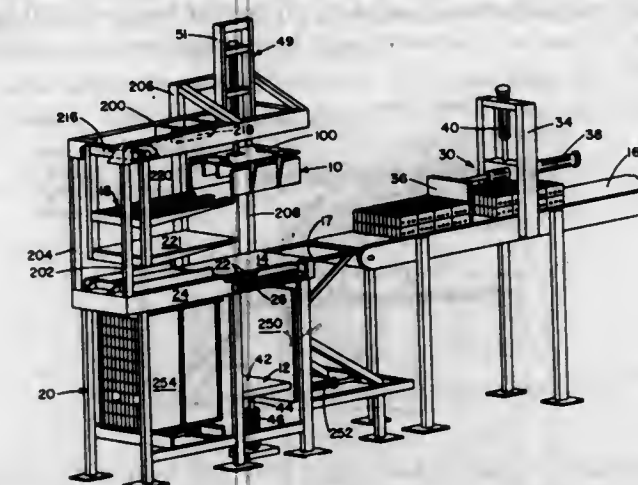
Int. Cl.<sup>2</sup> B65G 57/26

U.S. Cl. 214-152

2 Claims

1. A method for stacking double layer courses of cured bricks, each of said layers having a plurality of rows and columns of bricks therein, in preparation for a subsequent strapping operation, said method comprising the steps of:  
a. receiving successive ones of said courses on a receiving plate;  
b. applying gripping pressure simultaneously against all of the row ends of each successive course while still supported by said receiving plate above an elevator means;  
c. removing said receiving plate to provide open communication between said elevator means and said gripped and supported course;  
d. raising said elevator means until it reaches a point substantially in engagement with the underside of the lowermost layer of said course;  
e. releasing said course onto said elevator means;

f. lowering said elevator means to a point where the upper surface of the uppermost layer of said course is at a point beneath the level of said receiving plate; and



g. repeating steps (a) through (f) until a stack is formed.

4,013,184

## TRAILER FOR LIFTING AND TRANSPORTING A CONTAINER

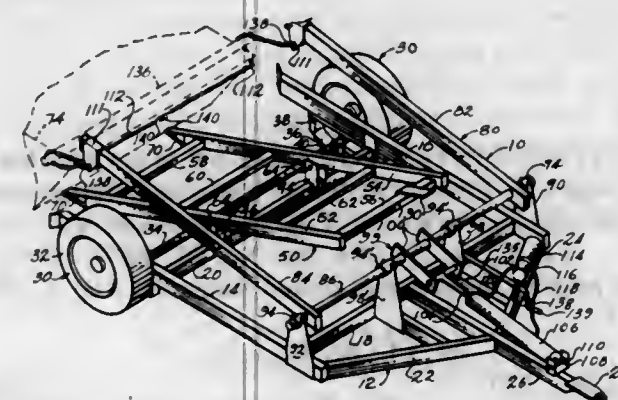
James H. Lacy, Lawrenceville, Ga., assignor to Lacy's Metal Products, Inc., Lawrenceville, Ga.

Filed Sept. 22, 1975, Ser. No. 615,699

Int. Cl.<sup>2</sup> B60P 1/28

U.S. Cl. 214-505

17 Claims



1. In a vehicle for loading and unloading and transporting a large container:  
a vehicle trailer having a trailer drawbar with a trailer coupling thereon,  
a rigid trailer frame chassis which is normally stationary when the container is being lifted on or off the trailer, wheels on the opposite side of said trailer frame chassis for engaging the ground while said trailer is moving thereover,  
container support means on said trailer chassis for supporting said container and said container support means comprising a movable support frame extending transversely across and being movably attached to said trailer frame chassis to receive said container, said support frame being inclined longitudinally from normal horizontal position in a direction from the ground upwardly over the trailer frame chassis for loading and unloading a container, and to move during loading or unloading of said container to shift with the longitudinal movement of said container thereby supporting at least part of the weight of said container and also guiding same,  
a power means on said trailer chassis for movement thereon and for attachment to said container to move same,  
said power means comprising a longitudinal lifting frame having one end thereof attached to said container and the other end attached to the trailer for movement from a

forwardly position in which said container is in place to a rearwardly position for loading said container on said movable frame, and means for attaching and detaching the end of said lifting frame to said container, said means removably attaching the ends thereof to said lifting frame and to said container, respectively, and being relatively movable on said lifting frame as said container is moved along said support frame and vice versa when said container is unloaded, said lifting frame pulling said container onto said movable frame and therealong as said movable frame shifts into position on said chassis with said container thereon.

4,013,185

## LIFT TRUCK ATTACHMENT

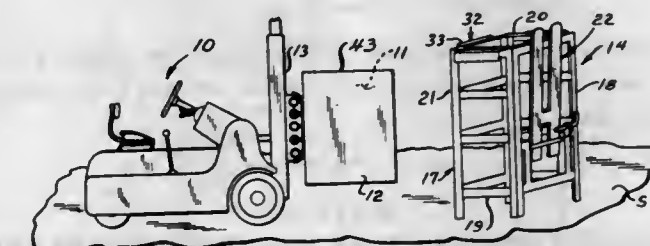
William Lee Bratton, St. Louis, Mo., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 15, 1975, Ser. No. 541,224

Int. Cl.<sup>2</sup> B66F 9/12

U.S. Cl. 214-621

16 Claims



1. An attachment for selectively converting a transportive squeeze truck to a fork lift truck, the squeeze truck having a pair of horizontally spaced squeeze members, means for selectively urging the squeeze members together to hold an object to be carried therebetween and means for lifting the squeeze members to lift the load carried therebetween, said attachment comprising: a box frame having a bottom portion adapted to stand on a support surface, said frame being constructed to prevent destructive squeezing deformation thereof by the squeeze members of a squeeze truck to permit the frame and a load thereon to be carried for transport by the truck; fork means movably carried by the frame substantially above said bottom portion to extend in a lift position horizontally therefrom a preselected distance above the support surface for disposition under a load to be lifted and transported by the truck for placement of the bottom portion on the support surface with the load supported at said preselected distance above the support surface; means for selectively retaining the fork means in a retracted position; support means on said frame arranged to overlie a portion of the truck squeeze members when the squeeze members are caused to engage the sides of the frame for squeezingly gripping the frame, whereby said support means provide a positive stop limiting movement of said frame downwardly between the squeezing members during a load carrying operation; and means on a rear portion of said frame defining an upwardly turned hook for hooking under a load to be lifted and transported by the truck.

4,013,186

## TIRE PRESS UNLOADER

Dale S. Barton, Columbiana; Ben Stoyanov, Akron, both of Ohio, and Robert M. Staats, Beaver Falls, Pa., assignors to NRM Corporation, Akron, Ohio

Filed Dec. 24, 1974, Ser. No. 536,252

Int. Cl.<sup>2</sup> B65G 61/00

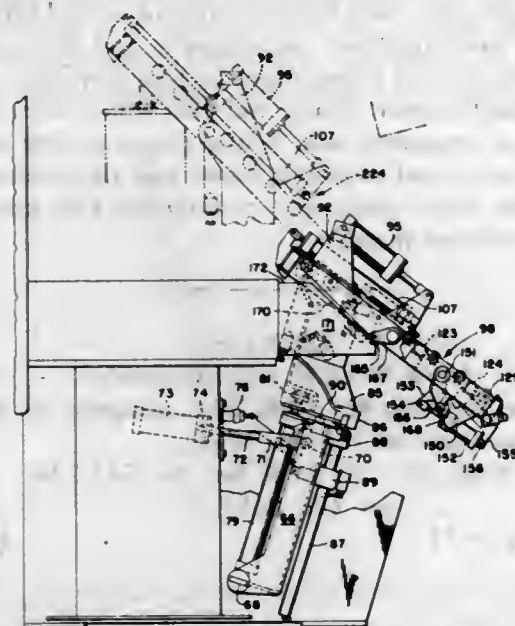
U.S. Cl. 214-660

33 Claims

1. A tire unloader for a tire press of the type including a stationary bottom mold section and a movable top mold section, the latter being movable to open and close the press, said unloader comprising a platform having a proximal and distal end, an elevator stanchion pivotally supporting said platform at its proximal end, said stanchion being pivotally mounted for



swinging the platform above the bottom mold section when the press is open, support means underlying the distal end of said platform to rigidify the same when thus in position to



receive the tire, and means responsive to the pivoting of said stanchion to move said support means to and from an operative position.

4,013,187

# HANGER CONSTRUCTION FOR SEMIRIGID PLASTIC CONTAINER

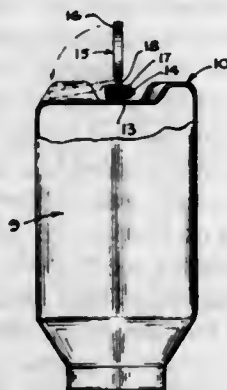
Harold Anthony Betka, Waukegan, Ill., assignor to Abbott Laboratories, Chicago, Ill.

Filed May 28, 1974, Ser. No. 473,609

Int. Cl.<sup>2</sup> B65D 23/00

U.S. Cl. 215-100 A

7 Claims



6. A plastic container having an integral base, an elongated, inverted, substantially T-shaped rib integral with and depending from said base, and a loop integrally joined to an elongated, substantially C-shaped bar complementary to and slidably affixed onto said T-shaped rib.

4,013,188

# INDUCTION SEALED CLOSURE

George C. Ray, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 1, 1973, Ser. No. 337,023

Disclosure was also published under second Trial Voluntary Patent Program on Mar. 30, 1976

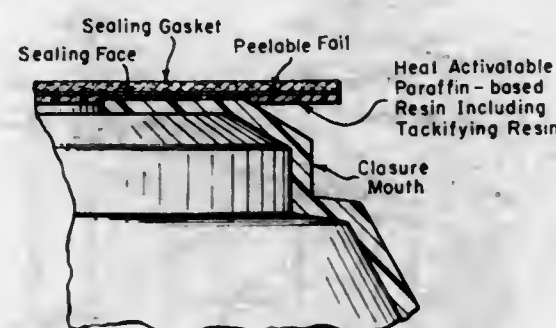
Int. Cl.<sup>2</sup> B65D 53/04, 53/06

U.S. Cl. 215-347

9 Claims

1. In an improved hermetically sealed package, an hermetic closure in combination comprising a closure mouth having a closure face, said face having a synthetic organic thermoplastic of a first melting point, and an abutting sealing membrane sealed to said closure face consisting essentially of an electrically conductive foil ply less than 5 mils thick having a frangible paraffin-based wax ply coated thereon, said wax ply having

a melting point less than the first melting point and having been heated to above its own melting point but less than said first melting point while in abutting face-to-face pressure contact with said closure face and forming a continuous caulking seal with said face, said wax ply having been caused to flow in the region of abutment and being deformed to caulk the



sealing face of the closure, said wax ply having a tackifying agent present in a minor weight percent thereof, the tensile strength of the wax ply being less than 60 psi and less than that of said synthetic organic thermoplastic material of said face whereby the ply is operative to fail in a cleavage pattern in the coating per se.

4,013,189

# INSULATION SYSTEM FOR LIQUIFIED GAS TANKS

Roger Cambridge Flocks, Tittlesfold Farm near Billingshurst, England, assignor to Conch, Lng, Moorestown, N.J.

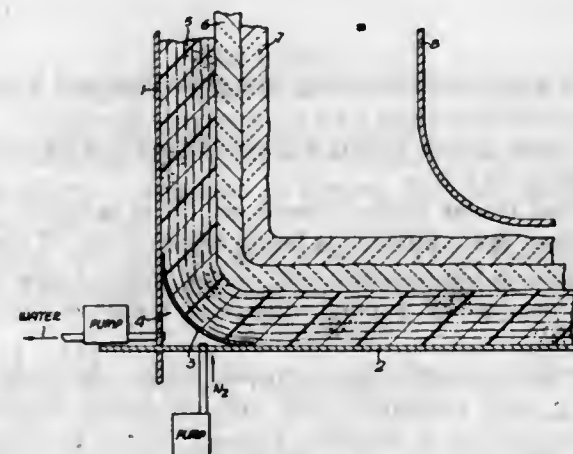
Filed Aug. 7, 1975, Ser. No. 602,807

Claims priority, application United Kingdom, Aug. 8, 1974, 35094/74

Int. Cl.<sup>2</sup> B65D 8/24

U.S. Cl. 220-9 LG

7 Claims



1. A thermally-insulating container comprising in combination:

- a. at least two adjacent metallic walls defining an angular corner;
- b. a load-bearing metallic corner plate extending across and spaced from said angular corner, said plate (i) being resiliently flexible; (ii) having a concavely curved surface; and (iii) being rigidly attached by welding to the said at least two adjacent walls along its edges; and
- c. an inner lining of a thermally insulating material which is (i) a foamed plastic (ii) applied directly onto said walls and said corner plate.

4,013,190

# FLAME ARRESTING AND EXPLOSION ATTENUATING SYSTEM

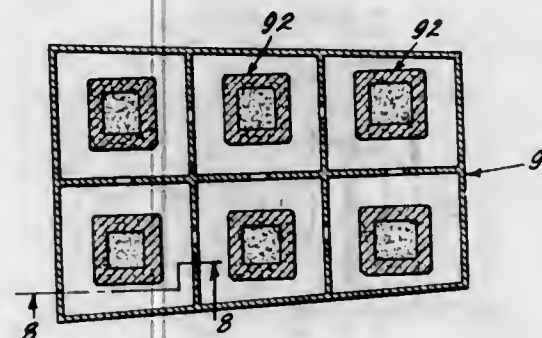
Edwin W. Wiggins, Bridgeton, and Quentin C. Malmberg, Ferguson, both of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation-in-part of Ser. No. 252,104, May 10, 1972, abandoned. This application June 27, 1974, Ser. No. 483,940

Int. Cl.<sup>2</sup> B65D 1/24; B64D 37/08

U.S. Cl. 220-22

1 Claim



1. An inerting tank construction for containing ignitable fuels which may exist simultaneously therein in a liquid phase and a gaseous phase comprising a structural enclosure, partition means in said structural enclosure dividing the interior thereof into a plurality of individual fuel cells, said partition means having at least one transfer aperture between each pair of adjacent fuel cells to permit fluid communication therebetween so that all of the cells in said enclosure are in communication with each other, and a relatively porous hollow member located in each of said fuel cells further to divide said cells into distinct cell portions, each of said porous members being formed of an open celled material having a pore size and pore density to permit relatively unrestricted liquid and gas flow therethrough and prevent substantial pressure differential from appearing thereacross, at least one of said porous members being located in each associated fuel cell in position to be spaced from all of the partition means which form the said associated fuel cell.

4,013,191

# LOCKABLE CLOSURE CAP

Theodor Gerdes, Langenfeld, Germany, assignor to Blau KG Fabrik fur Kraftfahrzeugteile, Langenfeld, Germany

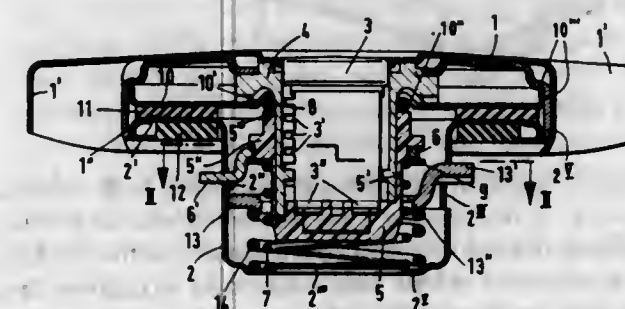
Filed Sept. 16, 1975, Ser. No. 613,830

Claims priority, application Germany, Sept. 18, 1974, 2444477

Int. Cl.<sup>2</sup> B65D 51/16, 55/14

U.S. Cl. 220-203

11 Claims



1. A lockable closure cap for containers and the like, comprising a cap unit; a cylinder lock mounted on said cap unit for rotation relative thereto about an axis between a locking and an unlocking position; a hollow cylindrical element surrounding and connected to said cylinder lock for shared rotation therewith and having an eccentric outer collar; a locking ring having a catch projection which extends radially thereof, supported on said eccentric outer collar; and retained in said cap unit against rotation about said axis but with freedom of

movement substantially radially of said axis in response to the rotation of said eccentric outer collar so that said catch projection moves between an extended and a retracted position as said cylinder lock rotates between said locking and unlocking position; and sealing means interposed between said cylindrical element and said cap unit and operative for preventing the contents of the container from penetrating into and escaping through said cylinder lock.

4,013,192

# PILL COUNTER

Austin E. Pillon, Sandwich West, Canada, assignor to ITL Industries, Inc., Newark, Ohio

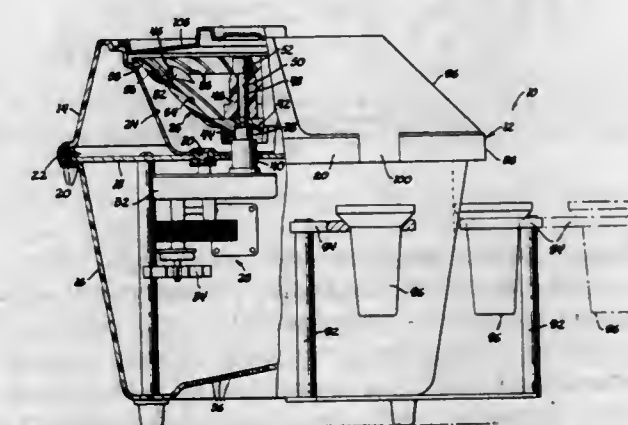
Filed Feb. 18, 1976, Ser. No. 658,984

Claims priority, application United Kingdom, May 5, 1975, 18766/75

Int. Cl.<sup>2</sup> B65G 47/44; B65B 57/20

U.S. Cl. 221-7

13 Claims



1. Apparatus for counting and dispensing pills and the like comprising: a housing; a vertical shaft rotatably mounted in said housing; a pill bowl fixedly mounted on said shaft for rotation therewith; said bowl having a lower portion for receiving pills from a stock bottle, an intermediate annular ledge above the lower bowl portion, and an upper annular edge above the annular ledge; means for selectively rotating said bowl; a stationary guide received within the bowl to guide the pills from the lower bowl portion upwardly to the annular ledge during bowl rotation and then along the ledge in single file and upwardly over the upper annular edge, said stationary guide having a central hub rotatably receiving said vertical shaft; a head detachably mounted in said shaft at the upper end thereof for engaging said hub and preventing axial displacement of said guide from said shaft, an exposed, generally Y-shaped slide on the housing including a main slide portion for receiving the pills guided over the bowl edge and a pair of branch slide portions constituting prescription bottle and stock bottle slide portions; said branch slide portions having a common junction with the main slide portions so as to receive pills therefrom and to guide the pills to prescription or stock bottles, respectively; each of said slide portions having an exposed channel shape with a bottom wall and a pair of side walls with the bottom walls of said branch portions being continuous with the bottom wall of the main slide portion from said common junction to permit the slide portions to be cleaned with a continuous wiping motion; each of said slide portions having a downwardly inclined orientation with an exposed channel shape so pills slide downwardly therethrough in a guided manner during use of the apparatus; means defining a stop edge at the inlet end of said main slide portion; said guide having a tongue portion that projects over the edge of said bowl into engagement with said stop portion to prevent rotation of said guide during rotation of said bowl and vertical shaft; a gate mounted at the common junction of the main slide portion with the prescription and stock bottle slide portions so as to selectively guide the pills from the main slide portion to either the stock or prescription bottle said portion; and control means for sensing the number of pills that have



passed through the main slide portion and for positioning the gate to guide the pills to the prescription bottle slide portion until a predetermined number of pills have been sensed and then to the stock bottle slide portion.

4,013,193

# APPARATUS FOR DISPERSING PLANAR NON-CIRCULAR OBJECTS

Johannes Lorsch, An der Bleiche 49, D-4172 Straelen, Germany

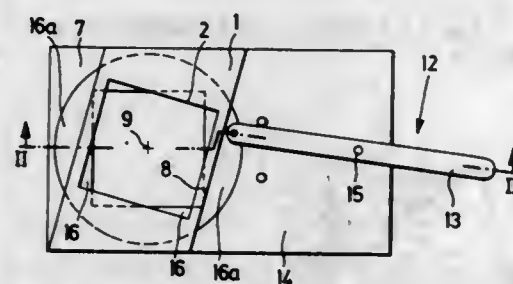
Filed Sept. 16, 1975, Ser. No. 613,736

Claims priority, application Germany, Sept. 23, 1974, 2445338

Int. Cl.<sup>2</sup> B65G 59/00

U.S. Cl. 221-264

6 Claims



1. Apparatus for dispensing single, essentially planar, non-circular, uniform, articles stacked in a delivery shaft including a dispensing mechanism arranged below said delivery shaft, said dispensing mechanism comprising a rotary valve having an aperture for receiving a lowest one of said articles, said valve being rotatable about a center axis of said delivery shaft; a base member disposed below said rotary valve, each of said delivery shaft and said base member having an aperture corresponding in shape to each other and to the articles being dispensed, said delivery shaft aperture and said base member aperture being angularly displaced relative to each other along said center axis; said base member having a center, said base member aperture being located to one side of the center of said base member; and a crank assembly linked to said rotary valve for providing reciprocating movement of said rotary valve between a first position aligned with said delivery shaft aperture and a second position aligned with said base member aperture; said crank assembly including an arm having one end linked to said rotary valve, and a free end extending beyond said base member, an intermediate portion of said arm being pivoted on a pin attached to said base member and located to the opposite side of the center, reciprocating movement of said free end of said arm remote to said rotary valve thereby imparting opposite reciprocating movement of said valve.

4,013,194

# DEVICE FOR METERING BY WEIGHT THE DELIVERY OF LIQUIDS

Filippo Moscarini, Rome, Italy, assignor to I.S.A.M. Istituto Sperimentale Auto e Motori S.p.A., Anagni (Frosinone), Italy

Filed May 13, 1975, Ser. No. 577,131

Claims priority, application Italy, May 14, 1974, 50985/74

Int. Cl.<sup>2</sup> B67D 5/38; G01F 1/86

U.S. Cl. 222-23

8 Claims

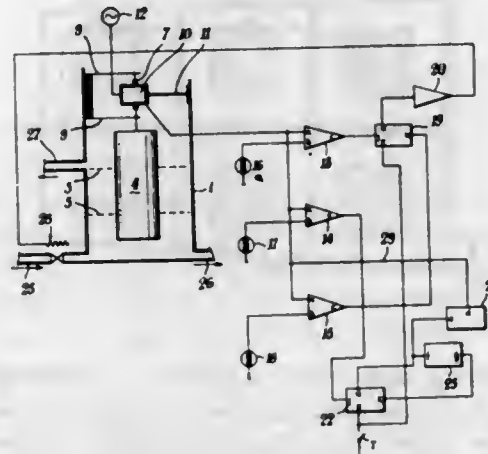
1. A device for measuring delivery of liquid by weight which eliminates the necessity for weighing a container comprising:

- a container for said liquid and an electrically controlled valve controlling the flow of said liquid to said container, a delivery aperture in said container for delivery of said liquid,
- a metering body immersed in said liquid,
- means supporting said metering body for limited movement in response to changes in liquid level in said container,

a mechanical-electrical transducer coupled to said metering body and producing electrical signals related to the movement of said metering body,

comparator means connected to said transducer producing a plurality of distinctive electrical signals when said body is in a corresponding plurality of distinctive positions as a result of various levels of said liquid,

a bi-stable device coupled to the output of said comparator means controlling the condition of an amplifier for operating said electrically controlled valve,



a second bi-stable device also coupled to the output of said comparator means, a timer for timing out a predetermined period in response to operation of said second bi-stable device and a digital indicator driven by said transducer when said timing means is timing out said predetermined period whereby the condition of said digital indicator at the conclusion of said predetermined period indicates the rate of liquid delivery.

4,013,195

# EXPULSION BLADDER

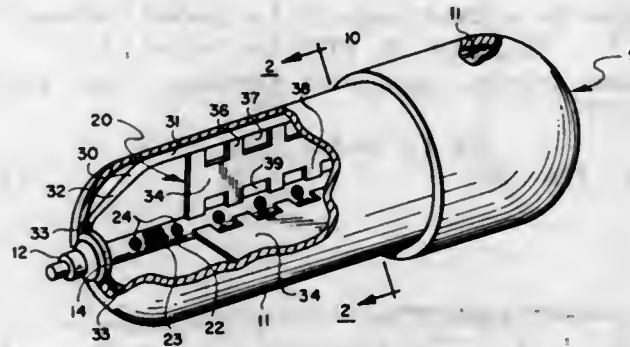
DeLacy F. Ferris, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 18, 1975, Ser. No. 550,408

Int. Cl.<sup>2</sup> B65D 35/28

U.S. Cl. 222-95

5 Claims



1. A liquid expulsion tank device containing both liquid and gas, said tank device having a framework inside of a bladder for controlling the deformation configuration of the bladder as it is being collapsed within said tank, said expulsion device further having a screen sufficient to produce a surface tension barrier to block passage therethrough of said gas, the improvement which comprises:

- means to keep a constant cumulative liquid and inert gas volume in said bladder prior to liquid expulsion from said tank whereby an ullage gas bubble within said bladder is greater than the pressure of the atmosphere surrounding said expulsion device to maintain said bladder pressed out against the interior walls of said tank to prevent bladder flexure during tank temperature cycling and liquid sloshing.

4,013,196

# PNEUMATIC DISPENSING APPARATUS FOR FINELY DIVIDED DRY SUBSTANCES

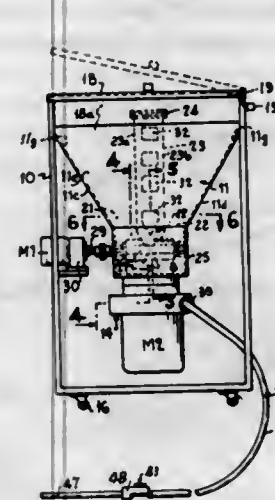
Amos Hines, Jr., 506 Franklin St., Forrest City, Ark. 72335

Filed June 2, 1975, Ser. No. 582,887

Int. Cl.<sup>2</sup> B65G 53/40

U.S. Cl. 222-193

2 Claims



1. Portable apparatus for pneumatically distributing finely divided substances such as dry powdered or granulated chemicals, comprising:

- a hopper (11) for normally supporting a bulk of said substance, said hopper having a restricted discharge opening (20) at its lower portion through which the substance tends to flow by gravity;
- means (23) movable transversely of said opening (20) for agitating said substance;
- a housing (35) having an inlet opening (38) a discharge opening (39) and having a fan therein;
- an imperforate conduit (25) connecting said hopper discharge opening to said housing inlet opening (38);
- said hopper opening, conduit, fan and housing inlet opening being axially and vertically aligned to cause the substance to be conveyed in a rectilinear path from said hopper to said fan under the concurrently acting forces of gravity, agitation and air suction;
- said hopper (11) comprising a plurality of connected trapezoidal plate sections (11c, 11d, 11e, 11f) of an inverted truncated pyramid;
- said agitating means comprising an elongated dasher plate (23) extending upwardly from said discharge opening in spaced face-to-face position relative to one of said plate sections (11f), the opposite lateral edges (23a, 23b) of said dasher plate being respectively spaced from the proximate faces of the pyramidal trapezoidal plate sections (11c, 11d) connected to said last-named section (11f) to thereby permit the bulk substance to laterally surround the dasher plate;
- said plate (25) being provided with longitudinally spaced openings (32) through which said substance is adapted to flow back and forth as the plate oscillates,
- means (24) for mounting said plate for oscillation about its upper end;
- means (33) for yieldingly biasing said plate for movement toward said last-named section (11), and
- means including said biasing means (33) for oscillating said dasher plate to alternately press the substance on one side thereof against said last-named plate section (11f) and to laterally displace the substance on the other side thereof away from the latter plate section, respectively.

4,013,197

# DOUBLE SEAL VALVE STEM

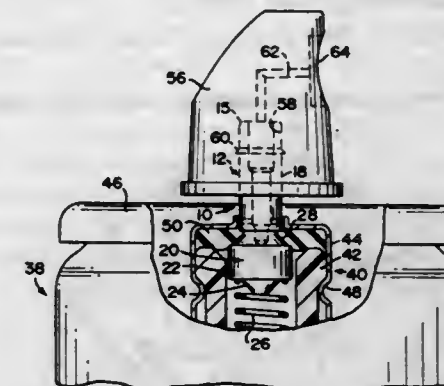
Ronald F. Ewald, Rolling Meadows, Ill., assignor to Seaquist Valve Company, Div. of Pittway Corporation, Cary, Ill.

Continuation of Ser. No. 264,204, June 19, 1972, abandoned. This application Sept. 10, 1975, Ser. No. 611,862

Int. Cl.<sup>2</sup> B65D 83/14

U.S. Cl. 222-402.24

6 Claims



1. A double seal cleaning action valve stem in combination with a valve assembly for an aerosol dispenser, said valve stem comprising:

- an elongated portion having a cavity formed therein, said valve stem further comprising an enlarged portion integrally attached to said elongated portion and at least partially defined by a diameter greater than the elongated portion; an annular beveled surface disposed in interconnecting relation between said enlarged portion and said elongated portion and inclined outwardly from the base of said elongated portion to said enlarged portion, an annular groove located between said elongated portion and said enlarged portion and extending radially inwardly into said valve stem; a dispensing port formed in a side wall of said elongated portion in communicating relation to said cavity; said valve assembly including a resilient sealing gasket having an aperture formed therein, the side wall of said aperture defining an inner peripheral surface of said sealing gasket, said stem fitted through said aperture so as to movably engage said inner peripheral surface; the outer peripheral portion of said sealing gasket affixed to a remaining portion of said valve assembly such that said inner peripheral surface flexibly engages said valve stem, said sealing gasket normally disposed in a double sealing engagement with both said side wall of said elongated portion and said annular beveled surface to force said sealing gasket radially inwardly into said annular groove, said enlarged portion including a sealing ledge arranged relative to said annular beveled surface and said annular groove to facilitate forcing said sealing gasket into said annular groove thereby defining a seal between said inner peripheral surface and said valve stem; said dispensing port normally disposed in isolated relation, beyond said sealing gasket relative to the aerosol dispenser, whereby movement of said valve stem into said valve assembly causes wiping action of said inner peripheral surface over said dispensing port and said elongated portion.

4,013,198

# MEASURING DISPENSER

Frank C. Miklas, Allentown, Pa., assignor to General Electric Company, Bridgeport, Conn.

Filed July 28, 1975, Ser. No. 599,409

Int. Cl.<sup>2</sup> G01F 11/46

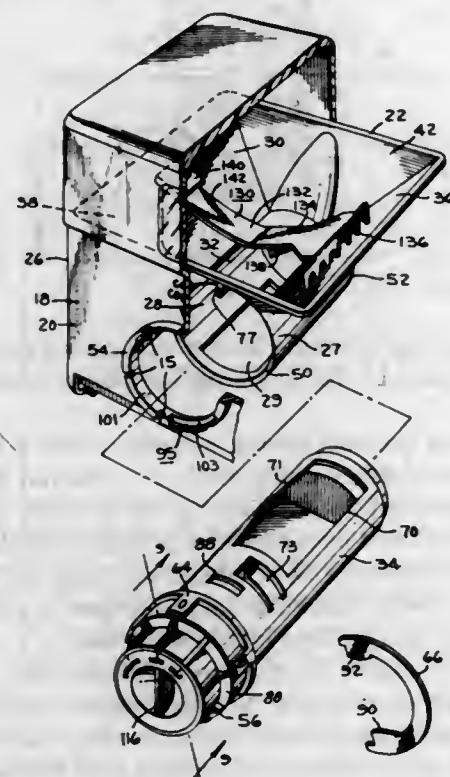
U.S. Cl. 222-438

14 Claims

- 1. A measuring dispenser comprising:
  - a. a canister having bottom wall means;
  - b. a first curved guide positioned at said bottom wall means;
  - c. a second curved guide positioned at said bottom wall means in line with the first curved guide;



- d. an enlarged opening provided in the bottom wall means of said canister between the first and second curved guides;
- e. a rotatable dispensing drum having a generally transverse wall and an enclosing side wall, said dispensing drum being positioned for rotational movement within said curved guides;
- f. an enlarged dispensing aperture formed in the enclosing side wall of said drum for cooperation with the enlarged opening formed in said bottom wall means;
- g. a slot provided in the generally transverse wall of said dispensing drum;
- h. a partition for separating said drum into variable measuring chambers;



ing chambers, the partition including a generally longitudinal member having a width slightly less than the inside diameter of said generally cylindrical drum and a generally transverse wall formed at one end of said partition, said partition being inserted within said drum with the longitudinal member extending through the slot in the transverse wall of the drum whereby variable measuring chambers are formed between the transverse wall of the drum and the transverse partition wall; and

i. means connected to the portion of the longitudinal member that extends through the slot in the transverse wall of the drum for moving the transverse partition wall toward and away from the transverse wall of the dispensing drum whereby to vary the volume of the measuring chambers that are provided between the transverse walls.

4,013,199

## MEASURING DISPENSER

Richard N. Brown, Macungie, Pa., assignor to General Electric Company, Bridgeport, Conn.

Filed July 28, 1975, Ser. No. 599,410

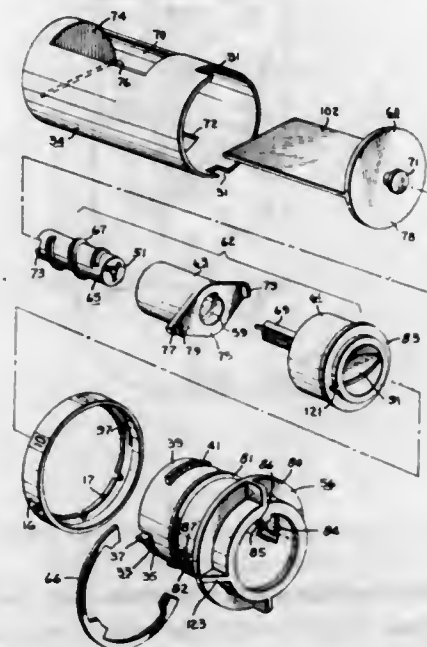
Int. Cl.<sup>2</sup> G01F 11/34

U.S. Cl. 222-438

15 Claims

1. A measuring dispenser comprising:
  - a. a canister having bottom wall means;
  - b. a first curved guide positioned at said bottom wall means;
  - c. a second curved guide positioned at said bottom wall means in line with the first curved guide;
  - d. an enlarged opening provided in the bottom wall means of said canister between the first and second curved guides;
  - e. a rotatable dispensing drum having a transverse wall and an enclosing side wall, said dispensing drum being positioned for rotational movement within said curved guides;
  - f. an enlarged dispensing aperture formed in the enclosing side wall of said drum for cooperation with the enlarged opening formed in said bottom wall means;

- g. a slot provided in the transverse wall of said dispensing drum;
- h. a partition for separating said drum into variable measuring chambers, the partition including a generally longitudinal member having a width slightly less than the inside diameter of said drum and a transverse wall formed at one end of said partition, said partition being inserted within said drum with the longitudinal member extending through the slot in the transverse wall of the drum and the transverse partition wall being positioned within the other end of said drum whereby variable measuring chambers



are formed between the transverse wall of the drum, the longitudinal partition member and the transverse partition wall; and

- i. means for moving the partition including the longitudinal member and the transverse partition wall in order to move the transverse partition wall toward and away from the transverse wall of the dispensing drum whereby to vary the volume of the measuring chambers that are provided between the transverse walls and the longitudinal member, the longitudinal partition member being slidable in the slot of the transverse wall of the drum as the transverse partition wall is being moved.

4,013,200

## DISPENSING CLOSURE

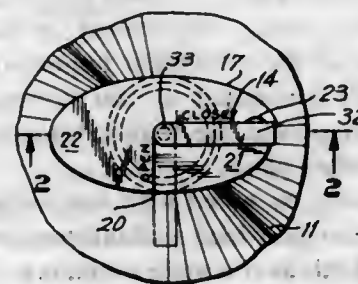
Alan R. Tripp, New York, N.Y., assignor to Ventura Product Development Corporation, Elmsford, N.Y.

Filed Oct. 29, 1975, Ser. No. 626,815

Int. Cl.<sup>2</sup> B65D 25/46

U.S. Cl. 222-534

7 Claims



1. A dispensing nozzle device comprising a closure defining body member attachable to the discharge opening of a receptacle so that an interior face of said body member is exposed to the interior of said receptacle, said body member including an oval top face having a quadrant recess formed therein extending to the periphery of said top face and delineated by vertical shoulders extending along the major and minor axes of said top face, a longitudinally extending tubular nozzle

member having a first port at its proximal end and a discharge opening at its distal end, and means pivotally supporting said nozzle member for swinging in a horizontal plane in said recess about a vertical axis at the proximal end of said nozzle member and at the center of said top face at a point proximate the juncture of said shoulders between a retracted first position and an extended second position, said body member having a second port formed therein lying in the path of said first port and communicating with said body member interior face and said ports being out of registry and in registry when said nozzle member is in its first and second position respectively, and the distal end of said nozzle member lying within the periphery and projecting beyond the periphery of said body member when said nozzle member is respectively in its first and second positions.

4,013,201

## FATIGUE REDUCING BACKPACK HARNESS

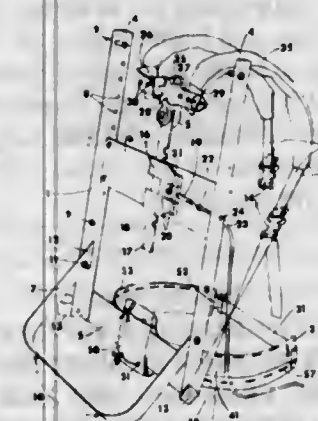
Glenn James Potter, 1332 S. Hope St., No. 302, Los Angeles, Calif. 90015

Filed Jan. 26, 1976, Ser. No. 652,466

Int. Cl.<sup>2</sup> A45F 3/14

U.S. Cl. 224-25 A

6 Claims



1. An adjustable pack frame assembly for mounting on a person's back for carrying a load thereon, comprising:

- a frame proper including right and left side bars rigidly connected near their lower ends to a lower crosspiece, an upper crosspiece to which said side bars are adjustably fastened higher up to accommodate the size of the wearer as by a pair of bolts and wing nuts on each side fitting selected holes in a row along each side bar, and means for attaching a knapsack or other container or burden to said side bars;
- a stand-up prop making the entire backpack free-standing, consisting of a U-shaped foot piece pivotally attached near its ends to the lower portions of the side bars by two spring-washer loaded bolts, the ends of the arms of said foot piece diagonally shaped terminally beyond the bolts so as to impinge on portions of said side bars and limit unfolding of said foot piece when it is brought far enough back to brace the loaded backpack upright;
- a shoulder suspension means consisting of:
  - said upper crosspiece,
  - left and right shoulder hooks, each a strip of flat lightweight hard resilient material such as hard aluminum given a curve convex upward and adjustably fastened to said upper crosspiece canted outward to fit the shoulder, each said hook padded on the underside, the pad secured to said hook by stitch-lacing whereby a strong strand or multiple strong strands are passed as stitches through the pad then as lacing through rows of small holes alongside the edges of the hard material, said rows being staggered to conserve hook strength, and said hook covered with a tubular waterproof material such as leatherette and having its ends made small and snug by tucking and/or purse-stringing,
  - two flexible straps pivotally attached to the forward ends

of said shoulder hooks and ending in quickly-adjustable levered buckles, and

two flexible straps, each pivotally secured low and laterally on said frame and engageable in a said shoulder hook buckle for stabilizing the load and modifying the curvature of said shoulder hook for best fit,

a hip-girdling member for carrying a substantial portion of the load, consisting of:

- a broad flat semi-rigid plate such as hard aluminum formed into a C-shape except where remaining flat in its mid-portion behind whereon is rigidly attached close to its back (outside) by one or more spacers a broad plate forming a broad narrow vertical slot into which the flat broad mid-portion of the lower crosspiece of the frame fits and wherein it is free to relatively rock with the vertical motions of the hips during walking, climbing, or cycling, on a removable pivot running horizontally through the middle of the assembly, limited by impingement of the crosspiece on said spacer or spacers,
- a quickly-adjustable levered buckle and strap means for completing the hip-girdling C-piece in front and non-constrictively fitting that member to the user's upper pelvis,
- a pad, waterproof on the outside, for the lower edge of and the inside of each arm of the semi-rigid C-piece, said pad being thicker along the top and of a curving wedge-shape and extending upward as a thin narrow flange, also downward similarly as a thin broad flange to curl around the lower edge of said C-piece, said flanges being secured by the said stitch-lacing technique to said C-piece in two rows of staggered holes,
- a fitted wrap-around waterproof cover for the pivot means bearing inside a post-sacral pad in its front portion and enclosing a grease-absorbing dust cover, said waterproof cover made in the form of a flexible flattened tube having grommets along its sides so it can be laced on the hip-girdling member at the back around said pivoted deep slot means, the laces when drawn and tied holding said waterproof cover in position;

4,013,202

## DEVICE FOR CONVENIENTLY LIFTING AND TRANSPORTING A LARGE SHEET OF MATERIAL

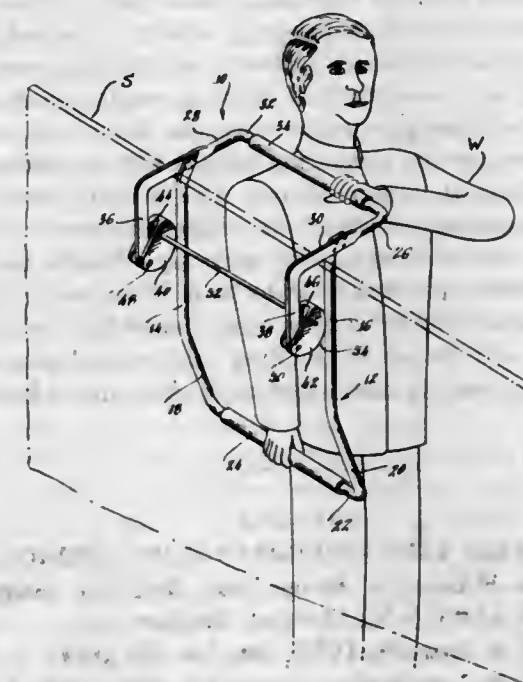
Herman J. Russo, 209 Scribner Ave., Norwalk, Conn. 06854

Filed Mar. 2, 1976, Ser. No. 663,063

Int. Cl.<sup>2</sup> B65D 71/00

U.S. Cl. 224-45 M

2 Claims



1. A carrying device arranged to permit a workman to easily lift and transport large sheets of construction material such as plywood, wallboard and the like, comprising:



a substantially U-shaped lower frame member having arms defining a plane against which a sheet of material may be placed and a crossbar, offset from said plane, forming a lower lifting region;

a substantially U-shaped upper frame member joined to the lower frame member and having a crossbar offset from said plane and forming an upper lifting region and having mounting arms adjacent to said plane;

cam means mounted eccentrically upon said mounting arms adjacent said plane, said cam means gravitationally rotating into gripping engagement with a sheet of material placed against said plane, and being rotated into tighter gripping engagement by gravitational forces exerted on the sheet of material as the frame members are lifted upwardly;

the cam means including a pair of cams mounted opposite the lower frame arms and rotatable into engagement therewith, the cams being joined for tandem motion by a connecting rod.

4,013,203

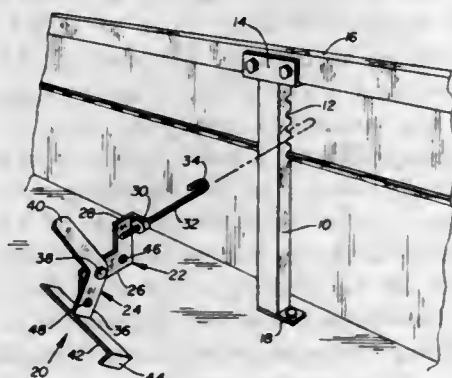
## LOCKABLE TIRE CARRIER

Willard Mack McCauley, Rte. 1, Box 230, Okolona, Ark. 71962

Filed May 8, 1975, Ser. No. 575,616  
Int. Cl.<sup>2</sup> B62D 43/08

U.S. Cl. 224-42.24

4 Claims



1. Apparatus for securing a spare tire to the bed of a pickup truck or the like wherein said tire is mounted on a flanged rim having an opening therethrough which comprises a vertically disposed bracket member having vertically spaced notches therein and attachable to said bed; a horizontally extending length adjustable bracket-engaging member having a hook at one end thereof adapted to engage one of the notches of said bracket when said bracket engaging member is passed through the opening in said tire rim; a pivotal tire rim-engaging member including a pivotal arm pivotally connected to the end of said bracket-engaging member opposite from said one end thereof, a horizontally extending keeper bar connected adjacent its horizontal center to one end of said pivotal arm adapted to engage said tire rim under pressure when said horizontally extending bracket is properly adjusted and when said pivotal arm is pivoted so as to be in horizontal alignment with said horizontally extending arm; means for pivoting said pivotal arm; and means for locking said pivotal arm to said horizontally extending arm when said arms are in horizontal alignment.

4,013,204

## SELF-ADJUSTING WEB-HANDLING DEVICE

Albert Joseph Hellemans, Borgerhout, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed June 30, 1975, Ser. No. 591,314

Claims priority, application United Kingdom, July 1, 1974, 29118/74

Int. Cl.<sup>2</sup> B65H 25/26

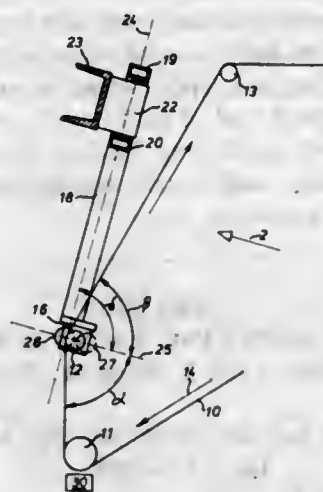
U.S. Cl. 226-21

4 Claims

1. A self-adjusting web-handling device for providing even

tension across a continuously moving web which is conveyed by guide means to come into engagement with said handling device along an upstream approach plane and to leave said device along a downstream exit plane at a defined included angle to said approach plane, said device comprising:

a roller mounted for free rotation and engagement by said web,



frame means for supporting the bearings of said roller, pivot means supporting said frame means for free pivotal movement about an axis that is situated halfway the length of the roller, that is normal to the bisector of said included angle, and that coincides with the tangent to the roller periphery at the side of the roller where the web is in engagement with the roller.

4,013,205

## GRIPPING SHOE EQUIPPING A DEVICE FOR PULLING AN ELONGATE MEMBER

Michel Fabre-Curtat, Lima, Peru, and Jean Thierry, Le Pecq, France, assignors to Institut Français du Pétrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activités Pétrolières Elf, France

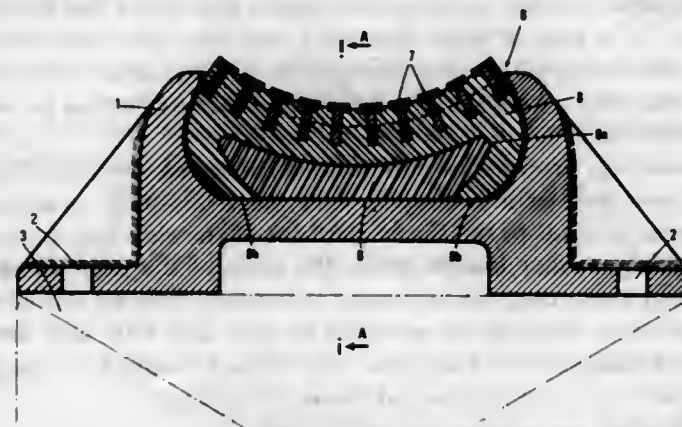
Filed June 16, 1975, Ser. No. 586,932

Claims priority, application France, June 18, 1974, 74.21550

Int. Cl.<sup>2</sup> B65H 17/34

U.S. Cl. 226-173

8 Claims



1. A gripping shoe which is to be secured to a pulling device to enable said pulling device to pull an elongated member by providing traction between said device and said elongated member comprising, in combination:

a rigid casing provided with means for securing said casing to the pulling device, said casing being open on a side opposite said securing means; and

a deformable element housed in said casing and provided with wear-resistant friction means for contacting the elongated member, wherein said deformable element has a composite structure comprising

a body member provided with a large internal recess, said

body member carrying said wear-resistant friction means and being at the same time deformable, of low elasticity, and mechanically resistant, and

a sole member of a highly deformable, elastic and substantially incompressible material, said sole member being housed in said recess and filling substantially the whole volume thereof.

4,013,206

## ADJUSTABLE OUTWARD CLINCH ANVIL ASSEMBLY

Walter G. Lemos, East Providence, R.I., assignor to Textron, Inc., Providence, R.I.

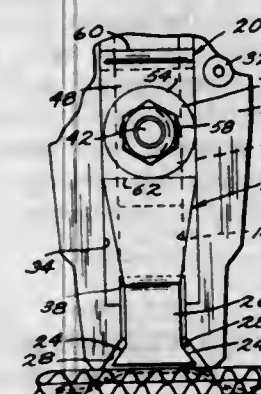
Filed Jan. 13, 1975, Ser. No. 540,703

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> B27F 7/16

U.S. Cl. 227-83

10 Claims



1. A stapling device comprising a housing defining a drive track, a staple magazine for receiving a supply of staples in stick formation and feeding successive leading staples laterally into the drive track, a staple driving element slidably mounted in said drive track through a drive stroke to drive a leading staple within said drive track outwardly thereof into a workpiece and a return stroke, the outer end of said drive track being defined by outwardly diverging side wall surfaces, said housing including a keyway formed in the exterior thereof parallel with said drive track, a spring metal anvil member having a fixed end portion slidably mounted within said keyway, said anvil member including a free end portion normally extending within the outward end of said drive track, the free end portion of said anvil member having a pair of outwardly diverging side wall surfaces cooperating with said diverging drive track side wall surfaces for deflecting the legs of a staple outwardly during the driving movement thereof and a cam surface engageable during the last portion of the staple driving element drive stroke to cam said free end portion outwardly of said drive track and enable the staple crown to move thereby during the last part of the driving movement of the staple, and means for fixedly securing the fixed end portion of said anvil member in any one of a multiplicity of adjusted positions within said keyway comprising:

a threaded stud extending from said housing outwardly through said keyway, the fixed end portion of said anvil member having a cam follower opening formed therein through which said stud extends,

a generally rectangular plate having an opening therein through which said stud extends, said plate being disposed in backing relation to the fixed end portion of said anvil member and including an inwardly bent end portion extending beyond said anvil member within said keyway throughout the width thereof and an opposite end portion extending throughout the width of said anvil member providing a flexure surface therefor,

an adjusting member rotatably mounted on said stud, said adjusting member including an inner cam portion disposed within the cam follower opening of said anvil member of a shape relative thereto such as to effect a displacement of said anvil member along said keyway in response to the rotational displacement of said adjusting member,

an outer knob portion for manually effecting rotational displacement of said adjusting member, and an intermediate portion disposed within the opening in said plate, and a locking nut threadably engaged on the outer end of said stud for maintaining said adjusting member in any position of rotational displacement and said anvil member in a fixed position within said keyway corresponding thereto.

4,013,207

## CURVED PIN AND INSERTER

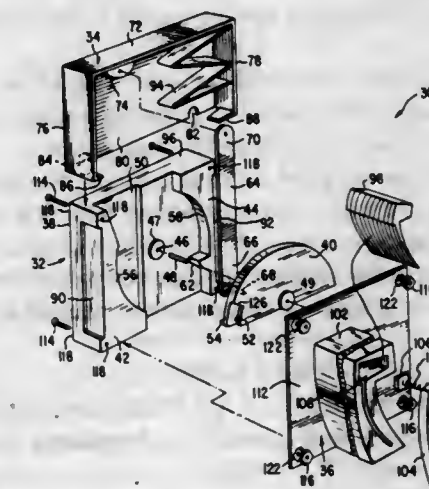
Kenneth B. Erkenbrack, Charlottesville, Va., assignor to New Products, Inc., Charlottesville, Va.

Division of Ser. No. 556,241, March 7, 1975, Pat. No. 3,952,935, which is a continuation-in-part of Ser. No. 464,382, April 26, 1974, abandoned. This application Jan. 28, 1976,

Ser. No. 652,959  
Int. Cl.<sup>2</sup> B25C 1/02

U.S. Cl. 227-120

2 Claims



1. A curved pin usable in an inserter apparatus which inserts said curved pin to a workpiece, the inserter having a body defining a substantially circular path for said pin to follow with the path terminating at an opening in the body through which said pin passes for insertion into the workpiece; a drive plunger rotatably mounted in the body, the drive plunger being provided with a pin head engaging receptacle; means to drive the plunger along the circular path; and means for supplying pins to the circular path, said pin comprising:

a curved shank, said shank being continuously curved to form substantially an arc of a circle and having substantially the same curvature as the circular path in the inserter body; and,

a pin head including a pin top extending inwardly from a first end of said shank and generally perpendicular thereto and a pin leg extending downwardly from a free end of said pin top at an obtuse angle to said pin top, said pin top and pin leg forming retaining means adapted to retain said pin head in the pin head engaging receptacle whereby said pin head may be engaged by the plunger upon actuation of the drive means and said pin may be driven along the circular path for insertion into a workpiece, said pin head being planar and of the same thickness as, and lying in the plane defined by said shank, the entire head extending radially inwardly toward the center of the circle defined by the arc of said shank.



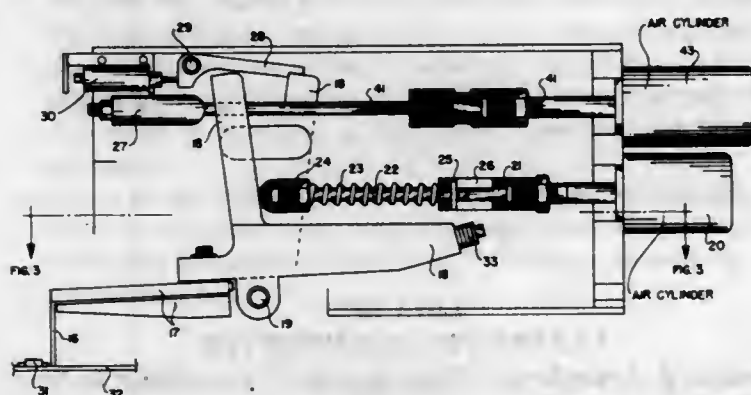
4,013,208

**SOLDERING MECHANISM FOR SOLDERING ELECTRONIC COMPONENT LEADS TO CONDUCTORS ON A PRINTED CIRCUIT BOARD, AND THE LIKE**

Richard Storrs Mason, Escondido; Robert Edward Bible, Rancho Santa Fe, and James Robert Beach, Encinitas, all of Calif., assignors to The Singer Company, Little Falls, N.J.  
Filed Mar. 8, 1976, Ser. No. 664,775  
Int. Cl.<sup>2</sup> H01L 21/60

U.S. Cl. 228-44.1 A

9 Claims



1. A mechanism for soldering electronic component leads to conductors on a printed circuit board, or the like, said mechanism comprising:

- a first soldering head assembly including a support frame;
- at least one pivot arm pivotally mounted on said frame;
- a soldering tip mounted on one extremity of said pivot arm;
- first actuating means mounted on said frame in position to engage said pivot arm and to turn said pivot arm in a first direction to move said soldering tip to an operative position;
- a tripper member mounted on said frame and normally engaging said pivot arm to prevent movement of said pivot arm by said actuating means;
- operating means coupled to said tripper member to move said tripper member to a position in which it releases said pivot arm; and
- means for supplying an electric current to said soldering tip to establish a soldering temperature at said tip.

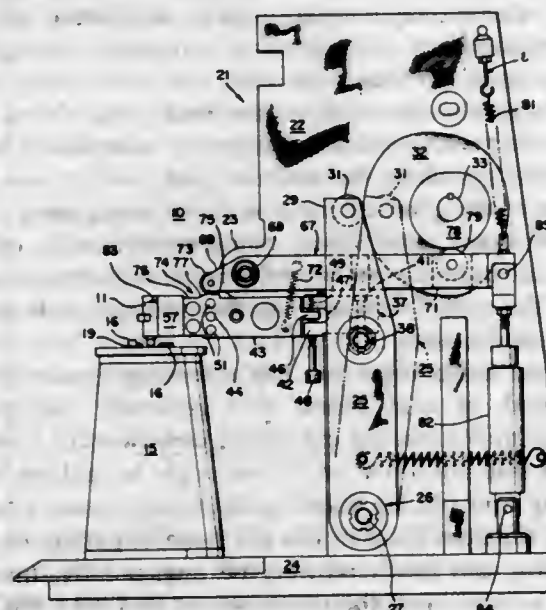
4,013,209

**HIGH FORCE FLEXIBLE LEAD BONDING APPARATUS**

Thomas L. Angelucci, and Joseph L. Angelucci, both of P.O. Box 604, Cherryhill, N.J. 08003  
Filed Mar. 24, 1976, Ser. No. 669,984  
Int. Cl.<sup>2</sup> H01L 21/603

U.S. Cl. 228-44.1 A

13 Claims



1. A high force bonding system for a gang lead bonder comprising:

- a rigid frame;
- a bonding station for supporting a semiconductor device,

means for positioning a flexible printed circuit juxtaposed a semiconductor device on said bonding station,

a vertical support lever pivotally mounted on said rigid frame,

a horizontal support lever pivotally mounted on said vertical support lever,

a thermode holder mounted on said horizontal support lever for receiving a removably mounted thermode therein,

a force lever pivotally mounted on said fixed frame,

said force lever comprising a short force arm and a long lever arm,

a roller follower at the end of said force arm for applying a downward force to said thermode holder,

means for moving said horizontal support lever and said thermode holder from a retracted position to a bonding position,

first cam means operably connected to said horizontal support lever for engaging said roller follower for depressing said thermode holder during movement from a retracted position to a bonding position, and

high pressure force means applied at the end of said force arm for rotating said force lever and operably transmitting a multiplied high pressure force through said roller follower to said thermode for bonding said flexible printed circuit to said semiconductor device.

4,013,210

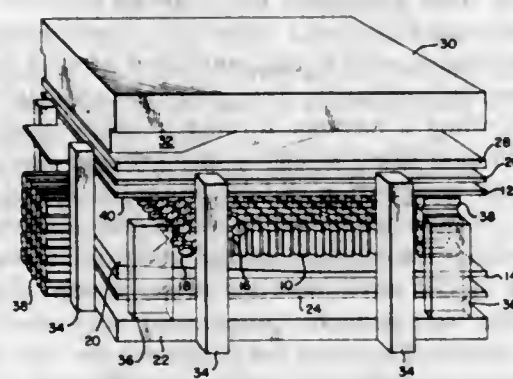
**METHOD OF DIFFUSION BONDING**

Czeslaw Deminet, 26037 Marine View Drive S., Kent, Wash. 98031  
Continuation of Ser. No. 282,595, Aug. 21, 1972, abandoned.

This application Sept. 26, 1974, Ser. No. 509,417  
Int. Cl.<sup>2</sup> B23K 19/00

U.S. Cl. 228-106

9 Claims



1. A method of making a diffusion bonded composite metallic structure of a material selected from a group consisting of titanium and titanium based alloys, comprising a panel portion having a relatively fragile cellular core and a load carrying portion connected to said panel portion, said method comprising:

- a. providing a cellular core component having a plurality of cellular core elements and having at least one bonding face made up of said cellular core elements,
- b. providing at least one face sheet component having a substantially planar bonding surface,
- c. providing a load carrying component having at least one planar bonding surface,
- d. forming a substantial vacuum at said bonding face and said bonding surfaces,
- e. heating said bonding face and said bonding surfaces at a temperature sufficient and for a time period sufficient to remove substantial surface contamination therefrom, while maintaining said bonding surfaces and bonding face sufficiently exposed to permit escape of contamination from said bonding surfaces and said face as gases, so as to make said surfaces and said face substantially uncontaminated,
- f. bringing the components to a bonding temperature and urging the bonding surface of said face sheet into contact

with the bonding face of said core component and said bonding surface of said load carrying component in a desired configuration by pressing a compliant medium against the opposed surface of said face sheet, the resulting contact pressure of the surface of said sheet against the surface of the load carrying component being no more than 10 pounds per square inch and the contact pressure of said sheet against said bonding face being less than a pressure level which would cause significant deformation of said cellular core component, and with sufficient heat and pressure and for a sufficient period of time to simultaneously cause diffusion bonding of said components to make said composite structure.

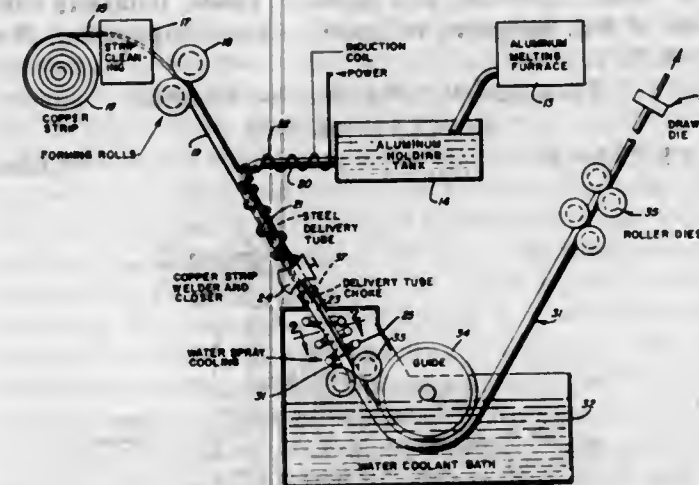
4,013,211

**METHOD OF FORMING A CLAD WIRE**

Jay W. Atman, 401 Manordale Road, Pittsburgh, Pa. 15241  
Filed Apr. 5, 1976, Ser. No. 673,795  
Int. Cl.<sup>2</sup> B23P 3/14

U.S. Cl. 228-126

23 Claims



1. A method of forming an elongated clad metal product comprising the steps of:

forming a strip of first metal progressively endwise into a circumferentially closed tube;

introducing fused second metal into the tube from a position upstream of the tube, said second metal having a melting temperature lower than that of said first metal;

causing the fused second metal to quickly solidify within the tube to form a core therein and concurrently cause the tube to pull radially relative to the core; and

contracting the tube about the solidified core after the temperature of the core drops below a preselected temperature.

4,013,212

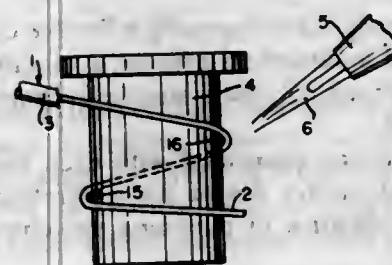
**SOLDERING METHOD**

Imrich M. Miller, Paterson, N.J., assignor to Universal Manufacturing Corporation, Paterson, N.J.  
Filed Jan. 21, 1972, Ser. No. 219,661

Int. Cl.<sup>2</sup> B23K 1/08

U.S. Cl. 228-203

6 Claims



1. A method for forming an electrical connection between

an uninsulated electrical terminal of electrically conductive material and an electrical conductor which has electrical insulation thereover comprising the steps of:

bringing a portion of said conductor having insulation thereon adjacent said uninsulated terminal and holding the conductor to the terminal,

applying heat from a flame of a temperature above the melting point of the insulation to a selected area of said conductor adjacent said terminal to remove the insulation from said area while said conductor is held to the terminal in an air environment, and

immersing the terminal with the electrical conductor held thereto in an ultrasonically agitated bath of liquid solder to solder them together with the solder connection being made in at least a portion of the area of the conductor where the insulation was removed.

4,013,213

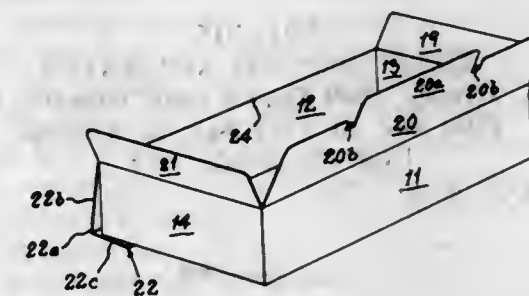
**POSTAL TRAY**

Buddy E. Giebel, Monroe, Mich., assignor to Union Camp Corporation, Wayne, N.J.  
Filed Apr. 12, 1976, Ser. No. 675,741

Int. Cl.<sup>2</sup> B65D 5/10

U.S. Cl. 229-39 R

2 Claims



1. A tray adapted primarily for handling, shipping and sorting mail comprising

opposed side and opposed end panels;

a bottom;

a narrow top closure flap secured to one side panel along a first hinge line; and

a wide top closure flap secured to the opposite side panel along a second hinge line;

said narrow and wide top closure flaps being provided with means to lock the flaps in closed position over the tray;

said wide top closure flap being scored along a longitudinal line substantially parallel to the second hinge line to provide a narrow top closure panel along the outer edge of the said flap and a wide top closure panel between the said longitudinal score line and the second hinge line; and

said wide top closure panel being approximately equal in width to the height of the side panel to which it is secured; whereby the said wide top closure flap can be reverse folded to substantially superimpose the wide panel of such flap on its adjacent side panel and to position the narrow panel of such flap under the bottom of the tray so that unobstructed access to the top of the tray is provided for easy sorting of the mail in such tray.

4,013,214

**PLASTIC DISPLAY CONTAINER HAVING HINGED COVER**

Roger P. Hansen, and Larry J. Vis, both of Rockford, Mich., assignors to Display Pack, Inc., Grand Rapids, Mich.

Filed May 17, 1976, Ser. No. 687,384

Int. Cl.<sup>2</sup> B65D 45/16, 51/04, 5/66

U.S. Cl. 229-44 R

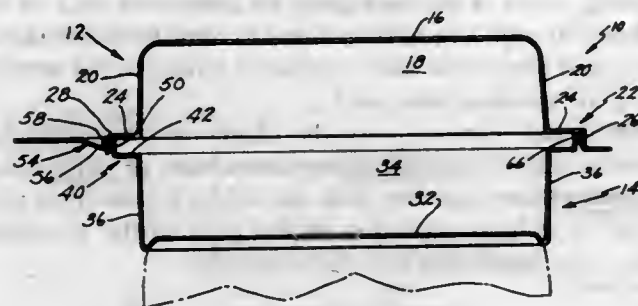
22 Claims

1. A container moldable from a resilient, semirigid plastic material comprising:

a cover member having a depending peripheral skirt integral with the side walls of said cover;



a base member having an upstanding peripheral skirt integral with the side walls of said base and receivable within the depending skirt of said cover member;  
one of said peripheral skirts having an angled slot therein at the juncture of said one of said peripheral skirts with one of said members; and



hinge means extending through said slot and outwardly from the other of said peripheral skirts for permitting opening pivotal movement of said cover member relative to said base member and preventing removal of said cover member from said base member when said cover is pivoted to an open position.

4,013,215

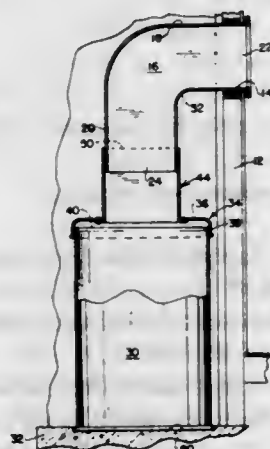
## TRASH DISPOSAL APPARATUS

Charles A. Mercier, 1009 Timber Lane, Wilmette, Ill. 60091  
Filed Nov. 10, 1975, Ser. No. 630,164

Int. Cl.<sup>2</sup> B65G 1/14

U.S. Cl. 232-43.1

3 Claims



1. A trash disposal apparatus for conducting small articles from a kitchen area within a residential building through an opening which is formed in the kitchen wall to a discharge area exteriorly of the building in relatively close proximity to the latter and below the level of such opening, said apparatus comprising a substantially cylindrical trash container having an open upper circular rim and disposed in an upright position in said discharge area, a circular disk-like cover for said container and provided with a depending peripheral apron-like flange adapted to encompass said upper rim of the container when the cover is in its operative position of closure on the container, said cover being formed with a central opening therein, a tubular sleeve fixedly secured to the cover and projecting vertically upwardly from said opening, an open-ended trash delivery chute of generally inverted L-shaped configuration and including an upper leg having a horizontal directional component and a vertical leg, a curved elbow-like juncture region establishing communication between said legs, the distal lateral end of said upper leg being adapted for reception within said wall opening and establishing a trash inlet, the lower end of said vertical leg establishing a trash discharge outlet, said sleeve being telescopically and loosely slidable on said vertical leg between a lowered position wherein the cover seats in its operative position of closure on the container, and a fully raised position wherein the upper

open rim of the sleeve frictionally engages and binds against said curved elbow-like juncture region, thus maintaining the cover in a raised position vertically spaced from the container to afford access to the interior of the latter, as well as to permit withdrawal of the container from said discharge area for emptying and replacement thereof, the frictional engagement between the upper rim of the sleeve and the curved juncture region constituting the sole supporting means for maintaining the cover in its fully raised position.

4,013,216

## PUNCH CHECK APPARATUS

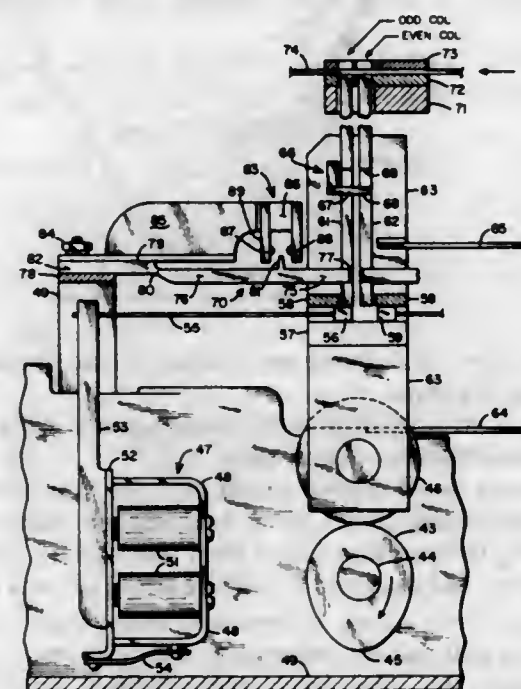
Jay A. Smith, Lansdale, and James P. Linde, Lafayette Hills, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 584,802

Int. Cl.<sup>2</sup> G06K 1/02

U.S. Cl. 234-34

3 Claims



1. A punch card subsystem for a card punch comprising: a register for receiving and storing a plurality of signals indicative of data to be punched into a card, a plurality of punch pins for punching said data into said card, a plurality of punch pin selection actuators responsive to said data stored in said register for selecting individual punch pins to be moved, punch pin driving means for moving said punch pins selected by said punch pin selection actuators, a shutter device associated with and movable by each said punch pin, said shutter device comprising a flexible cantilever having a fixed end mounted on a frame, a movable end connected to said punch pin and a shutter intermediate the ends of said lever, a sensing device associated with each said punch pin and each said shutter device for generating punch pin data signals indicative of punching movement of said punch pins, and error checking means for comparing said data stored in said register and said punch pin data signals for verifying correct card punch entries.

4,013,217

## DOUBLE INDUCTION AIR CONDITIONING WITH FLUIDIC CONTROL

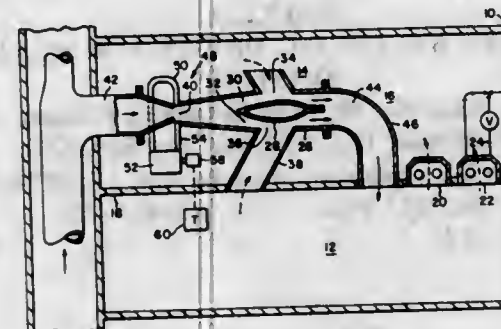
Edward A. Owen, Penn Hills Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 31, 1975, Ser. No. 627,733

Int. Cl.<sup>2</sup> F24F 13/04

U.S. Cl. 236-13

4 Claims



1. A double induction mixing box including means separating said box into two opposite side passages, a damperless opening to each of the two opposite side passages in said box and through which air from the room being conditioned is induced into one opening, and through which air from a ceiling plenum in which said mixing box is installed is induced into the other opening, in proportions to maintain a desired temperature in the room, said box having at its upstream end a narrow inlet opening connected to a primary air source for delivering air into said inlet opening in a correspondingly narrow stream of sufficient capacity and velocity to effect said induction of air at said damperless openings, said separating means having an upstream end spaced downstream from said inlet opening and spaced upstream from said damperless openings, and fluidic diverting means located at said inlet opening where said narrow stream of primary air enters the box for controlling the diversion of primary air between the opposite side passages to correspondingly control the induction of air into the one and the opposite side passages.

4,013,218

## SELF-INDICATING THERMOSTAT

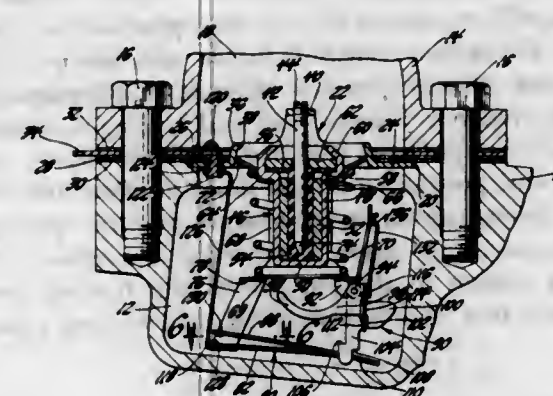
Jack B. King, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1976, Ser. No. 653,355

Int. Cl.<sup>2</sup> F01P 7/02

U.S. Cl. 236-34.5

5 Claims



3. A combination temperature responsive fluid control valve and overheat indicating assembly which provides a warning indication when an overheat condition is caused by unresponsiveness of the control valve to increased temperature, but does not provide an indication otherwise, comprising:

fluid passage forming means including an apertured frame adapted to be supported so as to intercept fluid flow;

a movable valve member operably cooperating with said passage forming means to prevent fluid flow through said aperture when in a closed operative position and allowing fluid flow therethrough when moved to a more open operative position;

a thermally activated power means operably connected to said valve member for moving said valve from its closed operative position to a more open operative position when fluid temperatures exceed a start-to-open temperature;

said frame supporting a bimetal type overheat warning switch of elongated and substantially flat configuration which is supported at one end to permit movement of the opposite second end portion from a first low temperature operative position to a second higher temperature operative position;

said bimetal switch member having elongated slot means extending therethrough from said first end to an intermediate location, thus separating said first end portion of said switch into side by side arm portions capable of independent movement;

all but one of said arm portions being connected to said frame with said one arm portion unattached and free to move in a substantially normal direction to the plane of the switch member as said opposite second end portion of the switch moves in a similar non-planar direction in response to fluid temperature changes;

means including an operably interconnected follower arm portion and latch arm portion, both pivotally mounted with respect to said power means and said bimetal switch and responsive to movements of said power means to engage said bimetal switch for preventing movement of its second end portion into said second operative position in response to overheat temperature conditions accompanied by responsive movement of said power means to the fluid temperature changes and alternately, for maintaining the second end portion of said bimetal switch in its second operative position after an overheat condition has occurred accompanied by failure of said power means to respond to the fluid temperature changes;

circuit means including a selectively activated warning indicator and a conductive support member cooperative with said movable one arm of said bimetal switch to activate said warning indicator in correspondence with movements of said bimetal switch into its second operative position, thereby indicating an overheat condition caused by unresponsiveness of said power means to fluid temperature changes.

4,013,219

## MANUALLY ACTUATED, SELF-EXPIRING, TEMPORARY OVERRIDE APPARATUS AND METHOD FOR THERMOSTATIC SYSTEM

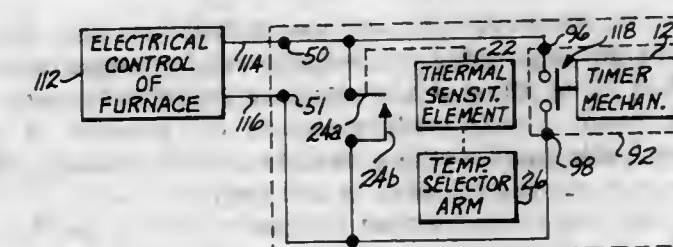
James W. Jacobson, 17643 NE. 30th Place, Redmond, Wash. 98052

Filed Mar. 15, 1976, Ser. No. 666,666

Int. Cl.<sup>2</sup> H01H 37/62; F23N 5/20

U.S. Cl. 236-46 R

2 Claims



1. In a thermostatically regulated system of the type having an electrically controlled means that can be turned on and off



to regulate an ambient temperature in a building, and including a thermostat mounted in such building and having a thermosensitive means for operating electrical contacts between open and closed conditions in response to such ambient temperature, means for setting a predetermined ambient temperature at which said contacts are operated by said thermosensitive means, and output terminal means connected to said contacts for alternately assuming first and second electrical states depending upon said conditions of said contacts, said terminal means adapted for connection to said electrically controlled means for turning such electrically controlled means on when said terminal means are in said first electrical state and for turning such electrically controlled means off when said terminal means are in said second electrical state, an improvement in said thermostat, comprising:

manually actuatable self-expiring timer means having a predetermined maximum timing interval; and electrical override means connected in circuit with said terminal means and responsive to said timer means when actuated to cause said terminal means to assume said first electrical state for the duration of said timing interval, independently of the operation of said electrical contacts by said thermosensitive means, whereby a normal operating mode is provided when said timer means is unactuated during which said electrically controlled means is thermostatically regulated to achieve said predetermined ambient temperature and an override mode is provided in response to manual actuation of said timer means for turning the electrically controlled means on for the duration of the timing interval to produce an unregulated temporary change in the ambient temperature.

4,013,220

#### BACK-PRESSURE-RESISTANT VAPOR TRAP FOR CONDENSATE DISCHARGE

Raimund Zoller, Oberwil, Switzerland, assignor to KERAG Kessel-,Apparate- und Anlagenbau Richterswil/Switzerland, Richterswil, Switzerland

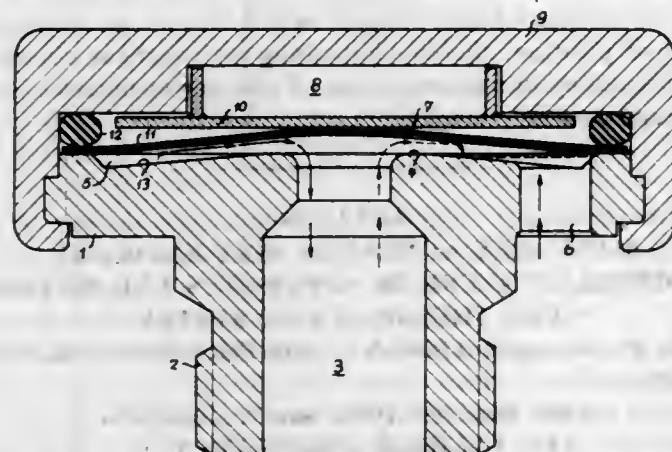
Filed July 7, 1975, Ser. No. 593,289

Claims priority, application Germany, July 9, 1974, 2432964

Int. Cl.<sup>2</sup> F16T 1/04

U.S. Cl. 236-56

4 Claims



1. A vapor trap for release of condensate comprising: a valve seat provided around the edge of a discharge opening;
- a movable discharge valve member in the form of a first membrane adjacent to said valve seat and arranged to be moved by the effect of a temperature-dependent vaporizable liquid control medium against the pressure of a vaporizable liquid working medium entering through an entrance opening provided in said valve seat, and
- a movable ring-shaped second membrane (11) in the flow path of said working medium between said entrance opening and said discharge opening for preventing back-flow, lying against the closure side of said first membrane (7) and peripherally clamped in common with said first membrane.

said valve seat being encircled by an obliquely profiled annular set back further valve seat surface (13) which is set back at the deepest part of its setback profile by at least the thickness of said second membrane (11), and the pliability of said second membrane (11) being greater than that of said first membrane (7) in the region where said membranes are peripherally clamped and being smaller than that of said second membrane (7) in the region of said valve seat (4).

4,013,221

#### PRESSURE BALANCING DEVICE FOR HEATING SYSTEMS

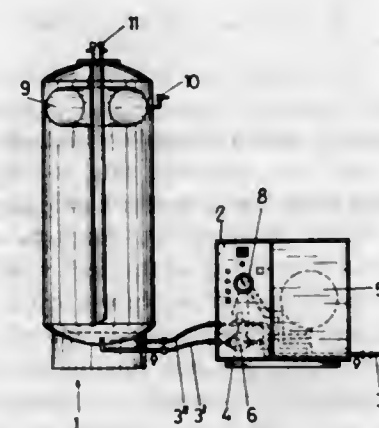
Anton Eder, Haus No. 68, 5733 Brambert, Pinzgau, Austria  
Filed Apr. 17, 1975, Ser. No. 569,070

Claims priority, application Austria, Apr. 17, 1974, 3185/74

Int. Cl.<sup>2</sup> F16L 55/04; F24H 9/20

U.S. Cl. 237-8 R

5 Claims



1. A pressure balancing device for use in a heating system employing therein a heating medium, said device comprising: an expansion tank adapted to be connected to said heating system and having separate feed and drain pipe means connected thereto for respectively feeding said heating medium to said expansion tank from said heating system and draining said heating medium from said expansion tank to said heating system;
- said expansion tank having therein first chamber means, fluid isolated from the exterior atmosphere, for storage of said heating medium received from said heating system, said first chamber means being maintained at a pressure lower than that of said heating system;
- second chamber means, having an interior in communication with the exterior atmosphere and an exterior exposed to the pressure in said first chamber means, for varying the volume of said first chamber means dependent upon the pressure therein;
- valve means, positioned in said feed pipe means, for normally closing said feed pipe means and for opening said feed pipe means upon an increase in pressure in said heating system to thereby pass said heating medium from said heating system to said first chamber means; and
- pump means, positioned in said drain pipe means, for normally closing said drain pipe means and for opening said drain pipe means upon a decrease in pressure in said heating system to thereby pump said heating medium from said first chamber means to said heating system.

4,013,222

#### ROTATING WASHER ASSEMBLY

Dalny Travaglio, Kensington, Calif., assignor to Jack Rogers, Concord, Calif.

Filed Sept. 22, 1975, Ser. No. 615,515

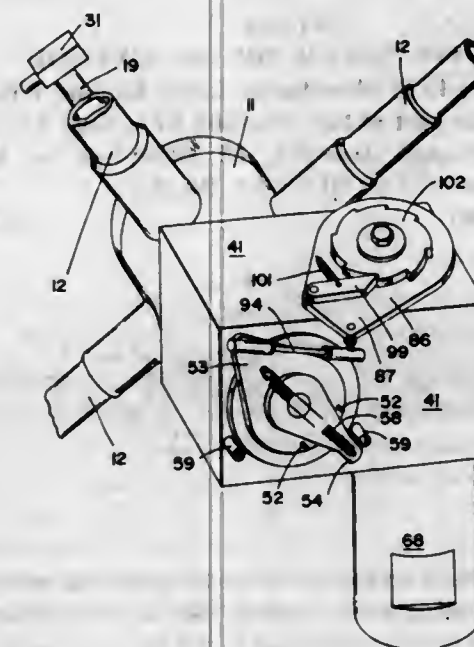
Int. Cl.<sup>2</sup> B05B 3/06, 3/16

U.S. Cl. 239-98

14 Claims

1. A washing device using cleansing liquid under pressure, comprising a spindle means rotatably secured in a housing and having a liquid flow channel therethrough,

nozzle means extending from said spindle means for spraying said liquid,  
reaction jet means, extending from said spindle means, for emitting at least one stream of liquid and driving said spindle means in a rotational motion,  
valve means for selectively permitting liquid flow to said reaction jet means, said valve means including a valve shaft extending coaxially within said spindle means and freely rotating therein, and a valve member secured on said valve shaft adjacent to said reaction jet means and including flow ports extending therethrough from said liquid flow channel of said spindle means to said reaction jet means.



1. An apparatus for spreading material, as liquid manure, onto a location comprising: a tank having a top wall and a chamber for holding material, wheel means for supporting the tank whereby the tank can be moved over the ground; an upright tubular wall secured to the top wall of the tank, said tubular wall having a portion extended down from the top wall into the chamber and a passage open at one end to the chamber and open at the other end outside of the tank whereby material can be placed in the chamber through said passage, said portion having a lower edge located below the top wall, open grid means secured to the tubular member and extended across said passage in general alignment with the lower edge of the portion of the tubular wall operable to prevent large objects from being placed in the chamber, fastening means for connecting the open grid means to the tubular wall, and means for removing material from the chamber and spreading the material onto a location.

4,013,223

#### FUEL INJECTION NOZZLE ARRANGEMENT

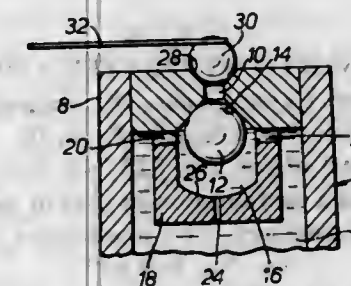
Barrie James Martin, Shenfield, England, assignor to Plessey Handel and Investments A.G., Zug, Switzerland  
Filed July 15, 1975, Ser. No. 596,205

Claims priority, application United Kingdom, July 16, 1974, 31549/74

Int. Cl.<sup>2</sup> B05B 17/06

U.S. Cl. 239-102

7 Claims



1. A fuel injection nozzle arrangement comprising a fuel injection nozzle having a fuel injecting orifice, and vibratory means for vibrating the nozzle to cause atomization of fuel ejected from the nozzle through the orifice, the nozzle having

a fuel-retaining valve at the fuel inlet side of the orifice arranged to normally close the orifice and thus prevent the injection of fuel but to be opened when the vibratory means is energized to permit injection of fuel, and the nozzle having a gas-excluding valve at the fuel outlet side of the orifice arranged to normally close the orifice and thus prevent the entry of gases into the nozzle through the orifice but to open under fuel injection pressure to permit the injection of fuel, and the fuel retaining valve being situated in a housing in the nozzle and the housing having at least one aperture at a position where the valve will tend to move when the vibratory means is activated thereby to allow fuel to enter the housing through this aperture and force the fuel-retaining valve towards the orifice when the nozzle is not being vibrated.

4,013,224

#### MATERIAL SPREADER

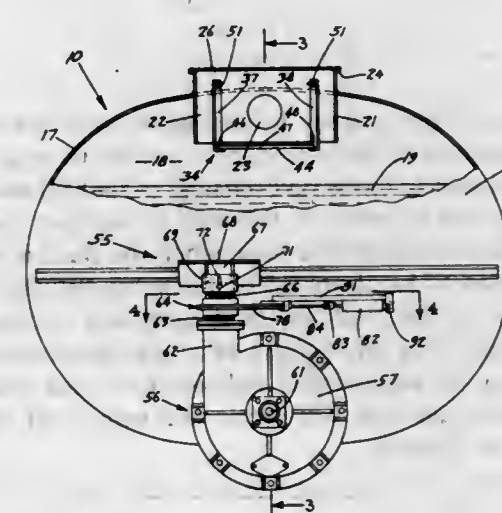
Thomas M. Carter, Wayzata, Minn., assignor to Veda, Inc., Long Lake, Minn.

Filed Sept. 22, 1975, Ser. No. 615,478

Int. Cl.<sup>2</sup> B05B 9/04; A01C 15/00, 23/00

U.S. Cl. 239-148

34 Claims



1. An apparatus for spreading material, as liquid manure, onto a location comprising: a tank having a top wall and a chamber for holding material, wheel means for supporting the tank whereby the tank can be moved over the ground; an upright tubular wall secured to the top wall of the tank, said tubular wall having a portion extended down from the top wall into the chamber and a passage open at one end to the chamber and open at the other end outside of the tank whereby material can be placed in the chamber through said passage, said portion having a lower edge located below the top wall, open grid means secured to the tubular member and extended across said passage in general alignment with the lower edge of the portion of the tubular wall operable to prevent large objects from being placed in the chamber, fastening means for connecting the open grid means to the tubular wall, and means for removing material from the chamber and spreading the material onto a location.

4,013,225

#### EXTENSION SPRAY GUN

J. C. Davis, 9818 Hathaway, Dallas, Tex. 75220  
Continuation-in-part of Ser. No. 464,992, April 29, 1974, Pat. No. 3,915,382. This application Aug. 25, 1975, Ser. No. 607,717

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> B05B 15/00

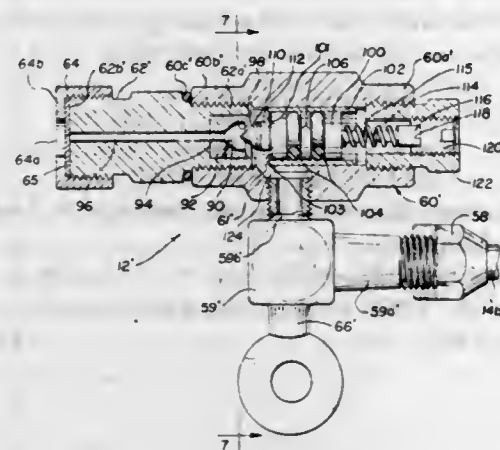
U.S. Cl. 239-195

10 Claims

1. A shut off valve on an extension spray gun comprising: a plurality of hollow pole sections, each of said pole sections having a bore extending therethrough; means telescopically securing each said pole section to another pole section; a



flexible hose extending through the bore in said hollow pole sections; spray valve means; means to secure said spray valve means to one of said pole sections; a spray nozzle having a chamber formed therein; means to secure said spray nozzle to the outer end of another pole section; means to secure a first end of said hose to said spray valve means; means to secure a second end of said hose to said chamber in said spray nozzle; means to deliver pressurized fluid to said spray valve; a piston slideably disposed longitudinally in said chamber; a tip adapter having a passage defined longitudinally therethrough and a seat positioned to receive one end of said piston; means



to secure said tip adapter to an end of said spray nozzle; a spray tip secured to said tip adapter; means to urge said piston against said seat to close said passage in said tip adapter when pressure in said chamber is reduced to prevent leakage upon constriction of said flexible hose when the fluid is not of sufficient pressure to be atomized by the spray tip; and an area of said piston on the end adjacent said seat exposed to said chamber such that when fluid of a pre-determined pressure sufficient to be atomized is delivered to said chamber, the force against said area will move said piston off of said seat, opening said passage.

4,013,226

#### VARIABLE JET NOZZLE WITH BALANCED TWO-DIMENSIONAL BLOCKER FLAP

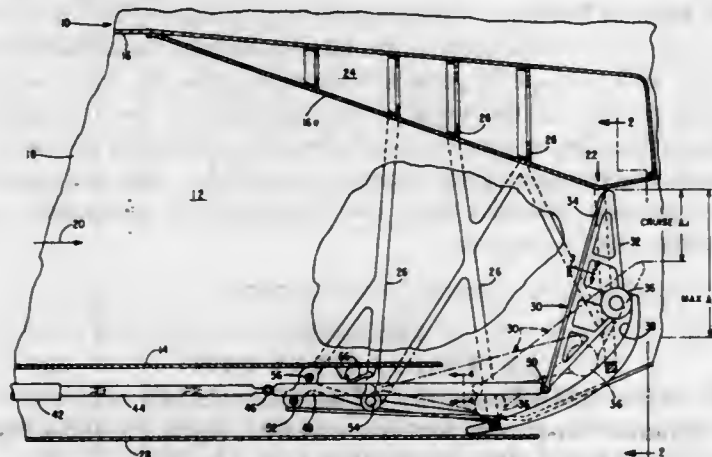
Charles M. Willard, Creve Coeur, Mo., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 14, 1976, Ser. No. 676,952

Int. Cl.<sup>2</sup> B64C 15/06

U.S. Cl. 239-265.29

9 Claims



1. A variable, jet nozzle throttling apparatus in combination with the airframe of a V/STOL jet aircraft including a duct that is defined in part by parallel first and second walls and by converging third and fourth walls to define a jet nozzle zone, said apparatus comprising:

a blocker-flap comprising a generally triangular truss-work having a base side and an apex opposite said base side, wheel means mounted at said apex for rollingly and pivot-

ally supporting said blocker flap, and a flap plate mounted on said base side and presenting a substantially two-dimensional blocking surface; curved track means, mounted on said airframe at opposite sides of said duct, for cooperation with said wheels; and linear actuator means, mounted on said airframe adjacent said third wall and coupled to one end of said blocker-flap, for moving said blocker-flap in translation and tilt along said track means between open positions wherein said blocking surface defines a nozzle zone wall and a closed position wherein said blocking surface obturates said duct.

4,013,227

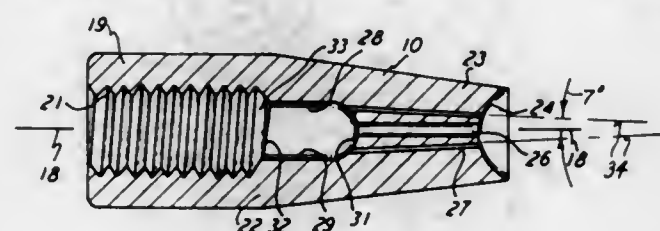
#### WELDING TORCH TIP AND METHOD

John T. Herrera, 4510 Shorehaven Lane, Racine, Wis. 53403  
Continuation-in-part of Ser. No. 605,911, Aug. 19, 1975, abandoned. This application Feb. 17, 1976, Ser. No. 658,177

Int. Cl.<sup>2</sup> F23D 23/00; B05B 1/14

U.S. Cl. 239-291

2 Claims



1. A welding torch tip for use in welding ferrous metals with Mapp gas, comprising an elongated body for attachment to a supply line which conducts the gas to the tip, said body having a gas-flow passageway extending through one end thereof and having an outlet end and extending along the longitudinal axis of said one end for the flow of the gas from the tip, said body having a chamber disposed in gas-flow communication with said passageway and being located on said longitudinal axis and of a cross-sectional size greater than the cross-sectional size of said passageway, for guiding the gas to flow through said body, said chamber being shaped to present an end wall of a concave shape extending transversely to the longitudinal axis of said passageway and with the center of the concave shape intersecting said passageway for mixing of the gases flowing through said body, said body having a concave end surface intersecting the gas outlet end of said passageway for directing the gases along the longitudinal axis of said one end, said body having a plurality of additional gas-flow passageways extending therein adjacent and spaced around the first said passageway and being in gas-flow communication with said chamber from said end wall for the flow of the gases from the tip, said additional gas-flow passageways aligned to intersect said concave end surface at locations spaced from the first said passageway at said end surface and having the longitudinal axes of said additional gas-flow passageways being angled inwardly and toward the longitudinal axis of the first said passageway.

4,013,228

#### FOAM GENERATING SPRAYER APPARATUS

Barry L. Schneider, Crystal Lake, Ill., assignor to Chemtrust Industries Corporation, Franklin Park, Ill.

Continuation-in-part of Ser. No. 523,740, Nov. 14, 1974, Pat. No. 3,946,947, and a continuation-in-part of Ser. No. 396,183, Sept. 11, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,649

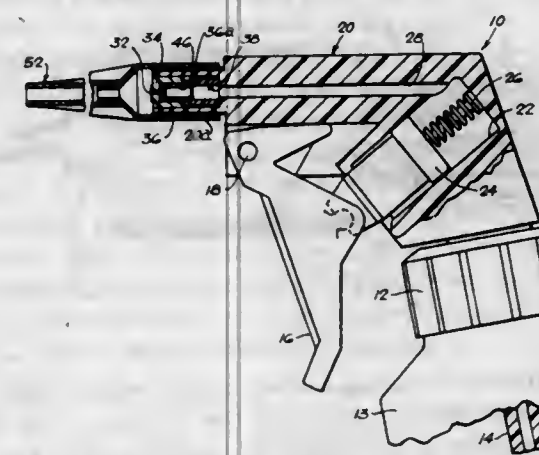
Int. Cl.<sup>2</sup> B05B 1/30, 1/34, 7/04

U.S. Cl. 239-401

10 Claims

1. An adjustable foam generating sprayer comprising, in combination: sprayer body means defining an inlet section through which liquid can pass, said inlet section including outlet orifice-forming means through which liquid passes for

providing a diverging stream flowing therefrom; and a foam-producing nozzle unit having a foam-producing section adjacent to and downstream from said outlet orifice-forming means which foam-producing section has an inlet end which receives the entire variably shaped stream issuing from said outlet orifice-forming means; air inlet port-forming means in communication with the exterior of the sprayer, and foam-producing passageway means communicating with said air inlet port-forming means and said inlet end of the nozzle unit



for effecting the aspiration of air through said air inlet port-forming means and the mixing thereof into the liquid stream as the stream through said foam-producing passageway means, said foam-producing nozzle unit being adjustably mounted on said sprayer body means for movement toward and away from said outlet orifice-forming means, thereby to vary the portions of the passageway means struck by the stream, which, in turn adjusts the quality of the foam of the stream flowing from the nozzle unit.

4,013,229

#### INJECTION NOZZLE FOR LIQUIDS, PARTICULARLY FOR FUELS

Ulrich Rohs, Roonstrasse 11, D 516 Duren, Germany

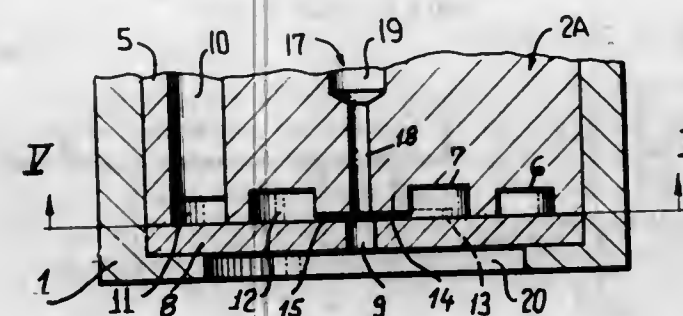
Filed Feb. 19, 1975, Ser. No. 551,132

Claims priority, application Germany, Feb. 19, 1974, 2407856

Int. Cl.<sup>2</sup> B05B 1/34

U.S. Cl. 239-493

9 Claims



1. An injection nozzle for liquids, said injection nozzle comprising a nozzle body having a discharge end, a cover plate opposing said nozzle body discharge end, said discharge end being configured to define a central core having an end surface, said cover plate having an exhaust orifice there-through in alignment with said core, said core end surface being of a greater size than said exhaust orifice and completely overlying said exhaust orifice, an annular recess in said nozzle body surrounding said core and together with said cover plate defining a spinning chamber, an inlet channel disposed outwardly of said spinning chamber, said inlet channel being defined by a recess in said nozzle body with said recess being closed by said cover plate, and spin channels extending from said inlet channel substantially tangentially into said spinning chamber immediately above said cover plate, said cover plate

being permanently spaced from said core end surface and defining between said cover plate and said core end surface a narrow gap through which liquid being injected passes from said spinning chamber into said exhaust orifice, said spin channels discharging into said spinning chamber substantially at the level of said gap, and said gap having a flow section at the periphery of said core materially less than the cross section of said exhaust orifice.

4,013,230

#### SHOWER HEAD

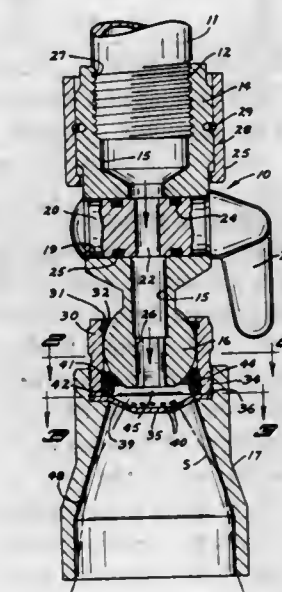
John T. Gondek, 1641 W. Innsbruck Circle, Minneapolis, Minn. 55421

Filed Nov. 10, 1975, Ser. No. 630,188

Int. Cl.<sup>2</sup> B05B 1/26

U.S. Cl. 239-499

8 Claims



1. In a shower head having an elongated body with one end adapted to be threaded onto the end of a water supply pipe and having a passage extending longitudinally therethrough, an annular skirt mounted on the other end of the body and positioned coaxially with said passage and extending axially a distance substantially beyond said other end of the body, a perforate plate member disposed between said other end of the body and the extended end of the skirt to restrict the flow of water from such passage through said skirt, said plate member having an annular series of apertures disposed about the axis of the skirt to divide the flow of water into a plurality of diverging jet sprays, the apertures and skirt being so formed as to direct said sprays into engagement with the edge portion of the extended edge of the skirt, and the entire inner side of the extended edge of said skirt having a smooth continuous surface.

4,013,231

#### AEROSOL CAN NOZZLE AND CAP ASSEMBLY

George E. Van Veldhoven, 13934 Yukon Ave., Hawthorne, Calif. 90250

Filed Oct. 17, 1974, Ser. No. 515,565

Int. Cl.<sup>2</sup> B65D 83/14

U.S. Cl. 239-579

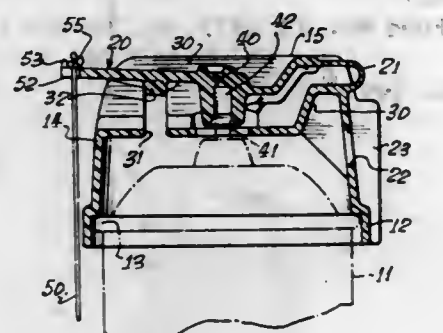
2 Claims

1. A readily cleanable nozzle and cap member for use on aerosol cans, said member comprising:  
a cylindrical skirt adapted to fit over the spray end portion of an aerosol can;  
a side wall affixed to said skirt and extending upwardly therefrom, said side wall curving inwardly to form a top wall;  
hinge means connected to said side wall comprising a loop of flexible plastic;  
a nozzle assembly supported by said hinge means and posi-



tioned to permit said nozzle assembly to swing at least 90° from its closed position to permit the nozzle to be positioned in an open position which is away from the outer surface of the rest of the cap and further positioned to cause at least a portion of said nozzle assembly to protrude below the top of said cylindrical wall when said hinge is in a closed position and to cause the lower extremity of said nozzle assembly to abut valve means on the spray end of an aerosol can; a flattened extension located on the opposite end of said nozzle assembly from the hinge means end thereof

disconnectable latching means interconnecting said side wall and said nozzle assembly to cause said nozzle assem-



bly hinge to remain in a generally closed position when said latching means is in a closed configuration, said latching means comprising a pair of flexible aligned fingers positioned on said flattened extension at a right angle with respect to the axis of said flattened extension and said top wall has at least one opening having a pair of upper stops positioned so that the spacing between the uppermost termination of said stops are closer together than the distance between the tips of said fingers but positioned far enough apart to permit the nozzle assembly and its aligned fingers to be repeatedly pulled upwardly out of said side wall without damage to said aligned fingers.

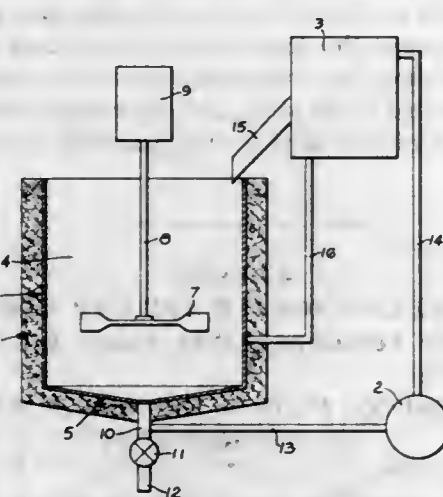
#### 4,013,232 DISPERSION OF PIGMENTS BY CRYOGENIC ATTRITION

Lewis Broughton, Stockport, England, assignor to National Research Development Corporation, London, England  
Filed Jan. 6, 1976, Ser. No. 646,749

Int. Cl.<sup>2</sup> B02C 23/06

U.S. Cl. 241—3

8 Claims



1. A method of forming a dispersion of an organic pigment in water consisting of the steps:  
first, forming a water-containing filter cake and reducing it to a fluid mass;  
second, adding a surface-active stabilizing agent to the fluid mass;  
third, causing a portion of the water present to freeze for forming ice particles.

fourth, agitating the pigment-water-stabilizing agent-ice mixture.

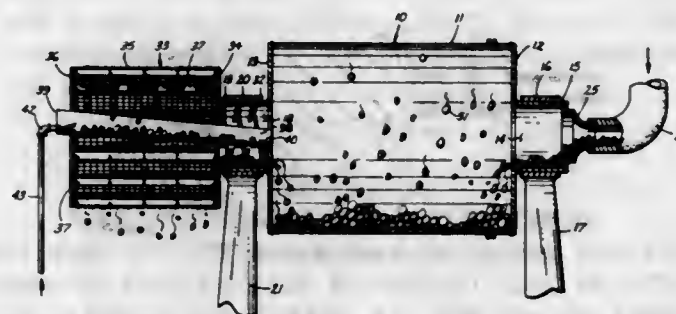
#### 4,013,233 BALL MILL

Kenneth G. Nylund, Rte. 1, Box 40C, Globe, Ariz. 85501  
Filed July 29, 1976, Ser. No. 709,591

Int. Cl.<sup>2</sup> B02C 23/12

U.S. Cl. 241—80

5 Claims



1. In a ball mill including a drum comprising an imperforate cylindrical wall and end plates at the opposite ends thereof, means for mounting the drum on a horizontal axis, power means for rotating the drum, an entry opening formed in one of said end plates, means for introducing ore aggregate into said drum through said entry opening, a discharge opening in the other of said end plates, a throat at said discharge opening, and a trommel screen mounted on said throat and having an open end remote from said throat; the improvement consisting of: mechanism for returning materials from said trommel screen through said throat to said drum, and comprising:

- a. pick up elements on the inner surface of said trommel screen for picking up materials therein as an incident to rotation of said trommel screen,
- b. a trough extending through said trommel screen, said throat, and to said drum and positioned to receive materials falling from said pick up elements as the latter reaches an upper position as an incident to rotation of said screen; and
- c. pressure fluid means for forcing the materials in said trough therealong and into said drum.

#### 4,013,234 DOUGH MIXER

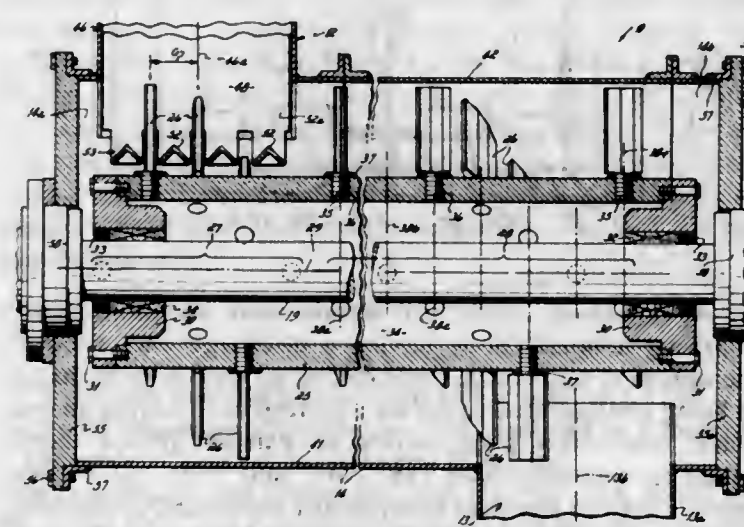
Rudolph J. Fay, Cincinnati, Ohio, assignor to J. W. Fay & Son, Inc., Cincinnati, Ohio

Filed Nov. 5, 1975, Ser. No. 628,896

Int. Cl.<sup>2</sup> B02C 19/00

U.S. Cl. 241—101.6

13 Claims



1. A mixer for admixing a food dough comprising:  
a mixer housing  
a plurality of blades fixed to a single mixer shaft disposed within said mixer housing, said blades all being of the same geometry,  
an inlet hopper having a grillwork floor disposed adjacent the exterior periphery of said single mixer shaft, a portion

of said blades projecting up and through said grillwork floor during rotation of said mixer shaft, said blades and grillwork floor cooperating to cut thoroughly any recycled dough scrap upon introduction of same into said mixer, the blades that cooperate with said grillwork floor being in the chopper section of said mixer and the blades that do not cooperate with said grillwork floor being in the mixer section of said mixer,

mounting means connecting said blades to said single mixer shaft, said mounting means being operable to adjust the pitch of said blades relative to a plane transverse to the axis of said mixer shaft, said blades within said chopper section lying substantially transverse to the axis of said mixer shaft, said blades within said mixer section being pitched relative to the axis of said mixer shaft, and the pitch of said blades increasing along the length of said mixer shaft within said mixer section from the inlet of said mixer section to the outlet of said mixer section, and drive means connected with said mixer shaft for rotating said mixer shaft within said housing.

#### 4,013,235

#### PULVERIZER HYDRAULIC DRIVE

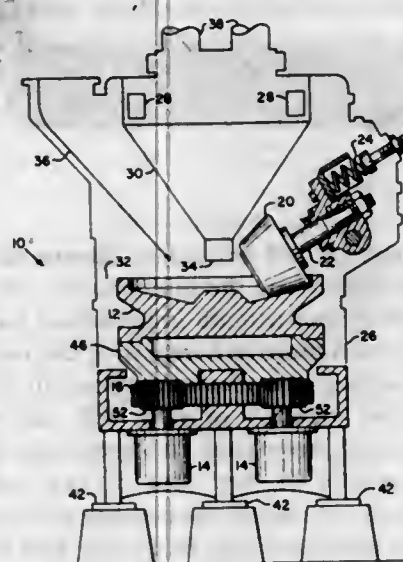
John Joseph Halloran, Jr., East Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.  
Filed May 19, 1976, Ser. No. 687,960

Claims priority, application Japan, July 29, 1975, 50-104116

Int. Cl.<sup>2</sup> B02C 15/00

U.S. Cl. 241—117

3 Claims



1. In a pulverizing mill, a housing having a lower base plate, a rotatable bowl within the housing, means coaxing with the upper surface of the bowl to perform the pulverizing function, a ring gear attached to the lower portion of the bowl, a plurality of hydraulic motors secured to the lower base plate, each motor having an associated drive gear which coacts with the ring gear of the bowl to cause rotation thereof.

#### 4,013,236

#### AUTOMATIC DISMOUNTING ROLL FOR ROLL TOWEL DISPENSERS

Jack Louis Perrin, Los Angeles, Calif., assignor to Towlsaver, Inc., Los Angeles, Calif.

Filed Mar. 11, 1976, Ser. No. 665,896

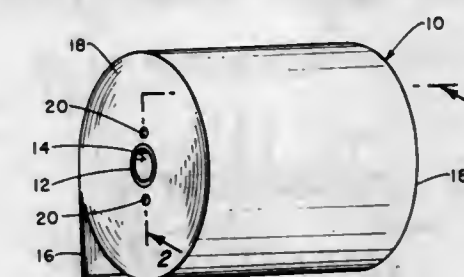
Int. Cl.<sup>2</sup> A47K 10/16, 10/22, 10/32

U.S. Cl. 242—1

17 Claims

6. In a roll of toweling adapted for automatic dismounting from roll end holders of a dispenser; the combination of: a strip of toweling continuously wound about a central core forming said roll, said core forming a roll central longitudinal axis; radially extending end surfaces on said roll; diametrically opposite and axially extending pin holes formed in one of said roll end surfaces having radially inner extremities radially outwardly of said roll core and equally radially spaced from

said roll central longitudinal axis; end holder engagement means formed at the other of said roll end surfaces adapted for engagement by a roll end holder until said roll strip of toweling



has been unwound to said radially inner extremities of said pin holes and said roll is being released at said one roll end surface.

#### 4,013,237

#### WINDING APPARATUS WITH TAILING DEVICE

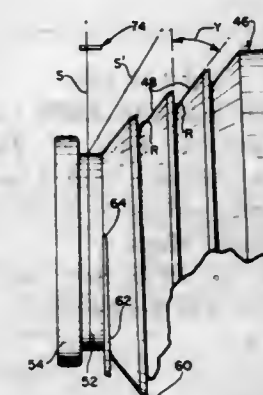
Thomas William Perrino, Johnston, R.I., assignor to Leeson Corporation, Warwick, R.I.

Filed Oct. 6, 1975, Ser. No. 620,213

Int. Cl.<sup>2</sup> B65H 54/00, 54/34

U.S. Cl. 242—18 PW

14 Claims



1. Apparatus for winding an advancing strand into a package comprising, strand take-up means mounted for rotation, strand traversing means for guiding said strand to said take-up means to wind the strand into a package thereon, drive means for contacting the surface of said take-up means and sequentially the surface of the package thereon to rotate said take-up means and said package, conical tailing means mounted on said take-up means for rotating therewith, said tailing means having a spiral groove formed therein, said groove being engageable with said strand to wind the strand into a strand tailing end of predetermined length on a predetermined section of said take-up means, the linear length of said groove being essentially equal to said predetermined length.

#### 4,013,238

#### DEVICE FOR CONTROLLING THE BALLOON AND TENSION IN THE THREAD FROM A THREAD STORING AND DISTRIBUTING APPARATUS TO AN OPERATING MACHINE

Sergio Calamani, Via Settima 27, Segrate San Felice (Milan); Eugenio Turri, Via Benedetto Marcello 1, and Ermanno Savio, Via Garofalo 29, both of Milan, all of Italy

Filed Oct. 20, 1975, Ser. No. 624,162

Claims priority, application Italy, Oct. 21, 1974, 28631/74  
Int. Cl.<sup>2</sup> B65H 51/02

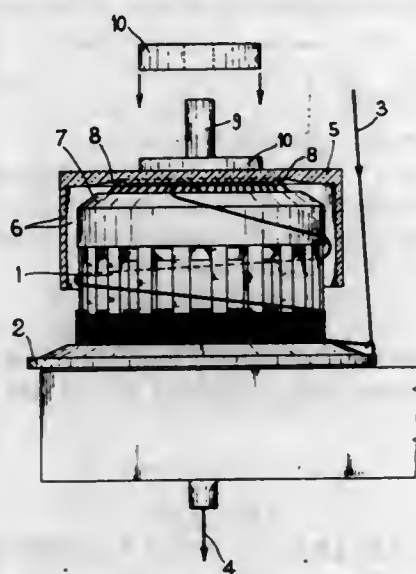
U.S. Cl. 242—47.01

5 Claims

1. A device for controlling the balloon of the tension in a thread from a thread storing and distributing apparatus to an operating machine, said device comprising: a bell having a base wall; a substantially cylindrical peripheral wall extending from said base wall; said bell having an inner diameter larger



than the outer diameter of storing apparatus to which the device is applicable; means for supporting and spacing said base wall on the top of a yarn storing apparatus; said means comprising a plurality of thin flexible elongated fingers having



one free end, said flexible fingers being inclined to the yarn movement direction during the unwinding step of the storing apparatus and being distributed according to a circular crown or sector, said bell being supported directly and safely by said fingers.

4,013,239

## CONTINUOUS LOOP TAPE CASSETTE

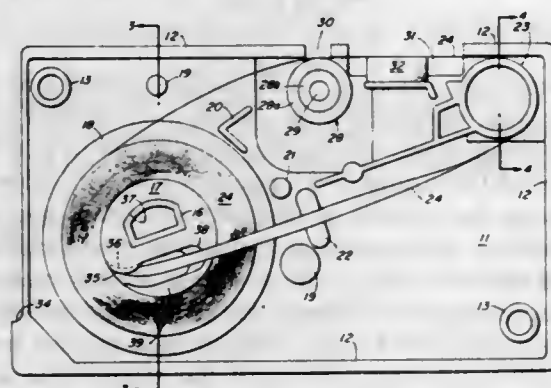
Paul R. Beswick, Ipswich; Paul W. Berton, Marblehead; Charles F. Ganem, Newton, and Clark E. Johnson, Jr., Weston, all of Mass., assignors to Micro Communications Corporation, Waltham, Mass.

Filed Apr. 14, 1975, Ser. No. 567,605

Int. Cl.<sup>2</sup> G11B 23/04

U.S. Cl. 242—55.19 A

9 Claims



1. A continuous loop tape cassette, comprising:  
a housing having

- A. a planar base means;
- B. a continuous wall affixed to the periphery of said base;
- C. a cover adapted to couple to said base;
- D. said wall having a flat, vertical reference surface with an opening therein to adapt said cassette to receive a tape drive and expose the tape along its axis for coupling said tape to an external device;
- E. said base means having a post means for engaging a flanged, generally circular, hub means;
- F. a stationary, generally circular, hub means having a flange for carrying a tape coil thereon, said hub means having a bore therethrough complementary to and fitted over said post means in fixed radial angular relation to said base means, said hub having means to avoid binding of said tape coil comprising a slot for guiding the inner convolution of the tape coil away from the coil toward the center of the coil, the leading end of the slot having an arc portion curving away from the coil

and toward said bore, and the trailing end of the slot being inclined toward the arc portion from the top of the hub to the flange; said arc portion being undercut therearound to facilitate containment of said tape between said hub and said flange;

G. a tape guide post near said wall opening, the base at the bottom of the post being raised to form a step above the upper surface of said flange; and

H. a tape coil carried by said hub means, the tape being uncoiled from the inside of the coil through said slot and passing around said arc portion and thence over said inclined portion to said tape guide post, and thence over said step and around the tape guide post to the outer convolution of said coil.

4,013,240

## ROLL SUPPORTING AND AUTOMATIC DISMOUNTING MECHANISM FOR ROLL TOWEL DISPENSERS AND METHOD OF USING

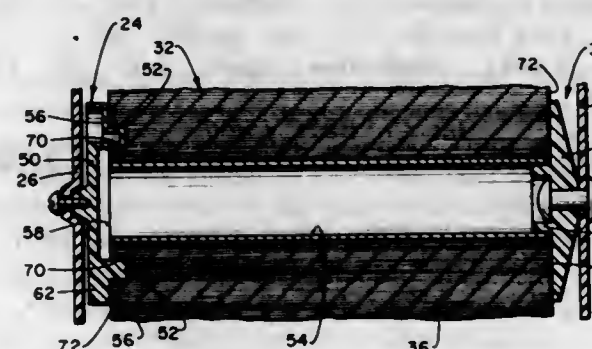
Jack Louis Perrin, Los Angeles, Calif., assignor to Towlsaver, Inc., Los Angeles, Calif.

Filed Mar. 11, 1976, Ser. No. 665,895

Int. Cl.<sup>2</sup> A47K 10/32, 10/22, 10/16

U.S. Cl. 242—55.53

31 Claims



1. In a roll supporting and automatic dismantling mechanism for roll towel dispensers; the combination of: a first roll end holder rotatable about a main longitudinal axis of a roll adapted to be supported thereby comprising circumferentially spaced axially projecting pins terminating axially in free ends towards the intended location of said roll, said pins being equally radially spaced from said roll longitudinal axis and being radially outwardly of any core of said roll, radially aligned roll end abutment means cooperable with each of said pins axially spaced from said pin free ends and effective to axially abut said roll at least tangentially adjacent radially inner extremities of said pins, axially outward recess means formed in said first holder extending axially outward of said abutment means, said recess means extending radially between said pin radially inner extremities and radially outwardly at least to a closed imaginary circumferential line circumscribed about said roll axis at said pin radially inner extremities; a second roll end holder comprising roll end support means adopted for generally axially releasably supporting an opposite end of said roll, said second holder support means being formed for releasing said roll opposite end upon dispensing of toweling of said roll progressively radially inwardly to said first holder pin radially inner extremities with said first holder recess means permitting said roll to pivot generally radially about said second roll holder and through said first holder recess means.

4,013,241

## MAGNETIC BRAKING AND CLUTCH SYSTEM

Robert C. Gray, 280 Clifford St., Blackfoot, Idaho 83221

Filed Mar. 6, 1975, Ser. No. 556,083

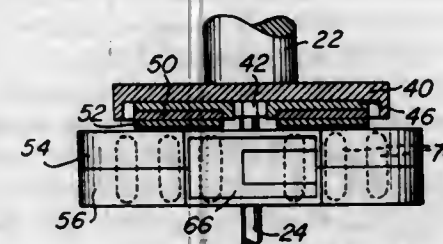
Int. Cl.<sup>2</sup> A01K 89/02

U.S. Cl. 242—84.52 B

9 Claims

9. A method for braking a rotatable spool fixed to a keyed shaft comprising moving a brake lined magnetic braking disk

carried on said keyed shaft towards and against a stationary member by positioning a plurality of radially moveable mag-



nets housed within said stationary member such that the resulting magnetic lines of flux will move said brake lined magnetic braking disk toward and against said stationary member.

4,013,242

## COP TUBE HOLDER FOR WINDING YARNS OR THREADS ON TEXTILE MACHINES

Frantisek Burysek, Usti nad Orlici; Karel Mikulecky, Chocen, and Zdenek Havranek, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

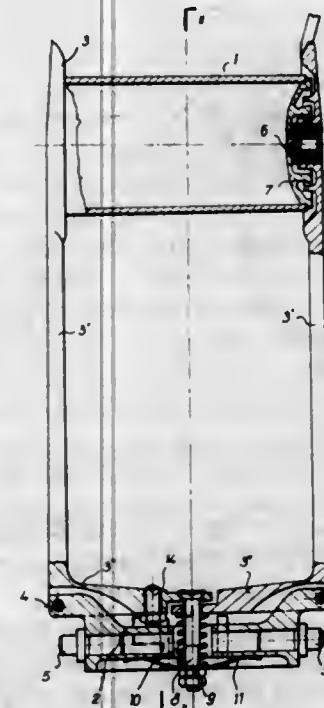
Filed Nov. 18, 1974, Ser. No. 524,534

Claims priority, application Czechoslovakia, Nov. 19, 1973, 7932/73

Int. Cl.<sup>2</sup> B65H 49/00

U.S. Cl. 242—129.51

2 Claims



1. For use in a textile machine, an apparatus for removably supporting an elongated cop tube for winding filaments, which comprises, in combination, a base member, first and second substantially right-angled levers each having first and second arms, means for pivotally supporting the apexes of the first and second levers in opposed, confronting relation on opposite ends of the base member with the first arms of the respective lever extending substantially horizontally toward each other, rotatable cop tube mounting means carried in opposed relation on the outer ends of the respective second arms of the levers for supporting opposite ends of the cop tube, and means kinematically coupling the outer ends of the first arms of the levers and responsive to the movement of the second arm of one of the levers for imparting an equal and opposite movement to the second arm of the other of the levers.

4,013,243

## MAGAZINE APPARATUS FOR RUN OFF SPOOLS

Ingo Mayer, Petersweg 8, Obertshausen, Germany (6053)

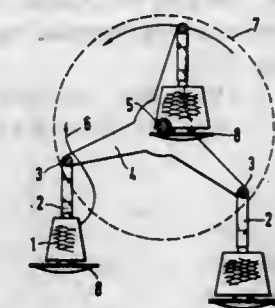
Filed Oct. 17, 1975, Ser. No. 623,276

Claims priority, application Germany, Oct. 18, 1974, 348826

Int. Cl.<sup>2</sup> B65H 49/02; D03J 5/08

U.S. Cl. 242—130

5 Claims



1. An improved magazine apparatus for presenting run off spools to a rewinding machine comprising:

- a drive means;
- a rotating means adapted to rotate in a vertical plane and driven by said drive means;
- at least two arm means pivotally connected to said rotating means and adapted to hang freely and downwardly therefrom during rotation of said rotating means; and,
- at least two spool holding means connected respectively to said arm means for maintaining said run off spools in a plane horizontal to the vertical plane of rotation of said rotating means.

4,013,244

## DEVICE FOR CONTROLLING THE POWER OF AN OPTICAL GUIDANCE BEAM

Rolf Helge Blom; Sten Harald Ragnar Forshufvud, and Lars-Erik Skagerlund, all of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

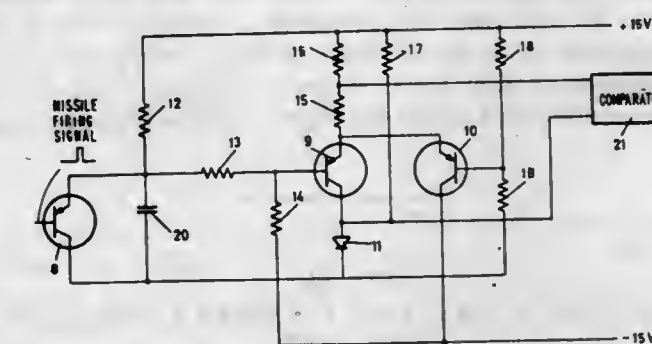
Filed Aug. 28, 1975, Ser. No. 608,819

Claims priority, application Sweden, Aug. 28, 1974, 7410865

Int. Cl.<sup>2</sup> F42B 15/02; F41G 9/00, 15/10

U.S. Cl. 244—3.13

3 Claims



1. Laser beam transmitting apparatus for controlling the output power of a laser diode the beam of which is directed in a selected direction so as to guide a missile or the like along the beam an toward a target; said transmitting apparatus comprising:

- first circuit means for supplying a variable amount of power to said diode,
- second circuit means responsive to the radiation emitted by said diode for generating a first signal representative of the magnitude of said radiation,
- control circuit means initiated into operation by the firing of the missile for generating a second signal representative of the desired increase of the magnitude of radiation emitted by said diode during the travel time of the missile toward the target,
- third circuit means for generating a signal proportional to the difference between said first and second signals for



controlling the amount of power supplied by said first circuit means to said diode.

4,013,245

## HOMING PROJECTILE

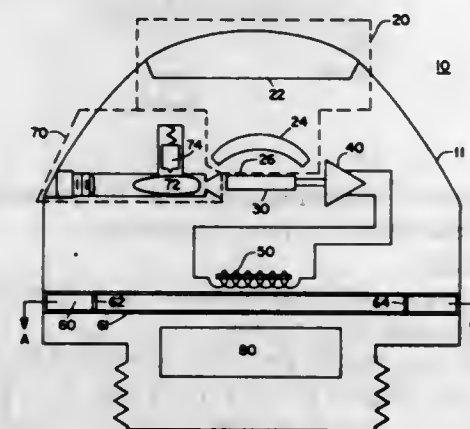
Lyman F. Vanbuskirk, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1975, Ser. No. 638,138

Int. Cl.<sup>2</sup> F41G 7/14, 7/00, 7/18; F42B 13/32

U.S. Cl. 244-3.16

6 Claims



1. A guidance system mounted in a spin-stabilized autorotative projectile for directing said projectile along a flight path towards a target comprising:

target detection means fixedly mounted in said projectile for providing an output signal representative of a deviation of the projectile flight path from the target;

drive means mounted in said guidance system and effectively coupled to said detection means output so as to receive said deviation signal for providing a force in response thereto having a frequency representative of the period of rotation of the projectile and an amplitude representative of the deviation path from the target;

a tuned frequency vane extensibly mounted in a slot extending through said projectile, said slot and vane being positioned transverse to said flight path, and coupled to said receiving and providing means and responsive thereto whereby the vane is periodically extended out of said projectile from an enclosed position within said slot in response to said force thereby creating a lift on said projectile which alters the flight path towards the target.

4,013,246

## MOUNTING BYPASS GAS TURBINES ENGINES ON AIRCRAFT

Douglas John Nightingale, Bristol, England, assignor to Rolls-Royce (1971) Limited, Great Britain

Filed Dec. 12, 1975, Ser. No. 640,158

Claims priority, application United Kingdom, Dec. 24, 1974, 55768/74

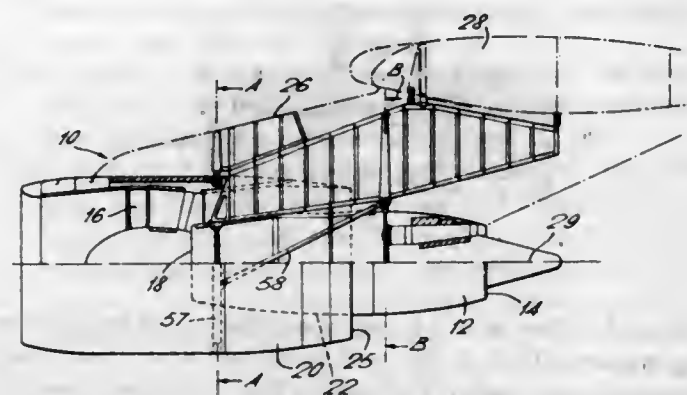
Int. Cl.<sup>2</sup> B64D 27/16

U.S. Cl. 244-54

6 Claims

1. An aircraft including structure for externally mounting an engine, a by-pass gas turbine engine having a longitudinal axis and which comprises an engine outer cowl and a core gas generator having an outer casing which is spaced from the engine outer cowl to define a by-pass passage, front and rear core mounting means for supporting the core gas generator from said structure and including connections on the core gas generator and on the structure which connections lie in two planes transverse to and spaced along the engine axis, and first and second cowl mounting means for supporting the engine outer cowl from the fixed structure independently

of the core gas generator, said cowl mounting means including connections on the engine outer cowl and on the



structure, which connections lie in the same two planes as the core engine mounting connections.

4,013,247

## MECHANICAL SUPPORT APPARATUS FOR THE STABILIZATION OF AN INFLATABLE ESCAPE SLIDE

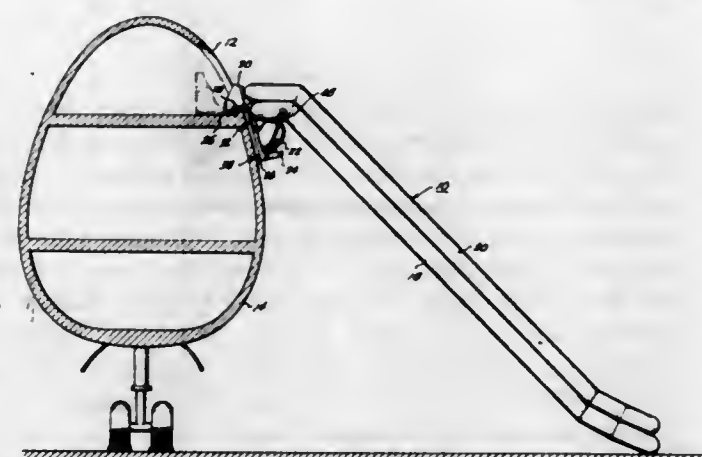
Leverett William Giffin, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1975, Ser. No. 645,390

Int. Cl.<sup>2</sup> B64D 25/14

U.S. Cl. 244-137 P

15 Claims



1. Apparatus for supporting an inflatable escape slide adjacent an egress door in an aircraft fuselage comprising:

at least one rigid frame member;

deployment means associated with said frame member for mounting said frame member for movement between a first position stowed in said fuselage adjacent said door and a second position wherein said frame member is positioned outside said fuselage and is oriented so that one end of said frame member is located adjacent said egress door and the opposite end of said frame member is located downwardly from said first end and adjacent said fuselage;

means for mounting said frame member and said deployment means on the interior of said fuselage adjacent said egress door;

latch means associated with said frame member for rigidly securing said frame member to the exterior surface of said fuselage when said frame member is in said second position; and

means for interconnecting said frame member to an inflatable escape slide to positionally stabilize said escape slide relative to said aircraft egress door during and after inflation of said escape slide.

4,013,248

## PARACHUTE EQUIPMENT

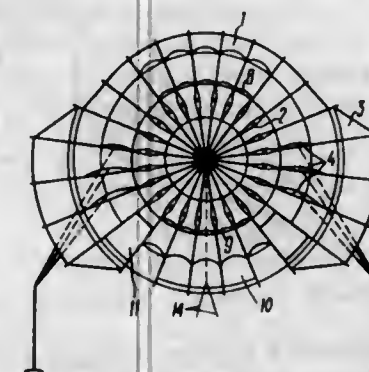
Ljudmila Nikolaevna Kalabukhova, Kutuzovskiy prospekt, 45, kv. 52; Svetlana Ivanovna Rudevskaya, prospekt mira, 184, kv. 192; Alexandr Alexandrovich Petrighenko, Amurskaya ulitsa, 21, korpus 2, kv. 2, and Alberta Sergeevna Smurova, Amurskaya ulitsa 19, kv. 23, all of Moscow, U.S.S.R.

Continuation of Ser. No. 432,157, Jan. 10, 1974, abandoned, which is a continuation of Ser. No. 320,681, Jan. 2, 1973, abandoned. This application May 30, 1975, Ser. No. 582,188

Int. Cl.<sup>2</sup> B64D 17/18

U.S. Cl. 244-145

2 Claims



1. A parachute provided with a canopy defined by radial gores joined together by radial seams, comprising a central shroud line; a system of radial vents in a central section of said canopy extending down to a fold line in the canopy and along a radial seam to reduce dynamic loads at the moment of deployment; stabilizing gores adjacent the periphery of said canopy at diametrically opposite sides; controlled valves disposed radially in canopy-sectors bounded by said stabilizing gores and reaching said fold line, each controlled valve being defined by a slot between a portion of a radial seam and a free hem of an adjoining gore overlapping it, the length of the slot exceeding that of said portion of the radial seam; first nozzles radially directing the air flow to the center of the canopy, constituted by a slot across a radial gore with two free hems, the length of one hem exceeding that of the other hem, and arranged at one side of the canopy between the sectors of said stabilizing gores; second nozzles adapted to direct the air flow radially off the center of said canopy, said second nozzles being constructed as said first nozzles and on the opposite side of said canopy between the sectors of said stabilizing gores; a group of vents in the sector of the second nozzles of the canopy including a central vent extending along the hem of the canopy across several radial gores, and lateral vents disposed symmetrically at the sides of said central vent between the hem of the canopy and said fold line of the canopy.

4,013,249

## AUXILIARY MOTOR MOUNTING ASSEMBLY

Martin H. Meyer, Waukegan, Ill., and Robert Zakrzewski, Franklin, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 3, 1975, Ser. No. 637,108

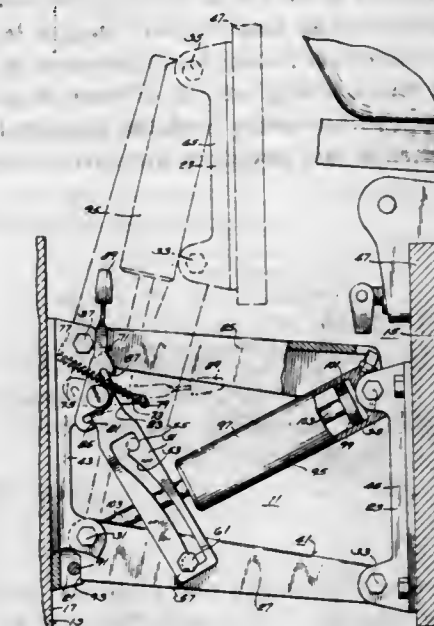
Int. Cl.<sup>2</sup> B63H 21/26

U.S. Cl. 248-4

29 Claims

1. A mounting device for a marine propulsion device comprising a first bracket adapted to be attached to a boat and having upper and lower parts, a second bracket adapted to support a marine propulsion device and having upper and lower parts, an upper link pivotally connected at its ends to said upper parts of said first and second brackets, a lower link pivotally connected at its ends to said lower parts of said first and second brackets, whereby to permit swinging of said second bracket relative to said first bracket between first and second positions, and means for selectively holding said second bracket in said first and second positions including a latching arm pivotally carried by one of said brackets and said links for movement so as to selectively prevent movement of

said second bracket from either one of said first and second positions in the direction toward the other of said first and



4,013,250

## DETACHABLE CUTLERY HOOK

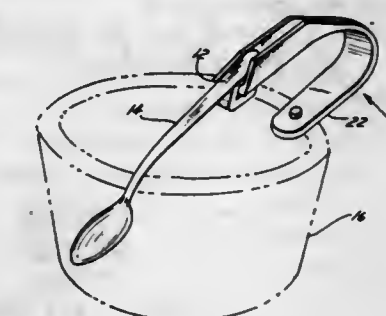
Andrew W. McGaffin, 282 Western Hut Road, Belmont, Lower Hut, Wellington, New Zealand

Filed Jan. 12, 1976, Ser. No. 648,021

Int. Cl.<sup>2</sup> A47G 21/14

U.S. Cl. 248-37.3

8 Claims



1. A cutlery hook comprising a one piece curved member having first and second end portions, said first end portion including a pair of resilient wall elements inclined towards each other to define therebetween a generally triangular space for receiving the end of a cutlery utensil in frictional engagement between said walls; an insert element, and cooperating means on said insert element and said first end portion of said one piece curved member for removably securing said insert element on said first end portion between said inclined walls to urge said utensil into tight frictional engagement with said walls.

4,013,251

## PAINT CAN HOLDER

John P. Cleveland, 7074 Dover Way, Arvada, Colo. 80004

Filed Nov. 24, 1975, Ser. No. 634,677

Int. Cl.<sup>2</sup> E06C 7/14

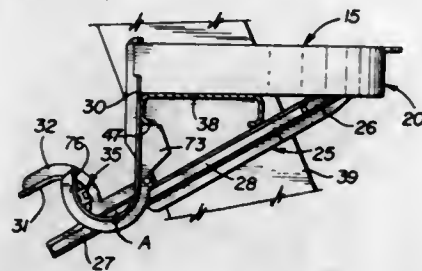
U.S. Cl. 248-210

13 Claims

1. A holder for selective use with liter, quart and gallon size paint cans and the like to hold said cans in level position adjacent elevated user work stations comprising a platform support having an inwardly disposed support face, an inner



base edge disposed on said platform and inclusive of means for selectively receive and support the lower rim of liter or quart size cans with the top limit of said inner base edge being positioned to provide support for the bottom of gallon size cans disposed on said platform, a lock element on said platform support adjacent the said support face, a hook component for engagement with said lock element to selectively extend above or below said platform, a brace arm attached to said platform support outwardly from the support face thereof for extension beneath said platform to provide outrigger sup-



port for an otherwise free end of said platform, said hook and brace arm being adapted for cooperative use to hold said platform and any cans disposed thereon at elevated positions for convenient use with said holder when configured for use on step ladders having said hook disposed below said platform and, accordingly, on the same side thereof as said brace arm, and means for cooperatively interengaging said hook and brace arm to hold the brace arm engaged with the bottom of a step of said ladder whereby said platform and cans held thereby are secured to the ladder step and ladder.

4,013,252

## HANGER BRACKET FOR MERCHANDISE

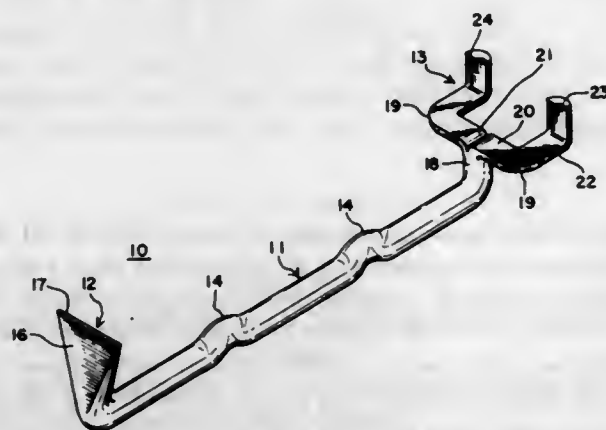
Leslie Braverman, Spring Valley, N.Y., assignor to Solo Products Corporation, Englewood, N.J.

Filed Dec. 15, 1975, Ser. No. 641,104

Int. Cl.<sup>2</sup> A47F 5/00

U.S. Cl. 248—220.4

6 Claims



1. An article support bracket device integrally formed of a single rod and mountable on a perforated board comprising a forwardly directed longitudinal support shank of circular transverse cross-section terminating at its rear in an upwardly directed base leg, and a pair of opposite transversely outwardly and rearwardly projecting coupling sections integrally formed with and extending from the rear of said shank and terminating in laterally spaced upwardly directed retainer legs, said coupling sections including first arms projecting laterally outwardly from the top end of said base leg and a second arm projecting rearwardly from the outer end of each of said first arms and terminating in one of said retainer legs, said arms and retainer legs being of semicircular transverse cross section, said arms having upwardly facing planar faces and said retainer legs having forwardly facing planar faces.

4,013,253

## BRACKET SUPPORT

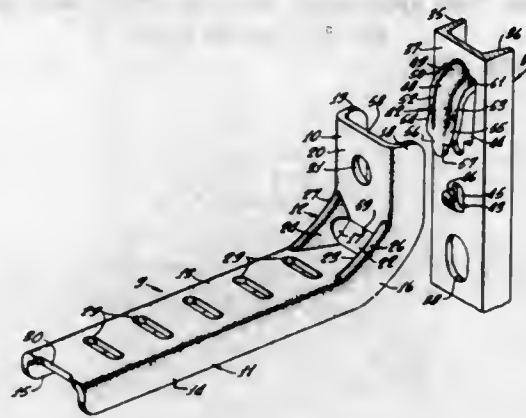
Frederick Perrault, 2644 W. 225th St., Torrance, Calif. 90505, and Raymond E. Perrault, 2404 Colt Road, Rancho Palos Verdes, Calif. 90274

Filed Nov. 19, 1975, Ser. No. 633,421

Int. Cl.<sup>2</sup> A47F 5/00

U.S. Cl. 248—223.3

17 Claims



1. In combination with a bracket having a part adapted for connection to a support, said part including an upper edge, a lower edge, and means defining an upwardly facing abutment surface intermediate said edges and facing towards said upper edge, said upper edge, lower edge and abutment being spaced fixed distances from each other, a support for said bracket comprising

a member having a surface, and opposed tabs outwardly of said surface,  
the first of said tabs overlapping said part of said bracket upwardly of said lower edge thereof,  
the second of said tabs overlapping said part of said bracket downwardly of said upper edge,  
said second tab having a portion in juxtaposition with said upwardly facing abutment surface for retaining said bracket against upward movement.

4,013,254

## MOUNTING CLIP LOCK

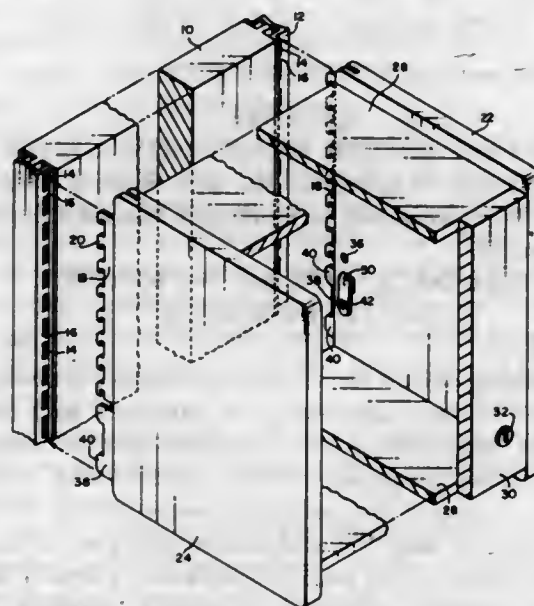
Bruce K. Boundy, Holland, and Robert J. Munsey, Grand Rapids, both of Mich., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1976, Ser. No. 647,028

Int. Cl.<sup>2</sup> A47G 29/02; A47F 5/08

U.S. Cl. 248—243

3 Claims



1. A locking mechanism for securing an element to a slotted standard, said slotted standard having a plurality of linearly aligned equidistantly spaced slots therein; said element comprising a body member, a tab clip having a plurality of linearly

aligned equidistantly spaced hook-shaped tabs fixed to said body member and extending from at least one edge thereof, said hook-shaped tabs being constructed and arranged to enter the slots in said slotted standard and be hooked therein; a locking tab mounted for limited slidable movement on said body member, said locking tab including at least one detent extending therefrom and linearly aligned with said hook-shaped tabs, said locking tab being slidable between a first position wherein said at least one detent is spaced from said hook-shaped tabs a distance equivalent to a multiple of said equidistant spacing and a second position different from any multiple of said equidistant spacing; said locking tab further including an aperture therethrough, and a locking pin and spring combination, said spring continuously urging said locking pin against said locking tab whereby when said locking tab is in said second position, said locking pin is urged into said aperture thereby securing said locking tab in said second position.

4,013,255

## EXTINGUISHER MOUNTINGS

Victor Edward Sentinella, Caterham, England

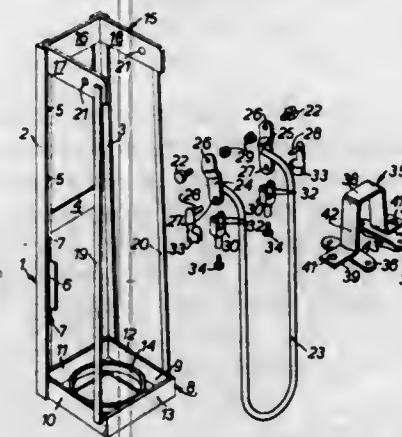
Division of Ser. No. 460,174, April 11, 1974, Pat. No. 3,921,950. This application Sept. 5, 1975, Ser. No. 610,766

Claims priority, application United Kingdom, Apr. 12, 1973, 17774/73; Oct. 18, 1974, 11384/74

Int. Cl.<sup>2</sup> A62C 39/00

U.S. Cl. 248—313

10 Claims



1. A mounting for a fire extinguisher, the mounting comprising:  
a spine member adapted for fixing in an upright position on a support,

first force applying means mounted at one end of said spine member and projecting transversely therefrom,  
second force applying means mounted at the other end of said spine member and projecting transversely therefrom to co-operate with said first force applying means, said second force applying means including an over-centre linkage pivotally connected to said other end of said spine member, said over-centre linkage comprising toggle link means pivotally mounted at one end to the top of said spine member and pivotally mounted at the other end to one end of pivot link means, the other end of said pivot link means being connected to pressure plate means adapted to apply pressure to the top of the extinguisher, said pressure plate means comprising first and second spaced pressure pad means arranged to act on opposite sides of the top of the extinguisher; said first link means comprising first and second pivot link members, said first pivot link member being rigidly attached at one end to said first pressure pad means and said second pivot link member being rigidly attached at one end to said second pressure pad means; and said toggle link means comprising first and second toggle link levers, said first toggle link lever being pivotally connected at one end to one side of the top of said spine member and pivotally connected at the other end to the other end of said first pivot link lever,

and said second toggle link lever being pivotally connected at one end to the other side of the top of said spine member and pivotally connected at the other end to the other end of said second pivot link lever, and  
manual operating means connected to said second force applying means and arranged to move said second force applying means from a position away from said first force applying means to a position towards said first force applying means in which position said over-centre linkage is in its over-centre position and said first and second force applying means apply retaining forces to the top and bottom of the extinguisher.

4,013,256

## COIL HANDLING PALLET

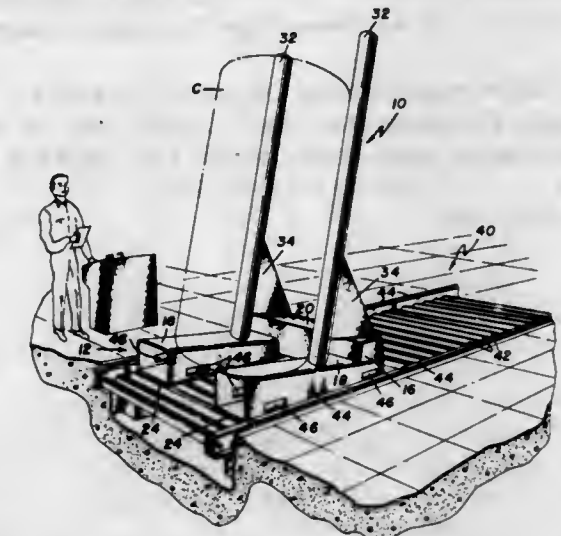
William J. Hill, Holden, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Apr. 24, 1975, Ser. No. 571,372

Int. Cl.<sup>2</sup> B65D 19/44

U.S. Cl. 248—346

8 Claims



1. In a rolling mill, a pallet for use in supporting a cylindrical product coil during the transfer thereof from one location to another, comprising: a generally U-shaped base section having laterally spaced leg members joined at their rearward ends by a bridging member, the upper surfaces of said leg members being inclined downwardly from front to rear, and a pair of support members extending upwardly from the rearward portions of said leg members, said support members being perpendicular to said upper surfaces, whereupon a coil supported on said pallet will have arcuate portions of its lowermost end resting on said inclined upper surfaces, with the inclination of said surfaces causing the coil to assume an inclined position resting against said support members.

4,013,257

## CHAIR CONTROL

Kenneth N. Paquette, Muskegon, Mich., assignor to The Shaw-Walker Company, Muskegon, Mich.

Continuation of Ser. No. 569,110, April 17, 1975, abandoned.

This application Mar. 3, 1976, Ser. No. 663,299

Int. Cl.<sup>2</sup> A45D 19/04

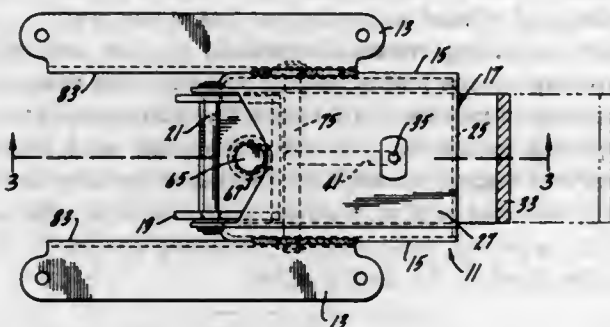
U.S. Cl. 248—379

13 Claims

1. A chair control including:  
a pair of chair seat supporting arms,  
a post cap adapted to be mounted on a chair post,  
a spring housing pivotally connected at one end thereof to said post cap for rotation about a generally horizontal axis,  
at least one compression spring positioned in said spring housing and engaging a wall of said housing located at the end of the housing away from said pivotal connection,  
a spring retaining member engaging the opposite end of said spring with said member pivotally mounted on said post cap for rotation about a generally horizontal axis and said spring biasing said member in an upward direction, and



means connecting said spring housing and said spring retaining member so that rotation of said spring housing



about its pivotal connection to said post cap will bring about rotation of said spring retaining member about its pivotal mounting to said post cap.

4,013,258

**CHAIR CONTROL FOR TILTABLE CHAIRS**

Frank Doerner, 138 Aberdeen Road, Kitchener, Ontario, Canada

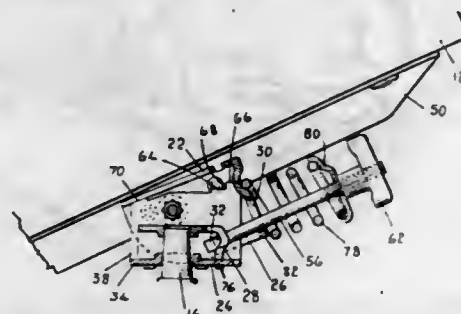
Continuation-in-part of Ser. No. 540,116, Jan. 10, 1976, abandoned. This application Apr. 6, 1976, Ser. No. 674,222.

Claims priority, application Canada, Dec. 24, 1974, 216923

Int. Cl.<sup>2</sup> A45D 19/04

U.S. Cl. 248—381

2 Claims



2. In a chair control for a tilting chair which comprises a fixed first frame member mounted in a fixed position on a chair post, a co-operating second frame member pivotally connected to said first frame member and attachable to the undersurface of a chair seat, biasing means connecting the first and second frame members and adapted to return said chair seat to a substantially horizontal position of rest after the chair seat has been tilted backwards, said biasing means consisting essentially of a bolt having at one end, an elongated head of vee shaped cross-section with the vee pointing towards the other end of the bolt, the improvement comprising said first frame member consisting of a base plate with a pair of upwardly extending arms formed integrally therewith, and an inner plate with a pair of spaced apart feet extending forwardly and downwardly from the front of said inner plate to form a slot therebetween, said bolt projecting through said slot formed between said feet with the point of the vee pivoting on the inner surface of the legs, and the ends of the pair of spaced apart feet extending downward through a pair of corresponding slots in said base plate of said first frame member.

4,013,259

**MOLD APPARATUS FOR FORMING RINGS**

David H. Tryon, 16880 Wing Lane, La Puente, Calif. 91744

Filed July 21, 1975, Ser. No. 597,770

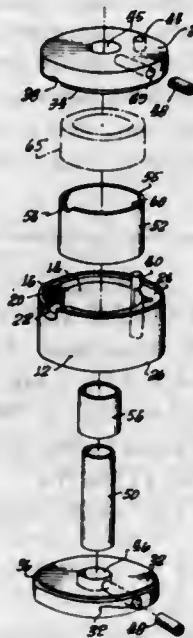
Int. Cl.<sup>2</sup> B22C 9/24; B29C 1/14

U.S. Cl. 249—57

5 Claims

1. A mold apparatus for forming various sized wax castings for finger-rings, comprising:  
a drum-housing, slightly larger than a finger ring; having a casting-bore disposed therein;  
a lower end-plate arranged to be removably received over the lower end of said drum-housing;

an upper end-plate arranged to be similarly removably received over the upper end of said drum-housing;  
said drum-housing and said upper and lower end-plates thereby defining a casting chamber therein;  
means, comprising a single supportpost, for removably securing said endplates to said drum-housing;  
said support-post being positioned in the finger-opening of the wax-casting of a finger-ring;  
said support-post coacting with said drum-housing to define a casting cavity corresponding to the wax-casting of a fingerring;



means positioned within said mold apparatus for allowing the wax casting material to be injected therein;  
finger sizing means, comprising one of a variety of predetermined-sized finger-ring bands adapted to be removably positioned within said casting bore, to encircle the outer surface of said support-post, for establishing the size of the finger-opening of the wax casting of a finger ring;  
ring sizing means, comprising one of a variety of predetermined-sized ring bands adapted to be removably positioned within and adjacent the inner surface of drum-housing, for establishing the overall size of the wax-casting of a fingerring.

4,013,260

**GAS ANALYZER**

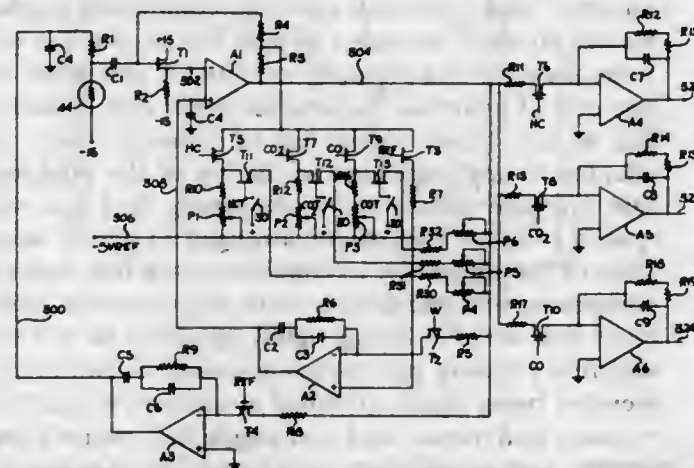
Edward A. McClatchie; Dean A. Watson, both of Berkeley, and Irvin G. Burrough, Walnut Creek, all of Calif., assignors to Andros, Incorporated, Berkeley, Calif.

Filed Sept. 27, 1974, Ser. No. 509,838

Int. Cl.<sup>2</sup> G01J 1/00; G01N 21/24, 21/26

U.S. Cl. 250—343

27 Claims



1. A gas analyzer comprising:  
an infrared energy source for repetitively directing along an

optical path and toward a sample cell first infrared energy having a first wave length generally different from the wave lengths absorbed by a gas sample, second infrared energy having a second wave length, at least some of which will be absorbed by a gas sample, and substantially no infrared energy;

a sample cell disposed in said optical path, said sample cell having substantially infrared transparent windows to allow infrared radiation to pass therethrough;

detector means sensitive to infrared radiation in said optical path passing through said sample cell, said detector means comprising a photodetector coupled to a controllable power source;

synchronizing means for providing signals indicative of the state of radiation being emitted from said infrared energy source;

electronic means coupled to said synchronizing means and said detector means for providing a first signal of a first predetermined level when said infrared energy source is directing said first infrared energy along said optical path, for providing a second signal of a second predetermined level when said infrared energy source is directing substantially no infrared energy along said optical path, and for providing a third signal of a level substantially equal to said first signal level when said infrared energy source is directing said second infrared energy along said optical path and said sample cell is substantially free of the gas to be detected;

said electronic means including automatic gain control means coupled to said power source to maintain the difference in said first and second signal levels at a predetermined level, whereby the difference in said third and first signal levels is indicative of the gas to be detected in the sample cell.

4,013,261

**DEVICE FOR PRODUCING WORK PIECES PERFORATED BY MEANS OF ELECTRON BEAMS**

Karl Heinz Steigerwald, Starnberg; Dieter König, Munich-Neuaußing; Wilhelm Scheffels, Germering, and Klaus Glieneck, Munich, all, Germany, assignors to Steigerwald Strahltechnik GmbH, Munich, Germany

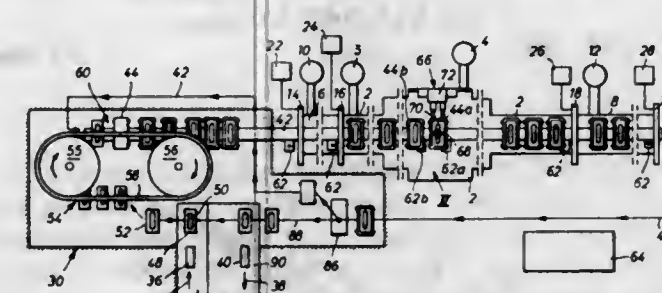
Filed Oct. 16, 1975, Ser. No. 622,947

Claims priority, application Germany, Oct. 16, 1974, 2449265

Int. Cl.<sup>2</sup> H01J 37/00

U.S. Cl. 250—453

30 Claims



1. A device for perforating foil blank work pieces with an electron beam comprising:  
an electron beam source;  
an evacuable electron beam work chamber coupled to said electron beam source for receiving the electron beam in a work area;  
input and output gating means for said work chamber providing entrance and exit of the work pieces to and from the chamber, said gating means including air locks for maintaining the evacuation of said chamber;  
a transport appliance having a transport track extending through the work area of said chamber at a location removed from said electron beam, across said air locks and between said input and output gating means;

a plurality of work piece carriers for receiving the work pieces in a predetermined position, said work piece carriers being adapted to be serially transported on said track and to be detachable therefrom; and  
transport control means for displacing the work piece carriers from said track at said work area for placing said work pieces in said electron beam for perforating the work pieces.

4,013,262

**ROTARY APPARATUS FOR MOVING WORKPIECES THROUGH TREATMENT BEAM WITH CONTROLLED ANGLE OF ORIENTATION AND ION IMPLANTER INCORPORATING SUCH APPARATUS**

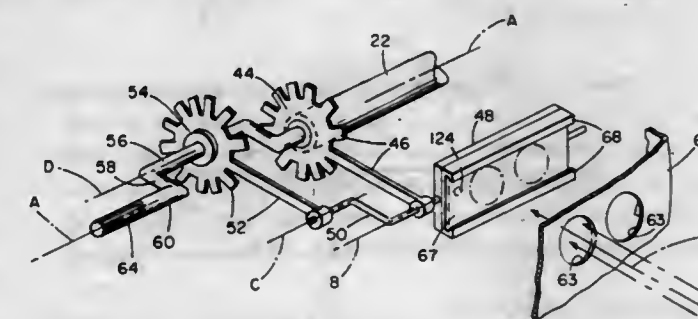
Charles M. Schott, Jr., Gloucester, and Geoffrey Ryding, Manchester, both of Mass., assignors to Varian Associates, Palo Alto, Calif.

Filed Dec. 13, 1974, Ser. No. 532,383

Int. Cl.<sup>2</sup> H01J 37/00

U.S. Cl. 250—492 A

21 Claims



1. An apparatus for distributing a beam substantially uniformly over a workpiece comprising a workpiece holder exposed to a treatment zone having said beam, first means for rotating said holder in a generally circular path about a first axis which is generally perpendicular to the axis of said beam, second means for counter-rotating said holder about a second axis parallel to said first axis at a rate dependent upon the rate of rotation of said holder about said first axis to provide, in cooperation with said first means, a constant angle of orientation of said holder relative to said beam, and third means for producing relative translational motion between said workpiece and said beam in a direction parallel to said first axis.

4,013,263

**CLAMP FOR REGULATING FLUID FLOW THROUGH PLASTIC TUBING**

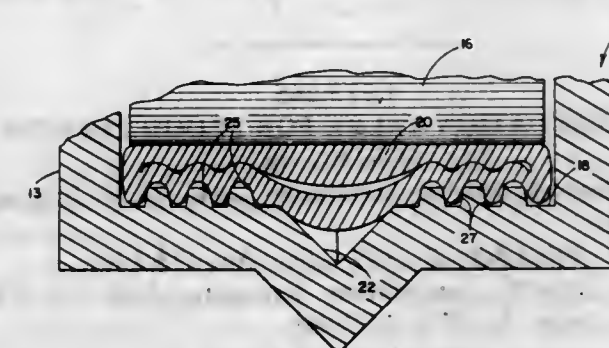
Marvin Adelberg, 4043 Cody Road, Sherman Oaks, Calif. 91403

Filed Dec. 24, 1975, Ser. No. 644,166

Int. Cl.<sup>2</sup> F16K 7/06

U.S. Cl. 251—6

8 Claims



1. In a clamp for regulating fluid flow through plastic tubing having a body portion with a longitudinal clamping surface, a variable cross-section longitudinal channel being formed in or along said surface and a roller wheel mounted in said body for longitudinal motion parallel to said clamping surface, the tubing being clamped between the roller wheel and said surface, the improvement comprising:



a plurality of distributed raised portions separated from each other by discrete valley portions formed in said clamping surface for locally gripping the tubing wall at given locations, the height of said raised portions above the lowest point of said valley portions and the separation between said raised portions having magnitudes of the order of the compressed wall thickness of the tubing, thereby constraining the tubing so as to reduce creep thereof.

4,013,264

# FLOW CONTROL VALVE WITH ISOLATED SEQUENCE CONTROL MECHANISM

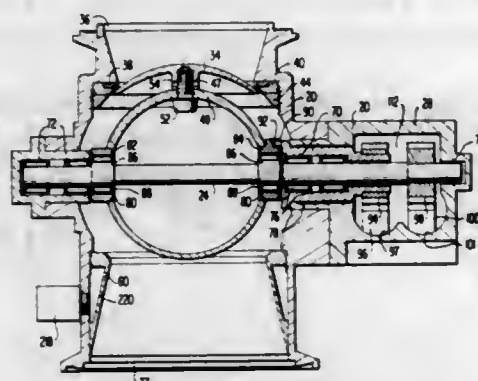
Morley V. Friedell, Wheat Ridge, Colo., assignor to Martin Marietta Corporation, Rockville, Md.

Filed Aug. 14, 1975, Ser. No. 604,760

Int. Cl.<sup>2</sup> F16K 31/04, 39/06

U.S. Cl. 251-56

23 Claims



1. In a spherical poppet valve of the type wherein a spherical valve poppet is pivotally mounted within a spherical valve casing for rotation from a first axially in-line position with respect to an annular valve seat to a second valve open position at an angle thereto and outside of the axial flow path through the seat opening, and shaft means are provided for rotating said valve poppet and for axially shifting said poppet relative to said seat when in axial alignment with said opening to fully close the said valve, the improvement wherein:

a radially compressible spring loading flow tube is mounted within said casing for rotation between an axially in-line position with respect to said annular valve seat and a position generally at right angles thereto, said flow tube is movable laterally at right angles to its axis, and means for mounting said spherical valve poppet on the side of said flow tube at a position such that said flow tube during radial compression spring biases said valve poppet against said valve seat when said spherical valve poppet is axially shifted into peripheral contact with said annular valve seat during lateral shifting of said flow tube which is at right angles to said seat, toward said valve seat to fully close said valve.

4,013,265

# AIR EVACUATION VALVE FOR BLOOD PRESSURE MEASURING DEVICE

Blasius Speidel, Hochmeisterstrasse 244, 7455 Jungingen, Germany

Filed July 30, 1974, Ser. No. 493,120

Claims priority, application Germany, July 30, 1973, 2338596; June 18, 1974, 2429046

Int. Cl.<sup>2</sup> F16K 24/00

U.S. Cl. 251-205

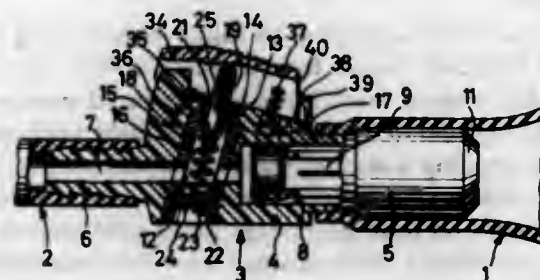
16 Claims

1. An air evacuation valve for the adjustable slow release of air from a pressurized air system and for the selective quick deflation of said system, which is particularly suited for use in conjunction with a blood pressure measuring device, for example, the valve comprising in combination:

a valve housing having a main bore communicating with said pressurized air system;

a cross bore in said housing extending outwardly from the housing main bore to an outlet to the atmosphere, said cross bore having a bore portion defining a valve seat separating the inside of the housing from said outlet;

a valve plunger received inside the cross bore so as to be axially movable therealong, the valve plunger having a first length portion located axially inside the valve seat and a second length portion extending through the valve seat to the outside of the housing, the second plunger length portion cooperating with the valve seat so as to progressively open an air throttling passage between it and the valve seat, in response to a displacement of the valve plunger towards the inside of the housing within the range of a predetermined axial opening stroke;



means for biasing the valve plunger axially outwardly in opposition to its opening displacement, so as to close said air throttling passage;

a bypass channel arranged in the second length portion of the valve plunger and extending from a portion thereof which is always exposed to the atmosphere to a point on the valve plunger which, when the latter has reached the inner end of its normal opening strokes, is positioned within the range of said throttling passage between said second plunger length portion and the valve seat, and which, when the valve plunger is forcibly moved inwardly beyond said end point, connects the inside of the housing with the atmosphere independently of the throttling passage, thereby permitting a quick bypass evacuation of air from the pressurized air system.

4,013,266

# CABLE TENSIONING DEVICE WITH IMPROVED LOADING AND REMOVAL CAPABILITY

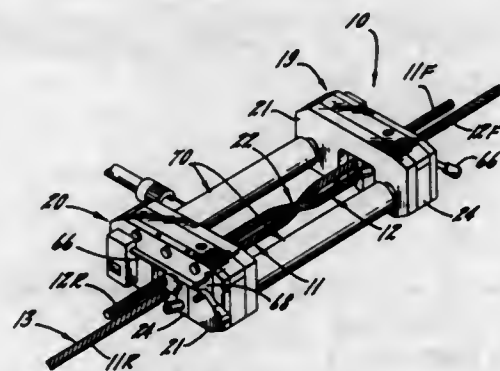
Ellsworth W. Lapp, c/o Lapp Engineering, 6060 S. 11th St., Rockford, Ill. 61109

Filed Mar. 4, 1976, Ser. No. 663,969

Int. Cl.<sup>2</sup> B66F 1/00

U.S. Cl. 254-69

2 Claims



1. A device for tensioning a cable having lapped end sections wrapped around another through an angle which is an odd multiple of 180° whereby a twist is formed in said cable, said first and second end sections having first and second free end portions, respectively, extending in opposite directions from said twist with the axes of the two free end portions being located substantially along the same straight line, said device comprising first and second members spaced from one another along said cable, linear actuating means connected

between said members, said actuating means being operable when actuated in one direction to spread said members apart and being operable when actuated in the opposite direction to draw said members toward one another, said first and second members having first and second cable-receiving throats, respectively, each adapted to accept said first and second cable end sections, first and second gripping elements within the respective throats and each having a longitudinally extending groove for receiving the respective cable free end portion, the groove in said first gripping element being longitudinally in line with the groove in said second gripping element, first and second jaws disposed in opposing relation with said first and second gripping elements, respectively, said first and second jaws having first and second longitudinally extending grooves, respectively, disposed in opposing relation with the grooves of the respective gripping elements, the groove in said first jaw being longitudinally aligned with the groove in said second jaw, means on said members for moving said jaws toward and away from said gripping elements between clamped and released positions, said jaws and said gripping elements clamping the respective cable free end portions in the respective grooves when said jaws are in said clamped positions and releasing the cable free end portions when said jaws are in said released positions, said gripping elements and said jaws being attached to and movable in unison with the respective members as the latter are spread apart and drawn toward one another and being operable to pull the clamped first and second cable free end portions in opposite directions along said line as said members are spread apart whereby tension is placed in said cable.

4,013,267

# PENDULUM JACK

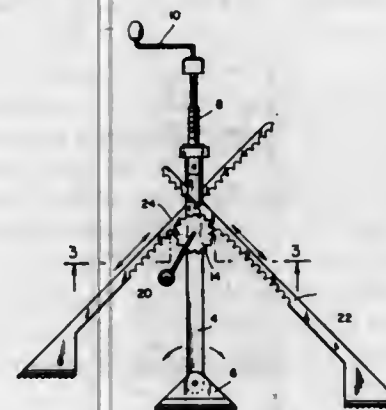
Norman W. Kirk, 9 Rosedale Ave., Montclair, N.J. 07042

Filed June 1, 1976, Ser. No. 691,425

Int. Cl.<sup>2</sup> B66F 3/08

U.S. Cl. 254-85

1 Claim



1. A pendulum jack comprising a central post, a swivel base, said post being pivotally mounted in said base, a screw lift disposed in said post, a chain hook secured to said lift, a pair of gears mounted on a common shaft on opposite sides of said post, a pair of legs having rack teeth engaging said gears, respectively, and adapted to be moved oppositely in translation in a direction depending on the selected angle of pivot for said post.

4,013,268

# VARIABLE PITCH VEHICLE WHEEL SUPPORT RAMP

Hugh M. Williams, 34 N.E. 37, Oklahoma City, Okla. 73105

Filed Mar. 8, 1976, Ser. No. 665,020

Int. Cl.<sup>2</sup> E02C 3/00

U.S. Cl. 254-88

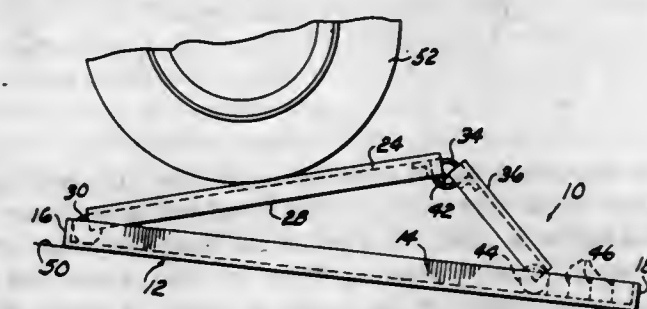
1 Claim

1. A vehicle wheel supporting device, comprising: an elongated channel-shaped base having upstanding legs and a bight portion adapted to flatly contact the surface of the earth and having an upstanding stop forming wall at its respective ends;

hingedly connected ramp means transversely and longitudinally overlying an intermediate portion of said base between said legs and said stop walls,

said ramp means comprising a channel-shaped elongated ramp having an upwardly disposed bight portion forming a planar wheel supporting surface, and a channel-shaped ramp brace of less length than said ramp,

the hingedly connected end portions of said ramp means being vertically movable toward and away from said base about the axis of the hinge connection;



4,013,269

# WIREGUIDE-TRANSPORT APPARATUS

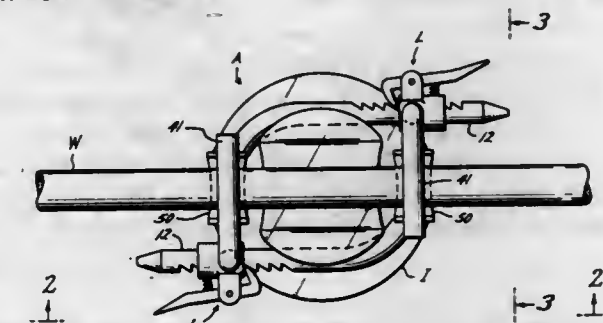
Jack R. Lovett, 1900 Irving, Orange, Tex. 77360

Filed Dec. 19, 1975, Ser. No. 642,580

Int. Cl.<sup>2</sup> B65H 59/00

U.S. Cl. 254-134.3 PA

5 Claims



1. An apparatus for supporting and guiding a wire cable as it is pulled axially into position atop a high top insulator, comprising:

a. a removable support means adapted to be affixed to a high top insulator, said removable support means including a pair of interfitting L-shaped segments each having a long leg and a short leg disposed at approximately 90° with respect to one another and having a bore formed at the end of the short leg for receiving the end of the long leg of the other segment in latch means for latching the long leg in said bore;

b. roller means carried on said support means and extending transversely with respect to the longitudinal axis of the cable for engaging and supporting said cable as it is moved axially into position on an insulator.

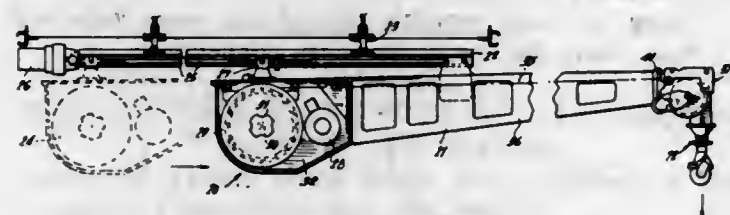


4,013,270

**COMBINED WINCH AND BOOM ASSEMBLY**  
Elmer Laky, Cranford, and Ralph Walsh, Oceanport, both of N.J., assignors to Breeze Corporations, Inc., Union, N.J.  
Filed Mar. 29, 1976, Ser. No. 671,548  
Int. Cl.<sup>2</sup> B66D 1/48

U.S. Cl. 254-173 R

8 Claims



1. A combined winch and boom assembly comprising an elongated boom member, an inboard end and an outboard end on said boom, a winch secured to the boom adjacent its inboard end, a cable receiving drum for said winch laterally disposed with respect to the boom, a source of rotary power for said drum, an output shaft connected to the source of rotary power and extending outwardly of said boom, lateral fastening means to couple the drum to the extended portion of the output shaft, a cable for the said drum, a traction sheave carried by the outboard end of the boom to receive the cable therethrough, a traction pulley in said sheave, a latch plate on said traction sheave swingably carried by said traction sheave above said pulley and a cable pendant swingably carried by the latch plate to receive and guide the cable passing through the traction sheave.

4,013,271

**MIXING DEVICE**

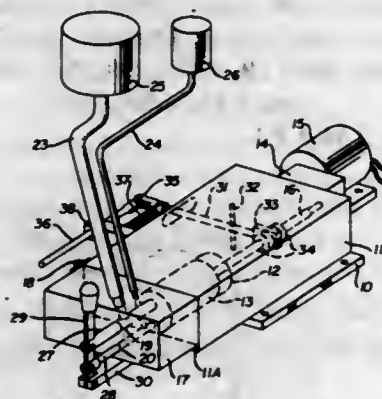
James H. Hoskinson, 10118 Duck Creek Road, Salem, Ohio 44460

Filed Sept. 18, 1975, Ser. No. 614,628

Int. Cl.<sup>2</sup> B01F 7/12, 13/00

U.S. Cl. 259-2

6 Claims



1. A mixing device having movable first and second body members with oppositely disposed engaging surfaces, a cylindrical bore formed in said first body member inwardly from the surface thereof and a flat surfaced circular member movably positioned in said cylindrical bore, means for imparting rotational and translational motion to said circular member, said second body member having a pair of tubular bores therein extending transversely from the surface thereof and positioned for registry with the surface of said circular member in the first body member when the body members are in engaged relation, valve elements slidably disposed in said tubular bores and passageways in said second body member communicating with said tubular bores and comprising means by which materials to be mixed may be delivered thereto, said valve elements movable longitudinally of said tubular bores from first positions flush with the surface of said second body member to second positions inwardly thereof beyond said communication passageways and whereby material in said

tubular bores is moved outwardly of the surface of the second body member when said valve elements close said communicating passageways.

4,013,272

**INLINE MIXER**

Willis G. Routson, Walnut Creek, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1973, Ser. No. 329,151

Int. Cl.<sup>2</sup> B01F 5/06

U.S. Cl. 259-4 R

2 Claims

1. A mixer, the mixer comprising a conduit having an inlet, a fluid source in operative engagement with the inlet end, an outlet having a discharge means, the conduit defining an internal passage having an entrance end and an exit end, the internal passage extending from the entrance end to the exit end, the conduit having an internal passage wall, the conduit being a shrunken tube, the tube being shrunken about a chain disposed within the passage, the chain comprising a plurality of links, said links and said passage wall defining at least one tortuous passage extending through said links and the tube forms a generally minimal surface over the chain.

4,013,273

**METHOD OF, AND MIXER FOR INTIMATE BLENDING OF FINE, DRY, PARTICULATE SOLID MATERIALS WITH MOIST WET OR SLURRIED PARTICULATE SOLID MATERIALS**

George Jack Danyliw, Sudbury, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

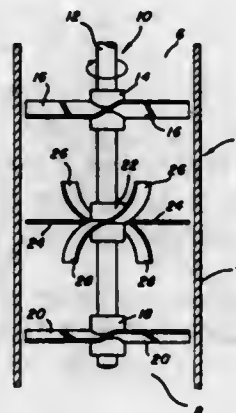
Filed Oct. 30, 1974, Ser. No. 519,128

Claims priority, application Canada, Dec. 19, 1973, 188485

Int. Cl.<sup>2</sup> B01F 7/20

U.S. Cl. 259-8

17 Claims



1. A blender for a particulate feed comprising an open ended, substantially tubular enclosure having an inlet end and an outlet end and an impeller positioned within the enclosure, the impeller comprising:

- a rotatable spindle positioned substantially axially within the enclosure and having blades mounted upon it including,
- a first set of blades that are radially extending, positioned relatively close to the inlet end, and pitched to advance the feed toward the outlet end;
- a second set of blades that are radially extending, positioned relatively close to the outlet end, and pitched to advance the feed toward the outlet end, the second set of blades having an average pitch less than the pitch of the first set of blades;
- a third set of blades containing radially extending and curved blades positioned between the first and second set of blades, said third set of blades including at least one group of blades curved towards the first set of blades and at least one group of blades curved towards the second set of blades.

4,013,274

**APPARATUS FOR GUIDING AND SEATING A STIRRER SHAFT FOR LABORATORY OR INDUSTRIAL GLASS APPARATUS**

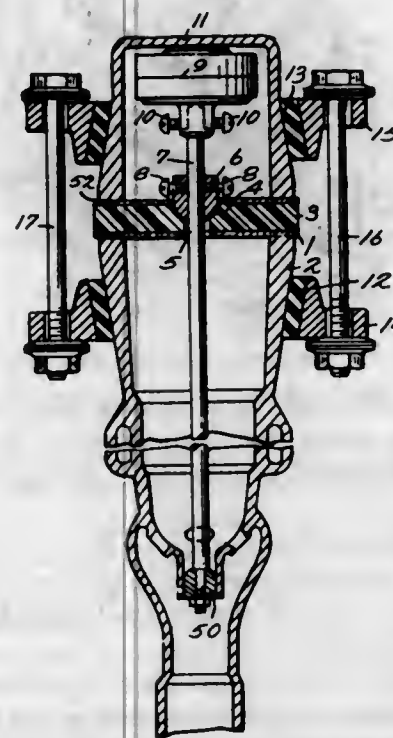
Günter Hering, Michelbach, and Werner Engels, Rodenbach, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany  
Filed June 3, 1976, Ser. No. 692,372

Claims priority, application Germany, June 5, 1975, 2524911

Int. Cl.<sup>2</sup> B01F 7/22

U.S. Cl. 259-102

9 Claims



1. Apparatus for guiding and sealing a stirrer shaft for laboratory or industrial glass apparatus, comprising: a stirrer shaft, rotatable about a shaft axis; a housing for containing said shaft; an abutment means in said housing for contacting said shaft; bearing means for mounting said stirrer shaft in said housing so that the angle between said stirrer shaft axis and a vertical axis may be adjusted, said bearing means including a smooth disc having a concentrically disposed spherical recess therein, a conical bore located at the lowest point of said recess and passing through said disc, and a body having a spherical surface and a central axial bore rotatably mounted in said spherical recess of said disc; and means for affixing said stirrer shaft in said bore of said body so that it projects through said bore in said disc and extends to said abutment.

4,013,275

**APPARATUS FOR DIVIDING AND KNEADING A PIECE OF DOUGH**

Herbert Schröder, and Reinhard Schröder, both of Angerstrasse 5, 8623 Staffelfeld, Ofr., Nurnberg, Germany

Filed Aug. 8, 1975, Ser. No. 603,123

Claims priority, application Germany, Aug. 9, 1974, 2438316

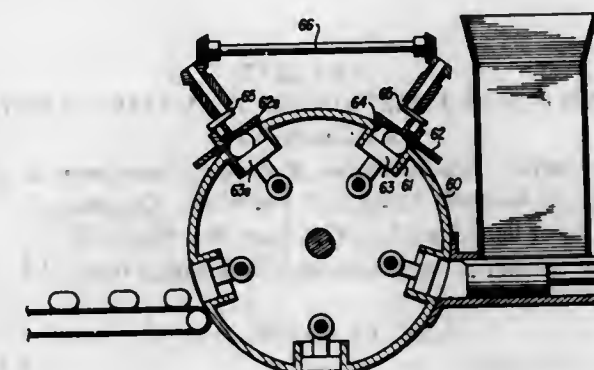
Int. Cl.<sup>2</sup> A21C 7/06

U.S. Cl. 259-185

9 Claims

1. In an apparatus for separating and kneading portions of dough including drum means rotatably mounted on a frame for rotating step-by-step in a constant direction of rotation; means connected to said drum means for initiating the step-by-step movement, said drum means including at least three circumferentially-spaced measuring chambers; dough supply means adjacent the outer circumference of said drum means for periodic alignment with the respective measuring chambers; kneading means adjacent the periphery of said drum

means for engaging dough in the measuring chambers and kneading the same; an exit portion adjacent the outer periphery of the drum means having associated therewith means for removing the kneaded dough from the drum means, said drum means having an inactive period, between two rotational steps, in which actuating means activate said dough supply means to feed a portion of dough into a first of said measuring chambers, and activate said removing means such that kneaded dough is removed at said exit portion from the third of said measuring chambers; reciprocating measuring-flask means in each of said measuring chambers; and control means for controlling the rotation of the measuring-flask means in the position of said dough supply means, the kneading means and said exit portion, the improvement in which, said dough supply means comprises dough conveying means reciprocatably supported for movement toward and away from the outer periphery of the drum, support bars oriented generally parallel to the axis of rotation of said drum means and connected to said measuring flasks and supported on said drum for radial movement toward and away from the outer periphery of the



drum for moving said measuring flasks in a corresponding direction, cam disc means rotatably supported on an axis of rotation parallel to said support bars for operatively engaging and radially moving the support bars, means for manually adjusting the position of said cam disc means to adjust the length of the reciprocating movement of the measuring flasks; at least one cam rail engageable with said support bars for retaining them in a path of movement orienting the measuring chambers in an operative position relative to the kneading means; and a second cam device supported for oscillatory movement and engageable with the cam rail for controlling the radial position of the measuring flasks relative to the kneading means, means for positioning said first cam disc and said cam rail such that for each operational position of the cam disc and cam rail wherein a support bar is in a transitional position therebetween, the support bar can have a transitional movement from the cam disc to the cam rail; and ejection lever means, said ejection lever means being operable for sequentially engaging the support bars of the measuring flasks arriving at the exit portion with kneaded dough and urging the dough from the measuring chambers.

4,013,276

**EXTRUDERS AND INJECTION MOULDING MACHINES**

Ambrose C. Boham; John C. Davies, and Brian J. Kendall-Smith, all of Birmingham, England, assignors to British Industrial Plastics Limited, Manchester, England

Filed Mar. 19, 1975, Ser. No. 559,980

Int. Cl.<sup>2</sup> B29B 1/10

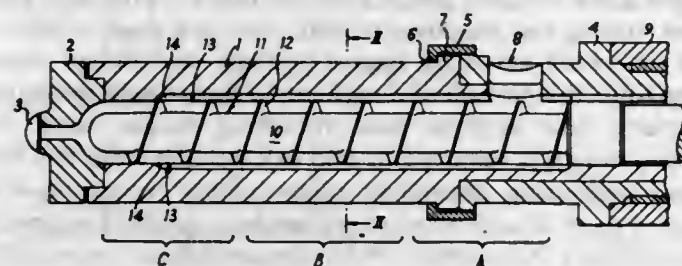
U.S. Cl. 259-191

6 Claims

1. A screw-housing for extruder and injection moulding machines, within which screw-housing there is defined a longitudinally extending bore for reception of a rotary screw, said bore having a feed zone characterised in that said screw-housing is particularly adapted for the feeding of thermosetting plastics material in the form of a fine powder and in the internal surface of the bore there is defined a major portion of the length of the screw-housing downstream of the feed zone thereof, said bore



terminating in a discharge opening, and said grooving terminating in spaced relation to that part of said bore coupled to



said discharge opening wherein a terminal portion of said bore is free of said grooving.

4,013,277

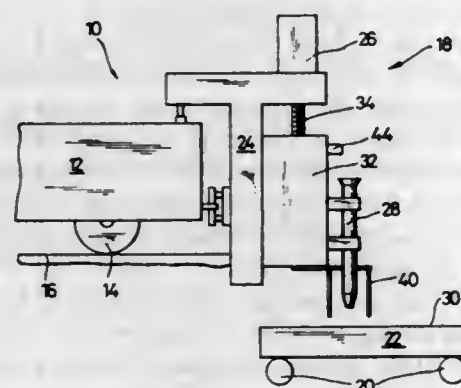
### DEVICE FOR POSITIONING A CUTTING TORCH AGGREGATE

Ewald Schmitt, Bischofsheim, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany  
Filed Apr. 9, 1975, Ser. No. 566,395  
Claims priority, application Germany, Apr. 11, 1974, 2417694

Int. Cl.<sup>2</sup> B23K 7/10

U.S. Cl. 266-76

5 Claims

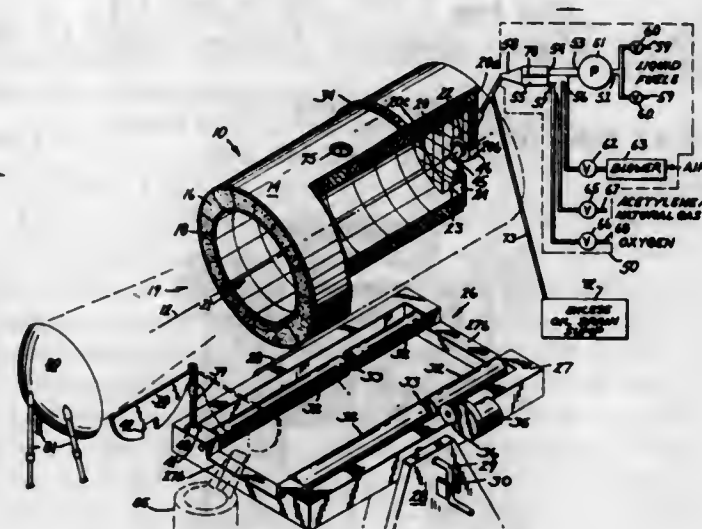


1. A device for positioning a cutting torch aggregate a predetermined distance from a workpiece comprising, in combination, a movable sled as part of said aggregate, torch means mounted to said sled for joint movement therewith, drive means for moving said sled up and down toward and away from the workpiece, said drive means including a spindle, means for rotating said spindle, a nut engaged with said spindle mounted for relative movement with respect thereto, said sled disposed for resting against said nut whereby the vertical positioning of said sled is determined by the relative movement of said nut, spacing means mounted to said sled and extending beyond said torch means for contacting the workpiece when said torch means is closer than the predetermined distance while said nut is being moved in its relative lowering direction, control means on said sled and said nut and connected to said spindle rotating means for reversing the direction of relative movement of said nut to its raising direction upon contact of said spacing means with the workpiece to thereby raise said sled until said torch means is at said predetermined distance, said control means including a movable control lever which activates said rotating means when said control lever is in a predetermined position, a stud connected with said nut for joint movement therewith, and said control lever being in the path of movement of stud whereby said control lever may be moved to said predetermined position upon contact by said study.

4,013,278  
**PORTABLE THERMAL METAL REFINING APPARATUS**  
Philip J. O'Donoghue, 6 E. 45th St., Minneapolis, Minn. 55409  
Filed Jan. 30, 1975, Ser. No. 545,295  
Int. Cl.<sup>2</sup> F27B 7/00

U.S. Cl. 266-213

9 Claims



7. A portable thermal metal refining apparatus for selectively reclaiming metals from a combination or mixture load of a plurality of materials having varied melting temperatures, comprising:

- a refining chamber characterized by:
  - a rigid cylindrical outer casing symmetrically disposed for rotation about a central axis longitudinally extending therethrough;
  - a firebrick refractory insulation layer lining the entire inner surface of said outer casing and mounted for rotation therewith;
  - a thin cylindrical smooth, non-porous glass layer lining the inner surface of said firebrick;
  - end plate means for sealingly closing one end of said refining chamber, said end plate means defining with said glass lining layer a cylindrical internal reduction cavity, said end plate means having an opening therethrough axially aligned with said central axis; and
  - that end of said refining chamber oppositely disposed from said end plate means remaining completely open, to substantially the same diameter of that of said reduction cavity for enabling unencumbered introduction of a load therethrough to said internal reduction cavity;
- support means for rotatably supporting said refining chamber for rotation about said central axis;
- drive means operatively connected to said refining chamber for controllingly rotating said chamber about said central axis;
- means for pivotally controlling the longitudinal inclination of said refining chamber, selectively enabling either said open or said closed end of said refining chamber to be positioned relatively lower than said respective opposite end thereof without interfering with the rotational motion of said refining chamber about said central axis;
- burner nozzle means fixedly mounted external of said refining chamber and operatively projecting through said opening in said end plate means for directing a reducing flame obliquely toward said load resting upon the lower portion of said internal reduction cavity;
- fuel supply means operatively connected with said burner nozzle means for controllingly supplying a pressurized mixture of selected fuels and air to said burner nozzle means; and
- free-standing reflector means operatively positioned in confronting spaced apart alignment with said open end of said refining chamber for reflecting heat back into said internal reduction cavity.

4,013,279

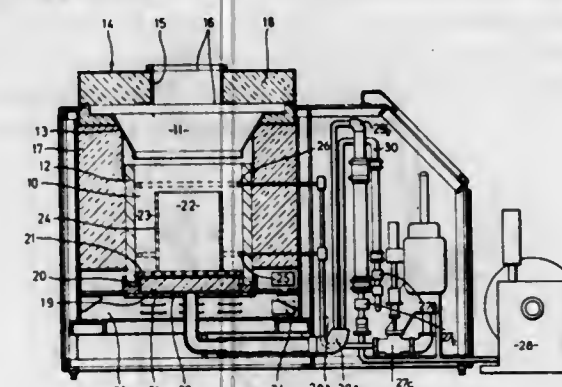
### TREATMENT FURNACE

Michael John Virr, Stourbridge, England, assignor to Fluidfire Development Limited, England  
Filed Aug. 5, 1974, Ser. No. 495,017  
Claims priority, application United Kingdom, Aug. 9, 1973, 37708/73

Int. Cl.<sup>2</sup> C21D 1/74

U.S. Cl. 266-249

4 Claims



- A heat treatment furnace comprising:
  - means defining a furnace chamber including a top and a bottom wall;
  - a bed of solid particles contained in the chamber and lying on said bottom wall of the chamber;
  - an annular, vertical, imperforate partition in the chamber separating an outer combustion zone of the bed from a treatment zone of the bed, said outer combustion zone having an annular configuration surrounding said treatment zone and said partition having upper and bottom edges;
  - feed means for feeding fuel and air to said outer combustion zone of said bed to burn therein to heat and fluidize said outer combustion zone and for feeding a treatment gas to said treatment zone of said bed to fluidize said treatment zone;
  - said bottom edge of said partition and said bottom wall of said chamber defining therebetween a gap through which said zones communicate; and
  - said upper edge of said partition and said top wall of said chamber defining therebetween a further gap through which said zones communicate;
  - whereby, during operation, particles of said bed which have been heated by combustion occurring in said combustion zone are caused to continuously flow upwardly in said outer combustion zone through said further gap between said upper edge of said partition and said top wall from said outer combustion zone to said treatment zone, downwardly through said treatment zone to transfer heat to said treatment zone, and through said gap between said lower edge of said partition and said bottom wall into said outer zone.

4,013,280

### WORKPIECE POSITIONING TABLE

Anwar Chitayat, 8 Gilbert Lane, Plainview, N.Y. 11803, and Stanley J. Squires, 27 Marbourne Road, Bethpage, N.Y. 11714

Filed Aug. 9, 1976, Ser. No. 712,596

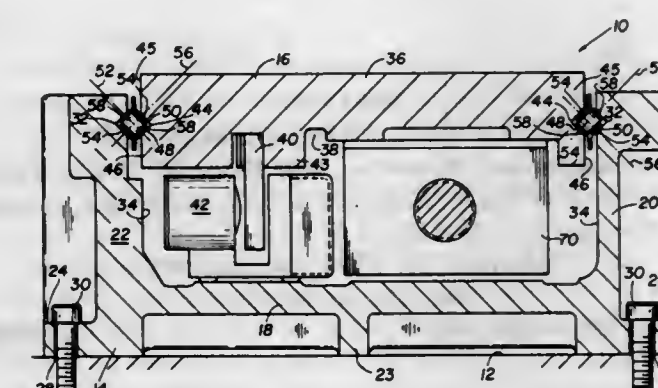
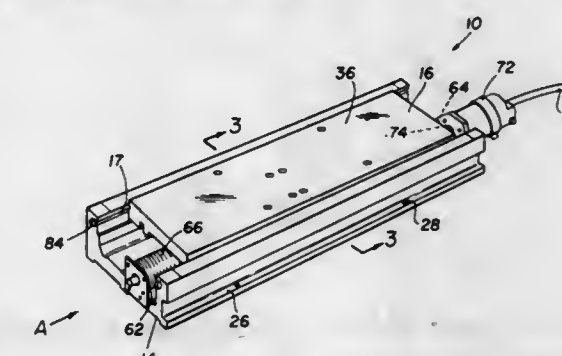
Int. Cl.<sup>2</sup> B23Q 3/02

U.S. Cl. 269-60

8 Claims

- A workpiece positioning table comprising in combination:
  - a generally channel-shaped base member having a bottom web element and a pair of laterally spaced side wall elements projecting upwardly therefrom, at least one of said side wall elements being pre-tensioned under the influence of a predetermined load so as to provide a spring force tending to flex said side wall element inwardly towards the other of said side wall elements;

a V-shaped notch formed in the inner face of each of said side wall elements at a location above said bottom web element and in vertically aligned relation, said notches extending lengthwise of the respective side walls; an elongated carriage member carried by said side wall elements for reciprocatory movement therealong, a V-shaped notch formed in each of the longitudinally extending outer edges of said carriage extending lengthwise of said respective outer edges;



sets of cross-mounted roller elements positioned within the adjacently aligned V-notches of said carriage and base members so as to rollably mount said carriage on the side walls of said base member; means for reciprocally moving said carriage member; and means for determining the extent of linear movement of said carriage member; whereby the pre-tensioning force of said at least one side wall element is sufficient to maintain said carriage member in aligned mounted relation on said side wall elements.

4,013,281

### JIG DRIVING APPARATUS

Yoshio Tokunaga, Higashikurume, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan  
Filed Sept. 26, 1975, Ser. No. 616,871  
Claims priority, application Japan, Oct. 17, 1974, 49-118684

Int. Cl.<sup>2</sup> B23Q 3/18

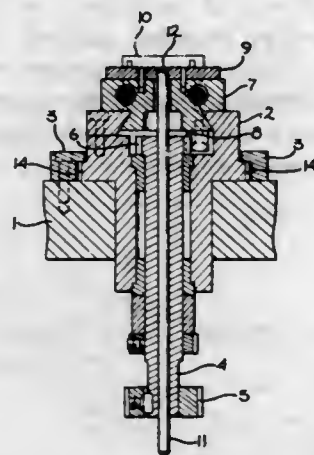
U.S. Cl. 269-61

8 Claims

- A jig of the type comprising a jig body, a jig operating plate movably coupled to said jig body, a jig plate for holding a workpiece mounted on the upper surface of said jig operating plate, and a jig driving means, the improvement comprising:
  - a driven shaft, said shaft being hollow and rotatably mounted in the central part of said jig body;
  - a means for converting rotation of said driven shaft to movement of said jig operating plate; and



an operating shaft, said operating shaft being slidably mounted in said driven shaft thereby allowing up and



down movement of said operating shaft for separating a workpiece from said jig plate.

4,013,282

**WORK TABLE ROLLER SUPPORT**

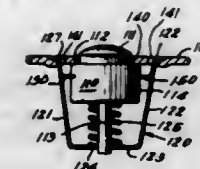
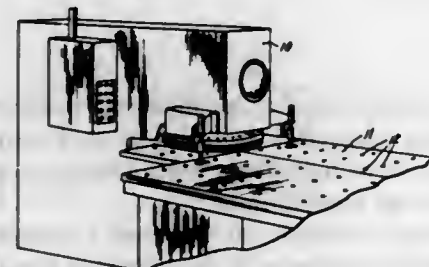
Harold Kaufmann, Rochester, and Kenneth Sprick, Zumbro Falls, both of Minn., assignors to Di-Acro Division, Houdaille Industries, Inc., Buffalo, N.Y.

Filed June 21, 1976, Ser. No. 698,472

Int. Cl.<sup>2</sup> B65G 13/00

U.S. Cl. 269—289 MR

5 Claims



1. In a machine tool having a work piece supporting table, the table having a plurality of spaced apart roller members projecting above a top table surface, the improvement of the roller members comprising roller elements received in a housing, a plurality of openings in the table, said roller member projectable through said openings from an undersurface of said table, means on the housing contacting the undersurface of said table when the roller members are projecting through said openings preventing movement of the housing through said openings, a spring clip having arm portions engaging said table and a bight portion spaced from said undersurface of said table underlying said housing, spring means interposed between said bight portion and said housing urging said housing away from said bight portion, said arms having free ends opposite said bight terminating in outturned flanges, said flanges overlying portions of said table, and blocking means extending between said arms and said housing preventing movement of said arms towards one another when said housing is at a first distance from said bight, said blocking means being out of contact with said housing when said housing is at a second distance with respect to said bight closer to said bight than said first distance whereby said legs are free to move towards one another.

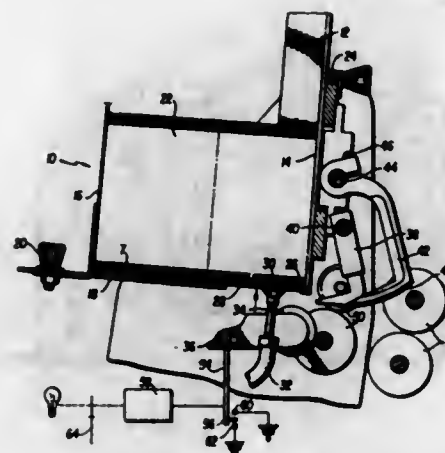
4,013,283  
**PULL-FOOT SHEET FEEDING DEVICE**  
Norwood E. Tress, Bath, and Winston A. Orsinger, Bethlehem, both of Pa., assignors to Bell & Howell Company, Phillipsburg, N.J.

Filed Aug. 29, 1975, Ser. No. 608,970

Int. Cl.<sup>2</sup> B65H 3/08, 3/50

U.S. Cl. 271—14

16 Claims



1. A sheet finding mechanism for feeding individual sheets separately from a stack comprising:  
a main hopper assembly for supporting a stack of sheets;  
means for drawing an exposed edge of an outer sheet away from the remaining stack;  
a pull-foot reciprocally movable between a first position in which it is between the remaining stack and the edge of the outer sheet which has been exposed and a second position in which it is away from the hopper assembly;  
roller means arranged to cooperate with the pull-foot, for continuously pinching the outer sheet between it and the pull foot while rolling on the sheet as the pull-foot moves away from the remaining stack and pulls the outer sheet from the remaining stack; and  
a further means for relatively moving said roller means and said pull-foot laterally toward each other in timed relation with reciprocations of said pull-foot for pinching the outer sheet between them.

4,013,284

**DECURLER DEVICE**

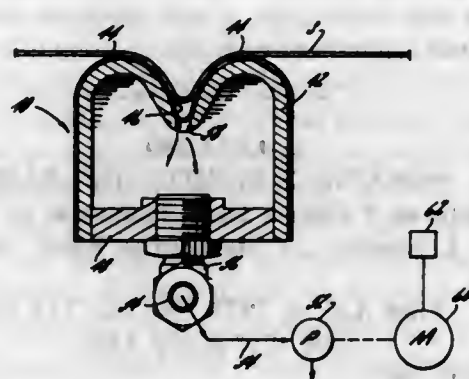
S. Gordon Demetre, Branford, Conn., assignor to Eastern Graphic Products, Inc., New Haven, Conn.

Filed Oct. 14, 1975, Ser. No. 622,410

Int. Cl.<sup>2</sup> B65H 29/04, 29/70

U.S. Cl. 271—183

5 Claims



1. An improved device for decurling curled sheets in a sheet handling apparatus having means for positively moving successive sheets along a delivery path comprising, in combination, an elongated suction bar disposed across the delivery path substantially transverse to the direction of sheet movement, said suction bar having a substantially M-shaped cross section with two smoothly rounded crests whose curvature is in the same direction as the curl of the sheets and a rounded

U-shaped trough between said crests and having a multiplicity of apertures therein, means bridging the legs of said M-shaped cross section below said trough for forming a vacuum manifold closed except for said apertures, means for drawing a vacuum in said manifold, the radius of said trough being substantially less than the radius of said crests so that as a curled sheet is moved across said crests and drawn into said trough by said vacuum it is progressively bent in a compound reverse curvature the sharpest bend of which is opposite the original direction of curl, and said crests and trough being coated with a smooth, hard plastic gel coat containing a dispersion of fine carbon particles and said bar having di-electric properties to electrically destaticize said sheets.

4,013,285

**COPYING MACHINE**

Mitchell V. Green, Natick, Mass.; Yukio Akita, Chiba, and Mitsuji Tachikawa, Tokyo, both of Japan, assignors to Copyer Co., Ltd., Tokyo, Japan

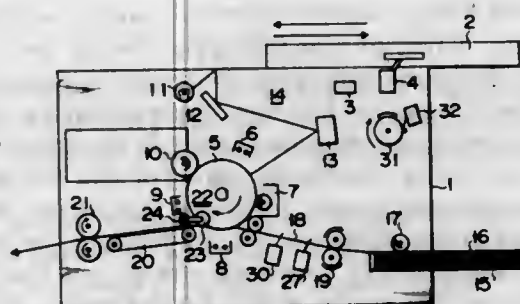
Filed Mar. 5, 1976, Ser. No. 664,180

Claims priority, application Japan, Mar. 6, 1975, 50-30262[U]

Int. Cl.<sup>2</sup> B65H 7/08

U.S. Cl. 271—261

6 Claims



1. In a copying apparatus comprising a copy paper-transporting device, a statically copying rotary drum whose peripheral surface is fitted with a photo-sensitive layer, a copy paper-feeding device for carrying the copy paper delivered from the copy paper-transporting device to the rotary drum, and a copy paper-separating device disposed near one end face of the rotary drum to guide one lateral edge portion of the copy paper projecting outward from the corresponding end face of the rotary drum by a prescribed width in a direction in which said copy paper can be detached from the rotary drum, thereby separating the copy paper statically adhered to the photo-sensitive layer mounted on the peripheral wall of the rotary drum, the improvement which further comprises a moved position-detecting switch for detecting the arrival of the forward end of the copy paper immediately in front of the rotary drum; a projecting width-detecting switch for determining whether one lateral edge portion of the copy paper projects outward from the corresponding end face of the rotary drum by a prescribed width, before the moved position of the copy paper is detected by said moved position-detecting switch; and means for restricting the operation of the copy paper-feeding device to prevent the copy paper from being brought to the rotary drum, in case the projecting width-detecting switch does not detect the projecting width of one lateral edge portion of the copy paper, but the moved position-detecting switch along detects the moved position of the copy paper.

4,013,286

**CARD MAGIC BOX**

Nobuo Nagai, Yamatokooryama, Japan, assignor to Nintendo Co., Ltd., Japan

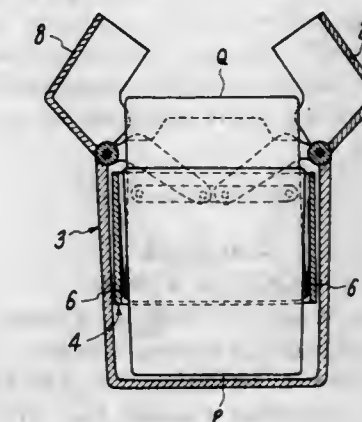
Filed Feb. 19, 1976, Ser. No. 659,554

Claims priority, application Japan, Sept. 13, 1975, 50-126617

Int. Cl.<sup>2</sup> A63J 21/00

U.S. Cl. 272—8 R

3 Claims



1. A card magic box comprising:  
a. a deck of uniformly-dimensioned playing cards, the configuration of which is such that either the top or the bottom edge of each card in the deck being slightly shorter than the other edge.  
b. an outer housing which is open at the top for loading and unloading said deck of cards, and  
c. an inner case as disposed in said outer housing, said inner case being open at the top and bottom and having side walls defining an internal space which is generally conforming to the shape of the deck and in which said deck is freely movable in a vertical direction, said inner case further having, in said internal space and adjacent its side walls that would face the corresponding longitudinal edges of said deck of playing cards upon loading of the deck into the inner case, a pair of resilient members as juxtaposed at a spaced interval shorter than the longer of said top and bottom edges of said deck, said resilient member being so configured and disposed that when said deck of cards is loaded into the inner case, it does not act upon the cards (P) positioned the shorter lateral edge down but selectively act upon and grips the card or cards (Q) positioned the longer lateral edge down and that in response to the upward movement of the inner case, the latter card or cards (Q) only are automatically raised.

4,013,287

**LEG EXERCISE AND FOOT REST FOR AUTOMOTIVE VEHICLES**

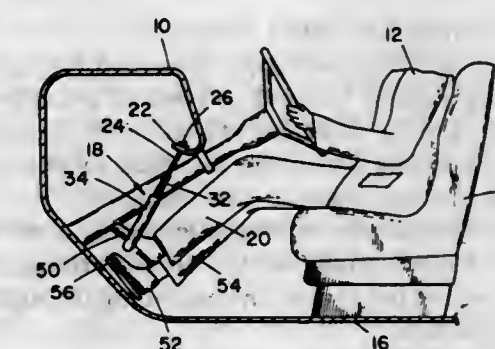
James J. Dickman, 2715 Durham Road, York, Pa. 17402

Filed Nov. 13, 1975, Ser. No. 631,740

Int. Cl.<sup>2</sup> A63B 21/04

U.S. Cl. 272—136

8 Claims



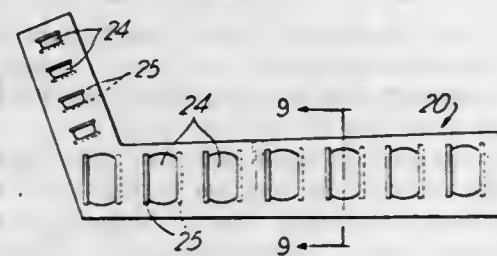
1. The combination of a leg exercising and rest device for drivers of automotive vehicles comprising; an automotive



vehicle having fixed means adjacent the dash panel thereof and positioned laterally from the brake pedal, an attaching member secured to said fixed means, extensible self-retracting means movably connected at one end to said attaching member and depending therefrom for free swinging support thereby laterally from the brake pedal of said vehicle, and foot-engageable means attached to the depending end of said extensible self-retracting means for reception of the foot of an occupant of the vehicle selectively for supporting and exercising the leg of the occupant attached to said foot by pushing upon said foot-engageable means to extend said extensible self-retracting means to develop tension therein and permitting said tension to retract said foot-engageable member and thereby exercise said leg of the occupant by successive movements as described.

#### 4,013,288 HOCKEY STICK

Ludovicus Jacobus Goverde, Whitby, Canada, assignor to Ontario Tool Design Inc., Ontario, Canada  
Filed July 14, 1975, Ser. No. 595,693  
Claims priority, application Canada, May 20, 1975, 227368  
Int. Cl.<sup>2</sup> A63B 59/14  
U.S. Cl. 273-67 A 4 Claims



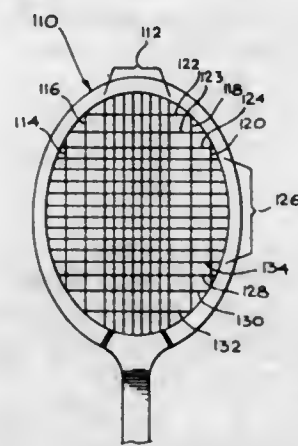
1. A unitary hockey stick molded from foamed nylon and having a blade portion, a shaft portion and a heel portion and a unitary reinforcement sheet member embedded in said blade portion and in the lower end of said shaft portion, the peripheral contour of said blade portion of the reinforcement sheet member substantially corresponding to that of the blade but being slightly smaller than the blade, said reinforcement sheet member further having a shaft section which extends into the lower end of said shaft portion of the stick at said heel portion of the stick.

#### 4,013,289 TENNIS RACKET

Bernard Kaminstein, 329 Franklin Place, Paramus, N.J. 07652  
Continuation-in-part of Ser. No. 591,813, June 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 529,705, Dec. 5, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 674,826  
Int. Cl.<sup>2</sup> A63B 51/00  
U.S. Cl. 273-73 D 10 Claims

1. A racket having improved ball impact properties comprising  
a frame defining a central opening.  
a handle extending outwardly from said frame,  
first string means forming a vertical plurality of strings extending in the direction of said handle, spaced over said central opening and being attached to said frame under tension through holes in said frame,  
said vertical plurality of strings including a vertical central group of substantially equally spaced strings, disposed on either side of the center line extending through the handle of said racket,  
a first pair of vertical strings positioned at one side of said vertical central group of strings, one of the strings in said first pair being spaced one inch from the nearest string of said central group of strings, the other string of said first

pair being spaced one inch from said one of said first pair of strings, and  
a second pair of vertical strings positioned on the other side of said central group of strings, one of said second pair being one inch from the nearest string in said central vertical group of strings, the other string of said second pair being spaced one inch from said one string of said second pair of strings,  
second string means forming a horizontal plurality of strings extending at right angles to said vertical plurality of strings, spaced over said central opening and being attached to said frame under tension through holes in said racket,  
said second string means including,  
a first group of horizontal strings evenly spaced from one another within the central opening of said racket, the first



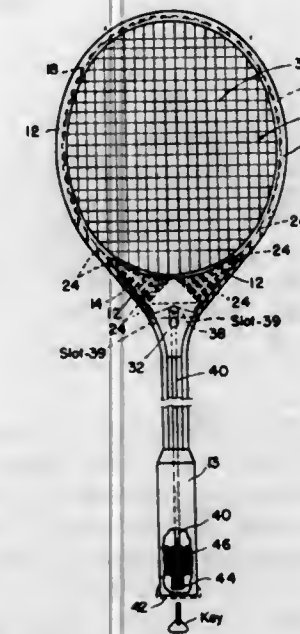
string of said first group of strings being positioned substantially 2 1/2 inches below the top of said racket,  
a first group of three strings spaced between the lowermost of said first group of horizontal strings, and said racket handle, a first of said first group being spaced substantially 1/4 of an inch away from said lowermost of said horizontal group of strings, the next string of said first group being spaced substantially 1/4 of an inch away from the first string, and the last string of said first group being spaced one inch away from said next string, and  
a second group of strings spaced between the top most of said first group of horizontal strings and the top of said racket, a first string of said second group being spaced substantially 1/4 of an inch away from said topmost string of said first group, and a second string of said second group being spaced substantially 1/4 of an inch away from said first string of said second group of horizontal strings.

#### 4,013,290

RACKET FOR TENNIS AND SIMILAR GAMES  
Robert Stevens, 552 Glorietta Ave., Newport Beach, Calif. 92660  
Continuation-in-part of Ser. No. 252,044, May 10, 1972, abandoned. This application Mar. 26, 1973, Ser. No. 344,751  
Int. Cl.<sup>2</sup> A63B 51/12  
U.S. Cl. 273-73 E 8 Claims

1. A game racket including: an annular head portion composed of a resilient material; a first string for the racket looped through holes in the head portions in a first series of passes extending transversely across the area circumscribed by the head portion, and a second string for the racket looped through holes in the head portion in a second series of passes extending longitudinally across the area circumscribed by the head portion; an elongated handle affixed to the head portion; a neck portion interposed between the handle and the head portion; first and second arms each extending partially around the opposite sides of said head portion on the outer peripheral surface thereof a limited distance adjacent said neck portion, said arms being coupled to the adjacent ends of said second series of passes; and an adjusting means attached to said arms to produce sliding movement of said arms relative to said head

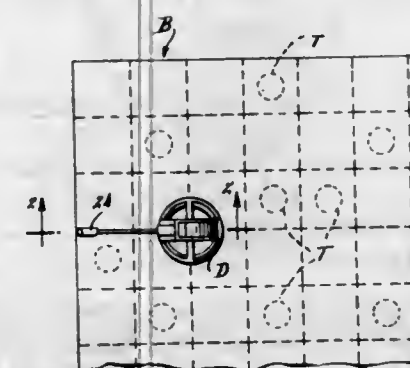
portion along the outer peripheral surface thereof to pull said second series of passes into tension by differential amounts proportional to the individual lengths of the passes of said second series, thereby to compress said head portion and cause said head portion to extend its lateral dimensions,



thereby to pull said passes of said first series into tension by differential amounts proportional to the individual lengths of said passes of said first series, so as to distribute the load applied thereto and thereby to pull the first series of passes into tension corresponding to the tension of the second series of passes.

#### 4,013,291 GAME WITH DETECTOR ASSEMBLY PROVIDING A STORED INDICATION OF THE PASSAGE OF THE ASSEMBLY OVER A MAGNET CONCEALED IN A GAME BOARD

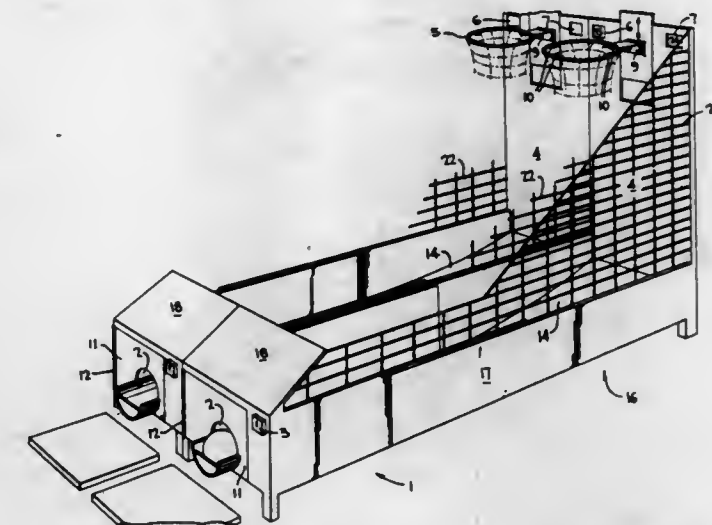
Robert L. Brass, Westport, Conn.; Arthur P. Venditti, Peabody, and Samuel T. Kjellman, Framingham, both of Mass., assignors to Robert L. Brass, Westport, Conn.  
Filed Nov. 24, 1975, Ser. No. 634,608  
Int. Cl.<sup>2</sup> A63F 3/00  
U.S. Cl. 273-130 A 12 Claims



1. A detector assembly arranged to be used in a game for indicating passage of the assembly over a magnet concealed in a game board, comprising:  
a pivotable indicator having two stable positions;  
means for selectively concealing the indicator; and  
magnetic means in the indicator for pivoting the indicator from one stable position to the other stable position as the indicator passes over a concealed magnet and encounters its magnetic field;  
the indicator remaining in the second stable position after once passing over a concealed magnet to provide a lasting indication thereof.

#### 4,013,292 AUTOMATIC BASKETBALL GAME HAVING SCORING INDICATOR AND TIME LIMITATION

Monroe Cohen, Brooklyn, and Gale Dorothea, Queens, both of N.Y., assignors to Shoot The Hoops, Inc., Brooklyn, N.Y.  
Continuation-in-part of Ser. No. 437,149, Jan. 28, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,876  
Int. Cl.<sup>2</sup> A63B 67/00  
U.S. Cl. 273-102.2 R 8 Claims



1. For use with a game wherein balls are dispensed to a player who attempts to win the game by throwing a certain number of balls into a target area, a control system comprising:

- a token-operated switch for producing a start pulse upon insertion of a token;
- a countdown clock for producing a time over signal at the end of a fixed time period, said clock comprising:
  - a multistage counter for providing a signal at a predetermined count,
  - a pulse source for applying a stream of pulses to said multistage counter, and
  - a clock control circuit having a first input, a second input from said multistage counter and a third input, said circuit being adapted to enable said pulse source in response to a signal on said first input and to disable said pulse source in response to a signal on said second input or a signal on said third input, whichever is first to occur;
- a thrown-ball sensing subsystem for counting the number of balls actually thrown by the player to generate a third signal to be applied to said clock control circuit when a predetermined number of balls have been counted;
- a score subsystem for registering the number of balls entering the target area, said score subsystem including an output terminal for carrying a win-indicating output signal;
- a logic gate connected to said output terminal and to said thrown-ball sensing subsystem and responsive to a win-indicating output signal or to a predetermined thrown-ball count, whichever is first to occur, to inhibit any further registration of balls entering the target area; and
- a game sequence subsystem connected to said thrown-ball sensing subsystem and to said countdown clock, said subsystem being responsive to a predetermined thrown-ball count or to the time-over signal, whichever is first to occur, to reset the game, said game sequence subsystem further including:
  - start logic connected to said token-operated switch and responsive to a start pulse to reset said ball sensing subsystem, and
  - game sequence logic connected to said countdown clock and responsive to a start pulse to generate the pulse source enabling first signal at the end of a time delay period sufficient to permit delivery of the balls to the player.



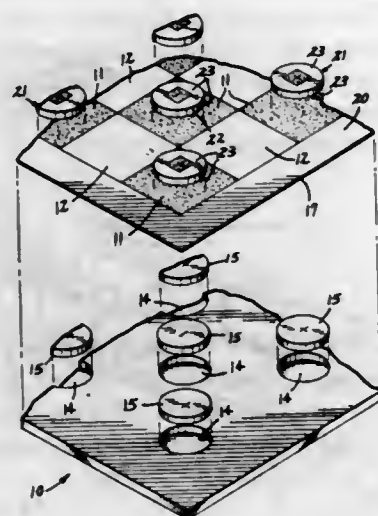
4,013,293

**MAGNETIC GAME APPARATUS**

Richard E. Hess, Brooklyn Park; Ronald A. Steinbrecher, Fridley, and Stephen A. A. Goddard, Minneapolis, all of Minn., assignors to H & S Enterprises, Inc., Anoka, Minn.  
Filed Nov. 6, 1975, Ser. No. 629,656  
Int. Cl.<sup>2</sup> A63F 3/02

U.S. Cl. 273-131 AD

3 Claims



1. In a game, in combination:  
a game board having a thin non-magnetic surface and comprising a uniform array of squares of two visually distinct characteristics arranged in rows and columns, each of alternating characteristics, the squares of one characteristic being played squares and those of the other characteristic being spacing squares;  
magnet positioned below the upper surfaces of said playing squares only with their magnetic axes generally perpendicular to the board, the upper poles of magnets in each row of squares being of like polarity and the upper poles of magnets in adjacent rows being of opposite polarity;  
and a plurality of thin reversible flat playing pieces including flat magnets arranged with their magnetic axes generally perpendicular to the flat surfaces, so that each piece in a first orientation is magnetically attracted to certain of said playing squares and repelled by others, while in the reverse orientation of the piece the attraction and repulsion by the squares is reversed;  
the pole strengths of said magnets being such that when like poles in a playing piece and a playing square resting thereon are abutting, the resulting upward repulsion is greater than the force exerted by gravity on the piece.

4,013,294

**PERSONALITY NEED HIERARCHY GAME**

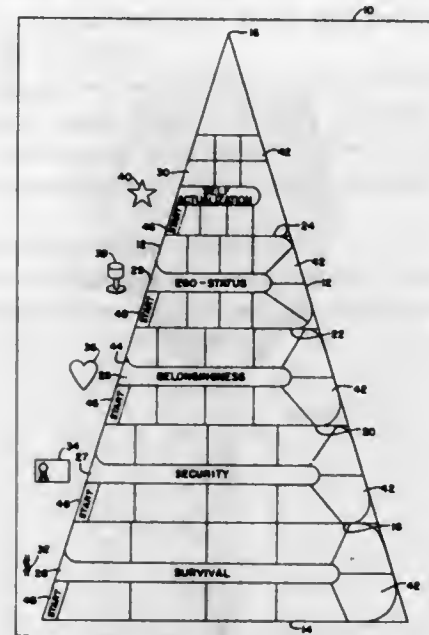
Ralph Smeda, Reston, Va., and Martha S. Swartz, Rochester, N.Y., assignors to The Singer Company, New York, N.Y.  
Continuation of Ser. No. 535,269, Dec. 23, 1974, abandoned.  
This application May 4, 1976, Ser. No. 683,141  
Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273-134 B

7 Claims

1. An amusement and educational game for creating an awareness of human personality needs comprising:  
a gameboard having:  
a plane figure outline thereon interiorly divided into a plurality of levels corresponding to a hierarchy of human personality needs;  
a plurality of continuous segments within at least some of the levels;  
at least some of the segments at each level having intelligible matter thereon denoting a player's loss or gain of human personality needs associated with the level;  
player moveable indicia for placing upon and traveling from segment to segment;  
random number selector means to indicate the number of segments to be traversed by an indicia; and

a scoresheet for use with the game board divided into a plurality of columns corresponding to the hierarchy of human personality needs appearing on the gameboard;



each of the columns enabling at least one player's human personality gains or losses to be recorded thereon.

4,013,295

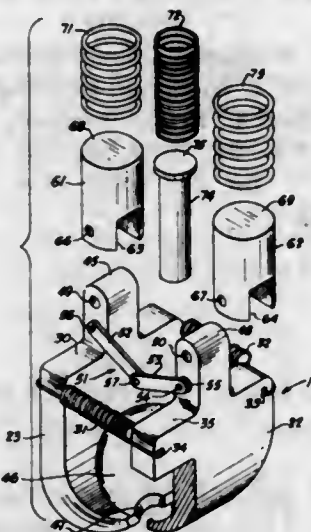
**GOLFER'S POSITIONING AND RETRIEVING DEVICE**

George Washington Baughman, 106 Interlachen Ave., Winter Park, Fla. 32789

Filed Sept. 12, 1975, Ser. No. 612,935  
Int. Cl.<sup>2</sup> A63B 57/00; A47F 13/06

U.S. Cl. 273-162 E

10 Claims



1. A portable golf ball teeing and retrieving apparatus for use with a golf ball, tee and golf ball handle comprising a pair of golf ball and tee gripping members, a resiliently biased latching means secured to said gripping members to hold said gripping members in either a golf ball and tee gripping position or a release position,  
a gripping and position control means mechanically coupled to said members so that initial downward pressure on the gripping and position control means allows said ball and said tee to be positioned with said tee in the ground and said ball positioned thereupon; further downward pressure on said gripping and position control means causes said gripping members to release said ball and tee and additional downward pressure on said gripping and position control means in excess of said initial pressure causes said gripping members to assume a ball gripping position.

4,013,296

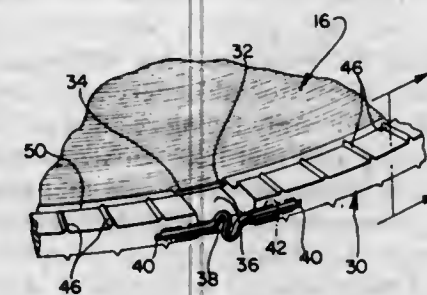
**PHONOGRAPH RECORD STORAGE AND PROTECTION APPARATUS**

Malcolm S. Keeney, 8727 Bay Pointe Drive, Tampa, Fla. 33615

Filed Dec. 8, 1975, Ser. No. 638,320  
Int. Cl.<sup>2</sup> G11B 3/68

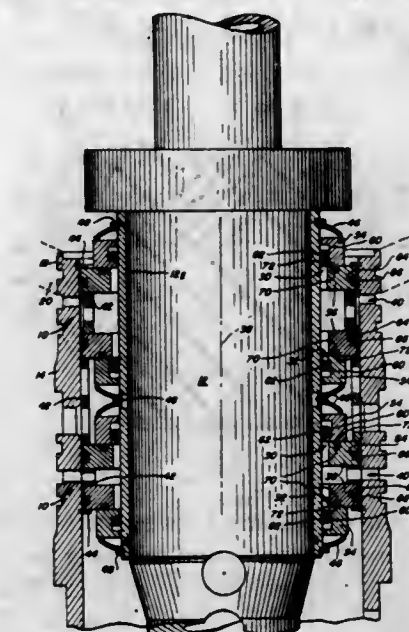
U.S. Cl. 274-42 R

8 Claims



1. A phonograph record accessory for protecting the opposite faces and rim of a disc type phonograph record during playing and storage of the record, the accessory comprising, a ring having an inner face including means for receiving the rim of the record and retaining the ring operatively mounted on the record, said ring further having opposite outer annular face means for engaging similar face means of adjacent rings and protecting the record faces from engagement with adjacent record and rings, said annular faces means being spaced outwardly in opposite directions from the receiving means, said ring further having opposite end portions and therebetween a gap, and means including a band spanning said gap and interconnecting said opposite end portions of said ring, said band being resilient for facilitating stretching of the band during placement of said ring on the record rim and for drawing said end portions toward each other and retaining said ring on the record, and said band being spaced outwardly from inner face of said ring and including means in the form of an open eye for increasing stretchability of the band and for receiving a suspension member extending through said eye, for suspending the record from a support.

acting on said area of non-engagement to move said second member axially to open said area of sealing en-



gagement to fluid flow therethrough prior to and during rotation of said shaft.

4,013,298

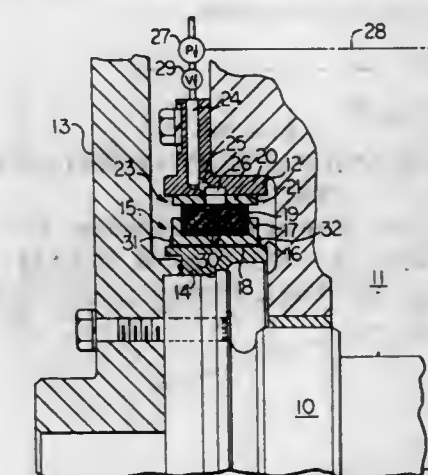
**DYNAMIC AIR BEARING SEAL FOR ENGINE CRANKSHAFT**

Roger O. Bjerk, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1976, Ser. No. 660,535  
Int. Cl.<sup>2</sup> F16J 9/00, 15/46

U.S. Cl. 277-75

10 Claims



1. A pressurized sealing arrangement comprising a rotatable shaft, a generally ring-shaped inner bearing of rigid material about said shaft defining an interior bearing surface thereon proximate to and in spaced relation with said shaft, said housing having at least one opening therein on said interior bearing surface, said bearing further including a flexible boot mounting means in the form of a porous ring of material and a thin non-porous skin thereover fixed to said bearing for supporting said inner bearing in spaced relation to said shaft, said skin further serving to define a chamber coterminous with said ring, and means for supplying pressurized air to said thus defined chamber so that air flows from said chamber through said at least one opening to continuously prevent retrograde movement of contaminants.

4,013,297

**STATIC SEAL WITH AN OPEN ROTATIONAL MODE**

Robert L. Smith, Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.

Filed Oct. 8, 1975, Ser. No. 620,682  
Int. Cl.<sup>2</sup> F16J 15/48

U.S. Cl. 277-3

5 Claims

1. For a shaft journaled to rotate at intermittent times within a sleeve, a seal comprising:  
a. a shaft, said shaft adapted to be connected to a motive source for intermittent rotation;  
b. a sleeve surrounding said shaft, said sleeve having a radial opening therein adapted to be connected to a source of fluid pressure;  
c. a first annular member surrounding said shaft and fixedly attached to said sleeve;  
d. a second annular member surrounding said shaft, and mounted thereon for axial movement along said shaft, said second annular member and said first annular member overlapping each other to form an annular area of engagement therebetween and an area of nonengagement adjacent said shaft;  
e. resilient sealing means located between said area of engagement;  
f. means located on the side of said second member opposite said sleeve opening for biasing said second member toward said first member to form a seal at said area of engagement when said shaft is not rotating and no fluid pressure is applied to said sleeve opening, and upon applying fluid pressure to said sleeve opening the pressure







4,013,305

## BUFFERING AIR-BAG MEANS

Isao Ichihara, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

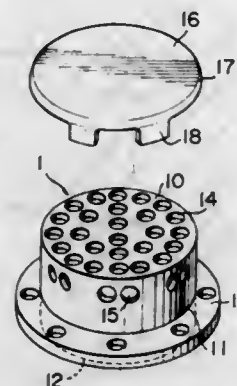
Filed Apr. 21, 1975, Ser. No. 569,934

Claims priority, application Japan, May 15, 1974, 49-54231

Int. Cl.<sup>2</sup> B60R 21/08

U.S. Cl. 280-742

2 Claims



1. A buffering air-bag means comprising a gas generating means having a completely hollow outer shell box which is mounted to the hub of a steering wheel, said outer shell box being formed of two substantially U-shaped cup members, the open ends of said cup members engaging with each other so that the open ends thereof close on each other to form a closed, substantially flat bottom wall, a cylindrical perforated sidewall and a perforated, substantially flat top wall, an air bag folded around said outer shell box and adapted to be inflated by gas generated by said gas generating means, and a deflecting plate spaced apart from said top wall of said outer shell box, said deflecting plate having a substantially flat, disc-shaped body which is provided with a plurality of leg portions spaced along the peripheral edge of said disc body, said leg portions being firmly connected to the upper peripheral edge portions of said cylindrical outer shell box so as to hold the substantially flat disc-shaped body relative to said outer shell box in spaced-apart relationship.

4,013,306

## VEHICLE OCCUPANT RESTRAINING BELT WITH DEVICE TO PROVIDE AN ARRANGEMENT IN WHICH SHOULDER BELT IS PREVENTED FROM TOUCHING SEATED OCCUPANT'S NECK

Yoshihisa Imabuchi; Kenshi Kurami; Yoshinori Akiyama, and Katsunobu Sobajima, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

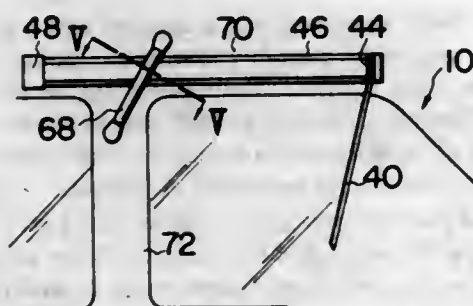
Filed Sept. 15, 1975, Ser. No. 613,419

Claims priority, application Japan, Sept. 18, 1974, 49-112416[U]

Int. Cl.<sup>2</sup> B60R 21/02

U.S. Cl. 280-745

1 Claim



1. In a vehicle having a vehicle body including a floor and a roof defining an occupant compartment in which is mounted

a vehicle seat accessible through a vehicle door opening selectively opened and closed by a vehicle body door whose front edge is pivotally secured to the vehicle body,

an occupant restraining belt arrangement comprising:

a lap belt having one end fixed adjacent a lower inboard portion of the seat;

a first inertia retractor mounted adjacent a lower inboard portion of the door and receiving the other end of said lap belt;

an apertured member slidably receiving an intermediate portion of said lap belt;

retractable means mounted on the vehicle body adjacent the outboard forward portion of the occupant compartment and above said apertured member in the lower rearward position;

an elongated flexible member having one end secured to said apertured member and the other end thereof received by said retractable means;

a shoulder belt having one end secured to an intermediate portion of said lap belt between said apertured member and the lower inboard portion of the seat;

a second inertia retractor mounted on the roof within the occupant compartment adjacent an outboard upper rear portion of the seat;

a track member mounted on an outboard portion of the roof in a generally longitudinally extending direction within the occupant compartment;

an apertured carrier mounted at said track member for longitudinal movement with respect thereto, said apertured carrier slidably receiving an intermediate portion of said shoulder belt, said apertured carrier being positioned in a rearward position adjacent the rear end of the seat with said shoulder belt in an occupant restraining position, said apertured carrier being positioned in a forward position with said shoulder belt in an easy-enter position;

drive means for moving said apertured carrier between the rearward position and the forward position as said shoulder belt slides through said apertured carrier to move said shoulder belt between the occupant restraining position and the easy-enter position;

control means for actuating said retractable means to retract said flexible member and for actuating said drive means during opening movement of the door to move said apertured member longitudinally of the vehicle body from the rearward position to an upper forward position moving said lap belt from an occupant restraining position to an easy-enter position as said first inertia retractor allows protracting movement of said lap belt and to move said apertured carrier to the forward position moving said shoulder belt to its easy-enter position as said second inertia retractor allows protracting movement of said shoulder belt, said control means actuating said retractable means to allow protraction of said flexible member from said retractable means as said first inertia retractor retracts said lap belt and for actuating said drive means during door closing movement of the door to permit said apertured member to move from the upper forward position to the lower rearward position moving said lap belt to its occupant restraining position and to move said apertured carrier to the rearward position moving said shoulder belt to its occupant restraining position as said second inertia retractor retracts said shoulder belt; and

a channel member mounted to the roof within the occupant compartment, straddling said track member, said channel member slidably receiving an intermediate portion of said shoulder belt, to provide an arrangement in which said shoulder belt extends diagonally across the chest of a seated occupant without touching the neck thereof when said shoulder belt is in its occupant restraining position.

4,013,307

## DUAL POSITION STABILIZER

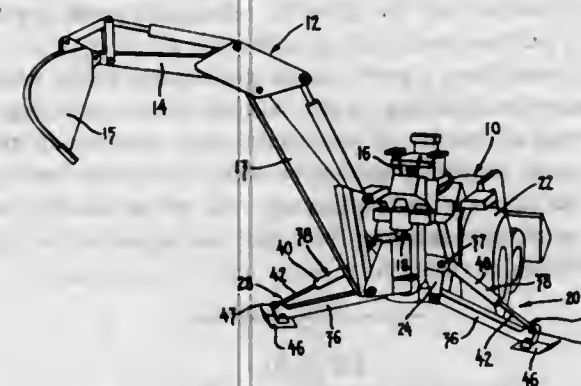
Allyn C. Dowd, Sterling Heights, and John D. Rogowski, Bloomfield Hills, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Sept. 22, 1975, Ser. No. 615,445

Int. Cl.<sup>2</sup> B60S 9/02

U.S. Cl. 280-764

11 Claims



1. Stabilizing apparatus for a vehicle supporting load handling equipment comprising a frame work having an elongated cavity rigidly attached to each side of the vehicle; ground engageable support means, a strut member supporting said ground engageable support means relative to said vehicle, a shaft supporting said strut for pivotal movement about a horizontal axis for swinging movement of said ground engageable support means between a transport position and a ground engaged position, a bearing received in said cavity journaling one end of said shaft to said frame work, bracket means holding said bearing in a selected one of two positions in said cavity in which said shaft is displaced angularly and horizontally about its other end relative to said vehicle, including a bracket member, a plate and a bearing engaging pad on said means detachably securing said plate to said plate, said plate covering one end of said shaft and said bearing in the attached position, said bearing engaging pad projecting from said plate toward said bearing to provide support on one side of said bearing with said plate in one position and on the other side of said bearing when said plate is rotated a half turn generally about the axis defined by said shaft for positioning said ground engageable support means in selected positions displaced longitudinally of said vehicle.

4,013,308

## ADJUSTABLE STABILIZER

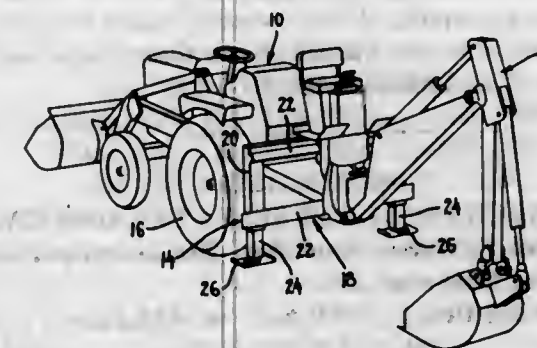
David S. Paul, Mississauga, Canada, assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Apr. 14, 1975, Ser. No. 568,080

Int. Cl.<sup>2</sup> B60S 9/12

U.S. Cl. 280-766

11 Claims



1. Stabilizer apparatus for a vehicle supporting load handling equipment comprising: a ground engaging foot member in the form of a generally flat pad, a support and support means movable relative to said support and between an elevated transport position and a lower operating position rela-

tive to said vehicles, means connecting said foot member to said support means for moving said foot member from a ground engaging position in which said pad is disposed generally horizontally to occupy a maximum horizontal width to an elevated transport position in which said pad is disposed to occupy a minimum horizontal width including an elongated link having opposite ends pivoted to said foot member and to said support means, respectively, and in which said link is disposed parallel to said pad when the latter is in its ground engaging position and in a position depending from said support means when the latter is in its elevated position.

4,013,309

## REPAIR KIT FOR PLASTIC PIPE

William H. Quick, 1818 Kanola Road, La Habra, Calif. 90631

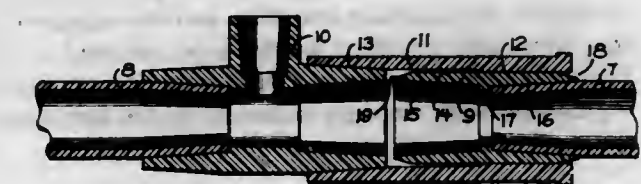
Continuation-in-part of Ser. No. 370,013, June 14, 1973,

abandoned. This application Nov. 17, 1975, Ser. No. 632,406

Int. Cl.<sup>2</sup> F16L 13/10, 47/00

U.S. Cl. 285-31

14 Claims



1. A nonmetallic plastic pipe coupling kit for coupling together by means of suitable cement, adjacent aligned ends of previously installed plastic pipe without need for axially displacing the installed pipe, said coupling kit comprising: first and second smooth-surfaced tubular plastic end members, each having a pipe-joining end adapted to have a first and second telescopic interference fit to the exterior of a respective one of the adjacent ends of said installed plastic pipe, said first and second interference fits being produced by tapers on the inner diameters of said end members, which inner diameters taper from diameters at the pipe-joining ends, which are slightly larger than the outer diameters of said adjacent pipe ends, to diameters, inward from the pipe-joining ends, which are slightly smaller than the diameters of said adjacent pipe ends, said first and second interference fits requiring slight deformation of the joining parts upon assembly.

said end members having also respective regions, beyond said tapered inner diameters wherein the inner diameter is substantially smaller than the outer diameter of said adjacent pipe ends, said regions being designed to serve as stops upon assembly of said end members to said adjacent pipe ends;

a third smooth-surfaced relatively long tubular plastic coupling member having an interior surface of revolution from end-to-end thereof, one end of which has a smaller inner diameter than the other end and is sized to have a third telescopic interference fit with the exterior of said first end member,

said exterior of said first end member having an essentially cylindrical surface which is approximately uniform in diameter throughout substantially all of its length, so that said one end of the interior surface of said coupling member may produce said third interference fit with the exterior surface of said first end member at essentially any location along the length of the exterior surface of said first end member, said third interference fit requiring slight deformation of the joining parts upon assembly,

the remaining interior surface at said other end of said coupling member being of larger diameter than said one end portion and sized along said other end portion to have a fourth interference fit with the exterior surface of the nearest end portion of said second end member, said fourth interference fit being produced by a taper on the inner diameters of said remaining interior surface, which



inner diameters taper from a diameter at said other end which is slightly larger than the outer diameter of said exterior surface of said second end member, to a diameter, inward from said other end, which is slightly smaller than the diameter of said exterior surface of said second end member, said fourth interference fit requiring slight deformation of the joining parts upon assembly, whereby said other end of said coupling member is adapted to slide loosely over said first end member and subsequently engage with an interference fit said second end member, whereby said coupling kit is adapted to produce a fluid-tight joint between said adjacent ends of said previously installed pipe, wherein the distance between said adjacent pipe ends may be such that said first and second end members, after they have been joined to said adjacent pipe ends, may be relatively close to each other, or may be spaced apart axially by a finite distance, thus allowing for ample tolerance of the coupling to variation in the initial spacing between said adjacent ends of said previously installed pipe, the four joinable contacting surfaces between the two end members, the coupling member, and the adjacent ends of the previously installed plastic pipe adapted to be held firmly bonded together in a fluid-tight manner by a bonding composition strongly adherent to the juxtaposed surfaces of said members.

#### 4,013,310 TUBING CONNECTOR

John F. Dye, Reedsburg, Wis., assignor to The Kendall Company, Boston, Mass.

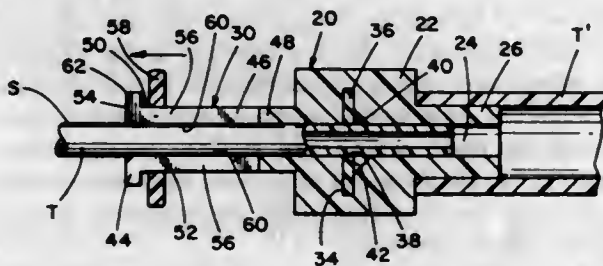
Continuation of Ser. No. 594,379, July 9, 1975, abandoned.

This application July 29, 1976, Ser. No. 709,742

Int. Cl.<sup>2</sup> F16L 17/02

U.S. Cl. 285—110

9 Claims



1. A connection device, comprising:
  - a tube having a lumen and an outer surface;
  - a housing having a passageway to receive the tube, and a tubular portion adjacent one end of the housing defining an end of the passageway to receive the tube and having an outer surface tapering from a first smaller diameter to a second larger diameter adjacent an outer end edge of the tubular portion, with the remainder of said passageway having a larger internal diameter than the outside diameter of said tube;
  - an annular flexible sealing member having an opening of a size to receive and frictionally engage said outer surface of the tube, said sealing member being retained in the housing with the opening aligned with the passageway, whereby an end of the tube may be inserted into the passageway and through the sealing member opening with the sealing member engaging the outer surface of the tube;
  - means for retaining the tube in the housing with the tube extending through the sealing member comprising, a plurality of gripping members at the one end of the housing, defined by a plurality of elongated slots extending from the end edge of the tubular portion and spaced peripherally around the tubular portion, and a ring slidably received on said tubular portion, with the inner

diameter of the ring being greater than said first diameter and less than said second diameter, whereby said ring may be positioned at an inner portion of the tubular portion for inserting the tube into the housing with an inner surface of the gripping members spaced from the outer surface of the tube, and said ring may be moved toward the outer end of the gripping members to flex the gripping members toward the tube and frictionally engage the inner surface of the gripping members against the outer surface of the tube to releasably lock the tube in place within the housing; and fluid transmitting means connected to the other end of the housing and having cavity means at least as large as the internal diameter of said remaining portion of the passageway, whereby said tube may be positioned at a selected location in the passageway or positioned with an end portion extending from the passageway into the cavity means in order to reduce slack in said tube.

#### 4,013,311 HIGH SECURITY DOOR LOCK

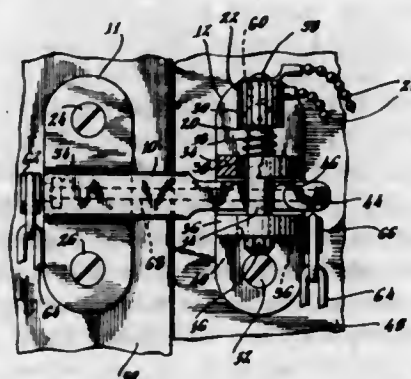
Richard L. Prezioso, 2050 Barnum Ave., Stratford, Conn. 06497

Filed Apr. 6, 1976, Ser. No. 674,225

Int. Cl.<sup>2</sup> E05C 5/02

U.S. Cl. 292—59

19 Claims



1. A high security door lock comprising:
  - crossbar means adapted for mounting on a door;
  - keeper means adapted for mounting on a door frame;
  - pin means for mechanically coupling said crossbar means to said keeper means;
  - said pin means including projection means integrally formed therewith;
  - said keeper means including at least one slot for receiving said pin means and said projection means;
  - locking channel means integrally formed with said keeper means and oriented at an angle to said slot for receiving said projection means upon insertion of said projection means through said slot and rotation of said pin means; and
  - biasing means coacting with said pin means for holding said projection means in said locking channel means and preventing coupling of said crossbar means for said crossbar means from said keeper means absent depression and rotation of said pin means.

#### 4,013,312 LATCH MECHANISM FOR SELF-CLEANING OVEN

Raymond Paul DeWeese, Kankakee, Ill., assignor to Roper Corporation, Kankakee, Ill.

Filed Dec. 5, 1975, Ser. No. 638,185

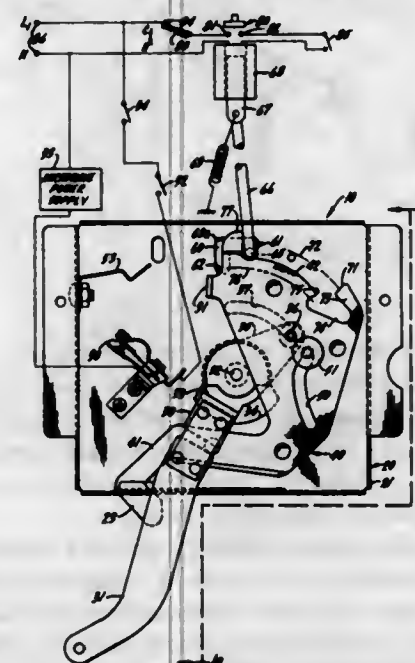
Int. Cl.<sup>2</sup> E05C 5/00

U.S. Cl. 292—113

8 Claims

1. In a door latch assembly for a pyrolytic self-cleaning oven or the like for cooperating with a striker on the oven door, the combination comprising a mounting plate having means for securing to the oven frame, a locking plate movable thereon, a hook-type bolt coupled to the locking plate for movement

therewith, an operating handle coupled to the locking plate for bodily moving the locking plate and its bolt between free and bolting positions, means fixed to the mounting plate defining a short slot adjacent the locking plate and oriented in the direction of movement of the adjacent portion of the locking plate, the slot having a shallow "idle" notch and deep "locking" notch spaced parallel to one another at right angles to the slot, a locking finger shiftable endwise in the slot and biased toward the notches, an actuator coupled to the locking finger so arranged that when the actuator is energized the locking finger is drawn into a shiftable position in the slot clear of the notches, a first abutment on the locking plate having a path of movement aligned with the slot but clear of the notches so that (a) when the actuator is de-energized and the finger occupies an idle position in the shallow notch the locking plate and bolt are freely movable by the operating handle between free and bolting positions and so that (b) when the actuator is ener-



- gized the finger is drawn into the slot in the path of movement of the first abutment with the result that, as the locking plate is moved fully into bolting position, the first abutment moves the finger to a position opposite the deep notch, a second abutment on the locking plate faced oppositely to the first abutment and having a path of movement aligned with the root of the deep notch so that when the actuator is de-energized the finger drops by reason of the force of bias into the deep notch blocking the locking plate, and thus the bolt, in bolting position until such time as the actuator may be re-energized, and a third abutment on the locking plate having a path of movement aligned with the slot and faced in the same direction as the second abutment and spaced from the latter so that, as the locking plate is subsequently returned to its free position, the third abutment shifts the finger into a position opposite the shallow notch, thereby permitting the finger to drop back into idle position when the actuator is thereafter de-energized.

#### 4,013,313 PIPE TURNING TOOL

John H. Gardels, P.O. Box 128, Wilcox, Nebr. 68982

Filed Apr. 12, 1976, Ser. No. 676,228

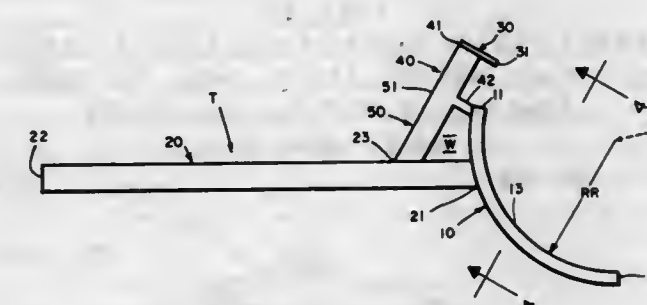
Int. Cl.<sup>2</sup> B25B 13/50; B65G 7/00

U.S. Cl. 294—17

5 Claims

1. Turning tool for irrigation pipe lying upon the earth's surface and the pipe having a circular cross-sectional shape including openable gates along the pipe longitudinal length and at least one longitudinally extending radial discontinuity at the pipe outer side such as a latch-recess, said pipe turning tool comprising:
  - A. An arcuate shoulder for abutment against the pipe outer side remote of the pipe radial discontinuity, said shoulder being spaced a substantially constant distance from a focal-point, said shoulder having two endward termini

- including an upper-end and a lower-end and also a geometric mid-point between said termini, the two end-ward termini and the focal-point defining an angle within the range of 60° to 135°;
- B. An elongate handle having a fore-end and a rear-end for manual control by the operator, the handle and the shoulder being substantially co-planar with the handle fore-end being rigidly attached to the shoulder whereby the handle rear-end is rearwardly remote from the shoulder, the handle fore-end being located remote from the shoulder mid-point whereby the shoulder arcuate length from one terminus to the handle fore-end bears a ratio of substantially two as compared to the remaining shoulder length;
- C. A header rigidly attached to the shoulder and upwardly offset of the shoulder upper-end;



- D. A detent extending rigidly downwardly from the header and having a lower free-end located a fixed-distance across a spatial gap from the shoulder upper-end, said detent lower free-end being adapted to engage with the pipe radial discontinuity whereby operator initiated movement of the handle rear-end causes controlled turning of the irrigation pipe about its central-axis;
- and
- E. A brace member extending rigidly upwardly and forwardly of the handle from a bracing-station located nearer to the handle fore-end than to the rear-end, said brace member being rigidly attached to the header and also to the shoulder at a buttress-locale whereby the bracing-station, the buttress-locale, and the handle fore-end collectively define the three points of a structurally rigid triangle.

#### 4,013,314 LIFTING HOOKS

Jean-Francois Archer, 10 Avenue Georges-Clemenceau, 78670 Villennes, France

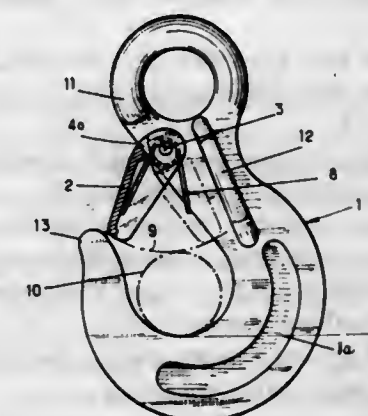
Filed Mar. 27, 1975, Ser. No. 562,856

Claims priority, application France, Mar. 29, 1974, 74.11174; Mar. 17, 1975, 75.08824

Int. Cl.<sup>2</sup> B66C 1/36

U.S. Cl. 294—82 R

9 Claims



7. In a lifting hook comprising a generally J-shaped body with a longer leg and a shorter leg defining a mouth therebetween, an eye at the top of said longer leg, and a catch pivoted



at a fulcrum near said eye to said longer leg for swinging within said mouth between a retracted position alongside said longer leg and an operative position athwart said mouth, said catch being provided with spring means biasing same into said operative position, said legs being interconnected by a bight portion for the support of a load-lifting member introduced into said mouth.

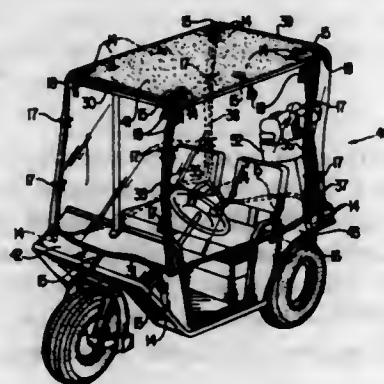
the improvement wherein said shorter leg progressively widens from said bight portion to its free end, said body having an annular portion surrounding said eye and broadening above said mouth into a pair of lateral projections overhanging said catch in said operative position thereof, the width of said body at said projections substantially equaling the maximum width of said shorter leg at said tip.

4,013,315

**RAIN CURTAIN ASSEMBLY FOR GOLF CARTS**  
George L. West, 1619 NW. 35th St., Ocala, Fla. 32670  
Filed Aug. 29, 1975, Ser. No. 609,089  
Int. Cl.<sup>2</sup> B60J 7/24

U.S. Cl. 296-83

5 Claims



1. A rain curtain assembly for a golf cart, having a passenger compartment with a top overlying said passenger compartment, comprising: a front panel, a rear panel and a pair of side panels, each of said front, rear and side panels having at least one suction cup connected by elastic means to the upper edge thereof and at least one suction cup connected by elastic means to the lower edge of each of said front and rear panels, a hook member connected by elastic means to the center portion of the lower edge of each of said front and rear panels, said suction cups and hook members providing releasable engagement with said golf cart, each of said front and rear panels having at least one tie cord on each side edge thereof, and each of said side panels having at least one tie cord on each side edge thereof for releasable tying engagement with a tie cord of one of said front or rear panels.

4,013,316

**MECHANICAL STOOL FOR HANDICAPPED PERSONS**  
Winifred Cropper, 100 Central Ave., Rochelle Park, N.J. 07662

Filed Jan. 21, 1975, Ser. No. 542,825

Int. Cl.<sup>2</sup> A47K 3/12; A47C 15/00

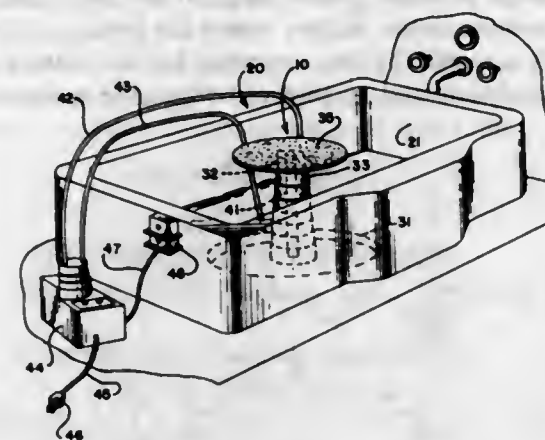
U.S. Cl. 297-347

1 Claim

1. A portable stool intended for use by handicapped persons and the like, comprising, in combination:

- a non-slip base member having a substantially flat disc configuration including a top surface and a bottom surface, said bottom surface of said base member removably engaging a bathing compartment;
- a seat member having a substantially disc shape including a top surface and a bottom surface;
- a telescopic support mast having one end affixed to said top surface of said base member with the opposite end of said telescopic support mast affixed to said bottom surface of said seat member with said seat member disposed vertically above and concentric with said base member, said

telescopic support mast comprising a series of concentrically disposed different diameter hollow collar members of cylindrical configuration, said collar members being nested within each other when said seat member is disposed adjacent said base member which corresponds to said mast being in a maximum retracted position, said collar members being telescoped outwardly to place said seat member spaced furthest away from said base member when said mast is in a maximum extended position; power means disposed inwardly of said support mast comprising an air operated piston and cylinder member with said piston being affixed to said seat member and with said cylinder being affixed to said base member;



control means connected to said power means for controlling power air pressure into said piston and cylinder member to effect extension and retraction of said mast; said control means being connected to said power means by flexible hose means for facilitating removal of the stool from the bathing compartment; and said base member and said seat member being cooperatively disc-shaped to provide a substantially flat disc-shaped compact structure when said telescoping supporting mast is in its fully retracted position enabling the bather to fully recline within the bathing compartment while the stool is disposed on the floor of the bathing compartment.

4,013,317

**LATERAL PROTECTION FOR MOTOR VEHICLES**  
Willi Reidelbach, Sindelfingen; Herbert Grach, Munich; Hans Lütze, Aidingen, and Dieter Weidemann, Weil der Stadt, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 461,112, April 16, 1974, abandoned.

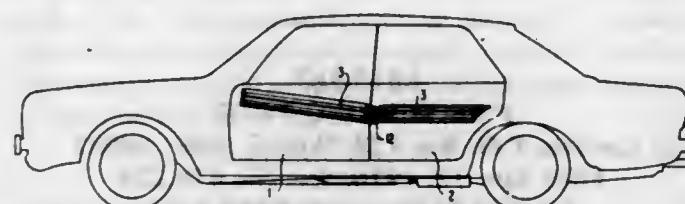
This application Mar. 12, 1976, Ser. No. 666,419

Claims priority, application Germany, Apr. 16, 1973, 2319124

Int. Cl.<sup>2</sup> B62D 21/00; B60J 5/04

U.S. Cl. 296-146

14 Claims



1. In a protection device for a vehicle of the type including side doors, relatively fixed structural parts of said vehicle for defining the side door openings, and reinforcement means for absorbing lateral impact forces on said vehicle, said reinforcement means extending in the longitudinal direction of said vehicle inside said doors, the improvement comprising structural force transmission means at each end of said reinforcement means for directly transmitting longitudinal impact forces on said vehicle between said reinforcement means and relatively fixed structural parts such that said longitudinal

impact forces on said vehicle are directed uninterruptingly in said longitudinal direction by said structural force transmission means and said reinforcement means, and

wherein said structural force transmission means includes at least one of a profiled hollow structural member arranged between one end of said reinforcement means and said relatively fixed structural parts of said vehicle and a structural bar interposed between aligned facing ends of two longitudinally disposed reinforcement means of two respective longitudinally disposed side doors arranged at least at one side of said vehicle.

4,013,318

PORTABLE FOOTREST

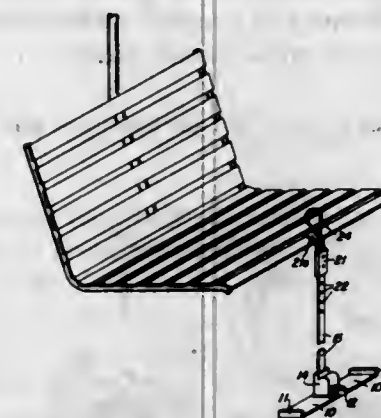
James G. Piper, P.O. Box 103, Park City, Utah 84060

Filed Feb. 25, 1976, Ser. No. 658,347

Int. Cl.<sup>2</sup> A47C 7/50

U.S. Cl. 297-438

10 Claims



1. A portable footrest adapted to be used with a chair in which the user of the footrest is sitting, comprising an integral foot support member, said foot support member comprising two pieces having mutually adjacent ends pivotally connected together as a unit so that the two pieces are movable about their interconnected mutual ends from a closed position in which they are folded upon each other in essentially parallel, side-by-side relationship to an open, operable position in which they extend outwardly in opposite directions from their interconnected mutual ends; a flexible suspension member; means for attaching one end of said suspension member to said foot support member at a point intermediate its ends so that the two pieces thereof are suspended from their interconnected mutual ends; and means for attaching the other end of said suspension member to said chair.

4,013,319

TUNNELING MACHINE WITH MASSIVE GUIDE FOR IMPACT TOOLS

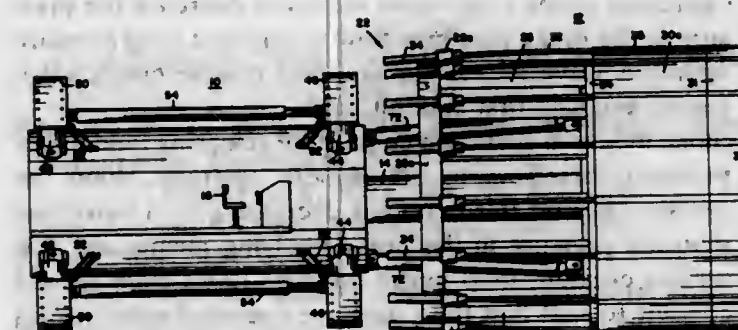
Boyd A. Wise, Webster, N.Y., assignor to Hydroacoustics Inc., Rochester, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,271

Int. Cl.<sup>2</sup> E21D 9/08

U.S. Cl. 299-31

32 Claims



1. Apparatus for cutting a kerf in an earth formation which comprises

an impact tool having an actuator coupled to a drill steel which receives a bit at the end thereof, said bit delivering impact energy in the form of force pulses to said formation;

a carriage supporting said actuator and being movable in directions toward and across said formation;

a web member having a shape which outlines said kerf, said web member having a mass and stiffness substantially greater than the mass and stiffness of said drill steel, said web being supported by said carriage and movable therewith into and along said kerf, the thickness of said web member being less than the width of the cross section of said bit in the direction across said kerf, said web member extending longitudinally from said carriage a substantial length along said drill steel up to a location immediately behind said bit, said web member having an opening extending completely therethrough from the front end of said web member which faces said formation and the rear end of said web which faces said actuator, front and rear bearings in said opening, said front bearing being disposed at said web member front end and said rear bearing being disposed at said web member rear end, said drill steel extending through said opening in said web member and penetrating said member and being in juxtaposition therewith along said substantial length so as to be in closely coupled relationship therewith, said drill steel being supported in said front and rear bearings, and said web member supporting and guiding said drill steel into and along said kerf.

4,013,320

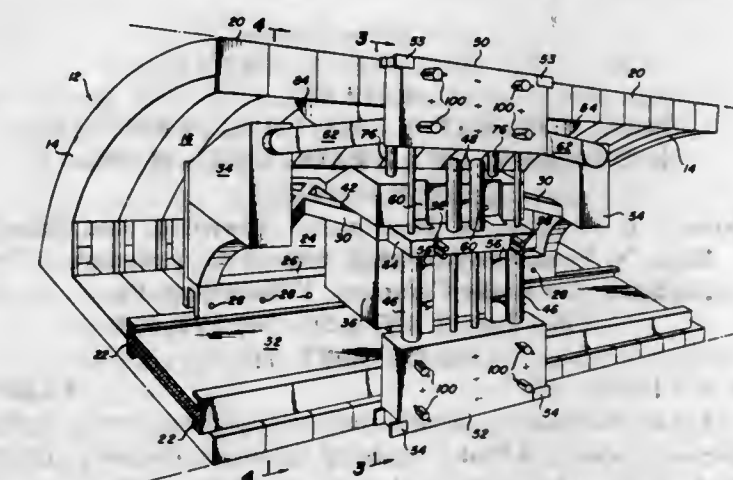
**HOOK PLOUGH APPARATUS FOR LONGWALL MINING**  
Robert W. Johns, Calgary, Canada, assignor to World Oil Mining Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 509,489, Sept. 26, 1974, Pat. No. 3,958,830. This application Oct. 31, 1975, Ser. No. 627,763

Int. Cl.<sup>2</sup> E21C 27/35; E21D 15/02

U.S. Cl. 299-33

21 Claims



1. A hook plough apparatus for use in longwall mining in conjunction with a mining shield having rails therein running along the length of the shield, said apparatus comprising:

- a. a power transmission frame mounted for movement along said rails,
- b. a plow mounting body connected to said frame,
- c. upper and lower ranging plow blocks mounted on said plow mounting body,
- d. means for propelling said frame, said body, and said ranging plow blocks simultaneously along said rails,
- e. means for extending said mounting body and said ranging plow blocks toward the mine wall relative to said frame, and
- f. means for vertically extending said ranging plow blocks relative to said mounting body.



# 4,013,321 PNEUMATICALLY ACTUATED HOPPER-FEEDER APPARATUS

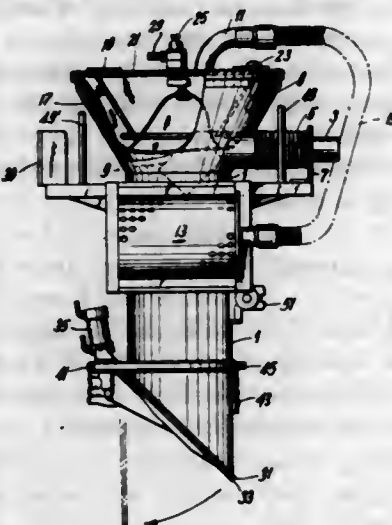
Frank P. Pendleton, Montclair, N.J., assignor to VAC-U-MAX, Belleville, N.J.

Filed Nov. 21, 1974, Ser. No. 525,768

Int. Cl.<sup>2</sup> B65G 53/60

U.S. Cl. 302-59

5 Claims



1. A pneumatically actuated hopper comprising a substantially straight-walled, vertical, cylindrical main body portion provided with an outwardly flared upper portion having an inverted frusto-conical configuration, a top cover having an inlet connectable with a source of vacuum, a filter beneath said inlet generally conforming to the interior configuration of said upper portion, located within said frustoconical portion, and separated therefrom by supporting means, a materials inlet beneath said filter screen leading into said hopper near the junction of said tubular body and said flared top portion, a baffle extending from said inlet within said hopper to direct materials downwardly into said tubular body, and a closure valve extending across the entire diameter of the lower discharge end of said tubular body and operable upon demand to open and expose the said entire discharge end to discharge of the material contained in said hopper.

# 4,013,322 BRAKE APPARATUS PROVIDING PERMANENT SUPPRESSION OF A TRAIN CONTROL BRAKE APPLICATION

Robert J. Worbois, N. Huntingdon Township, and John R. Reiss, N. Versailles Township, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 8, 1976, Ser. No. 693,744

Int. Cl.<sup>2</sup> B60T 7/16

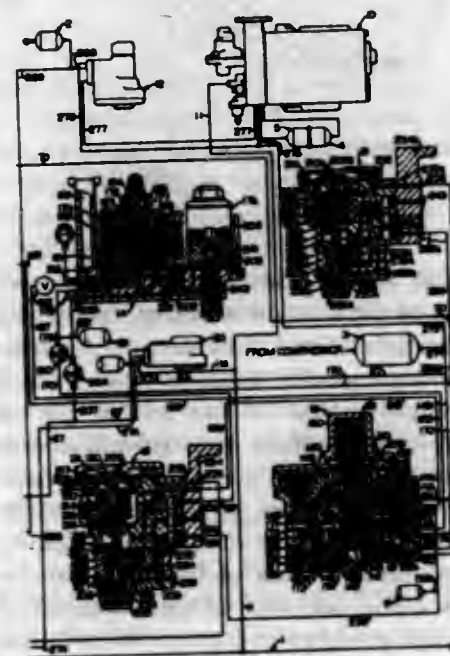
U.S. Cl. 303-18

9 Claims

1. In a locomotive brake control apparatus having a fluid pressure operated brake applying means, a normally charged brake pipe, a brake control valve means operatively responsive to a decrease in the pressure in the brake pipe to cause the supply of fluid under pressure to the brake applying means and to an increase in the pressure in the brake pipe to cause the release of fluid under pressure from the brake applying means, a main reservoir, an equalizing reservoir, a stop reservoir, a manually operative engineer's brake valve device having a self-lapping control valve means for controlling the pressure in the equalizing reservoir, a self-lapping relay valve means operative by variations of pressure in the equalizing reservoir to correspondingly control the pressure in the brake pipe, a fluid pressure operated brake application valve device having a normal position in which it establishes a charging communication via which the equalizing reservoir is charged by the self-lapping control valve means to cause operation of the relay valve means to supply fluid under pressure to the brake pipe to increase the pressure therein to effect a release

of the brakes and movable therefrom to an application position in which it cuts off the supply of fluid under pressure from the self-lapping control valve means to the equalizing reservoir and establishes a venting communication via which the equalizing reservoir is vented to atmosphere to cause operation of the relay valve means to release fluid under pressure from the brake pipe to decrease the pressure therein to effect an application of the brakes and an electro-responsive valve means operative automatically in response to a change in a track signal indication to a more restrictive indication to release fluid under pressure from the fluid pressure operated brake application valve device to the stop reservoir to effect movement of this valve device from its normal position to its application position, wherein the improvement comprises:

- a first fluid pressure operated valve means interposed between the brake application valve device and the electro-responsive valve means, this first valve means having a first position in which fluid under pressure may flow from the brake application valve device to the electro-responsive valve means and operable by fluid under pressure supplied thereto to a second position in which it prevents said flow,
- a first double check valve device having a pair of inlets and an outlet,



- a first conduit connecting said outlet to said first fluid pressure operated valve means,
- a second conduit connecting the fluid pressure operated brake applying means to one of said pair of inlets through which fluid under pressure supplied to the brake applying means may flow to said first fluid pressure operated valve means via said first double check valve device and said first conduit,
- a third conduit connecting the self-lapping relay valve means to the other of said pair of inlets through which fluid under pressure released from the brake pipe by operation of the relay valve means to decrease the pressure in the brake pipe may flow to said first fluid pressure operated valve means via said first double check valve means and said first conduit, and
- choke means in said third conduit for releasing fluid under pressure therefrom to atmosphere whereby, upon the pressure in said third conduit decreasing to a value less than the pressure in the brake applying means and said second conduit, fluid under pressure flows from second conduit to said first fluid pressure operated valve means to maintain it in its said second position until fluid under pressure is released from said brake applying means by operation of the brake control means in response to an increase in the pressure in the brake pipe.

# 4,013,323 REMOTE CONTROL BRAKE SYSTEM FOR A RAILWAY TRAIN

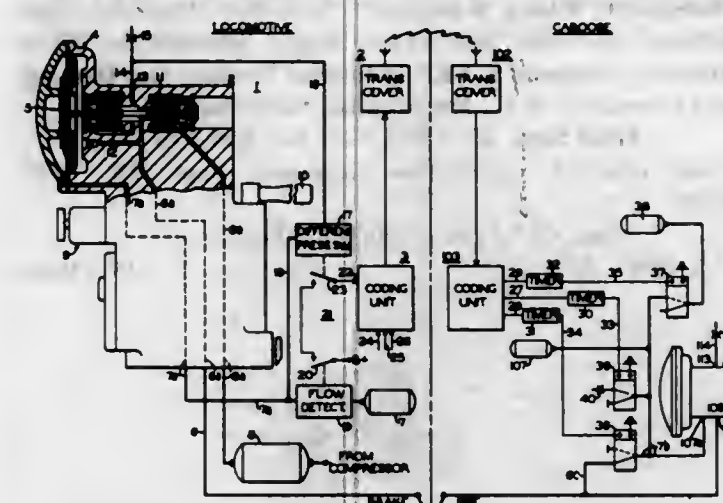
Richard O. Burkett, Apollo, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 9, 1976, Ser. No. 694,143

Int. Cl.<sup>2</sup> B60T 13/68

U.S. Cl. 303-20

13 Claims



1. A remote control brake system for a railway train having a continuous brake pipe extending through the train in which fluid pressure is varied for control of the train brakes, said system comprising:

- a first equalizing reservoir;
- a brake valve device to which said first equalizing reservoir and one end of said brake pipe is connected, said brake valve device being operable to effect variation of fluid pressure in said first equalizing reservoir, in response to which said brake valve device is operable to effect a corresponding variation of fluid pressure in said brake pipe;
- means for signalling a brake command in accordance with operation of said brake valve device;
- means for transmitting said brake command signal;
- means for receiving said transmitted brake command signal at a location along the train remote from said transmitting means; wherein the improvement comprises:
- a second equalizing reservoir connected to said brake pipe at said remote location, said second equalizing reservoir being charged to the pressure of said brake pipe at said remote location;
- control means for cutting off charging of said second equalizing reservoir and concurrently effecting venting of fluid pressure therefrom in accordance with said brake command signal being indicative of a brake application; and
- valve means for venting fluid pressure from said brake pipe at said remote location in response to a preponderance of fluid pressure in said second equalizing reservoir relative to the fluid pressure of said brake pipe at said remote location.

# 4,013,324 FAULT DETECTION FOR WHEEL SLIP CONTROL SYSTEM

Donald S. Quon, St. Louis, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Oct. 6, 1975, Ser. No. 620,206

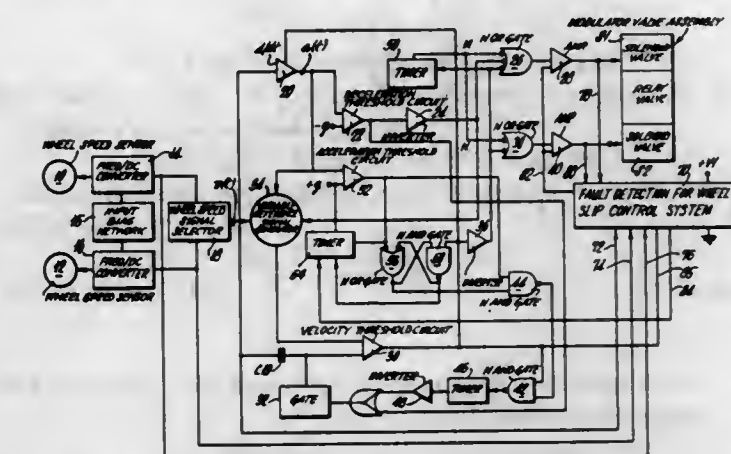
Int. Cl.<sup>2</sup> B60T 8/00, 8/02, 8/08, 8/10

U.S. Cl. 303-92

24 Claims

1. In a wheel slip control system having electric solenoids therein which are energized by an electric pulse in response to a logic circuit, and further having at least two point-type speed sensors which generate electrical signals having amplitudes proportional to wheel speeds, the invention of a fault detection system comprising:

- a first cyclic timing means operable in response to at least a first wheel slip control system signal to begin a timing cycle;
- means for resetting said first cyclic timing means in response to at least a second wheel slip control system signal provided that said second wheel slip control system signal occurs before the end of the timing cycle of said first cyclic timing means;
- means for generating a first wheel slip control system shutdown signal when said first cyclic timing means fails to be reset before the end of its timing cycle;
- a second cyclic timing means operable in response to at least a third wheel slip control system signal to begin a timing cycle;



- means for resetting said second cyclic timing means in response to said second wheel slip control system signal provided that said second wheel slip control system signal occurs before the end of the timing cycle of said cycle of said second cyclic timing means;
- means for inhibiting the resetting of said second cyclic timing means in response to said second wheel slip control system signal having a predetermined characteristic; and
- means for generating a second wheel slip control system shutdown signal when said second cyclic timing means fails to be reset before the end of its timing cycle.

# 4,013,325 DRILL ROD STABILIZING TOOL Ian Graeme Rear, 53 Louise St., Nedlands, Perth, Australia (6000)

Filed Sept. 4, 1975, Ser. No. 610,219

Claims priority, application Australia, Sept. 4, 1974, 8759/74

Int. Cl.<sup>2</sup> F16C 1/26

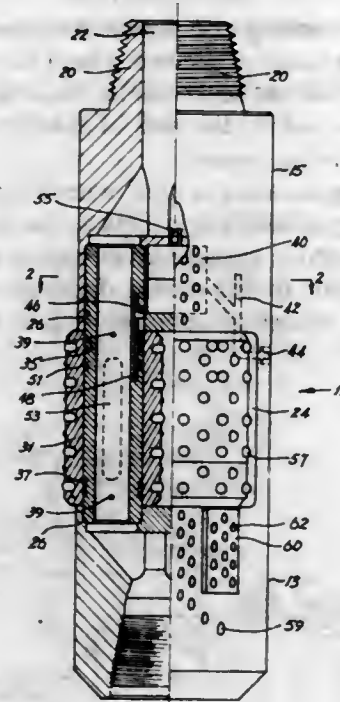
U.S. Cl. 308-4 A

13 Claims

1. A stabilizing tool, comprising: a substantially cylindrical body, said body having a longitudinal axis; said body having a plurality of substantially cylindrical chambers formed therein said chambers being located axially within the body and spaced symmetrically around the body with respect to the longitudinal central axis thereof, wherein the diameter of the chambers is such that a portion of the wall extends beyond the perimeter of the body to provide axial rectangular openings in the side of the body; each end of the body being provided with an axial fluid passageway which is divided to provide a fluid path through each chamber for the flow of drilling fluid through the stabilizing tool; stabilizing rollers rotatably mounted upon a hollow shaft mounted in said chambers such that the circumference of rotation of the rollers extend through said rectangular openings beyond the body; a lubricant reservoir provided in said body and vented to the fluid passageway for the application of fluid pressure to the lubricant in the reservoir; and



outlets in the reservoir communicating with the bearing surfaces between the rollers and shafts, wherein the lubricant reservoir is to store a lubricant of a different form from the drilling fluid.



4,013,326

#### GAS BEARING ROLL SHELL ASSEMBLY WITH PRELOAD MEANS

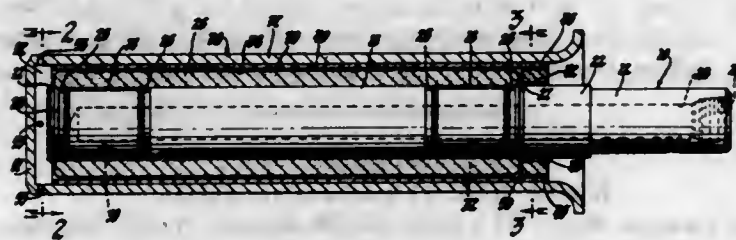
Donald J. King, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1976, Ser. No. 673,286

Int. Cl.<sup>2</sup> F16C 17/16

U.S. Cl. 308—9

2 Claims



1. A preloaded gas bearing roll shell assembly comprising: an axle having an enlarged diameter portion and supply passage means having an inlet adjacent a first axial end thereof adapted for connection to a source of gas under pressure, internal chamber means in said enlarged diameter portion in fluid communication with said supply passage means for receiving gas under pressure therefrom, and restrictive passage means through said enlarged diameter portion leading from said internal chamber means and onto an external circumferential surface thereof, a rotatable roll shell surrounding said enlarged diameter portion with a small radial clearance whereby said roll shell is adapted to be radially supported on a layer of gas supplied from said internal chamber via said restrictive passage means, said roll shell having an end wall adjacent an axial end thereof in juxtaposition to an axial end of said axle remote from said first axial end, and a thrust ring adjacent an opposite axial end thereof in juxtaposition to an annular face of said enlarged diameter portion, exhaust passage means leading from said radial clearance past said thrust ring to ambient, axial preload means for maintaining said thrust ring in close proximity to said annular face comprising a pressure chamber in direct fluid communication with said radial clearance and defined at least in part by an end portion of

said rotatable shell including said end wall, said end portion having vent means therethrough which is more flow restrictive than said exhaust passage means leading from said radial clearance past said thrust ring.

4,013,327

#### CLUTCH THRUST BEARING

Heinrich Kunkel; Armin Olschewski; Lothar Walter, all of Schweinfurt; Rainer Schurger, Schwanfeld; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

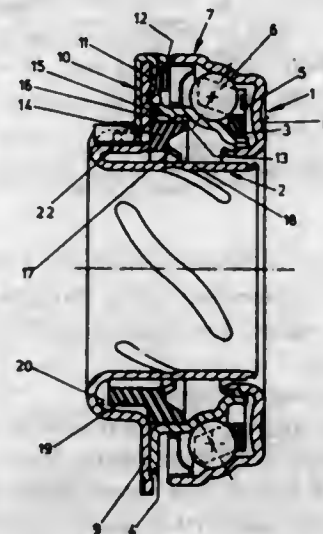
Filed Sept. 25, 1975, Ser. No. 616,575

Claims priority, application Germany, Sept. 28, 1974, 2446500

Int. Cl.<sup>2</sup> F16C 19/00; F16D 23/14

U.S. Cl. 308—233

19 Claims



1. In a self-centering clutch thrust bearing having a central axis and including inner and outer races, a plurality of rolling elements between said races, a sliding sleeve having at least a first annular part thereof situated radially inward of said inner race, said first annular part and said inner race having first and second facing surfaces, respectively, with an annular space defined therebetween, said sleeve being slightly movable radially relative to said inner race, thus defining radial play therebetween, and coupling means engaging and maintaining said sleeve and inner race in generally fixed axial relationship, the improvement in combination therewith comprising an elastic ring situated in said annular space on one of said first and second surfaces, the ring having resilient lugs extending toward the other of said surfaces for resiliently engaging the other of said surfaces during relative radial displacement therebetween, and thereby damping relative radial movement between said sleeve and inner race.

4,013,328

#### CABINET STRUCTURE FOR DENTAL TREATMENT ROOM

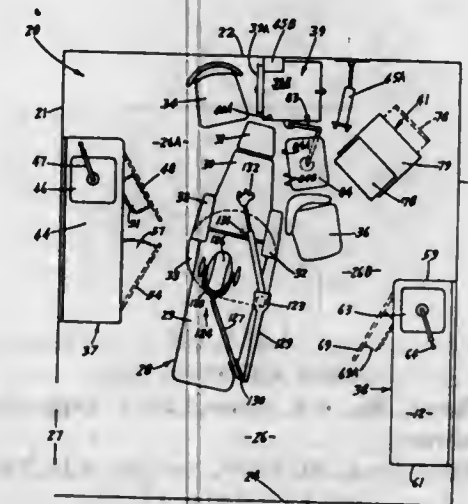
Hugo M. Wolf, 1451 NE. Glacier Lane, Minneapolis, Minn. 55421, and Leo H. Wolf, 2000 Idaho Ave. South, Minneapolis, Minn. 55426

Division of Ser. No. 292,478, April 3, 1972, Pat. No. 3,902,246. This application Mar. 14, 1975, Ser. No. 558,322 Int. Cl.<sup>2</sup> A47B 81/00; A61B 19/02; A61C 19/02; B01L 9/02 U.S. Cl. 312—209

32 Claims

1. Cabinet structures for use in a dental treatment room having a dental treatment chair having a head end and sides, the combination of a first cabinet means located adjacent the head end of the chair, second cabinet means located adjacent one side of the chair, third cabinet means located adjacent the opposite side of the chair, mobile cabinet means located between the first and third cabinet means adjacent said opposite side of the head of the chair, said second cabinet means having an upright door means located on the front of the second

cabinet means, means pivotally mounting the door means on the second cabinet means for movement about a generally upright axis to selective open and closed positions, generally horizontal shelf means mounted on the inside of the door means, a drawer located above said door means, and means movably mounting the drawer on the second cabinet means for selective generally horizontal movement to an out open position and to an in closed position, said third cabinet means having a door means with an access to the interior of the third cabinet means and container means attached to the inside of



the door means for storing objects moved through the opening, said mobile cabinet means having a pair of laterally spaced upright side panels, base means for carrying the side panels, a plurality of pull-out drawers movably mounted on the side panels adjacent the top of the base means, tray means movably mounted on the side panels above said drawers and coacting means on the tray means and side panels slidably mounting the tray means on the side panels for selective movement to a first out position in front of the mobile cabinet means and a second out position in back of the mobile cabinet means.

4,013,329

#### MULTIPLE PLATE ASSEMBLY FOR FORMING ELECTRICAL CONNECTOR OR SWITCH

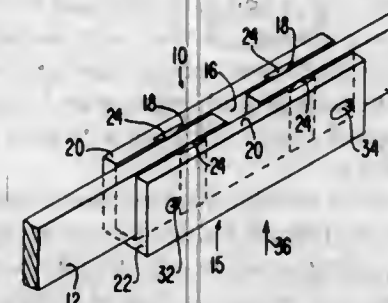
Peter E. Hugin, Los Altos, Calif., assignor to Multilam Corporation, Los Altos, Calif.

Filed Feb. 23, 1976, Ser. No. 660,549

Int. Cl.<sup>2</sup> H01R 41/00

U.S. Cl. 339—9 E

12 Claims



1. An electrical connector assembly comprising: a first rigid electrical conductor means and a second rigid electrical conductor means spaced from said first conductor means; an electrical connector unit having a number of rigid, electrically conducting plates; means mounting the plates of said connector unit in an operative position with said plates being spaced apart and in bridging relationship to said first conductor means and said second conductor means to electrically interconnect said first conductor means and said second conductor means, at least one of the conductor means being movable relative to the plates of said connector unit when the latter is in said operative position to compensate for temperature

cycling, each plate having a pair of opposed, outer faces with at least one face provided with a pair of spaced grooves therein aligned with a corresponding conductor means when the connector unit is in said operative position; and a louvered electrical connector device for each groove, respectively, each device being disposed within the corresponding groove and having a plurality of spaced, angled, resiliently mounted fins with each fin having a pair of opposed, outer curved edges in engagement with the adjacent plate and conductor means, respectively, when the connector unit is in said operative position whereby the first conductor means and the second conductor means are electrically connected to each other through the devices and said plates of said unit.

4,013,330

#### DUAL-STANDARD ELECTRIC PLUG

Jean-Daniel Hugly, Yverdon, Switzerland, assignor to The Gillette Company, Boston, Mass.

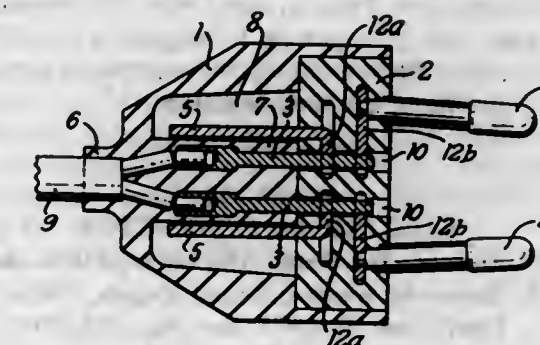
Filed Nov. 17, 1975, Ser. No. 632,283

Claims priority, application United Kingdom, Nov. 21, 1974, 50534/74

Int. Cl.<sup>2</sup> H01R 29/00

U.S. Cl. 339—31 R

19 Claims



1. A dual-standard electrical plug comprising: an insulating hollow casing having an opening, a terminal fitting within the casing, said fitting comprising a pair of conducting terminal pins extending towards the opening in the casing, an insulating insert insertable with a sliding action into the opening in the casing, said insert having apertures for receiving the terminal pins when said insert is received in the opening of the casing, respective pairs of conducting socket pins projecting from opposite faces of the insert, the socket pins of the respective pairs being insulated from each other when the insert is out of the casing and being adapted to differing standards in respect of their dimensions and relative positions, locking means for locking the insert in the casing with only one selected pin of each pair of socket pins projecting therefrom and the other socket pins accommodated in the casing, and connection establishing means in said insert for cooperative coupling with the terminal pins for establishing a conductive connection between said selected socket pins and the terminal pins received in the terminal pin-receiving apertures in the insert only when the insert is inserted into the casing.

4,013,331

#### ELECTRICAL HOUSING MEMBER

Robert James Kobler, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 520,572, Nov. 4, 1974, Pat. No. 3,971,613, which is a continuation of Ser. No. 572,589, Aug. 15, 1966.

This application Apr. 2, 1976, Ser. No. 672,929

Int. Cl.<sup>2</sup> H01R 13/48

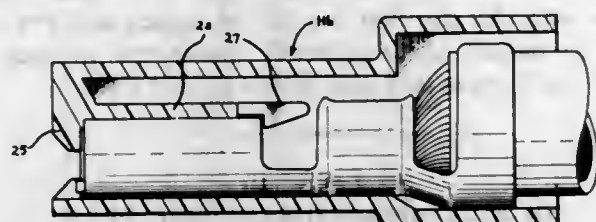
U.S. Cl. 339—59 R

2 Claims

1. An electrical connector assembly comprising a unitary dielectric housing of hard springy material and an electrical



terminal, said housing having at least one passageway therein in which said electrical terminal is located, forward stop means formed integrally from said housing and extending partially across said passageway toward which one end of a contact section is directed to limit movement of the electrical terminal in one direction, at least one inner stop means formed integrally from said housing and extending along part of said passageway, said inner stop means directed toward the rear of said passageway and comprising a unitary stiffly-flexi-



ble member having cam means and latching means spaced apart therealong, said cam means adapted to be engaged by said terminal during insertion of said terminal in said passageway to move said latching means away from the path of insertion of said terminal to allow insertion of said terminal into said passageway and said latching means moving back toward the path of insertion of the terminal when the terminal is fully inserted into said passageway to engage a section of said terminal to limit movement of the electrical terminal in a direction opposite to the one direction.

4,013,332

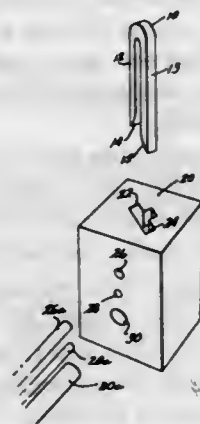
## ELECTRICAL CONNECTOR

William C. Dauser, Jr., North Muskegon, Mich., assignor to Lloyd A. Heneveld, trustee, Grand Rapids, Mich.  
Filed June 30, 1975, Ser. No. 591,490

Int. Cl.<sup>2</sup> H01R 9/08

U.S. Cl. 339-98

27 Claims



1. An electrical connector assembly adapted to be electrically conductively connected to an elongated conductor comprising:

- a conductor engaging connector means including a base with two elongated legs extending from said base and spaced from each other, said legs including at least two sides thereof intersecting to form cutting edges; said combined legs in transverse cross section being defined by an outline which is elongated in shape;
- a base member having a positioning means for positioning a conductor to be oriented in a first predetermined direction and for resisting movement of the conductor when the conductor engaging connector means is forced adjacent the conductor;
- opening means in the base member intersecting said positioning means, the overall combined, transverse, cross-sectional shape of said opening means being defined by an outline which has an elongated shape essentially the size and shape as said outline defining the overall shape of said legs;
- said elongated outline of said opening means extending

longitudinally in a direction oblique to the said first predetermined direction of said positioning means whereby when said legs are pushed through said opening means the sides of said opening means engage said legs to guide and orient said cutting edges into piercing relationship with a conductor located within said positioning means and thereby providing an electrical connection between said connection means and the conductor.

4,013,333

## WIRE CONNECTOR

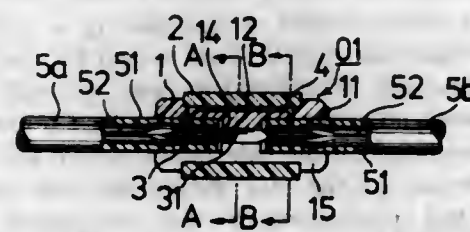
Te-Hsing Chang, No. 4-1, Lane 125, I Tung Street, Taipei, China /Taiwan

Filed Sept. 30, 1975, Ser. No. 618,746

Int. Cl.<sup>2</sup> H01R 11/20

U.S. Cl. 339-98

4 Claims



1. A connector for connecting electrically conductive wires together comprising:

- an inner socket of tubular construction, said inner socket comprising:
  - a longitudinal opening,
  - a partition wall disposed within said opening dividing said opening into two sections adapted to receive the ends of electrically conductive wires to be connected;
  - enlarged portions at opposite ends of the inner socket establishing therebetween a portion of reduced cross-section;
  - a split extending completely through the outer periphery of said inner socket and said enlarged portions;
  - a shallow groove formed in the outer periphery of said portion of reduced cross-section, said groove extending parallel to the axis of said opening and having holes at the ends thereof communicating with said two sections of said opening;
- an outer socket of tubular construction configured to fit around said portion of reduced cross section;
- an electrically conductive needle fixedly secured within said partition wall so as to extend axially within said inner sleeve, said needle having points at both ends projecting beyond the partition wall and into the opening sections so as to penetrate the ends of the electrically conductive wires being connected; and
- a spike insertable in said portion of reduced cross section, said spike including a bight portion sized for reception in said groove, and pointed arm portions positioned to extend through said holes and penetrate the ends of the electrically conductive wires being connected;
- said outer socket being insertable around said portion of reduced cross section to cover said spike and tighten said portion of reduced cross section against the ends of the electrically conductive wires being connected.

4,013,334

## DIAGNOSTIC APPARATUS

Horst Behnke, Esslingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

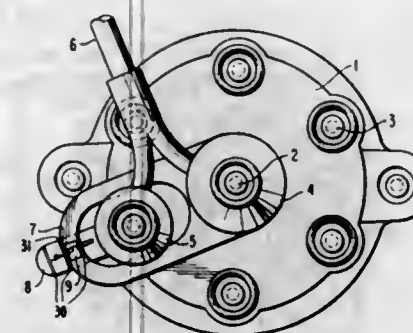
Filed June 9, 1975, Ser. No. 584,726

Claims priority, application Germany, June 14, 1974, 2428761

Int. Cl.<sup>2</sup> H01R 3/00

U.S. Cl. 339-113 R

20 Claims



1. A diagnostic apparatus with at least two pick-up means for picking up measurement values, characterized in that each pick-up means is constructed as an adaptor plug means for establishing a path between at least two parts to be connected, and in that a connecting means is provided for connecting the pick-up means together while enabling the pick-up means to be movable relative to one another.

4,013,335

## LAMP CAPS FOR HALOGEN LAMPS AND THE LIKE

László Várkonyi, György Szabó, József Ortó, László Nagy; János Spielmann; György Rabatin, and István Pozsonyi, all of Budapest, Hungary, assignors to Egyesült Izzolampa Es. Villamossági Resveny tarsasag, Budapest, Hungary

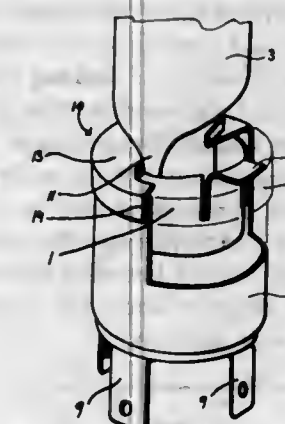
Filed July 2, 1975, Ser. No. 592,793

Claims priority, application Hungary, July 3, 1974, EE 2251

Int. Cl.<sup>2</sup> H01J 5/56

U.S. Cl. 339-144 R

10 Claims



1. In a lamp cap for interconnecting an elongated, constricted neck of a lamp to an electrode-bearing lamp holder, a cover disc overlying the lamp neck and engageable with the lamp holder, the cover disc having a radially inwardly extending flange on an inner end thereof, an elongated, hollow deformable insert positionable inside and coaxially with the cover disc for frictional engagement with the periphery of the lamp neck, and means for affixing the insert to the cover disc, the improvement in which the sleeve has a plurality of circumferentially spaced parallel slits extending axially along its peripheral wall from the inner end thereof; in which the insert includes an integral lug extending radially outwardly from the inner end of at least one portion of the sleeve located between adjacent ones of the slits; and in which the affixing means comprises means for engaging the lug with the flange of the cover disc.

4,013,336

## CONNECTOR CLIP

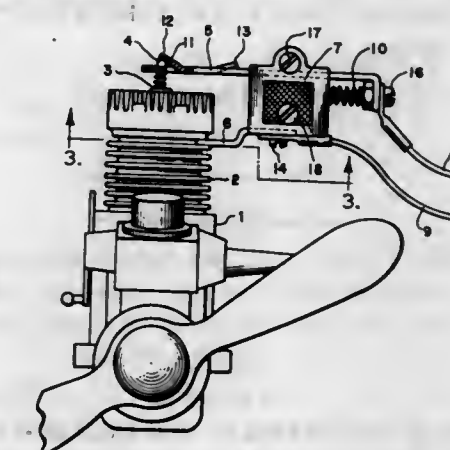
Dewey O. Broberg, Jr., Rte. No. 1, P.O. Box 102, Long Grove, Ill. 60047

Filed Mar. 25, 1976, Ser. No. 670,436

Int. Cl.<sup>2</sup> H01R 13/54

U.S. Cl. 339-253 R

11 Claims



1. A connector clip for releasably attaching a source of electrical current to the glow plug of a miniature internal combustion engine comprising:

- a first slidably disposed conductive means for receiving the insulated tip of the glow plug of said engine, having means associated therewith to limit the sliding motion thereof;
- a second conductive means for engaging said engine, and adapted for insertion between adjacent cooling fins thereof;
- an insulator body separating the first and second conductive means; and
- means for applying force to cause one of said conductive means to move in a substantially parallel direction relative to the other of said conductive means, thereby securing said connector clip to said engine.

4,013,337

## CONNECTION LUGS IN THE FORM OF A COMB FOR POWER TRANSISTORS

Bernard Roger, Carpiquet; Michel Ayel, Evreux, and Francis Debar, Thion, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

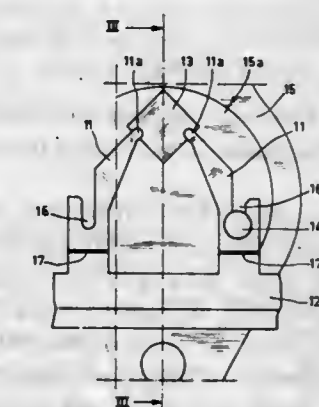
Filed June 26, 1975, Ser. No. 590,439

Claims priority, application France, July 8, 1974, 74.23644

Int. Cl.<sup>2</sup> H01R 13/12

U.S. Cl. 339-258 R

3 Claims



1. A connection lug assembly for power semiconductor devices, comprising:

- a generally planar base;
- a generally planar platform on said base for supporting a semiconductor crystal, said platform having a side surface in upstanding relationship with said base;
- a frame strip bent longitudinally into a Z-shape to abut said base and side surface of said platform and to overhang said platform;



connection strips integrally formed with said frame strip and supported from one end thereby over said platform, said connection strips each having a slot;  
a rigid conductor corresponding to and received by each slot, said conductors being disposed generally perpendicular to said base and having widened heads for cooperation with said slots to press said connection strips toward said platform for contacting predetermined places on the semiconductor crystal and for holding the crystal in place until soldering.

4,013,338

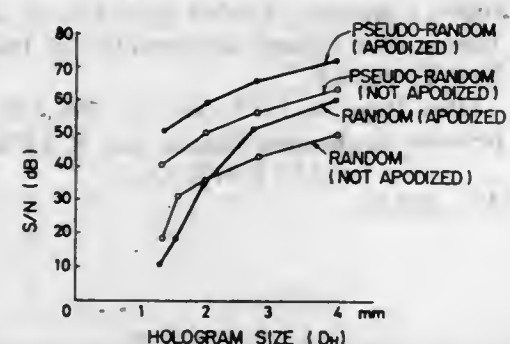
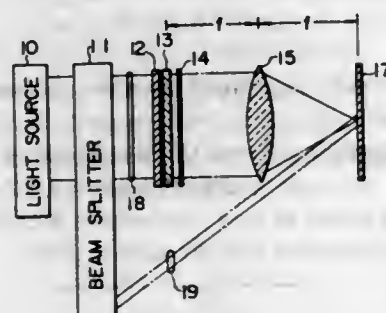
# FOURIER TRANSFORM HOLOGRAPHY USING PSEUDO-RANDOM PHASE SHIFTING OF OBJECT ILLUMINATING BEAMS AND APODIZATION

Isao Sato, and Makoto Kato, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan  
Filed Jan. 26, 1976, Ser. No. 652,154

Claims priority, application Japan, May 13, 1975, 50-56960  
Int. Cl.<sup>2</sup> G03H 1/16

U.S. Cl. 350—3.5

7 Claims



1. A system for forming a hologram of an array of beams of electromagnetic radiation on a Fourier transform plane, comprising:

a pseudo-random phase mask receptive in use of a beam of electromagnetic radiation and comprised of a plurality of phase shifting areas arranged in a pattern of rows and columns, there being an approximately equal number of phase shifting areas for each of the different phase shifts, wherein the number of different phase shifts is  $N$  which is greater than three inclusive and each of the different phase shifts is one of the multiples of  $m360^\circ/N$ , where  $m$  ranges from 1 to  $N$ , and the phase difference between orthogonally adjacent phase shifting areas is  $360^\circ/N$ , whereby the power spectrum of each of said phase-shifted beams on the Fourier transform plane distributes in orthogonal directions from the center maximum of the power spectrum;

means for apodizing the phase-shifted beams; and  
means for recording a Fourier transform hologram of said phase-shifted, apodized beams.

4,013,339

# OPTICAL IMAGE STABILIZING SYSTEM

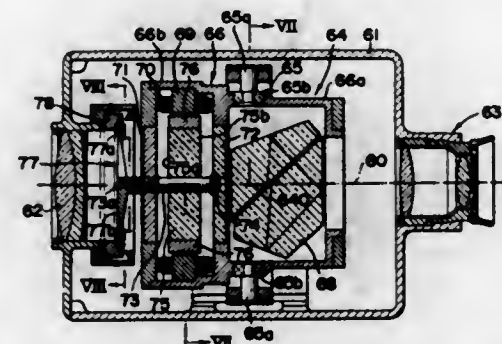
Kunio Ando, Warabi, and Takemi Saito, Kawagoe, both of Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Mar. 21, 1974, Ser. No. 453,489

Claims priority, application Japan, May 18, 1973, 48-54674  
Int. Cl.<sup>2</sup> G02B 23/02

U.S. Cl. 350—16

11 Claims



1. An optical image stabilizing system comprising in combination,

a housing having an opening for the transmission of light, a first stationary optical lens component having a straight line optical axis mounted on said housing for transmission of light passing through said housing opening, gimbals mounted in said housing, said gimbals including an inner ring and an outer ring,

an inertially stabilized second optical component located on said first optical component optical axis, and forming an imaging system with said first optical lens component, means for mounting said second optical component on said gimbals inner ring,

an electric motor including an annular rotor defining an inner space and an annular stator, means for rotatably mounting said rotor on said inner ring, means for fixedly mounting said stator on said inner ring, said rotor providing an inertial means for inertially stabilizing the inner ring of said gimbals,

said annular rotor being located in enclosing relationship with said first optical lens component optical axis whereby light rays from said first optical lens component may pass through said annular rotor inner space, and precession effect means for making said inner ring of the gimbals follow a large motion of said housing,

said precession effect means comprising an annular magnet fixed to said housing concentrically with said optical axis of said first optical component and an annular member fixed to said rotor concentrically therewith for creating an eddy current resistance between the annular member and said annular magnet when the annular member is rotated together with said rotor.

4,013,340

# BINOCULAR

Tetsuro Mukai, 1-26, Nishi, Kawaguchi, Saitama, and Yoshiro Mukai, 2-5-5 Gotokiji, Setagaya, Tokyo, both of Japan  
Filed May 22, 1975, Ser. No. 580,128

Claims priority, application Japan, June 1, 1974, 49-62394  
Int. Cl.<sup>2</sup> G02B 23/02

U.S. Cl. 350—36

8 Claims

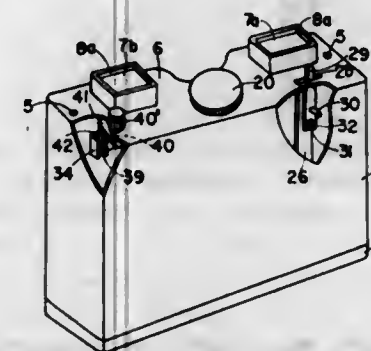
1. A binocular comprising:

a. a bedplate having a pair of holes adapted to receive a pair of objective lenses,

b. a support frame standing on said plate that is provided with optical members adapted to guide the light passing through said objective lenses into each of eyepieces,

c. a casing provided with a pair of openings at its top portion to accommodate said eyepieces and detachably attached to said bedplate in a manner to cover said support frame,

d. a lift nut installed within a cylindrical guide formed in the upper portion of said support frame, said cylindrical guide having a lengthwise opening in its side and being provided with a top portion, said lift nut being screwed onto the external thread of a lower portion of an adjustable shaft and the upper end thereof extending upwardly through a hole formed in said top portion of said casing in such a manner that it may be moved upwardly or downwardly by the clockwise or counterclockwise rotative movement of said adjustable shaft,  
e. a horizontal lift bar extending from said opening of said cylindrical guide, the center portion of said horizontal lift bar being attached to said lift nut,



f. an eyepiece tube attached to one end of said horizontal lift bar,

g. a slider fitted into a transverse groove formed in the other end of said horizontal lift bar and having an oblique slot said slider being designed to move on either side by the clockwise or counterclockwise rotative movement of a manual member provided on the outside of said casing, and

h. an eyepiece tube having a pin extending from its side portion and designed to move upwardly or downwardly by the movement of said slider on either side, said pin being inserted into an intersecting point between said oblique slot of said slider and a longitudinal slot provided in said other end of said lift bar.

4,013,341

# COLLAPSIBLE BINOCULAR INSTRUMENT

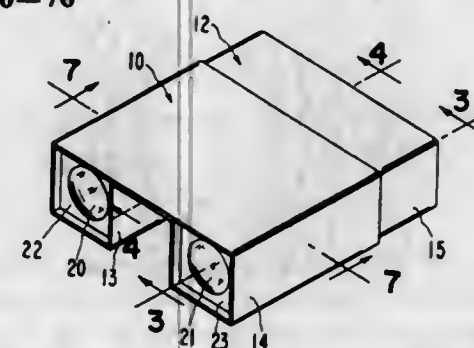
William T. Riley, 900 Welch Road, Suite 205, Palo Alto, Calif. 94303

Continuation-in-part of Ser. No. 540,377, Jan. 13, 1975, abandoned. This application Feb. 4, 1976, Ser. No. 655,185

Int. Cl.<sup>2</sup> G02B 7/02, 27/02

U.S. Cl. 350—70

31 Claims



1. A collapsible binocular instrument comprising:

a collapsible objective lens housing having first and second mutually parallel laterally spaced optical column portions;

first and second objective lens mounting elements moveably secured at an objective end of said first and second column portions, respectively, said first and second objective lens mounting elements including first and second objective lens means, respectively;

a collapsible ocular lens housing having first and second mutually parallel laterally spaced optical column portions;

and first and second ocular lens mounting elements moveably secured at a viewing end of said first and second column portions of said ocular housing, said first and second ocular lens mounting elements including first and second ocular lens means, respectively;

each of said lens mounting elements being moveable from a first viewing position in which said lens means are arranged with their optical axes substantially parallel to the axis of their respective column portions to a second storage position;

said column portions of said objective and said ocular lens sections being dimensioned for telescoping engagement therebetween.

4,013,342

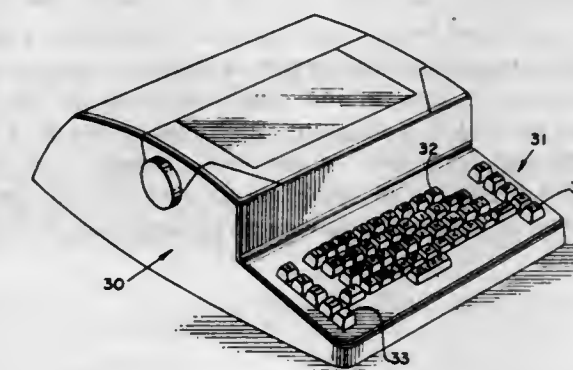
# KEYBOARD USING OPTICAL SWITCHING

Leo H. Narodny, Martin's Bay, St. John, Barbados  
Filed Dec. 19, 1975, Ser. No. 642,305

Int. Cl.<sup>2</sup> G02B 5/14

U.S. Cl. 350—96 C

7 Claims



1. A system for coupling light transmitted in a first optical fiber bundle to a second optical fiber bundle comprising,

a. a reflecting surface having a semi-ellipsoidal cavity, the major axis of said ellipsoid being in the plane of the open end of the reflecting surface,

b. said first and second fiber bundles located at the foci of said semi-ellipsoidal reflecting surface when in a light coupling position,

c. the ends of said first and second fiber bundles pointing toward said semi-ellipsoidal reflecting surface,

d. said semi-ellipsoidal reflecting surface and said pair of fiber bundles movable relative to one another to displace one of said bundles from the location of the foci of the semi-ellipsoidal reflecting surface so that cutoff of light is accomplished, whereby light is coupled from said first fiber bundle to said second fiber bundle when the ends of the fiber bundles are located at the foci of said semi-ellipsoidal reflecting surface and light transmitted in said first fiber bundle is not so coupled when said elements are relatively displaced.

4,013,343

# ELECTRO-OPTICAL DISPLAY ARRANGEMENT WITH STORAGE EFFECT USING A SOLID ELECTROLYTE

Pierre-Ernest Jaccard, Bienne, and Heinrich Hess, Nidau, both of Switzerland, assignors to Societe Suisse pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland

Filed Dec. 26, 1974, Ser. No. 536,578

Claims priority, application Sweden, Jan. 31, 1974, 741313

Int. Cl.<sup>2</sup> G02B 5/23; G02F 1/36

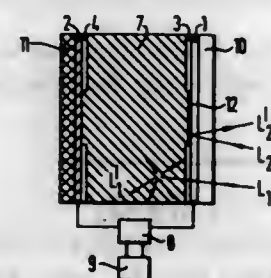
U.S. Cl. 350—160 R

29 Claims

1. An electro-optical display arrangement with storage effect adapted to be activated by an electronic control circuit comprising a voltage source, said display arrangement comprising a first element and a second element positioned on opposite sides and enclosing a system which includes at least one solid crystalline electrolyte of a type which enables the selective transport of ions through the application of an elec-



trical control signal between two control electrodes in contact with the solid crystalline electrolyte, at least one of said electrodes being transparent to light in the visual domain of electromagnetic radiation, said first element comprising a transparent one of said electrodes and comprising between said electrode and said solid electrolyte a transparent electrical insulator at selected portions leaving a potentially visible pattern defined by locations at which said electrode is electri-



cally in contact with said solid electrolyte, said second element comprising the other of said electrodes, the said two control electrodes being adapted to be electrically coupled to the said electronic control circuit to thereby bring a reversible accumulation of ions in the neighbourhood of the control electrode of said first element, such ions being in a valence state different from that of the ions elsewhere in the solid electrolyte sufficient to bring about a visible change in the appearance of the display as viewed through said first element.

4,013,344

## DISPLAY DEVICE

Francois Joseph Marie Bescond, Duell, France, assignor to U.S. Philips Corporation, New York, N.Y.

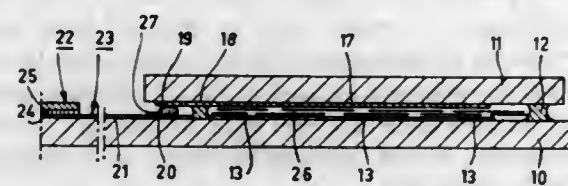
Filed June 9, 1975, Ser. No. 585,388

Claims priority, application France, June 24, 1974, 74.21835

Int. Cl.<sup>2</sup> G02F 1/13; H01R 13/24

U.S. Cl. 350-160 LC

4 Claims



1. A display device comprising two parallel spaced apart supporting plates, at least one electrode on the surface of each supporting plate, spacer means separating said plates and defining therewith a closed circumference, a display medium filling the volume defined by said supporting plates and said spacer member, said electrodes extending on parts of the supporting plates outside the said volume, connection strips on one of the supporting plates for electrical connection to said electrodes, contact means providing an electric connection between a connection strip and a corresponding electrode which is provided on the oppositely located supporting plate, said means comprising a pill having a surface area measured in a direction parallel to the surface of the supporting plate which is smaller in all directions than the surface area of the conductive surfaces with which the surface area of the pill is in contact so that the said contact cannot extend further than said surface, said pill consisting of a kneadable conductive material.

# 4,013,345 DEFORMABLE MIRROR LIGHT VALVE AND METHOD OF OPERATING THE SAME

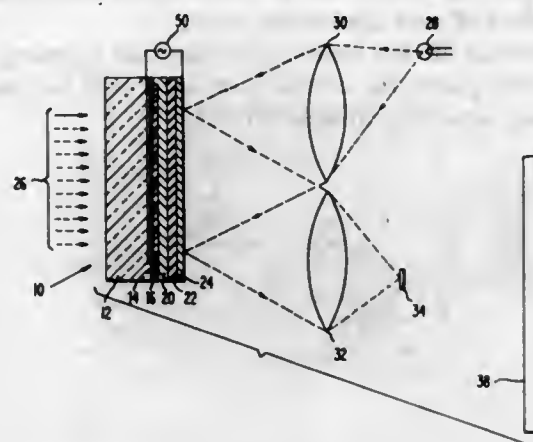
William Ronald Roach, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,899

Int. Cl.<sup>2</sup> G02F 1/34

U.S. Cl. 350-161 S

8 Claims



1. A deformable mirror light valve comprising: a transparent substrate of electrically insulating material, a plurality of transparent electrodes on one surface of said transparent substrate, a photoconductor layer on said transparent electrodes, an elastomer layer on said photoconductor layer, a deformable mirror on said elastomer layer, and means for applying a separate biasing voltage to each one of said transparent electrodes while said light valve is subjected to scanning addressing light with voltage reversals in the area of said photoconductor layer which corresponds to each one of said transparent electrodes being substantially coincident with said scanning addressing light.

4,013,346

## ENLARGING LENS SYSTEM

Masaki Matsubara, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

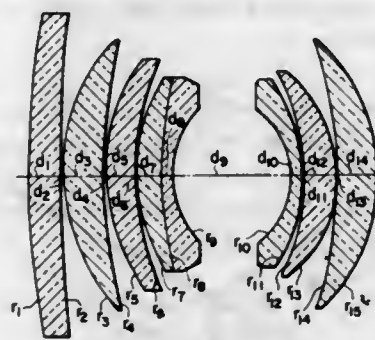
Filed Jan. 12, 1976, Ser. No. 648,569

Claims priority, application Japan, Jan. 13, 1975, 50-6183

Int. Cl.<sup>2</sup> G02B 13/24, 9/64

U.S. Cl. 350-176

6 Claims



1. An enlarging lens system comprising a front lens group arranged on the object side of the stop and a rear lens group arranged on the image side of the stop, said front lens group comprising a first, second, third and fourth lens components, said first lens component being a positive meniscus lens, said second lens component being a positive meniscus lens, said third lens component having positive refractive power, said fourth lens component having negative refractive power, said rear lens group comprising a fifth, sixth and seventh lens components, said fifth lens component having negative refractive power, said sixth lens component being a positive meniscus lens, said seventh lens component being a positive meniscus lens, said enlarging lens system satisfying the following conditions:

$$1.75 < n_n < 1.85$$

$$1.72 < n_b < 1.85$$

$$0.3f < |f_n| < 0.8f$$

$$0.3f < |f_b| < 0.8f$$

$$0.4f < \frac{r_c}{n_c - 1} < 0.9f$$

$$0.3f < \frac{r_d}{n_d - 1} < 0.6f$$

$$0.8 < \frac{f_I}{f_{II}} < 1.5$$

wherein reference symbols  $n_n$  and  $n_b$  respectively represent refractive indices of lenses respectively constituting the fourth and fifth lens components and positioned on the stop side therein (when the fourth and/or fifth lens components are single lenses,  $n_n$  and  $n_b$  respectively represent refractive indices of those single lenses), reference symbols  $f_n$  and  $f_b$  respectively represent focal lengths of said lenses on the stop side in the fourth and fifth lens components, reference symbols  $n_c$  and  $n_d$  respectively represent refractive indices of lenses respectively constituting the third and sixth lens components and positioned on the outer side therein (when the third and/or sixth lens components are single lenses,  $n_c$  and  $n_d$  respectively represent refractive indices of those single lenses), reference symbols  $r_c$  and  $r_d$  respectively represent radii of curvature of outer lens surfaces of the third and sixth lens components, and reference symbols  $f_I$ ,  $f_{II}$  and  $f$  respectively represent focal lengths of the front lens group, rear lens group and lens system as a whole.

4,013,347

# MOVABLE FILTER OPTICAL SYSTEM FOR PROVIDING IMPROVED OPTICAL TRANSMISSION CHARACTERISTICS

Akiyoshi Nakamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

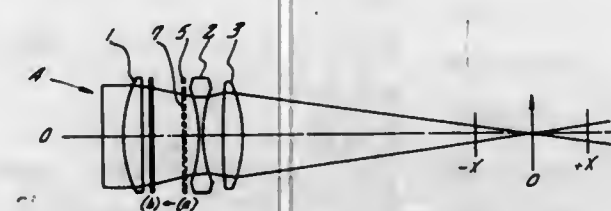
Filed May 2, 1975, Ser. No. 573,917

Claims priority, application Japan, May 4, 1974, 49-50020

Int. Cl.<sup>2</sup> G02B 5/02; G03B 3/00

U.S. Cl. 350-188

23 Claims



1. In a lens system having a plurality of lens components arranged on an optical axis for refracting transmitted light rays non-parallel to the optical axis, the improvement comprising: at least one optical element positioned on the image space side of the lens components and capable of intersecting the refracted light rays traveling non-parallel through the lens system; and means for moving the optical element along the optical axis, said optical element including a marginal area having a characteristic of influencing the transmission of a light ray passing therethrough and an inner area having a characteristic of transmitting any incident light ray with substantially no influence on the properties of the light ray, the axial movement of said optical element varying the amount of light rays transmitted non-parallel to the optical axis which pass through said marginal area of said optical element.

4,013,348

## OPTICAL SYSTEM FOR REPRODUCTION

Yu Yamada, Kokubunji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

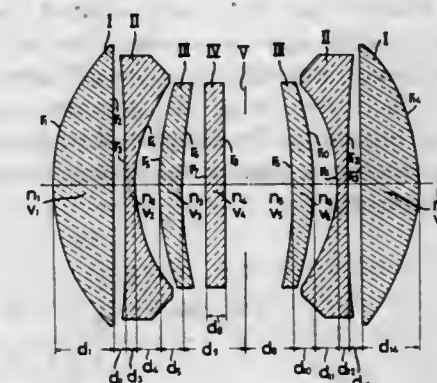
Filed May 7, 1975, Ser. No. 575,263

Claims priority, application Japan, May 13, 1974, 49-53001

Int. Cl.<sup>2</sup> G02B 9/60

U.S. Cl. 350-196

2 Claims



1. An optical system for reproduction having the following lens specifications:

the F-number of the image forming lens: 5

the picture angle: 40°

the magnification factor: 1-1.6

the focus distance: 280 mm

$r_1 = -r_{14} = 0.226896 f$	$d_1 = d_{14} = 0.0641808 f$
$r_2 = -r_{13} = \infty$	$d_2 = d_{13} = 0.0135136 f$
$r_3 = -r_{12} = -3.74228 f$	$d_3 = d_{12} = 0.0110534 f$
$r_4 = -r_{11} = 1.77267 f$	$d_4 = d_{11} = 0.0249592 f$
$r_5 = -r_{10} = 0.322519 f$	$d_5 = d_{10} = 0.0260289 f$
$r_6 = -r_9 = 0.564898 f$	$d_6 = d_9 = 0.0695292 f$
$r_7 = \infty$	$d_7 = 0.0213936 f$
$r_8 = \infty$	$d_8 = 0.0508455 f$
$n_1 = n_7 = 1.63854$	$v_1 = v_7 = 55.4$
$n_2 = n_6 = 1.58215$	$v_2 = v_6 = 42.1$
$n_3 = n_5 = 1.60729$	$v_3 = v_5 = 49.3$
$n_4 = 1.51633$	$v_4 = 64.1$

whereby

$f$  = focus distance

$r_1 - r_{14}$ : radius of curvature

$d_1 - d_{14}$ : thickness of air spaces and lenses

$n_1 - n_7$ : refractive index of lenses for d-line

$v_1 - v_7$ : dispersion of lenses for d-line

$r_7, r_8$ : radius of curvature

$n_4$ : refractive index of filter for d-line

$v_4$ : dispersion of filter for d-line.

4,013,349

## WIDE-ANGLE OBJECTIVE

Ludwig Bertele, and Klaus W. Hildebrand, both of Heerbrugg, Switzerland, assignors to Wild Heerbrugg Aktiengesellschaft, Heerbrugg, Switzerland

Filed Apr. 17, 1975, Ser. No. 569,278

Claims priority, application Switzerland, Apr. 22, 1974, 5494/74

Int. Cl.<sup>2</sup> G02B 9/64

U.S. Cl. 350-214

2 Claims

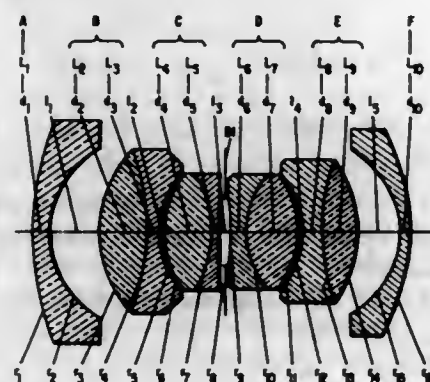
1. A wide-angle objective composed of six components separated from each other and located three at the object side of diaphragm and three at the image side of such diaphragm, said six lens components taken in consecutive order from the side of the object comprising:

a. a first lens component with dispersing refractive power composed of at least one meniscus lens member curved towards the object side;

b. a second lens component which follows an air space composed of a dispersing meniscus lens component curved towards the object side;



- c. a third lens component which follows a small air space and possessing a collecting refractive power and having a strongly convex curved outer surface facing the object side, said third lens component comprising at least two lens members and having a convex cemented surface facing the object side which at the side of the object possesses a greater refractive index than at the image side, one of said two lens members is a dispersing lens member situated closest to the diaphragm;
- d. a fourth lens component which follows the diaphragm space, said fourth lens component having a collecting refractive power and strongly convex curved outer surface which faces the image and possesses a concave cemented surface facing the image and which at the side of the image exhibits a greater refractive index than at the side of the object;



- e. a fifth lens component comprising a dispersing meniscus lens component which is curved towards the image;
- f. a sixth lens component with dispersing power which follows an air space and composed of at least one meniscus lens member curved towards the image;
- g. the difference of the reciprocal values of the radii of curvature of the lens surfaces bounding the diaphragm space being greater than  $0.43/F$  and smaller than  $1.3/F$ ;
- h. the axial spacing of the convex surfaces of the second and fifth lens components, and which convex surfaces face away from the diaphragm, is in the order of about between  $0.64 F$  and  $1.1 F$ ;
- i. the focal length of the first lens component facing the object is greater than  $-0.7 F$  and smaller than  $-1.6 F$ ; and
- j. wherein the symbol  $F$  represents the focal length of the entire objective.

4,013,350

## LARGE APERTURE SUPERWIDE-ANGLE LENS

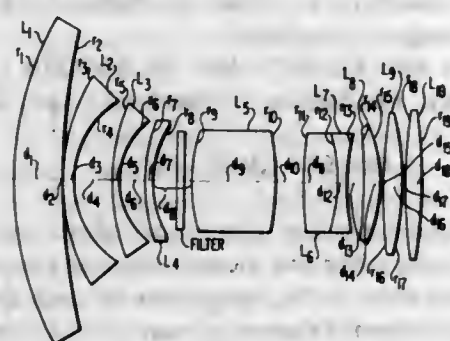
Ryota Ogawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1975, Ser. No. 608,948

Claims priority, application Japan, Aug. 29, 1974, 49-99178  
Int. Cl.<sup>2</sup> G01B 13/04

U.S. Cl. 350-214

2 Claims



1. A miniature and large aperture superwide-angle lens of the retrofocus type comprising ten lenses grouped in nine components wherein the first lens is a convex lens whose surface of greater curvature is convex to the object, the second lens is a negative meniscus lens, the third lens is a negative meniscus lens, and the fourth lens is a negative meniscus lens,

said second, third and fourth lenses being concave to the image, the fifth lens is a double-convex lens, the sixth and seventh lenses constitute a cemented doublet, said sixth lens being a double-convex lens whose surface of greater curvature is cemented with said seventh lens, said seventh lens being a double-concave lens, the combination of said sixth and seventh lenses forming a negative lens, the eighth lens is a positive meniscus lens whose surface of greater curvature is convex to the image, the ninth lens is a convex lens, and the tenth lens is a convex lens, said ninth and tenth lenses having their surfaces of greater curvature convex to the image, and a filter located between said fourth and fifth lenses, wherein the radii of curvature  $r_1$  to  $r_{19}$ , the lens thicknesses and lens separations  $d_1$  to  $d_{18}$ , the refractive indices  $\eta_1$  to  $\eta_{10}$ , and Abbe numbers  $\nu_1$  to  $\nu_{13}$  of said first to tenth lenses  $L_1$  to  $L_{10}$ , respectively, satisfy the following conditions:

$$F = 100, \text{ aperture ratio } 1:2, \text{ Angle of view } 2\omega = 94.6^\circ$$

$$F_{1,2,3,4} = -87.674$$

$$F_{1,2,3,4,5,6,7} = -136.712$$

$$\text{Backfocus} = 193.146$$

$$\Sigma p = 0.075$$

Lens L	Radius of Curvature r	Lens Thickness or Spacing d	Refractive Index $\eta$	Abbe No. $\nu$
$L_1$	$r_1 = 339.720$	$d_1 = 49.41$	$\eta_1 = 1.64000$	$\nu_1 = 60.2$
	$r_2 = 952.881$	$d_2 = 0.49$		
$L_2$	$r_3 = 218.581$	$d_3 = 9.95$	$\eta_2 = 1.74320$	$\nu_2 = 49.4$
	$r_4 = 93.059$	$d_4 = 32.61$		
$L_3$	$r_5 = 162.580$	$d_5 = 8.74$	$\eta_3 = 1.51821$	$\nu_3 = 65.0$
	$r_6 = 76.282$	$d_6 = 24.31$		
$L_4$	$r_7 = 213.538$	$d_7 = 8.74$	$\eta_4 = 1.74320$	$\nu_4 = 49.4$
	$r_8 = 97.733$	$d_8 = 26.69$		
(Thickness of filter = 7.28)				
$L_5$	$r_9 = 202.478$	$d_9 = 81.34$	$\eta_5 = 1.78470$	$\nu_5 = 26.2$
	$r_{10} = 272.635$	$d_{10} = 28.77$		
$L_6$	$r_{11} = 857.551$	$d_{11} = 33.97$	$\eta_6 = 1.64000$	$\nu_6 = 60.2$
	$r_{12} = 126.036$	$d_{12} = 4.85$	$\eta_7 = 1.84666$	$\nu_7 = 23.9$
$L_7$	$r_{13} = 276.629$	$d_{13} = 14.56$		
	$r_{14} = 766.797$	$d_{14} = 17.62$	$\eta_8 = 1.51821$	$\nu_8 = 65.0$
$L_8$	$r_{15} = 124.736$	$d_{15} = 0.49$		
	$r_{16} = 5992.735$	$d_{16} = 17.96$	$\eta_9 = 1.74320$	$\nu_9 = 49.4$
$L_9$	$r_{17} = -233.291$	$d_{17} = 0.49$		
	$r_{18} = 5117.276$	$d_{18} = 13.54$	$\eta_{10} = 1.69680$	$\nu_{10} = 55.5$
$L_{10}$	$r_{19} = 384.364$			

4,013,351

## CONVEX MIRROR AND FRAME

Ernest Haile, 30 Cadwalader Terrace, Trenton, N.J. 08618

Filed Aug. 8, 1975, Ser. No. 603,244

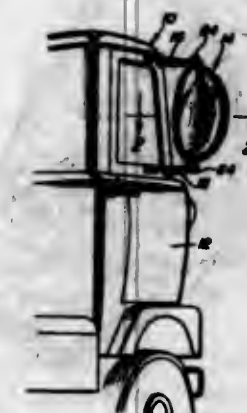
Int. Cl.<sup>2</sup> G02B 5/10

U.S. Cl. 350-293

12 Claims

1. A mirror construction comprising a mirror element including first and second opposite side edges, a mounting plate of a plan shape corresponding to the plan shape of said element over one side of which said element is placed in plan registry therewith, said plate including first and second opposite side edges corresponding with the first and second side

edges, respectively, of said element, the first side edge of said plate being generally straight and including a first flange extending therealong and projecting outwardly of said one side edge of said plate and including an outer free edge, said outer free edge of said first flange including opposite end portions which curve inwardly toward said plate, the free outer edge of said first flange terminating outwardly in a second inwardly directed flange overlying said one side of said plate in spaced relation relative thereto, the second side edge of said plate including opposite end portions which curve inwardly toward the remote ends of the first side edge of said plate, said second side edge end portions including retaining flange portions



extending therealong, projecting outwardly of said one side of said plate and terminating outwardly in intumed flange portions overlying said one side of said plate in spaced relation relative thereto, said second side edge of said element being held captive within said retaining flange portions and beneath said intumed flange portions, said first side edge of said element overlying said second flange, and a cap panel removably secured over the outer side of said first flange and including an outer marginal edge corresponding to and projecting outwardly beyond said free outer edge of said first flange, said outer marginal edge of said cap panel terminating outwardly in an intumed retaining flange overlying the first side edge of said element.

4,013,352

## SELF-BLIMPED MOTION PICTURE CAMERA

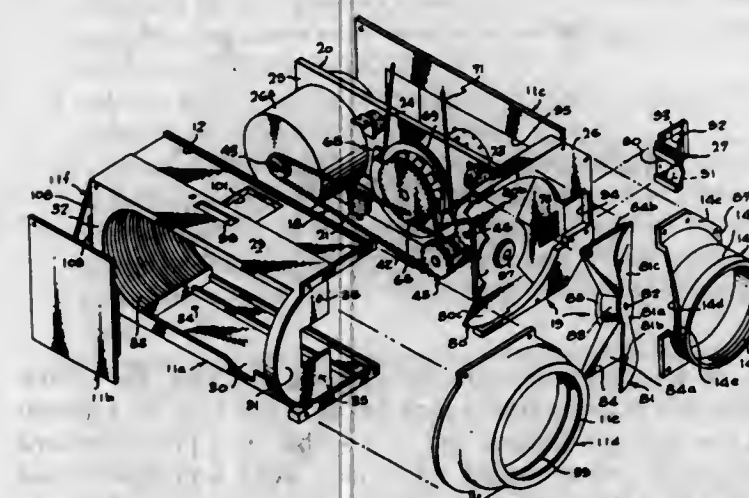
Jacob G. Monroy, 1038 N. Highland Ave., Hollywood, Calif. 90038

Filed Mar. 25, 1975, Ser. No. 561,696

Int. Cl.<sup>2</sup> G03B 31/00

U.S. Cl. 352-35

9 Claims



1. An unblimbed motion picture camera comprising:

a housing;  
a mounting frame floatingly, resiliently shock mounted within said housing, said frame including a plate to which all drive train components are mounted, and a forward panel affixed to said plate perpendicularly thereof, said drive train components consisting of:  
a motor,  
an idler assembly, including a shaft having an axis parallel to

that of said motor and perpendicular to said frame, said shaft being journal mounted within sleeve bearings, there being a driven pulley and two driver pulleys affixed to said shaft,  
a drive pulley for a film transport movement,  
a first belt connecting said motor, said idler assembly driven pulley and said transport movement drive pulley,  
a film-take-up reel drive clutch mechanism mounted on said plate and including a clutch drive pulley,  
a second belt connecting one of said idler driven pulleys to said clutch drive pulley, said belt being arranged so that the rotational direction of said clutch mechanism is opposite to said motor,  
a rotating shutter mechanism mounted to said frame forward panel, said shutter mechanism having a drive shaft extending rearwardly of said forward panel and attached to a pulley, and  
a third belt extending from the other idler driven pulley and being arranged to engage said shutter mechanism pulley, said motor, said idler assembly, said clutch mechanism, said film transport movement drive pulley and said shutter mechanism drive shafts all having sleeve bearings.

4,013,353

## OPTICAL REFLECTING SYSTEM

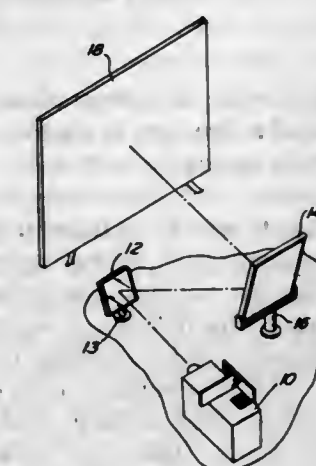
Robert Portner, Blackwood, and Phillip Miller, Turnersville, both of N.J., assignors to Magna Mir, Inc., Philadelphia, Pa. Continuation of Ser. No. 488,011, July 12, 1974, abandoned.

This application Jan. 7, 1976, Ser. No. 647,098

Int. Cl.<sup>2</sup> G03B 21/28; G02B 17/00, 5/10

U.S. Cl. 353-99

1 Claim



1. A reflection system comprising:  
a light emitting projecting means from which intelligible images are projected;  
said projecting means having a known focal length;  
a receiving surface;  
said receiving surface having a known maximum height and width;  
said receiving surface further being positioned at a known elevation with respect to said projecting means;  
an intermediate curved reflector positioned to receive beams from said projecting means and reflect said beams distortion-free against said receiving surface;  
the projection axis of said beams as emitted from said projection means being substantially perpendicular to the plane in which said receiving surface lies;  
said reflector having a surface curvature defined by a plurality of incremental arcs, the dimensions and angular disposition of which are successively determinable from each preceding incremental arc;  
a central incremental arc having dimensions and angular disposition having been determined from said focal length, said maximum height, said maximum width and said elevation, from which the first of said successive determinations is determinable; and,  
said plurality of incremental arcs having dimensions and angular disposition which are proportional to the dimen-



sions and angular disposition of each said preceding incremental arc and the number of all said preceding incremental arc.

4,013,354

# APPARATUS FOR SEPARATING TRANSFER MATERIAL IN AN ELECTROSTATIC COPYING DEVICE

Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mikata; Toshihide Iida; Koichi Miyamoto, both of Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Continuation of Ser. No. 413,221, Nov. 6, 1973, which is a division of Ser. No. 258,820, June 1, 1972, Pat. No. 3,804,512.

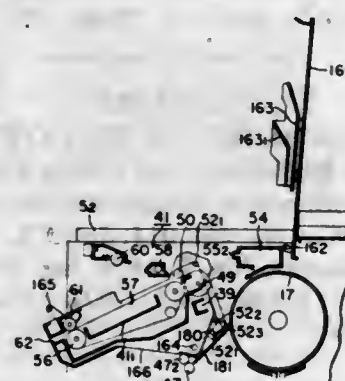
This application May 28, 1975, Ser. No. 581,546

Claims priority, application Japan, June 3, 1971, 46-38917; June 3, 1971, 46-38918; June 9, 1971, 46-48632; June 10, 1971, 46-41196; June 10, 1971, 46-41195; June 10, 1971, 46-41197; June 21, 1971, 46-44611; Aug. 30, 1971, 46-66740

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-3 R

5 Claims



1. A device for separating a transfer material from a surface to which the material is brought in contact comprising: a rotatable, endless separator belt; and means for supporting and positioning said separator belt along the surface to which the transfer material is brought in contact, said supporting means including a plurality of deflecting means for twisting said separation belt to define a separation path extending at least in part along said surface and a return path extending in a plane different from the plane of said separation path so that said return path is spaced from said surface, said deflecting means minimizing the relative deflection between said paths to thereby minimize the twisting of said separator belt, said supporting means further including rotatable means mounted adjacent to said surface and said separation path for guiding the transfer material into contact with said surface so that a portion of the transfer material is gripped between the separator belt and the rotatable means, and wherein rotation of said rotatable means causes the gripped portion of the transfer material to separate from said surface.

4,013,355

# NOTCH FILTER FOR COLOR TRANSPARENCY COPYING MACHINES

Louis D. Mailloux, Arcadia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed July 30, 1975, Ser. No. 600,345

Int. Cl.<sup>2</sup> G03G 15/01

U.S. Cl. 355-4

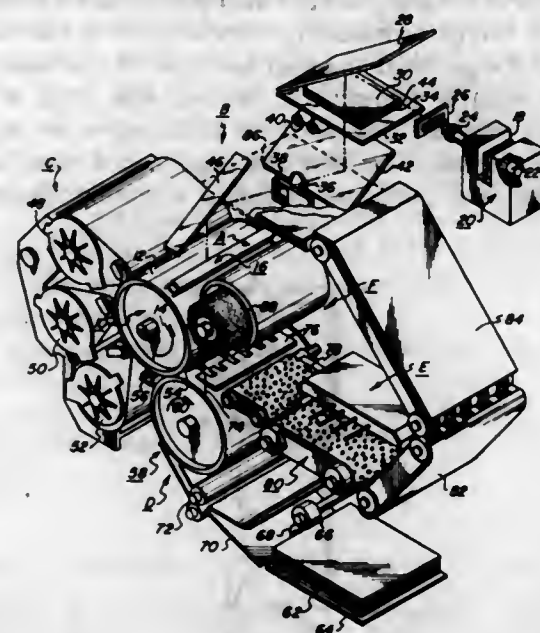
12 Claims

1. An electrophotographic printing machine for reproducing a color transparency, including:

a photoconductive member; means for producing a charge having a substantially uniform level on at least a portion of said photoconductive member;

means for forming a light image of the color transparency; means for modulating the light image to produce a halftone light image;

means for filtering successive light images of the color transparency to form successive blue, red, and green light images thereof; and a notch filter interposed into the optical path to block a portion of the red light image while transmitting the blue



and green light images therethrough, each light image transmitted through said notch filter passing through said filtering means and said modulating means to irradiate the charged portion of said photoconductive member recording thereon successive single color electrostatic latent images.

4,013,356

# APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES WITH LIQUID TONER

Friedrich Bestenreiner, Grunwald; Dieter Gliglberger, Unterhaching, and Gert Weidkuhn, Freiburg, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

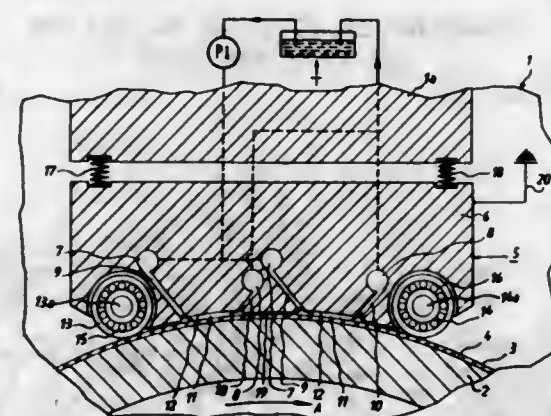
Filed Apr. 10, 1975, Ser. No. 566,685

Claims priority, application Germany, Apr. 11, 1974, 2417721

Int. Cl.<sup>2</sup> G03G 15/10

U.S. Cl. 355-10

9 Claims



1. In an electrophotographic copying machine, the combination of a printing base which has an active face for supporting electrostatic images and is movable in a predetermined direction to advance said active face along a predetermined path, with a developing apparatus which comprises electrode means adjacent to and having a side substantially parallel to said path so that said electrode means and said active face define narrow clearances, means for circulating liquid toner in said clearances having liquid supplying port means at one end and liquid evacuating port means at the other end of each of said clearances, as considered in said direction, arranged to supply and evacuate liquid toner in direction making oblique angles with said predetermined direction, wherein the number of clearances is  $n$  and

$$n = \frac{\ln \frac{\delta_0}{\delta_n}}{\ln \left( 1 - \frac{dq}{m\delta_0} \right)}$$

wherein,  $\delta_0$  is the initial density of charge of an image on said printing base,  $\delta_n$  is the remaining density of charge of a developed image,  $d$  is the distance between said side and said active face,  $q$  is the average charge of toner particles, and  $m$  is the average mass of toner particles.

4,013,357

# COPYING MACHINE IN WHICH, PAPER JAMMING AT COPYING PAPER CUTTING MECHANISM IS PREVENTED

Tadanobu Nakajima, Kashiwara, and Tatsuo Aizawa, Osaka, both of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

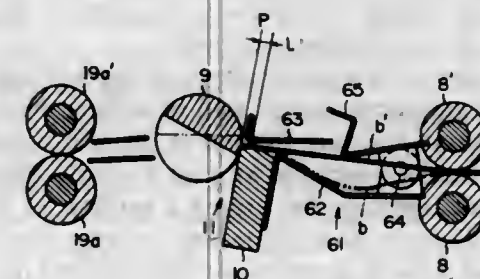
Filed Aug. 19, 1975, Ser. No. 605,925

Claims priority, application Japan, Aug. 23, 1974, 49-96705

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-13

6 Claims



6. An electrophotographic copying machine comprising: a paper feed device for feeding a roll-like copying paper; a copying paper transfer passage including a zone of a charging device, a light exposure zone, a zone of a developing device and a zone of a drying or fixing device in the above recited sequence;

a moving frame having a transparent plate for supporting thereon an original to be copied;

an optical system fixed in the machine to optically connect said transparent plate of said moving frame to said light exposure zone of said transfer passage and to focus an image of the original supported on said transparent plate onto said copying paper travelling in said light exposure zone;

said paper feed device comprising a feed reel for supporting a copying paper wound thereon in a roll-like form; a paper feed roller intermittently driven and rotated by means of a clutch mechanism to take out said copying paper from said feed reel; an introduction roller disposed on the introduction side of said transfer passage; and a copying paper-cutting mechanism disposed between said paper feed roller and said introduction roller to cut said copying paper taken out of said feed reel into a prescribed length;

said moving frame including a cut length-designating mechanism for designating a cut length of said copying paper corresponding to a predetermined light exposure range of said original;

first detecting mechanism means provided adjacent the

introduction end of said light exposure zone in said transfer passage to detect the forward end of the travelling copying paper, and to actuate first switch means so that the actuation of said first switch means is maintained while the copying paper is travelling;

second detecting mechanism means provided on a moving passage of said moving frame to detect said cut length-designating mechanism of said moving frame which is travelling along the moving passage of said moving frame and to actuate second switch means;

said first and second detecting mechanism means being disposed in such a positional relationship that when said moving frame moves from an exposure step initiating point by a distance  $(l_x - l_{min})$  equal to the difference of the length  $(l_x)$  of said predetermined light exposure range from the distance  $(l_{min})$  between said cutting position and said first detecting mechanism means, said second detecting mechanism means detects said cut length-designating mechanism means, by actuation of said first switch means, the movement of said moving frame for the light exposure step is initiated and said paper feed roller is released from the connection with a drive mechanism therefor by means of said clutch mechanism and is driven idly, by actuation of both the first and second switch means, said copying paper-cutting mechanism is actuated to cut said copying paper in a length corresponding to the light exposure range length of the original to be copied while said copying paper is placed under a certain tension;

paper jamming-preventing mechanism means positioned in said paper feed device to stop the front end of said copying paper, which is present at the cutting position when the operation of said paper-cutting mechanism is completed, at a position slightly retreated from said cutting position and to make the front end of said copying paper stand by for the next copying operation at this retreated position;

said paper jamming-preventing mechanism means including a copying paper transfer passage-regulating mechanism disposed so that two copying paper transfer passages having differing passage lengths are formed between said paper feed roller and said cutting mechanism;

said copying paper transfer passage-regulating mechanism being disposed with such a positional relation to said paper feed roller that while said paper feed roller is driven, the roll-like copying paper is moved along the longer said transfer passage by the driving force given to said copying paper by said paper feed roller, and that when said feed roller is released from the connection with the drive mechanism, supply of roll-like paper from said feed reel is interrupted, and thereafter said paper feed roller is driven by said copying paper whereby said roll-like copying paper is shifted from said longer transfer passage to the shorter said transfer passage, and the roll-like copying paper continues to move along said shorter passage;

said cutting mechanism being actuated while said roll-like copying paper is delivered along said shorter transfer passage, said roll-like copying paper being shifted from said shorter transfer passage to said longer transfer passage after the cutting operation, whereby the front end of said roll-like copying paper is stopped and made to stand by at a position retreated from said cutting position by a distance corresponding to the difference of the length between said two transfer passages; and

whereby, even if the transfer of said roll-like copying paper is started at a random position where the forward end of said roll-like copying paper is retreated from said cutting position, said copying paper can be cut precisely in a length corresponding to the desired copy length of the original.



4,013,358

**DEVICE FOR ADJUSTING STARTING POSITION FOR  
TRANSFER-TYPE ELECTROPHOTOGRAPHIC  
REPRODUCING APPARATUS HAVING BELT-LIKE  
PHOTOSENSITIVE MEMBER**

Yoshihisa Kawai, Hommachi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

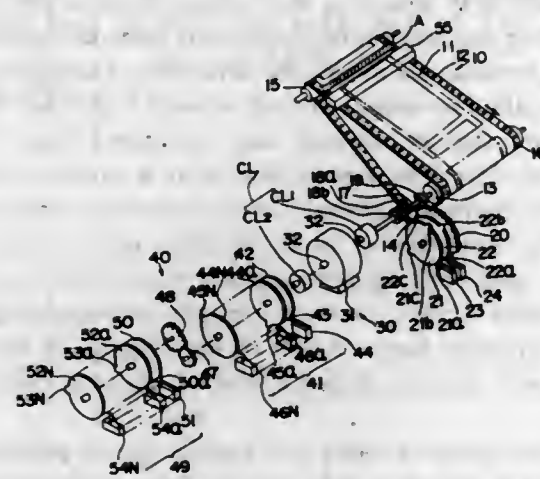
Filed Aug. 18, 1975, Ser. No. 605,736

Claims priority, application Japan, Sept. 2, 1974, 49-105715[U]

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-14

13 Claims



1. In a transfer-type electrophotographic reproducing apparatus having an image-forming system, a photosensitive member unit mounted for withdrawal from and insertion into the apparatus, the unit containing a photosensitive belt having a seam and being trained about a plurality of rollers for rotation to at least one position in an area receiving an image from the image-forming system when reproduction is initiated, and a drive source adapted to engage at least one of the rollers for providing the rotation, the engaging of the drive source with the one roller being conditionally enabled upon insertion of the unit into the apparatus and being disabled upon withdrawal therefrom, the improvement comprising the combination therewith of a device for adjusting a starting position of the belt, including

- a belt-position-adjusting control mounted in the unit for synchronous movement with the belt,
- means actuated by said adjusting control and adapted for engaging the drive source with the one roller to drive the belt while said seam is located within the image-receiving area,
- means actuated by the adjusting control and adapted for disengaging the drive source from the one roller to stop the belt when the seam is located at a given position outside the image-receiving area,
- a reproduction starting means for engaging the drive source with the one roller in response to said initiated reproduction, and
- means inhibiting said reproduction starting means while the seam is located within the image-receiving area, whereby the seam is prevented from occupying the image area during reproduction and reproduction initiation is prevented when the seam is in the image area.

4,013,359

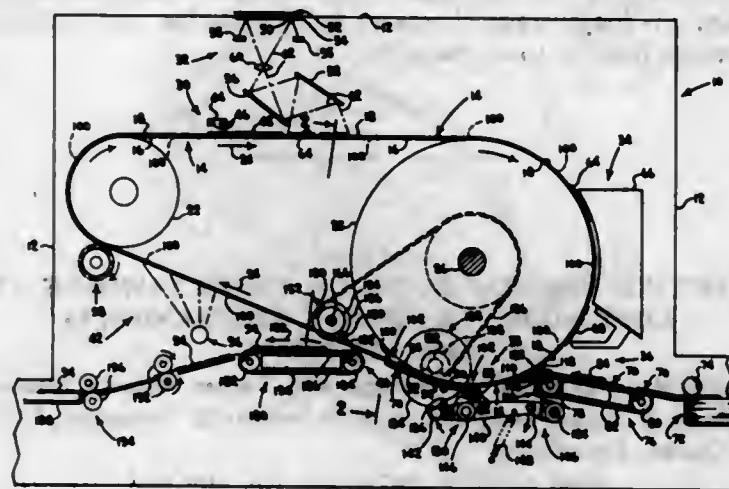
**ELECTROSTATIC COPIER INCLUDING MEANS FOR  
DETACHING PAPER FROM A PHOTOCONDUCTOR**  
Robert Clark DuBois, Fairfield; Eugene Patrick Lavin, Stratford, and Joseph F. Miciukiewicz, Trumbull, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 23, 1974, Ser. No. 500,048

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-16

9 Claims



1. In a copier including means for supplying electrostatic charge, apparatus for handling a sheet of paper comprising:
- a paper conveying means including a movable plate-type photoconductor adapted to be sufficiently electrically energized from said charge supplying means for electrostatically attaching the sheet of paper to the photoconductor for movement therewith;
  - means for detaching the attached sheet of paper from the moving photoconductor, said detaching means including at least one aperture formed in the photoconductor and finger means insertable at least partially through said at least one aperture for urging a portion of the attached sheet of paper away from said moving photoconductor and said detaching means including means for moving the inserted finger means in the direction of movement of said photoconductor.

4,013,360

**INFORMATION STORAGE SYSTEM**

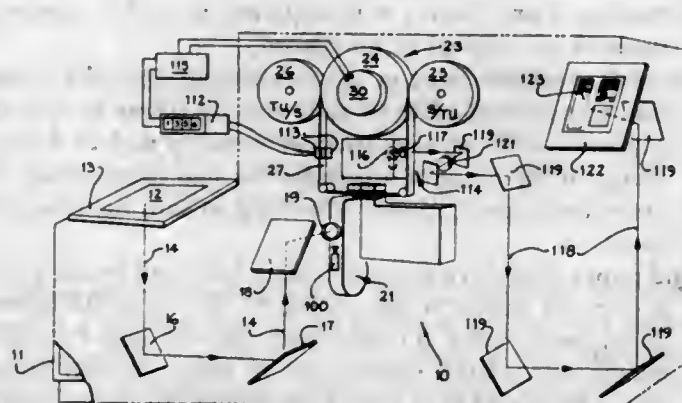
Richard J. Burke, Saratoga, and Charles J. Becker, San Jose, both of Calif., assignors to American Videonetics Corporation, Sunnyvale, Calif.

Filed June 27, 1973, Ser. No. 374,048

Int. Cl.<sup>2</sup> G03B 27/32

U.S. Cl. 355-27

7 Claims



1. In an information storage system, first and second films each capable of having a plurality of images recorded at different locations thereon, a recording station for recording an image of an object upon said first film, a transfer station for transferring an image from the first film to the second film, means for moving said first film independently of said second film along a predetermined path from the recording station to the transfer station, means for moving the second film independently of the first film along a second path including said

transfer station, whereby any desired location on the first film can be aligned with any desired location on the second film at the transfer station, and means for transferring an image from the desired location on the first film to the desired location on the second film when said locations are aligned at the transfer station.

4,013,361

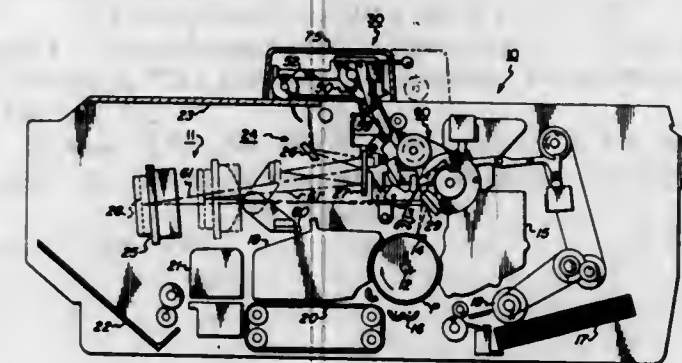
**OPTICAL APPARATUS AND REPRODUCING MACHINE**  
Robert F. Allis, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 20, 1975, Ser. No. 588,973

Int. Cl.<sup>2</sup> G03B 27/70

U.S. Cl. 355-60

24 Claims



1. In an apparatus for viewing an original and for projecting an image thereof onto a moving imaging surface, said apparatus including a lens arranged along an optical path, means for changing the projected image magnification, said magnification changing means including means for translating said lens in a plane of motion between first and second discrete positions so that the projected magnification is a function of the lens position, the improvement wherein:
- means are provided for automatically tilting said lens with respect to said plane of motion to a different extent at said first position than at said second position.

4,013,362

**ADJUSTABLE FORMS GUIDE**

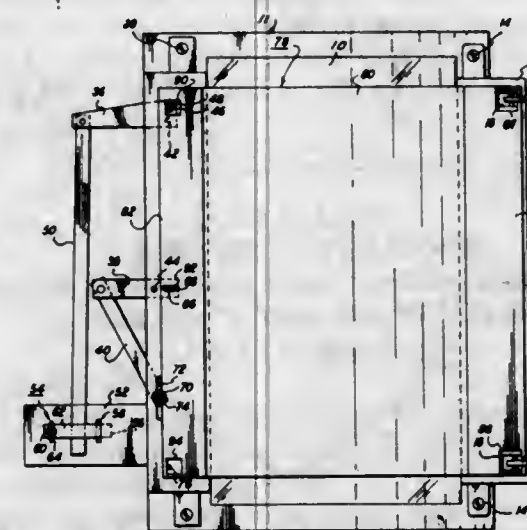
Maynard K. Beckman, Jr., Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 25, 1975, Ser. No. 616,520

Int. Cl.<sup>2</sup> G03B 27/62

U.S. Cl. 355-75

7 Claims



1. An adjustable guide for aligning a form on a platen comprising: a platen; support means extending along one side of said platen; first and second levers pivotally connected to said support about an axis generally transverse to said platen; said levers being spaced from each other in the direction in which said one side extends; a projection on each of said levers

extending upwards in a direction generally transverse to said platen; a stationary projection extending from said support means in a direction generally transverse to said platen; said stationary projection being spaced from the other said projections in the direction in which said one side extends; the projection on said first lever and the pivotal axis of said first lever being arranged that when said first lever is pivoted, its projection will translate in a direction which is generally in the same direction in which said one side extends; the projection on said second lever and the pivotal axis of said second lever being arranged that when said second lever is pivoted, its projection will translate in a direction generally transverse to the direction the projection on said first lever translates; and means, located on the side of said platen opposite said one side, being biased away from said platen in the same general direction as said second lever projection translates.

4,013,363

**VESICULAR FILM ADVANCING MODULE**

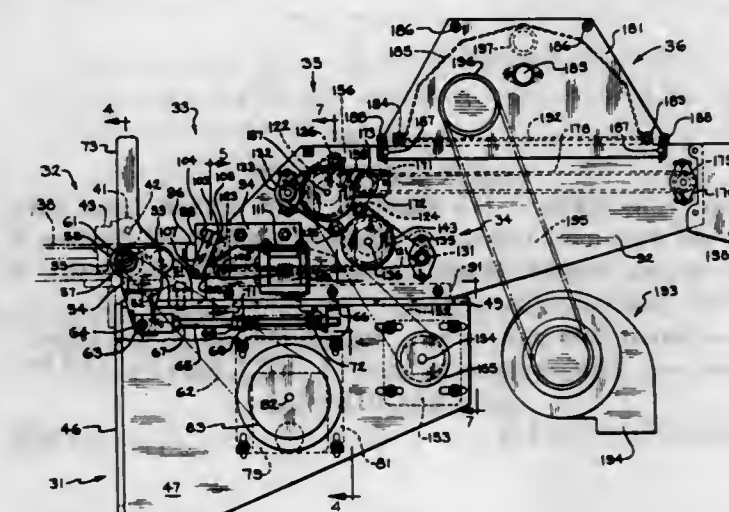
Dean H. Putnam, Toledo, Ohio, assignor to Magnagard Equipment Manufacturing Corporation, Toledo, Ohio

Filed July 21, 1975, Ser. No. 597,443

Int. Cl.<sup>2</sup> G03B 27/04

U.S. Cl. 355-97

9 Claims



1. In a microfiche duplicator having a basic processing module for exposing an unexposed segment of continuous strip of microfilm to duplicate a master microfiche and a selected one of a plurality of film advancing modules, a film advancing module for separating, developing and collecting the exposed film segment comprising a plurality of film stations for performing selected operations on the film segment wherein at least two of said film stations are positioned to define a generally S shaped, compact path of travel for the film segment and wherein a third one of said plurality of film stations and one of said film stations positioned to define the generally S shaped, compact path of travel are connected in series to a means for directing a flow of cooling air there-through.

4,013,364

**BASELINE CORRECTION IN DENSITOMETRIC  
MEASUREMENTS**

Kiyokazu Nakano; Hiroshi Yamamoto, both of Kyoto, and Yasunori Ito, Otsu, all of Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Aug. 22, 1975, Ser. No. 607,085

Claims priority, application Japan, Aug. 29, 1974, 49-99582

Int. Cl.<sup>2</sup> G01N 21/00; G01J 3/36

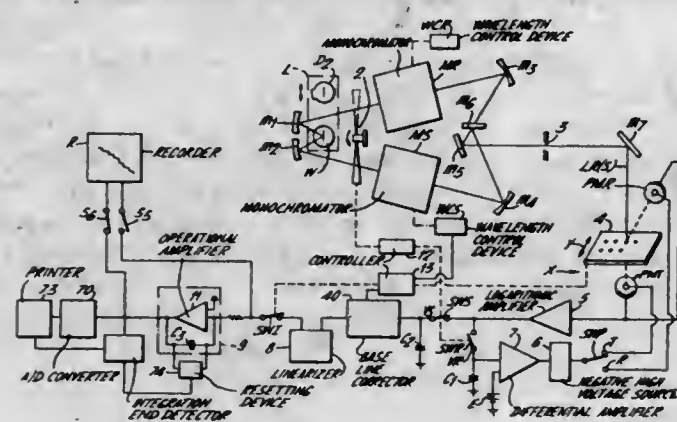
U.S. Cl. 356-73

16 Claims

1. A method of densitometric measurement of a sample spot developed on a supporting medium, comprising: scanning a predetermined area of said medium reciprocally along a single locus across said spot with light; changing the wave length of said scanning light with each stroke of reciprocation; measuring the intensity of the light from said scanned area to



produce a corresponding electrical signal; periodically sampling said signal produced at a predetermined point outside said spot along said single locus each time said wavelength is



changed; holding said sampled signal for a predetermined period of time; and correcting said signal produced during scanning of at least said spot before the next sampling by said sampled and held signal.

4,013,365

## LASER GYROSCOPE

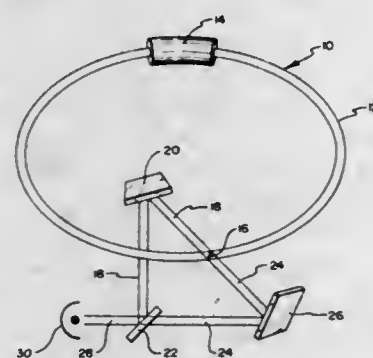
Victor Vali; Richard W. Shorthill, both of Salt Lake City, Utah; Raymond Goldstein, Arcadia, Calif., and Reuben S. Krogstad, Seattle, Wash., assignors to The University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 501,917, Aug. 29, 1974, abandoned. This application June 11, 1975, Ser. No. 585,981

Int. Cl.<sup>2</sup> G01B 9/02

U.S. Cl. 356-106 LR

1 Claim



1. An apparatus for determining rotation of an area comprising:

a single optical fiber waveguide circumscribing the area 360°;

a gain medium optically coupled with the optical fiber waveguide so as to form a laser cavity with the optical fiber waveguide;

means for initiating laser oscillation with laser radiation in a clockwise and a counterclockwise direction through the single optical fiber waveguide;

means for removing a portion of each of the clockwise and counterclockwise laser radiation from the optical fiber waveguide comprising an imperfect splice in the optical fiber waveguide, the imperfect splice deflecting a portion of each of the clockwise and counterclockwise laser radiation from the optical fiber waveguide;

means for combining the removed laser radiation; and means for detecting differences between the clockwise and counterclockwise laser radiation, the difference being a function of the rotation of the area, said means for detecting comprising a beat frequency detector.

#### 4,013,366 METHOD AND APPARATUS FOR INVESTIGATION OF SMALL DISPLACEMENTS OF A SOLID BODY BY MEANS OF COHERENT LIGHT

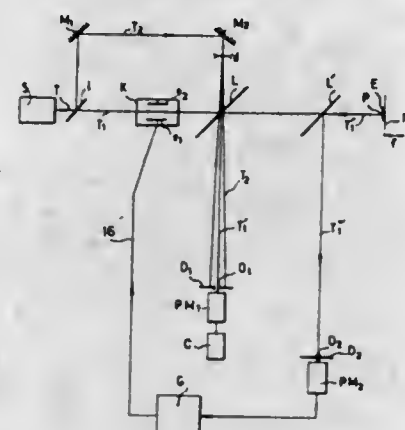
Michel Eric Philbert, Paris, France, assignor to Office National d'Etudes et de Recherches Aérospatiales (O.N.E.R.A.), Châtillon, France

Continuation-in-part of Ser. No. 467,074, May 6, 1974, abandoned. This application Aug. 20, 1975, Ser. No. 606,324 Claims priority, application France, May 23, 1973, 73.18751

Int. Cl.<sup>2</sup> G01B 9/02

U.S. Cl. 356-106 R

5 Claims



1. A method for monitoring the vibrating displacements of a light diffusing solid body comprising, producing interference between part of a laser beam diffused by said body and another part of said laser beam, and controlling the intensity of the laser beam with a part of the laser beam diffused by said solid body in order to avoid the speckled image from said solid body produced by the diffused laser beam.

4,013,367

#### APPARATUS FOR DETECTING IRREGULARITIES IN THE SURFACES OF MATERIALS

Yukio Nagao, Yamato, and Masayoshi Shimada, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

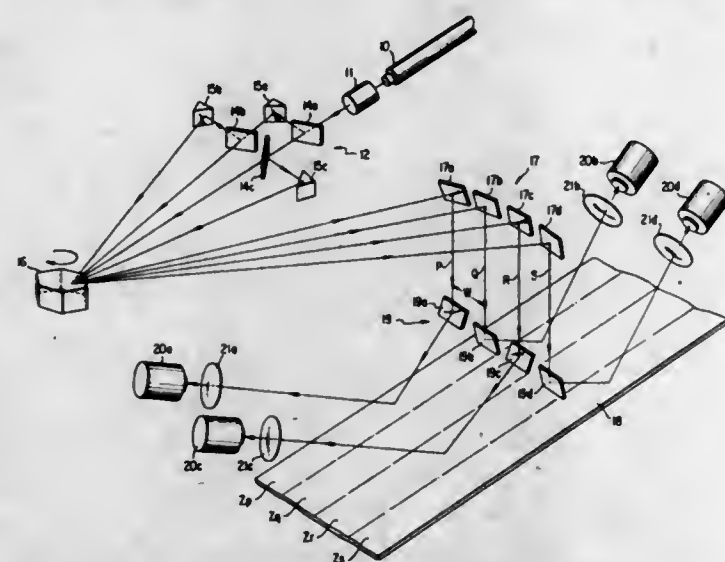
Filed May 13, 1975, Ser. No. 577,032

Claims priority, application Japan, May 13, 1974, 49-52271

Int. Cl.<sup>2</sup> G01N 21/32

U.S. Cl. 356-200

8 Claims



1. An apparatus, for detecting irregularities in the surface of a material which is in relative motion with respect to said apparatus and which has a plurality of adjacent, virtual zones defined thereon, comprising:

means including a light source for producing a light beam, dividing means for dividing said light beam from said light source into several fine light beams and for conducting said divided beams to a scanning means;

scanning means for receiving said light beams from said dividing means and for scanning said light beams substantially perpendicularly to the direction of motion of said material across scanning zones of predetermined width defined on said surface of said material by said scanning means, the scanning zones defined upon adjacent virtual zones being respectively spaced apart from one another; and

detecting means for receiving said light beams from said scanning means subsequent to its reflection from said surface of said material, said detecting means providing an indication of said surface irregularities.

4,013,368

#### SAMPLE CARTRIDGE FOR USE IN APPARATUS FOR EVALUATION OF BIOLOGICAL FLUID

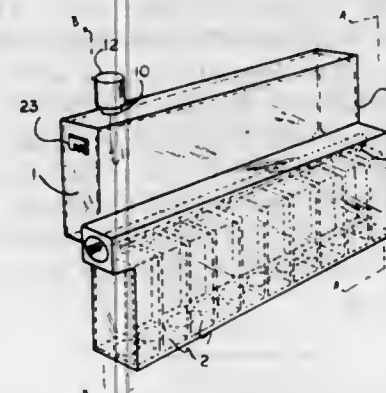
Jesse L. Acker, Rockaway, N.J., and Peter M. Meserol, E. Northport, N.Y., assignors to Akro-Medic Engineering, Inc., Denville, N.J.

Division of Ser. No. 290,654, Sept. 20, 1972, Pat. No. 3,837,745. This application Aug. 23, 1974, Ser. No. 500,166

Int. Cl.<sup>2</sup> G01N 1/10

U.S. Cl. 356-246

8 Claims



5. A self-contained cartridge of unitary construction comprising:

- a plurality of cuvettes,
- a first chamber for fluid mounted above said cuvettes,
- a second chamber mounted above said cuvettes adjacent said first chamber and substantially coextensive therewith,
- means intermediate said first chamber and said cuvettes for permitting the flow of fluid from said first chamber into said cuvettes, and,
- gas permeable means disposed intermediate said second chamber and said cuvettes to permit the gases present in said cuvettes to escape therefrom into said second chamber when the fluid passes from said first chamber into said cuvettes.

4,013,369

#### SPRAYER-WIPER DEVICE

Alice Turek, 1715 Illinois Road, Northbrook, Ill. 60062

Filed Nov. 7, 1975, Ser. No. 630,040

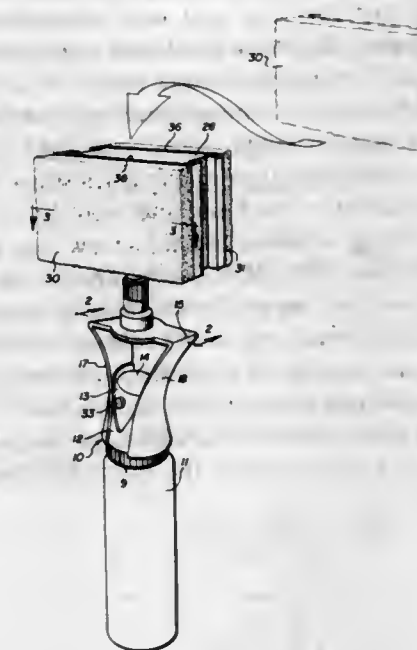
Int. Cl.<sup>2</sup> A47L 13/26

U.S. Cl. 401-139

5 Claims

1. A fluid dispensing-wiper device for contacting and subsequently cleaning and drying an object, said device comprising: a container for holding fluid; means for dispensing fluid from said container onto an object, said dispensing means being removably connected to said container; a single bracket means comprising a base and two resilient leg members depending from said base and biased toward each other; said base being spaced above said dispensing means; said resilient bracket leg members each including a lug means at the outboard end of said leg and said container

and dispensing means having a recess formed therebetween to receive said lugs whereby said lugs are positioned in said recess and said bracket is retained in a biased position in said container solely by said leg members and lug means.



4,013,370

#### FOUNTAIN TOOTH-BRUSH

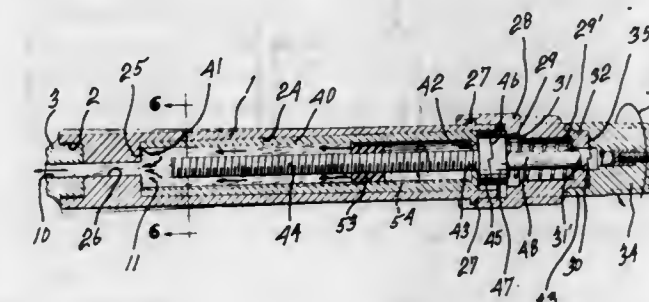
Antoine Gingras, 3705 St. Joseph Boulevard, East - Apt., Montreal, Quebec, Canada

Filed Dec. 1, 1975, Ser. No. 636,618

Int. Cl.<sup>2</sup> A46B 11/02

U.S. Cl. 401-175

5 Claims



1. A fountain type tooth-brush comprising an elongated hollow body forming a handle and open at its rear end, a tooth paste containing cartridge removably and non-rotatably located within said hollow body, a stem carried by the forward end of said body and carrying a tooth-brush head and tooth-brush bristles at the forward end thereof, said stem and tooth-brush head having a tooth paste passage opening within said tooth-brush bristles and in communication with the interior of said cartridge in said body for the supply of tooth paste from said cartridge to said brush bristles, said cartridge having a rear end wall, a piston longitudinally displaceable within said cartridge and non-rotatably mounted therein, a screw threaded within said piston, freely extending through a hole of said cartridge rear end wall and having a head secured to the end portion of said screw protruding rearwardly of said cartridge rear end wall, a cap removably secured to the rear end of said body and freely enclosing said head, a stem coaxial with said screw, extending within said cap, said cap having a rear end portion provided with a guiding hole, said stem axially displaceable and rotatable within said guiding hole of the rear end of said cap, said stem protruding rearwardly of said cap, an operating knob secured to the protruding rear end



portion of said stem, said stem having at its forward end a head located within said cap and in clutching and removable engagement with the screw head, a compression spring member disposed within said cap surrounding said stem and abutting at its rear end against the rear end wall of said cap and at its forward end against the stem head and urging the stem, stem head and screw forwardly of said body to a forward limit position in which said screw head abuts against the back of the rear end wall of said cartridge, rotation of said stem by means of said knob in one direction causing rotation of said screw through said clutched screw head and stem head in one direction, in turn causing rotation of said screw and rearward displacement of the assembly of the stem and screw to compress the spring member and move the screw head rearwardly away from said cartridge rear end wall, release of said operating knob allowing said spring member to produce forward movement of the screw and piston, such as the latter will produce pressure on the tooth paste in the cartridge ahead of the same to discharge said tooth paste to the brush bristles.

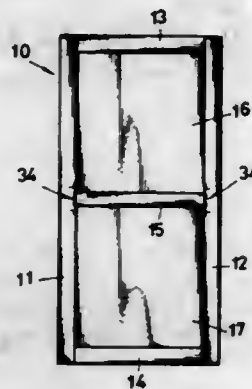
#### 4,013,371 JOINTING DEVICE

Mitsuo Nagase, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Oct. 9, 1975, Ser. No. 620,937  
Claims priority, application Japan, Oct. 11, 1974, 49-123445

Int. Cl.<sup>2</sup> F16B 7/18

U.S. Cl. 403-187

3 Claims



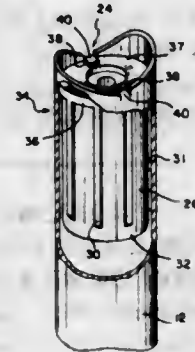
1. A T-shaped structural joint, comprising:
  - a. a horizontal tubular rail having a rectangular hollow cross-section, there being means defining a pair of elongated tapped sockets whose thread axis extends parallel to the length of said horizontal rail and said means being integral therewith at its upper and lower narrower interior surfaces;
  - b. a vertical tubular member having a rectangular hollow cross-section, there being a pair of flanges extending along opposite edges of and perpendicularly to one of the narrow sides of said vertical members, there being a pair of tapped holes in said one side of said member spaced apart by a distance greater than the vertical height of said rail, and disposed at an intermediate location along the height of said member;
  - c. a strip having a surface, which is flat throughout the extent of such strip, disposed flatwise against said one side of said member between said flanges and having apertures in registration with said tapped holes, said tubular rail engaging the opposite surface of said strip between said apertures, said strip having further apertures in registration with said tapped sockets; and
  - d. screws passing through said strip into said tapped holes and said tapped sockets.

#### 4,013,372 TUBING CONNECTION

Ralph B. Lay, and Donald L. Moore, both of Columbus, Ind., assignors to Cosco, Inc., Columbus, Ind.  
Filed June 18, 1975, Ser. No. 587,809  
Int. Cl.<sup>2</sup> F16B 12/40

U.S. Cl. 403-237

9 Claims



1. A tubing connection for an article of furniture comprising a first tube having an open end and a second tube, the open end of said first tube being arcuately recessed for mating engagement with the external surface of said second tube; a cylindrical insert for reception into the open end of said first tube and having a longitudinally extending central opening formed therein; a pair of opposed tabs on said first tube extending inwardly from the deepest portions of the arcuate recess at the open end thereof for retaining said insert within said first tube and for spacing said insert from the end of said first tube; and screw means receivable through an opening formed in said second tube and threadably receivable into the central opening of said insert to bindingly interconnect said first and second tubes.

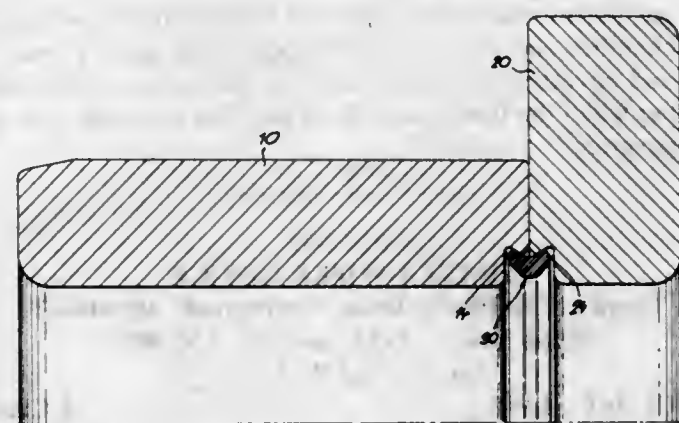
#### 4,013,373 SNAP-RING-CONNECTED COAXIAL ANNULAR MEMBERS

Horst Lamprecht, Oberwerrn, and Georg Welsch, Grafenheinfeld, both of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany  
Filed Sept. 12, 1975, Ser. No. 612,802  
Claims priority, application Germany, Sept. 13, 1974, 2443918

Int. Cl.<sup>2</sup> F16D 1/00; F16G 11/00

U.S. Cl. 403-291

10 Claims



5. In combination, a pair of coaxial annular members and an elastically deformable continuous connecting ring detachably holding said members together, said members being provided along adjoining faces thereof with confronting inner peripheral grooves bounded by tapering rims, the generatrices of each rim converging in a direction away from the respective groove bottom, said ring having an outer peripheral surface of double-frustoconical configuration defining a pair of lips diverging from a midplane at an angle equaling the angle of convergence of said rims, said lips being matingly received in

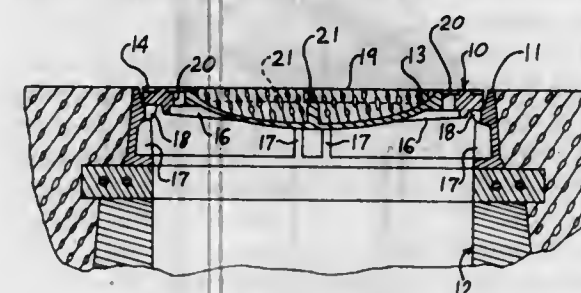
said grooves with said outer peripheral surface resting against said rim.

#### 4,013,374 COVER FOR MANHOLE STRUCTURES

Walter K. F. Weiler, Diez, and Rudolf C. Passavant, Aarbergen, both of Germany, assignors to Passavant-Werke Michelbacher Hütte, Germany  
Filed Oct. 16, 1975, Ser. No. 622,909  
Int. Cl.<sup>2</sup> E02D 29/08

U.S. Cl. 404-25

7 Claims



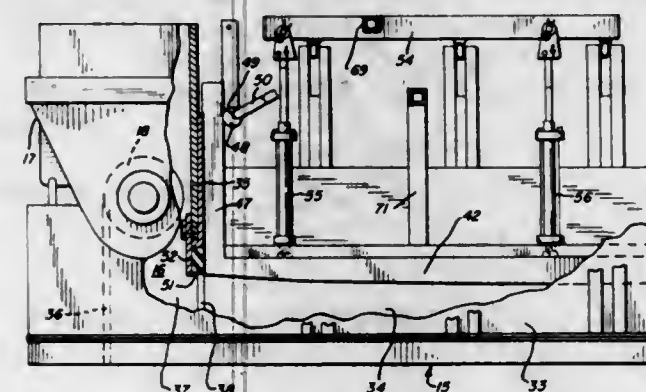
1. In a cover for manhole structures,
  - a. a metal portion constructed and arranged of high strength material providing maximum strength with a minimum of weight, and
  - b. a concrete portion carried by said metal portion with the specific gravity of said concrete portion exceeding the specific gravity of conventional concrete and being so proportioned relative to the weight of said metal portion that the combined weights of said metal portion and said concrete portion provide a manhole cover of a predetermined minimum weight.

#### 4,013,375 CURB FORMING MACHINE

Blaine Heaton, 411 Keith Ave., Crystal Lake, Ill. 60014  
Filed June 30, 1975, Ser. No. 591,458  
Int. Cl.<sup>2</sup> E01C 19/52

U.S. Cl. 404-98

7 Claims



7. In a machine for slip forming a concrete curb on the ground, including a movable carrier for travel across the ground, and a well on the carrier for delivering plastic concrete to a slip form in the rear of the well, the well having a rear wall at the front of the slip form, the improvement comprising:
  - slip form side walls spaced apart laterally with respect to the direction of carrier movement, said side walls defining the lateral surfaces of the curb and the lower edge of a side wall establishing the grade of the base of the curb, said side walls being open at the bottom to deposit concrete onto the ground;
  - a slip form top wall between the lateral walls defining the head of the curb;
  - means connected with the slip form top wall for moving the slip form top wall vertically between and with respect to the side walls to vary the vertical dimension of the formed

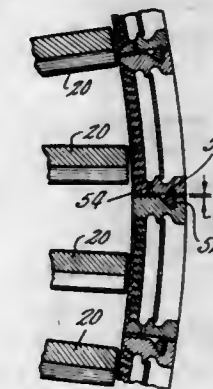
curb and establish the grade of the head of the curb, the rear wall of said well having an opening into the slip form with a vertical dimension corresponding with the maximum height of the slip form top wall with respect to the side walls; and  
a sealing plate extending upwardly from said slip form top wall adjacent the rear wall of the well to block a portion of said opening when the top wall is at a position below its maximum height.

#### 4,013,376 COOLABLE BLADE TIP SHROUD

Bernard Joseph Bisson, Winsted, and Loren Hawdon White, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.  
Filed June 2, 1975, Ser. No. 583,140  
Int. Cl.<sup>2</sup> F02C 7/18; F01D 25/12

U.S. Cl. 415-117

2 Claims



1. A shroud, which surrounds a portion of the flow path for the working medium gases in the turbine section of a gas turbine engine, comprising:
  - a plurality of arcuate segments disposed in end to end relationship wherein each arcuate segment has a plurality of lugs which interlock with corresponding lugs from the adjacent segment and wherein each pair of adjacent segments forms therebetween a substantially triangular shaped groove, the segments forming a sealing surface, having a multiplicity of cooling holes disposed therein, and including a plurality of axially adjacent chambers which extend circumferentially beneath the sealing surface;
  - a sealing member disposed within each of said triangular shaped grooves to inhibit the flow of fluid medium between the adjacent segments; and
  - baffle means, including a plurality of orifices incorporated therein, which is disposed across one side of each chamber of the arcuate segments, wherein the cooling holes of the sealing surface and orifices of the baffle means are sized and spaced to provide a substantially uniform pressure ratio across the sealing surface during operation of the engine.

#### 4,013,377 INTERMEDIATE TRANSITION ANNULUS FOR A TWO SHAFT GAS TURBINE ENGINE

David J. Amos, Nether Providence Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed Oct. 8, 1975, Ser. No. 620,608  
Int. Cl.<sup>2</sup> F01D 17/14

U.S. Cl. 415-161

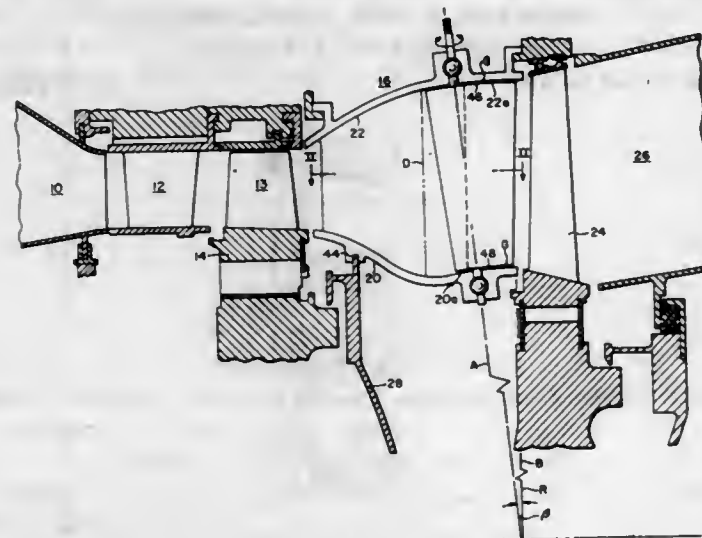
9 Claims

1. A two shaft gas turbine engine having a closely coupled fluid flow path between the compressor turbine and the power turbine through an annular duct means which comprises:
  - a plurality of individual arcuate segments comprising: radially opposed axially extending wall members, the arcuate extent of the upstream and downstream end thereof in conjunction with the radial spacing therebetween defining inlet and outlet areas respectively of said segment;



said wall members diverging radially from the inlet area to a point generally intermediate the axial extent of each said member and continuing from said point to the outlet area in a generally concentric relationship whereby the outlet area is greater than the inlet area of each said segment;

at least one vane extending radially between and interconnecting said wall members, said vane extending axially from adjacent said inlet area to beyond said generally intermediate point and having an ovate longitudinal section defined by the opposite faces of said vane diverging axially from the leading edge of said vane to generally said intermediate point and thence converging to the trailing edge of said vane within the axial extent of said segment;



said ovate shaped vane further defining a camber line from the leading edge to the trailing edge forming a progressively increasing angle with respect to the axis of said engine to effectively progressively reduce the area between adjacent vanes; and,

at least a second vane generally downstream of said one vane and extending radially to adjacent said opposed wall members and axially to adjacent said exit area whereby the increase in annular area provided by said diverging wall members is for the most part compensated for by the increase in vane width along a predetermined axial length and then by the reduction of area between adjacent vanes provided by said angular orientation of said camber line to maintain the velocity of the fluid passing through said segment generally constant from said inlet area to at least said second vane.

4,013,378

## AXIAL FLOW TURBINE EXHAUST HOOD

Josef Herzog, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 26, 1976, Ser. No. 670,876

Int. Cl.<sup>2</sup> F01D 1/02

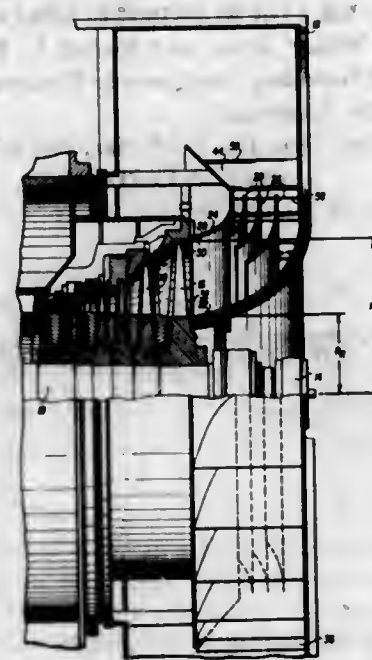
U.S. Cl. 415-209

8 Claims

1. A combined axial flow turbine and exhaust hood comprising:

- an axial flow turbine having last stage buckets adjacent the exhaust from said turbine;
- an exhaust hood including an exhaust duct having an annular opening connected to said turbine adjacent said last stage buckets, said duct having an inner wall positioned approximately at the root of said last stage buckets and an outer wall positioned approximately at the tip of said last stage buckets, said exhaust duct receiving steam in an axial direction at said annular opening and being curved to direct said steam in a radial direction;
- a plurality of first curved vanes positioned in spaced relationship in said exhaust duct between said inner and outer walls thereof for directing the steam in a radial direction at the trailing ends of said vanes;

- a guide ring surrounding said vanes adjacent the trailing ends thereof;
- a plurality of curved secondary vanes positioned in spaced relationship in said guide ring;



- said exhaust hood having a radially extending discharge opening;
- said secondary vanes being curved by varying amounts for directing steam from said first vanes toward said discharge opening.

4,013,379

## WAVE-POWERED PNEUMATIC SYSTEM FOR POWER GENERATION

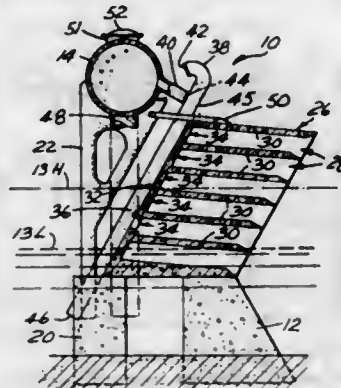
Richard D. Bolding, 2005 Stonehurst, Rialto, Calif. 92376

Filed Sept. 26, 1974, Ser. No. 509,333

Int. Cl.<sup>2</sup> F04B 35/00; F04F 11/00

U.S. Cl. 417-100

4 Claims



1. A wave-powered pneumatic system for producing compressed air to be used for energy storage or power generation, said system comprising, in combination:

- a seawall at the edge of the seashore at the point where waves just begin to break, said seawall extending parallel to the shore and having an upwardly and rearwardly inclined surface on the seaward side;
- an air-accumulating structure mounted on said seawall and having a plurality of vertically spaced collection chambers, each extending generally parallel to the line of travel of the waves, and each having an entrance opening at the seaward end into which the incoming waves pass, as they reach the said seawall, the inclined seaward face of said seawall acting to direct the waves into the entrances of the collection chambers;
- each of said collection chambers having laterally spaced side walls, vertically spaced top and bottom walls, and a rear end wall at the shoreward end of the chamber, said

collection chambers being substantially uniform in cross-sectional area from end to end, and said rear end wall being generally perpendicular to the line of travel of the wave as it moves along the collection chamber;

an exit opening through said rear end wall of each of said collection chambers, said exit opening being a relatively small proportion of the total area of the rear end wall;

a plenum chamber extending parallel to said seawall closely adjacent the shoreward side of said air-accumulating structure;

a plurality of ducts, each connected at one end to said exit opening of one of the collection chambers, and at the other end to said plenum chamber, each of said ducts also including a portion extending downwardly from its respective exit opening into the seawater to a depth of submergence sufficient to seal the conduit against loss of air under compression obtained by wave action in the collection chamber, said vertical portion of the duct allowing any water that enters the duct to drain back into the sea; and

valve means that allows air to flow in one direction only, from said duct to said plenum chamber, when the air pressure within the duct exceeds the air pressure within the plenum chamber, said valve means allowing atmospheric air to enter said duct when the pressure therein falls to subatmospheric pressure as the wave recedes;

said collection chamber receiving the solid mass of water from each wave as the wave moves toward shore and enters said entrance, said solid mass of water filling said chamber and acting as a piston to drive the air trapped in the chamber toward the rear end thereof, compressing the air and forcing it out through said duct to said plenum chamber, said rear end wall providing a barrier against which the wave dashes to expend its remaining energy before receding back into the sea, and only a small amount of water passing through said restricted exit opening into said duct, where it drains into the sea through said vertical duct portion.

4,013,380

## CONTROL SYSTEMS FOR VARIABLE CAPACITY HYDRAULIC MACHINES

Carlo Pensa, Como, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

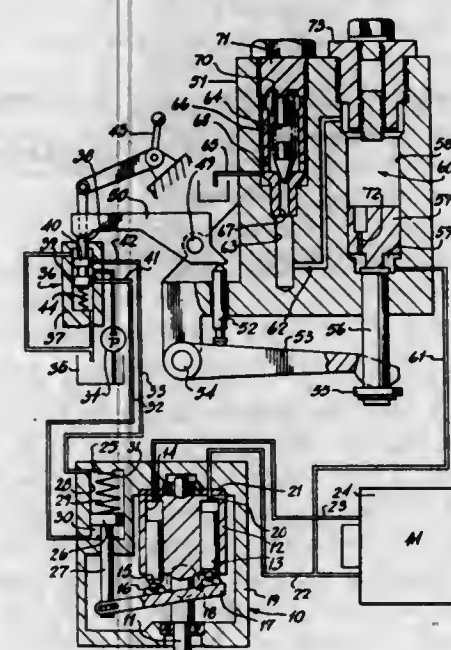
Filed Nov. 17, 1975, Ser. No. 632,734

Claims priority, application United Kingdom, Nov. 18, 1974, 49873/74

Int. Cl.<sup>2</sup> F04B 1/26

U.S. Cl. 417-218

7 Claims



1. A variable capacity hydraulic machine having a fluid outlet conduit, adjusting means for varying the capacity of

said machine including a fluid pressure source, a servo motor and a valve means to control said servo motor, said valve means connected to said fluid pressure source to receive pressurized fluid therefrom, manual control means operable upon said valve means to cause flow to or from said servo motor, and a control comprising override means operable upon said valve means to cause movement thereof to reduce the capacity of said machine upon fluid pressure in said conduit attaining a predetermined level, actuating means operable upon said override means and including a piston slidable within a cylinder and defining two chambers therein connected by a restrictive passage, one of said chambers being subjected to the pressure of fluid in said outlet conduit and the other of said chambers being connected to a pressure regulator, said pressure regulator operable upon attainment of said predetermined pressure in said other chamber to vent said other chamber and cause said piston to move relative to said cylinder to actuate said override means.

4,013,381

## PUMP CONTROL ASSEMBLY HAVING ADJUSTABLE BIASING MEANS

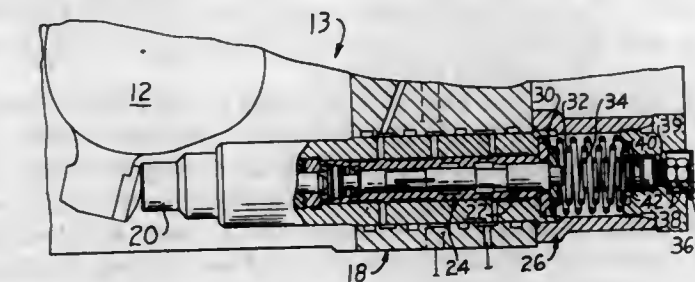
Allyn J. Hein, Camdenton, Mo.; William D. McMillan, Joliet, and Walter Z. Ruseff, New Lenox, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 9, 1976, Ser. No. 656,235

Int. Cl.<sup>2</sup> F04B 1/26

U.S. Cl. 417-222

9 Claims



1. In a pump control assembly for moving a swash plate of a variable displacement pump between maximum and minimum discharge rate positions, said pump having inlet and outlet means, said control assembly having a first means having a movable first actuating means for biasing the swash plate toward one of the maximum or minimum discharge rate positions and a second means having a movable second actuating means for biasing the swash plate toward the other discharge position, said second means having a spool and a sleeve movable within a housing and communicable with a pump discharge pressure signal for biasing the second actuating means, a first biasing means for biasing the sleeve in first direction, and a second biasing means for biasing the spool in the first direction, the improvement comprising:

- third biasing means positioned in the pathway of the movable spool for biasing the spool in the first direction, said third biasing means including:
- a guide element connected to one of the spools or the position changing means and extending into the third biasing means in the installed position;
- a flange extending from the guide element and into the third biasing means in the installed position for connecting the third biasing means to one of said position changing means or spool; and
- means for controllably changing the biasing position of the third biasing means in the pathway of the spool.



4,013,382

## WAVE POWER APPARATUS SUPPORTED AND OPERATED BY FLOATS IN WATER

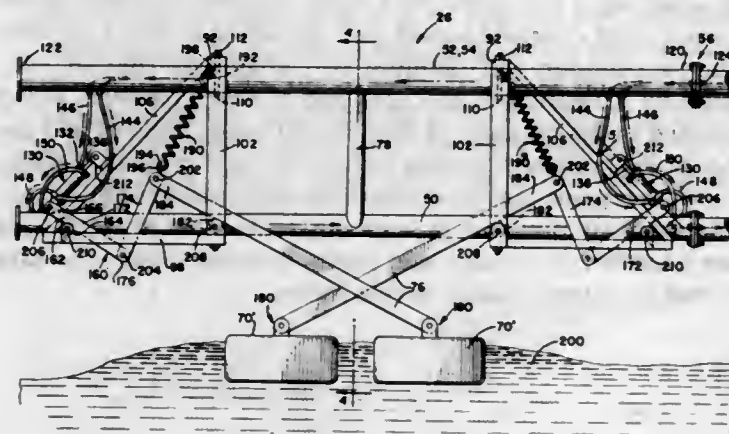
Richard E. Diggs, S. 12A Road, P.O. Box 776, Carthage, Mo. 64836

Filed Oct. 14, 1975, Ser. No. 622,256

Int. Cl.<sup>2</sup> F04B 17/00

U.S. Cl. 417-332

20 Claims



1. An apparatus for converting the movement of waves in a body of water into power, comprising:

a power station which generates power as a result of fluid flowing therethrough;

a plurality of frame sections each including a plurality of pipes connected to pipes of adjacent frame sections and to said power station for conducting fluid to and from said power station, a double-acting pump attached to said frame section and fluidly connected to said pipes so that actuation of said double-acting pump causes fluid to be moved through said pipes, and linkage means pivotally mounted on said frame section and connected to said double-acting pump in a manner such that movement of said linkage actuates said double-acting pump;

a float located in the water, said float undergoing upward and downward movement in accordance with the movement of waves in the water;

a connecting rod pivotally mounted on said frame section and attached to said float for connecting said float to said frame section, said connecting rod being pivotally connected to said linkage so that said float upward and downward movement is transmitted to said double-acting pump via said connecting rod and said linkage through a mechanical advantage to actuate said double-acting pump; and

spring means connected to said connecting rod and to said frame so that said frame section is supported by said float and movement of said float in one direction deforms said spring to bias same in a manner such that during movement of said float in an opposite direction, movement of said connecting rod is assisted by said spring so that movement of said linkage by said connecting rod is assisted by said spring whereby said spring assists said connecting rod in actuating said pump via said linkage during movement of said float in said opposite vertical direction.

4,013,383

## VERTICAL SHAFT IMPELLER PUMP APPARATUS

Clinton Rule, Beverly Farms, Mass., assignor to Rule Industries, Inc., Gloucester, Mass.

Continuation of Ser. No. 420,933, Dec. 3, 1973, Pat. No. 3,861,831. This application Nov. 29, 1974, Ser. No. 528,029. The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> F04B 17/00, 39/06, 35/04

U.S. Cl. 417-366

5 Claims

1. A vertical shaft impeller pump comprising:

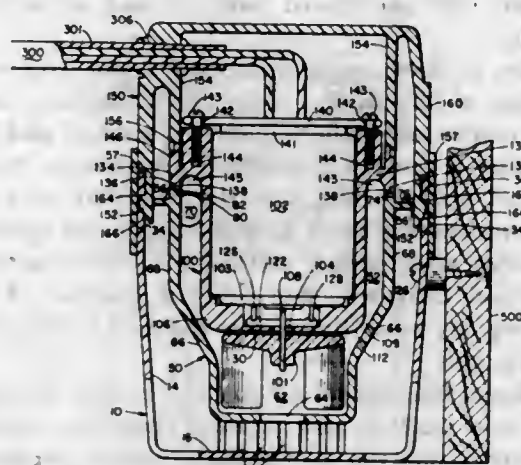
A. an external enclosure comprising intake means adapted to conduct fluid therethrough;

B. a separable, generally cup-shaped housing disposed

within and spaced apart from said external enclosure and comprising

i. inlet means adapted to conduct fluid from within said external enclosure into said housing, said inlet means being located at the lower portion of said housing, and

ii. discharge means adapted to conduct fluid from said housing to the exterior of the pump;



C. a separable fluid-tight casing disposed within and in spaced relationship with said housing, said spaced relationship defining an impeller chamber below said casing;

D. a prime mover disposed within said casing, said prime mover comprising a drive shaft extending in substantially fluid-tight relationship through the bottom of said casing and into said impeller chamber; and

E. an impeller disposed within said impeller chamber and affixed to said drive shaft.

4,013,384

## MAGNETICALLY DRIVEN CENTRIFUGAL PUMP AND MEANS PROVIDING COOLING FLUID FLOW

Kunihiro Oikawa, Niiza, Japan, assignor to Iwaki Co., Ltd., Tokyo, Japan

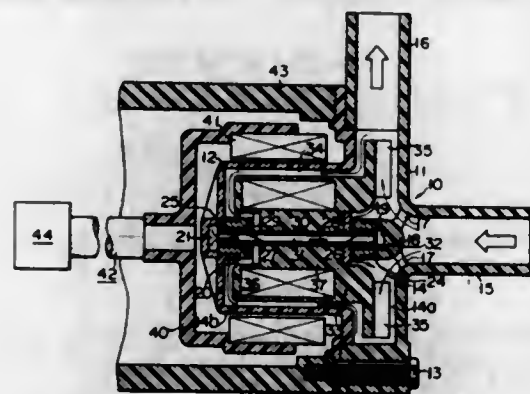
Filed Mar. 7, 1975, Ser. No. 556,325

Claims priority, application Japan, July 18, 1974, 49-85377[U]; July 18, 1974, 49-85378[U]

Int. Cl.<sup>2</sup> F04B 35/04, 39/06; F01D 25/12

U.S. Cl. 417-368

7 Claims



1. A magnetically driven centrifugal pump comprising a casing defining a chamber therein and providing inlet and outlet means, an impeller rotatably arranged in the chamber and provided with a first magnet, an actuating member disposed outside of the casing so as to rotate concentrically with the impeller and provided with a second magnet, drive means for driving the actuating member to rotate the impeller by a magnetic force generated across the first and second magnets, first and second ring-shaped bearing members fixedly mounted on the inner wall of the casing behind and in front of the impeller, respectively, and a supporting shaft having a longitudinal hole extending therethrough and rotatably supported at its rear and front end portions on the inner periph-

4,013,386

## POSITIVE DISPLACEMENT METERING PUMP

James V. Hardman, N. Caldwell, and Norman S. Wolfman, Cranford, both of N.J., assignors to Hardman Incorporated, Belleville, N.J.

Filed Sept. 8, 1975, Ser. No. 611,507

Int. Cl.<sup>2</sup> F04B 7/04

U.S. Cl. 417-489

14 Claims

eral walls of (by) said first and second bearing members, respectively, said impeller being fixed to the supporting shaft at a portion behind the front end portion thereof, said first and second bearing members respectively having first and second axial grooves in their inner peripheral walls (bearing surfaces), said first (and second) axial grooves communicating with the rear terminal opening (openings) of said longitudinal hole, (respectively,) said supporting shaft having at its front terminal surface at least one pumping groove which extends from the inner peripheral wall of the shaft to the outer peripheral wall thereof and has an opening opened at said outer peripheral wall, (connects the longitudinal hole of the shaft to the second axial groove of the second bearing member) the outer peripheral wall of the front end portion of the shaft being surrounded with the inner peripheral wall of the second bearing member so that, upon rotation of the shaft, the opening of the pumping groove intermittently communicates with the second axial grooves and means providing fluid communication between the outlet of the centrifugal pump and the first axial grooves.

4,013,385

## DEEP WELL PUMP SYSTEM

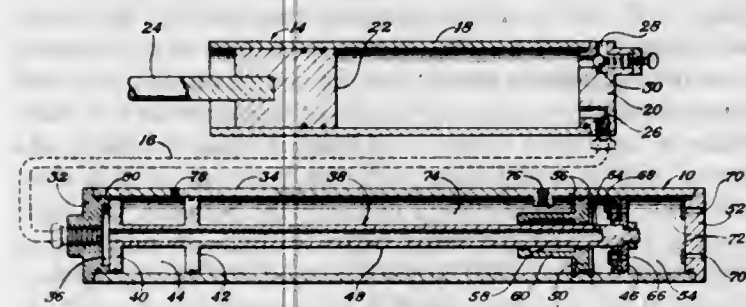
Fred M. Peterson, 3232 Shawnee Trail, Fort Worth, Tex. 76135

Filed June 6, 1975, Ser. No. 584,484

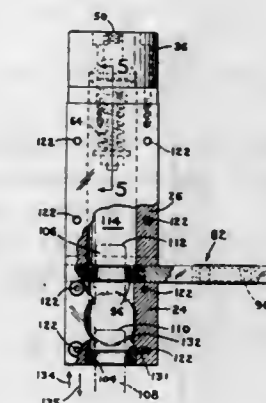
Int. Cl.<sup>2</sup> F04B 17/00

U.S. Cl. 417-377

2 Claims



1. In a surface pressure activated deep well pump system, a sub-surface pump unit and a surface power unit, a fluid delivery passage between the pump unit and the power unit, the depth of the pump unit defining a predetermined fluid column within the fluid delivery passage upward from the pump unit, said pump unit comprising a housing including an activating chamber, a discharge port communicating the activating chamber with the fluid delivery passage, a charge piston defining a wall of said activating chamber, said charge piston being slideably movable between a full discharge position and a full charge position, a valve intake through the housing, a working chamber within said housing remote from the activating chamber and in communication with the intake, a working piston slideably disposed within said working chamber for a selective inward drawing of fluid through said intake and a selective discharge of fluid through said discharge port, means interconnecting the charge piston and the working piston for synchronized movement, a collapsible volume chamber resiliently retaining said charge piston in the full discharge position, said collapsible volume chamber developing a resistance to movement approximately equal to the pressure of the fluid column plus a predetermined fluid discharge pressure, said power unit being operable to pressurize said fluid column above the predetermined fluid discharge pressure to collapse the collapsible volume chamber and effect a fluid trapping movement of the working piston, said power unit being subsequently operable to reduce pressure on the fluid column below the predetermined fluid discharge pressure to allow an expansion of the collapsible volume chamber and a discharge of fluid trapped by the working piston; a sealing chamber containing a liquid barrier disposed intermediate a pair of seal means at the respective ends of said collapsible volume chamber at which there is relative reciprocal motion for preventing entry of abrasive materials into said collapsible volume chamber.



1. A metering pump for pumping quantities of a flowable liquid composition, comprising in combination:

a pump body including a bore for receiving said composition to be dispensed;

feed inlet means for providing said flowable composition to said bore;

a dispensing outlet means including check valve means for discharging said composition from said pump;

a pressure chamber being defined intermediate said feed inlet and dispensing outlet means; said chamber having an inlet, and an outlet communicating with said dispensing outlet through said check valve means;

a piston mounted for axial reciprocation in said bore between a first position whereat said piston is withdrawn from said pressure chamber inlet and whereat said feed inlet may communicate with said pressure chamber inlet to enable feed of said composition to said pressure chamber inlet, and a second position whereat said piston passes at least partially into said pressure chamber inlet;

said pressure chamber inlet being bounded by first sealing means including an annular sealing surface which converges in the direction of said pressure chamber for substantially its entire extension along the axis of said bore to a diameter less than that of said piston, whereby said surface may slideably engage and seal with said piston upon said piston entering said pressure chamber; said sealing surface being elastically dilatable away from the axis of said bore to maintain the seal about said piston during entry and withdrawal from said pressure chamber and to compensate for wear; and at least one other surface of said sealing means being accessible to the interior of said pressure chamber, and elastically coupled to the backside of said sealing surface, whereby the increasing pressure developed by continued axial movement of said piston into said pressure chamber, acting through said accessible surface, increases sealing force between said sealing surface and piston;

and wherein said piston comprises a cylindrically shaped rod of generally uniform cross-section; the diameter of said rod being substantially less than that of said bore, to provide substantial clearance between said piston and the internal wall of said bore.



4,013,387

## OIL WELL PUMP

Lonnie L. Gage, Rte. 3, Walters, Okla. 73572

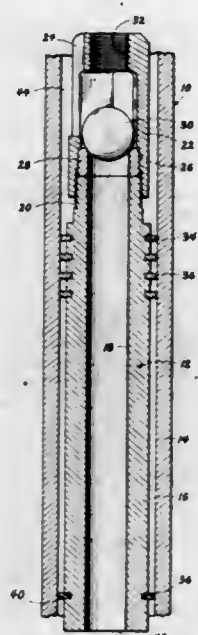
Continuation of Ser. No. 264,786, June 21, 1972, abandoned.

This application Jan. 2, 1974, Ser. No. 429,546

Int. Cl.<sup>2</sup> F04B 21/04

U.S. Cl. 417—554

5 Claims



1. A subsurface well pump comprising a first elongated stationary tubular member in communication with the well fluid reservoir, a second elongated tubular member in communication with the well fluid and concentrically arranged with respect to the stationary tubular member and reciprocal with respect thereto, valve means carried by one of said tubular members to provide alternate open and closed positions for the pump during operation thereof, and piston ring means provided on the outer periphery of one of said tubular members and engagable with the inner periphery of the other of said tubular members for precluding bypassing of the well fluid between the tubular members during operation of the pump, said piston ring means comprising at least one annular groove provided around the outer periphery of said one tubular member, at least one relatively thin metallic piston ring disposed in said groove, said ring having an internal bore concentric with the outer circumference thereof and being constantly urged in an outwardly radial direction for sealing engagement with the inner periphery of the said other tubular member, and wherein a slight clearance is provided between the internal bore of said piston ring and the bottom of each annular groove, a portion of said well fluid being trapped in said clearance to facilitate maintaining of said ring concentric with said groove and increase the sealing engagement of the ring and said other tubular member.

4,013,388

## SUPPORT MEANS FOR FLOATING ROTARY RING MEMBER

Paul E. Stratman, Minneapolis, Minn., assignor to Safe Way Hydraulics, Inc., Minneapolis, Minn.

Filed Oct. 6, 1975, Ser. No. 619,563

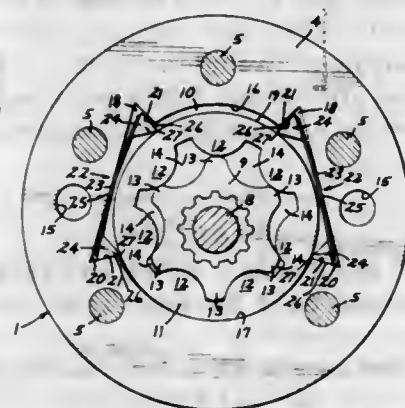
Int. Cl.<sup>2</sup> F04C 1/06

U.S. Cl. 418—108

2 Claims

1. A rotary fluid displacement device comprising a housing defining a rotor chamber having a peripheral wall defining a pair of diametrically opposed arcuate wall surfaces and a pair of circumferentially spaced radially inwardly opening recesses between said arcuate wall surfaces, said recesses each having a radially inwardly facing surface portion and opposite end surfaces angularly displaced from the inwardly facing surface portion thereof and extending generally radially inwardly

toward said arcuate surfaces; rotor means in said chamber having a cylindrical outer surface, said arcuate wall surfaces having a diameter greater than that of the outer cylindrical wall surface of said rotor means to provide greater than normal running clearance between said arcuate wall surfaces and said rotor means; characterized by a pair of mounting members each disposed in a different one of said recesses and each including an elongated body portion of flexible resilient material and a pair of generally radially inwardly projecting bearing elements secured to opposite ends of the body portion; one of said portions of each recess and its respective mounting member being longitudinally flat and the other thereof being curved so that each body portion engages its respective radi-



ally inwardly facing surface portion intermediate the ends of each thereof; said bearing elements comprising triangular blocks having radially inner edges for sliding engagement with circumferentially spaced portions of the cylindrical outer surface of said rotor means; said bearing elements being of a material that is compatible with the material of said rotor means, whereby good sliding engagement between said radially inner edges and said rotor means is obtained; said bearing elements being yieldingly urged into said sliding engagement with said outer cylindrical surface by engagement of said body portions with said inwardly facing recess surfaces, said bearing elements having flat outer end surfaces arranged for sliding engagement with the end surface of their respective recesses.

4,013,389

## RETREAD MOLD INCLUDING MATRIX BIASING MEANS

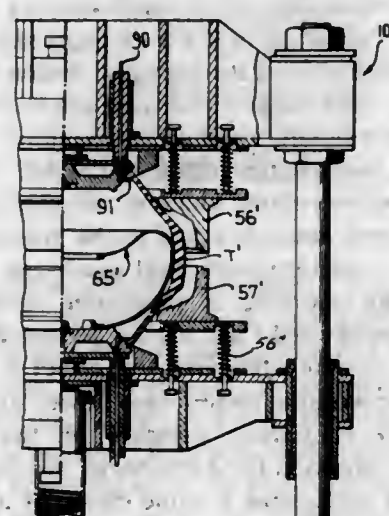
Kenneth T. MacMillan, 4992 Wesleyan Woods Drive, Macon, Ga. 31204

Division of Ser. No. 391,816, Aug. 27, 1973, Pat. No. 3,997,284. This application Dec. 4, 1975, Ser. No. 637,690

Int. Cl.<sup>2</sup> B29H 5/04

U.S. Cl. 425—21

4 Claims



1. A retread mold comprising a pair of relatively movable platens, means for imparting relative motion to said platens to move the same between a first spaced position and a second more adjacent position, a pair of relatively movable bead

aligner wheels, a first of said bead aligner wheels being carried by a first of said pair of platens, a second of said bead aligner wheels being carried by a second of said pair of platens, means for imparting relative motion to said bead aligner wheels to move the same between a first spaced position at which said platens are in their first position and a second more adjacent position at which said platens are in their second position, first and second matrices movably carried by said first and second platens, respectively, said matrices defining an annular curing chamber in the second position of said platens, said bead aligner wheels being in axial alignment and being disposed radially inboard of said matrices, first and second biasing means between each first platen and first matrix and each second platen and second matrix, respectively, for biasingly urging the first and second matrices toward each other though in axially spaced relationship in the first position of said platens, said spaced relationship being reducible in opposition to the forces of said first and second biasing means upon movement of said platens to the second position thereof thereby defining said annular chamber, an annular bladder having first and second marginal edge portions adapted to rest upon said first and second bead aligner wheels, respectively, said annular bladder being adapted for insertion into a tire adapted to be cured in said annular chamber, first and second mechanical means for gripping first and second beads of a tire to said first and second bead aligner wheels, respectively, at least when said platens and bead aligner wheels are in their first positions whereby the tire is radially foreshortened, and means for controlling the motion imparting means of said platens to move the same to their second position to form said annular chamber prior to the movement of said bead aligner wheels from their first position to their second position whereby the radially foreshortened tire is returned to its normal condition within said annular chamber.

4,013,390

## VULCANIZING MOLD FOR PNEUMATIC VEHICLE TIRES

Heinz J. Moeller, Apeln, and Heinz Jagau, Berenbostel, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

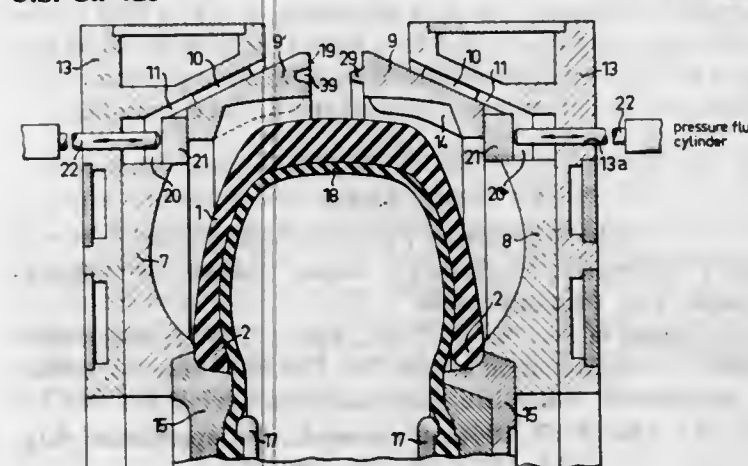
Filed Jan. 19, 1976, Ser. No. 650,075

Claims priority, application Germany, Jan. 21, 1975, 2502185

Int. Cl.<sup>2</sup> B29H 5/08

U.S. Cl. 425—47

6 Claims



1. A vulcanizing mold for pneumatic vehicle tires, which includes in combination: a first mold ring, a second mold ring arranged opposite said first mold ring, said mold rings being operable to receive therebetween a raw tire to be molded and to mold the side walls thereof, said first and second mold rings being selectively movable relative toward and away from each other, a first and a second rigid pressure ring respectively slidably surrounding said first and second mold rings and being guidingly engaged thereby, a first set of segments associated with and engageable by first pressure ring and distributed over the circumference of said first mold ring, a second set of segments associated with and engageable by said second

pressure ring and distributed over said second mold ring, power operable means respectively associated with said first and second mold rings and operable through the intervention of said pressure rings to move said sets of segments toward each other in the axial direction of said pressure rings, and combined holding and guiding ring means respectively surrounding said first and second sets of segments and movable toward each other for simultaneously guiding the respective pertaining segments in common in the axial direction of said pressure ring means and in a direction transverse to the axial direction of said pressure ring means for molding the tread surface of a raw tire to be molded in said mold.

4,013,391

## MIXING APPARATUS COMBINED WITH A MOLDING TOOL

Heinrich Boden, Opladen, and Ulrich Knipp, Schildgen-Nittum, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

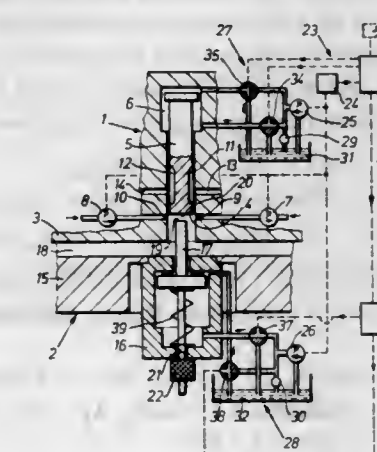
Filed Mar. 14, 1975, Ser. No. 558,515

Claims priority, application Germany, Mar. 20, 1974, 2413337

Int. Cl.<sup>2</sup> B29D 27/00

U.S. Cl. 425—145

16 Claims



1. A mixing apparatus combined with a molding tool for filling a mold cavity with a foamable reaction mixture of chemical components, the mixing apparatus comprising a mixing chamber into which injection apertures open and in which an ejector piston is displaceable, and from which an outlet aperture of the mixing chamber opens into the mold cavity, characterized in that a displacement piston adapted to move into the mixing chamber is arranged in that wall of the molding tool which faces the outlet aperture of the mixing chamber, the diameter of said displacement piston being smaller than the diameter of the mixing chamber.

4,013,392

## INJECTION MOULDING MACHINES

Samuel Charles Henry Smith, Surbiton, England, assignor to G.K.N. Windsor Limited, Surrey, England

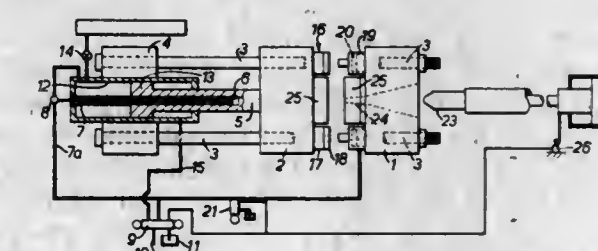
Filed May 3, 1974, Ser. No. 466,836

Claims priority, application United Kingdom, May 8, 1973, 21992/73

Int. Cl.<sup>2</sup> B29C 3/06; B29F 1/06

U.S. Cl. 425—157

3 Claims



1. An injection moulding machine comprising: a first platen carrying a first mould tool;



a second platen carrying a second mould tool; means associated with the first platen for moving the first platen towards the second platen to bring the first mould tool into engagement with the second mould tool, said moving means comprising a first piston and cylinder assembly having a first effective area and a second cylinder and piston assembly having a second effective area, greater than said first effective area, the cylinder of said first cylinder and piston assembly being fast with the piston of said second cylinder and piston assembly and the piston of said first cylinder and piston assembly being fast with the cylinder of said second cylinder and piston assembly;

stop means mounted in the path of said first platen and comprising cylinder and piston means placeable in a first condition to define a limit to the relative approach movement of said mould tools and in a second condition to permit said mould tools to move into engagement, said stop means having a third effective area which is smaller than said second effective area and greater than first effective area; and

control means connected to said cause fluid to be supplied to said first cylinder and piston assembly and to said cylinder and piston means of said stop means to move said mould tools to their limited position, to subsequently cause material to be injected between said mould tools, and to thereafter cause fluid to be supplied to said second cylinder and piston assembly and released from the cylinder of said stop means to move said mould tools into engagement.

4,013,393

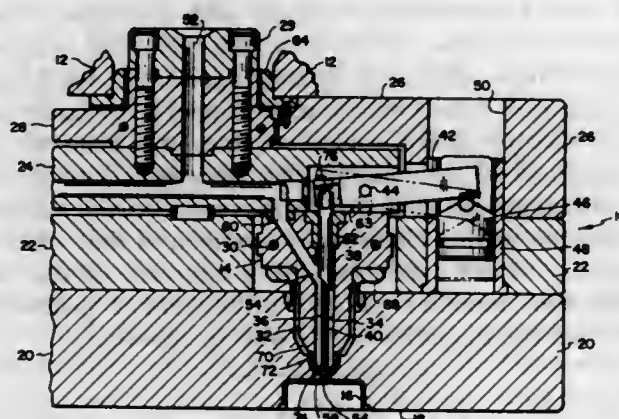
**VALVE-GATED INJECTION MOLDING MECHANISM**  
Jobst Ulrich Gellert, 11 Newton Road, Brampton, Ontario, Canada

Filed Feb. 4, 1976, Ser. No. 655,057

Claims priority, application Canada, Apr. 10, 1975, 224366  
Int. Cl.<sup>2</sup> B29F 1/05

U.S. Cl. 425-245 R

3 Claims



1. In an injection molding valve-gated mechanism having a vertical valve pin which reciprocates in a passage bore in a heater located in a mold to control flow of molten plastic from a molding machine to a cavity, the heater having a lower nozzle portion which is separated from the surrounding mold by an air space and through which the valve pin projects to provide a valve in a gate to the cavity, the valve pin being reciprocated by an air operated piston through a pivoted rocker arm having first and second ends, the improvement wherein the valve pin has a linear peak to provide a first bearing ridge extending transversely to the longitudinal axis of the rocker and has an upper end portion with flat opposite sides which is matingly received in a channel in the underside of the first end of the rocker arm to prevent rotation of the valve pin relative to the rocker arm during use, a first planar bearing surface on the first end of the rocker that cooperates with said first bearing ridge, the piston has a linear peak portion to provide a second bearing ridge extending transversely to the longitudinal axis of the rocker which extends between a

pair of upwardly projecting side portions of said piston to receive parallel surfaces of the periphery of the second end of the rocker arm in bearing contact thereon, a second planar bearing surface on the second end of said rocker that cooperates with said second bearing ridge, the side portions preventing rotation of the piston relative to the rocker arm during use.

4,013,394

**HOT ISOSTATIC PRESS SYSTEM**

Donald E. Witkin, and Arnold G. Bowles, both of Warren, Pa., assignors to National Forge Company, Irvine, Pa.

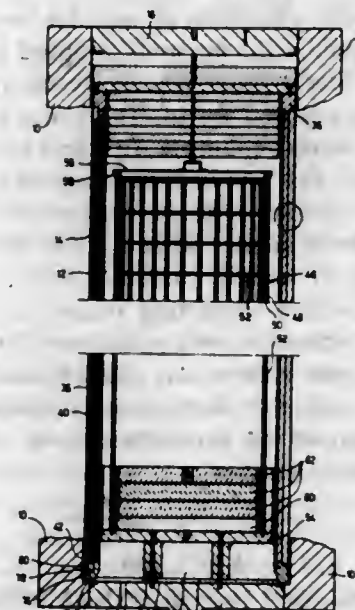
Filed Aug. 18, 1975, Ser. No. 605,416

Claims priority, application Japan, Aug. 19, 1974, 49-94876

Int. Cl.<sup>2</sup> B29C 3/00; B22F 3/00

U.S. Cl. 425-405 H

19 Claims



1. A hot isostatic press system comprising a substantially cylindrical vessel, a top cover assembly for closing a top end of the vessel, a bottom cover assembly for closing a bottom end of the vessel, a heat insulating sheath positioned within said vessel defining a furnace chamber, a heating element for heating said chamber, a plurality of elongated tubes circumferentially spaced in the heat insulating sheath, a first end of each tube being connected to a source of high pressure gas, and a second end of each tube opening to a top portion of said sheath and in communication with the furnace chamber.

4,013,395

**AERODYNAMIC FUEL COMBUSTOR**

Alex F. Wormser, Marblehead, Mass., assignor to Wingaersheek, Inc., Peabody, Mass.

Continuation of Ser. No. 142,402, May 11, 1971, abandoned, which is a continuation of Ser. No. 728,933, May 14, 1968, abandoned, which is a continuation-in-part of Ser. No.

535,215, March 17, 1966, abandoned. This application Aug. 23, 1973, Ser. No. 390,792

Int. Cl.<sup>2</sup> F23D 13/30

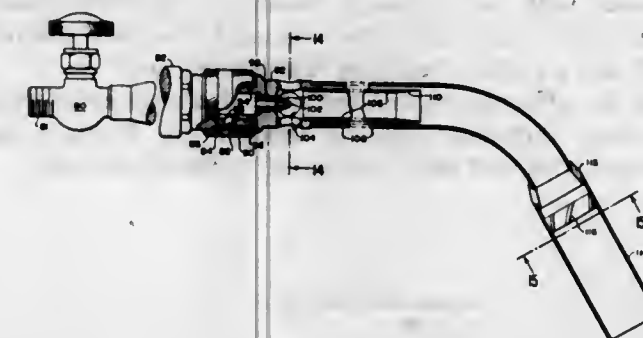
U.S. Cl. 431-9

27 Claims

1. A fuel burner which comprises:

- a mixing chamber,
- said mixing chamber including means for introduction therein of combustible material and combustion-supporting gas material and for mixture of the same therein to produce a combustible mixture, and including a downstream mixing chamber outlet,
- a combustion chamber,
- said combustion chamber including a combustion chamber inlet and a combustion chamber outlet, and
- a flameholder,

said flameholder being positioned between said mixing chamber outlet and said combustion chamber inlet and including a hub, a plurality of vanes extending outwardly from said hub, and enclosure means for cooperation with said vanes in defining a corresponding plurality of separated passages through said flameholder, said vanes including mixture guidance surfaces at an angle to the direction of net fluid flow through said flameholder from said mixing chamber to said combustion chamber, to produce a whirling motion in said mixture,



said vanes including also downstream end bluff body means for producing eddying of said mixture thereat, said eddying being of amount effective, in conjunction with said whirling motion, to hold separate flames at respective separate said vanes, thus producing a visible blue whirling flame pattern, said combustion chamber having an inner surface for confining and guiding burning mixture and efficient delivery, for then doing work, of hot gas through said combustion chamber outlet, and said combustion chamber outlet being open.

4,013,396

**FUEL AEROSOLIZATION APPARATUS AND METHOD**

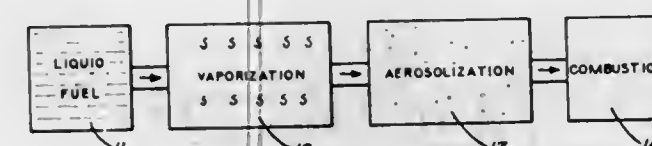
William L. Tenney, Crystal Bay, Minn. 55323

Filed Aug. 25, 1975, Ser. No. 607,716

Int. Cl.<sup>2</sup> F23D 11/44

U.S. Cl. 431-11

41 Claims



1. A method of burning combustible fuel comprising: providing a supply of liquid fuel, vaporizing the liquid fuel to change the fuel from a liquid phase to a vapor phase, condensing the fuel from the vapor phase to aerosol fuel by rapid mixing of air with the vapor phase fuel to form aerosol fuel particles, the majority of said aerosol fuel particles having a particle size of less than 1 micron in diameter, and burning the aerosol fuel particles in air.

4,013,397

**COMBUSTION APPARATUS**

Fernando M. Neugart, 32-21 37th St., Astoria, N.Y. 11102

Filed Dec. 5, 1975, Ser. No. 637,872

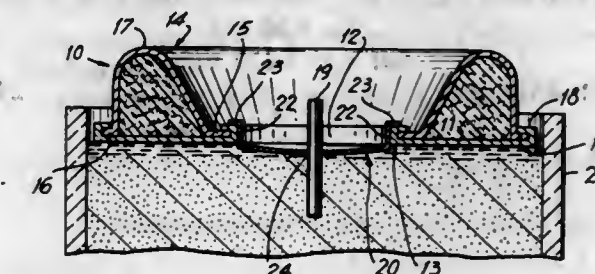
Int. Cl.<sup>2</sup> F23D 3/16, 3/24

U.S. Cl. 431-291

6 Claims

1. A combustion apparatus for use with a fuel such as a low temperature, meltable, solid fuel, comprising in combination, a conductor plate formed of metal and having a high thermal conductivity factor, said plate including a central aperture extending transversely therethrough, said plate including a substantially flat bottom portion, an outer perimeter portion, and an integral heat collector rim extending upwardly from

the upper surface of said plate surrounding said aperture, wick means extending through said aperture and including an upper end in adjacent proximate open spaced relation to said heat collector rim and said plate bottom and a lower end disposed beneath said bottom surface of said plate, wick holder means mounted in said aperture of said conductor plate for holding said wick means, and a centrally apertured cover plate mem-



ber, means securing said cover plate member to said conductor plate in overlying relation to the upper surface of said conductor plate with the aperture of said cover plate surrounding said rim, portions of the under surface of said cover plate being spaced from the upper surface of said conductor plate, thereby to form a closed hollow insulating compartment between said plates.

4,013,398

**FIREPLACE LIGHTER**

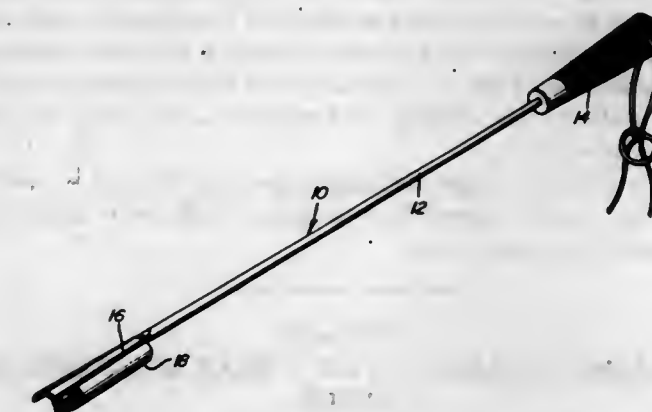
Henry E. Hendrix, 3404 S. 28th St., Fort Smith, Ark. 72901

Filed Aug. 11, 1975, Ser. No. 603,335

Int. Cl.<sup>2</sup> F23Q 2/00, 21/00

U.S. Cl. 431-344

3 Claims



1. An extension-type lighter including an elongated generally longitudinally straight shank, means on one end portion of said shank defining a handgrip, support means on the other end portion of said shank including a generally cylindrical sleeve member open at its opposite ends, disposed along said shank and extending along said shank with one end of said sleeve member opening endwise outwardly of said other end portion of said shank and defining a socket in which to removably telescopically receive a cigarette lighter, said sleeve member including a full length longitudinal slot formed therein opening through the opposite ends of said sleeve member, said sleeve member being constructed of resilient material and at least slightly expandable, the side of said sleeve member remote from said slot extending along and being secured to said other end portion of said shank, a cigarette lighter having a generally cylindrical body including ignition and fuel outlet means at one end thereof, the other end of said body being removably telescoped into and clamped within said one end of said sleeve member with said ignition and fuel outlet means disposed outwardly of said one end of said sleeve member, said other end portion of said shank including an elongated extension projecting endwise outwardly of said one end of said sleeve member and beyond said ignition and fuel outlet means.



4,013,399

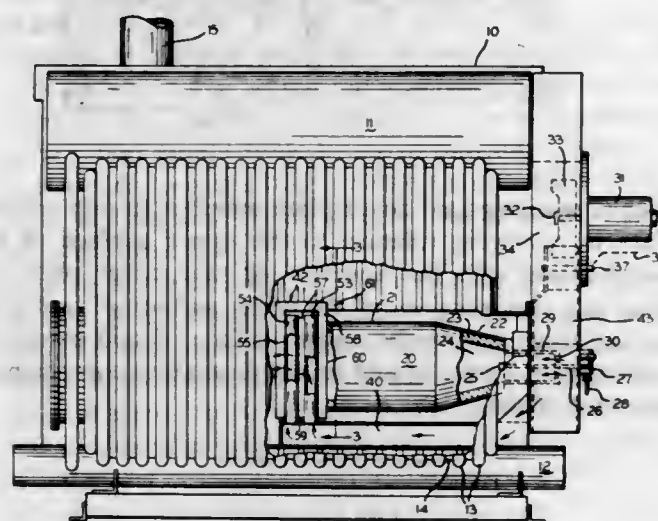
## REDUCTION OF GASEOUS POLLUTANTS IN COMBUSTION FLUE GAS

Glenn D. Craig, Menomonee Falls; David T. Feuling, Milwaukee, both of Wis.; and Paul G. LeHaye, Cape Elizabeth, Maine, assignors to Aqua-Chem, Inc., Milwaukee, Wis. Division of Ser. No. 488,057, July 12, 1974, Pat. No. 3,955,907, which is a division of Ser. No. 295,249, Oct. 5, 1972, Pat. No. 3,837,788. This application Oct. 9, 1975, Ser. No. 620,954

Int. Cl.<sup>2</sup> F23L 9/00

U.S. Cl. 431—351

29 Claims



1. Apparatus for dispersing combustion supporting gas into the gaseous combustion product stream within a combustion zone of a fuel burning device, said apparatus comprising:

a plurality of elongate, hollow tubular means, means supporting said tubular means in a position generally transverse to and extending across said combustion zone, said tubular means being spaced apart in a direction generally transverse to the flow direction of said combustion product stream for causing said stream to flow into the gaps therebetween, and a plurality of gas discharge openings formed in each of said tubular means for injecting combustion supporting gases into said stream.

4,013,400

## CLEANING APPARATUS FOR A HEAT AND PRESSURE FUSER

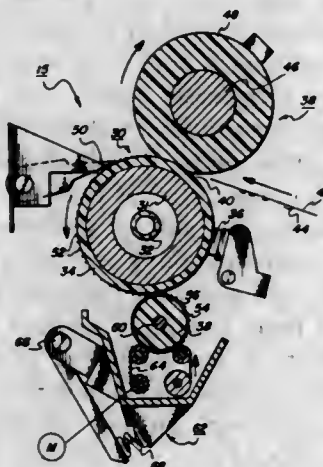
Raghulinga R. Thettu, Webster, and Michael J. Oszczakiewicz, Penfield, both of N.J., assignors to Xerox Corporation, Stamford, Conn.

Filed July 21, 1975, Ser. No. 597,734

Int. Cl.<sup>2</sup> F27D 23/00

U.S. Cl. 432—75

6 Claims



1. Fuser apparatus for fixing toner images to support material, said apparatus comprising:

a pair of nip-forming members between which said support material moves with said toner images contacting a heated one of said nip-forming members; means for elevating the surface temperature of said heated member to thereby render said toner images tacky; a cleaning member having a tacky surface, said cleaning member being positioned to contact the surface of said heated one of said nip-forming members; an elongated member having a coating of tackifiable material thereon; means for stationarily supporting said elongated member in contact with said cleaning member to thereby transfer tackifiable material to said cleaning member whereby said tacky surface becomes rejuvenated; and means for effecting movement of said elongated member whereby different portions thereof are brought into contact with said tacky surface at periodic intervals.

4,013,401

## APPARATUS FOR PREHEATING A RAW MATERIAL CHARGE FOR APPLICATION TO AN ELECTRIC FURNACE

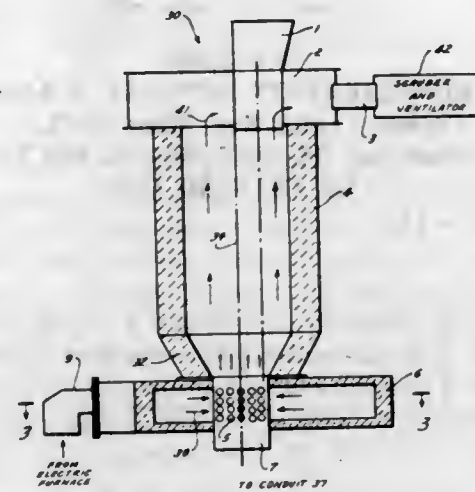
Assen Yordanov Georgiev, and Ivan Vassilev Genev, both of Sofia, Bulgaria, assignors to DSO "Cherna Metalurgia", Sofia, Bulgaria

Filed Sept. 18, 1975, Ser. No. 614,516

Int. Cl.<sup>2</sup> F27B 3/04

U.S. Cl. 432—164

3 Claims



1. In an apparatus for preheating a charge of raw material with hot gases prior to application of the charge to an electric furnace, the apparatus comprising a main charge-holding cylindrical reservoir having a first vertical axis, a cylindrical combustion chamber having a second vertical axis, and conduit means effecting communication between the combustion chamber and the bottom of the main reservoir, the improvement wherein the combustion chamber is disposed below and adjacent the bottom end of the first reservoir with its second axis offset from and parallel to the first axis; wherein the conduit means comprises a vertically disposed transition cylinder extending through the combustion chamber coaxial with the first axis of the main reservoir and communicating at its upper end with the main reservoir, the transition cylinder having a plurality of apertures in its peripheral wall for conducting hot gases from the combustion chamber into the interior of the transition cylinder and thereafter to the lower end of the main reservoir through the upper end of the transition cylinder; and wherein the apparatus further comprises means for coupling the charge in the main reservoir to the furnace through the interior of the transition cylinder.

4,013,402

## FIRED HEATER FOR A MULTIPHASE FEEDSTOCK

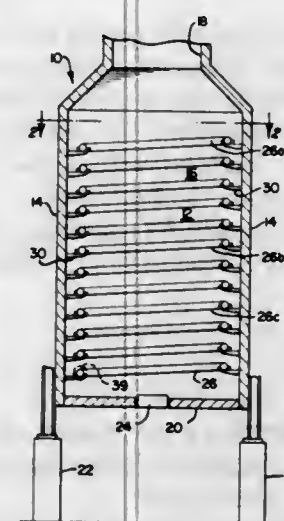
Eric Klein, Verona, and Ronald Burton Goodman, Parsippany, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed June 11, 1975, Ser. No. 585,895

Int. Cl.<sup>2</sup> F24H 1/00; F22B 11/02

U.S. Cl. 432—223

15 Claims



8. A heater for heating a feedstock at least a portion of which is in solid form, comprising a housing; at least one tube disposed in said housing and having an inlet and an outlet for said feedstock, said tube being bent in a manner to form series of contiguous superposed layers, each layer consisting of two substantially parallel straight portions of two curved portions respectively connecting the corresponding ends of said straight portions, each layer occupying a substantial portion of

the horizontal cross-sectional area of said housing, means for supporting said tube in said housing; and means associated with said housing for applying heat to said feedstock passing through said tube.

4,013,403

## SUPPORT MEANS FOR A ROLLER HEARTH IN A KILN

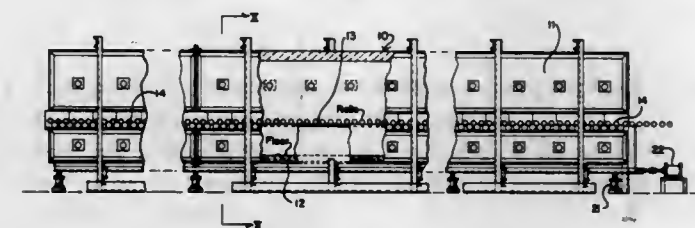
Francis X. Petrus, Glenshaw, Pa., assignor to Pullman Incorporated, Pittsburgh, Pa.

Filed Dec. 8, 1975, Ser. No. 638,461

Int. Cl.<sup>2</sup> F27D 3/00; F27B 9/14

U.S. Cl. 432—239

26 Claims



1. A kiln roller hearth support comprising:

a. an elevated ceramic base fixably attached to the floor of said kiln, b. a support beam aligned inwardly of the walls of said base, c. lifting means for raising and lowering said support beam inwardly of said base, said support beam having an upper surface which when raised is adapted to frictionally engage the rolls of the roller hearth so as to cause rotation of said rolls and from contact with the said rolls; and d. drive means for moving said support beam forward and rearward with said tunnel kiln.



# CHEMICAL

4,013,404

## METHOD OF DYEING HAIR WITH INDOLINES, INDOLES AND INDAZOLES

Richard Alfred Parent, Fairport, N.Y., and Frank Fred Loffelman, Middlesex, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 96,224, Dec. 6, 1970, abandoned.

This application Apr. 7, 1975, Ser. No. 565,883

Int. Cl.<sup>2</sup> D06P 1/32, 3/06; A61K 7/12

U.S. Cl. 8-11

7 Claims

1. A method for dyeing hair and other keratinaceous materials which comprises contacting said materials with a compound selected from the group consisting of 5-aminoindoline, 5,6-diaminoindoline, 5,7-diaminoindoline, 5-amino-6-nitroindoline, 5-bromo-7-nitroindoline, 5-hydroxyindoline, 6-nitroindoline, 5-aminoindole, 6-aminoindole, 5-hydroxyindole, 5-methoxyindole, 5-hydroxy-2-methylindole, 5-amino-2,3-dimethylindole, 6-nitroindole, and 5-aminoindole.

4,013,405

## AQUEOUS PRINTING PASTES FOR PRODUCING TRANSFER PRINTING PAPERS BY ROTARY SCREEN PRINTING

Henry Donenfeld, Brighton, Australia, assignor to Printon Australasia Pty. Limited, Victoria, Australia

Filed Mar. 12, 1974, Ser. No. 450,411

Claims priority, application Australia, Mar. 12, 1973, 2541/73; Apr. 2, 1973, 2833/73

Int. Cl.<sup>2</sup> D06P 0/00; B41M 3/12

U.S. Cl. 8-2.5 A

9 Claims

1. A sublimation printing paste for application to a substrate comprising a sublimable disperse dye, a thickener and water characterized by inclusion therein of an additive in an amount sufficient to improve the flow properties of said printing paste, said additive selected from the group consisting of 2-ethylhexyl alcohol, 2-ethylhexyl acetate, capryl acetate, phenyl methylacetate, eucalyptus oil, and emulsified ortho, meta, and para hydroxytoluene, so that said sublimable disperse dye may be transferred from said substrate to a textile fabric at a temperature at which said sublimable disperse dye sublimates.

4,013,406

## PROCESS FOR CONTINUOUSLY DYEING FILAMENTS OF SLIVERS OF WET-SPUN ACRYLONITRILE POLYMERS

Ulrich Reinehr, Dormagen; Hans Lenz, Dormagen-Hackebroich; Alfred Nogaj, Dormagen, and Günter Blankenstein, Stommeln, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 14, 1975, Ser. No. 541,065

Claims priority, application Germany, Jan. 16, 1974, 2401880

Int. Cl.<sup>2</sup> D06P 3/70

U.S. Cl. 8-17

3 Claims

1. A process for the continuous, uniform and penetrative dyeing with high fastnesses of a sliver or a filament of an acrylonitrile copolymer which has been produced by a standard wet-spinning process, which comprises subjecting the unstretched filament or sliver before dyeing to a combined washing, pressing and drying pretreatment by washing said filament or sliver once or several times at a temperature of up to 70° C, squeezing it out between squeezing rollers and drying it under the effect of heat, so that the spun material has a residual moisture content of at most 10% by weight and a residual solvent content of at most 4% by weight of the residual moisture content, and thereafter dyeing said filament or sliver in a dye bath over a period of from up to 60 seconds at a temperature in the range of from 20° to 100° C, stretching to between 2.5 and 6.5 times their original length and aftertreating.

4,013,407

## BACK DYEING, TUFTING, AND HOT AIR SUBLIMATION OF DYES TO PILE OF CARPETS

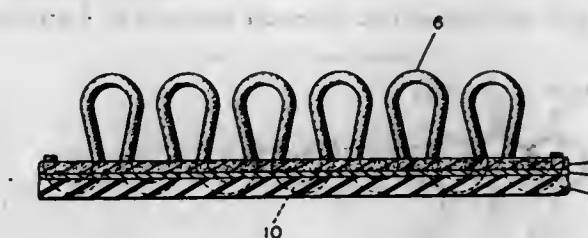
Leonard N. Ray, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Sept. 12, 1975, Ser. No. 612,772

Int. Cl.<sup>2</sup> D06P 7/00

U.S. Cl. 8-17

5 Claims



1. A process for making a decorative carpet through the use of sublimable dyes comprising the steps of:

- printing sublimable dyes on one side of the carpet backing prior to the time of the carpet face yarns are tufted into the carpet backing,
- tufting the carpet face yarns into the carpet backing with the carpet face yarn pile being on the opposite side of the carpet backing from that side of the carpet backing which contains the sublimable dyes,
- transferring the sublimable dyes from the carpet backing to the carpet face yarn through the application of a heated gaseous medium passing through the carpet from the carpet backing side of the carpet to the carpet face yarn side of the carpet, said heated gaseous medium vaporizes the sublimable dyes on the carpet backing and moves and deposits the dye on the carpet face yarns and
- applying a coating to the back of the carpet backing on that side of the backing which is the side of the carpet backing that had the design printed thereon with sublimable dyes to lock in excess or residual dyes to the back side of the carpet backing.

4,013,408

## EXHAUST PROCESS FOR THE DYEING OF SYNTHETIC ORGANIC TEXTILE MATERIALS IN NAVY BLUE TO BLACK SHADES

Hans Wilhelm Liechti, Oberwil, and Raymond Defago, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 467,044, May 6, 1974, Pat. No. 3,972,676.

This application Apr. 9, 1976, Ser. No. 675,387

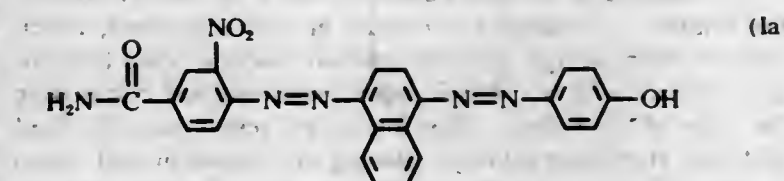
Claims priority, application Switzerland, May 9, 1973, 6539/73; Mar. 23, 1974, 4360/74

Int. Cl.<sup>2</sup> C09B 27/00, 45/48

U.S. Cl. 8-26

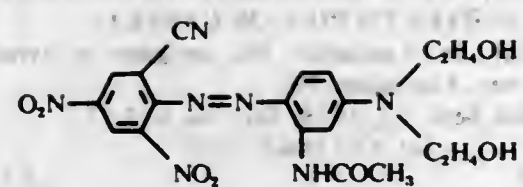
13 Claims

1. A process for dyeing synthetic organic textile material in navy blue to black shades, by the exhaust process, from halogenated hydrocarbons, which process comprises the use of at least one disazo of formula Ia

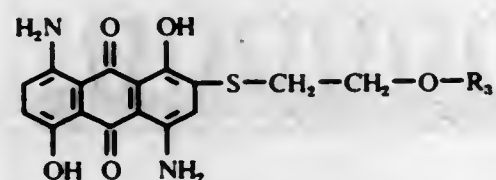


in admixture with the monoazo dyestuff of formula II

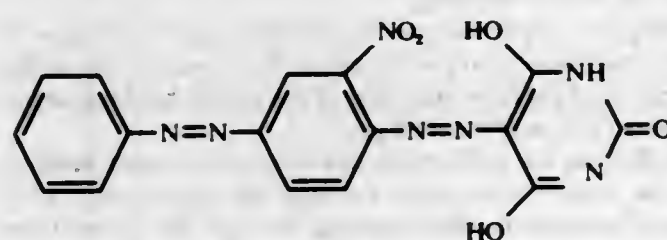




or with the anthraquinone dyestuff mixture of formula III



wherein  $R_3$  represents a mixture of H and  $-\text{CH}_2-\text{CH}_2-\text{S}-\text{CH}_2-\text{CH}_2-\text{OH}$ , and in addition a small amount of the disazo dyestuff of formula IV



or of formula V



4,013,409

#### 5-HYDROXYMETHYL-1-AZA-3,7-DIOXABICYCLO[3.3.0]-OCTANE AS A SETTING AGENT FOR PERMANENT WAVING

Warren J. Eggers, Aurora, Ill., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed June 23, 1975, Ser. No. 589,290  
Int. Cl.<sup>2</sup> A61K 7/09

U.S. Cl. 8—127.51

4 Claims

1. A method for treating keratinic fiber which has been treated with a thiol reducing compound comprising the steps of applying to said fiber an effective amount of a 5–15% by weight aqueous solution of 5-hydroxymethyl-1-aza-3,7-dioxabicyclo[3.3.0] octane, rinsing with water and drying said fiber.

4,013,410

#### CONTACT LENS STERILIZATION PROCESS AND APPARATUS

Michael D. Thomas, Elmhurst, and Francis E. Ryder, Barrington, both of Ill., assignors to Ryder International Corporation, Schaumburg, Ill.

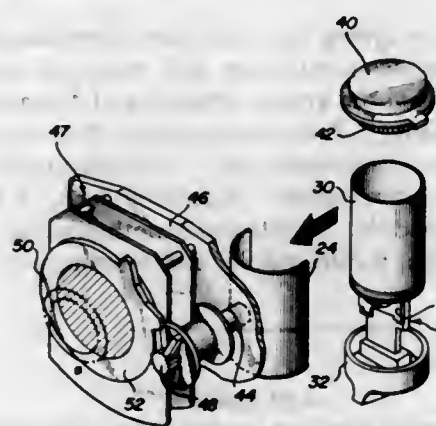
Filed June 23, 1975, Ser. No. 589,241  
Int. Cl.<sup>2</sup> A61L 13/00, 3/00

U.S. Cl. 21—58

12 Claims

1. A method of sterilizing contact lenses, by use of a sterilizing solution of hydrogen peroxide, in a closed vessel, which solution will undergo a decomposition reaction when brought into contact with a catalytic agent, said method comprising the steps of: providing a closed reaction vessel partially filled with said sterilizing solution; placing said lenses in said vessel in contact with said sterilizing solution; disposing said catalytic agent internally of said vessel but out of contact with said sterilizing solution; maintaining the strength of said sterilizing solution by delaying the decomposition reaction which will

take place between said solution and said catalytic agent, said step of maintaining the strength of the sterilizing solution including the steps of, positioning said vessel in a first orientation with said lenses in contact with said sterilizing solution while said catalytic agent is disposed above and out of contact with said sterilizing solution, inverting said vessel after a prescribed period of time to reposition said vessel in a second



orientation with said catalytic agent then becoming immersed in said sterilizing solution thereby commencing the decomposition reaction which will ultimately result in decay of said sterilizing solution, with said lenses remaining in contact with said sterilizing solution during said first and second orientations and allowing said sterilizing solution to decay to a level wherein the strength thereof is at a concentration non-injurious to eye tissue.

4,013,411

#### METHOD FOR DETECTING HEPATITIS ASSOCIATED ANTIGEN

Saul I. Shupack, Wayne, Pa., and Stephen F. Malin, Burlington, Mass., assignors to Villanova University, Villanova, Pa. Continuation-in-part of Ser. No. 177,134, Sept. 1, 1971, abandoned. This application July 19, 1974, Ser. No. 489,907

Int. Cl.<sup>2</sup> G01N 31/02, 31/16

U.S. Cl. 23—230 B

25 Claims

1. A method for testing biological materials for the presence of the hepatitis associated antigen which comprises contacting a biological material to be tested, in the presence of water, with at least one water soluble reagent selected from the group consisting of

cis, bis-triethylphosphine platinum (II) dichloride, cis, bis-triphenylphosphine hydrido platinum (II) chloride, and the anions ethylene platinum (II) trichloride, carbonyl platinum (II) trichloride, trans-2-butene platinum (II) trichloride, and isobutene platinum (II) trichloride,

said anions being associated with a non-interfering cation; said contact producing a characteristic persistent precipitate detectable in the reaction mixture if the biological material contains the hepatitis associated antigen, whereas any precipitate formed initially is not persistent if the biological material is free of said antigen.

4,013,412

#### METHOD FOR JUDGING PURITY OF PURIFIED ZINC SULPHATE SOLUTION USED FOR ELECTROLYTIC PRODUCTION OF ZINC

Satoshi Mukae, Shimonoseki, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed July 22, 1975, Ser. No. 598,031

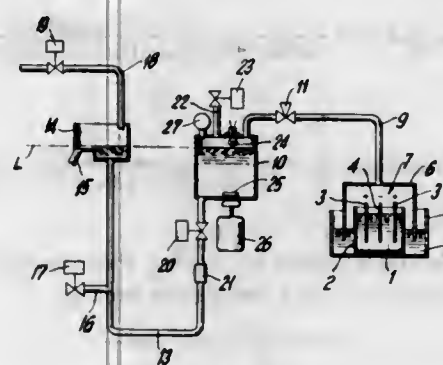
Claims priority, application Japan, Aug. 1, 1974, 49-88274 Int. Cl.<sup>2</sup> G01N 31/12; C25B 1/04; C25C 1/16; G01N 7/06

U.S. Cl. 23—230 PC

1 Claim

1. A method of ascertaining the purity of a purified zinc sulphate solution used for the electrolytic production of zinc comprising the steps of sampling a part of said purified zinc

sulphate solution and subjecting the same to electrolysis to generate a mixture of hydrogen gas and oxygen gas, feeding said gas mixture into a combustion chamber, igniting said hydrogen gas in said gas mixture by an ignition heater disposed within said combustion chamber while said combustion



chamber is fully closed, and measuring the internal pressure of said combustion chamber before and after the combustion of said hydrogen gas, thereby measuring the content of said hydrogen gas in said gas mixture so as to ascertain the purity of said zinc sulphate solution on the basis of the hydrogen gas content thus measured.

4,013,413

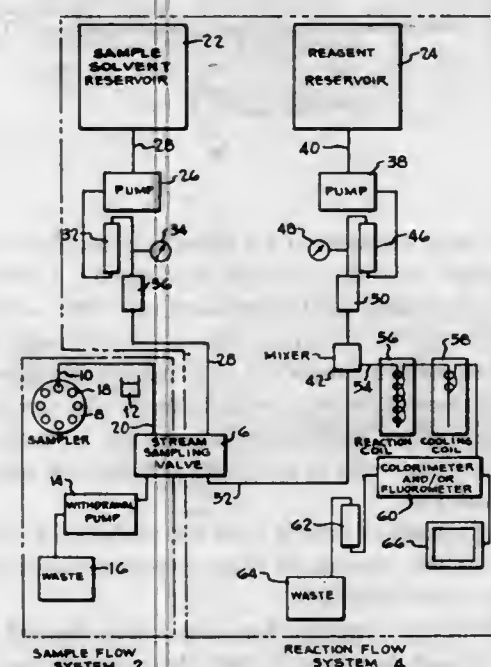
#### APPARATUS AND METHOD FOR RAPID ANALYSES OF PLURALITY OF SAMPLES

Kent K. Stewart, Silver Spring; Gary R. Beecher, Laurel, and Peter Edgar Hare, Takoma Park, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 10, 1975, Ser. No. 594,893

Int. Cl.<sup>2</sup> G01N 1/00, 31/00

U.S. Cl. 23—230 R



7. A method of analysis of a plurality of fluid samples, comprising:

- indexing a series of samples in sequence into sampling position;
- introducing the samples into a sample flow system in sequence;
- separating successive samples from each other in the sample flow system with individual segments of air, wash solution and air;
- energizing a stream sampling valve to remove a portion of each sample only and to transfer each of said portions to a reaction flow system in which fluid is flowing continually at a constant rate;
- mixing and reacting each sample with an appropriate reagent; and
- analyzing the reacted sample.

4,013,414

#### INDICATOR DYE

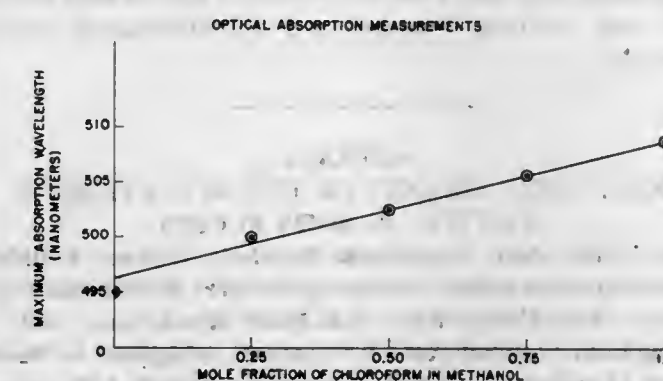
Francois A. Lavalley, Willoughby Hills, Ohio; Donald G. LeGrand, Burnt Hills, and George L. Gaines, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 5, 1975, Ser. No. 574,725

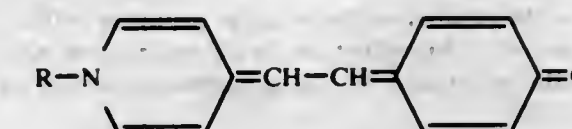
Int. Cl.<sup>2</sup> G01N 31/00, 31/22

U.S. Cl. 23—230 R

8 Claims



1. A method of identifying the acid condition of a liquid medium employing an organic solvent which comprises dissolving in said liquid medium a quantity of a soluble dye having the general formula



wherein R is an aliphatic hydrocarbon radical having approximately 12 to 20 carbon atoms so that color changes shift to longer wavelengths with increasing polarity of solvent and observing the color produced thereby.

4,013,415

#### PLASMA-CHEMICAL REACTOR FOR TREATMENT OF DISPERSE MATERIALS

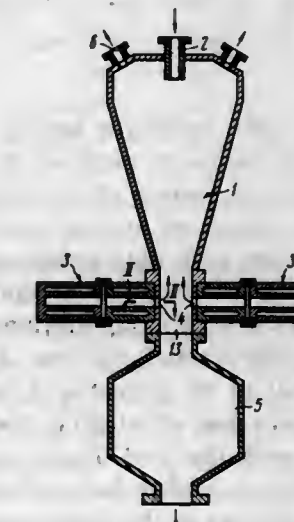
Igor Sergeevich Burov, ulitsa Yakuba Kolosa, 39, kv. 48; Vladimir Vladimirovich Bysjuk, ulitsa Ostrovskogo, 27, kv. 56; Alfred Lvovich Mosse, Leninsky prospekt, 72a, kv. 66; Leonid Stepanovich Shkurko, ulitsa Pulikova, 35, kv. 1, and Vyacheslav Andreevich Vashkevich, ulitsa Mendeleeva, 7, kv. 71, all of Minsk, U.S.S.R.

Filed June 7, 1974, Ser. No. 477,336

Int. Cl.<sup>2</sup> B01J 1/00

U.S. Cl. 23—252 R

12 Claims



1. A plasma-chemical reactor for treatment of disperse materials, with a process gas comprising: a vertical working



chamber; means for feeding the disperse materials into the top portion of said working chamber; a plurality of plasmatrions for plasma-heating of the process gas, said plasmatrions having nozzles arranged around and joined with the periphery of the bottom portion of said working chamber and directed generally at right angles to the vertical axis of said working chamber for feeding process gas directly into the bottom portion of said working chamber; means for withdrawing gaseous products from said working chamber at a location above the nozzles of said plasmatrions; and a bin connected to and located directly under said working chamber and communicating directly therewith.

4,013,416

# DIAGNOSTIC MEANS FOR THE DETECTION OF PROTEIN IN BODY FLUIDS

Walter Rittersdorf, Mannheim-Waldhof; Werner Güthlein, Mannheim-Neckarau; Wolfgang Werner, Mannheim-Vogelstang; Hans-Georg Rey, and Peter Rieckmann, both of Mannheim-Waldhof, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany  
Filed Feb. 26, 1976, Ser. No. 661,687

Claims priority, application Germany, Mar. 12, 1975, 2510633

Int. Cl.<sup>2</sup> G01N 31/22, 33/16

U.S. Cl. 23—253 TP

44 Claims

1. A diagnostic means for the detection of protein in body fluids, comprising an absorbent carrier impregnated with a pH indicator of the octahalosulfophthalein group, a buffer, and at least one linear or branched chain polypropylene glycol immiscible with water and having a molecular weight of from 500 to 10,000.

4,013,417

# ANALYZER FOR THE DETERMINATION OF HEMOGLOBIN AND OTHER RELATED COMPOUNDS IN WHOLE BLOOD AND HEMOGLOBIN SOLUTIONS

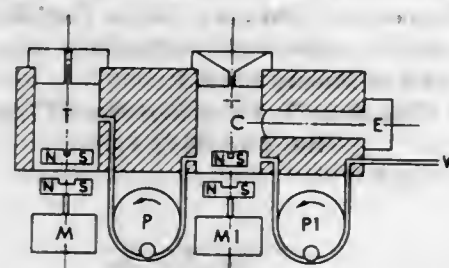
Italo Raffaele, Milan, Italy, assignor to Biomedix A.G., Vaduz, Liechtenstein  
Filed July 31, 1975, Ser. No. 600,802

Claims priority, application Italy, Aug. 9, 1974, 26213/74  
Int. Cl.<sup>2</sup> G01N 33/16, 21/26

U.S. Cl. 23—253 R

10 Claims

Hydraulic scheme



1. An analyzer for the automatic testing of samples of 5 to 10  $\mu$ l of hemoglobin solutions, particularly whole blood, and for the automatic determination of the total hemoglobin and of the percentage contents of at least the deoxyhemoglobin, the carboxyhemoglobin and the oxyhemoglobin, and/or the ratio of the third to the first component, comprising a tonometer, in which a buffer is kept in equilibrium with a gas having a predetermined oxygen partial pressure, a first pump for the transfer of the liquid to be tested to a cuvette, an oxygen electrode, the sensitive part of which is contained within said cuvette in contact with the said liquid, a second pump for emptying the cuvette, a dual wavelength optical system for measuring the absorbances of the liquid present in the cuvette at the wavelengths of 497 and 565 nm, light sensors adapted to sense the light passing through said optical system, computer means adapted to be fed with electrical signals, respectively corresponding to the values sensed by the oxygen electrode

and by the said light intensity sensors, and to process said signals according to the equations:

$$[\text{Hb tot}] = \frac{A_{497}}{(1 - K - K') + \epsilon_{497}^{\text{Hb}} K + \epsilon_{497}^{\text{HbCO}} K'}$$

$$\% \text{ oxyhemoglobin} = \frac{[\text{oxyhemoglobin}]}{[\text{total Hb}] - [\text{metHb}] - [\text{sulfHb}] - [\text{COHb}]}$$

and

$$\% \text{ carboxyhemoglobin} = \frac{[\text{HbCO}]}{[\text{total Hb}] - [\text{metHb}] - [\text{sulfHb}]}$$

and display means adapted to display the results of the calculations carried out by said computer means.

4,013,418

# LUMINESCENT REACTION TESTING

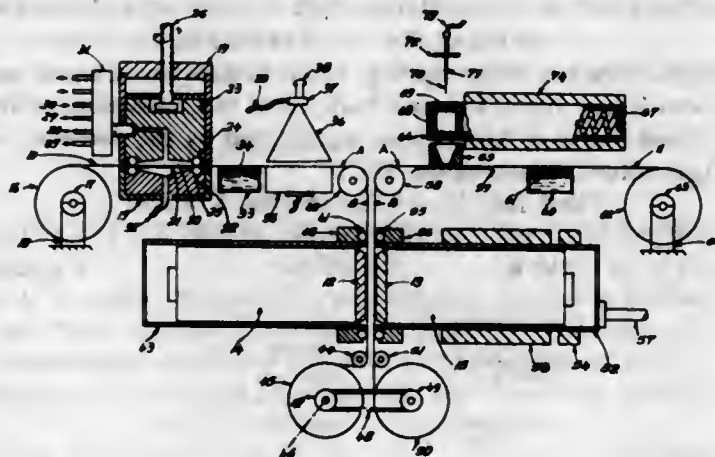
Chris J. Plakas, Alexandria, Va., assignor to Vitatek Corporation, Alexandria, Va.

Continuation-in-part of Ser. No. 630,943, Nov. 12, 1975. This application Feb. 19, 1976, Ser. No. 659,534

Int. Cl.<sup>2</sup> C12K 1/10; G01N 33/16; G21H 5/00

U.S. Cl. 23—253 R

10 Claims



1. A surface reaction system for detecting biological cells as reactive materials in a test sample containing a plurality of biological cells by means of luminescent reaction, comprising:

- filtering means for filtering said sample through an elongated ribbon of filter material to produce a residue on the ribbon containing biological cells from the sample;
- extraction means operatively associated with the ribbon for rupturing the cells in the residue while on said ribbon of filter material;
- advancing means coaxing with the ribbon for advancing a portion of the ribbon of filter material containing the residue to a new position;
- liquid dispenser means for depositing liquid reagent directly on said portion of the ribbon of filter material containing the residue while said portion is in said new position; and
- photodetector means in optical proximity to the ribbon for detecting the intensity of a luminescent reaction which occurs when the reagent and the ruptured cells in the residue react together.

4,013,419

# DIGESTION BOMB

Peter R. Betzer, 1830 7th St. North, St. Petersburg, Fla. 33704; and Donald Eggmann, 2869 60th St. North, St. Petersburg, Fla. 33710

Filed Jan. 30, 1976, Ser. No. 653,756

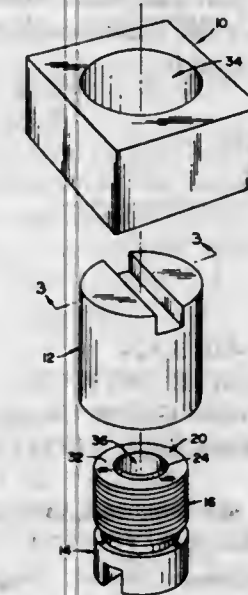
Int. Cl.<sup>2</sup> B65D 41/04; G01N 31/12

U.S. Cl. 23—259

2 Claims

1. A digestion bomb assembly comprising, in concentric

relationship, a cylindrical container including a cylindrical cavity and a sealable annular rim portion, a cylindrical cap threadably and sealably engageable with said container, said cap including a sealable cylindrical shaped portion having an angled edge configured and dimensioned to receive the said



rim portion of said container, and a removable rigid collar encircling the container and the cap at the threaded portion thereof, said container and said cap being composed of an inert metal-free plastic material and said collar being composed of a plastic material.

4,013,420

# CARBON BLACK REACTOR

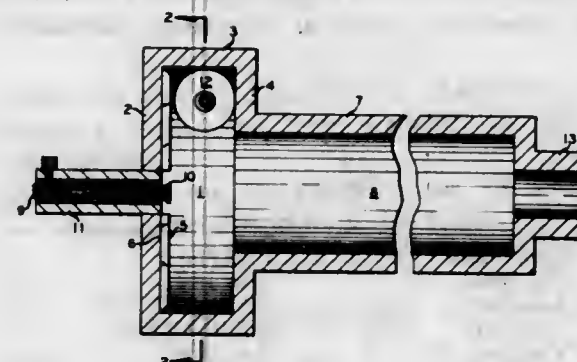
Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 23, 1975, Ser. No. 580,383

Int. Cl.<sup>2</sup> C09C 1/48, 1/50

U.S. Cl. 23—259.5

4 Claims



1. In a carbon black reactor comprising:

- an essentially cylindrically shaped precombustion section confined by an upstream wall, a cylindrical wall and a downstream wall;
- in axial alignment and open communication with said precombustion section a reaction section having an upstream inlet opening in said downstream wall of smaller diameter than the diameter of said cylindrical wall;
- first conduit means attached to the reactor for the axial introduction of the hydrocarbon feed into the reactor;
- second conduit means attached to the precombustion section for the tangential introduction of hot combustion gases into the precombustion section;
- third conduit means for the withdrawal of carbon black-containing gas attached to the downstream end of the reaction section;
- the improvement comprising
- turbulence-creating protrusions attached to at least one of said upstream and downstream walls confining said pre-

combustion section, said protrusions being arranged and shaped such as to at least partially destroy the inwardly spiraling boundary layer flow of the hot combustion gases that would exist without these protrusions and convert it into turbulent flow.

4,013,421

# APPARATUS FOR GROWING SINGLE CRYSTALS OF HIGH-MELTING OXIDES

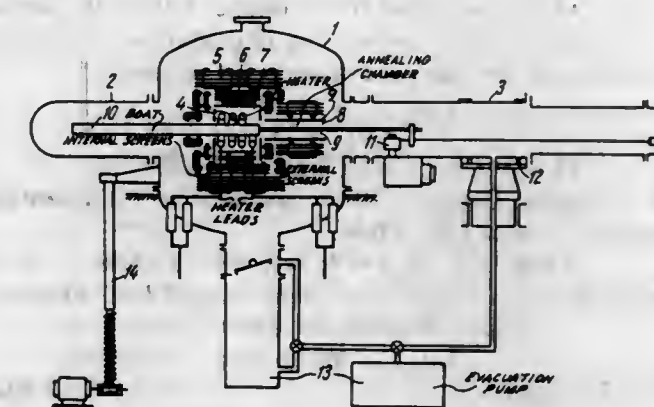
Khachik Saakovich Bagdasarov, Profsojuznaya ulitsa, 115, kv. 46; Nikolai Pavlovich Ilin, Leninsky prospekt, 44, kv. 260, both of Moscow, and Jury Alexandrovich Starostin, Leninsky raion, poselok Gazoprovod, 1, kv. 4, Moskovskaya oblast, all of U.S.S.R.

Filed Dec. 30, 1974, Ser. No. 537,571

Int. Cl.<sup>2</sup> B01J 17/08; H05B 5/12

U.S. Cl. 23—273 SP

4 Claims



1. An apparatus for growing single crystals of high-melting oxides in the form of lamellae, by crystallizing a melt in a boat, comprising: a crystallization chamber; a resistance heater accommodated in said crystallization chamber and composed of a coil having turns made of a rod material; current leads connected to an external power supply and having clamp means for securing said leads to ends of said heater for supplying power thereto; a metal boat containing the melt being crystallized; driving means for moving said metal boat with the melt through the coil turns of the resistance heater, said turns surrounding the boat when the latter is placed in the heater of the crystallization chamber and being arranged in planes normal to the boat axis and having incomplete sections distributed with a greater number of said sections in a bottom portion, where the melt is heated through the material of the boat, than in a top portion, where the melt is heated directly, with the result that the bottom and top portions of the turns ensure uniform heating of the melt in the boat; a multilayer system of sheet screens surrounding said resistance heater and including an internal layer of said screens, nearest to said resistance heater, made up of rods of a refractory material, adjoining one another along the entire length thereof and extending beyond the heater and defining beyond the heater an elongated space serving as an annealing chamber near the exit of the boat from the space defined by the coil turns of the heater, said current leads each include two parallel plates respectively having aligned holes for an end of the heater to be fitted therein and said plates being movable apart to ensure clamping of the heater end in said holes, and lock means connected with said plates for locking them in the position which they occupy when moved apart.



4,013,422

## GAS GENERATING APPARATUS

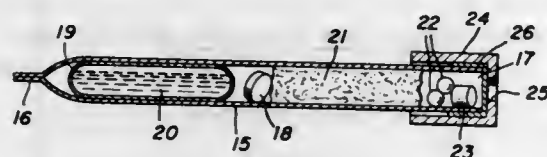
Ernest Elliott Spinner, Grandview, Mo., and Melvin Wayne Hounsell, Beloit, Wis., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Dec. 22, 1975, Ser. No. 643,259

Int. Cl.<sup>2</sup> B01J 7/02

U.S. Cl. 23-282

30 Claims



1. A gas generating apparatus comprising: a container having an opening, a gas generating solid material in the container, an ampoule containing a liquid which is reactive with the solid material to produce a gas, said ampoule being rupturable by squeezing the outside of the container to free the liquid to contact the solid material, means in the container which prevents liquid from flowing from the container after the ampoule is opened but which permits flow of gas generated in the container out of the container opening, and a solid desiccant material in the container which absorbs water which may enter the container before the ampoule is opened, thereby preventing degradation or premature reaction of the gas generating solid material.

4,013,423

## FLUID CAT CRACKER APPARATUS

David A. Evens, Cloquet, Minn., assignor to Continental Oil Company, Ponca City, Okla.

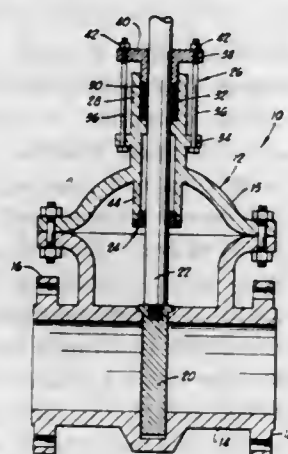
Filed Oct. 24, 1974, Ser. No. 517,668

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> B01J 8/24

U.S. Cl. 23-288 S

2 Claims



1. In an apparatus for carrying out a petroleum fluid catalytic cracking process, said apparatus including a catalytic reactor and a catalyst regenerator connected by conduit means through which particulated catalyst and mixtures of particulated catalyst and oil flow at superatmospheric pressure and high temperature, and including at least one shutoff valve disposed in said conduit means, the improvement wherein:

- a. said shutoff valve includes a valve stem disposed in a valve body, a valve stem guide means in and attached to said body, and a valve stem packing gland positioned between said guide means and the exterior of said valve body, and wherein said valve stem guide means comprises:
  - a. a cylindrical guide member having a bore therethrough in which said valve stem is slidably disposed;
  - b. at least one annular groove disposed in said bore; and

at least one expansible seal ring disposed within said groove around said valve stem, said seal ring being of a size and shape such that a seal is provided thereby between said valve stem and the inside surfaces of said groove whereby pressurized materials present within said valve body are prevented from flowing through said guide means into said valve stem packing gland and other areas of close clearance between said valve stem and said valve body.

4,013,424

## COMPOSITE ARTICLES

Paul Wildgoose, and Raymond George Ubank, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, Bristol, England

Continuation-in-part of Ser. No. 264,340, June 19, 1972, abandoned. This application Dec. 12, 1974, Ser. No. 532,248 Claims priority, application United Kingdom, June 19, 1971, 28893/71; July 6, 1971, 31517/71

Int. Cl.<sup>2</sup> B32B 15/00

U.S. Cl. 29-194

10 Claims



1. An article for use in a high temperature corrosive environment comprising a substrate consisting essentially of, by weight:

Aluminium	5 to 7%
Chromium	3 to 14%
Tantalum	1.5 to 12%
Tungsten	3.5 to 13.5%
Yttrium	0 to 0.5%
Nickel	Remainder

and the article further comprising a coating consisting essentially of, by weight:

Aluminium	10 to 30%
Chromium	3 to 14%
Tantalum	1.5 to 12%
Tungsten	3.5 to 13.5%
Yttrium	0.01 to 0.5%
Nickel	Remainder

wherein the contents of chromium, tantalum, tungsten and nickel occur in similar proportions in the substrate and the coating but to a lesser total amount in the coating to accommodate the higher aluminium content thereof.

4,013,425

## THERMOMETRIC BIMETALLIC STRUCTURE OF HIGH STRENGTH AT HIGH TEMPERATURE

Horst Mühlberger, Frankfurt am Main, and Manfred Rühle, Offenbach, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 22, 1976, Ser. No. 698,494

Claims priority, application Germany, June 26, 1975, 2528457

Int. Cl.<sup>2</sup> B32B 15/18; C22C 38/04, 38/12, 38/46

U.S. Cl. 29-195.5

14 Claims

1. A thermometric bimetallic structure having high strength at elevated temperature and comprising an active component and a passive component secured together, said active component consisting of an iron-nickel alloy having a coefficient of expansion of about  $19 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$  to  $22 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$  and composed by weight of

0.4% to 0.9%	carbon,
0.03% to 0.10%	nitrogen,
10.0% to 14.0%	nickel,
3.0% to 7.0%	manganese,
0.2% to 1.0%	niobium and/or tantalum,
0.5% to 1.5%	vanadium,
up to 1.5%	molybdenum,
up to 1.5%	tungsten,
up to 3.5%	chromium,
up to 0.5%	silicon, and
balance	iron with impurities which are due to the melting conditions.

the total of vanadium, molybdenum and tungsten being at most 2%; the passive component being metallic and having a coefficient of expansion of about  $3 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$  to  $12 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$ .

4,013,426

REMOVAL OF SULFUR FROM CARBONACEOUS FUEL  
Wilburn C. Schroeder, 7316 Radcliffe Drive, College Park, Md. 20740

Continuation of Ser. No. 426,039, Dec. 18, 1973, abandoned. This application Mar. 5, 1975, Ser. No. 555,405

Int. Cl.<sup>2</sup> C10L 9/10; C10B 57/00

U.S. Cl. 44-1 R

14 Claims

1. A process for desulfurizing coal comprising feeding crushed or pulverized coal at ambient temperature into a single desulfurization zone of a closed pressurized cyclic system, contacting the coal in said desulfurization zone with recycled hydrogen-containing gases and with burned recycle gases which provide sufficient heat to raise the temperature of the coal to a temperature within the range of about 1100° F to 1800° F thereby causing release of hydrogen from the coal, cracking of hydrocarbons in the coal to form hydrogen and methane and conversion of the sulfur compounds in the coal by reaction with part of the hydrogen in contact with the coal to form hydrogen sulfide, separating the desulfurized coal from the resulting hydrogen, methane and hydrogen sulfide containing gases, removing hydrogen sulfide from said gases, recycling a portion of the purified hydrogen and methane-containing gases to said desulfurization zone, introducing oxygen from an air separation plant into another portion of said purified hydrogen and methane gases and burning said gases with said oxygen to provide said burned recycle gases, and introducing the resulting burned recycle gases into said desulfurization zone to supply sufficient heat to raise the temperature of the coal to a temperature within said range, essentially the sole reactants fed to the system being coal and oxygen.

4,013,427

## SLAG BATH GENERATOR

Paul Gernhardt; Siegfried Pohl; Wilhelm Dangwiller, all of Bochum, and Wolfgang Grams, Wanne-Eickel, all of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

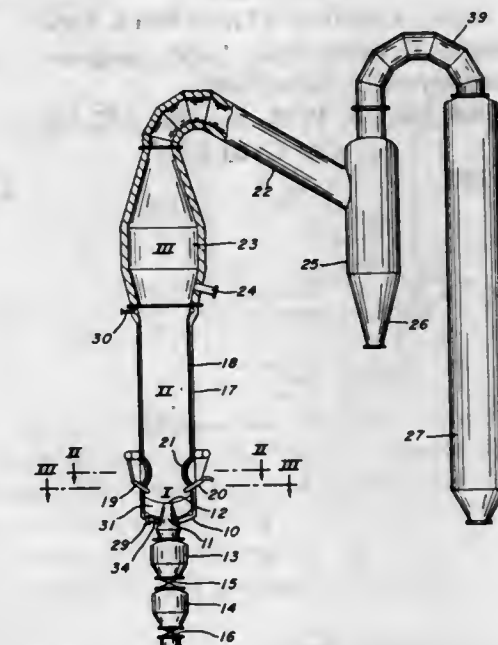
Filed Dec. 22, 1975, Ser. No. 642,899

Claims priority, application Germany, Jan. 31, 1975, 2504060

Int. Cl.<sup>2</sup> C10J 3/46, 3/48

U.S. Cl. 48-62 R

10 Claims



1. A slag bath generator including the combination of: a cylindrical pressure shell defining a vertical reactor shaft, wall means carried by said shell to form a slag bath within the lower end portion of said reactor shaft, an overflow wall projecting centrally into said reactor shaft to maintain a slag bath within the lower portion of said reactor shaft by discharging an overflow of slag from said slag bath, nozzles directed downwardly in said reactor shaft to produce a turbulent rotary motion at the surface of the slag bath by impingement of fine-grained fuel and a gasification medium fed by said nozzles in a generally tangential direction onto said slag bath, vertical coolant pipes surrounding said reactor shaft within said shell, said coolant pipes extending from said shell above said overflow wall to define a circumferential constriction, some of said coolant pipes projecting into said reactor shaft at a distance greater than the distance which other coolant pipes project in a manner to provide a serrated form to said circumferential constriction, a cupola coupled to said reactor shaft for forming a cooling zone, and gas-conducting means to supply cooling gas into said cupola.
5. A method of gasifying fine-grained fuel in a slag bath generator, said method including the steps of: injecting fine-grained fuel and a gasifying medium at a downwardly-inclined angle to tangentially impinge with a turbulent rotary motion upon a slag bath in the lower end of a vertically-extending reactor shaft formed by a vessel adapted to operate under pressure, maintaining a desired slag bath level in the vessel by discharging slag through an overflow in the bottom of said vessel, using a first treatment zone lying between the slag bath and a serrated circumferential constriction to said reactor shaft for high temperature gasification of said fuel, forming said serrated circumferential constriction by bent portions of vertically-arranged coolant pipes surrounding said reactor shaft, using a second treatment zone lying above said serrated



circumferential constriction in the reactor shaft for final gasification of the fuel at a lower temperature as compared with the temperature in the first treatment zone, said serrated circumferential constriction being adapted to conduct fuel and gases into the second treatment zone while reducing the turbulent rotary motion thereof, and discharging the fuel and gases from the top end of the reactor shaft into a cupola forming a third treatment zone for cooling the fuel and gases.

4,013,428

## COAL GASIFICATION PROCESS

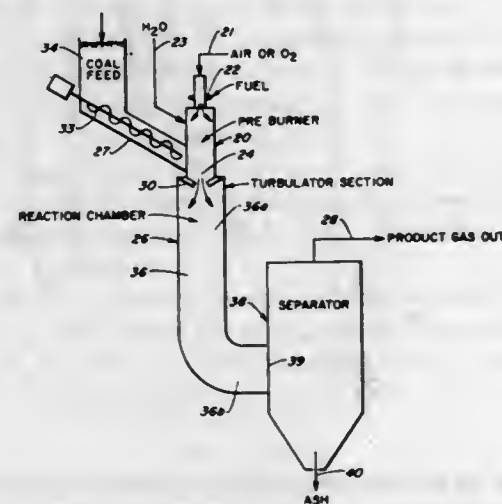
Robert P. Babbitt, Granada Hills, Calif., assignor to The Marquardt Company, Van Nuys, Calif.

Filed Jan. 26, 1976, Ser. No. 652,081

Int. Cl.<sup>2</sup> C10J 3/46

U.S. Cl. 48—202

24 Claims



1. A process for the gasification of coal comprising the steps of:

- combusting a hydrogen containing fuel and oxidizer selected from the group consisting of oxygen and air in a preburner to produce steam at a temperature substantially above the minimum temperature at which steam will react with coal to produce carbon monoxide and hydrogen, said minimum temperature being approximately 1712° F;
- introducing said steam and pulverized coal into a gasifier in controlled amounts and reacting the coal and steam in a substantially oxygen free environment while maintaining the reaction temperature above said minimum temperature throughout said gasifier; and
- discharging product gas comprising CO and H<sub>2</sub> from said gasifier at approximately said minimum temperature, the controlled amounts of said coal and said steam introduced to the gasifier being such that the coal and steam are substantially completely reacted to CO and H<sub>2</sub> and ash by the time of discharge.

4,013,429

## FRACTIONATION OF AIR BY ADSORPTION

Shivaji Sircar, Allentown, and John W. Zondlo, Bethlehem, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed June 4, 1975, Ser. No. 583,787

Int. Cl.<sup>2</sup> B01D 53/04

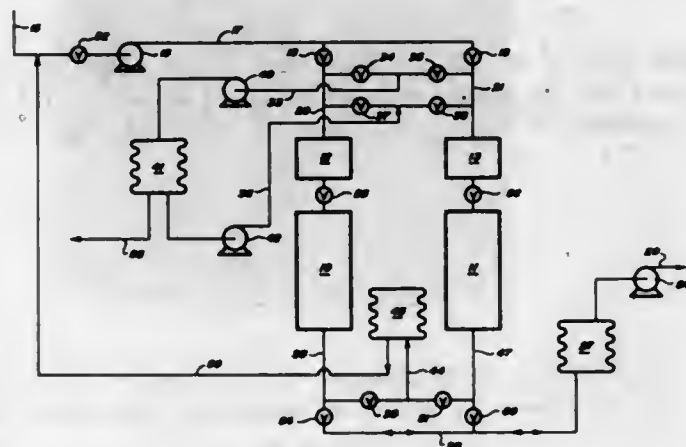
U.S. Cl. 55—33

10 Claims

1. The method for production of high purity nitrogen and an oxygen-enriched product from air containing water vapor and carbon dioxide, which comprises:

- during an on-stream period carried out at substantially atmospheric pressure
  - introducing ambient air into a first bed of adsorbent effective in adsorption of said water vapor and carbon dioxide;

- discharging unadsorbed gaseous effluent from said first adsorbent bed into a second adsorbent bed in series therewith and containing an adsorbent selective in retention of nitrogen as opposed to oxygen;
- continuously during said on-stream period withdrawing from said second bed a primary gaseous effluent stream as an oxygen-rich product having a higher oxygen concentration than the air stream charged to said bed;
- collecting said primary gaseous effluent in an expandable receiver;
- discontinuing introduction of charge to said first bed of adsorbent and initiating removal of contained gases from said first and second beds by
  - first rinsing said beds with high purity nitrogen gas introduced into said first bed and flowed through said bed into and through said second bed at a rate and for a time period sufficient to effect removal of void air from both beds and short of breakthrough of adsorbed water from said first bed; while collecting the rinse gas effluent from said second bed in a receiver separate from that in which said primary effluent was collected;
  - discontinuing introduction of said rinse gas to said first bed and the flow thereof to said second bed;
  - reducing the pressure at the air inlet end of said first bed while retaining gas flow communication between said first and second beds and causing substantially all



of the nitrogen retained by said adsorbent during step (b) to flow through said first bed, thereby inducing desorption of water vapor and carbon dioxide from said first bed and desorption of nitrogen from said second bed;

- collecting the desorbed gases rich in nitrogen in an expandable receiver, a portion of which collected gases from said receiver is employed as rinse gas in step (e);
- thereafter discontinuing gas flow communication between said second and first bed, while continuing withdrawal of gas only from said first bed to a further reduced pressure level;
- during said continued withdrawal of gas from said first bed introducing into said second bed a portion of the oxygen-rich primary effluent from step (d) thereby restoring said second bed to substantially its initial on-stream pressure;
- thereafter discontinuing withdrawal of gas from said first bed and restoring gas flow communication between said second and first bed to permit flow of contained pressuring gas from said second to said first bed to bring said first bed to substantially its on-stream pressure;
- when said first bed has substantially reached its on-stream pressure again initiating a new cycle in the recited sequence with an on-stream period commencing with step (a).

4,013,430  
PROCESS FOR REGENERATING ABSORBING SOLUTION USED FOR EXHAUST GAS PURIFICATION  
Keiji Adachi, Tokio Goral, both of Chiba; Kazuaki Ohami, Funabashi; Takehiko Takahashi, and Takayoshi Mizukami, both of Ichihara, all of Japan, assignors to Chisso Corporation, Osaka and Chisso Engineering Co. Ltd., Tokyo, both of, Japan

Filed Dec. 29, 1975, Ser. No. 645,174

Claims priority, application Japan, Dec. 28, 1974, 50-3986; Dec. 28, 1974, 50-3987

Int. Cl.<sup>2</sup> B01D 53/14

U.S. Cl. 55—37

5 Claims

1. In the process for treating industrial exhaust gaseous containing nitrogen oxides and SO<sub>2</sub> with an absorbing solution containing an iron chelate complex salt and a sulfite in an absorbing zone to remove nitrogen oxides and SO<sub>2</sub> from the industrial exhaust gases, the improvement which comprises regenerating and recirculating the absorbing solution by

- cooling the absorbing solution withdrawn from said absorbing zone during or after the absorption treatment, at a pH of 3.0 or lower and a temperature of about 0° C. to precipitate and remove the chelating agent constituting said iron chelate complex salt contained in the absorbing solution;
- heating the resulting absorbing solution at a temperature of 80° C or higher, to decompose dithionate, imidodisulfate and amidosulfate contained in the absorbing solution;
- removing SO<sub>2</sub> liberated from the absorbing solution, and removing ammonium sulfate by evaporating the absorbing solution to crystallize out and remove ammonium sulfate; and
- recirculating the resulting regenerated absorbing solution to said absorbing zone.

4,013,431

## PARTIAL OR COMPLETE SEPARATION OF GAS MIXTURES, CONTAINING AMMONIA AND CARBON DIOXIDE

Wilhelm Berkel, Mutterstadt, and Hans Gettert, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 1, 1974, Ser. No. 456,905

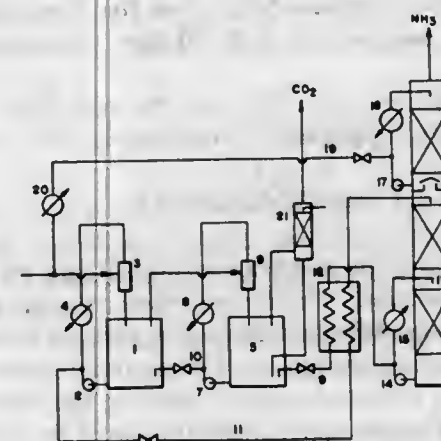
Claims priority, application Germany, Apr. 7, 1973, 2317603

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> B01D 53/14

U.S. Cl. 55—70

8 Claims



1. A process for the separation of a gas mixture containing ammonia and carbon dioxide by absorption in a solvent, which process comprises carrying out the absorption of said gas mixture in a mixing zone in which water as the solvent and said gas mixture are intimately mixed and thereafter separating non-absorbed gas mixture and water from one another, the residence time of the gas in the mixing zone being limited to a

maximum of 0.1 second in order to absorb the ammonia to a substantially greater extent than the carbon dioxide.

4,013,432

## BLOWER AND DUCT ARRANGEMENT FOR AIR FILTERING SYSTEM

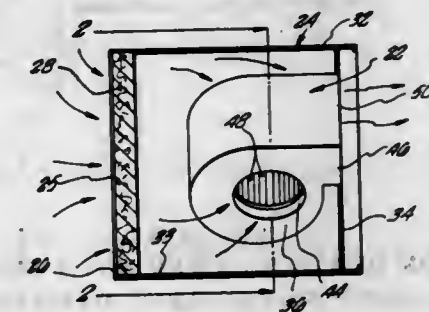
Richard H. Finger, Hollywood, Fla., assignor to Klykon, Inc., Miami, Fla.

Filed Apr. 21, 1975, Ser. No. 569,817

Int. Cl.<sup>2</sup> B01D 46/10

U.S. Cl. 55—467

6 Claims



1. An air flow system of the type in which a centrifugal blower unit having a motor-driven, essentially cylindrical, rotor element and a discharge port is mounted in an enclosure to draw air through a filtering media located at a first opening of said enclosure and discharge the filtered air through a second opening of said enclosure, the improvement therein comprising: said blower unit located within the enclosure and tilted with respect to the horizontal axis of said enclosure so that the axis of rotation of its rotor element extends along a line which makes an angle with the horizontal axis of said enclosure of between 15° to 75° inclusive, and has its midpoint located at approximately the geometric center of said enclosure.

4,013,433

## METHOD AND APPARATUS FOR PREPARING CONTAINER PACKAGES OF GLASS STRAND

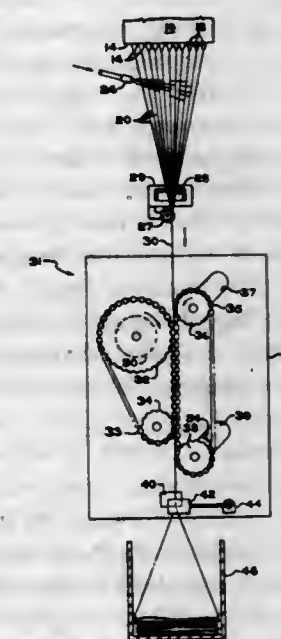
Thomas J. Briar, Trafford, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 1, 1976, Ser. No. 662,396

Int. Cl.<sup>2</sup> C03B 37/02

U.S. Cl. 65—2

15 Claims





prising a pair of elongated, driven, double toothed belts, said belts being meshed for a portion of their length between which said glass strand passes, a plurality of driven toothed pulleys around which said belts are driven and means for driving said pulleys and belts.

4,013,434

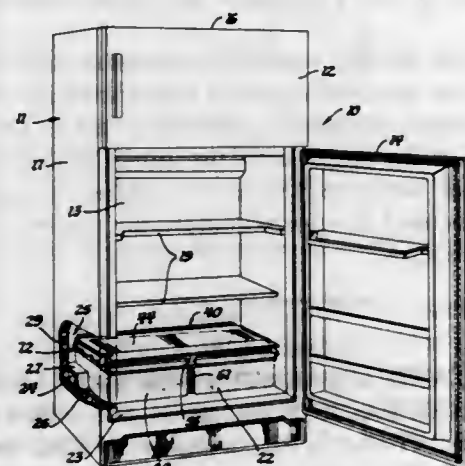
### HYDRATOR DRAWER COVER WITH ADJUSTABLE MOISTURE CONTROL DAMPER

Paul E. Kronenberger, and Robert Smith, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1976, Ser. No. 673,634  
Int. Cl.<sup>2</sup> F25D 17/04

U.S. Cl. 62—382

4 Claims



1. In a refrigerator cabinet having a food storage chamber furnished with a front access opening normally closed by a door, a refrigerating system associated with said cabinet including a refrigerant evaporator for chilling the interior thereof; a food storage closed receptacle in said chamber having an air vent for receiving refrigerated air from said chamber, a one piece baffle for adjusting the quantity of refrigerated air flowing through said vent, said receptacle having baffle engagement portions in the form of a plurality of spaced concave-like bearing surfaces opening outwardly therefrom, one edge of said baffle formed with a convex hinge surface adapted to pivot within the bearing surfaces, said baffle including a flexible arcuate finger formed integrally therewith, said finger located adjacent the opposite edge of said baffle and extending through said vent, said finger having an arcuate surface for engaging the adjacent edge portion of said vent, said finger spaced intermediate adjacent pairs of the concave-like bearing surfaces, baffle retaining means on said receptacle at said finger location causing elastic longitudinal arching of the flexible baffle between its bearing portions, which arching acts to frictionally hold said finger arcuate surface in a given relative position with said vent edge, and said finger including stop means for engagement with a stop surface carried by said receptacle, whereby said baffle may be rotated by the user from a fully closed to a fully open setting while imparting positioned stability so that the user may retain said baffle at any desired intermediate setting between its open and closed positions.

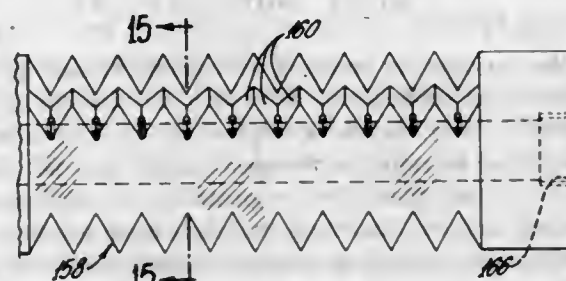
### 4,013,435 PRODUCTION OF ORGANIC FIBERS WITH INORGANIC CORES

John L. Kane, and George R. Machlan, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 12, 1975, Ser. No. 557,721  
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976  
Int. Cl.<sup>2</sup> C03B 37/02; C03C 25/02

U.S. Cl. 65—11 W

7 Claims



1. Apparatus for forming and coating filaments comprising a first tip section having a plurality of orifices from which a first fan of filaments are attenuated in a downward direction, a first applicator comprising a body having a supply chamber, a plurality of first grooves positioned in a common generally vertical plane, and passage means connecting said supply chamber with said grooves, means below said applicator for gathering said filaments into a strand, means for packaging the strand, a second tip section having a second fan of filaments are attenuated in a downward direction, a second applicator comprising a second body having a second supply chamber, a second plurality of second grooves positioned in a common generally vertical plane and parallel to the plane of the first grooves, and second passage means connecting said second supply chamber with said second grooves, second means below said applicator for gathering said second filaments into a second strand, second means for packaging the second strand, and an oven between said first and second applicators at one end and said first and second gathering means at the other end, said oven having at least one passage extending therethrough with heating means on opposite sides thereof for heating the first and second filaments passing therethrough.

4,013,436

### METHOD FOR THE PRODUCTION OF OBJECTS OF QUARTZ-GLASS BY DRAWING

Gerardus Henricus Antonius Maria Van Der Steen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,534  
Claims priority, application Netherlands, Nov. 18, 1974, 7414977

Int. Cl.<sup>2</sup> C03B 5/16

U.S. Cl. 65—32

1 Claim

1. A method for the continuous production of elongated objects of molten quartz which comprises: providing a starting material consisting of silicon dioxide in particle form, passing said starting material continuously at a predetermined rate to the upper part of a heated furnace, melting the starting material continuously in the upper, heated zone of the furnace in a gas atmosphere of hydrogen and helium in a volume ratio of 40–75% of hydrogen to 60–35% of helium at a melting temperature which is not less than 2050° C, heating of the molten material in the lower zone of the furnace by means of a separate heating device while a temperature is maintained which is less than 2050° C in the molten material and drawing the molten material continuously from the lower zone of the furnace by means of a forming device in the presence of an atmosphere containing hydrogen in a non-oxidizing carrier

gas, said starting material including silicon dioxide in particle form with oxides, hydroxides or compounds which upon heating are converted to oxides, of K and/or Mg in a quantity of between 50 and 200 × 10<sup>-3</sup> mol.% and/or Ca, Ba and/or Sr. in a quantity of between 5 and 200 × 10<sup>-3</sup> mol.%.

4,013,437

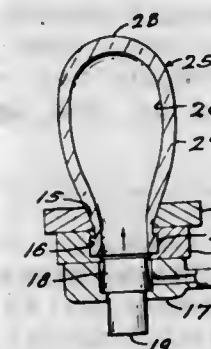
### METHOD FOR FORMING GLASS BOTTLES

John D. Northup, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 502,388, Sept., 1974, abandoned. This application May 15, 1975, Ser. No. 577,629  
Int. Cl.<sup>2</sup> C03B 9/14

U.S. Cl. 65—76

3 Claims



1. The method of forming a glass container or the like having thin walls of uniform thickness which comprises: feeding a charge of molten glass to a fixed, inverted one-piece parison body mold, split shoulder mold and neck mold forming a composite cavity therein; compacting the charge of glass in the composite cavity in the inverted blank or parison mold; counter-blowing the charge against the walls of the mold cavity and against a bottom closing baffle at the upper end of the inverted blank or parison mold; removing said baffle and the parison body mold; applying air under pressure to the interior of the parison while being supported by the neck mold and shoulder mold to expand the glass both vertically and transversely to the extent that the wall thickness of the expanded portion of the parison is of uniform thickness throughout; removing the shoulder mold from the parison; inverting the parison while being supported in the neck mold; enclosing the inverted parison within a blow mold; permitting the parison to sag within the blow mold to an extent less than the full height of the blow mold; and then expanding the parison within the blow mold cavity to form the container in its final form with uniform wall thickness.

4,013,438

### APPARATUS FOR MANUFACTURE OF FLOAT GLASS

Norman K. Gladieux, Oregon, and James W. Miller, Rossford, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

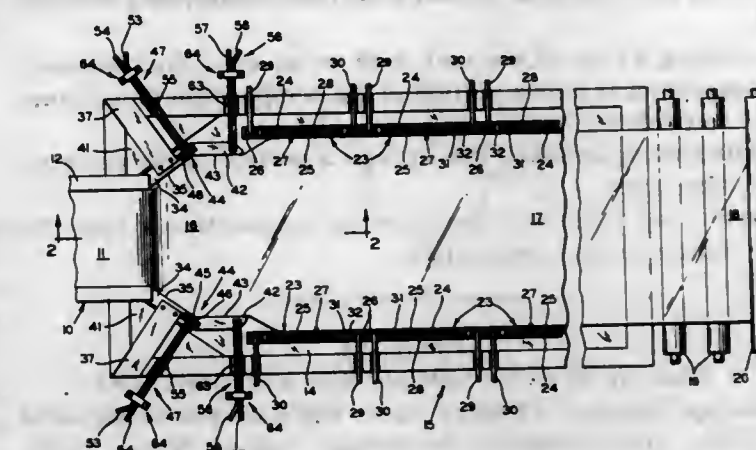
Filed Oct. 6, 1975, Ser. No. 619,570  
Int. Cl.<sup>2</sup> C03B 18/02

U.S. Cl. 65—94

13 Claims

12. In a method of operating a float glass facility to change from production of a glass ribbon of not substantially greater than equilibrium thickness to a ribbon of heavy glass wherein molten glass is continuously poured over a spout onto a body of molten metal in an elongated container between spaced restrictor tiles having extension tiles pivotally secured at their downstream ends and moved across said body to form said ribbon, the steps of installing fenders extending longitudinally along and spaced inwardly from the sides of said elongated container to restrict the lateral flow of said molten glass, and

swinging the free ends of said pivotally secured extension tiles from a position outwardly of said fenders to a position in-



wardly thereof to direct said molten glass between said fenders.

4,013,439

### GOB FORMING APPARATUS

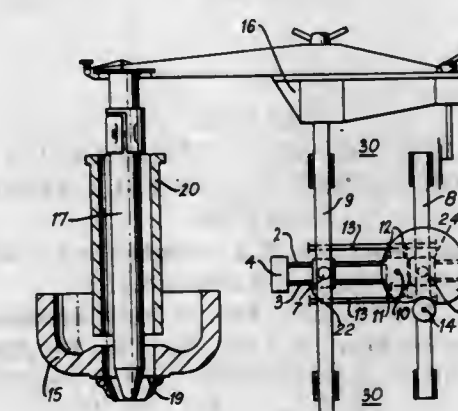
Petr Vlk, Wembley, England, assignor to British Hartford-Fairmont Limited, England

Filed May 8, 1975, Ser. No. 575,693  
Claims priority, application United Kingdom, May 13, 1974, 21076/74

Int. Cl.<sup>2</sup> C03B 9/00; G05G 1/00

U.S. Cl. 65—330

6 Claims



1. Gob forming apparatus for use in the production of glassware which apparatus comprises a refractory spout for molten glass and having an orifice in its floor, and, cooperating with the orifice, an axially reciprocating plunger, the plunger being mounted on an axially reciprocating shaft and a linkage for transmitting axial reciprocating movement to said shaft from a parallel shaft which is reciprocated by a drive means, the linkage comprising a bar; means pivotally mounting said bar, at a fixed position on the bar intermediate the ends of said bar, to a mounting member; means for adjusting the position of said mounting member in a direction parallel to said shafts and in a direction perpendicular to said shafts; a pivotal connection fixed on one axial shaft and slidably mounted on the bar to one side of said fixed position; and a pivotal connection fixed on the other axial shaft and slidably mounted on the bar to the other side of said fixed position.

4,013,440

### NITROGENOUS FERTILIZERS

William Henry Vale, East Brighton, Australia, assignor to Scientific and Applied Processes Pty., Ltd., Norwell, Australia

Continuation-in-part of Ser. No. 370,983; June 18, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,310  
Int. Cl.<sup>2</sup> C05F 11/02; C05C 9/00

U.S. Cl. 71—24

17 Claims

1. A process for the preparation of a nitrogenous composi-



tion suitable for use as a fertilizer and a soil conditioner and having a substantial nitrogen content of which is significant amount is in insoluble, slow-release form, comprising the steps of:

- treating a coal of low rank with an aqueous urea solution; subjecting at least a portion of the composition thus formed to oxidizing conditions;
- introducing an alkali into at least a portion of the composition; and
- removing water from the oxidized composition to form the nitrogenous composition.

4,013,441

## HERBICIDAL COMPOSITION AND METHOD

Giuseppe Bianchetti, Donato Pocar, and Riccardo Stradi, all of Milan, Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

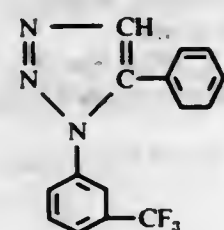
Filed Apr. 8, 1975, Ser. No. 566,050

Claims priority, application Italy, Apr. 19, 1974, 21651/74  
Int. Cl.<sup>2</sup> A01N 9/22; C07D 249/06

U.S. Cl. 71-92

8 Claims

1. A triazole compound of the formula:



4,013,442

## PROCESS FOR ENCAPSULATING PARTICLES BY IN-SITU FORMATION OF A METAL CARBONATE COATING

Faisal T. Kavar, Somerville, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 796,231, Feb. 3, 1969, abandoned. This application May 10, 1971, Ser. No. 141,968

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C05C 9/00

U.S. Cl. 71-28

10 Claims

1. A process for the encapsulation of particles by substantially water insoluble metallic carbonate salts comprising:
  - a. coating the particles with a finely divided solid material comprising the corresponding metal hydroxide of the metal carbonate; and
  - b. subjecting the coated particles to an atmosphere containing carbon dioxide for a time sufficient to at least substantially convert the hydroxide content of said coating to the corresponding carbonate.

4,013,443

## METHOD OF PREPARING LIQUID FERTILIZER

Edwin Kaine Schuman, 100 W. 14th, Rolla, Mo. 65401  
Filed Feb. 18, 1976, Ser. No. 659,148

Int. Cl.<sup>2</sup> C05D 1/02

U.S. Cl. 71-31

12 Claims

1. A method of preparing a liquid fertilizer comprising the steps of:
  - a. dissolving a quantity of (K<sub>2</sub>SO<sub>4</sub>:2MgSO<sub>4</sub>) in water at room temperature in a vessel connected to an agitator;
  - b. raising the solution slowly to a vigorous boil with frequent agitation for 10 to 15 minutes which reduces the volume by approximately 20% and dissolves approximately 80% of the (K<sub>2</sub>SO<sub>4</sub>:2MgSO<sub>4</sub>);
  - c. removing the insolubles by decantation;
  - d. adding a quantity of Na<sub>2</sub>HPO<sub>4</sub> to the admixture for reaction with the MgSO<sub>4</sub>, the quantity of Na<sub>2</sub>HPO<sub>4</sub> being in

excess of the stoichiometric amount thereof reactable with the constituents of the admixture;

- e. dissolving sufficient quantity of a dispersing agent selected from the group consisting of NaCl and KCl to the admixture to prevent agglomeration of the particles therein;
- f. adding a quantity of NH<sub>4</sub>NO<sub>3</sub> to the admixture for reaction with the constituents thereof, the quantity of said NH<sub>4</sub>NO<sub>3</sub> added to the admixture being in excess of the stoichiometric amount thereof reactable with the constituents of the admixture, the quantities of said MgSO<sub>4</sub>, Na<sub>2</sub>HPO<sub>4</sub>, and NH<sub>4</sub>NO<sub>3</sub> added to the water being sufficient to produce an acidic, buffered saturated solution and suspension and
- g. recovering the saturated solution and suspension after equilibrium conditions have been established and consisting substantially of Na<sub>2</sub>SO<sub>4</sub>, MgHPO<sub>4</sub>, MgNH<sub>4</sub>PO<sub>4</sub>, Na<sub>2</sub>HPO<sub>4</sub>, NaH<sub>2</sub>PO<sub>4</sub>, NH<sub>4</sub>NO<sub>3</sub>, NaNH<sub>4</sub>HPO<sub>4</sub>, (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, NaNO<sub>3</sub>, HNO<sub>3</sub>, NH<sub>4</sub>OH, the radicals [HPO<sub>4</sub>]<sup>-</sup>, [H<sub>2</sub>PO<sub>4</sub>]<sup>-</sup>, ionic Na, free NH<sub>3</sub>, H<sub>2</sub>O and substantial amounts of K<sub>2</sub>SO<sub>4</sub>.

4,013,444

## INHIBITING GRASS GROWTH WITH 5-ACETAMIDO-2,4-DIMETHYLTRIFLUOROMETHANESULFONANILIDE

Tomas L. Fridinger, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 331,676, Feb. 12, 1973, Pat. No.

3,894,078. This application June 19, 1975, Ser. No. 588,393  
Int. Cl.<sup>2</sup> A01N 9/14

U.S. Cl. 71-76

2 Claims

1. The method for inhibiting the rate of the growth of grass which comprises contacting grass with an effective amount of 5-acetamido-2,4-dimethyltrifluoro-methanesulfonamide or a horticulturally acceptable salt thereof.

4,013,445

## 1-(BIS-TRIFLUOROMETHYLPHENYL)-2-OXO-PYRROLIDINE-4-CARBOXYLIC ACID DERIVATIVES, THEIR PRODUCTION AND THEIR USE AS PLANT-GROWTH REGULATORS AND HERBICIDES

Daniel Bellus, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.  
Filed Oct. 23, 1975, Ser. No. 625,234

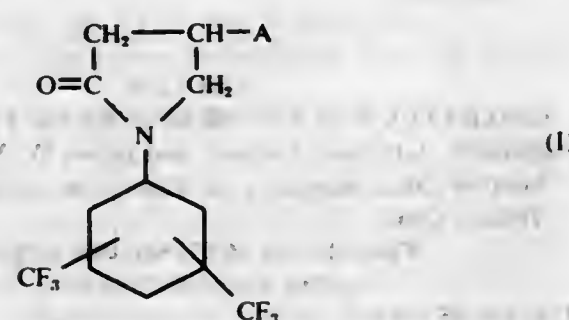
Claims priority, application Switzerland, Oct. 31, 1974, 14595/74

Int. Cl.<sup>2</sup> A01N 9/28

U.S. Cl. 71-76

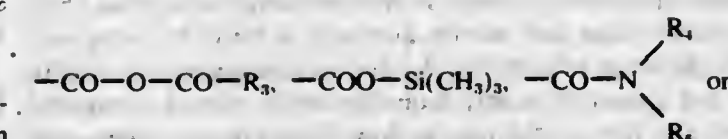
8 Claims

1. A 1-(bis-trifluoromethylphenyl)-2-oxo-pyrrolidine-4-carboxylic acid derivative of the formula I

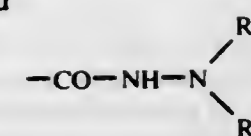


wherein

A represents a group -COO<sup>-</sup> H<sup>+</sup>, -COOR<sub>1</sub>, -COSR<sub>2</sub>, -CN, -COCl, -COF;



-continued



R<sub>1</sub> represents a mono- to trivalent metal cation of an inorganic or organic amine cation or quaternary ammonium cation, C<sub>1</sub>-C<sub>18</sub> alkyl, C<sub>1</sub>-C<sub>18</sub> alkyl substituted by halogen, hydroxyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, amino, mono- or di-(C<sub>1</sub>-C<sub>4</sub>) alkylamino, cyano, (C<sub>1</sub>-C<sub>4</sub> alk)oxy-carbonyl, carbamoyl, tetrahydrofuryl, tetrahydropyranyl, or oxacyclopropyl; alkenyl, halogenoalkenyl, alkynyl, halogenoalkynyl having 3 to 8 carbon atoms, cycloalkyl having 3 to 12 ring carbon atoms, phenyl, benzyl, phenethyl, or phenyl, benzyl or phenethyl substituted by C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, N-(C<sub>1</sub>-C<sub>4</sub> alkyl) amino, N, N-(C<sub>1</sub>-C<sub>4</sub>) dialkylamino, halogen, trifluoromethyl, amino or nitro,

R<sub>2</sub> represents alkyl having 1 to 6 carbon atoms, phenyl, benzyl, or phenyl or benzyl substituted by C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, N-(C<sub>1</sub>-C<sub>4</sub> alkyl) amino, N, N-(C<sub>1</sub>-C<sub>4</sub>) dialkylamino, halogen, trifluoromethyl, amino or nitro,

R<sub>3</sub> represents C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkyl substituted by at most 3 halogen atoms, or phenyl,

R<sub>4</sub> and R<sub>5</sub> each independently represent hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkyl substituted by halogen, hydroxyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, amino, mono- or di-(C<sub>1</sub>-C<sub>4</sub>) alkylamino, cyano, (C<sub>1</sub>-C<sub>4</sub> alk)oxy-carbonyl, carbamoyl, tetrahydrofuryl, tetrahydropyranyl, or oxacyclopropyl; C<sub>3</sub>-C<sub>6</sub> alkenyl, cycloalkyl having 3 to 8 ring carbon atoms, phenyl, phenyl substituted by C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, N-(C<sub>1</sub>-C<sub>4</sub> alkyl) amino, N, N-(C<sub>1</sub>-C<sub>4</sub>) dialkylamino, halogen, trifluoromethyl, amino or nitro, or

R<sub>4</sub> and R<sub>5</sub> together with the adjacent nitrogen atom also represent a saturated 3- to 8-membered heterocyclic ring, and said ring substituted by C<sub>1</sub>-C<sub>4</sub> alkyl.

8. Method for the regulation of plant growth, such as the inhibition of the growth of grasses and cereals, reduction of side shoots on tobacco plants, increase of the yield of soy beans, and the abscission of fruit, which comprises applying to the plant an effective amount of a pyrrolidine carboxylic acid derivative of the formula I of claim 1.

4,013,446

## METHOD FOR PREVENTING CREASING IN CITRUS FRUIT

Aharon Beresky, Haifa, and Avigdor Bar-Akiva, Rishon Le-Zion, both of Israel, assignors to Fertilizers & Chemicals Ltd., Haifa, Israel

Filed Aug. 5, 1975, Ser. No. 602,170

Claims priority, application Israel, Dec. 20, 1974, 46307

Int. Cl.<sup>2</sup> A01N 9/36

U.S. Cl. 71-86

3 Claims

1. A method for a significant reduction of creasing in citrus fruit wherein an effective amount of an aqueous solution of urea phosphate is applied to the citrus fruit by foliar sprays.

4,013,447

## COMPOSITIONS CONTAINING HERBICIDAL THIATRIAZINONE DERIVATIVES AND USE THEREOF

Ian Trevor Kay, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 20, 1975, Ser. No. 551,290

Claims priority, application United Kingdom, Mar. 1, 1974, 9317/74

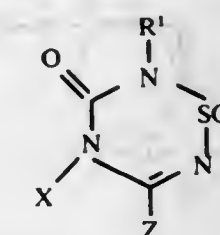
Int. Cl.<sup>2</sup> A01N 9/12

U.S. Cl. 71-91

8 Claims

1. A process of severely damaging or killing unwanted

plants, which comprises applying to the locus area an effective amount of a thiatriazine compound of the formula



and salts thereof, wherein R<sup>1</sup> is cyclohexyl or an alkyl radical of up to 8 carbon atoms; X is a hydrogen atom or an alkyl group of 1 to 3 carbon atoms; and Z is a group R<sup>2</sup>S— wherein R<sup>2</sup> is an alkyl group of 1 to 4 carbon atoms, or Z is a group —NR<sup>3</sup>R<sup>4</sup> wherein R<sup>3</sup> is a hydrogen atom, an alkyl radical of 1 to 5 carbon atoms, or an alkanoyl radical of 2 to 5 carbon atoms, and R<sup>4</sup> is an alkyl radical of 1 to 5 carbon atoms.

4,013,448

## 1,2,4-TRIAZOL-5-YL SULFAMIDES

Gerhard H. Alt, Creve Coeur, and James A. Klock, Overland, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

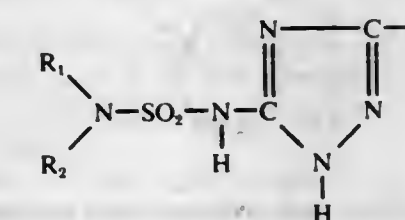
Filed Dec. 29, 1975, Ser. No. 645,187

Int. Cl.<sup>2</sup> A01N 9/16; C07D 249/14; A01N 9/22

U.S. Cl. 71-92

9 Claims

1. A compound of the formula



wherein R<sub>1</sub> and R<sub>2</sub> are independently selected from the group consisting of hydrogen and lower alkyl.

4,013,449

## METHOD OF CONTROLLING WEED GROWTH IN A PADDY FIELD

Tetsuo Takematsu; Makoto Konnai, both of Utsunomiya; Takayuki Isogawa, Tokyo, and Koshiro Kodama, Noshiro, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed July 14, 1975, Ser. No. 595,801

Claims priority, application Japan, July 12, 1974, 49-79091  
Int. Cl.<sup>2</sup> A01N 9/24

U.S. Cl. 71-106

7 Claims

1. A method of removing annual weeds from a flooded paddy rice field which comprises applying to the flooded water from 20-50 g/are of 3,4-dichloropropionanilide and 0.2 - 2.5 g/are of β-naphthyl-N-methyl carbamate.

4,013,450

## HERBICIDAL UREIDO CONTAINING CARBANILATES

John F. Olin, Ballwin, and Philip C. Hamm, Glendale, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 77,677, Oct. 2, 1970, Pat. No. 3,867,426.

This application Feb. 11, 1975, Ser. No. 549,128

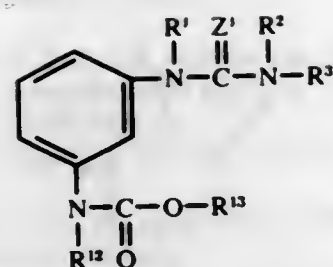
Int. Cl.<sup>2</sup> C07C 127/19

U.S. Cl. 71-111

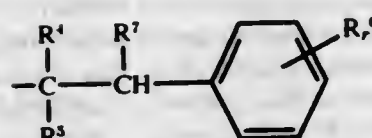
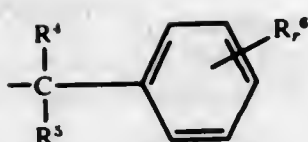
6 Claims

1. A meta-bifunctional substituted benzene having the formula

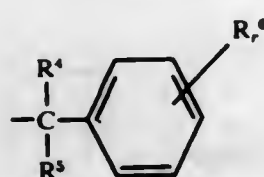




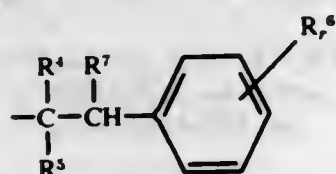
and the group



wherein Z<sup>1</sup> is selected from the group consisting of oxygen and sulfur; R<sup>1</sup> is selected from the group consisting of hydrogen, alkyl having a maximum of 8 carbon atoms and alkenyl having a maximum of 6 carbon atoms; R<sup>2</sup> is selected from the group consisting of hydrocarbyl selected from the group consisting of alkyl, alkenyl, alkynyl, and cycloalkyl said alkyl, alkenyl and alkynyl having a maximum of 12 carbon atoms and said cycloalkyl having 3 to 7 ring carbon atoms and a maximum of 4 chain carbon atoms, alkoxy having a maximum of 6 carbon atoms, chloroalkyl having a maximum of 6 carbon atoms and a maximum of 3 halogen atoms, chloroalkenyl having a maximum of 6 carbon atoms and a maximum of 3 halogen atoms, cycloalkenyl having 5 to 7 ring carbon atoms and a maximum of 4 chain carbon atoms, phenyl, substituted phenyl having a maximum of two substituents said substituents being selected from the group consisting of halogen, nitro and alkyl having a maximum of 4 carbon atoms, the group

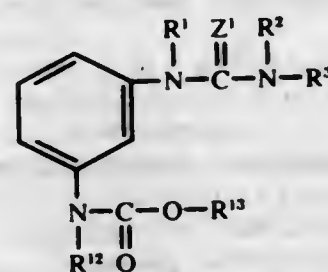


wherein R<sup>4</sup> and R<sup>5</sup> are each independently selected from the group consisting of hydrogen, alkyl having a maximum of 12 carbon atoms, alkenyl having a maximum of 3 carbon atoms, chloroalkyl having a maximum of 3 carbon atoms and a maximum of 3 halogen atoms, chloroalkenyl having a maximum of 3 carbon atoms and 3 halogen atoms, R<sup>6</sup> is selected from the group consisting of halogen, alkyl having a maximum of 14 carbon atoms, chloroalkyl having a maximum of 3 carbon atoms and a maximum of 3 halogen atoms, nitro, and alkoxy having a maximum of 3 carbon atoms; and r is one of the integers zero-to-three, the group

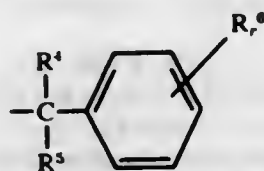


wherein R<sup>7</sup> is selected from the group consisting of alkyl and alkenyl each having a maximum of 4 carbon atoms, and R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> and r are as previously defined; and R<sup>3</sup> is selected from the group consisting of hydrogen, alkyl having a maximum of 12 carbon atoms, and alkenyl having a maximum of 8 carbon atoms; R<sup>12</sup> is selected from the group consisting of hydrogen, alkyl having a maximum of 6 carbon atoms and alkenyl having a maximum of 6 carbon atoms, cycloalkyl having from 3 to 7 ring carbon atoms, cyclohexenyl, phenyl, substituted phenyl having a maximum of two substituents said substituents being selected from the group consisting of halogen, nitro and alkyl having a maximum of 4 carbon atoms, the group

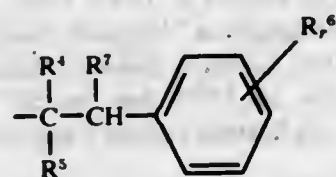
wherein R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup> and r are as previously defined.  
5. A herbicidal method which comprises applying to plants a herbicidal effective amount of a metal-bifunctional substituted benzene of the formula



wherein Z<sup>1</sup> is selected from the group consisting of oxygen and sulfur; R<sup>1</sup> is selected from the group consisting of hydrogen, alkyl having a maximum of 8 carbon atoms and alkenyl having a maximum of 6 carbon atoms; R<sup>2</sup> is selected from the group consisting of hydrocarbyl selected from the group consisting of alkyl, alkenyl, alkynyl and cycloalkyl said alkyl, alkenyl and alkynyl having a maximum of 12 carbon atoms and said cycloalkyl having 3 to 7 ring carbon atoms and a maximum of 4 chain carbon atoms, alkoxy having a maximum of 6 carbon atoms, chloroalkyl having a maximum of 6 carbon atoms and a maximum of 3 halogen atoms, chloroalkenyl having a maximum of 6 carbon atoms and a maximum of 3 halogen atoms, cycloalkenyl having 5 to 7 ring carbon atoms and a maximum of 4 chain carbon atoms, phenyl, substituted phenyl having a maximum of two substituents said substituents being selected from the group consisting of halogen, nitro and alkyl having a maximum of 4 carbon atoms, the group

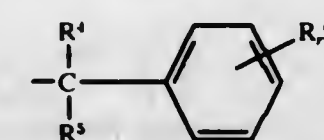


wherein R<sup>4</sup> and R<sup>5</sup> are each independently selected from the group consisting of hydrogen, alkyl having a maximum of 12 carbon atoms, alkenyl having a maximum of 3 carbon atoms, chloroalkyl having a maximum of 3 carbon atoms and a maximum of 3 halogen atoms, chloroalkenyl having a maximum of 3 carbon atoms and 3 halogen atoms, R<sup>6</sup> is selected from the group consisting of halogen, alkyl having a maximum of 14 carbon atoms, chloroalkyl having a maximum of 3 carbon atoms and a maximum of 3 halogen atoms, nitro, and alkoxy having a maximum of 3 carbon atoms; and r is one of the integers zero to three; the group

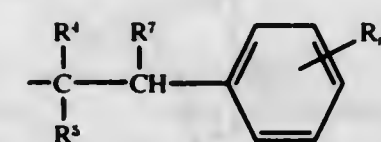


wherein R<sup>7</sup> is selected from the group consisting of alkyl and

alkenyl each having a maximum of 4 carbon atoms, and R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> and r are as previously defined; and R<sup>3</sup> is selected from the group consisting of hydrogen, alkyl having a maximum of 12 carbon atoms, and alkenyl having a maximum of 8 carbon atoms; R<sup>12</sup> is selected from the group consisting of hydrogen, alkyl having a maximum of 6 carbon atoms and alkenyl having a maximum of 6 carbon atoms, cycloalkyl having from 3 to 7 ring carbon atoms, cyclohexenyl, phenyl, substituted phenyl having a maximum of two substituents said substituents being selected from the group consisting of halogen, nitro and alkyl having a maximum of 4 carbon atoms, the group



and the group



wherein R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup> and r are as previously defined.

4,013,451

#### HERBICIDAL COMPOSITIONS FOR KILLING WEEDS IN VINEYARDS

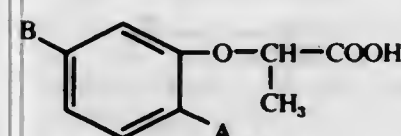
Pierre Poignant, Guy Borrod, and Raymond Richard, all of Lyon, France, assignors to Philagro S.A., Lyon, France  
Filed Sept. 5, 1975, Ser. No. 610,865

Claims priority, application France, Sept. 20, 1974, 74.32560

Int. Cl.<sup>2</sup> A01N 9/24

U.S. Cl. 71-116 10 Claims

1. A method of killing dicotyledon weeds in vineyards, comprising contacting said weeds with a quantity sufficient to kill said weeds of at least one compound of the formula



wherein A is CH<sub>3</sub> or Cl; B is H where A is CH<sub>3</sub> or B is H or Cl where A is Cl, or a simple derivative thereof.

4,013,452

#### UREA DERIVATIVES AND THEIR USE AS HERBICIDES

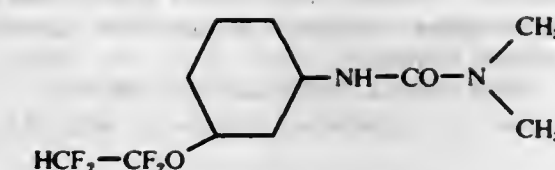
Otto Scherer, Bad Soden, Taunus; Gerhard Horlein, Frankfurt am Main, and Hubert Schonowsky, Neu-Isenburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany  
Division of Ser. No. 40,704, May 26, 1970, Pat. No. 3,937,726, which is a continuation-in-part of Ser. No. 628,843, April 6, 1967, abandoned, and Ser. No. 799,088, Feb. 13, 1969, abandoned, and Ser. No. 800,748, Feb. 19, 1969, abandoned.

This application July 21, 1975, Ser. No. 597,671

Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 71-120 4 Claims

1. A herbicidal preparation containing an effective amount of



as the active ingredient, in combination with an inert solid or liquid carrier, a solvent, adhesive, wetting agent, dispersing agent or grinding auxiliary.

4,013,453

#### FLAME SPRAY POWDER FOR WEAR RESISTANT ALLOY COATING CONTAINING TUNGSTEN CARBIDE

Maresh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed July 11, 1975, Ser. No. 594,943

Int. Cl.<sup>2</sup> C23C 7/00

U.S. Cl. 75-5 R 12 Claims

1. A composition of matter in the form of a powder mixture for use in the hard facing of metal substrates comprising a nickel-base alloy powder having substantially uniformly blended therewith a powder comprising agglomerates of nickel powder intimately combined with tungsten carbide powder,

the amount of tungsten carbide in said agglomerates ranging from about 70% to 90% by weight, with the nickel powder in said agglomerates ranging from about 30% to 10% by weight,

the ratio of said agglomerates to said nickel-base alloy powder in the powder mixture being such that the total mixture has an average tungsten carbide content ranging from about 10% to 30% by weight of said mixture,

the composition of said nickel-base alloy powder in said mixture comprising by weight about 2.5% to 20% Cr, about 0.5% to 6% Si, about 0.5% to 5% B, up to about 10% Fe and the balance essentially nickel.

4,013,454

#### COPRODUCTION OF IRON WITH METHANOL AND AMMONIA

Robert Kenneth Jordan, Carlton House, Suite 1431, 550 Grant St., Pittsburgh, Pa. 15219

Filed Mar. 4, 1975, Ser. No. 555,159

Int. Cl.<sup>2</sup> C21B 5/00, 3/04

U.S. Cl. 75-41 2 Claims

1. A process for the production of ferrous metal and methanol comprising,

a. operating a ferrous blast furnace using a carbonaceous fuel and combusted with a gas containing oxygen and carbon dioxide to produce ferrous metal and top gas containing carbon monoxide and carbon dioxide,

b. shifting the top gas from said ferrous blast furnace with steam to convert at least a part of the contained carbon monoxide to a gas containing carbon monoxide, carbon dioxide and hydrogen,

c. removing carbon dioxide from the shifted gas by a solvent based carbon dioxide removal process to produce a synthesis gas containing hydrogen, carbon monoxide and carbon dioxide, reacting said synthesis gas in a hydrogenation reactor to produce methanol.



4,013,455

## METHOD OF AND APPARATUS FOR TREATING A NONFERROUS METAL

Ulrich Kleeberg, Mulheim, and Jurgen Leimkuhler, Essen, both of Germany, assignors to Gottfried Bischoff Bau kompl., Essen, Germany

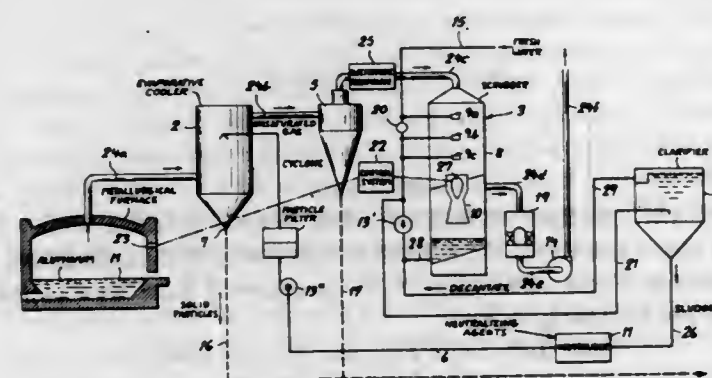
Filed Feb. 14, 1975, Ser. No. 550,016

Claims priority, application Germany, Feb. 21, 1974, 2408222

Int. Cl.<sup>2</sup> C22B 21/00

U.S. Cl. 75-68 R

7 Claims



1. A method of treating a nonferrous metal comprising the steps of:

heating a nonferrous metal in a metallurgical furnace to melt said metal and produce a hot impurity-bearing gas; evaporatively cooling said gas with a cooling liquid; thereafter separating particles from said gas in a dry process;

maintaining said gas above its dewpoint during evaporative cooling of said gas and particle separation therefrom; thereafter contacting said gas with a scrubbing liquid to scrub said gas and produce a scrubbing liquor; clarifying said liquor to produce a decantate and a sludge; recirculating said decantate for use as scrubbing liquid; neutralizing said sludge; and

recirculating the neutralized sludge and using same as at least part of said cooling liquid, whereby impurities in said gas are dissolved in said scrubbing liquid and separated out as crystals during the dry particle separation step.

3. An apparatus for treating a nonferrous metal comprising: a metallurgical furnace for melting a nonferrous metal and producing a hot gas;

a conduit defining a flow path for said gas; means in said conduit for evaporatively cooling said gas with a cooling liquid;

dry separator means downstream of the evaporative cooling means of said conduit for separating particles from said gas in a dry process;

scrubbing means including an annular gap washer downstream of said filter means in said conduit for contacting said gas with a scrubbing liquid for scrubbing said gas and producing a scrubbing liquor;

clarifying means connected to said scrubbing means for reducing said liquor to a decantate and a sludge;

means for feeding said decantate into said scrubbing means as said scrubbing liquid;

means connected to said clarifying means for neutralizing said sludge; and

means connected to the neutralizing means for feeding the neutralized sludge back to said evaporative-cooler means as at least part of said cooling liquid.

4,013,456

## METHOD FOR TREATING FLUE DUST CONTAINING LEAD

Svend Bergsøe, Astrup, Denmark, assignor to Paul Bergsøe &amp; Son a/s, Glostrup, Denmark

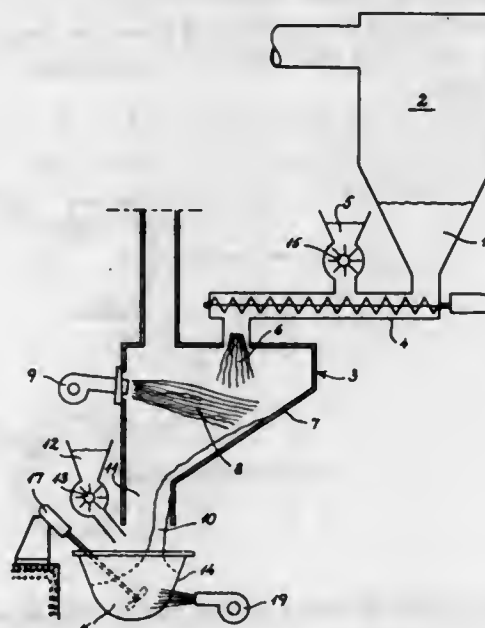
Filed June 4, 1975, Ser. No. 583,473

Claims priority, application Denmark, June 12, 1974, 3141/74

Int. Cl.<sup>2</sup> C22B 13/00

U.S. Cl. 75-77

10 Claims





initially bombarding the substrate as an electrode under DC or low frequency AC glow discharge under vacuum with ions of an inert non-metallic gas in the presence of available added or residual atmosphere oxygen; and exposing the resulting oxidized substrate as an electrode to a vapor cloud from a donor source comprising positive and negative ions of desired ambipolar photoconductive material, ions of the inert non-metallic gas comprising the glow discharge, and uncharged vaporized photoconductor material; in or adjacent to a low frequency AC electrical field utilizing the donor source of the vapor cloud of photoconductive material or adjacent structure as an additional electrode.

4,013,464

# PHOTOCONDUCTIVE AND RADIOCONDUCTIVE COMPOSITIONS AND ELEMENTS CONTAINING TETRAGONAL LEAD MONOXIDE

William A. Light, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,422

Int. Cl.<sup>2</sup> G03G 5/04

U.S. Cl. 96—1.5

9 Claims

1. A photoconductive and radioconductive insulating composition comprising tetragonal lead monoxide, a binder selected from the group consisting of polyvinylacetate, polyvinylformal and polyvinylbutyral and an anhydride capable of inhibiting dark conductivity in the composition, said anhydride present in effective amount less than about 4 percent of the weight of the lead oxide in the composition.

4,013,465

# REDUCING THE REFLECTANCE OF SURFACES TO RADIATION

Peter Brian Clapham, Chertsey, and Michael Christopher Hutley, Hanworth, both of England, assignors to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 467,354, May 6, 1974, abandoned.

This application Feb. 9, 1976, Ser. No. 656,757

Int. Cl.<sup>2</sup> G03C 5/00, 5/04

U.S. Cl. 96—36

16 Claims

1. A photo-exposure method for reducing the reflectance of a surface to electromagnetic radiation in a predetermined wavelength band which comprises applying a layer of photosensitive material to said surface, exposing the photosensitive layer to a regular pattern of light to which it is sensitive, and processing the exposed photosensitive layer to convert the effect of said light pattern on said photosensitive layer into a regular array of protuberances on said surface having a height which is not less than one third of the length of the longest wavelength in the band and at a spacing between adjacent protuberances which is less than the length of the shortest wavelength of the band divided by the refractive index of the material of which the protuberances consist.

4,013,466

# METHOD OF PREPARING A CIRCUIT UTILIZING A LIQUID CRYSTAL ARTWORK MASTER

Robert James Klaiber, Hopewell Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed June 26, 1975, Ser. No. 590,766

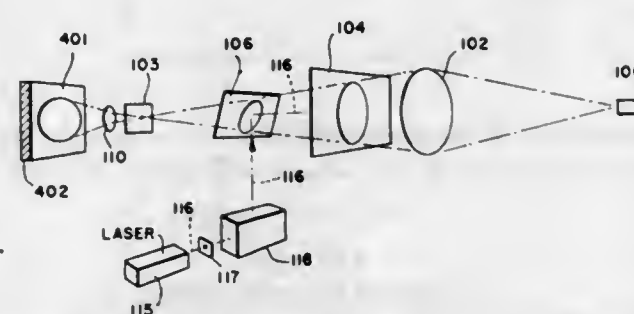
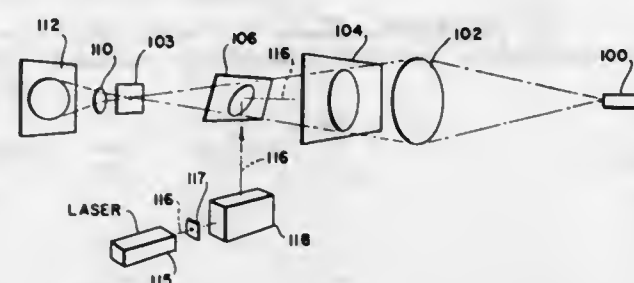
Int. Cl.<sup>2</sup> G03C 5/00, 5/04

U.S. Cl. 96—36

12 Claims

1. A method of forming a circuit mask which comprises: a. heating a selected portion of a cell comprising a liquid crystal above the transition temperature of said crystal to form an artwork master having a pattern formed therein capable of transmitting a desired radiant energy there-through in an imagewise manner;

- b. positioning a member, having a surface sensitive to said desired radiant energy, in a desired spatial relationship with said master;
- c. exposing said master to said desired radiant energy to



transmit said radiant energy through said pattern to form a radiation-exposed pattern on said sensitive surface; and d. treating said exposed sensitive surface to form a pattern capable of transmitting radiant energy therethrough to form the circuit mask.

4,013,467

# METHOD OF MANUFACTURING COLOR PICTURE TUBES USING ROTATING LIGHT ATTENUATOR

Kakuichiro Hosokoshi, Neyagawa, and Osamu Yoshida, Kyoto, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Division of Ser. No. 264,356, June 19, 1972, Pat. No.

3,906,515. This application June 5, 1975, Ser. No. 584,067

Claims priority, application Japan, June 18, 1971, 46-44414

Int. Cl.<sup>2</sup> G03C 5/00

U.S. Cl. 96—36.1

1 Claim

1. In a method of manufacturing a color screen for a color picture tube including the steps of: coating a photosensitive film on the inner surface of a face panel of the tube, securing a shadow mask to the inner surface of the facepanel with a specified gap in between, and exposing the photosensitive film through apertures of the shadow mask, a light-attenuator and a path-refracting lens to light beams emitted from a point-light source positioned at an off-center position of the axis of the face panel, said light-attenuator controlling exposures at the photosensitive film being located between the lens and the shadow mask in closer proximity to the shadow mask, the improvement that the light-attenuator is semitransparent with a specified distribution of light-transmission and rotates around an axis at its center during the light-exposure step, and that the distance between said point-light source and said light-attenuator is more than 1.5 times the distance between said point-light source and said refracting lens.

4,013,468

# METHOD OF HARDENING A PROTEIN-CONTAINING LAYER OF A SILVER HALIDE PHOTOGRAPHIC MATERIAL WITH AN ALKYL ESTER OF 1,2-DIHYDROQUINOLINE-N-CARBOXYLIC ACID

Peter Berghaller, Cologne; Wolfgang Himmelmann, Opladen, and Karl-Wilhelm Schranz, Odenthal-Hahnenberg, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed June 20, 1974, Ser. No. 481,190

Claims priority, application Germany, June 26, 1973, 2332317

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> G03C 1/30

U.S. Cl. 96—50 PT

11 Claims

1. The method of hardening a light sensitive silver halide material having at least one layer which contains at least in part a protein-containing hydrophilic binder by contacting the protein-containing hydrophilic binder with an effective amount of a hardening compound to cause a crosslinking reaction of the protein molecules in the binder the improvement according to which the hardening compound is an alkyl ester of carboxylic acid selected of 1,2-dihydroquinoline-N-carboxylic acid and 1,2-dihydroisoquinoline-N-carboxylic acid, the 1,2-dihydroquinoline nucleus of which being alkoxy substituted in its 2-position and the 1,2-dihydroisoquinoline nucleus of which being alkoxy substituted in its 1-position.

4,013,469

# CHEMICAL DEVELOPMENT OF A SILVER HALIDE EMULSION CONTAINING AN ARYLIUM SALT ON A POLYESTER FILM SUPPORT

Teruhide Haga, 145, 2-Chome, Ogikubo, Suginami, Tokyo; Koichi Horigome, 1407, 2-Chome, Kami-Shakujii, Nerima, Tokyo, and Mitsuo Ebisawa, 449, Kamikawa-cho, Hachioji, Tokyo, all of Japan

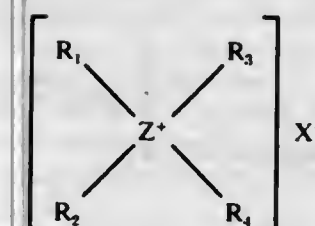
Continuation of Ser. No. 486,582, July 5, 1974, abandoned, which is a continuation of Ser. No. 277,587, Aug. 2, 1972, abandoned, which is a continuation of Ser. No. 60,108, July 31, 1970, abandoned. This application Feb. 6, 1976, Ser. No. 656,083

Int. Cl.<sup>2</sup> G03C 5/24, 1/34, 1/78

U.S. Cl. 96—63

4 Claims

1. A process for forming a silver image in a light-sensitive silver halide photographic material comprising a polyester film support, one or more layers on said support, including a silver halide emulsion layer and, incorporated in at least one of said layers, an antifogging amount of a compound having the formula



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> are individually benzyl, phenyl, naphthyl or C<sub>1</sub> to C<sub>12</sub>-alkyl phenyl group; Z is N, P, As or Sb; and X is an anion, said process comprising the steps of image-wise exposing said light-sensitive silver halide photographic material to light and developing the exposed material essentially only by treating with an aqueous silver halide developer.

4,013,470

# WARM IMAGE TONE PROVIDING PHOTOGRAPHIC ELEMENT

John T. Landon, Jr., Sao Paulo, Brazil, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,248

Claims priority, application United Kingdom, May 29, 1975, 23478/75

Int. Cl.<sup>2</sup> G03C 1/06, 1/02

U.S. Cl. 96—95

16 Claims

1. A photographic element containing an incorporated developing agent and which forms a warm image tone photographic print upon successive processing in an alkaline activator bath and a stabilizer bath, said element comprising a white reflective non-porous support, a silver halide emulsion layer which forms a viewable continuous tone silver image therein upon processing, wherein said silver halide is comprised of greater than 50 mole percent chloride, up to 5 mole percent iodide and the remainder bromide based on total halide, said layer additionally containing from 1 to 20 grams per mole of silver halide of an azaindene antifoggant, and in said emulsion layer or in a layer adjacent thereto, a mixture of from 1 to 10 mg per 0.1 meter<sup>2</sup> of a quaternary ammonium salt and from 1 to 10 mg per 0.1 meter<sup>2</sup> of a silver salt of a heterocyclic mercaptan represented by the general formula



wherein

Q represents the atoms necessary to complete a five- or six-membered heterocyclic ring.

4,013,471

# DEVELOPMENT OF PHOTOGRAPHIC SILVER HALIDE ELEMENTS

Robert Joseph Pollet, Vremde; Camille Angelina Vandeputte, Mortsel; Francis Jeanne Sels, Kontich; Gerard Laurens Vanreusel, Hove; Jozef Frans Willems, Wilrijk, and George Frans van Veelen, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Nov. 20, 1973, Ser. No. 417,498

Claims priority, application United Kingdom, Dec. 7, 1972, 56630/72

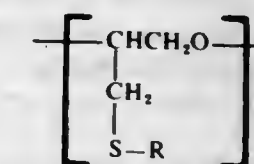
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> G03C 5/30, 1/72, 1/28, 1/06

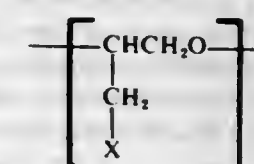
U.S. Cl. 96—66.3

22 Claims

1. A method of developing a photographic element containing developable silver halide, said method including having a polyoxyethylene compound present in the element or in the developer bath during development, said polyoxyethylene compound comprising from about 20 to 100 mole percent recurring units of the formula:



and 80 to 0 mole percent recurring units of the formula:





wherein R represents an aliphatic, aromatic, or heterocyclic group, and X is halogen.

4,013,472

**PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL**  
Ikutaro Horie, and Kameji Nagao, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 16, 1975, Ser. No. 541,467

Claims priority, application Japan, Jan. 16, 1974, 49-8123  
Int. Cl.<sup>2</sup> G03C 1/76

U.S. Cl. 96—67

7 Claims

1. A photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer and a surface disposed upon a silver halide emulsion layer consisting essentially of a binder containing an inorganic materials of which the main component is alumina-magnesium silicate having the following composition

SiO <sub>2</sub>	about 30	—	about 90 wt %
MgO	about 1	—	about 40 wt %
Al <sub>2</sub> O <sub>3</sub>	about 0.5	—	about 20 wt %

wherein the total of their contents is in the range of about 70 to 100 wt%, said inorganic material having a particle size when dispersed in water about 0.3 to 10 microns.

4,013,473

**RECORDING MATERIALS AND IMAGE RECEIVING MATERIALS FOR PRODUCING COPIES IN A DRY WAY**  
Jozef Frans Willems, Wilrijk; Albert Lucien Poot, Kontich; Jan Frans Van Besouw, Mortsel, all of Belgium; Alfons Klein, Dusseldorf, and Karlfried Wedemeyer, Cologne-Stammheim, both of Germany, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Aug. 21, 1975, Ser. No. 606,489

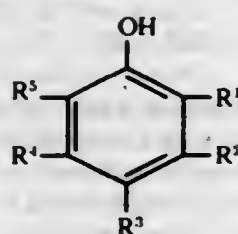
Claims priority, application Germany, Aug. 24, 1974, 2440678

Int. Cl.<sup>2</sup> G03C 1/42, 5/30

U.S. Cl. 96—114.1

13 Claims

1. Thermographic recording material or image-receiving material for dry copying processes comprising at least one layer and a substantially non-photosensitive reducible silver salt, a reducing agent, and optionally a toning agent or toning mixture, wherein the reducing agent corresponds to the following general formula:

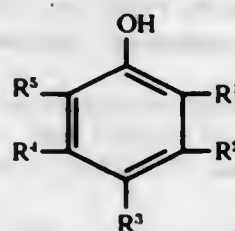


wherein:

- at least one of R<sup>1</sup> and R<sup>3</sup> represents a cyclopentyl group and the other, if any, represents hydrogen,
- R<sup>2</sup> represents a lower alkyl group containing 1-4 carbon atoms,
- R<sup>3</sup> represents hydrogen or a lower alkyl group containing 1-4 carbon atoms, and
- R<sup>4</sup> represents hydrogen.

12. Photographic recording process for the production of a visible silver image by (1) the image-wise exposure of a material comprising a layer that contains a photo-oxidizable reducing agent, which can be transferred by heat, and a photosensitive substance, which on the exposed areas transforms the reducing agent in a non-transferrable form by oxidation, (2) contacting the exposed layer with an image-receiving layer,

which contains a substantially non-photosensitive silver salt, optionally a toning agent and a reducing agent, and (3) overall heating the contacting layers, the photo-oxidizable reducing agent being transferred from the non-exposed layers of the photosensitive layer into the image-receiving layer wherein the image-wise reduction of the substantially non-photosensitive silver salt takes place in the presence of a phenol derivative of the following formula:



wherein:

- at least one of R<sup>1</sup> and R<sup>3</sup> represents a cyclopentyl group and the other, if any, represents hydrogen,
- R<sup>2</sup> represents a lower alkyl group containing 1-4 carbon atoms,
- R<sup>3</sup> represents hydrogen or a lower alkyl group containing 1-4 carbon atoms, and
- R<sup>4</sup> represents hydrogen.

4,013,474

**WOOD PRESERVATIVE COMPOSITIONS**

Leonard Teitell, and Sidney H. Ross, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 6, 1975, Ser. No. 575,100

Int. Cl.<sup>2</sup> C09K 3/18; C09D 5/14

U.S. Cl. 106—2

2 Claims

1. A durable decay resistant preservative formulation for use with wooden products which must withstand severe tropical humidities in excess of 18 months, said formulation consisting of:

- 5.0 parts by weight pentachlorophenol
- 10.0 parts by weight gamma-aminopropyltriethoxysilane
- 0.5 parts by weight water
- 84.5 parts by weight 2-butoxyethanol

4,013,475

**POLISH**

Marvin Liebowitz, Edison, and Eugene Howard Brandli, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

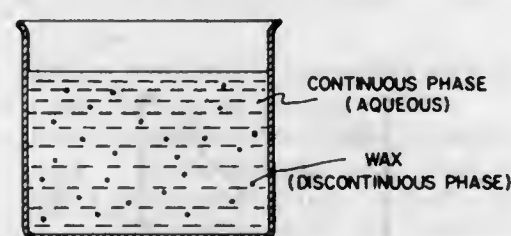
Filed Sept. 27, 1974, Ser. No. 510,033

Int. Cl.<sup>2</sup> C09G 1/12

U.S. Cl. 106—10

21 Claims

WAX EMULSION (OIL IN WATER EMULSION)



1. A process for the preparation of a stable water-in-oil double emulsion useful for treating hard surfaces which comprises intimately mixing

- A. a homogeneous organic solvent solution comprising (1) from about 0.05 to 9% of organopolysiloxane having a viscosity of from about 20 to 15,000 centistokes, (2) from about 5 to 50% of organic solvent having an aniline point of from about -22° to 185° F and a distillation range of

4,013,477

**METHOD FOR PREPARING DENSE, β-ALUMINA CERAMIC BODIES**

Arun D. Jatar, Ivan B. Cutler, Anil V. Virkar, and Ronald S. Gordon, all of Salt Lake City, Utah, assignors to The University of Utah, Salt Lake City, Utah

Filed July 30, 1975, Ser. No. 600,260

Int. Cl.<sup>2</sup> C04B 35/10

U.S. Cl. 106—73.4

4 Claims

1. In a process for forming a β'-alumina containing ceramic body comprising

- A. forming a green ceramic body from a matrix powder which is of a composition consistent with the formation of β'-alumina upon sintering and
- B. sintering said green ceramic body at a temperature and for a time necessary to achieve the desired final density and convert said composition to β'-alumina,

the improvement comprising mechanically mixing said matrix powder, with β'-alumina seed crystals prior to forming said green ceramic body, said seed crystals having a particle size up to 100 micrometers, the amount of said crystals ranging up to 50% by weight of said total mixture of seed crystals and matrix powder.

4,013,476

**NON-COMBUSTIBLE MOLDING MATERIAL**

Harutoshi Ueda, Osaka; Naoyuki Suzuki, Nara, and Masami Nagao, Takatsuki, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 406,611, Oct. 15, 1973, Pat. No.

3,945,840, Continuation-in-part of Ser. No. 183,077, Sept. 23, 1971, abandoned. This application Sept. 30, 1974, Ser. No.

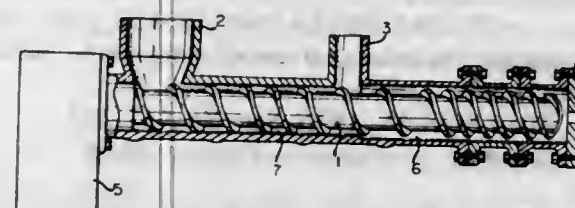
510,869

Claims priority, application Japan, Sept. 24, 1970, 45-84199; Sept. 24, 1970, 45-84200; Sept. 25, 1970, 45-84468; Oct. 22, 1970, 45-93321; Nov. 16, 1970, 45-101231; Dec. 28, 1970, 45-126941; Dec. 29, 1970, 45-124120

Int. Cl.<sup>2</sup> C09D 5/18; C04B 43/02

U.S. Cl. 106—15 FP

9 Claims



1. A non-combustible molding composition which is capable of hardening after being dehydrated to a moisture content of 5 to 50 % by weight consisting essentially of:

- a. 100 parts by weight of a hydraulic inorganic mixture consisting of an inorganic substance composed predominantly of silica selected from the group consisting of quartz rock, silica sand, aplite, pottery stone, silicate terra alba, diaspore, diatomaceous earth, fly ash, perlite, obsidian perlite, pumice microballoon, foamed shale pumice, foamed clay and vermiculite; and an inorganic substance composed predominantly of calcium oxide selected from the group consisting of slaked lime, quick lime and calcium carbonate, the molar ratio of the inorganic substance composed predominantly of calcium oxide to the inorganic substance composed predominantly of silica being from 0.5 to 1.2;
- b. 10 to 200 parts by weight of mineral fibers selected from chrysotile asbestos, amosite asbestos, crocidolite asbestos, amphibole asbestos, tremolite asbestos, actinolite asbestos, rock wool, glass fiber and slag wool; and
- c. 1 to 10 parts of vanadium oxide selected from the group consisting of vanadium pentoxide, vanadium sesquioxide, vanadium dioxide, vanadium monoxide, sodium metavanadate and ammonium metavanadate.

4,013,479

**AQUEOUS NATURAL RESINOID COMPOSITIONS**

Arthur Biddle, 3405 Floyd Ave., Richmond, Va. 23221, and Alpheus Eugene Clonts, 325 N. Laburnum Ave., Richmond, Va. 23223

Filed May 23, 1975, Ser. No. 580,337

Int. Cl.<sup>2</sup> C08L 89/00, 93/02

U.S. Cl. 106—133

11 Claims

1. A natural resin coating composition base comprising a liquid carrier base for said resin, a solubilizing agent for said resin, and vanillin in the presence of ammonia. The natural resin being a member of the plant, animal or mineral resinoid substances. Said vanillin being present in amounts to sufficiently eliminate obnoxious odors and poisonous effects of the fumes emitted by excess ammonia after the crosslinking action has taken place.



4,013,480

## CELLULOSIC SIZING AGENTS

Lewis E. Chumbley; Lawrence L. Sams, II, both of Lake Jackson; Russell T. McFadden, Freeport; Juan Longoria, III, Lake Jackson, all of Tex.; Donald A. Tomalia, Midland, Mich.; Robert J. Thomas, Midland, Mich., and James W. Lalk, Shepherd, Mich., assignors to The Dow Chemical Company, Midland, Mich.

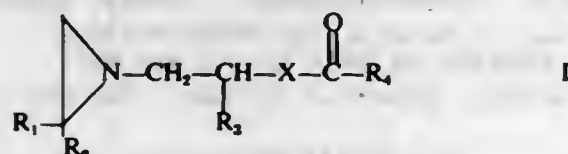
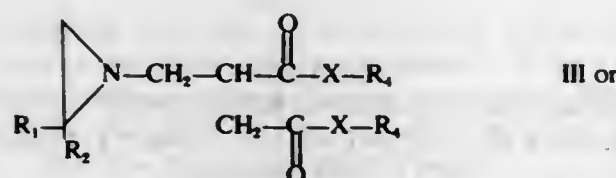
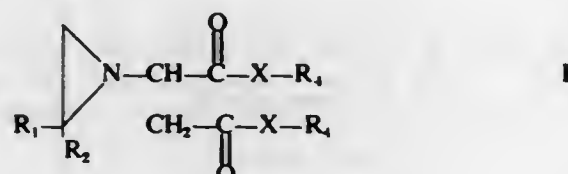
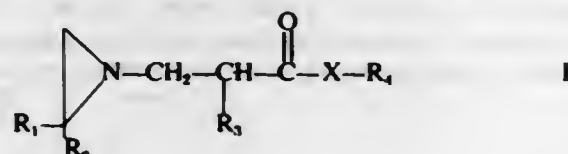
Continuation-in-part of Ser. No. 180,234, Sept. 13, 1971, abandoned, Ser. No. 323,373, Jan. 15, 1973, abandoned, and Ser. No. 323,374, Jan. 15, 1973, abandoned. This application Jan. 10, 1974, Ser. No. 432,265

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976  
Int. Cl.<sup>2</sup> C08J 3/02

U.S. Cl. 106-213

27 Claims

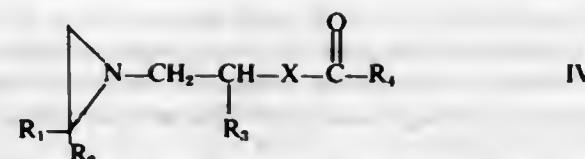
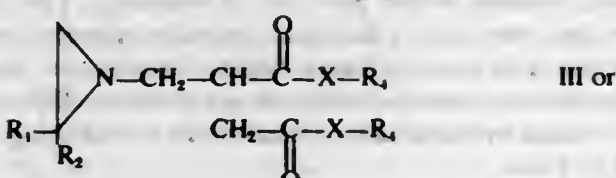
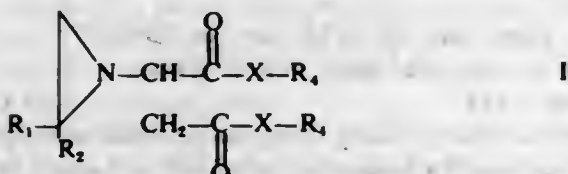
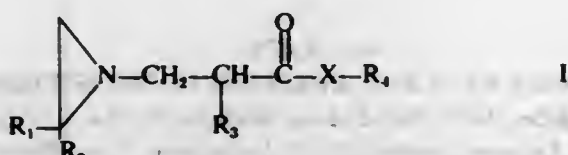
1. A mixture of (a) a ring-opened aziridiny homopolymer of an aziridiny monomer corresponding to the formula



and (b) cationic starch,

wherein: X is oxygen or amido nitrogen, R<sub>1</sub> and R<sub>2</sub> are hydrogen or lower alkyl of from 1 to 4 carbon atoms, R<sub>3</sub> is hydrogen or methyl and R<sub>4</sub> is an organic hydrophobic group.

15. In the process of sizing cellulosics, the improvement consisting of applying to a cellulosic, in an amount sufficient to size same, a sizing agent comprising a ring-opened aziridiny homopolymer of an aziridiny monomer corresponding to the formula



wherein: X is oxygen or amido nitrogen, R<sub>1</sub> and R<sub>2</sub> are hydrogen or lower alkyl of from 1 to 4 carbon atoms, R<sub>3</sub> is hydrogen or methyl and R<sub>4</sub> is an organic hydrophobic group.

4,013,481

## PIGMENT FORMULATION

Hans-Heinz Mölls; Karlheinz Wolf, both of Leverkusen; Reinhold Hörnle, Cologne, all of Germany; Gottfried Popp, Charleston, S.C.; Konrad Nonn, Leverkusen, and Jürgen Spille, Schildgen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 4, 1972, Ser. No. 311,779

Claims priority, application Germany, Dec. 4, 1971, 2160208

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 10, 1976  
Int. Cl.<sup>2</sup> C09C 3/00

U.S. Cl. 106-309

12 Claims

1. In the process of comminution of aqueous pigment dispersions or pigment pastes in the presence of a surface active agent; the improvement comprising utilizing as said surface active agent in an amount of 0.1 to 50% relative to pigment, a surface-active agent which is saponifiable under acidic or alkaline conditions; following comminution, saponifying said surface active agent under acidic or alkaline conditions; and removing saponification products having solubility in water; the resulting pigment being free of surface-active agent.

4,013,482

## PROCESS AND APPARATUS FOR THE MANUFACTURE OF DRY SOLID MOLASSES

Pierre Jaconelli, Venissieux, France, assignor to A.V.D. A Votre Disposition, France

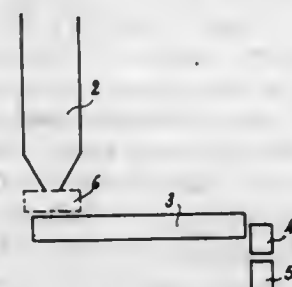
Filed Mar. 16, 1976, Ser. No. 667,282

Claims priority, application France, May 30, 1975, 75.17508

Int. Cl.<sup>2</sup> B01D 1/22; C13F 1/00, 3/00

U.S. Cl. 127-9

16 Claims



1. In the process for the manufacture of solid, dry molasses comprising drying the molasses and cooling and dividing the dried molasses, the improvement wherein said cooling and dividing step comprises:

cooling the molasses in a thin layer, immediately after said drying step, said layer being sufficiently thin in relation to the cooling temperature to allow the molasses to be cooled to the core thereof;

precursing the cooled molasses to coarse particles, and reducing the coarse particles to a powder by impact without crushing or significant friction.

4,013,483

## METHOD OF ADJUSTING THE THRESHOLD VOLTAGE OF FIELD EFFECT TRANSISTORS

Gérard Nuzillat, and Christian Arnado, both of Paris, France, assignors to Thomson-CSF, Paris, France

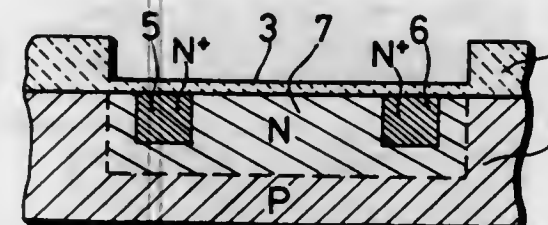
Filed July 22, 1975, Ser. No. 598,165

Claims priority, application France, July 26, 1974, 74.26057

Int. Cl.<sup>2</sup> H01L 21/265

U.S. Cl. 148-1.5

5 Claims



1. A method of adjusting threshold voltages of field-effect transistors comprising the following steps:

- starting from a semiconductor wafer having a first type of conductivity, manufacturing a plurality of production devices destined to become field-effect transistors, each possessing a source, a drain, a gate constituted by a metal compound, and a semiconductor region destined to become the channel of a field-effect transistor, and concomitant manufacturing, in the same wafer, of a monitoring device possessing a source, a drain, a gate constituted by said metal compound and a semiconductor region respectively of the same type as the source, drain, gate and semiconductor region of any production transistor, and an appendix electrically connected to the gate of said monitoring device, and electrically insulated from the source and drain of said monitoring device, said appendix being made of the same metal compound as said gates having dimensions which make it possible to contact it with measuring means;
- implanting ions in said wafer to modify the conductivity type of said regions, and concomitant measuring of the threshold voltage of said monitoring device, and
- stopping ionic implantation when the threshold voltage, in the monitoring device reaches a predetermined value.

4,013,484

## HIGH DENSITY CMOS PROCESS

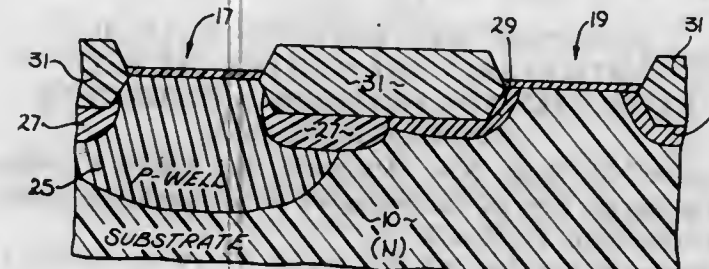
Edward J. Boleky, Saratoga, and Charles Scott, Mountain View, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 25, 1976, Ser. No. 661,386

Int. Cl.<sup>2</sup> H01L 21/265

U.S. Cl. 148-1.5

20 Claims



1. On a silicon substrate which includes a first area for a first MOS device and a second spaced-apart area for a second MOS device, a process for forming channel stops of opposite conductivity type in the intermediate region between said first and second areas, comprising the steps of:

forming a masking member on said substrate, said masking member protecting a portion of said intermediate region; doping the portion of said intermediate region unprotected by said masking member with a dopant of a first conductivity type to define a first channel stop;

removing said masking member; doping said intermediate region with a dopant of a second conductivity type forming a second channel stop adjacent to said first channel stop; whereby adjacent full channel stops may be fabricated in alignment with each other and with said first and second areas.

4,013,485

## PROCESS FOR ELIMINATING UNDESIRABLE CHARGE CENTERS IN MIS DEVICES

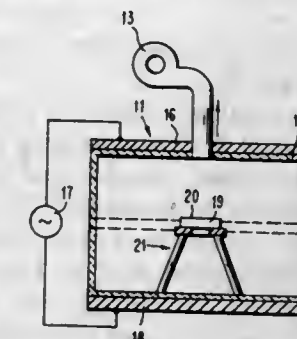
Tso-Ping Ma, Mount Kisco, and William Hsioh-Lien Ma, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,368

Int. Cl.<sup>2</sup> H01L 21/263

U.S. Cl. 148-1.5

7 Claims



1. A process for restoring the electrical properties of radiation damaged semiconductor structures comprising treating the structures with a radio frequency field which is oriented substantially perpendicular to the structures in a substantially neutral atmosphere at reduced pressure.

4,013,486

## SPOT SCARFING NOZZLE FOR USE IN GANG ARRANGEMENT

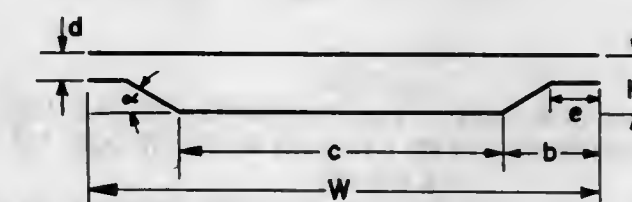
Stephen August Engel, Shenorock, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 26, 1975, Ser. No. 607,887

Int. Cl.<sup>2</sup> B23K 7/06

U.S. Cl. 148-9.5

5 Claims



1. An oxygen discharge nozzle for selectively scarfing defects in a metal body while avoiding the formation of fins along the boundaries of the scarfing cut, said nozzle being suited for simultaneous side-by-side operation in combination with other like nozzles to produce scarfing cuts at least as wide as the width of said combined nozzles, said nozzle comprising: an oxygen gas passage terminating in a nozzle discharge orifice, said orifice being characterized by having a central section and at least one end section, the central section being defined by parallel upper and lower edges and being adapted to discharge a sheet-like stream of cutting oxygen of uniform intensity across the metal body to be scarfed, and the end section being defined by having at least one of its edges inclined such that the height of the end section of the discharge orifice is gradually reduced to a lesser value towards the side edge of the orifice but remaining greater than zero at said edge so as to diminish the intensity of the oxygen stream towards said edge of the orifice to the point where the flow of oxygen discharged at said edge is insufficient to scarf the workpiece but sufficient to produce a fin-free scarfing cut at least as wide



as the width of said nozzle, thereby allowing a plurality of said nozzles to operate side-by-side to produce a fin-free cut of preselected width.

4,013,487

# NICKEL AND/OR COBALT-COATED STEEL WITH CARBURIZED INTERFACE

Lars H. Ramqvist; Nils Olle Grönder; Malte Spörreng, all of Nynashamn, and Per Enghag, Garphyttan, all of Sweden, assignors to Rederiaktiebolaget Nordstjernan, Sweden  
Filed Mar. 4, 1975, Ser. No. 555,108

Claims priority, application Sweden, Mar. 14, 1974, 7403411

Int. Cl.<sup>2</sup> C23C 11/12; C25D 5/50

U.S. Cl. 148—16.5

5 Claims

1. A process for producing a corrosion resistant carburized steel article which comprises, applying a first metal coating comprising a layer of metallic nickel and/or cobalt of thickness ranging from about 5 to 20 microns to the surface of said steel article having a carbon content ranging up to about 0.5% by weight, carburizing said metal coated steel at an austenitizing temperature ranging from about 800° to 1000° C for a time sufficient to produce a carburized zone of thickness at least about 0.1 mm beneath said metal coating, rapidly cooling said article from its austenitizing temperature to produce a martensitic structure in at least said carburized zone, and then applying to said nickel and/or cobalt layer a second metal coating of over 2 microns thick of a metal selected from the group consisting of Cr, Sn, Pb, Zn, Cu and Cd, said nickel and/or cobalt layer having been cleaned of any deposited carbon formed thereon during the carburization step, whereby said article is characterized by an adherent first metal coating bonded to said steel and a second metal coating covering said first metal coating, said article being characterized further by improved resistance to corrosion and improved physical properties.

4,013,488

# PROCESS FOR IMPROVING THE ANTI-CORROSION PROPERTIES OF STEEL COATED WITH NICKEL OR COBALT

Lars H. Ramqvist; Nils Olle Grönder; Malte Spörreng, all of Nynashamn, and Per Enghag, Garphyttan, all of Sweden, assignors to Rederiaktiebolaget Nordstjernan, Sweden

Claims priority, application Sweden, Mar. 14, 1974, 7403412  
Filed Mar. 4, 1975, Ser. No. 555,286

Int. Cl.<sup>2</sup> C23C 17/00

U.S. Cl. 148—143

5 Claims

1. A process for improving the corrosion resistance of a steel article subject to corrosion which comprises, plating said article with a first thin layer of at least one metal selected from the group consisting of nickel and cobalt over a thickness range of over about 2 to 50 microns, heat treating said coated article in a protective or reducing atmosphere at an austenitizing temperature falling within the range of about 725° to 1000° C at substantially less than about 45 minutes, and then applying a second thin layer of at least one metal selected from the group consisting of chromium, tin, lead, zinc, copper and cadmium to said first layer of a thickness of over about 2 to 50 microns, whereby a coated article is obtained characterized by improved resistance to corrosion.

4,013,489

# PROCESS FOR FORMING A LOW RESISTANCE INTERCONNECT IN MOS N-CHANNEL SILICON GATE INTEGRATED CIRCUIT

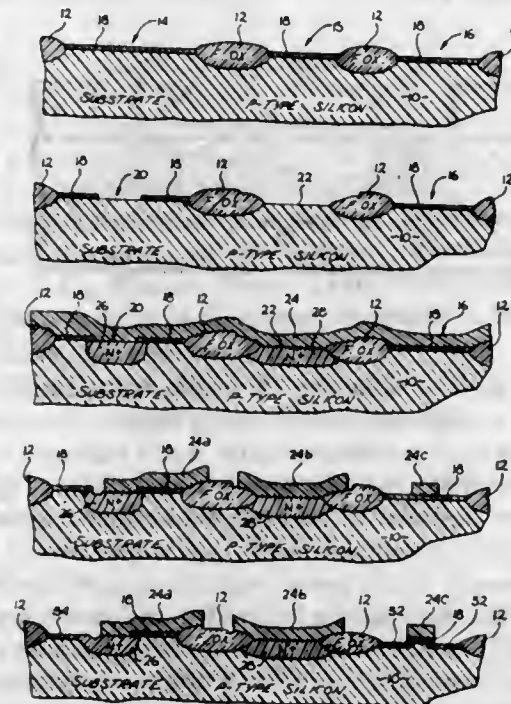
William G. Oldham, El Cerrito, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 10, 1976, Ser. No. 656,933

Int. Cl.<sup>2</sup> H01L 21/225, 21/20, 27/02

U.S. Cl. 148—174

9 Claims



1. In an MOS process for fabricating n-channel, silicon gate devices on a silicon substrate, where a polycrystalline silicon layer is formed on an oxide layer and where said polycrystalline silicon layer is etched in predetermined patterns such that at least source and drain regions may be doped in said substrate in alignment with said predetermined patterns, an improvement in said process wherein a low resistance crossunder is formed at a proposed site in the substrate comprising: removing said oxide layer at said proposed site of said crossunder prior to the formation of said polycrystalline silicon layer; and doping said polycrystalline silicon layer prior to said etching of said layer; whereby said polycrystalline silicon layer contacts said substrate at said site of said crossunder, thereby forming a low resistance crossunder in said substrate, whereby said polycrystalline silicon layer directly contacts said substrate at said site of said crossunder, thereby forming a low resistance crossunder at the point of contact in said substrate.

4,013,490

# PHOSPHOR IDENTIFICATION METHOD, PARTICULARLY ADAPTED FOR USE WITH EXPLOSIVES, FOR PROVIDING A DISTINCTIVE INFORMATION LABEL

Frederick M. Ryan, New Alexandria, and Robert C. Miller, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 345,375, March 27, 1973, which is a division of Ser. No. 143,772, May 17, 1971, Pat. No. 3,772,099. This application Aug. 12, 1974, Ser. No. 496,672  
Int. Cl.<sup>2</sup> C06B 45/00, 45/02, 39/00; C09K 3/00

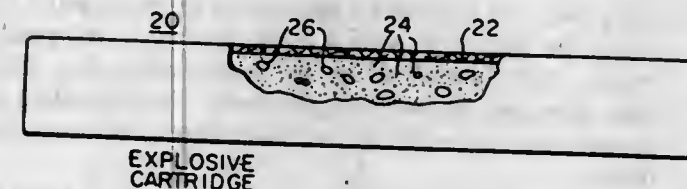
U.S. Cl. 149—2

23 Claims

1. The method of providing explosive material with an individualistic and readily identifiable label which can withstand the shock, high temperatures, pressures and reactive atmospheres encountered when said explosive material is detonated to provide identification for said explosive material, which method comprises:

a. selecting a combination comprising different inorganic

phosphor materials the most of which are inorganic phosphor materials activated by different ions which provide different and distinctive line emissions when said phosphor materials are excited by predetermined energy, with the different and distinctive emissions of said different selected phosphor materials providing indicia of sufficient different bits of then-known information regarding said explosive material to provide an identification of said explosive material; and



b. securing as an information label in intimate association with said explosive material and receptive to the shock, high temperatures, pressures and reactive atmospheres resulting from detonation thereof said selected predetermined combination of said different phosphor materials, whereby the later identification of said explosive material is determinable by said different and distinctive emissions of said selected phosphor materials.

4,013,491

# INCENDIARY COMPOSITIONS OF MAGNESIUM AND FLUOROALKYL PHOSPHATE ESTERS

Graham C. Shaw, Garland, Utah, and Russell Reed, Jr., Ridgecrest, Calif., assignors to Thiokol Corporation, Newtown, Pa.

Filed May 14, 1975, Ser. No. 577,199

Int. Cl.<sup>2</sup> C06B 45/10, 39/06, 39/02, 33/00

U.S. Cl. 149—19.3

11 Claims

1. An incendiary composition consisting essentially of particulate magnesium and a mono- or difluoroalkyl phosphate ester or mixture of said fluoroalkyl phosphate esters wherein the alkyl group or groups are all fluoroalkyl groups and have 5 to 11 carbon atoms.

4,013,492

# METHOD OF SIMULTANEOUSLY PLATING DISSIMILAR METALS

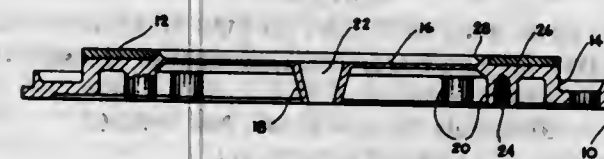
Edgar Avinell Rager, Campbell, and Barry Bruce Webber, Morgan Hill, both of Calif., assignors to Edgar Avinell Rager, Campbell, Calif.

Filed Oct. 21, 1975, Ser. No. 624,425

Int. Cl.<sup>2</sup> C25D 5/44, 5/36; C23C 3/00; B32B 15/20

U.S. Cl. 156—632

12 Claims



1. A process for plating an article comprising the steps of a. joining two dissimilar metals, including a first metal selected from the group consisting of ferromagnetic metals, brass metals, and copper metals with a second metal selected from the group consisting of aluminum metals and magnesium metals; b. simultaneously chemically cleaning exposed surfaces of said joined metals and thereafter, c. simultaneously depositing a layer of plating material on said exposed surfaces of said joined metals.

4,013,493

# PROCESS FOR ETCHING GLASS OR CERAMIC SURFACE

Truman L. Ward; Ruth R. Benerito, both of New Orleans, and Jacques J. Hebert, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 499,689, Aug. 22, 1974, Pat. No. 3,926,709. This application Sept. 8, 1975, Ser. No. 611,371  
Int. Cl.<sup>2</sup> C03C 15/00

U.S. Cl. 156—654

1 Claim

1. A process for etching a glass or ceramic surface, the process comprising placing an appropriately shaped or cut piece of sodium plumbite treated cellulosic textile containing about at least 25% lead, flat against the surface of glass or ceramic; heating the assembly in a closed heating chamber for about 60 minutes at temperatures of about from 600° to 700° C.; the chamber and contents being cooled gradually to avoid fracture of the original glass or ceramic surface; and peeling off the newly formed glasslike product to reveal an etched area that is identical to the shape and relief of the original cellulosic textile.

4,013,494

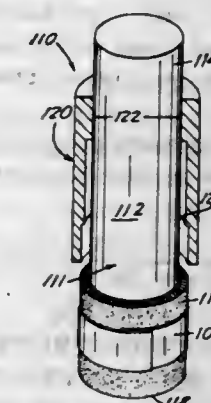
# TUBE FORMING METHOD

Richard A. Patterson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn. Division of Ser. No. 479,671, June 17, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,719

Int. Cl.<sup>2</sup> B29C 27/18; B29D 23/10

U.S. Cl. 156—86

6 Claims



1. A method for forming a tube from a predetermined length of tape having a coating of pressure sensitive adhesive extending the entire predetermined length of one surface of the tape, said method including the steps of: providing a multiplicity of resilient flexible bristles arranged with their tips projecting outwardly to define at least the major portion of a peripheral surface in the shape of a tube about an axis; wrapping the tape around said peripheral surface with the adhesive coating contacting the bristle tips and the ends of the tape overlapped to form a tube; and sliding the tube axially off the peripheral surface so that the flexible bristles are deflected axially of the peripheral surface thereby decreasing the cross section size of the peripheral surface defined by the bristle tips and breaking the contact between each bristle tip and the pressure sensitive adhesive on the inner surface of the tube.



4,013,495

## METHOD FOR REPAIRING PIGMENTED AND TEXTURED FLEXIBLE MATERIALS

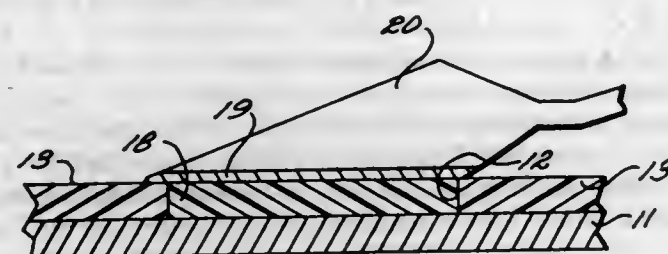
Harvey J. Golumbic, Fullerton, Calif., assignor to Vinyl-Chem International, Inc., Glendale, Calif.

Filed Sept. 17, 1975, Ser. No. 614,130

Int. Cl.<sup>2</sup> B32B 35/00

U.S. Cl. 156-98

10 Claims



1. A process for repairing damaged area in a pigmented vinyl base material comprising:

- preparing an area to be repaired in the vinyl base material by making a hole with a sharp, clean edge;
- cleaning the surface of the base material adjacent to the hole;
- drying the cleaned area;
- applying at least one layer into the hole, the layer being of a liquid vinyl-welding compound having a color contrasting with the color of the vinyl base material and having a fusion temperature about equal to that of the vinyl base material, and a high tensile strength relative to the vinyl base material;
- applying one top layer into the hole, the top layer being of a liquid vinyl-welding compound pigmented to match the color of the vinyl base material, and having a fusion temperature about equal to that of the vinyl base material, and a high tensile strength relative to the vinyl base material;
- working each layer before applying a successive layer around the edge of the hole to obtain intimate contact between the vinyl base material and the layers;
- curing each layer and fusing each layer into the vinyl base material before applying a successive layer by the application of heat after each layer has been worked;
- cooling each cured layer before applying a successive layer to prevent the premature curing of the successive layer; and
- leveling the last pigmented layer before it is cured to obtain a continuous surface between the vinyl base material and the last layer.

4,013,496

## METHOD FOR PRODUCING SHRUNKEN PILFER-PROOF NECK LABELS ON CONTAINERS

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 22, 1974, Ser. No. 526,124

Int. Cl.<sup>2</sup> B65C 3/20; B29C 27/22, 27/30; B32B 1/00

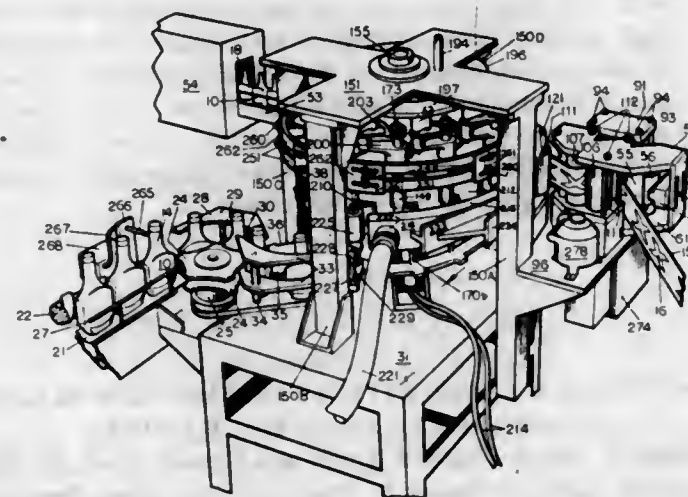
U.S. Cl. 156-85

7 Claims

1. The method of labelling containers each having a closure applied on one end thereof, comprising providing a web of preprinted, heat shrinkable, organic thermoplastic material, forming transverse pleats across the width of the web at spaced intervals along the length of the web, cutting lengths of said material from the web to form label blanks, each of the blanks having plural transverse pleats thereon, wrapping each of said blanks on a mandrel, overlapping the leading and trailing ends of the blank on the mandrel and bonding the overlapped ends together to form a seamed sleeve, the sleeve having said pleats disposed on either side of the said seam thereof,

placing the sleeve over a container with a closure thereon, the sleeve being positioned to encircle a portion of the container adjacent the closure and the closure, and heating the label sleeve sufficiently to shrink it into snug surface engagement with said container and closure and thereby isolate any wrinkles at said pleats.

4. The method of making a pilfer-proof package comprised of the steps of: providing a web of heat shrinkable organic thermoplastic material, scoring the web lengthwise thereof to form a partial depth slit in the web to provide a predetermined weakened line therein that extends along the length dimension thereof and disposed laterally in the web corresponding to a predetermined height location in labels to be made therefrom, cutting lengths of said material from the web to form label blanks,



wrapping each of said blanks on a mandrel, with said slit adjacent the mandrel and extending circumferentially of the mandrel, overlapping the leading and trailing ends of the blanks on the mandrel and heat sealing them together to form an axially seamed label sleeve, applying pressure to the heat sealed seam on the mandrel, placing the label sleeve over a bottle having a skirted closure closing one end thereof, the label sleeve encircling the neck of the bottle and closure and axially positioned thereon such that the circumferential slit is located adjacent the annular terminal edge of the closure skirt, and heating the material of the label sleeve sufficiently to shrink it into annular snug surface engagement with said bottle neck and closure providing a surface conforming, pilfer detecting label thereon.

4,013,497

## METHOD AND APPARATUS FOR DELABELING

William D. Wolf, Simsbury, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed July 31, 1975, Ser. No. 600,605

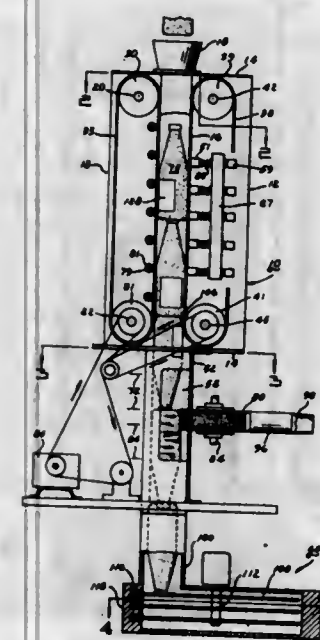
Int. Cl.<sup>2</sup> B32B 31/18

U.S. Cl. 156-154

18 Claims

11. A dry process for delabeling axially symmetrical, lightweight plastic containers comprising the steps of:
- sequentially inserting said containers lengthwise to a tubular feed passage;
  - driving the containers in the direction of their longitudinal axes along the feed passage toward a delabeling zone;
  - rotating the containers about their axes after reaching said zone;
  - abrading labels from the containers in the delabeling zone during said rotation;

- E. supporting the containers in a direction substantially perpendicular to their axes during said abrading and rotating; and



- F. air conveying the removal labels from said delabeling zone as released from the containers.

4,013,498

## ETCHING APPARATUS FOR ACCURATELY MAKING SMALL HOLES IN THICK MATERIALS

John J. Frantzen, North St. Paul, and Lee C. Barton, St. Anthony Village, both of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.

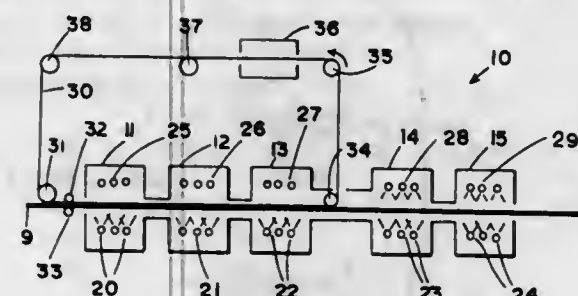
Division of Ser. No. 487,665, July 11, 1974, Pat. No.

3,971,682. This application Sept. 29, 1975, Ser. No. 617,682

Int. Cl.<sup>2</sup> C23F 1/02

U.S. Cl. 156-345

1 Claim



1. An apparatus for making elongated etched openings in a television aperture mask whereby the etched openings have a minimum dimension which is less than the thickness of the continuous sheet of metal;

means for receiving a sheet of material of thickness T having an etchant resist pattern on opposite sides, one of the etchant resist patterns defining an opening larger than the thickness of the material and the etchant resist pattern on the opposite side defining an opening having a dimension less than the thickness of said material;

an etchant resist shield for forming a leakproof seal over the etchant resist pattern which defines openings having a dimension less than the thickness of said material; said etchant resist shield comprising a belt of flexible material operable to be peeled off said sheet of material; a pair of rollers for applying said etchant resist shield into contact with said sheet of material;

means for supporting said sheet of material and said etchant resist shield during the etching of said sheet of material; a first set of at least three etching stations having means for spraying etchant upward onto the side of said material having etchant resist defining openings which are larger than the thickness of said material;

means for separating the etchant resist shield from the etchant resist without removing the etchant resist;

and a second set of at least two etching stations having means for simultaneously spraying etchant on the material from above and for spraying etchant on the material from below to produce an opening having a minimum dimension less than the thickness of said material.

4,013,499

## APPARATUS FOR SUPPORTING A TIRE WHILST A STRIP OF PREMOLDED TREAD IS BEING APPLIED THERETO IN ORDER TO RECONSTRUCT THE TREAD ON THE SAID TIRE

Italiana Benigni, Lucca, Italy, assignor to Ital-Rubber S.r.l., S. Alessio (Lucca), Italy

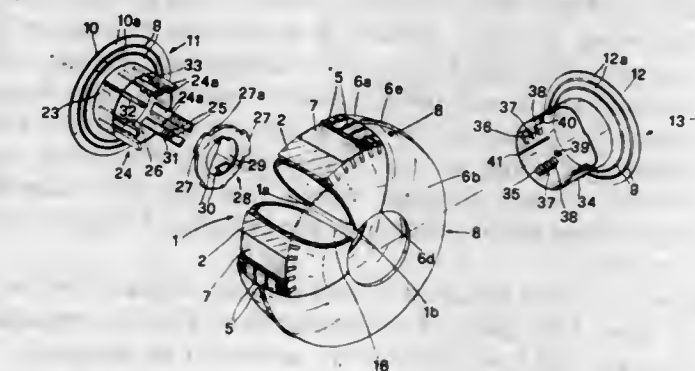
Filed Oct. 15, 1975, Ser. No. 622,648

Claims priority, application Italy, Oct. 31, 1974, 3514/74

Int. Cl.<sup>2</sup> B29H 17/38

U.S. Cl. 156-394

8 Claims



1. An improved apparatus for supporting a tire whilst a strip of premolded tread is being applied thereto in order to reconstruct the tread on the said tire, the apparatus comprising a rim which circumferentially supports the said tire, the outside surface of which, suitably prepared, has wound around it a strip of premolded tread, with special bonding means being interposed between said strip of tread and the surface of the tire facing it and including a protective casing which closely externally enshrouds the strip of tread and the side walls of tire, extending up to the vicinity of the beading on the tire, said rim being constituted by two coaxial tubular members, a first member of which is inserted axially in the second member, said first and second members having around their circumference parts that can be connected to one another in a free and complementary fashion at the time said first member is inserted in said second member, said parts having a plurality of grooves aligned in batches along planes perpendicular to the axis of said first and second member, it being possible to lock said first member to said second member and to unlock it therefrom by partially rotating in one direction or the other, a disk housed in one of the aforementioned batches of grooves, said first and second tubular members being provided externally with a rim portion extending symmetrically with respect to a plane perpendicular to the axis of the tire supporting rim wherein the surface pointing towards the inside of the said tire supporting rim is shaped to externally enshroud both the bead on the tire and part of the side walls thereof at the time said members are locked one to the other, and at least two further grooves provided on said surface and extending in a direction parallel to the plane of symmetry, said further grooves housing integrally the same number of sealing rings as there are grooves, these serving to lock the said protective casing up against the side walls of the tire in an air tight fashion.



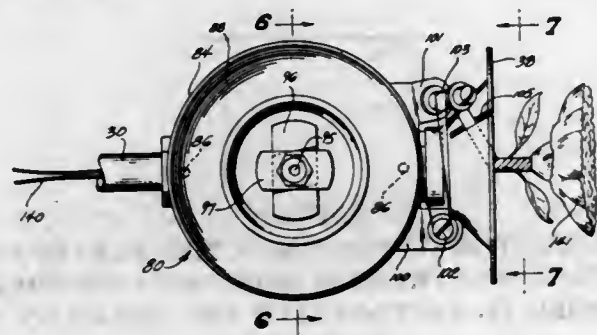
4,013,500

**APPARATUS FOR WRAPPING ELONGATED ARTICLES**  
James J. Koput, 13910 Forest Knoll Court, New Berlin, Wis. 53151, and Elmer P. Knoll, c/o General Delivery, Wautoma, Wis. 54982

Filed Oct. 6, 1975, Ser. No. 619,913  
Int. Cl.<sup>2</sup> B65H 81/00

U.S. Cl. 156-425

17 Claims



1. Apparatus for wrapping elongate articles with a flexible material, said apparatus comprising:

- a base;
- hollow spindle means rotatably mounted on said base and having an open front end for receiving articles to be wrapped;
- a face plate mounted on the front end of said spindle means extending generally radially from the axis of rotation of said spindle means having a central aperture aligned with the opening in said spindle means; said face plate being generally conical and having a concave front surface and further including at least a first radially extending slot formed therein through which said flexible material passes, said slot extending to the peripheral edge of said face plate;
- dispenser means attached to said spindle adjacent the back of said face plate for feeding said flexible material through said first slot onto the article to be wrapped;
- roller means disposed between said dispenser means and the back of said face plate for guiding said flexible material to said slot, said slot being angularly advanced from said roller means in the direction of rotation of said spindle means; and
- means for rotatably driving said spindle means.

4,013,501

**GROWTH OF NEODYMIUM DOPED YTTRIUM ALUMINUM GARNET CRYSTALS**

Le Grand Gerard Van Uiter, Morris Township, Morris County, and George John Zydzik, Columbia, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

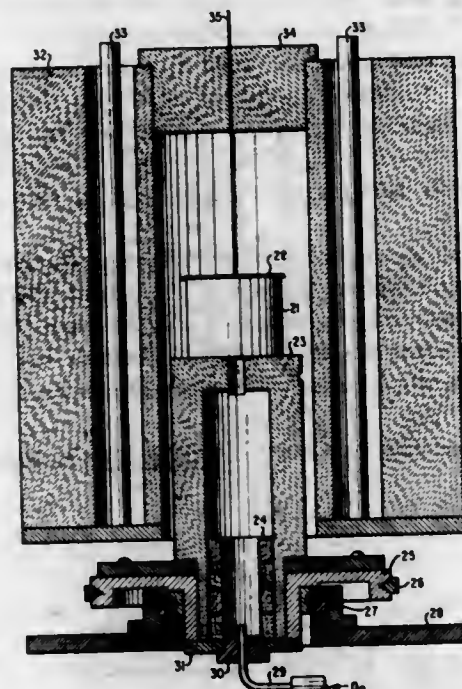
Filed May 27, 1976, Ser. No. 690,613  
Int. Cl.<sup>2</sup> B01J 17/04; C01F 17/00

U.S. Cl. 156-605

9 Claims

1. A method of growing neodymium-doped yttrium aluminum garnets from a melt of a mixture of flux components  $PbO$ ,  $PbF_2$ ,  $B_2O_3$ , and constituent components  $Nd_2O_3$ ,  $Y_2O_3$ , and  $Al_2O_3$  and maintained in an atmosphere containing a substantial amount of oxygen and at an initial temperature on the order of  $1300^\circ C$  CHARACTERIZED IN THAT said melt is (a) cooled at a first rate in the range of from  $0.1^\circ C$  per hour to  $10^\circ C$  per hour to a first temperature in the range of from  $1050^\circ C$  to  $1200^\circ C$ , (b) rapidly reheated to a temperature on the order of  $1300^\circ C$ , (c) cooled at a second rate in the range of from  $0.1^\circ C$  per hour to  $3^\circ C$  per hour to a second temperature in the range of from  $1050^\circ C$  to  $1200^\circ C$ , (d) maintained at said second temperature for a period of from 1-20 days, and (e) cooled at a third rate in the range of from  $0.1^\circ C$  per

hour to  $3^\circ C$  per hour to a temperature in the range of from  $900^\circ C$  to  $950^\circ C$  and further CHARACTERIZED IN THAT a



temperature gradient in the range of from  $5^\circ C/cm$  to  $80^\circ C/cm$  is maintained in said melt.

4,013,502

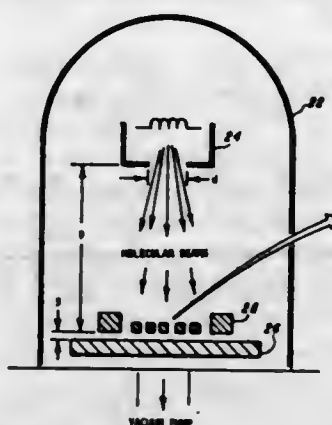
**STENCIL PROCESS FOR HIGH RESOLUTION PATTERN REPLICATION**

Edward J. Staples, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 18, 1973, Ser. No. 370,897  
Int. Cl.<sup>2</sup> C23C 13/08

U.S. Cl. 156-608

3 Claims



3. A method for replication of a patterned thin film on a substrate comprising:

- preparing a wafer of single crystalline semiconductor material so as to locate its upper and lower surfaces in planes parallel to a fast etching crystallographic plane of the single crystalline semiconductor material of said wafer,
- etching the upper surface of said wafer with an orientation dependent etchant to form a recess therein bounded by vertical side walls lying in planes respectively perpendicular to the upper surface of said wafer,
- forming a mask layer covering the upper surface of said wafer including the recessed area thereof,
- patterning said mask layer by selectively removing portions therefrom to expose at least one portion of the bottom surface of said recess formed in said wafer while another portion of the bottom surface of said recess remains covered by the patterned mask layer,
- epitaxially growing the same semiconductor material as that of said wafer on the said exposed at least one portion of the bottom surface of said recess until the level of said epitaxial growth is substantially flush with the upper surface of said wafer,

4,013,504

**METHOD AND APPARATUS FOR SPRAY DRYING SLURRIES AND THE LIKE**

Walter E. Morris, 752 Thurmond Drive, Macon, Ga. 31204  
Filed Sept. 18, 1975, Ser. No. 614,643

Int. Cl.<sup>2</sup> B01D 1/16

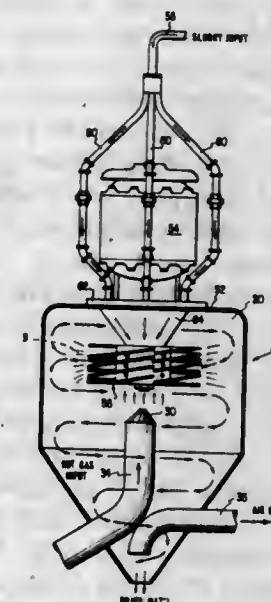
U.S. Cl. 159-4

7 Claims

removing the patterned mask layer from said wafer, etching the lower surface of said wafer in a region in registration with the recess formed in the upper surface of said wafer up to the depth of said recess to provide at least one patterned opening extending through said wafer in a membrane area defined by the epitaxial growth of said semiconductor material and a reduced thickness as compared to the remainder of said wafer, thereby defining a high resolution stencil having said at least one patterned opening through said membrane area, wherein the boundaries between each said opening and the membrane area of said stencil defining the periphery thereof lie substantially in planes perpendicular to the upper and lower surface of said stencil.

interposing said high resolution stencil between a molecular beam source of film-forming material and a substrate on which the patterned thin film is to be deposited wherein said high resolution stencil serves as a deposition mask, and

directing a molecular beam from the source onto the membrane area of said stencil such that the molecular beam passes through said at least one patterned opening to the portion of the substrate exposed therebeneath for depositing the patterned thin film thereon.



4,013,503

**FILAMENTARY SILICON CARBIDE CRYSTALS BY VLS GROWTH IN MOLTEN IRON**

Wilhelmus Franciscus Knippenberg, and Gerrit Verspui, both of Eindhoven, Netherlands, assignors to North American Philips Corporation, New York, N.Y.

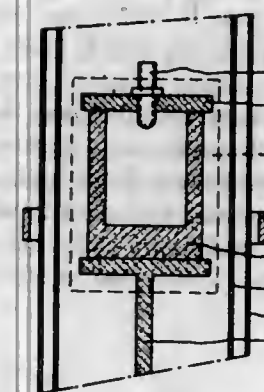
Continuation of Ser. No. 226,284, Feb. 14, 1972, abandoned, which is a continuation of Ser. No. 690,005, Dec. 12, 1967, abandoned. This application July 25, 1975, Ser. No. 599,087  
Claims priority, application Netherlands, Dec. 14, 1966, 6617544; Mar. 8, 1967, 6703609

The portion of the term of this patent subsequent to Mar. 20, 1990, has been disclaimed.

Int. Cl.<sup>2</sup> B01J 17/26, 17/32; C01B 31/36

U.S. Cl. 156-609

5 Claims



1. A method of manufacturing filamentary crystals of silicon carbide, comprising the steps of:

- applying elemental iron in finely divided form to a substrate surface capable of withstanding temperatures in the range of  $1150^\circ C$  to  $1400^\circ C$ ; and
- exposing said substrate surface to an atmosphere containing carbon and silicon at a temperature between  $1150^\circ C$  and  $1400^\circ C$ , until droplets comprising iron form on said surface dissolving carbon and silicon from said atmosphere and filamentary crystals of silicon carbide of desired length grow from said surface at the sites of said droplets carrying said droplets away from said surface on the ends of said crystals.

1. An apparatus for spray drying a slurry or the like comprising a drying chamber, a high speed rotary atomizing head within the drying chamber including a hollow body portion and external rotary driving means coupled with the body portion to rotate the same at high speed in the drying chamber, said hollow body portion having circumferentially spaced slurry discharge orifices extending radially of the rotational axis of the body portion, slurry delivery means connected with the hollow body portion for feeding a slurry thereto from a slurry source external to the drying chamber, a plurality of radially wide and axially spaced parallel spiral vanes on the exterior of the body portion of the atomizing head, each vane comprising an interrupted spiral segment extending for a part only of the circumference of said body portion and rigid therewith and being staggered on the body portion axially relative to adjacent segments to thereby define plural drying gas inlet mouths peripherally and axially distributed around the circumference of the rotary atomizing head, and said mouths each being adjacent to one of said slurry discharge orifices and each directing the gas transversely across the associated orifice axis, and conduit means connected in said drying chamber for introducing a heated drying gas into the chamber in proximity to the rotary atomizing head and for causing cyclonic flow of the gas in the drying chamber, the drying gas entering said mouths between said vane segments and passing radially and circumferentially over the faces of the vane segments to scrub and dry slurry films as the films move radially outwardly on the vane segments, atomized slurry particles which are formed radially from the atomizing head being further dried in said chamber by passing into the cyclonic flow stream of said gas, dry solids outlet means on the drying chamber, and spent drying gas exhaust means in the drying chamber.



4,013,505

## METHOD OF DEINKING PRINTED WASTEPAPERS

Cestmir Balcar, Roztoky; Antonín Kostka, Bratislava; Jaroslav Havraněk, Bratislava, and Marcel Lalák, Bratislava, all of Czechoslovakia, assignors to Vyzkumny ustav papieru a celulosy, Bratislava, Czechoslovakia

Continuation-in-part of Ser. No. 233,034, March 9, 1972, abandoned, and a continuation-in-part of Ser. No. 478,286, June 11, 1974, abandoned. This application May 30, 1975, Ser. No. 582,368

Int. Cl.<sup>2</sup> D21C 5/02

U.S. Cl. 162—5

5 Claims

1. Process of deinking printed wastepapers which comprises impregnating said papers with a solution of alkali reacting compounds selected from the group consisting of sodium hydroxide, potassium hydroxide, sodium silicate and sodium carbonate in an amount of from 0.5 to 4.0% by weight of wastepaper charge, and of from 0.2 to 2.0% by weight of wastepaper charge of surface active agents characterized by having wetting and detergent power selected from the group consisting of alkyl benzene sulphonates, alkyl ether polyoxyethylene sulphonates, alkyl phenyl ether polyoxyethylene sulphonates, polyoxyethylene alkyl phenol ethers, polyoxyethylene alkyl ethers, polyglycol esters of fatty acids, alkylolamides of fatty acids, and quaternary condensation products of fatty amine with ethylene oxide for releasing the printing ink from the paper, thereafter repulping said paper to effect separation of the ink from the paper, during the repulping adding large flakes of granular shape of high-adsorptive material to the solution containing paper, said flakes being prepared separately by precipitating a solution of metal soaps of organic acids with a solution of salt of alkaline earths, together with addition of a suitable organic compound of hydrocarbon character to increase the stability of said flakes and to improve adsorption of the printing ink onto said flakes, and thereafter removing said granular flakes with adsorbed printing ink from the repulped paper stock by latent vortex action in an outer vortex in the solution in which the repulped paper is suspended.

4,013,506

## METHOD AND APPARATUS FOR AUTOMATICALLY AND SIMULTANEOUSLY CONTROLLING SOLUTION VISCOSITY AND BRIGHTNESS OF A PULP DURING MULTI-STAGE BLEACHING

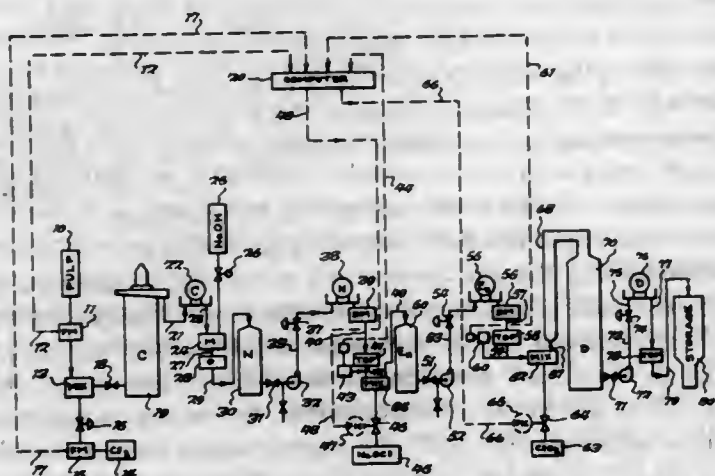
John A. Histed, L'Orignal; William H. Lawford, and Murray J. McLeod, both of Hawkesbury, all of Canada, assignors to Canadian International Paper Company, Montreal, Canada

Filed July 22, 1974, Ser. No. 490,324

Int. Cl.<sup>2</sup> D21C 9/14, 9/10

U.S. Cl. 162—49

28 Claims



1. A system for automatically and simultaneously controlling at predetermined fixed values both the solution viscosity and brightness of a pulp during a multi-stage bleaching process which employs first a chlorination stage followed by a plurality of other bleaching stages, in one of which other bleaching stages a hypochlorite bleaching reagent is used and

in which stage solution viscosity of said pulp is controlled, and in another subsequent bleaching stage employing a chlorine dioxide reagent final pulping brightness is controlled, comprising means for regulating the amount of addition of said hypochlorite bleaching reagent and the said chlorine dioxide reagent by means of generating two control signals which are representative of predetermined solution viscosity and brightness values, respectively, which means employs at least one optical reflectance monitoring sensor which electronically feeds reflectance values to a computer which transmits the said control signals to regulators which control the addition of said hypochlorite and chlorine dioxide bleaching reagents; one of said optical reflectance monitoring sensors monitoring the pulp subsequent to said chlorination stage and prior to said chlorine dioxide bleaching stage.

8. A process for automatically and simultaneously controlling at predetermined fixed values both the solution viscosity and brightness of a pulp bleached in a multistage bleaching process which employs a plurality of bleaching reagents, said process employs first a chlorination stage, one subsequent stage of said process employs hypochlorite bleaching reagent wherein pulp solution viscosity is controlled, in another subsequent stage subsequent to the addition of hypochlorite bleaching reagent which employs chlorine dioxide bleaching reagent final pulp brightness is controlled, in which process the amount of addition of said hypochlorite bleaching reagent and said chlorine dioxide bleaching reagent is regulated by means of two control signals which are representative of predetermined solution viscosity and brightness, respectively, said control signals being provided by at least one optical reflectance monitoring sensor which electronically feeds reflectance values to a computer which transmits the said control signals to regulators which control the addition of said hypochlorite and chlorine dioxide bleaching reagents; one of said optical reflectance monitoring sensors monitoring the pulp subsequent to said chlorination stage and prior to said chlorine dioxide bleaching stage.

4,013,507

## IONENE POLYMERS FOR SELECTIVELY INHIBITING THE VITRO GROWTH OF MALIGNANT CELLS

Alan Rembaum, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

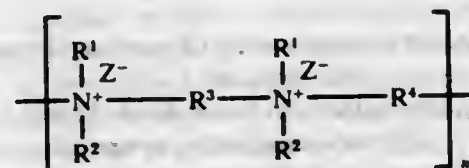
Division of Ser. No. 398,376, Sept. 18, 1973, abandoned. This application Feb. 5, 1975, Ser. No. 547,234

Int. Cl.<sup>2</sup> C12B 1/00; C12H 1/04; C12K 9/00

U.S. Cl. 195—1.8

14 Claims

1. A method of selectively inhibiting the in vitro growth of malignant animal cells comprising the steps of: adding to a mixture of normal and malignant cells an ionene polymer in an amount sufficient to selectively inhibit the growth of said malignant cells, said polymer having a molecular weight from 3,000 to 100,000 of the formula:



where  $R^1$  and  $R^2$  are lower alkyl,  $R^3$  and  $R^4$  are divalent aliphatic, aromatic or heterocyclic groups containing at least 3 carbon atoms, or  $R^3$  combined with  $R^1$  and  $R^2$  forms a cyclic group,  $Z^-$  is an anion and  $n$  is an integer; and binding said polymer to said malignant cells.

9. A method according to claim 8 in which the surface has a net negative charge before said coating is applied.

4,013,508

## PROCESS FOR THE PRODUCTION OF L-ASPARTIC ACID BY FERMENTATION OF HYDROCARBONS

Vittorio Zangrandi, and Paolo Peri, both of Milan, Italy, assignors to Liquechimica S.p.A., Milan, Italy

Filed Nov. 13, 1975, Ser. No. 631,454

Claims priority, application Italy, Nov. 21, 1974, 54163/74 Int. Cl.<sup>2</sup> C12B 1/00

U.S. Cl. 195—28 R

7 Claims

1. Process for the production of L-aspartic acid by fermentation of hydrocarbons, characterized in that the fermentation is obtained by incubation of a hydrocarbon-containing culture medium after inoculation with microorganisms first of *Candida Hydrocarbofumarica* ATCC 20473 and subsequently *Bacillus* species ATCC 31177 in a cumulative exocellular metabolism whereby to produce L-aspartic acid.

4,013,509

## PRODUCTION OF L(+)-TARTARIC ACID

Yoshio Kamatani, Osaka; Hisayoshi Okazaki, Kyoto; Ko Imai, Osaka; Noriaki Fujita, Osaka; Yoshio Yamazaki, Osaka, and Katsuhiko Ogino, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Jan. 19, 1976, Ser. No. 650,024

Claims priority, application Japan, Jan. 31, 1975, 50-13737; May 7, 1975, 50-54957

Int. Cl.<sup>2</sup> C12D 1/02

U.S. Cl. 195—30

7 Claims

1. In a method for the preparation of tartaric acid by micro-biologically hydrolyzing epoxysuccinic acid, an improved method for producing L(+)-tartaric acid, which comprises: (1) incorporating calcium cis-epoxysuccinate as a raw material in a culture medium; (2) incubating a microorganism which is capable of hydrolyzing cis-epoxysuccinic acid to L(+)-tartaric acid; and (3) thereby converting the calcium cis-epoxysuccinate into calcium L(+)-tartarate.

4,013,510

## GLYCOSIDE-HYDROLASE ENZYME INHIBITORS

Werner Frommer; Walter Puls, both of Wuppertal-Elberfeld; Dietmar Schafer, Neuhof near Fulda, and Delf Schmidt, Wuppertal-Vohwinkel, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 213,066, Dec. 28, 1971, Pat. No. 3,876,766. This application July 31, 1974, Ser. No. 493,463

Claims priority, application Germany, Dec. 28, 1970, 2064092

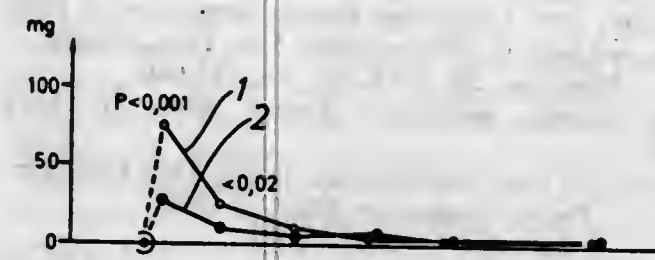
The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C12B 13/00

U.S. Cl. 195—31 R

1 Claim



1. A method of inhibiting the reaction of carbohydrates and carbohydrate-splitting enzymes of the digestive tract which comprises conducting the reaction of said carbohydrates and carbohydrate-splitting enzymes of the digestive tract in the presence of an enzyme inhibitor for said carbohydrate-splitting enzymes of the digestive tract derived from a strain of microorganism of the order Actinomycetales, wherein said enzyme inhibitor:

a. is substantially heat-stable at neutral pH values;

b. is stable to acid at pH 2;  
c. is stable to alkali at pH 12;  
d. is slowly dialyzable;  
e. is not inactivated by trypsin or pepsin;  
f. does not inhibit trypsin or pepsin;  
g. is not receptive to protein dyes;  
h. is free from characteristic UV absorption up to 250 nm.;  
i. is not inhibited by urea or  $\beta$ -mercaptoethanol;  
j. is of molecular weight 500–6000; and  
k. yields a monosaccharide on hydrolytic splitting.

4,013,511

## IMMOBILIZED ENZYMES

Leon Goldstein; Ephraim Katzir (Katchalski), both of Rehovot; Yehuda Levin, Tel-Aviv, and Shmaryahu Blumberg, Rishon Lezion, all of Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed May 10, 1974, Ser. No. 469,043

Claims priority, application Israel, May 13, 1973, 42254

Int. Cl.<sup>2</sup> C07G 7/02

U.S. Cl. 195—63

1 Claim

1. An enzymatically active substance, comprising: a polymeric hydrophilic carrier, selected from the group consisting of EMA-p,p'-diaminodiphenyl methane and EMA-hydrazide made cationic by reaction with N,N-dimethyl-1,3-propane diamine, said EMA-p,p'-diaminodiphenyl methane and EMA-hydrazide being the reaction product of ethylene-maleic anhydride copolymer (EMA) having pendent anhydride groups and an amount sufficient to provide an essentially complete reaction with the EMA pendent anhydride groups of diamine selected from the group consisting of hydrazine and p,p'-diaminodiphenylmethane whereby reaction between the diamine and the pendent anhydride groups of the EMA provides said polymeric carrier with pendent amine groups, and said cationic carrier having an enzyme covalently bound thereto.

4,013,512

## METHOD FOR ADSORPTION AND ELUTION OF LIPID HYDROLYZING ENZYMES

Yoshitsugu Kosugi; Hideo Suzuki, and Akira Kamibayashi, all of Chiba, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

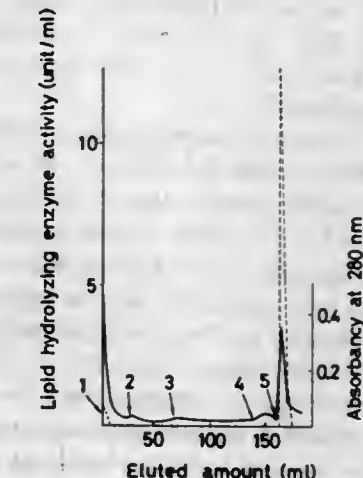
Filed Sept. 18, 1974, Ser. No. 507,050

Claims priority, application Japan, Nov. 19, 1973, 48-129919

Int. Cl.<sup>2</sup> C07G 7/02

U.S. Cl. 195—66 R

11 Claims



1. A method for separating a lipid hydrolyzing enzyme whose molecules have outwardly exposed hydrophobic residues from a solution containing said enzyme, which comprises:

1. bringing said crude lipid hydrolyzing enzyme solution



into contact with an insoluble carrier having a hydrophobic organic compound directly or through a spacer attached thereto forming a hydrophobic residue for thereby causing the lipid hydrolyzing enzyme contained in said crude lipid hydrolyzing enzyme solution to be adsorbed by the hydrophobic residue onto said insoluble carrier, said hydrophobic residue being a hydrophobic residue of the organic compound, the organic compound being an aromatic, alicyclic or heterocyclic compound, and

2. exposing the lipid hydrolyzing enzyme adsorbed on said hydrophobic residue to contact with one member selected from the group consisting of a liquid containing a surface active agent, a liquid containing a protein denaturing agent and an organic solvent miscible with water for thereby eluting the lipid hydrolyzing enzyme into the liquid.

4,013,513

# ION EXCHANGE CHROMATOGRAPHIC ISOENZYME SEPARATION AND ISOLATION

William H. Lederer, Pittsburgh, Pa., assignor to E-C Apparatus Corporation, St. Petersburg, Fla.

Filed Jan. 30, 1976, Ser. No. 654,142

Int. Cl.<sup>2</sup> C07G 7/026; C12K 1/00

U.S. Cl. 195-66 R

22 Claims

1. A process of separating and isolating fractions containing isoenzymes from a sample of tissue extract or blood serum comprising ion-exchange column chromatographically separating said sample containing said isoenzymes into a first fraction containing the hepatic isoenzyme of lactic acid dehydrogenase (LDH<sub>1</sub>) and a second fraction containing the myocardial isoenzymes of lactic acid dehydrogenase (LDH<sub>1,2</sub>), the myocardial isoenzyme of creatine phosphokinase (CPK-MB) and prostatic acid phosphatase by ion-exchange column chromatography said sample on a weakly-basic anion-exchange chromatographic resin and sequentially eluting and collecting said first fraction and said second fraction, said chromatographing, eluting and collecting being conducted in accordance with the following sequence:

a. passing said sample through the anion-exchange resin in a pre-swelled form in a chromatographic column and collecting a first eluate passing through the column;

b. passing a first aqueous buffered salt solution through the anion-exchange resin in the chromatographic column and collecting a second eluate with said first eluate to obtain said first fraction containing the hepatic isoenzyme of lactic acid dehydrogenase (LDH<sub>1</sub>), said first aqueous buffered salt solution having a pH of about 7.0 to 8.5, containing a salt with an anion corresponding to the anion of the anion-exchange resin prior to passing said sample, having a concentration in terms of the anion of about 0.01 to 0.15 equivalent/liter and being passed in an amount such that up to about 3 volume equivalents, based on said sample, of said first aqueous buffered salt solution are passed;

c. sequentially passing a second aqueous buffered salt solution and a third aqueous buffered salt solution through the anion-exchange resin in the chromatographic column to obtain a third eluate, said second aqueous buffered salt solution having a pH of about 7.0 to 8.5, containing a salt with an anion corresponding to the anion of the anion-exchange resin prior to the passing of said sample, having a concentration in terms of the anion of about 0.01 to 0.15 equivalent/liter and being passed in an amount such that at least about 4 volume equivalents, based on said sample, of said second aqueous buffered salt solution are passed, and said third aqueous buffered salt solution having a pH of about 7.5 to 8.5, containing a salt with an anion corresponding to the anion of the anion-exchange resin prior to the passing of said sample, having a concentration in terms of the anion of about 0.15 to 0.25 equivalent/liter and being passed in an amount such that about 4 or less volume equivalents, based on said sample, of said third aqueous buffered salt solution are passed; and

d. passing a fourth aqueous buffered salt solution through the anion-exchange resin in the chromatographic column and collecting a fourth eluate to obtain said second fraction containing the myocardial isoenzymes of lactic acid dehydrogenase (LDH<sub>1,2</sub>), the myocardial isoenzyme of creatine phosphokinase (CPK-MB) and prostatic acid phosphatase, said fourth aqueous buffered salt solution having a pH of about 6.5 to 7.5, containing a salt with an anion corresponding to the anion of the anion-exchange resin prior to the passing of said sample, having a concentration in terms of the anion of about 0.4 to 0.6 equivalent/liter and being passed in an amount such that about 1 to 6 volume equivalents, based on said sample, of said fourth aqueous buffered salt solution are passed.

4,013,514

# PREPARING A REACTOR CONTAINING ENZYMES ATTACHED TO DIALDEHYDE CELLULOSE

Bernard S. Wildt, Kirkwood, and Lloyd E. Weeks, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 215,432, Jan. 4, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 430,213 Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C07G 7/02

U.S. Cl. 195-68

8 Claims

1. A method for producing a biologically active flow-through reactor which comprises the steps of reacting a liquid permeable fibrous cotton with a periodic acid solution for a time sufficient to oxidize 5 to 80 percent of the glucose units in the cotton to units containing dialdehyde groups;

substantially freeing the fibrous dialdehyde cotton of excess periodic acid;

placing the fibrous dialdehyde cotton in a liquid permeable, flow-through reactor to constitute an elongated reactor core, and

passing a liquid containing an enzyme at a substantially neutral or alkaline pH through the fibrous dialdehyde cotton in the liquid permeable, flow-through reactor to react the enzyme through a primary amino group thereof not essential for biological activity directly with aldehyde groups of the cotton so as to form a carbonnitrogen double bond and thereby binding said enzyme to said core.

4,013,515

# PROCESS FOR THE PREPARATION OF THE ANTIBIOTIC 20,798 R.P.

Jean Florent; Jean Lunel, and Jacques Renaut, all of Paris, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Nov. 25, 1974, Ser. No. 527,040

Claims priority, application France, Nov. 27, 1973, 73.42191

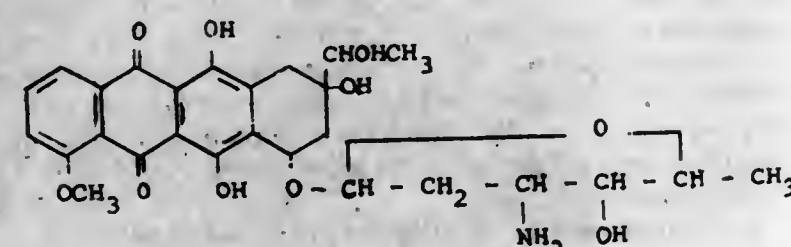
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C12B 1/00

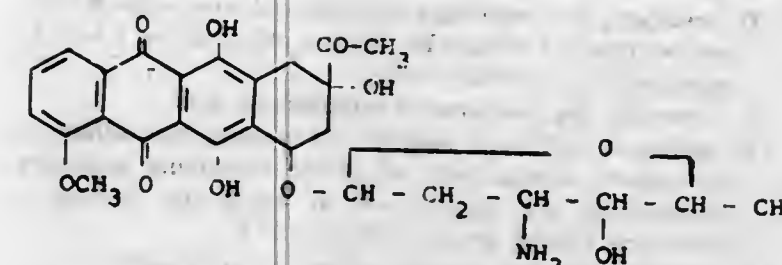
U.S. Cl. 195-80 R

15 Claims

1. Process for the preparation of the antibiotic 20,798 R.P. of the formula:

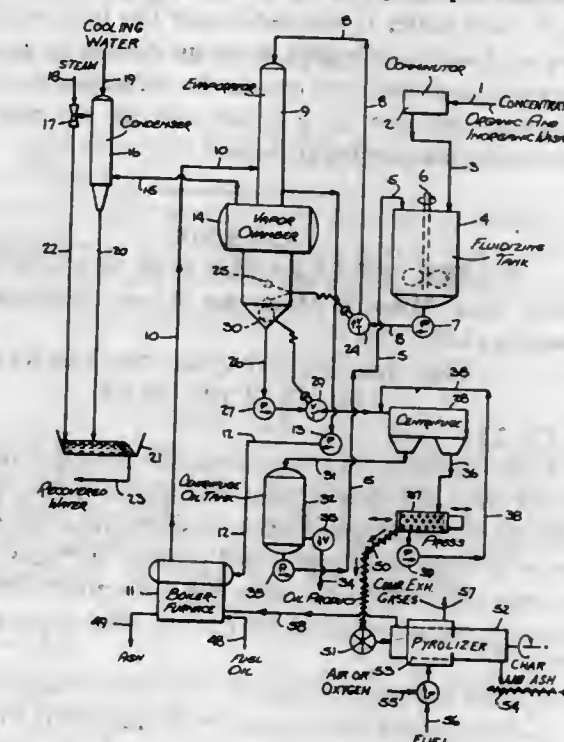


or an acid addition salt thereof, which comprises the microbiological reduction of daunorubicin of the formula:



or of an acid addition salt thereof using *Streptomyces lavendulae* (ATCC 8664), *Streptomyces roseochromogenes* (ATCC 13400), *Carynebacterium simplex* (ATCC 6946) or *Bacterium cycloxydans* (ATCC 12673), to convert the grouping -CO-CH<sub>3</sub> to -CHOHCH<sub>3</sub>.

to said second pyrolyzing means, said second pyrolyzing means being disposed to vaporize any remaining oil present on the



solids and to destructively distill the oil-free organic solids into organic vapors and gases and a residue of char and ash.

4,013,517

# CIRCULAR TRAVELING GRATE SINTERING MACHINE

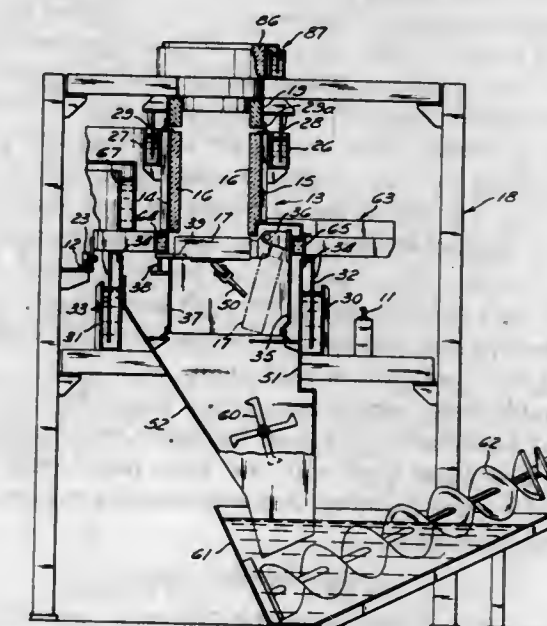
Thomas E. Ban, South Euclid; Roger L. Hulette, Berea, and Subir K. Mitr, Euclid, all of Ohio, assignors to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed Sept. 29, 1975, Ser. No. 617,849

Int. Cl.<sup>2</sup> C10B 33/00; B65G 49/00; F27D 1/12

U.S. Cl. 202-262

11 Claims



4,013,516

# APPARATUS AND PROCESS FOR THE PYROLYSIS OF WASTE SOLIDS CONCENTRATES

Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Hanover Research Corporation, East Hanover, N.J.

Filed Mar. 13, 1975, Ser. No. 558,080

Int. Cl.<sup>2</sup> C10B 43/00, 51/00; B01D 3/34, 1/00

U.S. Cl. 201-2.5

26 Claims

8. An apparatus system for pyrolyzing initially water-containing waste solids concentrates, said system comprising (1) a tank for receiving and mixing a stream of waste solids concentrate and a stream of oil, (2) an evaporator operable by heat, (3) a conduit extending from said tank to said evaporator for transferring the mixture of waste solids concentrate and oil from said tank into the evaporating region of said evaporator, (4) a combustion apparatus associated with said evaporator for supplying evaporative heat thereto to produce a substantially anhydrous mixture of waste solids and oil in said evaporator, (5) means for separating liquid-solid mixtures into their respective liquid and solid components, (6) a conduit extending from said evaporator to said separating apparatus for transferring the substantially anhydrous mixture of waste solids and oil from said evaporator to said separating apparatus in which said anhydrous mixture may be separated into substantially all waste solids and oil, (7) a first pyrolyzing means, (8) means for transferring separated waste solids from said separating apparatus to said first pyrolyzing means, said pyrolyzing means being disposed to receive said waste solids and substantially vaporize all the fluidizing oil remaining on the solids, (9) a second pyrolyzing means, and (10) means for transferring the solid residue from said first pyrolyzing means

1. A circular traveling grate machine comprising a circular trackway, annular burden confining means mounted for movement along said trackway, said burden confining means having spaced inner and outer vertical walls and a plurality of gas permeable pallets pivotally mounted with respect to a horizontal plane to one of said walls and releasably connected by pin means to the other of said walls, means for moving said burden confining means and said plurality of pallets along said trackway, stationary gas confining hood means disposed over said inner and outer walls, stationary gas confining windbox means disposed under said inner and outer walls, sealing means between the inner and outer walls and the hood and windbox means, a discharge station defined by a portion of said inner and outer walls, said hood means and a spent burden receiving chute, means to sequentially release the pin



means as each pallet enters the discharge station, means to guide each released pallet downwardly to a discharge position as each such pallet is pivoted under the influence of gravity, means to raise each pallet from its discharge position to its connected position, and means to sequentially perform the connection between each pallet and its pin means as each pallet leaves the discharge zone.

4,013,518

## WATER JET CLEANER FOR STANDPIPES

Stephen John Milko, 6 Manitoba Street, Stouffville, Ontario, Canada (LOH 1L0)

Filed Jan. 27, 1975, Ser. No. 544,632

Int. Cl.<sup>2</sup> C10B 43/08

U.S. Cl. 202-241

4 Claims

1. High pressure high volume water jet apparatus for cleaning coke oven standpipes, said standpipes having an elbow and an access port and cover plate at said elbow for access to the interior of said standpipe, and sealing surfaces around said port whereby said cover plate may effectively close the same against the escape of gases therefrom, said apparatus comprising:

- a support member swingable between an upper inoperative position and a lower position in alignment with a said port and having power operated means for swinging the same downwardly and upwardly;
- a carrier member slideably mounted on said support member and slideably in a telescopic manner relative thereto into and out of a said port, and having power operated means for moving the same;
- a high pressure water pipe rotatably mounted on said carrier member with an end extending therefrom and power operated means for at least partially rotating the same;
- at least two jet nozzle means at said end of said water pipe for directing jets of water along axes at a substantial angle to the axis of said water pipe and on opposite sides thereof simultaneously whereby to establish high pressure high volume jets in a divergent manner for striking the interior of said standpipe when introduced into said port and whereby also to clean said sealing surfaces of said port in an oblique manner when located outside said port;
- high pressure high volume pumping means having inlet and outlet means, tank means for supplying the inlet of said pumping means, conduit means connected to said outlet means for delivering of water to said water pipe, and recycle duct means for recycling water from said outlet to said tank, and valve means for controlling flow either through said conduit or through said recycle duct means, whereby said jets may be turned on or off without affecting the operation of said pump, and,
- rotatable water supply connection means having a fixed part and a rotatable part, said rotatable part being connected to said water pipe and said fixed part being fastened to said carrier member and said conduit means being connected thereto.

4,013,519

## RECOVERY METHOD FOR POLYESTER STILL BOTTOMS

Bruce Noel Hoppert, and Alfred Berghausen, III, both of Cincinnati, Ohio, assignors to Safetech, Inc., Cincinnati, Ohio

Filed Mar. 25, 1976, Ser. No. 670,123

Int. Cl.<sup>2</sup> B01D 21/01; C07C 29/26

U.S. Cl. 203-33

5 Claims

1. A recovery method for polyester still bottoms which includes polyester materials, antimony compounds, terephthalic acid, and glycols, comprising:

- A. subjecting the still bottoms to an alkaline hydrolysis step, the amount of water in step (A) being about 10 parts by weight of water for each part of terephthalic acid present, said alkali hydrolysis step carried out at a temperature of about 185° to 212° F. and at a pH of between about 8 to 8.5,

- B. acidifying the material from step (A) to a pH of about 6.2 to 6.5 to precipitate a portion of the antimony compounds therefrom,
- C. removing the precipitated antimony compounds and treating the unprecipitated material with activated carbon,
- D. acidifying the unprecipitated material from step (B) at a temperature of about 170° F. to a pH of about 1 to 3 to precipitate terephthalic acid,
- E. removing the precipitated terephthalic acid,
- F. adding a sufficient quantity of sodium thiosulfate to precipitate substantially all of the remaining antimony compounds, the temperature at which the mixture is maintained being about 180° to 212° F.,
- G. removing the precipitated antimony compounds,
- 5. The recovery method of claim 4 wherein the glycol recovery method comprises the steps of
- H. removing about one-half of the water after step (G) at a temperature of about 180° to 212° F.,
- I. adjusting the solution remaining after step (H) to a pH of about 6.5 to 8 and treating it with activated carbon,
- J. adding about two parts by weight per part of alcohol to the solution remaining after step (I) to precipitate sodium sulfate and removing the sodium sulfate so precipitated,
- K. evaporating a portion of the alcohol, and
- L. separating glycol from the solution of step (K) by distillation.

4,013,520

## PROCESS FOR SEPARATING 2,6-XYLENOL FROM A MIXTURE OF CRESYLIC ACIDS

Robert W. Maxwell, Jr., 607 Horizon View Drive, Pittsburgh, Pa. 15235

Filed May 22, 1975, Ser. No. 580,056

Int. Cl.<sup>2</sup> C07C 37/22; B01D 3/14

U.S. Cl. 203-34

5 Claims

- 1. A process for purifying 2,6-xyleneol from a mixture containing cresylic acids wherein 2,6-xyleneol is present as a major component in the mixture and the cresylic acids other than 2,6-xyleneol are present as impurities, comprising:
- contacting the mixture containing 2,6-xyleneol and cresylic acid impurities with an ester-forming phosphorus compound in an amount in the range of 0.5 to 5.0 equivalents per equivalent of cresylic acids other than 2,6-xyleneol and at a temperature in the range of 50°-250° C to produce a second mixture containing aryl phosphate esters, formed primarily from the cresylic acids other than 2,6-xyleneol, and unreacted 2,6-xyleneol; and distilling the unreacted 2,6-xyleneol from the aryl phosphate esters and in the second mixture.

4,013,521

## PROCESS FOR PURIFYING METHANOL BY DISTILLATION

Roger Hardiman Scott, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 389,545, Aug. 20, 1973, abandoned.

This application Jan. 29, 1975, Ser. No. 545,343

Claims priority, application United Kingdom, Aug. 15, 1973, 39949/73

Int. Cl.<sup>2</sup> B01D 3/40

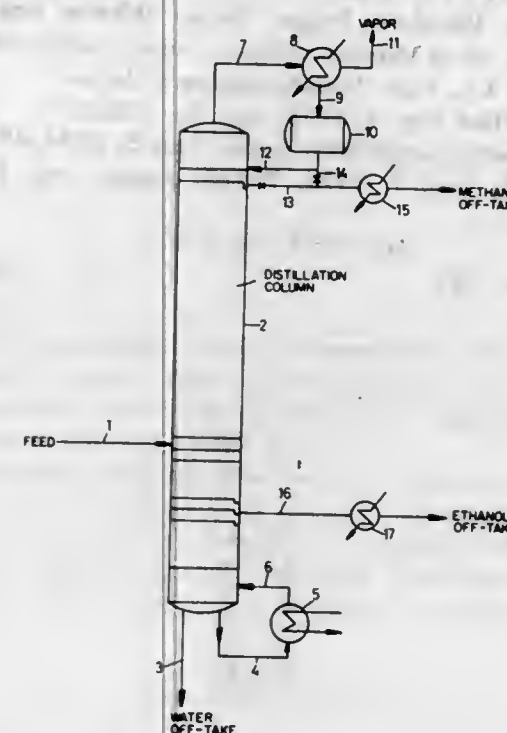
U.S. Cl. 203-85

5 Claims

- 1. A process for purifying methanol from a starting mixture of synthetic crude methanol consisting essentially of methanol, 8 to 30% by weight water and up to 0.5% by weight ethanol comprising:

- a. feeding said starting mixture to a distillation column at a level which when said column is in equilibrium operation, the water content within said column at said level is lower than in said mixture producing over a region of the column below the feed level a substantially constant methanol to water weight ratio,
- b. withdrawing water as bottoms,

- c. withdrawing product methanol from the upper part of the column, and



- d. withdrawing a side stream enriched in ethanol from a level below the end of the region remote from the feed level.

4,013,522

## METHOD AND APPARATUS FOR MEASURING THE CONCENTRATION OF CARBON MONOXIDE

Herbert Nischik, Erlangen, and Ferdinand von Sturm, Erlangen-Buchenbach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

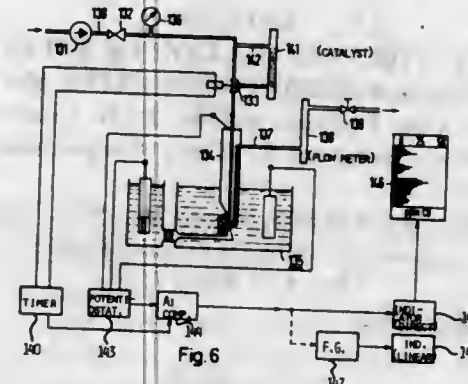
Filed Jan. 20, 1975, Ser. No. 542,549

Claims priority, application Germany, Jan. 23, 1974, 2403164; Nov. 15, 1974, 2454285

Int. Cl.<sup>2</sup> G01N 27/30, 27/46

U.S. Cl. 204-1 T

17 Claims



- 1. A method for determining the concentration of carbon monoxide in a measuring gas comprising the steps of:

- a. establishing an electrochemical reaction of the type causing current to flow using an electrolyte and a pair of electrodes, at least one of said electrodes being of a material whose activity is inhibited by carbon monoxide;
  - b. feeding the measuring gas directly to said one of said electrodes; and
  - c. determining the degree of inhibition of said electrochemical reaction which is caused by the carbon monoxide in said measuring gas.
17. A measuring electrode for use in measuring carbon monoxide concentrations in a measuring gas comprising:
- a. an electrode body having a recess therein;
  - b. a pressure plunger in the bottom of said recess;
  - c. at least one contact making and gas distribution screen next to said plunger;

- d. a catalytically active layer for effecting an electrochemical reaction of the type causing a current to flow next to said screen;
- e. a cover layer next to said catalytically active layer;
- f. at least one support frame and a pressure ring next to said cover layer;
- g. means in said electrode body for applying pressure to said pressure plunger;
- h. said electrode body having holes therein for feeding and discharging gas to said catalytically active layer; and
- i. means for electrically connecting said catalytically active layer with an external contact.

4,013,523

## TIN-GOLD ELECTROPLATING BATH AND PROCESS

Peter Stevens, Parsippany; John Martin Deuber, Nutley, and Kathleen Regina Roskiewicz, Landing, all of N.J., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Dec. 24, 1975, Ser. No. 644,236

Int. Cl.<sup>2</sup> C25D 3/62

U.S. Cl. 204-43 G

10 Claims

- 1. An aqueous bath suitable for the electrodeposition of an alloy of tin and gold, comprising

gold as the auricyanide	1-30 g/l gold equiv.
tin as a stannic halide complex	1-150 g/l tin equiv.

wherein the halide is selected from the group consisting of fluoride, chloride and bromide, the bath exhibiting a pH value not in excess of 3.

4,013,524

## ELECTROLYTIC CARBOXYLATION AND DIMERIZATION OF OLEFINS

Donald Armon Tyssee, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 21, 1972, Ser. No. 317,345

Int. Cl.<sup>2</sup> C25B 3/00, 3/10

U.S. Cl. 204-59 R

14 Claims

- 1. The method of electrolytic carboxylation and dimerization of alpha, beta-olefinic nitriles, esters and amides which comprises effecting electrolytic reduction at the cathode in an electrolysis medium comprising such olefinic compound, solvent, supporting electrolyte and carbon dioxide, with the concentration of the carbon dioxide with respect to the olefinic compound not being sufficient to prevent substantial dimerization, and causing production and recovery of a carboxylated dimer of the olefinic compound.

4,013,525

## ELECTROLYTIC CELLS

Alan Brian Emsley, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 19, 1974, Ser. No. 507,603

Claims priority, application United Kingdom, Sept. 24, 1973, 44682/73; July 4, 1974, 29683/74

Int. Cl.<sup>2</sup> C25C 1/26, 1/102, 1/103

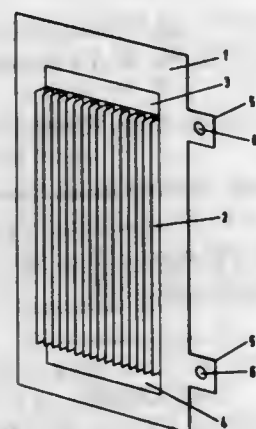
U.S. Cl. 204-98

30 Claims

- 1. An electrolytic cell comprising an anode, a cathode and a diaphragm separating the anode and the cathode wherein the anode presents to the cathode a plurality of spaced-apart parallel elongated members disposed in vertical planes so as to form a plurality of vertical channels, said members being constructed of a film-forming metal and carrying on at least part of their surfaces an electrocatalytically active coating and wherein said elongated members are rigidly mounted in the cell so that a substantial portion of said active surfaces is 6 millimeters or less from the cathode.

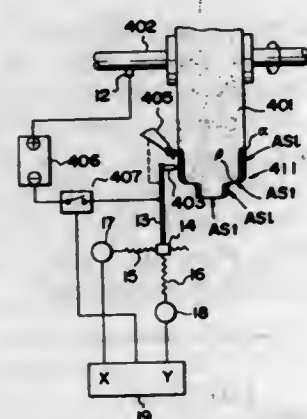


29. A method of manufacturing chlorine by electrolyzing an



aqueous alkali metal chloride solution in an electrolytic cell as claimed in claim 1.

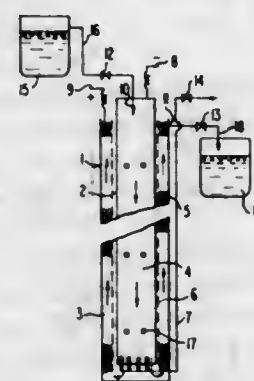
**4,013,526**  
**ELECTROCHEMICAL GRINDING WITH A CONDUCTIVITY-CONTROLLED WHEEL ELECTRODE**  
Kiyoshi Inoue, Tokyo, Japan; assignor to Inoue-Japan Research Inc., Yokohama, Japan  
Filed Apr. 14, 1975, Ser. No. 567,527  
Int. Cl.<sup>2</sup> B23P 1/00  
U.S. Cl. 204-129.46



1. A method of electrochemically grinding a workpiece by a rotating electrically conductive, abrasive wheel electrode with a machining surface constituted by an electrically conductive matrix and a layer of electrically nonconductive abrasive protrusions projecting therefrom, said method comprising the steps of:

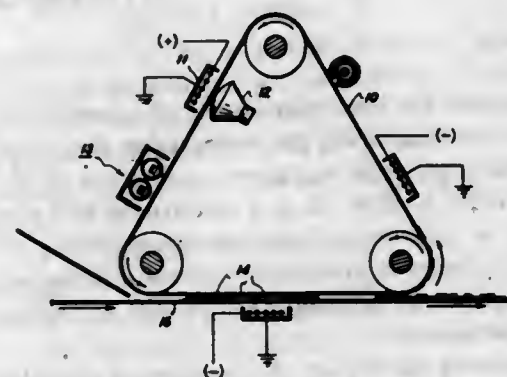
- preparing said wheel electrode with the machining surface of a contour corresponding to a shape to be imparted to said workpiece;
- treating said machining surface by electrochemically solubilizing said conductive matrix at said machining surface so as to impart thereto a conductivity which locally varies as a function of the shape of said machining surface; and
- electrochemically grinding said workpiece with said treated machining surface.

**4,013,527**  
**ELECTROLYTIC OXIDATION OF BLIX SOLUTION**  
Yoshio Idota; Haruhiko Iwano; Kazuo Shirasu, and Sachio Matsushita, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan  
Filed Aug. 4, 1975, Ser. No. 602,167  
Claims priority, application Japan, Aug. 5, 1974, 49-89604; New Zealand, Aug. 7, 1974, 90545; Japan, Aug. 8, 1974, 49-91033  
Int. Cl.<sup>2</sup> C25C 1/20  
U.S. Cl. 204-151



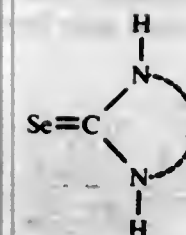
1. A process for electrolyzing a used blix solution obtained in processing color photographic materials, said blix solution originally containing an iron (III) chelated bleaching agent and a silver halide solvent, comprising:  
providing an electrolytic cell having a cathode compartment and an anode compartment having a liquid flow path therebetween and separated by a porous membrane; feeding into said cathode compartment at a flow rate of 3 liters/hour or more said blix solution;  
applying to the cathode of said electrolytic cell a potential of from about -0.20 to about -0.7 volts and to the anode a potential of about -0.10 to 0.50 volts while passing said blix solution from the cathode compartment to the anode compartment and controlling the cathode potential, anode potential and the current densities of said anode and cathode so as not to decompose the silver halide solvent.

**4,013,528**  
**PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS**  
Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.  
Division of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,445  
Int. Cl.<sup>2</sup> B01J 1/10  
U.S. Cl. 204-158 R



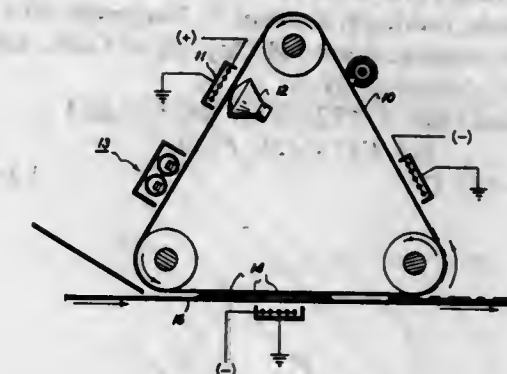
1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:  
a. forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula

**4,013,530**  
**PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS**  
Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.  
Division of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,437  
Int. Cl.<sup>2</sup> B01J 1/10  
U.S. Cl. 204-158 R

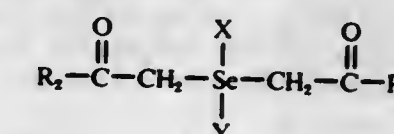


wherein

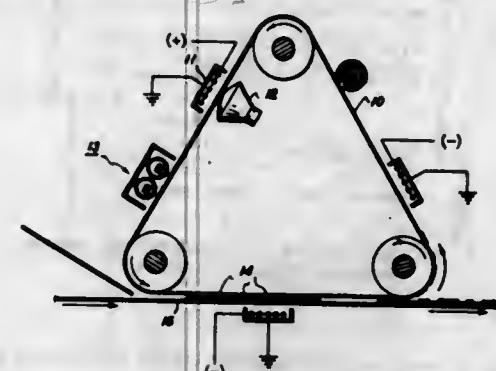
X is selected from among divalent alkyl radicals having at least 2 carbon atoms, divalent alkylene radicals having at least 2 carbon atoms, phenylene radicals, and divalent heterocyclic radicals; and  
b. subjecting said polymeric composition to sufficient energy to decompose said selenium compound whereby elemental selenium is deposited within the organic polymeric composition in substantial conformity with the distribution of said energy throughout the composition.



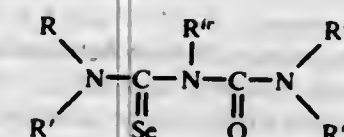
1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix, said process comprising:  
a. forming a polymeric composition from a film forming insulating polymer resin and at least one organoselenium compound of the formula



**4,013,529**  
**PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS**  
Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.  
Division of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,303  
Int. Cl.<sup>2</sup> B01J 1/10  
U.S. Cl. 204-158 R



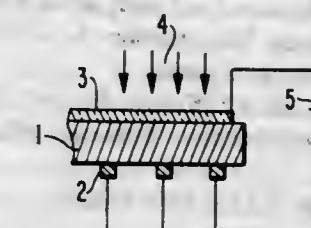
1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:  
a. forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula



wherein

R, R', R'', R''' and R'''' are independently selected from hydrogen, alkyl of 1-10 carbon atoms, phenyl, substituted phenyl, benzyl and substituted benzyl; and  
b. subjecting said polymeric composition to sufficient energy to decompose said selenium compound whereby elemental selenium is deposited within the organic polymeric composition in substantial conformity with the distribution of said energy throughout the composition.

**4,013,531**  
**METHOD OF PRODUCING HIGH MOLECULAR FILM CONTAINING IONIZED MATERIAL**  
Kenichi Nakamura, and Haruko Kakutani, both of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan  
Claims priority application Japan, Mar. 26, 1975, 50-35306  
Filed Mar. 24, 1976, Ser. No. 669,941  
Int. Cl.<sup>2</sup> C25D 1/18, 13/06  
U.S. Cl. 204-180 R



1. A method of forming in a high molecular film a non-uniform distribution of the volume concentration of ions of an ion dissociative substance comprising the steps of, preparing said high molecular film with a substantially uniform distribution of volume concentration of ions therein, heating said



film to a temperature which is lower than the melting point of said film and simultaneously applying an electric field across said layer in amounts and for a time sufficient to cause ion movement in said film away from regions receiving the combined heat and electric field, at least one of said heat and electric field being applied in a surface pattern corresponding to the desired non-uniform distribution pattern.

4,013,532

## METHOD FOR COATING A SUBSTRATE

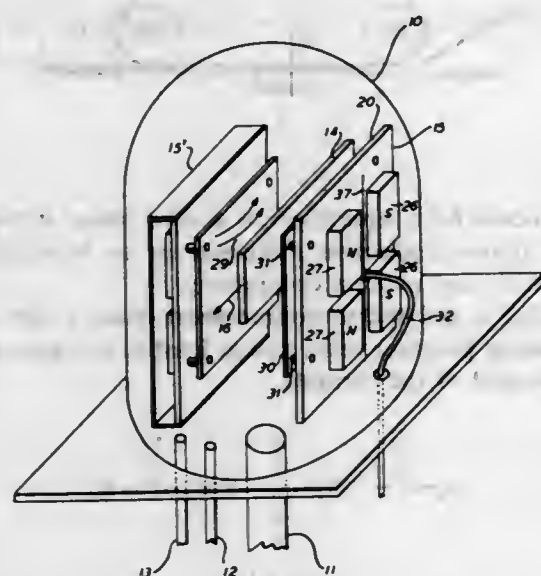
Robert L. Cormia, Oakland; Kazumi N. Tsujimoto, El Cerrito, and Sigurd Andresen, Redwood City, all of Calif., assignors to Airco, Inc., Montvale, N.J.

Filed Mar. 3, 1975, Ser. No. 554,823

Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—192 C

13 Claims



1. A method of coating a substrate with a layer of a polymeric material, which comprises:  
placing the substrate, a first electrode and a second electrode in a chamber which can be evacuated;  
introducing into the chamber a gaseous polymerizable substance;  
establishing a glow discharge in the chamber to deposit material comprising said polymerizable substance on the first electrode and the substrate;  
confining the glow discharge to a region adjacent to the first electrode; and  
applying an electric potential across the first and second electrodes so that material deposited on the first electrode is sputtered and redeposited on the substrate where a polymerized coating forms.

4,013,533

## VOLATILIZATION AND DEPOSITION OF A SEMI-CONDUCTOR SUBSTANCE AND A METALLIC DOPING IMPURITY

Gerard Cohen-Solal, Chatenay; Alain Zozime, Saint-Denis, and Claude Sella, Meudon La Foret, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Mar. 25, 1975, Ser. No. 561,946

Claims priority, application France, Mar. 27, 1974, 74.10601

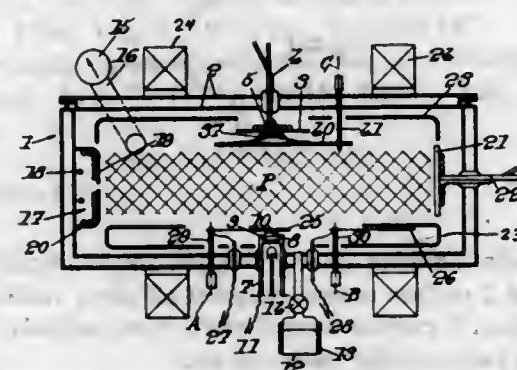
Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—192 S

3 Claims

1. A process for making a semi-conductor device having a p-n or n-p junction by a method comprising the steps of forming a first doped layer by sputter depositing on a substrate in a vacuum enclosure containing a lowpressure ionic plasma, a semi-conductor substance of an alloy  $Cd_xHg_{1-x}Te$  where x is a number between 0 and 1, volatilized from a source or target first comprising  $Cd_xHg_{1-x}Te$  in the enclosure, and co-sputter

depositing an n-type metallic doping impurity from the group consisting of aluminum, indium and gallium, volatilized from a second source or target in the enclosure; and forming a second doped layer on said first doped layer by co-sputter depositing



$Cd_xHg_{1-x}Te$ , volatilized from said first source, and a p-type metallic doping impurity from the group consisting of gold, copper and silver, volatilized from a third source or target in the enclosure.

4,013,534

## METHOD OF MAKING A MAGNETIC OXIDE FILM

Yoshikazu Ishii, Mito; Seizi Hattori, Tomobe, and Nobuo Inagaki, Katsuta, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

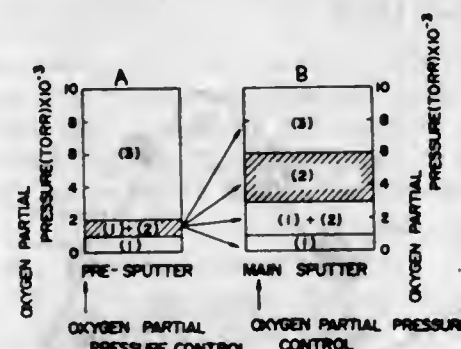
Filed Oct. 14, 1975, Ser. No. 621,857

Claims priority, application Japan, Nov. 12, 1974, 49-130208

Int. Cl.<sup>2</sup> C23C 15/00; G11B 5/82

U.S. Cl. 204—192 M

3 Claims



1. A method of making a magnetic oxide film on a substrate by sputtering thereto from an iron target in an atmosphere composed of a mixed gas containing an inert gas and oxygen, with the partial pressure of the oxygen being regulated, said method comprising the steps of:

pre-sputtering the iron target in the oxygen-argon atmosphere while maintaining the oxygen partial pressure between  $1 \times 10^{-3}$  and  $2 \times 10^{-3}$  Torr, with a shutter being disposed between the iron target and the substrate; and sputtering from the iron target to the substrate in the oxygen-argon atmosphere while maintaining the oxygen partial pressure between  $3 \times 10^{-3}$  and  $6 \times 10^{-3}$  Torr, with the shutter being removed from between the iron target and the substrate, thereby depositing a magnetite thin film of single-phase  $Fe_3O_4$  on the substrate.

4,013,535

## ELECTROLYTE SEPARATOR TENSIONING DEVICE

Donald Elias White, Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed June 7, 1976, Ser. No. 693,373

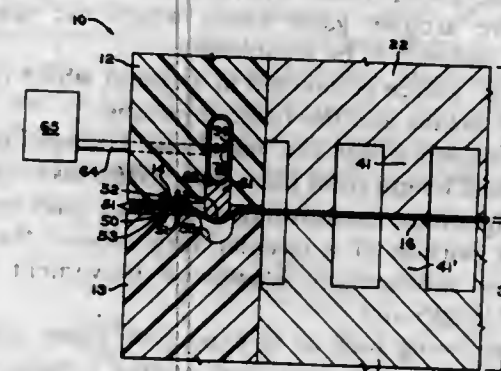
Int. Cl.<sup>2</sup> C25B 1/34, 13/00, 13/02; B01D 13/02

U.S. Cl. 204—252

8 Claims

1. An electrolytic cell having an electrolyte separator and a separator tensioning device, said tensioning device comprising

a chamber for containing a pressurized fluid, said chamber having a movable boundary portion, said movable boundary portion having an inward surface, adapted to be disposed



adjacent said pressurized fluid and an outward surface adjacent said separator, wherein movement of said movable boundary portion affects the tension of said separator.

4,013,537

## ELECTROLYTIC CELL DESIGN

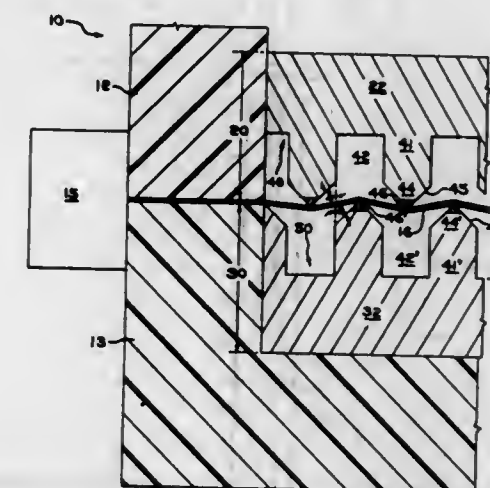
Donald Elias White, Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed June 7, 1976, Ser. No. 693,634

Int. Cl.<sup>2</sup> C25B 1/16, 1/26, 1/102, 13/02

U.S. Cl. 204—256

5 Claims



1. In an electrolytic cell comprising:  
a. an anolyte compartment and a catholyte compartment;  
b. an electrolyte separator extending between said anolyte and catholyte compartments;  
c. an anode within said anolyte compartment having a surface adjacent said electrolyte separator, said anode surface comprising at least one ridge and at least one groove;  
d. a cathode within said catholyte compartment having a surface adjacent said electrolyte separator, said cathode surface comprising at least one ridge and at least one groove, wherein said cathode surface substantially faces said anode surface and said at least one ridge of said cathode surface is opposite said at least one groove of said anode surface,  
the improvement wherein said at least one ridge of said cathode surface extends at least partially into said at least one groove of said anode surface, whereby a portion of said electrolyte separator is retained within said groove of said anode surface.

4,013,536

## ELECTROLYTIC CELL

Emile Cabaraux, Brussels, Belgium, assignor to Solvay & Cie, Belgium

Filed Jan. 20, 1975, Ser. No. 542,258

Claims priority, application Belgium, Feb. 6, 1974, 140615

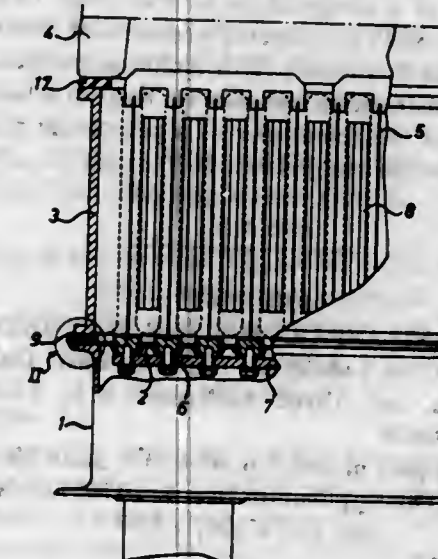
Disclosure was also published under second Trial Voluntary

Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> B01K 3/10; C22D 1/02

U.S. Cl. 204—252

10 Claims



1. A cell for the electrolysis of an aqueous solution of alkali metal halide, comprising, a bottom wall, an alternating sequence of substantially vertical and parallel anodes and cathodes supported by said bottom wall, peripheral sidewalls supported on the said base wall enclosing said cathodes and anodes, a sealing joint on which said peripheral sidewalls wall rests, the sealing joint comprising a framework which surrounds the anodes and cathodes made of flat, rigid bars, an envelope in which said framework is inserted and made of a material which is resistant to corrosion and has a hardness of the Shore A Scale between substantially 2 and 20, said envelope covering at least that part of the bars of the framework that face towards the interior of the cell and disposed between the framework and said peripheral sidewalls and bottom wall.

4,013,538

## DEEP SUBMERSIBLE POWER ELECTRODE ASSEMBLY FOR GROUND CONDUCTION OF ELECTRICITY

Harold N. Schneider, Springfield; Charles H. Titus, Newtown Square, and J. Kenneth Wittle, Berwyn, all of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Dec. 22, 1971, Ser. No. 211,010

Int. Cl.<sup>2</sup> C25B 1/100; E21B 43/00

U.S. Cl. 204—280

20 Claims

1. In a deep submersible power electrode assembly for direct underground installation exposed to a surrounding mixture of saline and oleaginous fluids under a hydrostatic pressure head of the order of at least several hundred feet, the combination comprising an impermeate elongate electrode body having a current conducting terminal and an exposed outer surface adapted to be traversed by current flowing between said body and said fluid mixture, a permeable tubular enclosure of insulating material loosely surrounding said electrode body and defining an annular space therebetween, said enclosure having permeability sufficiently small significantly to inhibit flow of said oleaginous fluid toward said electrode body but large enough to permit limited egress of saline water from said enclosure, and means including a supply conduit for introducing saline water into said annular space at one end of said enclosure and maintaining said water under pressure greater than said hydrostatic pressure of the fluid mixture outside, said enclosure, whereby the limited egress of saline water through said permeable enclosure constrains said saline



water to fill substantially the full length of said annular space thereby to cool the outer surface of said electrode body and to



conduct current at minimum surface density from said outer surface to said surrounding fluid mixture.

4,013,539

## THIN FILM DEPOSITION APPARATUS

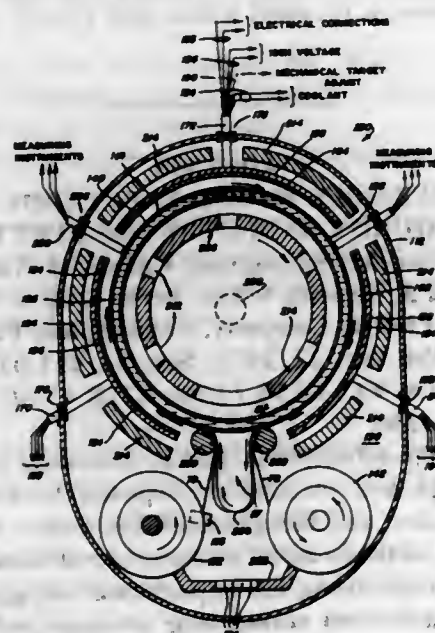
Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Division of Ser. No. 323,133, Jan. 12, 1973, Pat. No. 3,884,787. This application Nov. 1, 1974, Ser. No. 519,781

Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—298

36 Claims



1. Apparatus for depositing a thin film on a length of substrate which comprises:  
supply means carrying a supply of substrate to be coated,  
take-up means for accumulating coated substrate length,  
a pressure vessel having means therein for establishing a sputtering plasma condition within the vessel,  
anode means mounted in the vessel,  
cathode means comprising a plurality of targets secured on the interior of the vessel, each target having a surface formed of the material to be sputtered, the surface facing the exterior surface of the anode means but spaced there-

from, the said targets being circumferentially spaced with the said planar surfaces thereof defining at least part of a cylindrical surface that is coaxial with but larger in diameter than the anode means whereby to form a plurality of consecutive arcuate gaps within which the sputtering plasma is adapted to be established,  
a high voltage source connected in a circuit which includes the anode means and the cathode means,  
structure disposed within the vessel and arranged to guide the substrate length from the supply to the take-up means in a configuration establishing a tortuous path including at least a portion of a circular turn around the anode means, for substantially lengthwise movement of said substrate length and  
the said path being such as to expose only one surface of said substrate to the sputtering plasma condition while said substrate is in said tortuous path.

4,013,540

## PETROLEUM PITCH PREPARATION

Maurice Moyle, Oakville; Buenaventura B. Galvez, Islington; Eric C. Pease, Campbellville, and Alan Logan, Oakville, all of Canada, assignors to Gulf Oil Canada Limited, Toronto, Canada

Filed Mar. 10, 1975, Ser. No. 556,831

Int. Cl.<sup>2</sup> C10C 3/04

U.S. Cl. 208—4

7 Claims

1. A process for the preparation of a petroleum pitch binder for the manufacture of carbon electrodes, comprising (1) subjecting a full range decant oil petroleum fraction, obtained as the clarified bottoms fraction of a catalytic gas oil cracking operation and having a boiling range at atmospheric pressure at least 95% of which is above 450° F (232° C), to oxy-activated condensation by heating at a temperature in the range from 400° to 500° F (204° to 260° C) under a pressure in the range from atmospheric to four atmospheres and with the addition of air introduced to the fraction for a period of from one to 24 hours until the softening point of the material has risen to a value in the range from 120° to 180° F, (2) thereafter heating the resulting material for a period of from 3 to 300 minutes at a temperature in the range from 775° to 975° F (413° to 524° C) under a pressure of from 15 to 30 atmospheres, and finally (3) flash distilling the heated material to separate therefrom that portion thereof which must be removed to leave the remainder as a petroleum pitch with a softening point in the range from 175° to 275° F (79° to 135° C).

4,013,541

## METHOD AND APPARATUS FOR WAX DEOILING

Roy E. Irwin, 1456 Lakeshore Highway East, Oakville, Ontario, Canada, and Alfred Aufhauser, 8 E. 83rd St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 484,217, June 28, 1974, Pat. No. 3,926,776. This application Dec. 9, 1975, Ser. No. 639,201

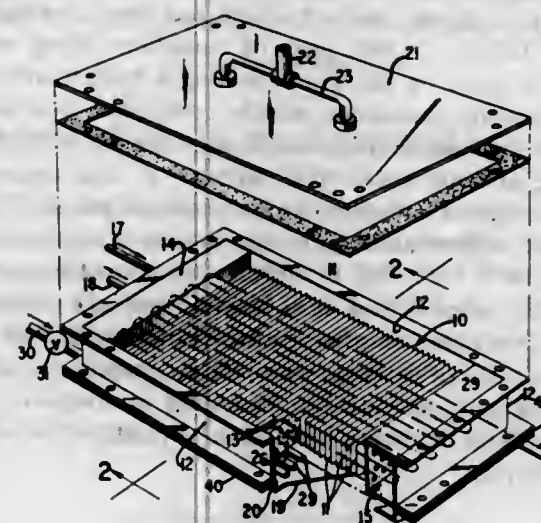
Int. Cl.<sup>2</sup> C10G 43/04

U.S. Cl. 208—32

8 Claims

1. In a method of separating lower melting point constituents from higher melting point constituents contained in a wax composition wherein said wax composition is confined in solid state between a succession of vertically disposed plates and said lower melting point constituents are removed therefrom by gradually increasing the temperature of said plates responsive to controlled increase in the temperature of a fluid flowed through a multiplicity of conduits that traverse said spaces and said plates in thermally conductive relation to said plates with concomitant increase in the temperature of said wax composition confined between said plates accompanied by drainage of said lower melting point constituents from said composition, the improvement which comprises introducing said wax composition in the melted state into spaces between the plates which are separated from each other by a distance of about

one-sixteenth to one half-inch and into a container adapted and disposed to maintain a body of said wax composition that is of substantial depth below the lower margins of said plates until said container contains a body of said wax composition that is in contact with the lower margins of said plates and until the depth of the wax composition between said plates is between about 4 and about 24 inches, lowering the temperature of said plates with concomitant solidification of the wax composition in the spaces between said plates, removing said body of wax composition from said container while the wax



composition in the spaces between said plates is in the solid state, gradually raising the temperature of said plates with concomitant rise in the temperature of the wax composition in said spaces accompanied by draining of lower melting point constituents from said spaces and recovering said lower melting point constituents that drain from said spaces separated from higher melting point constituents retained within said spaces and thereafter melting said higher melting point constituents and recovering them separated from said lower melting point constituents.

4,013,542

## PARTIAL PREDILUTION-DILUTION CHILLING

David A. Gudells, and David H. Shaw, both of Sarnia, Canada, assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 284,647, Aug. 29, 1972, Pat. No. 3,850,740. This application Oct. 21, 1974, Ser. No. 516,625

The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C10G 43/08

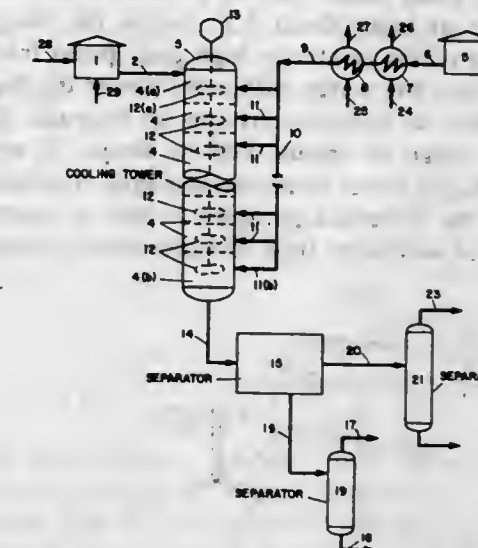
U.S. Cl. 208—33

7 Claims

1. A process for dewaxing a waxy petroleum oil feedstock comprising a waxy, deasphalted and topped crude oil the major portion of which boils above about 650°F. and which contains at least about 10 wt. % of residual material which process comprises:

- mixing said oil stock with between about 0.3 and 2 volumes of a predilution solvent per volume of said oil stock, thereby depressing the cloud point of said oil stock and forming a first mixture comprising said predilution solvent and said oil stock;
- introducing said first mixture at a temperature above the depressed cloud point of said oil stock into a cooling zone divided into a plurality of stages and passing said mixture from stage to stage of said cooling zone;
- introducing dewaxing solvent into at least a portion of said cooling zone at a plurality of spaced points therealong;
- mixing said dewaxing solvent with at least a portion of said first mixture as it passes from stage to stage of said

cooling zone under conditions of high agitation, thereby forming a second mixture comprising said dewaxing solvent, said predilution solvent and said oil stock; and  
e. cooling said oil stock contained in said second mixture as



it passes from stage to stage of said cooling zone, thereby reducing the temperature of said oil stock to below its depressed cloud point and precipitating at least a portion of said wax therefrom under said conditions of high agitation.

4,013,543

## UPGRADING SOLID FUEL-DERIVED TARS PRODUCED BY LOW PRESSURE HYDROLYSIS

Marvin Greene, Somerset, N.J., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 623,692, Oct. 20, 1975, Pat. No. 3,997,423. This application Dec. 15, 1975, Ser. No. 640,619

Int. Cl.<sup>2</sup> C10B 55/00

U.S. Cl. 208—50

9 Claims

1. A process of producing and upgrading carbonaceous tars comprising, in serial combination,

- adding liquid or crushed solid carbonaceous material to a reactor,
- adding hot hydrogen to the stream of carbonaceous material,
- reacting the hydrogen and the carbonaceous material at a pressure between atmospheric pressure and 250 psia. and a temperature between about 400° and about 2,000° C,
- quenching the mixture, with the total residence time for heat-up, reaction and quenching varying from about 2 milliseconds to about 2 seconds,
- processing said quenched reaction mixture to form a cold tar stream, and
- introducing said cold tar stream of step (e) into a fluid coking zone to obtain gas, upgraded carbonaceous tars, and hot coke.

4,013,544

## METHOD FOR MAKING AND SLURRYING WAX BEADS

LaVaun S. Merrill, Jr., Englewood, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 289,918, Sept. 18, 1972, Pat. No. 3,846,279. This application Aug. 21, 1974, Ser. No. 499,370

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> F17D 1/16

U.S. Cl. 208—93

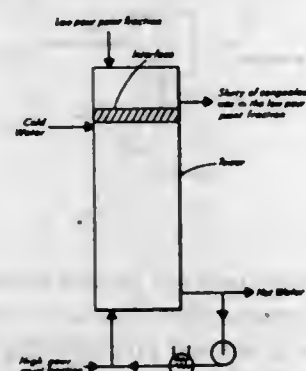
31 Claims

1. A process for transporting a hydrocarbon mixture as a slurry, the process comprising:

- fractionating the hydrocarbon mixture into at least a relatively low pour point fraction and a relatively high pour point fraction,



2. introducing at least a portion of the relatively high pour point fraction into the bottom of a tower having a continuous stream of water flowing countercurrent to the introduction of the relatively higher pour point fraction and wherein the water enters the top portion of the tower at a temperature at least about 5°F. below the congelation temperature of the relatively high pour point fraction,
3. dispersing into the water within the tower the high pour point fraction as particles having an average diameter within the range of about 0.05 to about 20 mm, said dispersion being under nonturbulent flow conditions, and permitting the dispersed particles to stay in contact with the water for sufficient time to substantially congeal the particles,



4. passing the resulting congealed particles through an interface, the interface being the juncture between a liquid hydrocarbon comprised of the low pour point fraction introduced into the top of the tower, and the water within the tower,
5. withdrawing at least a portion of the resulting slurry of the congealed particles in the liquid hydrocarbon at about the interface and thereafter transporting the slurry at temperature below those which bring about substantial solution of the congealed particles in the liquid hydrocarbon.
10. The process of claim 1 wherein an equivalent amount of up to about 50% by weight of the high pour point fraction is cracked before it is dispersed into the tower.

4,013,545

#### HYDROGENATION OF HYDROCARBONS UTILIZING A PRETREATED COBALT-MOLYBDENUM CATALYST

Lee Hillman, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 597,627, July 21, 1975, Pat. No. 3,981,796, which is a continuation-in-part of Ser. No. 418,700, Nov. 23, 1973, Pat. No. 3,933,683. This application July 22, 1976, Ser. No. 707,722

Int. Cl.<sup>2</sup> C10G 13/06; B01J 27/04; C07C 5/10

U.S. Cl. 208-111

4 Claims

1. A hydrocracking process utilizing a catalyst containing cobalt and molybdenum components present in oxide form which catalyst is activated according to a method which comprises the steps of:

- a. intimately contacting said hydrocracking catalyst with gaseous hydrogen, containing a sulfur compound, at a temperature within the range of from about 550° to about 800° F. for a sufficient time to effect the reduction and sulfiding of a major portion of said components; and
- b. stripping the resulting reduced and sulfided catalyst with substantially pure hydrogen at a temperature within the range of from about 750° to about 900° F.

4,013,546

#### REMOVING METAL CONTAMINANT FROM REGENERATED CATALYST IN CATALYTIC CRACKING PROCESS

Robert M. Suggitt, Wappingers Falls, N.Y., and Peter L. Paull, Weston, Conn., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 489,878, July 19, 1974, Pat. No. 3,985,639. This application Jan. 26, 1976, Ser. No. 652,583

Int. Cl.<sup>2</sup> B01J 37/22; C10G 11/04

U.S. Cl. 252-415

14 Claims

1. A method for removing metal contaminant from a crystalline aluminosilicate catalyst which has been contaminated with from 2000 to 15,000 ppm of vanadium along with the deposition of coke by use in converting a hydrocarbon feedstock containing vanadium which comprises contacting a regenerated crystalline aluminosilicate catalyst with molecular chlorine at from about 500° to 900° F. and separating a volatile chloride of vanadium from said catalyst, said catalyst having been regenerated by contacting at a temperature of from about 900° to 1,350° F. with an amount of oxygen sufficient to effect combustion of at least 85 percent of said coke to gaseous products comprising carbon monoxide and carbon dioxide in a ratio of carbon monoxide to carbon dioxide of at least 1:4 thereby providing a reducing atmosphere during regeneration and deterring formation of pentavalent vanadium on said catalyst.

4,013,547

#### DESULFURIZATION OF RESIDUAL PETROLEUM OILS WITH A CATALYST CALCINED AT HIGHER TEMPERATURES

Grant A. Mickelson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 22, 1976, Ser. No. 651,560

Int. Cl.<sup>2</sup> C10G 23/02

U.S. Cl. 208-216

7 Claims

1. A process for the hydrosulfurization of a residual petroleum feedstock, which comprises contacting said feedstock in admixture with added hydrogen at elevated desulfurization temperatures and pressures with a catalyst consisting essentially of a sulfided composite of about 1-7 weight-percent CoO and 8-16 weight-percent MoO<sub>3</sub> supported on a carrier consisting essentially of activated alumina, said catalyst being further characterized by:

- a. a total surface area between about 150 and 350 m<sup>2</sup>/g;
- b. a total pore volume between about 0.3 and 0.8 ml/g, at least about 40% of said pore volume being in pores of 75-100 Å diameter; and
- c. a pore volume in pores about 100 Å diameter of between about 0.01 and 0.1 ml/g;

said catalyst having been calcined at a temperature between about 1250° and 1400° F prior to said contacting.

4,013,548

#### HYDROPROCESSING OF HYDROCARBONS

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 672,183, March 31, 1976, which is a continuation-in-part of Ser. No. 538,240, Jan. 2, 1975, Pat. No. 3,957,624. This application Aug. 19, 1976, Ser. No. 715,813

Int. Cl.<sup>2</sup> C10G 23/04; B01J 23/58

U.S. Cl. 208-255

3 Claims

1. A process for hydrogenating a coke-forming hydrocarbon distillate containing di-olefinic and mono-olefinic hydrocarbons, and aromatics, which process comprises reacting said distillate with hydrogen, at a temperature below about 500° F., in contact with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.5 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % germanium and about 0.1 to about 3.5 wt. % halogen, wherein the platinum

group metal, cobalt and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal, and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states, and an alkali metal component, and recovering an aromatic/mono-olefinic hydrocarbon concentrate substantially free from conjugated di-olefinic hydrocarbons.

4,013,549

#### LUBE EXTRACTION WITH NMP/PHENOL/WATER MIXTURES

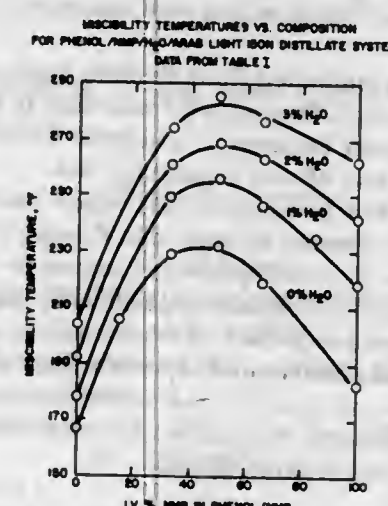
James D. Bushnell, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 311,287, Dec. 1, 1972, abandoned. This application June 5, 1974, Ser. No. 476,542 Disclosure was also published under second Trial Voluntary Patent Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C10G 21/06

U.S. Cl. 208-323

20 Claims



1. A process for upgrading a lubricating oil stock which comprises:

1. contacting said lubricating oil stock with a solvent comprising n-methyl-2-pyrrolidone and phenol wherein the amount of phenol in said solvent ranges between about 20 and 80 LV% based on the total amount of n-methyl-2-pyrrolidone and phenol in the solvent;
2. forming an extract phase and a raffinate phase; and
3. recovering an upgraded lubricating oil from said raffinate phase.

4,013,550

#### MANUFACTURE OF THERMOPLASTIC RESIN BEADS

Richard C. Weil, Monroeville, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed July 22, 1975, Ser. No. 598,088

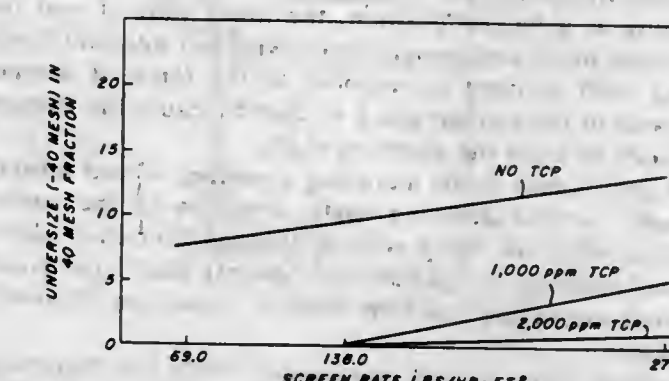
Int. Cl.<sup>2</sup> B03B 1/04

U.S. Cl. 209-9

12 Claims

1. In a method for classifying solid thermoplastic resin particles into predetermined fractions of differing sizes which sizes are within the range of minus 6 (-6) to plus 120 (+120) U.S. sieve and recovering the same, wherein said particles are combined with a finely divided inorganic salt selected from the group consisting of alkali and alkaline earth metal carbonates, phosphates, complexes of said carbonates and said phosphates, and mixtures of said carbonates and said phosphates, followed by dry dynamic screening said mixture to separate said particles into preselected fractions and recovering said fractions, the improvement comprising: conducting said screening at a rate of from 27 to 690 lbs/hr.

ft<sup>2</sup> of said mixture and the weight ratio of said salt to said particles being at least 500 and up to 3000 ppm of said salts and said weight ratio also being an amount above the breakdown point in classification of the particles for such



rate of screening; wherein said pre-selected fractions contain undersized resin particles in an amount no greater than 5% by weight of said pre-selected fractions. At least above the breakdown point for such rate of screening and up to 3,000 ppm of said salts.

4,013,551

#### DEVICE FOR SORTING OF GOODS

Sergio de Feudis, Nacka, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

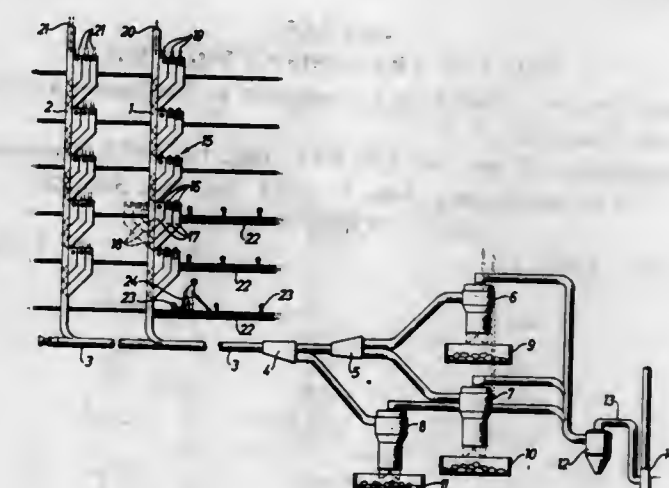
Filed Jan. 8, 1975, Ser. No. 539,386

Claims priority, application Sweden, Jan. 31, 1974, 7401308

Int. Cl.<sup>2</sup> B65G 51/02

U.S. Cl. 209-73

5 Claims



1. An arrangement for collecting, conveying and sorting material such as refuse or laundry into various kinds of goods, said material being transported in conveyance shafts from a number of depositing places to a common collecting place with separate containers for the various kinds of goods, comprising:

- a number of chute doors at each depositing place, the number of doors corresponding to the various kinds of goods being handled;
- at least one storage space for each kind of goods being located immediately inside the corresponding chute door in order to collect the goods after being entered through said chute door each storage space ending in a substantially vertical dumping shaft and having a lower sliding surface being directed obliquely downwards towards said dumping shaft;
- a discharge hatch for closing a discharge opening of each storage space, said hatch being kept in closed position by means of a locking mechanism, the discharge hatch forming part of an inner wall surface of said substantially vertical dumping shaft, the locking mechanism maintaining the discharge hatch closed and allowing a certain



amount of goods to be collected before the storage space is emptied, which occurs at disengagement of said locking mechanism, said discharge hatch being pivoted at its upper margin on a substantially horizontal axis so as to close the discharge opening of the storage space when being at a locked position, the lower part of said discharge hatch being operable to swing out into said dumping shaft to open in response to the force of dumped goods in the storage space to thereby cause the dumped goods to enter the dumping shaft;

said conveyance shafts including a number of said substantially vertical dumping shafts common to the various kinds of goods being entered through said chute doors, and collisted in said storage spaces, each conveyance shaft conveying material from at least two depositing places;

switching valves in said conveyance shafts for distributing the various kinds of goods to the corresponding containers;

means for controlling the disengagement of said locking mechanisms and the position of said switching valves in order to connect said storage spaces for one and the same kind of goods through the conveyance shafts with the corresponding container.

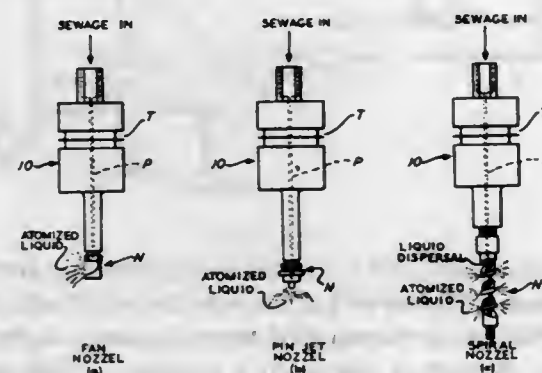
4,013,552

## SEWAGE TREATMENT PROCESS

Jacob Kreuter, Hazlet, N.J., assignor to Ecquacon Corporation, Matawan, N.J.  
Continuation of Ser. No. 281,843, Aug. 18, 1972, abandoned.  
This application Feb. 3, 1975, Ser. No. 546,287  
Int. Cl.<sup>2</sup> C02C 1/02, 5/04

U.S. Cl. 210-12

7 Claims



1. The process of sonobioaeration for treating sewage utilizing an electroacoustic horn, said sewage including liquid, solid organic matter and aerobic organisms comprising the steps of: exposing said electroacoustic horn to air; converting said sewage to a thin film; applying said thin film of sewage to the surface of said electroacoustic horn; and transmitting ultrasonic energy with said electroacoustic horn to said thin film of sewage, in the presence of said air, to atomize the thin film of sewage to reduce the particle size of said liquid and enrobe said reduced liquid particles with said air to provide said aerobic organisms with additional oxygen, derived from said air, for said aerobic organisms to utilize in the process of bio-chemical oxidation whereby said aerobic organisms convert said organic matter to a more stable compound.

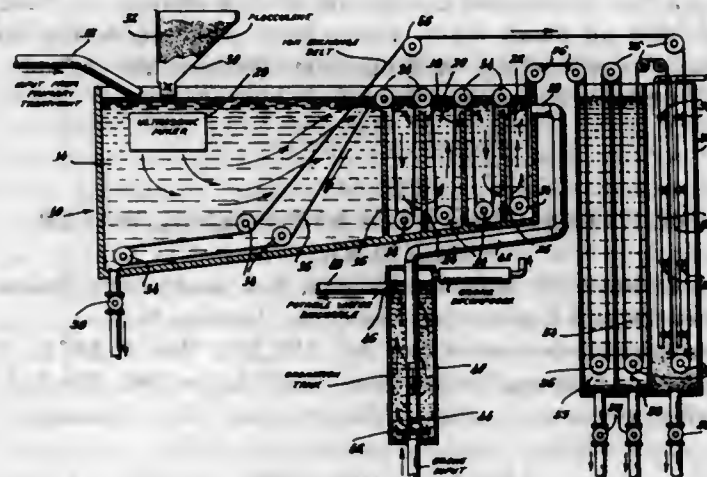
4,013,553

## FLUID TREATMENT METHOD

Eskil L. Karlson, Stamford, Conn., assignor to Iconex Systems Incorporated, Stamford, Conn.  
Division of Ser. No. 448,019, March 4, 1974, Pat. No. 3,912,636. This application June 4, 1975, Ser. No. 583,788  
Int. Cl.<sup>2</sup> C02C 9/02

U.S. Cl. 210-28

5 Claims



1. A method for separating and receiving selected materials from fluid medium contaminated with said materials comprising:

flowing said contaminated fluid medium through a separating tank forming a flow path for said fluid to be processed from a first inlet location to a second outlet location at the opposite end of said separating tank causing an endless foraminous belt which includes ion exchange resin to move through said flowing contaminated fluid medium in a multiplicity of serpentine transversals and in a direction such that said belt will pass through said transversals in a sequence which is counter directional to the flow of said contaminated fluid medium from the first inlet location to said second outlet location, whereby purified fluid medium is caused to exit said second outlet location of said separating tank.

4,013,554

## METHOD AND APPARATUS FOR PURIFYING WATER CONTAMINATED WITH ANODICALLY OXIDIZABLE ORGANIC MATTER

August Reis; Karl-Ernst Quentin, and Ludwig Weil, all of Munich, Germany, assignors to Sachs-Systemtechnik GmbH, Schweinfurt am Main, Germany  
Filed May 13, 1975, Ser. No. 577,044  
Claims priority, application Germany, May 17, 1974, 2424091

Int. Cl.<sup>2</sup> B01D 15/06

U.S. Cl. 210-40

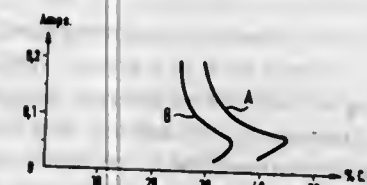
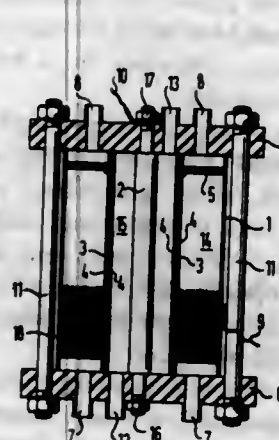
6 Claims

1. A method of purifying water contaminated with anodically oxidizable organic matter which comprises:

- agitating said contaminated water with particulate, electrically conductive, hydrophilic, carbonaceous material capable of adsorbing said organic matter at a rate sufficient to produce turbulent movement of said material in the mixture so produced; and
- contacting said mixture with the electrically conductive surface of a body while a potential applied to said surface and to said water makes the surface anodic relative to said contaminated water.

- said rate being sufficient to cause only intermittent contacting between said material and said surface.
- said intermittent contacting being continued until a

portion of said organic matter adsorbed on the particles of said material is destroyed by passage of current from flow, and perforated screen means concentrically positioned about said pipe means for preventing solid particles in the



said particles to said water during said intermittent contacting.

4,013,555

## PROCESS FOR REDUCING BOD IN FOOD PROCESSING PLANT WASTES

William R. Davis, Richmond, Va., assignor to Nalco Chemical Company, Oak Brook, Ill.  
Filed Mar. 24, 1976, Ser. No. 669,931  
Int. Cl.<sup>2</sup> C02B 1/20

U.S. Cl. 210-51

2 Claims

1. A process for reducing BOD in the form of soluble proteinaceous material in aqueous food processing plant wastes which comprises subjecting such wastes to the following series of sequential steps:

- adjusting the pH of the waste to 3 or less to form finely divided suspended particles;
- readjusting the pH of the waste with sodium aluminate to a value within the range of 6-7.5;
- flocculating the particles with an anionic acrylamide polymer; and then
- removing and collecting the flocculated particles from the food processing plant wastes.

4,013,556

## COMBINATION FLOW DISTRIBUTION AND COLLECTION APPARATUS

Thomas W. Evans, Houston, Tex., assignor to UOP Inc., Des Plaines, Ill.

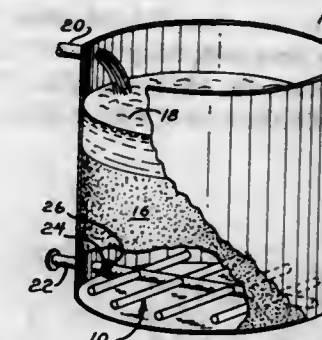
Filed Aug. 19, 1976, Ser. No. 715,814

Int. Cl.<sup>2</sup> B01D 23/20

U.S. Cl. 210-136

8 Claims

1. An apparatus for distributing fluid flow in one direction at one flow rate and collecting it in another direction at another flow rate comprising pipe means having an opening at one end through which fluid can enter or leave said apparatus and first and second sets of openings in the walls thereof, the first said set of openings permitting flow in either direction through said walls depending on whether the fluid is being distributed or collected, the second said set of openings having valve means associated therewith which are self-closing in one direction of flow and self-opening in the other direction of



fluid being collected which are larger than the screen perforations from being drawn into the pipe means.

4,013,557

## SEWAGE TREATMENT APPARATUS

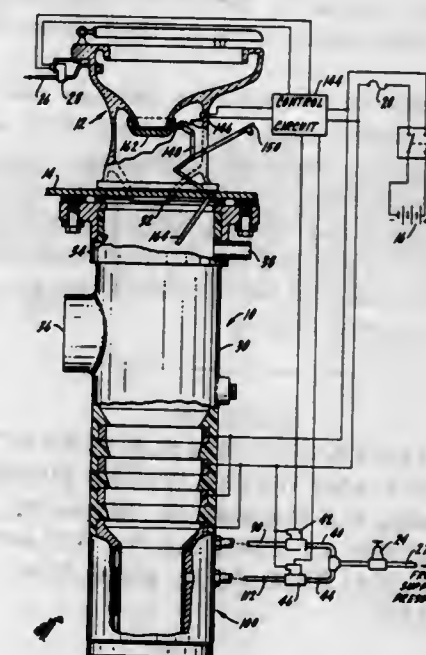
James D. Snodgrass, Darien, and Joseph J. Pilolla, Elmhurst, both of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.

Filed June 6, 1975, Ser. No. 584,508

Int. Cl.<sup>2</sup> C02B 3/06

U.S. Cl. 210-138

27 Claims



1. A sewage treatment apparatus comprising a casing having an inlet for reception of sewage and a discharge outlet, valve means adjacent said discharge outlet, a plurality of electrodes positioned about said casing between said valve means and inlet for providing an electrical potential to electrolytically treat sewage in said casing thereby rendering it substantially sterile, said electrodes and the interior of said casing defining a substantially open and unobstructed central treatment zone, means for closing said valve means to temporarily hold a batch of sewage within said zone, means for introducing a fluid under pressure into the casing at said central treatment zone and adjacent said electrodes to provide agitation and turbulence within the treatment zone resulting in a substantially homogeneous sewage liquid, means defining a plurality of projections positioned about said treatment zone and adjacent said electrodes to assist in reducing the sewage, and means for opening said valve means to discharge the batch of treated sewage.



4,013,558

## SYSTEM FOR PURIFYING LIQUIDS

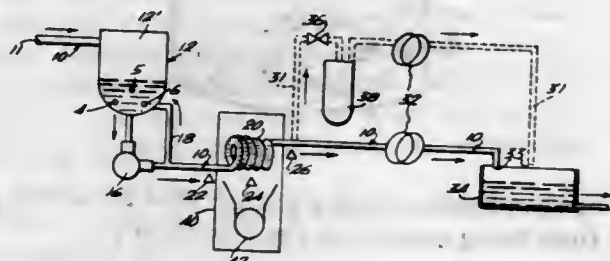
H. Colman Rosenberg, 1921 NE. 185th Terrace, North Miami Beach, Fla. 33161

Continuation-in-part of Ser. No. 443,416, Feb. 19, 1974, abandoned, and Ser. No. 255,646, May 22, 1972, abandoned. This application Mar. 18, 1975, Ser. No. 559,427

Int. Cl.<sup>2</sup> C02B 3/06; C02C 5/06

U.S. Cl. 210-149

5 Claims



1. A treatment system for flowable materials composed of liquids and solids which includes:

- A. a line for the flow, said line having an upstream with a main inlet and a downstream with a main outlet;
- B. mixing means in the line to maintain a relatively uniform consistency of the materials; and
- C. purifying means arranged downstream of said mixing means and including a microwave generator, and guide means to direct electromagnetic energy in a path toward a target area of said purifying means,
- D. said line including a pattern in the target area to conduct flow of the flowable material, said pattern comprising a coil which is convoluted to define a whirling or turbulent flow pattern of the flowable material to impart a mixing and wiping action within said coil for even excitation of the flowable material by the electromagnetic energy and to prevent build up of solids on the interior of said coil; and
- E. control means to control flow through said line in the target area, said control means including temperature sensing means to measure differential temperature of flowable material between the upstream and downstream coil zones and to provide a variable exposure time consistent with pre-established sterilization needs of the particular flowable material being treated and to maintain the temperature below boiling.

4,013,559

## PREFABRICATED PANELS FOR SUB-SURFACE SEWAGE EFFLUENT AND WASTE WATER DISPOSAL

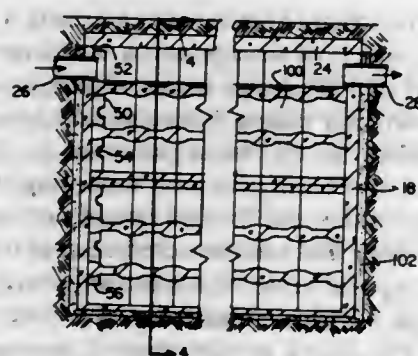
Rollin W. Johnson, 215 Magnolia St., Statesville, N.C. 28677

Filed Nov. 19, 1975, Ser. No. 633,442

Int. Cl.<sup>2</sup> B01D 21/24; C02C 5/04

U.S. Cl. 210-151

16 Claims



2. A ground absorption system for disposing of subsurface sewage effluent and waste water emitted from septic tanks which receives effluent from a source in a conventional manner comprising:

- a. at least one panel section, including:

- i. a top wall, bottom wall, end walls, and side walls and formed of a strong, porous cementitious material;
  - ii. a plurality of elongated chambers including an uppermost, lowermost, and at least one intermediate chamber arranged one above the other within said section, each of said chambers being at least partially separated from the adjacent chamber by a web of said porous cementitious material;
  - b. a pipe extending from said septic tank directly into the uppermost of said plurality of elongated chambers through which air, along with waste water, is delivered from said septic tank to said panel section;
  - c. said pipe having a divided inlet end in said septic tank including a first opening above the effluent and a second opening below the effluent level, whereby both air and effluent enter said pipe; and
  - d. communicating means extending through said webs for delivering air and overflow waste water to the intermediate and lower of said chambers throughout said panel section.
12. A prefabricated panel for receiving sewage effluent and waste water from a septic tank in a ground disposal circulation system comprising an elongated narrow housing formed of a porous cement material and having top and bottom walls, end walls, and side walls, a plurality of vertically spaced, cement, separator webs extending between the side walls along the length of said housing to form an upper, lower, and at least one intermediate elongated chamber; an inlet through one of said end walls into said upper chamber through which a pipe from said septic tank extends whereby said effluent and waste water is introduced into the housing; and a communicating means extending through said webs and interconnecting said chambers for introducing air, effluent and selected other materials into any of said intermediate or lower chambers.

4,013,560

## ENERGY PRODUCTION OF WET OXIDATION SYSTEMS

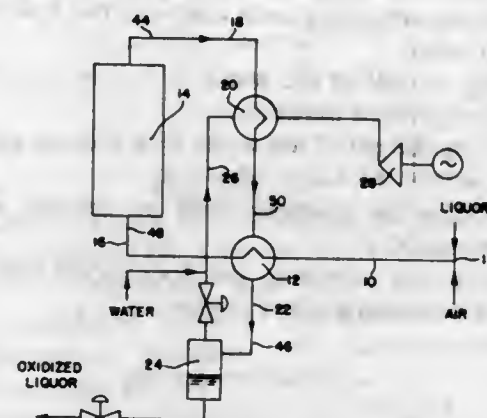
Louis A. Pradt, Wausau, Wis., assignor to Sterling Drug Inc., New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,942

Int. Cl.<sup>2</sup> C02C 5/04

U.S. Cl. 210-152

9 Claims



1. A wet oxidation apparatus comprising a reactor, a preheater therefor, and means to recover power, means supplying liquor and air through the preheater to the reactor, means cooling the oxidized products from the reactor to a point close to the temperature of the air and liquor supplied, means separating the liquid and gas phases at the lower temperature, means injecting a controlled amount of water into the relatively dry and cool gas stream from the separating means, means heating said gas stream with the products from the reactor to substantially completely vaporize the water injected, or completely vaporize and superheat the water injected, means delivering the gas stream so generated to the means for recovering power, the reactor stream cooling means comprising a heat exchanger heating the separated water injected gas phase, the preheater being heated by the reactant stream after leaving the cooling means.

4,013,561

## SEPARATORS

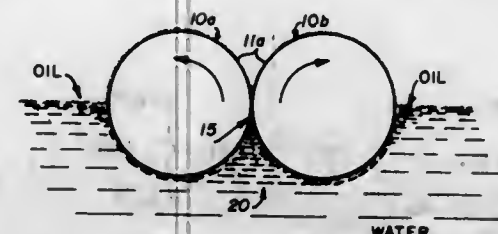
Herman H. Murphy, Box 61945, Sunnyvale, Calif. 94088

Continuation-in-part of Ser. No. 249,919, May 3, 1972, abandoned. This application Sept. 17, 1974, Ser. No. 506,716

Int. Cl.<sup>2</sup> E02B 15/04

U.S. Cl. 210-222

23 Claims



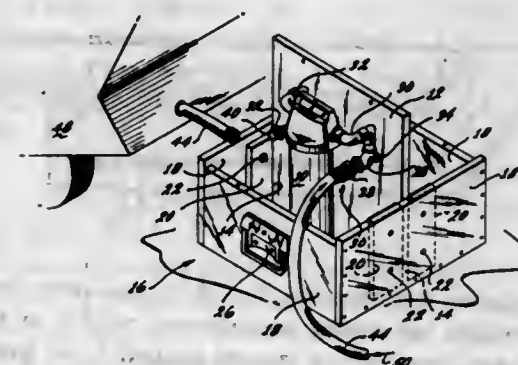
1. A skimming separator for scavenging floating matter from the face of a body of liquid by frictional tractive conveyance, which comprises in cooperative combination:

- a supporting structural frame means;
- motor means;
- a pair of contiguous cylinders 10 rotatably mounted on the frame means and rotated in opposite directions by the motor means, with the side of at least one of the pair of rotating cylinders 10 having a rough textured frictional traction surface material 11 thereon which traction surface material comprises a surface of discrete abrasive elements which is advanced in recirculation with rotation of the cylinders 10 and subjected to a compressive force in passing through a nip 15 formed between the pair of contiguous counter-rotating cylinders 10, the cylinders being mounted for moving the rough frictional traction surface through the proximate floating matter and through an upper layer of liquid and continuing moving through the liquid toward the nip, whereby partial immersion of the advancing traction surface 11 in a body of liquid frictionally engages a contacting layer of the liquid and tractively conveys the upper layer of the liquid and proximate matter floating thereon within the body of liquid directly into a collection reservoir 20 which is formed and confined in part by the advancing traction surface 11 and in part by the body of liquid, wherein the conveyed layer of liquid and floating matter is substantially retained by being at least partially prevented from further tractional conveyance by being compressed and squeezed off the traction surface 11 in passage through the nip 15 between the pair of contiguous cylinders 10, whereupon the traction surface 11 thereby becomes sufficiently regenerated for tractively conveying additional quantities of the upper layer of the liquid and proximate matter floating thereon during the subsequent recirculation of the traction surface 11 with rotation of the cylinders 10, thereby continually skimming floating matter from the face of the liquid by frictional tractive conveyance and separating the scavenged floating matter skimmed from the upper layer of the liquid by confinement within the collection reservoir; and a guard screen at least partially immersed in the liquid and in a spaced clearance position relative to the advancing traction surface with means connecting the guard screen with the frame means, whereby excessive quantities of solid matter are prevented from entering between the cylinders.

a plurality of vertical side wall members fixedly attached to said base member and perpendicular thereto forming an open ended container therewith;

holding means positioned along the inner surfaces of two of said vertical side walls;

a removable cover member covering the open end of said container and providing a support member when secured within said container by said holding means;



water filter means mounted to the inner surface of said cover member, said filter means being in a stored position when said cover is positioned as a closure for said container and in an operable position when said cover member is positioned as a support member; and

input and output conduit means for delivering unfiltered water to said filter means and removing filtered water therefrom.

4,013,563

## SWIMMING POOL STRAINER CONSTRUCTION

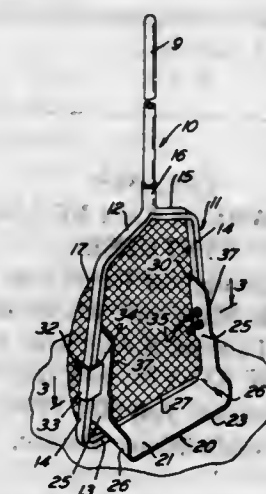
Albert V. Petrik, 2866 Joyce Road, Roslyn, Pa. 19001

Filed May 8, 1975, Ser. No. 575,592

Int. Cl.<sup>2</sup> B01D 33/34

U.S. Cl. 210-407

10 Claims



1. The combination with a swimming pool strainer including a handle, an open frame having a front face and extending from the handle, and net means across the frame, of a blade extending across and in front of a lower region of said frame spaced above the lower edge thereof for location adjacent to and spaced above a pool bottom upon forward strainer movement, said blade having a leading edge and a trailing edge and being generally rearwardly obliquely inclined from said leading edge to said trailing edge to effect hydrodynamic upward flow of water and sediment into said net means without scraping.

4,013,562

## PORTABLE WATER FILTER

Willie Gray Gott, 11311 Renee Ave., The Foothills, Yuma, Ariz. 85364

Filed Nov. 3, 1975, Ser. No. 628,579

Int. Cl.<sup>2</sup> B01D 39/04, 35/02

U.S. Cl. 210-232

8 Claims

1. A portable water filter comprising:

a base member;



4,013,564

## MULTIPURPOSE METABOLIC ASSIST SYSTEM

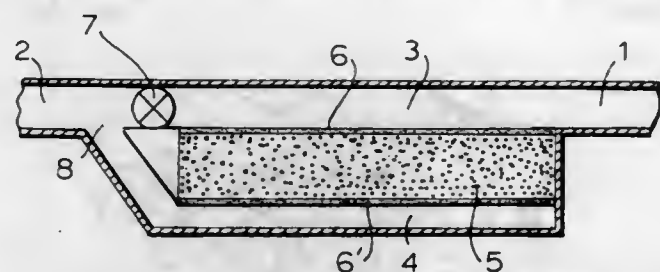
Yukihiko Nose, Cleveland Heights, Ohio, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 17, 1975, Ser. No. 559,395

Int. Cl.<sup>2</sup> B01D 31/00

U.S. Cl. 210-434

14 Claims



1. An apparatus for treating blood, comprising an inlet passageway means, an outlet passageway means, a treated blood component passageway means spaced from said inlet passageway means and being connected directly to said outlet passageway means, said apparatus having at least one space between at least a portion of said inlet passageway means and a portion of said treated blood component passageway, a particulate treatment agent for treating a component of the blood for removing undesirable materials from the blood, said agent being taken from the group consisting of an adsorption agent, a decomposition agent, an agent reacting chemically for removal of the undesirable materials and an agent reacting biologically for removal of the undesirable materials, said treatment agent being packed in said space, at least a portion of the inlet passageway means and the treated blood component passageway means which face said space being constituted by a porous membrane having pores of a size smaller than the size of the particles of the treatment agent and of the size for passing a component of the blood to be treated, and blocking passage of the remainder of the blood, and flow obstruction means for producing an increased pressure in said inlet passageway means, whereby when blood is supplied to the inlet passageway means, only the component of the blood to be treated is passed through the membrane of the inlet passageway means and said treatment agent, and the component is treated and the treated component from which the undesirable material has been removed is passed through the membrane of the blood component passageway and is collected in the treated blood component passageway means and supplied to said outlet passageway means and rejoins the remainder of the blood therein.

4,013,565

## POLYOXETANES WHICH CAN BE USED IN PEPTIDE SYNTHESIS

Jean Bouchaudon, Morsang-sur-Orge; Guy Bourat, Bourg-la-Reine, and Rodolphe Margraff, Ris Orangis, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 335,177, Feb. 23, 1973, Pat. No. 3,847,868. This application July 31, 1974, Ser. No. 493,474 Claims priority, application France, Feb. 28, 1972, 72.06696

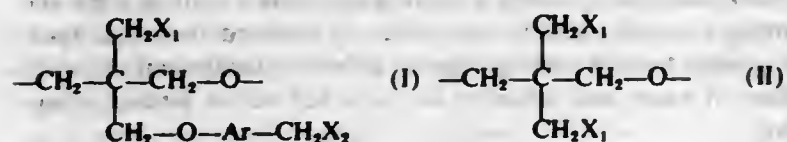
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> B01D 31/00

U.S. Cl. 210-500 M

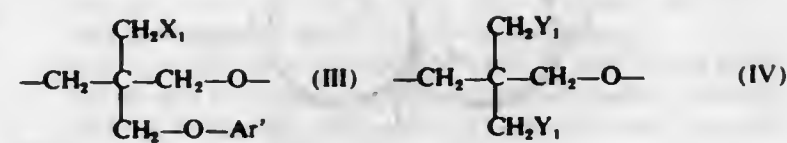
12 Claims

1. A membrane consisting of a polyoxetane which consists of essentially of a plurality of units of the formula:

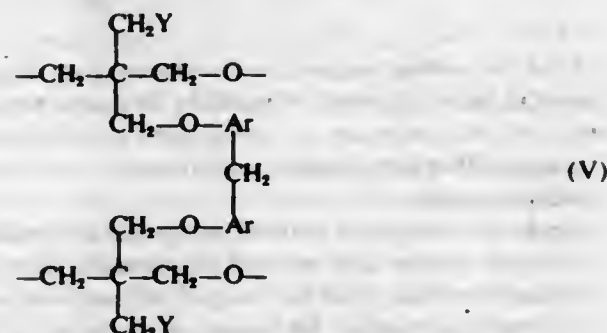


and

and, optionally, of units of at least one of the formulae:



and



in which:

each of X<sub>1</sub> and X<sub>2</sub>, which may be identical or different, represents a chlorine or bromine atom,

Y as defined under X<sub>1</sub>, or represents a radical of formula: -O-Ar-CH<sub>2</sub>X<sub>2</sub> or -O-Ar',

each of the Y<sub>1</sub> radicals, which may be identical or different, represents a -O-Ar' or -O-Ar-CH<sub>2</sub>X<sub>2</sub> radical,

Ar represents a divalent aromatic radical, the two free valencies of which are carried by carbon atoms of one or two aromatic benzene rings and

Ar' represents the radical -ARH,

the units (I) to (V) being connected to one another via the oxygen atom with a free valency of one of the units and a methylene group with a free valency of the adjacent unit, and a screen reinforcement.

4,013,566

## FLEXIBLE DESICCANT BODY

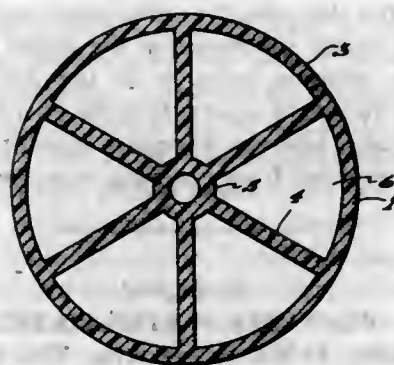
R. Daniel Taylor, North Ridgeville, Ohio, assignor to Adsorbex, Incorporated, North Ridgeville, Ohio

Filed Apr. 7, 1975, Ser. No. 565,544

Int. Cl.<sup>2</sup> B01D 27/04

U.S. Cl. 210-502

21 Claims



1. A flexible solid desiccant body comprising finely divided particles of desiccant material homogeneously distributed and encapsulated in a moisture transmissive polymer solid matrix of a cured thermoset aliphatic epoxy resin.

4,013,567

## HIGH-FREQUENCY TUBULAR OZONIZER

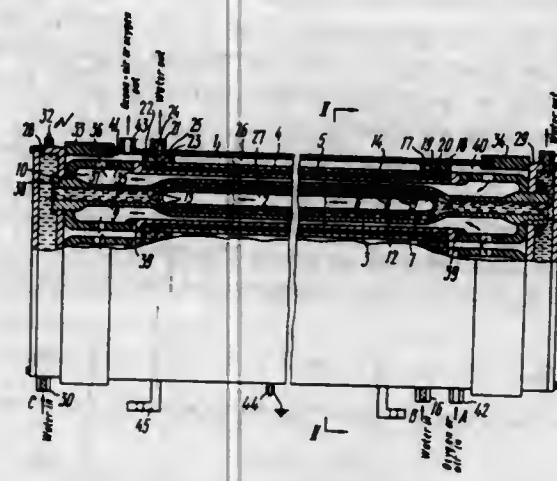
Jury Mikhailovich Emelyanov, Chertanovskaya ulitsa, 63, korpus 1, kv. 62, and Mikhail Fedorovich Emelyanov, Schelkovskoe shosse, 69, kv. 43, both of Moscow, U.S.S.R.

Filed July 31, 1975, Ser. No. 600,863

Int. Cl.<sup>2</sup> C01B 13/11

U.S. Cl. 250-540

3 Claims



1. A high frequency tubular ozonizer comprising a hollow housing, at least one ozonizing element accommodated in said housing, said ozonizing element including a low voltage tubular electrode formed by two coaxial disposed pipes and adapted to be cooled by a flowing liquid, the output pipe forming a cooling jacket with said housing and adapted to render the flow of the cooling liquid turbulent and increasing the intensity of cooling of said low voltage electrode, and a high voltage tubular electrode coaxially arranged inside the low voltage tubular electrodes in the form of a pipe of a varying cross-section having a middle expanded portion, a flange at one end thereof and a thread at the other end thereof and a core for rendering turbulent the flow of the cooling liquid and increasing the intensity of cooling of said high voltage electrode disposed in the middle expanded portion of the high voltage electrode; the opposing surfaces of the pipes of the low voltage and the high voltage electrodes forming a discharge zone, at least one of the surfaces of said pipes being coated with a layer of dielectric, two manifolds forming the butt ends of said housing and adapted for supplying and discharging, respectively, the cooling liquid to and from said high voltage electrode, at least two insulating, cup-shaped centering bushings having openings in the walls and bottom thereof disposed on the ends of the pipe of said high voltage electrodes and centering said high voltage electrode inside said low voltage electrode, branch pipe means for supplying cooling liquid to said low voltage electrode installed on the housing, two diaphragms arranged in parallel and installed between said housing and said outer pipe of said low voltage electrode, said outer pipe having an opening in the interval between said diaphragms, the space formed by said diaphragms opposite said branch pipe and from which space cooling liquid flows to the water jacket of said low voltage electrode, branch pipe means for discharging said cooling liquid from said low voltage electrode on said housing, two diaphragms arranged in parallel and installed between said housing and said outer pipe of the low voltage electrode, said outer pipe having an opening in the interspace between said diaphragms which form a space located opposite the second mentioned branch pipe, the cooling liquid from said water jacket being discharged from the ozonizer via said second mentioned branch pipe, two annular insulating bushings disposed respectively between each of said manifolds and the butt ends of said housing and along the perimeter thereof, said bushings, said butt ends and said manifolds in combination forming two spaces, the gas to be ozonized being fed from one of said spaces via an opening in one of said centering bushings to the discharge zone of each ozonizing element and the ozonized gas flowing to the other of said

spaces from said discharge zones and from the ozonizer through said second mentioned branch pipe.

4,013,568

## COMPOSITION AND METHOD FOR DRILLING FORMATIONS CONTAINING GEOTHERMAL FLUID

Paul W. Fischer, Whittier, Calif.; Jerry C. Jones, deceased, late of Memez Springs, N. Mex. (Shirley J. Jones, executrix); Delbert E. Pyle, Northridge, and Stephen Pyc, Brea, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Dec. 11, 1975, Ser. No. 639,652

Int. Cl.<sup>2</sup> C09K 7/08, 7/02; E21C 7/06

U.S. Cl. 252-8.5 C

15 Claims

1. A gas-containing aqueous drilling fluid comprising from about 99.5 to about 90 volume percent of a gas and from about 0.05 to about 10 volume percent of a clay-free aqueous dispersion containing from about 327 to about 347 pounds per barrel water, from about 10 to about 2 pounds per barrel lignite, from about 2.5 to about 0.5 pounds per barrel alkali metal or ammonium salt of a homopolymer of acrylic acid or a copolymer containing at least about 90 percent by weight acrylic acid and up to about 10 percent by weight acrylonitrile, methyl acrylate, ethyl acrylate or 2-methyl propanoic acid, which homopolymers and copolymers have an average molecular weight of 5,000 to 50,000 and from about 0.011 to 1 gallon per barrel of a mixture consisting essentially of a carrier liquid containing about 0.001 to 25 weight percent of an organic agent which is a tertiary amine having a molecular weight above 250 that releases ammonia or a vaporous amine and forms a resinous residue at downhole temperature and pressure conditions to function as an erosion and corrosion inhibitor.

4,013,569

## AQUEOUS ANIONIC SURFACTANT SYSTEMS CONTAINING AROMATIC ETHER POLYSULFONATES

Ying C. Chiu, and Harold J. Hill, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 562,283, March 26, 1975, Pat. No. 3,945,437. This application Oct. 15, 1975, Ser. No. 622,576

Int. Cl.<sup>2</sup> E21B 43/22

U.S. Cl. 252-8.55 D

8 Claims

1. An aqueous anionic surfactant system having a relatively high tolerance to multivalent cations, which system consists essentially of:

a substantially homogeneous aqueous liquid system containing at least one dissolved or dispersed petroleum sulfonate surfactant, at least one dissolved electrolyte that is predominately an alkali metal salt of a halogen acid, and at least one dissolved sulfonated alkyldiphenyl oxide that contains one ether group attached to the aromatic radicals, contains from 1 to 2 alkyl radicals of from 10 to 16 carbon atoms per molecule, and contains at least substantially two sulfonate groups per molecule; within said aqueous liquid system, proportions of the surfactant and electrolyte capable of providing, at a temperature of from about 50° to 300° F, an interfacial tension between the system and an oil of less than about 0.1 dyne per centimeter; and within said aqueous liquid system, a proportion of sulfonated alkyldiphenyl oxide which, at temperatures of from about 50° to 300° F, increases the salinity and multivalent cation tolerance of the system and causes the system to be capable of reducing the viscosity and stability of emulsions formed between the system and an oil.



4,013,570

## GRAPHITE AND COPPER IN HOT FORGING LIQUID LUBRICANT

Harold G. Lemmer, New Baltimore, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 7, 1975, Ser. No. 565,873

Int. Cl.<sup>2</sup> C10M 1/10, 3/02, 5/02, 7/04

U.S. Cl. 252-30

3 Claims

1. In a colloidal graphite-containing, hot forming liquid lubricant for ferrous powdered metal articles, the improvement which comprises including in said lubricant about 2% to 4%, by weight, powdered copper, having a particle size less than about 50 microns, which improvement permits presintering of lubricant-coated ferrous powdered metal preforms at temperatures above about 2050° F.

4,013,571

## EXTREME PRESSURE LUBRICATING COMPOSITION CONTAINING THIOSULFATE EXTREME PRESSURE AGENTS

Ralph P. Williams, and Rector P. Louthan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 24, 1975, Ser. No. 543,792

Int. Cl.<sup>2</sup> C10M 1/24

U.S. Cl. 252-42

5 Claims

1. An extreme pressure lubricant composition comprising a mineral, animal, or vegetable lubricating oil and an amount of t-butyl-t-butylthiosulfate which imparts improved extreme pressure characteristics to the lubricating oil.

4. A composition in accordance with claim 1 wherein the lubricating oil is present in the form of a lithium-based grease of about 000 to about 6 NLGI grade.

4,013,572

## HYBRID FIX SYSTEM INCORPORATING PHOTODEGRADABLE POLYMERS

Dana G. Marsh, Rochester, and John M. Pochan, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

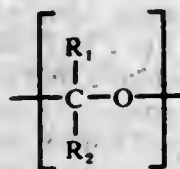
Filed Oct. 7, 1974, Ser. No. 512,590

Int. Cl.<sup>2</sup> G03G 9/00

U.S. Cl. 252-62.1 P

12 Claims

1. A toner comprising a colorant and a photodegradable polymer containing segments satisfying the formula:



wherein  $R_1$  is hydrogen or methyl and  $R_2$  is hydrogen, an alkyl radical of 1 to 6 carbon atoms, a chlorinated or fluorinated aliphatic radical of 1 to 6 carbon atoms or a cyano substituted radical of 1 to 5 carbon atoms provided that when  $R_1$  is methyl  $R_2$  is also methyl, and a photo-oxidant which upon activation by exposure to a degradable amount of activating radiation is capable of abstracting one or more electrons from one or more of the oxygen atoms in said polymer.

4,013,573

## CARRIER GRANULE FOR AN ORGANOSILANE

John W. Leikhim, Cincinnati; Edward J. Maguire, Jr., Forest Park; David C. Heckert, Oxford, and David M. Watt, Jr., Cincinnati, all of Ohio, assignors to The Procter &amp; Gamble Company, Cincinnati, Ohio

Filed Apr. 22, 1975, Ser. No. 570,536

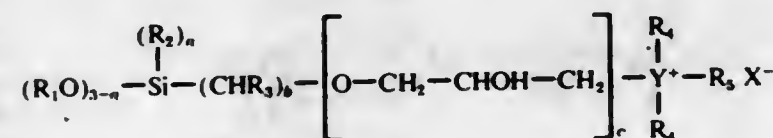
Int. Cl.<sup>2</sup> C11D 1/00

U.S. Cl. 252-89 R

23 Claims

1. A carrier granule containing an organosilane compound which comprises an inner core of an inert, organic or inorganic material whose surface has thereon an organosilane and a water-soluble or water-dispersible, normally solid, nonionic material consisting essentially of:

- from 25% to 95% of a water-soluble or water-dispersible inert organic or inorganic granular material which is inert to the organosilane, non-hygroscopic, non-electrolytic and non-alkaline and serves as the inner core;
- from 2% to 50% of an organosilane having the formula



or is a siloxane oligomer thereof wherein  $R_1$  is an alkyl group containing 1 to 4 carbon atoms,

$(CH_3)_3Si$  or  $Z(CH_2H_{2x})_m$

where  $x$  is 2 to 4,  $m$  is 1 to 20, and  $Z$  is hydrogen, an alkyl group containing 1 to 18 carbons or an acyl group containing 1 to 4 carbon atoms;  $R_2$  is an alkyl group containing 1 to 18 carbon atoms;  $a$  is 0 to 2;  $R_3$  is hydrogen or an alkyl group containing 1 to 18 carbon atoms;  $b$  is 1 to 3,  $c$  is 0 or 1;  $R_4$  is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms, a carboxy-substituted alkyl group containing 1 to 4 carbon atoms,

$(C_2H_5O)_mZ$  where  $x$ ,  $m$  and  $Z$  are as defined above, or oxygen provided only one  $R_4$  is oxygen and further provided that there is no  $X^-$  when  $R_4$  is oxygen;  $R_3$  is an alkyl, aryl or arylalkyl group containing 1 to 22 carbon atoms;  $X$  is bromide or chloride; and  $Y$  is nitrogen, sulfur or phosphorus; and

$c$ . from 3% to 70% of a water soluble or water-dispersible, normally solid nonionic material which melts or liquifies between the temperatures of 35° C and 95° C and wherein the organosilane and nonionic material are on the surface of the inner core.

4,013,574

## ORGANOSILANE-CONTAINING PRILL

John W. Leikhim, Cincinnati; Edward J. Maguire, Jr., Forest Park; David C. Heckert, Oxford, and David M. Watt, Jr., Cincinnati, all of Ohio, assignors to The Procter &amp; Gamble Company, Cincinnati, Ohio

Filed Apr. 22, 1975, Ser. No. 571,709

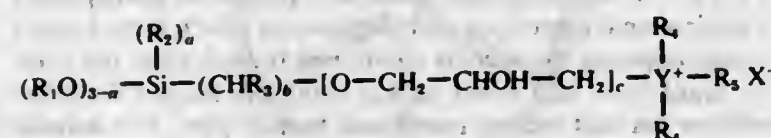
Int. Cl.<sup>2</sup> C11D 1/00

U.S. Cl. 252-89 R

20 Claims

1. A prill containing an organosilane compound which consists essentially of:

- an organosilane having the formula



or is a siloxane oligomer thereof wherein  $R_1$  is an alkyl group containing 1 to 4 carbon atoms,

$(CH_3)_3Si$  or  $Z(CH_2H_{2x})_m$

where  $x$  is 2 to 4,  $m$  is 1 to 20, and  $Z$  is hydrogen, and alkyl group containing 1 to 18 carbons or an acyl group containing 1 to 4 carbon atoms;  $R_2$  is an alkyl group containing 1 to 18 carbon atoms;  $a$  is 0 to 2;  $R_3$  is hydrogen or an alkyl group containing 1 to 18 carbon atoms;  $b$  is 1 to 3;  $c$  is 0 or 1;  $R_4$  is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms, a carboxy-substituted alkyl group containing 1 to 4 carbon atoms,

$(C_2H_5O)_mZ$

where  $x$ ,  $m$  and  $Z$  are as defined above, or oxygen provided only one  $R_4$  is oxygen and further provided that there is no  $X^-$  when  $R_4$  is oxygen;  $R_3$  is an alkyl, aryl or arylalkyl group containing 1 to 22 carbon atoms;  $X$  is bromide or chloride; and  $Y$  is nitrogen, sulfur or phosphorus; and

$b$ . a water-soluble or water-dispersible, normally solid nonionic material which melts or liquifies between the temperatures of 35° and 95° C and is compatible with said organosilane compound in a weight ratio of organosilane to nonionic material of from 4:1 to 1:50.

4,013,575

## DRY CLEANING WITH PERACIDS

Harry Marcus Castrantas, Newtown, Pa., and John T. Gresham, Skillman, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 28, 1975, Ser. No. 636,078

Int. Cl.<sup>2</sup> C11D 7/54

U.S. Cl. 252-104

19 Claims

1. An improved dry cleaning emulsion formulation consisting essentially of:

- about 0.1 to about 30% by weight water;
- about 0.1 to about 5.0% by weight of a surfactant which is capable of emulsifying water in a dry cleaning solvent or a dry cleaning solvent in water and which does not react with a peracid;
- a sufficient amount of an emulsion soluble peracid to provide about 0.001 to 0.15% by weight active oxygen;
- a sufficient amount of alkali to maintain the pH value of the emulsion from 2.0 to 9.0; and
- the remainder being at least 69% by weight dry cleaning solvent.

4,013,576

## CONTACT LENS TREATING COMPOSITION

Samuel Loshaek, Chicago, Ill., assignor to Wesley-Jessen Inc., Chicago, Ill.

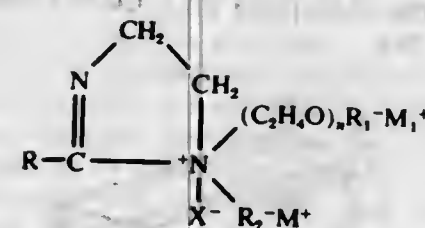
Filed Nov. 21, 1973, Ser. No. 417,913

Int. Cl.<sup>2</sup> C11D 1/84, 3/48

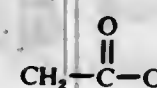
U.S. Cl. 252-106

7 Claims

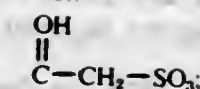
1. A substantially isotonic contact lens treating solution consisting essentially of water, a bactericide that is non-irritating to the human eye, and a quaternary ammonium amphoteric surfactant selected from:



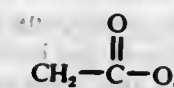
in which  $R$  is a  $C_6-C_{18}$  fatty acid radical;  $R_2$  is



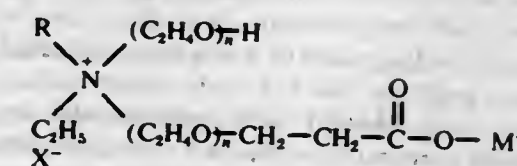
or



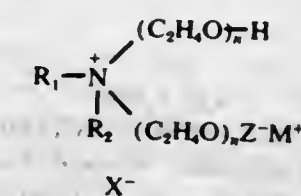
$M$  and  $M_1$  are alkali metals;  $X$  is OH or a sulfate or sulfonate acid group of an anionic surface active agent;  $R_1$  is H or



provided, however, when  $R_1$  is hydrogen,  $M_1$  is absent; and  $n$  is an integer from 1 to 40;



in which  $R$  is a hydrophobe  $C_6-C_{18}$  hydrocarbon radical;  $M$  is an alkali metal;  $X$  is a lower alkyl sulfate group or halide; and  $n$  is an integer from 1 to 40; and



in which  $R_1$  is a  $C_6-C_{18}$  fatty acid radical,  $R_2$  is a  $C_1-C_4$  alkyl;  $Z$  is a sulfate or sulfonate group;  $M$  is an alkali metal radical; and  $X$  is a lower alkyl sulfate group or halide, said solution having a pH of about 7; said amphoteric surfactant being present in an effective amount but no more than about 1% by weight, and said bactericide being present in an amount between approximately 0.01% and 0.015% by weight.

4,013,577

## HEAVY DUTY DRY BIODEGRADABLE DETERGENT COMPOSITION

Harold Eugene Wixon, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 14, 1972, Ser. No. 244,259

Int. Cl.<sup>2</sup> C11D 1/24, 3/08, 3/10

U.S. Cl. 252-109

19 Claims

1. A heavy duty dry detergent composition devoid of phosphate and nitrogenous builders and which consists essentially of about 8 to about 30% of water-soluble anionic synthetic detergent salt of the formula  $RO(C_2H_5O)_nSO_3M$ , wherein  $R$  is a substantially straight chain fatty alkyl of from 10 to 20 carbon atoms,  $n$  is a number from 2 to 6,  $n$  being from about one-fifth to one-third the number of carbon atoms in  $R$ , and  $M$  is a salt-forming cation; about 30 to 70% by weight of a water-soluble builder salt selected from the group consisting of silicates, carbonates, oxydiacetates, citrates and mixtures thereof; about 0 to 5% of an alkali metal soap; and about 10 to 50% by weight of a filler selected from the group consisting of sodium chloride, sodium sulfate and sodium bisulfate.



4,013,578

## DETERGENT INGREDIENT

Terence Frederick Child, and James Francis Davies, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,424

Claims priority, application United Kingdom, Aug. 15, 1973, 38645/73

Int. Cl.<sup>2</sup> C11D 3/12

U.S. Cl. 252-140

11 Claims

1. A process for treating finely divided calcium carbonate having a surface area of from about 5 to about 100 square meters per gram (m<sup>2</sup>/g) by contacting the calcium carbonate before said calcium carbonate has been dried with about 1% to about 50% by weight of the calcium carbonate of a water soluble dispersing aid in aqueous dispersion at a concentration of not more than 50% by weight of calcium carbonate, said dispersing aid being selected from the group consisting of alkali metal alkyl benzene sulphonates, alkali metal alkyl sulphates, alkali metal ethoxylated alcohol sulphates, alkali metal olefin sulphonates, ethoxylated alcohols, sugar esters, polyhydroxy alcohol sugar esters, alkyl ethanolamides, ethoxylated ethanolamides, sodium carboxymethylcellulose, sodium alginate, polyvinyl alcohol, hydroxyethylcellulose, gelatine, and mixtures thereof, and subsequently drying the treated calcium carbonate to impart a decreased tendency to aggregation of the treated calcium carbonate particles.

4,013,579

## ACIDIC CLEANING COMPOSITION

Yumio Nakasone, Funabashi; Miwako Abe, Ichikawa, and Hiroshi Mizutani, Yachiyo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed May 31, 1974, Ser. No. 475,584

Claims priority, application Japan, June 6, 1973, 48-63669

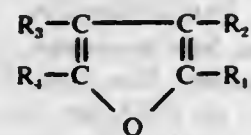
Int. Cl.<sup>2</sup> C11D 7/50

U.S. Cl. 252-143

10 Claims

1. A method of cleaning an object having adherent soil or stain thereon, which comprises applying to said object a liquid acidic cleaning composition, consisting essentially of

a. from 0.1 to 20 weight percent of at least one furancarboxylic acid compound having the formula



wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>, which can be the same or different, are hydrogen or -COOH, with the proviso that at least one of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> is -COOH.

b. up to 10 weight percent of anionic, cationic, nonionic or ampholytic water-soluble surfactants effective to promote penetration of the cleaning composition for dispersing and emulsifying dislodged soil.

c. up to 10 weight percent of mono- or di-ethylene glycol mono alkyl (C<sub>1</sub> to C<sub>4</sub>) ethers.

d. up to 10 weight percent of hydrotroping agent sufficient to dissolve (a), and

e. the balance is water and then rubbing said object to remove soil therefrom.

4,013,580

## METHOD OF PREVENTING FORMATION OF POPCORN CHLOROPRENE POLYMER

Takao Hayashi, and Akihiko Shimizu, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation-in-part of Ser. No. 386,851, Aug. 8, 1973, abandoned. This application May 21, 1975, Ser. No. 579,684

Claims priority, application Japan, Aug. 9, 1972, 47-79186

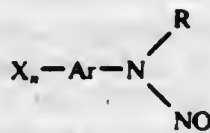
Int. Cl.<sup>2</sup> C07C 17/42, 21/21; 87/60

U.S. Cl. 252-182

5 Claims

1. A method for preventing the formation of popcorn chloroprene polymer, which comprises:

adding an N-nitroso aniline compound having the formula



wherein Ar is a phenyl group; R represents a C<sub>1-n</sub> alkyl or a carboxymethyl group and when R is C<sub>1-n</sub> alkyl, X is hydroxyl and n is 1 or 2; and when R is carboxymethyl group, X is halogen or hydroxyl and n is 0, 1 or 2, to chloroprene monomer, wherein said N-nitrosoaniline is easily removed from said chloroprene monomer by washing the same with an aqueous alkaline solution.

4,013,581

## BLEACH TABLET COMPOSITION

Arthur Elmer Huber, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 10, 1975, Ser. No. 594,910

Int. Cl.<sup>2</sup> C01B 13/00; C09K 3/00

U.S. Cl. 252-186

10 Claims

1. A bleach composition in tablet form, consisting essentially of:

a. a mixture of a solid peroxygen bleach and sodium sulfate, at a weight ratio of sodium sulfate:peroxygen bleach in the range from about 3:1 to about 1:3; and

b. a mixture of microfine, free-flowing starch and microcrystalline cellulose, at a weight ratio of starch:cellulose in the range from about 5:28 to about 28:5, the weight ratio of the mixture of starch and cellulose to the mixture of peroxygen bleach and sodium sulfate being in the range from about 1:5 to about 1:2.

4,013,582

## LIQUID CRYSTAL COMPOUNDS AND ELECTRO-OPTIC DEVICES INCORPORATING THEM

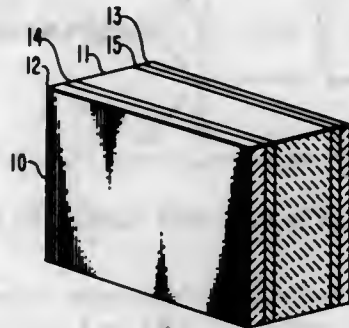
Dragan Milan Gavrilovic, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 17, 1976, Ser. No. 696,904

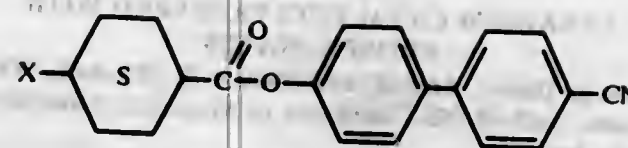
Int. Cl.<sup>2</sup> C09K 3/34; G02F 1/13; C07C 121/64, 69/96

U.S. Cl. 252-299

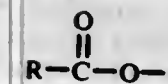
9 Claims



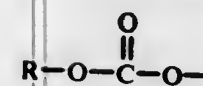
3. A liquid crystal compound having the formula



wherein X is a member selected from the group consisting of RO—,



and



groups wherein R is an alkyl group of 1-10 carbon atoms.

4,013,583

## PROCESSES FOR REGENERATING DISPERSIONS OF LIGAND STABILIZED, PALLADIUM AND PLATINUM (II) HALIDE COMPLEXES USED IN CARBONYLATION AND HYDROFORMYLATION CATALYSTS

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed May 27, 1975, Ser. No. 581,395

Int. Cl.<sup>2</sup> B01J 31/40, 27/32; C07C 51/00; C11C 3/02

U.S. Cl. 252-415

3 Claims

1. A process for the regeneration of dispersions of spent ligand-stabilized palladium(II) or platinum(II) halide catalysts in quaternary ammonium, phosphonium and arsonium salts of trihalostannate(II) and trihalogermanate(II), the spent catalysts being obtained from the carbonylation or hydroformylation of olefins, said ligand-stabilized groups being selected from the group consisting of P(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, P(p-CH<sub>3</sub>-C<sub>6</sub>H<sub>4</sub>)<sub>3</sub>, P(C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>CH<sub>2</sub>Cl, As(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, S(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, P(OC<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, P(n-C<sub>4</sub>H<sub>9</sub>)<sub>3</sub>, (C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>AsCH<sub>2</sub>CH<sub>2</sub>As(C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>, the process consisting essentially of:

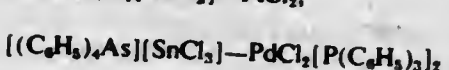
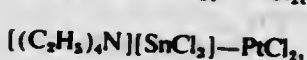
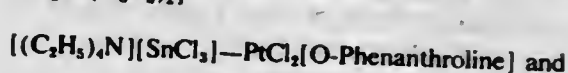
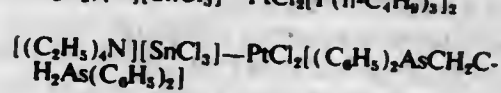
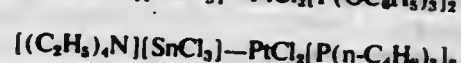
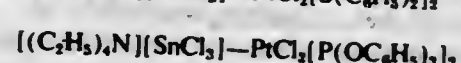
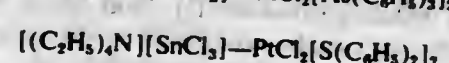
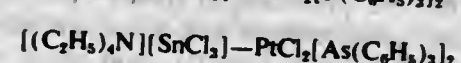
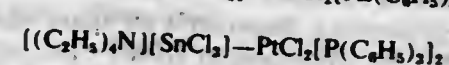
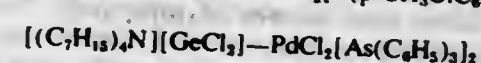
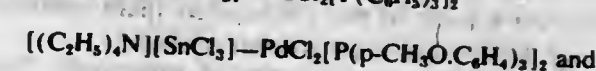
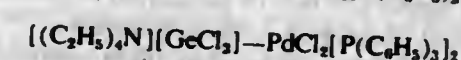
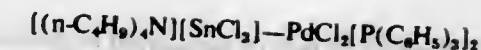
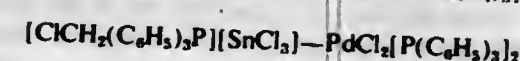
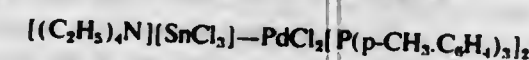
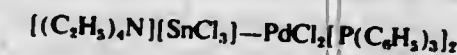
a. contacting each part by weight of said dispersions to be regenerated with from 0.1 part by weight to 10<sup>3</sup> part by weight of mineral acid consisting of mixtures of hydrochloric acid, having a specific gravity of from 1.00 to 1.20 at 20° C, and nitric acid having a specific gravity of from 1.00 to 1.51 at 20° C, said acids being in volume ratios ranging from 0.01 to 100 parts by volume of hydrochloric acid for each part by volume of nitric acid;

b. evaporating said mixture of solid catalyst plus acid to dryness at 50°-110° C;

c. adding additional stabilizing ligand in the ratio of 1-10 mole of ligand per mole of palladium or platinum present in said spent dispersions;

d. refluxing the mixture from (c) with excess organic solvent mixture, removing excess solvent and drying the dispersion to a solid in a vacuum.

2. A process for regenerating dispersions of spent ligand-stabilized palladium(II) and platinum(II) halide complexes in quaternary ammonium, phosphonium and arsonium salts of trihalostannate(II) or trihalogermanate(II) by ligand-stabilized palladium(II) and platinum(II), said ligand-stabilized catalyst being obtained from the carbonylation or hydroformylation of olefins, said ligand-stabilized dispersion to be regenerated selected from the group consisting of:



by the process consisting essentially of:

a. contacting each part by weight of said dispersions to be regenerated with from 0.1 part by weight to 10<sup>3</sup> part by weight of mineral acid consisting of mixtures of hydrochloric acid, having a specific gravity of from 1.00 to 1.20 at 20° C, and nitric acid having a specific gravity of from 1.00 to 1.51 at 20° C, said acids being in volume ratios ranging from 0.01 to 100 parts by volume of hydrochloric acid for each part by volume of nitric acid;

b. evaporating said mixture of solid catalyst plus acid to dryness at 50°-110° C;

c. adding additional stabilized ligand corresponding to the original ligand contained in the dispersion of spent catalyst prior to the catalyst's use in the aforementioned hydroformylation, hydrogenation and carbonylation reactions, said ligand's ratio of 1-10 moles of ligand per mole of palladium or platinum present in the spent dispersion;

d. refluxing the mixture from (c) with excess organic solvent mixture, removing excess solvent and drying the dispersion to a solid in a vacuum.

4,013,584

## PROCESSES FOR REGENERATING DISPERSIONS OF LIGAND STABILIZED, PALLADIUM AND PLATINUM (II) HALIDE COMPLEXES USED IN CARBONYLATION AND HYDROFORMYLATION CATALYSIS

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed May 27, 1975, Ser. No. 581,320

Int. Cl.<sup>2</sup> B01J 31/40, 27/32; C07C 51/00; C11C 3/02

U.S. Cl. 252-415

5 Claims

1. A process for the regeneration of dispersions of spent ligand-stabilized palladium(II) or platinum(II) halide catalysts in quaternary ammonium, phosphonium and arsonium salts of trihalostannate(II) and trihalogermanate(II), the spent catalysts being obtained from the carbonylation or hydroformylation of olefins, said ligand-stabilized groups being selected from the group consisting of P(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, P(p-CH<sub>3</sub>-C<sub>6</sub>H<sub>4</sub>)<sub>3</sub>, P(C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>CH<sub>2</sub>Cl, As(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, S(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, P(OC<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, P(n-C<sub>4</sub>H<sub>9</sub>)<sub>3</sub>, (C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>AsCH<sub>2</sub>CH<sub>2</sub>As(C<sub>6</sub>H<sub>5</sub>)<sub>2</sub>, the process consisting essentially of:

a. contacting the spent dispersions of catalyst with chlorine gas at 25° to 200° C for 1-48 hours at a flow rate between 1 and 500 cc per minute;

b. adding additional ligand corresponding to the original ligand contained in the dispersion of spent catalyst, prior to the catalyst's use in carbonylation, hydroformylation or hydrogenation reaction, the ligand being added at rates



of 1-10 moles of ligand per mol of palladium or platinum present in the spent dispersion to be regenerated;  
 c. adding inert solvent to the chlorinated spent catalyst;  
 d. refluxing the catalyst-inert solvent mixture;  
 e. removing the excess inert solvent mixture, and  
 f. drying the regenerated catalyst.

4. A process for regenerating dispersions of spent ligand-stabilized palladium(II) and platinum(II) halide catalysts in quaternary ammonium, phosphonium and arsonium salts of trihalostannate(II) or trihalogermanate(II), said spent catalysts being obtained through carbonylation or hydroformylation of olefins, by the process consisting essentially of:

a. passing chlorine over spent catalysts selected from the group consisting of:

$[(C_2H_5)_4N][SnCl_3] \cdot PdCl_2[P(C_6H_5)_3]_2$   
 $[(C_2H_5)_4N][SnCl_3] \cdot PdCl_2[P(p-CH_3C_6H_4)_3]_2$   
 $[ClCH_2(C_6H_5)_3P][SnCl_3] \cdot PdCl_2[P(C_6H_5)_3]_2$   
 $[(n-C_4H_9)_4N][SnCl_3] \cdot PdCl_2[P(C_6H_5)_3]_2$   
 $[(C_6H_5)_4As][SnCl_3] \cdot PdCl_2[P(C_6H_5)_3]_2$   
 $[(C_2H_5)_4N][GeCl_3] \cdot PdCl_2[P(C_6H_5)_3]_2$   
 $[(C_2H_5)_4N][SnCl_3] \cdot PdCl_2[P(p-CH_3O-C_6H_4)_3]_2$   
 $[(C_7H_{15})_4N][GeCl_3] \cdot PdCl_2[As(C_6H_5)_3]_2$   
 $[(C_2H_5)_4N][SnCl_3] \cdot PtCl_2[P(C_6H_5)_3]_2$   
 $[(C_2H_5)_4N][SnCl_3] \cdot PtCl_2[As(C_6H_5)_3]_2$   
 $[(C_2H_5)_4N][SnCl_3] \cdot PtCl_2[S(C_6H_5)_2]_2$   
 $[(C_2H_5)_4N][SnCl_3] \cdot PtCl_2[P(OC_6H_5)_3]_2$   
 $[(C_2H_5)_4N][SnCl_3] \cdot PtCl_2[P(n-C_4H_9)_3]_2$   
 $[(C_6H_5)_4N][SnCl_3] \cdot PtCl_2[(C_6H_5)_2AsCH_2CH_2As(C_6H_5)_2]$   
 $[(C_2H_5)_4N][SnCl_3] \cdot PtCl_2[O-Phenanthroline]$  and  
 $[(C_2H_5)_4N][SnCl_3] \cdot PtCl_2[(C_6H_5)_3]_2$

at 25°-200° C for 1-48 hours at a flow rate between about 1 and 500 cc per minute;

b. adding additional stabilizing ligand in the ratio of 1-10 mole of ligand per mole of palladium or platinum present in said spent dispersions;

c. refluxing the mixture from b) in excess organic solvent mixture, removing excess solvent and drying the solid dispersion in a vacuum.

#### 4,013,586 VANADIUM CATALYSTS PREPARED WITH PHOSPHONATES

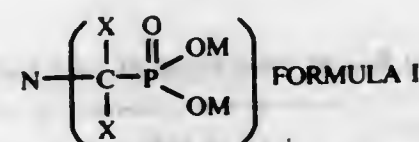
Thomas J. Dolan, Arnold, and Robert S. Mitchell, Webster Groves, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed July 24, 1975, Ser. No. 598,615  
 Int. Cl.<sup>2</sup> B01J 27/18, 37/00

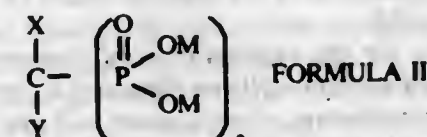
U.S. Cl. 252-437

11 Claims

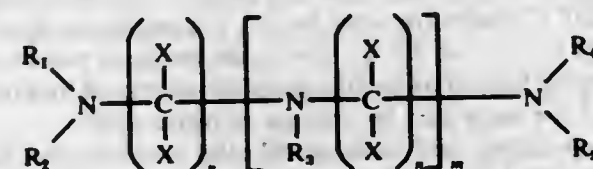
1. In a process for preparing a phosphorus-vanadium-oxygen catalyst wherein a pentavalent vanadium compound is contacted with a phosphorus compound under conditions to provide a substantial amount of tetravalent vanadium and to for a phosphorus-vanadium-oxygen precursor, the improvement which comprises contacting the pentavalent vanadium compound with a phosphonate compound selected from the group consisting of:



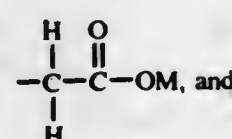
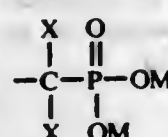
where each X is selected from the group consisting of hydrogen and lower alkyls containing 1 to 4 carbon atoms and M is a member selected from the group consisting of hydrogen and cations;



wherein X is a member selected from the group consisting of hydrogen and lower alkyl (1-4 carbon atoms) and Y is a member selected from the group consisting of hydrogen, hydroxyl and lower alkyl (1-4 carbon atoms), and M is a member selected from the group consisting of hydrogen and cations; and



wherein each X is selected from the group consisting of hydrogen and lower alkyls containing 1 to 4 carbon atoms; n is either 2 or 3; m is 0 to 12; R<sub>3</sub> is selected from the group consisting of hydrogen, lower alkyl containing 1 to 4 carbon atoms and -CH<sub>2</sub>PO<sub>2</sub>M group; R<sub>1</sub>, R<sub>2</sub>, R<sub>4</sub> and R<sub>5</sub> are from the group of radicals



#### 4,013,585 NITROHUMIC ACID-CONTAINING ADSORBENTS AND PROCESS FOR PRODUCING SAME

Kazuki Terajima; Shigeru Tomita; Yoshindo Matsuda, all of Tokyo, and Keiji Abe, Omiya, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed July 18, 1974, Ser. No. 489,505

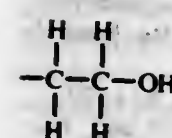
Claims priority, application Japan, July 19, 1973, 48-81928  
 The portion of the term of this patent subsequent to Aug. 19, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C02B 1/14, 1/52

U.S. Cl. 252-427

19 Claims

1. An adsorbent which comprises a mixture of at least one protein and a compound selected from the group consisting of nitrohumic acid and a water-insoluble salt thereof, wherein said protein is selected from the group consisting of petroleum proteins, yeasts, animal leather, animal hair and mixtures thereof and is present in an amount of about 5-50 parts by weight per 100 parts by weight of said nitrohumic acid.



-continued  
 FORMULA VI

with the proviso that at least two -C(X)(X)PO<sub>2</sub>M<sub>2</sub> groups are present at all times and are either R<sub>1</sub> and R<sub>2</sub> or R<sub>3</sub> and R<sub>4</sub> and that the compound gives a positive result with the vanadium reducing test.

#### 4,013,587 PROCESS FOR THE MANUFACTURE OF SPHERICAL ALUMINA-CONTAINING PARTICLES

Hermann Fischer, Ebern; Hubert Schindler, Dollbergen; Winfried Kuhrt, Hannover-Kirchrode, and Guenter Weidenbach, Hannover, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Feb. 3, 1976, Ser. No. 654,923

Claims priority, application Germany, Feb. 4, 1975, 2504463; Oct. 16, 1975, 2546318

Int. Cl.<sup>2</sup> B01J 21/04, 21/12, 23/72, 23/86

U.S. Cl. 252-448

19 Claims

1. A process for the preparation of alumina-containing particles, comprising the steps of:

- a. mixing an aluminum oxide hydrosol containing a hydrate of alumina or activated alumina and an additive component of wood flour, starch, carbon black or carbon powder with a solution of a hydrolyzable base to form a mixture;
- b. introducing said mixture in dispersed form into a water-immiscible liquid having a temperature of from about 60° to 100° C., whereby gel particles are formed;
- c. aging said gel particles in said liquid at said temperature and subsequently in an aqueous ammonia solution;
- d. recovering said aged particles; and
- e. drying and calcining said recovered particles.

#### 4,013,588 OXIDATION CATALYST FOR REMOVAL OF NITROGEN MONOXIDE IN EXHAUST GAS

Takaaki Tamura, Tokyo, Japan, assignor to Kogyo Kalhatus Kenkyusho (Industrial Research Institute), Tokyo, Japan

Filed May 6, 1974, Ser. No. 467,085

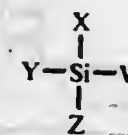
Claims priority, application Japan, May 12, 1973, 48-52826; May 12, 1973, 48-52827; May 12, 1973, 48-52828; May 12, 1973, 48-52829

Int. Cl.<sup>2</sup> B01J 29/00, 29/06

U.S. Cl. 252-454

5 Claims

1. An oxidation catalyst for the removal of nitrogen monoxide in exhaust gas, said catalyst being obtained by a procedure comprising heating a naturally occurring inorganic material at a temperature of from 100° to 900° C, said naturally occurring inorganic material being a tuff consisting essentially of SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub> and H<sub>2</sub>O, containing 1 to 10% by weight of total of an alkaline metal oxide and an alkaline earth metal oxide and having the X-ray diffraction pattern shown in Table I or Table II, said inorganic material having a mesh size of less than 50 mesh.



in which X, Y, Z and W are selected from the group consisting of (-R), (-Cl), (-Br), (-SiH), (-COOR), (-SiH Cl), -[OSi(OR)]<sub>n</sub>, OSi, (OR)<sub>3</sub>, in which R is an alkyl, cycloalkyl, aromatic alkylaromatic or alkyl-cycloalkyl radical having from 1 to 30 carbon atoms; n, m and p are whole numbers from 1 to 3, by bringing said silicon compound or a solution thereof in a compatible organic solvent whose boiling point is lower than the boiling point of the silicon compound into contact with said aluminum oxide, drying said impregnated aluminum oxide at a temperature in the range of from the boiling point of the silicon compound to 500° C, and then subjecting said impregnated aluminum oxide to controlled oxidation.

#### 4,013,589 PROCESS FOR THE PREPARATION OF MATERIALS HAVING IMPROVED MECHANICAL PROPERTIES AND MATERIALS OBTAINED THEREBY

Franco Buonomo; Vittorio Fattore, and Bruno Notari, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed Oct. 31, 1974, Ser. No. 519,791

Claims priority, application Italy, Sept. 19, 1974, 27455/74  
 Int. Cl.<sup>2</sup> B01J 29/06

U.S. Cl. 252-455 R

4 Claims

1. The process of improving the mechanical and thermal properties of aluminum oxide adapted for use as a catalyst or catalytic carrier which comprises impregnating said aluminum oxide with a silicon compound containing hydrolyzable radicals selected from the group consisting of the tetraesters of silicic acid, the halogen containing esters of orthosilicic acid and the organic silicon salts, slowly heating said impregnated aluminum oxide to the boiling temperature of said silicon compound in an inert atmosphere so as to react the silicon compound with the aluminum oxide and to distill off reaction products and excess silicon compound, and then reacting the hydrolyzable radicals bound to the silicon compound on said aluminum oxide with water in a closed vessel so as to hydrolyze said hydrolyzable radicals and distilling off vapors from said vessel and condensing said vapors outside the vessel until only water is condensed.

#### 4,013,590 PROCESS FOR PREPARING MATERIALS HAVING IMPROVED MECHANICAL AND THERMAL PROPERTIES AND MATERIALS OBTAINED THEREBY

Franco Buonomo; Vittorio Fattore, and Bruno Notari, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed Oct. 31, 1974, Ser. No. 519,792

Claims priority, application Italy, Oct. 31, 1973, 30787/73  
 Int. Cl.<sup>2</sup> B01J 29/06

U.S. Cl. 252-455 R

9 Claims

1. The process of improving the mechanical and thermal properties of aluminum oxide adapted for use as a catalyst or catalytic carrier which comprises impregnating said aluminum oxide with a silicon compound having the general formula:



4,013,591

**COMPOSITE SUPERCONDUCTING MATERIALS**  
René Granger, Thorigne; Alain Labsley, Rennes, and Serge Rolland, Cesson-Sevigne, all of France, assignors to Brevatome, Paris, France

Filed Mar. 11, 1974, Ser. No. 449,749

Claims priority, application France, Mar. 13, 1973, 73.08962

Int. Cl.<sup>2</sup> H01B 1/06

U.S. Cl. 252-512

7 Claims

1. A composite superconducting material comprising in combination, a monocrystalline matrix composed of a semiconductor substance exhibiting superconducting properties, and microprecipitated dispersed within said matrix establishing zones, said microprecipitates constituting a metallic constituent of said semiconductor substance.

4,013,592

**HIGH TEMPERATURE THERMISTOR COMPOSITION**  
Tomio Matsuoka; Yoshihiro Matsuo, both of Neyagawa, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

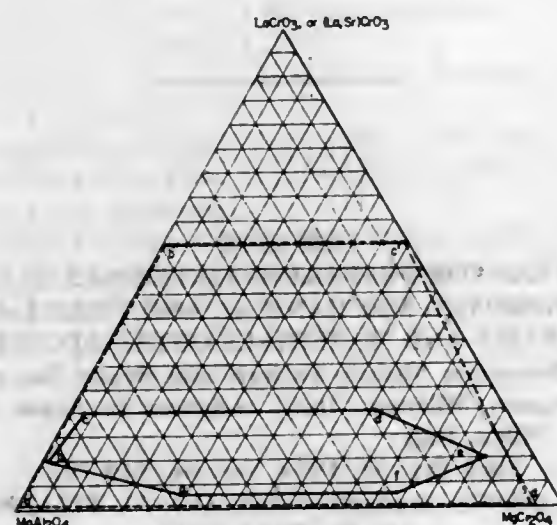
Filed Feb. 17, 1976, Ser. No. 658,666

Claims priority, application Japan, Feb. 19, 1975, 50-21201

Int. Cl.<sup>2</sup> H01B 1/08

U.S. Cl. 252-521

4 Claims



3. A high temperature thermistor composition having the ternary system A-MgAl<sub>2</sub>O<sub>4</sub>-B-MgCr<sub>2</sub>O<sub>4</sub>-C-LaCrO<sub>3</sub>, wherein said composition is defined by the area of FIG. 2 enclosed by following six composition points;

(a)	A=0.679	B=0.291	C=0.03
(b)	A=0.891	B=0.009	C=0.10
(c)	A=0.776	B=0.024	C=0.20
(d)	A=0.24	B=0.56	C=0.20
(e)	A=0.09	B=0.81	C=0.10
(f)	A=0.291	B=0.679	C=0.03

4,013,593

**FRAGRANCE COMPOSITIONS CONTAINING N-(2-FURFURYL)-PYRROLE**

Gary W. Shaffer, Wayne; Irene Tornell, Woodcliff Lake, and Kenneth L. Purzycki, Lake Parsippany, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Nov. 10, 1975, Ser. No. 630,235

Int. Cl.<sup>2</sup> C11B 9/00

U.S. Cl. 252-522

13 Claims

1. A method for improving fragrance compositions which include constituents other than natural oils wherein the improvement comprises adding thereto an olfactorily effective amount of N-(2-furfuryl)-pyrrole to impart naturalness and lift.

4,013,594

**POWDERED CLEANING COMPOSITION OF UREA-FORMALDEHYDE**

Helmut Hermann Froehlich, and William Jacob Lautenberger, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Continuation-in-part of Ser. No. 394,263, Oct. 8, 1973, abandoned, which is a continuation of Ser. No. 209,402, Dec. 17, 1971, abandoned. This application Jan. 16, 1974, Ser. No. 433,707

Claims priority, application France, Dec. 15, 1972, 72.44806; Germany, Dec. 15, 1972, 2261587; Japan, Dec. 16, 1972, 47-125837; United Kingdom, Dec. 15, 1972, 58090/72  
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C11D 1/38, 1/50, 3/26

U.S. Cl. 252-544

5 Claims

1. A powdered cleaning composition having a soil substantivity constant greater than 1.5 and consisting essentially of about 30 to 90% particulate polymeric ureaformaldehyde and about 10 to 70% fluid, the urea-formaldehyde having a particle size of about from 10 to 105 microns, an oil absorption value of no less than 90, fiber hardness and a bulk density of at least 0.2 g./cc., and the fluid consisting essentially of up to 100% water containing sufficient surfactant to give a surface tension of less than 40 dynes per centimeter and up to 100% of organic liquid selected from high boiling hydrocarbon solvents, tetrachloroethylene, methyl chloroform, 1,1,2-trichloro-1,2,2-trifluoroethane, an aliphatic alcohol containing from 1 to 4 carbon atoms, and mixtures of these.

4,013,595

**NON-FLAMMABLE RUG CLEANING COMPOSITION**  
Carl Walter Podella, Kenosha, and Fred Jay Reichley, Racine, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 23, 1975, Ser. No. 580,495

Int. Cl.<sup>2</sup> C11D 3/37, 3/20, 1/14

U.S. Cl. 252-545

13 Claims

1. In a rug cleaning composition of the type comprising:  
a. from 2 to 20% by weight of a rug cleaning polymer;  
b. from 0 to 5% by weight of a metal salt;  
c. from 0.5 to 10% by weight of at least one surfactant from 50 to 95% by weight water, and  
e. from 5 to 20% by weight hydrocarbon propellant;  
the improvement which comprises reducing the flammability of said composition by incorporating at least 0.3% by weight lauryl alcohol and wherein said surfactant includes from 0.3 to 10% by weight of the composition of CH<sub>3</sub>(CH<sub>2</sub>)<sub>10</sub>CH<sub>2</sub>OSO<sub>3</sub>M is a positively charged cation.

4,013,596

**ADHESIVE TETRAZOLE POLYMERS AND PROCESS OF MAKING THEREFOR**

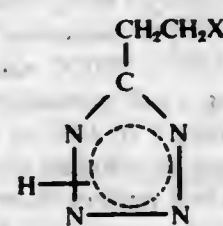
Fred J. Einberg, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 435,345, Jan. 21, 1974, Pat. No. 3,929,684. This application Mar. 7, 1975, Ser. No. 556,529  
Int. Cl.<sup>2</sup> C08G 73/06; C06B 45/10

U.S. Cl. 260-2 R

6 Claims

1. Process for forming tetrazole polymers comprising adding substances of the formula



where X is a member selected from the group consisting of Br, Cl, and I to a medium where base is present in a molar equivalent amount to said 5-(2-haloethyl) tetrazole or slightly less than a molar equivalent amount and then heating said medium at 50°-100° C. for a minimum of 5 days to form resulting tetrazole polymers whose inherent viscosity at 25° C is a number from about 0.03 - 0.36.

4,013,597

**FAST COOLING STYRENE POLYMER FOAMS**

Jose E. Granda, Alliquippa, Pa.; John J. Quinlan, Atco, N.J., and James J. Garland, Alliquippa, Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Filed June 17, 1975, Ser. No. 587,582

Int. Cl.<sup>2</sup> C08J 9/22

U.S. Cl. 260-2.5 B

12 Claims

1. Method of making foamable styrene polymer particles which yield fast cooling foamed moldings of large cross-section consisting of intimately mixing a dry blend of  
a. styrene polymer particles containing 3 to 20 weight per cent of a blowing agent, and  
b. 0.05 to 0.4 weight percent of a silicone surfactant selected from the siloxane-oxyalkylene copolymers having (1) at least one polysiloxane block which contains mers of the general formula R<sub>n</sub>SiO where R is selected from the group consisting of alkyl having 1 to 4 carbon atoms and halogenated alkyl having 1 to 4 carbon atoms, and (2) at least one polyoxyalkylene block attached to said polysiloxane block, and terminated by acetoxy or alkyl ether groups, and containing mers of general formula C<sub>n</sub>H<sub>2n</sub>O, where n is 2, 3 or 4.

4,013,598

**COMPOSITION AND METHOD FOR MAKING SEAMLESS FLOORING AND THE LIKE**

Robert M. Evans, 2399 Edgerton Road, University Heights, and Joseph S. Fogel, 1365 Forest Hills Blvd., Cleveland Heights, both of Ohio 44118

Division of Ser. No. 270,620, July 11, 1972, Pat. No. 3,908,043. This application July 2, 1975, Ser. No. 592,542  
Int. Cl.<sup>2</sup> 428 413, 423; C08K 5/01; C08L 1/14

U.S. Cl. 260-13

13 Claims

1. A polyurethane base coating composition capable of forming films of high abrasion and stain resistance comprising:  
(1) a solution in volatile organic solvent of an -NCO terminated prepolymer of a diisocyanate having unequal reactivity of the two isocyanate groups and a polyoxypropylene triol which has an equivalent weight of 180 to 400; said prepolymer having a free -NCO content of 5 to 10%, and (2) a polycaprolactone triol in amounts to react with most of said -NCO of said prepolymer, the ratio of the equivalents of free -NCO in said prepolymer to equivalents of -OH in the polycaprolactone cross-linking agent being greater than 1.75.

4,013,599

**FIRE-RETARDANT COATING COMPOSITION COMPRISING ETHERIFIED AND NON-ETHERIFIED AMINO-FORMALDEHYDE RESIN**

Richard Strauss, Wiesbaden; Arnold Giller, Weren, Taunusstein; Dieter Zacharowski, and Hans Wiener, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 447,372, March 1, 1974, abandoned. This application July 5, 1974, Ser. No. 485,868  
Claims priority, application Germany, Mar. 28, 1973, 2315416

Int. Cl.<sup>2</sup> C08L 3/02

U.S. Cl. 260-17.3

13 Claims

1. An aqueous fire-retardant coating composition capable of forming a foam layer and consisting of  
I. an aqueous preparation comprising  
a. a non-etherified amino-formaldehyde resin or its components or a mixture thereof

b. at least one ammonium phosphate,  
c. a skeleton-forming component and  
II. a solution of at least one further amino-formaldehyde resin being at least partially etherified with at least one alcohol having 1 to 12 C-atoms and dissolved in an organic solvent.

4,013,600

**AQUEOUS COMPOSITIONS OF POLYIMIDES CONTAINING HETERO-POLYSACCHARIDE**

Robert Cassat, Saint-Fons, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed May 16, 1975, Ser. No. 578,025

Claims priority, application France, May 20, 1974, 74.17451

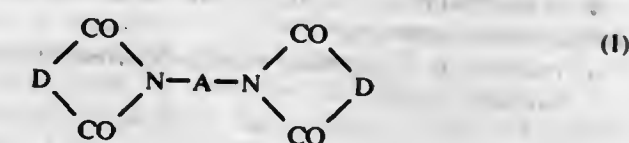
Int. Cl.<sup>2</sup> C08L 5/00

U.S. Cl. 260-17.4 ST

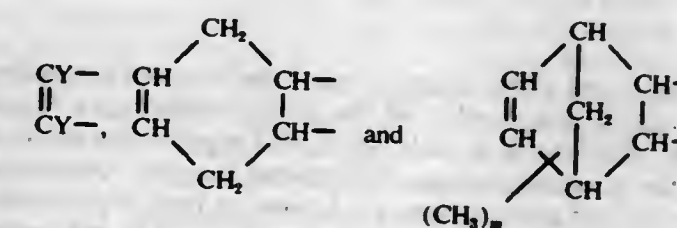
7 Claims

1. A pseudoplastic aqueous suspension of a prepolymer powder prepared from:

A. A imide group-containing compound chosen from the group consisting of:  
a. a bis-imide of the formula:

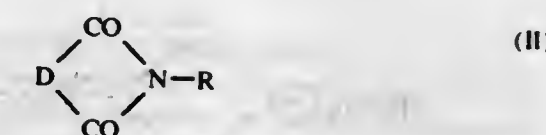


in which D represents a divalent radical which has the formula:



wherein Y represents H, CH<sub>3</sub> or Cl and m is equal to 0 or 1, and A represents a divalent organic radical containing 2 to 30 carbon atoms, and

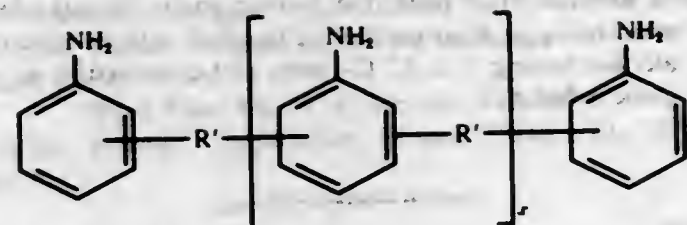
b. a mixture of a bis-imide of formula (I) and a mono-imide of the formula:



in which D is as defined above and R represents a hydrogen atom or a monovalent organic radical containing 1 to 20 carbon atoms, and

B. an amino compound chosen from the group consisting of:  
a. one or more polyamines containing 2 to 5 primary or secondary amino groups, at least one of these groups being primary,  
b. a mixture comprising one or more polyamines as defined under a) and one or more primary and/or secondary mono-amines and/or one or more secondary polyamines, and  
c. a polyamine of the general formula:





in which  $x$  represents a number from 0.1 to 2 and  $R'$  represents a divalent hydrocarbon radical with 1 to 8 carbon atoms, the suspension also comprising, based on the weight of the powder, 0.01 to 8% by weight of a heteropolysaccharide of very high molecular weight.

4,013,601

### WATER-DILUTABLE POLYAMIDE RESINS AND WATER-DILUTABLE EPOXY RESIN COMPOSITIONS CONTAINING SAID POLYAMIDE RESINS

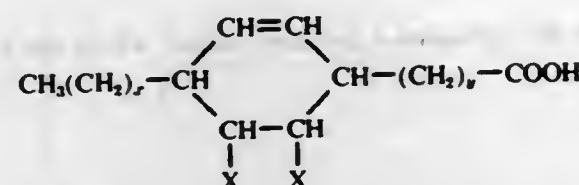
John A. Alford, Hanahan, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed July 31, 1975, Ser. No. 600,285  
Int. Cl.<sup>2</sup> C08J 3/06; C08L 63/10, 77/06

U.S. Cl. 260-18 PN

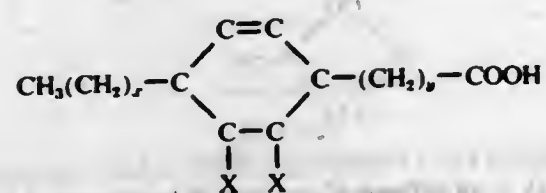
8 Claims

1. A method of producing a water-dilutable reactive polyamide resin comprising:  
a. reacting a  $C_{21}$ -cycloaliphatic dicarboxylic acid of the formula



wherein  $x$  and  $y$  are integers from 3 to 9,  $x$  and  $y$  together equal 12,  $X$  is a member of the group consisting of H and COOH, with one  $X$  of each moiety and a polyamine selected from the group consisting of diethylene triamine, triethylene tetramine and tetraethylene pentamine to form a polyamide resin, said  $C_{21}$ -cycloaliphatic dicarboxylic acid to polyamine being in a weight ratio from 1.5:1 to 3:1, and

- adding water up to about 55% to said polyamide resin.
- A water-dilutable coating composition comprising:  
a. 5-90% by weight of water as a solvent component,  
b. 5-40% by weight of an epoxy resin,  
c. 5-40% by weight of a polyamide resin produced by reacting a dibasic acid of the formula



wherein  $x$  and  $y$  are integers from 3 to 9,  $x$  and  $y$  together equal 12,  $X$  is a member of the group consisting of H and COOH with one  $X$  of each moiety and a polyamine selected from the group consisting of diethylene triamine, triethylene tetramine and tetraethylene pentamine, said dibasic acid to polyamine being in a weight ratio from 1.5:1 to 3:1,

- said water being added to said polyamide resin to form a solution, and
- said polyamide resin solution being mixed with said epoxy resin to form a stable emulsion.

4,013,602

### ULTRAFINE NATURAL CALCIUM CARBONATES AS FILLERS IN VARNISHES AND PAINTS

Pierre Delfosse, Paris, France, and Alfred Bosshard, Oftringen, Switzerland, assignors to Pius-Stauffer AG, Oftringen, Switzerland

Continuation of Ser. No. 401,498, Sept. 27, 1973, abandoned.

This application Apr. 14, 1975, Ser. No. 567,963  
Claims priority, application Germany, Oct. 9, 1972, 2251099; Feb. 26, 1973, 2309517  
Int. Cl.<sup>2</sup> C08K 3/26

U.S. Cl. 260-22 R

13 Claims

1. A varnish or paint containing ultrafine natural calcium carbonate as a filler, the carbonate having an average statistical particle diameter of from 0.5 to 0.7  $\mu$  and a maximum diameter of from 3 to 4  $\mu$ .

4,013,603

### COATING COMPOSITIONS FOR PROTECTING METALS

Michele Zavatti, Vittorio Baravalle, and Paolo Saracino, all of Milan, Italy, assignors to Labofina S.A., Brussels, Belgium

Filed Feb. 10, 1975, Ser. No. 548,406

Claims priority, application Italy, Feb. 20, 1974, 48563/74  
Int. Cl.<sup>2</sup> C08L 91/00

U.S. Cl. 260-28.5 D

9 Claims

1. In a sprayable composition used as a protective coating for metallic surfaces comprising a bituminous substance, a thixotropic agent and a filler, the improvement which comprises a composition having from about 5 to 20% by weight of a vinyl resin selected from the group consisting of homopolymer and copolymer of vinyl chloride, from about 10 to 30% by weight of a plasticizer for said vinyl resin, from 5 to 15% by weight of a bituminous substance, from 0.1 to 1.5% by weight of a thixotropic agent and from 20 to 65% by weight of a filler.

4,013,604

### ETHYLENE-VINYL ESTER-ALKYL VINYL TERPOLYMER EMULSIONS

Glenn E. Teer; Jerry G. Higgins, and George D. Warren, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Big Spring, Tex.

Filed Feb. 18, 1975, Ser. No. 550,374

Int. Cl.<sup>2</sup> C08L 31/04

U.S. Cl. 260-29.6 RB

20 Claims

1. A process for producing stable polymer emulsions of polymer particles comprising mixtures of polyethylene and terpolymers of ethylene, a vinyl monomer, selected from the group consisting of vinyl ester monomers of straight and branched chain carboxylic acids and straight and branched chain vinyl alkyl ether monomers, and an alkyl vinyl monomer having molecular weights in the range of from about 7,000 to 40,000 and particle sizes in the range of from about 200 to 1,000 angstroms which includes contacting ethylene, a vinyl monomer, and an alkyl vinyl monomer having from about 3 to about 24 carbon atoms, in an aqueous reaction medium having a pH of about 8.5 to 14.0 at a temperature in the range of from about 60° to 150° C and a pressure in the range of from about 1,400 to 20,000 psi in the presence of a water soluble persulfate initiator and an effective amount of an emulsifier selected from nonionic and anionic emulsifiers and mixtures thereof, wherein said vinyl monomer is present in an amount equal to about 0.5 to 20% by weight based on said aqueous reaction medium and wherein said alkyl vinyl monomer is present in an amount equal to about 0.1 to 10% by weight based on said aqueous reaction medium, to form said emulsion.

4,013,605

### PHENOLIC RESINS FROM ALKYL SUBSTITUTED DIMETHYLOLPHENOLS

Kurt Hiltzsch, Wiesbaden-Biebrich; Wolfgang Hesse, Wiesbaden, and Hans-Dieter Mummethy, Ingelheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Dec. 8, 1970, Ser. No. 96,283

Int. Cl.<sup>2</sup> C08L 61/06, 61/08, 61/12

U.S. Cl. 260-29.3

13 Claims

1. A process for the preparation of a flexible phenolic resin which comprises randomly and substantially alternately co-condensing A) a dimethylol derivative of a mononuclear monohydric alkylphenol, being substituted by one or two alkyl groups having from 1 to 20 carbon atoms, with B) a methylol derivative of a polyfunctional mono- to trihydric, mono- to trinuclear phenol having at least 3 functional groups in ortho- and para-position in which derivative at least half of the reactive hydrogen atoms in the polyfunctional phenol are substituted by methylol groups and wherein the ratio of the methylol groups of the derivative of the polyfunctional phenol compound B) in said resin per mol of the dimethylolalkyl phenol compound A) in said resin is from 1.4:1 to 6:1

4,013,606

### PROCESS FOR PREPARING WATER SOLUBLE IONIC POLYMERS

Edward G. Ballweber, Glenwood, and Kenneth G. Phillips, River Forest, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 385,960, Aug. 6, 1973, abandoned.

This application Jan. 31, 1975, Ser. No. 545,839

The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> C08L 61/20

U.S. Cl. 260-29.4 UA

10 Claims

1. A process of preparing a dispersion of a water soluble cationic power polymer which comprises diluting with water a water-in-oil emulsion of a water soluble acrylamide polymer containing 20% by weight to 50% by weight of said acrylamide polymer, adding to said diluted emulsion a surfactant and a premix of formaldehyde and a secondary amine selected from the group consisting of dimethylamine, methylethylamine, dibutylamine, methylamylamine, methylaminoethanol, diethanolamine, morpholine and piperidine, in which the ratio of formaldehyde to said secondary amine is within the range of 10:1 to 1:10, the dilution and resultant concentration of polymer being such that the concentration of resultant cationic polymer is 1 to 10% by weight and the formation of said cationic polymer occurs in not more than 20 minutes, the weight ratio of said premix to said acrylamide polymer being within the range of 1:2 to 2:1 and the resultant cationic polymer having a cationicity of at least 60%.

4,013,607

### SELF-STRIPPING COATING COMPOSITION

Sean G. Dwyer, Racine, and Daryl J. Hackbarth, Kenosha, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed June 19, 1974, Ser. No. 480,981

Int. Cl.<sup>2</sup> C08L 33/02

U.S. Cl. 260-29.6 H

20 Claims

1. In a stable coating composition adapted to simultaneously disperse a previously deposited dried coating composition and replace the dried composition with a fresh coating comprising: 50-96% water, 0-10% plasticizer, 0-5% leveling agent, 0-10% organic solvent, 0-5% surfactant, 0-15% wax, 0-10% film-modifying polymer and 3-18% polymeric coating agent; with the proviso that the total non-volatiles of the composition is in the range of from 4-20% and the combined non-volatiles of the leveling agent, solvent, plasticizer, surfactant, wax and film-modifying polymer are equal to or greater

than 9% and less than 200% of the non-volatiles of the polymeric coating agent; the improvement which comprises using as the polymeric coating agent a solution of an alkali-soluble resin having a weight average molecular weight from about 500 to 30,000 and an acid number from about 120 to 550, said resin being an addition resin formed from (a) at least 1 ethylenically unsaturated ligand-free monomer is selected from the group consisting of vinyl toluene, methyl methacrylate, butyl methacrylate, acrylonitrile, vinyl acetate, styrene,  $\alpha$ -methyl styrene, butyl acrylate, ethyl acrylate, 2-ethylhexylacrylate and mixtures thereof and (b) at least 1 ethylenically unsaturated monomer having at least 1 carboxyl group is selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, isocrotonic acid, maleic acid, fumaric acid and itaconic acid, wherein said resins contain from about 40-75% by weight of monomer (a) and from 60-25% by weight monomer (b), wherein the weight ratio of film-modifying polymer to polymeric coating agent is less than 0.57:1, adding aqueous ammonia to said composition in an amount sufficient to provide a pH of no less than 9.0, and said composition being substantially free of complex salts of cross-linking metals.

4,013,608

### METHOD OF PRODUCING POLYMER SOLUTIONS OF POLYMERS OR COPOLYMERS OF VINYL CHLORIDE SERIES

Fumiya Nagoshi, Kobe; Hideyuki Arakawa, Akashi; Hayashi Uchino, Kobe; Mitsuru Echigoya, Kobe, and Masaki Matsuo, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 3, 1975, Ser. No. 554,413

Claims priority, application Japan, Mar. 5, 1974, 49-26000  
Int. Cl.<sup>2</sup> C08K 5/20; C08L 27/06, 27/08, 32/20

U.S. Cl. 260-32.6 N

15 Claims

1. A method of producing solutions of polymers or copolymers of vinyl chloride series, comprising the steps of polymerizing in at least one step in a solvent mixture consisting essentially of 30 to 55 weight percent water, remainder N,N-dimethyl formamide, 100 parts by weight of a monomer mixture comprising at least 50 weight percent of vinyl chloride and less than 50 weight percent one or more monomers copolymerizable therewith, in the presence of 0.5 to 5.0 parts by weight of a surface active agent of a salt of monomeric compound having a sulphonate acid group selected from the group consisting of alkali metal salts of vinyl sulphonic acid, methacrylic acid sulphopropyl ester, methallyl sulphonic acid and styrene sulphonic acid and using an initiator for radical polymerization, and at a temperature of between 20° to 60° C, and after treating the resulting emulsion by at least distilling water and unreacted monomers from the resulting emulsion, and wherein said monomer mixture is 10 to 40 weight percent of the total weight of said solvent mixture and said monomer mixture.

4,013,609

### RESINOUS COMPOSITION

Kurt Hiltzsch, Wiesbaden-Biebrich, Germany, and Helmut Fritze, Vienna, Austria, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Division of Ser. No. 345,116, March 26, 1973. This application Mar. 18, 1975, Ser. No. 559,441

Claims priority, application Germany, Mar. 29, 1972, 2215268; May 25, 1972, 2225351

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C08F 8/44, 222/02

U.S. Cl. 260-33.6 UA

7 Claims

1. A resinous composition containing as an essential ingredient a binder comprising a product obtained by  
1. reacting in a first stage a solution of  
1. a copolymer containing a radical selected from the group consisting of (a) anhydride groups of vicinal



carboxylic groups, (b) a combination of such anhydride groups with vicinal carboxylic groups, (c) a combination of said anhydride groups with other radicals capable of forming vicinal carboxylic groups and (d) a combination of said anhydride groups with vicinal carboxylic groups and with other radicals capable of forming vicinal carboxylic groups, at a temperature of 50° to 180°C, with

2. at least one alcohol containing up to 2 hydroxy groups at least one of which being a non-tertiary hydroxy group to yield a reaction product in which at least a part of the anhydride groups is converted to semiester groups, and
- II. reacting
3. the product thus obtained in the presence of water at a temperature in the range from 50° to 120°C with
4. a salt-forming compound of a polyvalent metal, the solvent present in the first stage of the reaction being compatible with said alcohol and partially miscible with water only to such an extent that two phases are formed therewith together with at least one pigment and an aromatic hydrocarbon as a solvent.

4,013,610

## SPARINGLY GAS-PERMEABLE SYNTHETIC RESIN COMPOSITIONS

Akira Tomohiro, Nara, and Kenzo Kaneko, Toyonaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Japan  
Filed June 19, 1975, Ser. No. 588,166

Claims priority, application Japan, June 24, 1974, 48-72526  
Int. Cl.<sup>2</sup> C08K 3/40, 9/02

U.S. Cl. 260—37 EP

5 Claims

1. A sparingly gas-permeable synthetic resin composition impregnated with surface-treated glass flakes obtained by contacting glass flakes with an inorganic acid solution at a pH not higher than 1.0 at a temperature of 50° C up to the boiling point of the inorganic acid solution.

4,013,611

## PROCESS FOR PREPARING ELASTOMERS

Wolfgang Hecht; Ernst Wohlfarth, and Alois Strasser, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed June 23, 1975, Ser. No. 589,282  
Claims priority, application Germany, July 12, 1974, 2433697

Int. Cl.<sup>2</sup> C08L 83/04

U.S. Cl. 260—37 SB

13 Claims

1. An improved process for preparing compositions capable of being converted into elastomers comprising (A) triorganosiloxy-terminated diorganopolysiloxanes having at least one vinyl group in each terminal unit and a viscosity of from 10 to 5000 cP at 25° C.; (B) organopolysiloxanes having from 2000 to 50,000 cP at 25° C.; said organopolysiloxanes (B) containing organohydrogensiloxane units of the formula  $RHSiO$ , diorganosiloxane units of the formula  $R_2SiO$  and triorganosiloxy terminal units of the formula  $R_3SiO_{1/2}$ , in which R is selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, (C) fillers capable of being rendered hydrophobic and having a surface area of at least 50 m<sup>2</sup>/g and (D) catalysts which promote the addition of SiH groups to vinyl groups, the improvement which comprises mixing the organopolysiloxanes (B) with at least 75 percent by weight of fillers (C) having a surface area of at least 50 m<sup>2</sup>/g prior to mixing the above mixture with organopolysiloxanes (A) and catalysts (D).

4,013,612

## EPOXY COMPOSITION FOR ENCASING SEMICONDUCTOR DEVICES

Tooru Tamura, Ikeda; Nobuyuki Ojima, Katano; Sigeru Kondo, Higashi-Osaka, and Jizodo Yozo, Kagoshima, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 15, 1975, Ser. No. 622,729

Claims priority, application Japan, Oct. 18, 1974, 49-120838; Oct. 18, 1974, 49-120829

Int. Cl.<sup>2</sup> C08L 63/04

U.S. Cl. 260—37 EP

4 Claims

1. An epoxy resin composition for encasing semiconductive devices comprising a homogeneous mixture of a cresol novolac epoxy resin, phthalic anhydride as a curing agent, the amount of phthalic anhydride being 1.5 to 3 times the equivalents of epoxide groups, a derivative of imidazole as a curing accelerating agent, and the remainder being mineral filler.

4,013,613

## REINFORCED INTERCRYSTALLINE THERMOPLASTIC POLYESTER COMPOSITIONS

Visvaldis Abolins, Delmar, and Fred F. Holub, Schenectady, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 1, 1971, Ser. No. 185,886

Int. Cl.<sup>2</sup> C08L 67/02

U.S. Cl. 260—40 R

7 Claims

1. A reinforced intercrystalline normally rigid thermoplastic molding composition comprising, in combination,  
a. at least one high molecular weight normally crystalline polyester resin which very rapidly crystallizes from the melt;  
b. at least one high molecular weight normally crystalline, normally amorphous or normally partially crystalline and partially amorphous polymer which polymer comprises a mixture of a polymerization product of an ethylenically unsaturated monomer and at least one difunctionally reactive compound which is polymerizable by oxidation, said polymer being present in the concentration range of from 1 to 99 parts by weight of (a) to 99 to 1 parts by weight of (b); and  
c. a reinforcing amount of a reinforcing filler for said combination.

4,013,614

## METHOD OF PREPARING SHAPED ARTICLES FROM POLYMERIZABLE COMPOSITIONS

James M. Self, Taylor, S.C., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 544,966, Jan. 29, 1975, which is a continuation-in-part of Ser. No. 460,489, April 12, 1974, abandoned. This application May 6, 1976, Ser. No. 684,067

Int. Cl.<sup>2</sup> C08K 3/34

U.S. Cl. 260—40 R

11 Claims

1. The method of preparing a cured thermoset article which comprises

- A. spraying an alkaline mixture onto a substrate as a continuous mass, said alkaline mixture comprising:
  1. component 1 comprising one part by weight of an unsaturated polyester resin syrup; and
  2. component 2 comprising 0.1 to 10 parts by weight of aqueous sodium silicate containing 45 to 85 weight percent water and 55 to 15 weight percent sodium silicate solids having a weight ratio of  $SiO_2/Na_2O$  of 1.5 to 3.75;
- the said alkaline mixture including a polymerization initiator for unsaturated polyester resin syrup; and
- B. curing the said mass.

4,013,615

## ELECTROSTATIC SPRAY COATING POWDER PIGMENT COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Koichi Ohashi, Musashino; Yuzi Takahashi, Koganei, and Takashi Suzuki, Chofu, all of Japan, assignors to Tekkosha Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 469,537, May 13, 1974, abandoned. This application Sept. 10, 1974, Ser. No. 504,736  
Claims priority, application Japan, May 14, 1973, 48-52474; Sept. 10, 1973, 48-101223; Sept. 26, 1973, 48-107627

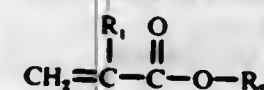
Int. Cl.<sup>2</sup> C08J 3/20

U.S. Cl. 260—42.53

18 Claims

1. A process for preparing powder compositions suitable for dry electrostatic spray coating, comprising the steps of emulsion polymerizing a reaction mixture of

1. first monomer component selected from the group consisting of vinyl chloride, monomer having the formula



wherein  $R_1$  is hydrogen or methyl and  $R_2$  is a hydrocarbon group having 1 to 18 carbon atoms, and mixtures of said monomers,

2. from 0 to 185 parts by weight, per 100 parts by weight of monomer component (1), of at least one comonomer copolymerizable with monomer component (1) and having a faster rate of polymerization than monomer component (1);
3. from 0.1 to 50 weight percent, based on the sum of components (1) and (2), of a water-insoluble pigment;
4. from 3 to 20 weight percent, based on the sum of components (1) and (2), of a water-soluble organic surfactant;
5. a water-soluble polymerization initiator in an amount effective to cause polymerization of components (1) and (2), and
6. from about 200 to about 400 weight percent, based on the sum of components (1) and (2), of an aqueous liquid medium while simultaneously vigorously agitating the reaction mixture throughout the polymerization so that the circulation number per minute of the reaction mixture is at least 3, wherein the circulation number per minute is equal to the integrated volume of the circulating flow of the reaction mixture per minute divided by the total volume of reaction mixture, in the polymerization vessel to produce substantially spherical polymer particles having a particle size within the range of about 30 to 250 microns, a bulk density of greater than 0.3 and a volume intrinsic resistivity of at least  $10^8$  ohm-cm; separating the solid polymer particles from the aqueous medium and drying the polymer particles.

4,013,616

## MIXED POLYMERIC STRUCTURAL MATERIAL AND METHOD

Richard A. Wallace, 43 Kingscote Garden, Stanford, Calif. 94305

Continuation-in-part of Ser. No. 201,111, Nov. 22, 1971, Pat. No. 3,846,366, and a continuation-in-part of Ser. No. 438,235, Jan. 31, 1974, Pat. No. 3,991,005. This application Sept. 5, 1974, Ser. No. 503,396

Int. Cl.<sup>2</sup> C08J 11/04

U.S. Cl. 260—42.46

20 Claims

1. A mixed polymeric composition comprising an intimate mixture of a comminuted filler and an adhesive polymer binder to form a continuous phase firmly bonding said filler particles together, the total polymer resin content comprising from 20% to 75% by weight of said composition, said filler comprising a comminuted fraction from a front-end solid

waste system comprising glass, cellulose and its derivatives, inorganic oxides and mixed polymer resins, including a significant quantity of polyethylene and polymer incompatible with polyethylene, said polymer binder comprising a polyethylene-compatible polymer selected from the group consisting of polypropylene, polyethylene, ethylene-propylene rubber, styrene-butadiene rubber, natural rubber, polystyrene, coumarone-indene copolymers, poly(ethylene-vinyl acetate) copolymers, polyisobutylene, and mixtures thereof.

4,013,617

## PROCESS FOR THE MANUFACTURE OF HYDROPHILIC POLYOLEFIN FIBERS CONTAINING INORGANIC PIGMENT

Wolfgang Gordon, Hofheim, Taunus; Hans Joachim Leugering, Frankfurt am Main, and Horst Schaefer, Schwalbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 16, 1975, Ser. No. 578,157

Claims priority, application Germany, May 18, 1974, 2424291

Int. Cl.<sup>2</sup> C08J 3/20

U.S. Cl. 260—42.55

12 Claims

1. A process for the manufacture of pigmented hydrophilic polyolefin fibers which comprises heating at at least an autogenous pressure a mixture of a polyolefin, a readily vaporizable solvent for the polyolefin, water, a hydrophilizing agent which is a water-soluble emulsifier and a particulate inorganic hydrophobic pigment to form a superheated dispersion of said pigment in an emulsion comprising a mixture of a solution of said polymer in said solvent and a solution of said hydrophilizing agent in said water, and passing said superheated dispersion through a nozzle into a relatively low pressure zone to flash evaporate solvent and water from said emulsion and form hydrophilic pigmented fibers of said polyolefin polymer.

4,013,618

## THERMALLY STABILIZED POLYESTER-POLYETHER BLOCK COPOLYMER COMPOSITION

Shozo Tsuji; Takahisa Minami, and Misao Sumoto, all of Otsu, Japan, assignors to Toyobo Co., Ltd., Japan

Filed Dec. 31, 1974, Ser. No. 537,760

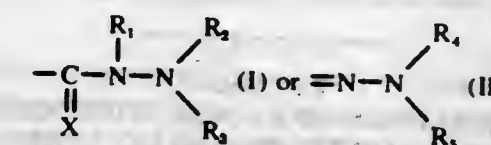
Claims priority, application Japan, Dec. 31, 1973, 49-1189

Int. Cl.<sup>2</sup> C08J 3/20

U.S. Cl. 260—45.8 N

17 Claims

1. A polyester-polyether block copolymer composition comprising a polyester-polyether block copolymer consisting of segments of polyester units produced from an aromatic dicarboxylic acid and an alkylene glycol having 2 to 15 carbon atoms and segments of polyether units of an aliphatic glycol having a molecular weight of about 400 to 6,000 wherein said polyether units are contained in the ratio of 1 to 85% by weight on the basis of the whole copolymer; a stabilizing amount for said block copolymer of at least one compound containing the group of the following formula:



wherein X is oxygen or sulfur,  $R_1$ ,  $R_2$  and  $R_3$  are each hydrogen or an organic residue selected from the group consisting of a straight or branched, saturated or unsaturated aliphatic hydrocarbon group, a saturated or unsaturated alicyclic hydrocarbon group, an aromatic hydrocarbon group, a heterocyclic group, a group wherein a hydrocarbon or heterocyclic group bonds to the nitrogen via oxygen, sulfur, imino, sulfinyl, sulfonyl, carbonyl, thiocarbonyl or hydrazo, carbazoyl, thiocarbazoyl, hydrazino or a group wherein any C-C bond in the hydrocarbon groups is intervened with oxygen, sulfur, imino,



sulfinyl, or sulfonyl, or  $R_2$  and  $R_3$  forms a Schiff's base with the adjacent nitrogen, and  $R_1$  and  $R_2$  are each hydrogen or an organic residue which is the same as defined for  $R_1$ ,  $R_2$  and  $R_3$ ; and a stabilizing amount for said block copolymer of at least one phenolic or amine radical scavenger and/or at least one peroxide decomposer.

#### 4,013,619 PHENOL ACETALS

Andreas Schmidt, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

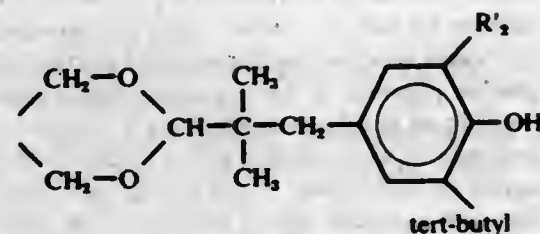
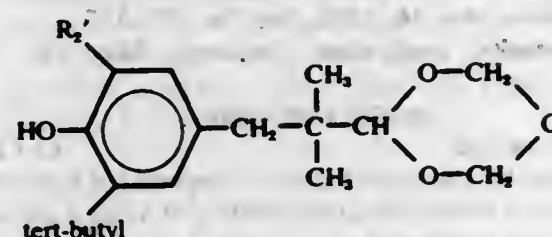
Filed Jan. 20, 1975, Ser. No. 542,631

Claims priority, application Switzerland, Jan. 21, 1974, 788/74

Int. Cl.<sup>2</sup> C08K 5/13

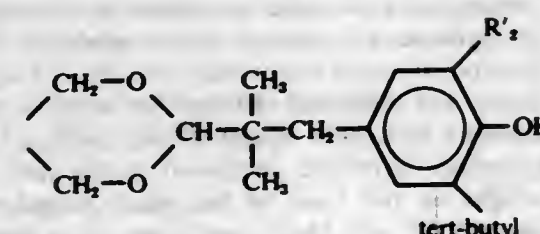
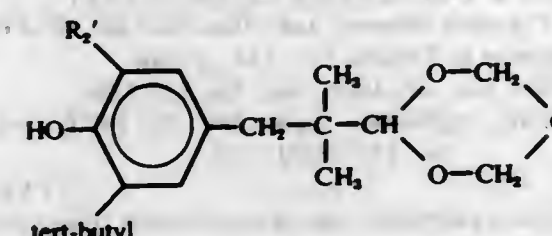
U.S. Cl. 260—45.8 A

I. A compound of the formula



in which  $R_2$  denotes methyl, isopropyl or tert-butyl.

4. A composition of matter comprising an organic polymer subject to oxidative degradation containing 0.005 to 5% by weight of a stabilizer compound of the formula



in which  $R_2$  denotes methyl, isopropyl or tert-butyl.

#### 4,013,620

#### STABILIZATION OF RUBBER WITH NICKEL COMPLEXES OF THIOPHENOL-ALKYLPHENOLS

William Arthur Henderson, Jr., Stamford, and Arnold Zweig, Westport, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 17, 1972, Ser. No. 218,132

Int. Cl.<sup>2</sup> C08K 5/37

U.S. Cl. 260—880 R

12 Claims

1. A composition comprising (1) a styrene, acrylic or vinyl chloride polymer modified with from about 1–75% of a grafted or ungrafted rubber, said rubber containing at least 5%, by weight, based on the total weight thereof, of repeating unsaturated hydrocarbon units and being normally subject to

deterioration by oxidation, having incorporated therein, as an inhibitor against said deterioration, (2) a stabilizing concentration of a nickel complex of a 2,2'-thiobis-(p-alkylphenol) wherein the complex forming ligand (A) is water, ammonia or an aliphatic or aromatic primary, secondary or tertiary amine and said alkyl group has from 1–18 carbon atoms, inclusive, said complex being characterized by a single ligand (A) to nickel coordinate bond and a single nickel to sulfur coordinate bond for each nickel atom in the complex molecule.

#### 4,013,621

#### SUBSTITUTED SULFONAMIDE DERIVATIVES OF HINDERED PHENOLS AND STABILIZED COMPOSITIONS

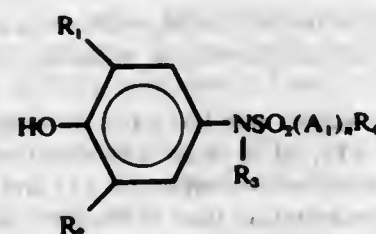
Martin Knell, Ossining, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 29, 1975, Ser. No. 572,774

Int. Cl.<sup>2</sup> C08K 5/42

U.S. Cl. 260—45.9 R

I. A compound of the formula



wherein

$R_1$  and  $R_2$  are each tert-butyl.

$R_3$  is hydrogen, lower alkyl of 1 to 4 carbon atoms or the group



$R_4$  and  $R_5$  are each independently alkyl of 1 to 18 carbon atoms or cycloalkyl of 5 to 12 carbon atoms, providing that  $R_4$  and  $R_5$  may each be independently hydrogen when  $n$  is 1.

$A_1$  and  $A_2$  are each independently phenyl, 1-naphthyl, 2-naphthyl, 1-(5,6,7,8-tetrahydro)naphthyl, 2-(5,6,7,8-tetrahydro)naphthyl or p-phenylene, and  $n$  is 0 or 1.

12. A composition of matter comprising an olefinic polymer subject to degradation and from 0.01 to 5% by weight of a stabilizing compound of claim 1.

#### 4,013,622

#### METHOD OF REDUCING BREAKDOWN IN POLYETHYLENE FILM

James V. DeJuncas, Hamilton Township; Gordon L. McIntyre, Trenton, and James F. O'Hara, Jr., Hightstown, all of N.J., assignors to Cities Service Company, Tulsa, Okla.

Filed June 23, 1975, Ser. No. 589,498

Int. Cl.<sup>2</sup> B29D 7/02; C08L 23/06

U.S. Cl. 260—45.95 S

4 Claims

1. A composition, to reduce breakdown in polyethylene blown film, comprising

a. a majority amount of low-density polyethylene of about 99 wt.%, depending on the levels of anti-block, slip, and anti-oxidant additives, based on the weight of the finished composition, and

b. a minor amount of polyethylene glycol, varying from about 100 to about 600 ppm, based on the weight of the finished composition, and wherein the molecular weight of the polyethylene glycol varies from about 600 to about 20,000.

#### 4,013,623

#### INTRACHAIN CHARGE TRANSFER COMPLEXES

Sam R. Turner, Webster, and Milan Stotka, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

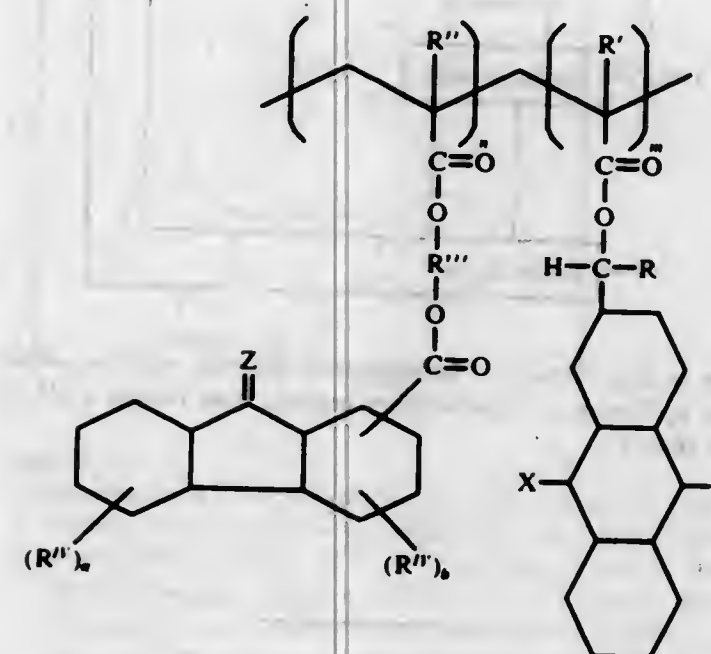
Filed July 16, 1975, Ser. No. 596,532

Int. Cl.<sup>2</sup> C08F 220/10, 220/12, 220/26

U.S. Cl. 260—63 UY

I. Copolymers of the formula

4 Claims



wherein

$R$  is hydrogen or alkyl of 1–6 carbon atoms;

$R'$  is hydrogen or methyl;

$R''$  is hydrogen or methyl;

$R'''$  is alkyl of 1–10 carbon atoms;

$R'''$  is selected from the group consisting of  $-\text{NO}_2$ , halogen,  $-\text{CN}$  and  $-\text{CF}_3$ ;

$X$  and  $Y$  are independently selected from the group consisting of hydrogen, chlorine, bromine, alkyl of 1–4 carbon atoms and phenyl;

$Z$  is oxygen or dicyanomethylene;

$a$  and  $b$  are in the range of from 0–4;

$n$  is in the range of from about 5 to about 95 percent of the total number of structural units of the copolymer; and

$m$  is in the range of from about 5 to about 95 percent of the total number of structural units of the copolymer.

#### 4,013,624

#### BRANCHED THERMOPLASTIC COPOLYESTERS

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 20, 1972, Ser. No. 236,266

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C08G 63/20

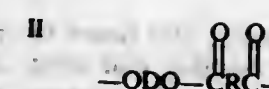
U.S. Cl. 260—75 R

16 Claims

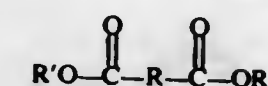
1. In a process for preparing a segmented thermoplastic copolyester, said copolyester consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula



and said short chain units being represented by the formula



which comprises reacting a dicarboxylic acid having a weight less than about 300; said acid being represented by the formula



wherein  $R$  is a divalent radical and  $R'$  is independently selected from the group consisting of hydrogen and  $\text{C}_1\text{--}\text{C}_{10}$  alkyl; a poly(alkylene oxide) glycol having a molecular weight of about 400–4,000 and a carbon to oxygen ratio of about 2.0–4.3 said glycol being represented by the formula



wherein  $G$  is a divalent radical, and a diol having a molecular weight less than about 250 and represented by the formula



wherein  $D$  is a divalent radical, the improvement which comprises conducting the reaction in the presence of about 0.3 to 1.2 equivalents per 100 moles of said dicarboxylic acid of a branching agent, said branching agent being represented by the formula  $(\text{HO})_a$ ,  $\text{X}(\text{COOH})_b$ , wherein  $X$  is a polyfunctional radical,  $a = 0\text{--}6$ ,  $b = 0\text{--}4$  and  $a + b = 3\text{--}6$ , said branching agent having a molecular weight of about 92 to 5,000.

#### 4,013,625

#### PROCESS FOR THE LINEARIZATION OF POLYURETHANES WITH LACTAMS AND LACTAM ADDITION COMPOUNDS

Kuno Wagner, Leverkusen, and Manfred Dahm, Berg-Neukirchen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 383,939, July 30, 1973, abandoned.

This application Dec. 2, 1975, Ser. No. 636,892

Claims priority, application Germany, Aug. 5, 1972, 2238667

Int. Cl.<sup>2</sup> C08G 18/08

U.S. Cl. 260—77.5 AA

10 Claims

1. A process for the linearization of isocyanate polyaddition products which are cross-linked via biuret, allophanate, uretidione or urethane imine groups which comprises reacting said isocyanate polyaddition products with a lactam, or a mixture of said lactam in association equilibrium with a Zerewitinoff active hydrogen containing compound, by impregnating said isocyanate polyaddition products thereby to cause said polyaddition products to swell, maintaining the state of swelling at least 5 seconds, and thereafter at least partly removing said lactam by extraction or evaporation from said polyurethane product.

#### 4,013,626

#### PROCESS FOR PREPARING POLYPYRROLIDONE WHEREIN POLYPYRROLIDONE IS WASHED WITH 2-PYRROLIDONE

Kiyoshi Katsumoto, El Cerrito, and Richard A. Wuopio, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Mar. 17, 1975, Ser. No. 559,293

Int. Cl.<sup>2</sup> C08G 69/24

U.S. Cl. 260—78 P

6 Claims

1. A process for producing 2-pyrrolidone polymer which comprises the steps of polymerizing 2-pyrrolidone under substantially anhydrous conditions in a reaction mixture comprising monomer, polymerization initiator and alkaline polymerization catalyst at a temperature of from about 18° to about



100° C for a period of from about 4 to about 100 hours to produce a solid polymeric product, and washing said solid polymeric product with 2-pyrrolidone to recover a first stream containing polymer, substantially free of said catalyst, and a second stream containing 2-pyrrolidone and catalyst.

4,013,627

# OIL AND WATER REPELLENT POLYMER CONTAINING ONIUM GROUPS

Stanley Temple, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Continuation-in-part of Ser. No. 290,769, Sept. 20, 1972, abandoned. This application Sept. 12, 1974, Ser. No. 505,221. Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C08F 226/02; C08L 27/12, 39/00

U.S. Cl. 526—245

9 Claims

1. Oil and water repellent solid polymer consisting essentially of, by weight:

- 20–99% of polymer chain repeat units from a monomer of the formula  $R_1CH_2CH_2OCOC(R)=CH_2$  wherein  $R_1$  is a perfluoroalkyl group of 4–14 carbon atoms and  $R$  is hydrogen or methyl;
- 1–80% of polymer chain repeat units from a vinyl monomer which has no non-vinyl fluorine atom; and
- 0.1–4%, based on the combined weights of (a) and (b), of polymer chain repeat units from a monomer of the formula  $CH_2=C(R)-Z-Y^+X^-$  wherein  $R$  is hydrogen or methyl,  $Z$  is a connecting group which activates but does not take part in vinyl polymerization,  $Y^+$  is an onium ionic group which is not sensitive to pH changes and  $X^-$  is a water solubilizing anion, the sum of (a) and (b) being 100%.

4,013,628

# PROCESS FOR THE PREPARATION OF INSULIN, ANALOGS AND DERIVATIVES THEREOF

Rainer Obermeier, Hattersheim (Main), and Rolf Geiger, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany  
Filed Aug. 14, 1975, Ser. No. 604,667

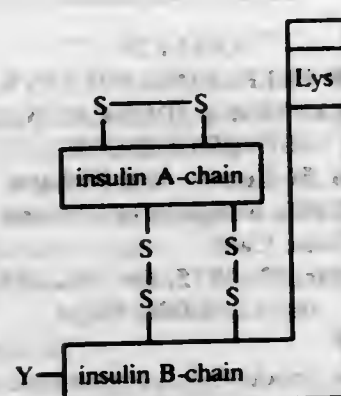
Claims priority, application Germany, Aug. 16, 1974, 2439296

Int. Cl.<sup>2</sup> A61K 37/26; C07C 103/52

U.S. Cl. 260—112.7

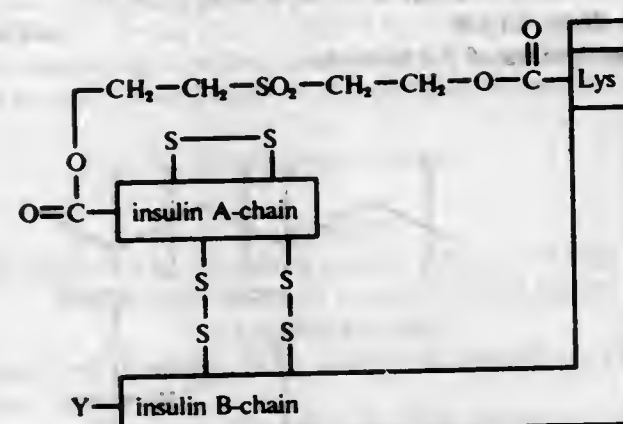
2 Claims

1. A method for making an insulin compound of the formula



and biologically-active analogs thereof in which one or more amino acids have been exchanged for other, preferably sim-

pler, amino acids or in which the chains are modified, preferably shortened, and in which  $Y$  is hydrogen or acyl, which method comprises treating a compound of the formula



or an analog thereof as hereinbefore defined, with an alkali metal hydroxide or a quaternary organic base having a pH of more than 13.

4,013,629

# ART OF CATALYZING THE REACTION BETWEEN A POLYOL AND A POLYALDEHYDE

Robert G. Cummisford, Brookfield; Richard J. Wasielewski, Milwaukee, and Robert K. Krueger, Sheboygan, all of Wis., assignors to Krause Milling Company, Milwaukee, Wis.  
Filed Feb. 21, 1975, Ser. No. 551,882

Int. Cl.<sup>2</sup> C07G 7/00

U.S. Cl. 260—123.7

27 Claims

1. In the modification of a polyol with a polyaldehyde, the improvement comprising the step of controlling, by accelerating or retarding the rate of the crosslinking reaction in a liquid solvent by the use of an inorganic alkali halide as a catalyst at such a temperature and pressure relationship as to maintain said liquid condition during the reaction, the polyol and polyaldehyde being of a type which would react in the absence of an alkali halide catalyst and being of a type which are mutually solvated in a solvent for the alkali halide.

4,013,630

# CHROMIUM COMPLEX DISAZO DYES

Fabio Beffa, Riehen, Switzerland, and Gerhard Back, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 2, 1976, Ser. No. 663,019

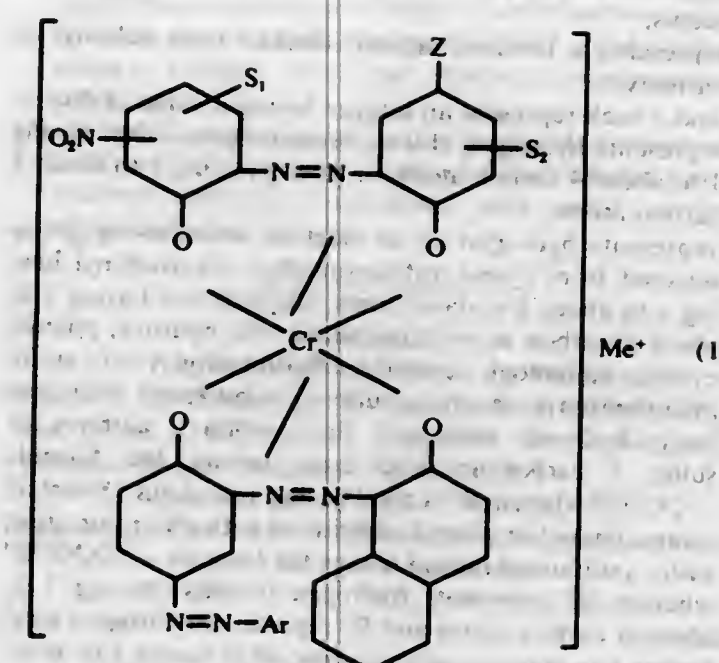
Claims priority, application Switzerland, Mar. 4, 1975, 2697/75

Int. Cl.<sup>2</sup> C09B 45/16

U.S. Cl. 260—145 A

6 Claims

1. Chromium complex dyes of the formula



wherein

$Z$  represents a phenyl radical, an alkyl radical of 4 to 12 carbon atoms, a cycloalkyl radical of 5 to 9 carbon atoms or an aralkyl radical of 7 to 12 carbon atoms,  $S_1$  represents hydrogen, halogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 2 carbon atoms, nitro, alkanoylamino of 2 to 3 carbon atoms or alkoxycarbonylamino of 2 to 3 carbon atoms,

$S_2$  represents hydrogen, alkyl of 1 to 5 carbon atoms, alkanoylamino or alkoxycarbonylamino, each of 2 to 3 carbon atoms,

$Me^+$  represents a cation, and

$Ar$  represents the radical of an aromatic diazo component which contains 1 to 3  $SO_3H$  groups and is optionally further substituted by carboxy, halogen, alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 2 carbon atoms or nitro.

4,013,631

# MONOAZO DYESTUFFS CONTAINING AN N-β-1,2,3-TRIAZOLYLETHYL ANILINO COUPLING COMPONENT

Gerhard Wolfrum, Opladen, and Heinrich Gold, Cologne-Stammheim, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 1, 1966, Ser. No. 591,141

Claims priority, application Germany, Nov. 8, 1965, 47620

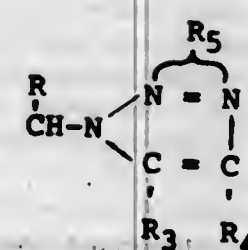
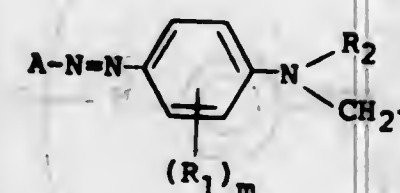
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl. C09b 29/36; D06p 1/08

U.S. Cl. 260—157

11 Claims

1. An azo dyestuff selected from the group consisting of



4,013,632

# WATER INSOLUBLE 6-(2-ACYLOXY-CARBETHOXY) BENZOTHAZOLE-AZO-BENZENE DYESTUFFS

Jean-Pierre Henri Stiot, St. Pierre les Elbeuf; Jean-Marie Louis Leroy, St. Etienne du Rouvray, and Claude Marie Henri Emile Brouard, Sotteville les Rouen, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed June 20, 1974, Ser. No. 481,440

Claims priority, application France, June 21, 1973, 73.22695

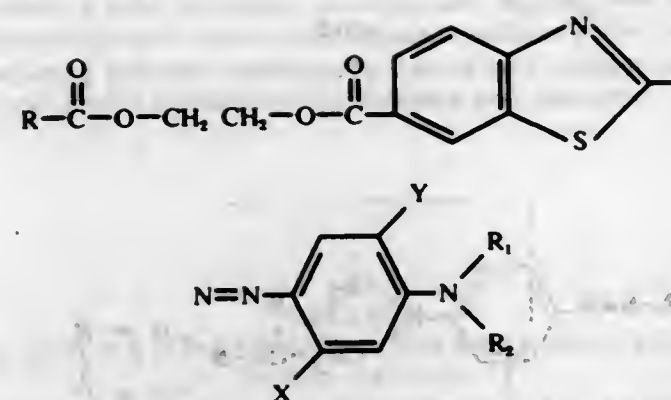
Int. Cl.<sup>2</sup> C09B 29/36; D06P 3/26, 3/48, 2/54

U.S. Cl. 260—158

3 Claims

1. A dyestuff of formula:





in which

R is methyl or ethyl,

X is hydrogen, chlorine, methyl, ethyl, acetamino, propionylamino, benzoylamino or cinnamoylamino,

Y is hydrogen, methoxy or ethoxy,

R<sub>1</sub> is alkyl having 1 to 4 carbon atoms unsubstituted or substituted by one or two chlorine, cyano, hydroxy, alkoxy containing 1 to 4 carbon atoms, acyl containing 2 to 5 carbon atoms, benzoyl, cinnamoyl, acyloxy containing 2 to 5 carbon atoms, benzoyloxy, cinnamoyloxy or carbalkoxy containing 2 to 5 carbon atoms and

R<sub>2</sub> is hydrogen or an alkyl group such as R<sub>1</sub>.

4,013,633

**YELLOW AZOPYRAZOLINE DYE RELEASING REDOX COMPOUNDS FOR PHOTOGRAPHIC COLOR TRANSFER**  
Jan R. Haase, Carl H. Eldredge, and Richard A. Landholm, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

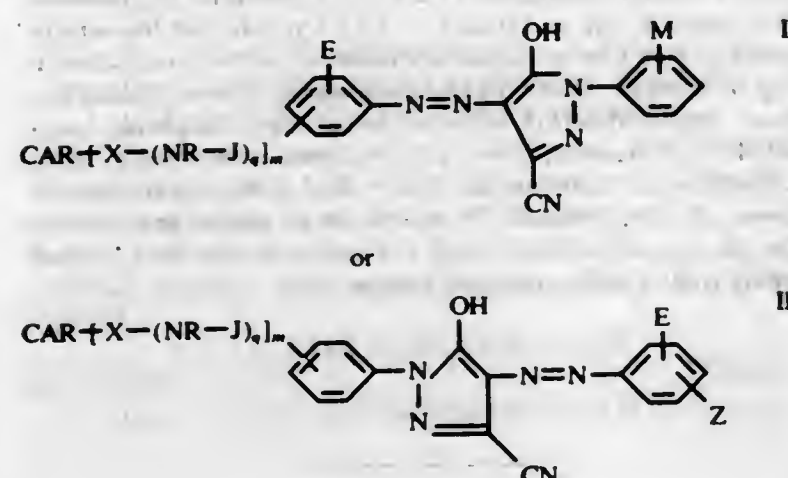
Filed June 27, 1975, Ser. No. 590,899

Int. Cl.<sup>2</sup> C09B 29/34, 29/38; G03C 1/10, 1/16

U.S. Cl. 260-162

17 Claims

1. A yellow image dye-releasing compound having a formula as follows



wherein

CAR represents a ballasted o- or p-sulfonamidophenol or o- or p-sulfonamidonaphthol carrier moiety which, as a function of oxidation under alkaline conditions, releases a diffusible dye from said compound;

X represents a bivalent linking group of the formula  $-R^1-L_n-R^2-$  where each R<sup>1</sup> can be the same or different and each represents alkylene having 1 to about 8 carbon atoms; phenylene; or phenylene substituted with carboxy, chloro, methyl or methoxy; L represents a bivalent radical selected from oxy, carbonyl, carboxamido, carbamoyl, sulfonamido, sulfamoyl, sulfinyl or sulfonyl; n is an integer having a value of 0 or 1; p is 1 when n equals 1 and p is 0 when n equals 0, provided that when p is 1 the carbon content of the sum of both R radicals does not exceed 14 carbon atoms;

R represents hydrogen or alkyl having 1 to about 6 carbon atoms;

J represents a bivalent radical selected from sulfonyl or carbonyl;

m and q each represent an integer having a value of 0 or 1; E represents hydrogen, chloro, bromo, fluoro, alkyl having 1 to about 4 carbon atoms or alkoxy having 1 to about 4 carbon atoms;

Z represents hydrogen or an electron withdrawing group selected from cyano, trifluoromethyl, alkylsulfonyl having 1 to about 8 carbon atoms substituted with hydroxy, phenyl, cyano, sulfamoyl, carboxy, fluorosulfonyl or sulfo; phenylsulfonyl or phenylsulfonyl substituted with carboxy, hydroxy, sulfamoyl, fluorosulfonyl, carboxy or sulfo; a carboxylic acid ester having the formula  $-COOR^3$  wherein R<sup>3</sup> is alkyl having 1 to about 18 carbon atoms, phenyl or phenyl substituted with chloro or nitro; sulfo, a sulfamoyl radical having the formula  $-SO_2NR^3R^4$  wherein R<sup>3</sup> represents hydrogen or alkyl having 1 to about 6 carbon atoms and R<sup>4</sup> represents hydrogen, alkyl having 1 to about 6 carbon atoms substituted with hydroxy, cyano, fluorosulfonyl, carboxy or sulfo; benzyl, phenyl, phenyl substituted with hydroxy, sulfonyl, sulfamoyl, carboxy or sulfo; alkylcarbonyl having 1 to about 8 carbon atoms, or phenylcarbonyl having 6 to about 9 carbon atoms, with the proviso that the carbon content of the sum of R<sup>3</sup> and R<sup>4</sup> not exceed 14 carbon atoms; a carbamoyl radical having the formula  $-CON(R^3)_2$  wherein each R<sup>3</sup> can be the same or different and is as described previously; and

M represents hydrogen, a solubilizing group or precursor thereof selected from carboxy, sulfo, a sulfamoyl radical as described for Z or a carboxylic acid ester as described for Z.

4,013,634

**TETRAAZO DIRECT UREA-DERIVED DYE HAVING A CORE OF H-ACID, K-ACID OR S-ACID**

Harvey Irvin Stryker, Carneys Point, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 21, 1974, Ser. No. 444,294

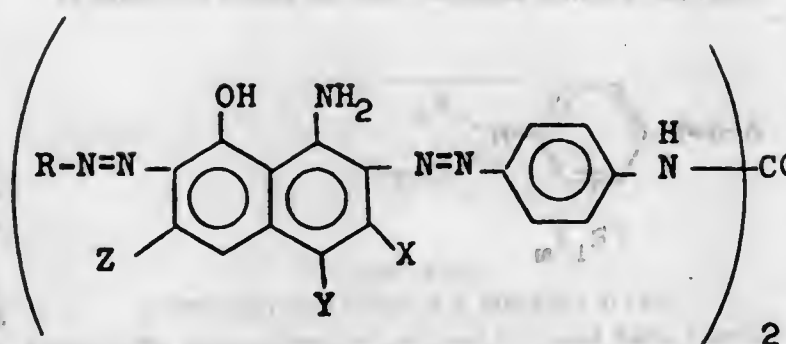
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C09B 43/14

U.S. Cl. 260-167

5 Claims

1. A water-soluble dye of the formula



wherein:

R is selected from unsubstituted phenyl, unsubstituted

naphthyl, phenyl substituted with up to 3 substituents and naphthyl substituted with up to 3 substituents, said substituents selected from the group methyl, ethyl, methoxy, ethoxy, sulfonic acid, and chlorotrimethylammonium acetyl, and

X, Y and Z are substituted so as to give derivatives of at least one of 1-amino-8-naphthol-4,6-disulfonic acid, 1-amino-8-naphthol-3,6-disulfonic acid, and 1-amino-8-naphthol-4-sulfonic acid.

4,013,635

**CYAN AZO DYE-PROVIDING COMPOUNDS**

Richard A. Landholm; Jan R. Haase, both of Rochester, N.Y., and James J. Krutak, Sr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 26, 1975, Ser. No. 553,381

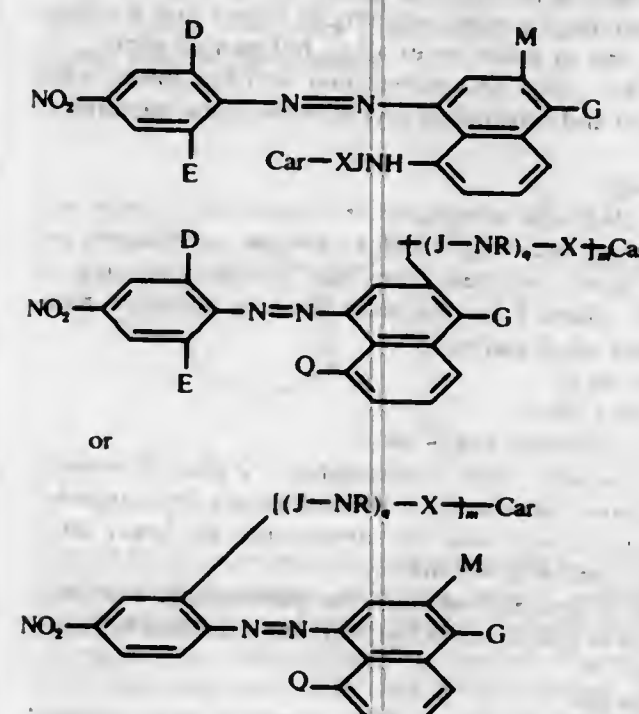
The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> C09B 29/10, 29/20; G03C 5/30, 5/54

U.S. Cl. 260-199

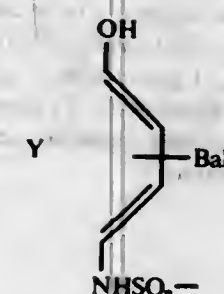
12 Claims

1. A cyan image dye-providing compound having a formula as follows:



wherein

CAR represents a carrier moiety which, as a function of oxidation under alkaline conditions, releases a diffusible dye from said compound and having the formula



wherein

Ball represents an organic ballasting group containing at least 8 carbon atoms which renders said compound non-diffusible in a photographic element during development in an alkaline processing composition;

Y represents the carbon atoms necessary to complete a benzene or naphthalene nucleus;

X represents  $-R^2-L_n-R^3-$  where each R<sup>2</sup> can be the same or different and each represents alkylene having 1 to about 8 carbon atoms; phenylene; or phenylene substi-

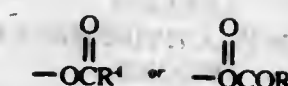
tuted with chloro, bromo, cyano, nitro, methoxy, methyl, ethyl, carboxy, or sulfo; L represents oxy, carbonyl, carboxamido, carbamoyl, sulfonamido, sulfamoyl, sulfinyl or sulfonyl; n is an integer having a value of 0 or 1; p is 1 when n equals 1 and p is 0 when n equals 0, provided that when p is 1 the carbon content of the sum of both R<sup>2</sup> radicals does not exceed 14 carbon atoms;

R represents hydrogen, or alkyl having 1 to about 6 carbon atoms;

J represents sulfonyl or carbonyl;

m and q each represent an integer having a value of 0 or 1; Q represents hydroxy,  $-NHCOR^3$  or  $-NHSO_2R^3$  wherein R<sup>3</sup> is alkyl having 1 to about 6 carbon atoms, alkyl substituted with hydroxy, cyano, sulfamoyl, carboxy or sulfo; benzyl, phenyl, or phenyl substituted with carboxy, cyano, chloro, methoxy, methyl or sulfamoyl;

G represents hydroxy, an alkali metal salt thereof, a photographically inactive amine salt thereof, or a hydrolyzable acyloxy group having the formula:



wherein R<sup>4</sup> is alkyl having 1 to about 18 carbon atoms, phenyl or phenyl substituted with chloro or nitro;

D represents halogen, cyano, nitro, trifluoromethyl, alkyl having 1 to about 6 carbon atoms, alkoxy having 1 to about 6 carbon atoms, carboxy,  $-COOR^4$  wherein R<sup>4</sup> is as described previously, fluorosulfonyl, trifluoromethylsulfonyl,  $-SO_3$ -phenyl or  $-SO_3$ -phenyl substituted with hydroxy, chloro, carboxy, sulfamoyl, methyl or methoxy; sulfo,  $-SO_2NR^5R^6$  wherein R<sup>5</sup> represents hydrogen or alkyl having 1 to about 6 carbon atoms and R<sup>6</sup> represents hydrogen, alkyl having 1 to about 6 carbon atoms, alkyl having 1 to about 6 carbon atoms substituted with hydroxy, cyano, sulfamoyl, carboxy or sulfo; benzyl, phenyl, phenyl substituted with hydroxy, sulfonyl, sulfamoyl, carboxy, or sulfo; alkylcarbonyl having 1 to about 8 carbon atoms, or phenylcarbonyl having 6 to about 9 carbon atoms, with the proviso that the carbon content of the sum of R<sup>5</sup> and R<sup>6</sup> not exceed 14 carbon atoms; also R<sup>5</sup> and R<sup>6</sup> may be combined with the nitrogen atom to which they are attached to form morpholino or piperidino;  $-CON(R^5)_2$  wherein each R<sup>5</sup> can be the same or different and is as described previously; alkylsulfonyl having 1 to about 8 carbon atoms, alkylsulfonyl having 1 to about 8 carbon atoms substituted with hydroxy, chloro, phenyl, cyano, sulfamoyl, carboxy or sulfo; phenylsulfonyl or phenylsulfonyl substituted with hydroxy, sulfamoyl, fluorosulfonyl, carboxy or sulfo; E represents hydrogen, halogen, nitro, cyano or trifluoromethyl; and

M represents sulfo, cyano, fluorosulfonyl, halogen,  $-SO_3$ -phenyl, a  $-SO_3$ -phenyl substituted with hydroxy, chloro, carboxy, sulfamoyl, methyl or methoxy; alkylsulfinyl having 1 to about 8 carbon atoms, alkylsulfinyl having 1 to about 4 carbon atoms substituted with cyano, hydroxy or carboxy; phenylsulfinyl;  $-SO_2NR^5R^6$ , or  $-CON(R^5)_2$  wherein R<sup>5</sup> and R<sup>6</sup> are as described previously; alkylsulfonyl having 1 to about 8 carbon atoms, alkylsulfonyl having 1 to about 6 carbon atoms substituted with hydroxy, chloro, phenyl, cyano, sulfamoyl, carboxy or sulfo; or phenylsulfonyl substituted with hydroxy, sulfamoyl, fluorosulfonyl, carboxy or sulfo; with the proviso that there be no more than one sulfo radical and no more than one carboxy radical present in said compound.



4,013,636  
N,N-DIETHYL-4-(2,4-DINITRO-6-ALKYLSULFONYL-PHENYLazo)-2-ALKOXY-5-ALKYL-CARBONYLAMINOANILINES

Ruedi Altermatt, Buckten, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

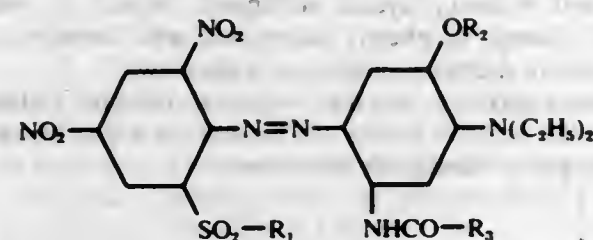
Filed Dec. 17, 1974, Ser. No. 533,522

Claims priority, application Switzerland, Dec. 21, 1973, 18039/73

Int. Cl.<sup>2</sup> C09B 29/26; D06P 3/26, 3/42, 3/54

U.S. Cl. 260—207

1. A compound of the formula



wherein each of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> is independently methyl or ethyl.

4,013,637  
WATER INJECTION IN A HYDRODESULFURIZATION PROCESS

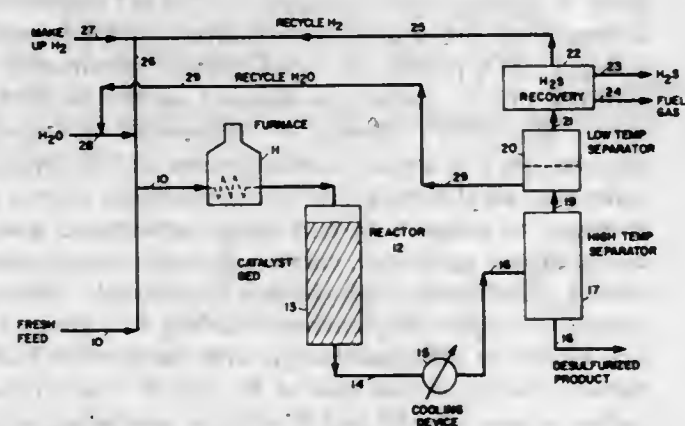
Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed June 3, 1975, Ser. No. 583,467

Int. Cl.<sup>2</sup> C10G 23/02

U.S. Cl. 208—216

14 Claims



1. A hydrodesulfurization process which comprises contacting, in a reaction zone, at hydrodesulfurization conditions, a substantially non-metal containing sulfur-bearing hydrocarbon feed selected from the group consisting of naphthas, vacuum gas oils, virgin gas oils, thermal and catalytic cycle oils, with a hydrogen-containing treating gas and a catalyst consisting essentially of cobalt metal, oxide or sulfide thereof and molybdenum metal, oxide or sulfide thereof; composited with an alumina carrier, and injecting into said reaction zone from about 1 to about 32 volume percent H<sub>2</sub>O based on said hydrogen-containing treating gas at start-of-run reaction zone temperatures ranging from about 550° to less than about 750° F., and discontinuing said injection of H<sub>2</sub>O into said reaction zone when the reaction zone temperature is about 750° F.

4,013,638  
AZABICYCLONONANECARBODITHIOIC ACID

John J. D'Amico, Dunbar, W. Va., assignor to Monsanto Company, St. Louis, Mo.

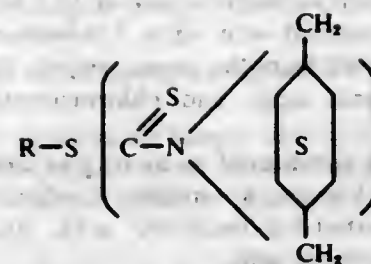
Filed Jan. 18, 1965, Ser. No. 426,348

Int. Cl.<sup>2</sup> C07D 401/12, 403/12, 411/12

U.S. Cl. 260—239 BA

1. A compound of the formula

16 Claims



where R is selected from a group consisting of —SCCl<sub>3</sub>, Y—S<sub>x</sub>, where x is an integer from 0 to 3, inclusive, and Y is the radical in parentheses,

lower alkyl,

cyano lower alkyl,

isothiocyano lower alkyl,

amino lower alkyl where amino is NH<sub>2</sub>, lower alkyl NH—,

(lower alkyl)<sub>2</sub>N—, 1-pyrrolidinyl, piperidino, morpholino,

or 1-hexamethyleniminyl,

lower alkenyl,

halogen-substituted lower alkenyl,

cyclohexenyl,

alkadienyl of 6 to 10 carbon atoms

aryl where aryl is phenyl or naphthyl and substituted aryl

where aryl has the same meaning as before and is substituted by one or more lower alkyl, halogen or nitro,

arythio lower alkyl and substituted arythio lower alkyl

where aryl and substituted aryl have the same meaning as before

lower alkynyl,

aryl lower alkyl and substituted aryl lower alkyl where aryl

has the same meaning as before and the substituents are one or more selected from the group consisting of

—CH<sub>2</sub>SY where Y has the same meaning as before, halogen, lower alkyl and nitro,

furyl lower alkyl,

pyranyl lower alkyl,

5-hydroxy pyranonyl lower alkyl,

2-phenyleneazoyl and substituted 2-phenyleneazoyl

wherein phenyleneazoyl is benzothiazoyl, benzoxazoyl,

or benzimidazoyl, and the substituents are lower alkyl,

chloro, nitro, or lower alkoxy,

substituted 2-thiazoyl wherein the substituents are lower alkyl, lower alkoxy carbonyl, carbamyl, anilino carbonyl or acetyl

2-pyrimidinyl,

2-pyrimidinyl containing one or two lower alkyl substituents,

phthalazinyl,

imidomethyl wherein imido is phthalimido, succinimido,

maleimido or tetrahydrophthalimido,

—CH(SY)C(O)R', and

—CH<sub>2</sub>C(O)R' where Y has the same meaning as before and R' is lower alkoxy or amino; where amino is NH<sub>2</sub>, mono-

lower alkylamino, di(lower alkyl)amino, 3-azabicyclo(3.2.2) non-3-yl, 1-pyrrolidinyl, piperidino, morpholino, 1-hexamethyleniminyl, N-phenyl-N-lower alkyl-

amino, N-(4-anilinophenyl)amino, and N-lower alkyl-N-(4-anilinophenyl)amino;

ammonium,

alkali metal,

alkaline-earth metal,

zinc,

copper,

lead, and

iron;

substituted ammonium selected from the group consisting of:

mono(lower alkyl) ammonium,

di(lower alkyl) ammonium,

tri(lower alkyl) ammonium,

cyclohexyl ammonium,

dicyclohexyl ammonium,

pyrrolidinium,

piperidinium, hexamethyleniminium, morpholinium, 3-azoniabicyclo(3.2.2) nonane, N,N-di(lower alkyl) cyclohexylammonium, N,N-di(lower alkyl) N-phenylammonium, and triethanol ammonium.

4,013,639  
PREPARATION OF ASYMMETRIC IMINODIBENZYL COMPOUNDS

Ryoichi Kitamura; Eiichi Kitamura; Tetsuo Kitamura, and Tameo Kitamura, all of Suita, Japan, assignors to Eiichi Kitamura; Tetsuo Kitamura and Tameo Kitamura, all of Osaka, Japan

Filed July 24, 1973, Ser. No. 382,120

Claims priority, application Japan, July 24, 1972, 47-74367; July 24, 1972, 47-74368

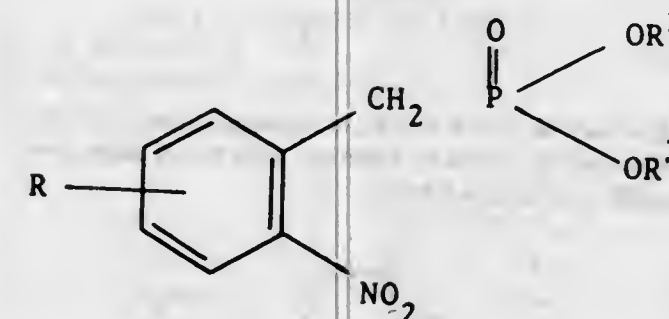
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07D 223/28

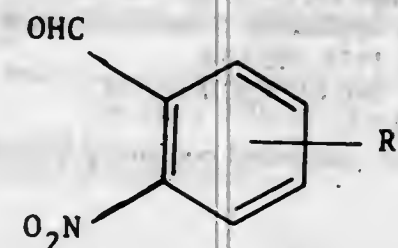
U.S. Cl. 260—239 D

8 Claims

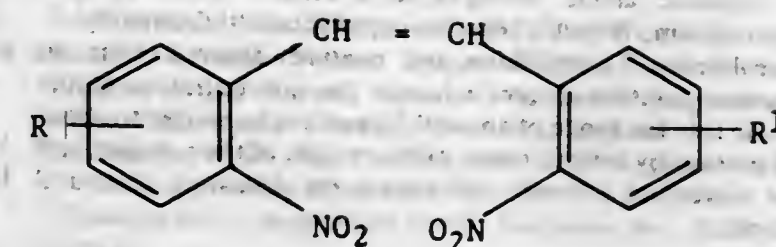
1. A process for preparing asymmetric iminodibenzyl derivatives, which comprises condensing a 2-nitrobenzyl phosphonic ester of the formula:



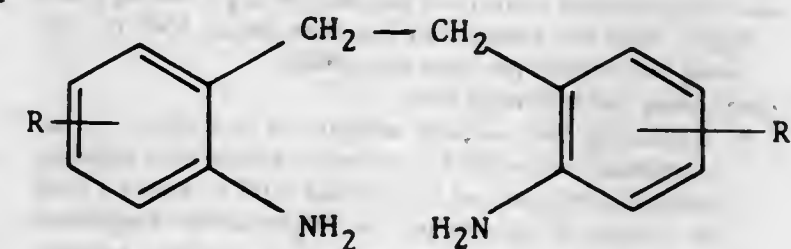
wherein R is one or more substituents selected from the group consisting of hydrogen, halogen, amino, sulfamoyl, lower alkyl, lower alkoxy and lower alkanoyl, and R<sup>2</sup> and R<sup>3</sup> are each hydrogen, lower alkyl, phenyl or phenyl (lower) alkyl, provided that when one of R<sup>2</sup> and R<sup>3</sup> is hydrogen, the other is different from hydrogen, with a 2-nitrobenzaldehyde of the formula:



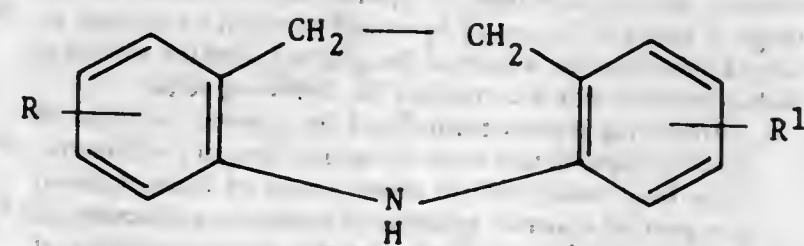
wherein R<sup>1</sup> is one or more substituents selected from the group consisting of hydrogen, halogen, amino, sulfamoyl, lower alkyl, lower alkoxy and lower alkanoyl, R and R<sup>1</sup> being asymmetrically attached to the respective positions of the benzene rings when R and R<sup>1</sup> are the same or different or being different when R and R<sup>1</sup> are attached to the same positions on the respective benzene rings, in an inert organic solvent in the presence of a condensing agent selected from the group consisting of an alkali metal alcoholate, sodium hydride and sodium amide, reducing the resultant 2,2'-dinitrostilbene of the formula:



wherein R and R<sup>1</sup> are each the same as defined above, by catalytic hydrogenation or in the presence of a reducing agent, and ringclosing the resultant 2,2'-diaminodibenzyl of the formula:



wherein R and R<sup>1</sup> are each the same as defined above, by heating in the presence or absence of a catalyst, to give an iminodibenzyl of the formula:



wherein R and R<sup>1</sup> are each the same as defined above.

4,013,640  
PROCESS FOR THE RECOVERY OF AMIDES

George S. Somekh, New Rochelle, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 459,968

Int. Cl.<sup>2</sup> C07D 201/16

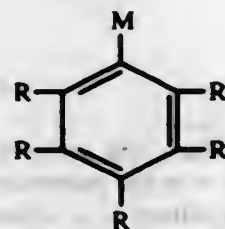
U.S. Cl. 260—239.3 A

10 Claims

1. A solvent extraction-distillation process for the recovery of a water-soluble amide selected from the group consisting of



an aliphatic amide having 1 to 8 carbon atoms, epsilon-caprolactam, N-methyl-epsilon-caprolactam, 1,5-dimethyl-2-pyrrolidone, 2-pyrrolidone and mixtures thereof, from an aqueous solution thereof wherein the concentration of the amide is in the range of about 0.25 percent by weight to about 25 percent by weight, based on the weight of the solution, and the solvent is a compound having the following structural formula:



wherein M is OH or CH<sub>2</sub>OH, R is hydrogen or an alkyl radical, there being at least one alkyl radical, and the total number of carbon atoms in all of said alkyl radicals taken together is 3 to 12, or a mixture of isomers thereof,

said compound or mixture of isomers having a boiling point higher than the amide and less than about 350° C. and being non-azeotropic with the amide, comprising the following steps:

a. contacting the aqueous solution of said amide in an extraction zone with the solvent in a solvent to aqueous solution feed ratio of from about 0.05 to about 1 part by volume of solvent per part by volume of aqueous solution, to provide an extract comprising solvent, amide, and no more than about 5 percent by weight of water based on the weight of the solution, and a raffinate comprising at least about 95 percent by weight of water based on the weight of the solution and less than about 5 percent by weight of solvent based on the weight of the solvent;

b. introducing the extract from step (a) into a distillation zone, wherein the pressure is less than about 500 millimeters of mercury and the temperature is less than the decomposition temperatures of the amide and the solvent at said pressure, to separate the solvent from a mixture of amide and water; and

c. recovering the mixture of amide and water.

9. A solvent extraction-distillation process for the recovery of epsilon-caprolactam from an aqueous solution thereof wherein the concentration of epsilon-caprolactam is in the range of about 0.25 percent by weight to about 25 percent by weight, based on the weight of the solution, and the solvent is dodecylphenol, which comprises the following steps:

a. introducing dodecylphenol and the aqueous solution of epsilon-caprolactam to an extraction zone at a volumetric ratio from about 0.05 to about 1 part of dodecylphenol per part of aqueous solution of epsilon-caprolactam, in said extraction zone contacting the aqueous solution of epsilon-caprolactam with dodecylphenol to provide an extract comprising dodecylphenol, epsilon-caprolactam and no more than about 5 percent by weight of water based on the weight of said aqueous solution of epsilon-caprolactam, and a raffinate comprising at least about 95 percent by weight of water based on the weight of said aqueous solution of epsilon-caprolactam and less than about 5 percent by weight of dodecylphenol based on the total weight of dodecylphenol fed to the extraction zone;

b. introducing the mixture of epsilon-caprolactam and dodecylphenol from step (a) into a distillation zone wherein the pressure is less than about 500 millimeters of mercury and the temperature is less than the decomposition temperatures of the epsilon-caprolactam and dodecylphenol at said pressure, to separate epsilon-caprolactam from the dodecylphenol; and

c. recovering the epsilon-caprolactam.

4,013,641

## INDOLOBENZOXAZEPINES

Richard E. Brown, East Hanover, N.J., assignor to Xerox Corporation, Stamford, Conn.

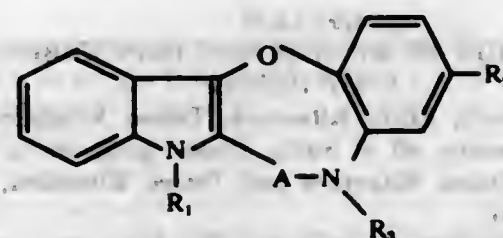
Filed Oct. 8, 1975, Ser. No. 620,734

Int. Cl.<sup>2</sup> C07D 498/04

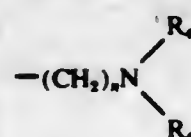
U.S. Cl. 260—239.3 P

15 Claims

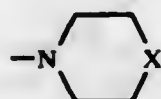
1. A substituted indolobenzoxazepine of the formula:



wherein R<sub>1</sub> is hydrogen, lower alkyl of 1 to 6 carbon atoms or an aralkyl group of 1 to 6 carbon atoms in the chain; R<sub>2</sub> is hydrogen, a halogen, lower alkyl of 1 to 6 carbon atoms or a trifluoromethyl group; A is a methylene group or a carbonyl group; R<sub>3</sub> is hydrogen, lower alkyl of 1 to 6 carbon atoms, or an ω-aminoalkyl group of the formula



in which n may be 2 to 4 and R<sub>4</sub> is hydrogen, lower alkyl of 1 to 6 carbon atoms or, taken together with the N atom form a heterocyclic ring of the formula



wherein X is oxygen, sulfur, —CH<sub>2</sub>CH<sub>2</sub>—, a bond connecting the adjacent carbon atoms, or CH-R<sub>5</sub> or N-R<sub>5</sub> wherein R<sub>5</sub> is hydrogen or lower alkyl of 1 to 6 carbon atoms.

4,013,642

## HETEROCYCLIC COMPOUNDS CONTAINING SULPHO GROUPS

Hans Rudolf Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 10, 1975, Ser. No. 585,739

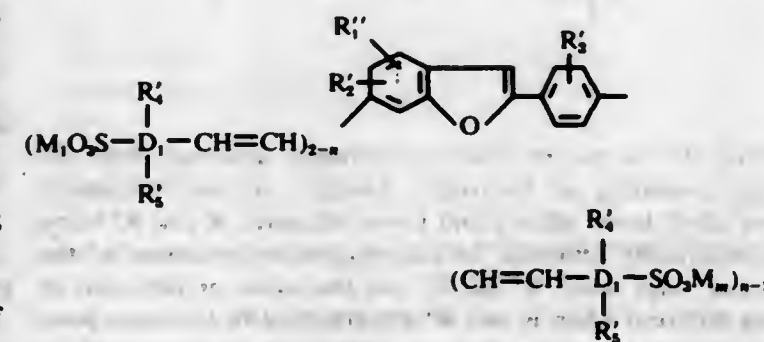
Claims priority, application Switzerland, June 12, 1974, 8031/74; June 12, 1974, 8033/74

Int. Cl.<sup>2</sup> C07D 307/78

U.S. Cl. 260—240 CA

7 Claims

1. A heterocyclic compound containing sulpho groups of the formula



wherein n denotes the number 1 or 2, R<sub>1</sub> denotes hydrogen or, if n is the number 2, conjointly

with R<sub>1</sub>, in the 4,5-position or the 6,7-position, denotes 1,3-butadienylene or in the 5,6-position denotes trimethylene;

R<sub>2</sub> denotes hydrogen and, if n is the number 1, also chloro, alkoxy of 1 to 4 carbon atoms or 4-phenyl;

R<sub>3</sub> denotes hydrogen or, if D<sub>1</sub> denotes phenylene, also chloro, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R<sub>4</sub> denotes hydrogen or, if D<sub>2</sub> denotes phenylene, also alkoxy of 1 to 4 carbon atoms;

R<sub>5</sub> denotes hydrogen, chloro or, if n is the number 2, also methoxy, cyclohexyl or phenyl or, conjointly with R<sub>2</sub> in the 4,5-position on the 6,7-position, denotes said 1,3-butadienylene or in the 5,6-position denotes said trimethylene;

D<sub>1</sub> denotes phenylene or 4,4'-biphenylene; and D<sub>2</sub> denotes a hydrogen ion, alkali metal ion, alkaline earth metal ion, ammonium ion or amine salt ion.

4,013,643

## N,N-DISUBSTITUTED 2,3-DIPHENYLALLYLAMINES

Leonard N. Nysted, Highland Park, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

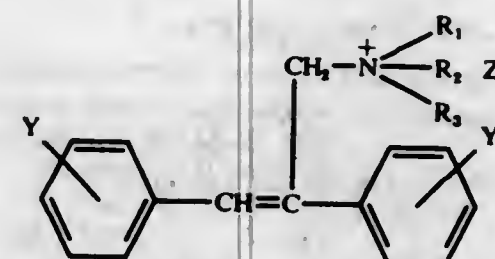
Continuation of Ser. No. 417,289, Nov. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 215,923, Jan. 6, 1972, abandoned. This application July 25, 1975, Ser. No. 599,311

Int. Cl.<sup>2</sup> C07D 239/06; C07C 87/29

U.S. Cl. 260—240 K

5 Claims

1. A compound of the formula



wherein Y and Y' are halogen, lower alkoxy, acetamido or hydrogen radicals, R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are lower alkyl radicals and Z is a halogen atom.

4,013,644

[8 α(E)]

13α,β]-5,8,13,13A-TETRAHYDRO-2,3,10,11-TETRAMETHOXY-9-(2-PHENYLETHENYL)-6H-DIBENZO[a,g]-QUINOLIZINES AND INTERMEDIATES THERETO

George R. Lenz, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

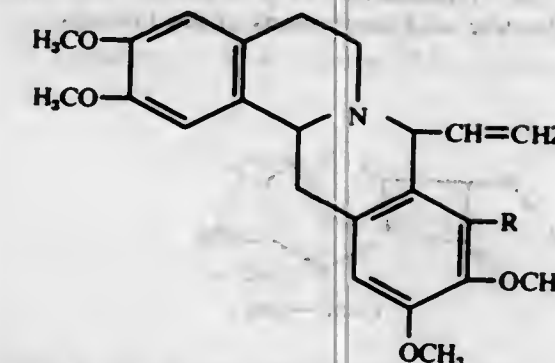
Filed Mar. 15, 1976, Ser. No. 666,803

Int. Cl.<sup>2</sup> C07D 215/14

U.S. Cl. 260—240 D

3 Claims

1. A compound of the formula



wherein Z represents phenyl optionally substituted by fewer than 4 methoxys and R represents hydrogen or methyl.

4,013,645

## FORMAMIDO CEPHALOSPORIN COMPOUNDS

Edward McKenzie Wilson, Hayes, England, and Adrian Charles Ward Curran, Glasgow, Scotland, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation of Ser. No. 874,039, Nov. 4, 1969, abandoned. This application Mar. 28, 1972, Ser. No. 238,992

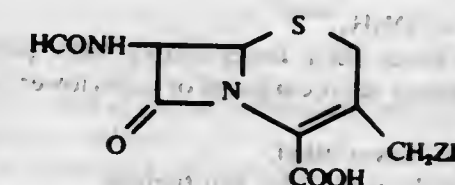
Claims priority, application United Kingdom, Nov. 5, 1969, 52438/68

Int. Cl.<sup>2</sup> C07D 501/20

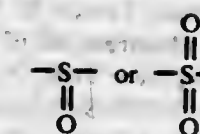
U.S. Cl. 260—243 C

3 Claims

1. A compound of the formula:



wherein R is an alkyl group containing 1–4 carbon atoms and Z is —O—, —S—,



or a salt or ester thereof.

4,013,646

## 1-(ω-HALOALKYL)-ISATOIC ANHYDRIDES

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

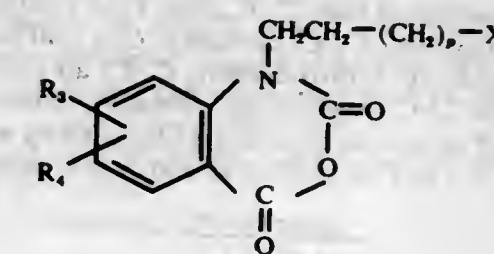
Division of Ser. No. 373,474, June 25, 1973, Pat. No. 3,894,022. This application Aug. 6, 1975, Ser. No. 602,387

Int. Cl.<sup>2</sup> C07D 265/26

U.S. Cl. 260—244 A

2 Claims

1. A compound of the formula:



wherein p is 0 or 1 each of R<sub>1</sub> and R<sub>2</sub> is, independently, hydrogen, halo of atomic weight of from 18 to 36, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms, and X is halo of atomic weight of from 35 to 127.

4,013,647

## MORPHOLINE CONTAINING TETRAZOLE-5-CARBOXAMIDE DERIVATIVES

John H. Sellstedt, Pottstown, and Dieter H. Klaubert, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,570

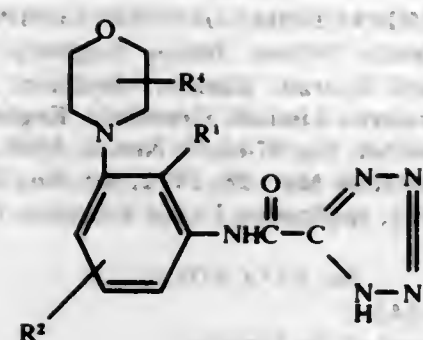
Int. Cl.<sup>2</sup> C07D 413/02

U.S. Cl. 260—247.2 A

4 Claims

1. A compound of the formula:





in which

R<sup>1</sup> is —CN or —CONH<sub>2</sub>;  
R<sup>2</sup> is hydrogen, lower alkyl, lower alkoxy, halo, polyhalo(lower)alkyl, lower alkyl carbonyl or carb(lower) alkoxy; and  
R<sup>3</sup> is hydrogen or lower alkyl;  
or a pharmaceutically acceptable salt thereof.

4,013,648

### Δ<sup>2,3</sup>-O-2-ISOCEPHEM-4-CARBOXYLIC ACID AND DERIVATIVES AS ANTIBACTERIAL AGENTS

Donald E. Horning, Candiac; Leeson R. Morris, St. Lambert, and James L. Douglas, Montreal, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

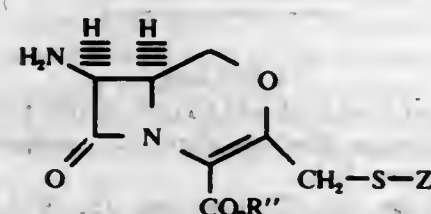
Filed July 23, 1975, Ser. No. 598,461

Int. Cl.<sup>2</sup> C07D 265/00, 273/00, 295/00; A01N 9/00

U.S. Cl. 260—244 R

23 Claims

1. The compound of the formula



wherein R'' is hydrogen or an easily cleavable ester carboxyl-protecting group and Z represents a 5- or 6-membered heterocyclic ring containing N, O or S, said heterocyclic ring being optionally substituted by one or two substituents selected from the group consisting of halo, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, cyano, carboxyl, amino, nitro, C<sub>3</sub>-C<sub>4</sub> cycloalkyl, C<sub>2</sub>-C<sub>4</sub> alkenyl, trifluoromethyl, hydroxy, hydroxymethyl, C<sub>1</sub>-C<sub>4</sub> alkylthio, C<sub>1</sub>-C<sub>4</sub> alkylamino, di(C<sub>1</sub>-C<sub>4</sub> alkyl)amino, mercapto, phenyl, benzyl, alkoxyalkyl of up to 4 carbons and -(CH<sub>2</sub>)<sub>n</sub>COOH in which n is an integer of 1 to 4, or carboxylic acid or acid addition salts thereof.

4,013,649

### METHOD OF MAKING

### 4-AMINO-6-T-BUTYL-3-MERCAPTO-1,2,4-TRIAZIN-5-ONE

Mitchell Joseph Bogdanowicz, Jr., Spencerport, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 385,750, Aug. 6, 1973, abandoned. This application Oct. 11, 1974, Ser. No. 514,259

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

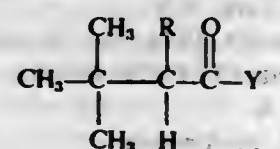
Int. Cl.<sup>2</sup> C07D 253/06

U.S. Cl. 260—248 AS

9 Claims

1. A method of making 4-amino-6-t-butyl-3-mercapto-1,2,4-triazin-5-one which comprises:

a. reacting a compound of the formula:

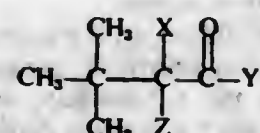


where

R is H, Br or Cl and

Y is Cl, Br or OH;

with Br<sub>2</sub> or Cl<sub>2</sub> in the presence of a catalyst when Y is OH, to produce a compound of the formula:

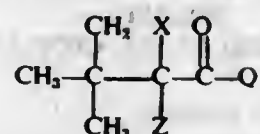


II

where X and Z are each independently Cl or Br and Y' is Cl or Br; then, contacting the compound with a compound selected from R'OH, R'SH and R<sup>2</sup>R<sup>3</sup>NH, where R<sup>1</sup> is H, C<sub>1</sub>-C<sub>4</sub> alkyl, phenyl, benzyl,

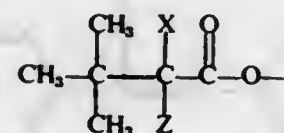
an alkali metal cation, or an alkaline earth metal cation, and R<sup>2</sup> and R<sup>3</sup> are each independently H, C<sub>1</sub>-C<sub>4</sub> alkyl, phenyl or benzyl;

to form a compound of the formula:



III

where Q is —OR<sup>1</sup>, —SR<sup>1</sup>, —NR<sup>2</sup>R<sup>3</sup> or



then

b. reacting the product of step a. with thiocarbonylhydrazide in a polar inert solvent.

4,013,650

### PROCESS FOR THE MANUFACTURE OF 3-METHYLENE-CEPHAM COMPOUNDS

Bruno Fechtig, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 17, 1973, Ser. No. 425,343

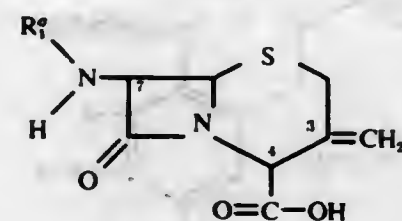
Claims priority, application Switzerland, Jan. 9, 1973, 224/73; Mar. 5, 1973, 4609/73

Int. Cl.<sup>2</sup> C07D 501/04

U.S. Cl. 260—243 C

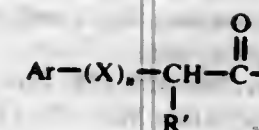
10 Claims

1. Process for the manufacture of α-7β-amino-3-methylenecephem-4-carboxylic acid compounds of the formula

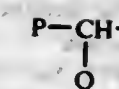


(I)

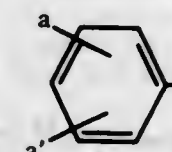
where R<sub>1</sub><sup>a</sup> represents hydrogen or 5-aminoadipoyl, wherein amino may be protected by benzoyl, or an acyl group of the formula



(B)



wherein P is thienyl, phenyl or



wherein a and a' are as defined above; Q is hydroxy, amino, carboxy or —SO<sub>2</sub>H; or R' is a group of the formula

R''—CH<sub>2</sub>—

wherein R'' is thienyl, furyl, 2-oxazolyl, 2-thiazolyl, or 1-tetrazolyl; R<sub>1</sub> is benzyl, 4-nitrobenzyl, 4-methoxybenzyl, diphenylmethyl, t-butyl or 2,2,2-trichloroethyl; and R<sub>2</sub> and R<sub>3</sub> when taken separately are independently C<sub>1</sub>-C<sub>4</sub> alkyl, benzyl or phenethyl, and when taken together with the attached nitrogen are pyrrolidino, piperidino, morpholino, thiomorpholino or a 4-substituted piperazino group of the formula



wherein R<sub>4</sub> is C<sub>1</sub>-C<sub>4</sub> lower alkyl.

4,013,651

### 3-SUBSTITUTED AMINO-CEPHALOSPORINS

Wayne Alfred Spitzer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

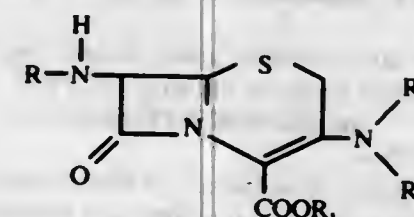
Filed May 12, 1975, Ser. No. 576,818

Int. Cl.<sup>2</sup> C07D 501/20, 501/22

U.S. Cl. 260—243 C

1. The compound of the formula

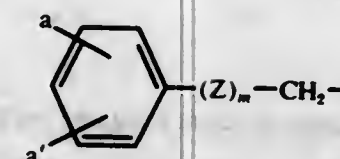
10 Claims



wherein R is hydrogen or an acyl group



and R' is C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>3</sub> cyanoalkyl, phenyl, halophenyl, methylphenyl, hydroxyphenyl, nitrophenyl, aminophenyl, or methoxyphenyl; or R' is a group of the formula



wherein a and a' are independently hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, halogen, nitro, amino, or carboxy, Z is O or S, and m is 0 or 1; or R' is a group of the formula

4,013,652

### PYRIDOPYRROLOBENZOXAZINE

Parthasarathi Rajagopalan, Westbury, N.Y., assignor to Endo Laboratories, Inc., Garden City, N.Y.

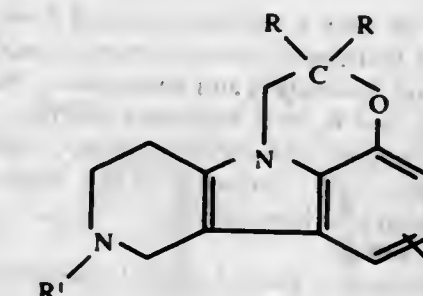
Division of Ser. No. 357,528, May 7, 1973, Pat. No. 3,914,421, which is a continuation-in-part of Ser. No. 263,766, June 19, 1972, abandoned. This application June 13, 1975, Ser. No. 586,746

Int. Cl.<sup>2</sup> C07D 265/00, 273/00, 295/00; A01N 9/00

U.S. Cl. 260—244 R

4 Claims

1. The compound of the formula:



where

The R's are the same or different and are H or CH<sub>3</sub>, and one of them can be C<sub>2</sub>-C<sub>6</sub> alkyl or phenyl;

R<sup>1</sup> is hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>3</sub>-C<sub>6</sub> cycloalkyl, C<sub>2</sub>-C<sub>4</sub> alkoxy-carbonyl, or substituted C<sub>1</sub>-C<sub>4</sub> alkyl where the substituent is the C<sub>3</sub>-C<sub>6</sub> cycloalkyl or phenyl; and

Z is H, Cl or CH<sub>3</sub>;  
or its pharmaceutically suitable salts.

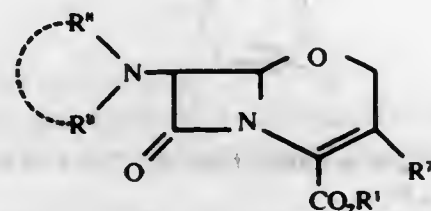


4,013,653  
1-OXACEPHEMS  
Saul Wolfe, Kingston, Canada, assignor to Queen's University at Kingston, Kingston, Canada

Filed July 21, 1975, Ser. No. 597,128  
Claims priority, application United Kingdom, June 30, 1975, 34614/75

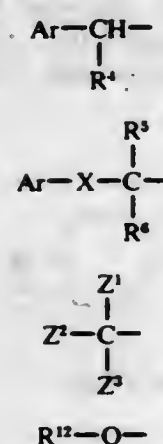
Int. Cl.<sup>2</sup> C07D 265/00, 273/00, 295/00  
U.S. Cl. 260—244 R

4. The compound of the formula:

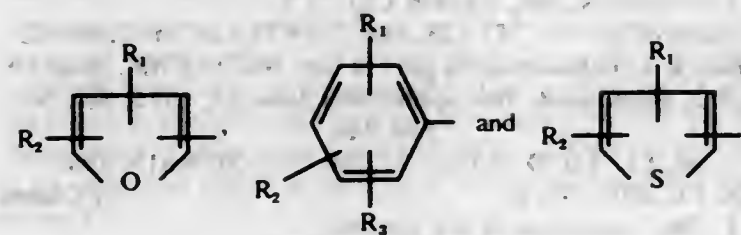


wherein R<sup>8</sup> is hydrogen and R<sup>9</sup> is hydrogen or

RCO-  
wherein R is selected from the group consisting of



wherein Ar is a monovalent radical selected from the group consisting of



wherein

R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are each a member selected from the group consisting of hydrogen, chloro, bromo, iodo, trifluoromethyl, phenyl, loweralkyl and loweralkoxy, but only one of said R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> may represent phenyl;

R<sup>4</sup> is hydrogen, amino, carbobenzoxyamino, phenyl, fluoro, chloro, bromo, iodo, carboxyl, SO<sub>3</sub>H, azido, hydroxy, loweralkanoyloxy or loweralkoxy;

X is oxygen or sulfur;

R<sup>5</sup> and R<sup>6</sup> are hydrogen, phenyl, benzyl, phenethyl or loweralkyl;

Z<sup>1</sup>, Z<sup>2</sup> and Z<sup>3</sup> are loweralkyl or the Ar- group;

R<sup>12</sup> is 2,2,2-trichloroethyl or benzyl;

provided that when R<sup>8</sup> and R<sup>9</sup> are taken together with the nitrogen to which they are attached, they form a phthalimido moiety;

R<sup>7</sup> is methyl or hydroxy; and

R<sup>1</sup> is hydrogen, loweralkyl, benzyl, benzhydryl, loweralkoxy, loweralkoxybenzyl, phenacyl, trimethylsilyl, 2,2,2-trichloroethyl, or pivaloyloxy.

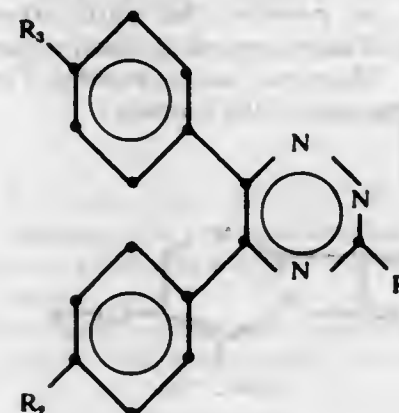
4,013,654  
5,6-DIARYL-1,2,4-TRIAZINES  
William B. Lacefield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 438,156, Jan. 31, 1974, Pat. No. 3,948,894. This application Mar. 10, 1976, Ser. No. 665,592

Int. Cl.<sup>2</sup> C07D 253/06

U.S. Cl. 260—248 AS

1. The compound of the formula,



wherein R is hydrogen or -(X)<sub>n</sub>R<sub>1</sub>, in which X is either O or S, n is an integer which is either 0 or 1, and R<sub>1</sub> is C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>7</sub>-C<sub>8</sub> aralkyl, C<sub>3</sub>-C<sub>8</sub> cycloalkyl, or C<sub>4</sub>-C<sub>8</sub> (cycloalkyl)alkyl; and R<sub>2</sub> and R<sub>3</sub> independently are halo, C<sub>1</sub>-C<sub>3</sub> alkyl, C<sub>1</sub>-C<sub>3</sub> alkoxy, or di(C<sub>1</sub>-C<sub>3</sub> alkyl)amino, with the proviso that at least one of R<sub>2</sub> and R<sub>3</sub> is halo or C<sub>1</sub>-C<sub>3</sub> alkyl; and the pharmaceutically-acceptable acid addition salts of basic members thereof.

4,013,655  
PRODUCTION OF ALKOXYLATED N-METHYLOL COMPOUNDS

Jürg Merz, Therwil, and Luzius Schibler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 26, 1973, Ser. No. 344,669

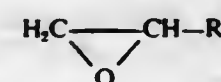
Claims priority, application Switzerland, Mar. 28, 1972, 4632/72

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

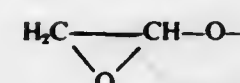
Int. Cl.<sup>2</sup> C07D 251/64

U.S. Cl. 260—249.6

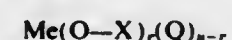
14 Claims  
1. A process for the manufacture of alkoxyalted N-methylol compound, which comprises reacting, at a temperature of 10 to 160°C and a pressure of 1 to 20 atmospheres gauge; (a) a N-methylolated amino triazine with (b) an alkylene oxide of the formula



wherein R is hydrogen, alkyl with 1 to 3 carbon atoms, phenyl or a



radical, in the presence of (c) at least one metal alcoholate of the formula



wherein Me is a n-valent transition metal of groups IV, V or VI of the periodic system, X is alkyl with 1 to 4 carbon atoms, halogenoalkyl with 2 to 4 carbon atoms, phenyl, benzyl or

cycloalkyl with at most 12 ring carbon atoms, Q is halogen or alkoxy with 1 to 4 carbon atoms, r is 1 to n and n is 4, 5, or 6, or in the presence of said component (c) together with (d) at least one alkali metal hydroxide or one alkali metal alcoholate of an alkanol with 1 to 4 carbon atoms.

4,013,656  
PROCESS FOR THE PREPARATION OF  
PYRIDYLAMINO-METHYLENEMALONIC ACID  
DERIVATIVES

Otto Ackermann, Troisdorf-Sieglar, Germany; Otto Bleh, deceased, late of Troisdorf-Bergheim, Germany (by Rita Bleh), and Dieter Morgenstern, Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

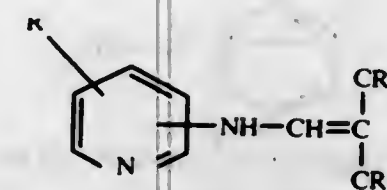
Continuation of Ser. No. 365,815, May 31, 1973, abandoned. This application Oct. 23, 1975, Ser. No. 625,287

Claims priority, application Germany, June 7, 1972, 2227651

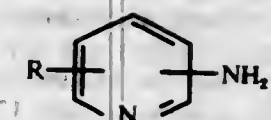
Int. Cl.<sup>2</sup> C07D 213/57, 213/55

U.S. Cl. 260—294.9

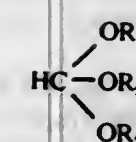
15 Claims  
1. A process for preparing a pyridylaminomethylenemalonic acid derivative of the formula:



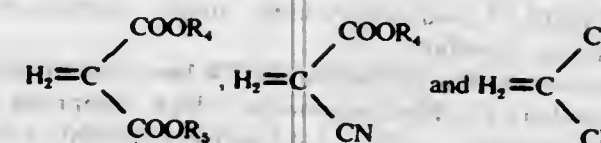
which comprises reacting together a pyridyl compound of the formula:



an alkoxy compound of the formula:



and a malonic acid derivative of the formulas selected of the groups of



wherein:

R<sub>6</sub> and R<sub>7</sub> and the groups OOR<sub>4</sub> or OOR<sub>5</sub> or =N  
R is hydrogen or unsubstituted C<sub>1</sub>-C<sub>4</sub> alkyl radical;  
R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are each independently methoxy or ethoxy substituted or unsubstituted C<sub>1</sub>-C<sub>3</sub> alkyl radicals;  
R<sub>4</sub> and R<sub>5</sub> are each independently methoxy or ethoxy substituted or unsubstituted C<sub>1</sub>-C<sub>3</sub> alkyl radicals  
at a temperature of 60 to 160° C.

4,013,657  
O-ETHYL-S-n-PROPYL-O-[PYRIDAZ-(6)-ON-(3)-YL]-  
THIONOTHIOLPHOSPHORIC ACID ESTERS

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe, all of Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

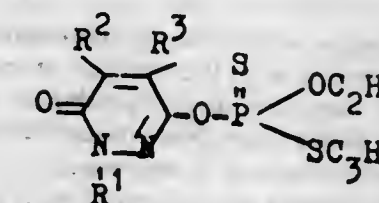
Filed Aug. 16, 1974, Ser. No. 498,288  
Claims priority, application Germany, Aug. 30, 1973, 2343741

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07F 9/40

U.S. Cl. 260—250 P

6 Claims  
1. An O-ethyl-S-n-propyl-O-[pyridaz-(6)-on-(3)-yl]-thionothiophosphoric acid ester of the formula



in which

R<sup>1</sup> is hydrogen, alkyl with 1 to 6 carbon atoms, or alkyl with 1 to 6 carbon atoms carrying a substituent selected from nitrile, halogen, alkoxy, carbonyl, alkylcarbonyl, alkoxy and alkylthio, in each case with 1 to 4 carbon atoms in the alkyl moiety; methyl substituted by pyrrolidine, piperidine or thiophene-1,1-dioxide; alkenyl or alkynyl with 2 to 6 carbon atoms; phenyl or phenyl carrying one substituent selected from halogen, alkyl with 1 to 4 carbon atoms, nitro, nitrile, alkoxy and alkylthio, each with 1 or 2 carbon atoms and 2 to 5 halogen atoms; pyrrolidine, piperidine or thiophene-1,1-dioxide, and  
R<sup>2</sup> and R<sup>3</sup> each independently is hydrogen or alkyl with 1 to 4 carbon atoms, or together are (CH)<sub>4</sub> forming a fused benzene ring with the adjoining carbon atoms.

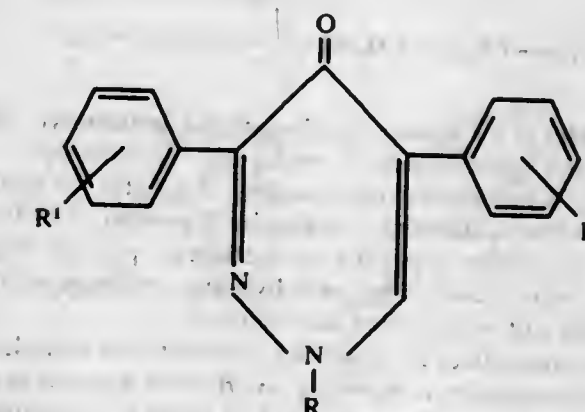
4,013,658  
SYNTHESIS OF 3,5-DIPHENYL-4(1H)-PYRIDAZINONES  
Riaz F. Abdulla, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed July 3, 1975, Ser. No. 593,094

Int. Cl.<sup>2</sup> C07D 237/14

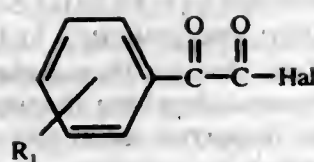
U.S. Cl. 260—250 A

4 Claims  
1. A process for making compounds of the formula

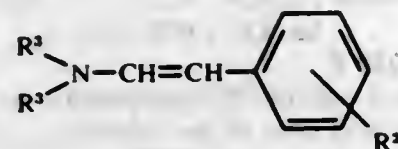


wherein R represents hydrogen or C<sub>1</sub>-C<sub>3</sub> alkyl, and R<sup>1</sup> and R<sup>2</sup> independently represent trifluoromethyl, hydrogen, fluoro, chloro, bromo or methyl, which process comprises contacting a glyoxyloxy halide of the formula

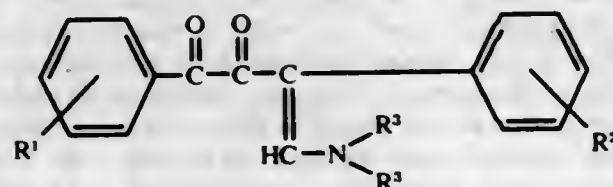




wherein Hal represents fluoro, chloro or bromo, with a styrylamine of the formula



wherein the R<sup>3</sup> groups independently represent C<sub>1</sub>-C<sub>3</sub> alkyl, or the R<sup>3</sup> groups combine with the nitrogen atom to which they are attached to form azetidino, pyrrolidino, piperidino, or morpholino, at a temperature from about 0° C. to about 40° C. in an inert reaction solvent in the presence of at least one equivalent per equivalent of product of a base chosen from the group consisting of tertiary amines and alkali metal carbonates and hydroxides to form an enaminoketone of the formula



and contacting the enaminoketone with a hydrazine of the formula R—NHNH<sub>2</sub>, or a hydrate or hydrohalide thereof, at a temperature from about 0° C. to about 40° C. in a second inert reaction solvent.

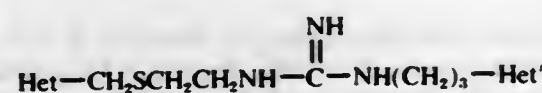
4,013,659

#### CERTAIN N,N'-DISUBSTITUTED GUANIDINE COMPOUNDS AND THEIR USE

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and Michael Edward Parsons, St. Albans, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England  
Continuation-in-part of Ser. No. 481,716, June 21, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,526  
Int. Cl.<sup>2</sup> C07D 403/00, 417/00

U.S. Cl. 424-263

1. A compound of the formula

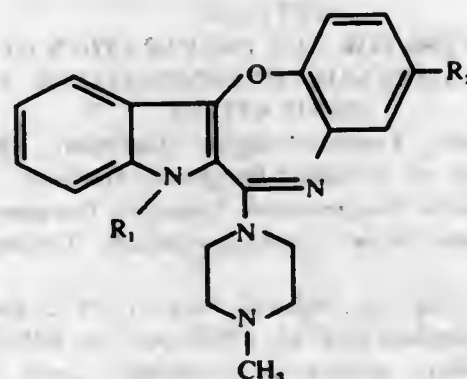


wherein Het is a 4-imidazolyl, 5-methyl-4-imidazolyl, 5-ethyl-4-imidazolyl, 5-halogeno-4-imidazolyl, 2-thiazolyl, 3-isothiazolyl, 4-halogeno-3-isothiazolyl, 2-pyridyl, 3-methyl-2-pyridyl, 3-ethyl-2-pyridyl, 3-halogeno-2-pyridyl, 3-hydroxy-2-pyridyl, 3-methoxy-2-pyridyl or 3-ethoxy-2-pyridyl ring, and Het' is a 4-imidazole ring; or a hydrate or pharmaceutically acceptable salt or hydrated salt thereof.

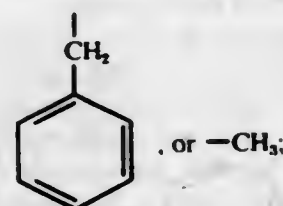
5. pharmaceutical composition to selectively stimulate histamine H<sub>2</sub>-receptors comprising an effective amount to stimulate said receptors of a compound of claim 1 in combination with a pharmaceutically acceptable diluent or carrier.

6. A method of selectively stimulating histamine H<sub>2</sub>-receptors which comprises administering a compound of claim 1 parenterally to an animal in an amount sufficient to stimulate said receptors.

4,013,660  
INDOLOBENZOXAZEPINES  
Richard E. Brown, Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.  
Filed Oct. 30, 1975, Ser. No. 627,159  
Int. Cl.<sup>2</sup> C07D 413/14  
U.S. Cl. 260-268 PC  
1. A compound of the general formula:



wherein R<sub>1</sub> is:



R<sub>2</sub> is -Cl.

#### 4,013,661 SUBSTITUTED 1,2-DIHYDROPYRIDINES AND PROCESS FOR PREPARING SAME

Reinhard A. Sulzbach, Burghausen, Germany, and Abul F. M. Iqbal, Glattbrugg, Switzerland, assignors to Monsanto Company, St. Louis, Mo.  
Continuation-in-part of Ser. No. 153,062, June 11, 1971, Pat. No. 3,816,439. This application Apr. 17, 1974, Ser. No. 461,685

Claims priority, application Switzerland, June 19, 1970, 9393/70

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976  
Int. Cl.<sup>2</sup> C07D 215/58, 211/92

U.S. Cl. 260-283 CN

5 Claims

1. Process for the production of 1,4-bis-(trimethylsilyl)-2-(1-carbomethoxyethyl)-1,2-dihydropyridine which comprises reacting acrylic acid methyl ester with 1,4-bis-(trimethylsilyl)-1,4-dihydropyridine under anhydrous and nonoxidizing conditions.

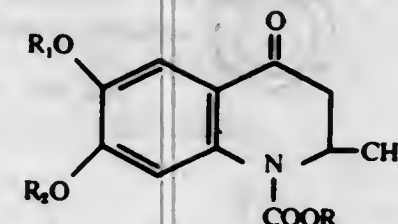
2. Process for the production of 1,4-bis-(trimethylsilyl)-2-(1-cyanoethyl)-1,2,3,6-tetrahydropyridine-3,6-endo-2-cyanoethylene which comprises reacting acrylonitrile with 1,4-bis-(trimethylsilyl)-1,2-dihydropyridine under anhydrous and nonoxidizing conditions.

3. Process for the production of 1,4-bis-(trimethylsilyl)-2-(1-cyanoethyl)-1,2-dihydroquinoline which comprises reacting acrylonitrile with 1,4-bis-(trimethylsilyl)-1,4-dihydropyridine under anhydrous and nonoxidizing conditions.

4. Process for the production of 1-(2,6-dichlorobenzyl)-2-(1-cyanoethyl)-1,2-dihydropyridine which comprises reacting acrylonitrile with 1-(2,6-dichlorobenzyl)-1,4-dihydropyridine under anhydrous and nonoxidizing conditions.

5. Process for the production of 1-phenyl-2-(1-cyanoethyl)-1,2-dihydropyridine which comprises reacting acrylonitrile with 1-phenyl-1,4-dihydropyridine under anhydrous and nonoxidizing conditions.

4,013,662  
ALKYL AND BENZYL  
6,7-DIALKOXY-2-METHYL-4-OXO-1,2,3,4-TETRAHYDROQUINOLINE-1-CARBOXYLATES  
Charles A. Harbert, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.  
Continuation-in-part of Ser. No. 534,659, Dec. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 428,441, Dec. 26, 1973, abandoned. This application Nov. 4, 1975, Ser. No. 628,809  
Int. Cl.<sup>2</sup> C07D 215/22  
U.S. Cl. 260-287 K  
1. The racemic mixture of a compound of the formula



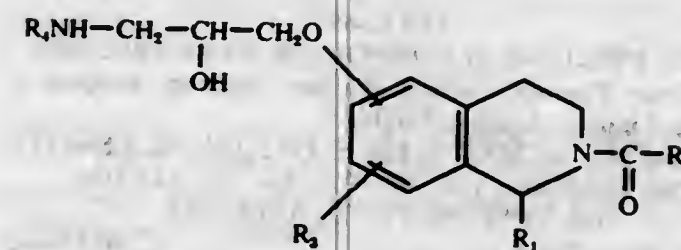
wherein R is selected from the group consisting of alkyl having from one to four carbon atoms and benzyl; and R<sub>1</sub> and R<sub>2</sub> are each alkyl having from one to four carbon atoms.

4,013,663  
ISOQUINOLINE COMPOUNDS  
Albert Westermann, Ludwigshafen (Rhine); Frank Zimmermann, Neustadt-Hardt; Dirk Wuppermann, Freinsheim; Ludwig Friedrich, Bruehl, and Manfred Raschack, Weisenheim am Sand, all of Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany  
Filed Oct. 30, 1975, Ser. No. 627,291  
Claims priority, application Germany, Nov. 15, 1974, 2454198; Apr. 30, 1975, 2519163  
Int. Cl.<sup>2</sup> C07D 217/04

U.S. Cl. 260-287 D

27 Claims

1. An isoquinoline compound of the formula



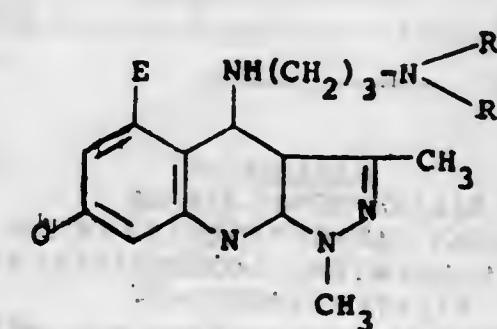
and salts thereof with physiologically tolerable acids, wherein R<sub>1</sub> is hydrogen or methyl, R<sub>2</sub> is hydrogen or lower alkyl, R<sub>3</sub> is hydrogen or methoxy, and R<sub>4</sub> is isopropyl or tertiary butyl.

4,013,664  
SYNTHESIS OF HERNANDALINE  
S. Morris Kupchan, Charlottesville, Va., and Venkataraman Kameswaran, Levittown, Pa., assignors to Research Corporation, New York, N.Y.  
Filed June 20, 1973, Ser. No. 371,814  
Int. Cl.<sup>2</sup> C07D 217/04

U.S. Cl. 260-288 D

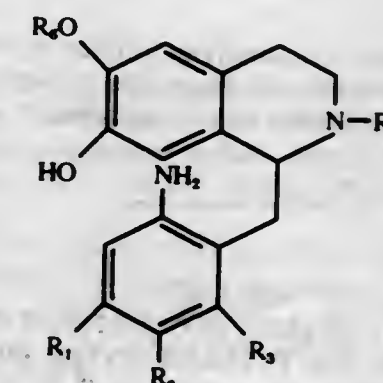
10 Claims

1. A method of synthesizing an aporphine of the formula



wherein E is hydrogen or lower alkoxy of 1 to 3 carbon atoms, G is lower alkyl or lower alkoxy of 1 to 3 carbon atoms, R<sup>1</sup> and R<sup>2</sup> are alike or different and each is lower alkyl of 1 to 5 carbon atoms; or a pharmaceutically acceptable salt thereof.

wherein  
R<sub>1</sub> and R<sub>2</sub> are hydrogen, lower alkyl, lower alkoxy or phenoxy,  
R<sub>3</sub> is hydrogen, halo, lower alkyl, lower alkoxy, or polylower alkoxy phenoxy,  
R<sub>4</sub> is lower alkyl,  
R<sub>5</sub> is hydrogen or lower alkyl,  
wherein the prefix lower alk. signifies an alkyl moiety of 1-5 carbon atoms, which comprises the sequential steps of:  
a. diazotizing a compound of the formula



and treating the thus produced diazonium salt with copper powder.

4,013,665  
ANTIVIRAL, SUBSTITUTED  
1,3-DIMETHYL-1H-PYRAZOLO(3,4b)QUINOLINES  
Ronnie Ray Crenshaw, Dewitt; George Michael Luke, Lafayette, and Paul Siminoff, Dewitt, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.  
Filed Oct. 1, 1973, Ser. No. 402,657  
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976  
Int. Cl.<sup>2</sup> C07D 215/46, 215/20  
U.S. Cl. 260-288 CF  
1. A compound corresponding to the formula

4 Claims



4,013,666  
**(8a,13a,8)-8-CARBOCYCLIC/CARBOCYCLIC  
 METHYL-5,8,13,13A-TETRAHYDRO-2,3,10,11-TET-  
 RAMETHOXY-6H-DIBENZO[a,g]QUINOLIZINES AND  
 INTERMEDIATES THERETO**

George R. Lenz, Glenview, Ill., assignor to G. D. Searle & Co.,  
 Chicago, Ill.

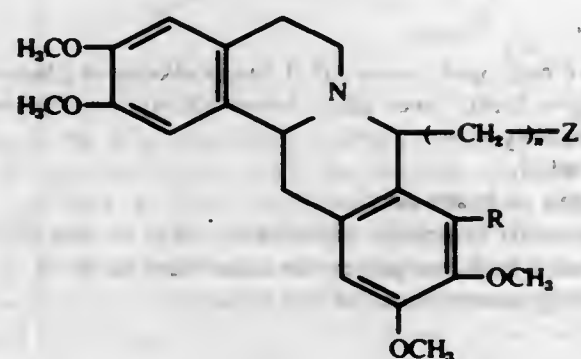
Filed Mar. 15, 1976, Ser. No. 666,802

Int. Cl.<sup>2</sup> C07D 215/14

U.S. Cl. 260-289 C

1. A compound of the formula

9 Claims



wherein Z represents (a) phenyl substituted by fewer than 4 methoxys or (b) cycloalkyl of fewer than 7 carbons, R represents hydrogen or methoxy, and n represents 0 or 1.

4,013,667  
**2,2-DIARYL-3-(1-AZABICYCLO[2.2.2]OCT-2-YL)PRO-  
 PIONAMIDES AND INTERMEDIATES THERETO**

Chung H. Yen, Skokie, Ill., assignor to G. D. Searle & Co.,  
 Chicago, Ill.

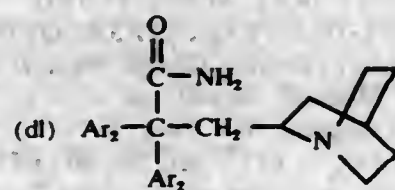
Filed Mar. 8, 1976, Ser. No. 664,723

Int. Cl.<sup>2</sup> C07D 453/02

U.S. Cl. 260-293.53

1. A compound of the general formula

3 Claims



wherein Ar<sub>1</sub> and Ar<sub>2</sub> are independently selected from the group consisting of phenyl, monosubstituted halophenyl and monosubstituted lower alkylphenyl wherein the lower alkyl radicals contain 1 to 6 carbon atoms, and may be alike or different.

4,013,668  
**5-(1,1-DIPHENYL-3-(5- OR  
 6-HYDROXY-2-AZABICYCLO[2.2.2]OCT-2-  
 YL)PROPYL)-2-ALKYL-1,3,4-OXADIAZOLES AND  
 RELATED COMPOUNDS**

Gilbert W. Adelstein, Evanston; Aziz Karim, Niles, and Chung  
 H. Yen, Skokie, all of Ill., assignors to G. D. Searle & Co.,  
 Chicago, Ill.

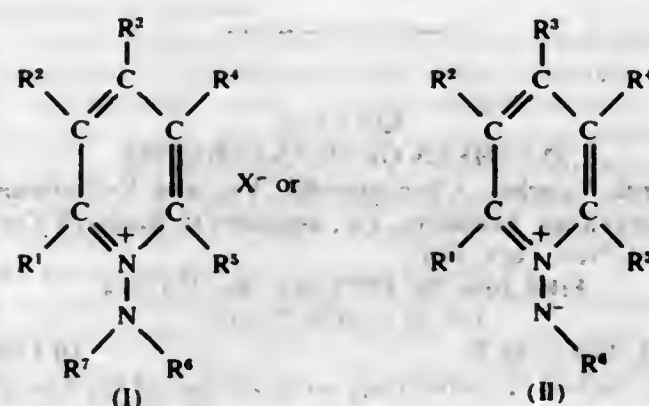
Filed Mar. 10, 1976, Ser. No. 665,609

Int. Cl.<sup>2</sup> C07D 413/06

U.S. Cl. 260-293.54

1. A compound of the formula

10 Claims



4,013,669  
**ESTER-PYRIDINIUM COMPOUNDS AS ACARICIDES**  
 John Henry Parsons, Saffron Walden, England, assignor to  
 Fisons Limited, London, England  
 Division of Ser. No. 321,476, Jan. 5, 1973, Pat. No. 3,886,171.

This application Jan. 30, 1975, Ser. No. 545,698

Int. Cl.<sup>2</sup> C07D 213/02; A01N 9/22

U.S. Cl. 260-295 R

1. A compound of the general formula

10 Claims

wherein

R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> are the same or different and each represents hydrogen or alkyl of 1 to 4 carbon atoms; R<sup>6</sup> represents a group of formula COOR<sup>11</sup> wherein R<sup>11</sup> represents phenyl; phenyl substituted by halogen and/or alkyl of 1 to 4 carbon atoms; or benzofuryl; R<sup>7</sup> represents hydrogen, alkyl of 1 to 4 carbon atoms or benzoyl substituted by halogen; and X<sup>-</sup> represents one equivalent of an anion.

4,013,670  
**DERIVATIVES OF PYRROLIDINE AND PIPERIDINE**  
 Elden H. Bankt, Woodbury, and William R. Brown, St. Paul,  
 both of Minn., assignors to Riker Laboratories, Inc.,  
 Northridge, Calif.

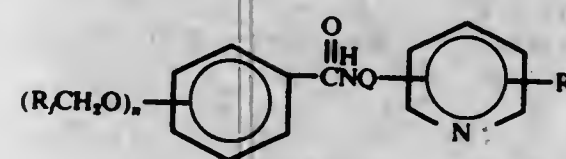
Division of Ser. No. 457,099, April 1, 1974, Pat. No.  
 3,900,481. This application May 27, 1975, Ser. No. 580,890

Int. Cl.<sup>2</sup> C07D 213/26

U.S. Cl. 260-295 AM

1. A compound of the formula

8 Claims



wherein R<sub>1</sub> is a perfluoroalkyl radical containing from one to three carbon atoms, n is one to three, Q is a carbon-nitrogen bond, methylene or methylmethylene and R' is hydrogen, methyl or ethyl.

4,013,671  
**SUBSTITUTED BENZOPYRANO[3,4-c]PYRIDINES AND  
 PROCESS FOR THEIR PREPARATION**

Richard E. Brown, Hanover, and John Shavel, Jr., Mendham,  
 both of N.J., assignors to Warner-Lambert Company, Mor-  
 ris Plains, N.J.

Continuation of Ser. No. 538,424, Jan. 3, 1975, Pat. No.  
 3,961,057, which is a division of Ser. No. 343,613, March 23,  
 1973, abandoned, which is a continuation-in-part of Ser. No.  
 122,498, March 9, 1971, abandoned. This application Mar.

15, 1976, Ser. No. 666,829

Int. Cl.<sup>2</sup> C07D 311/06, 311/76

U.S. Cl. 260-295 T

1. 1,2,3,4-Tetrahydro-8-methoxy-5H-[1]benzopyrano-[3,4-  
 c]pyridin-5-one.

3 Claims

4,013,672  
**2,5,7,8-TETRAHYDRO-1,2,4,5,6-PENTAAZABENZO[6,7]-  
 CYCLOHEPTA[1,2,3-CD]-AS-INDACENES**  
 Hans Hoehn, Tegernheim, Germany, assignor to E. R. Squibb  
 & Sons, Inc., Princeton, N.J.

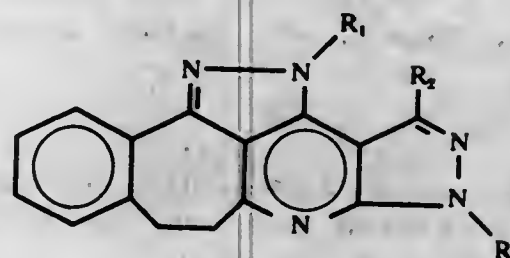
Filed Mar. 15, 1976, Ser. No. 666,540

Int. Cl.<sup>2</sup> C07D 471/14

U.S. Cl. 260-296 P

1. A compound of the formula

10 Claims



wherein

R<sub>1</sub> is hydrogen, lower alkyl or hydroxy-lower alkyl; R<sub>2</sub> and R<sub>3</sub> each is hydrogen, lower alkyl or phenyl; and acid addition salts thereof.

4,013,673  
**2,3-DIHYDRO-3-(2-PYRIDINYL)-4H-1-BENZOPYRAN-  
 4-ONE N-OXIDES**

David T. Connor, Parsippany; Patricia Young, Madison, and  
 Max Von Strandtmann, Rockaway, all of N.J., assignors to  
 Warner-Lambert Company, Morris Plains, N.J.

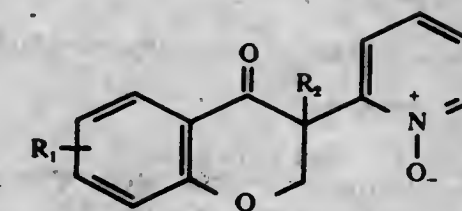
Filed Apr. 13, 1976, Ser. No. 676,441

Int. Cl.<sup>2</sup> C07D 405/04

U.S. Cl. 260-297 B

1. A compound of the formula:

5 Claims



wherein R<sub>1</sub> is hydrogen, halogen, lower alkyl of 1-6 carbon atoms, hydroxy, lower alkoxy of 1-6 carbon atoms or amino and R<sub>2</sub> is hydrogen or -CH<sub>2</sub>OH.

4,013,674  
**N-(1,2,2,2-TETRACHLOROETHYL)-FORMIMIDE-CHLO-  
 RIDES FOR SYNTHESIZING TRICHLOROTHIAZOLE**  
 Gunther Beck, and Helmut Heitzer, both of Leverkusen, Ger-  
 many, assignors to Bayer Aktiengesellschaft, Leverkusen,  
 Germany

Filed Dec. 9, 1975, Ser. No. 639,137

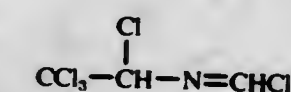
Claims priority, application Germany, Dec. 12, 1974,  
 2458827; Dec. 12, 1974, 2458825

Int. Cl.<sup>2</sup> C07D 263/30

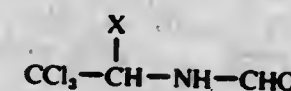
U.S. Cl. 260-302 R

1. N-(1,2,2,2-tetrachloroethyl)-formimide-chloride of the  
 formula

15 Claims



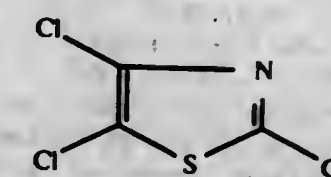
2. A process for the preparation of N-(1,2,2,2-tetrachloroethyl)-formimide-chloride according to claim 1, comprising contacting a formamide of the formula



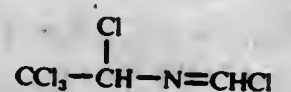
wherein

X is OH or Cl, with approximately the stoichiometrically required amount of a highly reactive inorganic acid chloride.

11. A process for the preparation of trichlorothiazole of the formula



comprising reacting N-(1,2,2,2-tetrachloroethyl)-formimide-chloride of the formula





with sulfur in the temperature range from 150° to 250° C.

4,013,675

# N-(3-METHYL-5-ISOTHIAZOLYL)-2-METHYLPENTANAMIDE

Joseph Deli, Rockford, Ill., and Henry C. Stevens, Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 5, 1975, Ser. No. 574,792

Int. Cl.<sup>2</sup> C07D 275/02

U.S. Cl. 260—306.8 A

1 Claim

1. N-(3-methyl-5-isothiazolyl)-2-methylpentanamide.

4,013,676

# AMINOPHENYLAMIDINES, THEIR PRODUCTION AND THEIR PHARMACEUTICAL USE

Hartmund Wollweber, Wuppertal-Elberfeld, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 398,692, Sept. 19, 1973, Pat. No. 3,911,010, which is a division of Ser. No. 151,581, June 9, 1971, Pat. No. 3,818,070. This application May 22, 1975, Ser. No. 579,916

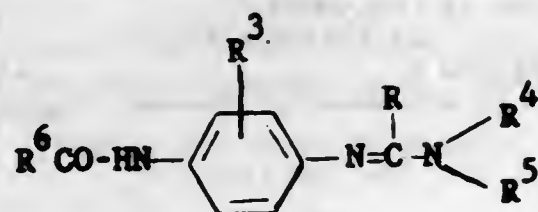
Claims priority, application Germany, June 13, 1970, 2029298

Int. Cl.<sup>2</sup> 260 302 D; C07D 261/18

U.S. Cl. 260—307 H

4 Claims

1. A compound selected from the group consisting of an aminophenylamidine and the physiologically acceptable acid addition salts thereof, said aminophenylamidine having the formula:



wherein

R is alkyl of 1 to 5 carbon atoms, alkenyl of 2 to 5 carbon atoms or cycloalkyl of 3 to 7 carbon atoms;  
R<sup>3</sup> is hydrogen, chloro, fluoro, bromo, cyano, trifluoromethyl, alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms or alkenyl of up to 4 carbon atoms;  
R<sup>4</sup> is alkyl of up to 4 carbon atoms, alkenyl of up to 4 carbon atoms, alkynyl of up to 4 carbon atoms or alkoxy of up to 4 carbon atoms;  
R<sup>5</sup> is alkyl of up to 5 carbon atoms, alkenyl of up to 4 carbon atoms, or cycloalkyl of 3 to 7 carbon atoms; and  
R<sup>6</sup> is isoxazolyl unsubstituted or substituted by alkyl of up to 4 carbon atoms.

4. The compound according to claim 1 which is N-[4-(5-methylisoxazol-3-ylcarbonylamino)-phenyl]-N',N'-dimethylacetamide.

4,013,677

# PREPARATION OF

## 1,2,4-TRIAZOLYL-(1)-PHENOXY-ACYL-METHANES

Claus Stölzer, Wolfgang Kramer, Karl Heinz Büchel, and Werner Meiser, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 5, 1975, Ser. No. 547,429

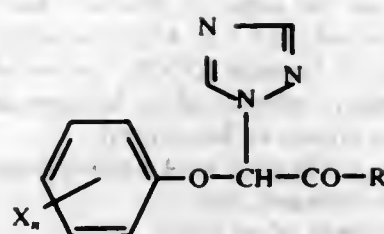
Claims priority, application Germany, Feb. 12, 1974, 2406665

Int. Cl.<sup>2</sup> C07D 249/08

U.S. Cl. 260—308 R

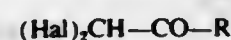
10 Claims

1. A process for the preparation of a 1,2,4-triazolyl-(1)-phenoxy-acyl-methane of the formula



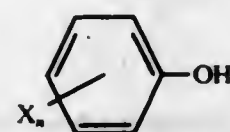
in which

R is alkyl with 1 to 4 carbon atoms or phenyl, each X independently is alkyl with 1 to 4 carbon atoms, halogen, alkoxy, carbonyl with 1 or 2 carbon atoms in the alkoxy, nitrile, phenyl or nitro, and n is an integer from 0 to 5, comprising reacting a dihaloketone of the formula



in which

Hal is halogen, with 1,2,4-triazole and with a phenol of the formula



in the presence of an acid-binding agent selected from the group consisting of alkali metal and alkaline earth metal hydroxides and carbonates and tertiary amines and a polar organic solvent as diluent, at a temperature of about 0° to 150° C.

4,013,678

# PROCESS FOR PREPARING HETEROCYCLICALKYLTHIOALKYL-N-CYANOQUANIDINES

Thomas Henry Brown; Graham John Durant, both of Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Aug. 20, 1975, Ser. No. 606,269

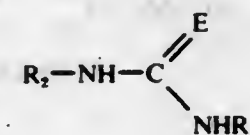
Claims priority, application United Kingdom, Sept. 2, 1974, 38257/74

Int. Cl.<sup>2</sup> C07D 233/18

U.S. Cl. 260—309

3 Claims

1. A process for the production of a compound of the formula:



wherein E is NCN, R<sub>1</sub> is methyl, and R<sub>2</sub> is a grouping of the structure



wherein Het is 5-methyl-4-imidazolyl; and m is 1, and n is 2; which comprises treating a compound of the formula



wherein Het and m are as defined hereinabove and Z is halogen, which forms a good leaving group, with a mercaptan of the formula

4,013,681

# DERIVATIVES OF THIOPHENE

Joseph V. Karabinos, Orange, Conn., and Louis G. Nickell, Honolulu, Hawaii, assignors to Hawaiian Sugar Planters' Association, Honolulu, Hawaii

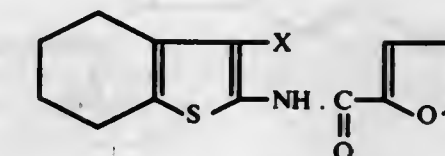
Filed June 23, 1975, Ser. No. 589,401

Int. Cl.<sup>2</sup> C07D 333/24

U.S. Cl. 260—332.2 C

3 Claims

1. A compound of the formula



wherein X is cyano or C<sub>1</sub>-C<sub>4</sub> carboalkoxy.

4,013,682

# N-HYDROXY-AMIDINE COMPOUNDS

Harm Jan Panneman, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 488,648, July 15, 1974; Pat. No. 3,978,126. This application May 24, 1976, Ser. No. 689,301

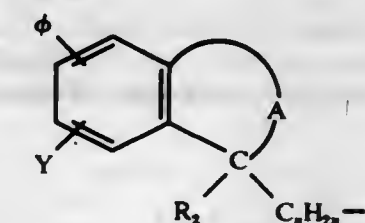
Claims priority, application Netherlands, Aug. 3, 1973, 7310741

Int. Cl.<sup>2</sup> C07D 317/44

U.S. Cl. 260—340.5

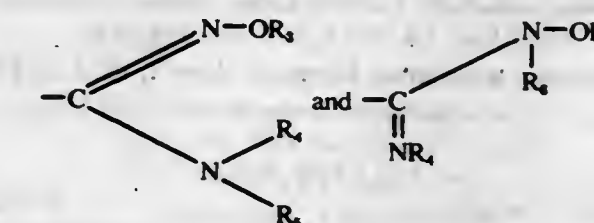
4 Claims

1. A compound of the formula:



in which

B is N-hydroxy-amidino of the group consisting of



A is selected from the group consisting of methylene, lower alkyl-substituted methylene, ethylene, lower alkyl substituted ethylene, propylene and lower alkyl substituted propylene, said lower alkyl containing from 1 to 6 carbon atoms;

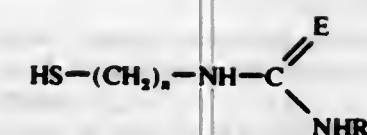
Q and Y together form an alkylendioxy group, in which the alkylene group has 1 to 4 carbon atoms;

C<sub>6</sub>H<sub>4</sub> is alkylene containing 1 to 4 carbon atoms or a single bond,

R<sub>2</sub> is selected from the group consisting of hydrogen, alkyl containing 1 to 6 carbon atoms, aryl and phenylalkyl the alkyl group of which contains 1 to 4 carbon atoms;

R<sub>3</sub> is selected from the group consisting of hydrogen, alkyl containing 1 to 6 carbon atoms, phenylalkyl the alkyl group of which contains 1 to 4 carbon atoms, and acyl derived from an organic carboxylic acid containing 1 to 18 carbon atoms;

R<sub>4</sub> and R<sub>5</sub> are selected from the group consisting of hydrogen, alkyl containing 1 to 6 carbon atoms and phenylalkyl the alkyl group of which contains 1 to 4 carbon atoms;



wherein n, E and R<sub>1</sub> are as defined hereinabove, in the presence of a base, said reactants and base being present in molar equivalent amounts.

4,013,679

# SUBSTITUTED 6,7-DIHYDRO [1,7-ab](1) BENZAZEPINE COMPOUNDS

Mario Riva, Monza (Milan); Luciano Toscano, Milan; Giampiero Grisanti, Milan, and Alberto Bianchetti, Milan, all of Italy, assignors to Pierrel S.p.A., Milan, Italy

Filed June 30, 1975, Ser. No. 591,763

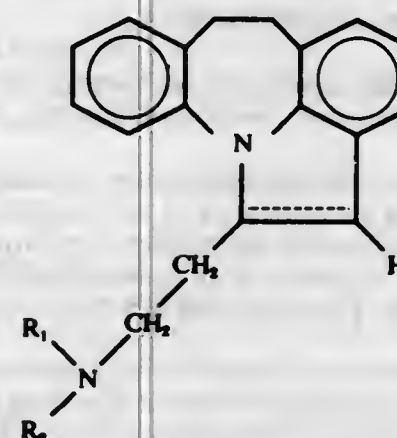
Claims priority, application United Kingdom, July 3, 1974, 29419/74

Int. Cl.<sup>2</sup> C07D 487/06

U.S. Cl. 260—326.9

9 Claims

1. An indole or indoline compound having the formula:



wherein R<sub>1</sub> and R<sub>2</sub> are the same or different and are hydrogen, methyl or benzyl and the pharmaceutically acceptable acid addition salts thereof.

4,013,680

# PROCESS FOR THE PREPARATION OF AROMATIC α-KETO CARBOXYLIC ACIDS

Martin Godfrey Johnson, Rickmansworth; John Peter Turnbull, London, and Harold Alfred Crisp, Harrow Weald, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed June 18, 1975, Ser. No. 587,813

Int. Cl.<sup>2</sup> C07D 333/24

U.S. Cl. 260—332.2 A

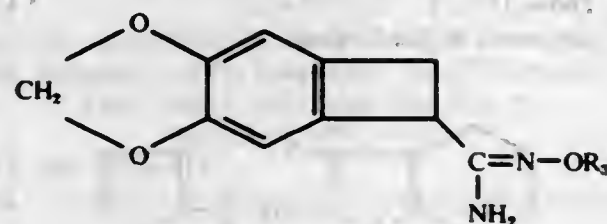
7 Claims

1. A process for the preparation of an α-keto acid of the formula R.CO.CO.OH in which R is selected from the group consisting of phenyl, thienyl, furyl and benzofuryl, which process comprises oxidizing in a first stage the corresponding methyl ketone of the formula R.CO.CH<sub>3</sub> in aqueous solution with an inorganic nitrite salt and hydrochloric or sulphuric acid, raising the pH to about 1.5 to 2.5 and completing the oxidation in a second stage by adding more of said nitrite salt to the reaction mixture, said process being carried out at a temperature of 40°-100° C with from 2-3 moles nitrite salt per mole ketone being added in said first stage and from 1.5-2.5 moles nitrite salt per mole of ketone being added in said second stage.



$R_4$  is selected from the group consisting of hydrogen, alkyl containing 1 to 6 carbon atoms, phenyl, methylphenyl, benzyl and methylbenzyl; and the pharmaceutically acceptable acid addition salts thereof.

4. A compound of the formula:



in which

$R_3$  is selected from carbamoyl, N-methylcarbamoyl and N,N-dimethylcarbamoyl and the pharmaceutically acceptable acid addition salts thereof.

4,013,683

#### PROCESS FOR MAKING $\beta$ -BROMOCITRACONIC ANHYDRIDE

R. Garth Pews, and Ralph A. Davis, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich. Filed June 12, 1973, Ser. No. 369,373

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07D 307/60

U.S. Cl. 260—346.8 R

9 Claims

1. The process of making  $\beta$ -bromocitraconic anhydride by the reaction of citraconic anhydride with bromine in the vapor phase at a temperature of about 200°–500°C and with a molar ratio of citraconic anhydride to bromine of about 1:1 to about 4:1.

4,013,684

#### PREPARATION OF

#### 2,5-DIMETHYLFURAN-3-CARBOXYLIC AMIDES

Hans Rupert Merkle, Ludwigshafen, and Harro Siegel, Speyer, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany Filed May 14, 1973, Ser. No. 359,768

Claims priority, application Germany, June 7, 1972, 2227547

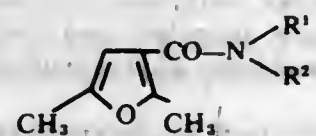
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C07D 307/66

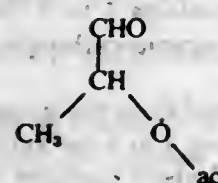
U.S. Cl. 260—347.3

4 Claims

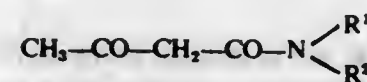
1. A process for the production of a 2,5-dimethylfuran-3-carboxylic amide of the formula



where  $R^1$  and  $R^2$  are identical or different and each denotes hydrogen, phenyl, substituted phenyl, cycloalkyl, substituted cyclohexyl, alkenyl, cycloalkenyl, alkynyl, bicycloalkyl or alkyl of 1 to 4 carbon atoms, wherein an  $\alpha$ -acyloxypionaldehyde of the formula



where ac denotes formyl, acetyl, propionyl, butyryl or isobutyryl, is reacted with an acetoacetamide of the formula



where  $R^1$  and  $R^2$  have the above meanings, in the presence of 0.005 to 25% by weight, with reference to the  $\alpha$ -acyloxypionaldehyde, of an acid catalyst selected from the group consisting of sulfuric acid and p-toluenesulfonic acid.

4,013,685

#### PROCESS FOR THE MANUFACTURE OF N(MERCAPTOMETHYL) PHTHALIMIDE S-(O,O-DIMETHYL PHOSPHORODITHIOATE)

Shen Fu Liang, El Cerrito, and Richard Alan Zeleny, Lafayette, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 10, 1975, Ser. No. 557,002

Int. Cl.<sup>2</sup> C07D 209/34

U.S. Cl. 260—326 E

12 Claims

2. A process for the production of N(mercaptomethyl) phthalimide S-(O,O-dimethyl phosphorodithioate), comprising the steps of:

- Forming a mixture of N-hydroxymethyl phthalimide, an organic solvent in the amount of 45 to 80 gallons of said solvent per pound-mole of said N-hydroxymethyl phthalimide, and 25 to 50 gallons of an aqueous solution of 35 to 40 wt. % HCl per pound-mole of said N-hydroxymethyl phthalimide;
- reacting said mixture at a temperature of from about 45° to about 75° C at a pressure of from about 0 psig to about 50 psig which intimately contacting said reacting mixture with anhydrous HCl at a rate of from approximately 15 to approximately 65 pounds HCl per hour per pound-mole of N-hydroxymethyl phthalimide used to form the mixture in step (a), to maintain the concentration of said aqueous HCl at 35 to 40 wt. %, to form N-chloromethyl phthalimide in a first aqueous-organic mixture;
- separating the organic phase having the N-chloromethyl phthalimide dissolved therein from said first aqueous-organic mixture;
- forming a second mixture of said separated organic phase having the N-chloromethyl phthalimide dissolved therein from step (c) and an additional quantity of organic solvent such that the total of the quantities of said solvent added in this step and in step (a) amount to 80 to 130 gallons of said solvent per pound-mole N-hydroxymethyl phthalimide used to form the mixture in step (a), a sodium O,O-dimethyl dithiophosphate in a molar quantity equal to from 110 to about 150% of the molar quantity of N-hydroxymethyl phthalimide used to form the mixture in step (a);
- reacting said second mixture at a temperature of from about 45° to about 70° C at a pressure ranging from ambient to about 10 psig, to form N(mercaptomethyl) phthalimide S-(O,O-dimethyl phosphorodithioate) in a second aqueous-organic mixture;
- separating the organic phase having the N(mercaptomethyl) phthalimide S-(O,O-dimethyl phosphorodithioate) dissolved therein from said second aqueous-organic mixture; and
- recovering the N(mercaptomethyl) phthalimide S-(O,O-dimethyl phosphorodithioate) from said organic phase.

4,013,686

#### 4-(1-PYRROLIDINYL)-2H-1-BENZOTHIOPYRAN-1,1-DIOXIDE

Harold Zinnes, Rockaway, and Neil A. Lindo, Chatham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 421,556, Dec. 4, 1973, abandoned, which is a division of Ser. No. 243,523, April 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 163,076, July 15, 1971, abandoned. This application Dec. 6, 1974, Ser. No. 530,254

Int. Cl.<sup>2</sup> C07D 409/04

U.S. Cl. 260—326.84

1 Claim

1. 4-(1-pyrrolidinyl)-2H-1-benzothiopyran-1,1-dioxide.

4,013,687

#### ANTHRAQUINONE DISPERSING AGENTS

Hugh Patrick Dryhurst Paget; Leslie Richard Rogers; James Kenneth Davenport Royle; James Frederick Stansfield, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England Continuation-in-part of Ser. No. 432,989, Jan. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 219,843, Jan. 21, 1972, abandoned. This application Dec. 10, 1974, Ser. No. 531,370

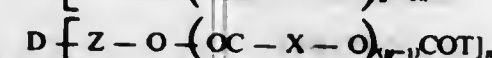
Claims priority, application United Kingdom, Feb. 11, 1971, 4445/71

Int. Cl.<sup>2</sup> C09B 1/16, 1/503

U.S. Cl. 260—376

4 Claims

1. A dyestuff selected from the classes of dyestuff represented by the formulae



or mixtures thereof

wherein D is an anthraquinone radical which is free from water solubilising groups and which is attached to Z through a carbon atom on one of the benzene rings present in D; n is 1 to 4; Z is a linking group of the formula  $-B)_m A-$  wherein B is  $-NH-$ ,  $-SO_2NH-$  or  $-CO-NH-$ , m is 0 or 1 and A is alkylene or  $\beta$ -hydroxy-alkylene containing up to 20 carbon atoms or monocyclic arylene-lower-alkylene, X is alkylene or alkenylene containing from 8 to 20 carbon atoms with at least 4 carbon atoms between the  $-CO-$  and  $-O-$  groups, T is alkyl or alkenyl containing from 8 to 20 carbon atoms and y is a positive integer between 2 and 20.

4,013,688

#### RADIOIMMUNOASSAY AGENTS

John C. Babcock, and J. Allan Campbell, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

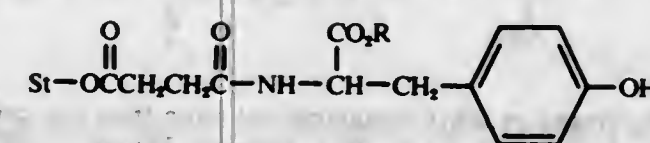
Filed Dec. 20, 1972, Ser. No. 316,974

Int. Cl.<sup>2</sup> C07J 5/00

U.S. Cl. 260—397.45

1 Claim

1. A compound having the following structural formula



wherein St is a steroid moiety linked through the 11-carbon atom and selected from the group consisting of those moieties corresponding to

20 $\alpha$ -hydroxypregn-4-en-3-one  
20 $\beta$ -hydroxypregn-4-en-3-one  
17 $\alpha$ -hydroxypregn-4-ene-3,20-dione  
21-hydroxypregn-4-ene-3,20-dione  
17 $\alpha$ ,21-dihydroxypregn-4-ene-3,20-dione  
17 $\beta$ -hydroxyandrost-4-en-3-one (testosterone)  
17 $\beta$ -hydroxy-5 $\alpha$ -androst-3-one  
17 $\beta$ -hydroxy-5 $\beta$ -androst-3-one  
5 $\alpha$ -androst-3 $\beta$ ,17 $\beta$ -diol  
17 $\beta$ -hydroxyestr-4-en-3-one (19-nortestosterone)  
estrone  
estradiol  
estriol  
estr-5-ene-3 $\beta$ ,17 $\beta$ -diol  
androst-5-ene-3 $\beta$ ,17 $\beta$ -diol  
dehydroepiandrosterone  
pregnenolone  
21-hydroxypregnenolone  
17 $\alpha$ -hydroxypregnenolone  
17,21-dihydroxypregnenolone  
17 $\beta$ ,17 $\alpha$ -dimethyl-17-hydroxyandrost-4-en-3-one.

and R is a lower alkyl group containing from 1 to 6 carbon atoms inclusive.

4,013,689

#### PERFLUORINATED VINYL ETHERS

Thomas Martini, Neuenhain, Tannus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany Filed Apr. 16, 1976, Ser. No. 677,513

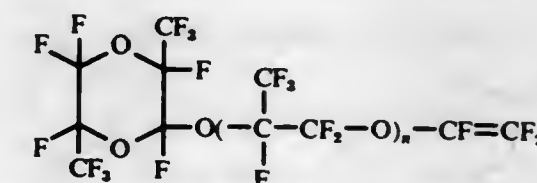
Claims priority, application Germany, Apr. 19, 1975, 2517357

Int. Cl.<sup>2</sup> C07D 319/12

U.S. Cl. 260—340.6

1 Claim

1. Perfluorinated vinyl ethers of the formula



wherein n is 0 or 1.

4,013,690

#### ORGANIC COMPOUNDS

Annemarie Closs, Binningen; Walter Haefliger, Basel, and Daniel Hauser, Binningen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jan. 30, 1975, Ser. No. 545,331

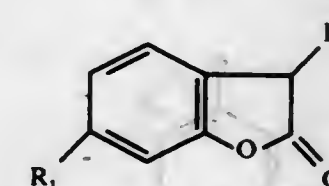
Claims priority, application Switzerland, Feb. 5, 1974, 1552/74

Int. Cl.<sup>2</sup> C07D 307/86

U.S. Cl. 260—343.3 R

9 Claims

1. A compound of formula I,



wherein

$R_1$  is cycloalkyl of 3 to 8 carbon atoms or phenyl, and  $R_2$  is hydrogen or alkyl of 1 to 4 carbon atoms.



4,013,691

## PROCESS FOR THE SIMULTANEOUS MANUFACTURE OF EPSILON-CAPROLACTONES AND CARBOXYLIC ACIDS

Takao Maki, Fujisawa, and Kazuyuki Mineta, Yokohama, both of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Oct. 8, 1975, Ser. No. 620,755

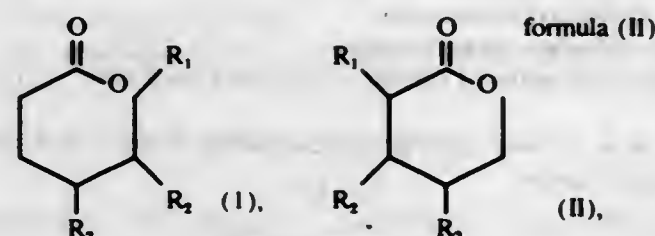
Claims priority, application Japan, Oct. 23, 1974, 49-122200

Int. Cl.<sup>2</sup> C07D 313/02

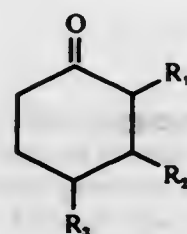
U.S. Cl. 260—343

14 Claims

1. In a process for the simultaneous manufacture of epsilon-caprolactones of formula (I),



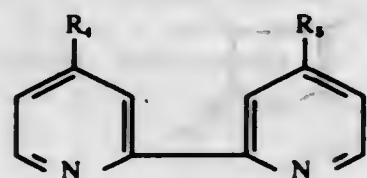
or mixtures thereof, wherein R<sub>1</sub> is selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>3</sub> alkyl and halogen; and R<sub>2</sub> and R<sub>3</sub> are selected from the group consisting of hydrogen and C<sub>1</sub>-C<sub>3</sub> alkyl, and of carboxylic acids of formula (III), R'-CO<sub>2</sub>H (III), wherein R' is selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>10</sub> alkyl, C<sub>1</sub>-C<sub>3</sub> alkenyl, C<sub>1</sub>-C<sub>10</sub> formyl-substituted alkyl, phenyl, C<sub>1</sub>-C<sub>12</sub> aralkyl, chloromethyl and furyl, by oxidizing a cyclohexanone of formula (IV),



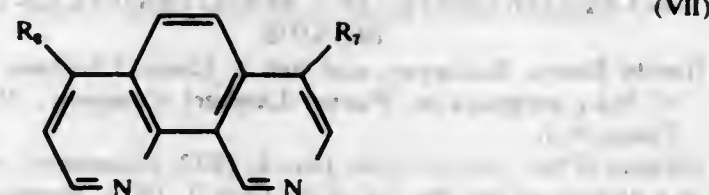
wherein R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are as defined above, and an aldehyde of formula (V),



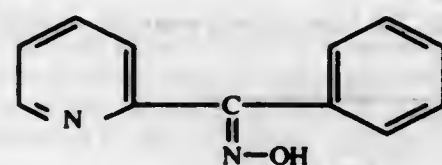
wherein R' is as defined above, with molecular oxygen, the improvement which comprises effecting said oxidation in the presence of a soluble compound of a metal selected from the group consisting of iron, palladium, vanadium, chromium, molybdenum, tungsten and cerium, and a compound which has a heterocyclic ring containing at least one nitrogen atom and which acts as a multidentate ligand, selected from the group consisting of:



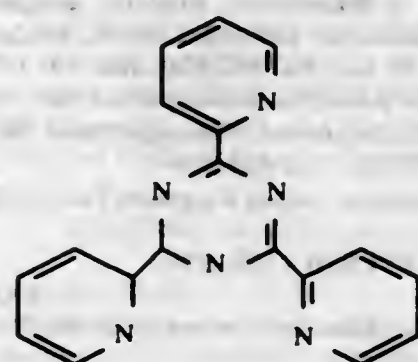
wherein R<sub>4</sub> and R<sub>5</sub> are selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl and C<sub>6</sub>-C<sub>10</sub> aryl;



wherein R<sub>4</sub> and R<sub>5</sub> are selected from the group consisting of hydrogen C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>6</sub>-C<sub>10</sub> aryl, nitro and halogen;



and



4,013,692

## CERTAIN 3-PHENYL-BENZOFURAN LOWER ALKANOIC ACIDS AND ESTERS THEREOF

Robert A. Scherrer, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

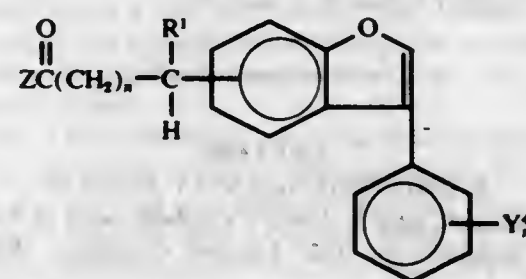
Continuation of Ser. No. 516,583, Oct. 21, 1974, abandoned, which is a division of Ser. No. 199,318, Nov. 16, 1971, Pat. No. 3,862,134. This application Nov. 28, 1975, Ser. No. 636,351

Int. Cl.<sup>2</sup> C07D 307/20

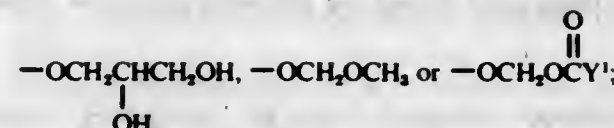
U.S. Cl. 260—346.2 R

22 Claims

1. A compound of the formula



wherein Z is



R<sup>1</sup> is hydrogen or alkyl containing not more than two carbon atoms, Y<sup>1</sup> is alkyl, Y<sup>2</sup> is alkyl, halogen, haloalkyl, alkoxy, dialkylamino, alkylthio, alkylsulfonyl, alkylsulfinyl or hydroxyl, each alkyl in Y<sup>1</sup> and Y<sup>2</sup> containing not more than four carbon atoms; n is 0-2; and r is 0-5; and wherein the group containing Z is attached to the 5, 6, or 7 position of the benzofuran ring.

4,013,693

## SUBSTITUTED PHENYL ESTERS OF PGA, Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,600, Jan. 8, 1974, Pat. No. 3,952,088.

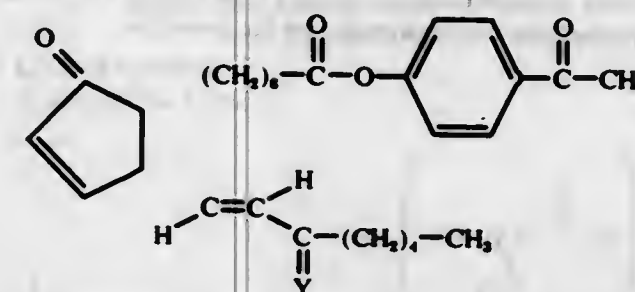
This application Apr. 21, 1976, Ser. No. 678,840

Int. Cl.<sup>2</sup> C07C 177/00

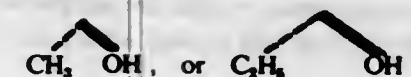
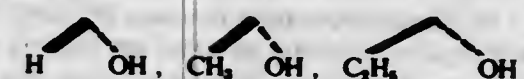
U.S. Cl. 260—390

12 Claims

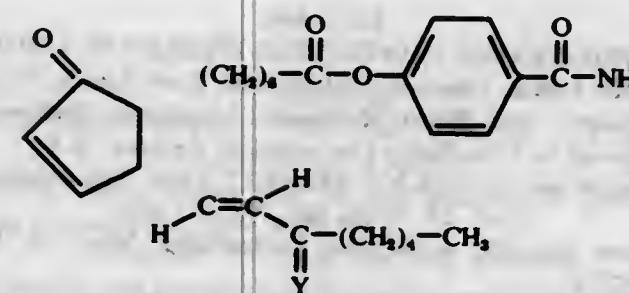
1. An Optically active compound of the formula:



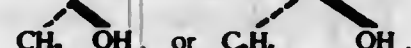
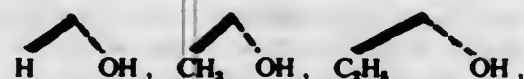
or a racemic compound of that formula and the mirror image thereof, wherein Y is



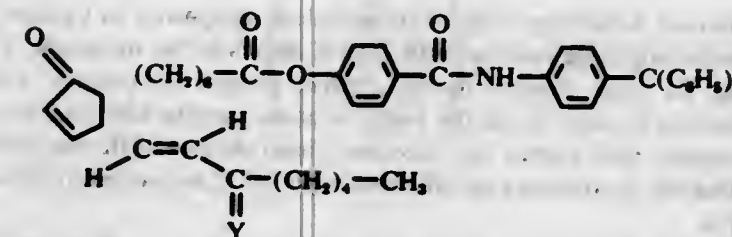
5. An optically active compound of the formula:



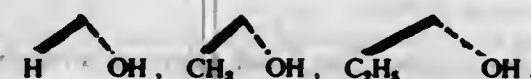
or a racemic compound of that formula and the mirror image thereof, wherein Y is



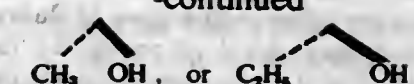
9. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein Y is



-continued



4,013,694

## CERIA CATALYZED CONVERSION OF PHENOLS TO DIBENZOFURANS

Norman A. Fishel, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 8, 1975, Ser. No. 603,061

Int. Cl.<sup>2</sup> C07D 307/91

U.S. Cl. 260—346.2 M

13 Claims

1. Process for the production of a dibenzofuran compound which comprises contacting a phenolic compound feedstock comprising a phenol having an unsubstituted ortho position selected from phenols and polycyclic phenols having no substituents other than alkyl, hydroxy, aryl, aralkyl and alkaryl in the vapor phase at a temperature of 300° to 700° C at a gas hourly space velocity of from 1 hr<sup>-1</sup> to 2,000 hr<sup>-1</sup> with a catalyst essentially composed of a member of the class of ceria and combinations of ceria with an oxide of a metal of the group consisting of aluminum, silicon, magnesium, titanium, zirconium, hafnium, calcium, potassium, sodium, lanthanum, neodymium, praseodymium, samarium, thorium, and uranium and mixtures thereof

4,013,695

4,4,5,5-TETRADEHYDRO-PGE<sub>1</sub> ANALOGS Chiu-Hong Lin, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

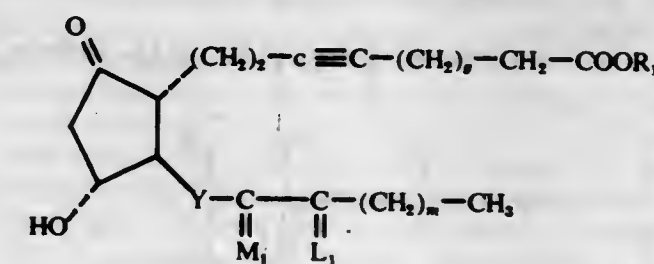
Filed Oct. 2, 1975, Ser. No. 619,077

Int. Cl.<sup>2</sup> C07C 177/00

U.S. Cl. 260—410.9 R

32 Claims

1. A prostaglandin analog of the formula



wherein g is one, 2, or 3;  
wherein Y is trans-CH=CH—;  
wherein M<sub>1</sub> is



wherein R<sub>5</sub> is hydrogen or methyl;  
wherein m is one to 5, inclusive;  
wherein L<sub>1</sub> is



or a mixture of



and



wherein R<sub>5</sub> and R<sub>6</sub> are hydrogen, methyl, or fluoro, being the



same or different, with the proviso that one of  $R_3$  and  $R_4$  is fluoro only when the other is hydrogen or fluoro; and wherein  $R_1$  is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,013,696

# ELEMENT COMPRISING A COATING LAYER CONTAINING A MIXTURE OF A CATIONIC PERFLUORINATED ALKYL AND AN ALKYLPHENOXY-POLY(PROPYLENE OXIDE)

John M. Babbitt, E. Rochester, and James F. Houle, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

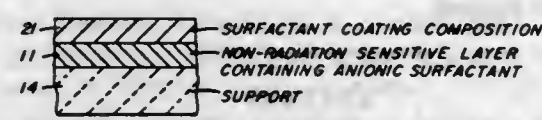
Division of Ser. No. 382,618, July 25, 1973, Pat. No. 3,850,640, which is a continuation-in-part of Ser. No. 230,450, Feb. 29, 1972, Pat. No. 3,775,126. This application Aug. 28, 1974, Ser. No. 501,379

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> G03C 1/76; C09D 3/04

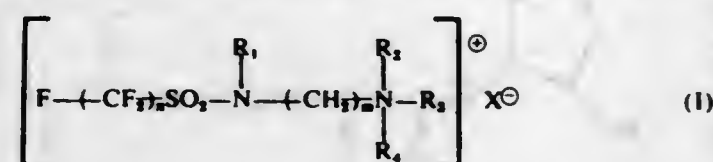
U.S. Cl. 428-412

14 Claims



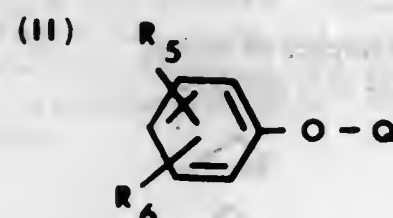
1. An element comprising a support, a layer (a) containing at least one anionic surfactant and contiguous to said layer (a) a layer (b) containing a mixture of at least one cationic surfactant and at least one nonionic surfactant, said layer (b) being farther from said support than is said layer (a); said mixture comprising

A. at least one cationic surfactant having the formula (I):



wherein  $n$  is an integer of from 1 to 9,  $m$  is an integer of from 1 to 6,  $R_1$  is hydrogen or a lower alkyl group of from 1 to 4 carbon atoms,  $R_2$ ,  $R_3$  and  $R_4$  are independently selected alkyl groups of from 1 to 6 carbon atoms, and  $X^-$  is an anionic moiety; and

B. at least one non-ionic surfactant having the formula (II):



wherein  $R_5$  is an alkyl group of from 6 to 18 carbon atoms,

$R_6$  is hydrogen or an alkyl group of from 1 to 18 carbon atoms and  $Q$  is a polyether group comprising from about 3 to 15 units of hydroxypropylene oxide, said polyether group comprising  $n$ -propylene and isopropylene moieties; the weight ratio of said cationic surfactant to said nonionic surfactant in said mixture being from about 2:1 to about 1:75, respectively.

# 4,013,697 PREPARATION OF CARBOXYLIC ACIDS FROM SALTS OF NITROKETONES

Mahmoud S. Kablaoui, Wappingers Falls, and Richard F. Love, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

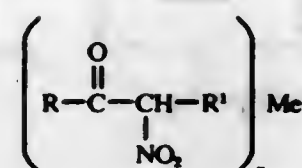
Filed June 23, 1975, Ser. No. 589,327

Int. Cl.<sup>2</sup> C07C 51/00, 53/00, 53/08, 53/22

U.S. Cl. 260-413

12 Claims

1. A method of preparing a carboxylic acid which comprises contacting an ammonium, Group IA or Group IIA metal salt of a nitroketone corresponding to the formula:



where  $R$  is an alkyl group of from 1 to 25 carbon atoms, where  $R^1$  is hydrogen or an alkyl group of from 1 to 25 carbon atoms, where  $Me$  is  $NH_4$ , a Group IA metal or a Group IIA metal and where  $n$  is 1 to 2, at a temperature of about 20° to 100° C. with from 10 to 100 parts by weight of water per part by weight of said nitroketone salt in the presence of an acidic mineral acid salt, wherein said acidic salt is ammonium chloride, ammonium nitrate, ammonium sulfate, ammonium hydrogen sulfate, ammonium phosphate or calcium nitrate, where the mole ratio of said nitroketone salt to said acidic salt is from about 1:0.01 to 1:2.

4,013,698

# POLYSILOXANES CONTAINING HYDROXYL GROUPS Friedrich Lohse, Oberwil, Switzerland; Kurt Munk, Wyhlen, Germany, and Heinz Rembold, Arlesheim, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 558,996, March 17, 1975. This application Mar. 29, 1976, Ser. No. 671,636

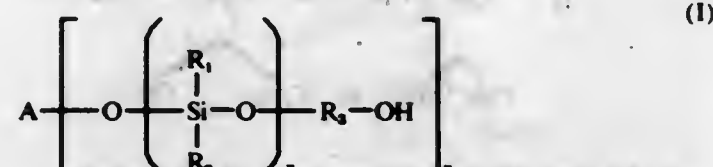
Claims priority, application Switzerland, Mar. 25, 1974, 004107/74

Int. Cl.<sup>2</sup> C07F 7/18

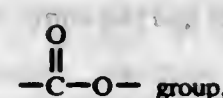
U.S. Cl. 260-448.8 R

3 Claims

1. A polysiloxane of formula I



wherein  $A$  denotes a di- or three-valent alicyclic or cycloaliphatic-aliphatic residue with 2-15 C atoms in the molecule,  $R_1$  and  $R_2$  each denote methyl, ethyl, propyl or phenyl, and wherein  $R_1$  and  $R_2$  on the same Si atom denote identical substituents and within the siloxane chain denote different substituents,  $R_3$  denotes an alkylene with 2-8 C atoms interrupted by a



$n$  denotes the number 2 or 3, and  $x$  denotes a number from 2 to 20.

# 4,013,699 ALUMINIUM AND/OR MAGNESIUM SALTS OF AMINO-ACIDS

André Henri Pannetier, Maisons-Laffitte, and Robert Pipon, Melles, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Aug. 8, 1974, Ser. No. 495,781

Claims priority, application France, Aug. 9, 1973, 73.29163; June 26, 1974, 74.22228

Disclosure was also published under second Trial Voluntary

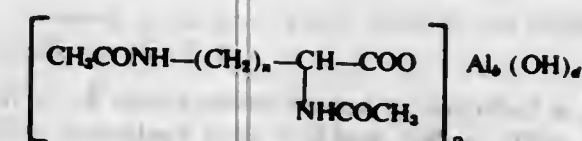
Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07F 5/06

U.S. Cl. 260-448 R

7 Claims

1. A salt of the formula:



wherein the amino-acid moiety is of the D or L form or a mixture of the D and L forms,  $n$  represents 3 or 4,  $a$  represents an integer from 1 through 10,  $b$  represents an integer from 1 through 9, and  $d$  represents an integer from 1 through 19, the numbers represented by the indices  $a$ ,  $b$  and  $d$  being connected by the relationship  $a + d = 3b$ .

# 4,013,701 PROCESS FOR THE PRODUCTION OF POLYISOCYANATES

Gert Jabs, Cologne, and Günther Loew, Leichlingen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 8, 1975, Ser. No. 575,849

Claims priority, application Germany, May 22, 1974, 2441843

Int. Cl.<sup>2</sup> C07C 119/042, 119/045, 119/048

U.S. Cl. 260-453 AR

8 Claims

1. A process for the production of modified polyisocyanates suitable for the production of hydrophilic foams comprising

- heating an organic polyisocyanate with an organic sulphonic acid containing from 0.1 to 5 percent by weight of water at a temperature of from 40° to 90° C. the isocyanate group to sulphonic acid group molar ratio being from 100:0.1 to 100:50, and
- stopping the heating thereof once 50 to 100 percent of the carbon dioxide theoretically expected from the reaction of the entire amount of the water with the isocyanate groups has evolved from the reaction mixture.

4,013,702

# PROCESS FOR THE PURIFICATION OF POLYCARBONATES

Jean-Pierre L. Cartier, Evry, and Jean-Pierre G. Senet, Vaux le Penil, both of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed Dec. 4, 1975, Ser. No. 637,760

Claims priority, application France, Dec. 11, 1974, 74.40836

Int. Cl.<sup>2</sup> C07C 68/08

U.S. Cl. 260-463

13 Claims

1. A process for purification of an oligocarbonate formed by transesterification between a diol and a diphenylcarbonate, which comprises the steps of

- introducing liquid water into the oligocarbonate which is at an elevated temperature of between 150° and 200° C and under a reduced pressure not in excess of 250 mm Hg such that the oligocarbonate is in the liquid state, and (ii) flushing the mixture with an inert gas whilst maintaining the temperature and further reducing the pressure whereby degassing is effected.

4,013,703

# CYANOACRYLIC ACID ADDUCTS

Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

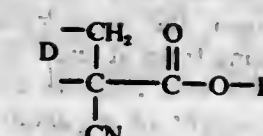
Division of Ser. No. 512,276, Oct. 4, 1974, Pat. No. 3,975,422, which is a continuation-in-part of Ser. Nos. 308,375, Nov. 21, 1972, abandoned, and Ser. No. 308,376, Nov. 21, 1972, abandoned. This application Nov. 18, 1975, Ser. No. 633,143

Int. Cl.<sup>2</sup> C07C 121/46, 121/66

U.S. Cl. 260-464

1 Claim

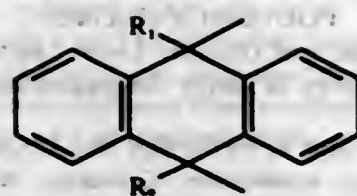
1. As a new composition of matter a compound represented by the formula



wherein  $D$  is selected from the group consisting of

wherein  $R_1$ ,  $R_2$ ,  $R_3$ , and  $R_4$  are alkyl, cycloalkyl, aralkyl, betahydroxy, ethoxymethyl, ethoxyethyl, phenoxyethyl, oleylmethyl, allyloxyethyl, or a polyalkylene ether group of the formula  $(C_n H_{2n} O)_x$  or wherein  $n$  has an average value from 1-4,  $x$  has an average value from 2 to about 150 and  $R$  is hydrogen or alkyl of 1 to about 12 carbon atoms at a pressure of oxides of carbon and hydrogen of from about 1000 psia to about 15,000 psia and a temperature of about 100° C. to about 375° C. sufficient to produce said diols and triols.

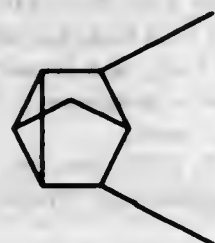




where  $R_1$  and  $R_2$  are the same  $R_1$  and  $R_2$  may be H, an alkyl group of 1 to 5 carbons, phenyl, Br or Cl and where  $R_1$  and  $R_2$  are different,  $R_1$  is H and  $R_2$  may be any of the group consisting of an alkyl group of 1 to 5 carbons, phenyl, Br and Cl



where  $R_3$  is H or  $\text{CH}_3$  and



## 4,013,704

## 2,5-DIISOPROPYLTEREPHTHALONITRILE

Elmore Louis Martin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del. Continuation of Ser. No. 241,850, April 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 153,428, June 15, 1971, abandoned. This application May 2, 1975, Ser. No. 573,991

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C07C 121/58

U.S. Cl. 260—465 H

1 Claim

1. 2,5-Diisopropylterephthalonitrile.

## 4,013,705

## AMMOXIDATION PROCESS FOR MAKING DICYANONAPHTHALENE

Ronald D. Bushick, Glen Mills, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Filed Mar. 9, 1976, Ser. No. 665,342

Int. Cl.<sup>2</sup> C07C 120/14, 121/62

U.S. Cl. 260—465 C

12 Claims

1. An ammoxidation process for preparing 2,6-dicyanonaphthalene from 2,6-dimethylnaphthalene which comprises reacting said dimethylnaphthalene and ammonia at a temperature of from about 375° to about 550° C. in the presence of added oxygen, the molar ratio of ammonia to dimethylnaphthalene being from at least about 10:1 to about 30:1 and the catalyst for said reaction comprising at least about 0.5 to 20% by weight of an alkali metal vanadium bronze supported on  $\alpha$ -alumina and promoted with an iron compound in an amount from about 0.5 mole percent to about 25 mole percent of the catalyst expressed as oxides.

4,013,706  
DERIVATIVES OF SUBSTITUTED UREA, ACYL UREAS, AND SULPHONYL UREAS, AND A PROCESS FOR PRODUCING THE SAME

Jesus Anatel, Paris, and Jean Bercochea, Reims, both of France, assignors to Sucreries du Solonnais et Compagnie Sucriere, Paris, France

Filed Nov. 13, 1974, Ser. No. 523,550

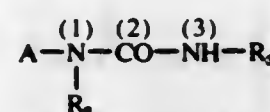
Claims priority, application France, Nov. 14, 1973, 73.40527; Oct. 25, 1974, 74.35907

Int. Cl.<sup>2</sup> C07C 125/06

U.S. Cl. 260—471 C

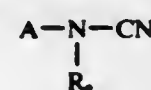
5 Claims

1. A process for producing compounds of the general formula:



in which A is hydrogen or a monovalent group  $\text{R}_1-\text{X}$  (in which X is  $-\text{CO}$  or  $-\text{SO}_2$ , and  $\text{R}_1$  is alkyl, cycloalkyl, aralkyl, alkoxy, aryl, aryloxy, or etheroxy),  $\text{R}_2$  is hydrogen, alkyl, cyclo-alkyl, aralkyl, or aryl, and  $\text{R}_3$  is hydrogen or an alkyl radical derived from a secondary or tertiary alcohol, with the restriction that, when  $\text{R}_2$  is hydrogen,  $\text{R}_3$  is alkyl and that when  $\text{R}_2$  is hydrogen,  $\text{R}_3$  is alkyl, cycloalkyl, aralkyl, or aryl, said process comprising

reacting a cyanamide of the formula:



(in which A and  $\text{R}_2$  have the meanings given above), with a compound adapted to readily form a carbo cation ( $\text{R}_3^+$ ) selected from the group consisting of tertiary alcohols, secondary alcohols and unsaturated compounds, in the presence of a catalyst of sulfuric acid or a Lewis acid.

## 4,013,707

## SUBSTITUTED PHENYL ESTERS OF PGA,

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 431,600, Jan. 8, 1974, Pat. No. 3,952,048.

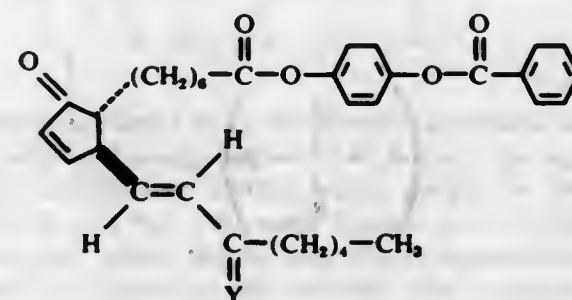
This application Apr. 21, 1976, Ser. No. 679,428

Int. Cl.<sup>2</sup> C07C 177/00

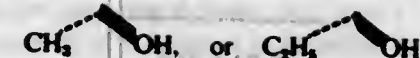
U.S. Cl. 260—471 R

8 Claims

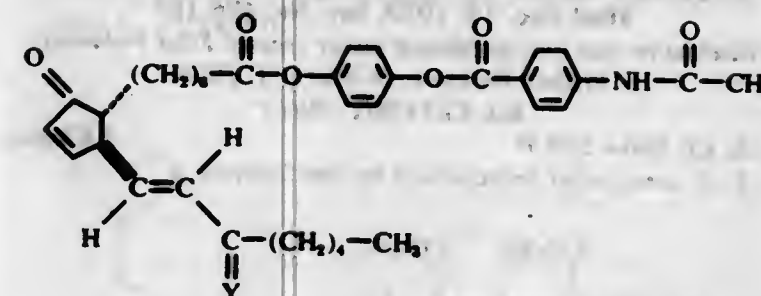
1. An optically active compound of the formula:



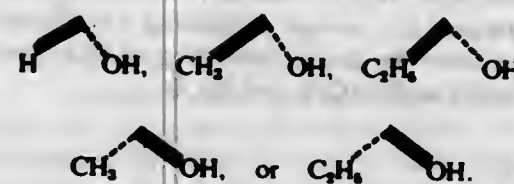
or a racemic compound of that formula and the mirror image thereof, wherein Y is



5. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein Y is



## 4,013,708

## ARYLCHALCOGENO-SUBSTITUTED ALIPHATIC ACIDS AND ESTERS

Georges Haas, Oberwil; Pier Giorgio Ferrini, Binningen, and Alberto Rossi, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 11, 1974, Ser. No. 505,111

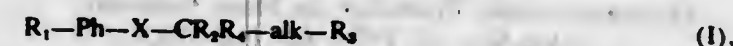
Claims priority, application Switzerland, Sept. 18, 1973, 13387/73; Sept. 18, 1973, 13389/73

Int. Cl.<sup>2</sup> C07C 65/00, 65/14, 69/76

U.S. Cl. 260—473 G

14 Claims

1. A compound of the general formula I



wherein  $\text{R}_1$  denotes cycloalkyl or 1-cycloalkenyl with 5 to 8 ring members, Ph denotes o- m- or p-phenylene, unsubstituted or monosubstituted by lower alkyl, lower alkoxy or halogen, X denotes the oxy or thio group,  $\text{R}_2$  denotes hydrogen or alkyl with 1 to 4 C atoms,  $\text{R}_3$  is hydrogen or, if  $\text{R}_1$  is 1-cycloalkenyl, it is also alkyl with 1 to 4 C atoms,  $\text{R}_4$  denotes carboxyl or carboxyl esterified by a lower alkanol, cycloalkanol or phenylalkanol, and  $\text{CR}_2\text{R}_3\text{-alk}$  denotes alkylene with 4 to 11 C atoms, straight or branched in the  $\alpha$ -position to the group X, which separates the groups  $[\text{R}_1-\text{Ph}-\text{X}-\text{CR}_2\text{R}_3]$  X and  $\text{R}_4$  by 4 to 11 carbon atoms, or a therapeutically acceptable salt thereof.

## 4,013,709

PRODUCTION OF  $\omega$ -FORMYL CARBOXYLIC ACID ESTERS

Helmut Waldmann, Leverkusen; Wulf Schwerdtel, Leverkusen-Steinbuechel, and Wolfgang Swodenk, Odenthal-Globus, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 410,074, Oct. 26, 1973. This application Jan. 23, 1976, Ser. No. 651,989

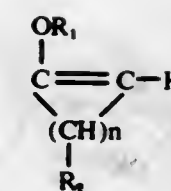
Claims priority, application Germany, Oct. 27, 1972, 2252780

Int. Cl.<sup>2</sup> C07C 67/00

U.S. Cl. 260—483

9 Claims

1. A process for the production of an  $\omega$ -formyl carboxylic acid ester, comprising reacting hydrogen peroxide with an enol ether of a cyclic ketone of the formula



wherein

$\text{R}_1$  is alkyl of 1 to 3 carbon atoms, or alkyl of 1 to 3 carbon atoms substituted by fluorine, chlorine, alkoxy of 1 to 3 carbon atoms, cyano or phenyl,  $n$  is an integer of about 3 to 10, and

$\text{R}_2$  each independently is hydrogen, fluorine, chlorine, cyano, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 6 carbon atoms substituted by fluorine, chlorine, cyano or alkoxy of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms substituted by fluorine, chlorine, cyano, alkoxy of 1 to 4 carbon atoms or alkyl of 1 to 6 carbon atoms,

in the presence of a catalyst consisting essentially of a carboxylate, carbonyl, nitrosocarbonyl, acetate or acetylacetate of a metal of the Fifth or Sixth Secondary Group of the Periodic Table at a temperature of  $-80^\circ$  to  $+30^\circ$  C.

## 4,013,710

## LIQUID VINYLIDENE-TERMINATED POLYMERS

Douglas E. Skillicorn, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 292,926, Sept. 28, 1972, Pat. No.

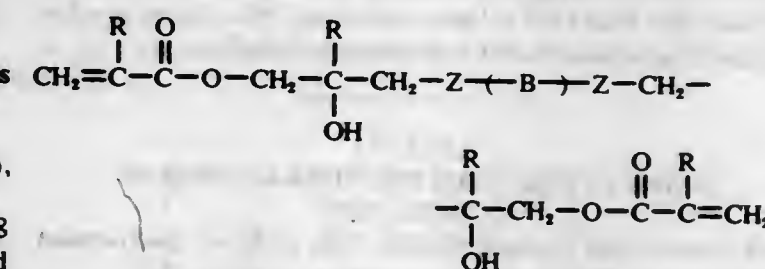
3,910,992. This application June 11, 1975, Ser. No. 585,962

Int. Cl.<sup>2</sup> C07C 69/54, 69/66

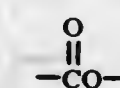
U.S. Cl. 260—484 A

5 Claims

1. A liquid vinylidene-terminated polymer having a molecular weight of from about 1000 to about 20,000 of the structure



wherein B is a polymeric backbone of carbon-carbon linkages derived from polymerized units of dienes containing 4 to about 8 carbon atoms interpolymerized with vinyl nitriles; Z is selected from the group consisting of  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{NH}-$ ,



and  $-\text{O}-\text{CH}_2-\text{CH}_2-$ ; and R is hydrogen or an alkyl radical containing 1 to 4 carbon atoms.

## 4,013,711

## AZULENE COMPOUNDS

Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 363,207, May 23, 1973, Pat. No.

3,935,253. This application Nov. 3, 1975, Ser. No. 628,304

Claims priority, application Switzerland, June 5, 1972, 8265/72

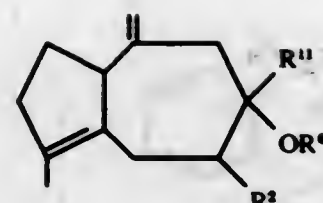
Int. Cl.<sup>2</sup> C07C 69/02, 69/06, 69/14, 69/78

U.S. Cl. 260—488 B

6 Claims

1. A compound of the formula





wherein  $R^I$  represents hydrogen or lower alkyl,  
 $R^II$  represents the acyl residue of a member selected from the group consisting of formic acid, acetic acid, propionic acid, butyric acid and benzoic acid and  $R^III$  represents hydrogen or lower alkyl.

4,013,712

**PROCESS FOR MAKING ALKANE-1,2-DIOL DIESTERS**  
 Dulce Ragoonanan, and Brian W. Harris, both of Trinidad, Trinidad And Tobago, assignors to Texaco Trinidad, Inc., Trinidad, Trinidad And Tobago

Filed Mar. 6, 1975, Ser. No. 555,917

Int. Cl.<sup>2</sup> C07C 67/04

U.S. Cl. 260—497 R

6 Claims

1. A liquid phase process for producing alkane-1,2-diol diesters in the absence of metal catalyst from an alkene of the formula:



wherein R is an alkyl group having from 5 to 20 carbon atoms, comprising pre-aerating said alkene with an oxygen containing gas to form the corresponding peroxide; determining the maximum peroxide content of said alkene during aeration; terminating said aeration when said content has decreased from 20 to 40 percent from its maximum, decomposing said peroxide with a mono-carboxylic acid having from 1 to 6 carbon atoms; heating the resulting decomposition mixture to between 80° and 150° C. and recovering the diester product by distilling said acid and any unreacted olefin.

4,013,713

**DIARYLVINYL-DIHYDROPHENANTHRENE COMPOUNDS**

Kurt Weber, and Christian Lüthi, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 316,804, Dec. 20, 1972, abandoned.

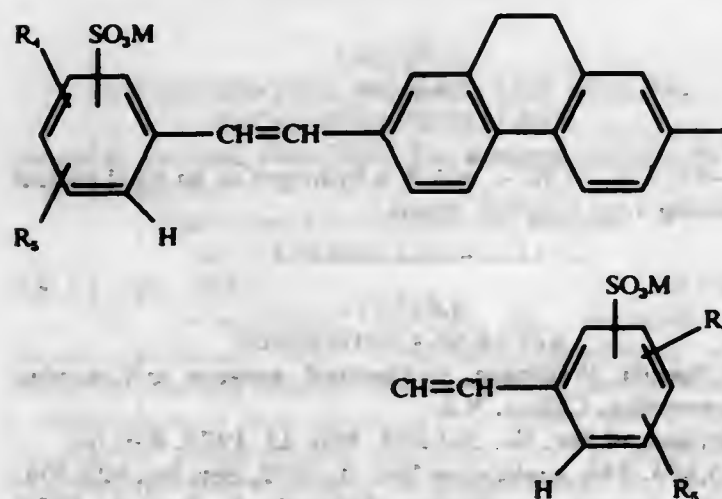
This application Sept. 15, 1975, Ser. No. 613,697

Int. Cl.<sup>2</sup> C07C 143/24

U.S. Cl. 260—505 R

5 Claims

1. Styryl compounds corresponding to the formula



wherein  $R^I$  denotes hydrogen, an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, or halogen,  $R^II$  denotes hydrogen, an alkyl group with 1 to 4 carbon atoms, an

alkoxy group with 1 to 4 carbon atoms, halogen, or  $SO_2M$  and M represents a hydrogen ion or a salt-forming cation.

4,013,714

**SUBSTITUTED BIS-(DICARBOXYMETHYL)-ETHERS**  
 Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1973, Ser. No. 426,157

Disclosure was also published under second Trial Voluntary

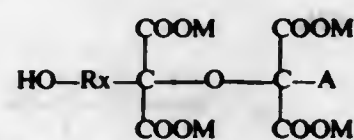
Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07C 59/12

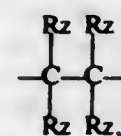
U.S. Cl. 260—535 P

3 Claims

1. A compound represented by the formula



wherein M is selected from the group consisting of alkali metal, ammonium, alkyl ammonium containing 1 to 4 carbon atoms and alkanol ammonium containing 1 to 4 carbon atoms; A is selected from the group consisting of hydrogen, methyl, ethyl,  $-CH_2OH$  and  $RxOH$ ; and Rx is



Rz being selected from the group consisting of hydrogen, alkyl, alkoxy alkyl, and  $-COOM$ , the total number of carbon atoms in Rx being from 2 to 22.

4,013,715

**PROCESS FOR THE MANUFACTURE OF 2-HALO-ETHANE-PHOSPHONIC ACID DIHALIDES AND VINYL-PHOSPHONIC ACID DIHALIDES**

Manfred Finke, Flachbach, Taunus, and Hans-Jerg Kleiner, Bad Soden, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 18, 1974, Ser. No. 524,812

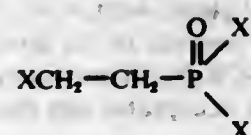
Claims priority, application Germany, Nov. 19, 1973, 2357676

Int. Cl.<sup>2</sup> C07F 9/38

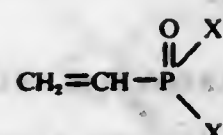
U.S. Cl. 260—543 P

24 Claims

1. A process for the manufacture of halo-ethane-phosphonic acid dihalides and vinyl-phosphonic acid dihalides of the formulae I and II

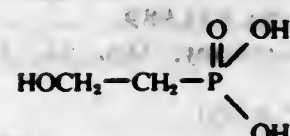


(I)



(II)

in which X represents halogen, which comprises reacting hydroxy-ethane-phosphonic acid of the formula



(III)

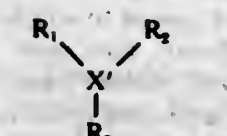
a salt or an ester thereof with an acid halide of the formula

(CO)<sub>n</sub>X<sub>2</sub>

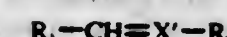
(IV)

in which X has the meaning defined above and n stands for 1 or 2, in the presence of a catalyst consisting of a compound that:

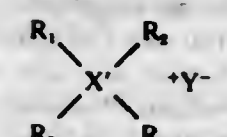
contains at least one nitrogen or phosphorous atom which is bound by three or four valences to carbon, two valences possibly forming a double bond and further has the formula V, VI, or VII:



(V)

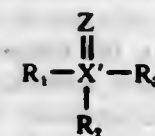


(VI)



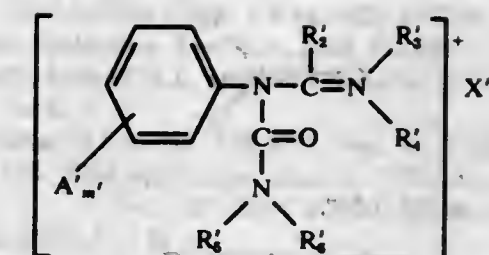
(VII)

in which X' represents a nitrogen or phosphorous atom, Y is an inorganic or organic acid radical, and  $R_1$ ,  $R_2$ ,  $R_3$ , and  $R_4$  are identical or different organic radicals which are straight chain or branched alkyl radicals having from 1 to 20 carbon atoms, alkenyl radicals having from 2 to 20 carbon atoms, cycloalkyl radicals having from 4 to 8 carbon atoms, or phenyl or benzyl groups or acyl groups having from 1 to 4 carbon atoms, all radicals  $R_1$  to  $R_4$  possibly being substituted by halogen, or alkoxy having from 1 to 4 carbon atoms, or a dialkyl-amino group the alkyl groups of which have from 1 to 4 carbon atoms, two of the radicals  $R_1$  to  $R_4$  may form a ring, and the catalyst has a molecular weight of up to 500; or contains a nitrogen or phosphorus atom bound by three valences to carbon and has the formula VIII:



(VIII)

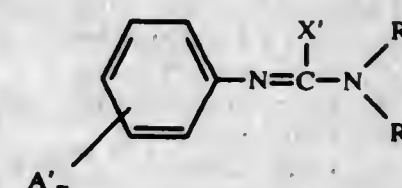
in which Z represents oxygen or, if X' is phosphorus, Z also represents sulfur, two halogen atoms, or the group  $NR_5$  in which  $R_5$  has the same meaning as  $R_1$ , or represents hydrogen, and 2 or 3 of the radicals  $R_1$  to  $R_5$  may form a cycle, optionally including for example oxygen, sulfur, or nitrogen as a hetero-atom.



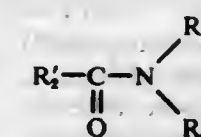
wherein

$A'$  is H, halogen,  $C_1-C_4$  alkyl, trifluoromethyl, methoxy or ethoxy;  
 $m'$  is an integer of 1 to 3;  
 $R_2'$  is H or methyl;  
 $R_3'$  is a  $C_1-C_4$  alkyl;  
 $R_4'$  is a  $C_1-C_4$  alkyl;  
 $R_5'$  is a  $C_1-C_4$  alkyl;  
 $R_6'$  is a  $C_1-C_4$  alkyl; and  
 $X'$  is halide

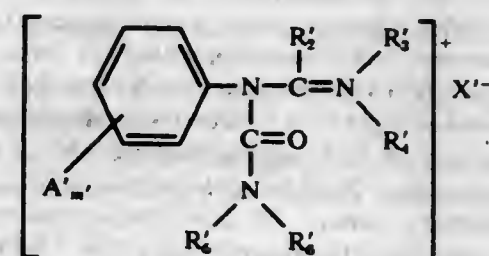
comprising reacting a formamidine of the formula



with an amide of the formula



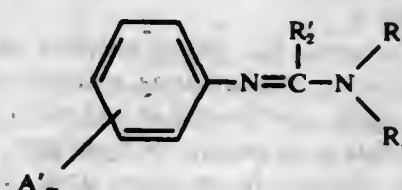
4. A process for the preparation of a compound of the formula



wherein

$A'$  is H, halogen,  $C_1-C_4$  alkyl, trifluoromethyl, methoxy or ethoxy;  
 $m'$  is an integer of 1 to 3;  
 $R_2'$  is H or methyl;  
 $R_3'$  is a  $C_1-C_4$  alkyl;  
 $R_4'$  is a  $C_1-C_4$  alkyl;  
 $R_5'$  is a  $C_1-C_4$  alkyl;  
 $R_6'$  is a  $C_1-C_4$  alkyl; and  
 $X'$  is halide

comprising reacting a formamidine of the formula



with a compound of the formula

4,013,716

**PREPARATION OF N-ARYL-IMIDOCARBONYL UREAS**  
 Jean Abblard, St. Didier au Mont d'Or, and Pierre Poignant, Nyons, both of France, assignors to PEPRO, Societe pour le Developpement et la Vente de Specialites Chimiques, Lyon, France

Filed Mar. 25, 1974, Ser. No. 454,303

Claims priority, application France, Mar. 27, 1973, 73.11843

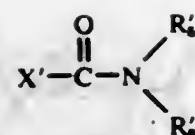
Int. Cl.<sup>2</sup> C07C 127/19; A01N 9/20

U.S. Cl. 260—553 A

4 Claims

1. A process for the preparation of a compound of the formula





for 5-30 hours at 50°-150° C.

4,013,717

# **BENZOYL PHENYL UREA DERIVATIVES HAVING INSECTICIDAL ACTIVITIES**

Kobus Wellinga, and Rudolf Mulder, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 354,393, April 25, 1973, Pat. No. 3,933,908, which is a division of Ser. No. 143,668, May 14, 1971, Pat. No. 3,748,356. This application Oct. 23, 1975, Ser. No. 625,126

Claims priority, application Netherlands, May 15, 1970, 7007040

Int. Cl.<sup>2</sup> C07C 127/22; A01N 9/20

U.S. Cl. 260-553 E

29 Claims

1. A compound selected from the group consisting of N-(2,6-dimethylbenzoyl)-N'-(3,4-dichlorophenyl) urea, N-(2,6-dimethylbenzoyl)-N'-(4-chlorophenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-cyclopropylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-isopropylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-n-butylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-t-butylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-phenylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-n-propylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(3-cyclopropylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-sec-butylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-isobutylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-ethylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-n-dodecylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-benzylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(methyl)-N'-(4-t-butylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(ethyl)-N'-(4-isopropylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(ethyl)-N'-(4-n-butylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(ethyl)-N'-(4-t-butylphenyl) urea, N-(2,6-difluorobenzoyl)-N'-(4-n-butylphenyl) urea, N-(2,6-difluorobenzoyl)-N'-(4-t-butylphenyl) urea, N-(2,6-difluorobenzoyl)-N'-(4-isopropylphenyl) urea, N-(2,6-difluorobenzoyl)-N'-(4-isobutylphenyl)-N'-(methyl) urea, N-(2,6-dichlorobenzoyl)-N'-(3-chloro-4-methylsulphonylphenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(2-methyl-4-chloro-phenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(methyl)-N'-(4-nitro-phenyl) urea, N-(2,6-dichlorobenzoyl)-N'-(4-nitrophenyl) urea, N-(2,6-difluorobenzoyl)-N'-(4-thiomethylphenyl) urea, and N-(2,6-difluorobenzoyl)-N'-(methoxymethyl)-N'-(3,4-dichlorophenyl) urea.

4,013,718

# **INTEGRATED PROCESS FOR THE PRODUCTION OF UREA**

Mario Guadalupi; Giorgia Pagani, both of Milan; Umberto Zardi, San Donato Milanese, and Ivo Paris, Melegnano, all of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 177,629, Sept. 3, 1971, abandoned.

This application Mar. 20, 1974, Ser. No. 453,028

Claims priority, application Italy, Sept. 3, 1970, 29295/70

Int. Cl.<sup>2</sup> C07C 126/00

U.S. Cl. 260-555 A

4 Claims

1. Integrated process, for the production of urea which comprises compressing, the raw urea synthesis gases coming from steam reforming, or obtained in any other conventional manner, and consisting essentially of hydrogen, nitrogen and sufficient carbon dioxide to produce urea, to a pressure slightly higher than the urea synthesis pressure and, after compression, passing said raw urea synthesis gases still containing the carbon dioxide necessary for the production of

urea to the bottom of a jacketed vertical film heat exchanger wherein it is counter-currently contacted with a film of ammonia solution to produce carbamate; removing reaction heat by causing a cooling fluid film to flow through said jacket; withdrawing the obtained carbamate from the bottom of said vertical film heat exchanger wherein the temperature ranges between 100° and 250° C, as a very concentrated solution; withdrawing raw synthesis gases containing ammonia and free of carbon dioxide from the top of said vertical film heat exchanger and passing them into a cooler where a portion of the ammonia condenses, feeding said condensed ammonia to said vertical film heat exchanger, the cooled gas being methanated and after cooling the methanated gases are passed to a jacketed film absorber with vertical tubes wherein they meet in countercurrent flow a film of water or a very diluted aqueous solution of ammonia, which absorbs the ammonia contained in said methanated gases; cooling said film absorber by a cooling fluid which flows along the jacket side so as to maintain in said film absorber a temperature in the range 10°-60° C, its pressure being comprised between 100 and 250 kg/cm<sup>2</sup>, said film absorber being provided at the bottom also with the gas coming from an apparatus for the synthesis of ammonia, from the bottom of said film absorber a concentrated ammonia solution is withdrawn and sent to said vertical film heat exchanger where it absorbs the CO<sub>2</sub>, forming carbamate; from the top of the said film absorber venting part of the gaseous stream coming from the synthesis of the ammonia to avoid the accumulation of inerts, thereafter mixing said gaseous stream from the synthesis of ammonia and the methanated gases after having gone through said film absorber; the gaseous mixture so obtained, saturated with water being subsequently dehydrated by contact with liquid ammonia which is mixed thoroughly with said gaseous mixture in an apparatus that forms a large exchange surface between said gaseous mixture gas and ammonia, immediately downstream of such contact between ammonia and said gaseous mixture separating said gaseous mixture and said liquid ammonia; forwarding the separated gaseous mixture to said apparatus for the synthesis of ammonia after said gaseous mixture is compressed up to the synthesis pressure of ammonia, namely 100-250 kg/cm<sup>2</sup> and passing a solution of ammonia, to the urea solution coming from a carbamate decomposer combining the solution of the carbamate with ammonia which is forwarded to the bottom of a urea reactor in the same zone wherein are introduced the vapors coming from a carbamate decomposer, the temperature being regulated by the amount of the vapors introduced into the exchanger from said carbamate decomposer and ranges between 150° and 250° C., while the pressure ranges between 100 and 250 kg/cm<sup>2</sup>; withdrawing solution of urea, carbamate, ammonia and water from the top of the reactor which is sent to said carbamate decomposer where it is heated and stripped by means of NH<sub>3</sub> which flows countercurrently and acts as a stripping agent; the urea from the solution so obtained being thereafter separated.

4,013,719

# **ADAMANTYL PHENOXY ALKYLAMIDES**

Georges Haas, Oberwil; Roland Jaques, Allschwil; Alberto Rossi, Oberwil, and Martin Rüegg, Fullinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 409,192, Oct. 24, 1973, Pat. No. 3,933,835. This application Aug. 18, 1975, Ser. No. 605,574

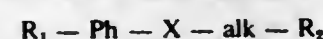
Claims priority, application Switzerland, Nov. 1, 1972, 15923/72; Sept. 18, 1973, 13386/73

Int. Cl.<sup>2</sup> C07C 103/26, 83/10; A61K 31/165

U.S. Cl. 260-559 B

3 Claims

1. A compound of the formula



wherein R<sub>1</sub> is adamantyl, Ph is phenylene or phenylene substituted by nitro, lower alkyl, lower alkoxy, halogen or trifluoromethyl, X is oxy, alk is unbranched alkylene with 1 to 10

carbon atoms, unbranched alkylene with 1 to 10 carbon atoms which carries an unbranched alkyl radical with 1 to 8 carbon atoms in the α-position with respect to R<sub>1</sub>, or alkenylene with 2 to 7 carbon atoms which is unbranched or branched with an unbranched alkyl radical of 1 to 3 carbon atoms in α- or β-position with respect to R<sub>1</sub>, and R<sub>2</sub> is carbamoyl N-mono- or N,N-di-lower alkylcarbamoyl or N-hydroxycarbamoyl, or a therapeutically acceptable salt thereof.

4,013,720

# **AMINE CONDENSATE**

Eric Samuel Nicholson, and Brian Thomas Ashworth, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 20, 1976, Ser. No. 650,756

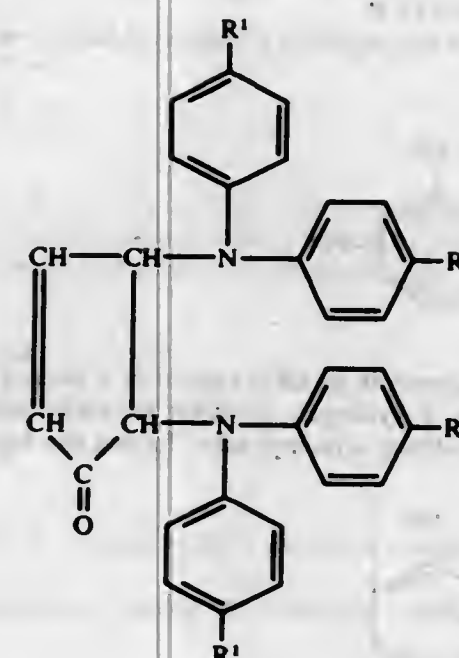
Claims priority, application United Kingdom, Feb. 10, 1975, 5564/75

Int. Cl.<sup>2</sup> C07C 87/54

U.S. Cl. 260-570.5 CA

3 Claims

1. An amine condensate of the formula:



where R<sup>1</sup> and R<sup>2</sup> are the same or different and are hydrogen, alkyl, alkoxy or dialkylamino.

4,013,721

# **PROCESS OF CATALYTIC OXIDATION OF LUPULONES TO HULUPONES**

Wolfgang Reininger, Munich, and Alfons Hartl, Germering, both of Germany, assignors to Atlantic Research Institute Limited, Nassau, Bahamas

Filed Sept. 13, 1973, Ser. No. 397,106

Claims priority, application Germany, Sept. 13, 1972, 2244895

Int. Cl.<sup>2</sup> C07C 45/00

U.S. Cl. 260-586 D

13 Claims

1. A process of catalytic oxidation wherein lupulone or lupulone-bearing material is mixed into a polar alkaline medium in which lupulones are soluble and reacted with oxygen-containing gas in contact with a catalyst selected from the group consisting of noble metals, transition metals, and bismuth oxide applied to a carrier selected from the group consisting of kieselguhr, activated carbon, calcium phosphate, magnesium oxide, dolomite, fired clay and strongly acid cation exchangers.

4,013,722

# **PROCESS FOR THE PREPARATION OF SELECTIVELY HALOGENATED KETONES AND KETALS**

Eddie N. Gutierrez, Fort Lee, and Robert C. Reardon, Jr., Tenafly, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

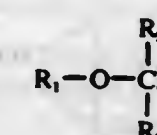
Division of Ser. No. 426,855, Dec. 20, 1973, Pat. No. 3,919,328. This application Aug. 1, 1975, Ser. No. 601,242

Int. Cl.<sup>2</sup> C07C 45/00, 49/16

U.S. Cl. 260-593 H

10 Claims

1. A method for preparing selectively halogenated ketones which comprises preparing a mixture of symmetrically and unsymmetrically halogenated ketals by treating with a halogen selected from the group consisting of chlorine and bromine ether compounds of the formula:



wherein R<sub>1</sub> is a straight chain unsubstituted alkyl group of from 1 to 20 carbon atoms, and R<sub>2</sub> and R<sub>3</sub> are straight chain unsubstituted alkyl groups of from 1 to 10 carbon atoms; said treatment being in an organic solvent selected from the group consisting of methanol, ethylene glycol and 2,3-butanediol wherein the ratio of said solvent to said ether is from about 5:1 to about 20:1 and at a temperature of from about 0° C to about 80° C whereby symmetrically halogenated ketals and unsymmetrically halogenated ketals are formed; separating said symmetrically halogenated ketals from said mixture subsequently and separately hydrolyzing both said unsymmetrically and symmetrically halogenated ketals under acid conditions.

4,013,723

# **PROCESS FOR PREPARING ALDEHYDES**

Helmut Waldmann; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Globus, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 27, 1972, Ser. No. 318,965

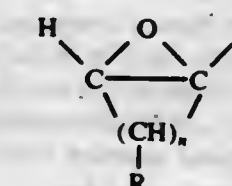
Claims priority, application Germany, Jan. 13, 1972, 2201455

Int. Cl.<sup>2</sup> C07C 45/22, 47/12, 47/14, 47/28

U.S. Cl. 260-601 R

5 Claims

1. Process for splitting oxirane compounds into aldehydes which comprises reacting an oxirane compound having the formula



wherein

n is an integer of from 3 to 10 and each of the carbon atoms determined by n are substituted by R independently of each other, and

R is selected from the group of hydrogen, fluorine, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl and phenyl optionally substituted by fluorine, chlorine, or C<sub>1</sub>-C<sub>6</sub> alkoxy, with non-aqueous hydrogen peroxide in a solvent that does not react with said oxirane compound nor cause decomposition of said hydrogen peroxide, in the presence of at least one vanadium or molybdenum acetate acetyl acetate, benzoate or naphthenate in an amount of 0.01 to 10 moles-% based on the amount of hydrogen peroxide, and at a temperature in the range of from -80° to +100° C.



4,013,724

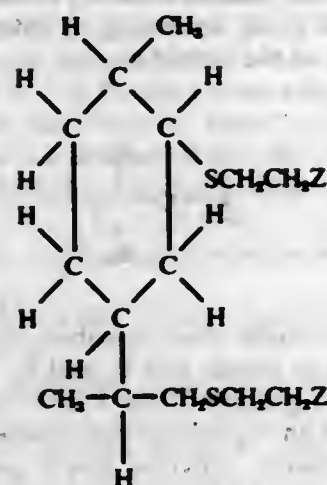
**SYNTHESIS OF A DITHIOL FROM 1-METHYL-2-(2-HYDROXYETHYLTHIO)-4-[1-METHYL-2-(2-HYDROXYETHYLTHIO)ETHYL]CYCLOHEXANE**  
Paul F. Warner, Phillips, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 24, 1975, Ser. No. 598,964  
Int. Cl.<sup>2</sup> C07C 149/26

U.S. Cl. 260-609 D

3 Claims

1. A group of compounds having a structural formula of



where the Z group is one of OH and SH but not both in the same compound.

4,013,725

# PROCESS FOR PREPARING HYDROPEROXIDE

Eiichi Yonemitsu, Kashiwa; Takeo Igarashi, Nagareyama; Naoto Osaki; Tetsuo Aoyama, both of Tokyo, and Yukiya Nakazato, Matsudo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed May 6, 1975, Ser. No. 574,898  
Claims priority, application Japan, May 14, 1974, 49-53570; May 14, 1974, 49-53571

Int. Cl.<sup>2</sup> C07C 179/02, 179/04

U.S. Cl. 260-610 B

14 Claims

1. A process for preparing hydroperoxide by autoxidizing secondary alkyl group-substituted methylbenzenes, wherein the secondary alkyl group is isopropyl or isobutyl, with oxygen-containing gas in the presence of water at a pressure of about atmospheric up to about 50 kg/cm<sup>2</sup> gauge and at a temperature of from 50° to 130° C which comprises using as a catalyst a water-soluble chelate compound in which nitrogen-containing polycarboxylic acid is selected from the group consisting of ethylene diamine tetraacetic acid, cyclohexane diamine tetraacetic acid, and nitrilotriacetic acid, and is coordinated to at least one metal selected from the class of cobalt, nickel, manganese, copper, and iron.

4,013,726

# AZULENE COMPOUNDS

Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

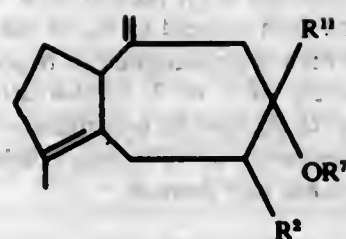
Division of Ser. No. 363,207, May 23, 1973, Pat. No. 3,935,253. This application Nov. 3, 1975, Ser. No. 628,303  
Claims priority, application Switzerland, June 5, 1972, 8265/72

Int. Cl.<sup>2</sup> C07C 43/18

U.S. Cl. 260-611 F

6 Claims

1. A compound of the formula



wherein R<sup>2</sup> represents hydrogen or lower alkyl, R<sup>7</sup> represents lower alkyl, or lower alkoxy lower alkyl, "lower" referring to groups having 1 to 6 carbon atoms, and R<sup>11</sup> represents hydrogen or lower alkyl.

4,013,727

**PROCESS FOR PREPARING HYDROXYPHENYL ETHERS**  
Sumio Umemura; Nagaki Takamitsu; Toshikazu Hamamoto, and Nobuyuki Kuroda, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Oct. 20, 1975, Ser. No. 623,937

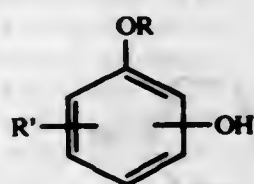
Claims priority, application Japan, Nov. 7, 1974, 49-127515; Nov. 7, 1974, 49-127516

Int. Cl.<sup>2</sup> C07C 37/00

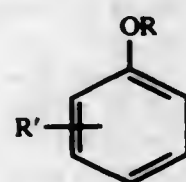
U.S. Cl. 260-613 R

16 Claims

1. A process for preparing a hydroxyphenyl ether having the formula:



wherein R represents an alkyl radical or a phenyl radical and R' represents a hydrogen atom or an alkyl radical, which comprises oxidizing a phenyl ether having the formula:



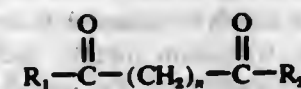
wherein R and R' have the same meanings as above, with hydrogen peroxide in the presence of a ketone, or with a ketone peroxide, at a temperature of 20° to 250° C. in the presence of a catalyst selected from the group consisting of an activated clay, a boric acid or a boric acid derivative, the amount of catalyst being more than 0.001 weight percent of said phenyl ether, said ketone being selected from the group consisting of (i) through (iii) following:

i. a ketone having from 3 to 20 carbon atoms and represented by the following formula:



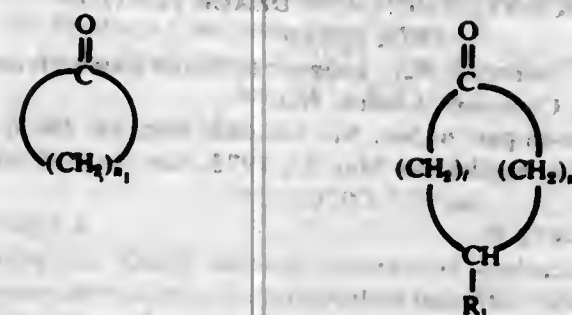
wherein R<sub>1</sub> and R<sub>2</sub> may be the same or different and each represents a straight or branched alkyl group of 1 - 18 carbon atoms or phenyl group, and either R<sub>1</sub> or R<sub>2</sub> may be an aliphatic group having an unsaturated bond;

ii. a diketone having from 3 to 20 carbon atoms and represented by the following formula:



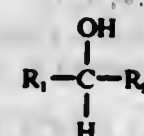
wherein n is an integer of from 0 to 16, inclusive, and R<sub>1</sub> and R<sub>2</sub> have the same meanings as above;

iii. a cycloketone having the following formula:



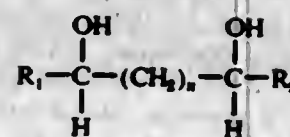
wherein n<sub>1</sub> represents an integer of from 4 to 11, inclusive, l + m represents an integer of from 3 to 10, inclusive, and R<sub>1</sub> has the same meaning as above; and said ketone peroxide being obtained by reaction of hydrogen peroxide and a ketone selected from the group of said (i) to (iii) or derived from a secondary alcohol selected from the group consisting of a secondary alcohol having the following formula:

iv. a secondary alcohol having from 3 to 20 carbon atoms and represented by the following formula:



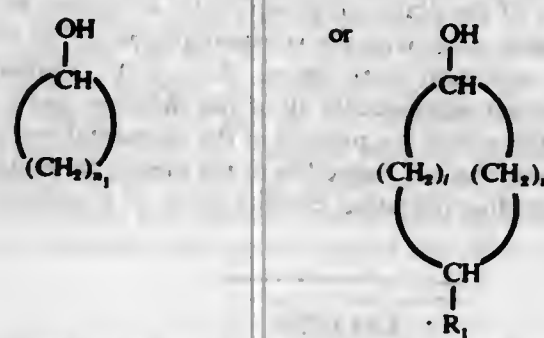
wherein R<sub>1</sub> and R<sub>2</sub> have the same meanings as above;

v. a di-secondary alcohol having from 3 to 20 carbon atoms and represented by the following formula:



wherein R<sub>1</sub>, R<sub>2</sub> and n have the same meanings as above; and

vi. a cycloalcohol having the following formula:



wherein R<sub>1</sub>, n<sub>1</sub>, l and m have the same meanings as above.

4,013,728

# PROCESS FOR HALOGENATING A BISPHENOL

David R. Brackenridge, Royal Oak, Mich., assignor to Ethyl Corporation, Richmond, Va.

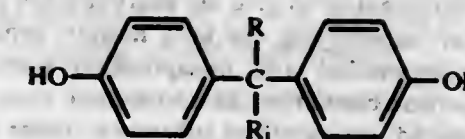
Continuation-in-part of Ser. No. 281,851, Aug. 18, 1972, abandoned. This application Apr. 5, 1976, Ser. No. 673,387  
Int. Cl.<sup>2</sup> C07C 37/00

U.S. Cl. 260-619 A

11 Claims

1. Process for producing an alkylidene bis(dibromophenol), said process comprising a bromination step and a post-heating step;

said bromination step comprising reacting bromine and an alkylidene bisphenol having the formula



wherein R and R<sub>1</sub> are independently selected from the class consisting of hydrogen and alkyl groups of from 1 to about 3 carbons, in a water-acetic acid mixture, the concentration of acetic acid being from about 75 to about 95 weight percent; and said post-heating step comprising subsequently heating the thereby-produced reaction mixture at a temperature of from about 80° to about 120° C. for a period of from about 5 to about 60 minutes.

4,013,729

# HYDROCARBON UPGRADING PROCESS IN SECONDARY ALCOHOL PRODUCTION

Robert M. Suggitt, Wappingers Falls, and Walter C. Gates, Jr., Newburg, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 428,638, Dec. 26, 1973. This application Jan. 26, 1976, Ser. No. 652,584

Int. Cl.<sup>2</sup> C07C 29/12

U.S. Cl. 260-632 C

11 Claims

1. In a process for producing secondary alcohols from n-paraffins wherein a portion of said n-paraffin is converted to a borate ester along with oxygenated by-products, wherein said borate ester is separated from a mixture of unreacted paraffin, olefin and oxygenated by-products and where said borate ester is hydrolyzed to said secondary alcohol, the improvement which comprises:

a. catalytically hydrogenating said mixture at a temperature of from about 600° to 750° F. in the presence of a catalyst composed of alumina, a Group VIII metal and from about 0.05 to 2.0 weight percent of an alkali metal oxide, alkaline earth metal oxide or thallous oxide; and  
b. recycling said hydrogenated product of (a) for conversion with said n-paraffin to said borate ester.

4,013,730

# PROCESS FOR THE PREPARATION OF MONOCHLOROTOLUENE

John C. Graham, Warren, Mich., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 1, 1975, Ser. No. 601,691

Int. Cl.<sup>2</sup> C07C 25/04

U.S. Cl. 260-650 R

14 Claims

1. A process for the preparation of parachlorotoluene which comprises reacting toluene with chlorine in the presence of about 0.01 to about 10.0 percent by weight of a catalyst system comprising a Lewis acid catalyst and a co-catalyst selected from the group consisting of diphenyl selenide and aluminum selenide.

4,013,731

# PROCESS FOR THE MANUFACTURE OF SOLANESOL

Masako Asahina, Tokyo; Hideki Kato, Kawagoe, and Hideaki Fukawa, Fukuoka, all of Japan, assignors to Nishin Flour Milling Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 352,322, April 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 29,702, July 21, 1972, abandoned. This application July 28, 1975, Ser. No. 599,780

Claims priority, application Japan, Apr. 24, 1969, 44-31303  
Int. Cl.<sup>2</sup> C07C 29/00, 29/24

U.S. Cl. 260-643 A

11 Claims

1. A process for producing solanesol from potato leaves comprising: extracting potato leave with an organic solvent in which the fatty matter of potato leaves is soluble, evaporating



off said organic solvent from the resulting organic solvent extract of said fatty matter to give the pasty residue containing said fatty matter, saponifying the fatty matter, separating by extraction the saponified and unsaponified portions, said unsaponified portion containing said solanesol, molecular-distilling the separated unsaponified substance under a vacuum higher than  $1 \times 10^{-2}$  mmHg, collecting the solanesol fraction at 180° to 240° C. and further refining said solanesol fraction by fractionally crystallizing from an organic solvent.

4,013,732

# CONVERSION OF METHANOL TO GASOLINE WITH MINIMUM DURENE PRODUCTION

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,239  
Int. Cl.<sup>2</sup> C07C 1/20

U.S. Cl. 260—668 R

6 Claims

1. A method for converting a feed material selected from the group comprising methanol, dimethylether, and mixtures thereof to aliphatic and aromatic gasoline boiling components which comprises, passing the feed material at a temperature selected from within the range of 500° F to 1000° F and a pressure below 750 psig in contact with a special class of crystalline zeolite conversion catalysts represented by ZSM5 wherein the crystalline zeolite is used with a binder support material substantially free of aluminum oxide and, recovering an aromatic gasoline product of desired low durene concentration further controlled by using a low operating pressure.

4,013,733

# DEHYDROGENATION METHOD

Richard E. Rausch, Mundelein, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 434,476, Jan. 18, 1974, Pat. No. 3,939,220, which is a continuation-in-part of Ser. No. 304,177, Nov. 6, 1972, Pat. No. 3,790,473, which is a continuation-in-part of Ser. No. 142,079, May 10, 1971, Pat. No. 3,702,294, which is a continuation-in-part of Ser. Nos. 819,114, April 24, 1969, abandoned, and Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application Oct. 6, 1975, Ser. No. 620,078

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> C10G 35/06; C07C 3/28, 5/32

U.S. Cl. 260—668 D

12 Claims

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting said hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a combination of a platinum or palladium component, an iridium component, a rhenium component and a tin component with a porous carrier material in amounts sufficient to result in a composite containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.01 to about 2 wt. % rhenium, and about 0.01 to about 5 wt. % tin, wherein substantially all of the platinum or palladium component, the iridium component and the rhenium component are present in the corresponding elemental metallic state and wherein substantially all of the tin component is present in an oxidation state above that of the elemental metal.

4,013,734

# NOVEL CATALYST AND ITS USE FOR STEAM HYDROCONVERSION AND DEALKYLATION PROCESSES

Chang J. Kim, Somerset, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 424,662, Dec. 14, 1973, abandoned. This application May 22, 1975, Ser. No. 579,867  
Int. Cl.<sup>2</sup> C07C 3/58

U.S. Cl. 260—672 R

6 Claims

1. A hydrocarbon conversion process which comprises comingling water with said hydrocarbon in a molar ratio ranging from 1.0:1 to 20.0:1, heating the mixture at a temperature of from 300° to 600° C., at a pressure of from 0–1500 psig, in contact with a catalyst composition consisting of a Group VIII metal selected from the group consisting of rhodium, palladium, ruthenium, iridium and platinum in combination with a Group VB element, said Group VB element and metal being deposited on an alumina support.

5. A process according to claim 1 wherein said hydrocarbon conversion process is a dealkylation process.

4,013,735

# DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights; John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 564,386, April 2, 1975, Pat. No. 3,960,711. This application May 18, 1976, Ser. No. 681,007

Int. Cl.<sup>2</sup> C07C 3/04; C10G 27/08; B01J 23/63

U.S. Cl. 260—673.5

28 Claims

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2 wt. % rhenium, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, rhenium, catalytically available cobalt and tin are uniformly dispersed throughout the porous carrier material; wherein the average crystallite size of the cobalt and tin is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,013,736

# SYNTHESIS OF LOW VISCOSITY LOW POUR POINT HYDROCARBON LUBRICATING OILS

Charles Woo, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 16, 1975, Ser. No. 596,308

Int. Cl.<sup>2</sup> C07C 3/20

U.S. Cl. 260—676 R

5 Claims

1. A process for the preparation of a synthetic hydrocarbon lubricating oil having a viscosity of less than 100 SUS at 100° F. and a pour point of -40° F. or less, which comprises the polymerization of aliphatic alpha-olefins of from about 5 to 20 carbon atoms at a polymerization temperature in the range of from about 300° to 800° F. for from about 1 to 20 hours in the presence of from about 0.5 to 20 weight percent of a silica-alumina molecular sieve acidic catalyst, fractionating to obtain a fraction boiling within the range of about 550° to 800° F., and then hydrofining said fraction to thereby form said lubricating oil.

4,013,737

# UPGRADING SYNTHETIC GASOLINE

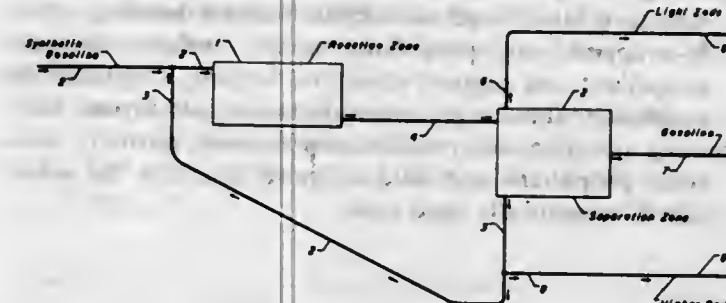
Dennis J. Ward, South Barrington, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 16, 1975, Ser. No. 587,467

Int. Cl.<sup>2</sup> C07C 5/24

U.S. Cl. 260—683.2

7 Claims



1. A process for improving low octane number gasoline synthesized from carbon monoxide and hydrogen, having an initial boiling point of about 110° F. and an end boiling point of about 480° F. and containing straight-chain olefins of from 5 to 14 carbon atoms per molecule, which process comprises contacting said gasoline with a solid phosphoric acid catalyst at a temperature of from about 300° F. to about 700° F., a pressure of from about 20 to about 60 atmospheres and a rate of feed of 0.1 to 50 volumes/hour of gasoline per volume of catalyst, and recovering the resultant higher octane olefin-containing hydrocarbon product.

4,013,738

# HYDROCARBON ISOMERIZATION PROCESS

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Nov. 20, 1975, Ser. No. 633,889

Int. Cl.<sup>2</sup> C07C 5/22

U.S. Cl. 260—683.2

14 Claims

1. A process for isomerizing a C<sub>4</sub> to C<sub>20</sub> olefin which comprises contacting said olefin at isomerization conditions including a temperature of 0° to 245° C., a pressure of atmospheric to 100 atmospheres, and a liquid hourly space velocity of 0.1 to 10 with a catalyst comprising a porous carrier material containing, on an elemental basis, 0.01 to 2 wt. % platinum group metal, 0.1 to 5 wt. % cobalt, 0.01 to 5 wt. % tin and 0.1 to 10 wt. % halogen, wherein substantially all of the platinum group metal, cobalt and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal and cobalt are present in the elemental metallic state and wherein substantially all of the tin is present in an oxidation state above that of the elemental metal.

4,013,739

# POSTTREATMENT OF COPOLYMER OF STYRENE AND ACRYLONITRILE

William J. I. Bracke, Hamme, and Jacqueline Brandli, Brussels, both of Belgium, assignors to Labofina S.A., Brussels, Belgium

Division of Ser. No. 553,610, Feb. 27, 1975. This application Jan. 9, 1976, Ser. No. 647,772

Claims priority, application Belgium, Oct. 24, 1974, 149845  
Int. Cl.<sup>2</sup> C08L 9/00

U.S. Cl. 260—880 R

3 Claims

1. A process for producing a copolymer of styrene and acrylonitrile partially grafted to an elastomeric polymer and substantially free of acrylonitrile which comprises copolymerizing styrene and acrylonitrile in the presence of a butadiene elastomer and treating the resulting copolymer at a temperature of between 100° and 110° C. with an aqueous solution of a sulphur compound selected from the group consisting of

4,013,740

# SUBSTITUTED FLUOROPHOSPHAZENES

Heinrich Adolph, Limburgerhof; Gerd Wunsch, Speyer, and Volker Klier, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany  
Filed July 1, 1974, Ser. No. 484,437

Claims priority, application Germany, July 10, 1973, 2334917

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C07C 9/15; A01N 9/36

U.S. Cl. 260—927 N

11 Claims

1. A substituted fluorophosphazene of the formula



where Z denotes OR or SR, wherein R denotes lower alkyl and n denotes one of the integers 2, 3, or 4.

4,013,741

# CARBURETOR

William H. Edmonston, Lake Isabella, Calif., assignor to Lectron Products, Inc., Troy, Mich.

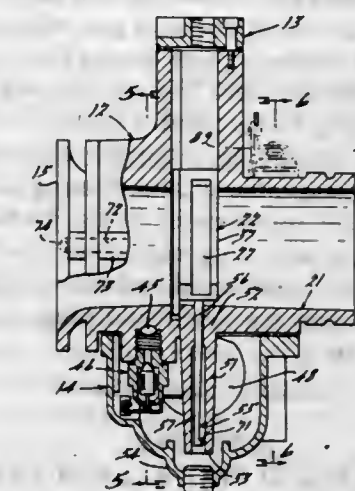
Continuation-in-part of Ser. No. 563,594, March 31, 1975.

This application May 30, 1975, Ser. No. 582,430

Int. Cl.<sup>2</sup> F02M 9/06

U.S. Cl. 261—44 R

6 Claims



1. A carburetor comprising a body with inlet and outlet ends, a throat extending through said body from one end to the other, a throttle slide in said body extending transversely to the throat at an intermediate portion thereof, said slide being movable to vary the unblocked portion of said throat, said slide comprising a thin flat member of substantially rectangular shape having a central enlargement on the downstream face thereof, the slide being thin from said enlargement outwardly to its side edges, the height of said slide being only slightly greater than the height of said throat, said enlargement being in the path of said throat, the lower edge of said slide having a centrally disposed downwardly open concave recess, the bottom of said enlargement being spaced above the upper central portion of said concave recess, a fuel tube extending transversely to said throat and having an opening into said throat concentric with said recess, a pin disposed in said tube and having fuel metering means associated therewith at one side thereof downstream of said slide for regulating flow of fuel from said passage into the stream of air traversing said throat, one end of said pin extending into said tube, means mounting the other end of said pin in said enlargement so that the pin extends downwardly therefrom past said recess, the pin being centrally disposed with respect to the recess

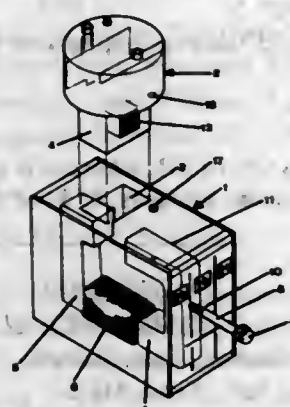


whereby the widest portion of said recess is aligned with said pin, the end of said fuel tube adjacent said throat being flush with the throat whereby air may pass through the entire space between said recess and said throat past said pin.

4,013,742

**DEVICE FOR WETTING AND HEATING GASES, PREFERABLY BREATHING GASES IN RESPIRATORS**  
Volker Lang, 8012 Spitzwegstr. 63 b, Ottobrunn, Germany  
Filed July 28, 1975, Ser. No. 599,478  
Claims priority, application Germany, July 29, 1974, 2436406

Int. Cl.<sup>2</sup> B01F 3/04; A61M 15/00  
U.S. Cl. 261-130 10 Claims



1. Humidifying and heating apparatus for respiratory gas, comprising a transformer for inductively heating a humidifying liquid, and a vessel for containing said liquid and provided with an inlet and an outlet for said gas, wherein said transformer comprises a magnetic core having first and second legs and disposed in a housing, said first leg carrying a primary coil and said housing being formed with a socket, and wherein said vessel comprises a depending extension defining a plug connector releasably engageable in said housing socket, a secondary winding of said transformer being formed by a plate which is mounted in said plug connector and has an upper portion in contact with said liquid and a lower portion adapted to straddle said second leg when said plug connector is engaged in said socket.

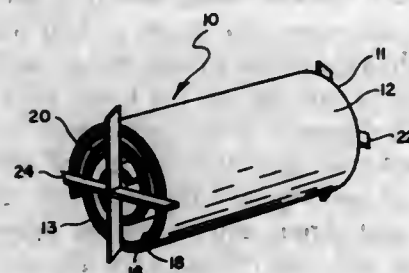
4,013,743

**SPIRAL GRAIN SOLID PROPELLANT FABRICATION PROCESS**

Thomas L. Blasche, Jr.; Donald D. Kobbeman, and Boyce M. Corley, all of Waco, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.  
Filed Feb. 12, 1973, Ser. No. 331,404  
Int. Cl.<sup>2</sup> C06B 21/00

U.S. Cl. 264-3 R

5 Claims



1. A method of fabricating a spirally wound, solid propellant motor grain with a support structure therein, the improvement comprising the steps of:  
spreading a layer of uncured solid propellant onto both sides of a support structure, said solid propellant being an ammonium perchlorate oxidized composition containing

a binder system that cures at a relatively high temperature, said support structure being a flexible, uncured, reinforced fabric tape with a thermosetting resin binder thereon that cures at a relatively high temperature, partially curing said uncured solid propellant applied to both sides of said uncured flexible support structure to a gelled state, forming said partially cured solid propellant and support structure into a layered, longitudinally-extending, spirally-wrapped solid propellant motor configuration, said propellant and support structure forming longitudinally-extending, annular air spaces between said layers, and heating simultaneously said finally formed, partially cured solid propellant and said support structure to a fully cured, structurally rigid state.

4,013,744

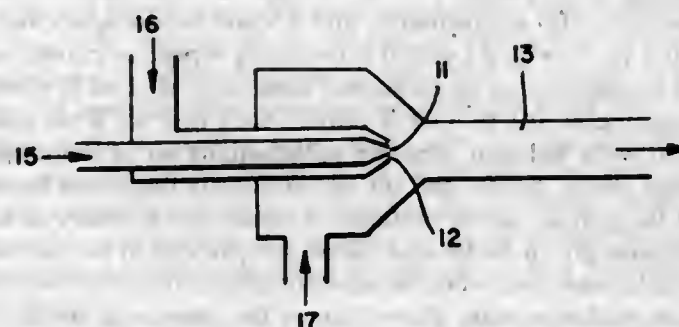
**PROCESS FOR THE MANUFACTURE OF FIBRIDS OF THERMOPLASTICS MATERIALS**

Heribert Kuerten, Mannheim; Otto Nagel, Neustadt; Richard Sinn, Ziegelhausen; Werner Weink, Mannheim, and Peter Engler, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany  
Filed Feb. 26, 1973, Ser. No. 335,783

Claims priority, application Germany, Feb. 25, 1972, 2208921  
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976  
Int. Cl.<sup>2</sup> B01J 2/06

U.S. Cl. 264-11

7 Claims



1. A process for the manufacture of fibrids of a thermoplastic polymer material which comprises extruding strands of molten thermoplastic polymer material through orifices of die means into a shear gradient zone between and created by a propulsive jet of liquid flowing from a nozzle adjacent said die means at a velocity of 10-100 meters per second and flowing in the same direction as said strands and a slower moving liquid body entrained by the propulsive jet and located in a liquid-filled zone surrounding said orifices and the propulsive jet, passing said strands, the propulsive jet and the entrained liquid immediately and directly into and through a tubular impulse exchange zone having a mean diameter of two to 20 times the diameter of said nozzle of said propulsive jet and a length of 2-30 times its hydraulic diameter to provide shear stresses acting on said strands within said impulse exchange zone, and causing said strands of molten thermoplastic polymer to solidify by the cooling of said melt by said liquid and to be broken up into fibrids by said shear stresses within said impulse exchange zone.

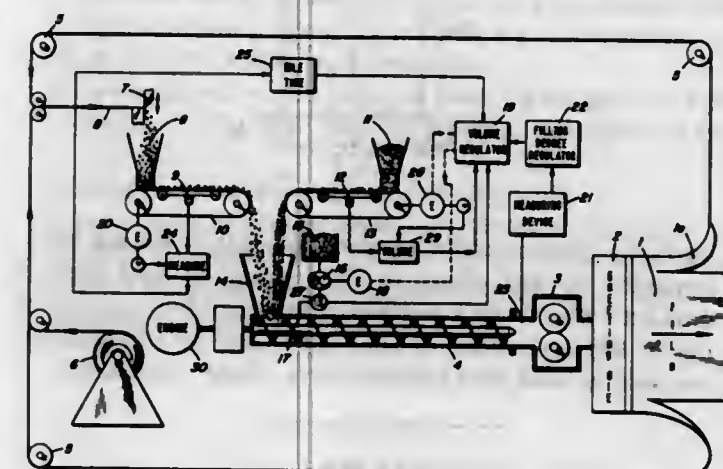
4,013,745

**PROCESS FOR THE EXTRUSION OF A PLASTIC FOIL HAVING SMALL VARIATIONS IN THICKNESS**

Hans Brinkmann; Gottfried Eisele; Helmut Gormar, all of Troisdorf; Horst Pabst, Bonn-Beuel; Helmut Putz, Troisdorf; Hans Jurgen Schrick, Troisdorf, and Uwe Sommermeyer, Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany  
Filed May 20, 1975, Ser. No. 579,153

Claims priority, application Germany, June 1, 1974, 2426714  
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B29C 17/08, 29/00; B29D 7/02; B29F 3/00  
U.S. Cl. 264-37 14 Claims



1. A process for extruding a film from materials including virgin polymer and returned scrap, said film having small variations in thickness, comprising:  
feeding virgin polymer to an extruder screw inlet and measuring the feed rate thereof;  
moving said virgin polymer and returned scrap through an extruder screw press and then moving said materials at a constant rate from the screw press and through a pump having a constant volume output per unit of time;  
then extruding said materials through a sheeting die, forming film;  
severing margins of said film and recycling the severed margins as scrap to said screw inlet;  
measuring the weight per unit time of recycled material returned to said screw inlet;  
subtracting the measured quantity of said severed margins from a nominal feed rate for said extruder and controlling the rate at which virgin polymer is fed according to differences between the amount of scrap returned and the nominal feed rate; and  
maintaining the pressure constant at an inlet to said constant volume pump.

4,013,746

**METHODS OF MANUFACTURE OF SEMICONDUCTOR BODIES**

Kenneth A. Goreham, London, and John R. Perry, Daventry, both of England, assignors to Smiths Industries Limited, London, England

Filed Apr. 21, 1975, Ser. No. 570,328  
Claims priority, application United Kingdom, May 2, 1974, 19282/74

Int. Cl.<sup>2</sup> C04B 35/56

U.S. Cl. 264-66

16 Claims

1. In a known method of manufacturing a semiconductor body, comprising the step of compacting a mixture containing particulate silicon carbide and the step of sintering said mixture, said mixture including a non-conductive silicate material to provide a nonconductive silicate matrix for said silicon-carbide particles during said sintering step, the improvement

wherein the said mixture is heated to coat said silicon carbide with nonconductive silicate matrix material, milling said



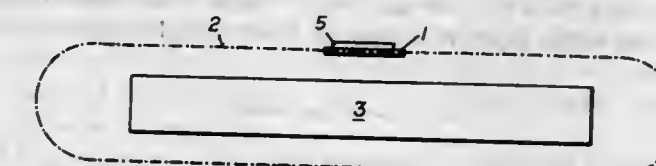
coated silicon carbide, and compacting said coated silicon carbide.

4,013,747

**METHOD FOR MAKING SPECTACLE FRAME COMPONENTS**

Gerald Hampel, Vienna, Austria, assignor to Optipatent AG, Zug, Switzerland  
Continuation-in-part of Ser. No. 689,952, Dec. 12, 1967, abandoned. This application Aug. 20, 1970, Ser. No. 65,654  
Claims priority, application Germany, Dec. 22, 1966, 1604419

Int. Cl.<sup>2</sup> B29C 9/00; C08G 51/04  
U.S. Cl. 264-73 15 Claims



11. A method of coloring epoxy resin eyeglass frames and parts thereof manufactured from liquid ingredients, an epoxy composition and a hardener, comprising the steps of adding small amounts of a coloring agent selected from azo dyes and pigments to at least one of the liquid ingredients prior to casting the liquid ingredients, metering the liquids into a mold having cavities therein in the form of eyeglass frames and parts thereof, completely curing the liquid ingredients and included coloring agent in the mold to produce a self-sustaining, completely polymerized colored eyeglass frames or parts thereof, removing the colored polymerized eyeglass frames or parts thereof from the mold, and subjecting selected portions of the colored polymerized eyeglass frames or parts thereof to heat to chemically bleach selected areas of the frame and parts thereof to produce demi-shades in the colored polymerized eyeglass frames or parts thereof.

4,013,748

**METHOD FOR MAKING COMPOSITE PLASTIC ARTICLE**

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471  
Continuation-in-part of Ser. No. 213,914, Dec. 30, 1971, abandoned. This application July 2, 1973, Ser. No. 375,824  
The portion of the term of this patent subsequent to Mar. 6, 1990, has been disclaimed.

Int. Cl.<sup>2</sup> B29C 17/07; B29D 3/00

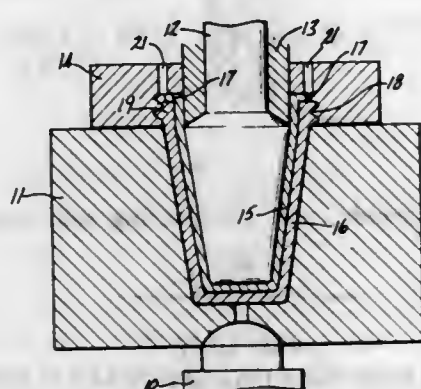
U.S. Cl. 264-90

14 Claims

1. In the process of forming a composite plastic article from



a parison having at least two layers of material wherein the parison is formed on a core in a parison mold by molding the organic plastic material around the core in the parison mold cavity and wherein the parison is subsequently expanded in a blow mold, the steps which comprise applying a preformed liner to said core, said liner having substantially continuous side and end portions which conform to the sides and end of the core and prevent direct contact between the core and plastic being molded therearound, subsequently pressure molding an outer layer of organic plastic material around said liner substantially enclosing said liner to form a composite



parison by injecting plastic into said mold cavity around said core and liner and causing the injected plastic to fill the space therearound in a manner such that substantially all air in said mold cavity in the space between said core and liner and between the liner and the injected plastic is forced toward the portion last to be filled, venting such air from said portion, bringing said liner to a temperature at which it is capable of being expanded together with said outer layer, at least in part by means of said outer layer, introducing said liner and outer layer into a blow mold in said heated state, and expanding said liner and outer layer in unison to form a multilayered hollow article.

4,013,749

## METHOD OF SHAPING FIBER MATERIALS

Sten Thore Henriksson, Erik Sjöbloms väg 8, S-890 23 Sjölevad, Sweden

Filed June 24, 1975, Ser. No. 589,956

Int. Cl.<sup>2</sup> B29J 5/02

U.S. Cl. 264-128

4 Claims

1. A method for producing compressed boards by hot pressing which comprises

- a. treating wood chips with an aqueous solution of
  1. water glass, and
  2. a compound capable of liberating acetic acid under the conditions of hot pressing,
- b. hot pressing said treated wood chips under temperature conditions sufficient to cause liberation of acetic acid, whereby the acetic acid liberated during hot pressing causes gelation of the water glass, which in turn causes binding of the hot pressed wood chips to take place.

4,013,750

## METHOD FOR MAKING BRASSIERE PAD PREFORMS

Herbert Magidson; Otto L. Huber, both of Beverly Hills, and Helmut Hennrich, Manhattan Beach, all of Calif., assignors to Moldex/Metric, Inc., Culver City, Calif.

Division of Ser. No. 473,735, May 28, 1974, Pat. No. 3,947,207. This application June 9, 1975, Ser. No. 585,235

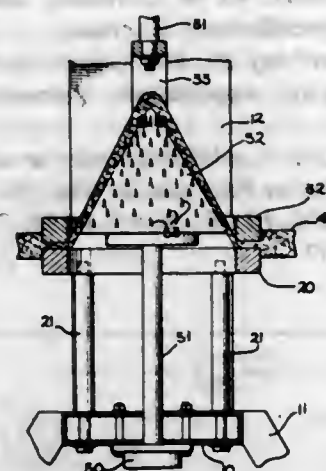
Int. Cl.<sup>2</sup> B29C 11/00

U.S. Cl. 264-136

7 Claims

1. A method of preforming seamless brassiere pads fabricated from sheet fibrous batting material which comprises:
  - a. clamping said sheet of fibrous batting material at the periphery of said pad; and
  - b. driving a substantially conical member into said sheet, said conical member having a plurality of pins extending

from the surface of said member and aligned in the direction of motion of said member said pins being distributed over substantially all of the surface of said member with the exception of an area surrounding the apex of said member whereby when said conical member is driven



into said sheet, a predetermined amount of stretch will be imparted to said sheet in the region of said sheet in contact with the apex portion of said member and stretching of the remainder of said sheet will be progressively arrested as said pins progressively engage said sheet.

4,013,751

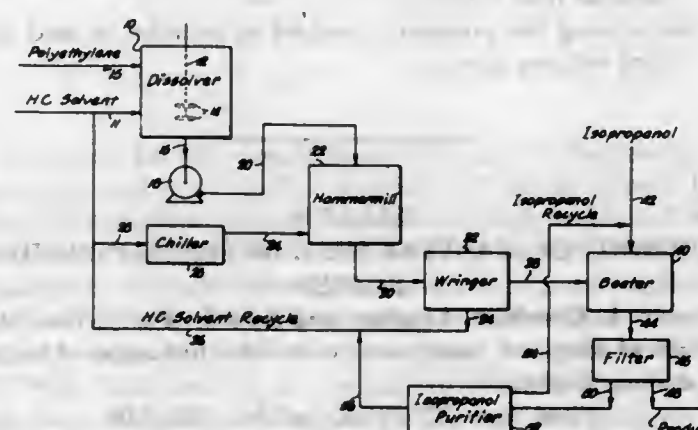
## FIBRILS AND PROCESSES FOR THE MANUFACTURE THEREOF

Joseph C. Davis, DeSoto, Kans.; Francis R. Galiano, Beaumont, Tex., and Robert W. Hill, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa. Continuation-in-part of Ser. No. 193,716, Oct. 29, 1971, abandoned, and Ser. No. 202,302, Nov. 26, 1971, abandoned, and Ser. No. 211,562, Dec. 23, 1971, abandoned, and Ser. No. 234,321, March 13, 1972, abandoned, and Ser. No. 236,189, March 20, 1972, abandoned, and Ser. No. 238,463, March 27, 1972, abandoned, and Ser. No. 254,456, May 18, 1972, abandoned, and Ser. No. 256,718, May 25, 1972, abandoned, and Ser. No. 287,494, Sept. 8, 1972, abandoned, and Ser. No. 322,317, Jan. 10, 1973, abandoned, and Ser. No. 322,327, Jan. 10, 1973, abandoned, and Ser. No. 322,592, Jan. 10, 1973, abandoned. This application June 14, 1974, Ser. No. 479,357

Int. Cl.<sup>2</sup> B01J 2/06

U.S. Cl. 264-140

17 Claims



1. A process for producing a mass of entangled solvent swollen filaments from a high molecular weight polymer consisting essentially of the sequential steps of:

- a. dissolving said polymer in a solvent at a temperature above 100° C. to prepare a solution thereof having a viscosity of at least about 50 centipoises;
- b. subjecting said heated polymer solution to shearing forces and attenuating said solution into liquid streams to

orient the solute polymer molecules in said liquid streams while maintaining said polymer solution at a temperature sufficiently high to maintain substantially all of said polymer in solution;

- c. feeding said liquid streams into a cooling zone in which said streams are cooled to a temperature to precipitate substantially all of said solute polymer as solvent swollen polymer filaments; and
- d. recovering said polymer as a mass of entangled solvent swollen filaments from said solvent;

said polymer being selected from the group consisting of:

1. an olefin polymer having an inherent viscosity of at least 3.5 and selected from the group consisting of:
  - i. an ethylene homopolymer,
  - ii. a copolymer containing at least 90 weight % of polymerized ethylene and the balance a polymerized olefin hydrocarbon containing at least 4 carbon atoms,
  - iii. a propylene homopolymer, and
  - iv. a copolymer containing at least 50 weight % of polymerized propylene and the balance polymerized ethylene;
2. a mixture of olefin polymers of (1), and
3. a mixture of polymers containing at least 20 weight % of an olefin polymer of (1) and up to 80 weight % of a diluent polymer that is soluble at 100° C. in the solvent employed in step (a).

4,013,752

## METHOD OF MANUFACTURING RETICULATE SHEET MATERIAL

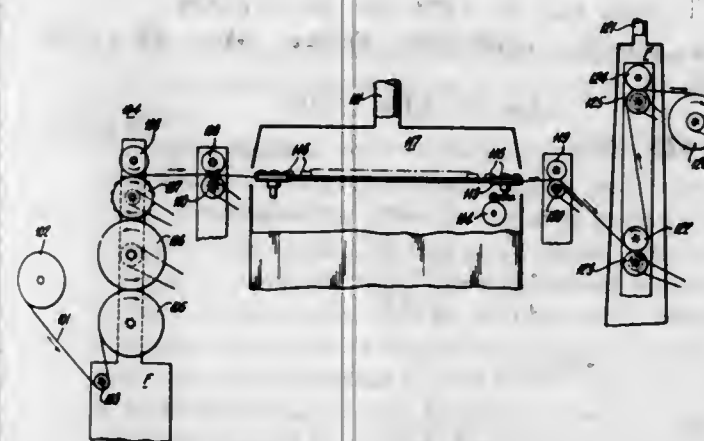
Frank Kalwaktes, Somerville, and Peter L. Doviak, South Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Division of Ser. No. 54,961, July 15, 1970, Pat. No. 3,666,609. This application Feb. 9, 1972, Ser. No. 182,561

Int. Cl.<sup>2</sup> B28B 1/48; D01D 5/20

U.S. Cl. 264-154

7 Claims



1. A method for manufacturing a reticulate, polymer, sheet having a set of filaments extending across the sheet and intersecting in molecularly oriented integral junctures with a second set of filaments comprising:

1. Heating a film of molecularly orientable, thermally stable, oxidation resistant synthetic polymer;
2. Embossing said heated film to form a net like structure of substantially unoriented ribs and junctures which define a uniform pattern of openings throughout the structure, said ribs and junctures having substantially uniform cross-sectional areas throughout the structure; and
3. Stretching the embossed film in the longitudinal direction at a ratio of at least 3:1 and in the transverse direction at a ratio of at least 4:1 so that the total area stretch of the structure is from 12:1 to 40:1, whereby the ribs and junctures are substantially uniformly molecularly oriented throughout said sheet.

956 O.G.—53

4,013,753

## PROCESS FOR THE PRODUCTION OF SPONTANEOUSLY CRIMPING POLYACRYLONITRILE COMPOSITE FIBRES WITH IMPROVED CRIMP PROPERTIES

Hermann Lohwasser; Alfred Nagaj, and Horst Wieden, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 30, 1974, Ser. No. 510,576

Claims priority, application Germany, Oct. 9, 1973, 2350632

Int. Cl.<sup>2</sup> D01D 5/22

U.S. Cl. 264-168

7 Claims

1. A process for the production of spontaneously crimping polyacrylonitrile composite fibers which comprises side-by-side spinning of two different acrylonitrile polymers in dimethylformamide solution by the dry-spinning process, stretching the fibers which still contain dimethylformamide to at least three times their original length in a bath of hot water which contains from 12 to 30%, by weight, of dimethylformamide, and drying the stretched fibers under tension or under conditions of partial shrinkage.

4,013,754

## STATIC LEACHING COPPER ORE

John C. Stauter, and Gerald F. Pace, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed June 12, 1973, Ser. No. 369,379

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> C01G 3/00; C22B 3/00

U.S. Cl. 423-27

5 Claims

2. A process for static leaching copper mineral values from a source material comprising sizing said source material, contacting a first portion of said source material with an acid leach solution by adding said solution to said source material and percolating said acid leach solution through said source material, adding a sweep solution to said source material to displace said acid leach solution, recovering an effluent pregnant leach liquor from said source material, segregating the first portion of effluent pregnant leach liquor forming a first portion of concentrated pregnant leach liquor from the last portion of said effluent leach liquor forming a first portion of recycle leach liquor, contacting a second portion of said source material with said recycle acid leach solution by adding said recycle leach liquor to said source material and percolating said leach liquor through said source material, adding a sweep solution to said source material to displace said acid leach solution, recovering an effluent pregnant leach liquor from said source material, and segregating the first portion of effluent pregnant leach liquor forming a second portion of concentrated pregnant leach liquor from the last portion of said effluent leach liquor forming a second portion of recycle leach liquor.

4,013,755

## FILTRATION OF SOLID-CONTAINING TITANYL SULFATE SOLUTIONS

Raoul Weller, Berchem; Joffe Leuridan, Antwerp, and Jozef Renier, Kapellen, all of Belgium, assignors to Bayer Antwerpen N.V., Antwerpen, Belgium

Filed Nov. 5, 1975, Ser. No. 628,877

Claims priority, application Germany, Nov. 15, 1974, 2454220

Int. Cl.<sup>2</sup> C01G 23/00, 23/04

U.S. Cl. 423-82

2 Claims

1. In the production of a solid-free solution of titanyl sulfate by digesting ilmenite or titanium slag with sulfuric acid, re-



moving the non-digested particles from the solid-containing solution and filtering the solid-containing solution of titanyl sulfate to separate the solids, the improvement which comprises applying a filter aid to a membrane filter to form a coating thereon, adding a filter aid to the solid-containing solution of titanyl sulfate, filtering the solution in same membrane filter at a temperature of about 60 to 90° C and under a pressure of about 4 to 16 bars to form a filter cake of a thickness of about 10 to 35 mm, washing the filter cake with about 0.1 to 0.5 m<sup>3</sup> of wash liquid per m<sup>3</sup> of filtrate at a flow rate of about 0.1 to 1.2 m/h under a pressure of about 1 to 16 bars and squeezing the filter cake after washing to a solid content of about 50 to 70% by weight.

4,013,756

## PROCESS FOR PREPARING PHOSPHINE

Edward James Lowe, Stourton, near Stourbridge, and Frederick Arthur Ridgway, Stourbridge, both of England, assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 188,604, Oct. 12, 1971, Pat. No. 3,861,882, which is a continuation of Ser. No. 599,915, Dec. 7, 1966, abandoned. This application Nov. 29, 1974, Ser. No. 528,583

Int. Cl.<sup>2</sup> C01B 25/01, 25/02, 25/04

U.S. Cl. 423-299

6 Claims

1. A method for preparing phosphine which comprises quenching a vapor comprising P<sub>2</sub> molecules with a liquid at a temperature below the solidification point of red phosphorus, the reacting the thus formed red phosphorus at a temperature in excess of 250° C with water in the presence of sufficient phosphorus pentoxide to maintain the system in the liquid state at atmospheric pressure.

4,013,757

HIGH PRESSURE THERMAL HYDROLYSIS PROCESS TO DECOMPOSE TRIAZINES IN ACID WASTE STREAMS  
Sidney Berkowitz, Highland Park, and Charles V. Juelke, Belle Meade, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Apr. 17, 1975, Ser. No. 569,019

Int. Cl.<sup>2</sup> C01C 1/08

U.S. Cl. 423-358

3 Claims

1. A process for treating an acid waste stream having a pH of from about 0 to about 6 and containing a triazine ring compound selected from the group consisting of cyanuric acid, melamine, ammeline and ammelide, to effect decomposition of said triazine ring compound into the decomposition products ammonia and carbon dioxide, which comprises heating said acid waste stream at a temperature of from about 225° to about 275° C under the autogenously developed pressure for a time of from about one to about 15 minutes, until decomposition of said triazine ring compound into said decomposition products is effected, and recovering a waste stream having no detectable amount of said triazine ring compound.

4,013,758

## PROCESS FOR PREPARING HYDRAZINES

Hans Osborg, 80 Longview Road, Port Washington, N.Y. 11050

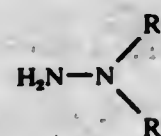
Filed Aug. 7, 1975, Ser. No. 602,837

Int. Cl.<sup>2</sup> C07C 109/00

U.S. Cl. 423-407

16 Claims

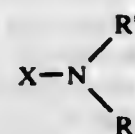
1. A process for preparing hydrazines of the formula:



wherein R and R' are each selected from hydrogen, phenyl

and lower alkyl, provided that when one of R and R' is phenyl, the other of R and R' is hydrogen, which comprises:

- providing a reaction mixture consisting essentially of equimolar proportions of the corresponding amine compound of formula:



wherein X is selected from chlorine or bromine; a corresponding amide selected from the group consisting of an alkali metal amide and an alkaline earth amide; and from about 50 to about 1,000 percent by weight of the amide, of an inert, non-aqueous carrier solvent for at least one of said amide and said amine, which is a liquid at temperatures within the range of from about -110° to about 200° C;

- reacting said amine compound with said amide compound in said reaction mixture, at a temperature of from 0° to about -50° C; and
- separating the desired hydrazine compounds from the resulting reaction mixture.

4,013,759

## ACETYLENE-LIKE BLACK AND PROCESS

Claude Giet, La Barthe de Neste, France, assignor to Societe Anonyme: Produits Chimiques Ugine Kuhlmann, Paris, France

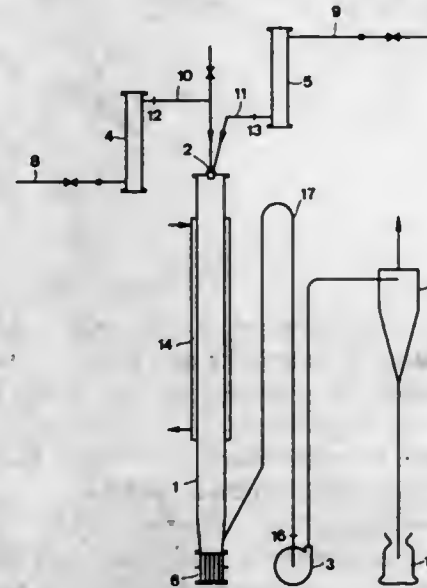
Filed May 15, 1974, Ser. No. 470,279

Claims priority, application France, May 15, 1973, 73.17581

Int. Cl.<sup>2</sup> C09C 1/48

U.S. Cl. 423-445

7 Claims



1. A carbon black having an electrical resistivity, measured under a pressure of 6.3 bars, in the range of 0.4 to 0.7 ohm/cm and a carbon content higher than 99%, having an adsorption capacity for water of filter index of at least about 80 gm of 3% acetic water for 5 gm of carbon black, a particle size, measured by nitrogen adsorption, of less than about 200 Å and a surface area in the range of 85 to 115 m<sup>2</sup>/gm.

4,013,760

## PROCESS FOR THE PRODUCTION OF ISOTROPIC PYROLYTIC CARBON PARTICLES

Hans Huschka, Grossauheim, and Franz-Josef Herrmann, Rodenbach, both of Germany, assignors to HOEGE Hochtemperaturreaktor-Brennelement GmbH, Grossauheim, Germany

Filed July 11, 1974, Ser. No. 487,786

Claims priority, application Germany, July 30, 1973, 2338562

Int. Cl.<sup>2</sup> C01B 31/02, 31/04

U.S. Cl. 423-449

9 Claims

1. A process of producing isotropic pyrolytic carbon particles of high heat conductivity comprising pyrolyzing a hydrocarbon gas on isotropic carbon granulates to form a deposit of isotropic pyrolytic carbon on the isotropic carbon granulates having a particle size above 100 μm and then grinding to form an isotropic carbon powder having a particle size below 100 μm and an average particle size larger than 5 μm.

4,013,761

## CHLORINE DIOXIDE GENERATION

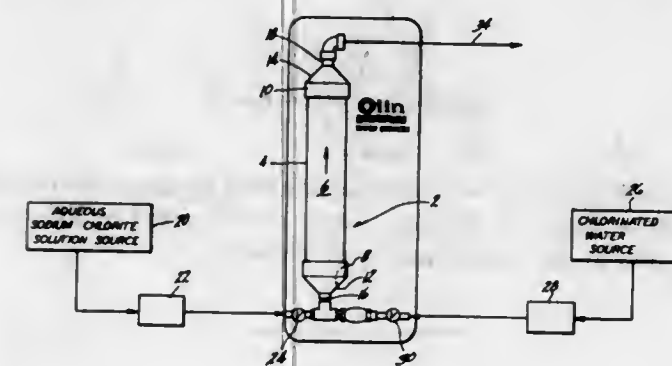
William J. Ward, Lenexa, and Kenneth E. Gasper, Overland Park, both of Kans., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 23, 1976, Ser. No. 651,685

Int. Cl.<sup>2</sup> C01B 11/02

U.S. Cl. 423-477

13 Claims



6. A method of generating chlorine dioxide and supplying an aqueous stream containing the generated chlorine dioxide, comprising:

- feeding an aqueous sodium chlorite solution to the inlet of a chlorine dioxide generation vessel, said vessel being made of an oxidizing agent-inert plastic material, and said vessel having walls defining a confined space for fluid flow in an overall mean flow direction approximately parallel to said walls; at least two reducing couplings, at least one of said couplings being located at one end of said vessel and attached to said walls to form an inlet and at least one other of said couplings being located at the other end of said vessel and attached to said walls to form an outlet, said couplings being attached to said vessel walls by solvent weld, said couplings having surfaces which reduce the cross-sectional area of said confined space defined by said vessel walls, said coupling surfaces forming an angle of at least 110° with said vessel walls; said aqueous sodium chlorite solution being fed to the inlet by metering the aqueous sodium chlorite solution from an aqueous sodium chlorite solution source to said inlet via an injection check valve;
- feeding an aqueous sodium hypochlorite solution to said inlet by metering the sodium hypochlorite solution through an injection check valve to said inlet at a rate of about 0.4 to about 1.0 moles of sodium hypochlorite per mole of sodium chlorite;
- feeding a mineral acid to said inlet by metering the mineral acid through an injection check valve to said inlet at a rate of about 0.10 to about 1.0 moles of mineral acid per mole of sodium chlorite;

- mixing and reacting said sodium chlorite solution, said sodium hypochlorite solution and said mineral acid in said vessel and minimizing the heat buildup resulting from the exothermic reaction by feeding a water stream to said vessel; and
- withdrawing from the outlet of said vessel an aqueous stream containing chlorine dioxide reaction product.

4,013,762

## GROWTH PROMOTION

Harvey D. Benson, Cincinnati; Joyce Francis Grunwell, Hamilton; John O'Neal Johnston, Cincinnati, all of Ohio, and Vladimir Petrow, Chapel Hill, N.C., assignors to Richardson-Merrell Inc., Wilton, Conn.

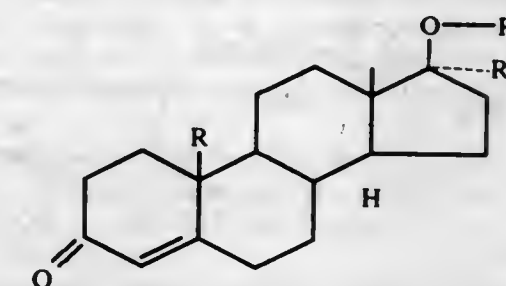
Filed May 10, 1976, Ser. No. 684,947

Int. Cl.<sup>2</sup> A61K 31/56

U.S. Cl. 424-242

11 Claims

1. A method of promoting the growth of poultry and ruminants which comprises administering thereto a growth promoting effective amount of a compound of the formula:



wherein R is -CHO or -CH<sub>2</sub>OR<sub>1</sub>; each of R<sub>1</sub> and R<sub>2</sub> is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 20 carbon atoms and is straight or branched, benzoyl, phenylalkylcarbonyl wherein the alkyl moiety has from 1 to 6 carbon atoms and is straight or branched or cycloalkylcarbonyl wherein the cycloalkyl moiety has from 5 to 10 carbon atoms; R<sub>3</sub> is hydrogen; or R<sub>2</sub> and R<sub>3</sub> together form a double bond between the 17-position carbon atom and the oxygen atom.

4,013,763

## HETEROCYCLIC COMPOUNDS

Yutaka Kuwada; Kanji Meguro; Hideaki Natsugari; Yoshiaki Sato, all of Hyogo, and Hiroyuki Tawada, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed July 3, 1975, Ser. No. 592,814

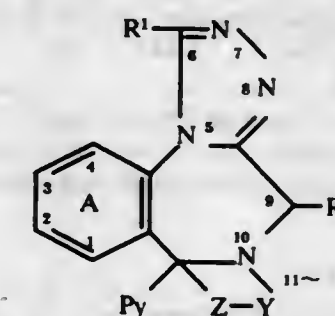
Claims priority, application Japan, July 12, 1974, 49-80646; July 25, 1974, 49-85787

Int. Cl.<sup>2</sup> C07D 491/22

U.S. Cl. 424-246

27 Claims

1. A heterocyclic compound of the general formula



wherein R<sup>1</sup> represents a hydrogen atom or a straight chain alkyl, branched alkyl or cyclic alkyl, said alkyl groups having up to 6 carbon atoms, a benzyl, phenethyl, phenyl, tolyl or naphthyl group; R<sup>2</sup> represents hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms; Py represents a pyridyl group; Y represents an ethylene or a trimethylene group which may have lower alkyl group as substituent; Z represents

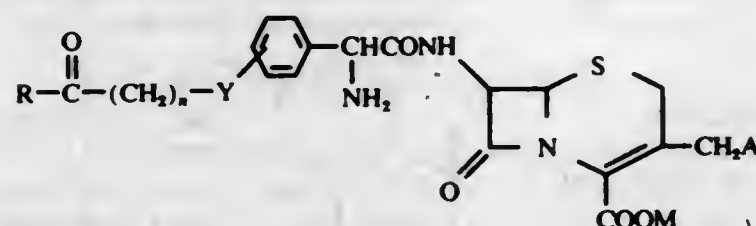


an oxygen atom, a sulfur atom or —NH—group; and the ring A is either unsubstituted or substituted by a halogen atom, nitro, alkyl, alkoxy or trifluoromethyl group, said alkyl or alkoxy group containing from 1 to 4 carbon atoms.

**4,013,764**  
**PHARMACEUTICAL COMPOSITIONS COMPRISING**  
**SUBSTITUTED PHENYLGLYCYLCEPHALOSPORINS**  
**AND METHODS OF TREATING BACTERIAL**  
**INFECTIONS**

John Gerald Gleason, Cornwells Heights, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.  
 Division of Ser. No. 384,771, Aug. 1, 1973, Pat. No. 3,953,439.  
 This application Dec. 15, 1975, Ser. No. 640,999  
 Int. Cl.<sup>2</sup> A61K 31/54

U.S. Cl. 424—246 14 Claims  
 8. A method of treating bacterial infections comprising administering by injection to a warm-blooded animal a pharmaceutical composition comprising an effective but non-toxic dose of 250 to 1000 mg of a compound of the formula:

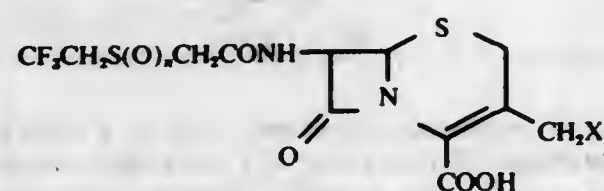


in which:

Y is O, NH or S;  
 n is 1 to 5;  
 R is NH<sub>2</sub> or OR', where R' is hydrogen or lower alkyl of from one to four carbon atoms;  
 M is hydrogen or an alkali metal or ammonium cation;  
 A is SHet and  
 Het is a five or six membered heterocyclic group containing carbon and one to four atoms selected from the group consisting of N, O and S, each such group being unsubstituted or substituted with from one to two groups selected from lower alkyl, alkoxyalkyl, each alkoxy or alkyl having from one to four carbon atoms, hydroxy, trifluoromethyl and SR', where R' is hydrogen or alkyl of from 1 to 4 carbon atoms,  
 and a pharmaceutically acceptable carrier therefor.

**4,013,765**  
**COMPOSITIONS AND METHODS FOR TREATING**  
**BACTERIAL INFECTIONS WITH SUBSTITUTED**  
**ACETAMIDOCEPHALOSPORINS**  
 Robert M. DeMarinis, King of Prussia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.  
 Division of Ser. No. 428,536, Dec. 26, 1973, Pat. No. 3,957,770. This application Dec. 29, 1975, Ser. No. 644,475  
 Int. Cl.<sup>2</sup> A61K 31/54

U.S. Cl. 424—246 20 Claims  
 11. A method of treating bacterial infections comprising administering by injection to a warm-blooded animal an effective but non-toxic dose of 250–1000 mg of a compound of the formula

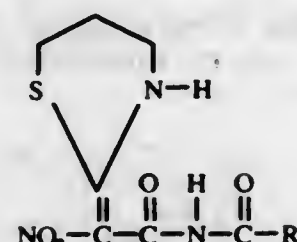


where  
 n is 0, 1, or 2;  
 X is SHet; and

Het is a 5 or 6-membered heterocyclic ring containing carbon and 1–4 atoms selected from the group consisting of N, O, and S, unsubstituted or substituted with one or two substituents selected from the group consisting of alkyl of C<sub>1</sub>–C<sub>6</sub>, alkoxy of C<sub>1</sub>–C<sub>6</sub>, allyloxy, oxide, halogen, carbamyl, carboxyl, carbalkoxy of C<sub>1</sub>–C<sub>6</sub>, mercapto, methylthio trifluoromethyl, hydroxy, amino, alkylamino and dialkylamino, each undefined alkyl having 1–6 carbon atoms

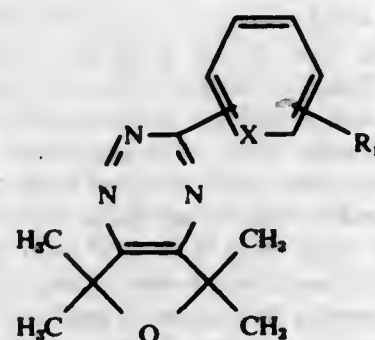
or a non-toxic pharmaceutically acceptable salt thereof.

**4,013,766**  
**N-(NITRO(TETRAHYDRO-2H-1,3-THIAZIN-2-**  
**YLIDENE)ACETYL)BENZAMIDES**  
 Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.  
 Filed Mar. 26, 1976, Ser. No. 670,765  
 Int. Cl.<sup>2</sup> C07D 279/06; A61K 31/54  
 U.S. Cl. 424—246 3 Claims  
 1. A compound of the formula:



wherein R is phenyl or phenyl substituted by from one to three of one or more of halogen, nitro, cyano, alkyl or alkoxy of from one to six carbon atoms or phenoxy.

**4,013,767**  
**3-PYRIDYL AND**  
**PYRIDYL-N-OXIDE-FURO[3,4-E]-AS-TRIAZINES**  
 Gregory B. Bennett, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.  
 Filed Aug. 15, 1975, Ser. No. 605,069  
 Int. Cl.<sup>2</sup> C07D 253/08; A61K 31/53  
 U.S. Cl. 424—249 9 Claims  
 1. A compound of the formula



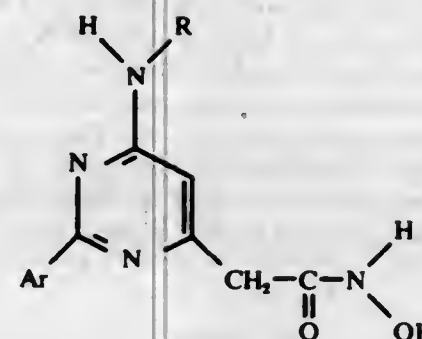
wherein  
 R<sub>1</sub> represents hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, straight chain lower alkoxy, or trifluoromethyl and  
 X represents N or N→O,  
 provided that when R<sub>1</sub> represents t-butyl or trifluoromethyl, R<sub>1</sub> and the triazine ring are on other than adjacent carbon atoms,  
 or a pharmaceutically acceptable salt thereof.

**4,013,768**  
**PYRIMIDIN-6-yl ACETHYDROXAMIC ACIDS, THEIR**  
**THERAPEUTIC APPLICATION AND THEIR PROCESS OF**  
**PREPARATION**

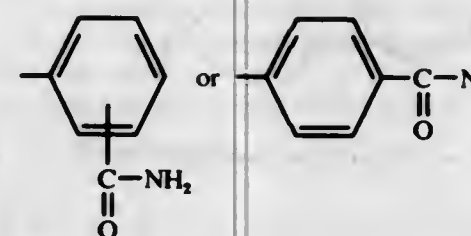
Claude P. Fauran, Paris; Jeannine A. Eberlé, Chatou; Guy R. Bourgerie, Colombes; Guy M. Raynaud, Paris, and Claude J. Gouret, Meudon, all of France, assignors to Delalande S.A., Courbevoie, France

Filed Mar. 3, 1975, Ser. No. 554,532  
 Claims priority, application France, Mar. 19, 1974, 74.09235

Int. Cl.<sup>2</sup> C07D 239/26 12 Claims  
 U.S. Cl. 424—251  
 1. A compound having the formula



wherein R is



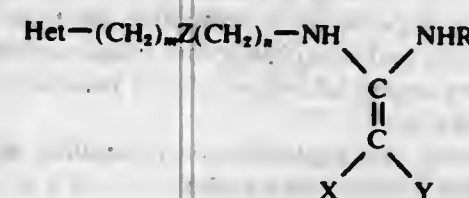
in which

is pyrrolidino or piperidino, and Ar is phenyl substituted by one chloro, one fluoro, one trifluoromethyl, one methylenedioxy or by one or more methoxy,  
 or the hydrochloric acid addition salt thereof.

12. A composition for treating a condition of circulatory insufficiency, gastro-duodenal ulcers, respiratory insufficiency, hypertension, edema, depression, pain, inflammation or cerebral deficit, comprising an effective amount of a compound as claimed in claim 1 for treating the condition, together with a therapeutically acceptable carrier.

**4,013,769**  
**PYRIDYL-ALKYLAMINOETHYLENE COMPOUNDS**  
 Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote; Charon Robin Ganellin, Welwyn Garden City, and Hunter Douglas Prain, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England  
 Continuation-in-part of Ser. No. 468,617, May 9, 1974, Pat. No. 3,953,460. This application Nov. 5, 1975, Ser. No. 629,194

Int. Cl.<sup>2</sup> A61K 31/44; C07D 213/28  
 U.S. Cl. 424—263 9 Claims  
 1. A compound of the formula:

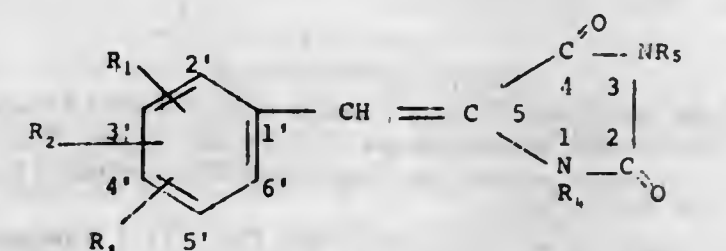


wherein X and Y, which may be the same or different, are hydrogen, nitro, cyano or SO<sub>2</sub>Ar but are not both hydrogen or both nitro; R is Het'(CH<sub>2</sub>)<sub>m</sub> Z'(CH<sub>2</sub>)<sub>n</sub>; Z and Z' are —S— or methylene; m and m<sub>1</sub> are 0, 1 or 2 and n and n<sub>1</sub> are 2 or 3, provided that each of the sum of m and n and the sum of m<sub>1</sub> and n<sub>1</sub> is 3 or 4; Het is a pyridine ring which ring is optionally substituted by lower alkyl, hydroxyl, halogen or amino; Het' is a nitrogen containing 5 membered heterocyclic ring selected from imidazole, oxazole, isoxazole or triazole which ring is optionally substituted by lower alkyl, hydroxyl, halogen or amino; and Ar is phenyl optionally substituted by halogen or methyl, or a pharmaceutically acceptable acid addition salt thereof.

8. A method of inhibiting H-2 histamine receptors which comprises administering orally or parenterally to an animal, in an effective amount to inhibit said receptors, a compound of claim 1.

**4,013,770**  
**ANTIVIRAL 5-(SUBSTITUTED BENZAL) HYDANTOINS**  
 Kekhusroo R. Bharucha, Toronto; Djordje Ajdukovic, Montreal; Vytautas Pavilans, Westmount, and Heinrich Maria Schrenk, Don Mills, all of Canada, assignors to Canada Packers Limited, Toronto and The Institute of Microbiology and Hygiene of the University of Montreal, Ville Laval, both of Canada  
 Continuation-in-part of Ser. No. 262,920, June 16, 1972, abandoned. This application June 11, 1974, Ser. No. 478,310  
 Int. Cl.<sup>2</sup> A61K 31/415

U.S. Cl. 424—273 16 Claims  
 1. A therapeutic composition in dosage unit form comprising a solid or sterile liquid pharmaceutical carrier and from about 1 to 500 milligrams of a compound of the formula:

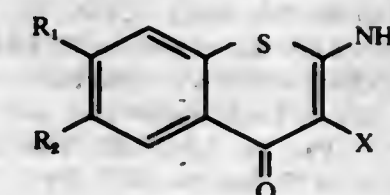


wherein:

Formula I includes individual geometrical isomers and mixtures thereof,  
 R<sub>1</sub> is hydrogen or alkoxy of 1 to 4 carbon atoms and R<sub>2</sub> and R<sub>3</sub> are each alkoxy of 1 to 4 carbon atoms;  
 and R<sub>4</sub> and R<sub>5</sub> are each hydrogen or an alkanoyl group containing from 1 to 20 carbon atoms with the proviso that one of R<sub>4</sub> and R<sub>5</sub> is an alkanoyl group.

**4,013,771**  
**SUBSTITUTED 2-AMINOTHIOCHROMONES**  
 Richard E. Brown, East Hanover, and David M. Lustgarten, Dover, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 15, 1975, Ser. No. 640,667  
 Int. Cl.<sup>2</sup> C07D 335/06 8 Claims  
 1. A compound of the Formula I:



wherein R<sub>1</sub> and R<sub>2</sub> each represent hydrogen, lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms or halogen; and X represents cyano carboxamido.



4,013,772

## FUNGICIDAL METHODS EMPLOYING SUBSTITUTED OXIRANE COMPOUNDS

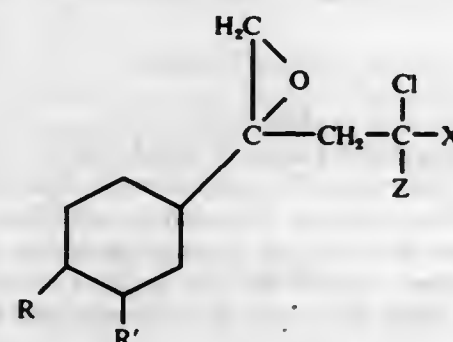
Thomas M. Ozretich, Vancouver, Wash., assignor to The Dow Chemical Company, Midland, Mich.  
Division of Ser. No. 294,339, Oct. 2, 1972, Pat. No. 3,930,835, which is a continuation-in-part of Ser. No. 61,848, Aug. 6, 1970, abandoned. This application Mar. 5, 1975, Ser. No. 555,465

Int. Cl.<sup>2</sup> A01N 9/28

U.S. Cl. 424—278

2 Claims

1. A method of controlling fungal organisms comprising applying to said fungal organisms and/or their habitats a fungicidal amount of a compound of the formula:



wherein X represents halogen; Z represents hydrogen, halogen, cyano or lower alkyl of 1 to 4 carbon atoms; R and R' each independently represent hydrogen, halogen, cyano, nitro, alkoxy of 1 to 4 carbon atoms, trifluoromethyl, benzyloxy or lower alkyl of 1 to 4 carbon atoms, with the proviso that when R' is hydrogen, R is other than hydrogen.

4,013,773

## SOLID COMPOSITION

Masuo Murakami, Hirotsu Kawada, both of Tokyo; Tadayoshi Ohmura, Higashikurume, and Hiroshi Sugiura, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 312,972, Dec. 7, 1972, abandoned  
This application Feb. 4, 1975, Ser. No. 547,022

Claims priority, application Japan, Dec. 9, 1971, 46-99676

Int. Cl.<sup>2</sup> A61K 31/355, 31/22

U.S. Cl. 424—284

2 Claims

1. A single phase solid composition consisting of one part of Vitamin E acetate and 0.5-6 parts of calcium lactate hydrate.

4,013,774

## INSECTICIDAL N-THIO-SUBSTITUTED CARBAMATES OF DIHYDROBENZOFURANOLS

Melancthon S. Brown, deceased, late of Berkeley, Calif. (by Gustave K. Kohn, special administrator), and Gustave K. Kohn, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

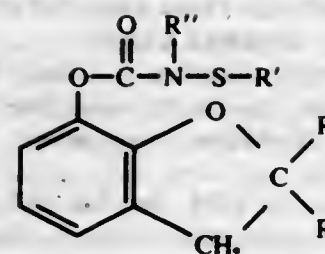
Division of Ser. No. 490,178, July 29, 1974, Pat. No. 3,897,463, which is a division of Ser. No. 317,317, Dec. 21, 1972, Pat. No. 3,847,951, which is a continuation-in-part of Ser. Nos. 235,796, March 17, 1972, abandoned, and Ser. No. 235,797, March 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,117, Feb. 28, 1972, Pat. No. 3,792,169, which is a division of Ser. No. 855,421, Sept. 4, 1969, Pat. No. 3,663,594, which is a continuation-in-part of Ser. No. 764,299, Oct. 1, 1968, abandoned, and Ser. No. 250,908, May 8, 1972, Pat. No. 3,843,689. This application June 13, 1975, Ser. No. 587,195

Int. Cl.<sup>2</sup> A01N 9/28

U.S. Cl. 424—285

30 Claims

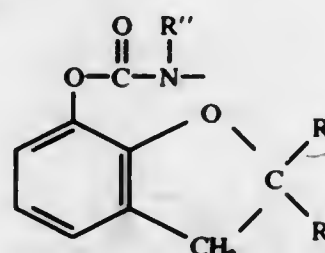
1. A method for killing insects which comprises contacting said insects or their hosts with an insecticidally effective amount of a compound of the formula



wherein

R and R'' individually are hydrogen or alkyl of 1 to 4 carbon atoms;

R' is alkyl of 1 to 12 carbon atoms; alkenyl of 2 to 12 carbon atoms; monocyclic or bicyclic aryl of 6 to 10 carbon atoms; alkyl of 2 to 12 carbon atoms substituted with 1 to 5 fluorine, chlorine or bromine atoms; alkenyl of 2 to 12 carbon atoms substituted with 1 to 5 fluorine, chlorine or bromine atoms; monocyclic or bicyclic aryl of 6 to 10 carbon atoms substituted with 1 to 5 fluorine, chlorine or bromine atoms, or 1 to 2 nitro groups; or



wherein R and R'' individually are hydrogen or alkyl of 1 to 4 carbon atoms.

4,013,775

## PROCESS FOR PREPARING A SUGAR TABLET

Arthur L. Nelson, West Chester, Pa.; Donald J. Skrabacz, Cicero, and Burbank Young, Lockport, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 254,552, May 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 141,030, May 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 767,520, Oct. 14, 1968, abandoned. This application July 3, 1974, Ser. No. 485,480  
Int. Cl.<sup>2</sup> A61J 3/10; A23G 3/00

U.S. Cl. 426—285

3 Claims

1. A process for preparing a sugar tablet which comprises:  
a. uniformly admixing to a wet, centrifuged cake sugar of crystalline dextrose having from about 12 to about 15% by weight moisture therein, said moisture including about 9% by weight water of hydration and about 2 to about 4% by weight of a low D.E. starch hydrolysate having a D.E. in the range from about 10 to about 13 and a descriptive ratio of at least about 2, wherein the descriptive ratio is the sum of the percentages of saccharides with a degree of polymerization of 1 to 6 divided by the D.E.;  
b. drying and continuing to mix the admixture of centrifuged cake sugar of crystalline dextrose and starch by hydrolysate;  
c. recovering a substantially non-hygroscopic agglomerated crystalline dextrose and starch hydrolysate which passes through a screen having at least a Tyler No. 10 mesh, said recovered agglomerated crystalline dextrose exhibiting bulk density and compressibility characteristics capable of forming strong tablets which are resistant to breaking and dusting; and  
d. compressing said agglomerated crystalline dextrose and starch hydrolysate into a tablet.

4,013,776

## PHENYLSULPHINYL-AMIDINE DERIVATIVES

Victor Lafon, Paris, France, assignor to Societe Anonyme dite: Laboratoire L. Lafon, Maisons-Alfort, France

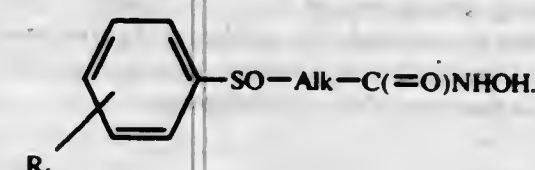
Filed Sept. 29, 1975, Ser. No. 617,665

Claims priority, application United Kingdom, Sept. 30, 1974, 42387/74  
Int. Cl.<sup>2</sup> C07C 119/00, 103/30, 83/08; A61K 31/185

U.S. Cl. 424—315

7 Claims

1. A phenylsulphinyl derivative of the formula:



in which R<sub>1</sub> is at least one substituent selected from the group consisting of H, F, Cl, Br, CF<sub>3</sub>, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy and NO<sub>2</sub>, and Alk represents a C<sub>2</sub>-C<sub>4</sub> hydrocarbon radical having a linear or branched chain.

4,013,777

## BIS-PHENOXYPROPANOLAMINES

Donald F. Colella, Cornwells Heights, Pa., and Carl Kaiser, Haddon Heights, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

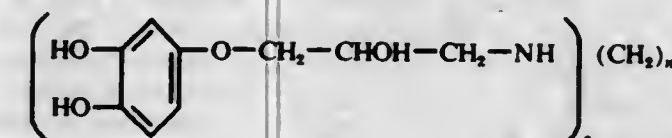
Filed Aug. 22, 1975, Ser. No. 606,916

Int. Cl.<sup>2</sup> A01N 9/20; C07C 91/16

U.S. Cl. 424—316

5 Claims

1. A chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound, wherein n is from 2 to 8.

4. A pharmaceutical composition in dosage unit form having  $\beta$ -adrenergic stimulant activity comprising a pharmaceutical carrier and an effective amount of the chemical compound as defined in claim 1.

5. The method of producing  $\beta$ -adrenergic stimulant activity which comprises administering internally to animals requiring bronchodilation an amount sufficient to produce said activity a chemical compound as defined in claim 1.

4,013,778

## METHOD FOR REDUCING BLOOD PRESSURE

Glenn C. Morrison, Dover, and Wlaczslaw A. Cetenko, Parsippany, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 494,793, Aug. 5, 1974, Pat. No. 3,973,016.

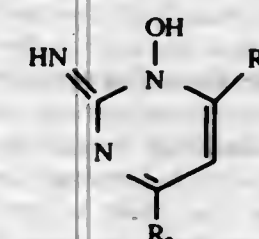
This application Sept. 29, 1975, Ser. No. 617,546

Int. Cl.<sup>2</sup> C07D 239/70

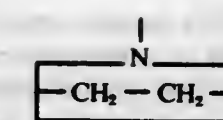
U.S. Cl. 424—251

4 Claims

1. A hydroxypyrimidine of the formula:



wherein R<sub>1</sub> is CH<sub>3</sub> or -NH<sub>2</sub>; and wherein R<sub>2</sub> is



4,013,779

## PROCESS FOR REMOVAL OF AMMONIA, HYDROGEN SULFIDE AND HYDROGEN CYANIDE FROM GASES CONTAINING THESE SUBSTANCES

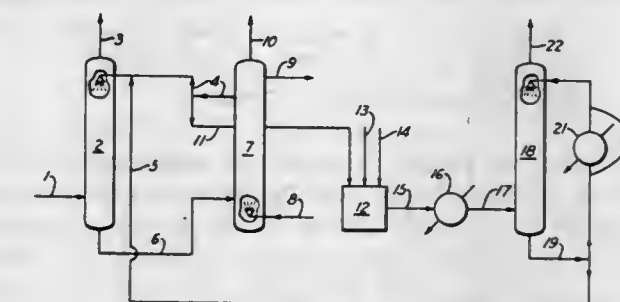
Egon Haese, Bochum, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Jan. 2, 1974, Ser. No. 430,233

Claims priority, application Germany, Dec. 30, 1972, 2264264  
Int. Cl.<sup>2</sup> C01B 17/04; B01D 53/34

U.S. Cl. 423—573 R

11 Claims



1. A process for removing gaseous ammonia, hydrogen sulfide and hydrogen cyanide forming part of gas from coke plants and the like, said process including the steps of:  
washing said gas with an aqueous metallic salt solution of a salt selected from the group consisting of iron salts, manganese salts and magnesium salts and formed by an acid selected from the group consisting of sulfuric acid and sulfurous acid to absorb gaseous ammonia, hydrogen sulfide and hydrogen cyanide;  
oxidizing the metallic salt solution bearing the absorbed gases to form and precipitate elemental sulfur;  
recovering the elemental sulfur from the solution;  
returning a first portion of the resulting oxidized solution to the gas washing step;  
heating the remaining portion of the resulting oxidized metallic salt solution to a temperature of at least 900° C to produce products of combustion including nitrogen, water vapor, the acid anhydride of said acid and metallic oxide of the metal of said salt;  
cooling said acid anhydride of said acid in the presence of said metallic oxide of the metal of said salt together with sufficient quantities of water to produce said aqueous metallic salt solution; and  
using the produced aqueous metallic salt solution together with said first portion of said oxidized metallic salt solution to wash further quantities of said gaseous ammonia, hydrogen sulfide and hydrogen cyanide from the gas.

4,013,780

## RECOVERY OF IODINE FROM BRINE WITH LINEAR ALKYL BENZENE SOLVENTS

Kishan K. Seth, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 17, 1975, Ser. No. 632,199

Int. Cl.<sup>2</sup> C01B 7/14

U.S. Cl. 423—501

14 Claims

1. A process for extracting free iodine from brine comprising contacting said brine containing free iodine with an organic solvent substantially inert to said iodine and substantially insoluble in said brine, said solvent being a substituted aromatic hydrocarbon which is a linear alkyl benzene compound or mixture of linear alkyl benzene compounds having



from about 6 to about 14 carbon atoms in the alkyl chains which is normally liquid at room temperature and having an extraction distribution coefficient of at least 10, at a solvent to brine ratio of from about 1:10 to about 1:100 parts per part by weight and recovering said free iodine from said solvent.

4,013,781

# PROCESS FOR OBTAINING HYDROGEN AND OXYGEN FROM WATER USING IRON AND CHLORINE

Rudolf Schulten, Richterich, Germany, assignor to Rheinische Braunkohlenwerke AG, Cologne, Germany

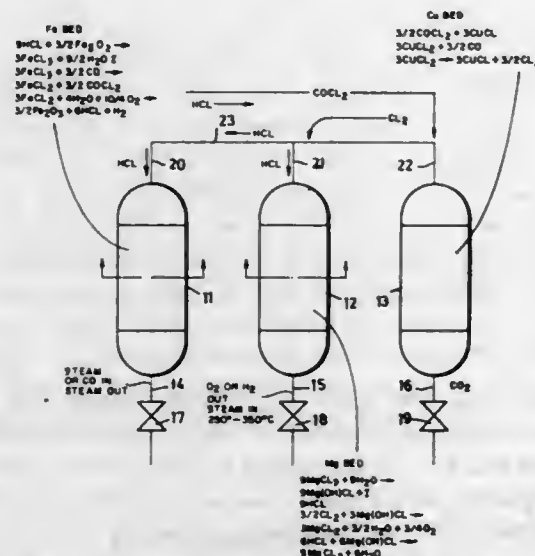
Filed July 12, 1974, Ser. No. 488,189

Claims priority, application Germany, July 14, 1973, 2336017

Int. Cl.<sup>2</sup> C01B 13/00

U.S. Cl. 423—579

5 Claims



1. A process for obtaining hydrogen and oxygen from water in a multi-step circulatory process using iron compounds and chlorine as adjuvants, in which the circulatory process is carried out in a system of three beds which respectively contain inorganic compounds of magnesium, iron and copper, wherein the process comprises the following steps:

- passing steam at a temperature of approximately 250°–350° C. through a first bed containing magnesium chloride, and passing the hydrogen chloride produced thereby through a second bed containing ferric oxide to convert the ferric oxide to ferric chloride;
- passing carbon monoxide through the ferric chloride converting this to ferrous chloride, and passing the resultant chlorine carried as phosgene in the carbon monoxide stream through a third bed containing cuprous chloride, converting the cuprous chloride to cupric chloride;
- passing an inert gas heated to approximately 600°–800° C. through the cupric chloride, converting the cupric chloride to cuprous chloride and producing chlorine which is passed through the magnesium bed to liberate oxygen and reform magnesium chloride; and
- passing steam heated to approximately 600°–800° C. through the second bed with the addition of a small amount of oxygen to convert the ferrous chloride into ferric oxide and liberate hydrogen and hydrogen chloride, the oxygen and hydrogen produced in the conversion steps being withdrawn.

5. A process for obtaining hydrogen and oxygen from water in a multi-step circulatory process using iron compounds and chlorine as adjuvants, in which the circulatory process is carried out in a system of three beds which respectively contain inorganic compounds of magnesium, iron and copper, wherein the process comprises the following steps:

- passing steam at a temperature of approximately 250°–350° C. through a first bed containing magnesium chloride, and passing the hydrogen chloride produced thereby through a second bed containing ferrous-ferric

oxide to convert the ferrous-ferric oxide to ferrous-ferric chloride;

- passing carbon monoxide through the ferrous-ferric chloride, and passing the resultant chlorine carried as phosgene in the carbon monoxide stream through a third bed containing cuprous chloride, converting the cuprous chloride to cupric chloride;
- passing an inert gas heated to approximately 600°–800° C. through the cupric chloride, converting the cupric chloride to cuprous chloride and producing chlorine which is passed through the magnesium bed to liberate oxygen and reform magnesium chloride; and
- passing steam heated to approximately 600°–800° C. through the second bed to liberate hydrogen and hydrogen chloride, the oxygen and hydrogen produced in the conversion steps being withdrawn.

4,013,782

# PROCESS FOR THE OXIDATION OF A METAL HALIDE IN THE VAPOR PHASE

Stanley Powell, Stockton-on-Tees, and Glyn Thomas, Middlesbrough, both of England, assignors to Tioxide Group Limited, Billingham, England

Filed Feb. 13, 1974, Ser. No. 441,941

Claims priority, application United Kingdom, Mar. 22, 1973, 13752/73

Int. Cl.<sup>2</sup> C01B 13/14

U.S. Cl. 423—613

10 Claims

1. A process for the oxidation of a metal halide in the vapour phase to produce particles of the corresponding metal oxide, said process comprising forming the lateral walls of a reaction zone from crimped annular plates separated by uncrimped annular plates, the plane of said annular plates being essentially perpendicular to the longitudinal axis of the reaction zone, introducing reactants into the reaction zone, at least one of which is introduced radially through the orifices formed between the crimped and uncrimped annular plates by first passing said reactant through means surrounding said reaction zone walls for facilitating uniform introduction of reactants through said orifices, maintaining the temperature in the reaction zone sufficiently high for the reactants to react, passing the particulate metal oxide reaction products from the reaction zone into a reaction-completion zone and thereafter into a quenching zone wherein sufficient cooling gas is introduced to reduce the temperature of the resulting mixture to below about 600° C.

4,013,783

# PANCHROMATICALLY SENSITIVE ZINC OXIDE

Jan A. de Putter, Lomm, and Johannes Kortenoeven, Helden-Panningen, both of Netherlands, assignors to Oec-van der Grinten N.V., Venlo, Netherlands

Filed Apr. 30, 1975, Ser. No. 573,140

Claims priority, application Netherlands, May 3, 1974, 7405944

Int. Cl.<sup>2</sup> C01G 9/02; G03G 5/08

U.S. Cl. 423—622

8 Claims

1. In a process for producing a panchromatically sensitive zinc oxide, wherein finely divided zinc oxide is reacted with ammonia gas and carbon dioxide gas and the reaction product is heated to constant weight at a temperature between 190° and 350° C, the improvement which comprises keeping the zinc oxide particles mutually in motion during the reacting of them with the ammonia and carbon dioxide and terminating said reacting at a stage thereof at which the zinc oxide product will have a sensitivity to moisture so low that it exhibits a half-potential dark discharge time of at least 25 seconds, in that at least 25 seconds is required for a photoconductive layer made with the zinc oxide to reach half its maximum charging potential by discharge from that potential in the dark, where said layer is composed of the zinc oxide and a moisture-insensitive binder in the weight ratio of 7:1, applied

to a thickness of approximately 15 microns on a conductive support, and upon being charged to the maximum potential the photoconductive layer is kept in the dark, in air having a temperature of 40° C. and a dew point of 28° C., until its potential has dropped to half the maximum potential.

7. A panchromatically sensitive zinc oxide consisting essentially of a thermally stabilized, panchromatically sensitive reaction product of finely divided zinc oxide and ammonia and carbon dioxide gases, said product containing nitrogen in its crystal lattice and have been heated to constant weight at a temperature between 190° and 350° C. and having a sensitivity to moisture so low that it exhibits a half-potential dark discharge time of at least 25 seconds, in that at least 25 seconds is required for a photoconductive layer made with the zinc oxide to reach half its maximum charging potential by discharge from that potential in the dark, where said layer is composed of the zinc oxide and a moisture-insensitive binder in the weight ratio of 7:1, applied to a thickness of approximately 15 microns on a conductive support, and upon being charged to the maximum potential the photoconductive layer is kept in the dark, in air having a temperature of 40° C. and a dew point of 28° C., until its potential has dropped to half the maximum potential.

4,013,784

# DELAYED RELEASE PHARMACEUTICAL PREPARATIONS

Peter Spelser, Clausiusstr. 25, 8006 Zurich, Switzerland

Filed Oct. 2, 1974, Ser. No. 511,174

Claims priority, application Germany, Dec. 6, 1973, 2360796

Int. Cl.<sup>2</sup> A61K 9/22

U.S. Cl. 424—19

10 Claims

1. A delayed release pharmaceutical preparation in granular form comprising intermixed particles of at least one orally administrable therapeutically active agent and a substantially non-toxic water-soluble calcium salt selected from the group consisting of calcium levulinate, calcium gluconate, calcium citrate and calcium chloride, at least part of said particles of said agent and said salt being enveloped by solidifying a melt of at least one triglyceride of a fatty acid of 12 to 18 carbon atoms, said salt being present in an amount to provide at least 1½ moles of calcium ion for each mole of said triglyceride and forming a substantially insoluble calcium soap with the fatty acid produced upon hydrolysis of said triglyceride in the intestinal tract, the granules of said preparation being of a grain size between about 0.1 mm. and about 1.0 mm. and containing between about 1 and 50% of said agent.

4,013,785

# APAP TABLET CONTAINING FUMED SILICA AND PROCESS FOR MANUFACTURING SAME

Leonard Weintraub, Millburn, and Allan H. Rosenberg, Randolph, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,913

Int. Cl.<sup>2</sup> A61K 47/00

U.S. Cl. 424—23

13 Claims

1. A process for preparing a tablet containing n-acetyl-p-aminophenol in therapeutically effective quantities which comprises:

- forming a solution of n-acetyl-p-aminophenol in an organic solvent containing from about 1 to 30% by weight of n-acetyl-p-aminophenol based on the total weight of said solution;
- distributing in said solution from about 5.2% to 25% by weight based on the weight of n-acetyl-p-aminophenol of powdered fumed silicon dioxide to form a dispersion or suspension of said powdered fumed silicon dioxide is said solution;
- drying said dispersion or suspension to form a dried mix comprising n-acetyl-p-aminophenol and fumed silicon dioxide; and

d. pressing a quantity of tableting mix containing said dried particulate mix comprising a unit dosage amount of n-acetyl-p-aminophenol and fumed silicon dioxide to form a tablet;

said organic solvent being selected so that said n-acetyl-p-aminophenol is soluble therein and said fumed silicon dioxide is substantially insoluble therein; the relative amounts of said n-acetyl-p-aminophenol and said fumed silicon dioxide employed being such that said dried mix contains from about 5 to 20% by weight of said fumed silicon dioxide based on the combined weight of n-acetyl-p-aminophenol and fumed silicon dioxide.

4,013,786

# HAIR CREME RINSES AND HAIR CONDITIONERS CONTAINING HYDROPHOBIC-LIPOPHOBIC PERFLUORINATED COMPOUNDS

John A. Cella, Plandome Mills, N.Y.; August Emil Fiebig, Jr., Chicago, and Franz J. Pum, Glen Ellyn, both of Ill., assignors to Alberto Culver Company, Melrose Park, Ill.

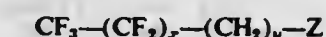
Filed May 31, 1974, Ser. No. 474,953

Int. Cl.<sup>2</sup> A61K 7/08

U.S. Cl. 424—70

12 Claims

1. A composition, for treating human live hair, selected from the class consisting of creme rinses and hair conditioners having an aqueous carrier, which includes, as an ingredient thereof, a hydrophobic-lipophobic compound of anionic, cationic, nonionic or amphoteric character corresponding to the formula



where Z comprises a member selected from the class consisting of a water-solubilizing group and an oil-solubilizing group, x is an integer from 2 to 17, and y is an integer from 0 to 4, said compound being present in proportions, based on the weight of the composition, in the range of about 0.05% to not in substantial excess of the solubility or ready dispersibility of said compound in the composition and not in excess of 10%.

4,013,787

# PIPERAZINE BASED POLYMER AND HAIR TREATING COMPOSITION CONTAINING THE SAME

Guy Varlerberghe, Montjay-la-Tour par Claye-Souilly, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 310,088, Nov. 28, 1972, Pat. No. 3,917,817. This application July 29, 1975, Ser. No. 600,188

Claims priority, application Luxembourg, Nov. 29, 1971, 64371; France, Aug. 2, 1974, 74,27030

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> A61K 7/06

U.S. Cl. 424—70

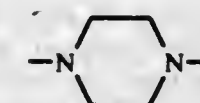
20 Claims

1. A cosmetic composition for conditioning the hair comprising a solution in a solvent selected from the group consisting of water and water-lower alkanol, of a member selected from the group consisting of

- a film-forming cationic polymer having a molecular weight of about 1,000 to 15,000 and having the formula



wherein A represents



and Z represents B and B' wherein B and B' each indepen-



dently represent a bivalent radical selected from the group consisting of (i) hydroxypropylene, (ii) alkylene having up to 5 carbon atoms inclusive and interrupted by 1-2 members selected from the group consisting of  $-\text{CONH}-$ ,



and  $-\text{CONH}-\text{R}_1-\text{NHCO}-$  wherein  $\text{R}_1$  represents alkylene having up to 6 carbon atoms, (iii) hydroxy alkylene wherein the alkylene moiety has up to 6 carbon atoms inclusive and interrupted by a member selected from the group consisting of alkylamine wherein the alkyl moiety has 8-18 carbon atoms, benzylamine, oleylamine and oxygen, and (iv) hydroxy propylpiperazinyl-hydroxy propyl.

- the quaternary ammonium salt of the cationic polymer in (1) and
- the oxidation product of the cationic polymer in (1), said member being present in an amount of about 0.1 to 5 percent by weight of said composition.

4,013,788

#### WATERSOLUBLE EXTRACTS OF CORYNEBACTERIA, PROCESS FOR OBTAINING THEM AND THEIR USE

Pierre Jolles, Paris, and Daniele Migliore-Samour, Kremlin-Bicetre, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Apr. 30, 1975, Ser. No. 573,200

Claims priority, application France, May 6, 1974, 74.15570

Int. Cl.<sup>2</sup> A61K 39/02, 39/00

U.S. Cl. 424-92

7 Claims

1. An immunological adjuvant composition comprising low molecular weight hydrosoluble fragments consisting essentially of a disaccharide-tetrapeptide, a tetrasaccharide-heptapeptide and the dimer, trimer and tetramer of the latter, said adjuvant being produced by the steps of subjecting delipidated bacterial residue of *Corynebacterium Parvum* containing diaminopimelic acid to grinding and homogenization in aqueous medium, centrifuging to remove undissolved solids from the aqueous medium, salting out of active material from the aqueous medium, and dialyzing said fragments containing diaminopimelic acid, having a molecular weight between 1,000  $\pm$  200 and 8,000  $\pm$  200 and being associated with non-aminated reducing sugars.

4,013,789

#### MIXTURE OF ANTIBIOTICS PRODUCED BY NEW SPECIES OF MICROMONOSPORA

Walter D. Celmer; Frank C. Sciavolino, both of New London; Walter P. Cullen, East Lyme, and John B. Routien, Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 431,845, Jan. 9, 1974, Pat. No. 3,914,218.

This application May 29, 1975, Ser. No. 581,808

Int. Cl.<sup>2</sup> A61K 35/74

U.S. Cl. 424-115

2 Claims

1. A process for preparing an antibiotic mixture which comprises cultivating *Micromonospora lacustris* Routien sp. nov. ATCC 21975 in an aqueous nutrient medium containing an assimilable source of carbon and nitrogen until substantial antibiotic activity is obtained and separating said antibiotic mixture therefrom.

4,013,790

#### PHOSPHINE-DEVELOPING PESTICIDE AND PROCESS FOR PRODUCTION THEREOF

Wolfgang Kapp, Offenbach (Main), Germany, assignor to Deutsche Gesellschaft für Schädlingbekämpfung mbH, Frankfurt am Main, Germany

Filed Sept. 10, 1975, Ser. No. 611,848

Claims priority, application Germany, Sept. 11, 1974, 2443333

Int. Cl.<sup>2</sup> A01N 11/00

U.S. Cl. 424-128

17 Claims

1. A phosphine-developing pesticide which comprises (1) a phosphide selected from the group consisting of magnesium phosphide and aluminum phosphide, (2) a thermally decomposable material, comprising a chemical compound which releases a gas in the temperature range between 20° and 65° C to give a vapor pressure of at least 50 Torr., in amount of about 10 to 30 percent by weight, and (3) about 2 to 14 percent by weight of ethylene oxide polymer having a molecular weight of between 4000 and 12000.

4,013,791

#### PEPTIDES HAVING AN ANTIHYPERTENSIVE EFFECT

Hans Wissmann, Bad Soden, Taunus; Rolf Gelger; Ernst Lindner, both of Frankfurt am Main, and Bernhard Schölkens, Bad Soden, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 3, 1975, Ser. No. 637,114

Claims priority, application Germany, Dec. 5, 1974, 2457463

Int. Cl.<sup>2</sup> A61K 37/00; C07C 103/52

U.S. Cl. 424-177

4 Claims

1. A peptide derivative of formula I



in which Y stands for the sarcosyl, succinamoyl or succinoyl radical.

2. A pharmaceutical composition suitable for the diagnosis and/or treatment of hypertonia, which comprises an effective amount of a compound as claimed in claim 1, optionally in admixture or conjunction with an inert carrier and/or preserving agent.

4,013,792

#### PROCESS FOR THE PRODUCTION OF BASE FOR TOPICAL STEROIDS

Martin L. Eichman, Wilmington, Del., and Susan C. Belsole, Chester, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 460,254, April 11, 1974, abandoned. This application Sept. 18, 1975, Ser. No. 614,386

Int. Cl.<sup>2</sup> A61K 31/56, 31/71

U.S. Cl. 424-181

1 Claim

1. A stable aqueous clear gel composition comprising about 0.02625% by weight of betamethasone 17-benzoate about 0.5% by weight of neomycin sulfate, about 35% by weight propylene glycol, about 16.67% by weight ethanol, about 1.5% by weight of hydroxypropyl methylcellulose having a viscosity of from about 80 to about 120,000 centipoises, about 1% by weight of sodium chloride and a sufficient amount of 1N hydrochloric acid to adjust the pH of the composition to about 4.0 to 5.0.

4,013,793

#### COMBATING PESTS WITH O-ETHYL-S-PROPYL-THIONOETHIOL OR DITHIOPHOSPHORIC ACID PHENYL OR NAPHTHYL ESTERS

Shigeo Kishino, Tokyo; Akio Kudamatsu, Kanagawa; Iwao Takase, Tokyo; Kozo Shiokawa, Kanagawa, and Shin-ichi Yamaguchi, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 471,081, May 17, 1974, Pat. No. 3,898,334, which is a division of Ser. No. 123,087, March 10, 1971, Pat. No. 3,825,636. This application Apr. 25, 1975, Ser. No. 571,881

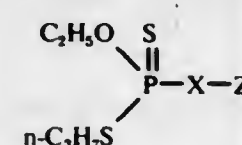
Claims priority, application Japan, Mar. 13, 1970, 45-20845

Int. Cl.<sup>2</sup> A01N 9/36

U.S. Cl. 424-210

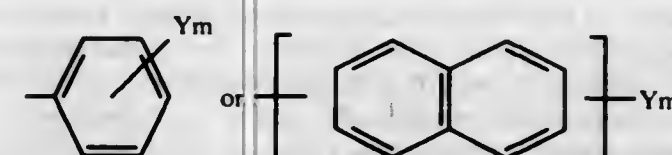
9 Claims

1. An insecticidal, acaricidal and nematocidal composition comprising an insecticidally, acaricidally, or nematocidally effective amount of a phosphoric acid ester of the formula



in which

X is an oxygen or sulfur atom,  
Z is a group of the formula



Y is a halogen atom or a lower alkyl, lower alkoxy, lower alkylmercapto, lower alkyl-sulfinyl, nitro, cyano or phenyl group, and at least one Y is lower alkoxy, lower alkyl-mercapto, lower alkyl-sulfinyl, nitro or cyano, and m is 1 or 2,

in admixture with a diluent.

4,013,794

#### O-ALKYL-S-ALKYL-O-PHENYL PHOSPHATES AND INSECTICIDAL AND ACARICIDAL METHOD OF USE

Fritz Maurer; Hans-Jochem Riebel; Lothar Rohe, all of Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 518,838, Oct. 29, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,849

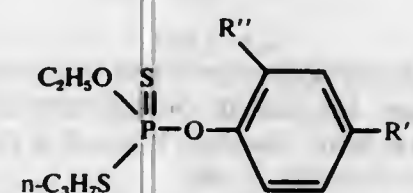
Claims priority, application Germany, Nov. 17, 1973, 2357526

Int. Cl.<sup>2</sup> A01N 9/36; C07F 9/18

U.S. Cl. 424-212

11 Claims

1. An O-phenylthionothiolphosphoric acid ester of the formula



in which

R'' is hydrogen or halogen, and

R''' is lower alkylsulfonyl, halogeno-lower alkylsulfonyl or 1-fluoro-1-carbo-lower alkoxyethylmercapto.

10. A method of combating insects or acarids which com-

prises applying to the insects or acarids, or to a habitat thereof, an insecticidally or acaricidally effective amount of a compound according to claim 1.

4,013,795

#### COMBATING PESTS WITH DICHLOROVINYLTIONOPHOSPHORIC ACID ESTER AMIDES

Wilhelm Sirrenberg, Sprockhovel im westphalia; Bernhard Homeyer, Opladen; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 267,759, June 30, 1972, abandoned. This application Sept. 30, 1974, Ser. No. 510,836

Claims priority, application Germany, July 3, 1971, 2133200

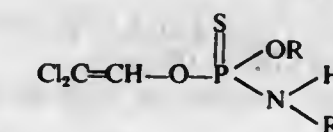
Disclosure was also published under second Trial Voluntary

Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> A01N 9/36

U.S. Cl. 424-219 8 Claims

1. A method of combating a pest selected from the group consisting of insects, acarids and nematodes which comprises applying to such pest or its habitat an insecticidally, acaricidally or nematocidally effective amount of a dichlorovinylthionophosphoric acid ester amide of the formula



in which

R is methyl, isopropyl, isobutyl or sec.-butyl, and  
R<sub>2</sub> is methyl, ethyl, propyl or allyl.

4,013,796

#### HOT-PRESSED IONIC FLUORIDE OPTICAL BODIES FREE OF ABSORPTION BANDS AND METHOD OF MAKING THEM

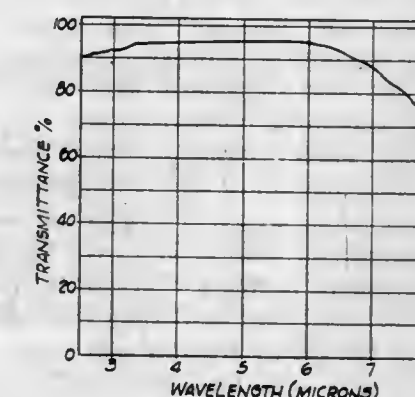
Carl F. Swinehart, University Heights, and Herbert Packer, Cleveland Heights, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Aug. 27, 1973, Ser. No. 391,890

Int. Cl.<sup>2</sup> C01D 3/02; C01F 11/22, 17/00, 5/28

U.S. Cl. 423-490

7 Claims



1. An optical body consisting essentially of a hot-pressed polycrystalline mass of pressable fluoride represented by the general formula:  $\text{M}_m\text{F}_n$  wherein M represents one or two elements selected from the group consisting of an alkali metal, and an alkaline earth metal, m is an integer representing the number of atoms of said one or two elements, and n is an integer which satisfies the valence requirements of  $\text{M}_m$ , said body characterized by a transmittance in excess of about 90%, without correction for reflection losses, in a portion of a pre-determined usable wavelength range from about 1 micron to about 7 microns, and, less than 1% per millimeter absorption



due to absorption bands in the transmission spectra within said range wherein said absorption is due to at least one impurity selected from the group consisting of carbon dioxide, water, hydroxyl ion and acid fluorides.

4,013,797

# BACTERIAL COMPOSITION AND PROCESS FOR FERMENTATION OF MEAT THEREWITH

Alfred J. Gryczka, Sarasota, Fla., assignor to Microlife Technologies, Inc., Sarasota, Fla.

Filed Dec. 10, 1975, Ser. No. 639,473

Int. Cl.<sup>2</sup> A23L 1/31

U.S. Cl. 426—56

19 Claims

1. The bacterial concentrate which comprises:
  - a. *Micrococcus* sp. NRRL-B-8048; and
  - b. between about 0.01 and 100 parts by bacterial count of a lactic acid producing bacterium which ferments in meat per part of the *Micrococcus* wherein the concentrate contains at least about  $1 \times 10^9$  bacteria cells per ml and sufficient nutrient medium for the bacterial cells to enhance growth during the fermentation and is frozen in the presence of a bacterial freezing stabilizing agent to less than about  $-20^\circ\text{C}$ .

4,013,798

# SELECTIVELY VENTABLE FOOD PACKAGE AND MICRO-WAVE SHIELDING DEVICE

Costas E. Goltos, Weston, Mass., assignor to Teckton, Inc., Wellesley, Mass.

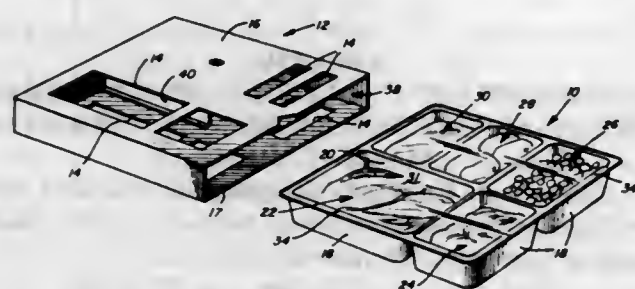
Continuation of Ser. No. 417,905, Nov. 21, 1973, abandoned.

This application Dec. 24, 1975, Ser. No. 644,163

Int. Cl.<sup>2</sup> B65B 25/22

U.S. Cl. 426—107

6 Claims



1. A package comprising:
  - a tray formed from a material transparent to electromagnetic radiation, said tray having a bottom wall, a peripheral upstanding side wall and ridge means extending upwardly from the bottom wall and cooperative with said bottom wall and said peripheral side wall to define a plurality of at least three compartments;
  - said compartments each containing a food component, at least two, but less than all of said compartments containing food components which will give off water vapor when heat conditioned, said at least two, but less than all of said compartments defining ventable compartments;
  - a radiation transparent cover extending over said tray and being sealed to the upper edge of said ridge means and said peripheral side wall to isolate said compartments from each other;
  - means communicating said ventable compartments with each other to permit communication of said water vapor from one of said ventable compartments to the other of said ventable compartments; and
  - at least one portion of the seal between said cover and said peripheral wall associated with a selected one of said ventable compartments being constructed to be weaker than the other portions of said seal, said one portion of the seal being sufficiently weak as to rupture in response to build up of water vapor pressure in said ventable compartments beyond a predetermined magnitude whereby the water vapor generated in each of said ventable com-

partments may vent, sequentially, through said ventable compartments and through the ruptured seal in a predetermined direction.

4,013,799

# PREPARATION OF A STABILIZED PRECOOKED BABY FOOD FORMULATION THICKENED WITH MODIFIED TAPIOCA STARCH

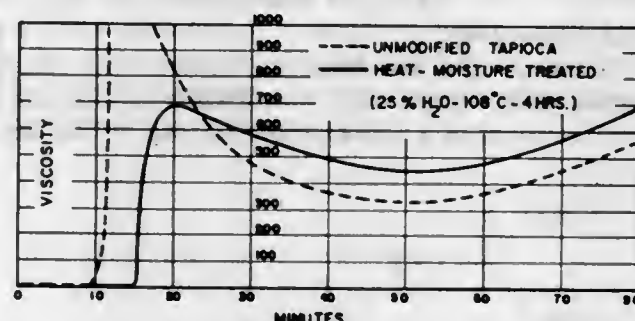
Wayne J. Smalligan; Vincent J. Kelly, and Estela G. Enad, all of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed May 30, 1972, Ser. No. 257,563

Int. Cl.<sup>2</sup> A23L 1/10

U.S. Cl. 426—578

11 Claims



1. A process for preparing a thickened, wet, ready-to-eat baby food from an aqueous formulation having a pH of up to 4.5, consisting essentially of the steps of: incorporating into said aqueous formulation from about 5 to 55 pounds per 100 gallons of final formulation of an ungelatinized tapioca starch modified by adjusting the moisture content thereof to about 15–35% by total weight, heating said moisture adjusted starch to a temperature of about  $70^\circ\text{C}$ – $130^\circ\text{C}$ , and maintaining said temperature for about from 1 to 72 hours; filling and sealing containers with said aqueous formulation; and heating said starch-containing aqueous formulation for a period of time sufficient to commercially sterilize the formulation.

4,013,800

# 4-HYDROXY-5-METHYL-2,3-DIHYDROFURAN-3-ONE AND METHODS OF MAKING AND USING THE SAME

Hideo Shimazaki, Tokyo; Shuji Tsukamoto; Tadaomi Saito, both of Yokohama; Sadanari Eguchi, Sendai, and Yasushi Komata, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Division of Ser. No. 881,951, Dec. 29, 1969, Pat. No. 3,647,825, which is a continuation-in-part of Ser. No. 712,397, March 12, 1968, abandoned. This application July 16, 1971, Ser. No. 163,434

Claims priority, application Japan, Mar. 15, 1967, 42-16265; Apr. 15, 1967, 42-23921

Int. Cl.<sup>2</sup> A23L 1/22, 1/231

U.S. Cl. 426—536

13 Claims

1. A method of imparting a maltol-like flavor and aroma to an ingestible composition which comprises mixing said composition with 10 to 500 parts per million (by weight) of 4-hydroxy-5methyl-2,3-dihydrofuran-3-one, based on the weight of said ingestible composition.

4,013,801

# EDIBLES SWEETENED WITH FLAVANONES

Daniel J. Dawson; Kenneth M. Otteson, both of Menlo Park, and C. Thomas Seltz, Mountain View, all of Calif., assignors to Dynapol Corporation, Calif.

Filed Feb. 13, 1976, Ser. No. 657,906

Int. Cl.<sup>2</sup> A23L 1/236

U.S. Cl. 426—548

19 Claims

1. A sweetened edible composition comprising an edible material having admixed therewith a sweetening amount in the range of from about 0.002% to about 1% by weight basis material of flavanone represented by the structural formula

4,013,804

# METHOD AND COMPOSITION FOR TREATING WOOD AND COATED WOODEN ARTICLES OBTAINED THEREBY

Stanley A. Gruetzman, Shoreview, Minn., assignor to Andersen Corporation, Bayport, Minn.

Continuation-in-part of Ser. Nos. 507,371, Sept. 19, 1974, abandoned, and Ser. No. 575,365, May 7, 1975, Pat. No. 3,996,410. This application Mar. 5, 1976, Ser. No. 664,166

Int. Cl.<sup>2</sup> B05D 3/06

U.S. Cl. 427—33

10 Claims

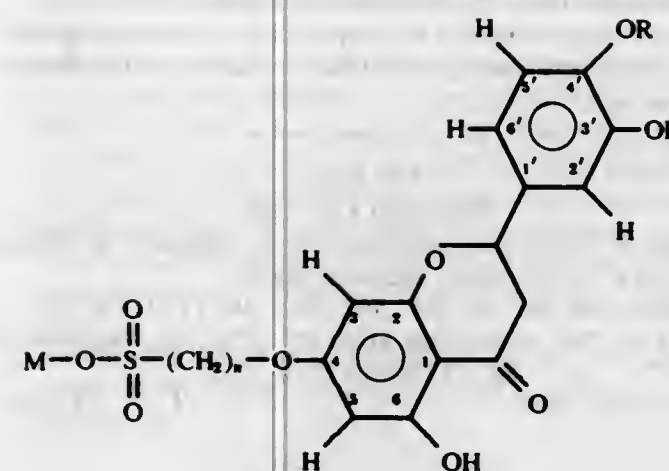
1. A process for the preservation and electrostatic coating of a wooden substrate with a coating which is adhered to the substrate; said process comprising the steps of:

- a. placing the wooden substrate in substantially continuous motion with a conveying means;
- b. directing the resulting substantially continuous motion of said wooden substrate through a treatment zone for treatment of said wooden substrate with a liquid means comprising a liquid solution for preserving the wood and improving its electrical conductivity, said liquid solution comprising:

an amount, at least equal to the threshold concentration, as determined by test NWMA-M-1-70, of a plasticized biocidal wood preservative with toxicity toward *Lenzites Trabea* Pers. ex. Fr., Madison 617, A.T.C.C., said wood preservative comprising at least one biocidal agent selected from the group consisting of a copper salt, a mercury salt, an organometallic compound, and a phenolic compound; said amount being within the range of 0.1–10% by weight;

an amount of a paraffin wax sufficient to provide said wooden substrate with at least 60% water repellency, as determined by NWMA test M-2, said paraffin wax having a drop melt point, by ASTM D-127, below  $145^\circ\text{F}$ , said amount being less than 2% by weight of said solution, and about 80 to about 99% by weight of a substantially non-aqueous, organic solvent system comprising at least 10% by weight of a polar organic liquid with a solubility in water greater than 5 wt. % and a boiling point at normal ambient conditions of less than  $120^\circ\text{C}$ ;

- c. directing the said substantially continuous motion of the treated wooden substrate, emerging from said treatment zone, through an evaporation zone to an electrostatic spraying zone; and
- d. electrostatically spraying the treated wooden substrate with a coating composition in said electrostatic spraying zone.



wherein R is a lower alkyl of from one to three carbon atoms inclusive, n is an integer of from one to three inclusive and M is hydrogen or a physiologically acceptable metal cation.

4,013,802

# CORN FLAKE PROCESS AND PRODUCT

Stanley H. Reesman, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Filed May 21, 1975, Ser. No. 579,355

Int. Cl.<sup>2</sup> A23L 1/164

U.S. Cl. 426—621

12 Claims

1. In the art of producing corn flakes from corn grits which have been cooked and wherein the cooked grits are flaked and toasted to produce a blistered appearance, the improvement which comprises subjecting said cooked grits to a humid gaseous atmosphere having a temperature of about  $120^\circ\text{F}$ – $300^\circ\text{F}$  for a period of time effective to produce a grit temperature of at least  $120^\circ\text{F}$  and to plasticize the grits preparatory to flaking.

4,013,803

# FABRICATION OF AMORPHOUS BUBBLE FILM DEVICES

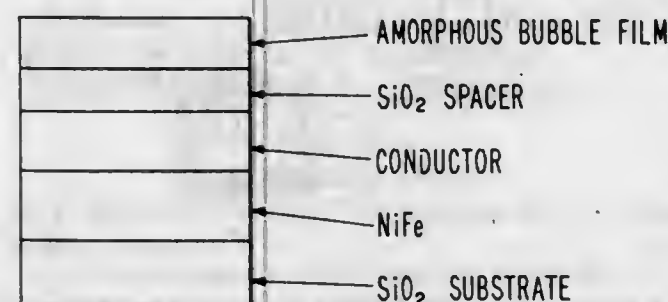
Richard M. Josephs, Willow Grove, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,417

Int. Cl.<sup>2</sup> B05D 5/12; C23C 11/00

U.S. Cl. 427—8

5 Claims



1. The method of fabricating an amorphous bubble film memory device of the type having a plurality of layers comprising essentially a substrate layer, a bubble film layer, an insulating layer, a magnetic film layer and a conductor layer wherein the improvement consists of:

- a. forming said amorphous bubble film as the topmost layer of said plurality of layers.

4,013,805

# ACID-MODIFIED POLY(VINYL ACETATE) TEXTILE SIZES

Albert E. Corey, East Longmeadow, and Donald D. Doner-meyer, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 406,508, Oct. 15, 1973, Pat. No.

3,919,449. This application Sept. 19, 1975, Ser. No. 614,827

The portion of the term of this patent subsequent to Nov. 11,

1992, has been disclaimed.

Int. Cl.<sup>2</sup> B05D 3/02; D03D 25/00

U.S. Cl. 427—390 R

8 Claims

1. A method for sizing textiles which comprises applying to the textile material an aqueous solution of the interpolymerization product of from 90.5 to 95.5 weight percent of vinyl acetate, from 4.0 to 7.5 weight percent of acrylic acid and from 0.5 to 2.0 weight percent of a monoalkyl ester of maleic, fumaric, or citraconic acids in which the alkyl group contains from 1 to 8 carbon atoms; wherein the solvent portion of the solution is an aqueous solution of a base selected from the group consisting of hydroxide carbonates and bicarbonates of alkali metals, ammonia, methylamine, dimethylamine, trimethylamine, ethylamine, diethylamine, triethylamine and morpholine.



4,013,806

**MANUFACTURE OF THIN LAYERS OF POLYURETHANE ELASTOMERS**

Otto Volkert, Ludwigshafen; August Wigger, Frankenthal; Manfred Zuerger, Mannheim, and Peter Richter, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 4, 1973, Ser. No. 421,608

Claims priority, application Germany, Dec. 4, 1972, 2259360

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> B05D 3/06

U.S. Cl. 427—54

17 Claims

1. In a process for the formation on a substrate of thin polyurethane elastomeric layers of from about 0.2 to 5 mm thickness having a Shore hardness A of not more than 70° by curing a liquid polyurethane-elastomer-forming reaction mixture which consists essentially of

A. at least one polymeric material containing at least two hydroxyl groups in the molecule which are capable of reacting with isocyanates, said polymeric material being selected from the group consisting of polyesters, polyethers, polyester urethanes and polyether urethanes; and B. diisocyanates or prepolymers derived from at least one of the hydroxyl-containing compounds mentioned under (A) above and diisocyanates, which prepolymers contain at least two isocyanate groups in the molecule,

which curing is effected by heating said mixture, the improvement which comprises: incorporating into said reaction mixture a minor amount of substantially compatible monomers having at least two photocrosslinkable double bonded carbon atoms prior to applying said mixture to the substrate; pouring said mixture onto said substrate to form a layer thereon; irradiating said layer to effect photocrosslinking of the monomers and gelling of the layer; and thereafter heating the layer to form a polyurethane elastomer.

4,013,807

**COATING ELECTRONIC COMPONENTS BY MEANS OF FLUIDIZED BED**

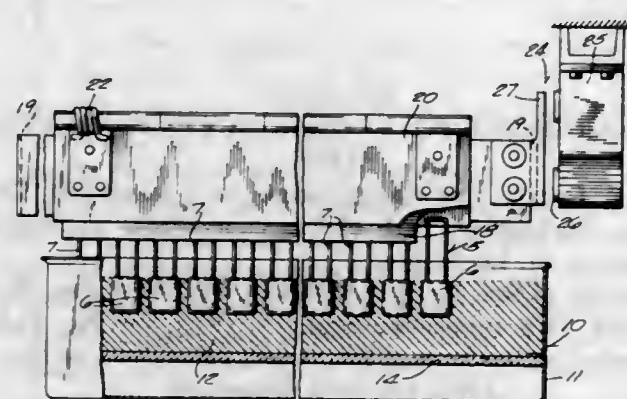
Gordon A. Putney, New Berlin, and William D. McCoy, Brookfield, both of Wis., assignors to Systemation Div. of Koerper Engineering Associates, Inc., Milwaukee, Wis.

Filed Mar. 26, 1975, Ser. No. 562,186

Int. Cl.<sup>2</sup> B05D 1/24

U.S. Cl. 427—184

3 Claims



1. A method by which a workpiece that comprises a body and electrical leads that project to one side of the body can have applied to it a substantially uniform thickness coating of heat plasticizable material, which coating covers all portions of the body but covers substantially only so much of each lead as to provide a seal around it at its junction with the body, and wherein the coating is applied by heating the workpiece and supporting it by its leads, body lowermost, in a fluidized bed that comprises heat plasticizable material in finely divided solid form suspended in a vessel by gas blown upwardly through the material from the bottom of the vessel, which method is characterized by:

A. so supporting the body in the fluidized bed that the top of the body is substantially at the level of the surface of the material in the fluidized bed; and

B. while the workpiece is so supported, vibrating it in directions substantially parallel to the surface of the fluidized bed.

4,013,808

**SEALED CASTER**

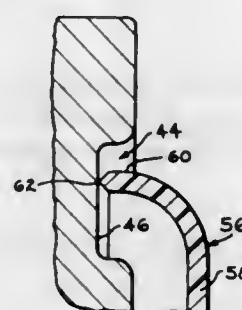
Thomas A. Crawford, Jackson, Mich., assignor to Midwest Precision Corporation, Jackson, Mich.

Division of Ser. No. 537,101, Dec. 30, 1974, Pat. No. 3,964,124. This application Mar. 12, 1976, Ser. No. 666,205

Int. Cl.<sup>2</sup> B05D 3/12, 1/18

U.S. Cl. 427—289

7 Claims



1. The method of sealing a caster having a forked body including an upper bearing body, wheel supporting legs and a wheel mounted upon said legs for rotation about an axis, comprising the steps of mounting a mandrel upon the body legs having a configuration defining a wheel engageable skirt, coating the caster body and mandrel with a liquid resilient coating material adhering the material thereto, curing the coating material to form a resilient sealing covering, severing the coating material upon said mandrel at a location wherein the severed edges will sealingly engage a wheel rotatably mounted upon the caster legs, removing the mandrel and severed coating material from the caster body, and rotatably mounting a wheel upon the caster legs such that said severed edges sealingly engage the wheel.

4,013,809

**METHOD OF SEALING A POROUS BLOCK**

Giuseppe Marocco, Turin, Italy, assignor to Soberman Establishment, Liechtenstein, Liechtenstein

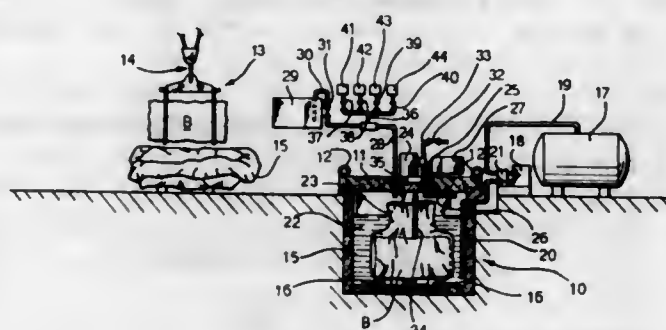
Filed Dec. 23, 1975, Ser. No. 643,738

Claims priority, application Italy, Dec. 31, 1974, 70807/74

Int. Cl.<sup>2</sup> B05D 3/00

U.S. Cl. 427—296

4 Claims



1. A method for consolidating a block of marble or other natural stone, having cavities open to the outside, comprising the following sequential steps:

- placing a block to be consolidated in a bag made of liquid-tight flexible sheet material, said bag having an open mouth;
- enclosing said bag and said block placed therein in a pressure-tight container, with said bag having its mouth above said block and open upwardly;
- evacuating said container into a vacuum state;

- while said vacuum is maintained in said container, supplying a liquid into said container and around said bag until said liquid reaches a level lower than the level of said open mouth;
- while said vacuum is maintained in said container, supplying a fluid hardenable resin composition into said container in such a manner that said fluid composition is introduced into said bag through its open mouth, until said block is immersed in said fluid resin composition;
- while said liquid is maintained around said bag, releasing said vacuum from said container, so that said resin composition deeply penetrates into said cavities in said block; and
- while said liquid is still around said bag, allowing said resin composition to harden in said cavities and around said block.

4,013,810

**SANDWICH PANEL CONSTRUCTION**

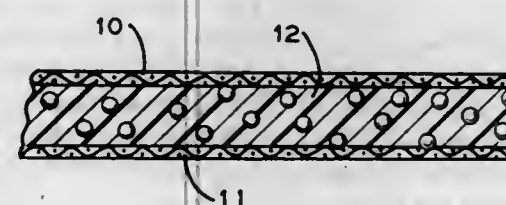
William Gordon Long, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 22, 1975, Ser. No. 606,912

Int. Cl.<sup>2</sup> B32B 5/18, 5/16, 5/22

U.S. Cl. 428—308

5 Claims



1. A sandwich panel consisting essentially of a foam core of thermoplastic resin, non-fibrous shapes mixed with said thermoplastic resin and formed from material remaining in the solid state at a higher temperature than the plasticizing temperature of said thermoplastic resin wherein said non-fibrous shapes are not more than 35% by weight of said foam core, and face sheets formed from thermoplastic resin reinforced with graphite fibers for said face sheets being bonded to said foam core, said thermoplastic resin in said face sheets being the same type as said foam core resin.

4. A method for manufacturing a sandwich panel consisting essentially of the steps of mixing a thermoplastic resin with a solvent to dissolve said thermoplastic resin, mixing hollow glass spheres with said dissolved thermoplastic resin, casting said mixture of glass spheres and dissolved thermoplastic resin into a desired shape, drying said cast mixture to drive off said solvent to form a foam core for the sandwich panel wherein said spheres are not more than 35% by weight of said foam core preparing a mixture of said thermoplastic resin with graphite fibers, compression molding said resin and fibers to produce a void-free face sheet, placing said face sheet on said foam core, and remolding under conditions of heat and pressure said face sheet to cause said thermoplastic resin to flow and to bond said face sheet to said foam core.

4,013,811

**LAMINATED ANODE**

Gerald F. Maruska, Madison, Wis., assignor to Oscar Mayer & Co. Inc., Madison, Wis.

Filed Mar. 11, 1975, Ser. No. 557,293

Int. Cl.<sup>2</sup> B65D 5/56

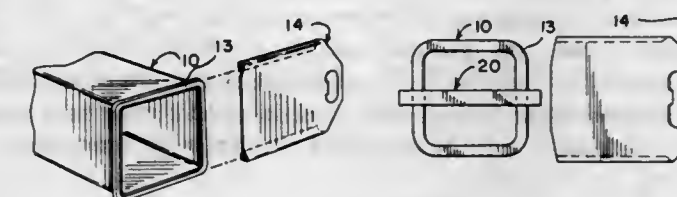
U.S. Cl. 428—35

8 Claims

1. In the processing of a meat material in a metal mold of stainless steel, laminated means for substantially preventing the attack of the metal mold by the salts in the meat material, said means comprising (a) a layer of sacrificial metal less noble than the mold metal, said metal layer to be positioned at the end of the mold and held in generally full surface contact with the meat material and in electrical contact with the mold metal and (b) a layer of impermeable material between the

metal mold and the layer of sacrificial metal in the area where the meat material is in contact with the layer of sacrificial metal for preventing contact of the sacrificial metal and mold in said area, said impermeable material having a character such as to prevent staining of the mold during sacrificing of the metal layer.

3. A laminated anode for use in a metal mold of stainless steel during processing of a meat material in the mold to protect the mold surfaces in contact with the meat material against corrosive action, said anode being adapted to be



placed and held between the mold and a cover therefor and being in strip form and flexible and including a layer of sacrificial metal less noble than the metal of the mold selected from the group consisting of aluminum, magnesium or zinc and a layer of impermeable material approved for use with food, wherein said sacrificial metal is in electrical contact with the mold and the meat material and said impermeable material being such as to protect the cover from sacrificial metal deposits and said strip being disposable after the processing of the meat material.

4,013,812

**LAMINATED FABRIC**

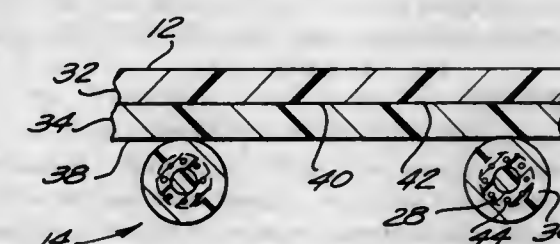
David H. Geiger, Kirby Lane, Rye, N.Y. 10580  
Continuation-in-part of Ser. No. 381,065, July 20, 1973, Pat. No. 3,899,622. This application Aug. 5, 1975, Ser. No. 602,114

The portion of the term of this patent subsequent to Aug. 12, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> B32B 7/04, 31/06

U.S. Cl. 428—245

16 Claims



1. A composite sheet material comprising a foraminous web formed of a plurality of fibers defining a plurality of openings in the web and a thin film of heat sealable plastic sheet material having a pair of opposite sides, said fibers being coated with a heat sealable plastic material, and said plastic sheet being secured on one side thereof to said plastic coating on said fibers and extending across said openings, thereby to form said composite sheet.



4,013,813

**AMINOALKYLPHOSPHONIC ACID ESTER-BASED TEXTILE FIRE RETARDANTS**

Robert Bruce LeBlanc, Wickford, and James Henry Badger, Narragansett, both of R.I., assignors to LeBlanc Research Corporation, East Greenwich, R.I.

Filed Feb. 27, 1975, Ser. No. 553,872  
Int. Cl.<sup>2</sup> C09K 3/28; C09D 5/18

U.S. Cl. 428-272

4 Claims

1. The process for rendering fire retardant to textile material comprising a cellulosic fiber blended with polyester, comprising impregnating and material with a water-soluble condensation product and dimethyl aminomethylphosphonate and up to about 6 times its molar amount of at least one member selected from the group consisting of  $P(CH_2OH)_3$  and  $P(CH_2OH)_2Y$  wherein Y is an equivalent amount of the anion of a least one acid, drying said material, and curing said material by at least one of heating and contact with ammonia.

4,013,814

**POLY(HALOETHYL-ETHYLENEOXY) PHOSPHORIC ACID ESTER POLYMERS**

Edward D. Well, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.  
Division of Ser. No. 535,004, Dec. 20, 1974, which is a division of Ser. No. 409,486, Oct. 25, 1973, Pat. No. 3,896,187, which is a continuation-in-part of Ser. No. 164,928, July 21, 1971, abandoned, which is a continuation of Ser. No. 760,988, Sept. 19, 1968, abandoned. This application Jan. 23, 1976, Ser. No. 651,861

Int. Cl.<sup>2</sup> C07L 9/08

U.S. Cl. 428-277

8 Claims

1. A method for increasing the flame resistance of a member selected from the group consisting of fabrics, paper and adhesives comprising applying thereto a liquid poly(chloroethyl-ethyleneoxy) phosphoric acid ester prepared by reacting tris(2-chloroethyl) phosphate by heating said phosphate to a temperature within the range of from about 140° to about 220° C. in the presence of a basic catalyst with ethylene dichloride as reaction by-product; and terminating said reaction by-product level with ethylene dichloride in an amount of from about 0.5 mole to about 0.9 mole ethylene dichloride per mole of tris(2-chloroethyl) phosphate in said reaction in an effective amount sufficient to increase the flame resistance of said member.

4,013,815

**FIRE RETARDANT UNSATURATED POLYESTERS**

Edwin Dorfman; Willis T. Schwartz, Jr., both of Grand Island, and Raymond R. Hindersinn, Lewiston, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 383,749, July 30, 1973, abandoned. This application Dec. 18, 1975, Ser. No. 642,026  
Int. Cl.<sup>2</sup> C08L 67/06

U.S. Cl. 428-285

37 Claims

1. An unsaturated polyester composition which is copolymerizable with a copolymerizable unsaturated monomer to form a fire retardant polymer composition, said unsaturated polyester composition comprising an  $\alpha,\beta$ -ethylenically unsaturated polyester of a polycarboxylic compound and a polyhydric alcohol, which contains halogen in a proportion of greater than about 4.4 weight percent, and about 0.55 to about 50 weight percent of iron compound that is insoluble in said polyester when admixed with a copolymerizable unsaturated monomer, or an iron compound that is soluble in said polyester and monomer but which is free of iron-to-carbon bonds, wherein said composition is substantially phosphorus-free, wherein the proportions are based on the weight of unsaturated polyester.

4,013,816

**STRETCHABLE SPUN-BONDED POLYOLEFIN WEB**

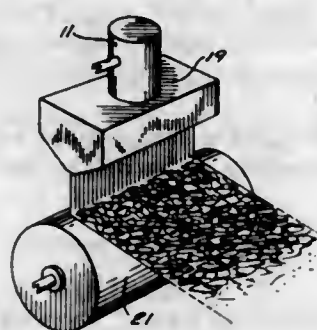
Reinhardt N. Sabee, and C. Craig Sabee, both of Appleton, Wis., assignors to Draper Products, Inc., Appleton, Wis.

Filed Nov. 20, 1975, Ser. No. 633,991

Int. Cl.<sup>2</sup> D04H 3/14

U.S. Cl. 428-288

4 Claims



4. A spun-bonded polypropylene web having at least 50% tensile web elongation at break, the filaments of said web being extruded at a velocity in excess of 15 meters per second onto a chilled surface having a temperature less than 65° and having a size of 20 denier per filament dpf or less, a basis weight in grams/square meter which is less than the sum of 7 times denier per filament plus 200 divided by denier per filament minus 20 and plus 50, said filaments having a birefringence of less than 0.0120 and wherein more than 70% of all filament crossover points are fuse bonded and wherein said fused bonds do not separate when the web is stretched to 50% of its original dimension.

4,013,817

**METHOD FOR ADHERING A RUBBER COMPOSITION TO A METAL MATERIAL**

Kinji Masuda, Higashi-Murayama; Hideaki Saigo, Yokohama; Kazuo Naito, Kodaira; Tadashi Utsunomiya, Higashi-Murayama, and Sakae Inoue, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed July 2, 1975, Ser. No. 592,702

Claims priority, application Japan, July 4, 1974, 49-75884

Int. Cl.<sup>2</sup> B05D 7/14, 3/00; B32B 15/06, 15/08

U.S. Cl. 428-462

17 Claims

1. A method for adhering a butadiene-acrylonitrile copolymer rubber (NBR) composition to a metal material, which comprises compounding

A. at least one of halogenated aromatic hydrocarbons having the following general formula



or



wherein Ar is benzene nucleus residue or naphthalene nucleus residue and when there are two or more Ar groups, they may be same or different, R is a hydrocarbon residue having 1-6 carbon atoms, hydrogen atom or halogen atom, and when there are two or more R groups, they may be same or different, X is halogen atom and when there are two or more X groups, they may be same or different, when there are two or more  $CX_mH_{3-m}$  groups, they may be same or different, m is 1-3, n' is 1-3, and when Ar is benzene nucleus residue, n is 1-6 and n' is 0-5 (provided that  $n+n' \geq 6$ ) and when Ar is naphthalene nucleus residue, n is 1-8 and n' is 0-7 (provided that  $n+n' \geq 8$ ), and

B. at least one compound selected from oxides, carbonates, sulfides and hydroxides of metals of groups I, II, IV, V and VIII in the Periodic Table, and aluminum hydroxide, to the NBR composition, the amount of said component (A) being 0.2-20 parts by weight based on 100 parts by weight of total polymer, and the amount of said component (B) being 0.5-10 parts by weight based on 1 part by weight of said component, (A), contacting the resulting rubber composition with the metal material, and vulcanizing the rubber composition to adhere the composition to the metal material.

4,013,818

**HIGH TEMPERATURE SECONDARY BATTERIES**

Barry Anthony Askew, Broadstone, and Ronald Holland, Wareham, both of England, assignors to National Research Development Corporation, London, England

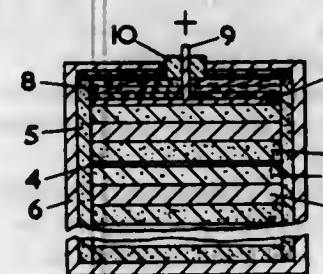
Filed Sept. 25, 1975, Ser. No. 616,821

Claims priority, application United Kingdom, Sept. 28, 1974, 42248/74

Int. Cl.<sup>2</sup> H01M 43/00

U.S. Cl. 429-112

12 Claims



1. A high temperature lithium-sulphur secondary battery comprising a stack of cells, each cell including a pellet of immobilized electrolyte sandwiched between a negative electrode pellet composed at least partially of lithium and a positive electrode pellet composed at least partially of a metal sulphide, and an intercell metal sheet adapted to prevent direct chemical action between the electrode pellets of adjacent cells while maintaining electrical contact between them, the pellets being contained within a close-fitting tube of material which is both (1) electrically insulating at the battery operating temperature and (2) chemically inert with respect to the electrodes, the electrolyte and the battery reaction.

4,013,819

**HANDLE CONSTRUCTION FOR BATTERIES**

Nicholas G. Grabb, Scarborough, Canada, assignor to Varta Batteries Limited, Willowdale, Canada

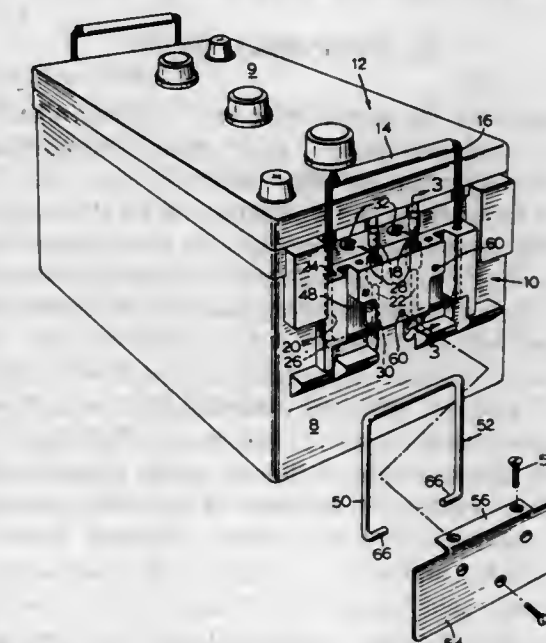
Filed Aug. 27, 1975, Ser. No. 608,141

Int. Cl.<sup>2</sup> H01M 2/10

U.S. Cl. 429-187

12 Claims

1. A battery handle rope and rope holder combination comprising a length of rope having at each end thereof a rigid elongate lug, and a rope holder body portion integrally molded with a side of a battery case, said rope holder body portion comprising two separate laterally spaced apart sets of first and second passageways, each passageway having a top and a bottom opening, said first and second passageways being spaced apart with the bottom opening of each passageway being unobstructed, each passageway being adapted to receive and permit passage therethrough of said length of rope and said lugs, the area beneath the bottom opening of each passageway being sufficiently unobstructed to permit removal of said rigid elongate lug from the bottom opening of said first passageway and permit insertion of the same lug into the bottom of said second passageway when an end of said battery handle rope is threaded through a set of said first and second passageways, means for securing said rigid elongate lugs in the upper portion of said second passageway, the location of the



moment is exerted on said lug, and when said means for securing said elongate lug in second passageway is accidentally released and said battery handle rope is under tension, said elongate rigid lug frictionally binds in the lower portion of said second passageway as a turning moment is exerted on said lug as it is about to be withdrawn from the bottom of said second passageway by the tension in said rope so that said battery handle rope is retained in said rope holder.

4,013,820

**UNIVERSALLY USEABLE TABLETING INGREDIENTS**

Bahram Farhadieh, Libertyville, and James Maynard Berdahl, Gurnee, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 7, 1974, Ser. No. 521,989

Int. Cl.<sup>2</sup> C08B 5/00, 13/00

U.S. Cl. 536-64

5 Claims

1. The process of making a powdered, controlled-release tableting medium of essentially unlimited shelf-life consisting essentially in dissolving a nontoxic polymeric film-forming material having repeating free carboxylic acid groups attached to the polymeric chain in a low boiling, substantially water-free organic liquid and combining this solution with a solution of ammonia, sodium hydroxide or potassium hydroxide in an alcohol of 1-3 carbon atoms under conditions of turbulence over a period of at least 15 minutes and separating the formed polymer salt from the liquid phase by a method which does not require exposing said polymer salt to an extended period of heat.



4,013,821

**PROCESS FOR PREPARATION OF MIXED CELLULOSE ETHERS CONTAINING 2,3-DIHYDROXYPROPYL ETHER GROUPS**

Konrad Engelskirchen, Lank, Niederrhein, and Joachim Galinke, Düsseldorf-Holthausen, both of Germany, assignors to Henkel &amp; Cie G.m.b.H., Düsseldorf, Germany

Filed Mar. 17, 1975, Ser. No. 558,631

Claims priority, application Germany, Mar. 29, 1974, 2415154

Int. Cl.<sup>2</sup> C08B 1/1193

U.S. Cl. 536-88

13 Claims

1. A process for the preparation of cellulose mixed ethers containing 2,3-dihydroxypropyl ether groups comprising suspending a starting cellulose ether having at least one substituent selected from the group consisting of alkyl having 1 to 4 carbon atoms, hydroxyalkyl having 1 to 4 carbon atoms, carboxyalkyl having 2 to 4 carbon atoms and mixtures thereof in an aqueous inert organic solution, said cellulose ether having a total degree of substitution (D.S.) of 0.05 to 4.0, reacting said ether with an etherifying agent selected from the group consisting of glycidol, glycerol monohalohydrin and mixtures thereof under etherifying conditions and at a pH above 7.5 to produce the corresponding cellulose mixed ethers, adding to said suspension a sufficient quantity of a compound supplying borate ions to provide a suspended cellulose mixed ether product which has an increased viscosity in aqueous solution, and recovering said suspended mixed ether product; the amount of said compound supplying borate ions being in the range of 0.01 to 0.5 part by 1 part by weight of said ethers.

4,013,822

**CHROMIUM-CONTAINING CATALYST SYSTEMS AND THEIR USE FOR THE POLYMERIZATION OF OLEFINS**

Hans Feichtinger, Dinslaken; Hans-Walter Birnkraut, Oberhausen; Siegfried Lütze, Gelsenkirchen; Wolfgang Payer, Oberhausen, and Dieter Schnier, Wesel-Blumenkamp, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Filed July 9, 1975, Ser. No. 594,481

Claims priority, application Germany, July 15, 1974, 2433904

Int. Cl.<sup>2</sup> C08F 4/22, 4/62, 10/00

U.S. Cl. 526-129

23 Claims

1. An olefin polymerization catalyst comprising a chromium compound deposited on a carrier material, which chromium compound is complexed with a straight-chain, branched-chain, or cyclic aliphatic hydrocarbon or mixture thereof such that the mol ratio of aliphatic hydrocarbon to chromium compound is 1:2-3, said chromium compound being deposited on said carrier material in an amount between  $10^{-3}$  and 10 millimols chromium compound per gram of carrier material, said carrier material also containing a trialkyl, tricycloalkyl, triaryl, monohalodihydrocarbyl or monoalkyldihydrocarbyl aluminum compound.

4,013,823

**PROCESS FOR PREPARING ELASTOMERIC COPOLYMERS OF ETHYLENE AND HIGHER ALPHA-OLEFINS**

Paolo Longi, Nazzareno Cameli, Sandro Parodi, and Remo Cervi, all of Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 368,358, June 8, 1973, abandoned.

This application Feb. 7, 1975, Ser. No. 547,928

Claims priority, application Italy, June 9, 1972, 25464/72

Int. Cl.<sup>2</sup> C08F 210/00, 212/00, 110/02

U.S. Cl. 526-166

4 Claims

1. A process for preparing saturated, elastomeric and vulcanizable copolymers of ethylene with alpha-olefins having the general formula  $\text{CH}_2 = \text{CHR}$  in which R is an alkyl radical containing from 1 to 6 carbon atoms, or low-unsaturated

copolymers of ethylene, said alpha-olefins  $\text{CH}_2 = \text{CHR}$  and polyenes, which process comprises copolymerizing, at a temperature of from  $-50^\circ\text{C}$  to  $+150^\circ\text{C}$ , a mixture of said monomers in contact with a catalyst prepared by mixing:

- a catalyst-forming component selected from the group consisting of the hydrides and organometallic compounds of aluminum with
- a catalyst-forming component consisting of the product obtained by cogrinding a halogenated Ti compound with a support comprising, as the essential support constituent, an anhydrous magnesium or manganese dihalide, and with a Lewis base, under conditions such that, in the absence of the base, the support attains a surface area higher than  $5\text{ m}^2/\text{g}$ , the total molar ratio between the magnesium or manganese dihalide and the Lewis base in the catalyst being between 2:1 and 5:1, and the amount of Ti in catalyst-forming component (b) being between 0.1% and 30% by weight.

2. A process for preparing saturated, elastomeric and vulcanizable copolymers of ethylene with alpha-olefins having the general formula  $\text{CH}_2 = \text{CHR}$  in which R is an alkyl radical containing from 1 to 6 carbon atoms, or low unsaturated copolymers of ethylene, said alpha-olefins, and polyenes, which process comprises copolymerizing at a temperature of  $-50^\circ\text{C}$  to  $+150^\circ\text{C}$ , a mixture of said monomers in contact with a catalyst obtained by mixing:

- a catalyst-forming component selected from the group consisting of hydrides and organometallic compounds of aluminum with
- a catalyst-forming component consisting of the product obtained by cogrinding a support the essential support constituent of which is a magnesium or manganese dihalide at least partially complexed with a Lewis base and a halogenated titanium compound, under conditions such that magnesium or manganese dihalide not complexed with the Lewis base attains a surface area higher than  $5\text{ m}^2/\text{g}$ , the total molar ratio between the magnesium or manganese dihalide and the Lewis base in the catalyst being between 2:1 and 5:1, and the amount of Ti in the catalyst-forming component (b) being between 0.1% and 30% by weight.

4,013,824

**MIXING OF ORGANOSULFUR MOLECULAR WEIGHT MODIFIER WITH EMULSIFIER IN PRESENCE OF MONOMER OR DILUENT**

Carl A. Urameck, and John E. Burleigh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 360,960, May 16, 1973, abandoned.

This application Nov. 18, 1974, Ser. No. 524,828

The portion of the term of this patent subsequent to Dec. 17, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> C08F 1/09, 1/36, 3/02

U.S. Cl. 526-205

12 Claims

10. In a process of aqueous emulsion polymerization wherein at least one polymerizable monomer is polymerized in the presence of components comprising a free-radical initiator, aqueous emulsifier solution, organosulfur compound as molecular weight modifier, in aqueous medium, the steps which comprise:

- admixing components consisting essentially of said aqueous emulsifier solution, said organosulfur compound, and an additive which is a polymerization-inert hydrocarbon diluent,
- coagitating the admixture of aqueous emulsifier, organosulfur compound and additive, prior to admixture with said

4,013,825

**MANUFACTURE OF INSOLUBLE AND ONLY SLIGHTLY WATER-SWELLABLE POLYMERS OF N-VINYL LACTAMS OF IMPROVED ADSORPTIVITY**

Walter Denzinger, Speyer; Ernst Hofmann, and Karl Herrle, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 3, 1975, Ser. No. 592,811

Claims priority, application Germany, Aug. 5, 1974, 2437640

Int. Cl.<sup>2</sup> C08F 26/06, 26/10

U.S. Cl. 526-208

3 Claims

initiator, to form a coagitated mixture, wherein the degree of coagitation employed is sufficient to markedly increase the reactivity of said organosulfur compound as said molecular weight modifier,

wherein the amount of said additive employed is an effective amount sufficient to substantially avoid depletion of said organosulfur compound molecular weight modifier during said aqueous emulsion polymerization and is in the range of about 0.1 to 50 phm.

and thereafter admixing said coagitated admixture with said polymerizable monomer, said initiator, and aqueous medium, and polymerizing said polymerizable monomer under aqueous emulsion polymerization conditions;

wherein said polymerizable monomer is a polymerizable conjugated diene, monovinyl-substituted aromatic compound, monopropenyl-substituted aromatic compound, polymerizable vinyl nitrile ester of acrylic or methacrylic acid, vinyl ester, or vinyl halide; and said inert hydrocarbon diluent is an aliphatic, cycloaliphatic, or aromatic hydrocarbon, said organosulfur compound is a mercaptan, dialkyldixanthogen, diaryl disulfide, tetraalkylthiuram mono or disulfide, mercaptothiazole, or mixture, and said emulsifier in said emulsifier solution is a rosin acid soap, disproportionated rosin soap, fatty acid soap, alkarylsulfonated, nonionic emulsifier, or mixture.

1. A process for the manufacture of insoluble and only slightly swellable homopolymers of a vinyl lactam or copolymers of two or more vinyl lactams, said vinyl lactam being selected from the group consisting of N-vinyl pyrrolidone, N-vinyl-caprolactam and N-vinyl piperidone in dilute aqueous solution, in which the vinyl lactam or a mixture of the vinyl lactams is polymerized at a pH of at least 6 and at most 10 and with the exclusion of oxygen, wherein the polymerization or copolymerization is initiated by 0.5 to 10% by weight of said monomers of divinyl ethylene urea, and wherein from 0.05 to 2% by weight, based on vinyl lactam of at least one  $\alpha$ - or  $\beta$ -ketocarboxylic acid selected from the group consisting of ascorbic acid, ethyl aceto-acetate and pyruvic acid and mixtures thereof is present in the reaction mixture.



## ELECTRICAL

4,013,826

### HIGH-VOLTAGE OVERHEAD TRANSMISSION LINE WITH UNIQUELY STRESSED ELEMENTS

Karl-Heinz Herzig, Viernheim, Germany, assignor to BBC Brown, Boveri & Cie, Mannheim, Germany

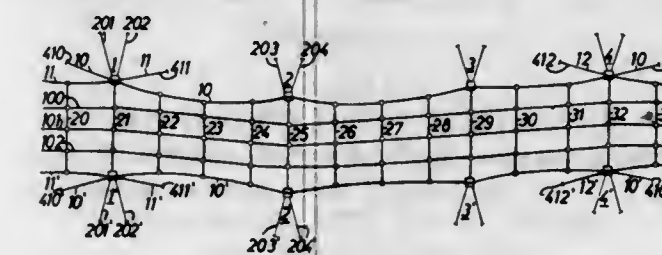
Filed July 9, 1975, Ser. No. 594,353

Claims priority, application Germany, July 9, 1974, 2432849

Int. Cl.<sup>2</sup> H02G 7/00, 7/22

U.S. Cl. 174-43

4 Claims



1. High-voltage overhead transmission line with masts, insulator chains and conductor cables attached to high-strength guy lines and with ground wires comprising: a plurality of guyed masts with thrust footings forming support positions each with at least two support points in a plane normal to the conductor cables, each guy line passing over at least two support points and being anchored to the ground at its ends, the guyed masts of each support position and the guy lines in a rigging field being tied together in an approximately horizontal plane by catenary-arranged insulators, the conductor cables being suspended from the network thus formed.

4,013,827

### PROCESS AND AN ARRANGEMENT FOR FACSIMILE CODING WITH ADDRESS INSERTION OF A SPECIFIC SURFACE ELEMENT SCANNED FOR TRANSMISSION LIMITING FAULT EFFECTIVENESS UP TO THE NEXT INSERTED ADDRESS

Alexander Starck, Munich, and Wolfgang Postl, Hoehenrain, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

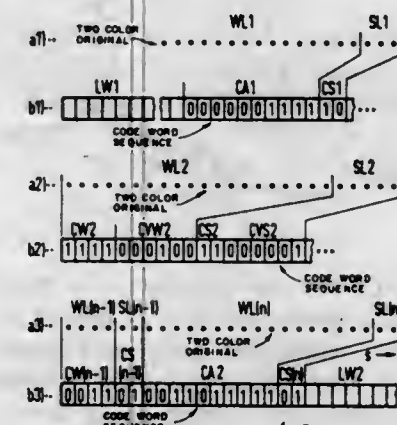
Filed Oct. 22, 1975, Ser. No. 624,660

Claims priority, application Germany, Dec. 9, 1974, 2458119

Int. Cl.<sup>2</sup> H04N 7/12

U.S. Cl. 358-263

9 Claims



1. In a process for facsimile coding in which the items of information contained on a two-color original consisting of individual surface elements are scanned for the purpose of transmission, in which sequence lengths are represented in lines by code words composed of binary characters, and in which a line synchronizing word is produced at the beginning of the coding of each line, the improvement therein comprising the step of: inserting address words which indicate an address of a

specific surface element of the sequence after the line synchronizing word after a given number of transmitted binary characters.

4,013,828

### METHOD AND ARRANGEMENT FOR REDUCING THE BANDWIDTH AND/OR TIME REQUIRED TO TRANSMIT A DITHERED IMAGE

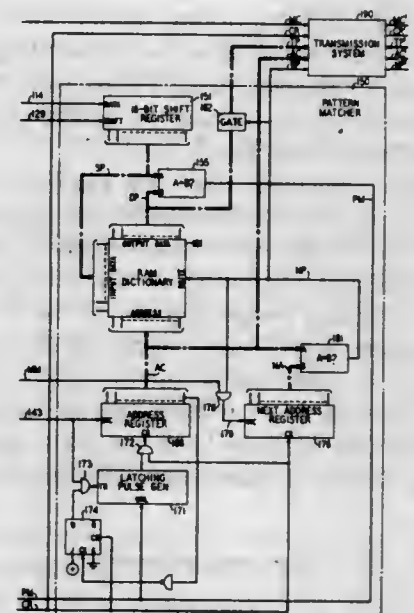
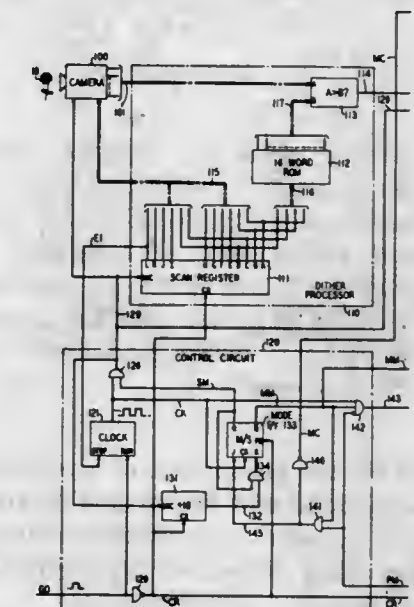
Charles Norris Judice, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 20, 1976, Ser. No. 659,723

Int. Cl.<sup>2</sup> H04N 7/12

U.S. Cl. 358-133

20 Claims



1. Display apparatus comprising means for generating a plurality of image words representing respective N-bit patterns of a dithered image, means for generating a plurality of multibit data words each corresponding to a respective one of said image words, each data word having less than N bits, and means responsive to each data word for displaying the pattern associated with the image word corresponding to that data word.



4,013,829

**METHOD FOR THE PRODUCTION OF PRINTING FORMS**

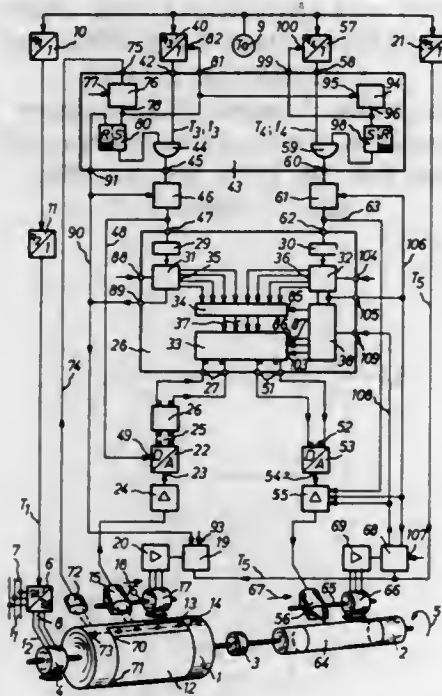
Walter Baar, and Jürgen Dölves, both of Kiel, Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Kiel, Germany  
Filed Feb. 27, 1976, Ser. No. 661,984

Claims priority, application Germany, Feb. 28, 1975, 2508734

Int. Cl.<sup>2</sup> H04N 1/06

U.S. Cl. 358—299

19 Claims



1. A method for the production of a printing form by the scanning point-by-point and line-by-line of an image pattern along successive cylindrical peripheral image lines and engraving cavities along corresponding cylindrical peripheral engraving lines, the steps comprising:

generating image signals from said image pattern from along one of said cylindrical peripheral image lines;  
reading said image signals into a storage device;  
reading said stored signals out of said storage device and coupling said read-out image signals to an engraving device;

engraving with said engraving device along a cylindrical peripheral engraving line corresponding to said one image line in response to said read-out image signals;  
moving said engraving device to a succeeding cylindrical peripheral engraving line;

inhibiting the engraving and the read-out of said image signals at least during the time said engraving device is being moved to the succeeding engraving line, continuing the read-out and engraving of said succeeding engraving line at the stored image signals or cavities marking the end of the moving of said engraving device

and in that, when the end of the engraving line is reached, the first portion of it, which was previously omitted, is engraved retrospectively and the next movement of the engraving device to the succeeding engraving line takes place.

4,013,830

**VIDEO DISC STYLUS**

Harry Louis Pinch, Princeton, N.J., and Herbert Irwin Moss, Yardley, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 19, 1975, Ser. No. 578,899

Int. Cl.<sup>2</sup> G11B 3/44

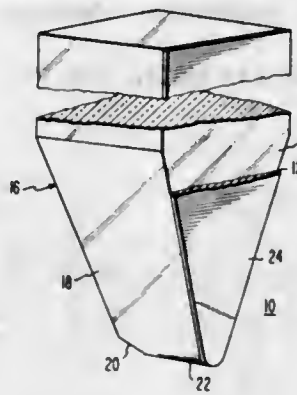
U.S. Cl. 358—128

5 Claims

1. A stylus comprising:

a support structure of dielectric material tapering to a tip at one end thereof, the tip having a curved bottom surface; and  
a cermet film on a portion of the support structure's surface,

the cermet film composed of a conductive material and a dielectric material which has a high adherence to the support structure, the concentration of the constituent materials in the cermet film varying through the thickness



of the film so that the film at the interface with the support structure has a high dielectric concentration while the cermet film at its exposed surface has a high conductive material concentration.

4,013,831

**METHOD FOR THE PRODUCTION OF PRINTING FORMS**

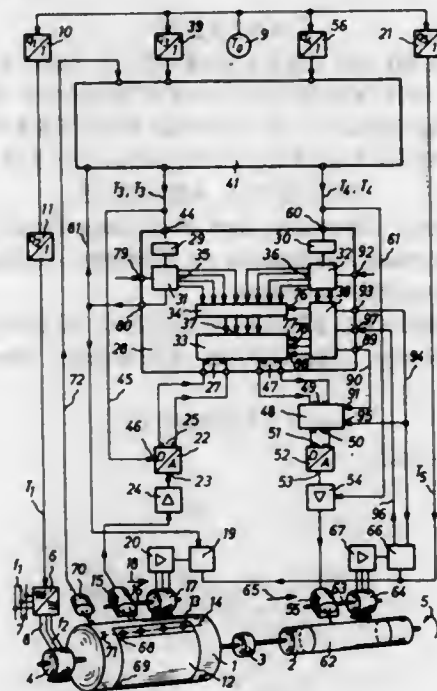
Jürgen Dölves, and Dieter Grieger, both of Kiel, Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Kiel, Germany  
Filed Mar. 12, 1976, Ser. No. 666,494

Claims priority, application Germany, Mar. 11, 1975, 2510533

Int. Cl.<sup>2</sup> H04N 1/06

U.S. Cl. 358—299

8 Claims



1. A method for the reproduction of a printing form by the scanning point by point and line by line of an image pattern along successive cylindrical peripheral image lines and engraving cavities along corresponding cylindrical peripheral engraving lines, wherein the engraving of the cavities is carried out by an engraving member including an engraving needle as a cutting tool, said engraving needle effecting a stroke into the engraving position whenever a cavity is to be engraved on an engraving line, the steps comprising,

generating image signals from said image pattern from along one of said image lines, said image signals representing the lengths of strokes of said engraving needle and the depths of the cavities to be engraved;

moving down said engraving needle into the engraving position at the beginning of one engraving line with a partial stroke length being less than the stroke lengths defined by the corresponding image signal;

moving down said engraving needle into the engraving position during the engraving of several cavities of said engraving line with partial stroke lengths, which increase from cavity to cavity until said partial stroke length being substantially equal to the nominal value defined by the corresponding image signal;  
engraving the residual cavities of said engraving line to depths defined by the corresponding image signals; and then,  
re-engraving the incomplete cavities of said engraving line in accordance with the corresponding image signals.

4,013,832

**SOLID STATE IMAGE MODULATOR**

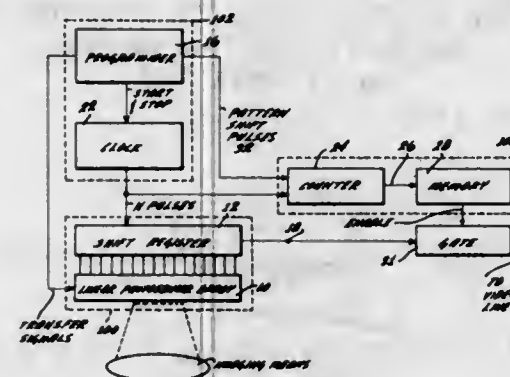
Graham M. Douglas, Monrovia, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed July 28, 1975, Ser. No. 599,899

Int. Cl.<sup>2</sup> H04N 5/30, 3/14

U.S. Cl. 358—212

8 Claims



1. For use with an array of N photosensors which produce output signals in response to radiant energy incident on them, apparatus for electrically producing the same effect as if the pattern of radiant energy incident on the photosensors were modulated by placing a given alterable or movable pattern of spatially-varying transmittance in the path of the radiant energy incident on the photosensors, said apparatus comprising: signal attenuating means coupled to each photosensor for attenuating the output signals of the photosensors according to a given pattern which is referenced to the relative locations of the photosensors within the array and which is independent of the electrical and optical characteristics of the photosensors.

4,013,833

**VIDEO SYSTEM AND METHOD FOR PRESENTATION AND REPRODUCTION OF X-RAY FILM IMAGES**

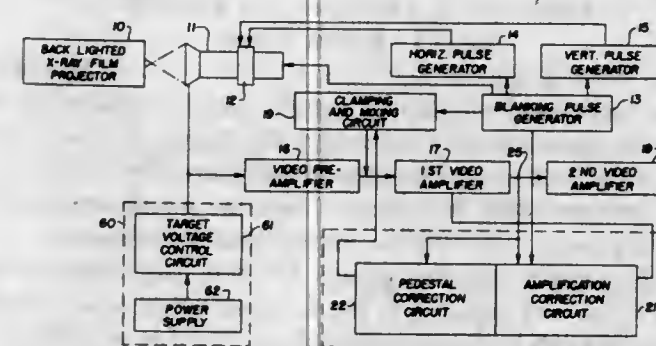
Samuel Morton Zimmerman, 3530 Forest Lane, Suite 98, Dallas, Tex. 75235

Filed Aug. 14, 1975, Ser. No. 604,807

Int. Cl.<sup>2</sup> H04N 5/19

U.S. Cl. 358—111

14 Claims



1. In a video camera including a pickup tube with electron beam generating means and a target plate, means for vertically and horizontally deflecting the electron beam, means for generating blanking and synchronizing signals for blanking

said electron beam and controlling said deflecting means in synchronism therewith, amplifying means including a plurality of stages connected to the output of said target plate for amplifying the composite video signal produced thereby, and clamping circuit means for coupling said blanking signal generating means and said amplifying means, the improvement comprising:

an amplification correction circuit; means for feeding the composite video signal from the output of one video amplifier stage to said amplification correction circuit; said amplification correction circuit including: means for removing the blanking component from said composite video signal; means for rectifying the remaining video signal component of said composite video signal to produce a varying DC reference voltage signal proportional to said video signal component, and defining an amplification correction signal; and means for feeding said amplification correction signal to the output bias voltage circuit for one of said video amplifier stages for varying the gain of said one video amplifier.

4,013,834

**GHOST SIGNAL ERASING SYSTEM**

Yoshihiro Kino, Machida; Nobuaki Furuya, Tokyo, and Mitsuru Asanuma, Machida, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

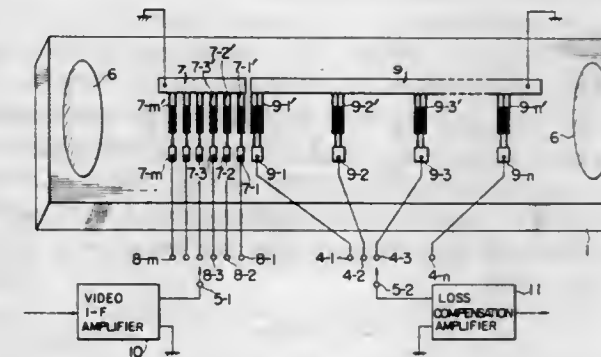
Filed Apr. 17, 1975, Ser. No. 568,834

Claims priority, application Japan, Apr. 18, 1974, 49-44071

Int. Cl.<sup>2</sup> H04N 5/44; H03H 7/30; H01V 7/00

U.S. Cl. 358—166

2 Claims



2. A variable delay element comprising  
a piezoelectric medium,  
a plurality of first interdigitated electrode pairs formed on said medium,  
a plurality of second interdigitated tapped-electrode pairs formed on said medium spaced from said first plurality of electric pairs, a video intermediate frequency signal applied to a selected one of said first interdigitated electrode pairs causing an elastic surface wave to be generated and propagated along the surface of said piezoelectric medium, said propagated wave being extracted as a delayed video intermediate frequency signal voltage from a selected one of said second interdigitated tapped-electrode pairs, and

switch means for selecting different ones of said first and second interdigitated electrode pairs so as to change the combination of first and second interdigitated electrode pairs, thereby varying the delay time.

4,013,835

**DATA ENTRY SYSTEM**

Joseph J. Eachus, Cambridge; Theodore S. Graff, Sudbury, and Douglas H. Seggelin, Whitman, all of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Oct. 23, 1975, Ser. No. 825,240

Int. Cl.<sup>2</sup> G08C 21/00

U.S. Cl. 178—18

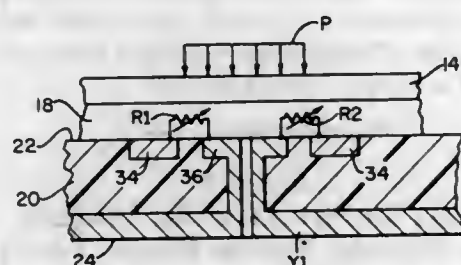
23 Claims

1. In a data entry system wherein data is entered by depress-



ing locations on a touch sensitive device, apparatus for identifying a depressed location comprising:

- a matrix of conductors comprising a plurality of first conductors oriented in a first direction, a plurality of second conductors oriented in a second direction transverse to said first directions;
- a plurality of pressure sensitive electroconductive means for conducting electrical current between respective first and second conductors, each said pressure sensitive electroconductive means being operative to conduct an electrical current when the location immediate thereto has been depressed;
- means for sequentially testing each pressure sensitive electroconductive means for the existence of the current that is established between a respective first conductor and a



respective second conductor when the location immediate thereto has been depressed; and means, responsive to said testing means, for terminating the testing of each pressure sensitive electroconductive means when a depressed location has been identified, said terminating means comprising:

- means, responsive to said testing means, for generating a status signal indicative of a depressed location having been identified,
- means for applying the status signal to said means for sequentially testing each electroconductive means so as to terminate the sequential testing, and
- means for temporarily maintaining the signal level of the generated status signal after the location is no longer depressed.

4,013,836

## DATA TRANSMISSION AND DISPLAY SYSTEM

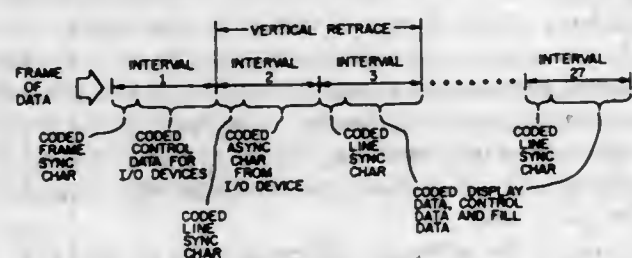
Robert C. Williams, Churchville, Pa., assignor to GTE Information Systems Incorporated, Morristown, N.J.

Filed Sept. 3, 1974, Ser. No. 502,895

Int. Cl.<sup>2</sup> H04L 5/14

U.S. Cl. 178—58 R

15 Claims



1. A data transmission system comprising:
  - a data transmission line having a first end and a second end;
  - data source means coupled to the first end of the data transmission line for transmitting data;
  - data handling means coupled to the second end of the data transmission line for utilizing data transmitted by the data source means and capable of initiating data;
  - said data source means being operative in a plurality of intervals of time to transmit data synchronously over the data transmission line in a first direction for use by the data handling means;
  - first circuit means coupled to the second end of the data transmission line and to the data handling means and

operative to receive and couple the data transmitted synchronously by the data source means over the data transmission line in the first direction to the data handling means; and

said data handling means being operative when data is initiated thereby to transmit said data asynchronously over the data transmission line in a second direction to the data source means, said transmission of data occurring in predetermined intervals of time intermediate predetermined ones of the plurality of intervals of time during which data is transmitted synchronously by the data source means over the data transmission line in the first direction.

4,013,837

## VOICE SECURITY METHOD AND SYSTEM

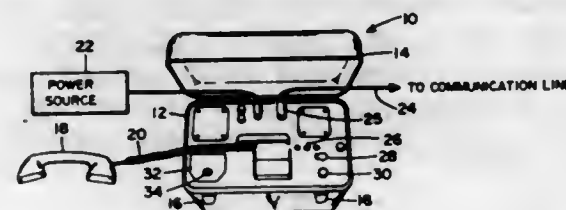
Kenneth M. Branscome, Dallas; William M. Feath, Irving; George E. Goode, Richardson; Kenneth W. Heizer, and Barrie O. Morgan, both of Dallas, all of Tex., assignors to Datotek, Inc., Dallas, Tex.

Division of Ser. No. 293,412, Sept. 29, 1972. This application Jan. 29, 1975, Ser. No. 545,082

Int. Cl.<sup>2</sup> H04K 1/02

U.S. Cl. 179—1.5 S

1 Claim



1. In a voice scrambler decoding system connectable to a communications line, the combination comprising:
  - registers for receiving a predetermined digital sequence via the communications line prior to reception of scrambled voice data;
  - means for summing voltage signals from said registers representative of the digital sequence stored in said registers;
  - means for generating a first signal when the summed voltage signal is above a predetermined threshold value;
  - means for generating a second signal when the differential of said summed voltage indicates the first occurrence of a negative-going value of said summed voltage;
  - means responsive to said first and second signals for generating an enable signal; and
  - means responsive to said enable signal for storing a prime digital word received via the communications line to synchronize said system.

4,013,838

## TELEPHONIC ENQUIRY SYSTEM

Maw-Kuei Tsai, Santa Clara, Calif., assignor to Tonix Corporation, Santa Clara, Calif.

Filed Apr. 5, 1976, Ser. No. 673,878

Int. Cl.<sup>2</sup> H04M 1/10

U.S. Cl. 179—2 A

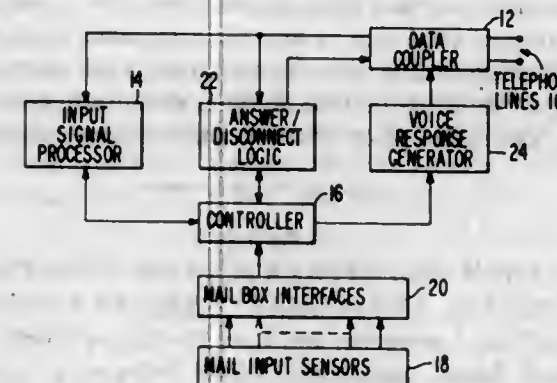
10 Claims

1. An improved telephone remote enquiry system of the type which automatically answers a telephone call from a dial type or push-button type telephone and thereafter responds to a code number signal transmitted over the telephone lines by the calling party, wherein the improvement comprises:
  - multifrequency decoder means for detecting whether the code number signal is in the form multifrequency signals from a push button type telephone and for decoding any such multifrequency signals into a binary coded decimal output representative of the code number signal,
  - dial pulse counter means for counting dial telephone produced pulses to generate a binary coded decimal output representative of the code number signal,

mode selector means for determining whether the code number signal is in the form of dial pulses or multifrequency signals and for selecting the appropriate binary coded decimal output of either the multifrequency decoder means or the dial pulse counter means,

system control means activated by the binary coded decimal output signal from the mode selector means for providing an audible response over the telephone lines to the calling party which is specific to the code number signal, and wherein the dial pulse counter means further includes dial pulse processing and counting means for detecting and counting dial pulse signals over noise pulses, the dial pulse processing and counting means including,

first means for detecting the first leading pulse of a train by checking whether the next subsequent pulse occurs within a predetermined time period thereafter,



- second means for comparing the amplitudes of all subsequent pulses with a first fixed percentage of the amplitude of the immediately preceding pulse and qualifying as valid all such pulses whose amplitudes exceed the first fixed percentage,
- third means for restarting the first means if the amplitude of the next valid pulse occurs before the expiration of the predetermined time period following the receipt of the first leading pulse, the third means repeating this procedure in iterative fashion until the first leading pulse is finally determined by the receipt of a subsequently occurring valid pulse at the end of the predetermined time period with no intervening valid pulses, and
- fourth means for counting pairs of valid pulses which occur with predetermined timed relationships with respect to the finally determined leading pulse and for generating an output signal representative of the count.

4,013,839

## SYSTEM FOR MONITORING DIALLED TELEPHONE NUMBERS

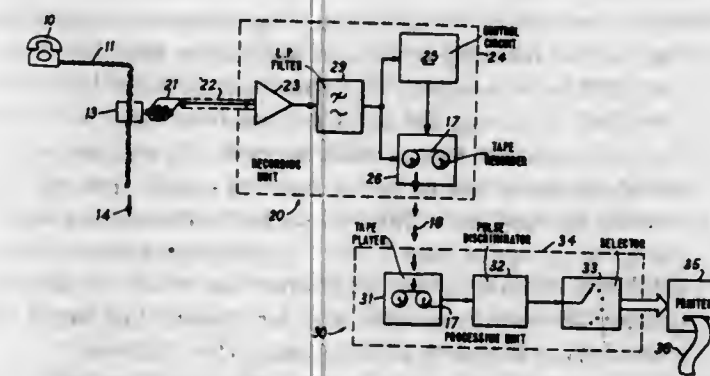
Arthur Stewart Bell, London, England, assignor to Telstop S.A., Luxembourg, Germany

Filed Nov. 8, 1974, Ser. No. 522,129

Int. Cl.<sup>2</sup> H04M 15/06

U.S. Cl. 179—7 R

23 Claims



1. A system for monitoring numbers dialled over a telephone line the system comprising at least one recording means

for sensing dial pulses representative of numbers dialled as well as pulses bearing no relationship to said numbers dialled on a monitored telephone line and for recording each of the sensed pulses on a recording medium, and processing means for playing-back the recorded pulses on the recording medium, for analysing the pulses recorded thereon to determine the numbers dialled on the monitored line and for producing a display of numbers dialled.

4,013,840

## TDM AND FDM TELEPHONE COMMUNICATION

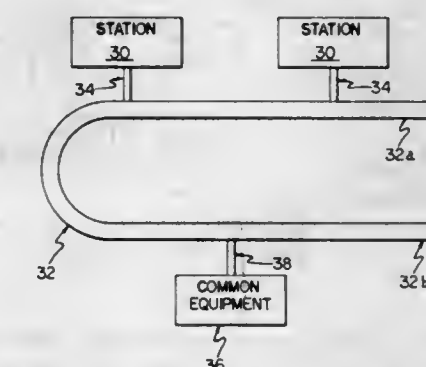
Scott K. Anderson, Orem, Utah, assignor to Teleplex, Inc., Orem, Utah

Continuation-in-part of Ser. No. 492,397, July 29, 1974, abandoned, and a continuation-in-part of Ser. No. 253,265, May 15, 1972, abandoned, and a continuation-in-part of Ser. No. 601,363, Aug. 4, 1975. This application July 11, 1975, Ser. No. 595,100

Int. Cl.<sup>2</sup> H04J 1/10

U.S. Cl. 179—15 FD

18 Claims



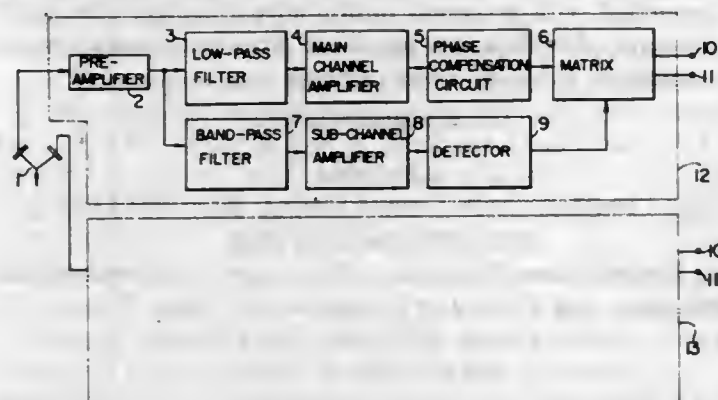
1. A random access communication system for a plurality of telephone sets comprising:
  - a data processor;
  - common cabling for communicating frequency multiplexed amplitude modulated signals between said telephone sets and control signals between said telephone sets and said data processor;
  - means for coupling said processor and said sets to said cabling;
  - a plurality of said telephone sets, each of said telephone sets comprising:
    - a transmitter for transmitting a carrier signal over said cabling to other telephone sets, each said transmitter comprising an adjustable source of said carrier signals to transmit selected carrier signals and means to amplitude modulate the carrier signal transmitted by said transmitter,
    - a receiver for receiving a carrier signal over said cabling from other telephone sets, each said receiver being pre-tuned to receive only one carrier signal which differs for each telephone set and is dedicated thereto and means to amplitude demodulate the carrier signal received by said receiver, and
    - means for initiating a call to a called telephone set comprising means responsive to pulse code groups which are included in said control signals for digitally adjusting the frequency of the carrier signal of the transmitter associated with a calling telephone set to the dedicated carrier signal associated with the receiver of the called telephone set and adjusting the frequency of the carrier signal of the transmitter associated with the called set to the dedicated carrier signal associated with the receiver of the calling set; and
  - wherein said data processor responds to said means for initiating a call by transmitting pulse code groups which are included in said control signals identifying the called and calling telephone sets to said calling and called sets respectively, and wherein said control signals are transmitted in time division multiplex format.







into audio signals; and a bias circuit interposed between said cartridge and said reproducing circuit for varying the bias current of said cartridge in a direct relationship with changes in ambient temperature, said bias circuit including a tempera-



ture sensitive element having an electrical resistance which varies inversely with changes in the ambient temperature thereby compensating for the temperature characteristic of said cartridge and producing an output voltage which is substantially independent of changes in ambient temperature.

4,013,846

## PISTON LOUDSPEAKER

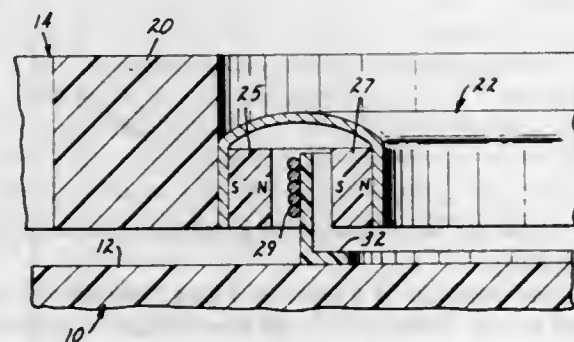
William G. Krawczak, White Bear Lake, and William M. Mularie, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 608,446, Aug. 28, 1975, abandoned. This application June 1, 1976, Ser. No. 691,472

Int. Cl.<sup>2</sup> H04R 9/06

U.S. Cl. 179—115.5 R

7 Claims



## 1. A loudspeaker comprising:

- a rigid, light-weight diaphragm having broad front and rear faces,
- a magnetically permeable keeper having a channel-shaped cross-section and forming a substantially closed loop, means supporting said keeper adjacent and spaced from said rear face of said diaphragm with the open side of said channel facing said diaphragm,
- a pair of magnets formed of fine grain, high coercivity, permanent magnetic material and supported within said keeper channel, one along each side wall of said channel, said magnets extending around said substantially closed loop of said keeper and being magnetized and positioned with opposite poles in spaced facing relation, and
- a voice coil secured to said rear face of said diaphragm and positioned in the space between said magnets around said substantially closed loop of said keeper.

4,013,847

## NO-LOAD TAP CHANGER SWITCH WITH RACK AND PINION GEAR OPERATING MECHANISM

Edward F. Guidosh, Coltsville Township, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 24, 1975, Ser. No. 599,241

Int. Cl.<sup>2</sup> H01H 3/00, 19/54

U.S. Cl. 200—18

2 Claims

- 1. Tap changer apparatus comprising: a tank,

first, second and third winding phases disposed in said tank, said winding phases each having tapped winding sections with tap leads connected thereto, said winding phases being horizontally spaced in said tank with their longitudinal axes in a common plane,

an elongated insulating member disposed in said tank with its longitudinal axis substantially parallel to said common plane,

first, second and third contact sets mounted in horizontally spaced relation from one another on said elongated insulating member, each of said contact sets including a plurality of stationary electrical contacts positioned in an arc pattern around and equidistant from an axis of rotation, first, second and third rotatable contacts pivotally mounted from a first side of said elongated insulating member on the axes of said first, second and third contact sets, respectively, for selective engagement with the associated stationary electrical contacts,



said tap leads from the first, second and third winding phases being connected to the first, second and third contact sets and their associated rotatable contacts, respectively,

an elongated operating member mounted for linear movement on a common side of said insulating member, first, second and third coupling means operatively connected between said elongated operating member and said first, second and third rotatable contacts, respectively, said first, second and third coupling means translating linear movement of said elongated operating member to rotary movement of said first, second and third rotatable contacts, respectively,

and rotary operating means operable from outside of said tank, said rotary operating means including fourth coupling means operably connected to said elongated operating member for translating rotary movement of said rotary operating means to linear movement of said elongated operating member.

4,013,848

## SPRING SHORTING MEANS FOR PHOTOFLASH ARRAY

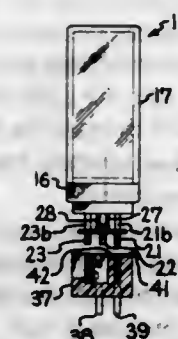
Donald R. Schindler, Burton Township, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,037

Int. Cl.<sup>2</sup> H01R 13/70

U.S. Cl. 200—51.1

9 Claims



- 1. A flash lamp array comprising a body portion containing a plurality of flash lamps and having at least two electrical terminals extending downwardly from the underside of said body portion and being substantially mutually parallel and spaced apart from each other and adapted to be inserted into a socket having a surface, at least a first one of said terminals being provided with a lateral shoulder, and a resilient elongated member positioned below and substantially parallel to

said underside of the body portion of the array and connected electrically to a second one of said terminals and engaging resiliently against said shoulder so as to normally short-circuit said first and second terminals, said resilient elongated member being positioned to engage said surface of the socket and be lifted out of engagement with said shoulder when said array is plugged into said socket.

4,013,849

## POWER PACK PLUG SWITCH

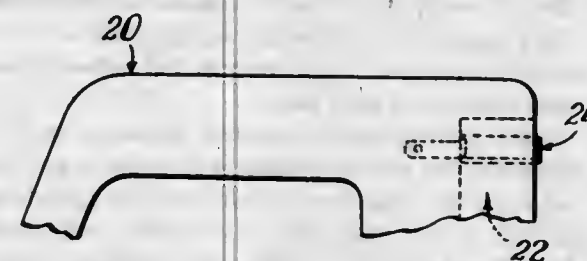
Vincent B. Brown, Prospect Heights, Ill., assignor to Methode Electronics, Inc., Chicago, Ill.

Filed Feb. 18, 1975, Ser. No. 550,867

Int. Cl.<sup>2</sup> H01R 33/30, 33/54

U.S. Cl. 200—51.09

8 Claims



- 1. A plug switch for a rechargeable power pack comprising a housing, a first pair of terminal blades secured in said housing and projecting outwardly at one end thereof for insertion in an electrical socket; a carrier member slidable in said housing between first and second positions; spring means normally biasing said carrier member to said first position, an opening formed into said housing at said one end in direct communication with said carrier member for permitting engagement of said carrier member with a member associated with an electrical socket; first and second elongated contact members carried by said carrier member; each of said first pair of terminal blades having a terminal contact portion with one contact portion in continuous sliding engagement with said first elongated contact member and with the other contact portion in continuous sliding engagement with said second elongated contact portion; a second pair of terminal blades secured in said housing and projecting outwardly from one side thereof; each of said second pair of terminal blades having a contact member disposed in the path of travel of said carrier member such that said first and second elongated contact members are brought into electrical engagement, respectively, with one and the other contact members of said second pair of terminal blades upon said carrier being moved to said first position; a third pair of terminal blades secured in said housing and projecting outwardly from said one side; each of said third pair of terminal blades having a contact member disposed in the path of travel of said carrier member such that said first and second elongated contact members are brought into electrical engagement, respectively, with one and the other contact members of said third pair of terminal blades upon said carrier being moved to said second position.

4,013,850

## TURN SIGNAL ASSEMBLY AND SELF-CANCELLING MEANS ATTACHABLE EXTERNALLY TO A STEERING COLUMN POST

Dale L. Bull, Reed City, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Apr. 7, 1975, Ser. No. 565,480

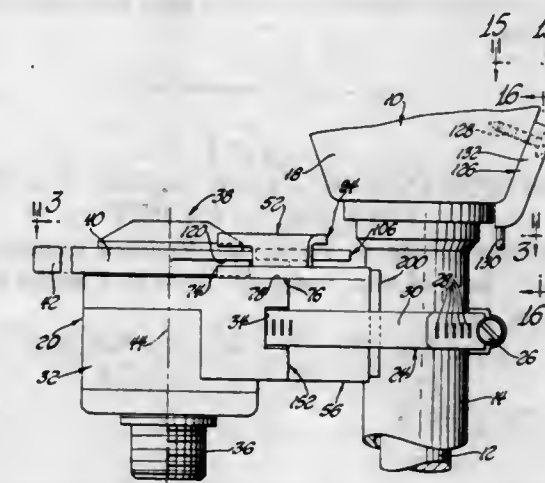
Int. Cl.<sup>2</sup> H01H 3/16, 9/00; B60Q 1/00

U.S. Cl. 200—61.27

19 Claims

- 1. A turn signal switch and assembly for an associated vehicle having manually controlled vehicular steering gear means and steering gear column housing means, comprising turn signal switch housing means for enclosing and containing actuatable electrical switching members therein, rotatable

selector lever means carried by said switch housing means generally externally thereof, said selector lever means being selectively manually rotatably positionable into a neutral position and any of a plurality of operating positions as to thereby accordingly actuate said switching members within said switch housing means, abutment means operatively carried by said selector lever means as to be situated externally of said switch housing means, motion transmitting means situated generally externally of said switch housing means and having a first portion in operative juxtaposition to said abutment means, said motion transmitting means further comprising a second portion adapted to be at times operatively engaged by actuating means moving in response to indicia of said steering gear means being actuated to steer said associated vehicle in a non-linear path, said actuating means being effective when said selector lever means has been selectively positioned in one of said operating positions corresponding to a



left-turn operation of said associated vehicle and when said steering gear means is being actuated in a right-turn direction to engage said motion transmitting means and thereby forcibly cause said motion transmitting means to react against said abutment means to thereby cause said selector lever means to be rotated from said one of said operating positions to said neutral position, and support body means situated externally of said switch housing means, said support body means being separate from said switch housing means and effective to support said motion transmitting means, said support body means comprising first mounting surface means effective for operative mounting engagement with said column housing means externally thereof and second mounting surface means effective for operative mounting engagement with said switch housing means as to thereby position said switch housing means externally and eccentrically of said column housing means.

4,013,851

## VEHICLE DETECTION APPARATUS

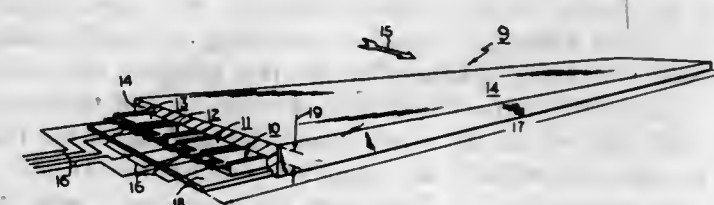
Cosmo Abbondante, Burlington, Mass., assignor to Bofors America, Inc., Linden, N.J.

Filed July 25, 1975, Ser. No. 598,930

Int. Cl.<sup>2</sup> H01H 13/16

U.S. Cl. 200—86 R

9 Claims



- 1. Apparatus for closing an electrical circuit during application of force by a vehicle tire or the like, comprising a relatively thin, narrow and elongated contact member having a flexibility which tends to preserve a substantially flat condition thereof following its bending transverse to its direction of



elongation, substantially rigid holder means having an elongated open-topped shallow channel therein, said contact member being fitted within said channel with long edges of said member confined against lateral movement thereby, said contact member having electrically-conductive lower surfaces disposed opposite substantially flat electrically-conductive upper surfaces within said channel, thin and narrow elongated spacer means under the long margins of said contact member and confined to the marginal areas thereof, said spacer means normally maintaining a relatively minute spacing between said electrically-conductive surfaces while permitting said lower surfaces to be deflected into non-wiping broad-area engagement with said upper surfaces upon application of force to the top of said contact member, substantially yieldable means padding the areas above said top of said contact member and transmitting forces applied thereto to said contact member, said yieldable means being in contiguous unbonded relationship with said top of said contact member, and means making separate electrical connections with said electrically-conductive surfaces.

4,013,852

## EXPULSION INTERRUPTION DEVICE FOR HIGH VOLTAGE SWITCHES

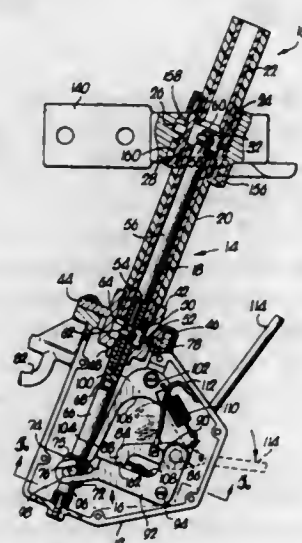
Gerald Bernard Roberts, Paris, and Richard Eugene Roberts, Centralia, both of Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Feb. 10, 1975, Ser. No. 548,561

Int. Cl.<sup>2</sup> H01H 33/12, 9/38

U.S. Cl. 200-146 R

4 Claims



1. An arc-suppressing interrupter adapted to be interposed in an electrical circuit in conjunction with a blade-type disconnect switch for actuating the interrupter, the latter comprising:

- a closed housing;
- an elongated expulsion tube attached to said housing and in communication with the interior thereof, the interior of said tube being formed of arc-suppressing material;
- spaced electrical contacts within said tube;
- means for electrically connecting one of said contacts with said circuit;
- an elongated, axially shiftable plunger rod telescopically received within said tube and extending into said housing, said rod being operable in the rest position thereof to electrically connect said spaced contacts, and to electrically disconnect the same upon axial shifting of the rod;
- a conductive, shiftable actuating arm mounted externally of said housing and in disposition for engagement with the blade of said switch during opening of the latter, said arm being engageable and shiftable with said blade during opening thereof prior to termination of current flow through said blade;
- means electrically connecting said actuating arm and the other of said electrical contacts for defining a shunt path

through the latter and said plunger rod normally electrically interconnecting the spaced contacts; and actuating means positioned within said housing and operably coupled to said plunger rod and actuating arm respectively, said actuating means including:

- a generally L-shaped link having elongated first and second leg sections, said link being operably coupled adjacent the end of said first leg section to said plunger rod, and pivotally supported within said housing at a point adjacent the end of said second leg section;
- an elongated crank having link-engaging structure thereon pivotally supported intermediate the ends thereof within said housing and operably coupled with said actuating arm for pivoting of the crank in response to said movement of the actuating arm;
- a stop arm pivotally supported within said housing adjacent one end of the stop arm, with the remaining end thereof normally being in operative movement-blocking engagement with said plunger rod;
- a drive spring operatively connected between one end of said crank and said link;
- a return spring interconnected between said stop arm adjacent the pivotal connection thereof, and said crank adjacent the end thereof remote from said drive spring;
- said link, crank, stop arm drive spring and return spring being cooperatively located and arranged for extending said drive spring and tensionably energizing the same upon pivoting of said crank in response to said movement of the activating arm, and for extending and tensionably energizing said return spring upon said pivoting of said crank,
- said stop arm and crank having respective engagement surfaces located for causing said crank to engage said stop arm, after the crank has been pivoted a predetermined distance to accomplish said tensionable energization of said drive and return springs, for pivoting of said stop arm out of said movement-blocking disposition to clear said plunger rod, in order to permit said drive spring to quickly pull said link towards said crank with consequent deenergization of said drive spring for axial, electrical disconnecting movement of said plunger rod,
- said return spring, after said deenergization of said drive spring, being operable for simultaneously pivoting said stop arm and crank for causing said link-engaging structure to engage said link for return movement of said plunger rod back to said rest position, and for return movement of said stop arm back to said normal movement-blocking disposition.

4,013,853

## MULTI-PHASE COMPRESSED-GAS CIRCUIT-BREAKER CONSTRUCTION

Thomas E. Alverson, Brookfield, Ohio; Otto H. Soles, North Huntingdon, Pa.; Melvyn D. Hopkins, Pittsburgh, Pa., and Charles E. LeRow, Jr., Jeannette, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 27, 1974, Ser. No. 527,930

Int. Cl.<sup>2</sup> H01H 33/54

U.S. Cl. 200-148 B

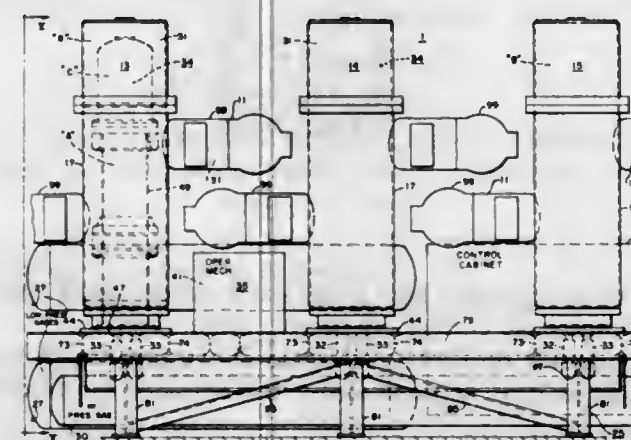
2 Claims

1. A multi-phase compressed-gas circuit-breaker installation comprising, in combination:

- a. means defining a generally-rectangularly-shaped lower main metallic support frame;
- b. upstanding metallic legs disposed at the corners of said generally-rectangularly-shaped lower main metallic support frame for supporting said rectangular support frame a predetermined distance above foundation level;
- c. a plurality of laterally-spaced upstanding generally-cylindrically-shaped circuit-breaker assemblies (13,14) extending upwardly from and supported by said lower main rectangularly-shaped metallic support frame;
- d. first line-terminal connecting means (39) for each circuit-breaker assembly disposed adjacent the upper end of the respective circuit-breaker assembly;

circuit-breaker assembly disposed adjacent the upper end of the respective circuit-breaker assembly;

- e. cooperable second line-terminal connecting means (39) disposed below the aforesaid first-mentioned first line-terminal connecting means (39) yet spaced upwardly from said main lower-disposed rectangularly-shaped metallic support frame;
- f. pressure-operated separable power contact means for each circuit-breaker assembly disposed internally thereof and interposed between the respective pair of first and second line-terminal connecting means;
- g. valve means provided for each circuit-breaker assembly for causing the actuation of the pressure-operated power contacts thereof and disposed internally thereof and also above said metallic support frame;
- h. horizontally-extending valve-rod actuating linkage supported by said support frame and extending generally horizontally below the several circuit-breaker assemblies and mechanically interconnected with the several interiorly-disposed valve means for the respective circuit-breaker assemblies;



- i. said valve-rod actuating linkage being disposed in the available space between the support frame and the foundation level;
- j. a horizontally-extending high-pressure gas-reservoir extending lengthwise of the circuit-breaker assembly and supported by said support frame;
- k. gas-conduit means interconnecting said high-pressure gas-reservoir tank and each circuit-breaker assembly;
- l. an operating mechanism housing compartment disposed above the support frame and interposed between two adjacently-disposed circuit-breaker assemblies;
- m. said mechanism compartment housing containing an operating mechanism for operating said horizontally-extending valve-rod linkage;
- n. means providing at least one low-pressure gas-reservoir tank disposed rearwardly of the lower-disposed rectangularly-shaped frame support and extending generally horizontally; and,
- o. gas-conduit means interconnecting said horizontally-extending low-pressure gas-reservoir tank with each circuit-breaker assembly.

4,013,854

## COAXIAL SWITCH

Lester J. Workman, P.O. Box 5547, Sarasota, Fla. 33579

Filed Apr. 14, 1975, Ser. No. 567,764

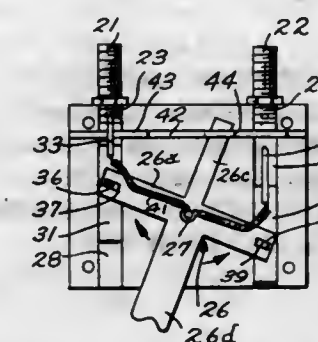
Int. Cl.<sup>2</sup> H01H 33/66

U.S. Cl. 200-153 S

8 Claims

1. A coaxial switch including a switch body having a metallic walled recess therein, an input coaxial line connection mounted to a wall of said switch body and including a central conductor communicating with said metallic walled recess, a plurality of output coaxial line connections mounted to a wall of said switch body and each including a central conductor communicating with said metallic walled recess, a switch operator including at least one connecting pin for positive engagement in a central conductor of an output coaxial line

connection, electrical connection means connecting said connecting pin to the central conductor of said input coaxial line, connecting mounting means mounting said switch operator for selective movement between a plurality of positions with said at least one connecting pin engaging the central conductor for a different one of said output coaxial line connections at each of the plurality of positions, and at least one conductive shielding member separate from but operatively coupled to said switch operator and moved in accordance therewith, said shielding member moved by said switch operator to a position immediately adjacent and covering all of the central conductors of the plurality of output coaxial connections other than the one engaged by said connecting pin, wherein said switch body housing has a cylindrical configuration with said input coaxial connection disposed at an end of the cylindrical switch body housing and said output coaxial connections disposed around the wall of the cylindrical switch body housing, and wherein said shielding member is cylindrical and disposed within said cylindrical body housing for rotation therein, said cylindrical shielding member being provided with an aperture in the wall thereof, said switch operator being mounted to an end of said cylindrical body housing and having a control portion external to said housing and another portion including said connecting pin within said housing, said switch operator being mounted such that said connecting pin can be both rotated and longitudinally displaced between engaged and disengaged positions by said control portion, said connecting pin extending through the aperture in said shielding member and positively engaging the central conductor of one of the output coaxial connections when engaged, said connecting pin and said shielding member both being rotated by said control portion so that said connecting pin is always aligned with the aperture in said shielding member.



4,013,855

## MODULAR PUSHBUTTON SWITCH

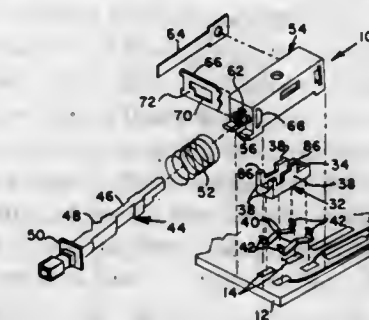
John Erwin Reichen; Richard Neff Meyer, both of Portland, and Gary William Reed, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 17, 1975, Ser. No. 558,580

Int. Cl.<sup>2</sup> H01H 9/00

U.S. Cl. 200-314

13 Claims



1. Pushbutton switch means comprising: dielectric means having spaced stationary electrical contact means; housing means having a contact-carrying means movably disposed therein; movable electrical contact means mounted on said contact-



carrying means for electrical engagement with said stationary electrical contact means;  
 retaining means provided by said dielectric means and said housing means for latchably retaining said housing means onto said dielectric means;  
 spring-biased actuator means extending through said housing means and being connected to said contact-carrying means for moving said contact-carrying means and said movable electrical contact means thereon between first and second positions so that said movable electrical contact means moves into and out of electrical engagement with said stationary electrical contact means; and  
 latching means provided in said housing means and by said actuator means and being movable by actuation of said actuator means to latch said contact-carrying means in one of said first and second positions.

4,013,856

## PUSH BUTTON ASSEMBLY

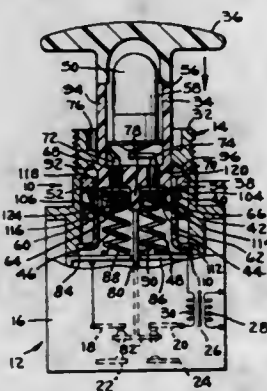
Roger V. Joss, Clinton; William Semonchik, Normal, and Arthur H. Unwin, Bloomington, all of Ill., assignors to General Electric Company, New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 619,088

Int. Cl.<sup>2</sup> H01H 9/20

U.S. Cl. 200—314

7 Claims



1. A push button assembly including an operating unit and a switch unit having an enclosure, said operating unit comprising:

- a. a housing fastened to said switch unit enclosure and having a hollow interior section;
- b. a collar member having one end positioned within said interior section of said housing and another end extending outward therefrom;
- c. a mushroom head fixed to said another end of said collar member;
- d. an actuating plunger having one end mechanically coupled to said one end of said collar member, and having another end coupled to said switch unit;
- e. means for maintaining said collar member in a first position comprising:
  - i. means for biasing said collar member in the direction outward from said interior section of said housing;
  - ii. a projection having an upper and lower wall extending from an exterior surface of said collar member and joining at an apex distal from said exterior surface; and
  - iii. said interior section of said housing having a portion in juxtaposition with said upper wall of said projection to limit the outward movement of said collar member, whereby when said upper wall of said projection is pressed against said portion of said interior section of said housing, said collar member is maintained in the first position; and
- f. means for maintaining said collar member in a second position comprising:
  - i. a washer member, having a flat surface positioned within said interior section of said housing;
  - ii. a spring seat, having a first flat surface, fixed within said interior section of said housing; and
  - iii. a spring member biased toward said exterior surface of

said collar member and positioned between the planes formed by the respective flat surfaces of said washer member and said spring seat, whereby said collar member is maintained in the second position when said spring member is squeezed between said upper wall of said projection and said flat surface of said washer member.

4,013,857

## ILLUMINATION-TYPE SMALL-SIZED SWITCH

Yukihisa Tanaka, Tokyo, Japan, assignor to Nihon Kaihiteki Industrial Company, Ltd., Tokyo, Japan

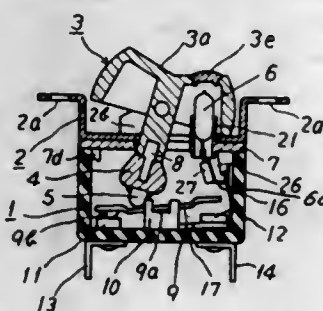
Filed May 14, 1975, Ser. No. 577,206

Claims priority, application Japan, June 12, 1974, 49-67364[U]

Int. Cl.<sup>2</sup> H01H 9/16

U.S. Cl. 200—315

8 Claims



1. An illumination-type small-sized switch which comprises a switch case containing therein switch contacts; an actuator rockably positioned above said switch case; a light emitter disposed under said actuator for illuminating the same; and an insulating plate placed on the upper surface of said switch case for supporting said light emitter, said insulating plate having a circular opening and being formed on its upper surface with a resilient cylinder-shaped rising piece surrounding said opening, and said light emitter being fitted into said rising piece.

4,013,858

## ROCKER SWITCH WITH INTEGRAL OFF LOCK

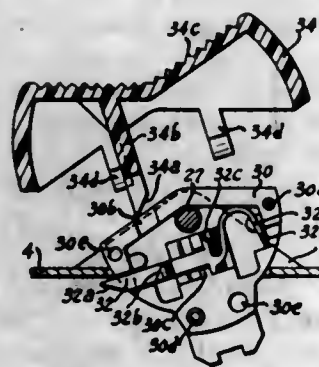
Stuart W. Grebner, Garner; James V. Johnson, and Leonardus J. Josemans, both of Smithfield, all of N.C., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed July 2, 1975, Ser. No. 592,411

Int. Cl.<sup>2</sup> H01H 3/02

U.S. Cl. 200—321

11 Claims



1. A self-enclosed rocker switch comprising: an insulating housing; stationary contact means within said housing connected to external terminals; movable contact means within said housing selectively operable to an "on" position closing a circuit with respect to said stationary contact means or to an "off" position opening said circuit; a rocker assembly;

supporting means on said housing pivotally mounting said rocker assembly for rocking movement to actuate said movable contact means;  
 and said rocker assembly comprising:  
 contact actuator means extending into said housing for actuating said movable contact means to said "on" or "off" position;  
 a spring-biased locking member having a locking position and an unlocking position and projecting from said contact actuator means in its said locking position to catch on said housing thereby to prevent pivotal movement of said rocker assembly;  
 and a removable rocker button having high end portions with a valley therebetween and means for coupling the same to said contact actuator means so that selective depression of one of said high end portions effects pivotal movement of said rocker button and said contact actuator means coupled thereto and means on said rocker button operable when inserted into said contact actuator means together with said coupling thereof for moving said locking member against the force of its bias spring into said unlocking position clear of said housing to afford normal pivotal movement of said rocker assembly.

4,013,859

## INDUCTION COOKING UNIT HAVING COOKING LOAD SENSING DEVICE AND ESSENTIALLY ZERO STAND-BY POWER LOSS

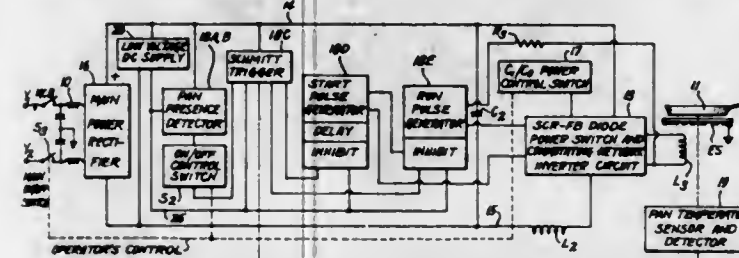
Philip H. Peters, Jr., Greenwich, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Filed June 4, 1975, Ser. No. 583,662

Int. Cl.<sup>2</sup> H05B 5/04

U.S. Cl. 219—10.49

39 Claims



1. In an induction cooking unit having essentially zero stand-by power requirements and comprising high frequency power inverter circuit means for developing relatively high frequency power excitation currents for supply to an induction heating coil connected to and excited by said high frequency power inverter circuit means and gating circuit means coupled to and controlling operation of the high frequency power inverter circuit means; the improvement comprising induction heating load sensing and control means for sensing the presence of a load located in induction heating relationship with respect to the induction heating coil and for controlling operation of the power inverter circuit means, said induction heating load sensing and control means comprising low power, high frequency electric sensing signal generating means for deriving a high frequency electric sensing signal having a frequency different from that at which the induction heating coil is excited, load sensing coil means coupled to and excited by said high frequency electric sensing signal generating means, said load sensing coil means being physically positionable adjacent an induction heating coil in a location to provide inductive coupling of the high frequency electric sensing signal to a load being inductively heated and including means for minimizing the effect of inductive coupling from the induction heating coil at the induction heating coil excitation frequency, detector means responsive to the high frequency

electric sensing signal derived from said load sensing coil for detecting changes induced in the high frequency electric sensing signal by the presence of an induction heating load, and means for coupling the output from said detector means to control operation of the gating circuit means of an induction cooking unit.

27. An induction cooking unit pan load sensing device for sensing the presence of a pan load located in induction heating relationship with respect to an induction cooking coil; said pan load sensing device comprising low power, high frequency oscillatory sensing electric signal generating means for deriving high frequency electric sensing signal having a frequency different from the frequency at which the induction heating coil is excited, pan load sensing coil means coupled to and excited by said high frequency oscillatory sensing electric signal generating means, said pan load sensing coil means being physically positioned adjacent an induction cooking coil in a location to provide inductive coupling of the high frequency oscillatory sensing electric signal to a pan load being inductively heated and including means for minimizing the effect of inductive coupling from the induction cooking coil, pan load sensing detector means responsive to the high frequency sensing electric signal emitted by said pan load sensing coil for detecting changes induced in the high frequency sensing electric signal by the presence of a pan load to be inductively heated, and means for deriving a control output signal from said pan load detector means to control operation of an induction cooking unit.

4,013,860

## HAND HELD ELECTRO-MECHANISM SEALER

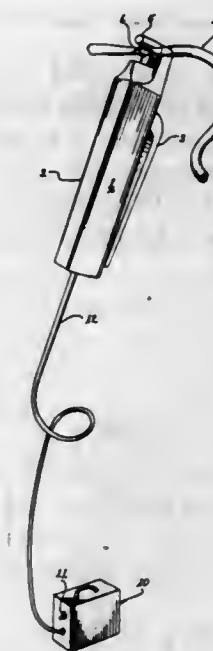
Craig Hosterman, Paradise Valley; William E. Michel, Scottsdale, and Dale R. Oldham, Phoenix, all of Ariz., assignors to Engineering & Research Associates, Inc., Tucson, Ariz.

Filed Apr. 9, 1976, Ser. No. 675,235

Int. Cl.<sup>2</sup> H05B 9/04; B32B 19/02

U.S. Cl. 219—10.81

14 Claims



1. A hand held sealer for sealing heat weldable tubing, said sealer having an electrically attached electrical power supply for generating Rf power, said sealer comprising in combination:

- a. a body for receiving the tubing;
- b. a pivotable handle for actuating operation of said sealer;
- c. a pair of jaws for compressing the tubing therebetween, one of said pair of jaws being positionably biased in response to pivotal movement of said handle;
- d. means disposed intermediate said handle and said one movable jaw for translating pivotal movement of said handle into translatory movement of said one movable jaw;



- e. resonant circuit means disposed within said handle for applying Rf power across the tubing compressed intermediate said pair of jaws, said resonant circuit including a variable capacitor developed by said pair of jaws for regulating the applied power by bringing said resonant circuit into and out of tune as the position of said one movable jaw varies;
- f. a pre-load capacitor electrically connected to said resonant circuit for developing an initial state of tune of said resonant circuit during initial compression of the tubing intermediate said pair of jaws, whereby said pre-load capacitor insures that sufficient flow of Rf power will occur across said pair of jaws to heat and soften the initially compressed tubing;
- g. first switch means responsive to pivotal movement of said handle for electrically interconnecting said resonant circuit with the power supply;
- h. timing means for generating a first electrical signal at the conclusion of a first time period and for generating a second electrical signal at the conclusion of a second time period;
- i. second switch means responsive to said timing means for electrically disconnecting said pre-load capacitor from said resonant circuit at the conclusion of said first time period; and
- j. third switch means responsive to said timing means for electrically terminating the flow of Rf power from the power supply to said resonant circuit at the conclusion of said second time period;

whereby, the initial heating of the tubing during said first time period allows sufficient compression of the tubing by said pair of jaws to render the capacitive effect of said pair of jaws sufficient to bring said resonant circuit into tune during said second time period without the capacitance contributed by said pre-load capacitor and permit maximum power transfer across the tubing to establish a weld whereafter further movement of said pair of jaws de-tunes said resonant circuit to diminish the flow of power across the tubing and prevents rupture of the heated tubing.

4,013,861

## MICROWAVE OVEN DOOR SEAL

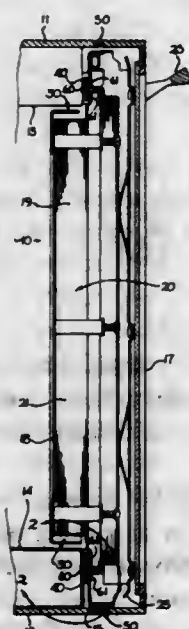
John Lloyd Westfall, Shreveport, La., assignor to The Frymaster Corporation, Shreveport, La.

Filed Aug. 13, 1975, Ser. No. 604,259

Int. Cl.<sup>2</sup> H05B 9/06

U.S. Cl. 219—10.55 D

5 Claims



1. A device for suppressing leakage of microwave energy from the space defined by a door and a wall of an oven cavity

of a combination thermal microwave oven, said device comprising:

- a flexible conductive gasket for conductively sealing said door to said wall of said cavity;
- a choke means for electrically shorting leaking microwave energy passing between said door and said wall of said cavity, said choke means disposed around said door and formed from said wall of said cavity, said door and said flexible conductive gasket, said choke formed such that minimum current in the electrical short occurs near said flexible conductive gasket;
- a means for absorbing the microwave energy leaking from said oven cavity and by-passing said flexible conductive gasket and said choke means;

Whereby said flexible conductive gasket maintains physical and conductive contact with said wall of said oven cavity, thereby maintaining the integrity of said choke means.

4,013,862

## TRANSVERSELY AND ANGULARLY ADJUSTABLE TOOL HOLDER EDM ELECTRODES

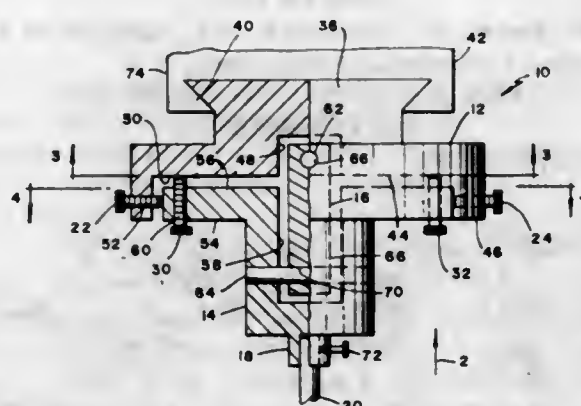
Thomas J. O'Connor, 100 Morgan Road, Ann Arbor, Mich. 48106

Filed Jan. 17, 1975, Ser. No. 541,738

Int. Cl.<sup>2</sup> B23P 1/08

U.S. Cl. 219—69 E

5 Claims



1. A tool holder for supporting an electrode for electrical discharge machining or the like, comprising a base, a tool supporting member, and means operable between the base and tool supporting member for supporting the tool supporting member on the base for both transverse movement in two relatively perpendicular directions and pivotal movement about two relatively perpendicular pivot axes comprising a first shaft secured to said base, a second shaft secured to said tool supporting member and extending axially perpendicular to said first shaft, and a connecting member having a pair of openings therethrough extending perpendicular to each other receiving said first and second shafts therein.

4,013,863

## METHOD OF FINISHING A WORKPIECE OF A NON-CONDUCTING MATERIAL, PARTICULARLY DIAMOND, BY MEANS OF SPARK EROSION

Cornelis van Osenbruggen; Johannes van Ruler, and Theodorus Maria Berendina Schoenmakers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 471,041, May 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 437,324, Jan. 28, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,090

Claims priority, application Netherlands, Feb. 7, 1973, 7301683

Int. Cl.<sup>2</sup> B23P 1/08

U.S. Cl. 219—69 D

4 Claims

1. In the method of finishing a workpiece of a non-conducting material by means of spark erosion in which a voltage is

applied between the surface of the workpiece present in a dielectric liquid and an electrode also present in the dielectric liquid to effect a spark-over between the workpiece and the electrode, the improvement wherein said dielectric liquid is an emulsion of an aqueous solution of an electrolyte in an organic dielectric liquid and a surfactant, the drops of said emulsion being smaller than the wavelength of visible light.

4,013,864

## APPARATUS FOR FABRICATING THROUGH-THE-WALL BATTERY CONNECTORS

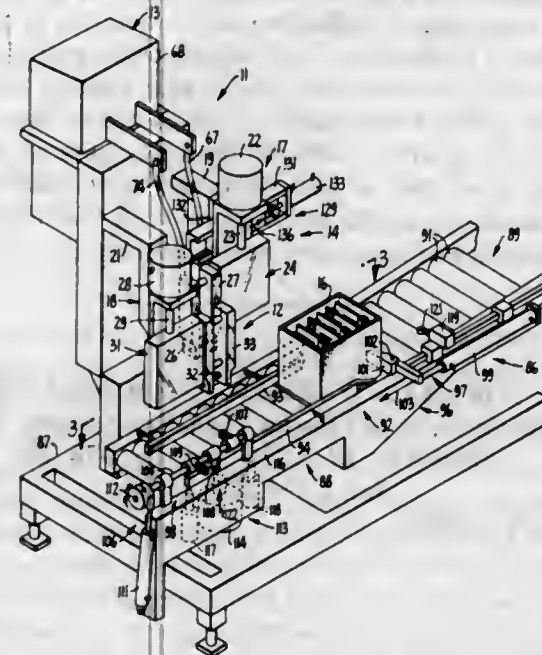
Ernest G. Tiegel, Redwood City, and Ralph G. Tiegel, San Carlos, both of Calif., assignors to Tiegel Manufacturing Company, Belmont, Calif.

Continuation-in-part of Ser. No. 753,137, Aug. 16, 1968. This application Mar. 6, 1975, Ser. No. 555,883

Int. Cl.<sup>2</sup> B23K 19/00; H01M 10/12

U.S. Cl. 219—80

34 Claims



1. An apparatus for connecting battery plate units positioned in adjacent cell chambers of a battery case, through an aperture in a partition between said adjacent cell chambers by extruding and fusing the lead of projections carried on said plate units through said aperture, comprising:

- an electrode assembly means comprising a pair of opposed electrodes adapted to fit about said partition and into said adjacent cell chambers and overlies said projections, said electrodes being configured and dimensioned relative to said aperture to extrude a portion of each of said projections into said aperture;
- means for moving said electrodes relatively toward each other for forcing said plate unit projections against said partition and for extruding a portion of each of said projections into said aperture and into contact with each other within said aperture; and
- means for passing an electric current through said electrodes for fusing said lead in and at the aperture and forming an intercell connection between said plate units and said cells.

4,013,865

## METAL HONEYCOMB WELDING APPARATUS AND METHOD

Everett E. Jones, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed July 29, 1974, Ser. No. 492,497

Int. Cl.<sup>2</sup> B23K 1/14

U.S. Cl. 219—117 HD

12 Claims

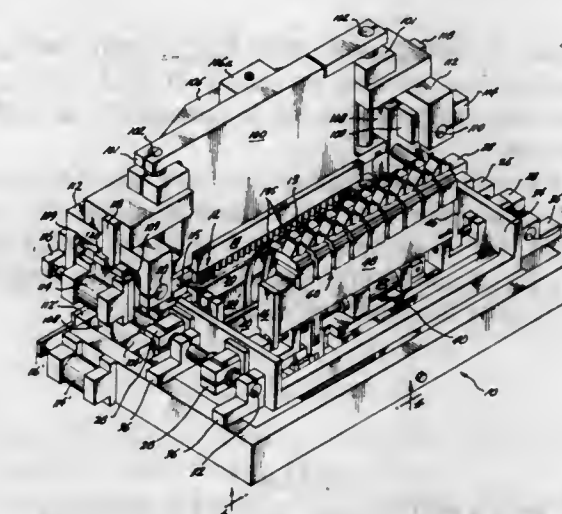
1. Welding apparatus for making honeycomb core panels from corrugated metal strips, said strips having raised projection arrays thereon comprising:

a base on which the core panel under fabrication is positionable with one end thereof substantially coincident with a welding station extending across the base;

first movable electrode means insertable within and retractable upwardly from core cells adjacent said welding station to establish electrical contact with inwardly facing surfaces of outer apices on said core, said first electrode means further movable between a first, strip engaging, position to a second welding position while engaged with said core whereby said core is advanced through said apparatus;

second movable electrode means insertable within and retractable downwardly from core cells adjacent said welding station to establish electrical contact with inwardly facing surfaces of outer apices on said core, said second electrode means further movable between a first, strip engaging, position to a second welding position while engaged with said core whereby said core is advanced through said apparatus;

welding means movable on said base from a strip-receiving



location to said welding station, said welding means including strip positioning means to receive and carry a corrugated metal strip into registry with said core with said raised projection arrays between said strip and said core whereby honeycomb cells are formed and further including at least one welding element engageable with the apices of said strip to impose welding current simultaneously across all said raised projection arrays at a node, to form a series of spot welds at said node;

means to move said first and said second movable electrode means in a sequence from strip engaging position wherein said welding means brings said strip into contact with said electrode means to a welding position wherein said strip is welded to said core forming cells, then return to said strip engaging position by withdrawing said electrode means from said cells, said means to move said first and said second movable electrode means alternatively moving said first and said second electrode means in said sequence; and

means to impose a welding current between said welding elements and said electrodes.

4,013,866

## PLASMA TORCHES

Thomas Joseph Fox, Loughborough, and John Ernest Harry, Edmondthorpe, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 4, 1976, Ser. No. 663,992

Claims priority, application United Kingdom, Mar. 5, 1975, 09148/75

Int. Cl.<sup>2</sup> B23K 9/08

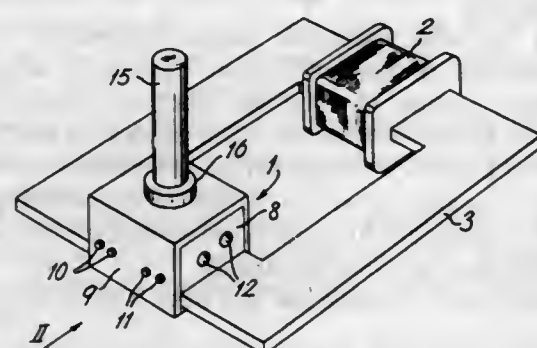
U.S. Cl. 219—121 P

10 Claims

1. A heating device comprising: a plasma torch incorporating



a hollow structure having an inlet and an outlet by means of which a stream of gas may be passed through said structure, said outlet being constituted by a conductive nozzle having an elongated exit aperture whose length is much greater than its width, and  
at least one internal electrode having an active portion disposed within said structure out of contact with said nozzle, said active portion having dimensions small compared with the length of said aperture and being disposed



adjacent to said aperture with said aperture being closest to said active portion at a part of said aperture from which said aperture extends longitudinally in both directions; and  
means for generating a magnetic field directed across the width of said aperture and extending along said aperture at least over a portion of said aperture which contains said part of said aperture and which has a length much greater than the width of said aperture.

4,013,867

## POLYPHASE ARC HEATER SYSTEM

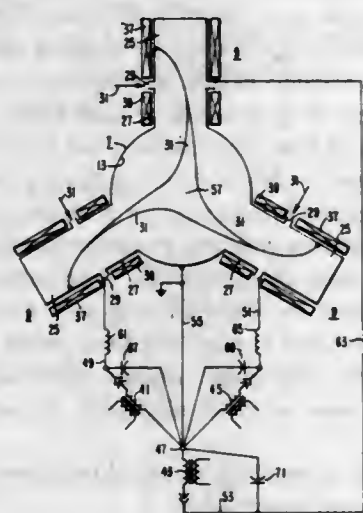
Maurice G. Fey, Plum Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 11, 1975, Ser. No. 603,579

Int. Cl.<sup>2</sup> H05B 7/18

U.S. Cl. 219-121 P

10 Claims



1. An arc heater system as a high energy heat source comprising a housing forming a plenum chamber, a plurality of arc heaters mounted on the housing and extending substantially radially thereon, each arc heater comprising a downstream electrode adjacent the housing and an upstream electrode remote therefrom and an intermediate gap therebetween, a polyphase wye-connected power system comprising one conductor for each phase and a neutral conductor, the upstream electrodes of each arc heater being connected to one of the phase conductors respectively, the downstream electrodes being connected to the neutral conductor, whereby arc heated jet streams from the arc heaters merge and project into the housing.

4,013,868  
METHOD OF MULTIPLE GAS SHIELDED ARC WELDING  
Fusao Koshiga, Kawasaki, Jinkichi Tanaka, and Itaru Watanabe, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1975, Ser. No. 633,384

Claims priority, application Japan, Nov. 26, 1974, 49-135180

Int. Cl.<sup>2</sup> B23K 9/24

U.S. Cl. 219-137 WM

3 Claims



1. A method of effecting multiple electrode gas shielded arc welding comprising depositing weld metal in a plurality of layers with a leading electrode or electrode group and a trailing electrode or electrode group; said leading electrode or electrode group being made of an electrode wire having a chemical composition with different amounts of deoxidizing elements from that of the electrode wire constituting said trailing electrode or electrode group such that the properties of the plurality of layers are made substantially uniform.

4,013,869

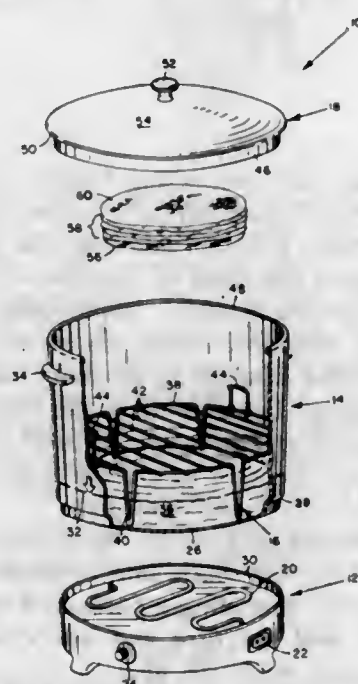
## TORTILLA WARMER AND HYDRATER

Maria Amelia Orts, 221 Buena Vista, San Antonio, Tex. 78207  
Filed Apr. 12, 1976, Ser. No. 676,298

Int. Cl.<sup>2</sup> F27D 11/02

U.S. Cl. 219-401

4 Claims



1. An apparatus adapted for warming and hydrating cold, dry tortillas, said apparatus comprising:  
base means having a resistive heating element located therein, said resistive heating element being adapted for connection to a source of electric power;  
cylindrical container means located on said base means, said cylindrical container means having an upper opening and being adapted for receiving water therein;  
rack means insertable through said upper opening, said rack means being suspended at a predetermined horizontal plane above a bottom of said container, said rack means allowing free fluid flow therethrough;  
an upper cloth pad and a lower cloth pad located on said rack means and being adapted for receiving said tortillas to be warmed and hydrated therebetween

cover means for covering said opening of said container means;  
thermostat means connected to said resistive heating element, said thermostat means controlling current flow through said resistive heating element to maintain temperature of water in said cylindrical container means at a predetermined level to produce steam and heat said tortillas.

4,013,870

## TERMINAL BLOCK MOUNTING FOR A PLUG-IN SURFACE HEATING UNIT

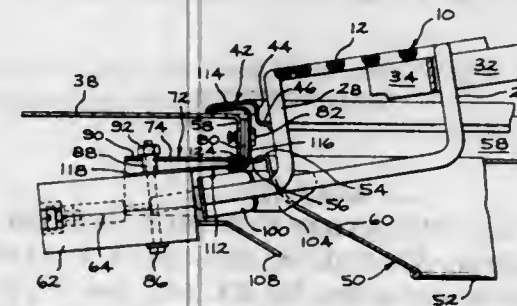
Glen H. Summers, Elmhurst, Ill., assignor to General Electric Company, Louisville, Ky.

Filed June 4, 1976, Ser. No. 692,956

Int. Cl.<sup>2</sup> H05B 3/68

U.S. Cl. 219-451

5 Claims



1. In a terminal block assembly for a plug-in surface heating element supported in an opening in a cooktop, the heating element is a metal sheathed electrical resistance element of spiral form with radial, outwardly-directed, terminal portions in close formation which plug into a dielectric terminal block, a sheet metal mounting bracket rigidly fastened to the cooktop, and lost-motion fastening means for supporting the terminal block from the mounting bracket for limited freedom of vertical and angular movement therebetween, the improvement comprising a resilient means for biasing the movable terminal block into its uppermost position with respect to the mounting bracket, said spring means being a folded spring blade having a tab at the top for seating on the cooktop, a vertical midsection that is fastened to the cooktop and an elongated cantilever section underlying the cooktop and fastened to the top of the terminal block, so as to normally bias the terminal block to its uppermost position with respect to the mounting bracket.

4,013,871

## IMAGE FIXING ROLL FOR ELECTROPHOTOGRAPHY

Ryoichi Namiki, Hino, and Shigeru Muramatsu, Tokyo, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 328,963, Feb. 2, 1973, abandoned.

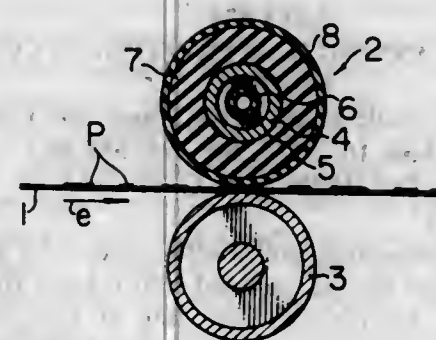
This application Apr. 15, 1975, Ser. No. 568,310

Claims priority, application Japan, Feb. 9, 1972, 47-14175; Mar. 1, 1972, 47-21209

Int. Cl.<sup>2</sup> H05B 1/02

U.S. Cl. 219-471

22 Claims



21. An image-fixing roller for heat-fixing electrophotographic toner images on support sheets, comprising:

an inner circumferential roller layer and an outer circumferential roller layer;  
heat source means mounted within a region surrounded by at least said outer layer;  
said inner layer being made of a rubber-like material which is resilient and is highly heat-conductive;  
said outer layer being made of a rubber-like material which is resilient and non-tacky, with a non-abrasive outer circumferential surface having offset preventing properties, said outer circumferential surface contacting said toner images; and wherein the hardness and the thickness of the outer layer are less than those of the inner layer.

4,013,872

## TEMPERATURE CONTROL DEVICE

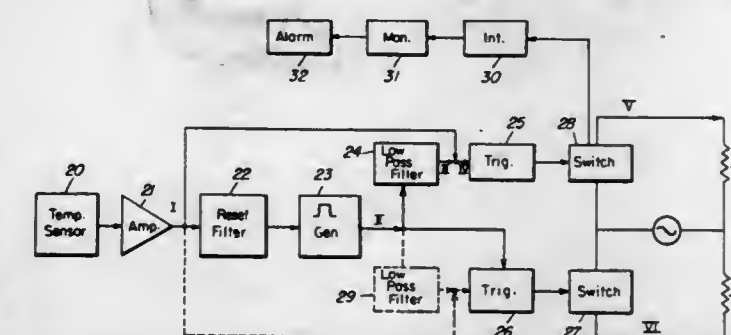
John R. Glass, Mickleton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1975, Ser. No. 574,075

Int. Cl.<sup>2</sup> H05B 1/02

U.S. Cl. 219-497

22 Claims



11. Apparatus for controlling the temperature of a temperature-controlled environment, comprising:

1. temperature sensing means for sensing the temperature of the environment,
2. first signal generating means connected to the temperature sensing means for producing a first signal in proportion to the temperature,
3. second signal generating means operatively connected to the first signal generating means for producing a second signal having a periodic deviation from a reference level, the duration of the deviation from the reference level being in proportion to the first signal,
4. means for deriving from said second signal a third signal having a value which varies with time,
5. heat supply control means operatively connected to the first signal generating means and the third signal generating means for controlling the supply of heat to the environment in response to the first and third signals.

4,013,873

## ELECTRIC HEATING FARROWING PAD WITH MEANS FOR OVERHEAD AND SIDE SHIELDING OF ELECTRIC CORD

Eldred Olson, Colfax, Ill., assignor to Vi-Amino Feeds, Inc., Colfax, Ill.

Filed Nov. 6, 1975, Ser. No. 629,581

Int. Cl.<sup>2</sup> H05B 3/08

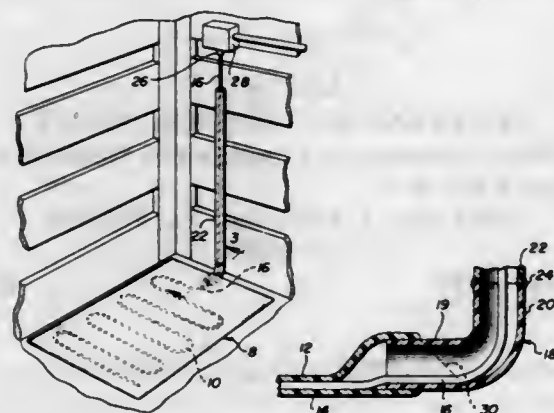
U.S. Cl. 219-541

2 Claims

1. An electric heating farrowing pad having upper and lower rigid plastic walls with an electrical resistance heating element between said plastic walls, said heating element connected to an elongated electric cord with a terminating male plug, and means to shield said electric cord for connection to an electrical outlet, including  
a rigid cylindrical elbow fitting through which said electric cord may pass, a horizontal arm of said elbow fitting fixed between said upper and lower plastic walls, a vertical arm joined to said horizontal arm, and  
an elongated rigid cylindrical connector having a continu-



ous sidewall of easily cut material and having a length sufficient to enclose substantially the entire length of said electric cord up to about the male plug, the sidewalls of the elbow fitting and tubular connector having substantially uniform configurations and dimensions to allow end



to end coupling by selectively aligning and coupling the tubular connector end with said elbow fitting, whereby the cord may be alternatively shielded for overhead connection by coupling the connector to said vertical arm or be shielded for sidewall connection by cutting the elbow fitting and coupling the connector to the horizontal arm.

4,013,874

# ADDRESS DECODER FOR USE WITH MULTICHANNEL ANALYZERS

Richard B. Culver, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

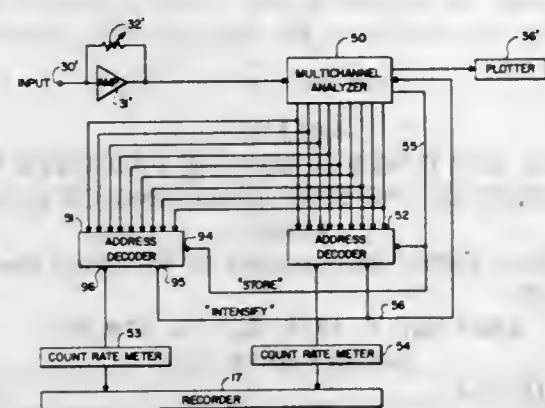
Continuation of Ser. No. 244,013, April 14, 1972, abandoned.

This application Sept. 5, 1975, Ser. No. 610,600

Int. Cl.<sup>2</sup> G01T 1/00; G05B 1/03

U.S. Cl. 235-92 PC

5 Claims



1. A system for producing a radioactivity log indicative of the number of gamma rays falling within at least two predetermined energy bands, comprising:  
an elongated well logging instrument adapted to traverse an earth borehole;  
means within said instrument for detecting gamma radiation;  
means within said instrument to generate electrical signals indicative of said detected radiation;

means to transmit said electrical signals to the earth's surface from said well logging instrument;  
a multichannel analyzer at the earth's surface having an unknown address scaler output, said analyzer being adapted to receive said electrical signals;  
a first address decoder circuit, comprising:  
means for comparing said unknown address scaler output with first and second reference words; and  
means to generate a first voltage pulse in response to said address scaler having a numerical value equal to or higher than said first reference word while being less than or equal to said second reference word;  
a second address decoder circuit, comprising:  
means for comparing said unknown address scaler output with third and fourth reference words; and  
means to generate a second voltage pulse in response to said address scaler having a numerical value equal to or higher than said third reference word while being less than or equal to said fourth reference word.

4,013,875

# VEHICLE OPERATION CONTROL SYSTEM

Daniel R. McGlynn, 329-84th St., Brooklyn, N.Y. 11209

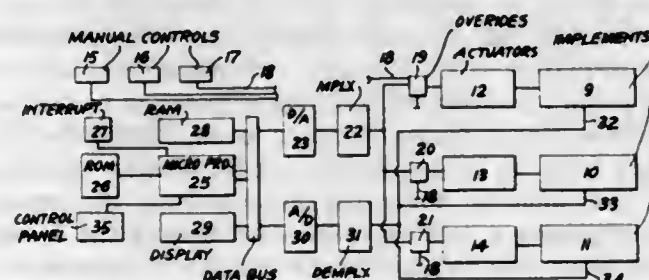
Continuation-in-part of Ser. No. 432,691, Jan. 11, 1974,

abandoned. This application Jan. 3, 1975, Ser. No. 538,356

Int. Cl.<sup>2</sup> G06F 9/06, 15/20

U.S. Cl. 235-150.2

11 Claims



1. An artificial earth satellite comprising horizon sensor means for determining the attitude of said satellite with respect to the earth; radiation sensor means for detecting the presence and position of a radiation emitting event on the surface of the earth with respect to said satellite attitude; communications means for communicating said presence and position information externally of said satellite, and a stored program digital computer in said satellite, said computer comprising storage means in which is stored information representative of operations to be performed by said communications means, and microprocessor means for receiving said stored information from said storage means, and for supplying control information to said communications means.

4,013,876

# DOCUMENT SCANNING AND PRINTING SYSTEM AND METHOD

Wayne D. Anstin, 10405 Mann Drive, Cupertino, Calif. 95014

Filed June 16, 1975, Ser. No. 586,967

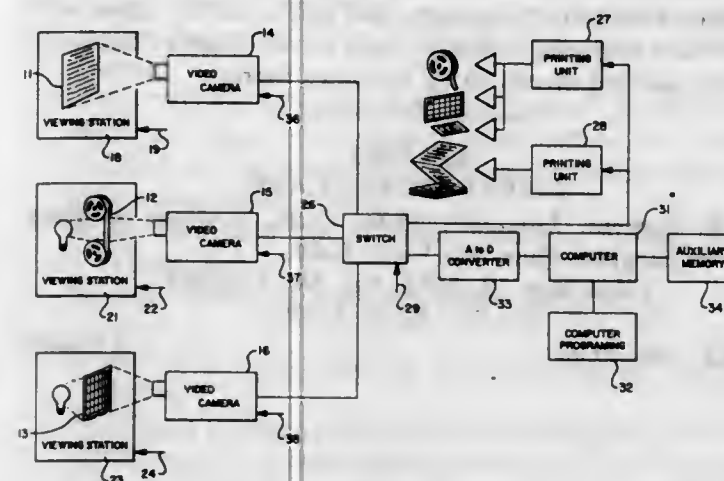
Int. Cl.<sup>2</sup> H04N 1/06; G06F 3/14

U.S. Cl. 235-151

5 Claims

1. A document scanning and printing system for producing a printed document having updated information from documents containing information including at least one video camera for viewing the documents containing information and generating an electrical signal representative of the information, means for presenting the documents containing information to said video camera whereby said camera generates said

electrical signal, means for processing said electrical signal to generate a new signal having updated information and means



responsive to said new signal for producing a printed document having the updated information.

4,013,877

# COMBINED CYCLE ELECTRIC POWER PLANT WITH A STEAM TURBINE HAVING AN IMPROVED VALVE CONTROL SYSTEM

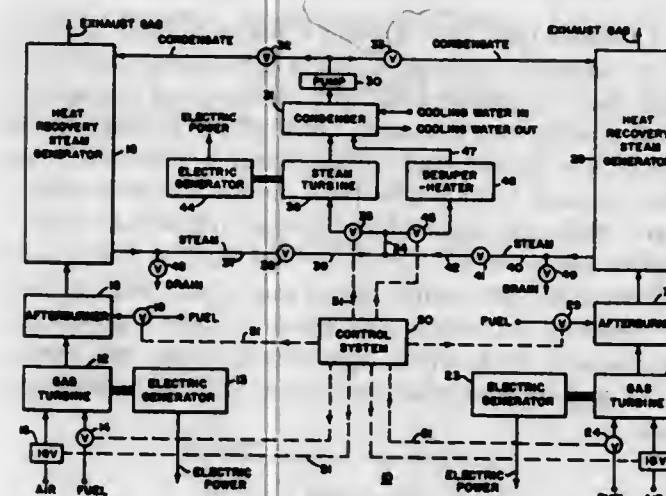
Robert Uram, East Pittsburgh; Ross T. Marano, Murrysville; Richard S. Heiser, and Jeong Y. Surh, both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 13, 1974, Ser. No. 497,344

Int. Cl.<sup>2</sup> F01K 23/00

U.S. Cl. 235-151.21

9 Claims



1. A combined cycle electric power plant comprising at least one gas turbine, means for generating steam in response to heat energy from the gas turbine, a steam turbine driven by steam supplied to it from the steam generating means, means for generating electric power under the driving power of the turbine, a plurality of valve means to control the admission of steam to the turbines, a digital computer and an analog control system for operating the valve means, said digital system including means to generate repetitive output pulses in response to input voltages depending on plant conditions including steam pressure, said analog system including means to generate an output pulse of a variable duration depending on input conditions including steam pressure, a hybrid interface unit responsive selectively to either the repetitive output pulses of the digital system and the output pulse of the analog system to generate an analog representation having a value depending on the duration of the selected applied pulses, and control means for each valve means governed by the value of the analog representation to position its respective valve means.

4,013,878

# DEVICE FOR AN ITERATIVE DETERMINATION OF THE VARIATION OF A FUNCTION IN A PLANE

Wolfgang Wagner, Norderstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

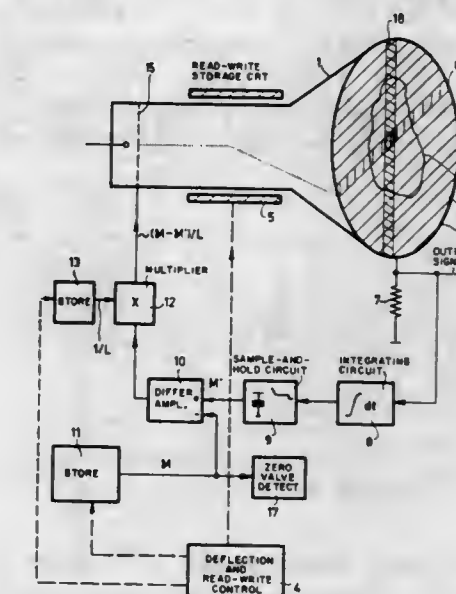
Filed Sept. 16, 1975, Ser. No. 613,813

Claims priority, application Germany, Sept. 24, 1974, 2445482

Int. Cl.<sup>2</sup> G01T 1/00; G06F 15/42

U.S. Cl. 235-151.35

9 Claims



1. A device for an iterative determination of the surfacewise distribution of a function which is derived from measuring values obtained by scanning a plane of measurement along a plurality of substantially parallel strips, and wherein the resulting primary integral values associated with each strip, are stored in a first store, comprising: a read-write storage cathode ray tube having a charge storing target whereon is stored a charge image of the distribution of the function obtained during a first approximation; means for integrating output signals from the target during the reading operation of the tube; means for sampling the integral signal from the integrating means according to the length of respective scanning strips and for holding the sampled integral values; differential means for comparing the sampled integral values with corresponding primary integral values retrieved from said first store; and control means for adjusting the density of charges in each scanning strip on said target in response and proportionally to the variations of the difference signal.

4,013,879

# DIGITAL MULTIPLIER

Robert Edward Bornmann, Clifton, N.J.; John Richard Cowan, Brooklyn, N.Y., and Mark Joel Schneider, Nutley, N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 2, 1975, Ser. No. 582,945

Int. Cl.<sup>2</sup> G06F 7/52

U.S. Cl. 235-164

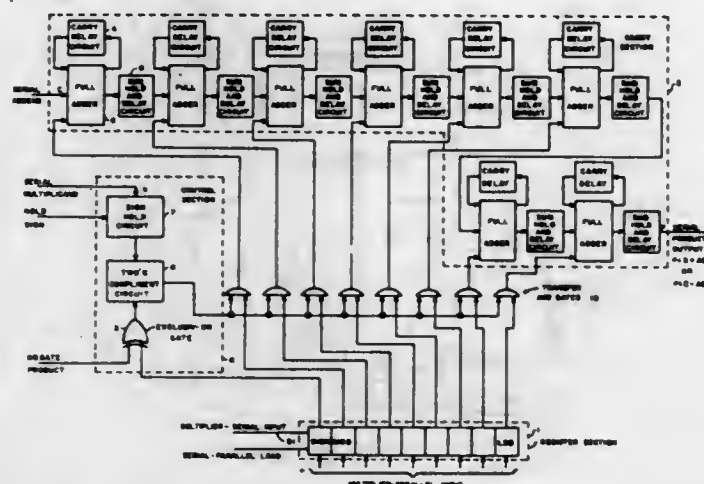
42 Claims

1. A digital CMOS/LSI synchronous serial multiplier comprising:

first means to store a X-bit sign magnitude multiplier number in parallel, where X is an integer greater than one; a first input for a serial N-bit 2's complement multiplicand, where N is an integer greater than one; second means including (X - 1) adder stages connected in series; third means coupled to said first means, said first input and said second means to couple each of the magnitude bits of said multiplier number into a different one of said adder stages, said adder stages performing successive additions of the magnitude bits of said multiplier to provide as an output of a last of said adder stages a serial product having M bits, where M is an integer greater than one; and



a second input for a serial Y-bit 2's complement addend coupled to a first of said adder stages to add said addend to said product;  
said first means including  
a sign bit flip flop,  
(X-1) magnitude bit flip flops, and  
(X-1) gate circuit coupled to said sign bit flip flop and said magnitude flip flops in a predetermined manner to provide a X-bit register; and  
each of said gate circuits including



two AND gates, each of said AND gates being under control of a different control signal, one of said AND gates being coupled to an output of an immediately preceding one of said flip flops and the other of said AND gates being coupled to an associated bit of said multiplier number, and  
an OR gate having two inputs each coupled to the output of a different one of said two AND gates and an output coupled to a next succeeding one of said flip flops.

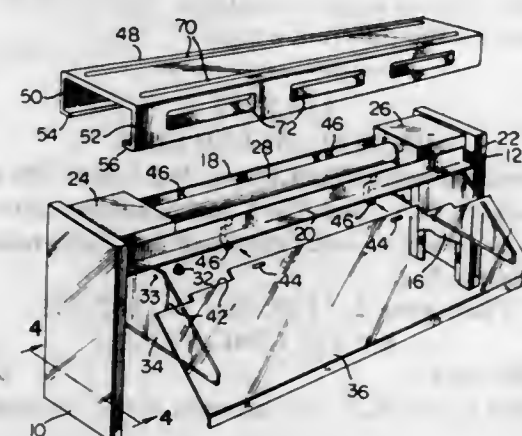
4,013,880

**BREATH GUARD CANOPY FOR SERVING UNIT**  
Robert J. Kennedy, Jr., and Kendall S. Smith, II, both of West Lafayette, Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Dec. 8, 1975, Ser. No. 638,969  
Int. Cl.<sup>2</sup> A47F 11/10, 3/00

U.S. Cl. 240-2 AD

11 Claims



1. A breath guard canopy comprising: spaced support members, means supporting said support members, at least one transparent guard element extending between and resting on said support members and inclining downwardly toward one edge, aperture means formed in said guard element near the other edge, and spring clip means engageable with said aperture means for releasably holding said guard element in place on said support members.

7. A breath guard canopy according to claim 1 which includes spaced upstanding pylons forming the means supporting said support members, rails extending horizontally between and connected to said pylons, illuminating means ex-

tending horizontally between the pylons near the upper ends thereof for illuminating the space beneath the canopy, and a cover member in the form of a downwardly opening channel extending horizontally between said pylons at the upper ends thereof and engaging said rails, said cover member enclosing said illuminating means along the sides thereof.

4,013,881

**SAFETY SIGNAL CANE**

Otto E. Sargent, Mountain View, Calif., assignor to Mary Elvera Sargent, Mountain View, Calif.

Filed May 19, 1975, Ser. No. 570,788

Int. Cl.<sup>2</sup> F21V 33/00

U.S. Cl. 240-6.42

3 Claims



1. In a tubular type cane having a shank portion, a handle portion, an angular Lucite tube, and a light source powered by an electric battery means, said light source being contained in said shank portion and manually controllable through the use of an electrical switch and coiled wire: a reflector means contained in said Lucite tube and composed of a shaft to which are obliquely appended fin-type reflectors made of highly reflective material located on said shaft so as to provide 360° of reflected light beams about said shaft, and not just a "glow," thereby providing the most refulgent multi-directional refraction of flashing light beams from the exterior surfaces of said tube without obstructing the vision of the user or others.

4,013,882

**THERMOMETER CARRYING CASE AND ILLUMINATING DEVICE**

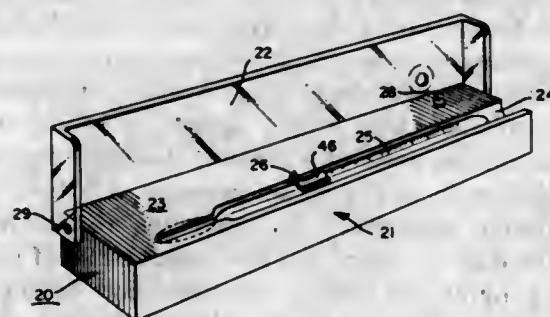
Elliott E. Engler, 5 Roosevelt Road, Westport, Conn. 06880

Filed Apr. 25, 1975, Ser. No. 571,590

Int. Cl.<sup>2</sup> F21V 33/00

U.S. Cl. 240-6.46

11 Claims



1. An illuminating device for medical thermometers comprising a housing incorporating

4,013,884

**OPTICAL DEVICE FOR A SURFACE VEHICLE GUIDANCE SYSTEM USING A LIGHT-CONTRAST PROGRAMME**

Rafael Rafaelevich Dvali, ulitsa Barnova, 109; Otar Vladimirovich Margvelashvili, prospekt I. Chavchavadze, 11; Alexei Dmitrievich Nozadze, prospekt Tsereteli, 69; Mikhail Erastovich Burdzgla, ulitsa Atskhurskaya, 4b, and Alexandr Nikolaevich Melitauri, ulitsa Barnova, 91, all of Tbilisi, U.S.S.R.

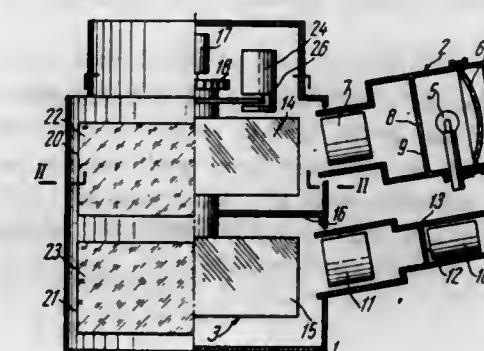
Filed Oct. 16, 1975, Ser. No. 622,977

Claims priority, application U.S.S.R., Oct. 24, 1974, 2069995

Int. Cl.<sup>2</sup> G05B 1/00; H01J 3/14

U.S. Cl. 250-202

7 Claims



- A. illuminating means contained within said housing;
- B. access means formed in said housing for providing accessibility to said illuminating means;
- C. switch means controllably connected to said illuminating means for activating and deactivating said illuminating means;
- D. an elongated recess formed in a surface of said housing and extending to the edge of said surface, for securely holding and retaining the thermometer when not in use, said recess incorporating
  - a. an elongated slot extending along a portion of said recess, and
  - b. communicating with said illuminating means;
- E. a cover
  - a. mounted to said housing and overlying said elongated recess,
  - b. at least a portion thereof being transparent, and
  - c. incorporating thermometer securing means cooperating with the recess and moveably from a thermometer entry position to a thermometer holding position, assuring secure retention of a thermometer in the recess, and
- F. an elongated magnifier mounted to said cover in juxtaposed spaced relationship with said elongated recess extending at least the length of said elongated slot, and operably magnifying a thermometer's indicia whereby a medical thermometer securely positioned and retained within said recess is illuminated through said elongated slot and easily and accurately read through said transparent magnifier and cover portion.

4,013,883

**PNEUMATIC CONTROL INSTALLATION FOR HEADLIGHTS**

Rudolf Andres, Sindelfingen, and Hermann Möller, Aidingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

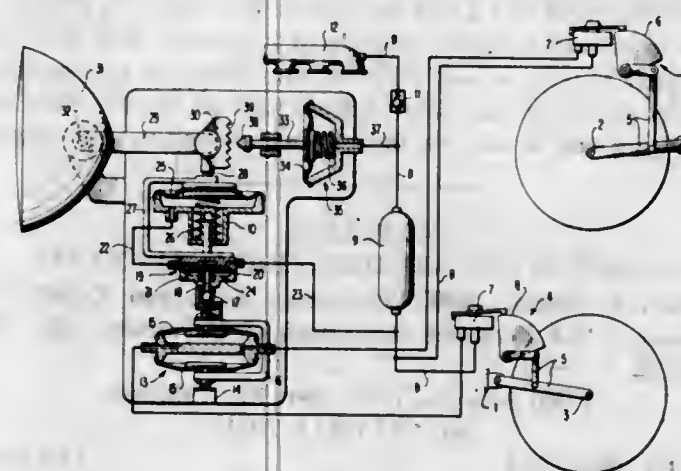
Filed Oct. 29, 1974, Ser. No. 518,893

Claims priority, application Germany, Oct. 30, 1973, 2354204

Int. Cl.<sup>2</sup> B60Q 1/04

U.S. Cl. 240-7.1 LJ

35 Claims



1. A pneumatically operating control installation for the automatic alignment of motor vehicle headlights which comprises means for aligning the headlights of the motor vehicle so as to have a constant light range essentially independently of the load of the vehicle including transmitter means measuring the change in distance of a respective axle with respect to the body of the motor vehicle, pressure modulator means operatively connected with the transmitter means and differential control means and control shifting means operatively connected with the pressure modulator means, characterized in that the control shifting means includes a control rod means engaging at the pivotal headlight, and servo-adjusting motor means for holding fast said control rod means in case of a pressure failure.

4,013,885

**SOLAR ENERGY SUN TRACKER**

Daniel Blitz, Boston, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 8, 1976, Ser. No. 647,535

Int. Cl.<sup>2</sup> G01J 1/20

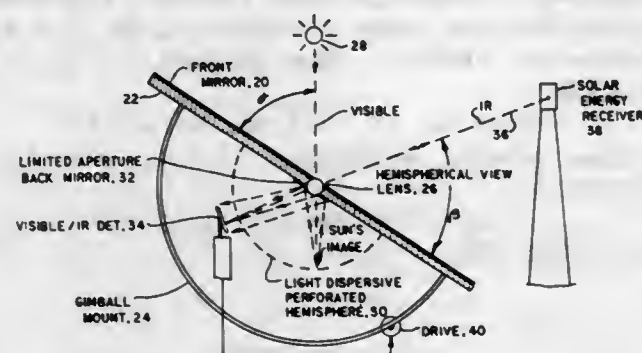
U.S. Cl. 250-203 R

25 Claims

1. Apparatus for use in the proper positioning of individually steerable mirrors spaced from a solar energy receiver, each mirror assembly comprising,  
a front reflector having an aperture,  
a support for said front reflector,  
means coupled to said support for adjusting the position of said front mirror about said aperture,  
an imaging surface behind said front reflector,



a reflector located in back of said front reflector surrounding said aperture and concentric therewith, said back reflector lying in a plane parallel to said front reflector, and means located on a line from said solar receiver through



said aperture for detecting the concentricity of the images of the sun in the visible region of the electromagnetic spectrum as reflected from said imaging surface by said back reflector with the IR image of said solar energy receiver and for driving said reflector adjusting means so as to maintain concentricity.

4,013,886

## LIGHT PROJECTOR AND DETECTOR UNIT

August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs- und Finanzierungsgesellschaft Serania AG, Glarus, Switzerland

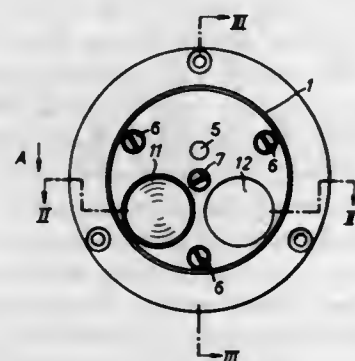
Filed Feb. 18, 1975, Ser. No. 550,263

Claims priority, application Switzerland, Feb. 21, 1974, 2427/74

Int. Cl.<sup>2</sup> G01D 21/04

U.S. Cl. 250-221

8 Claims



1. Light gate object sensing and detector unit for use with a reflecting device at the end of the gate path remote from the detector, said unit comprising:

means for projecting a beam of light towards said reflecting device, the direction of projection of said beam being the principal light projection direction of said means; light responsive receiving means for receiving light from said reflecting device, said light responsive receiving means being located adjacent said light projecting means, having a preferential light reception direction substantially parallel to said principal light projection direction, and including photoelectric means (10) for producing an electric signal in response to light received;

a casing open at the front housing said projecting means and said receiving means;

adjustable support means for both said projecting means and for said receiving means, located within said casing and including a mounting body forming a front for the unit in which said projecting means and photoelectric means are set with their respective light projection and preferential light reception directions frontwardly directed and including also means for angularly adjusting

simultaneously with two degrees of freedom the direction of projection of said projecting means and the preferential light reception direction of said receiving means; optical alignment indicating means (5) including a light-emitting diode carried on said support means so as to be visible from the exterior of the unit for indicating the intensity of light received from said reflecting means by said receiving means, and a two-stage transistor amplifier (14, 15) having its input connected to the output of said photoelectric means (10) and having its output connected to said light-emitting diode and also to an additional output terminal for providing an object detecting output distinct from the output of said alignment indicating means.

4,013,887

## METHODS AND APPARATUS FOR SPATIAL SEPARATION OF AC AND DC ELECTRIC FIELDS WITH APPLICATION TO FRINGE FIELDS IN QUADRUPOLE MASS FILTERS

Wade L. Fite, 305 Pasadena Drive, Pittsburgh, Pa. 15215

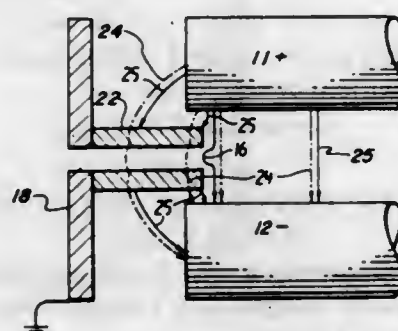
Division of Ser. No. 346,250, March 30, 1973, Pat. No.

3,867,632. This application Jan. 8, 1975, Ser. No. 539,587

Int. Cl.<sup>2</sup> H01J 1/00, 39/34

U.S. Cl. 250-282

5 Claims



1. In a method of spatially separating ac and dc electric fields, the use of a material which functions substantially as a material having high dielectric constant to the ac fields and substantially as an electrical conductor to the dc fields, the method comprising the subjecting of a spatial volume to a said ac electric field and a said dc electric field and the placing of a shield of said material whereby it intercepts said fields before their receipt in said volume, said shield of said material thereby shielding said volume from said dc electric field and permitting said ac electric field to be received in said volume.

4,013,888

## MONITOR FOR ATMOSPHERIC POLLUTANTS

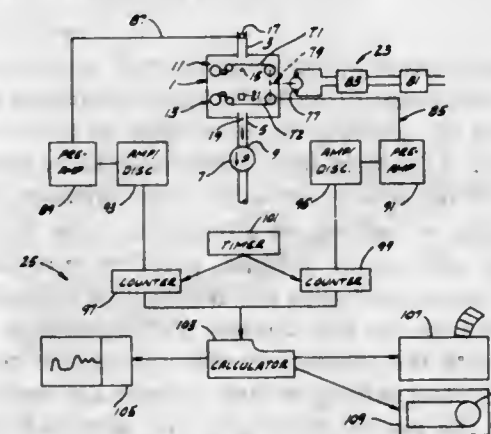
Edward S. Macias, 6907 Waterman Ave., and Rudolph B. Husar, 7162 Pershing Ave., both of University City, Mo. 63130

Filed July 24, 1975, Ser. No. 598,568

Int. Cl.<sup>2</sup> G01T 7/02

U.S. Cl. 250-304

15 Claims



1. Apparatus for monitoring the mass concentrations of

atmospheric pollutants above and below a predetermined size, comprising:

a receptacle having an air inlet and outlet; means for continuously drawing air through the inlet and thence through the receptacle and the outlet; a first collector means in the receptacle for collecting pollutants above said predetermined size, said first collector means being movable through a first station and being adapted to collect pollutants above said size from the air entering the receptacle through the inlet on successive areas thereof; a second collector means in the receptacle for collecting pollutants below said predetermined size, said collector means being movable through a second station and being adapted to collect pollutants below said size from the air which has passed the first station on successive areas thereof; means for holding a first source of radiation for passage thereof through said area of the first collector means at the first station; means for detecting radiation from said first source passing through said area of the first collector means; means for holding a second source of radiation for passage thereof through said area of the second collector means at the second station; means for detecting radiation from said second source passing through said area of the second collector means; means for periodically operating said collector means to move the pollutant-bearing areas thereof away from said stations and to bring fresh areas for collection of pollutants into position at said stations, the collector means dwelling between successive operations thereof; and means responsive to said first and second detecting means for indicating the mass concentration of pollutants above and below said predetermined size for each dwell period between the successive operations of the collector means.

4,013,889

## ELECTRONIC AMPLIFICATION

Austen John Fryer, Welwyn Garden City, England, assignor to Hawker Siddeley Dynamics Limited, England

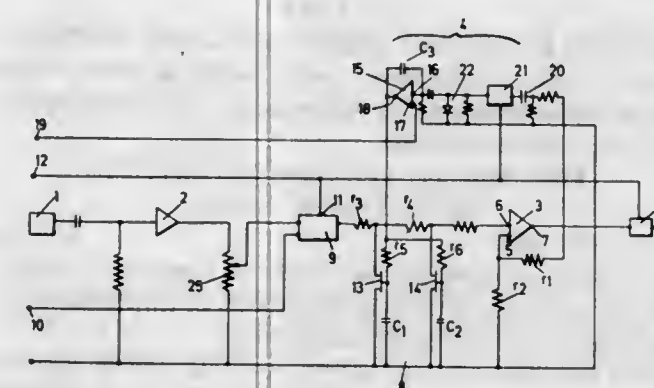
Filed June 9, 1975, Ser. No. 584,854

Claims priority, application United Kingdom, June 13, 1974, 26234/74

Int. Cl.<sup>2</sup> H01J 31/49

U.S. Cl. 250-332

7 Claims



1. For use in a scanning apparatus of the type in which a multi-detector array traverses a field of view, the detectors being sensitive to variations in electro-magnetic radiation, and wherein a plurality of video channels correspond in number with the number of detectors constituting the array, each channel being electrically coupled to a respective detector and incorporating an a.c. coupled amplifier for amplifying the signal received from the respective detector, an improvement for equalizing the gains of said amplifiers, one with another, at the end of each scan, using a reference a.c. source which is temporarily applied to input of each detector amplifier at the end of each scan in lieu of the output of the respective detector, said improvement comprising in each channel:

controllable attenuator means controlling the gain of the channel detector amplifier; integrating amplifier means for comparing the output of the channel detector amplifier when the latter is coupled to the a.c. reference source with a further reference signal and integrating any resultant difference signal; and means for applying integrated signal as a drive for the said controllable attenuator means to reset the gain of the channel so as to reduce the said difference signal to zero.

4,013,890

## CASSETTE

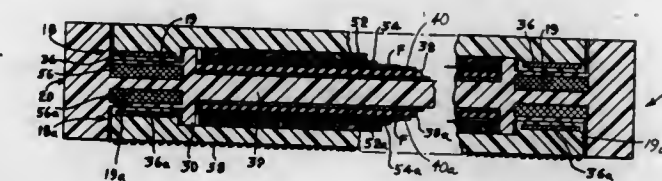
Raymond M. Conrad, 745 Woodruff Road, Milford, Conn. 06460

Filed Feb. 2, 1976, Ser. No. 654,581

Int. Cl.<sup>2</sup> G03D 13/08; G03C 3/00

U.S. Cl. 250-480

9 Claims



1. A cassette comprising a generally rectangular body member having a generally rectangular marginal frame and an outwardly facing film support surface within the boundary of said marginal frame and cooperating therewith to define a film compartment opening outwardly through one face of said body member, said marginal frame having a continuous groove formed therein surrounding said film compartment, said groove opening outwardly through said one face, a generally rectangular panel member hingedly connected to one end of said marginal frame for movement between open and closed positions relative to said film compartment, said panel member in its closed position generally overlying said film support surface and cooperating with said marginal frame to define a substantially smooth planar surface comprising said one face, said panel member having a continuous rectangular bead at its peripheral edge received within said groove when said panel member is in its closed position and comprising a light-tight barrier around said film compartment, and magnetic coupling means for releasably retaining said panel member in its closed position and comprising strips of material including a strip of magnetic material and a strip of magnetized material, one of said strips embedded in said frame inwardly of the outwardly facing inner surface of said groove and wholly surrounded by the material of said frame, the other of said strips embedded in said bead outwardly of the inwardly facing surface of said bead and wholly surrounded by the material of said panel.

4,013,891

## METHOD FOR VARYING THE DIAMETER OF A BEAM OF CHARGED PARTICLES

Wen-Chuang Ko, Wappingers Falls, N.Y., and Erich Sawatzky, San Jose, Calif., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 18, 1975, Ser. No. 641,054

Int. Cl.<sup>2</sup> H01J 37/00

U.S. Cl. 250-492 A

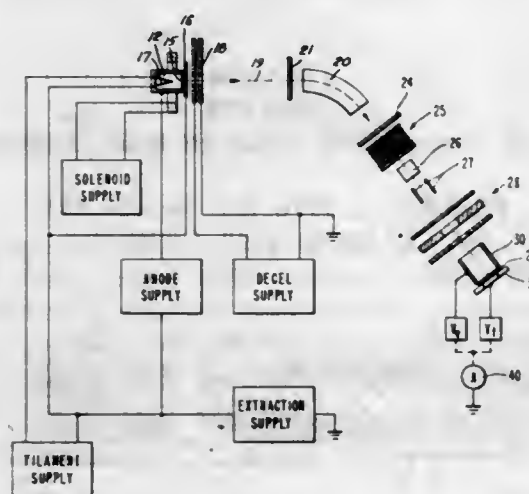
10 Claims

1. In the method of bombarding a target with a beam of primary charged particles, a method for varying the diameter of said beam having a beam current of at least



$$\frac{V_0^{3/2}}{1.27 \times 10^{30} \sqrt{m_1} \left(\frac{L}{r_0}\right)^2} \text{ amperes}$$

where  $V_0$  is the acceleration potential in volts of a charged particle;  $m_1$  is the mass of said particle in kilograms;  $r_0$  is the radius of the beam at the principal plane of said lens and  $L$  is the distance from said principal plane to the focal point, comprising:



focusing the beam through a lens, passing the focused beam through an envelope of conductive material, said envelope spaced from and coaxial with said beam, at least the portion of said envelope being disposed between said lens and beam focal point, applying a selected D.C. electrical potential to the envelope, and controlling the beam diameter by changing and potential in a direction away from ground potential to increase the beam diameter or by changing said potential in a direction toward ground potential to decrease the beam diameter.

#### 4,013,892 IR GENERATOR HAVING ELLIPSOIDAL AND PARABOLOIDAL REFLECTORS

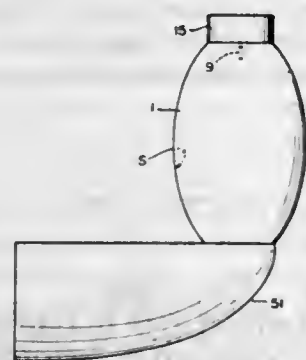
John Charles Udart, Byron, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Jan. 29, 1973, Ser. No. 327,692

Int. Cl.<sup>2</sup> G01J 1/00

U.S. Cl. 250-504

4 Claims



1. In an IR generator, the combination of a first shell having an inner reflective ellipsoidal surface and a second shell having an inner reflective paraboloidal surface; said shells being secured together with said surfaces' respective major and principal axes transverse to each other; said first shell being adapted for providing a source of radiation at one focus of said ellipsoidal surface and said shells having openings where they are secured together, for

allowing said radiation to enter said second shell via the other focus of said ellipsoidal surface; said paraboloidal surface being a semiparaboloid, one side of which has a flat plate having one of said openings therein.

#### 4,013,893 OPTICAL BAR CODE SCANNING DEVICE

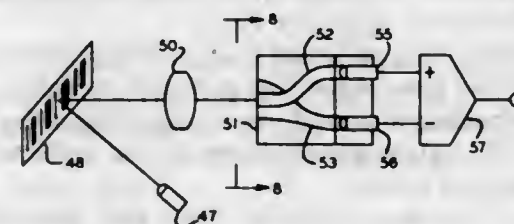
Urs W. Hertig, Auburn, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Aug. 7, 1975, Ser. No. 602,587

Int. Cl.<sup>2</sup> G06K 7/10

U.S. Cl. 250-568

9 Claims



1. In an optical bar code scanning device for high data density bar code reading, the bar code comprising a plurality of bar code elements: means for illuminating the bar code to be read so that light is reflected therefrom, a pair of photodetectors, means for gathering the reflected light so that it falls on the photodetectors, said photodetectors being arranged in the device so that one of them can receive no more reflected light than would be received from a code bar that is twice the width of the smallest bar code element, the other of said photodetectors being arranged so that it receives less reflected light by a predetermined amount than is received by said first mentioned photodetector, and means for comparing the outputs of the two photodetectors.

#### 4,013,894 SECURE PROPERTY DOCUMENT AND SYSTEM

Francis C. Foote, Rocky River, and Charles K. Beck, Mentor, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed May 27, 1975, Ser. No. 581,351

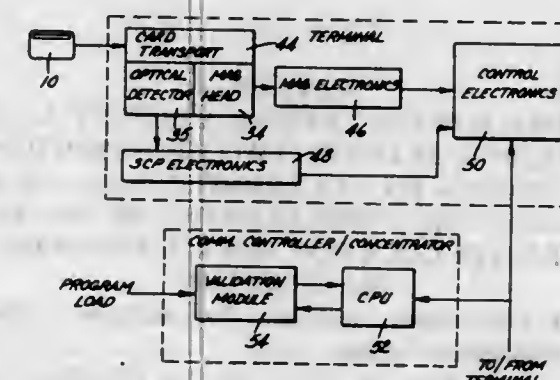
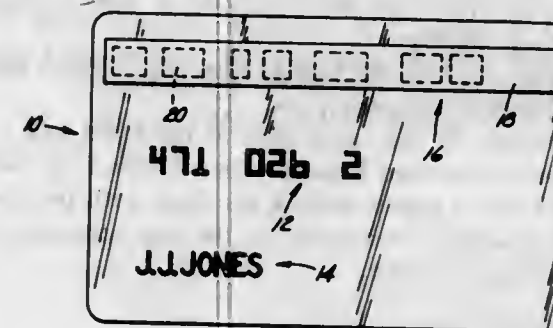
Int. Cl.<sup>2</sup> G06K 19/08

U.S. Cl. 250-569

35 Claims

1. A secure property for an article in a group of authentic articles for preventing certain alterations or duplication of the article, said secure property comprising: at least two sets of data carried by said article, each said data set containing at least one data element which has a spacial relationship to at least one data element of the other data set, one of said data sets containing informational data to be rendered secure by said secure property and being substantially different than the data of said other data set, said spacial relationship between said data set elements being substantially unique to said article within said group of authentic articles whereby the authenticity of said article may be determined, one of said data sets comprising means including a plurality of radiant energy modifying elements for providing data in the form of detectable radiant energy signals in response to irradiation with radiant energy of appropriate characteristics; the other of said data sets comprising

magnetic data including a plurality of magnetic flux changes at least some of which are randomly spaced



within limits from at least some of said radiant energy modifying elements.

#### 4,013,895 CLAMPING TOOL AND METHOD

Toshio Akiyoshi, and Hakushi Shibuya, both of Kukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

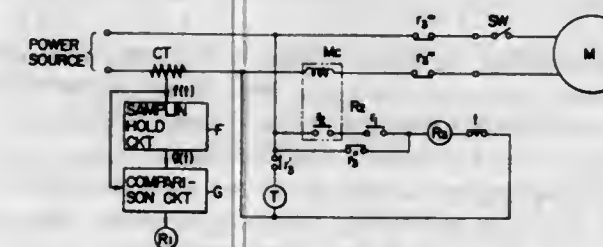
Filed Aug. 28, 1973, Ser. No. 392,372

Claims priority, application Japan, Aug. 28, 1972, 47-100247[U]; Dec. 16, 1972, 47-126485; Dec. 23, 1972, 48-2904

Int. Cl.<sup>2</sup> F16D 17/00

U.S. Cl. 307-126

9 Claims



1. In a motor-type clamping tool of the type having a motor as a driving power source for said clamping tool and circuit means for supplying electric power to energize said motor, the improvement characterized by,

first means connected to said motor for providing a first electrical signal output in response to the differential coefficient of one of the quantities of motor load current, motor applied voltage, motor applied electrical power, and motor rotational rate reaching a predetermined value, said predetermined value being substantially at zero, second means connected to said motor for providing an electrical switching operation in response to said one quantity reaching a second predetermined value, and third means responsive to the coincident occurrence of said first electrical signal and said electrical switching operation for cutting off the supply of electric power to said motor.

#### 4,013,896 HIGH-SPEED LOGIC GATE WITH TWO COMPLEMENTARY TRANSISTORS AND SATURABLE RESISTORS

Jean-Edgar Picquendar, and Pham Ngu Tung, both of Paris, France, assignors to Thomson-CSF, Paris, France

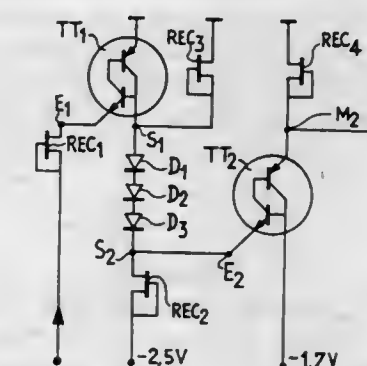
Filed Oct. 15, 1975, Ser. No. 622,611

Claims priority, application France, Oct. 18, 1974, 74.35145

Int. Cl.<sup>2</sup> H03K 19/08, 19/40, 19/34

U.S. Cl. 307-214

6 Claims



1. A logic gate comprising: first and second solid state components, each component comprising first and second complementary transistors integrated upon one and the same substrate and having respective emitters, bases and collectors, the first transistor having for its base a portion of the collector of said second transistor, and for its collector, the base of said second transistor, said second transistor having its base diffused into its collector, and its emitter into its base, said components having each a first, a second and a third terminal, connected respectively to the emitter of said first transistor, to the base of said second transistor and to the emitter of said second transistor, said first terminals having first connections to ground, said second terminal of said first component having a second connection to ground, and a fixed voltage dropper for connection to the second terminal of said second component, means for connecting a two level voltage to said third terminal of said first component, and second and third connections for connecting to fixed d.c. voltages said second and said third terminal of said second component.

#### 4,013,897 INFORMATION SIGNAL TRANSFER METHOD AND A CHARGE TRANSFER

Yoshiaki Kamigaki, Kokubunji; Hideo Sunami, and Yokichi Itoh, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 304,922, Nov. 9, 1972, abandoned. This application Nov. 1, 1974, Ser. No. 520,095

Claims priority, application Japan, Nov. 12, 1971, 46-89938

Int. Cl.<sup>2</sup> G11C 19/28; H01L 29/78

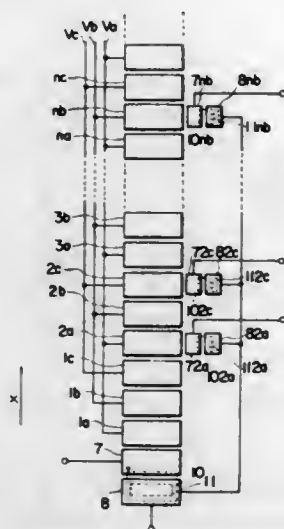
U.S. Cl. 307-221 D

4 Claims

1. In a charge transfer device for the transfer of charge carriers representing signal information along a semiconductor substrate between signal input means for introducing such charge carriers into said substrate and an output means for detecting said charge carriers, including an insulating layer disposed on the surface of the substrate between the signal input means and the output means, charge carrier transfer means for transferring charge carrier introduced into said substrate by said input means, said charge carrier transfer means including a plurality of spaced electrodes disposed on said insulating layer and means connected to the electrodes for providing voltages to the electrodes for transferring charge carriers introduced into the substrate, said semiconductor substrate consisting entirely of semiconductive material of one type of conductivity adjacent said spaced electrodes, the improvement comprising signal means connected to said input means to provide an information signal to said input means,



said input means functioning to introduce into said substrate a set of substantially equal first and second signals of charge carriers representing said information signal, said first signal being introduced into said substrate before said second signal, said output means functioning to detect said introduced second signal as information, said input means including at least first and second charge carrier injection electrodes connected to receive the information signal from said signal means, said first and second charge carrier injection electrodes being sequentially mounted in line upon said semiconductor sub-



strate in relative spaced relationship and in spaced relationship to said output, said first charge carrier injection electrode being disposed adjacent one of the electrodes of said charge carrier transfer means and said second charge carrier injection electrode being disposed adjacent one of the other electrodes of said charge carrier transfer means disposed between said one of the electrodes of said charge carrier transfer means and said output means, said signal means being arranged to operate so as to simultaneously provide said signal information to said first and second charge carrier injection electrodes.

4,013,898

## HYSTERESIS CIRCUIT

Shinichi Makino, Fujisawa, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

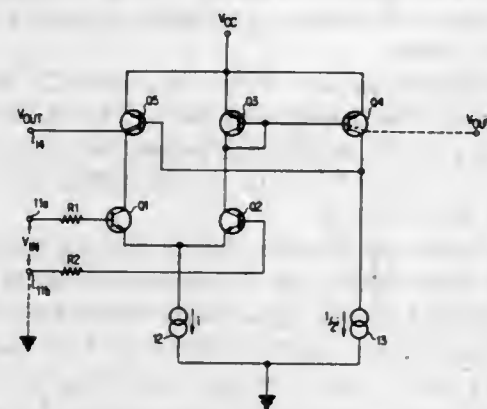
Filed Jan. 14, 1976, Ser. No. 649,042

Claims priority, application Japan, Jan. 17, 1975, 50-7088

Int. Cl.<sup>2</sup> H03K 5/20

U.S. Cl. 307-235 F

5 Claims



1. A hysteresis circuit comprising a differential amplifier including first and second transistors, a first input terminal connected via a resistor to the base of the first transistor, a second input terminal connected to the base of the second transistor, the emitters of the first and second transistors being connected to one terminal of a first current source, a current mirror circuit comprising third and fourth transistors

of a complementary type to the first and second transistors connected between the collector of the second transistor and one terminal of a second current source having a current capacity substantially half that of the first current source, the other terminals of the first and second current sources being connected together, and a fifth transistor of the same type as the third and fourth transistors connected between the collector of the first transistor and a power source terminal with the base of the fifth transistor connected to the one terminal of the second current source.

4,013,899

# APPARATUS FOR CONVERTING A POTENTIAL SIGNAL DEVELOPED BETWEEN TWO HIGH IMPEDANCE ELECTRODES TO A CURRENT SIGNAL AND FOR TRANSMITTING THIS CURRENT SIGNAL TO A REMOTE LOCATION OVER A TWO WIRE TRANSMISSION

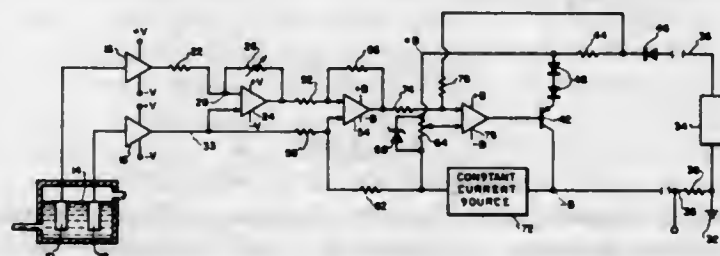
Eugene H. Guicheteau, Audubon, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 26, 1976, Ser. No. 671,000

Int. Cl.<sup>2</sup> H03K 17/00

U.S. Cl. 307-235 F

4 Claims



1. Apparatus for converting a potential difference signal developed between two electrodes which have a high internal impedance to a current signal and for transmitting this current signal to a remote location over a two-wire transmission line which has in series a power supply, one side of which is coupled to a ground reference potential to provide power for the converting and transmitting apparatus, comprising in combination:

a first amplifier having a relatively high impedance input terminal and a relatively low impedance output terminal; a second amplifier having a relatively high impedance input terminal and a relatively low impedance output terminal; means coupling one electrode to the input terminal of the first amplifier and means coupling the other electrode to the input terminal of the second amplifier; differential amplifying means including a pair of input terminals and an output terminal for producing a signal at said output terminal whose magnitude is a function of the difference between the signals coupled to said input terminals; means for coupling the output of said first amplifier to one of said input terminals; means for coupling the output of said second amplifier to the other of said pair of input terminals; means including a constant current source coupling said two-wire transmission line to said other of said input terminals in order to reference the signal at said output terminal of said difference amplifying means to ground potential of said power supply and to establish the signal at said output terminal within a predetermined range; and means including a feedback impedance in said two-wire transmission line for controlling the flow of current in said transmission line as a function of the signal level at the output terminal of said difference amplifying means.

4,013,900

# CROSS INHIBIT CIRCUIT TO PREVENT MISFIRES OF ALTERNATELY TRIGGERED SWITCHING DEVICES

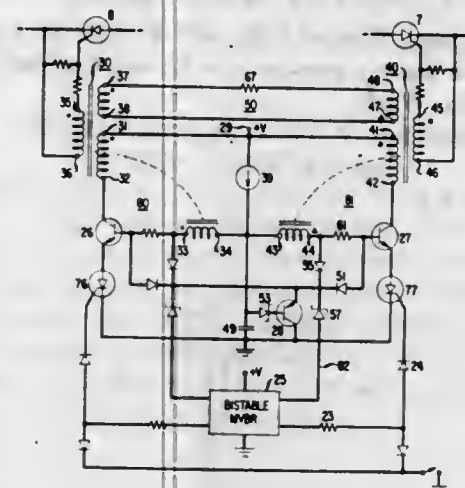
Robert John Kakalec, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1975, Ser. No. 645,894

Int. Cl.<sup>2</sup> H03K 17/72; H02M 1/08

U.S. Cl. 307-252 K

4 Claims



1. In a circuit to supply trigger signals to a first and second switching device, first means for triggering said first switching device including a first magnetic apparatus, second means for triggering said second switching device including a second magnetic apparatus, cross inhibit means for inhibiting triggering of said first and second switching devices by spurious trigger signals comprising a first winding coupled to said first magnetic apparatus, a second winding coupled to said second magnetic apparatus, a high impedance electrical path connecting said first and second windings so that a positive signal in one of said magnetic apparatus causes a negative signal in another of said magnetic apparatus and said high impedance is sufficient to attenuate signals due to stored energy inside said magnetic apparatus below a trigger threshold level.

4,013,901

# STACKED LOGIC DESIGN FOR I<sup>2</sup>L WATCH

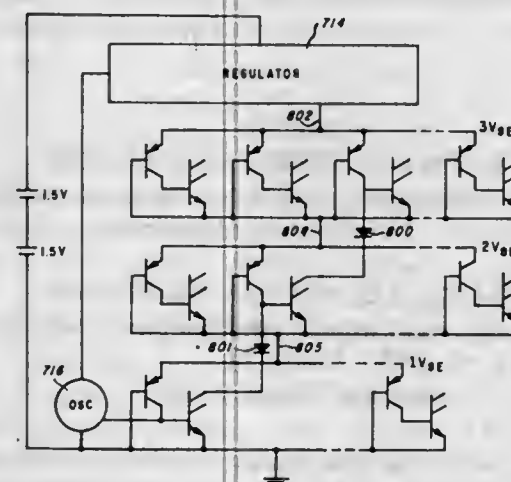
Clark R. Williams, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 19, 1974, Ser. No. 443,535

Int. Cl.<sup>2</sup> H03K 11/02, 19/08

U.S. Cl. 307-296

14 Claims



1. A digital system in the form of a monolithic semiconductor integrated circuit which is energizable from a single power source of predetermined magnitude connected between first and second terminals thereof, said system comprised of:

a. first and second logic levels each having at least one logic input and at least one logic output, each of said logic levels being comprised of a plurality of interconnected logic elements with each of said logic elements being comprised of semiconductor devices and having first and second power electrodes for energization thereof; b. first means coupling the first power electrodes of the logic elements of said first level in common to said first terminal; c. second means electrically coupling the second power electrodes of the logic elements of said second level in common to said second terminal; d. third means electrically coupling the second electrodes of the logic elements of said first level in common to the first electrodes of the logic elements of the second level; and e. a PN junction device coupling the at least one logic output of said first level to the at least one logic input of said second level.

4,013,902

# INITIAL RESET SIGNAL GENERATOR AND LOW VOLTAGE DETECTOR

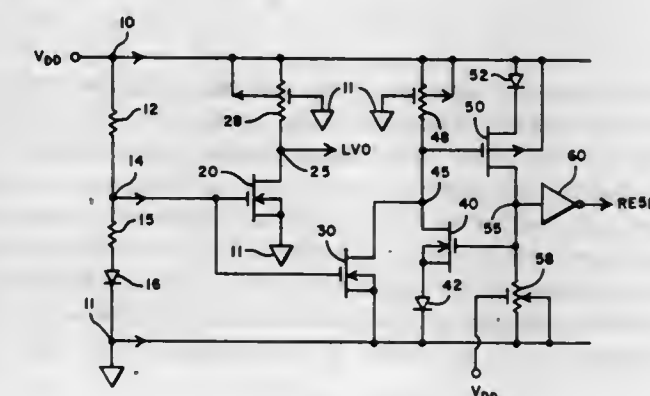
Robert L. Payne, Crystal, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 6, 1975, Ser. No. 602,171

Int. Cl.<sup>2</sup> H03K 21/32, 17/20, 17/30, 17/60

U.S. Cl. 307-268

7 Claims



1. An apparatus for generating a power up initial reset signal, said apparatus comprising: first and second input terminals for connection to a source of electric potential; a first current path between said first and second input terminals formed by a first resistor connected between said first input terminal and a first junction node and a first MOS field effect transistor of a first channel polarity having its drain connected to said first junction node and having its source connected through a first diode to said second input terminal; a second current path between said first and second input terminals formed by a second resistor connected between said second input terminal and a second junction node and a second MOS field effect transistor of a second channel polarity having its drain connected to said second junction node and having its source connected through a second diode to said first input terminal; means connecting the gate of said first field effect transistor to said second junction node; means connecting the gate of said second field effect transistor to said first junction node; and a third MOS field effect transistor of a first channel polarity having its drain connected to said first junction node, its source connected to said second input terminal, and its gate connected through an impedance to said first input terminal, whereby upon application of a voltage signal between said first and second input terminals, the voltage appearing at said second node in said second current path is first near the potential of said second input terminal, but upon conduction of said third field effect transistor is



switched so as to be near the potential of said first input terminal.

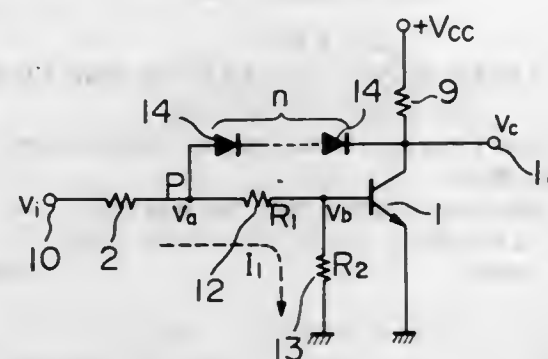
**4,013,903**  
**HIGH SPEED SWITCHING CIRCUIT WHICH REDUCES EFFECT OF MINOR CARRIER STORAGE AND PREVENTS UNDESIRABLE OSCILLATION**

Jyunji Sakamoto; Norio Imaizumi, and Eisuke Shiratani, all of Gunma, Japan, assignors to Tokyo Sanyo Electric Co., Ltd. and Sanyo Electric Co., Ltd., Osaka, both of Japan  
Filed Dec. 6, 1974, Ser. No. 530,285  
Claims priority, application Japan, Dec. 7, 1973, 48-143188[U]

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976  
Int. Cl.<sup>2</sup> H03K 3/33, 5/08

U.S. Cl. 307—300

3 Claims



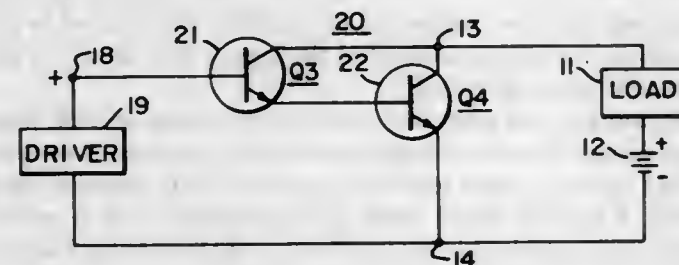
1. A switching circuit comprising a transistor whose emitter is grounded, a load connected in the collector circuit of said transistor, a first resistor, the value of resistance of which is  $R_1$ , being connected between an input point and the base of said transistor, a second resistor, the value of resistance of which is  $R_2$ , being connected between the base of said transistor and the ground, at least one diode connected between said input point and the collector of said transistor, and an output terminal connected to the collector of the transistor.

**4,013,904**  
**DARLINGTON TRANSISTOR SWITCHING CIRCUIT FOR REACTIVE LOAD**

Raymond F. Chick, Greensburg, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed Aug. 28, 1975, Ser. No. 608,479  
Int. Cl.<sup>2</sup> H03K 3/26, 17/56, 19/08

U.S. Cl. 307—315

10 Claims



1. A transistorized switching circuit for a reactive load, comprising an input transistor and an output transistor, each said transistor having a base, emitter, and collector electrodes, said input transistor being directly electrically coupled at its emitter electrode to the base electrode of the output transistor, means for connecting a predetermined switching voltage to the base and emitter electrode of the input transistor, means for connecting electrically a reactive load in series with a supply voltage source across the collector and emitter electrode of the output transistor, said input transistor structured to have a collector-emitter sustaining voltage substantially less than the collector-emitter sustaining voltage of the output transistor said sustaining voltages being of sufficient differ-

ence that the input transistor collector-emitter clamps any reactive load voltage to the sustaining voltage of the input transistor and prevents power dissipation at the sustaining voltage of the output transistor, and the sustaining voltage of the output transistor is the disconnected common connection of the input and output transistor collectors.

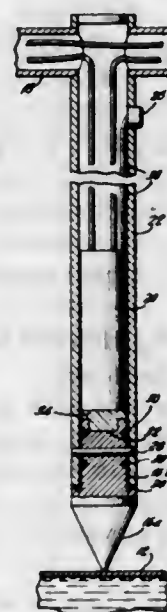
**4,013,905**  
**REMOTE ACOUSTIC PROBE**  
Richard Breneman, Benton City, and Dwight L. Parry, Richland, both of Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed Jan. 9, 1974, Ser. No. 431,954

Int. Cl.<sup>2</sup> H01L 41/08

U.S. Cl. 310—8.3

10 Claims



1. An apparatus for sensing acoustic emissions from a member under stress comprising:  
a. an elongated tubular body;  
b. a hard metallic pointed member disposed at one end of said body for receiving and transmitting said acoustic emissions from said member when in firm and direct contact therewith;  
c. acoustic transducer means in said body acoustically coupled to said pointed member for receiving said acoustic emissions through said pointed member from said member under stress when said pointed member is in direct contact therewith and converting said emissions into electrical voltages proportional to the amplitude of the emissions received; and  
d. means for acoustically isolating said pointed member and said acoustic transducer means from said tubular body.

**4,013,906**  
**ELECTROMAGNETIC LEVITATION**  
John Frederick Eastham, Aberdeen, Scotland, assignor to National Research Development Corporation, London, England

Filed May 12, 1975, Ser. No. 576,663  
Claims priority, application United Kingdom, May 14, 1974, 21256/74; Oct. 19, 1974, 46481/74

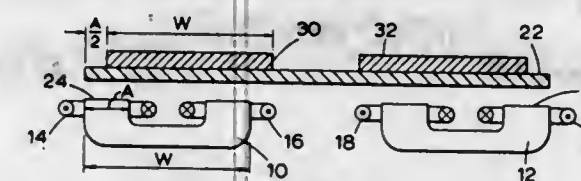
Int. Cl.<sup>2</sup> H02K 41/02

U.S. Cl. 310—13

7 Claims

1. An electrical machine having a primary comprising a core of magnetic material having at least two pairs of rows of pole faces disposed in a common plane and arranged to provide paths for working flux between the pole faces of each row in planes substantially perpendicular to said rows, and a secondary confronting said pole faces and comprising electrically conductive material arranged to provide longitudinal paths for

electric current on each side of each row of pole faces and transverse paths interconnecting said longitudinal paths and at least one core member of magnetic material extending longitudinally of the electrically conductive material on the opposite side thereof to the primary and having its lateral edges so disposed relative to the primary that the magnetic field produced when the primary is energized from a polyphase alter-



nating current supply is operative to produce a force between said primary and said secondary having first components tending to maintain said primary and said secondary spaced apart from one another, second components tending to maintain said primary and said secondary in alignment with one another in a lateral direction and third components tending to cause relative displacement between said primary and said secondary in a longitudinal direction.

**4,013,907**  
**BATTERY POWERED MOTOR ASSEMBLY**  
Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co. Ltd., Tokyo, Japan

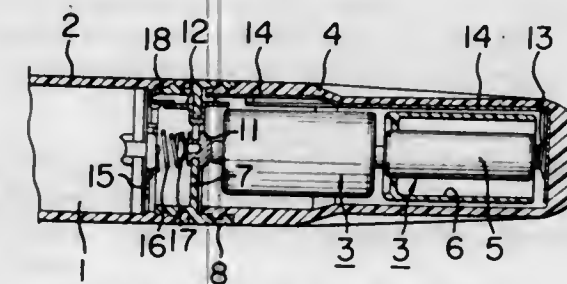
Filed June 30, 1975, Ser. No. 591,448

Claims priority, application Japan, July 2, 1974, 49-76073

Int. Cl.<sup>2</sup> H02K 7/14

U.S. Cl. 310—50

6 Claims



1. A battery-powered motor assembly comprising; and electric motor;  
a motor casing to fixedly retain the motor;  
a battery casing to retain at least one battery therein and axially aligned to said motor casing;  
a circuit switch which is turned on and off by the relative rotation of said motor and battery casing to energize and deenergize said motor;  
a partition wall member covering airtightly an open end face of said battery casing facing said motor casing;  
a battery housing space defined by said battery casing and said partition wall member;  
a motor housing space defined by said motor casing and said partition wall member;  
a first electric contact member sealingly extending through the center of said partition wall member to electrically engage with one terminal of the battery and one terminal of said motor;  
and a second electric contact member sealingly extending through said partition wall member spaced from the center thereof to electrically engage with the other terminal of the battery and the other terminal of said motor;  
said battery housing space and said motor housing space being separated by said partition wall member; and  
an intermediate casing coaxially fitted to said motor and battery casings, said intermediate casing carrying said partition wall member.

**4,013,908**  
**COOLING SYSTEM FOR A SUPERCONDUCTIVE EXCITER WINDING**

Erich Weghaupt, Mulheim (Ruhr), Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

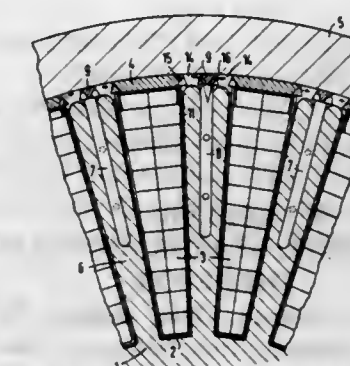
Filed June 2, 1975, Ser. No. 583,159

Claims priority, application Germany, Mar. 13, 1975, 2511104

Int. Cl.<sup>2</sup> H02K 1/20

U.S. Cl. 310—61

4 Claims



1. Cooling system for a superconductive exciter winding in a turbogenerator rotor, the exciter winding having winding coils formed of a multiplicity of individual windings that are received in slots formed at the outer periphery of a solid support cylinder and retained therein by a bracing cylinder shrink-fitted on the support cylinder, comprising coolant distribution channels disposed radially in teeth located between and defining the slots formed in the support cylinder and in filler members located between winding head coils, said coolant distribution channels surrounding the individual windings over the entire length thereof and being connected in peripheral direction on both sides thereof with coolant channels extending substantially parallel to one another in radial direction with the individual winding coils and surrounding the same at the bottom of the slots.

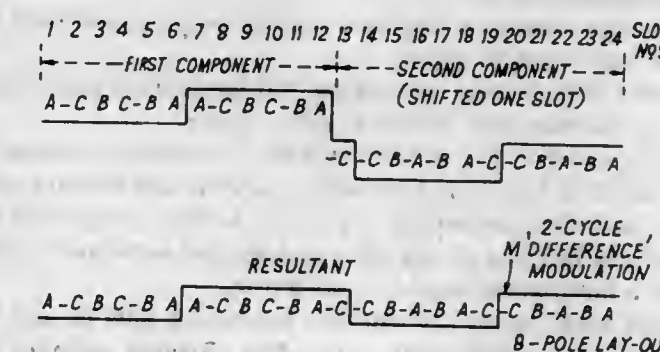
**4,013,909**  
**ELECTRIC MOTORS**  
Alexander Richard William Broadway; William Fong, both of Westbury-on-Trym, and Gordon Hindle Rawcliffe, Bristol, all of England, assignors to National Research Development Corporation, England

Continuation of Ser. No. 410,353, Oct. 29, 1973. This application May 6, 1975, Ser. No. 575,044  
Claims priority, application United Kingdom, Nov. 3, 1972, 50832/72

Int. Cl.<sup>2</sup> H02K 3/00

U.S. Cl. 310—180

4 Claims



1. A 3-phase alternating-current, speed-changing electric machine of the pole-amplitude modulation type, having a composite 3-phase stator winding consisting solely of two 3-phase winding components providing alternative first and second pole-numbers, the said two components being combined as said composite stator winding, the first in a first



half-perimeter of the machine stator and the second in the second half-perimeter of the machine stator, said composite winding providing alternative pole-numbers respectively equal to double the said first and second pole-numbers of said components.

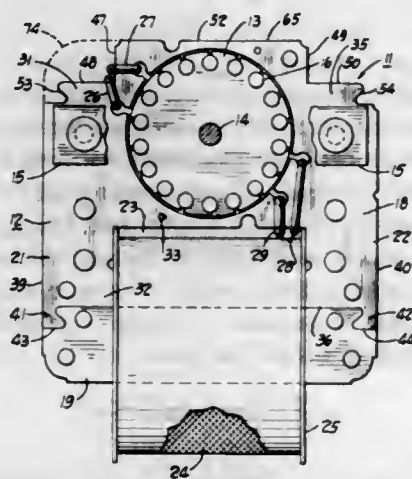
4,013,910

## ELECTRIC MOTOR, STATOR AND LAMINATION THEREFOR

Andrew F. Deming, Alliance, Ohio, assignor to The Alliance Manufacturing Company, Inc., Alliance, Ohio  
Division of Ser. No. 43,039, June 3, 1970, Pat. No. 3,694,903.  
This application Mar. 15, 1972, Ser. No. 234,704  
Int. Cl.<sup>2</sup> H02K 3/06

U.S. Cl. 310-211

6 Claims



1. An electric motor, comprising in combination, a laminated stator and a rotor, a rotor portion and a winding portion on said stator, an aperture in said rotor portion for said rotor, leg means on said stator interconnecting said winding and rotor portions and surrounding a window space, winding means on said winding portion passing through said window space to establish flux in said stator, first and second complementary pieces of lamination material forming at least part of each of several layers in said laminated stator, first edge means on said first lamination piece defining part of said window space, second edge means on said second lamination piece defining another part of said window space, means establishing a part of said lamination material removed to form said first edge means of said window space of said first lamination piece as a unitary projecting part of another one of said first and second lamination pieces in a lamination layer in said stator, means establishing said unitary projecting part of said first lamination piece as an active flux carrying member in a layer in said laminated stator, first and second legs as part of said leg means, said second leg being unitary with said rotor portion and said winding portion and defining said first lamination piece, and said first leg being substantially all of said second lamination piece.

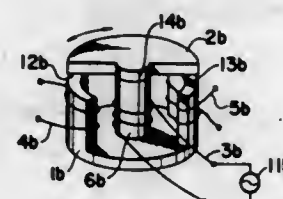
4,013,911  
DISPLACEMENT - ELECTRICITY TRANSDUCER  
Hideo Fujiwara, Tachikawa; Yukio Ichinose, and Kenji Kato, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 21, 1974, Ser. No. 516,806  
Claims priority, application Japan, July 22, 1974, 49-83179; July 24, 1974, 49-84182; Oct. 19, 1973, 48-116842

Int. Cl.<sup>2</sup> H02P 13/10

U.S. Cl. 340-199

53 Claims



1. A displacement-electricity transducer comprising: a movable magnetic core and a fixed magnetic core which are oppositely arranged so as to have predetermined gaps between at least two oppositely disposed portions of said respective magnetic cores, both said magnetic cores forming substantially two closed magnetic circuits, each circuit including one of said gaps and a common magnetic path portion, said movable magnetic core and said fixed magnetic core being more closely coupled at said common path portion than at said gaps, wherein upon displacement of said movable magnetic core relative to said fixed magnetic core, the area of common projection between opposing portions of said magnetic cores having one of said gaps therebetween in one of said closed magnetic circuits increases, while the area of common projection between opposing portions of said magnetic cores having the other of said gaps therebetween in the other closed magnetic circuit decreases; a first coil which is wound around the common magnetic path portion of said two closed magnetic circuits; at least one second coil which is wound around a portion other than said common magnetic path portion in at least one of said closed magnetic circuits; and an A.C. power source for applying an A.C. voltage to said first coil.

4,013,912

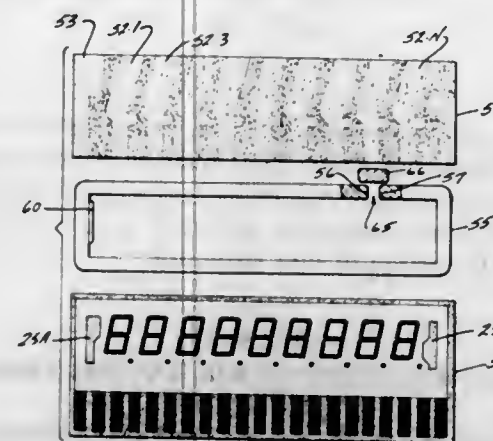
GAS MIXTURE FOR GLOW DISCHARGE DEVICE  
David C. Hinson, Whitehouse, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 412,576, Nov. 5, 1973, Pat. No. 3,904,915, which is a continuation-in-part of Ser. No. 279,875, Aug. 11, 1972, Pat. No. 3,886,393. This application Apr. 14, 1975, Ser. No. 567,793

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> H01J 17/20, 17/48, 63/04; H05B 33/10  
U.S. Cl. 313-226

8 Claims



1. In a process for operating a cathode glow gas discharge information display device which comprises a matrix of gas discharge cells, each having at least one cathode electrode element having a configuration defining the glow discharge portion of the display, and an ionizable gaseous medium, the improvement which comprises decreasing the device operating currents by operating the device with an ionizable gaseous medium consisting essentially of about 20 to 35 percent atoms of argon and about 80 to 65 percent atoms of a xenon-based composition, said xenon-based composition consisting essentially of about 95 to 100 percent atoms of xenon and about 5 to 0 percent atoms of another selected component.

4,013,913

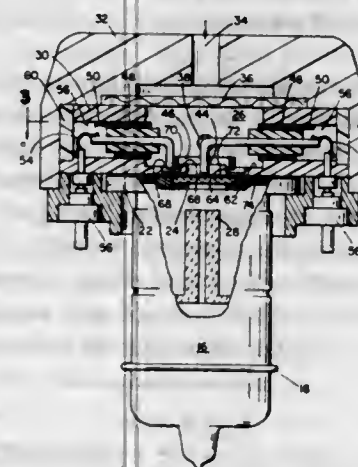
ION DETECTION ELECTRODE ARRANGEMENT  
John N. Driscoll, Natick, and Frederick F. Spaziani, Lexington, both of Mass., assignors to HNU Systems Inc., Newton Upper Falls, Mass.

Filed Jan. 19, 1976, Ser. No. 650,531

Int. Cl.<sup>2</sup> H01J 1/52

U.S. Cl. 313-242

21 Claims



1. An electrode arrangement for detecting ionized species in apparatus comprising a radiation source for ionizing said species and detection electrodes comprising an anode and a cathode, said arrangement comprising: said cathode having an annular configuration defining an annulus extending in a transverse plane across the axis of radiant energy emission from said radiation source;

said anode having a distal end positioned centrally of said cathode annulus in the path of radiant energy emission from said radiation source; and a shield opaque to said radiant energy extending between said cathode and said radiation source, said shield having an aperture therethrough aligned with said cathode annulus and defining a wall of said shield spaced radially inwardly from said cathode annulus, said anode thereby adapted for direct exposure to said radiant energy through said aperture and said cathode shielded from said radiant energy by said shield.

4,013,914

## ELECTRODE PROTECTING MEANS FOR ELECTRIC DISCHARGE LAMPS

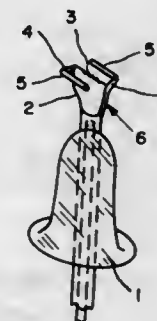
James P. Clune, Middleton; Harry W. Aptt, Jr., Gloucester, and Sebastian J. Marci, Middleton, all of Mass., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,418

Int. Cl.<sup>2</sup> H01J 1/52, 19/40

U.S. Cl. 313-313

2 Claims



1. A discharge tube comprising two electrodes, at least one wire probe electrically connected to each electrode and mounted in proximity thereto to act as a collector of electrons during a positive half-cycle on an electrode and, on each wire probe, a coating of a dielectric material having very low electron leakage to store some of the collected electrons and to attract during a negative half-cycle a part of positive ions impinging upon the electrode.

4,013,915

## LIGHT EMITTING DEVICE MOUNTING ARRANGEMENT

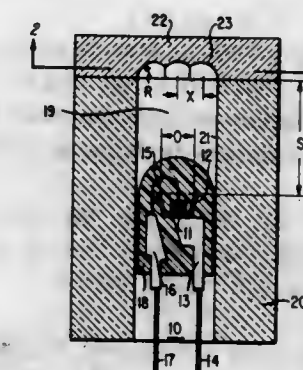
William Henry Dufft, Shillington, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 23, 1975, Ser. No. 625,022

Int. Cl.<sup>2</sup> H05B 33/02

U.S. Cl. 313-499

6 Claims



1. An optical device comprising: a solid state light-emitting device; a body of material defining a cavity with side walls and an opening at the top within which cavity is mounted said light-emitting device, the walls of said cavity forming spectrally reflective surfaces; and a filter element having top and bottom surfaces formed over



the opening in said cavity with the top surface facing away from the cavity and the bottom surface facing the cavity wherein said top surface is flat and said bottom surface includes a plurality of spherical surfaces formed therein in the area over said cavity with the concave side of the surfaces facing said cavity such that a plurality of images of said light-emitting device is formed by said surfaces.

4,013,916

# SEGMENTED LIGHT EMITTING DIODE DEFLECTOR SEGMENT

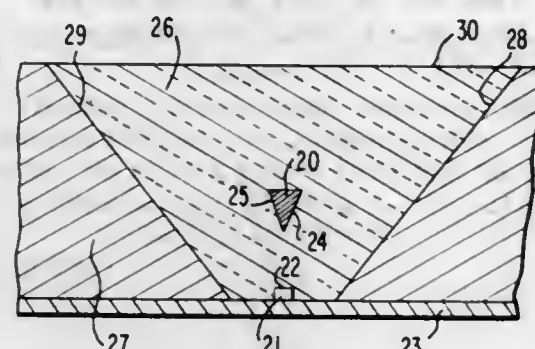
Raymond E. Brown, Los Gatos, Calif., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 3, 1975, Ser. No. 619,432

Int. Cl.<sup>2</sup> H01J 1/62

U.S. Cl. 313-510

12 Claims



1. A method of controlling the distribution of light along the surface of an electroluminescent semiconductor display segment, where said segment is comprised of a base, a body of reflector material having an upper and lower surface and an aperture therebetween, said lower surface connected to said base in a light-tight manner, said aperture having reflective sides and a central axis, an electroluminescent semiconductor attached to said base essentially centrally located in said aperture, said semiconductor having a generally Lambertian pattern of light emission upward from said base the rest of said aperture being substantially occupied by a solid translucent medium from said lower surface to substantially said upper surface forming a viewing surface, said method comprising the step of:

introducing a deflector body into said translucent medium into said Lambertian pattern of light emission such that light emitted by said semiconductor upon striking said deflector is controllably reflected towards the reflective sides of said aperture and thence to said viewing surface to produce along said viewing surface a distribution of light different from said Lambertian pattern.

4,013,917

# COUPLED CAVITY TYPE SLOW-WAVE STRUCTURE FOR USE IN TRAVELLING-WAVE TUBE

Toshinori Horigome; Sadanori Hamada, and Takami Sato, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,734

Claims priority, application Japan, Dec. 3, 1974, 49-139088

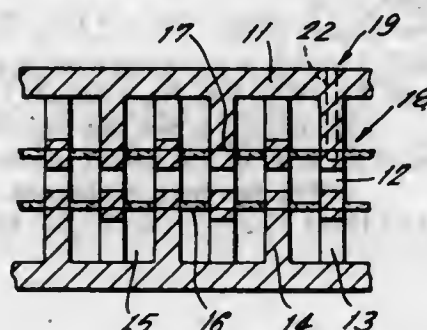
Int. Cl.<sup>2</sup> H01J 25/34

U.S. Cl. 315-3.5

4 Claims

1. A coupled cavity type slow-wave structure for use in a travelling-wave tube, wherein a plurality of partition walls are arranged at a given spacing within a circular waveguide to define a plurality of cavities; each partition wall serving as the common wall between adjoining cavities and provided with central apertures which are axially aligned to permit passage of electron beams therethrough, and coupling slots communicating the adjoining cavities with each other; characterized by being further comprised of dielectric cylindrical spacers each having an inner diameter larger than the diameter of said

central apertures and axially aligned with said central apertures between each pair of said partition walls, said dielectric cylindrical spacers being brazed to said partition walls;



said electron-beam passing portion, including said dielectric cylindrical pieces which are placed in encircling relation to said central apertures, being hermetically sealed and is adapted to be removably mounted as a unit within the peripheral portion of said structure.

4,013,918

# ELECTROLUMINESCENT DIODE HAVING THRESHOLD EFFECT

Jacques Lebaillly, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

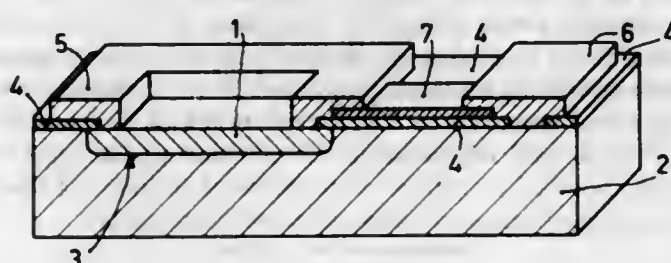
Filed July 2, 1974, Ser. No. 485,225

Claims priority, application France, July 3, 1973, 73.24412

Int. Cl.<sup>2</sup> H01L 27/15, 33/00; H05B 33/14

U.S. Cl. 315-71

16 Claims



1. A monolithic electroluminescent semiconductor device comprising:

- a monocrystalline semiconductor body having a major surface;
- a semiconductor zone which extends along a part of said major surface of said semiconductor body, said zone adjoining a portion of the semiconductor body and forming therewith a diode that can emit radiation, said diode having a junction which extends to at least said surface of said semiconductor body;
- a current path element disposed at said major surface and connected electrically in parallel with said junction, said current path element being physically separate from said semiconductor zone and said semiconductor body portion and leaving said junction at least partly intact at said surface, whereby the current voltage characteristics of said current path and of said diode intersect each other and the dynamic admittance of said current path at the intersection is smaller than that of said diode.

4,013,919

# DISCHARGE LAMP HAVING FUSE-SWITCH GUARD AGAINST JACKET FAILURE

Eugene K. Corbly, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,858

Int. Cl.<sup>2</sup> H05B 41/231; H01J 7/44

U.S. Cl. 315-73

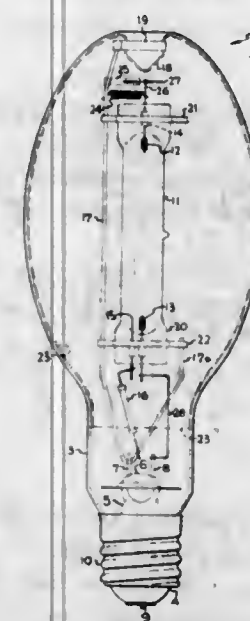
5 Claims

1. A jacketed electric lamp comprising a vitreous outer envelope having inlets sealed therethrough; a vacuum or a nonoxidizing filling in said outer envelope;

an inner envelope of material which transmits ultraviolet radiation within said outer envelope;

said inner envelope having electrodes sealed into its ends and containing an ionizable medium comprising a metal which produces radiation including ultraviolet which is transmitted by the inner envelope and normally intercepted at the outer envelope;

and means connecting the electrodes of the inner envelope to the inlets of the outer envelope, said means including a fuse-switch comprising a resistive heater connected in series circuit with the inner envelope and made of a metal



that oxidizes rapidly upon contact with air at the temperature caused by normal lamp current flow through it, and a thermal switch shunting said heater and located in heat-receiving relationship from said heater and from said inner envelope, said switch being normally open when the lamp is off but closing upon heating by said heater, and thereafter being held closed by heat from said inner envelope when the lamp is operating normally but cooling and reopening upon air contact should the outer envelope be broken, whereupon said heater carries lamp current and oxidizes rapidly, culminating in burn through of said heater and permanent disablement of the lamp.

4,013,920

# SAFETY SWITCH WHICH RENDERS HID LAMP INOPERATIVE ON ACCIDENTAL BREAKAGE OF OUTER ENVELOPE

John Petro, Belleville, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 22, 1976, Ser. No. 651,306

Int. Cl.<sup>2</sup> H01J 7/44, 13/46, 17/34; H01K 1/62

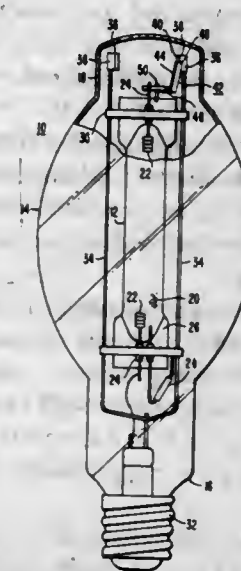
U.S. Cl. 315-73

5 Claims

1. In combination with a high-intensity discharge lamp comprising an elongated radiation-transmitting arc tube which is longitudinally disposed and supported within an elongated light-transmitting protective envelope having a neck portion and a dome portion and which is opaque to short wavelength ultraviolet radiations, said arc tube enclosing a discharge-sustaining filling and having electrodes operatively positioned therein proximate the ends thereof, electrical lead-in means sealed through said arc tube and connected to said electrodes, electrical adaptor means affixed to the neck portion of said envelope to facilitate electrical connection of said lamp to a source of electrical power, electrical conductor means electrically connecting said electrical adaptor means to said electrical lead-in means, said electrical conductor means including an arc tube supporting frame comprising elongated rigid metallic supporting members longitudinally disposed within said protective envelope and having extremity portions proximate the dome portion of said protective envelope, and flexible leaf-spring metallic members affixed proximate the extremity

portions of said rigid metallic supporting members and laterally extending therefrom with the extremity portions of said leaf-spring members urged toward the inner surface of said dome portion of said protective envelope by the resiliency of said leaf-spring members to provide a lateral and somewhat resilient support for said arc tube, the improvement which comprises:

switch means having a normal closed position in which said switch means is electrically conducting and an open position in which said switch means is electrically non-conducting, said switch means included in series circuit arrangement intermediate said arc tube supporting frame and one of said electrical lead-in means, said switch



means including a mechanically actuated contact member comprising a resilient elongated body having one end affixed to said one of said electrical lead-in means, and the other end of said resilient elongated body being movable and urged by its resiliency toward the inner surface of said dome portion of said protective envelope and in electrical contact with one of said leaf-spring metallic members to maintain said switch means in said closed position, and breakage of said protective envelope permitting said resilient elongated body and said leaf-spring support member which normally contacts said resilient elongated body to be moved by their resiliencies out of electrical contact with each other, thereby to render said lamp inoperative.

4,013,921

# WARNING LIGHT CONTROL

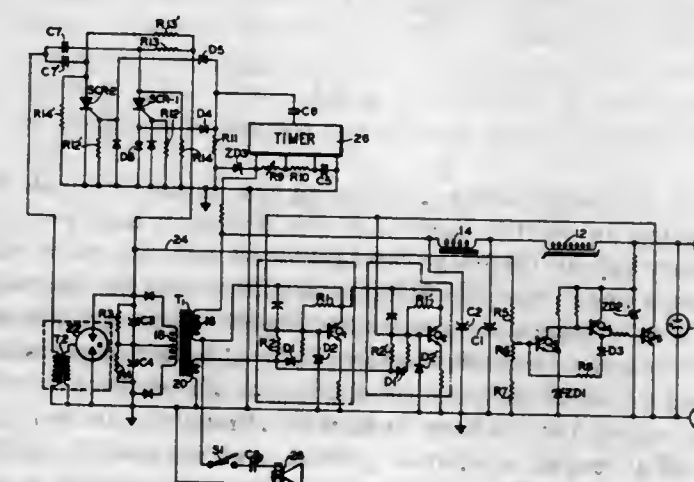
William I. Corbly, East Haddam, Conn., assignor to Austin Electronics, Inc., Deep River, Conn.

Filed June 2, 1975, Ser. No. 582,654

Int. Cl.<sup>2</sup> H05B 37/00, 39/00, 41/14

U.S. Cl. 315-241 R

8 Claims



1. Apparatus for controlling the energization of a warning light, the warning light including a gaseous discharge lamp with a trigger pulse transformer coupled thereto, said energization control apparatus comprising:



timer means, said timer means including a square wave generator and producing an output signal having two states, the square wave generator having an adjustable duty cycle;

static inverter means adapted to be supplied from a low voltage direct current source, said inverter means including an oscillator which generates an alternating voltage at a frequency greater than the frequency of said timer means square wave generator output signal, the output of said inverter means being a high DC voltage;

means coupling the high DC voltage produced by said static inverter means to said warning light gaseous discharge lamp;

capacitor means connected to a winding of the trigger pulse transformer of said warning light, said capacitor means cooperating with said pulse transformer winding to define a series resonant circuit;

means delivering the high output voltage produced by said static inverter means to said capacitor means;

normally open switch means, said switch means establishing a discharge path for said capacitor means when in the closed condition;

means responsive to each change in the level of the output signal of said timer means square wave generator for producing a switching control pulse for application to said switch means whereby said switch means is closed to permit discharge of said capacitor means with the resultant generation of a trigger pulse in said series resonant circuit;

means coupling the output signal of said timer means to said switching control pulse producing means; and means for delivering switching control pulses provided by said switching control pulse producing means to said normally open switch means.

#### 4,013,922 SUNLAMP DEVICE

Andries van der Meulen, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

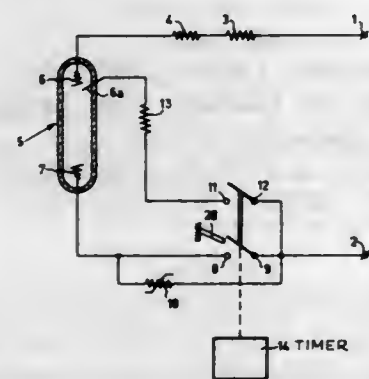
Filed July 10, 1975, Ser. No. 594,589

Claims priority, application Netherlands, Aug. 1, 1974, 7410336

Int. Cl.<sup>2</sup> H05B 41/19, 41/36

U.S. Cl. 315-362

13 Claims



1. A Sunlamp device comprising two input terminals for supplying an electric current to the device, a high pressure mercury vapour discharge tube provided with two main electrodes, a switch having a first position for setting the discharge tube into operation, means connecting the discharge tube and the switch in series circuit across the input terminals, a resistor having a positive temperature coefficient of resistance thereby to extinguish the discharge tube with a time delay on termination of a desired irradiation period, said resistor of positive temperature coefficient of resistance being connected in circuit so that in the first position of the switch it carries substantially no current and in a second position of said switch said resistor is in series with the discharge tube across the input terminals of the device, and means for preventing the discharge tube from restriking after extinction thereof by main-

taining the voltage between the main electrodes of the discharge tube at a low voltage different from zero.

#### 4,013,923

##### HIGH VOLTAGE REGULATION SYSTEM

Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

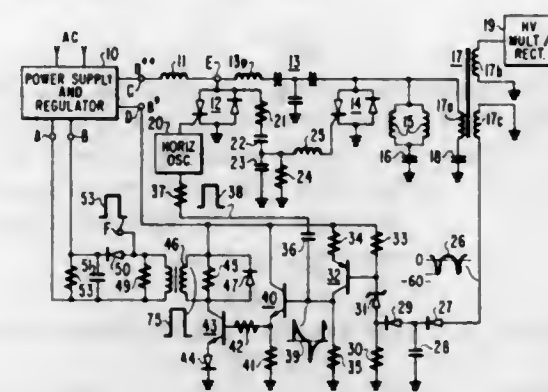
Filed Mar. 22, 1976, Ser. No. 668,967

Claims priority, application United Kingdom, Sept. 2, 1975, 36089/75

Int. Cl.<sup>2</sup> H01J 29/70

U.S. Cl. 315-411

5 Claims



1. A high voltage regulating system comprising:  
a switching regulator power supply;  
a deflection system coupled to said supply for receiving operating current therefrom for producing periodic retrace voltage pulses suitable for rectification for providing an ultra potential for a cathode ray tube;  
a source of sync pulses coupled to said deflection system for synchronizing said periodic pulses; and  
power supply control means coupled to a source of periodic voltage waveforms in said deflection system, said source of sync pulses and said power supply, said control means including:  
a differentiating network for differentiating said sync pulses;  
a transistor stage coupled to said differentiating network for receiving differentiated pulses therefrom;  
means for developing a first control signal representative of the level of said periodic waveforms and applying said first control signal to said transistor stage to control the bias thereon for controlling the width of said differentiated sync pulses obtained from said transistor stage; and  
means for developing a second control signal from said width-modulated sync pulses and for coupling said second control signal to said switching power supply for controlling the duty cycle of said switching.

#### 4,013,924

##### METHODS AND MEANS FOR DETECTING THE PRESENCE OF MOISTURE ADJACENT INSULATED PIPES

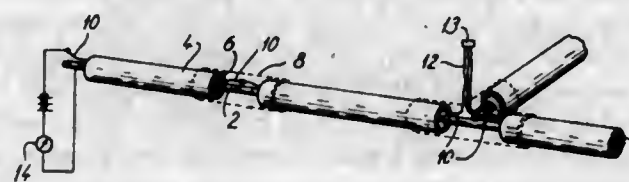
Gunnar Buhl Christensen, and Ove Thastrup, both of Fredericia, Denmark, assignors to A/S E. Rasmussen, Denmark

Filed Mar. 19, 1970, Ser. No. 21,028

Int. Cl.<sup>2</sup> H02H 7/26

U.S. Cl. 361-49

8 Claims



1. A pipe system including a prefabricated conductor ele-

ment for use in a subterranean fluid conductor system comprising a fluid conducting length of pipe surrounded by a dry, hygroscopic insulating foam material of artificial resin enclosed with an outer protective pipe casing of water tight material, at least one electrical wire embedded in said insulating material so as to extend along said pipe and said pipe casing in spaced relationship thereto within the insulating material, the insulating material is surrounded by a moisture tight protective tube bridged tightly by tube casings adjacent the joints between individual pipe lengths, said tube casings being provided with a one way valve in a wall portion thereof, these valves being oriented so as to allow moisture to escape from the interior of said casings.

#### 4,013,925

##### OVERLOAD PROTECTION CIRCUIT FOR VOLTAGE REGULATOR

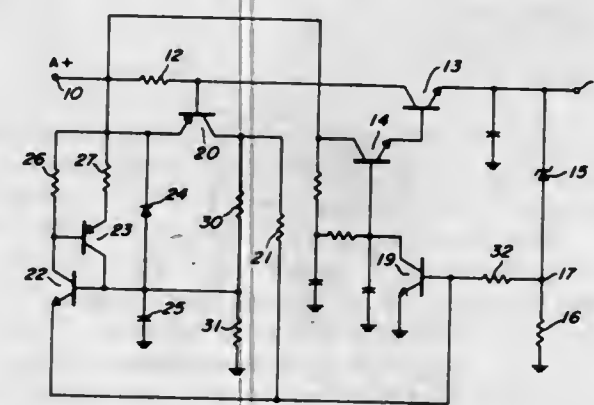
Lee Don Tice, Rolling Meadows, and David Michael Drury, Mundelein, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 10, 1975, Ser. No. 630,561

Int. Cl.<sup>2</sup> H02H 7/20

U.S. Cl. 361-18

4 Claims



1. In a voltage supply for providing output to a loading circuit, an overload protection circuit comprising in combination:

an input terminal coupled to a source of DC voltage;  
an output terminal coupled to the loading circuit;  
a common terminal;  
voltage regulating means coupled across the output means and having first diode means and first resistor means connected in series across the output and common terminals, first transistor means having a base-emitter circuit coupled in parallel with the first resistor means, second and third transistor means in a Darlington connection coupled to the output terminal, the first transistor means forming an amplifier coupled to the Darlington-connected transistor means and to the common terminal for providing an output voltage which is substantially the sum of the voltages on the first diode means and the amplifier;  
limiting means coupled to the input terminal and to the voltage regulating means and comprising a sensing resistor coupled between the input terminal and the collector of the second transistor means, fourth transistor means having an emitter coupled to the input terminal, a base coupled to the collector of the second transistor means and a collector coupled through a second resistor to the base of the transistor amplifier for causing the fourth transistor to conduct when an excessive current flows through the sensing resistor, thereby shunting the third transistor for maintaining the current in the loading circuit at substantially a predetermined level;

latching means coupled to the input terminal and including fifth and sixth transistor means connected back to back and coupled to the base of the first transistor means, a timing capacitor coupled between the fifth transistor base and the common terminal, third resistor means coupled between the collector of the fourth transistor means and

the timing capacitor for charging the capacitor when the fourth transistor is conducting and for causing the fifth and sixth transistor means to conduct when the charge on the timing capacitor reaches a predetermined level, thereby causing the transistor amplifier to become saturated and the second and third transistor means to be cut off; and

delay means comprising a fourth resistor coupled across the timing capacitor for providing a delay in reaching the predetermined level of charge on the timing capacitor, and a second diode means coupled to the timing capacitor and to the latching means for providing a quick discharge path for the capacitor when the DC voltage source is disconnected from the input terminal.

#### 4,013,926

##### CIRCUIT BREAKER WITH IMPROVED TRIP ACTUATOR AND UNDERVOLTAGE RELEASE MECHANISM

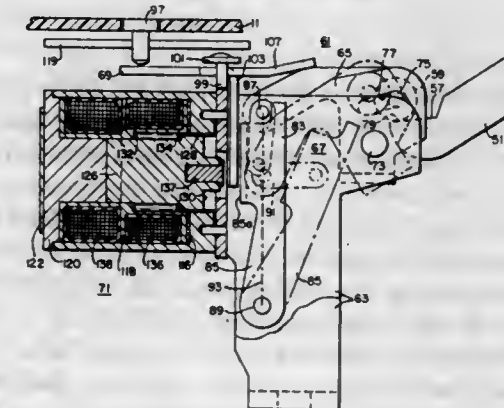
Walter W. Lang, Beaver Falls; John A. Wafer, Monroeville; Walter V. Bratkowski, McKeesport, and Suresh K. Bhate, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 11, 1975, Ser. No. 595,184

Int. Cl.<sup>2</sup> H02H 3/38

U.S. Cl. 361-115

10 Claims



1. A circuit interrupter comprising:  
separable contacts;  
releasable means operable upon actuation to effect automatic separation of said contacts; and  
a release actuator comprising:  
a cylindrical plunger operable between first and second positions, said plunger actuating said releasable means when operated to said second position;  
means for biasing said plunger toward said second position;  
a holding coil coaxially wound about said plunger and operable when energized by a voltage above a predetermined value to oppose the action of said bias means and maintain said plunger in said first position; and  
a trip coil wound about said plunger and being coaxial and non-concentric with said holding coil, said trip coil operable upon energization by an overcurrent control signal to aid said bias means and overcome the action of said holding coil to operate said plunger to said second position.

#### 4,013,927

##### SURGE ARRESTER

Alexander George Gilberts, Algonquin, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Sept. 18, 1975, Ser. No. 614,742

Int. Cl.<sup>2</sup> H02H 1/04, 3/22

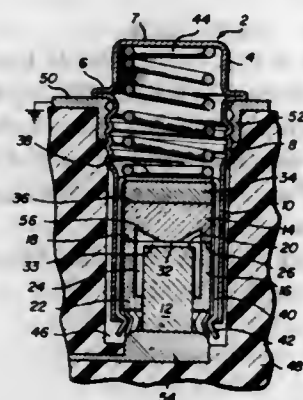
U.S. Cl. 361-119

6 Claims

1. In a surge arrester for providing overvoltage protection for a communications line or the like and which comprises a housing, a pair of spaced electrodes, insulating means surrounding a first of said electrodes and with a transverse end of said first electrode being recessed within said insulating



means, the second of said electrodes having a part of a transverse end seated on said insulating means and presented toward said first electrode whereby an arc gap is provided that is determined by the extent of said first electrode within said insulating means, and means for retaining said electrodes and said insulating means in said housing; characterized by said second electrode having valley structure in said transverse end that opens toward said first electrode and with a single plateau only projecting from the floor of said valley structure, the end surface of the plateau being flat and forming one side of the arc gap and being symmetrical relative to the central axis of said second electrode; the valley structure having a first pair of walls that are on opposite sides of said end surface and which slope away therefrom toward the floor



of the valley structure, a second pair of walls that are on opposite sides of and spaced from said end surface, said second pair of walls being respectively circumferentially intermediate the first pair of walls, said second electrode also having opposed flats axially spaced from said end surface and being joined respectively to said second pair of walls to form obtuse angles therebetween, the valley structure together with said second pair of walls and said flats constituting a region that completely surrounds said plateau and provides a vent across an end of said insulating means for particles that erupt from said electrodes into said arc gap, said part of said transverse end comprising spaced ridges which are small as compared to the peripheral extent of said second electrodes such that the vent is unobstructed throughout a major portion of said peripheral extent.

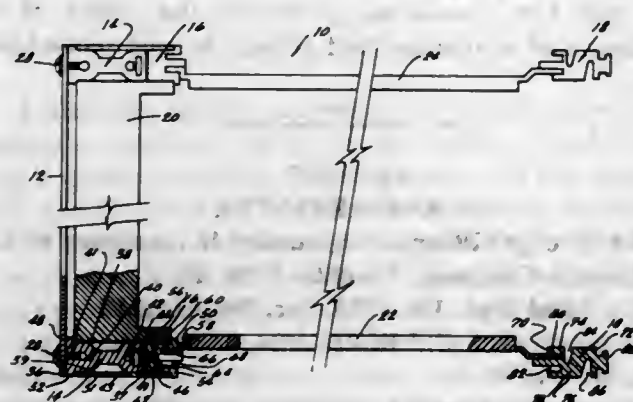
#### 4,013,928 CARD CAGE ASSEMBLY

George A. Sarinopoulos; Robert E. McCarthy, both of Oklahoma City, and Joseph R. Waldrop, Bethany, all of Okla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Apr. 24, 1974, Ser. No. 463,694  
Int. Cl.<sup>2</sup> H02B 1/02

U.S. Cl. 361-380

6 Claims



1. In a card cage assembly having a back panel, side plates, card guides, an elongated rear bar, an elongated clamping bar, electrical connectors having end portions secured to the rear

bar and the clamping bar, and an elongated front bar, the front bar and the clamping bar supporting the card guides, the improvement comprising:

- the rear bar further including a first side portion, a second side portion, a top and bottom portion, and end portions, said first side portion having an extruded channel formed therein and said second side portion having an extruded channel formed therein; and
- the front bar further including a first side portion, a second side portion, a top and bottom portion, and end portions, said top and bottom portion having extruded channels formed therein; and
- thread-forming screw securing means engageable in said channels for constructing the assembly.

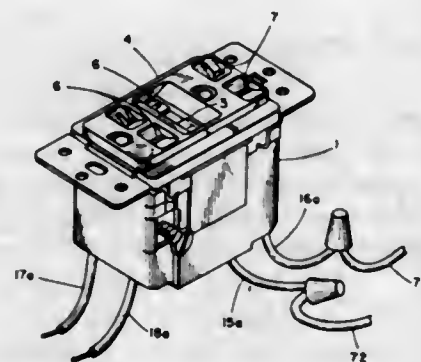
#### 4,013,929 MULTIPLE DUTY COMPONENTS OF A GROUND FAULT RECEPTACLE

Robert E. Dietz, Cedar Rapids; Darrell P. Ophaug, Marion, both of Iowa, and Lynn B. Steve, Port Richey, Fla., assignors to Square D Company, Park Ridge, Ill.

Filed Apr. 18, 1975, Ser. No. 569,260  
Int. Cl.<sup>2</sup> H02B 1/04

U.S. Cl. 361-357

2 Claims



1. A compact ground fault receptacle assembly for mounting in a common trade size junction box, comprising a unitary case having components mounted internally thereof, including internal socket means in said case for receiving the plug of an electrical appliance, internal conductor means in said case leading from said socket means for connection to an external power source, including said external power source, internal breaker contact means in said case to interrupt said conductor means, internal contact separation means in said case electrically connected to and powered by said external power source, internal sensing means in said case electrically and magnetically connected to said conductor means to detect an abnormal ground condition therein and to produce an electrical signal on detection thereof, internal signal responsive switching means in said case electrically connected to said contact separation means and said external power source to normally prevent application of full voltage of said external power source to said contact separation means thus rendering said separation means normally inoperative, said signal responsive switching means being electrically connected to said sensing means and being responsive upon receipt of an abnormal ground condition signal to cause full voltage of said external power source to be applied to said contact separation means rendering it operative to separate said breaker contacts and interrupt said conductor means, said internal socket means, internal conductor means, internal breaker contact means, internal contact separation means, and internal signal responsive switching means being operably mounted wholly within said case of said compact ground fault receptacle assembly, said internal conductor means includes feed-through terminals leading therefrom on the load side of said internal breaker contact means for ground fault protection of receptacles connected in parallel to said feed-through terminals, said internal contact separation means, said internal sensing means and said internal signal responsive switching means each in-

cluding components operably mounted to perform multiple functions enabling incorporation of a complete and improved ground fault interrupting mechanism within the small confines of said case of said compact receptacle assembly.

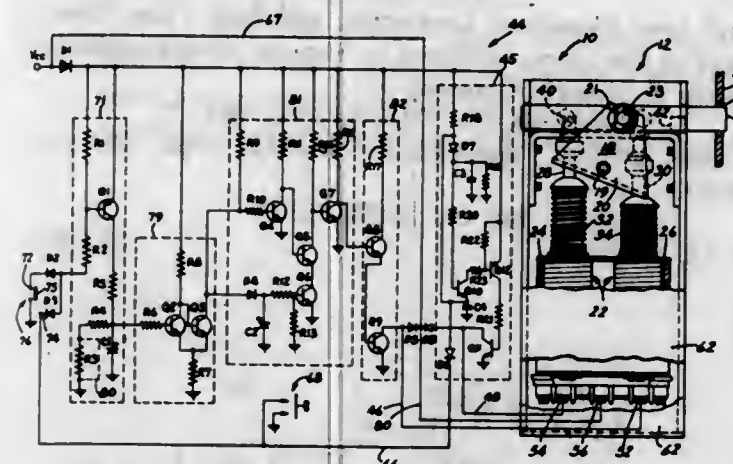
#### 4,013,930 ELECTRONIC DOOR LOCK

David Geller, Chicago, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Oct. 20, 1975, Ser. No. 624,055  
Int. Cl.<sup>2</sup> E05B 47/02

U.S. Cl. 361-172

10 Claims



1. Electrical control apparatus for use in locking and unlocking a closed door which has a lockbolt capable of being moved between a locked position and an unlocked position by an electrically energizable bolt mover, comprising: an electronic unlocking circuit for energizing the bolt mover so as to move the bolt to the unlocked position; switching means for actuating said electronic unlocking circuit when the door is to be unlocked; control means responsive to said switching means for generating a control signal time-delayed by at least a predetermined interval after the actuation of said unlocking circuit; and an electronic locking circuit responsive to said time-delayed control signal for energizing the bolt mover only when the door is closed so as to move the lockbolt to the locked position, thereby causing said door, when closed, to be automatically locked after at least said predetermined interval following the unlocking of the door.

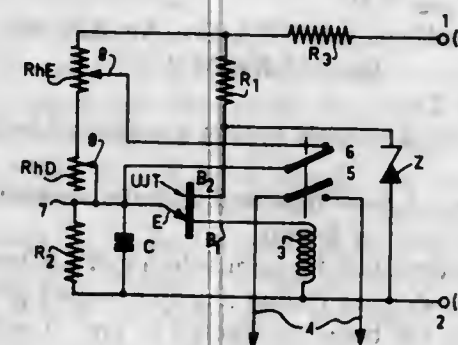
#### 4,013,931 VOLTMETRIC SYSTEM COMPRISING AN ELECTROMAGNETIC RELAY

Wladimir de Fligue, 203 rue d'Aulnay, Le Plessis-Robinson (Hauts-de-Seine), and Claude Henri Mottet, 70 rue de la Gare, Ezanville (Val-d'Oise), both of France

Filed July 24, 1975, Ser. No. 598,834  
Claims priority, application France, Aug. 7, 1974, 74.27470  
Int. Cl.<sup>2</sup> H01H 47/32

U.S. Cl. 361-187

6 Claims



1. A device responsive to a substantially direct voltage

source of variable voltage comprising: voltage divider means connected to said source and having an intermediate portion; a unijunction transistor having its emitter connected to the lower voltage end of said intermediate portion; an electromagnetic relay having: a coil connected in series with the bases of said transistor and said source, at least one normally open contact, and one normally closed contact shunting said intermediate portion and voltage stabilizing means shunting the series-connected transistor bases and coil.

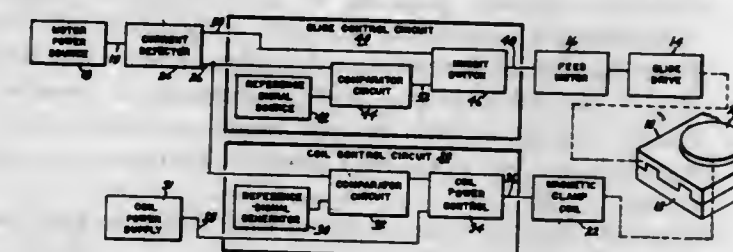
#### 4,013,932

APPARATUS FOR CONTROLLING A MAGNETIC CLAMP  
Pawan Kumar Aggarwal, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 6, 1975, Ser. No. 619,654  
Int. Cl.<sup>2</sup> B23Q 5/10

U.S. Cl. 318-39

6 Claims



1. An apparatus for controlling a magnetic work clamp comprised in part of a clamp coil being energized by a coil power supply, said work clamp being contained on a machine tool having a machine slide driven by a feed motor responsive to a motor power source, wherein the improvement comprises:

- means responsive to the motor power source for generating a first signal as a function of the power being supplied to said feed motor;
- means connected to the generating means for comparing the first signal to a reference signal to produce a control signal; and
- means connected between the clamp coil and the coil power supply and responsive to the comparing means for regulating the power applied to the clamp coil as a function of the control signal.

#### 4,013,933 NEEDLE POSITION DETECTOR FOR INDUSTRIAL TYPE SEWING MACHINES

Takashi Dohi; Kenichi Ohara, and Iwao Gotoh, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

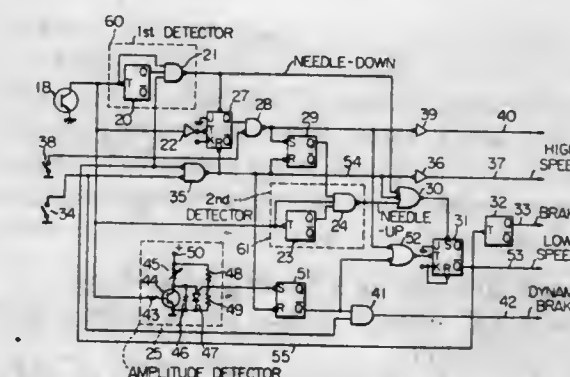
Filed Mar. 20, 1974, Ser. No. 452,915  
Claims priority, application Japan, Mar. 23, 1973, 48-33141

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> G05G 5/00; H02P 3/06; D05B 69/22

U.S. Cl. 318-467

9 Claims



1. A needle position detector for a sewing machine having a motor drivable at high and low speeds, a needle armshaft



adapted to be driven selectively by said motor to cause the needle to move reciprocally between upper and lower dead points, comprising in combination:

a light source and a circuit including a single photoelectrical device disposed in opposed relation to said light source to receive a light beam therefrom;

a disc coaxially connected to said needle armshaft for rotation therewith in synchronism with the reciprocal movement of said needle;

said disc being disposed between said photoelectrical device and said light source and having cutaway portions permitting passage of said light beam from said light source to said photoelectrical device and intervening portions interrupting said light beam, with transition portions between said cutaway portions and said intervening portions passing between said light source and said photoelectrical device as said disc rotates to produce electrical signals in said circuit, said transition portions comprising a first transition portion disposed in predetermined angular relationship to said needle armshaft corresponding to the lower dead point to produce a first signal and an angularly spaced second transition portion disposed in predetermined angular relation to said needle armshaft corresponding to the upper dead point to produce a second signal;

first brake means for decelerating said motor to said low speed;

a needle-down switch for energizing said first brake means; speed sensing means for detecting when said motor has decelerated to said low speed to deenergize said first brake means;

a needle-down position detector coupled to said speed sensing means and to said photoelectrical device to produce a needle-down position signal in response to said first signal;

second brake means responsive to said needle-down position signal for decelerating said motor to a standstill with the needle at the lower dead point;

memory means coupled to said needle-down position detector to receive said needle-down position signal;

a needle-up switch for operating said motor at said low speed; and

a needle-up position detector coupled to said needle-up switch, said memory means and said photoelectrical device to produce a needle-up position signal in response to said second signal;

said second brake means being receptive of said needle-up position signal to decelerate said motor to a standstill with the needle at said upper dead point.

4,013,934

## BATTERY CHARGING CIRCUIT

George J. Frye, 12175 SW. Douglas, Portland, Oreg. 97225

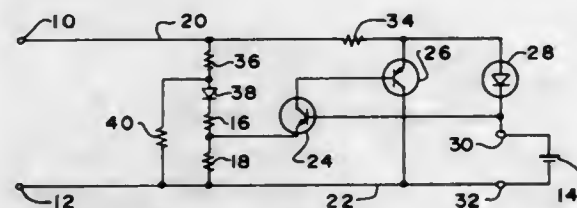
Continuation of Ser. No. 508,200, Sept. 23, 1974, abandoned.

This application Nov. 7, 1975, Ser. No. 629,775

Int. Cl.<sup>2</sup> H02J 7/04

U.S. Cl. 320-35

9 Claims



1. A circuit for charging a battery, comprising:  
a regulated DC voltage source for providing current to charge said battery;  
an amplifier means for regulating said current to said battery by diverting at least a portion of said current through a conduction path in shunt with said battery;  
biasing means connected to said amplifier means for provid-

ing a predetermined operating point, said amplifier means including at least a first transistor having its base connected to one terminal of said battery and its emitter coupled to said biasing means, said transistor being biased into conduction when the voltage across said battery reaches said predetermined operating point; and temperature compensation means connected between said biasing means and said conduction path for compensating for the negative temperature coefficient of said battery.

4,013,935

## CIRCUIT ARRANGEMENT FOR A DC TO DC CONVERTER

Bernd Josef Siepmann, Geretsried, and Peer Thilo, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

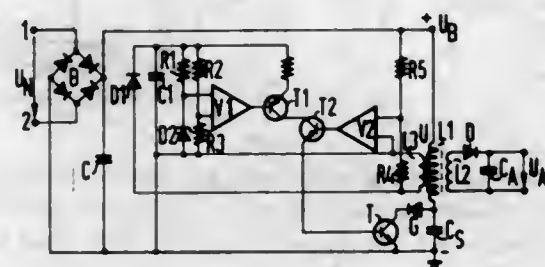
Filed Aug. 11, 1975, Ser. No. 603,679

Claims priority, application Germany, Sept. 20, 1974, 2445033

Int. Cl.<sup>2</sup> H02M 3/335

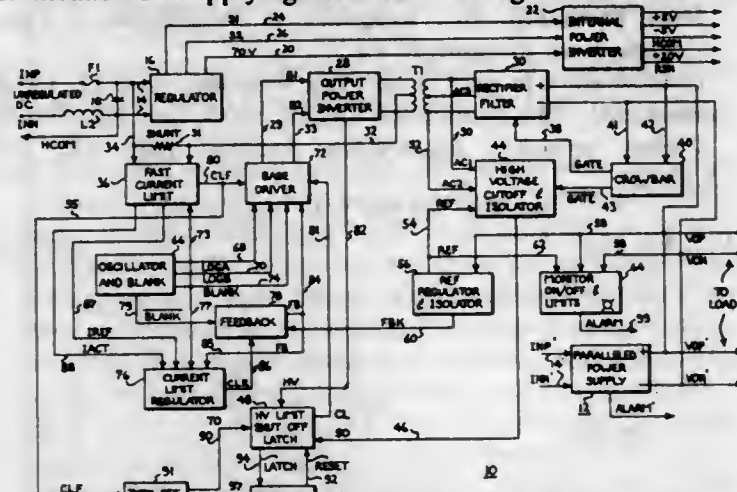
U.S. Cl. 321-2

11 Claims





- b. an independently operable cutoff means associated with each of said power supplies for producing a shut-off signal when the voltage of its associated power supply secondary circuit exceeds a predetermined value; and,  
c. means for supplying said shut-off signal to the drive



means of the associated power supply for inhibiting the application of drive signals to the switching means of the associated power supply whereby said associated power supply is turned off while permitting all other power supplies in the system to continue supplying power to said load.

4,013,939

# MULTIPLE FEEDBACK CONTROL APPARATUS FOR POWER CONDITIONING EQUIPMENT

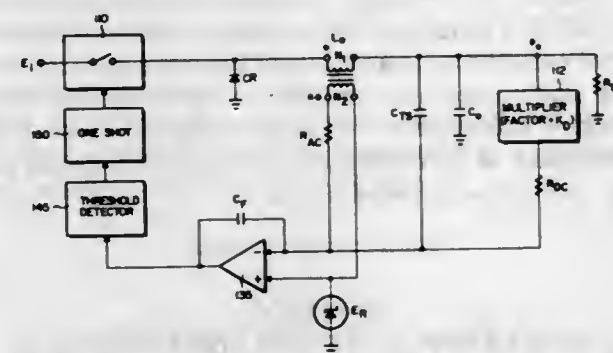
John Biess, Canoga Park, and Yuan Yu, Palos Verdes Penn., both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 30, 1974, Ser. No. 537,294

Int. Cl.<sup>2</sup> H02M 3/10; G05F 1/46

U.S. Cl. 323-17

6 Claims



1. Control apparatus for power conditioning equipment, said equipment comprising selective switching means and an energy storage element, said energy storage element comprising a capacitor and an inductor having a power winding, said control apparatus comprising:

- first electrical means for sensing only the final output DC voltage of said equipment,
- second electrical means for sensing only the instantaneous dynamic energy level within said energy storage element, said second means comprising a signal winding on said inductor,
- amplification means, responsive to said first and second electrical means, said amplification means generating an output signal,
- threshold detection means to generate a control signal when the DC level of said amplification means output signal exceeds an established value, and
- controller means, responsive to said control signal, for selectively operating said switching means.

4,013,940

# SEMICONDUCTOR CIRCUIT DEVICE

Isamu Kaji, Kyoto, Japan, assignor to Naoyuki Maeda, Inuyama, Japan

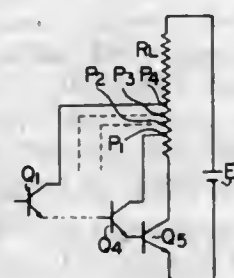
Filed Dec. 12, 1975, Ser. No. 640,391

Claims priority, application Japan, Dec. 21, 1974, 49-147241

Int. Cl.<sup>2</sup> G05F 1/56

U.S. Cl. 323-22 T

5 Claims



1. A semiconductor circuit device having a Darlington circuit including a power transistor connected to a load and a multiplicity of forward stage current amplifying transistors for driving subsequent current amplifying transistors and said power transistor, wherein plural intermediate taps are provided on said load connected to the collector of said power transistor and said current amplifying transistors having each of the collectors thereof connected to one of said taps, respectively.

4,013,941

# TRANSFORMER VOLTAGE REGULATOR RESPONSIVE TO INPUT VARIATIONS

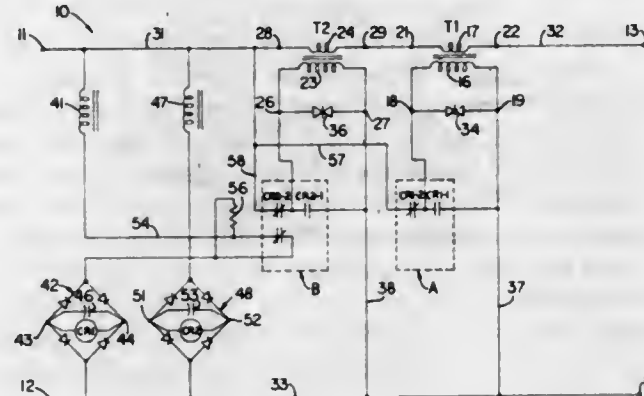
Charles R. Moore, 1615 Merrifield, Mishawaka, Ind. 46544

Filed Mar. 26, 1976, Ser. No. 670,981

Int. Cl.<sup>2</sup> G05F 5/00, 1/24

U.S. Cl. 323-45

8 Claims



1. A voltage regulator apparatus for controlling a voltage at the output side of a line in accordance with variations of the voltage at the input side of the line, comprising:

- a transformer having primary and secondary windings, said secondary winding being inserted in said line, said primary winding having a pair of input terminals;
- control means including a switching means between said input side of said line and one of said pair of input terminals to said primary winding and between said pair of input terminals of said primary winding for at least one of (1) connecting said primary winding to said input side of said line and (2) shorting out said primary winding and a series connected saturable inductor having a predefined saturation level and rectifier means connected to said input side of said line, said rectifier having an input terminal and an output terminal; and
- sensing means responsive to a predefined voltage at said output terminals of said rectifier means occurring when said inductor is saturated, said sensing means being non-

responsive to said voltage at said output terminal when said inductor is in an unsaturated state, a responsiveness of said sensing means to said output voltage effecting an altering of the state of said switching means to at least one of connecting said primary winding to said input side of said line and shorting out said primary winding.

4,013,942

# PHASE SHIFTER

Valery Anatolevich Boshnyaga, 1, Kostjuzhensky pereulok 1; Lev Pavlovich Kalinin, ulitsa Stefana Velikogo 51-a, kv. 35, and Vitaly Mikhailovich Postolaty, ulitsa Demokraticheskaya 6/1, kv. 58, all of Kishinev, U.S.S.R.

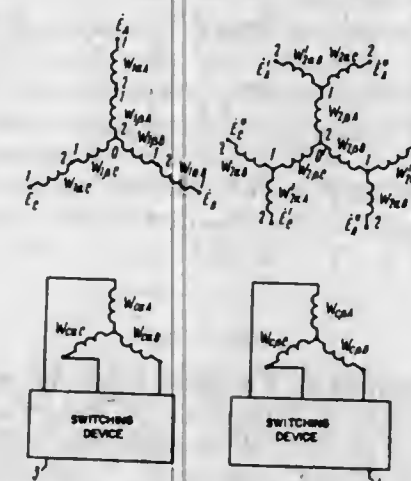
Filed July 21, 1975, Ser. No. 597,888

Claims priority, application U.S.S.R., July 22, 1974, 2048088; July 22, 1974, 2048097; July 22, 1974, 2048099; July 22, 1974, 2048092

Int. Cl.<sup>2</sup> H02J 3/00

U.S. Cl. 323-119

4 Claims



1. A phase shifter comprising three-phase multiwinding transformers, each of said transformers having primary windings connected in series with respect to like phases and arranged in a three-phase system, and having secondary windings and control windings, a first three-phase transformer having other secondary windings connected to said secondary windings of the first transformer, said secondary windings being arranged in a three-phase system, switching devices, the control windings of each three-phase transformer being connected to respective switching devices, the beginnings of the two secondary windings of the two other phases of the first three-phase transformer being connected to the beginnings of the secondary windings of each phase of the second transformer, the ends of said secondary windings of each phase of the second transformer being connected to a common neutral point.

4,013,943

# SOLID STATE ELECTROLYTIC CELL GAS SENSOR HEAD

Jack Chou, and Doris H. Chou, both of 900 N. Broadway, Suite 725, Santa Ana, Calif. 92701

Continuation-in-part of Ser. No. 505,546, Sept. 13, 1974, Pat. No. 3,955,268. This application June 10, 1976, Ser. No. 694,840

Int. Cl.<sup>2</sup> G01N 27/00; H01L 7/00; G01N 27/62

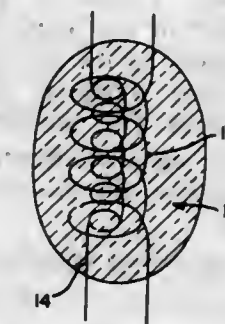
U.S. Cl. 324-33

9 Claims

1. A solid state electrolytic cell gas sensor head which causes the dissociation of gaseous impurities to be measured into charged species such as ions and complex ions and does not operate by changing the electro-conductivity of the sensor head in response to the adsorption of at least one gaseous impurity, comprising:

- a relatively inert, electrolyte base material, capable of dissociating selected impurities into species such as ions and complex ions;
- a signal source;

a fine, chemically inert, strong and ductile heating wire coupling signals from the signal source to the base; and



a fine collector electrode disposed in the base a short distance from the heating wire, electrically coupled to the heating wire by means of ions and complex ions dissociated by the base and capable of collecting the signal.

4,013,944

# PRESSURE INSENSITIVE SYSTEM FOR MEASURING THE LENGTH OF A CABLE DEPLOYED UNDERWATER USING MAGNET ACTUATED REED SWITCHES

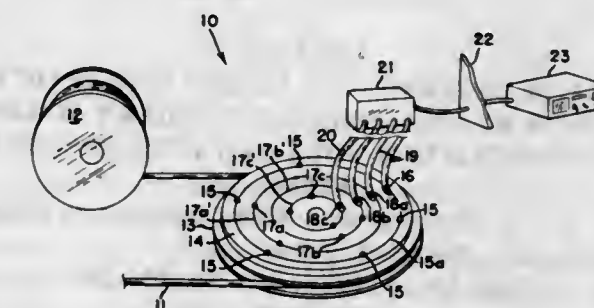
John A. Benya, and Gale W. McGuffey, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 2, 1976, Ser. No. 646,203

Int. Cl.<sup>2</sup> G01R 33/12

U.S. Cl. 324-34 L

5 Claims



1. An apparatus for measuring the length of cable deployed from a winch submerged in water comprising:

- a fairlead sheave disposed in the water to receive the cable directly from the winch having a predetermined grooved circumference for rotatably receiving the cable;
- a plurality of magnets radially mounted on the fairlead sheave for radiating electromagnetic energy;
- a plurality of reed switches disposed adjacent to the magnets to be magnetically actuated by the magnets for thereby providing coded signals representative of the deployed length of the cable;
- a plurality of sections of tubing disposed in the water, each being fluid filled and each containing at least one of the reed switches for ensuring compensation for ambient pressure variations and to assure reliable actuation thereof
- means coupled to the reed switches for presenting a visual readout of the signals; and
- means coupled to the sections of tubing and connecting the reed switches and the presenting means for maintaining a watertight integrity thereacross.

4,013,945

# ROTATION SENSOR FOR BOREHOLE TELEMETRY

Donald S. Grosso, West Hartford, Conn., assignor to Teleco Inc., Middletown, Conn.

Filed May 12, 1975, Ser. No. 576,623

Int. Cl.<sup>2</sup> G01R 33/04

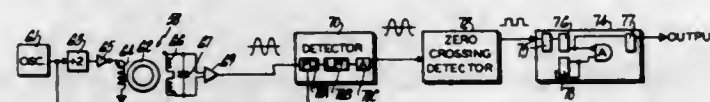
U.S. Cl. 324-34 R

28 Claims

1. A rotation sensing system for sensing the absence of



rotation of a rotatable member in an ambient magnetic field and activating a control mechanism upon the absence of rotation of the member, the rotation sensing system including: fluxgate magnetometer means for generating an output signal as a function of the angular relationship of the magnetometer means to the direction of the ambient magnetic field said fluxgate magnetometer being mounted for rotation with the rotatable member and having a first output signal of known frequency and which varies in phase angle with the rate of rotation of the rotatable member; detector means for receiving said first output signal;



means for generating a reference signal of the frequency of said first output signal, said reference signal being delivered to said detector means; said detector means comparing the phase difference between said first output signal and said reference signal and generating a second output signal the frequency of which is commensurate with the rate of rotation of the rotatable member; and signal generating means for receiving said second output signal and generating a third output signal when the frequency of said second output signal is commensurate with the absence of rotation.

4,013,946

#### MEANS FOR DETERMINING A FIRST MAGNETIC FIELD DIRECTION BY MEASURING SECONDARY MAGNETIC FIELDS INDUCED IN A BODY ROTATED IN SAID FIRST FIELD

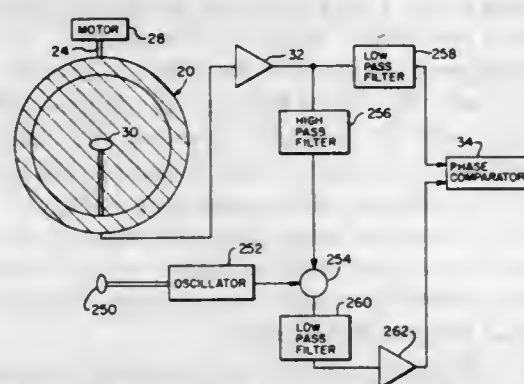
John R. Lewis, Framingham, Mass., assignor to Harnessed Energies, Inc., Maynard, Mass.

Filed Apr. 2, 1975, Ser. No. 564,284

Int. Cl.<sup>2</sup> G01R 33/02

U.S. Cl. 324-43 R

19 Claims



1. A device for determining the direction of a primary magnetic field comprising, in combination: a body mounted for rotation about an axis of rotation and comprising means for defining at least one electrical path disposed transversely to said axis; means for rotating said body about said axis; means for detecting those secondary magnetic field components induced by rotation of said body in said primary magnetic field which are substantially at a frequency equal to the rotational frequency of said body, and for providing a corresponding first electrical signal responsively to said secondary field components; means for generating a variable tertiary magnetic field at said body and at a frequency different from said secondary field; means for detecting a fourth magnetic field induced by rotation of said body in said tertiary magnetic field and

for providing a second electrical signal responsive to said fourth magnetic field; and means for determining the relative phase shift of said first and second electrical signals, said phase shift being related to the direction of said primary field.

4,013,947

#### CENTRAL COUPLER FOR A CENTRALIZED MONITOR SYSTEM FOR MOTOR VEHICLES

Hiroshi Arai, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

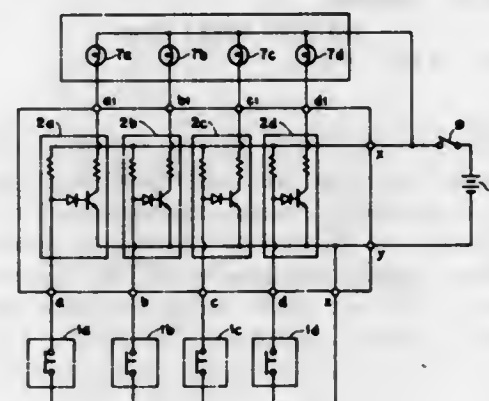
Filed Aug. 15, 1975, Ser. No. 605,215

Claims priority, application Japan, Jan. 21, 1975, 50-9410

Int. Cl.<sup>2</sup> G01R 31/02; B60Q 1/00

U.S. Cl. 324-51

3 Claims



1. A central coupler for a monitor system for motor vehicles of the type including a plurality of abnormality-detecting sensors disposed as applied to respective vehicle parts or objects to be monitored, each sensor being in the form of a switch of the functional type which is made on when the respective object is normal in the operating condition and off when the object shows abnormalities, and a corresponding plurality of warning display means, said central coupler comprising:

a housing; a plurality of switching circuits accommodated in said housing each of which is made off and on in response to the on and off positions assumed by the associated sensor, each of said switching circuits also controlling an associated one of said warning display means; and at least two multi-terminal connectors external to said housing, a first one of said connectors electrically coupling said plurality sensors to said switching circuits and a second one of said connectors electrically coupling said switching circuits to a source of D.C. power and further connecting said switching circuits to said display means such that the operation of said switching circuits and said display means may be tested by disconnecting said first one of said connectors from said sensors, whereby a malfunction of either a switching circuit or a display means is indicated by a failure of said monitor system to give a warning.

4,013,948

#### DISCHARGE DETECTION SYSTEM FOR DETERMINING THE DISTANCE TO A DIELECTRIC WEAK POINT IN A CABLE

Shigenobu Tanaka, Hilaru Yasuhara, and Munetsuke Oguchi, all of Sakura, Japan, assignors to The Fujikura Cable Works, Ltd., Tokyo, Japan

Filed Aug. 12, 1975, Ser. No. 604,028

Claims priority, application Japan, Aug. 23, 1974, 49-96832

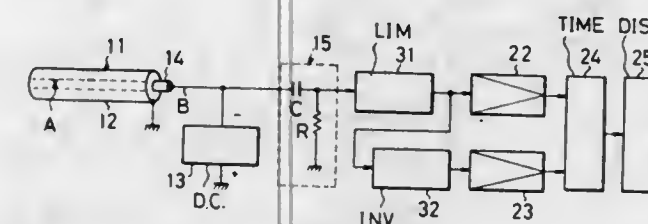
Int. Cl.<sup>2</sup> G01R 31/08, 31/11

U.S. Cl. 324-52

1 Claim

1. A cable test system consisting of a connector for connecting a cable to be tested to the system, a D.C. high voltage source connected between a terminal of said connector and

the ground, a differentiation circuit connected to said terminal, a limiter circuit connected to the output of said differentiation circuit, first and second pulse amplifier means coupled to the output of said limiter circuit for amplifying the output thereof, said first amplifier means amplifying pulses of only a first polarity and said second amplifier means amplifying pulses of only an opposite polarity, a time counter connected to the outputs of said first and second pulse amplifier means so as to be started by the output of said first amplifier means and



stopped by the output of said second pulse amplifier means and a display unit connected to the output of said time counter for displaying the distance from said connector to a dielectric weak point of the cable to be tested according to the output of said timer, wherein said first amplifier means comprises a first amplifier circuit which amplifies pulses of only one polarity and wherein said second amplifier means comprises a second amplifier which amplifies pulses of only said one polarity and an inverter circuit connected between the output of said limiter circuit and said second amplifier.

4,013,949

#### RETURN LOSS TEST SET

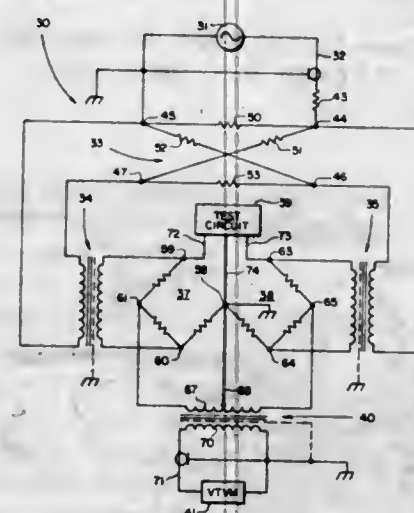
George E. Ice, San Carlos, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 9, 1976, Ser. No. 656,502

Int. Cl.<sup>2</sup> G01R 27/04

U.S. Cl. 324-58 B

9 Claims



1. Apparatus for testing the return loss of a balanced circuit under test having at least a pair of terminals which are ungrounded and are to operate into a load having a prescribed impedance, some balanced circuits under test also having a grounded center terminal, said apparatus comprising: a pair of resistive bridges each having a bridge resistance which is equal to one half of the value of the prescribed impedance, one nodes of each of said bridges being electrically connected together and to a ground reference potential, one arm between said one node and an other node of each of said bridges being open; first means connecting the pair of ungrounded output terminals of the test circuit to associated ones of said other nodes of said bridges, any center ground terminal of the test circuit being connected to said one nodes of said bridges; second means for producing an indication which is a measure of the return loss of the circuit under test;

third means producing an AC test signal; fourth means responsive to the output of said third means for coupling equal amplitude test signals of the same phase to said bridges; and fifth means coupling a reflected output signal from the two nodes of said bridges that are opposite said one nodes and applying this reflected signal to said second means for providing an indication of the return loss of the test circuit.

4,013,950

#### APPARATUS FOR MEASURING THE ELECTROMAGNETIC IMPEDANCE OF SOILS

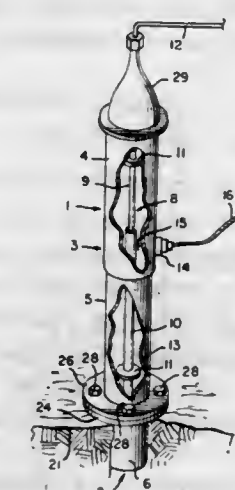
Robert A. Falls, Lorton, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1976, Ser. No. 676,099

Int. Cl.<sup>2</sup> G01R 27/04

U.S. Cl. 324-58.5 R

10 Claims



1. Apparatus for measuring the electromagnetic characteristics of soil comprising: a. a telescopic slotted line having a telescopic outer conductor and a telescopic inner conductor surrounded by and coaxial with said telescopic outer conductor, b. an earth probe having an outer conductor and an inner conductor surrounded by and coaxial with said outer conductor, and c. means to electrically secure said telescopic slotted line to said earth probe.

4,013,951

#### CIRCUIT TESTING APPARATUS

Mitsuhiko Ezoe, and Hiroshige Ozawa, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed July 31, 1975, Ser. No. 600,587

Claims priority, application Japan, Aug. 2, 1974, 49-88711; Sept. 17, 1974, 49-106942

Int. Cl.<sup>2</sup> G01R 15/12

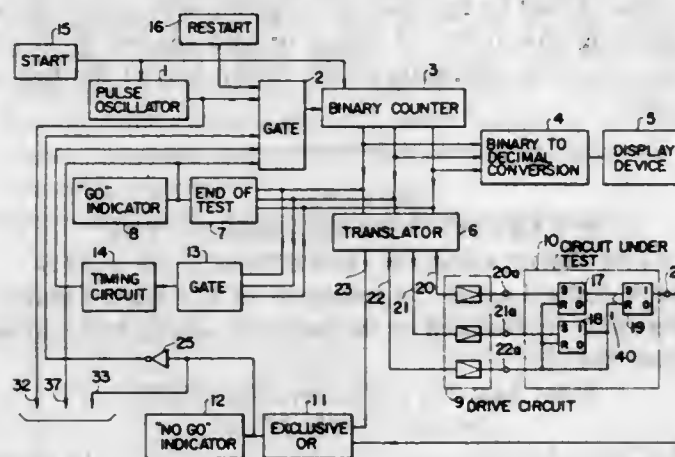
U.S. Cl. 324-73 R

8 Claims

1. Apparatus for automatically applying a series of tests to an electrical circuit and indicating the result of the tests, comprising: pattern generating means for generating a sequence of test pulse patterns and applying the same to a circuit to be tested and for generating a standard sequence of output pulse patterns corresponding to a sequence of output pulse patterns which would be developed by the circuit to be tested in response to the applied test pulse patterns if the circuit to be tested operates error free, said pattern generating means generating the test pulse patterns at respective intervals corresponding to intervals required by the circuit to be tested to develop output pulse patterns in response to respective ones of the test pulse patterns applied to the circuit to be tested; means for comparing a sequence of output pulse patterns



developed by the circuit to be tested with the standard sequence of output pulse patterns to check for noncoincidence between the output pulse patterns developed in response to a test pulse pattern and corresponding pulse



patterns of the standard sequence of output pulse patterns; indicating means for indicating the result of the comparison; and means for disabling said pattern generating means upon the occurrence of said noncoincidence.

4,013,952

### MEANS FOR CURRENT MEASURING IN STATIC CONVERTORS

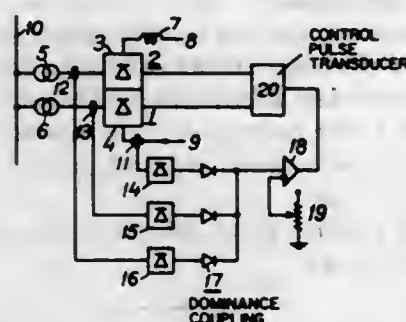
Bertil Hammarlund, and Göte Liss, both of Ludvika, Sweden, assignors to Asea Aktiebolag, Vasteras, Sweden

Filed Feb. 27, 1975, Ser. No. 553,730

Claims priority, application Sweden, Mar. 22, 1974, 7403873

Int. Cl.<sup>2</sup> G01R 19/22; H04B 1/68

U.S. Cl. 324-119



1. Means for measuring the load current in a static convertor (1,2) having an alternating current side and a direct current side, said measuring means having an output (18), which measuring means comprises a direct-current measurement device (11) on the direct-current (8,9) of the convertor and an alternating-current measurement device (12,13) of the alternating-current side (10) of the convertor, and a dominance coupling means (17 or 27-31) connecting said measurement devices for comparing the signals therefrom and selecting the greatest of said signals and for supplying such greatest signal to the output.

4,013,953

### OPTICAL FLUID CONTAMINATION AND CHANGE MONITOR PROCESSING CIRCUIT

George Frank Skala, Scotia, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

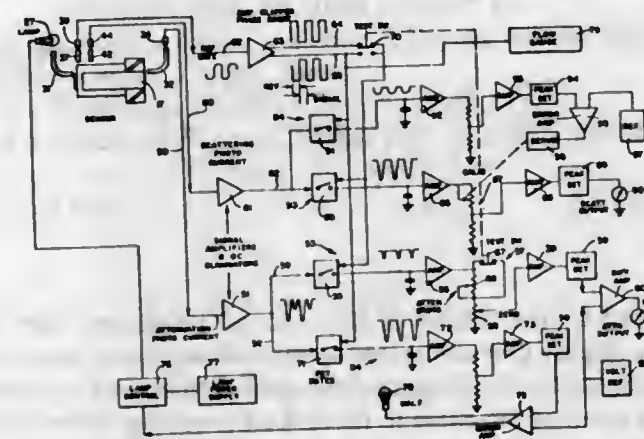
Division of Ser. No. 352,614, April 19, 1973, Pat. No. 3,936,192, which is a continuation of Ser. No. 847,675, Aug. 5, 1969, abandoned. This application Nov. 7, 1974, Ser. No. 521,789

Int. Cl.<sup>2</sup> G01R 1/02; G01N 21/22

U.S. Cl. 324-130

1. A signal processing circuit for an optical fluid contamination

monitor comprising input means for sequentially deriving separate reference and sample input signals of the same frequency; means for developing two separate sequential gate control signals of the same frequency and in phase with the respective reference and sample input signals; first and second gate means connected in parallel circuit relationship and supplied with said reference and sample input signals, said first gate means being responsive to a first one of said gate control



signals for passing only the reference input signal and said second gate means being responsive to the second of said gate control signals for passing only the sample input signal; indicator means responsive to the output from said second gate means for deriving an output indication of the value of said sample signal; and regulating means responsive to the reference signal output from said first gate means for regulating the value of both said sample and reference signals.

4,013,954

### SPEED SENSOR ASSEMBLY

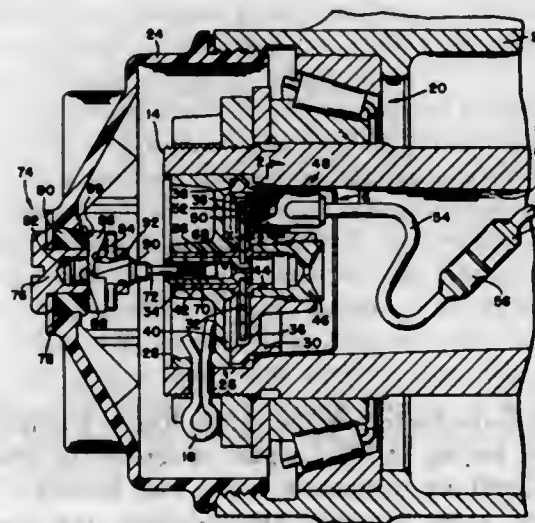
Brian C. Deem; Gilbert A. Pataky, and George W. Thompson, all of Elyria, Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Filed June 21, 1974, Ser. No. 481,938

Int. Cl.<sup>2</sup> G01P 3/48; H02K 19/20

U.S. Cl. 324-173

9 Claims



1. In a vehicle having a non-rotative axle, a vehicle wheel rotatably mounted on said axle, said axle defining a bore therewithin, and means for measuring the rotational velocity of said vehicle wheel, said measuring means being mounted within said bore and enclosed by said axle; said measuring means including a support, a tone wheel rotatably mounted on said support for rotation about the axis of the tone wheel, means mounting said support within said bore and substantially preventing movement of said support with respect thereto, means drivingly interconnecting said tone wheel with said vehicle wheel, and electromagnetic means mounted on said support adjacent said tone wheel for generating electrical signals proportional to the rotational velocity of said tone

4,013,956

### TELECOMMUNICATION SYSTEM WITH AUTOMATICALLY SWITCHED MODEMS

Johannes Dornaus; Jürgen Lahmer, and Bernd Refflinghaus, all of Nuremberg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

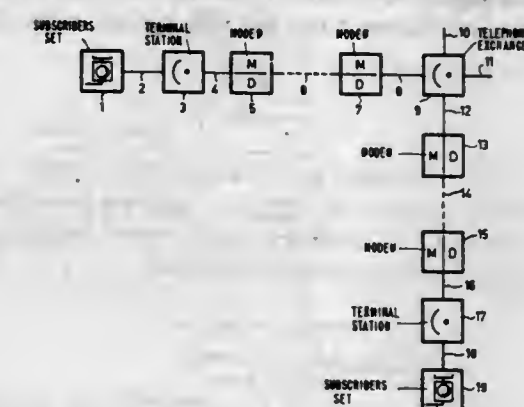
Filed May 5, 1975, Ser. No. 574,614

Claims priority, application Germany, May 9, 1974, 2422504

Int. Cl.<sup>2</sup> H04B 1/44

U.S. Cl. 325-22

4 Claims



4,013,955

### ANALOG SIGNAL PROCESSOR

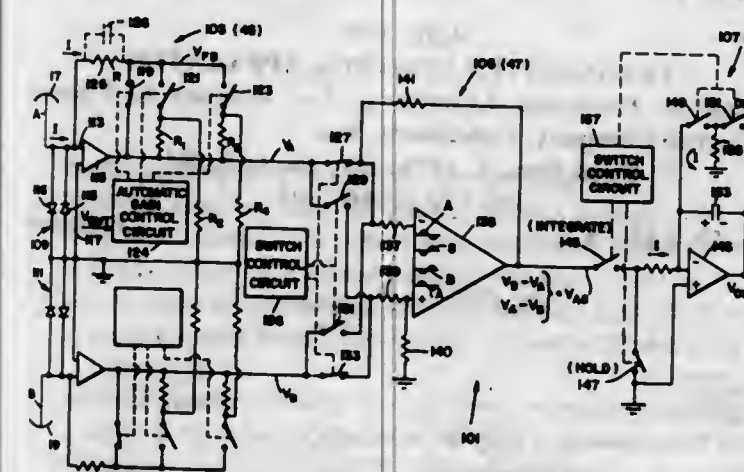
Peter B. Wagner, Reno, Nev., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 2, 1975, Ser. No. 592,852

Int. Cl.<sup>2</sup> H02M 7/00; H03K 5/00; 321 9 R; 8 R; 78; 27

U.S. Cl. 324-72

6 Claims



1. A analog signal processor comprising:  
a. an analog current to voltage convertor;  
b. a synchronous rectifier;  
c. an integrate and hold circuit;  
d. said analog current to voltage convertor includes first and second operational amplifiers;  
e. first current means for producing a first alternating current signal and second current means for producing a second alternating current signal that is 180° out of phase with respect to said first alternating current signal;  
f. said first current means being connected to the input of said first operational amplifier;  
g. said second current means being connected to the input of said second operational amplifier;  
h. the output of said first operational amplifier and the output of said second operational amplifier being connected to the input of said synchronous rectifier;  
i. means for controlling said synchronous rectifier whereby the negative portion of the output signal from said second operational amplifier is inverted and added to the positive portion of the output signal from said first operational amplifier and the negative portion of the output signal from said first operational amplifier is inverted and added to the positive portion of the output signal from said second operational amplifier;  
j. the output of said synchronous rectifier being connected to the input of said integrate and hold circuit; whereby  
k. the output of said integrate and hold circuit indicates a d.c. voltage output that is proportional to the output of said synchronous rectifier.

1. Telecommunication system of the type comprising two terminal stations which are coupled to one another for the transmission of information signals via a transmission path which includes at least one telephone exchange, at least one pair of modems which are included in one of the parts into which the telephone exchange divides the transmission path and serve to convert a given modulation type to a given other modulation type suitable for the part of the transmission path situated between the said modems and vice versa, the improvement wherein of the pair of modems the one nearer to the exchange includes a signalling receiver means responsive to the detection of a given signalling signal from a terminal station for delivering a start signal at an output, and an auxiliary-signal generator means connected to that output for supplying, under the control of the start signal, an auxiliary signal constituted by at least one frequency component occurring in the frequency spectrum of the said second modulation type to another part of the transmission path, which part is connected to the said telephone exchange, said modem nearer to the telephone exchange including an auxiliary-signal detector means responsive to the detection of the said frequency component in a signal originating via the telephone exchange from another part of the transmission path connected to the telephone exchange for delivering a switching signal, and switching means connected to the auxiliary signal detector and to the auxiliary signal generator for disconnecting said auxiliary signal generator and for shunting this modem under the control of the switching signal.

4,013,957

### CHANNEL-SELECTING APPARATUS FOR A MULTICHANNEL TRANSCEIVER

Fumiaki Tojo, Tokyo, Japan, assignor to Kanda Tsushin Kogyo Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,562

Claims priority, application Japan, Apr. 26, 1975, 50-50248; May 13, 1975, 50-55475; May 29, 1975, 50-63515

Int. Cl.<sup>2</sup> H04B 1/44

U.S. Cl. 325-25

20 Claims

1. A channel-selecting apparatus for a multichannel transceiver which comprises:  
channel changeover switch means including a first switch assembly operative to generate an electric pulse signal each time it is operated and a second switch assembly for producing a specified number of electric pulse signals each time it is operated;  
counter means coupled with the switch means to count electric pulse signals delivered therefrom;







decoder means for producing, when said detector means is enabled, detect signals associated with any of said output signals which correspond to said status signal for at least a minimum time duration, said detect signals being used in preventing the selection of any output signal which corresponds to said status signal,

loss of activity means for detecting a loss of signal activity in each of said output signals and producing associated enable signals by comparing each of said output signals with an associated signal related to the background noise level of said output signal,

line failure detector means coupled to said loss of activity means for preventing the selection of any of said output signals in which a detected loss of signal activity exists for at least a predetermined duration of time,

circuitry for coupling said loss of activity detector means to said decoder means and, in response to a pause being detected in any of said output signals, enabling said decoder means for any of said output signals which include a detected pause,

filter means coupled to said loss of activity means and between said load means and said transmission line means for inserting a status signal filter between said load means and said transmission line means in response to a signal pause being detected by said loss of activity detector, said status signal filter preventing the load means from responding to a selected output signal having a detected audio pause followed by said status signal, and

signal loss equalization means for separately amplifying each of said received output signals by a gain factor which substantially compensates for the magnitude variation of said received output signals contributed by said transmission line means, whereby said voting circuit means compares said compensated output signals in order to select the output signal having the optimum signal quality level.

4,013,963

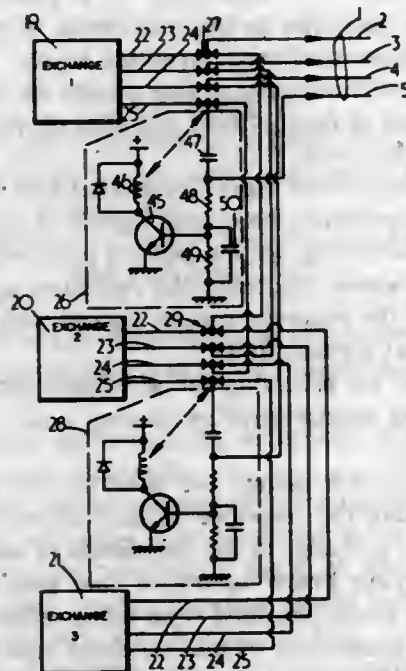
## WIRED BROADCASTING SYSTEMS

Eric John Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England  
Filed Aug. 6, 1975, Ser. No. 602,534  
Claims priority, application United Kingdom, Aug. 6, 1974, 34512/74

Int. Cl.<sup>2</sup> H04N 1/44, 7/10

U.S. Cl. 325—308

4 Claims



1. A wired broadcasting system comprising a program exchange, three program sources each presenting a plurality of video program signals at said exchange, three program selectors at said exchange each connected to a respective said source, a plurality of subscriber units connected to the ex-

change by respective cables to receive program signals from the respective program selectors, means located at each subscriber unit for controlling the respective program selectors connected to the program exchange by a two pair cable and provided with a first d-c control signal generating means for applying d-c program selector control signals to one of the pairs and a second control signal generating means for applying a second control signal to the other pair to control the connection of one of the program selectors to said cable, and two change over units controllable by said second control signal generating means, a first said change over unit constructed to disconnect a first said selector from said cable and to connect a second said selector thereto and the second said change over unit constructed to disconnect said second selector from said cable and to connect the third selector thereto.

4,013,964

## AUTOMATIC GAIN CONTROL MEANS FOR A SINGLE SIDEBAND RADIO RECEIVER

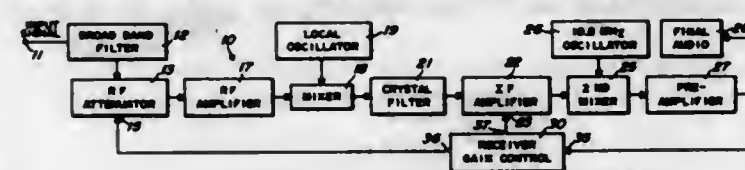
Frank Robert Skutta, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 22, 1975, Ser. No. 624,615

Int. Cl.<sup>2</sup> H04B 1/16

U.S. Cl. 325—319

7 Claims



1. Automatic gain control means for a single sideband radio receiver comprising:
  - a. signal amplifying means forming a portion of the radio receiver and including an input adapted to receive a signal for controlling the gain of said signal amplifying means;
  - b. audio amplifying means forming a portion of the radio receiver and providing an audio output signal;
  - c. capacitive storage means having an output coupled to the input of said signal amplifying means for supplying a signal to control the gain thereof;
  - d. first coupling circuitry connecting the audio output signal of said audio amplifier means to said capacitive storage means in a first charging path for charging said capacitive storage means at a first predetermined rate; and
  - e. second coupling circuitry, including switching means only operative when the audio output signal exceeds a predetermined value, connecting the audio output signal of said amplifier means to said capacitive storage means in a second charging path, when said switching means is operative, for charging said capacitive storage means at a second predetermined rate faster than the first predetermined rate.

4,013,965

## CIRCUIT FOR PREVENTING ERRORS IN DECODING INFORMATION FROM DISTORTED PULSES

James A. Scharfe, Jr., P.O. Box 267, 627 Fremont Ave., South Pasadena, Calif. 91030

Continuation of Ser. No. 494,928, Aug. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 423,171, Dec. 10, 1973, abandoned. This application Feb. 5, 1976, Ser. No. 655,556

Int. Cl.<sup>2</sup> H04L 27/10

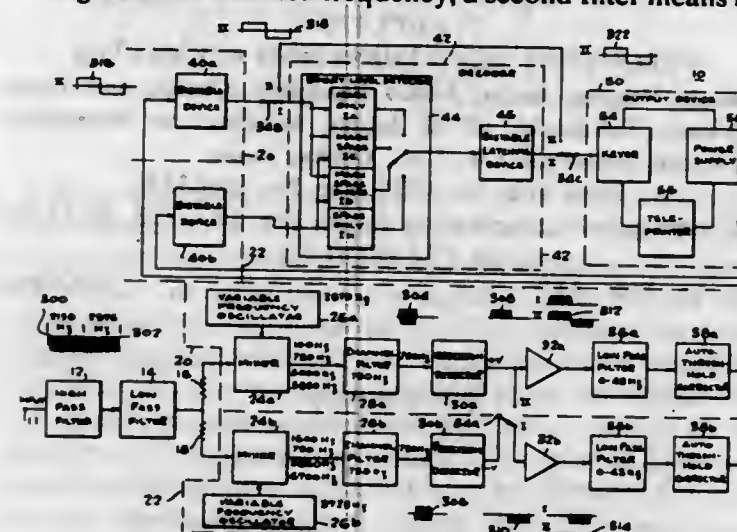
U.S. Cl. 325—320

34 Claims

1. A frequency shift converter for converting at least first and second series of information AC signals having first and second frequencies respectively to a series of binary coded DC pulses comprising:
  - a. at least first and second demodulator channels, each demodulator channel detecting the envelope of each received information AC signal in one series of information

AC signals, said first demodulator channel comprising a first mixer means for mixing two AC signals, a first oscillator means for generating a first oscillating AC signal having a first selected frequency, a first filter means for filtering AC signals, and a first demodulator means for demodulating AC signals, said first mixer means mixing first oscillating AC signal from said first oscillator means with AC signals in said first series of AC information signals to produce at least first intermediate AC signals having a first predetermined frequency, said first filter means filtering said first intermediate AC signals to pass substantially only AC signals having said first predetermined frequency, said first demodulator means detecting said filtered first intermediate AC signals to produce a first series of pulsating DC signals in response to said first series of information AC signals;

said second demodulator channel comprising a second mixer means for mixing two AC signals, a second oscillator means for generating a second oscillating signal having a second selected frequency, a second filter means for



filtering AC signals, and a second demodulator means for demodulating AC signals, said second mixer means mixing second oscillating AC signals from said second oscillator means with AC signals in said second series of information AC signals to produce at least second intermediate AC signals substantially having said first predetermined frequency, said second filter means filtering said second intermediate AC signals to pass substantially only AC signals having said first predetermined frequency; said second demodulator means detecting said filtered second intermediate AC signals to produce a second series of pulsating DC signals in response to said second series of information AC signals;

said first and second oscillating signals each having a frequency not at the mid-frequency between said first and second frequencies of said first and second information AC signals; and

means for combining said series of pulsating DC signals from said demodulator channels to produce a series of binary coded DC pulses.

4,013,966

## FM RF SIGNAL GENERATOR USING STEP RECOVERY DIODE

Kenneth J. Campbell, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 16, 1975, Ser. No. 622,925

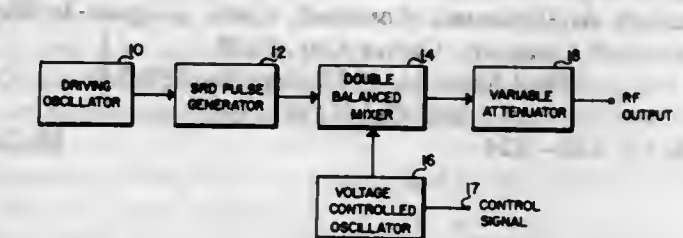
Int. Cl.<sup>2</sup> H04B 1/02

U.S. Cl. 325—363

9 Claims

1. In a signal generator for generating frequency modulated RF signals available for testing key parameters of FM receivers the combination comprising:
  - a. signal generating means for generating an output signal of a predetermined frequency;
  - b. pulse generating means coupled to said signal generating means for generating narrow output pulses at said predetermined frequency;

c. modulator circuit means coupled to said pulse generating means;



d. variable frequency signal means coupled to said modulator circuit means for frequency modulating said narrow pulses to provide a plurality of frequency modulated RF signals at the output of said modulator circuit means.

4,013,967

## MID-PULSE DETECTOR

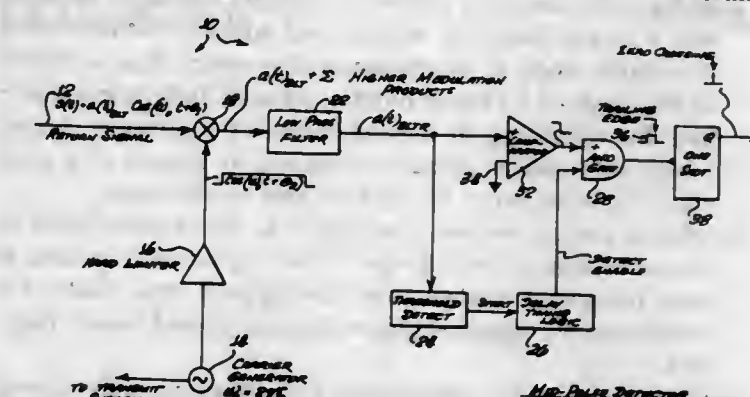
Frank A. Fassbind, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1976, Ser. No. 681,317

Int. Cl.<sup>2</sup> H03K 9/10

U.S. Cl. 329—104

1 Claim



1. Apparatus, in a receiver, for detecting the mid-pulse phase reversal of an input signal  $s(t) = a(t)_{BLT} \cos(\omega_c t + \theta_1)$ , where the signal  $a(t)_{BLT}$  is a modulating signal  $a(t)$  after band-limiting by a transmitter and  $\cos(\omega_c t + \theta_1)$  relates to a carrier having a frequency  $f_c$ , comprising:
  - means for generating a signal having a frequency of  $f_c$ ;
  - a hard-limiter whose input is connected to the signal generating means, and whose output is the signal  $\sin(\omega_c t + \theta_2)$  hard limited, and  $\theta_2$  is the phase change due to the hard limiting;
  - a multiplier circuit, whose two inputs are connected to the input signal  $s(t)$  and the output of the hard limiter, the output of the multiplier comprising the signal  $a(t)_{BLT}$  plus the sum of higher modulation products;
  - a low-pass filter, whose input is connected to the output of the multiplier and whose output is  $a(t)_{BLTR}$ , which is the signal  $a(t)$  as modified by the band limiting effects of the transmitter and receiver, the higher modulation products being filtered out by the low-pass filter;
  - a threshold detector, whose input is connected to the output of the low-pass filter, which senses the presence of a received pulse;
  - a delay timing logic circuit, whose input is connected to the output of the threshold detector, for delaying its output signal with respect to its input signal;
  - a comparator, serving the function of a zero crossing detector, whose input is connected to the output of the low-pass filter, which detects the mid-pulse zero crossing of a  $a(t)_{BLTR}$ , and therefore of  $a(t)$ ;
  - an AND gate, whose inputs are connected to the outputs of the comparator and of the delay timing logic circuit, and whose output comprises a positive-going pulse whose trailing edge represents the mid-pulse of  $a(t)_{BLTR}$ ; and
  - a one-shot, whose input is connected to the output of the AND gate, and whose output is a sharp pulse representing the mid-pulse of  $a(t)$ .

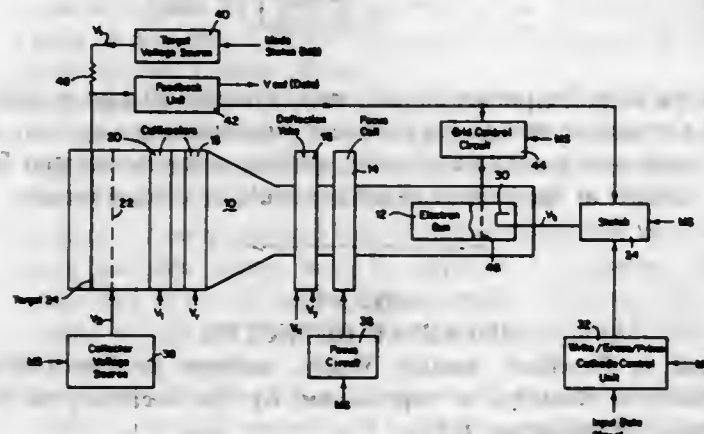


4,013,968

**FEEDBACK CONTROLLED STORAGE TUBE DEVICES**  
Kenneth A. Huelsman, Carlsbad, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.  
Filed Mar. 14, 1975, Ser. No. 558,530  
Int. Cl.<sup>2</sup> G11C 11/23

U.S. Cl. 328—124

18 Claims



## 1. In combination:

a storage tube having a cathode, a target conductor element and a target dielectric surface and adapted for operating in a write mode of operation during which data is stored in the form of a charge pattern on said dielectric surface and for operating in a read mode of operation during which said charge pattern is sensed by means of a read electron beam so as to retrieve said stored data; feedback circuit means, responsive to the sensed level of stored charge on said target dielectric surface as data is read from said storage tube during said read mode, for producing an output signal indicative of said stored data; and

switching means for operatively intercoupling, only during said read mode, said feedback circuit means with said storage tube, so that during said read mode the potential between said cathode and target conductor is continuously and automatically controlled as a function of the output signal from said feedback circuit means so as to allow readout of data written over a range of charge levels associated with a plurality of transfer characteristic curves of the target structure of said storage tube.

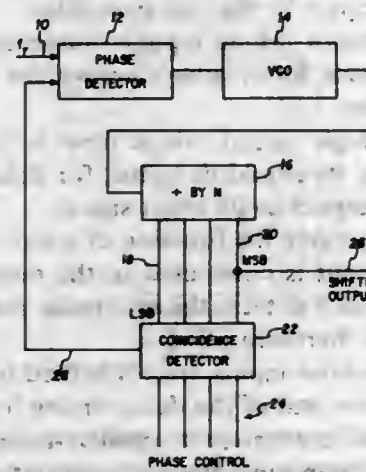
4,013,969

**PROGRAMMABLE DIGITAL PHASE CONTROL APPARATUS**

Charles M. Dennison, Hiawatha, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.  
Filed Mar. 18, 1976, Ser. No. 668,105  
Int. Cl.<sup>2</sup> H03B 3/04

U.S. Cl. 328—155

3 Claims



## 1. Phase shifting apparatus comprising in combination:

phase detector and variable frequency oscillator means including first and second input means and an output means for providing an output signal which changes in frequency in accordance with difference in phase of signals applied to said input means thereof; means for supplying a reference frequency signal to said first input means; counter means connected to said output means of said oscillator means for providing a repetitive series of digital word outputs of the number of cycles generated; variable count detection means, connected between said second input means and to said counter means for providing a signal to said phase detector whenever the count of said counter means coincides with a predetermined count set in said count detection means; and apparatus output means, connected to said counter means, for providing an output signal phase shifted from, but of the said frequency as, the reference frequency.

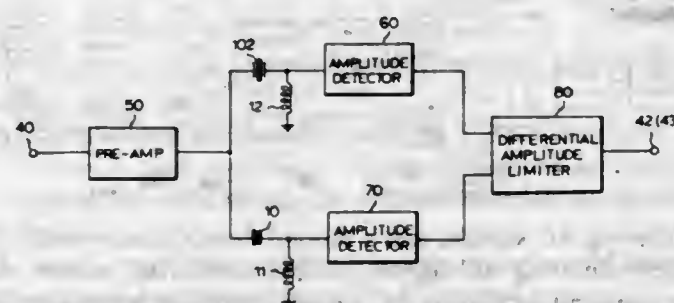
4,013,970

**FREQUENCY DISCRIMINATING APPARATUS**

Takashi Nagata, Ikeda; Yasuo Nakajima, Osaka, and Teruo Kitani, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Feb. 19, 1976, Ser. No. 659,555  
Claims priority, application Japan, Feb. 19, 1975, 50-21205  
Int. Cl.<sup>2</sup> H03D 3/16

U.S. Cl. 329—117

6 Claims



1. A frequency discriminating apparatus for discriminating a frequency in comparison with a predetermined frequency as a center frequency of frequency discrimination, comprising: a pre-amplifier for receiving an input signal to said apparatus and including a tuning circuit for tuning said input signal; a reference capacitor coupled to said pre-amplifier for receiving at the input terminal thereof an output signal from said pre-amplifier; a piezoelectric resonator having a piezoelectric lead titanate ceramic plate with an input electrode and an output electrode on entire opposed major surfaces thereof, respectively, said input electrode being coupled to said pre-amplifier for receiving said output signal from said pre-amplifier, said ceramic plate being poled with a poling field of not less than 50 kV/cm in the thickness direction of said ceramic plate and having a thickness for causing it to vibrate in the thickness-extensional vibration mode at the 3rd harmonic overtone of said ceramic plate upon being excited by said output signal from said pre-amplifier for setting the center frequency of frequency discrimination between the resonant frequency and the anti-resonant frequency of said 3rd harmonic overtone of said ceramic plate; a first amplitude detector coupled to said output electrode of said piezoelectric resonator for detecting the amplitude of the output signal from said output electrode of said piezoelectric resonator; and second amplitude detector coupled to the output terminal of said reference capacitor for detecting the amplitude of the output signal from the output terminal of said reference capacitor; and a differential amplitude limiter coupled to said first amplitude detector and said second amplitude detector for differentially adding output signals from said first and said second amplitude detectors and for limiting the added output signals from said first and said second amplitude detectors to predetermined amplitudes in two frequency ranges, one of which includes said resonant

frequency and the other of which includes said anti-resonant frequency of said 3rd harmonic overtone of said ceramic plate.

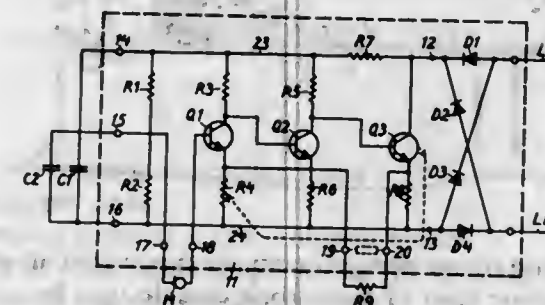
4,013,971

**INTEGRATED AMPLIFIER**

Olaf Sternbeck, Bromma, Sweden, assignor to Telefonaktiebolaget L. M. Ericsson, Stockholm, Sweden  
Filed Nov. 19, 1975, Ser. No. 633,509  
Claims priority, application Sweden, Dec. 4, 1974, 7415220  
Int. Cl.<sup>2</sup> H03F 3/04

U.S. Cl. 330—23

10 Claims



1. In an integrated amplifier comprising an output transistor stage connected to a pair of terminals for simultaneously receiving DC operating currents and transmitting AC signals and at least one other transistor amplifier stage formed on a silicon monolithic chip and at least one negative feedback network coupled between said output transistor amplifier stage and said other transistor amplifier stage, the elements of said network including resistors at least partly formed on the silicon monolithic chip, characterized in that at least one resistor included in the negative feedback network has a temperature coefficient which is greater than the temperature coefficient of the other resistors in the negative feedback network, and in that said one resistor is situated on the monolithic chip geometrically adjacent but not in contact with said output transistor amplifier stage so that the amount of negative feedback is dependent on the amount of heating of the monolithic chip in the region of said output transistor stage caused by the amplitude of the operating current passing through said output transistor amplifier.

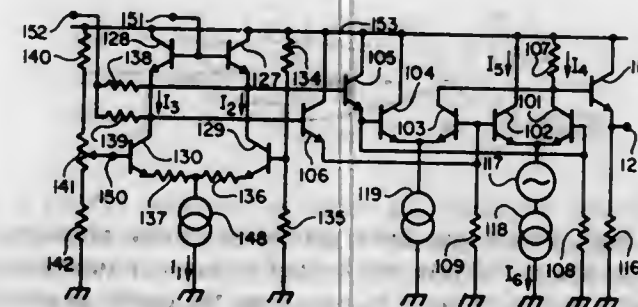
4,013,972

**AMPLIFIER WITH GAIN CONTROL MEANS**

Shigeo Nishitoba, and Kazuo Tokuda, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan  
Filed May 3, 1976, Ser. No. 682,799  
Claims priority, application Japan, May 7, 1975, 50-55719  
Int. Cl.<sup>2</sup> H03G 3/30

U.S. Cl. 330—29

5 Claims



1. An amplifier comprising: a differential amplifier having a common electrode terminal, first and second bias terminals and an output terminal; means for applying an input signal to said common electrode terminal of said differential amplifier; first and second transistors whose emitters are connected to said first and second bias terminals, respectively;

third and fourth transistors whose collectors are connected to the respective bases of said first and second transistors; a constant current source coupled to the respective emitters of said third and fourth transistors; fifth and sixth transistors whose emitters are connected to the respective collectors of said third and fourth transistors; a constant voltage source connected to the bases of said fifth and sixth transistors; a bias voltage source impressing a constant voltage on the base of said third transistor; means for applying bias voltage to the base of said fourth transistor; and first and second current supply sources for supplying currents to said first and second transistors, respectively.

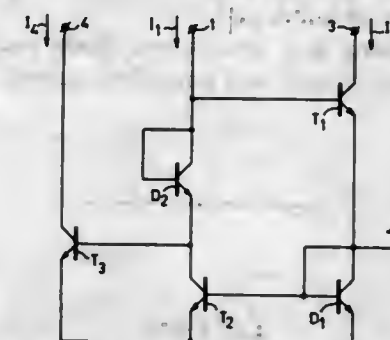
4,013,973

**AMPLIFIER ARRANGEMENT**

Rudy Johan van de Plassche, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.  
Filed July 17, 1975, Ser. No. 596,663  
Claims priority, application Netherlands, July 22, 1974, 7409851  
Int. Cl.<sup>2</sup> H03F 3/45

U.S. Cl. 330—30 D

12 Claims



1. An amplifier comprising, first and second input terminals, first and second output terminals, a common terminal, a first transistor, means connecting the collector-emitter path of the first transistor in series with a first semiconductor junction between the first output terminal and the common terminal so as to form a common junction point between the first transistor and the first semiconductor junction, a second transistor, means connecting a second semiconductor junction in series with the collector-emitter path of the second transistor between the first input terminal and the common terminal, means connecting the first semiconductor junction in shunt with the base-emitter junction of the second transistor, means connecting the base of the first transistor to the first input terminal, a third transistor with its collector-emitter path connected between the second output terminal and the common terminal, means connecting the base of the third transistor to the collector of the second transistor, and means connecting said second input terminal to said common junction point between the first transistor and the first semiconductor junction.

4,013,974

**MICROSTRIP BROADBAND AVALANCHE DIODE AMPLIFIER**

John P. Quine, Colonie, N.Y., assignor to General Electric Co., Schenectady, N.Y.  
Filed Mar. 22, 1976, Ser. No. 669,319  
Int. Cl.<sup>2</sup> H03F 3/10; H03H 7/38

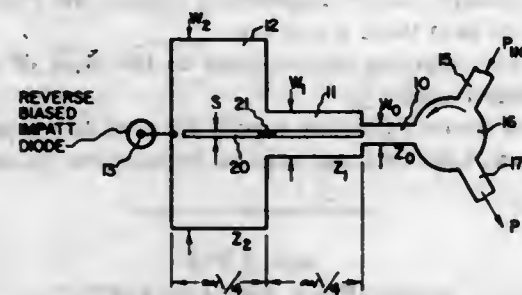
U.S. Cl. 330—34

11 Claims

1. A broadband microwave semiconductor diode amplifier comprising: a dielectric substrate having a continuous conductive ground plane on one major surface and, on the other major surface, a two-section microstrip impedance transformer comprising first and second quarter wavelength



sections at a selected microwave frequency, said first transformer section being coupled to an output microstrip transmission line having a predetermined characteristic impedance, a microwave semiconductor diode means connected symmetrically to an edge of said second transformer section, said first and second transformer sections each having respective width dimensions selected to match the imped-



ance of said microwave diode means to the output line impedance with the width of said second transformer section being at least approximately one-half wavelength, said two section transformer further having a longitudinal slot located centrally of the width dimension and an absorbing resistor bridging the slot for suppressing spurious mode resonance, and means for biasing said microwave diode means and transmitting input signals and amplified output signals.

4,013,975

## VARIABLE RESISTANCE CIRCUIT

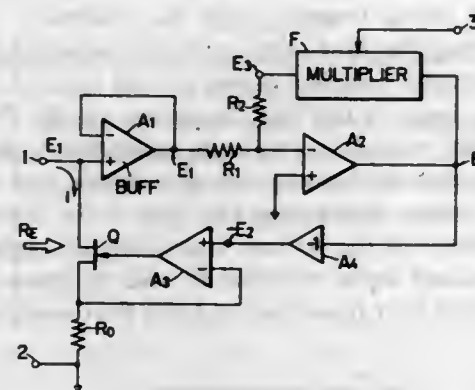
Koji Kataoka, and Hisayuki Uchilike, both of Musashino, Japan, assignors to Kabushikikaisha Yokogawa Denki Seisakusho, Tokyo, Japan

Filed Mar. 26, 1976, Ser. No. 670,673

Claims priority, application Japan, Mar. 31, 1975, 50-38758; Mar. 31, 1975, 50-38759

Int. Cl.<sup>2</sup> H03G 11/00, 3/12, 3/18; H03F 3/16

U.S. Cl. 330-145 10 Claims



1. A variable resistance circuit comprising: a field effect transistor having drain, source and gate electrodes; a terminal connected to one of said drain or said source of said field effect transistor; an amplifier having a feedback circuit including a multiplier; a differential amplifier having a first and second input and an output; said terminal being connected to said first input through said amplifier; the other one of said source or said drain of said field effect transistor being connected to said second input; said gate of said field effect transistor being connected to said output; and a reference resistor connected between said other one of said source or said drain and a common potential point; wherein an equivalent resistance present between said terminal and said common potential point is selectively utilized.

4,013,976

## GAS DYNAMIC LASERS

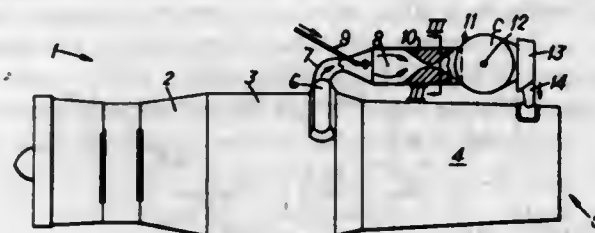
Roland John Hill, Quarndon, and Norman Thomas Jewell, Mickleover, both of England, assignors to Rolls-Royce (1971) Limited, London, England

Continuation-in-part of Ser. No. 272,842, July 18, 1972, Pat. No. 3,899,749. This application Jan. 21, 1975, Ser. No. 542,864

Claims priority, application United Kingdom, July 20, 1971, 33872/71

Int. Cl.<sup>2</sup> H01S 3/22, 3/095

U.S. Cl. 331-94.5 G 29 Claims



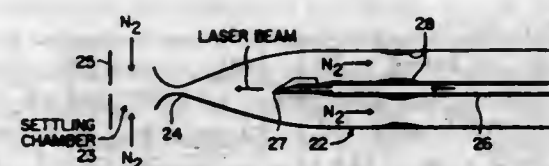
1. A method of operating a combustion powered air-breathing gas dynamic laser of the carbon dioxide type by taking gases from a continuous combustion engine, burning in said engine gases at least one fuel to produce a gaseous mixture for lasing, and passing said gaseous mixture through said laser; said continuous combustion engine being a gas turbine engine, said gases taken from said engine being diverted from the normal flow path therethrough into an auxiliary flow path including therein said laser, said at least one fuel including at least one hydrocarbon fuel whereby the gaseous  $H_2O:CO_2$  ratio in the combustion gases is caused to be in the range between 2:1 and 1:11.5, and said gaseous mixture being lased by aerodynamically expanding said mixture supersonically and passing it through an optically resonant cavity.

4,013,977

AERODYNAMIC WINDOW FOR CHEMICAL LASER  
Hermann W. Behrens; Gerhard L. Grohs, both of Rancho Palos Verdes, and Charles L. Dalley, Palos Verdes Estates, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.  
Filed Sept. 11, 1975, Ser. No. 612,619

Int. Cl.<sup>2</sup> H01S 3/02

U.S. Cl. 331-94.5 D 4 Claims



1. A high power gas laser providing cavity pressures of about 1 to about 200 torr and having an aerodynamic window to permit a radiation beam to pass from the cavity to ambient atmosphere, said window comprising:  
a. an optical duct axially aligned and surrounding the beam, the interior of said duct being in communication with the laser cavity to maintain the duct at cavity pressure, said duct having an inclined leading edge; and  
b. means for providing a supersonic flow of gas against the leading edge of said duct, whereby the gas expands tangentially across the leading edge thereof and then flows along the exterior of said duct.

4,013,978

## LASERS AND PHOTOCOAGULATORS

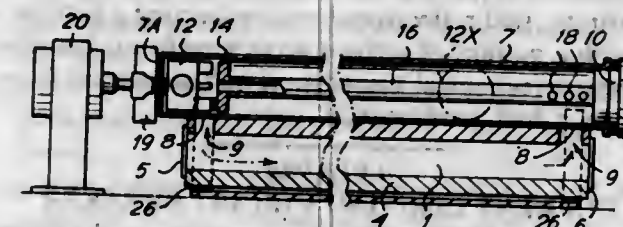
Pio Burlamacchi; Riccardo Pratesi, and Umberto Vanni, all of Florence, Italy, assignors to Consiglio Nazionale delle Ricerche, Rome, Italy

Filed Sept. 25, 1975, Ser. No. 616,889

Claims priority, application Italy, Sept. 27, 1974, 9577/74

Int. Cl.<sup>2</sup> H01S 3/092

U.S. Cl. 331-94.5 L 9 Claims



1. A wave guide laser comprising a resonant cavity; a housing defining a cell receiving recess; a pair of flash tubes supported by the housing on opposite sides of the cell receiving recess; reflectors for said flash tubes supported by the housing; an elongate wave guide cell removably located in the recess, the cell having two opposite parallel transparent walls, each of which is arranged to face a corresponding flash tube when the cell is located in the recess; a reservoir secured to the cell and communicating with opposite longitudinal ends of the cell; an active liquid comprising a dye in solution filling the cell and the reservoir; and circulation means located in the liquid for circulating the liquid between the cell and the reservoir.

4,013,979

## CMOS OSCILLATOR WITH FIRST AND SECOND MOS TRANSISTORS OF OPPOSED TYPE INTEGRATED ON THE SAME SUBSTRATE

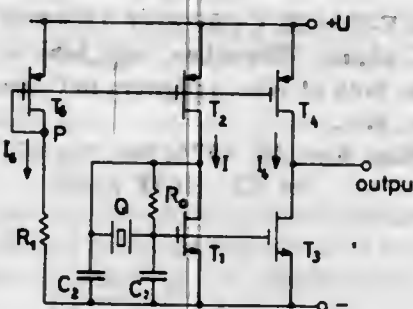
Eric Vittoz, Cernier, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Sept. 22, 1975, Ser. No. 615,709

Claims priority, application Switzerland, Sept. 20, 1974, 12789/74

Int. Cl.<sup>2</sup> H03B 5/24, 5/36

U.S. Cl. 331-108 B 13 Claims



1. A CMOS oscillator in which the oscillator circuit comprises a first and a second MOS transistor of opposed type integrated on the same substrate, the source-drain path of the first transistor being connected in series with the drain-source path of the second transistor between the terminals of a voltage supply and the drain and gate of the first transistor being coupled to each other through a frequency determining network, and at least a third MOS transistor ( $T_0$ ,  $T_8$ ,  $T_{12}$ ) of the same channel type as the second transistor, integrated on the same substrate, the sources of the said second and third transistors being connected together to one terminal of the voltage supply and the gates thereof being connected together to a point (P) at a potential such that the mean drain current of the

first transistor is maintained at a value just higher than the value at which oscillation starts.

4,013,980

## EQUALIZER FOR PARTIAL RESPONSE SIGNALS

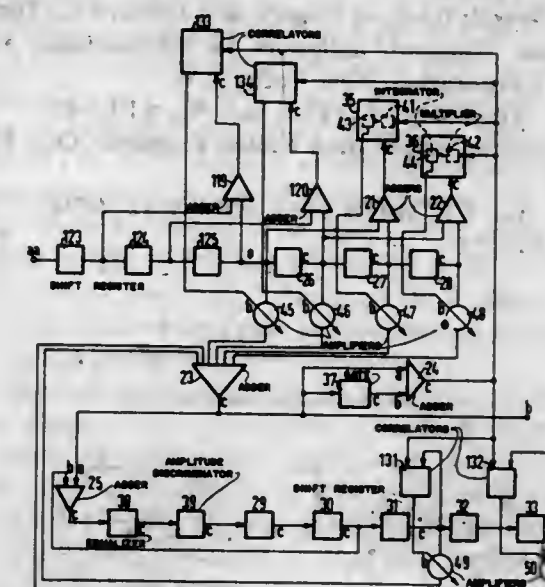
Gero Schollmeier, Gauting, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 560,320, March 20, 1975, abandoned, which is a continuation of Ser. No. 419,092, Nov. 26, 1973, abandoned. This application June 26, 1975, Ser. No. 590,507

Claims priority, application Germany, Jan. 5, 1973, 2300480

Int. Cl.<sup>2</sup> H04B 3/04; H03H 7/16

U.S. Cl. 333-18 6 Claims



1. In an equalizer for partial response signals comprising a multi-stage shift register coupled to a first analog adder, a corrected signal being produced from the output of said first analog adder, the improvement comprising: second analog adder means having inputs connected to outputs of at least two of the stages of said shift register, amplifier means including means for adjusting the gain thereof responsive to the value of the control signal coupled thereto, one of said outputs of said two stages of said shift register being connected to an input of said amplifier means and from an output thereof to an input of said first analog adder, correlator means for producing said control signal which is coupled to said amplifier means and having an input connected to an output of said second analog adder means.

4,013,981

## CONSTANT-RESISTANCE COUPLED-LINE TYPE EQUALIZER

Sotokichi Shintani, Mitaka; Michitoshi Tamori, Tanashi, and Nobuo Nagai, Sapporo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed June 19, 1975, Ser. No. 588,221

Claims priority, application Japan, June 29, 1974, 49-74488

Int. Cl.<sup>2</sup> H03H 7/14

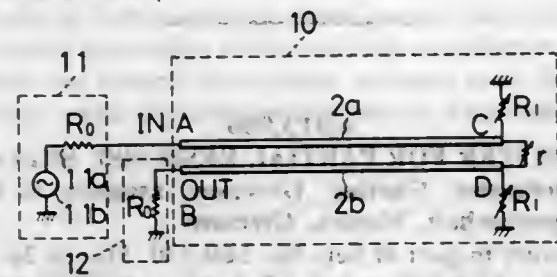
U.S. Cl. 333-28 R 5 Claims

1. An equalizer including a four port directional coupler using strip coupling lines, characterized in that two far end ports of the directional coupler are grounded through two resistances  $R_1$ , respectively, while interconnecting the two far end ports through a resistance  $r$ , an input port is formed at one



of the near end ports of the directional coupler, and an output port is formed at the other end thereof, wherein

$$G_1(G_1+2g)=G_0^2$$



where,  $G_1=1/R_1$ ,  $g=1/r$ ,  $G_0=1/R_0$ , and  $R_0$  is the resistance of a power source and a load.

4,013,982

## PIEZOELECTRIC CRYSTAL UNIT

Alan F. B. Wood; Graham Rogers, and Edward G. Tuckett, all of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

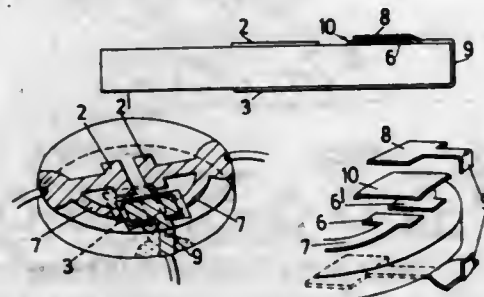
Filed Sept. 4, 1975, Ser. No. 610,343

Claims priority, application United Kingdom, Oct. 22, 1974, 45609/74

Int. Cl.<sup>2</sup> H03H 9/20, 9/04, 9/32, 9/24

U.S. Cl. 333-72

2 Claims



1. A piezoelectric crystal unit comprising a piezoelectric crystal element having on opposite faces thereof an electrode pattern with at least one of said patterns being extended to the other face of the element where a portion of said extension is in juxtaposition with an extended portion of the other of said patterns with a dielectric layer between the two portions.

4,013,983

SURFACE WAVE ELECTRO-MECHANICAL DEVICE  
Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France

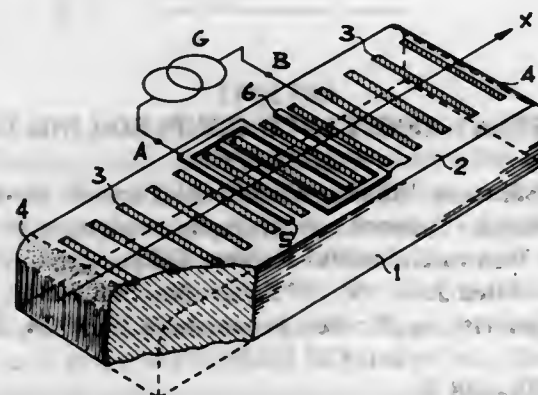
Filed Nov. 7, 1975, Ser. No. 629,963

Claims priority, application France, Nov. 8, 1974, 74.37075

Int. Cl.<sup>2</sup> H03H 9/04; H03H 9/26; H03H 9/32, 9/30

U.S. Cl. 333-72

12 Claims



1. A surface wave electromechanical device comprising a crystalline substrate having a face for propagating surface wave vibratory energy, at least one electromechanical transducer positioned on said face for radiating said surface wave

vibratory energy, and surface wave selectively reflecting means arranged in said face for receiving said surface wave vibratory energy; said surface wave selectively reflecting means comprising at least one grating of reflective elements causing along the propagation path of said surface wave vibrating energy a periodic physical modification of the propagation characteristics of said crystalline substrate; said periodic physical modification arising from the creation in said face of ion implanted areas wherein numerous point defects are introduced in the regular lattice structure of said crystalline substrate; said reflective elements forming a pattern coinciding with a pattern of surface wave wavefronts launched by said electro-mechanical transducer, and separated from one another by a half wavelength.

4,013,984

## CURRENT LIMITING CIRCUIT BREAKER

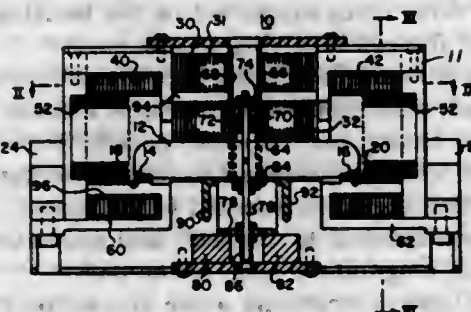
John A. Wafer, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 22, 1975, Ser. No. 607,006

Int. Cl.<sup>2</sup> H01H 3/00

U.S. Cl. 335-185

17 Claims



1. A circuit interrupter comprising:  
a housing;  
a bridging contact arm disposed within said housing;  
a pair of movable contacts attached in spaced apart relationship to said bridging contact arm;  
a pair of stationary contacts supported within said housing aligned with said pair of movable contacts;  
magnetic drive means having a magnetically open slot formed therein within which is disposed said bridging contact arm in proximity to the open end thereof; and  
a pair of yokes formed of ferromagnetic material each disposed around one movable contact and one stationary contact for enhancing arc movement during circuit interruption.

4,013,985

## THREE-PHASE CURRENT TRANSFORMER

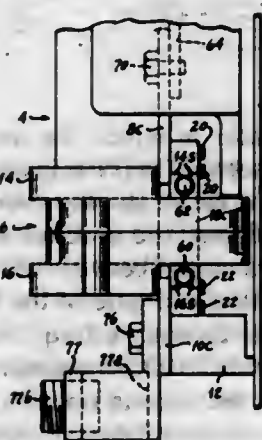
Robert O. Graham, Milwaukee, and John A. Rauenbuehler, New Berlin, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 15, 1976, Ser. No. 677,407

Int. Cl.<sup>2</sup> H01F 27/04

U.S. Cl. 336-5

10 Claims



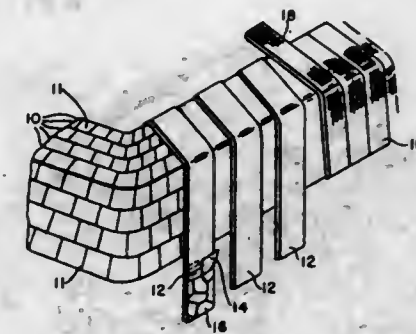
1. A unitary plural-phase current transformer comprising:

an insulating housing comprising abutting, complementary housing parts having a plurality of walls enclosing a plurality of cavities therewithin and pairs of adjoining notches in abutting edges of corresponding walls thereof providing a pair of holes from each said cavity to the outside;

a plurality of secondary coil and loop magnetic core combinations, one in each of said cavities;  
a plurality of pairs of terminal inserts retained in said pairs of holes with the inserts of each pair thereof connected to the respective ends of a different secondary coil and each said insert having an electrical connector portion;  
aligned apertures extending through both of said housing parts and through the respective loop magnetic cores therein;  
bus bars extending through said apertures and said loop magnetic cores, respectively, and serving as one-turn primary windings for the transformer;  
and means rigidly securing said housing parts together to enclose said coil-core combinations and portions of said inserts with the electrical connector portions of said inserts being accessible from the outside for connection to an external device.

4,013,987  
MICA TAPE BINDER  
Newton C. Foster, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed Aug. 22, 1975, Ser. No. 607,007  
Int. Cl.<sup>2</sup> H01F 27/32; B32B 19/00  
U.S. Cl. 336-206

10 Claims



1. A flexible, non-tacky, fully loaded, preimpregnated tape, for electrical conductors used in high voltage devices, comprises at least one layer of a micaeous material impregnated with about 20 to 35 wt.% of a resinous admixture, capable of forming an infusible thermoset insulation consisting essentially of: (1) 45 to 55 parts by weight of an epoxy resin having an epoxy equivalent weight of between about 170 to 210; (2) 45 to 55 parts by weight of an epoxy resin having an epoxy equivalent weight of between about 215 to 300 and (3) about 7 to 11 parts of zinc 2-ethyl hexonate as a latent catalyst per 100 parts of total epoxy resin; said admixture preheated up to 140° C before impregnation.

6. A flexible, non-tacky tape, for electrical conductors used in high voltage devices, comprises at least one layer of a micaeous material impregnated with about 3 to 15 wt.% of a resinous admixture consisting essentially of: (1) an epoxy resin having an epoxy equivalent weight of between about 215 to 300 and (2) about 7 to 11 parts of zinc 2-ethyl hexonate as a latent catalyst per 100 parts of epoxy resin.

4,013,988

## HERMETICALLY SEALED MOTOR PROTECTOR

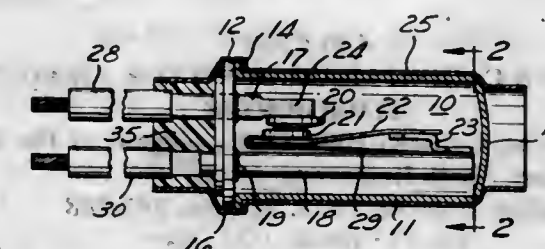
Ronald L. Holden, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed Jan. 19, 1976, Ser. No. 650,117

Int. Cl.<sup>2</sup> H01H 51/34

U.S. Cl. 337-89

17 Claims



4,013,986  
INDUCTIVE TRANSDUCER FOR RECTILINEAR OR ROTATIONAL DISPLACEMENT

Albert Weckenmann, Oberasbach-Altenberg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

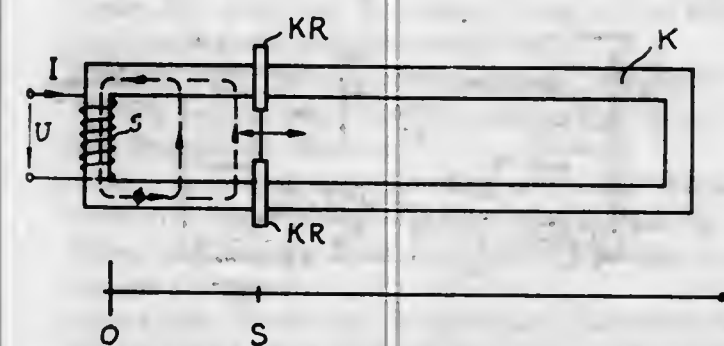
Filed July 23, 1974, Ser. No. 491,180

Claims priority, application Germany, Oct. 22, 1973, 2352851

Int. Cl.<sup>2</sup> H01F 21/04

U.S. Cl. 336-75

3 Claims



1. A transducer for converting a mechanical displacement into an analog electrical output magnitude in accordance with a predetermined function of the displacement of a body, comprising:

an elongated ferromagnetic core having two elongated members joined at at least one end by a transverse core portion and elsewhere separated by an elongated gap free of intermediate ferromagnetic members;  
a coil wound on a transverse end portion of said core; and  
short-circuiting ring means comprising short circuits respectively encircling individually each of said two elongated members at substantially the same distance from said end portion of said core, mechanically constituted as a single unit, and displaceably mounted for movement in the direction of elongation of said members relative to said core with a conductive part of said ring means always passing completely through said gap and thereby completing said short circuits, for varying the inductance of said coil in response to displacement of said ring means.

1. A motor protector comprising a housing assembly defining a hermetically sealed switch chamber, a pair of substantially straight and parallel support pins extending into said chamber, said support pins being electrically isolated from each other, a bimetal snap assembly cantilever mounted by welding to one support element, said bimetal snap assembly including a movable contact mounted on the free end thereof, a fixed contact welded to the other support pin, said bimetal assembly operating in response to predetermined bimetal temperatures to move said movable contact along a line of action into and out of engagement with said fixed contact, a reference plane containing said line of action and being substantially parallel to and spaced from the axes of said support pins, the weld between one said support pin and said bimetal snap assembly being spaced from and on one side of said reference plane, and the weld between said fixed contact and said other support pin being spaced from and on the other side of said reference plane.



4,013,989

**FUSIBLE ELECTRIC CONTROL DEVICE**

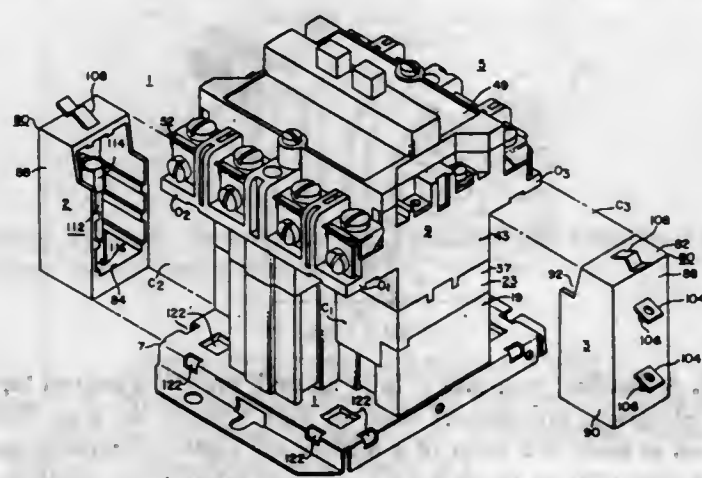
William F. Born, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1975, Ser. No. 561,726

Int. Cl.<sup>2</sup> H01H 85/14

U.S. Cl. 337-227

7 Claims



1. An electric control device, comprising: a first insulating housing having a length, a width, a height, and at least one cavity; a control mechanism comprising a plurality of contacts, a movable member for operating said contacts between open and closed operating positions; an electromagnet, and means for energizing said electromagnet; energization of said electromagnet causing said movable member to operate said contacts from one to the other of said operating positions; the path of movement of said movable member extending into said at least one cavity; and at least one fuse assembly comprising a second insulating housing, means within said second insulating housing for engaging a fuse, and terminal means associated with said engaging means for electrically connecting a fuse to apparatus to be protected; said fuse assemblies being removably disposed within said cavities to occupy a volume substantially within the confines of said length, width and height of said first housing, said second insulating housing comprising means defining a cutout preventing interference with the path of movement of said movable member.

4,013,990

**BELLOWS CAGING MECHANISM FOR AIRBORNE HYDROPHONE**

John A. Devine, Granada Hills, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed June 30, 1975, Ser. No. 591,268

Int. Cl.<sup>2</sup> H04R 1/22, 1/44

U.S. Cl. 340-3 T

8 Claims

1. In a sonar system wherein a transducer is suspended into a body of water and returned therefrom, said transducer including an assembly of piezoelectric hydrophones and projector elements, said elements projecting sonar signals and said hydrophone receiving echo signals over a desired high frequency range and wherein a low frequency hydrophone assembly is included, said low frequency hydrophone assembly comprising

- a sealed housing attached to said assembly including an electronics package
- a chamber including a support plate and means attaching said support plate to said housing and a bellows fastened to said support plate,
- a low frequency hydrophone in said chamber having electrical connections to said electronics package and mechanical connectors to said sealed housing, said mechanical connectors including a plurality of compliant suspension members wherein, in air, said bellows is expanded

thereby firmly securing said hydrophone between said bellows and said sealed housing and when said bellows is



exposed to water pressure at a predetermined depth it is collapsed, leaving said hydrophone suspended in said chamber on said compliant suspension members.

4,013,991

**FISH LOCATOR**

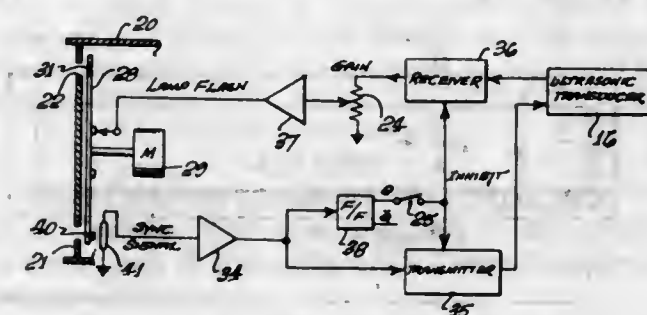
Orville R. Balcom, Lomita, Calif., assignor to Cetec Corporation, Santa Ana, Calif.

Filed Feb. 13, 1976, Ser. No. 657,731

Int. Cl.<sup>2</sup> G01S 9/70

U.S. Cl. 340-3 C

3 Claims



1. In an ultrasonic depth indicator for locating fish and the like, the combination of: an ultrasonic transducer; a transmitter for providing an electrical input to said transducer; a receiver for the electrical output of said transducer; an indicator; drive means for rotating said indicator; means for connecting said receiver output to said indicator for pulsing said indicator as a function of receiver outputs; synchronization means for generating a transmitter trigger signal in synchronism with indicator rotation providing a trigger signal for every revolution; a logic circuit having said trigger signal as an input and producing an inhibit signal as an output for predetermined input signals; and means for connecting said inhibit signal to said transmitter and receiver for inhibiting operation thereof.

4,013,992

**DIVER'S PIEZOELECTRIC MICROPHONE WITH INTEGRAL AGC PREAMPLIFIER**

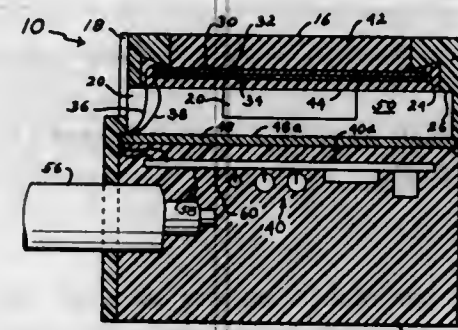
Larry F. Dewberry; Robert H. Banks, and Clell A. Dildy, all of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 28, 1976, Ser. No. 653,186

Int. Cl.<sup>2</sup> H04B 13/00

U.S. Cl. 340-10

2 Claims



1. A piezoelectric microphone for use in association with diving equipment of a type having molded rubber microphone support means having a recess for holding said microphone in a position for impingement thereon of sound waves, said microphone comprising:

- a tubular housing having a generally cylindrical sidewall formed of a rigid electrically insulating material and having a plurality of ports extending therethrough at a predetermined distance from one end thereof, said housing being characterized by a plurality of relieved zones each extending from said one end to a corresponding one of said ports so as to provide air passages between said side wall and said microphone support means, and further characterized by a first internal annular shoulder between said one end and said ports, a second internal annular shoulder coplanar with the edges of said ports adjacent said one end, and a third internal annular shoulder between said ports and the opposite end of said housing, said first annular shoulder being conical;
- a piezoelectric crystal bimorph diaphragm disposed in said housing with peripheral portions making line contact with said first annular shoulder;
- flexible, elastomeric waterproofing compound formed in protective layers on opposite sides of said diaphragm and filling said housing from said one end to said second annular shoulder;
- a ground plate comprising an electrically conductive shielding layer and disposed in said housing with peripheral portions engaging said third annular shoulder, said ground plate and diaphragm defining an airspace therebetween that is adapted by said ports and said relieved zones for communication with pressures within said diving apparatus;
- automatic gain control preamplifier means, electrically connected to said diaphragm and disposed in a cavity defined in said housing between said ground plate and said opposite end of said housing, for gain controlled amplification of electrical signals generated by said diaphragm in response to said impingement by said sound waves;
- an electrical-power and signal transmitting cable extending into said cavity and connected to said automatic gain control preamplifier means; and
- waterproof potting compound filling the remainder of said cavity around said automatic gain control preamplifier means.

4,013,993

**ELEVATOR SYSTEM**

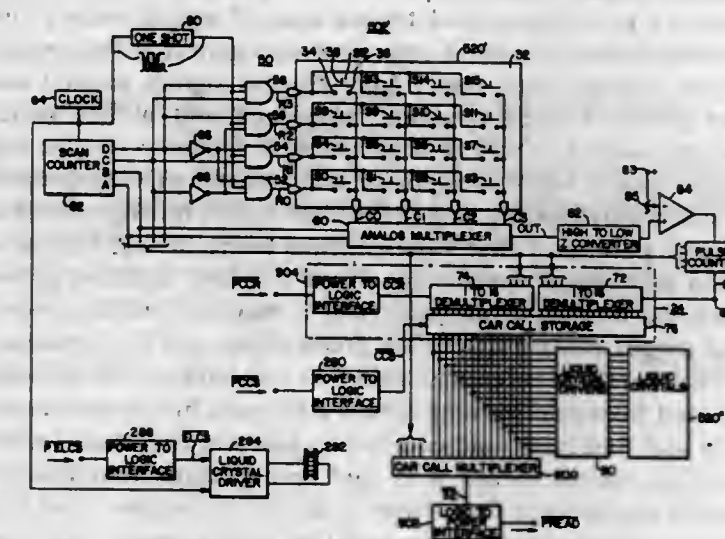
Alan F. Mandel, Pittsburgh, Pa.; Theodore E. Frask, Wayne, N.J., and Denis E. Bedel, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1976, Ser. No. 669,014

Int. Cl.<sup>2</sup> G02F 1/13; G08B 5/36

U.S. Cl. 340-19 R

11 Claims



1. An elevator system, comprising: an elevator car mounted for movement in a building to serve the floors therein, a car station in said elevator car including call means for indicating requests for elevator service, a normally energized light source in said car station associated with said call means, a first source of electrical power for said light source, an emergency source of electrical power connected to energize said light source upon failure of said first source of electrical power, and means associated with said car station which enables light from said light source to provide emergency lighting for said elevator car.

4,013,994

**VEHICLE WARNING SYSTEM**

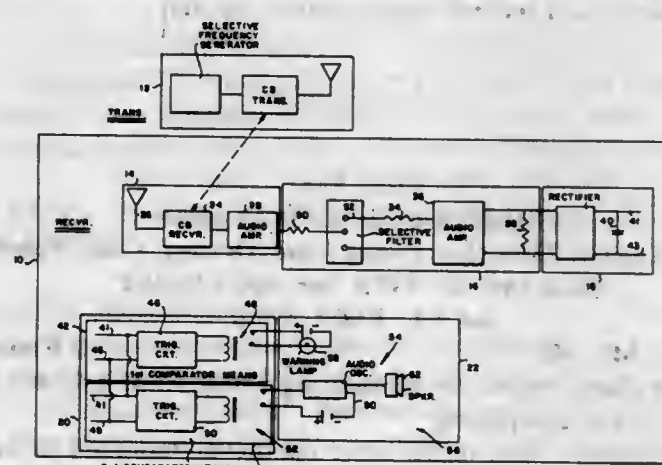
Anthony Ragano, 806 S. Westshore Blvd., Tampa, Fla. 33609, and Steven A. Barton, 3315 31st Ave. North, Apt. 215, St. Petersburg, Fla. 33713

Filed Dec. 5, 1974, Ser. No. 529,815

Int. Cl.<sup>2</sup> G08B 3/10

U.S. Cl. 340-33

11 Claims



1. A vehicular warning system for use in combination with a remote transmitter to provide a positive warning signal when the relative distance therebetween reaches a predetermined minimum range, said vehicular warning system comprises a receiver means including circuitry to receive incoming signals from the remote transmitter, a decoder means coupled to said receiver means to receive said incoming signals therefrom,



said decoder means including circuitry to decode said incoming signals of a predetermined wave form and generate decoder output signals in response thereto, a rectifier means coupled to said decoder means to receive said decoder output signals therefrom, said rectified means including circuitry to rectify said output signals and generate trigger control signals in response thereto, a control means coupled to said rectifier means to receive said trigger control signals therefrom, said control means including a first comparator means having circuitry to compare said trigger control signals with a first predetermined threshold reference and generate first trigger output signals when said trigger control signals exceed said first predetermined threshold reference and a first switch means coupled to said first comparator means to receive said trigger output signals therefrom, and a warning means coupled to said control means, said first switch means having a first and second state, said first switch means being in said first state when said trigger control signals are less than said first predetermined threshold reference and in said second state when said trigger control signals are greater than said first predetermined threshold reference, said first comparator means being isolated from said warning means when said first switch means is in said first state, and coupled to said warning means when said first switch means is in said second state, said warning means including a first warning device to receive said first trigger output signals when said first switch means is in said second state, said first warning device including circuitry to generate a first warning signal in response to said first trigger output signal; said control means further includes a second comparator means having circuitry to compare said trigger control signals with a second predetermined threshold reference and generate a second trigger output signal when said trigger control signal exceeds said second predetermined threshold reference and a second switch means coupled to said second comparator means to receive said second trigger output signals therefrom, said second predetermined threshold reference being greater than said first predetermined threshold reference, and wherein said warning means further includes a second switch means including a first and second state, said second switch means being in said first state said trigger control signals are less than said second predetermined threshold reference and in said second state when said trigger control signals are greater than said second predetermined threshold reference, said second comparator means being isolated from said warning means when said second switch means is in said first state and coupled to said warning means when said second switch means is in said second state; said warning means further including a second warning device to receive said second trigger output signals when said second switch means is in said second position said second warning device including circuitry to generate a second warning signal in response to said second trigger output signals.

4,013,995

## VEHICLE BURGLAR ALARM

Joe J. Adamo, 7306 Grovewood Lane, Orange, Calif. 92669  
Filed Oct. 24, 1975, Ser. No. 625,402

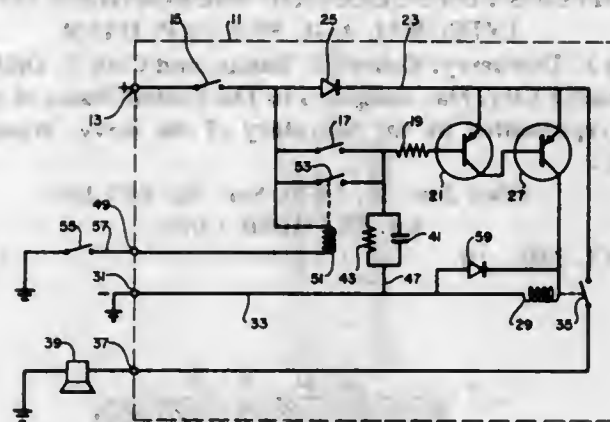
Int. Cl.<sup>2</sup> B60R 25/10

U.S. Cl. 340-65

3 Claims

1. An alarm system for monitoring vibration of a device to be protected, comprising:
  - a. an elongated, thin metal strap cantilever mounted at one end on said device and free at the other end;
  - b. a contact plate mounted on said device adjacent said free end of said metal strap and spaced from said free end by a gap;
  - c. a signaling device connected to said strap and said plate and activated by contact therebetween;
  - d. electronic amplifier means for activating a signaling mechanism for a predetermined period of time in response to a single contact between said strap and said plate, and

means for extending said predetermined period of time in



response to each successive contact between said strap and said plate.

4,013,996

## BACKUP WARNING DEVICE

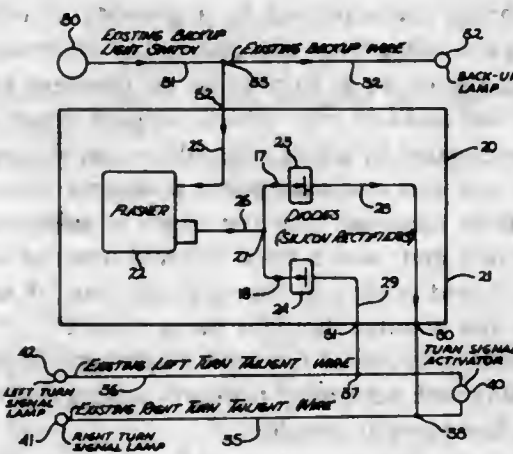
Wynant D. Hubbard, 3004 Willow Lane, Thousand Oaks, Calif. 91360

Filed Sept. 25, 1975, Ser. No. 616,829

Int. Cl.<sup>2</sup> B60Q 1/22

U.S. Cl. 340-70

2 Claims



1. An electrical signal processing system for a vehicle having a back-up lamp and a right and left turn signal lamp, where means is provided in said vehicle for generating constant voltage on a back-up line during backing of said vehicle and an impulsive signal selectively on either a right or left turn signal line during turning of said vehicle, said back-up line coupled to said back-up lamp and said right and left turn signal lines coupled to said right and left turn signal lamps respectively; comprising:
  - a. pulsing means electrically coupled to said back-up line;
  - b. a first electrical directional limiting means electrically coupled to said pulsing means and to said right turn signal line for permitting current flow only from said pulsing means to said right turn signal line;
  - c. a second electrical directional limiting means, electrically coupled to said pulsing means and to said left turn signal line; for permitting energy flow only from said pulsing means to said left turn signal line and for maintaining electrical isolation between said right and left turn signal lines;

Whereby said right and left turn signal lamps will flash when said vehicle is backing and will otherwise operate normally.

4,013,997

## ERROR DETECTION/CORRECTION SYSTEM

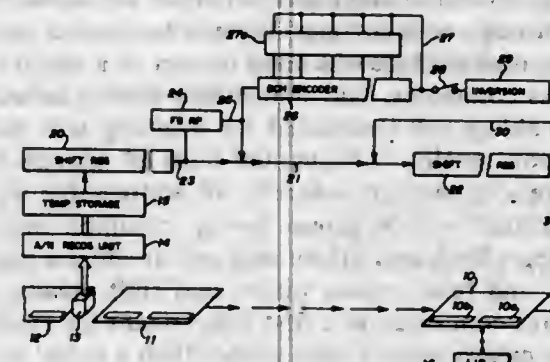
Stephen Smith Treadwell, III, Dallas, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Nov. 17, 1975, Ser. No. 632,576

Int. Cl.<sup>2</sup> G06F 11/12; G06K 5/00

U.S. Cl. 340-146.1 AL

7 Claims



1. In the bar code printing of information on documents subject to uncontrolled printing in the area of a bar encoded data field, the combination which comprises:
  - a. BCH encoding means for adding a variable BCH code with the length of the code depending on the size of the document to said information to be printed as a bar code on said document; and
  - b. means in electrical communication with said BCH encoding means for dynamically and selectively altering said BCH code to accommodate a plurality of information field lengths at least as frequently as the information field rate.

4,013,998

## SYSTEM TO RENDER CONSTANT THE PROBABILITY OF FALSE ALARM IN RADAR SIGNALS CONVERTED INTO NUMERICAL FORM

Tullio Bucciarelli, Piazza Tarquinia, 2, 00183 - Rome, and Giovanni Picardi, Via Nicola Festa, 12, 00137 - Rome, both of Italy

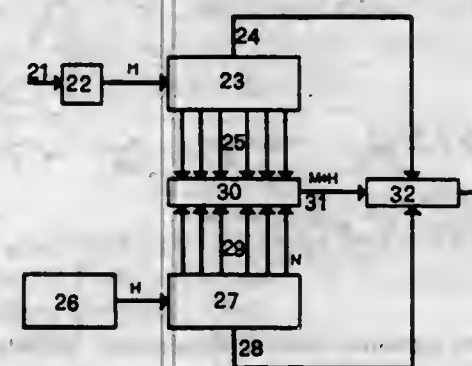
Filed Nov. 29, 1974, Ser. No. 528,006

Claims priority, application Italy, Nov. 30, 1973, 54005/73

Int. Cl.<sup>2</sup> H04B 1/10; G06F 7/02

U.S. Cl. 340-146.2

3 Claims



1. Apparatus for obtaining constant false alarm probability in radar signals comprising:
  - means to transform analog video signals into M bit digital signals;
  - a first digital delay block comprising M digital delay lines connected to receive said digital signals and having a central M-bit output and N lateral outputs of M-bits, means for generating a and H-bit binary noise signal;
  - a second digital delay block comprising H digital delay lines for receiving said binary noise signal and having a central H-bit output and N lateral outputs, each one comprising H-bits;
  - computing means for generating a signal word correspond-

ing to the value of the M+H bits by processing the N-lateral outputs of the first digital delay line block and by processing the N-lateral outputs from the second digital delay line block; and comparator means connected to receive the output signal from said computing means and the signals from the central bit outputs of said first digital delay block and said second digital delay block for generating a quantized video signal.

4,013,999

## SINGLE READ STATION ACQUISITION FOR CHARACTER RECOGNITION

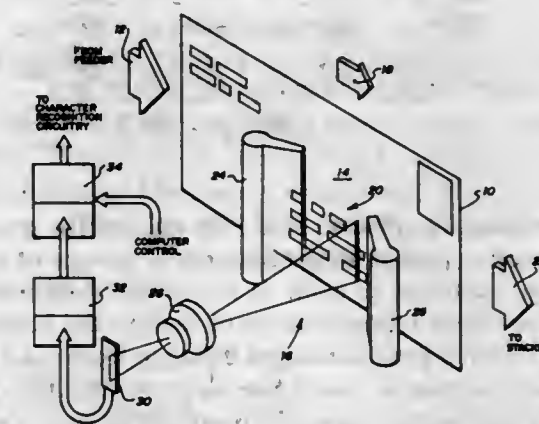
Jerry D. Erwin, Dallas; Dale R. Duvall, Fort Worth, and Richard K. Habitzreiter, Dallas, all of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 497,703, Aug. 15, 1974. This application Dec. 15, 1975, Ser. No. 640,750

Int. Cl.<sup>2</sup> G06K 9/12

U.S. Cl. 340-146.3 H

8 Claims



1. A single read station acquisition system for character recognition of multiline data using a self-scan photocell array as the reading station, said system including: means for reading and temporarily storing multiple lines simultaneously, means for compressing the read data into search segments to evaluate the top and bottom positions of character line, means for determining line linkage between the elements of one search segment of compressed data and the elements of the preceding search segment for future processing, line tracker means for extracting character lines from a temporary storage for transmission to a line block memory, and means for transmitting the data in the line block memory to a character recognition unit.

4,014,000

## PATTERN RECOGNITION SYSTEM UTILIZING A PLURALITY OF PARTIAL STANDARD PATTERNS

Takeshi Uno, Sayama; Sadahiro Ikeda, Tokyo, and Hirotsada Ueda, Sayama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 29, 1976, Ser. No. 671,048

Claims priority, application Japan, Mar. 28, 1975, 50-36758

Int. Cl.<sup>2</sup> G06K 9/08

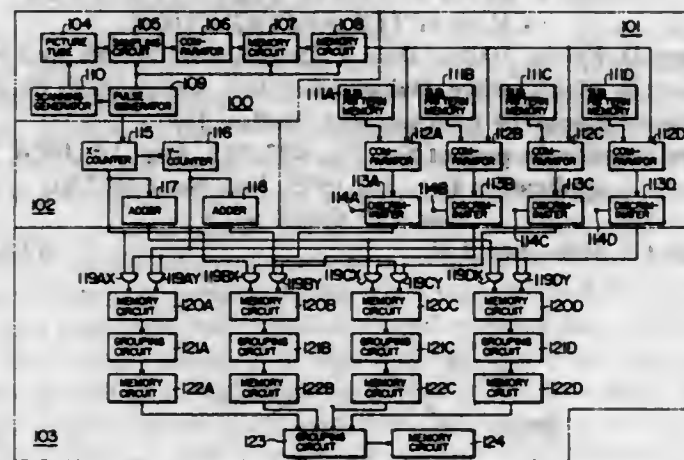
U.S. Cl. 340-146.3 MA

9 Claims

1. A pattern recognition system comprising:
  - image pickup means for sequentially scanning an image of an object to produce first signals representative thereof;
  - first means, responsive to said first signals, for generating second signals representative of partial image patterns of a two-dimensional pattern of said object as sequentially scanned by said image pickup means;
  - second means for forming a plurality of two dimensional substandard patterns, each of which approximately corresponds to selected portion of the two-dimensional pattern of said object;
  - third means, responsive to the scan of said object by said image pickup means, for generating third signals repre-



sensitive of the respective sequential positions of said partial image patterns;  
 fourth means, coupled to said first means and said second means, for comparing said each partial image pattern with said respective substandard patterns, and for extracting said each partial image pattern which is within a predetermined degree of coincidence with said substandard pattern;  
 fifth means, coupled to said third means, for storing positions representative of said respective partial image patterns in response to the outputs of said fourth means; and



sixth means, coupled to said fifth means, for grouping said respective partial image patterns to groups of said partial image patterns, in each of which the distances between the positions representative of said partial image patterns are within a predetermined distance from each other in a two-dimensional coordinate system, and for calculating the coordinate of specific positions of said object in the two-dimensional coordinate system from the groups of said partial image patterns.

4,014,001

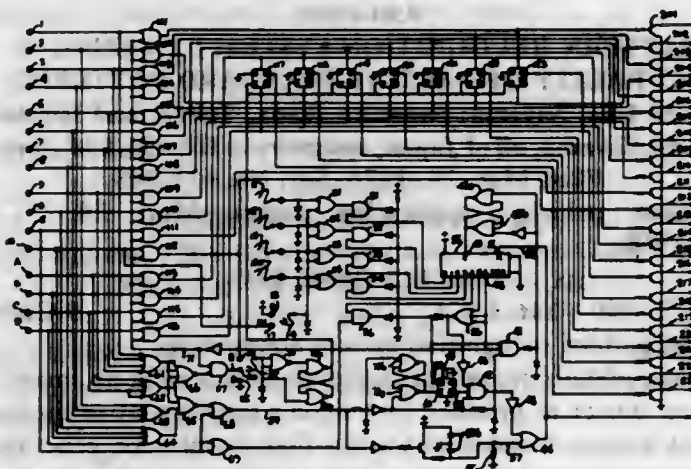
#### ADDRESSABLE SIGNALLING APPARATUS HAVING MASTER CALLING FEATURE WITH OUTPUT LATCHES AND WRONG DIGIT REJECT

Donald A. Bradley, Milpitas, Calif., assignor to Speedcall Corporation, Hayward, Calif.

Continuation of Ser. No. 519,630, Oct. 31, 1974. This application Dec. 22, 1975, Ser. No. 643,234  
 Int. Cl.<sup>2</sup> H04Q 9/00

U.S. Cl. 340-147 MD

6 Claims



1. An addressable signalling apparatus in a group of similar apparatus having a multiple unit address comprising, a plurality of input terminals, each terminal corresponding to one address unit of a set of address units, programmable address connectors, each address connector connected to one of said input terminals in a preselected address program,

a series of OR gates, having inputs and an output, each of said OR gates having as one input different ones of said address connectors representing unique units of address and all of said OR gates having a second input a designated one of said address connectors representing a substituted unit of address,  
 an output means for signalling,  
 a multi-cell shift means connected to said output means, to said OR gates and to said input terminals, for sequentially shifting through cells corresponding to sequential units of said programmable address upon receipt of a signal from an address connector, said shift means having an output means enabling cell connected for enabling said output means upon receipt of sequential units of address from said address connectors whereby all addressable signalling apparatus in said group having common units of address apart from said substituted unit of address may be signalled, and reset means within said shift means, said reset means connected to a first logic means for enabling said reset means when a signal other than a signal in one of said address connectors is transmitted to the apparatus.

4,014,002

#### DATA ACQUISITION AND TRANSFER SYSTEM

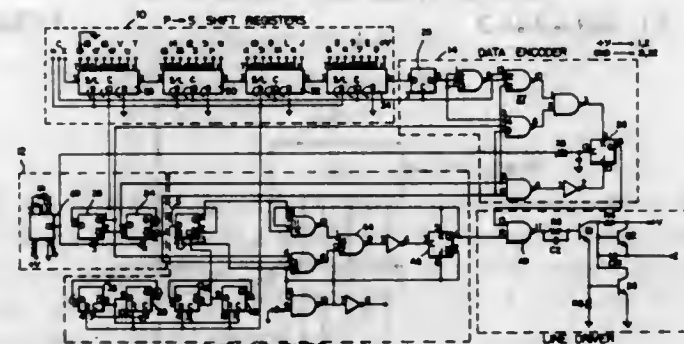
John F. Tucker, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 5, 1976, Ser. No. 673,830

Int. Cl.<sup>2</sup> H04L 7/00; H03K 7/08, 9/08; H04Q 9/00

U.S. Cl. 340-168 B

9 Claims



1. A data communication system for serially transferring binary data between a first and second location comprising:  
 a. parallel to serial shift registers for receiving data in parallel form,  
 b. timing control circuit means for generating a sequence of timing signals,  
 c. data encoder circuit means coupled to the output of said parallel to serial shift registers and to said timing control circuit means for encoding data as a binary zero if the transition from a low to a high to a low is one clock pulse width in time and a binary one if the transition from a low to a high to a low is three clock pulse width in time,  
 d. receiver circuit means for receiving said encoded data and having start pulse detector means for detecting the beginning of a data word and information detector means for detecting the presence of data.

4,014,003

#### CIRCUIT FOR CONTROLLING A SEMI-CONDUCTOR VALVE

Oskar Beckmann, St. Polten, Austria, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 5, 1974, Ser. No. 529,925

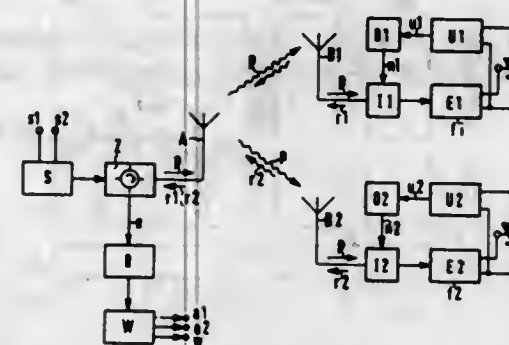
Claims priority, application Germany, Dec. 5, 1973, 2360670

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> G08B 23/00

U.S. Cl. 340-171 R

13 Claims



1. In apparatus for the wireless transmission of a control signal to the control path of a controllable semiconductor valve said apparatus including a high frequency transmitter including means for generating a carrier and means to modulate the carrier by the control signal to form a modulated signal and an antenna connected to said transmitter for radiating said modulated signal, and a high frequency receiver coupled to an antenna for receiving said modulated signal, said receiver including means for demodulating said signal and feeding the demodulated control signal to the control path of the semiconductor valve, the improvement comprising:

- a means coupled to the semiconductor valve providing an output state signal representing the state of said semiconductor valve;
- a controllable reflecting modulation means terminating the antenna of the high frequency receiver, having a control input coupled to said means providing a state signal, for remodulating a portion of the received transmission and reflecting it as a return signal over said receiver antenna;
- a modulation dependent signal filter coupled to the antenna of the high frequency transmitter providing said return signal as an output; and
- a return signal receiver coupled to the output of said modulation dependent signal filter.

4,014,004

#### AUTOMATIC REPORT REGISTER

Robert Melvin Fuller, Rochester, N.Y., assignor to Harris Corporation, Cleveland, Ohio

Filed Aug. 4, 1975, Ser. No. 601,561

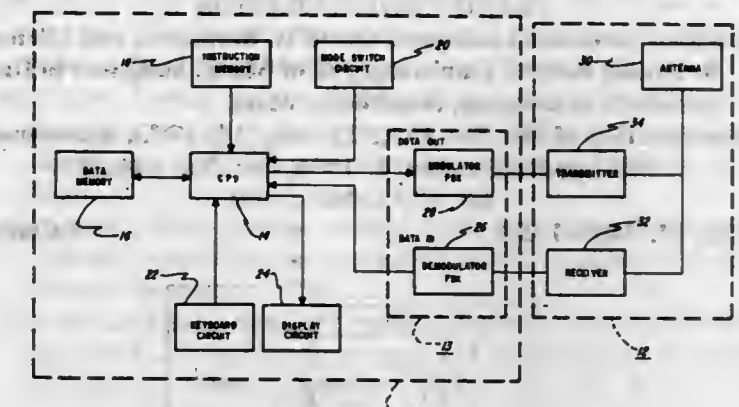
Int. Cl.<sup>2</sup> G06F 1/00, 15/48; H04Q 9/00; H04B 1/38

U.S. Cl. 340-172.5

19 Claims

1. A report register for use with a mobile unit for automatically transmitting data to a distant station via a radio in response to an interrogation signal from the distant station, comprising:  
 input switch means for accepting input data to be stored;  
 means for storing data;  
 means for displaying data;  
 switch means having a plurality of record data positions and at least one transmit data position;  
 means responsive to said switch means in said record data positions for applying input signals received from said input switch means to said storage means;  
 means responsive to said switch means in said record posi-

tions for applying data stored in said storage means to said displaying means, and



means responsive to an interrogation signal and said switch means in said transmit position for outpulsing the data stored in said storage means to the radio for transmission.

4,014,005

#### CONFIGURATION AND CONTROL UNIT FOR A HETEROGENEOUS MULTI-SYSTEM

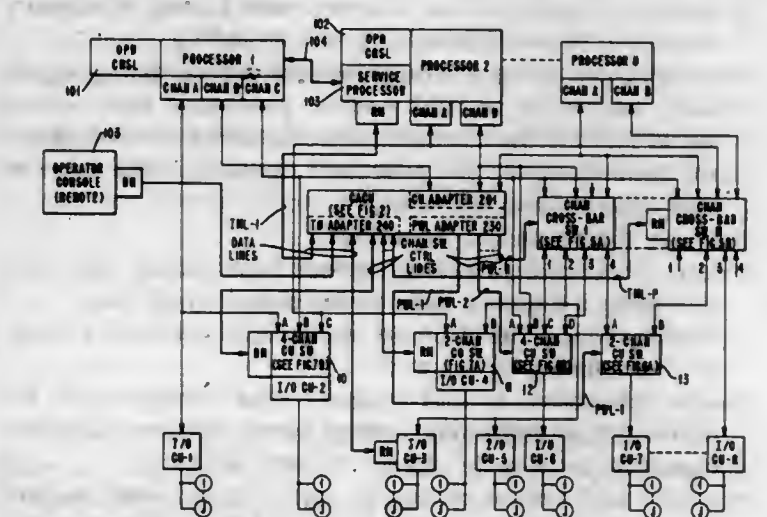
Joel Lawrence Fox, Rhinebeck, and Eugene Everett Marquardt, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 5, 1976, Ser. No. 646,698

Int. Cl.<sup>2</sup> G06F 1/00

U.S. Cl. 340-172.5

5 Claims



1. A system configuration and control unit (CACU) for a combination of: one or more CPU's, a plurality of I/O devices and/or device switches, and one or more operator stations; each CPU having one or more data channels; the CACU being capable of configuring one or more data channels; the CACU being capable of configuring one or more data processing systems (DPS) from the one or more CPU's, the channels, the I/O devices and/or the device switches, and the one or more operator stations, the CACU comprising:

a random access storage unit having a first location for storing a first bit pattern for a current configuration of the DPS and having a second location for storing a second bit pattern for a next configuration of the DPS,  
 a processor unit coupled to the random access storage unit,  
 a configuration storage unit containing a plurality of persistent bistable devices, and a write/readout unit connecting the persistent bistable devices to the processor unit,  
 channel adapter means for connecting the processor to each CPU includable in the DPS through a respective channel, and  
 means for transmitting the state of a subgroup of the persistent bistable elements in the configuration storage unit to a respective I/O device or device switch in order to control the connections of the respective I/O devices or device switches into the data processing system.







4,014,012

## SEGMENT SCANNING METHOD FOR CALCULATOR DISPLAY SYSTEM

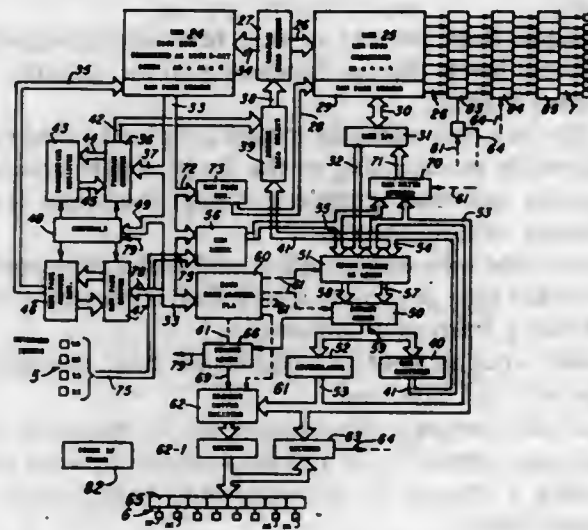
Edward R. Caudel, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 7, 1975, Ser. No. 565,489

Int. Cl.<sup>2</sup> G09F 9/32

U.S. Cl. 340-336

9 Claims



1. A method of actuating a display having a plurality of characters by outputting data in a scanned sequence from data memory means which contains data representing a plurality of characters, wherein the display is of the type having a plurality of segments in each character with all like segments in all characters being electrically connected together and each character position of the display having an electrode common to all segments of that character, comprising the steps of repeatedly actuating the segments in a regular sequence, and for actuation of each segment,

- comparing in a comparator a representation of the segment currently to be actuated with each of the characters from the data memory means in said scanned sequence, to generate a display signal for each character according to a code when a character contains the segment currently to be actuated,
- storing a code corresponding to occurrence of the display signals for the segment currently to be actuated,
- and actuating selected ones of said common electrodes according to the stored code.

4,014,013

## DIRECT DRIVE DISPLAY SYSTEM FOR MOS INTEGRATED CIRCUITS USING SEGMENT SCANNING

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 7, 1975, Ser. No. 566,021

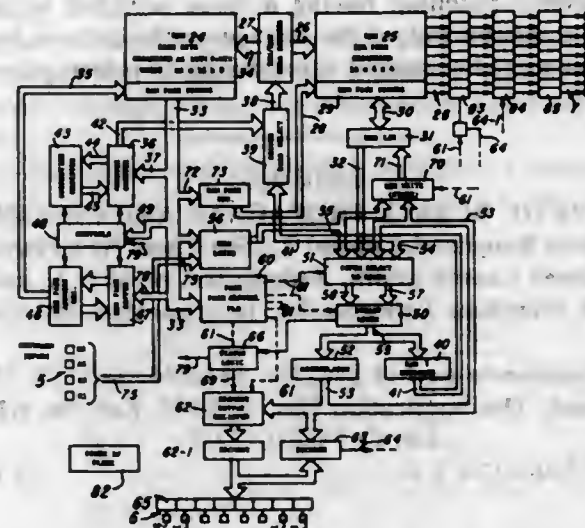
Int. Cl.<sup>2</sup> G09F 9/32

U.S. Cl. 340-336

9 Claims

1. A character display system including a visible light emitting diode display having a plurality of character positions of the type containing a plurality of segments in each character position, all like segments in all character positions being electrically connected together and each character position having an electrode common to all segments of the character position, wherein the improvement comprises an MOS integrated circuit device for actuating the display directly without intervening drivers, the MOS device including segment scan means connected to said segments and generating a repeating sequence of signals for actuating said segments in a regular pattern, and the MOS device also including character actuator means connected to said common electrodes and generating a sequence of signals for selectively actuating combinations of said common electrodes responsive to coded data represent-

ing the characters to be displayed, whereby the segment scan means and the character actuator means may be directly



connected to the segments and common electrodes of the light emitting diodes without intervening driver devices.

4,014,014

## SYNCHRONIZED MULTISPEED TRANSDUCER POSITION INDICATING SYSTEM

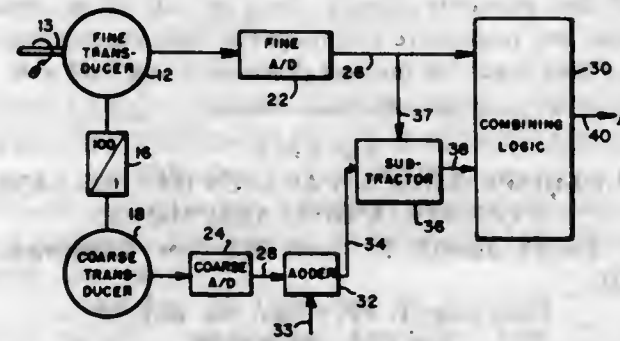
Donald H. Jones, Pittsburgh, and Paul F. McNally, Gibsonia, both of Pa., assignors to Contraves-Coerz Corporation, Pittsburgh, Pa.

Filed June 6, 1975, Ser. No. 584,376

Int. Cl.<sup>2</sup> H03K 13/02

U.S. Cl. 340-347 SY

11 Claims



7. A method for synchronizing the digitalized position output of a multispeed system having a coarse transducer and a fine transducer providing overlapped decimal digit output comprising the steps of:

- adding a first constant number of counts to the digitalized coarse transducer output to yield a modified coarse transducer output;
- subtracting the most significant digit of the fine transducer output from the modified coarse transducer output; and
- combining the fine transducer output with a portion of the modified coarse transducer output obtained in the second step to obtain a nonambiguous output.

4,014,015

## ABSOLUTE DIGITAL POSITION MEASUREMENT SYSTEM

Philip M. Gundlach, Highland, Ill., assignor to Devtron Corporation, Highland, Ill.

Filed May 5, 1975, Ser. No. 574,526

Int. Cl.<sup>2</sup> G08C 9/04

U.S. Cl. 340-347 P

31 Claims

1. In a linear position measurement system comprising a linear member having a length many times as great as its width and an interacting member, the interacting member being movable lengthwise relative to the linear member, the improvement comprising:

- permutated code means carried by said linear member for defining absolute positions along its length,
- means independent of said interacting member for producing an alternating magnetic field along substantially the entire length of said linear member, and
- means carried by said movable member for coupling with said alternating magnetic field to produce signals in said permutated code means so as to produce absolute position information in said linear member representative of the position of said movable member along said linear member.

4,014,016

## AUDIO INDICATING SYSTEM

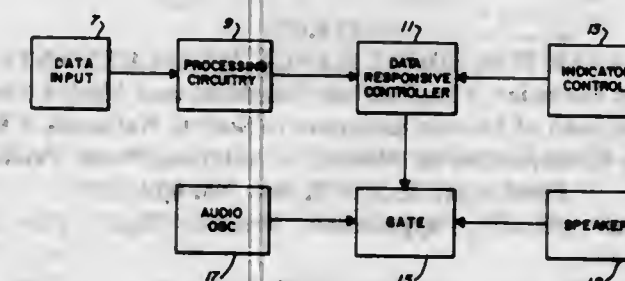
Jay G. Sherritt, and Joseph A. Eccher, both of Boulder, Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Nov. 29, 1974, Ser. No. 528,120

Int. Cl.<sup>2</sup> G08C 19/22; G08B 3/10

U.S. Cl. 340-384 R

26 Claims



1. An audio indicating system providing a calculator output in audio form by individual digits, said system comprising: input means to receive electrical signals indicative of retrievable information and producing output signals reflective thereof; signal controlling means connected with said input means and receiving said output signals therefrom, said signal controlling means providing a coded output signal the composition of which depends upon said output signal received from said input means; audio means connected with said signal controlling means to receive said coded output signal therefrom, said audio means, in response to received coded output signals from said signal controlling means, providing, for each of said individual digits, a preselected number of audio tones at substantially the same predetermined frequency with the number of said tones being determined by the composition of said coded signal received from said signal processing means; and means for causing a second output from said audio means at a frequency different from that of said predetermined frequency and causing an audio indication of the positioning of a decimal point in said output.

4,014,017

## SYSTEM FOR EDITING CHARACTERS

Harry W. Moore, III, Dryden, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 13, 1975, Ser. No. 604,401

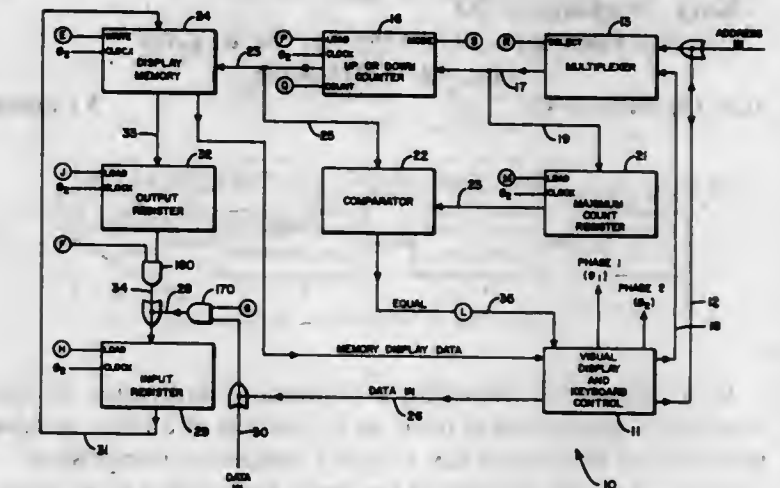
Int. Cl.<sup>2</sup> G06F 3/14

U.S. Cl. 340-324 AD

10 Claims

1. A system for editing characters stored in a memory comprising: memory means for storing data representative of a plurality of characters to be displayed, visual means connected to said memory means for displaying said plurality of characters in a matrix of columns and rows, keyboard control means having a plurality of data entry keys, edit function keys and means for generating addresses designating the address of each of said characters in said memory by columns and rows, counter means operably connected to said keyboard control means and settable with a first address in said memory means to be edited,

a maximum count register operably connected to said keyboard control means and settable with a last address in said memory means to be edited, an output register connected to said memory means for receiving and storing characters from said memory means at the address indicated by said counter means, an input register operably connected to said keyboard control means for receiving and storing edit characters and operably connected to said output register for receiving and storing characters from said memory means, and comparison means for comparing the address in said counter means with the address in said maximum count



register and for generating a signal indicating the completion of an edit function, whereby the depression of the edit function key initiates an edit function in said keyboard control means which sequentially transfers the character in said memory means designated by said counter means to said output register and said character in said input register to the designated address in said memory means, then transfers the character in said output register to said input register and increments the counter means one count to designate a new address in said memory means to permit the repetition of the edit function until said comparison means generates a signal indicating a comparison has been made.

4,014,018

## PULSE RADAR APPARATUS

Philip David Lane Williams, Banstead, and Harry Donald Cramp, New Malden, both of England, assignors to Decca Limited, London, England

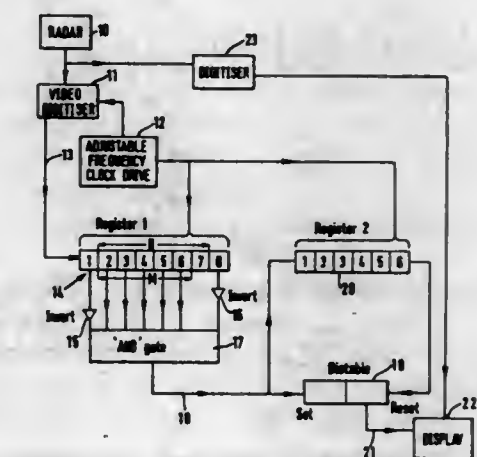
Filed July 16, 1975, Ser. No. 596,454

Claims priority, application United Kingdom, Aug. 6, 1974, 34522/74

Int. Cl.<sup>2</sup> G01S 7/44

U.S. Cl. 343-5 VQ

15 Claims



1. In a receiver for pulse radar apparatus utilising transmitted pulses of a predetermined duration and providing received radar signals; the provision of means for sampling the ampli-







4,014,025

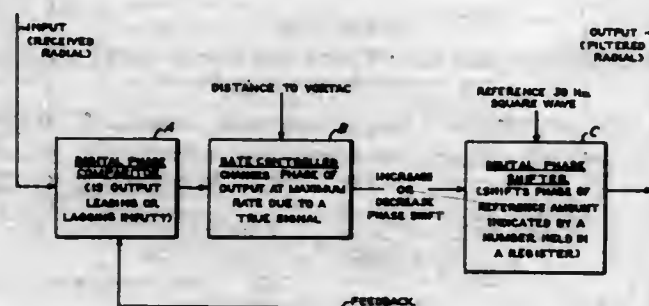
**SCALLOPING SUPPRESSION SYSTEM AND METHOD**  
Andrew M. Vesel, Mount Arlington, N.J., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Mar. 24, 1975, Ser. No. 561,466

Int. Cl.<sup>2</sup> G01S 1/50

U.S. Cl. 343-106 R

24 Claims



1. A scalloping suppression system for use in a bearing determining apparatus wherein the bearing of an object relative to a station is determined by comparing at said object the relative phase of a reference signal and a variable phase signal emitted at said station, comprising means for deriving from said reference signal a first signal having the same phase as said reference signal and means for deriving from said variable signal a second signal having the same phase as said variable phase signal, means for causing the phase of said first signal to follow changes in the phase of said second signal, means for limiting the rate of change of phase of said first signal to the maximum rate which could be due to an actual bearing change between said object and said station, said phase following means including means for separately delaying each cycle of said first signal and means for separately phase comparing each delayed cycle of said first signal with a cycle of second signal.

4,014,026

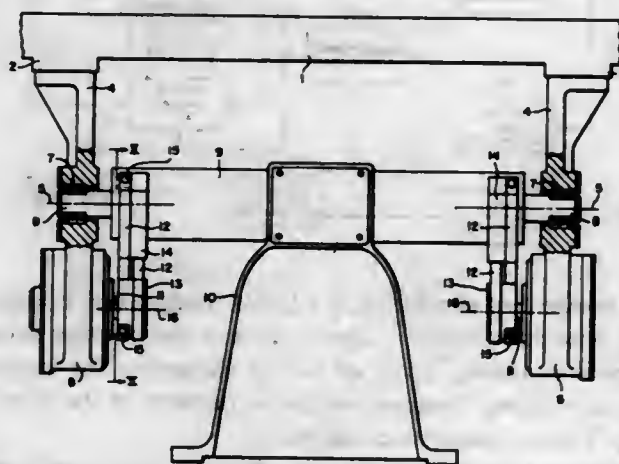
**POWER OPERATED ANTENNA ASSEMBLY**  
Douglas K. Comstock, Glen Burnie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 25, 1975, Ser. No. 635,484

Int. Cl.<sup>2</sup> H01Q 3/06

U.S. Cl. 343-766

3 Claims



1. An antenna assembly comprising, shaft means defining a horizontal axis, arm means mounted on said shaft means for rocking movement vertically about said horizontal axis, said arm means extending fore and aft of such axis, an antenna mounted on the forward end of said arm means, motor means mounted on the rearward end of said arm means, and drive means coupling said motor means to said shaft means for effecting the aforesaid rocking movement.

4,014,027

**OMNIDIRECTIONAL ANTENNA FOR AROUND A MAST**  
Michiel Antonius Reinders, Zoetermeer, Netherlands, assignor to De Staat der Nederlanden, te Dezen Vertegenwoordigd Door de Directeur-Generaal der Posterijen, Telegrafie en Telefonie, The Hague, Netherlands

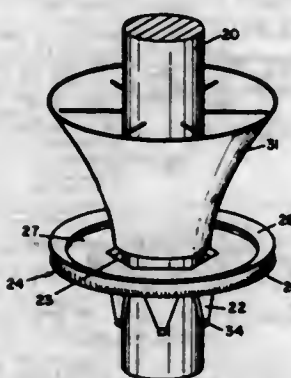
Filed Jan. 19, 1976, Ser. No. 650,306

Claims priority, application Netherlands, Jan. 21, 1975, 7500682

Int. Cl.<sup>2</sup> H01Q 19/14

U.S. Cl. 343-779

3 Claims



1. An omnidirectional antenna surrounding a mast having a uniform diametrical cross-section at all angles comprising:  
A. an annular truncated rotation-symmetrical reflector;  
B. an annular radiator having an outer circular peripheral edge and an inner polygonal edge adjacent the mast, and  
C. a plurality of triangular shaped horns parallel to the axis of said mast feeding the polygonal inner edge of said radiator.

4,014,028

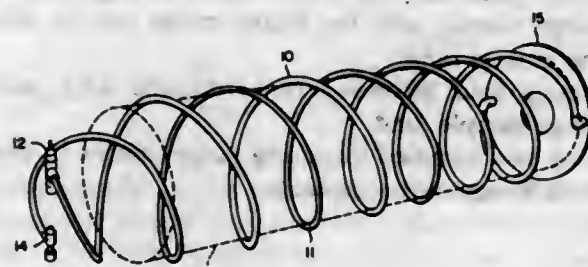
**BACKFIRE BIFILAR HELICAL ANTENNA**  
John A. Cone, Cypress; Robert A. Archer, Torrance; Edward R. Pacheco, Fountain Valley, and Creath E. Peyton, Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Aug. 11, 1975, Ser. No. 603,429

Int. Cl.<sup>2</sup> H01Q 1/36

U.S. Cl. 343-895

5 Claims



1. A backfire antenna for radiating or receiving a circularly polarized wave over a predetermined frequency range, said antenna comprising:  
a. a first helix having a constant diameter;  
b. a second helix having a constant diameter and being wound in the same direction of that of said first helix, each of said helices having an input terminal, and said helices being coaxial; and  
c. means connected to the input terminal of said first helix and to the input terminal of said second helix for simultaneous transfer of high frequency current to each helix, said currents being of substantially equal magnitudes and substantially 180° out of phase with respect to each other, said helices having such a diameter and such a pitch that the high frequency currents on adjacent turns of said helices are out of phase and cancel each other for currents moving from said terminals outwardly, while currents moving towards said terminals at opposite points of said helix are in phase to provide a backfire antenna.

whereby a circularly polarized wave is received or radiated backward from said terminals, the circularly polarized wave having a direction of polarization opposite that of the direction of winding of said helices.

4,014,029

**STAGGERED NOZZLE ARRAY**

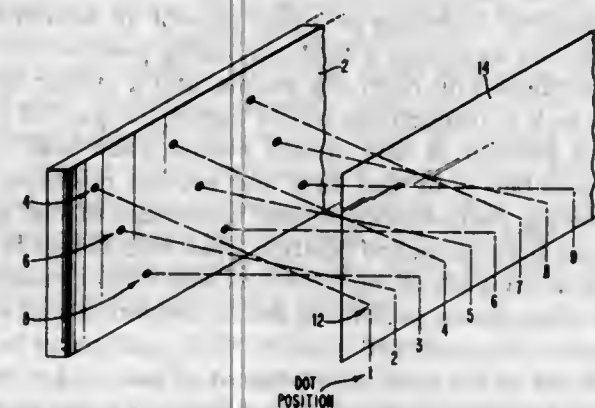
Ramon Lane, Crompond, and Howard Hyman Taub, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,974

Int. Cl.<sup>2</sup> G01D 15/18

U.S. Cl. 346-1

25 Claims



1. In a jet printer including a nozzle plate having at least two rows of nozzles, with the nozzles in one row being staggered with respect to the nozzles in another row, a method of printing at least a portion of a line at a time on a printing medium, wherein said line is comprised of a plurality of dot positions, said method comprising the steps of:  
directing the jets from one row of nozzles towards a selected first group of non-adjacent dot positions on said line on said printing medium; and  
directing the jets from another row of nozzles, in a non-parallel trajectory with respect to the trajectory of the jets from said one row of nozzles, towards a selected second group of non-adjacent dot positions on said line on said printing medium.

4,014,030

**HALF-TONE IMAGING WITH FLYING SPOT SCANNER SYSTEM**

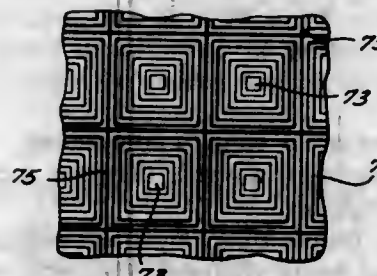
Howard M. Stark, Webster, N.Y., and William Streifer, Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 23, 1976, Ser. No. 660,092

Int. Cl.<sup>2</sup> G03G 15/30

U.S. Cl. 346-160

11 Claims



1. A method for imparting half-tone imaging capability to a flying spot scanning system wherein a collimated light beam is modulated in response to a video electrical signal and reflected as a plurality of beams of modulated light sweeping across a photosensitive surface which comprises:  
positioning proximate the photoreceptor surface but out of contact therewith a light attenuating member having an optional light transmission characteristic that varies in a

continuous and cyclic pattern with a cycle period of at least about 10 times the maximum lateral extent of said light beam.

4,014,031

**ELECTROPHOTOGRAPHIC TYPESETTING METHOD AND APPARATUS THEREFOR**

Shigeru Hasegawa, Yokohama; Katsuyoshi Takai, Fujimi; Hiroharu Yamazaki; Sueo Kikkawa, both of Tokyo, and Elzo Suyama, Hayama, all of Japan, assignors to Sakata Shokai Ltd. and Tokyo Broadcasting System, Inc., both of Tokyo, Japan

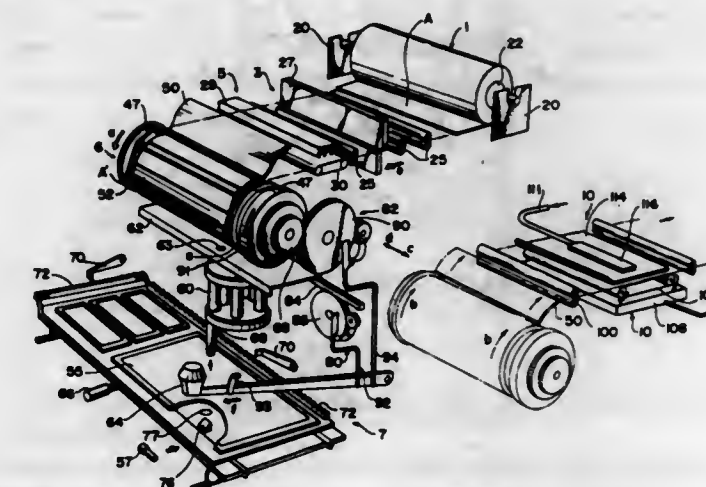
Filed Aug. 29, 1975, Ser. No. 609,041

Claims priority, application Japan, Mar. 28, 1975, 50-37657

Int. Cl.<sup>2</sup> B41B 13/00, 21/24

U.S. Cl. 354-5

2 Claims



1. An apparatus for making prints comprising:  
an electrically charging device for electrically charging a photoconductive material;  
a photoconductive material holding device for holding said electrically charged material; and  
an image exposing device having a phototypesetting machine adapted to expose said charged material to light through desired characters, numerals and/or other symbols in the original plate of said phototypesetting machine, said photoconductive material holding device including a rotary holding drum about which said electrically charged photoconductive material is disposed in position and held at the opposite side edges of the material in the axial direction of said drum, said photoconductive material holding device also including a pair of endless belts spaced away from each other in the axial direction of said drum, each of said belts being partially trained around the corresponding outer periphery of said drum, the engaging faces of said belts with said outer peripheries being driven at the same rate and in the same direction as those of said outer peripheries of said drum whereby when an electrically charged photoconductive material is fed onto the holding drum, the material is pinched between the rotating drum and holding belts so that the material is held at the opposite side edges thereof on the holding drum.

4,014,032

**PHOTOGRAPHIC APPARATUS**

John Currie, Walton-on-Thames, England, assignor to Photo-Me Limited, Walton-on-Thames, England

Filed Sept. 8, 1975, Ser. No. 611,528

Claims priority, application United Kingdom, Sept. 10, 1974, 39411/74

Int. Cl.<sup>2</sup> G03B 17/50; G03D 3/04; B01F 13/00

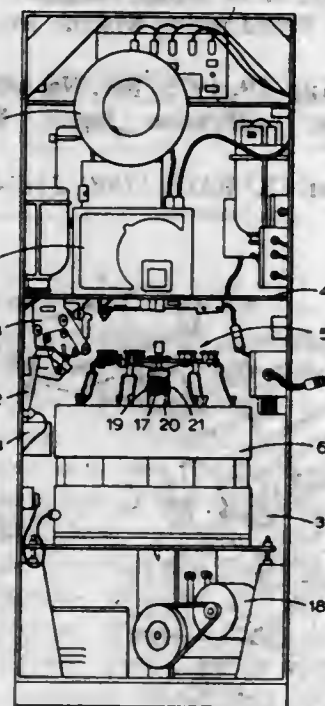
U.S. Cl. 354-93

2 Claims

1. A photographic apparatus comprising a camera, a circular array of open topped processing tanks adapted to contain



processing liquids and arranged beneath the camera, a film carrier disposed beneath the camera and above the array of processing tanks, the said carrier being arranged to receive exposed film from the camera, means for moving the carrier up and down and for rotating it step by step thereby to dip the film carried by the carrier into each tank of the array in turn, an agitator in each tank, each said agitator comprising a vertically disposed operating stem spaced from a tank side, said stem arranged to be moved downwards in the tank when the



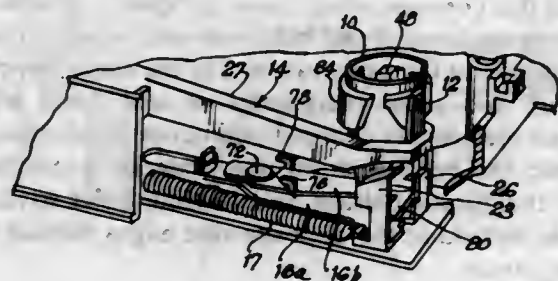
carrier moves downwards, means for moving the operating stem upwards when the carrier moves upwards, and a plurality of agitator blades extending transversely of the stem and mounted thereon for limited pivotal movement with respect thereto, with an end of each blade remote from the stem, movably socketed in a transverse groove in said tank side, which blades are movable about their respective connections to the stem and tank side by upward and downward movement of the operating stem thereby to agitate liquid in the tank.

4,014,033

**PERCUSSIVE FLASH UNIT OPERATING MECHANISM**  
Kwok Yan Chan, North Point, Hong Kong, assignor to W. Haking Industries, Ltd., Victoria, Hong Kong  
Filed Feb. 11, 1975, Ser. No. 548,904  
Int. Cl.<sup>2</sup> G03B 15/04

U.S. Cl. 354-142

6 Claims



1. In a still camera including a housing having shutter means operative to expose film in the housing, manually operable trigger means including a portion exposed to the outside of the camera housing for manual operation for operating the shutter means to effect a picture taking operation, and manually operable shutter resetting means exposed to the outside of the housing for advancing the film and resetting the shutter for operation by said manually operable trigger means, and a flash unit-receiving means exposed to the outside of the camera housing for receiving a flash unit of the percussive type requiring a force against a flash producing portion thereof to effect

a flash operation, the improvement comprising striker means mounted for movement; in response to operation of said manually operable shutter resetting means, from an uncocked to a cocked position and including force applying means positioned so as to be able to effect the application of a flash initiating force against a flash producing portion of a unit in said flash unit-receiving means during the movement of said striker means from its cocked to its uncocked position, spring means for urging said striker means from said cocked to said uncocked position, means for releasing said striker means from said cocked position upon operation of said manually operable trigger means unless hindered from being so released, and a striker holding member having first and second positions when a flash unit is respectively inserted into and removed from said flash unit-receiving means, said striker holding member including as a part thereof an actuator portion positioned to engage a flash producing portion of a flash unit in said flash unit-receiving means, and a striker holding portion which is respectively out of and in the path of movement of a portion of said striker means when said striker holding member is in said first and second positions, said striker holding portion stopping any movement of said striker means to its fully uncocked position when said striker holding portion is in the path of movement of said striker means, the striker holding means permitting the movement of said striker means to its fully uncocked position when said striker holding portion is out of the path of movement of said striker means, said striker holding member having a force receiving means in the path of movement of said force applying means when the striker means is permitted to be moved to its fully uncocked position which force applying means then moves said striker holding member into a position where said actuator portion there is capable of contacting the flash producing portion of a flash unit in the flash unit-receiving means.

4,014,034

**SINGLE LENS REFLEX CAMERA**

Toshinori Imura, Sakai, Japan, assignor to Minolta Camera

Kabushiki Kaisha, Japan

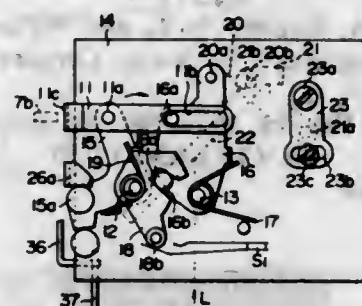
Filed Apr. 21, 1975, Ser. No. 569,753

Claims priority, application Japan, Apr. 25, 1974, 49-46013[U]; Apr. 25, 1974, 49-46511[U]; Apr. 25, 1974, 49-46512[U]

Int. Cl.<sup>2</sup> G03B 19/12, 9/02

U.S. Cl. 354-152

23 Claims



1. A single lens reflex camera comprising:

- a first drive member movable between a cocked position and a rest position;
- a drive-force transmitting member engaging said drive member and being rotatable therewith when said first drive member moves from its cocked position to its rest position;
- an actuating member reciprocally movable from a first position to a second position and being engaged by said drive-force transmitting member for effecting such movement of said actuating member;
- spring means for causing said actuating member to return from its second position to its first position;
- a diaphragm normally biased for movement from an open aperture position to a stopped down position;

a diaphragm drive member operatively coupled with said actuating member and rotatable in association with the movement of said actuating member and, upon movement of said actuating member from its first to its second position, said diaphragm drive member serving to enable said diaphragm, normally biased in a direction for being stopped down, to be stopped down from its open aperture position to a preadjusted diaphragm aperture, and upon return movement of said actuating member, said spring means causing said diaphragm drive member to drive the diaphragm against its normal biasing from its stopped down position to its open position;

a reflecting mirror movable between a viewing position and a picture taking position and biased so as to be normally located in its viewing position;

a reflecting mirror drive member coupled to said reflecting mirror and adapted to be operatively coupled to said actuating member such that upon advancing movement of said actuating member, said mirror drive member drives said reflecting mirror from its viewing position to its picture taking position, and upon return movement of said actuating member, said mirror drive member being disengaged from said actuating member; and means for disengaging said first drive member from said drive-force transmitting member.

4,014,035

**MULTIPLE EXPOSURE CAMERA TAKE-UP SPOOL**

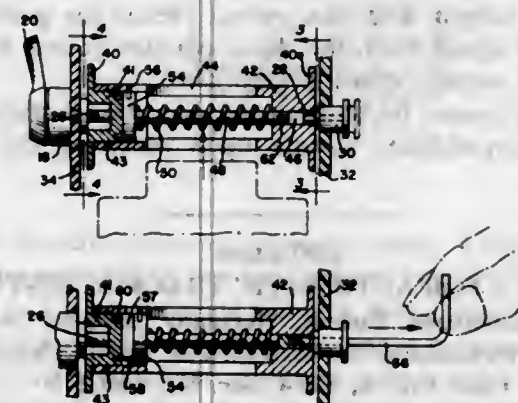
Carl Rex Canfield, Jr., 12317 Windsor Drive, Carmel, Ind. 46032

Filed Sept. 23, 1975, Ser. No. 616,080

Int. Cl.<sup>2</sup> G03B 1/40

U.S. Cl. 354-209

8 Claims



1. In a camera of the type having a roll film supply spool and a film take-up spool, a shutter cocking and film advancing mechanism coupled to the film take-up spool, whereby cocking the shutter rotates the film take-up spool to advance the film for the subsequent taking operation, to thereby prevent double exposures, and a movable retainer pin engaging one end of the film take-up spool the improvement comprising, means carried by said take-up spool to prevent rotation of the take-up spool upon actuation of the shutter cocking mechanism, whereby double exposures may be deliberately made.

4,014,036

**SINGLE-ELECTRODE CHARGE-COUPLED RANDOM ACCESS MEMORY CELL**

Irving T. Ho, Poughkeepsie, and Hwa N. Yu, Yorktown Heights, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Continuation of Ser. No. 159,860, July 6, 1971, abandoned.

This application Sept. 24, 1973, Ser. No. 400,481

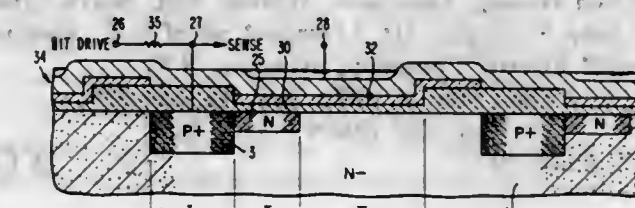
Int. Cl.<sup>2</sup> H01L 29/78

U.S. Cl. 357-24

6 Claims

1. A charge coupled random access memory array comprising:  
a semiconductor body having therein an impurity of a first conductivity type,

a plurality of charge couple memory cells arranged in columns and rows on said body,  
bit lines extending in the column direction, each bit line in operative relation to a column of said cells,  
word lines extending in the row direction, each word line in operative relation to a row of said cells,  
each of said cells comprised of a first region in said semiconductor body having embodied therein an impurity of a second opposite conductivity type, said first region of said cell in operative electrical connection with one of said bit lines,  
a second region in said body in adjacent lateral relationship to said first region in the row direction,  
a third region in said body in adjacent lateral relationship to said second region, and spaced from said first region by said second region, said third region spaced from the first region of the adjacent memory cell,  
a surface layer of dielectric material overlying at least said second region and said third region,  
means associated with said dielectric layer providing said second region with a first predetermined threshold voltage, and said third region with a second threshold voltage



less in absolute magnitude than said first predetermined threshold voltage,  
a single conductive electrode on said surface layer of dielectric material and extending over said second and third regions in superimposed relation and in operative electrical connection with one of said word lines,  
said single electrode having a first portion over said second region of said body, and a second portion over said third region of said body,  
a means of applying at least two voltage levels to said conductive electrode to control the storage of charges in, and flow of charges to, said third region, the first of said voltage levels applied to said conductive electrode is of an absolute magnitude less than said first predetermined threshold voltage of said second region, but equal to or greater than said second threshold voltage of said third region, thereby inverting only said third region for charge storage capability,  
the second of said voltage levels of an absolute magnitude equal to or greater than said first predetermined threshold voltage of said second region thereby inverting both of said second and third regions for charge flow capability.

4,014,037

**SEMICONDUCTOR DEVICE**

Takeshi Matsushita, Sagami-hara; Hisao Hayashi, Atsugi; Teruaki Aoki, Tokyo; Hisayoshi Yamoto, Hatano, and Yoshiyuki Kawada, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 24, 1975, Ser. No. 561,532

Claims priority, application Japan, Mar. 30, 1974, 49-36175

Int. Cl.<sup>2</sup> H01L 29/34

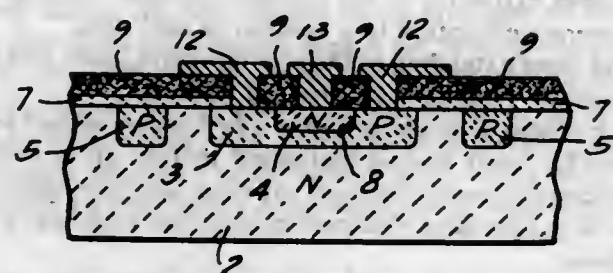
U.S. Cl. 357-52

5 Claims

1. A semiconductor device comprising:  
a semiconductor single crystal substrate;  
a polycrystalline silicon layer containing oxygen in the range of 2 to 45 atomic percent on and in substantially electrical contact with said substrate;



said layer having a predetermined electric property such



that the surface state of said substrate is substantially unaffected by an electric field across said layer.

4,014,038

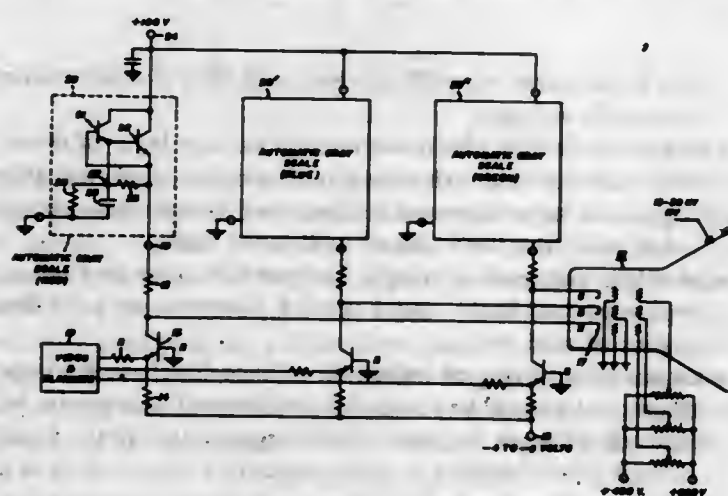
### AUTOMATIC GRAY SCALE CONTROL CIRCUIT FOR A COLOR TELEVISION RECEIVER

Ying-Chen Hwang, Liverpool; William Pell, North Syracuse, and John F. Zeigler, III, Liverpool, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,554  
Int. Cl.<sup>2</sup> H04N 9/535, 3/24

U.S. Cl. 358-29

16 Claims



1. In a color television receiver, the combination comprising:

- A. a three gun CRT, each gun having a  
1. cathode  
2. signal grid, and  
3. screen grid,

- B. three video drivers for said three guns, each driver having  
1. video and blanking signals applied thereto, and  
2. a load to which the cathode of the associated gun is direct coupled,

3. the impedance between cathode and ground during blanking being selected to cause said CRT to self-bias itself to cut off during vertical blanking at a predetermined small current level,

- C. three sources of controlled d.c. bias potentials for energizing said three drivers, each source

1. providing a potential substantially equal to the cut-off potential of the associated CRT gun, and

2. comprising:  
a. an energy storage circuit including a capacitor,  
b. means for charging said capacitor to said cut-off potential during vertical blanking, said energy storage circuit having a time constant adequate to maintain said potential substantially constant between successive vertical blanking pulses, and  
c. voltage control means coupled to said energy storage circuit for coupling a bias potential to said driver load equal to said stored cut-off potential during video and for decoupling said bias potential during blanking.

4,014,039

### AUTOMATIC PROGRAM LOCATOR FOR TAPE DECKS

Tatsuhiko Yasunaga, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

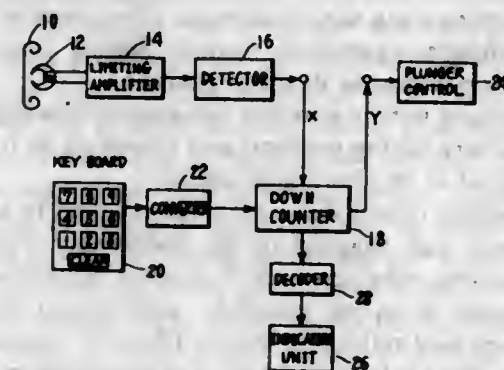
Filed Apr. 24, 1975, Ser. No. 571,411

Claims priority, application Japan, Apr. 24, 1974, 49-61056

Int. Cl.<sup>2</sup> G11B 27/24, 15/18, 15/02

U.S. Cl. 360-72

10 Claims



1. An automatic program locating system for tape reproduction systems comprising:

- a. a sensing head in physical contact with a tape when the tape reproduction system is in the fast forward or rewind drive mode;  
b. recorded passage detection circuit means connected to receive signals from the sensing head for generating a silence detection signal when the sensing head reaches a silence portion between recorded programs;  
c. down counter means which counts down one count in response to each occurrence of a silence detection signal;  
d. key input means for introducing a desired number into the down counter;  
e. count output detection circuit means for generating a control signal when the down counter counts from said desired number down to zero; and  
f. shifting means for shifting the operational states of the tape reproduction system upon receiving the control signal.

4,014,040

### APPARATUS FOR AUTOMATIC TRACK REGISTRATION

Wolfgang Kornhaas, Fuerth, Germany, assignor to E.M.V. Elektro-Mechanische Versuchsanstalt, Fuerth, Germany

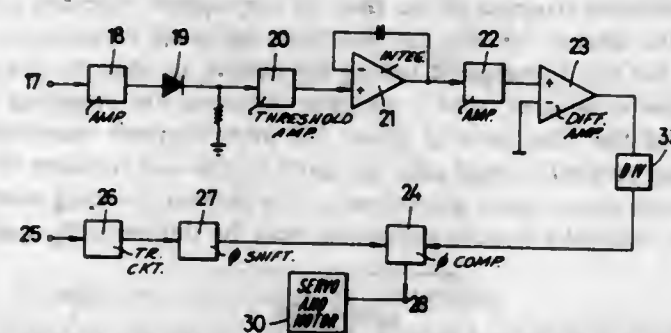
Filed Feb. 6, 1974, Ser. No. 440,279

Claims priority, application Germany, Feb. 8, 1973, 2306197

Int. Cl.<sup>2</sup> G11B 15/46

U.S. Cl. 360-73

3 Claims



1. An automatic track searching device for a magnetic video tape recorder/reproducer comprising magnetic tape supply and take-up reels, tape transport means operatively associated with said reels, a guide drum provided with a slot and helically encircled at a determinable wrap angle by the magnetic tape, at least one video head rotating in said guide drum and scanning said tape through said slot in diagonal video tracks, and a stationary track finding magnetic head in said guide drum within said wrap angle and having a magnetic gap flush with the guide drum surface and having a length equal to the width and a direction perpendicular to the direction of said video tracks; said track finding head scanning about the center of the magnetic tape in longitudinal direction to produce an

amplitude-modulated high-frequency output voltage, the peaks of said output voltage being a measure of the actual position of said video tracks; a threshold amplifier, said output voltage, after being amplified and rectified, being applied to said threshold amplifier, said threshold amplifier having a threshold voltage which is lower than the peak of said output voltage and higher than said peak voltage multiplied by the difference of said video track width and the interspace between said video tracks and divided by said video track width; a phase comparator, the output of said threshold amplifier being connected to said phase comparator and being phase compared with the rated position signals of said rotating video head to form an error signal; said error signal being applied to said tape transport means to readjust the relative positions of said tape and said rotating video head so as to minimize tracking error between said video head and said video tracks.

4,014,041

### CASSETTE RECORDING AND HANDLING DEVICE

Rodolfo Ciatelli, Rome, Italy, assignor to Autovox S.p.A., Roma, Italy

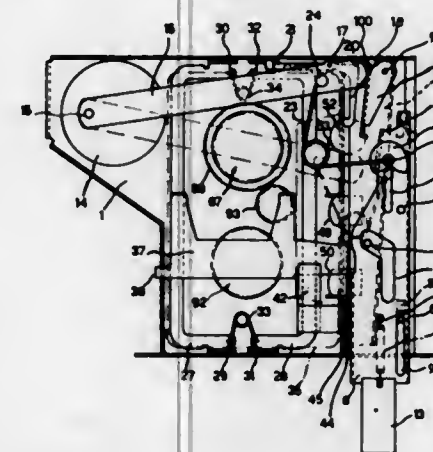
Filed Apr. 1, 1975, Ser. No. 564,204

Claims priority, application Italy, Apr. 5, 1974, 50170/74

Int. Cl.<sup>2</sup> G11B 15/10, 15/24

U.S. Cl. 360-96

5 Claims



1. In a cassette recorder having a frame, a tape transport mechanism operable in fast forward and fast rewind modes in response to a control device therefor, and a cassette handling mechanism mounted in said frame, and a motor driving said tape transport mechanism; a slide member reciprocable on a bridge of said frame between an internal, retracted position and an external, extracted position, said slide having a slot therein and having a front end and a rear end; a spring biasing said slide toward its external position; an arm pivoted in said frame and carrying a recording head, an erase head and a pressure roller of a capstan, said arm also carrying a pivot engaging said slot in said slide to shift said heads and said pressure roller into inoperative positions when the slide is pushed inward into its retracted position and to shift said heads and pressure roller into operative positions when said slide is moved to its extracted position; a handle linked to the front end of said slide and engaging said arm and the control device for selecting the fast forward and rewind modes of said tape transport mechanism.

4,014,042

### TAPE RECORDER AND MAGNETIC TAPE CASSETTE

Klaus Schoettl, Ludwigshafen; Heinrich Wittkamp, Mannheim; Karl Uhl, Frankenthal, and Gerhard Rotter, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 467,636, May 7, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,301

Claims priority, application Germany, May 9, 1973, 2323327

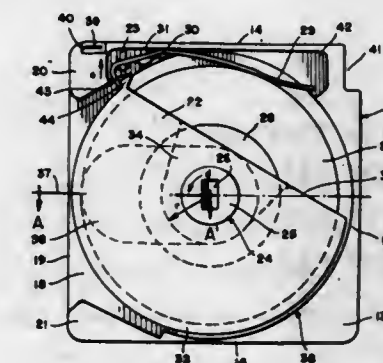
Int. Cl.<sup>2</sup> G11B 23/02, 15/32

U.S. Cl. 360-132

10 Claims

1. A magnetic tape cassette comprising a housing containing a tape roll wound on a reel, said housing having an opening

formed in a wall thereof, and said housing containing a sheath partly surrounding the roll, means mounting said reel in said housing for both rotational and transverse movement relatively thereto, and means mounting said sheath in said housing for movement relatively thereto from a normal position in which said



sheath substantially keeps said reel from transversely moving relatively to said housing and in which said sheath closes said opening, to an operative position in which said reel is freed for transverse movement in the direction of said opening and part of the roll of tape thereon is made accessible for edge driving from the outside of said opening.

4,014,043

### CASSETTE TYPE MAGNETIC RECORDING AND REPRODUCING APPARATUS

Tetsuji Yoshii, Neyagawa, Japan, assignor to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 71,592, Sept. 11, 1970, Pat. No. 3,872,509.

This application May 15, 1974, Ser. No. 470,305

Claims priority, application Japan, Sept. 19, 1969, 44-76031;

Oct. 2, 1969, 44-78825; Mar. 31, 1970, 45-27573; Apr. 17, 1970,

45-37730[U]; Apr. 17, 1970, 45-37731[U]

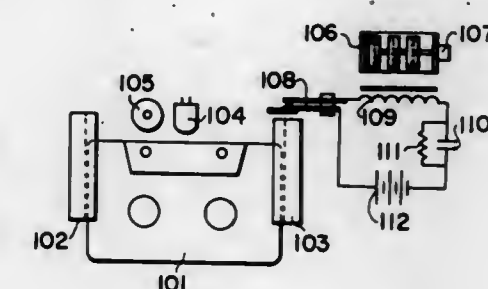
Disclosure was also published under the second Trail Voluntary

Protest Program on Apr. 6, 1976

Int. Cl. G11B 27/14

U.S. Cl. 360-137

1 Claim



1. A cassette type magnetic recording and reproducing machine in which a tape is housed in a cassette, comprising:

- a. a cassette support;  
b. means for indicating the amount of feed of the tape in the cassette; and  
c. means, interposed between the cassette support and the indicating means, for automatically zero resetting the indicating means directly in response to movement of the cassette into the playing position of the tape, including, in electrical circuit, a power source, a switch which is closed on movement of the cassette into the playing position of the tape, an electromagnet which resets said indicating means, and a resistor and capacitor having a predetermined relatively short time constant, said electromagnet being operative for a relatively short time until said capacitor is charged.



# DESIGN PATENTS

GRANTED MARCH 22, 1977

## ERRATA

For	See
CLASS	PATENT NO.
016-028 .....	243,758
014-044 .....	243,771
013-033 .....	243,772
014-058 .....	243,773
024-023 .....	243,776
048-024 A .....	243,787
014-071 .....	243,794
015-007 .....	243,796
028-019 .....	243,800



## TABLE 7

**MARCH 22, 1977**

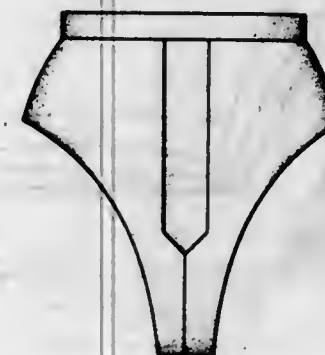
**John Neville Lloyd, 80a Walsingham Road, Hove, Sussex BN3 4FF, England**

Filed Apr. 21, 1975, Ser. No. 570,240

**Term of patent 14 years**

**Int. Cl. D2—01**

U.S. Cl. D2-10



3 Francis A. Schaefer, Wilson, Wyo., assignor to Rocky Mountain Featherbed Company, Inc., Jackson, Wyo.

**Filed Feb. 24, 1975, Ser. No. 552,161**

**Term of patent 14 years**

Int. Cl. D2—02

U.S. Cl. D2-190



**Francis A. Schaefer, Wilson, Wyo., assignor to Rocky Mountain Featherbed Company, Inc., Jackson, Wyo.**

**Filed Feb. 24, 1975, Ser. No. 552,160**

**Term of patent 14 years**

**Int. Cl. D2—02**

U.S. Cl. D2-191

Louise Poirier, Montreal, Canada, assignor to Canadian Lady-  
Canadelle Inc., Montreal, Canada

**Filed Jan. 14, 1975, Ser. No. 540,944**

**Term of patent 14 years**

Int. Cl. D2-01

U.S. Cl. D2-24



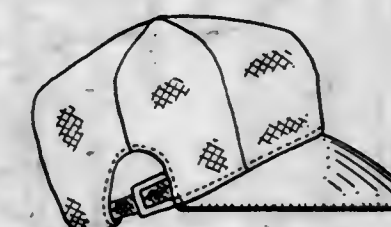
**Erline L. Huffman, P.O. Box 621, Litchfield Park, Ariz. 85340**

Filed May 21, 1975, Ser. No. 579,671

**Term of patent 14 years**

Int. Cl. D2—03

U.S. Cl. D2-244

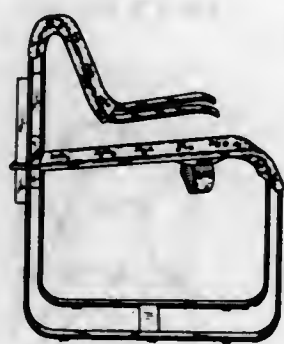




243,726  
CHAIR

Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy  
Filed Mar. 18, 1975, Ser. No. 559,448  
Claims priority, application Italy, Sept. 19, 1974, 60914/74  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-69

243,727  
ARMCHAIR

Ricardo Godofredo Blanco, Buenos Aires, Argentina, assignor to Dia S.R.L., Buenos Aires, Argentina  
Filed June 20, 1975, Ser. No. 588,828  
Claims priority, application Argentina, May 30, 1975, 27923

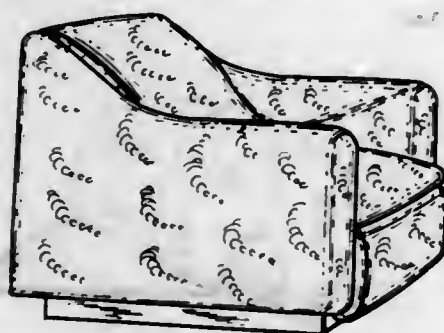
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-69

243,728  
UPHOLSTERED SEAT

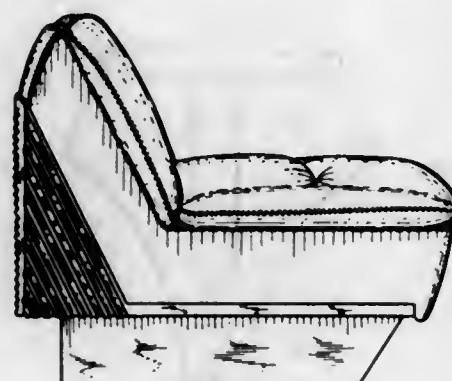
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy  
Filed July 14, 1975, Ser. No. 595,405  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-71

243,729  
CHAIR

Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy  
Filed Mar. 18, 1975, Ser. No. 559,390  
Claims priority, application Italy, Sept. 19, 1974, 60918/74  
Term of patent 14 years  
Int. Cl. D6-01

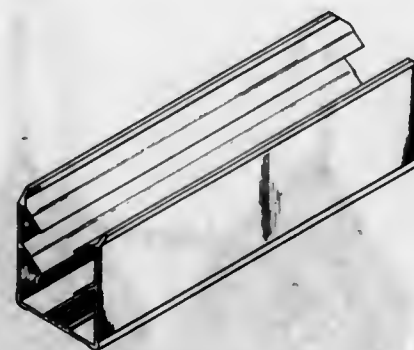
U.S. Cl. D6-75

243,730  
WAND HOLDER

Robert B. Koenig, Dallas, and Rodney Barclay, Richardson, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.  
Filed Dec. 15, 1975, Ser. No. 640,919

Term of patent 14 years  
Int. Cl. D6-99

U.S. Cl. D6-85

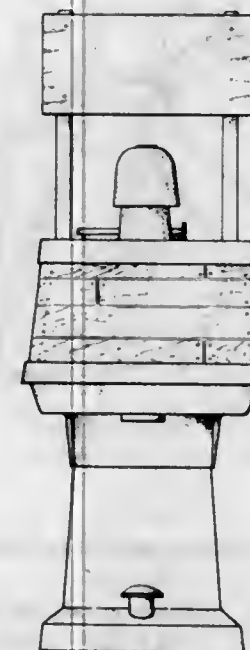


## 243,731

## SOAP DISPENSER OR THE LIKE

Linda Jansen Donaldson, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc., Minneapolis, Minn.  
Filed Apr. 14, 1975, Ser. No. 567,912  
Term of patent 14 years  
Int. Cl. D23-02

U.S. Cl. D6-95

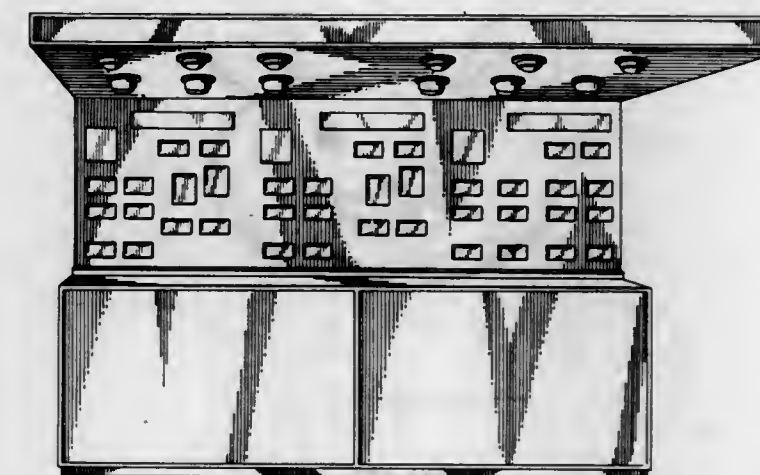


## 243,733

## JEWELRY DISPLAY CASE

Jerry Shaw, 50 W. Fairlawn Blvd., and Samuel G. Solitt, 2121 Brookshire Road, both of Akron, Ohio 44313  
Filed Nov. 12, 1975, Ser. No. 630,979  
Term of patent 14 years  
Int. Cl. D20-02

U.S. Cl. D6-127



## 243,734

## DISPLAY RACK

Rafael T. Bustos, Atlanta, Ga., assignor to Leggett & Platt Incorporated and International Beverage Supply Displays Inc., part interest to each  
Filed June 25, 1975, Ser. No. 590,397  
Term of patent 14 years  
Int. Cl. D6-04; D20-02

U.S. Cl. D6-134



## 243,732

## COMBINED DISPLAY AND STORAGE RACK

Joseph J. Vogt, 4294-26th St., Dorr, Mich. 49323  
Filed Mar. 3, 1975, Ser. No. 554,479  
Term of patent 14 years  
Int. Cl. D6-04; D20-02

U.S. Cl. D6-127

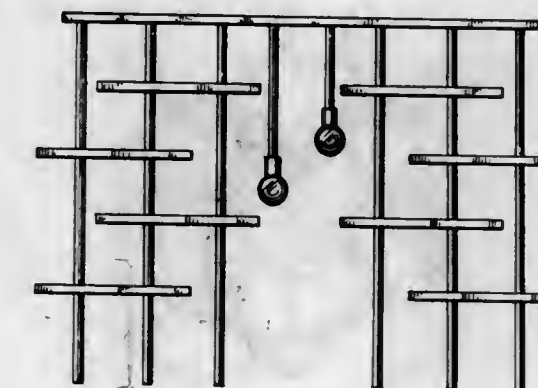


## 243,735

## SHELVING AND LIGHT FIXTURES THEREFOR

Richard Walton Enners, 172 Wedgewood Circle, Eatontown, N.J. 07724  
Filed Oct. 21, 1975, Ser. No. 624,462  
Term of patent 14 years  
Int. Cl. D6-04

U.S. Cl. D6-186





243,736  
PILLOW

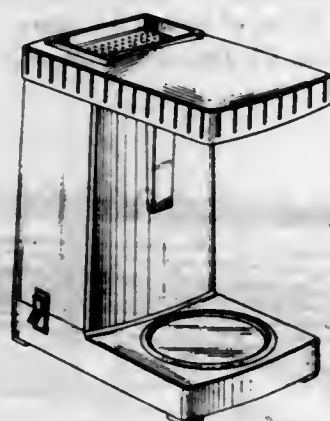
Haruo Ishizuka, 2043-19, Bingo, Kasukabe, Saitama, Japan  
Filed Oct. 31, 1974, Ser. No. 519,764  
Term of patent 14 years  
Int. Cl. D6-09

U.S. Cl. D6-203

243,737  
COFFEEMAKER

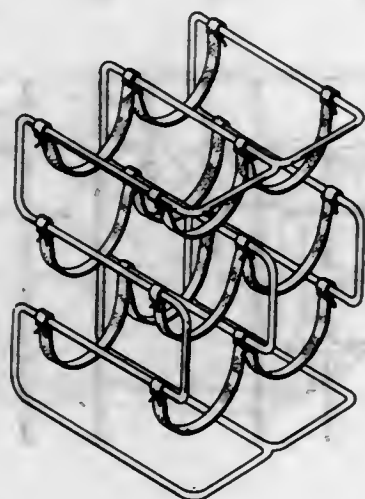
David L. Painter, Glenview, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.  
Filed Aug. 15, 1975, Ser. No. 605,131  
Term of patent 14 years  
Int. Cl. D7-02

U.S. Cl. D7-62

243,738  
WINE RACK

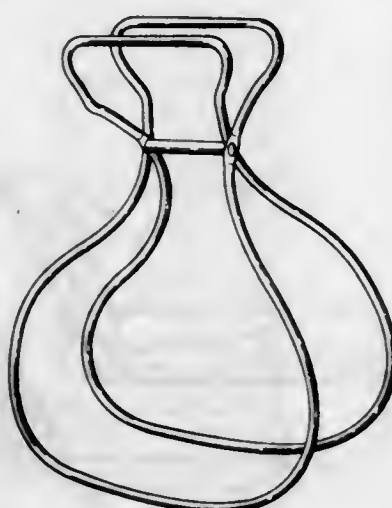
Michael K. Johnson, 1230 Monterey Blvd., San Francisco, Calif. 94127  
Filed Oct. 3, 1975, Ser. No. 619,210  
Term of patent 14 years  
Int. Cl. D7-99; D6-04

U.S. Cl. D7-71

243,739  
MEAT LIFTING TONGS

James P. Mazza, 1135 Fifth St., Sandusky, Ohio 44870  
Filed Sept. 4, 1975, Ser. No. 610,148  
Term of patent 14 years  
Int. Cl. D7-06

U.S. Cl. D7-105

243,740  
HIBACHI

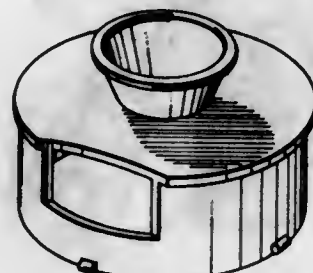
William R. Small, P.O. Box 1874, Ontario, Calif. 91762  
Filed Aug. 11, 1975, Ser. No. 603,763  
Term of patent 14 years  
Int. Cl. D7-04

U.S. Cl. D7-110

243,741  
COFFEEMAKER LID OR SIMILAR ARTICLE

Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company  
Filed July 28, 1975, Ser. No. 599,415  
Term of patent 14 years  
Int. Cl. D7-02

U.S. Cl. D7-131

243,742  
CORDLESS TOOL

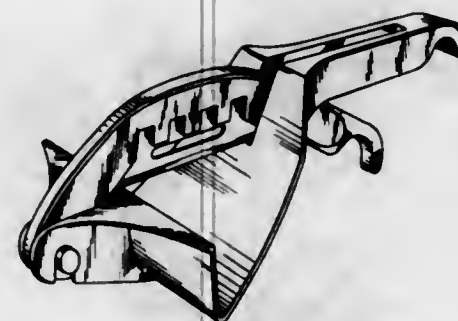
Lawrence Emmerson House, II, Baltimore, and Roderick Francis Bunya, Cockeysville, both of Md., assignors to The Black and Decker Manufacturing Company  
Filed Aug. 19, 1975, Ser. No. 605,860  
Term of patent 14 years  
Int. Cl. D8-05

U.S. Cl. D8-69

243,743  
MANUAL WINDOW SHADE AND ROLLER CUT OFF KNIFE

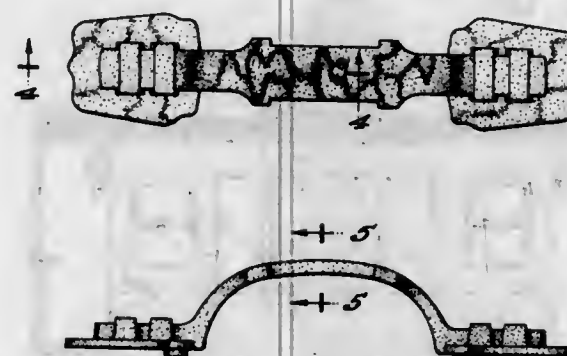
Paul J. Erpenbeck, Muskegon, Mich., assignor to Breneman, Inc., Cincinnati, Ohio  
Filed Feb. 4, 1976, Ser. No. 655,123  
Term of patent 14 years  
Int. Cl. D8-03

U.S. Cl. D8-98

243,744  
PULL

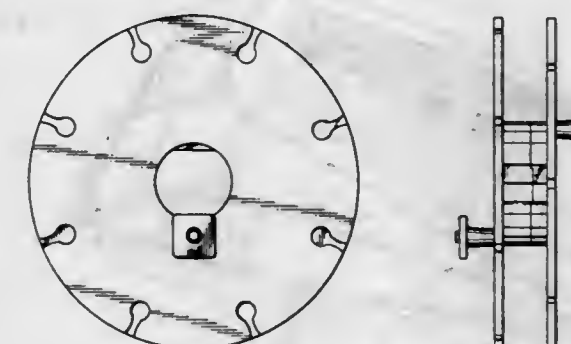
Hubert Dolnar, Pierrefonds, Canada, assignor to Unican Security Systems, Ltd., Montreal, Canada  
Filed Feb. 25, 1976, Ser. No. 661,172  
Term of patent 14 years  
Int. Cl. D8-06

U.S. Cl. D8-318

243,745  
SKI ROPE REEL

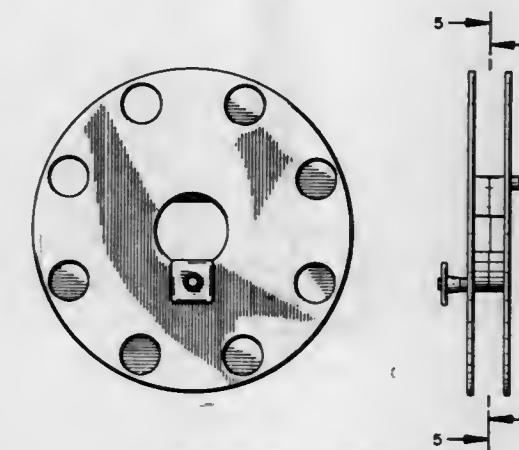
John W. Youngblood, 3201 Franklin, Waco, Tex. 76710  
Filed Apr. 26, 1976, Ser. No. 679,888  
Term of patent 14 years  
Int. Cl. D8-99

U.S. Cl. D8-359

243,746  
PORTABLE REEL

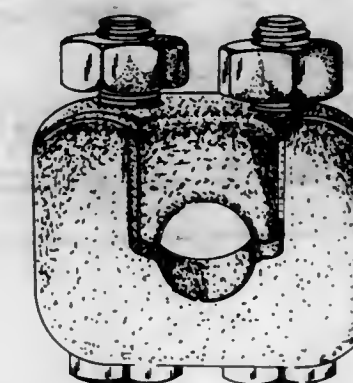
John W. Youngblood, 3201 Franklin, Waco, Tex. 76710  
Filed May 10, 1976, Ser. No. 684,855  
Term of patent 14 years  
Int. Cl. D8-99

U.S. Cl. D8-359

243,747  
WIRE CLAMP

Carl Unghanse, Sollentuna, Sweden, assignor to AB Lundquists Patent, Stockholm, Sweden  
Filed Aug. 1, 1975, Ser. No. 601,140  
Claims priority, application Sweden, Feb. 4, 1975, 259/75  
Term of patent 14 years  
Int. Cl. D8-08

U.S. Cl. D8-396





243,748

## INTERVAL SIGNALLING TIMER

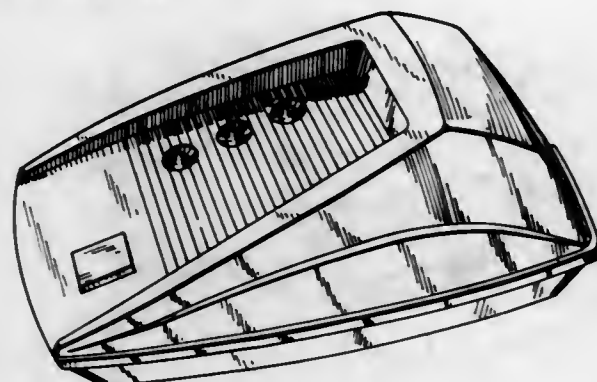
Daniel F. Krause, Loveland, Colo., assignor to Teletymer Inc., Denver, Colo.

Filed July 3, 1975, Ser. No. 592,738

Term of patent 14 years

Int. Cl. D10-02

U.S. Cl. D10-40



243,749

## ELECTRONIC PART SIZING GAGE

Edward F. Menninger, Sterling Heights, Mich., assignor to The Valeron Corporation, Oak Park, Mich.

Filed Sept. 11, 1975, Ser. No. 612,485

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-71



243,750

## DIGITAL DISPLAY BALANCE

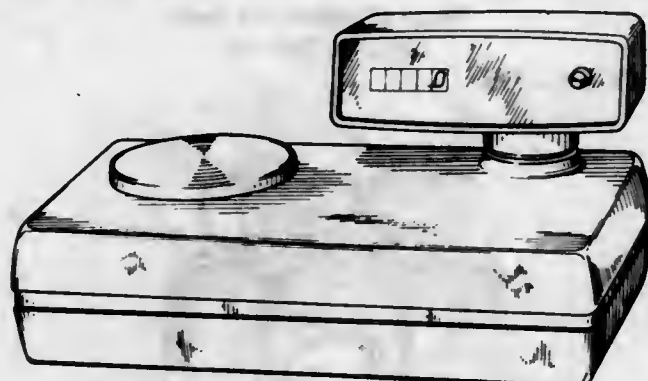
Bernard Wasko, Bronxville, and Manfred Hegemann, Nyack, both of N.Y., assignors to Voland Corporation, New Rochelle, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,623

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-91



243,751

## KEYBOARD FOR A CALCULATOR OR A COMBINED CALCULATOR AND WATCH OR SIMILAR ARTICLE

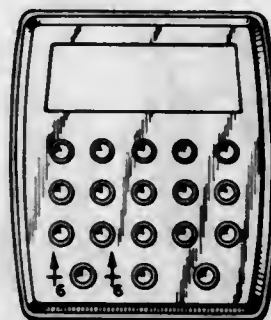
John Price, 20 Trask Road, Peabody, Mass. 01960; Richard E. Seeger, 1 Hill St., Topsfield, Mass. 01983, and William J. Lynn, 2 Murray Road, Groveland, Mass. 01834

Filed Mar. 6, 1975, Ser. No. 555,854

Term of patent 14 years

Int. Cl. D10-07

U.S. Cl. D10-122



243,752

## CART FOR HOUSE AND GARDEN TOOLS

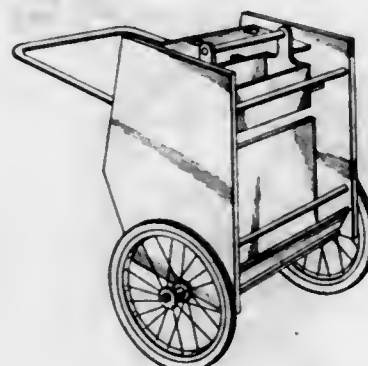
James R. Kardas, Manchester Center, Vt. 05255

Filed Oct. 20, 1975, Ser. No. 624,082

Term of patent 14 years

Int. Cl. D12-02

U.S. Cl. D12-32



243,753

## TRAILER

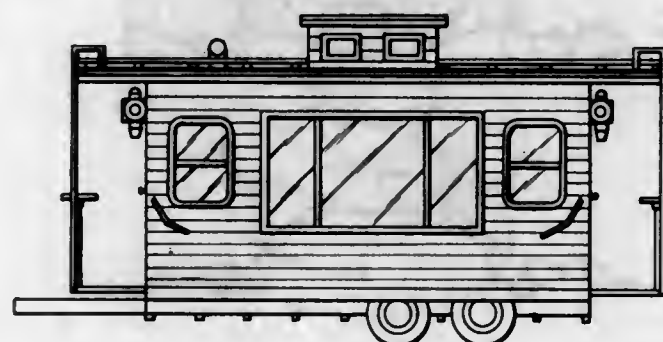
Kenneth A. Raupp, and Ruth M. Raupp, both of 22260 Edison, Dearborn, Mich. 48124

Filed Sept. 2, 1975, Ser. No. 609,798

Term of patent 14 years

Int. Cl. D12-10

U.S. Cl. D12-102



243,754

## BICYCLE

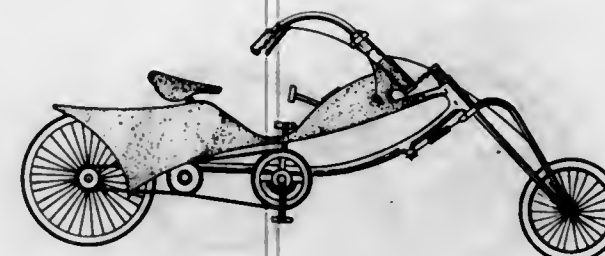
John Cruze Silva, Jr., P.O. Box 1082, Saugus, Mass. 01970

Filed May 5, 1975, Ser. No. 574,407

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-111



243,755

## BICYCLE

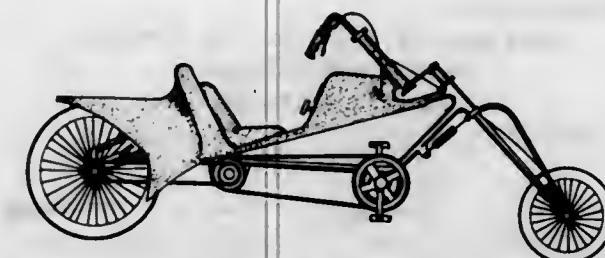
John Cruze Silva, Jr., P.O. Box 1082, Saugus, Mass. 01970

Filed May 5, 1975, Ser. No. 574,408

Term of patent 14 years

Int. Cl. D12-11

U.S. Cl. D12-111



243,756

## VEHICLE TIRE

Shigeo Makino, Tokorozawa; Hiroshi Kojima, Hino; Toshio Hayakawa, Kodaira, and Shigeo Watanabe, Kokubunji, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

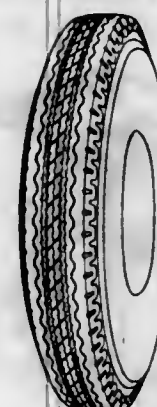
Filed May 14, 1976, Ser. No. 686,281

Claims priority, application Japan, Dec. 26, 1975, 50-50904

Term of patent 14 years

Int. Cl. D12-15

U.S. Cl. D12-142



243,757

## VEHICLE TIRE

Toshio Hayakawa, Kodaira, and Sigemitsu Nakamura, Murayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

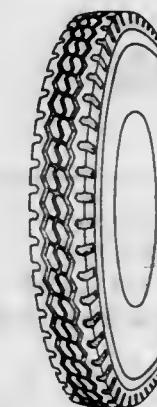
Filed May 14, 1976, Ser. No. 686,280

Claims priority, application Japan, Dec. 8, 1975, 50-47914

Term of patent 14 years

Int. Cl. D12-15

U.S. Cl. D12-147



243,758

## MICROFICHE READER-PRINTER

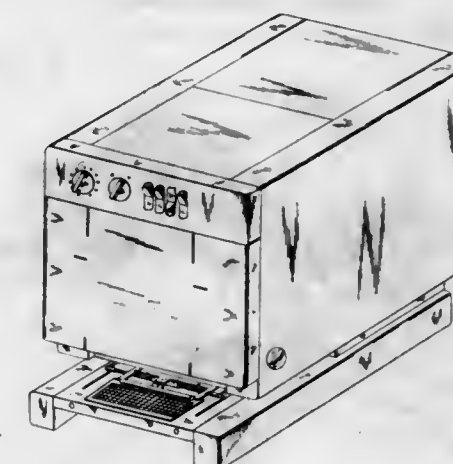
Paul D. Miller, New York, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,377

Term of patent 14 years

Int. Cl. D16-3

U.S. Cl. D16-28





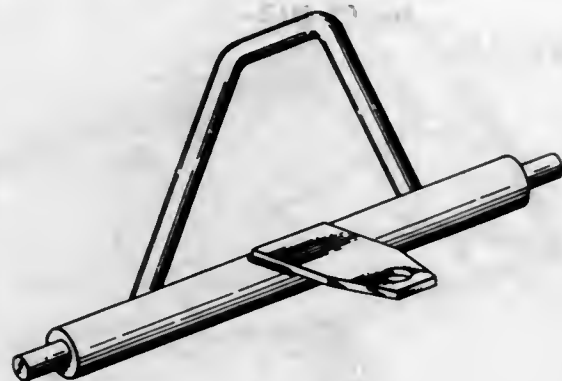
243,759

**TRACTOR TOWING HITCH**

Jerry L. Utzinger, 6268 Jackson Pike, Grove City, Ohio 43123  
Filed Dec. 11, 1975, Ser. No. 639,779

Term of patent 14 years  
Int. Cl. D12-16

U.S. Cl. D15-28



243,760

**PHOTO LAMP**

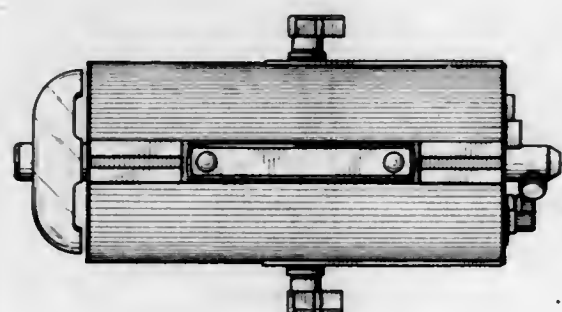
Robert C. Devinney, Jr., Costa Mesa, Calif., assignor to Larson Enterprises, Inc.

Filed Aug. 7, 1975, Ser. No. 602,913

Term of patent 14 years

Int. Cl. D16-05

U.S. Cl. D16-42



243,761

**BINOCULAR WITH EYECUPS THEREFOR**

Claus O. Huckenbeck, Sherman Oaks, Calif., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

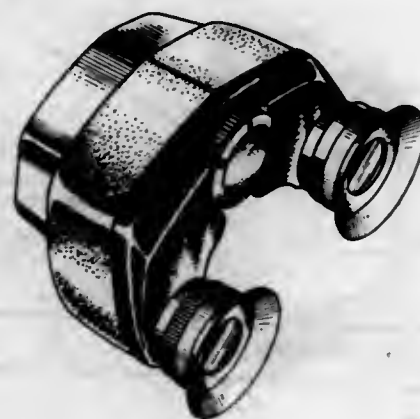
Filed Feb. 14, 1975, Ser. No. 549,878

The portion of the term of this patent subsequent to June 18, 1988, has been disclaimed.

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. 16-59



243,762

**PAIR OF SPECTACLES**

David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Oct. 28, 1975, Ser. No. 626,163

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-65



243,763

**COLOR SELECTION GUIDE**

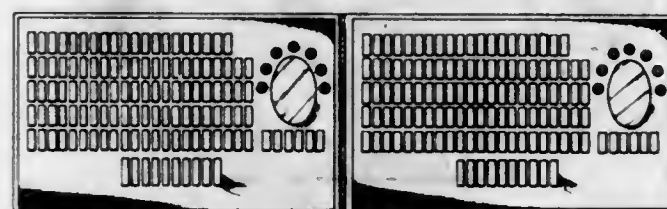
Robert C. Dorr, Woodland Hills, Calif., assignor to Ameritone Paint Corporation

Filed June 11, 1975, Ser. No. 586,046

Term of patent 14 years

Int. Cl. D19-07

U.S. Cl. D19-59



243,764

**COMBINED PENCIL SHARPENER AND CATCH BOX**

Werner Mübius, Hindenburgstrasse 77, Erlangen, Germany (8520)

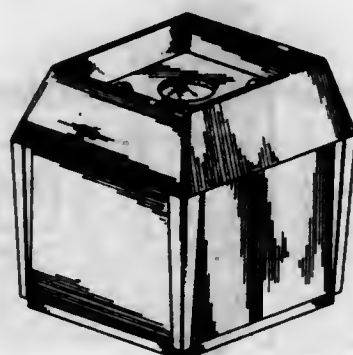
Filed Aug. 4, 1975, Ser. No. 601,405

Claims priority, application Germany, Feb. 3, 1975, 7064

Term of patent 14 years

Int. Cl. D19-06

U.S. Cl. D19-73



243,765

**COLLAPSIBLE COCKROACH CATCHER OR SIMILAR ARTICLE**

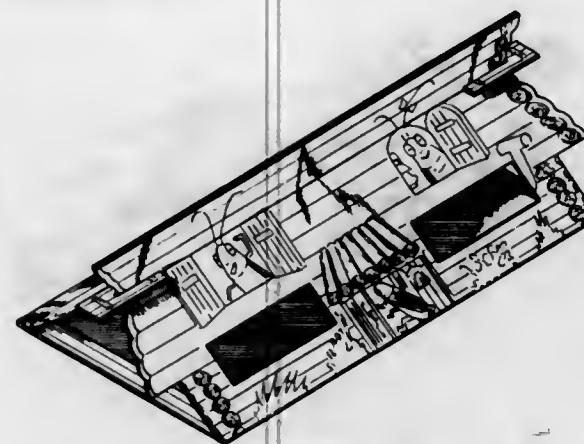
Tadanobu Nakai, Nara, Japan, assignor to Tokiwa Chemical Industries, Limited, Osaka, Japan

Filed Dec. 29, 1975, Ser. No. 645,031

Term of patent 14 years

Int. Cl. D22-06

U.S. Cl. D22-19



243,766

**SUMP BASIN**

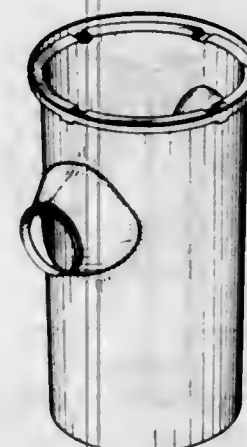
Harold Isaacs, 3107 Wilmette Ave., Wilmette, Ill. 60091

Filed Sept. 29, 1975, Ser. No. 617,305

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-1



243,767

**WATER SOFTENER**

Harry Wayne Rutherford, 1661 Molina Lane, Gardena, Calif. 90247

Filed Nov. 24, 1975, Ser. No. 634,999

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-3



243,768

**BRAKE FLUID FILTER**

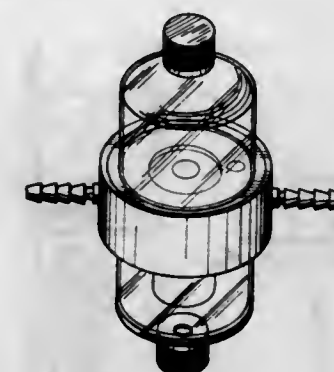
Charles R. Hinojosa, Camuy, P.R., assignor to Besenbruch-Hofmann Inc., Lindenhurst, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,377

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-4



243,769

**DRIP CATCHER FOR A PAINT SPRAY GUN**

Chris A. Rocchio, 724 NW. 28th St., Wilton Manors, Fla. 33311

Filed July 23, 1975, Ser. No. 598,180

Term of patent 14 years

Int. Cl. D23-01

U.S. Cl. D23-36



243,770

**RESTAURANT BUILDING**

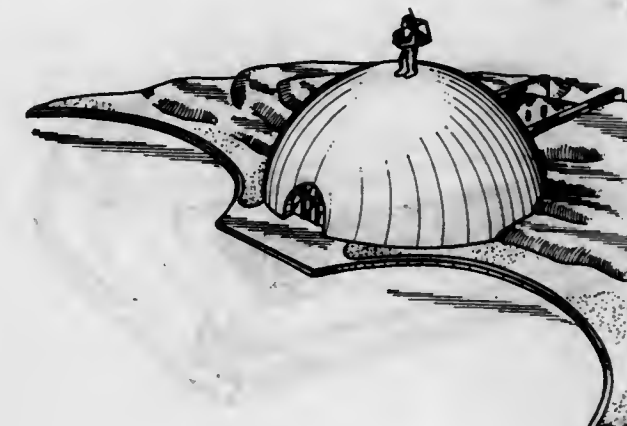
Constantine P. Gianacakis, 8695 Meade St., Montague, Mich. 49437

Filed Oct. 18, 1974, Ser. No. 516,014

Term of patent 14 years

Int. Cl. D25-03

U.S. Cl. D25-9





243,771

**COMPUTER OR SIMILAR ARTICLE**

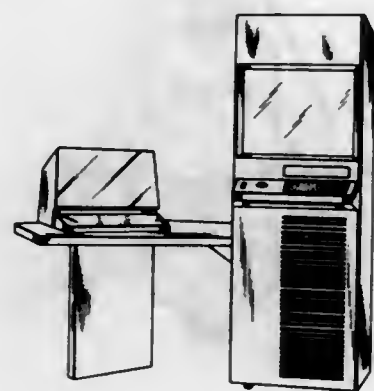
John F. Graham, Sudbury, and Richard R. Dillon, Marlboro, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Nov. 28, 1975, Ser. No. 635,839

Term of patent 14 years

Int. Cl. D14-02

U.S. Cl. D14-44



243,772

**MOTOR CONTROLLING RELAY**

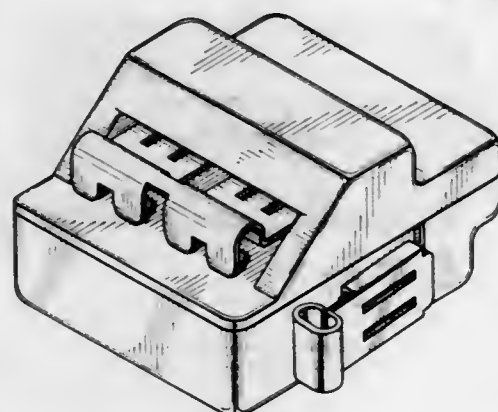
Eugene T. McKinnon, Pacific Palisades; Alvin S. Drutz, Los Angeles, and Randall Danta, Reseda, all of Calif., assignors to Eugene T. McKinnon and Alvin S. Drutz

Filed Feb. 13, 1975, Ser. No. 549,754

Term of patent 14 years

Int. Cl. D13-03

U.S. Cl. D13-33



243,773

**SWITCHBOARD FOR TELECOMMUNICATIONS SWITCHING SYSTEM**

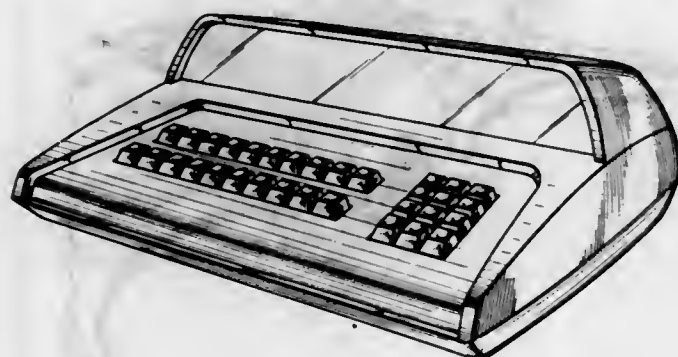
Donald A. Foglia, West Deal, N.J., assignor to Siemens Corporation, Iselin, N.J.

Filed Mar. 11, 1976, Ser. No. 666,063

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-58



243,774

**COMBINED PIPE AND TOBACCO CONTAINER**

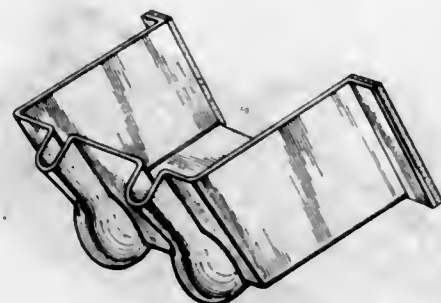
Perry J. Molinaro, 641 Bower Hill Road, Pittsburgh, Pa. 15243

Filed Jan. 15, 1975, Ser. No. 541,192

Term of patent 3 1/2 years

Int. Cl. D27-99

U.S. Cl. D27-6



243,775

**LIGHTER**

Yoichi Ohsawa, Tokyo, Japan, assignor to Win Lighter Corporation, Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 607,886

Term of patent 14 years

Int. Cl. D27-05

U.S. Cl. D27-36



243,776

**MORTAR AND PESTLE COVER**

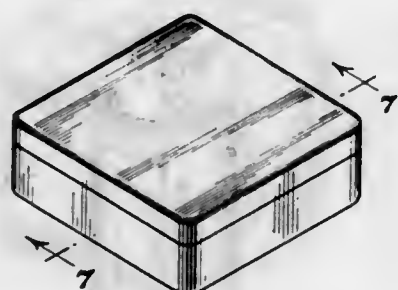
Arthur J. Gregory, 17931 S. Dixie Hwy., Miami, Fla. 33157

Filed Apr. 11, 1975, Ser. No. 567,313

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D24-23



243,777

**PUTTING TARGET UNIT FOR A GOLF GAME APPARATUS**

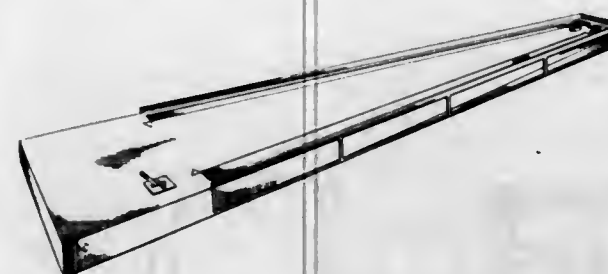
Frederick T. Lewis, 1141 Lighthouse Ave., Pacific Grove, Calif. 93950

Filed Feb. 21, 1975, Ser. No. 551,518

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-5 NN



243,778

**GOLF CLUB HEAD**

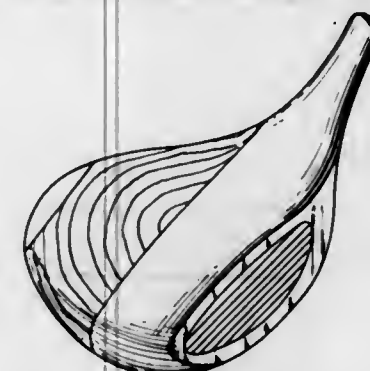
William R. Raymont, 25001 El Cartijo, Mission Viejo, Calif. 92675

Filed June 16, 1975, Ser. No. 587,083

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-5 GH



243,779

**POCKET AMUSEMENT DEVICE**

Arisuke Yamagata, No. 9-10, Tateishi, 7-chome, Katsushika, Tokyo, Japan

Filed Aug. 13, 1975, Ser. No. 604,097

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-15 R



243,780

**POCKET PIN BALL GAME BOX**

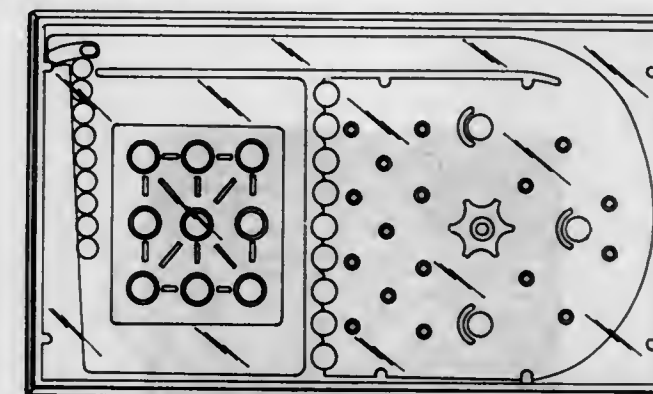
Arisuke Yamagata, No. 9-10, Tateishi, 7-chome, Katsushika, Tokyo, Japan

Filed Aug. 13, 1975, Ser. No. 604,313

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-5 JJ



243,781

**POCKET BASEBALL GAME BOX**

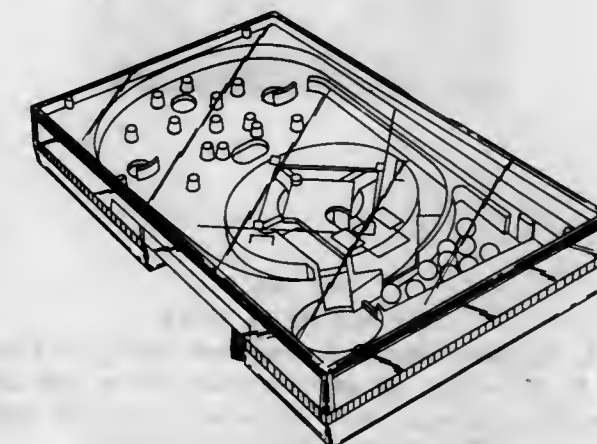
Arisuke Yamagata, No. 9-10, Tateishi, 7-chome, Katsushika, Tokyo, Japan

Filed Aug. 13, 1975, Ser. No. 604,314

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-5 BG



243,782

**HOOP TARGET FOR LAWN GAME**

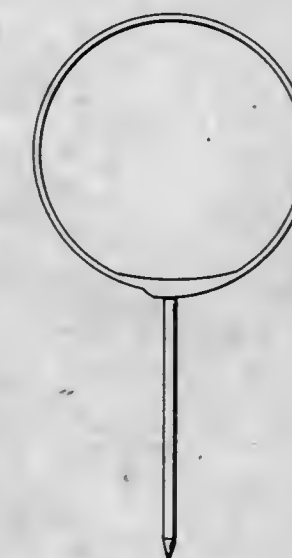
Thomas F. G. Hickey, 37 Washington Road, Pittsford, N.Y. 14534

Filed Sept. 19, 1975, Ser. No. 615,190

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-5 PP





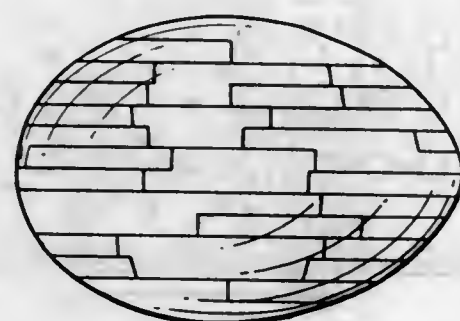
243,783

## PUZZLE OR SIMILAR ARTICLE

Leonard Kleinman, 163 Bergen St., Brooklyn, N.Y. 11217,  
and Harry Zelenko, 240 E. 61st St., New York, N.Y. 10021  
Filed Jan. 24, 1975, Ser. No. 543,866

Term of patent 7 years  
Int. Cl. D21-01

U.S. Cl. D34-15 M



243,785

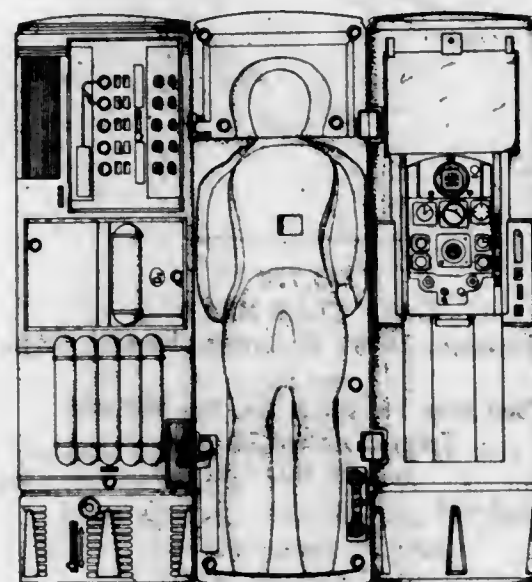
## TOY MEDICAL UNIT

Robert E. Cordrey; Donald E. England; George P. Giordano;  
Alan E. Hoeweler, all of Cincinnati, Ohio, and John F.  
Mayer, Fort Thomas, Ky., assignors to General Mills Fun  
Group, Inc., Minneapolis, Minn.

Filed May 22, 1975, Ser. No. 580,089

Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D34-15 R



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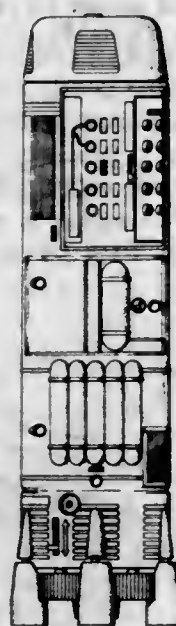
## TOY MEDICAL UNIT

Robert E. Cordrey; Donald E. England; George P. Giordano;  
Alan E. Hoeweler, all of Cincinnati, Ohio, and John F.  
Mayer, Fort Thomas, Ky., assignors to General Mills Fun  
Group, Inc., Minneapolis, Minn.

Filed May 22, 1975, Ser. No. 579,753

Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D34-15 R



243,786

## TOY BABY CARRIAGE

John V. White, 13206 Bryson St., Arleta, Calif. 91331  
Filed July 11, 1975, Ser. No. 595,033

Term of patent 14 years  
Int. Cl. D21-01

U.S. Cl. D34-15 AJ



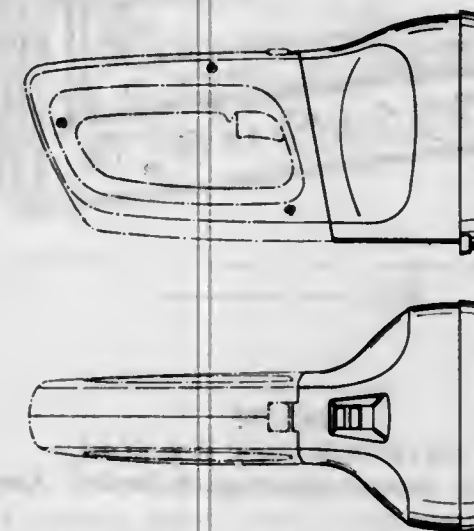
243,787

## DETACHABLE FLASHLIGHT HEAD

Roderick Francis Bunyen, Cockeysville, Md., assignor to The  
Black and Decker Manufacturing Company  
Filed Aug. 19, 1975, Ser. No. 605,839

Term of patent 14 years  
Int. Cl. D26-02

U.S. Cl. D48-24 A



243,789

## CURTAIN MATERIAL

Peter E. Schroeder, AM Falter 8, CH866 Lucerne, Switzerland  
Filed Aug. 25, 1975, Ser. No. 607,839

Claims priority, application Germany, May 26, 1975, 360  
Term of patent 14 years  
Int. Cl. D5-05

U.S. Cl. D47-6 E



243,788

## CURTAIN MATERIAL

Peter E. Schroeder, AM Falter 8, CH866 Lucerne, Switzerland  
Filed Aug. 25, 1975, Ser. No. 607,835

Claims priority, application Germany, May 26, 1975, 360  
Term of patent 14 years  
Int. Cl. D5-05

U.S. Cl. D47-6 E



243,790

## CURTAIN MATERIAL NO. 588

Peter E. Schroeder, AM Falter 8, CH866 Lucerne, Switzerland  
Filed Sept. 29, 1975, Ser. No. 617,677

Claims priority, application Germany, May 13, 1975, 289  
Term of patent 14 years  
Int. Cl. D5-05

U.S. Cl. D47-6 E





243,791

## MARKER LENS

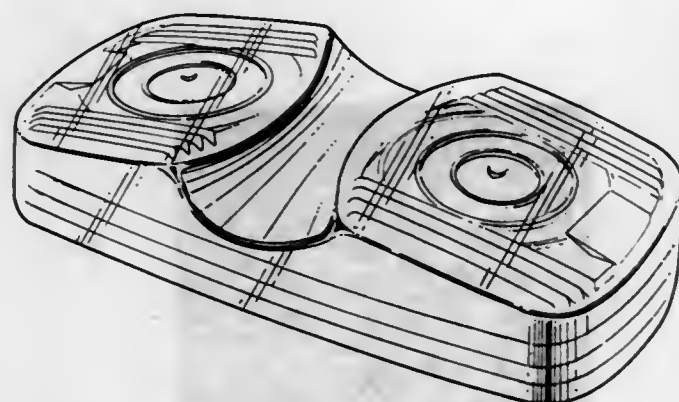
Robert I. Nagel, Skokie, Ill., assignor to Dominion Auto Accessories Limited, Toronto, Canada

Filed Nov. 29, 1974, Ser. No. 528,164

Term of patent 14 years

Int. Cl. D26-06

U.S. Cl. D48-32 A



243,792

## MARKER LENS

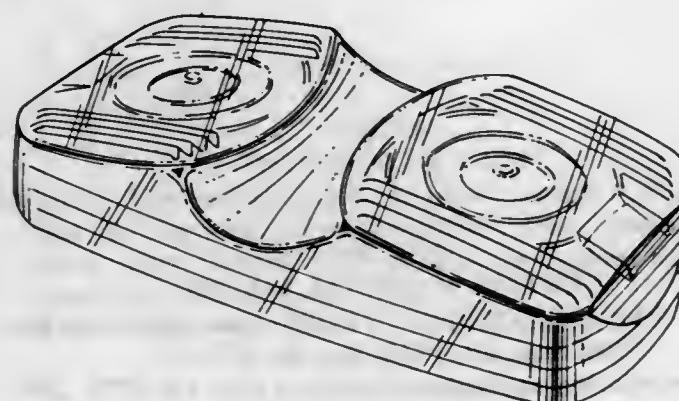
Robert I. Nagel, Skokie, Ill., assignor to Dominion Auto Accessories Limited, Toronto, Canada

Continuation-in-part of Ser. No. 528,164, Nov. 29, 1974. This application Dec. 29, 1975, Ser. No. 645,034

Term of patent 14 years

Int. Cl. D26-06

U.S. Cl. D48-32 A



243,793

## MARKER LENS

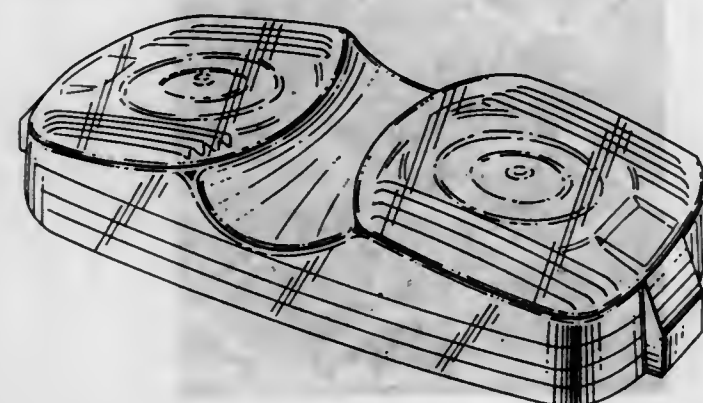
Robert I. Nagel, Skokie, Ill., assignor to Dominion Auto Accessories Limited, Toronto, Canada

Continuation-in-part of Ser. No. 528,164, Nov. 29, 1974. This application Mar. 11, 1976, Ser. No. 666,081

Term of patent 14 years

Int. Cl. D26-06

U.S. Cl. D48-32 A



243,794

## COMBINED AMPLIFIER AND TUNER

Hitoshi Mukai, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

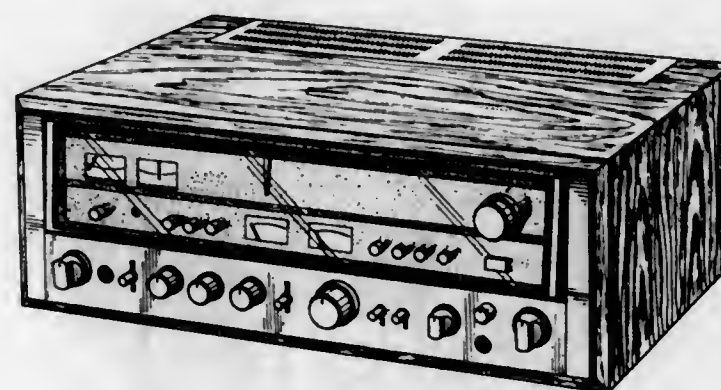
Filed June 18, 1975, Ser. No. 588,109

Claims priority, application Japan, Feb. 19, 1975, 50-6506

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-71



243,795

## CARTRIDGE TYPE INK ROLL

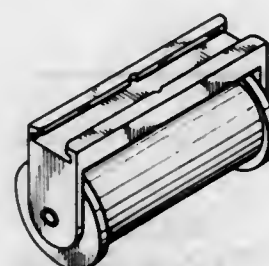
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

Filed Dec. 23, 1974, Ser. No. 535,212

Term of patent 14 years

Int. Cl. D18-99

U.S. Cl. D64-11 R

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PUMP

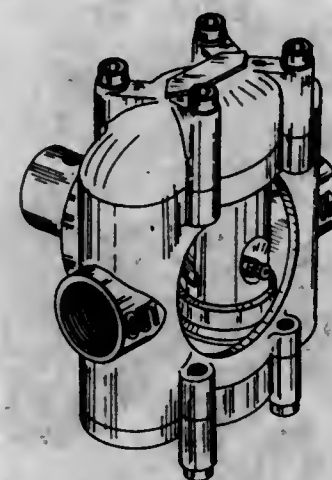
Ramon Pareja, Minneapolis, Minn., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed July 10, 1975, Ser. No. 594,727

Term of patent 14 years

Int. Cl. D15-02

U.S. Cl. D15-7



243,797

## FLEXIBLE CONTAINER FOR BARIUM RADIOLOGICAL EXAMINATIONS

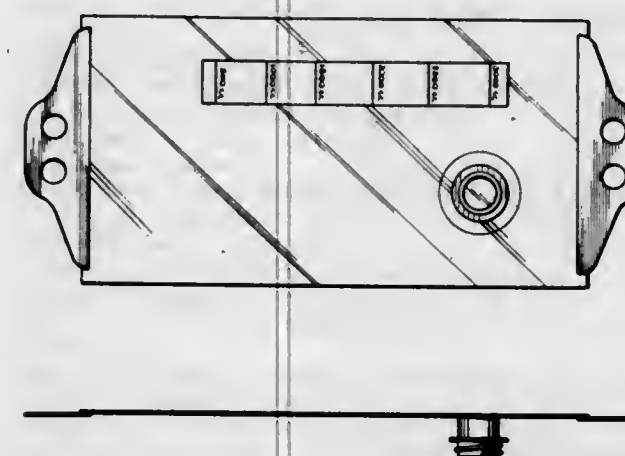
Franklin R. Greene, Flushing, N.Y., assignor to E-Z-EM Company Inc., Westbury, N.Y.

Filed June 30, 1975, Ser. No. 591,628

Term of patent 14 years

Int. Cl. D24-99

U.S. Cl. D83-1 U



243,798

## MEDICINE TRAY

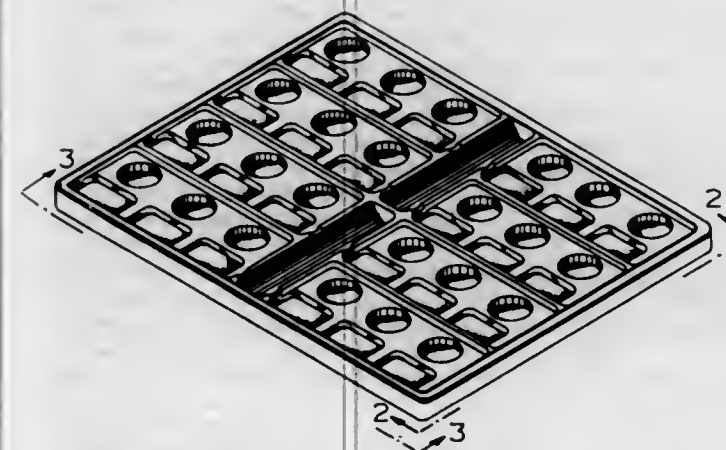
Ronald E. Swartz, Toledo, Ohio, assignor to The Lane Drug Company, Toledo, Ohio

Filed Oct. 4, 1974, Ser. No. 511,948

Term of patent 14 years

Int. Cl. D24-99

U.S. Cl. D83-1.0



243,799

## SPHYGMOMANOMETER

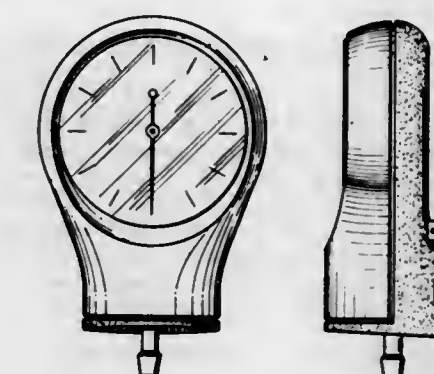
Mace Hudson Bell, Rowayton, Conn., assignor to Sybron Corporation, Rochester, N.Y.

Filed May 17, 1976, Ser. No. 686,931

Term of patent 14 years

Int. Cl. D24-02

U.S. Cl. D83-12 R



243,800

## HEATED CAP FOR CONDITIONING HAIR AND PERMANENT WAVING

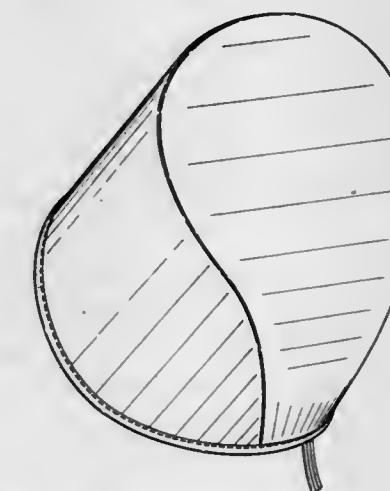
Richard Mast, Brooklyn, N.Y., assignor to Ricar Industries Inc., Brooklyn, N.Y.

Filed May 23, 1975, Ser. No. 580,490

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-19





# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MARCH, 1977

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- A. B. Chance Company: See—  
Roberts, Gerald Bernard; and Roberts, Richard Eugene, 4,013,852.
- A. B. Dick Company: See—  
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- A. H. B. Services (Engineers) Limited: See—  
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- A/S E. Rasmussen: See—  
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- A.V.D. A Votre Disposition: See—  
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- A. W. Ferrin, Beatrice Ferrin, Donald H. Stephen, Trustees of the Lectrolog Company, Trust U/A dated 1/1/74: See—  
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- AB Bofors: See—  
Blom, Rolf Helge; Forshufvud, Sten Harald Ragnar; and Skagerlund, Lars-Erik, 4,013,244.  
Brandstrom, Karl Ivar, 4,012,938.
- Abblard, Jean; and Poignant, Pierre, to PEPRO, Societe pour le Developement et la Vente de Specialites Chimiques. Preparation of n-aryl-imidocarbonyl ureas. 4,013,716, Cl. 260-553.00A.
- Abbondante, Cosmo, to Bofors America, Inc. Vehicle detection apparatus. 4,013,851, Cl. 200-86.00R.
- Abbott Laboratories: See—  
Betka, Harold Anthony, 4,013,187.  
Farhadieh, Bahram; and Berdahl, James Maynard, 4,013,820.
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- Abe, Keiji: See—  
Terajima, Kazuki; Tomita, Shigeru; Matsuda, Yoshindo; and Abe, Keiji, 4,013,585.
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- Abrams, Gilbert Lawrence. Method for molding composite articles. 4,012,827, Cl. 29-453.000.
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Netto, Tito Livio Martins; and Barbeta, Ludgero Raul, 4,012,871.
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- Ackermann, Otto; Bleh, Otto, deceased (by Bleh, Rita); and Morgenstern, Dieter, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of pyridylamino-methylenemalononic acid derivatives. 4,013,656, Cl. 260-294.900.
- Active Fire Sprinkler Corporation: See—  
Hirsch, Morti, 4,012,875.
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- Adamo, Joe J. Vehicle burglar alarm. 4,013,995, Cl. 340-65.000.
- Adams, Theodore J.: See—  
Porter, Stephen G.; and Adams, Theodore J., 4,013,033.
- Addressograph Multigraph Corporation: See—  
Foote, Francis C.; and Beck, Charles K., 4,013,894.
- Adelberg, Marvin. Clamp for regulating fluid flow through plastic tubing. 4,013,263, Cl. 251-6.000.
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- Adsorbex, Incorporated: See—  
Taylor, R. Daniel, 4,013,566.
- Agence Nationale de Valorisation de la Recherche (ANVAR): See—  
Cohen-Solal, Gerard; Zozime, Alain; and Sella, Claude, 4,013,533.  
Jolles, Pierre; and Migliore-Samouir, Daniele, 4,013,788.
- Agency of Industrial Science & Technology: See—  
Kosugi, Yoshitsugu; Suzuki, Hideo; and Kamibayashi, Akira, 4,013,512.
- AGFA-Gevaert, A.G.: See—  
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- Bestenreiner, Friedrich; Giglberger, Dieter; and Weidkuhn, Gert, 4,013,356.
- AGFA-GEVAERT N.V.: See—  
Hellemans, Albert Joseph, 4,013,204.  
Pollet, Robert Joseph; Vandeputte, Camille Angelina; Sels, Francis Jeanne; Vanreusel, Gerard Laurens; Willems, Jozef Frans; and van Veelen, George Frans, 4,013,471.  
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- Aggarwal, Pawan Kumar, to Cincinnatti Milacron Inc. Apparatus for controlling a magnetic clamp. 4,013,932, Cl. 318-39.000.
- Aiagi, Kunio: See—  
Yamaki, Yasuhito; and Aiagi, Kunio, 4,013,056.
- Aida Engineering Ltd.: See—  
Imanishi, Shozo, 4,012,937.
- Air Preheater Company, Inc., The: See—  
Kochey, Edward L., Jr.; and Hatch, Edward A., 4,013,024.  
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- Air Products and Chemicals, Inc.: See—  
Sircar, Shivaji; and Zondlo, John W., 4,013,429.
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Cormia, Robert L.; Tsujimoto, Kazumi N.; and Andresen, Sigurd, 4,013,532.
- Airprint Systems, Inc.: See—  
Warning, Walter B., Sr.; and Warning, Walter B., Jr., 4,013,037.
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Nakajima, Tadanobu; and Aizawa, Tatsuo, 4,013,357.
- Ajdukovic, Djordje: See—  
Bharucha, Keshusroo R.; Ajdukovic, Djordje; Pavlanis, Vytautas; and Schrenk, Heinrich Maria, 4,013,770.
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Shimazaki, Hideo; Tsukamoto, Shuji; Saito, Tadaomi; Eguchi, Sadanari; and Komata, Yasushi, 4,013,800.
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Green, Mitchell V.; Akita, Yukio; and Tachikawa, Mitsuji, 4,013,285.
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Imabuchi, Yoshihisa; Kurami, Kenshi; Akiyama, Yoshinori; and Sobajima, Katsunobu, 4,013,306.
- Akiyoshi, oshio; and Shibuya, Hakushi, to Mitsubishi Denki Kabushiki Kaisha. Clamping tool and method. 4,013,895, Cl. 307-126.000.
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Acker, Jesse L.; and Meserol, Peter M., 4,013,368.
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de Feudis, Sergio, 4,013,551.
- Akzona Incorporated: See—  
Panneman, Harm Jan, 4,013,682.
- Alberto Culver Company: See—  
Cella, John A.; Fiebig, August Emil, Jr.; and Pum, Franz J., 4,013,786.
- Albright, Alva Z. Flywheel tree feller and buncher. 4,013,106, Cl. 144-34.00R.
- Alford, John A., to Westvaco Corporation. Water-dilutable polyamide resins and water-dilutable epoxy resin compositions containing said polyamide resins. 4,013,601, Cl. 260-18.0PN.
- Alliance Manufacturing Company, Inc., The: See—  
Deming, Andrew F., 4,013,910.
- Allis-Chalmers Corporation: See—  
Fear, James R., 4,013,136.
- Allis, Robert F., to Xerox Corporation. Optical apparatus and reproducing machine. 4,013,361, Cl. 355-60.000.
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Giattino, Louis Robert, 4,013,012.
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- American Chain & Cable Company, Inc.: See—  
Nelson, Walter T., 4,013,161.



- American Cyanamid Company: See—  
Copeland, Melvin; and Konazewski, William Peter, 4,013,065.  
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Parent, Richard Alfred; and Loffelman, Frank Fred, 4,013,404.
- American Denture Corporation: See—  
Abdenour, Joseph D., 4,012,838.
- American Home Products Corporation: See—  
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- American Optical Corporation: See—  
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- American Store Equipment Corporation: See—  
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- AMP Incorporated: See—  
Kobler, Robert James, 4,013,331.
- Anatol, Jesus; and Berecoechea, Jean, to Sucreries du Soissonais et Compagnie Sucrerie. Derivatives of substituted urea, acyl ureas, and sulphonyl ureas, and a process for producing the same. 4,013,706, Cl. 260-471.00C.
- Andersen Corporation: See—  
Gruetzman, Stanley A., 4,013,804.
- Anderson, Bruce W., to Bendix Corporation. The. Segmented friction disc for brakes. 4,013,147, Cl. 188-218.0XL.
- Anderson, Scott K., to Teleplex, Inc. TDM and FDM telephone communication. 4,013,840, Cl. 179-15.0FD.
- Ando, Kunio; and Saito, Takemi, to Fuji Photo Optical Co., Ltd. Optical image stabilizing system. 4,013,339, Cl. 350-16.000.
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- Andresen, Sigurd: See—  
Cormia, Robert L.; Tsujimoto, Kazumi N.; and Andresen, Sigurd, 4,013,532.
- Andrews, George M., to Vega Industries, Inc. Factory-built fireplace with flush hearth installation. 4,013,059, Cl. 126-120.000.
- Andros, Incorporated: See—  
McClatchie, Edward A.; Watson, Dean A.; and Burrough, Irvin G., 4,013,260.
- Andruszkiewicz, Julian. Prehung door assembly. 4,012,868, Cl. 49-380.000.
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- Angenieux-CLB S.A.: See—  
Lauzier, Rene, 4,013,144.
- Anstin, Wayne D. Document scanning and printing system and method. 4,013,876, Cl. 235-151.000.
- Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Dehydrocyclization with an acidic multimetallic catalytic composite. 4,013,735, Cl. 260-673.500.
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Matsushita, Takeshi; Hayashi, Hisao; Aoki, Teruaki; Yamoto, Hisayoshi; and Kawada, Yoshiyuki, 4,014,037.
- Aoyama, Tetsuo: See—  
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- Appleman, William S.: See—  
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- Appt, Harry W.: See—  
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- Aqua-Chem, Inc.: See—  
Craig, Glenn D.; Feuling, David T.; and LeHaye, Paul G., 4,013,399.
- Arai, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Central coupler for a centralized monitor system for motor vehicles. 4,013,947, Cl. 324-51.000.
- Arai, Hiroshi: See—  
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- Archer, Robert A.: See—  
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- ARCO Medical Products Company: See—  
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- ARCO Polymers, Inc.: See—  
Grand, Jose E.; Quinlan, John J.; and Garland, James J., 4,013,597.
- Armstrong, Bernard C. Walking type agricultural implement with harness. 4,013,131, Cl. 172-370.000.
- Armstrong Cork Company: See—  
Ray, Leonard N., Jr., 4,013,407.
- Armstrong, Timothy G.; Kroll, Arthur S.; and Shuster, Frank A., to Eastman Kodak Company. Self-compensating photoconductor web. 4,013,041, Cl. 118-656.000.
- Arnado, Christian: See—  
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- Asahi Kogaku Kogyo Kabushiki Kaisha: See—  
Ogawa, Ryota, 4,013,350.
- Asahina, Masako; Kato, Hideki; and Fukawa, Hideaki, to Nisshin Flour Milling Co., Ltd. Process for the manufacture of solanesol. 4,013,731, Cl. 260-643.00A.
- Asanuma, Mitsuru: See—  
Kino, Yoshihiro; Furuya, Nobuaki; and Asanuma, Mitsuru, 4,013,834.
- Ascoli, Enzo, to Gillette Company. The. Dry shavers. 4,012,837, Cl. 30-43.900.
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Hammarlund, Bertil; and Liss, Gote, 4,013,952.
- Ashkin, Peter B., to Hewlett-Packard Company. Variable resolution display. 4,014,011, Cl. 340-324.00R.
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- Askew, Barry Anthony; and Holland, Ronald, to National Research Development Corporation. High temperature secondary batteries. 4,013,818, Cl. 429-112.000.
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- Aufhauser, Alfred: See—  
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- Babbitt, John M.; and Houle, James F., to Eastman Kodak Company. Element comprising a coating layer containing a mixture of a cationic perfluorinated alkyl and an alkylphenoxy-poly(propylene oxide). 4,013,696, Cl. 428-412.000.
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- Balz, Gunther W., to Roto-Finish Company. Reciprocal finishing apparatus. 4,012,869, Cl. 51-163.200.
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- Ban, Thomas E.; Hulet, Roger L.; and Mittra, Subir K., to McDowell-Wellman Engineering Company. Circular traveling grate sintering machine. 4,013,517, Cl. 202-262.000.
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- Briggs & Stratton Corporation: See—  
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- British Hartford-Fairmont Limited: See—  
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- Brown, Dorvin. Methods and solutions for improvement of offset printing. 4,013,008, Cl. 101-451,000.
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- Yamada, Yu, 4,013,348.
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- Eisenhauer, William A. Universal planisphere complete guidance and computer system. 4,012,851, Cl. 35-44.000.
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- Eldec Corporation: See—  
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- Eldredge, Carl H.: See—  
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- Lacefield, William B., 4,013,654.
- Spitzer, Wayne Alfred, 4,013,651.
- Ellingson, Robert T., to Astro Plastics, Inc. Unitary wall member guard. 4,012,878, Cl. 52-288.000.
- Emelyanov, Jury Mikhailovich; and Emelyanov, Mikhail Fedorovich. High-frequency tubular ozonizer. 4,013,567, Cl. 250-540.000.
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- Emhart Industries, Inc.: See—  
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- Durant, Graham John; Emmett, John Colin; Ganellin, Charon Robin; and Prain, Hunter Douglas, 4,013,769.
- Emsley, Alan Brian, to Imperial Chemical Industries Limited. Electrolytic cells. 4,013,525, Cl. 204-98.000.
- Enad, Estela G.: See—  
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- Endo Laboratories, Inc.: See—  
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- Engels, Werner: See—  
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- Engelskirchen, Konrad; and Galinke, Joachim, to Henkel & Cie G.m.b.H. Process for preparation of mixed cellulose ethers containing 2,3-dihydroxypropyl ether groups. 4,013,821, Cl. 536-88.000.
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- Ramqvist, Lars H.; Grinder, Nils Olle; Sporrang, Malte; and Eng-hag, Per, 4,013,488.
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- Engler, Elliott E. Thermometer carrying case and illuminating device. 4,013,882, Cl. 240-6.460.
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- Enright, Wayne Jay, to Bunker Ramo Corporation. Setting means for estimated time of arrival clock hands. 4,012,900, Cl. 58-126.00D.
- Enters, Edward W.; and Ite, Mark J., to Gilson Bros. Co. Clutch mechanism for rotary tillers and the like. 4,012,963, Cl. 74-242.15R.
- Environment/One Corporation: See—  
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- Erkenbrack, Kenneth B., to New Products, Inc. Curved pin and inserter. 4,013,207, Cl. 227-120.000.
- Erwin, Jerry D.; Duvall, Dale R.; and Habitzreiter, Richard K., to Recognition Equipment Incorporated. Single read station acquisition for character recognition. 4,013,999, Cl. 340-146.30H.
- Eskeli, Michael. Turbine. 4,012,912, Cl. 60-682.000.
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- Evens, David A., to Continental Oil Company. Fluid cat cracker apparatus. 4,013,423, Cl. 23-288.00S.
- Ewald, Ronald F., to Seaquist Valve Company, Div. of Pittway Corporation. Double seal valve stem. 4,013,197, Cl. 222-402.240.
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- Fabre, Brian K.; and Vander Laan, John S., III. Extender for increasing the travel of motorcycle shock absorbers. 4,013,149, Cl. 188-281.000.
- Fabre-Curtat, Michel; and Thierry, Jean, to Institut Francais du Pétrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activités Pétrolières Elf. Gripping shoe equipping a device for pulling an elongate member. 4,013,205, Cl. 226-173.000.
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- Fauran, Claude P.; Eberle, Jeannine A.; Bourgery, Guy R.; Raynaud, Guy M.; and Gouret, Claude J., to Delalande S.A. Pyrimidin-6-yl acethydroxamic acids, their therapeutic application and their process of preparation. 4,013,768, Cl. 424-251.000.
- Fay, Rudolph J., to J. W. Fay & Son, Inc. Dough mixer. 4,013,234, Cl. 241-101.600.
- Fear, James R., to Allis-Chalmers Corporation. Battery mount. 4,013,136, Cl. 180-68.500.
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- Fischer, Hermann; Schindler, Hubert; Kuhr, Winfried; and Weidenbach, Guenter, to Kali-Chemie Aktiengesellschaft. Process for the manufacture of spherical alumina-containing particles. 4,013,587, Cl. 252-448.000.
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- Georgiev, Assen Yordanov; and Genev, Ivan Vassilev, to DSO "Cherna Metalurgia". Apparatus for preheating a raw material charge for application to an electric furnace. 4,013,401, Cl. 432-164,000.
- Gerber Products Company: See—  
Smalligan, Wayne J.; Kelly, Vincent J.; and Enad, Estela G., 4,013,799.
- Gerdes, Theodor, to Blau KG Fabrik fur Kraftfahrzeuge. Lockable closure cap. 4,013,191, Cl. 220-203,000.
- Gerigk, Gunter; Bittner, Klaus-Jurgen; and Kostner, Armin, to Hoechst Aktiengesellschaft. Sheathed tubular stick. 4,013,099, Cl. 138-109,000.
- Germershausen, Raimond; and Becker, Wilfried, to Rheinmetall G.m.b.H. Variable-elevation field guns for mortar and cannon applications. 4,012,986, Cl. 89-17,000.
- Gernhardt, Paul; Pohl, Siegfried; Danguillier, Wilhelm; and Grams, Wolfgang, to Dr. C. Otto & Comp. G.m.b.H. Slag bath generator. 4,013,427, Cl. 48-62,00R.
- Gettett, Hans: See—  
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- Gewerkschaft Eisenhutte Westfalen: See—  
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- Gewiss, Lucien Victor, to Marc Wood S.A. Machine for manufacturing herringbone-pleated structures. 4,012,932, Cl. 72-187,000.
- Giardina, Carmelo: See—  
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- Giattino, Louis Robert, to Altus Corporation. Electronic safe arming and fuzing system. 4,013,012, Cl. 102-70,20R.
- Giebel, Buddy E., to Union Camp Corporation. Postal tray. 4,013,213, Cl. 229-39,00R.
- Giet, Claude, to Societe Anonyme: Produits Chimiques Ugine Kuhlmann. Acetylene-like black and process. 4,013,759, Cl. 423-445,000.
- Giffin, Leverett William, to Boeing Company, The. Mechanical support apparatus for the stabilization of an inflatable escape slide. 4,013,247, Cl. 244-137,00P.
- Gigilberger, Dieter: See—  
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- Gilberts, Alexander George, to Reliable Electric Company. Surge arrester. 4,013,927, Cl. 361-119,000.
- Giller, Arnold: See—  
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- Gillette Company, The: See—  
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- Gilson Bros. Co.: See—  
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- Gingras, Antoine. Fountain tooth-brush. 4,013,370, Cl. 401-175,000.
- Girling Limited: See—  
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- Givaudan Corporation: See—  
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- Gladieux, Norman K.; and Miller, James W., to Libbey-Owens-Ford Company. Apparatus for manufacture of float glass. 4,013,438, Cl. 65-94,000.
- Glass, John R., to Mobil Oil Corporation. Temperature control device. 4,013,872, Cl. 219-497,000.
- Glaxo Laboratories Limited: See—  
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- Gleason, John Gerald, to SmithKline Corporation. Pharmaceutical compositions comprising substituted phenylglycylcephalosporins and methods of treating bacterial infections. 4,013,764, Cl. 424-246,000.
- Glieneck, Klaus: See—  
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- Gocke, Eberhard; and Vollmer, Rudolf, to Braukmann Armaturen AG. Valve structure. 4,013,088, Cl. 137-116,000.
- Goddard, Stephen A.: See—  
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- Godet, Sidney, to International Telephone and Telegraph Corporation. Quadruphase modulator. 4,013,960, Cl. 325-139,000.
- Goebel, Klaus Karl-Heinz. Articulated netting, particularly for shuttering. 4,013,114, Cl. 160-330,000.
- Goens, Duane N.; and Kruesi, Paul R., to Cyprus Metallurgical Processes Corporation. Process for the recovery of cuprous chloride in the presence of metal impurities. 4,013,457, Cl. 75-104,000.
- Goffe, Frederick William Frank; and Pilkington, Donald James, to Shoe & Allied Trades Research Association, The. Measuring method and apparatus. 4,012,943, Cl. 73-37,700.
- Goffe, William L.; Mammino, Joseph; and Ewing, Joan R., to Xerox Corporation. Migration imaging system. 4,013,462, Cl. 96-1,0PS.
- Gold, Heinrich: See—  
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- Goldstein, Abe: See—  
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- Goldstein, Raymond: See—  
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- Goltos, Costas E., to Teckton, Inc. Selectively ventable food package and micro-wave shielding device. 4,013,798, Cl. 426-107,000.
- Golumbic, Harvey J., to Vinyl-Chem International, Inc. Method for repairing pigmented and textured flexible materials. 4,013,495, Cl. 156-98,000.
- Gondek, John T. Shower head. 4,013,230, Cl. 239-499,000.
- Goode, George E.: See—  
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- Goodfellow, Andrew Culross: See—  
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- Gordon, Ronald S.: See—  
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- Gordon, Wolfgang; Leugering, Hans Joachim; and Schaefer, Horst, to Hoechst Aktiengesellschaft. Process for the manufacture of hydrophilic polyolefin fibers containing inorganic pigment. 4,013,617, Cl. 260-42,550.
- Goreham, Kenneth A.; and Perry, John R., to Smiths Industries Limited. Methods of manufacture of semiconductor bodies. 4,013,746, Cl. 264-66,000.
- Gormar, Helmut: See—  
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- Gottfried Bischoff Bau kompl.: See—  
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- Gouret, Claude J.: See—  
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- Goverde, Ludovic Jacobus, to Ontario Tool Design Inc. Hockey stick. 4,013,288, Cl. 273-67,00A.
- Grabb, Nicholas G., to Varta Batteries Limited. Handle construction for batteries. 4,013,819, Cl. 429-187,000.
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- Graff, Theodore S.: See—  
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- Graham, John C., to Hooker Chemicals & Plastics Corporation. Process for the preparation of monochlorotoluene. 4,013,730, Cl. 260-650,00R.
- Graham, Robert O.; and Rauenbuehler, John A., to Cutler-Hammer, Inc. Three-phase current transformer. 4,013,985, Cl. 336-5,000.
- Grams, Wolfgang: See—  
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- Granberg, Eloff. Adjustable chainsaw file guide and holder. 4,012,969, Cl. 76-36,000.
- Granda, Jose E.; Quinlan, John J.; and Garland, James J., to ARCO Polymers, Inc. Fast cooling styrene polymer foams. 4,013,597, Cl. 260-2,50B.
- Granger, Rene; Lapsley, Alain; and Rolland, Serge, to Brevatome. Composite superconducting materials. 4,013,591, Cl. 252-512,000.
- Granitz, Fritz; Robiczek, Gunther; Jabkowski, Fridolin; and Stoger, Franz, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Method of exchanging supporting or driving rollers in a continuous casting plant and apparatus for carrying out the method. 4,012,825, Cl. 29-427,000.
- Grassme, Ulrich, to Siemens Aktiengesellschaft. Time switch device for X-ray diagnostic apparatus. 4,013,036, Cl. 116-129,00T.
- Gray, Robert C. Magnetic braking and clutch system. 4,013,241, Cl. 242-84,52B.
- Grebner, Stuart W.; Johnson, James V.; and Josemans, Leonardus J., to Cutler-Hammer, Inc. Rocker switch with integral off lock. 4,013,858, Cl. 200-321,000.
- Green, Mitchell V.; Akita, Yukio; and Tachikawa, Mitsuji, to Copyer Co., Ltd. Copying machine. 4,013,285, Cl. 271-261,000.
- Greene, Marvin, to Cities Service Company. Upgrading solid fuel-derived tars produced by low pressure hydrolysis. 4,013,543, Cl. 208-50,000.
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- Greiner, Yvan: See—  
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- Groeger, Ingo, to Siemens Aktiengesellschaft. Circuit arrangement for placing information in a programmable ECL read only memory. 4,014,007, Cl. 340-173,00R.
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- Grosso, Donald S., to Teleco Inc. Rotation sensor for borehole telemetry. 4,013,945, Cl. 324-34,00R.
- Grubbs, George B. Half-log wall construction. 4,012,876, Cl. 52-233,000.
- Gruetzman, Stanley A., to Andersen Corporation. Method and composition for treating wood and coated wooden articles obtained thereby. 4,013,804, Cl. 427-33,000.
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- Grunzweig & Hartmann und Glasfaser AG: See—  
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- Gryczka, Alfred J., to Microlife Technics, Inc. Bacterial compositions and process for fermentation of meat therewith. 4,013,797, Cl. 426-56,000.
- GTE Automatic Electric Laboratories Incorporated: See—  
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- Guenther, William D., to Dana Corporation. Piston assembly. 4,013,057, Cl. 123-193,00P.
- Guicheteau, Eugene H., to Honeywell Inc. Apparatus for converting a potential signal developed between two high impedance electrodes to a current signal and for transmitting this current signal to a remote location over a two wire transmission. 4,013,899, Cl. 307-235,00F.
- Guida, Joseph. Magna comb. 4,013,084, Cl. 132-11,00R.
- Guidosh, Edward F., to Westinghouse Electric Corporation. No-load tap changer switch with rack and pinion gear operating mechanism. 4,013,847, Cl. 200-18,000.
- Guillerm, Jean; and Fondronnier, Jacques, to Centre Technique du Bois. Apparatus for cutting various materials. 4,013,108, Cl. 144-175,000.
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- Gulf Research & Development Company: See—  
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- Gundlach, Philip M., to Devtron Corporation. Absolute digital position measurement system. 4,014,015, Cl. 340-347,00P.
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- Company. Process for the preparation of selectively halogenated ketones and ketals. 4,013,722, Cl. 260-593.00H.
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- Haas, Georges; Jaques, Roland; Rossi, Alberto; and Ruegg, Martin, to Ciba-Geigy Corporation. Adamantyl phenoxy alkylamides. 4,013,719, Cl. 260-559.00B.
- Haase, Jan R.; Eldredge, Carl H.; and Landholm, Richard A., to Eastman Kodak Company. Yellow azopyrazolone dye releasing redox compounds for photographic color transfer. 4,013,633, Cl. 260-162.000.
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- Haese, Egon, to Dr. C. Otto & Comp. G.m.b.H. Process for removal of ammonia, hydrogen sulfide and hydrogen cyanide from gases containing these substances. 4,013,779, Cl. 423-573.00R.
- Hafner, Reinhard; Wöjck, Karl; and Schlenker, Gerhard, to Maschinenfabrik Augsburg-Nürnberg AG. Reciprocating piston engine construction, particularly multi-part cylinder and crankshaft connection arrangement. 4,013,058, Cl. 123-195.0AC.
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- Hagg, Arthur C., to Westinghouse Electric Corporation. Elevator system having a drive sheave with rigid but circumferentially compliant cable grooves. 4,013,142, Cl. 187-20.000.
- Haile, Ernest. Convex mirror and frame. 4,013,351, Cl. 350-293.000.
- Hall, W. Richard. Sewing machine feeder system. 4,013,026, Cl. 112-153.000.
- Halloran, John Joseph, Jr., to Combustion Engineering, Inc. Pulverizer hydraulic drive. 4,013,235, Cl. 241-117.000.
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- Hammarlund, Bertil; and Liss, Göte, to Asea Aktiebolag. Means for current measuring in static converters. 4,013,952, Cl. 324-119.000.
- Hampel, Gerald, to Optipatent AG. Method for making spectacle frame components. 4,013,747, Cl. 264-73.000.
- Hanna, Belah N., to Hanna Enterprises, Inc. Disposal of liquid effluent from sewage treatment plants. 4,013,087, Cl. 137-110.000.
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- Hansen, Roger P.; and Vis, Larry J., to Display Pack, Inc. Plastic display container having hinged cover. 4,013,214, Cl. 229-44.00R.
- Harada, Tatsuo; Moriyama, Shigeo; Kita, Toshiaki; and Yamaguchi, Hidenori, to Hitachi, Ltd. Concave diffraction grating and a manufacturing method thereof. 4,012,843, Cl. 33-19.00A.
- Harbert, Charles A., to Pfizer Inc. Alkyl and benzyl 6,7-dialkoxy-2-methyl-4-oxo-1,2,3,4-tetrahydroquinoline-1-carboxylates. 4,013,662, Cl. 260-287.00K.
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- Hecht, Wolfgang; Wohlfarth, Ernst; and Strasser, Alois, to Wacker-Chemie GmbH. Process for preparing elastomers. 4,013,611, Cl. 260-37.05B.
- Heckert, David C.: See—  
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- Heitzer, Helmut: See—  
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- Heizer, Kenneth W.: See—  
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- Hendrix, Henry E. Fireplace lighter. 4,013,398, Cl. 431-344.000.
- Heneveld, Lloyd A., trustee: See—  
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- Henkel & Cie G.m.b.H.: See—  
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- Hennrich, Helmut: See—  
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- Henriksson, Sten Thore. Method of shaping fiber materials. 4,013,749, Cl. 264-128.000.
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- Herrera, John T. Welding torch tip and method. 4,013,227, Cl. 239-291.000.
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- Herrmann, Franz-Josef: See—  
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- Hertig, Urs W., to Welch Allyn, Inc. Optical bar code scanning device. 4,013,893, Cl. 250-568.000.
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- Hess, Richard E.; Steinbrecher, Ronald A.; and Goddard, Stephen A., to H & S Enterprises, Inc. Magnetic game apparatus. 4,013,293, Cl. 273-131.0AD.
- Hesse, Wolfgang: See—  
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- Hill, Robert W.: See—  
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- Hill, William H., to Peter Strong & Company, Inc. Method and composition for treating teeth. 4,012,839, Cl. 32-15.000.
- Hill, William J., to Morgan Construction Company. Coil handling pallet. 4,013,256, Cl. 248-346.000.
- Hill, William J.: See—  
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- Hillyer, Anthony William, to Raleigh Industries Limited. Clutch and back pedal brake. 4,013,151, Cl. 192-6.00R.
- Himmelman, Wolfgang: See—  
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- Hindersinn, Raymond R.: See—  
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- Hines, Amos, Jr. Pneumatic dispensing apparatus for finely divided dry substances. 4,013,196, Cl. 222-193.000.
- Hinson, David C., to Owens-Illinois, Inc. Gas mixture for glow discharge device. 4,013,912, Cl. 313-226.000.
- Hintz, Doran M.; and Steinberger, Lief H. Method of forming a wood boring tool. 4,012,970, Cl. 76-102.000.
- Hirsch, Morti, to Active Fire Sprinkler Corporation. Overhead structural, fire extinguishing and ventilating system. 4,012,875, Cl. 52-168.000.
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- Hitachi, Ltd.: See—  
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- Ho, Irving T.; and Yu, Hwa N., to International Business Machines Corporation. Single-electrode charge-coupled random access memory cell. 4,014,036, Cl. 357-24.000.
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- Hoehn, Hans, to E. R. Squibb & Sons, Inc. 2,5,7,8-Tetrahydro-1,2,4,5,6-pentaazabenz[6,7]-cyclohepta[1,2,3-cd]-as-indacenes. 4,013,672, Cl. 260-296.00P.
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- Kupchan, S. Morris; and Kameswaran, Venkataraman, to Research Corporation. Synthesis of hermandaline. 4,013,664, Cl. 260-288.000.
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- Liebowitz, Marvin; and Brandli, Eugene Howard, to Colgate-Palmolive Company. Poliah. 4,013,475, Cl. 106-10.000.
- Liechti, Hans Wilhelm; and Defago, Raymond, to Ciba-Geigy Corporation. Exhaust process for the dyeing of synthetic organic textile materials in navy blue to black shades. 4,013,408, Cl. 8-26.000.
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- Nagai, Nobuo, to Nintendo Co., Ltd. Card magic box, 4,013,286, Cl. 272-8.00R.
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- Nagao, Kameji: See—  
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- Nagao, Masami: See—  
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- Nagao, Yukio; and Shimada, Masayoshi, to Tokyo Shibaura Electric Co., Ltd. Apparatus for detecting irregularities in the surfaces of materials, 4,013,367, Cl. 356-200.000.
- Nagase, Mitsuo, to Yoshida Kogyo Kabushiki Kaisha. Jointing device, 4,013,371, Cl. 403-187.000.
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- Naito, Kazuo: See—  
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- Narodny, Leo H. Keyboard using optical switching, 4,013,342, Cl. 350-96.00C.
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- Nashua Corporation: See—  
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- Nylund, Kenneth G. Ball mill, 4,013,233, Cl. 241-80.000.
- Nysted, Leonard N., to G. D. Searle & Co. N,N-Disubstituted 2,3-diphenylallylamines, 4,013,643, Cl. 260-240.00K.
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- Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): See—  
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- Peterson, Fred M. Deep well pump system. 4,013,385, Cl. 417-377.000.
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- Rittersdorf, Walter; Guthlein, Werner; Werner, Wolfgang; Rey, Hanz-Georg; and Rieckmann, Peter, to Boehringer Mannheim G.m.b.H. Diagnostic means for the detection of protein in body fluids. 4,013,416, Cl. 23-253.00TP.
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- Shimazaki, Hideo; Tsukamoto, Shuji; Saito, Tadaomi; Eguchi, Sadanari; and Komata, Yasushi, to Ajinomoto Co., Inc. 4-Hydroxy-5-methyl-2,3-dihydrofuran-3-one and methods of making and using the same. 4,013,800, Cl. 426-536.000.
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- Soteropulos, Gust; and Meiers, Gerald Franklyn, to Deere & Company. Ground-rolled cylindrical baler. 4,012,892, Cl. 56-341.000.
- Southard, James S., to C.G. Conn, Ltd. Percussion processor for electronic musical instrument. 4,012,982, Cl. 84-1.010.
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- Tamura, Tooru; Ojima, Nobuyuki; Kondo, Sigeru; and Yozo, Jizodo, to Matsushita Electric Industrial Co., Ltd. Epoxy composition for encasing semiconductor devices. 4,013,612, Cl. 260-37.0EP.
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- Tenney, William L. Fuel aerosolization apparatus and method. 4,013,396, Cl. 431-11.000.
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- Witkin, Donald E.; and Bowles, Arnold G., to National Forge Company. Hot isostatic press system. 4,013,394, Cl. 425-405.00H.
- Wittkamp, Heinrich: See—  
Schoettle, Klaus; Wittkamp, Heinrich; Uhl, Karl; and Rotter, Gerhard, 4,014,042.
- Wittle, J. Kenneth: See—  
Schneider, Harold N.; Titus, Charles H.; and Wittle, J. Kenneth, 4,013,538.
- Wixon, Harold Eugene, to Colgate-Palmolive Company. Heavy duty dry biodegradable detergent composition. 4,013,577, Cl. 252-109.000.
- Wohlfarth, Ernst: See—  
Hechtel, Wolfgang; Wohlfarth, Ernst; and Strasser, Alois, 4,013,611.
- Wojik, Karl: See—  
Hafner, Reinhard; Wojik, Karl; and Schlenker, Gerhard, 4,013,058.
- Wolf, Hugo M.; and Wolf, Leo H. Cabinet structure for dental treatment room. 4,013,328, Cl. 312-209.000.
- Wolf, Karlheinz: See—  
Molls, Hans-Heinz; Wolf, Karlheinz; Hornle, Reinhold; Popp, Gottfried; Nonn, Konrad; and Spille, Jürgen, 4,013,481.
- Wolf, Leo H.: See—  
Wolf, Hugo M.; and Wolf, Leo H., 4,013,328.
- Wolf, William D., to Monsanto Company. Method and apparatus for delabeling. 4,013,497, Cl. 156-154.000.
- Wolfe, Saul, to Queen's University at Kingston. 1-Oxacephems. 4,013,653, Cl. 260-244.00R.
- Wolfman, Norman S.: See—  
Hardman, James V.; and Wolfman, Norman S., 4,013,386.
- Wolfrum, Gerhard; and Gold, Heinrich, to Bayer Aktiengesellschaft. Monoazo dyestuffs containing an N-B-1,2,3-triazolethyl anilino coupling component. 4,013,631, Cl. 260-157.000.
- Wollweber, Hartmund; and Flucke, Winfried, to Bayer Aktiengesellschaft. Aminophenylamides, their production and their pharmaceutical use. 4,013,676, Cl. 260-307.00H.
- Woo, Charles, to Exxon Research and Engineering Company. Synthesis of low viscosity low pour point hydrocarbon lubricating oils. 4,013,736, Cl. 260-676.00R.
- Wood, Alan F. B.; Rogers, Graham; and Tuckett, Edward G., to International Standard Electric Corporation. Piezoelectric crystal unit. 4,013,982, Cl. 333-72.000.
- Woolf, Jerome: See—  
Kubilius, Fabian; Pavlovic, Gary Frank; and Woolf, Jerome, 4,013,039.
- Worbois, Robert J.; and Reiss, John R., to Westinghouse Air Brake Company. Brake apparatus providing permanent suppression of a train control brake application. 4,013,322, Cl. 303-18.000.
- Workman, Lester J. Coaxial switch. 4,013,854, Cl. 200-153.00S.
- World Oil Mining Ltd.: See—  
Johns, Robert W., 4,013,320.
- Wormser, Alex F., to Wingersheek, Inc. Aerodynamic fuel combustor. 4,013,395, Cl. 431-9.000.
- Wright, Charles E. Dental cleaning means and method of manufacture therefor. 4,013,085, Cl. 132-89.000.
- Wunsch, Gerd: See—  
Adolph, Heinrich; Wunsch, Gerd; and Kiener, Volker, 4,013,740.
- Wuopio, Richard A.: See—  
Katsumoto, Kiyoshi; and Wuopio, Richard A., 4,013,626.
- Wuppermann, Dirk: See—  
Westermann, Albert; Zimmermann, Frank; Wuppermann, Dirk; Friedrich, Ludwig; and Raschack, Manfred, 4,013,663.
- Xerox Corporation: See—  
Allis, Robert F., 4,013,361.
- Beckman, Maynard K., Jr., 4,013,362.
- Brown, Richard E., 4,013,641.
- Chu, Joseph Y. C.; and Gunther, W. H. H., 4,013,528.
- Chu, Joseph Y. C.; and Gunther, W. H. H., 4,013,529.
- Chu, Joseph Y. C.; and Gunther, W. H. H., 4,013,530.
- Goffe, William L.; Mammino, Joseph; and Ewing, Joan R., 4,013,462.
- Mailloux, Louis D., 4,013,355.
- Marsh, Dana G.; and Pochan, John M., 4,013,572.
- Stark, Howard M.; and Streifer, William, 4,014,030.
- Thettu, Raghulinga R.; and Oszczakiewicz, Michael J., 4,013,400.
- Turner, Sam R.; and Stolka, Milan, 4,013,623.
- Yaguchi, Mitsuro: See—  
Akachi, Hisateru; Miyajima, Hideo; and Yaguchi, Mitsuro, 4,012,894.
- Yamada, Yu, to Canon Kabushiki Kaisha. Optical system for reproduction. 4,013,348, Cl. 350-196.000.
- Yamaguchi, Hidenori: See—  
Harada, Tatsuo; Moniyama, Shigeo; Kita, Toshiaki; and Yamaguchi, Hidenori, 4,012,843.
- Yamaguchi, Shin-ichi: See—  
Kishino, Shigeo; Kudamatsu, Akio; Takase, Iwao; Shiokawa, Kozo; and Yamaguchi, Shin-ichi, 4,013,793.
- Yamaichi, Ryoze: See—  
Suzuki, Kinya; Mori, Kenji; Takeuchi, Yasuo; Torii, Masao; Takahashi, Hiroji; and Yamaichi, Ryoze, 4,012,918.
- Yamaki, Yasuhiro; and Aiage, Kunio, to Fuji Jukogyo Kabushiki Kaisha. Automatic control system for a gasoline-powered combustion engine. 4,013,056, Cl. 123-179.0BG.
- Yamamoto, Hiroshi: See—  
Nakano, Kiyokazu; Yamamoto, Hiroshi; and Ito, Yasunori, 4,013,364.
- Yamanouchi Pharmaceutical Co., Ltd.: See—  
Murakami, Masuo; Kawada, Hirotsu; Ohmura, Tadayoshi; and Sugiura, Hiroshi, 4,013,773.



- Yamazaki, Hiroharu: See—  
Hasegawa, Shigeru; Takai, Katsuyoshi; Yamazaki, Hiroharu; Kikawa, Sueo; and Suyama, Eizo, 4,014,031.
- Yamazaki, Toshio: See—  
Toyota, Hiroshi; Yamazaki, Toshio; and Iketani, Takashi, 4,013,017.
- Yamazaki, Yoshio: See—  
Kamatani, Yoshio; Okazaki, Hisayoshi; Imai, Ko; Fujita, Noriaki; Yamazaki, Yoshio; and Ogino, Katsuhiko, 4,013,509.
- Yamoto, Hisayoshi: See—  
Matsushita, Takeshi; Hayashi, Hisao; Aoki, Teruaki; Yamoto, Hisayoshi; and Kawada, Yoshiyuki, 4,014,037.
- Yasuhara, Hikaru: See—  
Tanaka, Shigenobu; Yasuhara, Hikaru; and Oguchi, Munetsuke, 4,013,948.
- Yasuhiro, Sato; Toshio, Sato; Shuichi, Kawasaki; Toshio, Takaishi; Sadao, Okuyama; and Norio, Yamanashi, to Toyo Seikan Kaisha Limited. Fruit treating apparatus. 4,013,001, Cl. 99-550,000.
- Yasunaga, Tatsuhiro, to Sharp Kabushiki Kaisha. Automatic program locator for tape decks. 4,014,039, Cl. 360-72,000.
- Yeda Research & Development Co. Ltd.: See—  
Goldstein, Leon; Katzir (Katchalski), Ephraim; Levin, Yehuda; and Blumberg, Shmaryahu, 4,013,511.
- Yen, Chung H., to G. D. Searle & Co. 2,2-Diaryl-3-(1-azabicyclo[2.2.2]oct-2-yl)propionamides and intermediates thereto. 4,013,667, Cl. 260-293,530.
- Yen, Chung H.: See—  
Adelstein, Gilbert W.; Karim, Aziz; and Yen, Chung H., 4,013,668.
- Yoder, Paul D., to Parker-Hannifin Corporation. Hose clamp body. 4,012,814, Cl. 24-284,000.
- Yonemitsu, Eiichi; Igarashi, Takeo; Osaki, Naoto; Aoyama, Tetsuo; and Nakazato, Yukiya, to Mitsubishi Gas Chemical Company, Inc. Process for preparing hydroperoxide. 4,013,725, Cl. 260-610,00B.
- Yoshida Kogyo Kabushiki Kaisha: See—  
Nagase, Mitsuo, 4,013,371.
- Yoshida, Osamu: See—  
Hosokoshi, Kakuichiro; and Yoshida, Osamu, 4,013,467.
- Yoshii, Tetsuji, to Matsushita Electric Industrial Co., Ltd. Cassette type magnetic recording and reproducing apparatus. 4,014,043, Cl. 360-137,000.
- Yoshizawa, Keiichi, to Kabushiki Kaisha Seikosha. Rotary indicating plate type digital display device. 4,012,898, Cl. 58-2,000.
- Young, Burbank: See—  
Nelson, Arthur L.; Skrabacz, Donald J.; and Young, Burbank, 4,013,775.
- Young, Patricia: See—  
Connor, David T.; Young, Patricia; and Von Strandtmann, Max, 4,013,673.
- Yozo, Jizodo: See—  
Tamura, Tooru; Ojima, Nobuyuki; Kondo, Sigeru; and Yozo, Jizodo, 4,013,612.
- Yu, Hwa N.: See—  
Ho, Irving T.; and Yu, Hwa N., 4,014,036.
- Yu, Yuan: See—  
Biess, John; and Yu, Yuan, 4,013,939.
- Zacharowski, Dieter: See—  
Strauss, Richard; Giller, Arnold; Zacharowski, Dieter; and Wiener, Hans, 4,013,599.
- Zahnradfabrik Friedrichshafen AG: See—  
Jablonsky, Erich, 4,012,993.
- Zakrzewski, Robert: See—  
Meyer, Martin H.; and Zakrzewski, Robert, 4,013,249.
- Zangrandi, Vittorio; and Peri, Paolo, to Liquichimica S.p.A. Process for the production of L-aspartic acid by fermentation of hydrocarbons. 4,013,508, Cl. 195-28,00R.
- Zardi, Umberto: See—  
Guadalupi, Mario; Pagani, Giorgio; Zardi, Umberto; and Paris, Ivo, 4,013,718.
- Zavatti, Michele; Baravalle, Vittorio; and Saracino, Paolo, to Labofina S.A. Coating compositions for protecting metals. 4,013,603, Cl. 260-28,50D.
- Zeigler, John F., III: See—  
Hwang, Ying-Chen; Peil, William; and Zeigler, John F., III, 4,014,038.
- Zeleny, Richard Alan: See—  
Liang, Shen Fu; and Zeleny, Richard Alan, 4,013,685.
- Zeyher, Craig H. Adjustable wrench mechanism. 4,012,971, Cl. 81-170,000.
- Zimmer, Darrel E.; and Brace, Paul H., to Barber-Colman Company. Control of heating and cooling available from central sources to a multi-zone temperature controlled space. 4,013,118, Cl. 165-22,000.
- Zimmerman, Samuel Morton. Video system and method for presentation and reproduction of x-ray film images. 4,013,833, Cl. 358-111,000.
- Zimmermann, Frank: See—  
Westermann, Albert; Zimmermann, Frank; Wuppermann, Dirk; Friedrich, Ludwig; and Raschack, Manfred, 4,013,663.
- Zinnes, Harold; and Lindo, Neil A., to Warner-Lambert Company. 4-(1-Pyrrolidinyl)-2H-1-benzothiopyran-1,1-dioxide. 4,013,686, Cl. 260-326,840.
- Zoller, Raimund, to KERAG Kessel-,Apparate- und Anlagenbau Richterswil/Schweiz. Back-pressure-resistant vapor trap for condensate discharge. 4,013,220, Cl. 236-56,000.
- Zondlo, John W.: See—  
Sircar, Shivaji; and Zondlo, John W., 4,013,429.
- Zozime, Alain: See—  
Cohen-Solal, Gerard; Zozime, Alain; and Sella, Claude, 4,013,533.
- Zuerger, Manfred: See—  
Volkert, Otto; Wigger, August; Zuerger, Manfred; and Richter, Peter, 4,013,806.
- Zweig, Arnold: See—  
Henderson, William Arthur, Jr.; and Zweig, Arnold, 4,013,620.
- Zydzik, George John: See—  
Van Uiter, Le Grand Gerard; and Zydzik, George John, 4,013,501.

# CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 381,709	3,984,567	Jan. 13, 1976	Oct. 5, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977	B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977	B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976	B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976	B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977	B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976	B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976	B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977	B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977



**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED**

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976	B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977	B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976	B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977	B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976	B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 452,944	4,009,773	Mar. 30, 1976	Dec. 1, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 453,031	3,998,678	Mar. 16, 1976	Mar. 21, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 456,153	3,997,992	Mar. 9, 1976	Oct. 21, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 460,846	3,985,817	Feb. 24, 1976	Nov. 16, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 461,184	3,992,482	Feb. 17, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976	B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976	B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976	B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977	B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976	B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976	B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977	B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976	B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976	B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977	B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976	B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976	B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976	B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976	B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976	B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976

**CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED**

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976	B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976	B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976	B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976	B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976	B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976	B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977	B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976	B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977	B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977



PI 44 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977	B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976	B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977	B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976	B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977	B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976	B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977	B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977	B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976	B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977	B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976	B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976	B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976	B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977	B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976	B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976	B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976	B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976	B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976	B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976	B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976	B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976	B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976	B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976	B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976	B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976	B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977	B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976	B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977	B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976	B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977	B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977	B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976	B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976	B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976	B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976	B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976	B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977	B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976	B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977	B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976	B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977	B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976	B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976	B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976	B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976	B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976	B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976	B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976	B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976	B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976	B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977	B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976	B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977	B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977	B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976	B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976	B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976	B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976	B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976	B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
				B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
				B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PI 45  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976	B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976	B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976	B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976	B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976	B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977	B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976	B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976	B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976	B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976	B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976	B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976	B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976	B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976	B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976	B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976	B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976	B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977	B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976	B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976	B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976	B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976	B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977	B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976	B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977	B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977	B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976	B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976	B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976	B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976	B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976	B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977	B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976	B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976	B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976	B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976	B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976	B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976	B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976	B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976	B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976	B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976	B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977	B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976	B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976	B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976	B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976	B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977	B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976	B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 517,858	4,000,999	Apr. 17, 1976	Jan. 4, 1977	B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977	B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977	B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 518,226	3,993,509	Apr. 10, 1976	Nov. 23, 1976	B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977	B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976	B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976	B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976	B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976	B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976	B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976	B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976	B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976	B 527,788	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976	B 527,972	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976	B 527,999	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977	B 528,277	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976	B 528,299	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976	B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976	B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976	B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976	B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976	B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977	B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977	B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976	B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976	B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976	B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976	B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976	B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976	B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976	B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977	B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976	B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976	B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976	B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976	B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976	B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977	B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977



# CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 545,955	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976	B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976	B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976	B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976	B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976	B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976	B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976	B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976	B 548,440	3,993,401	Feb. 17, 1976	Sep. 28, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976	B 548,462	3,993,401	Feb. 17, 1976	Sep. 28, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977	B 548,688	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976	B 548,719	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976	B 548,978	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977	B 549,198	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976	B 549,244	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976	B 549,394	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976	B 549,931	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976	B 549,964	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976	B 550,693	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976	B 550,744	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976	B 550,810	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976	B 551,133	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976	B 551,463	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976	B 551,527	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976	B 551,809	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976	B 551,952	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977	B 552,006	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976	B 552,489	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976	B 552,498	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976	B 552,508	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977	B 552,508	4,001,250	Jan. 16, 1976	Jan. 4, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976	B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977	B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976	B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976	B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976	B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976	B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976	B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976	B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976	B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976	B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976	B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976	B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976	B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976	B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976	B 555,146	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976	B 555,437	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977	B 555,456	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976	B 555,772	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976	B 556,057	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977	B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976	B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976	B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976	B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976	B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976	B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977	B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976	B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976	B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
				B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976

# CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977	B 575,776	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977	B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976	B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 562,698	3,983,972	Jan. 13, 1976	Oct. 12, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 562,813	3,985,491	Feb. 3, 1976	Dec. 7, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 563,070	3,996,230	Mar. 9, 1976	Oct. 12, 1976	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 563,165	4,000,977	Mar. 9, 1976	Dec. 7, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976	B 584,597	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 564,252	4,001,293	Mar. 2, 1976	Oct. 12, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 564,314	3,984,996	Jan. 20, 1976	Jan. 4, 1977	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 564,902	4,001,351	Mar. 23, 1976	Sep. 21, 1976	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 565,180	3,981,685	Jan. 27, 1976	Nov. 9, 1976	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 565,275	3,990,299	Apr. 6, 1976	Dec. 21, 1976	B 589,668	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 7, 1976	B 590,158	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977	B 590,502	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976	B 591,141	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 566,556	3,998,511	Mar. 23, 1976	Oct. 12, 1976	B 592,143	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 566,572	3,988,590	Mar. 16, 1976	Mar. 8, 1977	B 592,146	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 566,585	4,001,083	Mar. 2, 1976	Oct. 26, 1976	B 592,658	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Nov. 16, 1976	B 594,871	4,001,245	Mar. 23, 1976	Jan. 4, 1977
B 567,076	4,011,187	Mar. 23, 1976	Dec. 7, 1976	B 596,692	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 567,158	3,988,073	Mar. 23, 1976	Oct. 12, 1976	B 597,410	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 567,207	3,991,689	Apr. 13, 1976	Jan. 4, 1977	B 597,438	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 567,435	3,995,724	Feb. 3, 1976	Nov. 16, 1976	B 601,141	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 567,854	3,985,038	Feb. 3, 1976	Sep. 21, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 567,892	4,000,855	Mar. 16, 1976	Oct. 19, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 568,226	3,992,698	Feb. 24, 1976	Jan. 18, 1977	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 568,770	3,982,213	Feb. 10, 1976	Dec. 28, 1976	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 569,125	3,986,980	Feb. 24, 1976		B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 569,293	4,004,149	Mar. 30, 1976					
B 569,501	3,999,250	Mar. 9, 1976					



# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 22ND DAY OF MARCH, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Bell & Howell Company: *See—*  
Krtous, George F.; and Schreyer, Carl G., Re. 29,159.  
Black Clawson Fibreclaim, Inc.: *See—*  
Marsh, Paul G., Re. 29,156.  
Cartier, Roger J.; Obermann, George; and Willigman, John, to Singer Company, The. Timer blade arrangement. Re. 29,158, Cl. 200-38.00B.  
Galkiewicz, Thomas M.: *See—*  
Petersen, Kenneth C.; and Galkiewicz, Thomas M., Re. 29,157.  
Grinnell Fire Protection Systems Company, Inc.: *See—*  
Mears, James W.; and O'Brien, William J., Re. 29,155.  
Krtous, George F.; and Schreyer, Carl G., to Bell & Howell Company. Vertical record card adapter for record tape machine. Re. 29,159, Cl. 360-88.000.  
Marsh, Paul G., to Black Clawson Fibreclaim, Inc. Fuel by-products of municipal refuse. Re. 29,156, Cl. 44-1.00D.  
Mears, James W.; and O'Brien, William J., to Grinnell Fire Protection Systems Company, Inc. On-off sprinkler. Re. 29,155, Cl. 169-37.000.  
Obermann, George: *See—*  
Cartier, Roger J.; Obermann, George; and Willigman, John, Re. 29,158.  
O'Brien, William J.: *See—*  
Mears, James W.; and O'Brien, William J., Re. 29,155.  
Petersen, Kenneth C.; and Galkiewicz, Thomas M., to Schenectady Chemicals, Inc. High temperature resistant polychloroprene adhesive resin. Re. 29,157, Cl. 260-25.000.  
Schenectady Chemicals, Inc.: *See—*  
Petersen, Kenneth C.; and Galkiewicz, Thomas M., Re. 29,157.  
Schreyer, Carl G.: *See—*  
Krtous, George F.; and Schreyer, Carl G., Re. 29,159.  
Singer Company, The: *See—*  
Cartier, Roger J.; Obermann, George; and Willigman, John, Re. 29,158.  
Willigman, John: *See—*  
Cartier, Roger J.; Obermann, George; and Willigman, John, Re. 29,158.

# LIST OF DESIGN PATENTEES

- AB Lundquists Patenter: *See—*  
Unghanse, Carl, 243,747.  
American Optical Corporation: *See—*  
Johnsen, David W., 243,762.  
Ameritone Paint Corporation: *See—*  
Dorr, Robert C., 243,763.  
Barclay, Rodney: *See—*  
Koenig, Robert B.; and Barclay, Rodney, 243,730.  
Bausch & Lomb Incorporated: *See—*  
Huckenbeck, Claus O., 243,761.  
Bell, Mace Hudson, to Sybron Corporation. Sphygmomanometer. 243,799, 3-22-77, Cl. D83-12.00R.  
Besenbruch-Hofmann Inc.: *See—*  
Hinojosa, Charles R., 243,768.  
Black and Decker Manufacturing Company, The: *See—*  
Bunyea, Roderick Francis, 243,787.  
House, Lawrence Emmerson, II; and Bunyea, Roderick Francis, 243,742.  
Blanco, Ricardo Godofredo, to Dia S.R.L. Armchair. 243,727, 3-22-77, Cl. D6-69.000.  
Breneman, Inc.: *See—*  
Erpenbeck, Paul J., 243,743.  
Bridgestone Tire Company Limited: *See—*  
Hayakawa, Toshio; and Nakamura, Sigemitsu, 243,757.  
Makino, Shigeo; Kojima, Hiroshi; Hayakawa, Toshio; and Watanabe, Shigeo, 243,756.  
Bunyea, Roderick Francis, to Black and Decker Manufacturing Company, The. Detachable flashlight head. 243,787, 3-22-77, Cl. D48-24.00A.  
Bunyea, Roderick Francis: *See—*  
House, Lawrence Emmerson, II; and Bunyea, Roderick Francis, 243,742.  
Bustos, Rafael T., to Legget & Platt Incorporated; and International Beverage Supply Displays Inc., part interest to each. Display rack. 243,734, 3-22-77, Cl. D6-134.000.  
Canadian Lady-Canadelle Inc.: *See—*  
Poirier, Louise, 243,722.  
Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., to General Mills Fun Group, Inc. Toy medical unit. 243,784, 3-22-77, Cl. D34-15.00R.  
Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., to General Mills Fun Group, Inc. Toy medical unit. 243,785, 3-22-77, Cl. D34-15.00R.  
Danta, Randall: *See—*  
McKinnon, Eugene T.; Drutz, Alvin S.; and Danta, Randall, 243,772.  
Dart Industries Inc.: *See—*  
Painter, David L., 243,737.  
Devinney, Robert C., Jr., to Larson Enterprises, Inc. Photo lamp. 243,760, 3-22-77, Cl. D16-42.000.  
Dia S.R.L.: *See—*  
Blanco, Ricardo Godofredo, 243,727.  
Dillon, Richard R.: *See—*  
Graham, John F.; and Dillon, Richard R., 243,771.  
Dolnar, Hubert, to Unican Security Systems, Ltd. Pull. 243,744, 3-22-77, Cl. D8-318.000.  
Dominion Auto Accessories Limited: *See—*  
Nagel, Robert I., 243,791.  
Nagel, Robert I., 243,792.  
Nagel, Robert I., 243,793.  
Donaldson, Linda Jansen, to General Mills Fun Group, Inc. Soap dispenser or the like. 243,731, 3-22-77, Cl. D6-95.000.  
Dorr, Robert C., to Ameritone Paint Corporation. Color selection guide. 243,763, 3-22-77, Cl. D19-59.000.  
Drutz, Alvin S.: *See—*  
McKinnon, Eugene T.; Drutz, Alvin S.; and Danta, Randall, 243,772.  
E-Z-EM Company Inc.: *See—*  
Greene, Franklin R., 243,797.  
England, Donald E.: *See—*  
Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., 243,784.  
Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., 243,785.  
Enners, Richard Walton. Shelving and light fixtures therefor. 243,735, 3-22-77, Cl. D6-186.000.  
Erpenbeck, Paul J., to Breneman, Inc. Manual window shade and roller cut off knife. 243,743, 3-22-77, Cl. D8-98.000.  
Foggia, Donald A., to Siemens Corporation. Switchboard for telecommunications switching system. 243,773, 3-22-77, Cl. D14-58.000.  
Fratelli Saporiti: *See—*  
Offredi, Giovanni, 243,726.  
Offredi, Giovanni, 243,728.  
Offredi, Giovanni, 243,729.  
GAF Corporation: *See—*  
Miller, Paul D., 243,758.  
General Electric Company: *See—*  
Hauenstein, Max C., 243,741.  
General Mills Fun Group, Inc.: *See—*  
Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., 243,784.  
Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., 243,785.  
Donaldson, Linda Jansen, 243,731.  
Gianacacos, Constantine P. Restaurant building. 243,770, 3-22-77, Cl. D25-9.000.  
Giordano, George P.: *See—*  
Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., 243,784.  
Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., 243,785.  
Graham, John F.; and Dillon, Richard R., to Honeywell Information Systems, Inc. Computer or similar article. 243,771, 3-22-77, Cl. D14-44.000.



## LIST OF DESIGN PATENTEES

Greene, Franklin R., to E-Z-EM Company Inc. Flexible container for barium radiological examinations. 243,797, 3-22-77, Cl. D83-1.00U.  
 Gregory, Arthur J. Mortar and pestle cover. 243,776, 3-22-77, Cl. D24-23.000.  
 Hauenstein, Max C., to General Electric Company. Coffemaker lid or similar article. 243,741, 3-22-77, Cl. D7-131.000.  
 Hayakawa, Toshio; and Nakamura, Sigemitsu, to Bridgestone Tire Company Limited. Vehicle tire. 243,757, 3-22-77, Cl. D12-147.000.  
 Hayakawa, Toshio: See—  
 Makino, Shigeo; Kojima, Hiroshi; Hayakawa, Toshio; and Watanabe, Shigeo, 243,756.  
 Hegemann, Manfred: See—  
 Wasko, Bernard; and Hegemann, Manfred, 243,750.  
 Hickey, Thomas F. G. Hoop target for lawn game. 243,782, 3-22-77, Cl. D34-5.0PP.  
 Hinojosa, Charles R., to Besenbruch-Hofmann Inc. Brake fluid filter. 243,768, 3-22-77, Cl. D23-4.000.  
 Hoeweler, Alan E.: See—  
 Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., 243,784.  
 Cordrey, Robert E.; England, Donald E.; Giordano, George P.; Hoeweler, Alan E.; and Mayer, John F., 243,785.  
 Honeywell Information Systems, Inc.: See—  
 Graham, John F.; and Dillon, Richard R., 243,771.  
 House, Lawrence Emerson, II; and Bunyea, Roderick Francis, to Black and Decker Manufacturing Company, The. Cordless tool. 243,742, 3-22-77, Cl. D8-69.000.  
 Huckenbeck, Claus O., to Bausch & Lomb Incorporated. Binocular with eyecups therefor. 243,761, 3-22-77, Cl. 16-59.000.  
 Huffman, Erlene L. Visor cap. 243,725, 3-22-77, Cl. D2-244.000.  
 International Beverage Supply Displays Inc.: See—  
 Bustos, Rafael T., 243,734.  
 Isaacs, Harold. Sump basin. 243,766, 3-22-77, Cl. D23-1.000.  
 Ishizuka, Haruo. Pillow. 243,736, 3-22-77, Cl. D6-203.000.  
 Johnson, David W., to American Optical Corporation. Pair of spectacles. 243,762, 3-22-77, Cl. D16-65.000.  
 Johnson, Michael K. Wine rack. 243,738, 3-22-77, Cl. D7-71.000.  
 Kabushiki Kaisha Sato Kenkyusho: See—  
 Sato, Yo, 243,795.  
 Kardas, James R. Cart for house and garden tools. 243,752, 3-22-77, Cl. D12-32.000.  
 Kleinman, Leonard; and Zelenko, Harry. Puzzle or similar article. 243,783, 3-22-77, Cl. D34-15.00M.  
 Koenig, Robert B.; and Barclay, Rodney, to Recognition Equipment Incorporated. Wand holder. 243,730, 3-22-77, Cl. D6-85.000.  
 Kojima, Hiroshi: See—  
 Makino, Shigeo; Kojima, Hiroshi; Hayakawa, Toshio; and Watanabe, Shigeo, 243,756.  
 Krause, Daniel F., to Teletymer Inc. Interval signalling timer. 243,748, 3-22-77, Cl. D10-40.000.  
 Lane Drug Company, The: See—  
 Swartz, Ronald E., 243,798.  
 Larson Enterprises, Inc.: See—  
 Devinney, Robert C., Jr., 243,760.  
 Lear Siegler, Inc.: See—  
 Pareja, Ramon, 243,796.  
 Leggett & Platt Incorporated: See—  
 Bustos, Rafael T., 243,734.  
 Lewis, Frederick T. Putting target unit for a golf game apparatus. 243,777, 3-22-77, Cl. D34-5.0NN.  
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 Lynn, William J.: See—  
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## CLASSIFICATION OF PATENTS

ISSUED MARCH 22, 1977

NOTE—First number, class; second number, subclass; third number, patent number

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CLASS 40	517	4,012,828	CLASS 70	CLASS 93	2	4,013,037	CLASS 99	129 T	4,013,036	CLASS 143	144	4,013,102
CLASS 41	567	4,012,829	CLASS 71	CLASS 94	2	4,013,037	CLASS 100	129 T	4,013,036	CLASS 144	18	4,013,104
CLASS 42	578	4,012,830	CLASS 72	CLASS 95	2	4,013,037	CLASS 101	129 T	4,013,036	CLASS 145	86	4,013,105
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CLASS 44	575	4,012,832	CLASS 74	CLASS 97	2	4,013,037	CLASS 103	129 T	4,013,036	CLASS 147	86	4,013,105
CLASS 45	575	4,012,833	CLASS 75	CLASS 98	2	4,013,037	CLASS 104	129 T	4,013,036	CLASS 148	86	4,013,105
CLASS 46	591	4,012,833	CLASS 76	CLASS 99	2	4,013,037	CLASS 105	129 T	4,013,036	CLASS 149	86	4,013,105
CLASS 47	591	4,012,835	CLASS 77	CLASS 100	2	4,013,037	CLASS 106	129 T	4,013,036	CLASS 150	86	4,013,105
CLASS 48	591	4,012,835	CLASS 78	CLASS 101	2	4,013,037	CLASS 107	129 T	4,013,036	CLASS 151	86	4,013,105
CLASS 49	591	4,012,835	CLASS 79	CLASS 102	2	4,013,037	CLASS 108	129 T	4,013,036	CLASS 152	86	4,013,105
CLASS 50	591	4,012,835	CLASS 80	CLASS 103	2	4,013,037	CLASS 109	129 T	4,013,036	CLASS 153	86	4,013,105
CLASS 51	591	4,012,835	CLASS 81	CLASS 104	2	4,013,037	CLASS 110	129 T	4,013,036	CLASS 154	86	4,013,105
CLASS 52	591	4,012,835	CLASS 82	CLASS 105	2	4,013,037	CLASS 111	129 T	4,013,036	CLASS 155	86	4,013,105
CLASS 53	591	4,012,835	CLASS 83	CLASS 106	2	4,013,037	CLASS 112	129 T	4,013,036	CLASS 156	86	4,013,105
CLASS 54	591	4,012,835	CLASS 84	CLASS 107	2	4,013,037	CLASS 113	129 T	4,013,036	CLASS 157	86	4,013,105
CLASS 55	591	4,012,835	CLASS 85	CLASS 108	2	4,013,037	CLASS 114	129 T	4,013,036	CLASS 158	86	4,013,105
CLASS 56	591	4,012,835	CLASS 86	CLASS 109	2	4,013,037	CLASS 115	129 T	4,013,036	CLASS 159	86	4,013,105
CLASS 57	591	4,012,835	CLASS 87	CLASS 110	2	4,013,037	CLASS 116	129 T	4,013,036	CLASS 160	86	4,013,105
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CLASS 60	591	4,012,835	CLASS 90	CLASS 113	2	4,013,037	CLASS 119	129 T	4,013,036	CLASS 163	86	4,013,105
CLASS 61	591	4,012,835	CLASS 91	CLASS 114	2	4,013,037	CLASS 120	129 T	4,013,036	CLASS 164	86	4,013,105
CLASS 62	591	4,012,835	CLASS 92	CLASS 115	2	4,013,037	CLASS 121	129 T	4,013,036	CLASS 165	86	4,013,105
CLASS 63	591	4,012,835	CLASS 93	CLASS 116	2	4,013,037	CLASS 122	129 T	4,013,036	CLASS 166	86	4,013,105
CLASS 64	591	4,012,835	CLASS 94	CLASS 117	2	4,013,037	CLASS 123	129 T	4,013,036	CLASS 167	86	4,013,105
CLASS 65	591	4,012,835	CLASS 95	CLASS 118	2	4,013,037	CLASS 124	129 T	4,013,036	CLASS 168	86	4,013,105
CLASS 66	591	4,012,835	CLASS 96	CLASS 119	2	4,013,037	CLASS 125	129 T	4,013,036	CLASS 169	86	4,013,105
CLASS 67	591	4,012,835	CLASS 97	CLASS 120	2	4,013,037	CLASS 126	129 T	4,013,036	CLASS 170	86	4,013,105
CLASS 68	591	4,012,835	CLASS 98	CLASS 121	2	4,013,037	CLASS 127	129 T	4,013,036	CLASS 171	86	4,013,105
CLASS 69	591	4,012,835	CLASS 99	CLASS 122	2	4,013,037	CLASS 128	129 T	4,013,036	CLASS 172	86	4,013,105
CLASS 70	591	4,012,835	CLASS 100	CLASS 123	2	4,013,037	CLASS 129	129 T	4,013,036	CLASS 173	86	4,013,105
CLASS 71	591	4,012,835	CLASS 101	CLASS 124	2	4,013,037	CLASS 130	129 T	4,013,036	CLASS 174	86	4,013,105
CLASS 72	591	4,012,835	CLASS 102	CLASS 125	2	4,013,037	CLASS 131	129 T	4,013,036	CLASS 175	86	4,013,105
CLASS 73	591	4,012,835	CLASS 103	CLASS 126	2	4,013,037	CLASS 132	129 T	4,013,036	CLASS 176	86	4,013,105
CLASS 74	591	4,012,835	CLASS 104	CLASS 127	2	4,013,037	CLASS 133	129 T	4,013,036	CLASS 177	86	4,013,105
CLASS 75	591	4,012,835	CLASS 105	CLASS 128	2	4,013,037	CLASS 134	129 T	4,013,036	CLASS 178	86	4,013,105
CLASS 76	591	4,012,835	CLASS 106	CLASS 129	2	4,013,037	CLASS 135	129 T	4,013,036	CLASS 179	86	4,013,105
CLASS 77	591	4,012,835	CLASS 107	CLASS 130	2	4,013,037	CLASS 136	129 T	4,013,036	CLASS 180	86	4,013,105
CLASS 78	591	4,012,835	CLASS 108	CLASS 131	2	4,013,037	CLASS 137	129 T	4,013,036	CLASS 181	86	4,013,105
CLASS 79	591	4,012,835	CLASS 109	CLASS 132	2	4,013,037	CLASS 138	129 T	4,013,036	CLASS 182	86	4,013,105
CLASS 80	591	4,012										



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34 R	4,013,106				21	4,013,204	4,013,891	4,013,651
35 R	4,013,107				173	4,013,205	4,013,892	4,013,652
175	4,013,108				504	4,013,567	4,013,893	4,013,653
CLASS 148	68.5	4,013,136	386	4,013,168	568	4,013,894	4,013,894	4,013,654
1.5	4,013,483				569		4,013,894	4,013,655
4,013,484								4,013,656
4,013,485								4,013,657
9.5	4,013,486							4,013,658
16.5	4,013,487							4,013,659
143	4,013,488							4,013,660
174	4,013,489							4,013,661
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19.3	4,013,491							4,013,651
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347	4,013,111							4,013,657
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85	4,013,496							4,013,659
86	4,013,494							4,013,660
98	4,013,495							4,013,661
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654	4,013,493							4,013,670
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330	4,013,114							4,013,675
CLASS 162	5	4,013,505	521	4,013,170				4,013,676
49	4,013,506							4,013,677
CLASS 164	151	4,013,160	521	4,013,170				4,013,678
51	4,013,115							4,013,679
262	4,013,116							4,013,680
CLASS 165	409	4,013,162	521	4,013,170				4,013,681
10	4,013,117							4,013,682
22	4,013,118							4,013,683
27	4,013,119							4,013,684
48	4,013,120							4,013,685
154	4,013,122							4,013,686
162	4,013,121							4,013,687
CLASS 166	18	4,013,847	521	4,013,170				4,013,688
250	4,013,123							4,013,689
4,013,124								4,013,690
273	4,013,125							4,013,691
CLASS 168	86 R	4,013,851	521	4,013,170				4,013,692
4	4,013,126							4,013,693
CLASS 169	146 R	4,013,852	521	4,013,170				4,013,694
37	Re.29.155							4,013,695
57	4,013,127							4,013,696
61	4,013,128							4,013,697
CLASS 172	117 HD	4,013,856	521	4,013,170				4,013,698
370	4,013,131							4,013,699
464	4,013,129							4,013,700
719	4,013,130							4,013,701
804	4,013,132							4,013,702
CLASS 173	241	4,013,518	521	4,013,170				4,013,703
32	4,013,133							4,013,704
CLASS 174	33	4,013,519	521	4,013,170				4,013,705
43	4,013,826							4,013,706
CLASS 175	34	4,013,520	521	4,013,170				4,013,707
73	4,013,134							4,013,708
CLASS 177	43 G	4,013,523	521	4,013,170				4,013,709
144	4,013,135							4,013,710
CLASS 178	59 R	4,013,524	521	4,013,170				4,013,711
18	4,013,835							4,013,712
58 R	4,013,836							4,013,713
CLASS 179	129.46	4,013,526	521	4,013,170				4,013,714
1.5 S	4,013,837							4,013,715
2 A	4,013,838							4,013,716
7 R	4,013,839							4,013,717
15 BT	4,013,841							4,013,718
15 FD	4,013,840							4,013,719
18 EB	4,013,843							4,013,720
99	4,013,844							4,013,721

128	4,013,749	92	4,013,324	57	4,013,959	336	4,014,012	299	4,013,829	219	4,013,795
136	4,013,750			139	4,013,960		4,014,013		4,013,831	242	4,013,762
140	4,013,751		CLASS 307	144	4,013,961	347 P	4,014,015			246	4,013,763
154	4,013,752			304	4,013,962	347 SY	4,014,014		CLASS 360		4,013,764
168	4,013,753			308	4,013,963	384 R	4,014,016	72	4,014,039		4,013,765
	CLASS 266			319	4,013,964			73	4,014,040		4,013,766
76	4,013,277			320	4,013,965	5 VQ	4,014,018	88	Re.29.159	249	4,013,767
213	4,013,278			363	4,013,966	5 W	4,014,019	96	4,014,041	251	4,013,768
249	4,013,279					7 AG	4,014,020	132	4,014,042		4,013,769
	CLASS 269			124	4,013,968	13 R	4,014,022	137	4,014,043	263	4,013,770
60	4,013,280			155	4,013,969	14	4,014,021		CLASS 361		4,013,769
61	4,013,281					100 SA	4,014,023	18	4,013,925	273	4,013,771
289 MR	4,013,282					106 R	4,014,024	49	4,013,924	275	4,013,771
	CLASS 271			104	4,013,967		4,014,025	115	4,013,926	278	4,013,772
14	4,013,283	4 A	4,013,325	117	4,013,970	766	4,014,026	119	4,013,927	284	4,013,773
183	4,013,284	9	4,013,326			779	4,014,027	172	4,013,930	285	4,013,774
261	4,013,285	233	4,013,327			895	4,014,028	187	4,013,931	315	4,013,776
	CLASS 272			23	4,013,971			357	4,013,929	316	4,013,777
8 R	4,013,286	8.3	4,013,905	29	4,013,972			380	4,013,928		CLASS 425
136	4,013,287	13	4,013,906	30 D	4,013,973		CLASS 346				4,013,389
	CLASS 273	50	4,013,907	34	4,013,974	1	4,014,029		CLASS 401	21	4,013,390
67 A	4,013,288	61	4,013,908	145	4,013,975	160	4,014,030	139	4,013,369	47	4,013,391
73 D	4,013,289	180	4,013,909				CLASS 350	175	4,013,370	145	4,013,391
73 E	4,013,290	211	4,013,910			3.5	4,013,338		CLASS 403	157	4,013,392
102.2 R	4,013,292			94.5 D	4,013,977	16	4,013,339	187	4,013,371	245 R	4,013,393
130 A	4,013,291	209	4,013,328	94.5 G	4,013,976	36	4,013,340	237	4,013,372	405 H	4,013,394
131 AD	4,013,293			94.5 L	4,013,978	70	4,013,341	291	4,013,373		
134 B	4,013,294			108 B	4,013,979	96 C	4,013,000	408	4,012,884		CLASS 426
162 E	4,013,295						4,013,342		4,012,885	56	4,013,797
	CLASS 274						4,013,344			107	4,013,798
42 R	4,013,296						4,013,343			285	4,013,775
	CLASS 277						4,013,345			536	4,013,800
3	4,013,297	3.5	4,013,917				4,013,346	25	4,013,374	548	4,013,801
75	4,013,298	71	4,013,918				4,013,347	98	4,013,375	578	4,013,799
165	4,013,299	73	4,013,919				186			621	4,013,802
	CLASS 280						198				
5 A	4,013,300	241 R	4,013,920				214				CLASS 427
95 R	4,013,301	362	4,013,921				4,013,350				4,013,803
154.5 R	4,013,302	411	4,013,922				4,013,351	117	4,013,376	8	4,013,804
491 D	4,013,303		4,013,923				CLASS 352	161	4,013,377	33	4,013,804
618	4,013,304						4,013,352	209	4,013,378	54	4,013,806
742	4,013,305								CLASS 417	184	4,013,807
745	4,013,306						CLASS 353	100	4,013,379	289	4,013,808
764	4,013,307						4,013,353	218	4,013,380	296	4,013,809
766	4,013,308						CLASS 354	222	4,013,381	390 R	4,013,805
	CLASS 285						5	332	4,013,382		CLASS 428
31	4,013,309						4,014,031	366	4,013,383	35	4,013,811
110	4,013,310						93	368	4,013,384	245	4,013,812
	CLASS 292						142	377	4,013,385	272	4,013,813
59	4,013,311						152	489	4,013,386	277	4,013,814
113	4,013,312						209	554	4,013,387	285	4,013,815
	CLASS 294								CLASS 418	288	4,013,816
17	4,013,313								4,013,388	308	4,013,810
82 R	4,013,314								CLASS 423	412	4,013,696
	CLASS 296									462	4,013,817
83	4,013,315										CLASS 429
146	4,013,317										4,013,818
	CLASS 297										4,013,819
347	4,013,316										CLASS 431
438	4,013,318										4,013,395
	CLASS 299										4,013,396
31	4,013,319										4,013,397
33	4,013,320										4,013,398
	CLASS 302										4,013,399
59	4,013,321										CLASS 432
	CLASS 303										4,013,400
18	4,013,322										4,013,401
20	4,013,323										4,013,402
											4,013,403
											CLASS 526
											4,013,822
											4,013,823
											4,013,824
											4,013,825
											4,013,826
											CLASS 536
											4,013,820
											4,013,821



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D2— 10 243,721	186 243,735	D10— 40 243,748	71 243,794	D24— 23 243,776	243,784
24 243,722	203 243,736	71 243,749	7 243,796	D25— 9 243,770	243,785
190 243,723	D7— 62 243,737	91 243,750	28 243,759	D27— 6 243,774	D47— 6 E 243,788
191 243,724	71 243,738	122 243,751	243,758	36 243,775	243,789
244 243,725	105 243,739	D12— 32 243,752	42 243,760	D28— 19 243,800	243,790
69 243,726	110 243,740	102 243,753	65 243,762	D34— 5 BG 243,781	D48— 24 A 243,787
71 243,727	D8— 131 243,741	111 243,754	59 243,763	5 GH 243,778	32 A 243,791
75 243,728	69 243,742	243,755	73 243,764	5 JJ 243,780	243,792
85 243,729	98 243,743	142 243,756	19 243,765	5 NN 243,777	243,793
95 243,730	318 243,744	147 243,757	1 243,766	5 PP 243,782	D64— 11 R 243,795
127 243,732	359 243,745	D13— 33 243,772	3 243,767	15 AJ 243,786	D83— 1 U 243,797
243,733	396 243,746	D14— 44 243,771	4 243,768	15 M 243,783	1.0 243,798
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## PATENTS

1 : 4,012,987	4,013,259	8 : 4,014,028	4,012,887	4,013,410	4,012,886
2 : 4,013,104	4,013,260	4,013,125	4,013,006	4,013,545	4,013,106
4 : 4,013,007	4,013,263	4,013,251	4,013,026	4,013,548	4,013,168
4,013,049	4,013,272	4,013,264	4,013,097	4,013,557	4,013,493
4,013,233	4,013,290	4,013,374	4,013,119	4,013,576	4,013,637
4,013,860	4,013,309	4,013,457	4,013,184	4,013,606	4,012,911
5 : 4,013,196	4,013,329	4,013,544	4,013,389	4,013,643	4,013,019
4,013,203	4,013,341	4,012,901	4,013,504	4,013,644	4,013,161
4,013,398	4,013,352	4,013,024	4,013,087	4,013,666	4,013,413
6 : 4,012,794	4,013,355	4,013,045	4,013,164	4,013,667	4,013,426
4,012,808	4,013,360	4,013,202	4,013,241	4,013,668	4,014,026
4,012,822	4,013,379	4,013,235	Re.29,158	4,013,675	4,012,811
4,012,866	4,013,428	4,013,284	Re.29,159	4,013,733	4,012,812
4,012,884	4,013,484	4,013,291	4,012,798	4,013,735	4,012,813
4,012,929	4,013,489	4,013,311	4,012,802	4,013,737	4,012,821
4,012,947	4,013,492	4,013,359	4,012,806	4,013,738	4,012,823
4,012,950	4,013,495	4,013,359	4,012,868	4,013,738	4,012,836
4,012,953	4,013,507	4,013,376	4,012,908	4,013,820	4,012,850
4,012,955	4,013,532	4,013,459	4,012,928	4,013,849	4,013,066
4,012,969	4,013,547	4,013,497	4,012,935	4,013,856	4,013,128
4,012,970	4,013,561	4,013,553	4,012,951	4,013,870	4,013,167
4,012,972	4,013,562	4,013,620	4,012,960	4,013,873	4,013,177
4,012,984	4,013,568	4,013,662	4,012,976	4,013,925	4,013,239
4,012,989	4,013,616	4,013,681	4,012,996	4,013,927	4,013,256
4,012,991	4,013,626	4,013,691	4,012,997	4,013,930	4,013,262
4,012,998	4,013,685	4,013,789	4,013,030	4,013,962	4,013,285
4,012,999	4,013,741	4,013,882	4,013,037	4,013,964	4,013,383
4,013,012	4,013,750	4,013,890	4,013,050	4,014,015	4,013,395
4,013,023	4,013,766	4,013,921	4,013,053	4,014,019	4,013,539
4,013,031	4,013,774	4,013,945	4,013,064	4,012,968	4,013,798
4,013,048	4,013,801	4,013,126	4,013,069	4,013,057	4,013,805
4,013,068	4,013,832	4,013,594	4,013,072	4,013,070	4,013,835
4,013,074	4,013,838	4,013,624	4,013,086	4,013,147	4,013,842
4,013,080	4,013,861	4,013,627	4,013,112	4,013,372	4,013,851
4,013,091	4,013,864	4,013,704	4,013,118	4,013,651	4,013,885
4,013,092	4,013,876	4,013,792	4,013,120	4,013,654	4,013,913
4,013,109	4,013,881	4,012,910	4,013,129	4,013,658	4,013,914
4,013,122	4,013,916	4,012,865	4,013,130	4,013,880	4,013,946
4,013,123	4,013,939	4,012,988	4,013,139	4,013,941	4,014,006
4,013,124	4,013,943	4,013,013	4,013,157	4,012,958	4,012,807
4,013,135	4,013,944	4,013,033	4,013,160	4,014,035	4,012,838
4,013,145	4,013,949	4,013,062	4,013,187	4,012,891	4,012,863
4,013,149	4,013,965	4,013,295	4,013,197	4,012,892	4,012,869
4,013,166	4,013,966	4,013,296	4,013,215	4,013,110	4,012,872
4,013,195	4,013,968	4,013,315	4,013,228	4,013,303	4,012,880
4,013,201	4,013,977	4,013,419	4,013,249	4,013,929	4,012,904
4,013,208	4,013,990	4,013,432	4,013,266	4,013,969	4,012,942
4,013,222	4,013,991	4,013,558	4,013,298	4,013,751	4,012,975
4,013,231	4,013,995	4,013,797	4,013,312	4,013,761	4,012,982
4,013,236	4,014,001	4,013,854	4,013,336	4,013,865	4,012,983
4,013,240	4,014,002	4,013,992	4,013,369	4,013,027	4,013,029
4,013,245	4,014,011	4,013,994	4,013,375	4,013,297	4,013,047
4,013,253	4,014,016	4,012,885	4,013,409	4,012,862	4,013,054



4,013,102		4,013,169	4,012,966	39 : Re.29,156	4,013,096	4,013,225
4,013,117	34 :	4,012,796	4,013,016	4,012,814	4,013,142	4,013,269
4,013,143		4,012,831	4,013,039	4,012,820	4,013,198	4,013,300
4,013,154		4,012,842	4,013,041	4,012,851	4,013,199	4,013,362
4,013,188		4,012,846	4,013,059	4,012,889	4,013,211	4,013,385
4,013,213		4,012,921	4,013,063	4,012,965	4,013,216	4,013,480
4,013,214		4,012,959	4,013,065	4,013,005	4,013,217	4,013,502
4,013,218		4,012,971	4,013,083	4,013,018	4,013,283	4,013,556
4,013,254		4,013,000	4,013,084	4,013,034	4,013,287	4,013,569
4,013,257		4,013,077	4,013,200	4,013,111	4,013,322	4,013,604
4,013,302		4,013,103	4,013,252	4,013,134	4,013,323	4,013,724
4,013,307		4,013,152	4,013,280	4,013,141	4,013,377	4,013,743
4,013,332		4,013,209	4,013,292	4,013,155	4,013,394	4,013,780
4,013,570		4,013,212	4,013,319	4,013,186	4,013,403	4,013,833
4,013,683		4,013,267	4,013,361	4,013,234	4,013,407	4,013,837
4,013,688		4,013,270	4,013,378	4,013,271	4,013,411	4,013,869
4,013,693		4,013,289	4,013,397	4,013,326	4,013,429	4,013,874
4,013,695		4,013,316	4,013,400	4,013,363	4,013,433	4,013,901
4,013,707		4,013,321	4,013,404	4,013,414	4,013,454	4,013,997
4,013,728		4,013,345	4,013,453	4,013,434	4,013,474	4,013,999
4,013,730		4,013,351	4,013,458	4,013,435	4,013,490	4,014,012
4,013,799		4,013,353	4,013,460	4,013,437	4,013,513	4,014,013
4,013,802		4,013,368	4,013,462	4,013,438	4,013,520	4,012,861
4,013,808		4,013,386	4,013,463	4,013,461	4,013,538	4,013,010
4,013,850		4,013,402	4,013,464	4,013,496	4,013,550	4,013,299
4,013,862	27 :	4,013,442	4,013,485	4,013,517	4,013,563	4,013,318
4,012,832		4,013,466	4,013,486	4,013,519	4,013,575	4,013,365
4,012,834		4,013,475	4,013,528	4,013,535	4,013,596	4,013,477
4,012,839		4,013,501	4,013,529	4,013,537	4,013,597	4,013,491
4,012,878		4,013,516	4,013,530	4,013,564	4,013,647	4,013,840
4,013,137		4,013,523	4,013,546	4,013,566	4,013,705	51 : 4,013,127
4,013,224		4,013,543	4,013,572	4,013,573	4,013,764	4,013,207
4,013,230		4,013,549	4,013,583	4,013,574	4,013,765	4,013,294
4,013,278		4,013,552	4,013,584	4,013,581	4,013,775	4,013,418
4,013,282		4,013,577	4,013,613	4,013,598	4,013,777	4,013,479
4,013,293		4,013,582	4,013,621	4,013,710	4,013,803	4,013,555
4,013,328		4,013,593	4,013,623	4,013,762	4,013,836	4,013,664
4,013,388		4,013,622	4,013,633	4,013,796	4,013,844	4,013,810
4,013,396		4,013,634	4,013,635	4,013,847	4,013,867	4,013,938
4,013,423		4,013,641	4,013,640	4,013,848	4,013,877	4,013,950
4,013,444		4,013,646	4,013,649	4,013,853	4,013,887	4,013,959
4,013,494		4,013,660	4,013,652	4,013,894	4,013,899	53 : 4,012,797
4,013,498		4,013,671	4,013,665	4,013,910	4,013,904	4,012,799
4,013,586		4,013,673	4,013,696	4,013,912	4,013,915	4,012,957
4,013,670		4,013,686	4,013,697	4,013,919	4,013,926	4,013,042
4,013,692		4,013,703	4,013,729	4,013,932	4,013,984	4,013,210
4,013,804		4,013,722	4,013,748	4,013,954	4,013,987	4,013,219
4,013,846		4,013,732	4,013,752	4,013,988	4,013,989	4,013,247
4,013,902		4,013,734	4,013,758	4,012,902	4,013,993	4,013,772
28 : 4,012,876		4,013,757	4,013,786	4,013,090	4,014,014	4,013,905
4,013,138		4,013,767	4,013,812	4,013,268	44 : Re.29,155	4,013,967
29 : 4,012,801		4,013,771	4,013,814	4,013,387	4,012,956	54 : 4,013,182
4,012,913		4,013,778	4,013,815	4,013,420	4,012,961	4,013,638
4,012,962		4,013,785	4,013,859	4,013,571	4,013,206	4,013,700
4,013,171		4,013,828	4,013,875	4,013,754	4,013,237	55 : 4,012,804
4,013,185		4,013,830	4,013,891	4,013,824	4,013,813	4,012,900
4,013,190		4,013,872	4,013,892	4,013,928	4,014,023	4,012,963
4,013,226		4,013,879	4,013,893	4,012,930	4,012,816	4,013,061
4,013,324		4,013,900	4,013,936	4,012,973	4,013,601	4,013,105
4,013,381		4,013,920	4,013,953	4,013,051	4,013,614	4,013,136
4,013,382		4,013,960	4,013,974	4,013,855	47 : 4,012,853	4,013,174
4,013,422		4,014,009	4,014,004	4,013,934	4,013,078	4,013,176
4,013,443		4,014,010	4,014,005	4,012,828	4,013,131	4,013,227
4,013,448		4,014,022	4,014,017	4,012,835	48 : 4,012,852	4,013,310
4,013,450		4,014,024	4,014,029	4,012,847	4,012,877	4,013,399
4,013,514		4,014,025	4,014,030	4,012,873	4,012,912	4,013,500
4,013,524	36 : Re.29,157	4,012,827	4,014,036	4,012,874	4,012,917	4,013,560
4,013,694		4,012,854	4,014,038	4,012,888	4,012,944	4,013,595
4,013,852		4,012,857	4,012,896	4,012,920	4,013,008	4,013,607
4,013,888		4,012,875	4,013,038	4,012,946	4,013,032	4,013,629
4,014,020		4,012,903	4,013,101	4,013,035	4,013,046	4,013,807
31 : 4,012,967		4,012,934	4,013,183	4,013,073	4,013,158	4,013,811
4,013,313		4,012,940	4,013,331	4,013,081	4,013,172	4,013,816
32 : 4,013,955		4,012,949	4,013,559	4,013,082	4,013,178	4,013,985
33 : 4,012,909			4,013,858			

## DESIGN PATENTS

4 :	243,725		243,786	243,791	243,743	243,783	243,798		
6 :	243,738	8 :	243,748	243,792	243,749	243,797	42 :	243,774	
	243,740	9 :	243,741	243,793	243,753	243,800	43 :	243,768	
	243,760		243,762	24 :	243,742	243,770	39 :	243,731	
	243,761		243,799		243,787	27 :	243,796		243,733
	243,763	12 :	243,769	25 :	243,751	34 :	243,735		243,739
	243,767		243,776		243,754		243,773		243,759
	243,772	13 :	243,734		243,755	36 :	243,750	50 :	243,752
	243,777	17 :	243,737		243,771		243,758	56 :	243,723
	243,778		243,766	26 :	243,732		243,782		243,724



**OFFICIAL GAZETTE of the  
UNITED STATES PATENT and TRADEMARK OFFICE**

March 29, 1977

Volume 956

Number 5

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# PATENT AND TRADEMARK OFFICE NOTICES

## Revised Procedures for Recording Searches and Considerations of Certain Prior Art

In order to provide a more complete, accurate, and uniform record of what has been searched and considered by the examiner for each application, the Patent and Trademark Office has established revised procedures for recording search data in the application file. Such a record is of importance to anyone evaluating the strength and validity of a patent, particularly if the patent is involved in litigation. These new procedures will also facilitate the printing of certain search data on patents.

Under the revised procedures, searches are separated into two categories and listed, as appropriate, in either the "SEARCHED" box or a newly added "SEARCH NOTES" box on the file jacket.

Until file jackets can be reprinted to include a second search data box, all file jackets for new applications will have the "SEARCH NOTES" box stamped therein by the Mail Room. If additional space is required, entries will be continued on the outside right flap of the file jacket.

The revised procedures will apply to all new applications in which the first search is made after April 1, 1977 and do not affect the manner in which references are listed on the form PTO-892, "Notice of References Cited." Appropriate changes in the Manual of Patent Examining Procedure will be made.

### A. "SEARCHED" Box Entries

Search entries made here, except those for search updates (see item A. 3 below), will be printed under "Field of Search" on the patent front page. Therefore, the following searches will be recorded in the "SEARCHED" box by the examiner along with the date and the examiner's initials, according to the following guidelines:

1. A complete search of a subclass, including all United States and foreign patent documents and other publications placed therein.

The complete classification (class and subclass) will be recorded.

2. A limited search of a subclass, for example, a search that is restricted to an identifiable portion of the patent documents placed therein. If, however, only the publications in a subclass are searched, such an entry is to be made under "SEARCH NOTES" rather than under "SEARCHED." (See item B. 4 below.)

The class and subclass, followed by the information defining the portion of the subclass searched in parenthesis, will be recorded.

3. An update of a search previously made.

This search entry will be recorded in a manner to indicate clearly which of the previously recorded searches have been updated, followed by the expression "(updated)." Search update, entries, although recorded in the "SEARCHED" box, will not be printed.

When a search made in a parent application is updated during the examination of a continuing application, those searches updated, followed by "(updated from parent S.N. \_\_\_\_\_)" will be recorded. If the parent has been patented, the patent number "Pat. N. \_\_\_\_\_" instead of serial number in the above phrase will be recorded.

4. A mechanized search of a file of documents in a specific art, conducted by using key terms to retrieve documents. The name of the mechanized search system as it appears in the following list will be recorded along with the expression "MS File" to indicate mechanized search file.

## Mechanized Search Systems

### Termatrix Systems:

Automatic Fuel Controls  
Boots & Shoes  
Chemical Testing  
Combined Fasteners  
Electrical Contact Materials  
Surface Bonding Using Critical Metal

### Edge-Notched Card System:

Fluid Devices

### Punch Card Systems:

Electrolysis  
Organometallics  
Steroids

### Computer Controlled Microfiche Search Systems (CCMSS):

A-D Convertors  
Digital Data Processing Systems  
Special Purpose Digital Processing Systems

When a search with a Termatrix or Edge-Notched card system is conducted, the examiner will complete form PTO-1041 in two copies, recording all queries searched, even those which yield only non-relevant documents. All documents returned by the system in response to a query which are not actually reviewed will have an "X" drawn through their associated access and patent numbers. The examiner will place one copy of the form PTO-1041 in the application file on the right flap of the file jacket, the other copy of the form PTO-1041 will be forwarded to the Office of Search Systems.

When conducting a search with a Punched Card system, the examiner will place in the application file the Code Sheet on which the terms searched have been marked along with the machine tape listing the documents retrieved. Any document not actually reviewed will have an "X" drawn through that document's number on the listing.

When conducting a search with the CCMSS search systems, the machine-produced search report, which lists the terms and tagged documents, will be placed in the application file on the right flap of the file jacket. Any tagged document not actually reviewed will have an "X" drawn through that document number on the search report.

### B. "SEARCH NOTES" Box Entries

Entries made in the "SEARCH NOTES" box are of equal importance to those placed in the "SEARCHED" box; however, these entries will not be printed on any resulting patent. They are intended to complete the application file record of areas and/or documents considered by the examiner in the search. The examiner will record the following searches in the "SEARCH NOTES" box and in the manner indicated, with each search dated and initialed:

1. A cursory search, or scanning, of a subclass, i.e., a search usually made to determine if the documents classified there are relevant.

The classification will be recorded, followed by "(Cursory)."

2. A consultation with other examiners to determine if relevant search fields exist in their areas of expertise.

The class and subclass discussed, if not actually searched, will be recorded, followed by "(consulted)." This entry may also include the name of the examiner consulted and the art unit.

MARCH 29, 1977

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3. A search of a publication not located within the classified patent file, e.g., a library search, a text book search, a Chemical Abstracts search, etc. The following data will be recorded for each type of literature search:

- a. Abstracting publications, such as Chemical Abstracts or the Engineering Index—the name of the publication, the list of terms consulted in the index, and the period covered will be recorded.
- b. Periodicals—The title and period or volumes covered, as appropriate, will be recorded.
- c. Books—The title and author, edition or date, as appropriate, will be recorded.
- d. Other types of literature not specifically mentioned above (i.e., catalogs, manufacturer's literature, private collections, etc.)

Unless the search is a cursory or browsing one, data as necessary to provide unique identification of material searched will be recorded. Specific materials cited by the examiner will not be recorded again here.

- e. Computer search in Scientific Library—An on-line computerized literature searching service which uses key terms and index terms to locate relevant publications in many large bibliographic data bases is available to examiners in the Scientific Library of the Patent and Trademark Office. A member of the library staff is assigned to assist examiners in selecting key terms and to program the search.

There are two on-line search systems: The Lockheed Information Systems and the SDC Search Service. These search systems include many data bases.

A copy of the search printout will be made and placed in the application file, attached to the right flap of the file jacket.

The examiner will also indicate which publications were reviewed by initialling and dating the copy of the printout in the left margin adjacent to each reviewed publication. If only an abstract of a document was reviewed, the note "ck'ed abst." will be made next to the initials and date. If the complete document was reviewed, the note "ck'ed doc." will be placed with the initials and date.

4. A search of only the publications in a subclass.

The class and subclass followed by "(publications only)" will be recorded.

5. A review of art cited in a parent application or in an original patent, as required for all continuing and re-issue applications, or a review of art cited in related applications or patents mentioned within the specification, such as those included to provide background of the invention.

The serial number of a parent application that is still pending or abandoned, followed by "refs. checked" or "refs. ck'ed" will be recorded. If for any reason not all of the references are checked because they are not available or clearly not relevant, such exceptions will be noted.

The patent number of a parent or related application that was patented or of an original patent now being reissued will be recorded along with the expressions "refs. checked" or "refs. ck'ed."

### C. Not Recorded

The following data will not be recorded in either of the search boxes, but will be noted in the application file as indicated below.

1. Citations of prior art by applicants conforming to Rule 98 and the practice thereunder.

In each instance where all prior art referred to in a paper placed in the application file is considered, the examiner will place the notation "all ck'ed" and his or her initials adjacent to the citation.

2. Citations of prior art by applicants not conforming to Rule 98 and the practice thereunder.

In each instance where an examiner considers, but does not cite on form PTO-892, specific prior art referred to in a paper placed in the application file, the examiner

will place a notation adjacent to the reference. If all the references referred to in such a paper are reviewed, the examiner will place the notation "all ck'ed" and his or her initials adjacent to the citation. If included in the specification, the examiner will write his or her initials adjacent to any reference(s) checked and enter "checked" or "ck'ed" in the left margin opposite the initials. If presented in a separate paper or in the remarks of an amendment, the examiner's initials and "checked" or "ck'ed" will be entered adjacent to the citation(s) or wherever possible to indicate clearly those checked.

RENE D. TEGMEYER,  
Assistant Commissioner for Patents.

Date: 2-22-77.

## December 1976 and January 1977 Classification Orders

The reclassifications covered by the following classification changes became effective during December 1976 and January 1977.

Classification Order	Class	Subclasses
Dec. 3, 1976: Abolished..... Established.....	561, effective	303 21. 303 91-119.
Dec. 6, 1976: Abolished..... Established.....	562, effective	30 3-23. 30 400-450.
Dec. 6, 1976: Abolished..... Established.....	563, effective	248 216-226. 248 216.1-216.4; 217.1-217.4; 218.1-218.4; 219.1-219.4; 220.1-220.4; 221.1-221.4; 222.1-222.4; 223.1-223.4; 224.1-224.4; 225.1-225.4; 226.1-226.5; 231.1 and 503.1.
Dec. 6, 1976: Abolished..... Established.....	564, effective	114 .5; 43.5; 66.5 and 235-237. 114 242-292.
Dec. 15, 1976: Abolished..... Established.....	565, effective	114 206-209. 114 293-311.
Dec. 16, 1976: Abolished..... Established.....	566, effective	206 72 (Incorrectly numbered as "62" in the Manual of Classification). 73-77 and 801. 55-3600. Cross Reference Art Col- lection 824; 825; 828 and 829. 206 223.
Dec. 21, 1976: Abolished..... Established.....	567, effective	52 79; 169; 236; 237; 309 and 751-760. 52 79.1-79.9; 79.11-79.14; 169.1-169.9; 169.11- 169.14; 236.1-236.9; 309.1-309.9 and 309.11- 309.17.
Jan. 6, 1977: Abolished..... Established.....	568, effective	66 75. 66 75.1 and 75.2.
Jan. 11, 1977: Abolished..... Established.....	569, effective	156 2-25. 156 625-668. Cross Reference Art Col- lection 901-905.
Jan. 18, 1977: Abolished..... Established.....	570, effective	29 200-12. 29 38.9; 56.5; 56.6; 281.1- 281.6; 283.5; 564.1-564.8; 566.1-566.4; 650; 700- 824. 29 563.
Jan. 28, 1977: Abolished..... Established.....	571, effective	139 55. 139 55.1; 455 and 456.

ALFRED C. MARMOR  
Administrator for Documentation  
February 14, 1977



## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,965,678, Sundberg and Cross, POLYOXYETHYLENE ETHERS OF BRANCHED CHAIN ALCOHOLS, filed Apr. 30, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c1641, *GAF Corporation v. Hodag Chemical Corporation*. By stipulation order cause dismissed without prejudice, June 10, 1976.

3,047,196, Levine and Phillips, GARMENT HANGER, filed Nov. 10, 1976, D.C., S.D. Fla. (Miami), Doc. (FL) 76-6487-C-SMA, *Huron Machine Products Inc. v. A. and E. Warbern Inc., doing business as Warbern Packaging Industries Inc. and Warbern Packaging Industries Inc. of Florida Inc.*

3,068,882, W. Odendahl, VALVE CONSTRUCTION, filed Nov. 9, 1976, D.C., E.D. Pa. (Philadelphia), Doc. 76-3484, *Yarway Corporation v. Klein, Schanzlin and Becker Aktiengesellschaft*.

3,160,440, J. T. Gelardi, CONTINUOUS TWISTER AND FEEDER MECHANISM FOR BRUSH MACHINES OR THE LIKE, filed Dec. 4, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75-3502, *American Technical Industries Inc. v. Marathon Manufacturing Company*. Patent is valid and the claims thereof are valid. The defendant has taken a license under plaintiff's CT patent and the parties have settled all other causes of action and counterclaims in this litigation. Counterclaims are dismissed with prejudice, Nov. 11, 1976.

3,180,335, Duncan and Baker, DISPOSABLE DIAPER; Re. 26,151, same, filed Jan. 26, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c237, *Procter & Gamble Company v. Weyerhaeuser Company*. Complaint dismissed without prejudice, counterclaim dismissed without prejudice, Feb. 7, 1974.

3,180,557, S. Thulin, BAG WITH HANDLE OF WELDABLE PLASTIC MATERIAL, filed Apr. 8, 1976, D.C.N.J. (Newark), Doc. 76-648, *Mobil Oil Corp. v. Aktiebolaget Celloplast & Celloplast U.S.A. Inc.* Order terminating action administratively, Nov. 16, 1976.

3,228,413, F. Stevens, KEG TAPPING DEVICE, filed Nov. 17, 1976, D.C.N.J. (Newark), Doc. 76-2202, *Hoff-Stevens Inc. v. Vending Components Inc.*

3,517,677, A. Smith, INVALID WALKER, filed Sept. 21, 1976, D.C. Minn. (St. Paul), Doc. 3-76-352, *Alfred A. Smith v. Bird & Cronin Inc.*

3,538,725, Guenther and Barcik, HOOD LOCKING DEVICE, filed Oct. 29, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2760, *Chapman Performance Products v. Ramm Industries Co. et al.* Cause dismissed for want of prosecution, May 19, 1975.

3,625,758, Stahl, Steffen, Schneble and McCormack, BASE MATERIAL AND METHOD FOR THE MANUFACTURE OF PRINTED CIRCUITS, filed Feb. 9, 1976, D.C. Del. (Wilmington), Doc. 76-63, *Kollmorgen Corp. v. RCA Corporation*. It is hereby stipulated by and between the parties hereto that this action be dismissed without prejudice, Sept. 24, 1976.

3,625,793, Sheridan and Jackson, BALLOON-TYPE CATHETERS AND METHOD OF MANUFACTURE, filed Oct. 8, 1976, D.C., E.D. Pa. (Philadelphia), Doc. 76-3141, *Mallinckrodt Inc. v. Air Products, Chemicals Inc. and The Foregger Company Inc.*

3,664,915, W. Gore, SEALING MATERIAL, filed May 24, 1972, D.C. Del. (Wilmington), Doc. 4389, *Johnson & Johnson v. W. L. Gore & Associates Inc.* Defendant is owner of the patent in suit. Claims 1-9, all the claims of patent issued to defendant are invalid, Sept. 7, 1976.

3,743,280, D. Martinez, EXERCISING DEVICE, filed May 5, 1976, D.C. Mass. (Boston), Doc. CA-76-1780-T, *Rainbow Lifeguard Products Inc. v. L. J. Shulman & Son Inc.* Consent judgment entered that above patent is valid and has been infringed and enjoining defendants from further infringement, July 7, 1976.

3,776,095, M. Atchisson, WEAPON CONVERSION BOLT ASSEMBLY DEVICE, filed Sept. 20, 1976, D.C. Conn. (Hartford), Doc. H-76-375, *Bingham, Ltd. and Maxwell G. Atchisson v. Okay Industries Inc.*

3,826,222, J. Romick, UNIT-DOSE MEDICATION HANDLING SYSTEM, filed Nov. 12, 1976, D.C., N.D. Ohio (Cleveland), Dpc. 76-C-1202, *J. M. Romick v. Americare Inc.*

3,835,543, Polydoris and Wollar, MEASURING INSTRUMENT, filed Sept. 8, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3348, *ENM Company v. Transformer Manufacturers Inc. et al.*

3,871,585, Crossman, Kenrick and LeMieux, AIR BED; 3,887,187, same, AIR CUSHION TABLE GAME; 3,927,885, same, PUCK AND BAT FOR AN AIR CUSHION TABLE GAME, filed Oct. 14, 1976, D.C., S.D.N.Y., Doc. 76-C-4555 (MP), *Brunswick Corporation v. Munro Games Inc.*

3,887,187. (See 3,871,585.)

3,890,975, W. McGregor, CONTROLLED RELEASE SUTURE, filed May 21, 1976, D.C., S.D.N.Y., Doc. 76-C-2301, *American Cyanamid Co. v. Ethicon Inc.*

3,927,885. (See 3,871,585.)

3,992,887, W. Fisher, TRENCH SHORING ASSEMBLY WITH FORCE TRANSFERRING ACCESSORY, filed Nov. 23, 1976, D.C., W.D. Mich. (Grand Rapids), Doc. K76-599Ca9, *Griswold Machine & Engineering Inc. v. Efficiency Production Inc.*

Re. 26,151. (See 3,180,335.)

Re. 28,685, A. Varga, METHOD AND APPARATUS FOR THE TREATMENT OF COTTON FIBRES, filed Mar. 26, 1976, D.C., M.D.N.C. (Greensboro), Doc. C-76-144-D, *Carding Specialists (Canada) Limited v. Gunter & Cooke Inc.* Same, filed Apr. 1, 1976, D.C., S.D.N.C. (Greenville), Doc. 76-0557, *Carding Specialists (Canada) Limited v. John D. Hollingsworth on Wheels Inc.*

D. 239,168, D. Hart, VEHICLE WIND DEFLECTOR, filed Sept. 17, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c3459, *Donald G. Hart v. Leisure Manufacturing Co. Inc.*

## Erratum

Under Patent Suits, in the OFFICIAL GAZETTE of Dec. 21, 1976, volume 953, page 881, the paragraph beginning with 3,708,967, and the paragraph beginning with 3,826,068 should be deleted. Also, 3,859,776 (See 3,708,967) should be deleted.

## PATENT NOTICES

## Certificates of Correction for the Week of Mar. 29, 1977

Re. 28,801	3,961,969	3,985,882	3,998,367
3,786,248	3,962,514	3,986,087	3,998,668
3,804,831	3,964,933	3,986,332	3,998,700
3,830,923	3,965,217	3,986,392	3,998,762
3,836,530	3,965,551	3,987,537	3,998,773
3,838,292	3,967,188	3,988,084	3,998,875
3,847,980	3,967,481	3,988,128	3,998,957
3,855,129	3,968,175	3,988,243	3,999,001
3,868,341	3,968,685	3,988,727	3,999,135
3,869,452	3,968,750	3,988,828	3,999,306
3,871,716	3,969,443	3,989,403	3,999,535
3,873,509	3,970,702	3,989,526	3,999,593
3,875,143	3,970,999	3,989,604	3,999,626
3,880,792	3,971,828	3,990,933	4,000,176
3,881,987	3,972,210	3,990,937	4,000,207
3,886,484	3,973,081	3,991,040	4,000,380
3,912,659	3,973,484	3,991,260	4,000,385
3,914,009	3,973,745	3,991,942	4,001,026
3,921,963	3,974,715	3,991,985	4,001,283
3,925,537	3,975,201	3,992,380	4,001,343
3,929,103	3,975,304	3,992,432	4,001,509
3,940,484	3,977,767	3,992,457	4,001,801
3,941,121	3,977,768	3,992,536	4,001,822
3,943,085	3,977,974	3,992,542	4,001,877
3,943,258	3,978,420	3,992,924	4,001,949
3,946,509	3,978,677	3,993,091	4,002,297
3,947,663	3,979,018	3,993,194	4,002,377
3,948,607	3,979,975	3,993,263	4,002,408
3,949,077	3,980,579	3,994,848	4,002,411
3,950,290	3,980,828	3,995,071	4,002,568
3,950,574	3,981,573	3,995,168	4,002,576
3,950,591	3,982,039	3,995,290	4,002,589
3,951,776	3,982,131	3,996,344	4,002,637
3,951,794	3,982,312	3,996,741	4,002,735
3,952,349	3,982,499	3,996,944	4,002,773
3,955,387	3,982,596	3,997,037	4,002,902
3,955,427	3,982,647	3,997,147	4,003,002
3,955,923	3,982,801	3,997,269	4,003,032
3,956,066	3,983,368	3,997,449	4,003,179
3,956,515	3,983,631	3,997,454	4,003,385
3,956,528	3,983,777	3,997,504	4,003,499
3,958,088	3,983,953	3,997,772	4,003,872
3,958,561	3,984,574	3,997,944	4,003,969
3,958,776	3,985,056	3,998,196	4,004,424
3,959,874	3,985,347	3,998,220	4,004,708
3,960,706	3,985,753	3,998,298	4,004,926
3,960,726			

## Disclaimers

Design No. 232,417.—*Stefan Macko*, Milwaukee, Wis. BOTTLE. Patent dated Aug. 20, 1974. Disclaimer filed Feb. 4, 1977, by the assignee, *Miller Brewing Company*.

The term of this patent subsequent to Aug. 13, 1988, has been disclaimed.

3,841,083.—*John M. Bergey*, Lancaster, Pa. SELF-ILLUMINATED LIQUID CRYSTAL TIMEPIECE. Patent dated Oct. 15, 1974. Disclaimer filed Feb. 14, 1977, by the assignee, *Time Computer, Inc.*

The term of this patent subsequent to Mar. 27, 1990, has been disclaimed.

3,915,577.—*Rupert James Cropton*, Sunbury on Thames, England. DISPENSERS. Patent dated Oct. 28, 1975. Disclaimer filed Feb. 11, 1977, by the assignee, *Gavia, A.G.*

Hereby enters this disclaimer to claims 7 and 8 of said patent.

3,990,455.—*Richard L. Panici*, Hanover, Mass. TEETHER. Patent dated Nov. 9, 1976. Disclaimer filed Jan. 21, 1977, by the assignee, *Kiddie Products, Inc.*

The term of this patent subsequent to Nov. 9, 1990, has been disclaimed.

3,994,240.—*Robin L. Berg*, Hudson, Wis., and *Marvin A. Luger*, Hugo, and *Neil C. Olsen*, Edina, Minn. COIL CAR COVER. Patent dated Nov. 20, 1976. Disclaimer filed Feb. 14, 1977, by the assignee, *Proform, Inc.*

Hereby enters this disclaimer to claim 13 of said patent.

4,001,304.—*Kayson Nyl*, Sellersville, and *Sandra I. Graham*, North Wales, Pa. ACRYLIC ACID ESTERS. Patent dated Jan. 4, 1977. Disclaimer filed Feb. 2, 1977, by the assignee, *Rohm and Haas Company*.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

4,003,416.—*Bernard E. Weidenaar*, Hacienda Heights, Calif.; *Frederick L. Voelz*, Orland Park, and *James J. Simnick*, Riverdale, Ill.; and *Peter P. Moskovich, Jr.*, Gary, Ind. LIQUID DISPENSING NOZZLE ASSEMBLY. Patent dated Jan. 18, 1977. Disclaimer filed Jan. 24, 1977, by the assignee, *Atlantic Richfield Company*.

The term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

4,004,621.—*Bernard E. Weidenaar*, Hacienda Heights, Calif.; *Frederick L. Voelz*, Orland Park, and *James J. Simnick*, Riverdale, Ill.; and *Peter P. Moskovich, Jr.*, Gary, Ind. LIQUID-DISPENSING NOZZLE ASSEMBLY. Patent dated Jan. 25, 1977. Disclaimer filed Jan. 24, 1977, by the assignee, *Atlantic Richfield Company*.

The term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

## Dedication

2,996,664.—*Fred J. Vogel* and *Edward J. Adolphson*, Wauwatosa, Wis. CORONA DETECTOR. Patent dated Aug. 15, 1961. Dedication filed Jan. 28, 1977, by the assignee, *Allis-Chalmers Corporation*.

Hereby dedicates to the People of the United States, the entire remaining term of said patent.



## PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner  
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 26, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
<b>CHEMICAL EXAMINING GROUPS</b>	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-22-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	3-18-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-22-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-1-76
<b>ELECTRICAL EXAMINING GROUPS</b>	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	10-15-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Rocket Metallurgy, Rocket Fuels; Radio-Active Material.	1-12-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director..... Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-9-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-7-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	9-10-75
<b>MECHANICAL EXAMINING GROUPS</b>	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-26-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	8-2-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.	5-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-2-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	7-22-76

**Expiration of patents:** The patents within the range of numbers indicated below expire during March 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,926,352 to 2,931,037, inclusive  
Plant Patents..... Numbers 1,919 to 1,925, inclusive

## REISSUES

MARCH 29, 1977

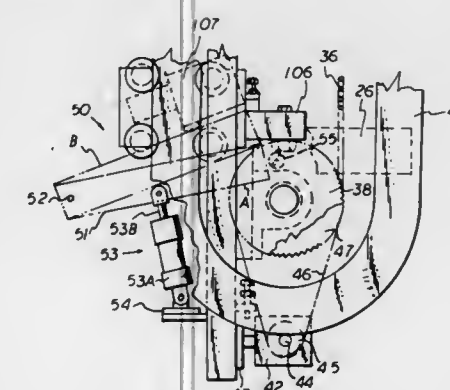
Matter enclosed in heavy brackets **[ ]** appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

### Re. 29,160 SCREEN PRINTING MACHINE WITH OVAL RAIL FOR INDEXING PALLETS

David Jaffa, Fairlawn, N.J., assignor to Precision Screen Machines Inc., Hawthorne, N.J.  
Original No. 3,795,189, dated Mar. 5, 1974, Ser. No. 292,860, Sept. 28, 1972. Application for reissue Sept. 29, 1975, Ser. No. 617,750  
Int. Cl.<sup>2</sup> B41L 13/16

U.S. Cl. 101—123

25 Claims



1. A screen printing machine comprising a supporting frame means, an oval shaped rail mounted on said frame means, a plurality of pallet means disposed in a common plane circumferentially spaced about said oval rail, drive means operatively interconnecting said pallet means for indexing said **[pallets]** *pallet means* about said oval rail in said common plane, and **[a]** printing head means mounted on said frame means for movement between an operative printing position and an inoperative non-printing position, *said pallet means having substantially coplanar movement as they approach, traverse and depart said printing head means,* indexing means connected to said drive means for indexing said **[pallets]** *pallet means* about said oval rail, said indexing means **[including a]** *includes* ram stop means, a ram stop cam follower operatively associated with said drive means, and **[and an]** activating means for moving said ram stop means into and out of operative position relative to said cam follower to effect the indexing of said **[pallets]** *pallet means* about said oval rail.

### Re. 29,161 DEVICES FOR THE GENERATION OF ULTRASONICS AND THEIR APPLICATION TO THE PREPARATION OF EMULSIONS

Louis Duthion, Paris; Claude Charles Doyotte, Le Plessis Robinson; Claude Jean-Marie Seguela, Argenteuil; Gabriel Barthelemy, Paris; Alain Cinquanta, and Yves Drapeau, both of Le Havre, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Original No. 3,809,372, dated May 7, 1974, Ser. No. 286,061, Sept. 5, 1972. Application for reissue Oct. 29, 1975, Ser. No. 626,835

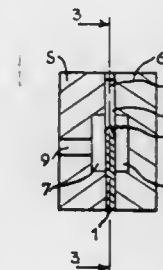
Claims priority, application France, Sept. 3, 1971, 71.31975; Dec. 20, 1971, 71.45738; June 27, 1972, 72.23201  
Int. Cl.<sup>2</sup> B01F 3/08, 5/06

U.S. Cl. 259—4 R

28 Claims

1. Device for generating **[ultrasonics]** waves in a fluid in the sonic to ultrasonic range, comprising a membrane, two side

plates located on each side of the membrane and each having at least one recess, said recesses forming adjacent opposing pairs, said membrane having at least a first discontinuity which forms a passage through which the fluid penetrates into the device and at least a second discontinuity extending the first discontinuity and forming a communication between each



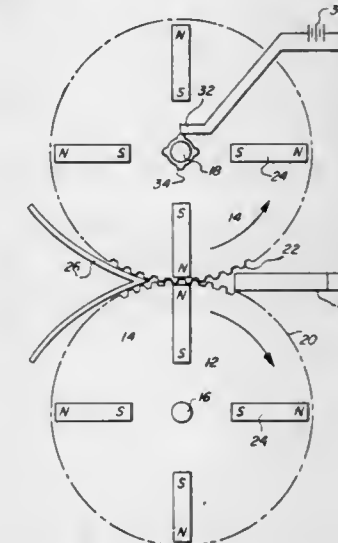
pair of said recesses located on each side of the membrane, each such second discontinuity leaving a substantial portion of said membrane extending between each respective pair of recesses sufficient to effectively vibrate, and a conduit from one recess of each pair via which the fluid is evacuated from the device.

### Re. 29,162 ABUTMENT SWIVEL DOORSTOP

Lyall A. McLennan, 2896 Trinity St., Vancouver 6, British Columbia, Canada  
Original No. 3,861,726, dated Jan. 21, 1975, Ser. No. 345,061, Mar. 26, 1973. Application for reissue Oct. 23, 1975, Ser. No. 625,016  
Int. Cl.<sup>2</sup> E05C 5/00

U.S. Cl. 292—67

14 Claims



1. In abutment stop mechanism for blocking opening movement of a closure swingable about an upright axis including a stop member and a mount separate from the closure, mounted adjacent to the closure in closed position and **[but]** independently of the closure **[in closed position]** and supporting the stop member for turning about a stop member turning axis between a closure-blocking position of the stop member obstructing **[and a closure-clearing position, in which closure-blocking position the stop member obstructs]** a predetermined opening-movement path of a stop-engageable portion of the closure and a closure-clearing position of the stop member out of the opening-movement path of the closure, in which closure-blocking position of the stop member a closure-engageable portion of the stop member located a substantial distance from such stop member turning axis is engageable by such



stop-engageable portion of the closure to limit its movement [of such stop-engageable portion] along such predetermined opening-movement path, [and in which closure-clearing position the stop member is out of the opening-movement path of the stop-engageable portion of the closure, the closure-engageable portion of the stop member being located a substantial distance from the stop member turning axis,] the improvement comprising the mount [being mounted with] mounting the stop member for turning about an upright stop member turning axis substantially perpendicular to and offset slightly from such predetermined opening-movement path of the stop-engageable portion of the closure and located so that a line joining such stop member turning axis and the closure-engageable portion of the stop member in closure-blocking position is at an angle of less than 45° to such predetermined opening-movement path of the stop-engageable portion of the closure, whereby [of less than 45° so that] pressure of the stop-engageable portion of the closure on the stop member will exert on the stop member a compressive force toward the stop member turning axis greater than the stop member swinging force acting perpendicular to a line joining the stop member turning axis and the stop-engageable portion of the closure when the closure is in its position closest to the stop member turning axis, and latch means engageable between the mount and the stop member for preventing swinging of the stop member out of closure-blocking position relative to the mount.

7-[D-(—)- $\alpha$ -amino- $\alpha$ -(p-hydroxyphenyl)-acetamido]decephalosporanic acid,  
7-[D-(—)-2,2-dimethyl-4-(p-hydroxyphenyl)-5-oxo-1-imidazolidinyl]cephalosporanic acid, and  
7-[D-(—)-2,2-dimethyl-4-(p-hydroxyphenyl)-5-oxo-1-imidazolidinyl]decephalosporanic acid, and the non-toxic, pharmaceutically acceptable salts thereof.

## Re. 29,165

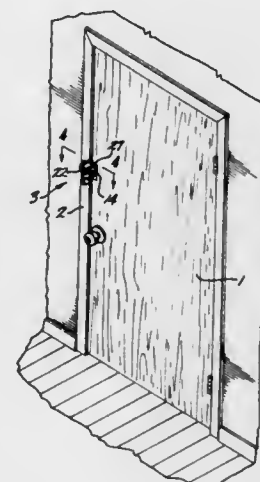
## ELECTROMOTIVE DEVICE INCLUDING MAGNETIC SHIELD INTERACTING WITH PERMANENT MAGNET POLE FACES

George Fred Bode, Rte. No. 1, Middletown, Md. 21769  
Original No. 3,895,245, dated July 15, 1975, Ser. No. 472,909, May 23, 1974. Application for reissue Nov. 18, 1975, Ser. No. 633,002

Int. Cl.<sup>2</sup> H02K 37/00

U.S. Cl. 310—46

13 Claims



6. An electromotive device comprising a magnetic shield, a pair of rotors, each of said rotors having a plurality of spaced, permanent magnet pole faces on its periphery, said rotors being mounted for synchronous rotation of the pole faces of the pair of rotors relative to a point of closest proximity between the peripheries of the two rotors so that while the rotors are in proximity to said point magnetic fields extending from the pole faces of the two rotors interact to produce forces on the rotors causing rotation of the rotors, said shield being mounted relative to the periphery of said rotors and said point to prevent substantial interaction of the magnetic pole faces of the two rotors on one side of said point, whereby the magnetic fields of the two rotors interact asymmetrically on the different sides of the point to rotatably drive the rotors in predetermined directions relative to the point, and electromagnet means responsive to the rotation of one of the rotors for supplying a magnetic field to one of the rotors to rotatably drive the rotor between the shield and the point in the same direction it rotates in response to the interaction.

## Re. 29,164

## 7-AMINO-CEPHALOSPORANIC AND DECEPHALOSPORANIC ACID DERIVATIVES

Leonard Bruce Crast, Jr., North Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.  
Original No. 3,489,752, dated Jan. 13, 1970, Ser. No. 665,256, Sept. 5, 1967. Application for reissue Dec. 22, 1975, Ser. No. 643,010

Int. Cl.<sup>2</sup> C07D 417/00

U.S. Cl. 260—243 C

8 Claims

14. A compound selected from the group consisting of:

## Re. 29,166

## MAGNETIC FLAW DETECTOR SYSTEM FOR RECIPROCATING PAIRS OF LEAKAGE FIELD DETECTORS WITH MEANS FOR ADJUSTING THE SPACING BETWEEN EACH PAIR OF DETECTORS

Friedrich M. O. Forster, In Laisen 70, D-7410 Reutlingen 1, Germany

Original No. 3,743,928, dated July 3, 1973, Ser. No. 105,856, Jan. 12, 1971. Application for reissue Mar. 26, 1976, Ser. No. 670,622

Claims priority, application Germany, July 30, 1970, 2037787

Int. Cl.<sup>2</sup> G01R 33/12

U.S. Cl. 324—37

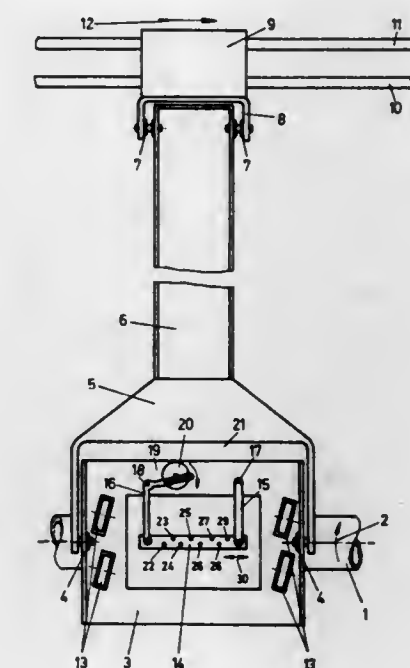
8 Claims

1. Apparatus for detecting defects in the walls of metal tubing, comprising:

means for generating a magnetic field within the body of said tubing whereby a stray field is produced lying radially outwardly of said tubing adjacent defects in said tubing; a plurality of paired sets of magnetic field sensing devices arranged in spaced relation to the outer surface of said tubing, the devices of each pair being electrically connected in opposition and positioned relative to each other and the test pieces such that a straight line connecting the devices of each pair would be oriented at an acute angle with respect to the tubing longitudinal axis;

means for adjusting the spacing between paired sets of devices;

means for producing relative helicoidal movement between the tubing and the sensing devices; and



means for reciprocating the field sensing devices generally longitudinally of the tubing during relative movement.



# PLANT PATENTS

GRANTED MARCH 29, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,026

## MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277  
Filed Jan. 23, 1976, Ser. No. 651,700  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—9

1 Claim

1. A new and distinct variety of miniature moss rose plant of hardy dwarf, rounded, much branched, bush type, as illustrated and described, characterized (1) by buds which are heavily covered with soft moss-like appendages—said "moss" covering the sepals and extending downward onto the peduncle, and (2) by buds and flowers resembling the Baby Pinocchio (U.S. Plant Pat. No. 2,967) miniature rose in general form and size, but less double, the color being a light shade of pink; the general color effect being light pink — of a shade resembling Fairy Moss (miniature—U.S. Plant Pat. No. 3,083); and further characterized by a plant which is of moderate vigor, compact growth habit with short internodes, easy to propagate by budding as well as by cuttings; with small semi-glossy to mat foliage; and flowers, produced recurrently throughout the growing season, borne singly or several to the stem in loose clusters.

4,027

## ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277  
Filed Jan. 23, 1976, Ser. No. 651,952  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—10

1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type, as illustrated and described, characterized by buds and flowers of a color similar to Baccara (a greenhouse florist variety, H.T. rose) and in plant habit and flower size being similar to Pink Mandy, (miniature); the bud and flower color also resembling Fire Princess (miniature) but being of considerably darker shade, the general color effect being a dark red with a fluorescent orange undertone; the small buds having sepals which are noticeably longer than average with frilled or serrated edges; and further characterized by a plant which is vigorous and compact, the shoots and branches having very short internodes, said plant being easy to propagate from cuttings, with small glossy foliage, an abundance of bloom, with flowers borne singly or several to the stem in loose clusters.

4,028

## MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277  
Filed Jan. 23, 1976, Ser. No. 651,953  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—8

1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type as illustrated and described, characterized by buds and flowers resembling the Easter Morning (U.S. Plant Pat. No. 2,177) miniature rose in general form and size but color is rich clear yellow with better than average lasting quality, the general color effect being deep yellow; and further characterized by a plant which is of vigorous and compact growth, easy to propagate from cuttings, with medium small semi-glossy foliage and an abundance of bloom, with flowers borne singly or several to stem in loose clusters.

4,029

## MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277  
Filed Apr. 1, 1976, Ser. No. 672,742  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—7

1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, as illustrated and described, characterized by buds and flowers which are striped (variegated) in varying proportions of red and white of a color combination resembling Ferdinand Pichard (an older H.P. variety) and a plant habit somewhat taller than broad, the bud and flower form resembling Baby Darling (miniature — U.S. Plant Pat. No. 2,582) and the size similar to New Penny (miniature — not patented); and further characterized by a plant which is vigorous and compact, the shoots and branches having fairly short internodes, said plant being easy to propagate from cuttings (often blooming in small pot when plant is not over 6 inches tall) with small semi-glossy foliage, an abundance of bloom, with flowers borne singly or several to the stem in loose clusters.

4,030

## ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277  
Filed Apr. 19, 1976, Ser. No. 677,880  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—10

1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched bush type, substantially as illustrated and described, characterized by extra long lasting buds and flowers of a color similar to Fire Princess (miniature — U.S. Plant Pat. No. 3,084) and with bud and flower form similar to Eleanor (miniature — U.S. Plant Pat. No. 2,175), the general color effect being a bright shade of red (or orange red) with better than average color stability; the small buds having sepals which tend to remain against the opening buds and flowers; and further characterized by a plant which is vigorous and compact, being easy to propagate from cuttings, with small glossy to semi-glossy foliage, an abundance of bloom, with flowers borne singly or several to the stem in loose sprays or clusters.

4,031

## ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277  
Filed Apr. 19, 1976, Ser. No. 677,882  
Int. Cl.<sup>2</sup> A01H 5/00

U.S. Cl. Plt.—9

1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, essentially as illustrated and described, characterized by buds and flowers of a bright pink color resembling the Judy Fischer miniature rose (U.S. Plant Pat. No. 3,137) and resembling the Sheri Anne miniature rose (U.S. Plant Pat. No. 3,826) in size and form of bud and flower; and further characterized by a plant which is vigorous and compact, said plant being easy to propagate from cuttings, with medium small, disease resistant, glossy foliage, an abundance of bloom, with better than average keeping quality, with flowers borne singly or several to the stem in loose clusters.

# PATENTS

GRANTED MARCH 29, 1977

## ERRATA

For CLASS	See PATENT NO.
297-303 .....	4,014,086
355-050 .....	4,014,112
062-003 .....	4,014,178
062-088 .....	4,014,179
124-081 .....	4,014,307
299-001 .....	4,014,574
299-002 .....	4,014,575
302-031 .....	4,014,576
302-035 .....	4,014,577
302-052 .....	4,014,578
303-003 .....	4,014,579
303-082 .....	4,014,580
305-054 .....	4,014,581
429-057 .....	4,014,712
209-073 .....	4,014,784
252-062.1 L .....	4,014,856
526-065 .....	4,014,859
358-086 .....	4,015,074
358-158 .....	4,015,075
358-167 .....	4,015,076
358-280 .....	4,015,077
179-006.3 R .....	4,015,078
358-164 .....	4,015,079
358-104 .....	4,015,080
358-206 .....	4,015,081
219-010.49 .....	4,015,084
219-010.55 E .....	4,015,085
219-060 A .....	4,015,086
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361-019 .....	4,015,168
361-045 .....	4,015,169
361-018 .....	4,015,171
361-129 .....	4,015,172
361-388 .....	4,015,173
361-153 .....	4,015,174
361-313 .....	4,015,175
361-232 .....	4,015,176
354-029 .....	4,015,198



# PATENTS

GRANTED MARCH 29, 1977

NOTE:—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this issue. These entries will be in numerical order by document publication number.

## GENERAL AND MECHANICAL

4,014,044

### PROTECTIVE DEVICE

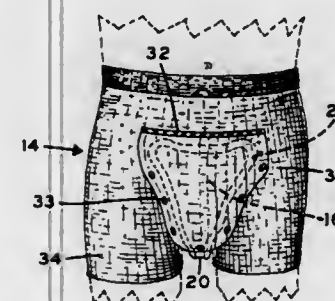
David C. Figueroa, 194 15 E. Adams, Reedley, Calif. 93654,  
and David R. Corneliuz, 3856 E. Farrin, Fresno, Calif.  
93726

Filed Jan. 14, 1976, Ser. No. 648,974

Int. Cl.<sup>2</sup> A41D 13/00; A41C 1/00

U.S. Cl. 2—2

5 Claims



1. A protective device particularly suited for use in protecting the pelvic organs of a wearer comprising:

- A. a garment fabricated from elastomeric material and characterized by a tubular body portion configured to receive the body of a wearer, means for stabilizing the body portion of the garment on the body of a wearer including a pair of tubular leg portions attached to the body portion configured to receive the legs of the wearer in friction-fit engagement, means defining a first pocket in the body portion of the garment arranged to be disposed adjacent to the pelvic region of a wearer when the body of a wearer is received by the body portion of the garment, and means defining a second pocket in said body portion arranged to be disposed adjacent to the lumbar region of a wearer when said first pocket is disposed adjacent to said pelvic region; and
- B. a guard including a substantially rigid protective cup disposed in said first pocket adapted to be positioned in protective relation with the pelvic region of the wearer, a plate disposed in said second pocket adapted to be received over the lumbar region of the wearer, and a substantially rigid bar extended between the cup and the plate and connected thereto adapted to be received between the legs of a wearer in spaced protective relation with the pelvic organs of the wearer when the body of the wearer is received by the body portion of the garment.

4,014,045

### WORKMAN'S BREAK-AWAY SAFETY APRON

Joseph R. Moyer, 80 Allen Drive, Wayne, N.J. 07470

Filed Jan. 19, 1976, Ser. No. 650,266

Int. Cl.<sup>2</sup> A41D 13/04

U.S. Cl. 2—51

4 Claims

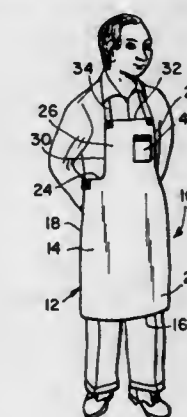
1. A workman's break-away safety apron comprising in combination:

- an elongated body including a lower section defined by a lower laterally-extending edge, a pair of longitudinally extending side edges and laterally-extending medial edges extending inwardly from said side edges, and an upper section having a central area constituting a continuation of the lower section and the periphery defined by side edges which extend upwardly from the inner termini of said medial edges and a laterally-extending upper edge connecting the tops of the side edges of said upper section;
- a segment of non-metallic pressure fastening material secured to said lower section at each of the junctures of the medial edges and the side edges thereof;

a segment of non-metallic pressure fastening material secured to said upper section at each of the junctures of said upper edge and the side edges thereof;

a neck band formed of a strip of flexible material having a segment of non-metallic pressure fastening material secured to each end thereof and detachably connected to the corresponding segments of non-metallic pressure fastening material on the said upper section of the apron body;

and a two-piece waist band including a first strip of flexible



material having a segment of non-metallic pressure fastening material at one end thereof and a plurality of first nonpressure fastening means on the other end thereof and a second strip of flexible material having a segment of non-metallic pressure fastening material at one end thereof and at least one second non-pressure fastening means cooperable with said first fastening means on the other end of said first strip, said first and second strips being detachably connected to the corresponding segments of non-metallic pressure fastening material on the said lower section of the apron body.

4,014,046

### DISPOSABLE CUFF PROTECTOR

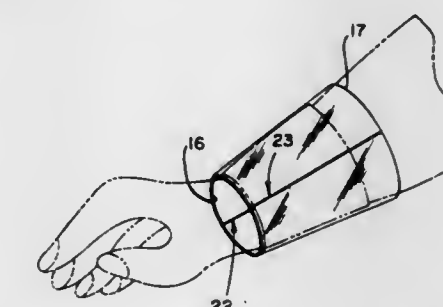
Evelyn R. Craig, 1159 Harvard Road, Piedmont, Calif. 94610

Filed Oct. 10, 1975, Ser. No. 621,378

Int. Cl.<sup>2</sup> A41D 27/16

U.S. Cl. 2—60

3 Claims



- 1. A plurality of disposable cuff protectors comprising:
  - a. a roll of double layered sheet material;
  - b. a plurality of sections successively formed in said double layered sheet material, each of said sections being defined by parallel sides constituting the outer edges of said sheets;
  - c. said sections are divided by first and second narrow transversely running controllably releasable sealing linear areas defining the only areas in sealing contact between each of said layered sheets;
  - d. said first controllably releasable sealing linear areas are located at spaced intervals along said sheets and extend



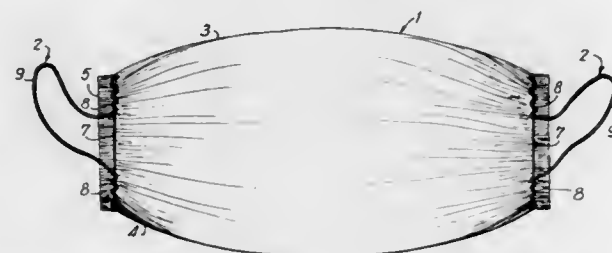
- transversely across said sheets and form a first angle with the outer edges of said sheet;
- c. said second controllably releasable sealing linear areas are located at spaced intervals along said sheets and extend transversely across said sheets between said first sealing linear areas and form a second angle with the outer edges of said sheet thereby forming a conical tube with one end opening greater than the other;
- f. a first perforated tear line disposed centrally of said first linear area and extending from outer edge to outer edge of said sheet; and
- g. a second perforated tear line disposed centrally of said second linear area and extending from outer edge to outer edge of said sheet.

**4,014,047**  
**FACE MASK**

James W. Zobel, P.O. Box 125, Mount Kisco, N.Y. 10549  
Division of Ser. No. 537,262, Dec. 20, 1974, Pat. No. 3,960,096. This application Oct. 20, 1975, Ser. No. 623,818  
Int. Cl.<sup>2</sup> A62B 23/06

U.S. Cl. 2-206

5 Claims



1. A face mask comprising an elongated sheet of porous material having upper and lower longitudinal edges and transverse side edges, a line of stitches of elastic material sewn to said material along both side edges at an inwardly spaced location from said edges, and a length of cord at each side edge secured to said material by the line of stitches thereat without said cord penetrating the porous material and without said stitches penetrating said cord, each length of said cord having opposite spaced ends which are interwoven with said line of stitches to be anchored to said porous material along said side edges, said cord having a free intermediate portion between said ends which forms an ear loop, said elastic material being sewn to said porous material and interwoven with said cord lengths when the porous material is taut such that when the porous material is relaxed, the elastic material exerts a pull on the porous material to gather and contract the material at the side edges.

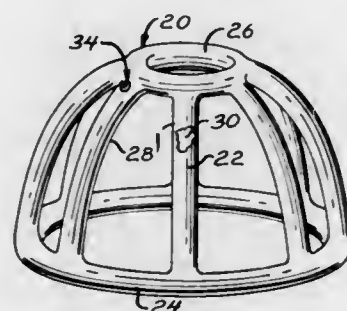
**4,014,048**  
**INFLATION DEVICE**

Frederick A. Rappleyea, Park Ridge, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 24, 1975, Ser. No. 634,579  
Int. Cl.<sup>2</sup> A42B 3/02

U.S. Cl. 2-413

20 Claims



1. A cushion device for a protective headgear, comprising:

an inflatable liner having a wall at least partially defining a cavity, and an opening extending through said wall;

a fluid lock member secured to said liner wall in the opening, said lock member having an elongated wall section defining a chamber, a flexible outer wall defining an outer portion of the chamber and having a first preformed slit extending between said chamber and the outside of the outer wall, said slit being normally closed to prevent passage of fluid therethrough and being openable a sufficient distance to permit passage of a blunt tip of an inflation needle through said outer wall into the chamber, and said valve member having a flexible inner wall defining an inner portion of the chamber and having a second preformed slit spaced from and generally aligned with the first slit and extending from said chamber to the cavity, with said second slit being normally closed to prevent passage of fluid therethrough and being openable a sufficient distance to permit passage of the blunt tip of the inflation needle or fluid from the chamber to said cavity.

**4,014,049**

**ARTIFICIAL INTRAOCULAR LENS AND SUPPORTING SYSTEM THEREFOR**

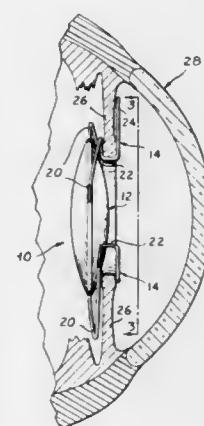
William Richards, Medway, and Bernard Grolman, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Apr. 7, 1976, Ser. No. 674,348

Int. Cl.<sup>2</sup> A61F 1/16, 1/24

U.S. Cl. 3-13

10 Claims



1. A pseudophakos comprising:
- a lens having oppositely disposed anterior and posterior optically finished side surfaces;
- a plurality of slender and resilient supporting arms affixed to said lens adjacent its periphery, said arms each being of a looped configuration including a bight disposed a substantial distance laterally away from said periphery of said lens and a free end positioned adjacent one of said side surface of said lens when said arm is in a relaxed condition;
- said free end of said arm being in the configuration of a clip for receiving the irido-pupillary margin of an eye when the pseudophakos is implanted for use and wherewith said lens may be centered relative to the pupil, each free end of each arm when in said relaxed condition being approximately equally radially spaced from said center of said lens an amount approximately corresponding to the radial dimension of said pupil when said pupil is at approximately maximum normal dilation whereby under such condition of pupil dilation said clips do not apply appreciable force against said pupil margin while at maximum pupil contraction only minimal gentle holding force is applied.

**4,014,050**  
**APPARATUS EMPLOYING A TIMER FOR CONTROLLING THE QUANTITY OF WATER FLUSHED BY A TOILET**

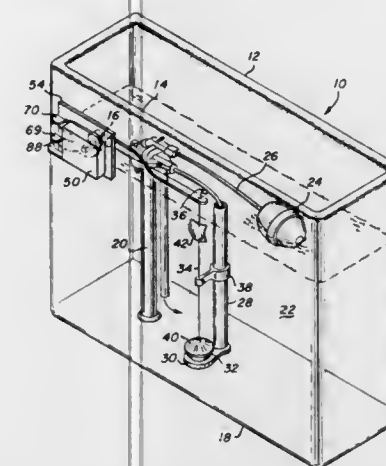
Forrest C. Goldsworthy, 2595 Aragon Court, San Jose, Calif. 95125

Filed Apr. 15, 1976, Ser. No. 677,224

Int. Cl.<sup>2</sup> E03D 1/34, 5/02; A61B 19/00

U.S. Cl. 4-67 A

11 Claims



1. In a toilet including a tank having a water outlet, a valve seatably disposed on the water outlet and a lift rod attached to the valve an improved apparatus for controlling the quantity of water flowing through the outlet comprising:
- a timer including a rotatable output shaft, said timer being responsive to the angular rotation of said shaft from an initial position and operative to return said shaft to said initial position after a time duration corresponding to the amount of angular rotation of said shaft;
- a crank coupled to said shaft and being capable of rotating said shaft through a predetermined angle when a force is applied to it;
- means mounting said timer to the tank; and
- means coupled between said shaft and the lift rod for moving the lift rod a dimension such that the valve is unseated when said shaft is not in said initial position, and said valve is seated when said shaft is in said initial position, whereby when a force applied to said crank rotates said crank and hence said shaft through said predetermined angle said means coupled between said shaft and the lift rod is moved a dimension sufficient to unseat the valve from the water outlet causing water to flow through the water outlet, and whereby the return of said shaft to said initial position causes said means coupled between said shaft and the lift rod to seat the valve on the water outlet after a time duration corresponding to the predetermined angle, said time duration serving to control the quantity of water flowing out of the tank.

**4,014,051**

**BACK SCRATCHING AND/OR SCRUBBING DEVICE**

Lewis A. Pettit, 915 S. Second St., Millville, N.J. 08332

Filed Sept. 4, 1975, Ser. No. 610,180

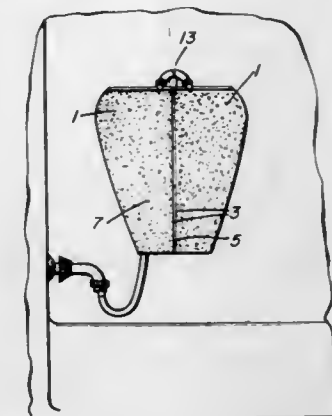
Int. Cl.<sup>2</sup> A47K 3/22; A47L 13/12, 13/50; E04F 21/16

U.S. Cl. 4-158

4 Claims

1. A device for scratching and scrubbing the human back which is adapted for attachment to a wall surface comprising, in combination, a pair of substantially flat operating elements providing front and rear surfaces; and having adjacent edges of said operating elements being in substantial edgewise alignment, means converting said operating elements for relative pivotal movement about a vertical axis; the remote edges of said operating elements being downwardly tapered when viewed in elevation; a plurality of supporting members connected to the backs of said operating elements and extending rearwardly with respect thereto; a rearwardly-facing suction

cup connected to the outer end of each of said supporting members; and means carried on the front surface of each of



said operating elements for contacting the skin on the back of the user of the device.

**4,014,052**

**APPARATUS FOR MAINTAINING A PREDETERMINED LIQUID LEVEL**

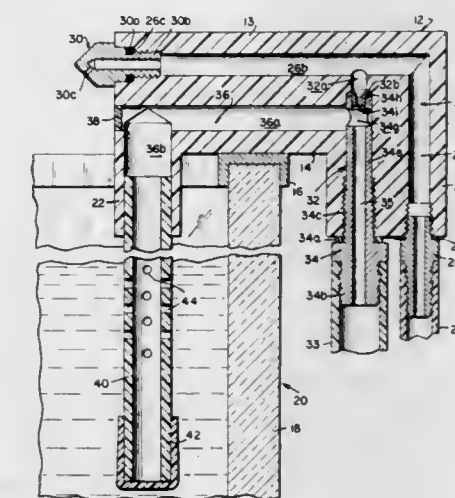
Keith H. Wolos, Pequannock, N.J., assignor to Meridian Industries, Inc., Pompton Plains, N.J.

Filed Feb. 26, 1976, Ser. No. 661,799

Int. Cl.<sup>2</sup> E04H 3/16, 3/18; F16L 22/02

U.S. Cl. 4-172

16 Claims



1. An apparatus adapted to be mounted on a liquid-containing tank having at least one upstanding wall and constructed to control the level of the liquid contained in said tank by providing fresh liquid from an external pressurized source and expelling liquid from said tank to an external drain comprising a housing having a supporting wall adapted to rest on and straddle said upstanding wall with a first portion of said housing extending over the surface of the liquid in said tank and a second portion of said housing extending outwardly of said upstanding wall, a first liquid passageway formed in said housing having a supply inlet in said second housing portion adapted to be coupled to a source of pressurized liquid and a supply outlet in said first housing portion adapted to emit liquid into said tank from a position above the level of the liquid in said tank, a second liquid passageway formed in said housing having a drain inlet connected to said first liquid passageway and a drain outlet in said second housing portion arranged to be coupled to said drain, means in said second liquid passageway for restricting the flow of liquid from said first passageway to said second passageway, and a third liquid passageway in said housing having a liquid inlet in said first housing portion adapted to be coupled to the liquid in said tank and a liquid outlet coupled to the second liquid passageway, so that as liquid from said pressurized source flows from said supply inlet toward said supply outlet of said first passageway a portion of said liquid is diverted to flow through said



restricting means and said second passageway, creating a region of reduced pressure in said second passageway whereby liquid from said tank is drawn through said third liquid passageway to said region of reduced pressure and is expelled from said second liquid passageway through said drain outlet.

4,014,053

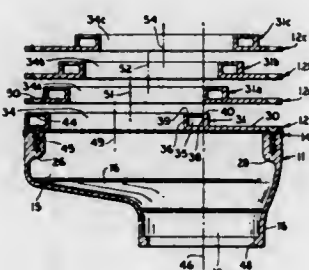
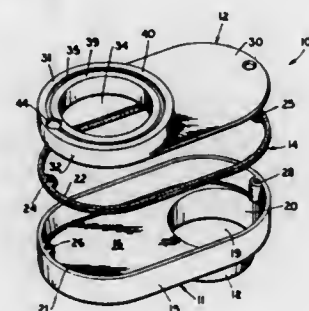
# OFF-SET FLANGE FOR MOUNTING A WATER CLOSET, AND METHOD OF USING SAME

Basil B. Jones, Rte. 2, Box 400, Clearwater, Fla. 33515  
Filed June 12, 1975, Ser. No. 586,161

Int. Cl.<sup>2</sup> E03D 11/00

U.S. Cl. 4-252 R

5 Claims



1. An off-set flange for mounting a water closet, said off-set flange comprising a body including a bottom, a discharge spout extending from said bottom and having a first centerline, a generally vertical wall extending from said bottom, a cover for said body selectively receivable on the upper edge of said wall, said cover defining an opening therethrough for placing material into said body, said opening having a second centerline, said second centerline being spaced from said first centerline.

4,014,054

# SHAMPOO DEVICE

Edward J. Pasquarello, 5 Silvermine Road, Woburn, Mass. 01801

Filed May 7, 1976, Ser. No. 684,159

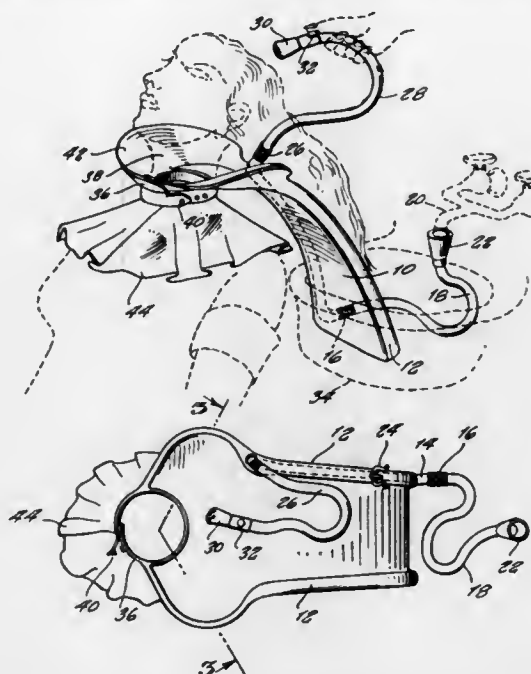
Int. Cl.<sup>2</sup> A47K 3/12; A61H 35/00

U.S. Cl. 4-159

9 Claims

1. A shampoo device, comprising a tray shaped liquid receiving surface for conveying liquid away from the head, a pair of opposing laterally disposed ridges on said tray for preventing water overflow, at least one of said ridges defining an internally disposed channel open at both ends and adapted to convey a flow of water, first and second hose engaging part means disposed on each open end of said channel, a first length of hose communicating with said first part and a supply of water, a second length of hose communicating with said second part and adapted to supply water to the head, an

arcuate shaped collar adapted to engage the neck, closure means adapted to securely engage said collar about the neck



and a flexible apron of water impermeable material depending from said collar and adapted to engage the shoulders.

4,014,055

# SHEET-SPREAD WITH INTEGRAL PILLOW RETAINING SLEEVE

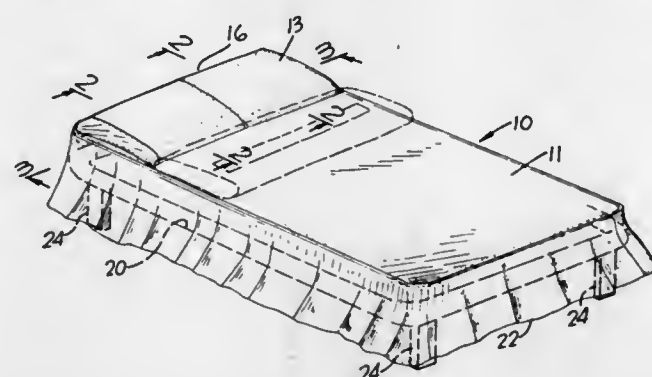
Susan Torres, c/o Mrs. G. Mendez, P.O. Box 40, Jackson, N.J. 08527

Filed Jan. 27, 1975, Ser. No. 544,636

Int. Cl.<sup>2</sup> A47G 9/00

U.S. Cl. 5-334 C

1 Claim



1. A sheet-spread device comprising a generally rectangular body portion of cloth, said body portion including edges which correspond to the top, bottom and sides of a bed adapted to receive said sheet-spread, said generally rectangular portion having a width and length corresponding to said associated bed, a pillow receiving tubular sleeve having the axis thereof disposed transversely to the length of the generally rectangular portion, said sleeve being joined to said rectangular portion along a longitudinal line on the circumference thereof disposed generally parallel to the axis thereof, said line being spaced from the top of the generally rectangular section a distance such that when the sleeve has a pillow disposed therein the extremity of the sleeve registers with the top of the generally rectangular section, said sheet-spread further comprising a depending retaining section having a peripherally disposed elastic member for tight fitting engagement with the bed; and a depending flounce over said retaining section.

4,014,056

# TANK MOUNTING MEANS

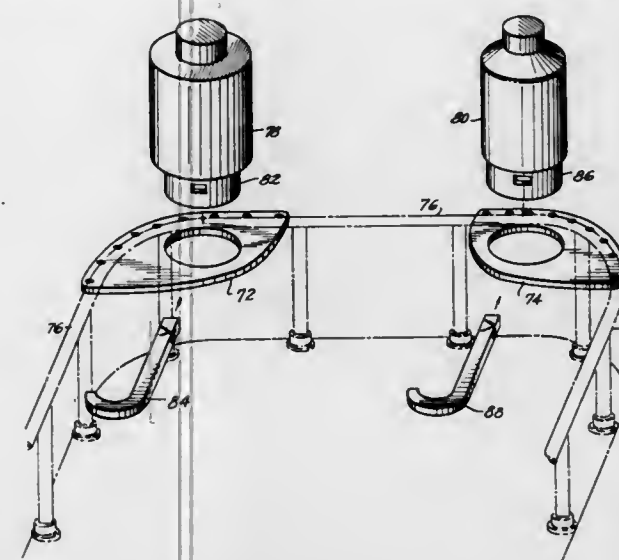
Richard A. Wainwright, 10504 Wheatly St., Kensington, Md. 20795

Filed Jan. 26, 1976, Ser. No. 652,087

Int. Cl.<sup>2</sup> B63B 17/00

U.S. Cl. 9-1.7

16 Claims



1. A marine tank mount for a water surface traversing vessel comprising a rack, said rack being attached to a deck member of the vessel, the deck member being disposed above the water surface, said rack being above the vessel deck and at least partially horizontal, the horizontal portion of said rack being provided with at least one opening, at least one tank, said tank being provided with a bottom flange, said tank being mounted on said rack whereby said flange extends downwardly through said opening, the portion of said flange below said rack being provided with at least two holes, and a locking bar, said bar extending through said holes, whereby said tank is attached to said vessel above the deck of the vessel.

4,014,057

# CHAIN-LIKE RESCUE DEVICES PARTICULARLY FOR SMALL BOATS

Kalervo Kuojärvi, Mikonkatu 25 B 29, 00100 Helsinki 10, Finland

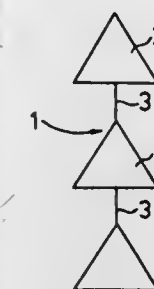
Filed June 13, 1975, Ser. No. 586,629

Claims priority, application Finland, June 17, 1974, 741847

Int. Cl.<sup>2</sup> B63C 9/26, 9/22

U.S. Cl. 9-14

8 Claims



1. In a rescue device for a vessel such as a small boat, a plurality of bodies each formed with an aperture large enough to facilitate manual grasping of the bodies by an individual to be rescued or to receive a foot of the individual to be rescued, and connecting means connecting said bodies in a given sequential arrangement one to the next and forming with said bodies a chain-like structure by means of which an individual can with his hands and feet climb upwardly along the structure back to the vessel, each body having opposed upper and lower end regions when the chain-like structure hangs freely, and each of said end regions of each body being formed with openings passing therethrough, respectively, and said connecting means including a plurality of units each including a

rod of substantially U-shaped configuration having a pair of opposed legs terminating in a pair of free end regions, respectively, and a substantially straight rod extending across said legs at said free end regions thereof and connected thereto, and the U-shaped rod of one of said units of said connecting means extending through one of said openings of each body while the substantially straight rod of one of said units extends through the other of said openings of each body.

4,014,058

# FEEDING DEVICE FOR HIGH SPEED NUT FORMERS

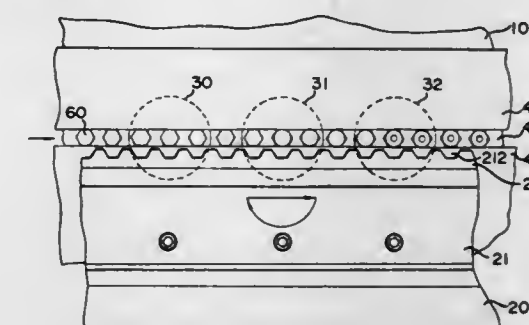
Yuan Ho Lee, 85 Jen Ho Road, Tainan, China /Taiwan

Filed Dec. 29, 1975, Ser. No. 644,942

Int. Cl.<sup>2</sup> B21D 53/24

U.S. Cl. 10-76 T

4 Claims



1. A feeding device for a high speed nut forming machine having a machine body on which at least two dies are mounted comprising:

a manipulating mechanism provided on said machine body and adapted to provide advancing motion along a straight line and returning motion along an arched path;

two guide plates provided on said machine body and spaced parallel to one another to define a feeding path between two successive dies, the feeding path having its center axis congruous with a line drawn through and connecting the centers of the two successive dies; and

a feeding plate having an edge having a plurality of equally spaced indentations thereon, at least two of said indentations having a suitable shape to hold and convey workpieces positioned in the feeding path between the two parallel guide plates, the distance between a least two of said indentations being a suitable fraction of the distance between the two successive dies, the feeding plate being provided on the manipulating mechanism and adapted to have the edge thereof having the plurality of indentations thereon moveably and removeably positioned in the feeding path;

thereby to successively hold, convey, and release workpieces in said feeding path due to the alternating advancing straight line and returning arched path motions provided by the manipulating mechanism so that workpieces are moved along said feeding path in a plurality of discrete steps from one die to the next successive die.

4,014,059

# FRAME CONSTRUCTION FOR A DOCKBOARD

Thomas G. Artzberger, Menomonee Falls, and Thomas J. Wiener, Brown Deer, both of Wis., assignors to Kelley Company, Inc., Milwaukee, Wis.

Filed July 28, 1975, Ser. No. 599,891

Int. Cl.<sup>2</sup> E01D 1/00

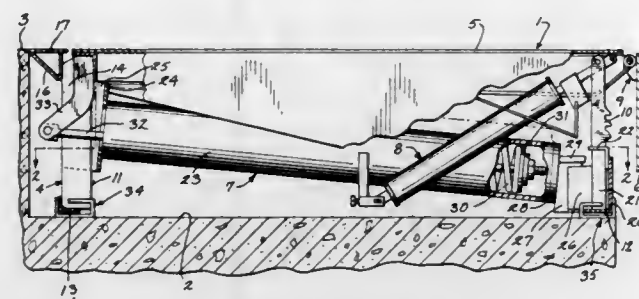
U.S. Cl. 14-71.3

8 Claims

1. In a dockboard construction, a frame including a rear frame section and a front frame section, a ramp hinged to the rear frame section and movable between a generally horizontal cross traffic position and an upwardly inclined position, said rear frame section including a base member and a plurality of vertical supports extending upwardly from said base member, said ramp being hinged to said vertical supports, said rear frame section also including a horizontal plate connected



to the upper end portions of said vertical supports and extending rearwardly of said supports, said horizontal plate adapted to be mounted substantially flush with the upper surface of the dock, said rear frame section also including a generally V-



shaped support having a vertical leg and a diagonal leg, said vertical leg being attached to the upper end portions of said vertical supports and said diagonal leg being secured to the underside of said horizontal plate.

4,014,060

## SHOE SOLE CLEANER

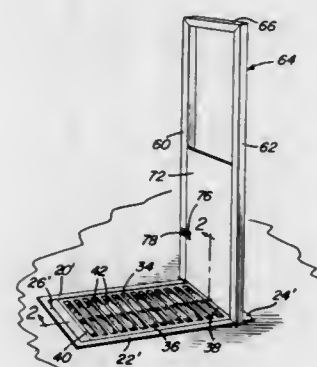
Wallace N. Taylor, P.O. Box 824, Dothan, Ala. 36301

Filed Dec. 4, 1975, Ser. No. 637,722

Int. Cl.<sup>2</sup> A47L 23/22

U.S. Cl. 15—36

7 Claims



7. In combination, a shoe sole cleaner including a support grill, motorized brush means supported beneath said grill including bristles projecting upwardly through said grill, a position retainer supported adjacent one marginal edge portion of said grill, a cover panel having one marginal edge pivotally supported adjacent said one marginal edge portion for swinging of said cover panel between a first horizontal position closely overlying said grill and a second upstanding position at least closely adjacent said position retainer, said cover panel and said position retainer including coacting latch means releasably retaining said cover panel in said second position.

4,014,061

## VEHICLE WIPER BLADE CONSTRUCTION

Willi Jurowski; Alfred Kohler; Hans Prohaska, all of Bietigh-eim, and Eugen Schrade, Ludwigsburg, all of Germany, assignors to SWF-Spezialfabrik für Autozubehör Gustav Rau GmbH, Germany

Filed Aug. 22, 1975, Ser. No. 606,979

Claims priority, application Germany, Aug. 22, 1974, 2440179

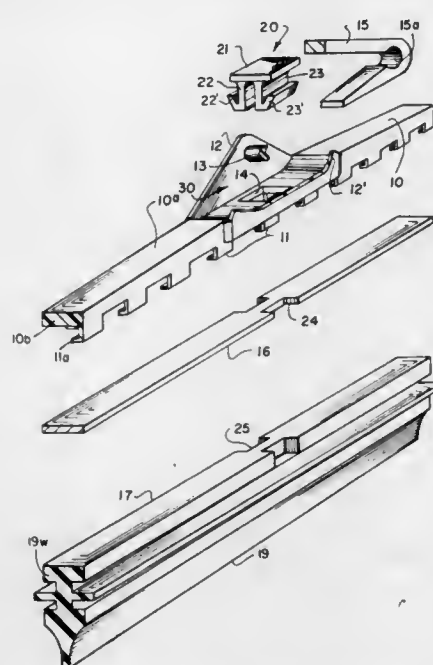
Int. Cl.<sup>2</sup> B60S 1/04

U.S. Cl. 15—250.42

3 Claims

1. A wiper blade for wiper arm installations in vehicles, comprising a blade yoke having top and bottom surfaces and a side wall on each side of said top surface, said side walls including lower portions extending downwardly from said bottom surface and with intumed flange portions adjacent the bottom ends thereof defining wiper blade supports which extend inwardly from respective opposite sides and terminate in opposite inner edges which are spaced apart, a wiper blade

having an outer blade portion and an inner flat web portion and an intermediate portion of smaller width than said web portion interconnecting said web portion and said blade portion, said web intermediate portion being positionable between opposite blade supports and said blade being insertable with said intermediate portion located between said supports from an end of said yoke so as to position said web portion between said supports and said yoke bottom, a spring bar engageable between said web portion and said bottom, said blade web portion and said spring bar being provided with



laterally aligned notches extending inwardly from respective opposite sides, said yoke having an opening therethrough overlying said notches and the portions of said spring bar and said web portion between the notches, and a U-shaped locking member having laterally spaced longitudinally extending first and second leg portions engageable in the respective notches and a central connecting portion interconnecting said legs disposed over said yoke, each locking leg portion having outwardly extending parts engageable below a respective one of said yoke side walls, said leg portions locking said blade and said spring bar against longitudinal movement.

4,014,062

## THREAD CLEANER WITH ROTATABLE AND ADJUSTABLY SUPPORTED BRUSHES

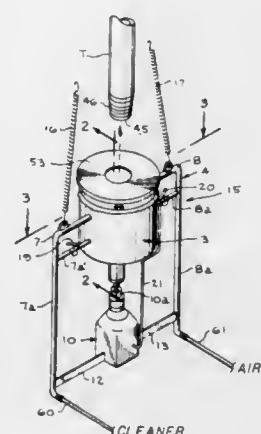
Thomas W. Scott, 116 Maplewood Drive, Lafayette, La. 70501, and Walter J. Roy, 122 W. Henry, Rayne, La. 70578

Filed Jan. 6, 1975, Ser. No. 538,867

Int. Cl.<sup>2</sup> B08B 9/02

U.S. Cl. 15—104.04

4 Claims



1. A cleaner for cleaning the threads on a pipe end comprising:  
a housing having an open end;  
a frame extending from each side of said housing;

resilient means connected to said frame for resiliently and movably supporting said housing in an elevated position; a disc rotatably supported in said housing opposite said open end of said housing;  
brush means for engaging the threaded pipe end;  
adjustable means supporting said brush means on said disc for lateral adjustment thereof;  
a member projecting from said disk adjacent said brush means for engaging within the end of a pipe to support it while the threaded pipe end is cleaned;  
a cover for said housing open end having an opening therein for receiving the threaded pipe end therethrough to be engaged by said brushes for cleaning thereof; and  
means for rotating said disc and brushes thereon for cleaning the threaded pipe end in said housing.

4,014,063

## APPARATUS FOR CLEANING TUBES AND FITTINGS

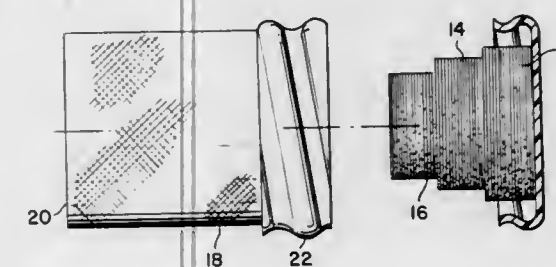
Edward J. Bunke, Montgomery, Ala., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 12, 1976, Ser. No. 675,952

Int. Cl.<sup>2</sup> A46B 5/02; B08B 9/02

U.S. Cl. 15—111

4 Claims



1. Apparatus for cleaning tubing and fittings having hollow circular cross sections differing in diameter, said apparatus comprising:

a hollow cylinder open at one end and closed at the other;  
a first ring shaped cleaning brush having an outer diameter essentially equal to the inner diameter of the cylinder and disposed concentrically within the cylinder abutting the closed end and having a first inner diameter said first brush having four equidistantly disposed radial slots therein dividing the first brush into four quadrants;  
a second ring shaped cleaning brush having a like outer diameter and a second inner diameter larger than the first inner diameter, said second brush being disposed concentrically within the cylinder abutting the first brush, said second brush having four equidistantly disposed radial slots therein aligned with the four slots in the first brush and dividing the second brush into four quadrants; and  
a third ring shaped cleaning brush having a like outer diameter and a third inner diameter larger than the second inner diameter, said third brush being disposed concentrically within the cylinder abutting the second brush and the open end of the cylinder, said third brush having four equidistantly disposed radial slots therein aligned with the four slots in the second brush and dividing the third brush into four quadrants.

4,014,064

## HAIRBRUSH

Kenichi Okazaki, 3-2-, 2-chome, Higashi-honmachi, Yaoshi, Osaka, Japan

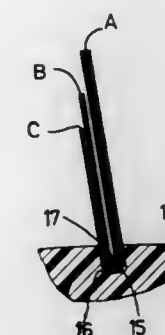
Continuation-in-part of Ser. No. 486,410, July 8, 1974, abandoned. This application May 9, 1975, Ser. No. 576,048

Int. Cl.<sup>2</sup> A46B 3/16

U.S. Cl. 15—159 A

1 Claim

1. A hairbrush comprising a main body having a face portion, a plurality of tufts of bristles, each of said tufts compris-



ing synthetic resin bristles of two lengths, the longer length being greater in number than the shorter length, each of said resin bristles being bent at a point other than the mid-point of the bristle, to form a long portion and a short portion, wherein the long portions of each bristle are equal, said bristles being affixed to said face portion at the bend portion of the bristle,

so that the ends of said bristles are at three different heights, or steps, from the face portion of the main body, the middle height bristle being proportionately lesser in number than the highest bristle, and the shortest height bristle being proportionately lesser in number than the middle height bristle, the corresponding three steps of each tuft being equal in height.

4,014,065

## MAGNETIC DEVELOPER REMOVAL SYSTEM

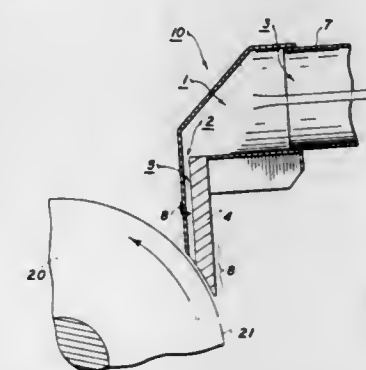
Frederick W. Hudson, W. Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 27, 1975, Ser. No. 608,362

Int. Cl.<sup>2</sup> A47L 9/02

U.S. Cl. 15—306 R

6 Claims



1. In a magnetic imaging system wherein a member having a latent magnetic image is developed with magnetic developer material, the improvement comprising: developer material removal means comprising a chamber having an entrance and exit ports; the cross-sectional area ratio of entrance port to exit port being sufficiently small to assure substantially uniform air-flow across the entrance port when the chamber is subjected to negative pressure through the exit port; the entrance port of the chamber being in communication with means for subjecting the developed surface of the member to a substantially uniform shearing air flow when the chamber is subjected to the negative pressure.

4,014,066

## LOCKING LEVER FOR PLASTIC LINK

William H. Harbison, Valparaiso, and John J. Plisky, Munster, both of Ind., assignors to The Anderson Company, Gary, Ind.

Filed Mar. 31, 1976, Ser. No. 672,252

Int. Cl.<sup>2</sup> B60S 1/04

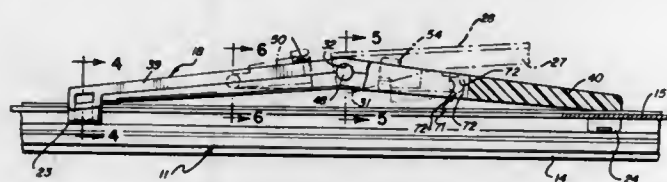
U.S. Cl. 15—250.42

10 Claims

8. In a wiper assembly having a wiper blade, a pressure-distributing superstructure operatively connected with the wiper blade, and means for pivotally connecting at least two parts of the superstructure together, a portion of one of the parts



having a vertical open space between a pair of spaced apart walls permitting deflection of the walls of the said part inwardly into the vertical open space during assembly and disassembly of two of the parts of the superstructure, in combination with a lock having a mounting portion and a locking



portion, said lock having said mounting portion pivotally positioned in a remote portion of said vertical open space to position said locking portion within the vertical open space between the walls of the second part to prevent deflection of the walls of the second part inwardly into the vertical open space.

4,014,067

## CARPET CLEANING IMPLEMENT

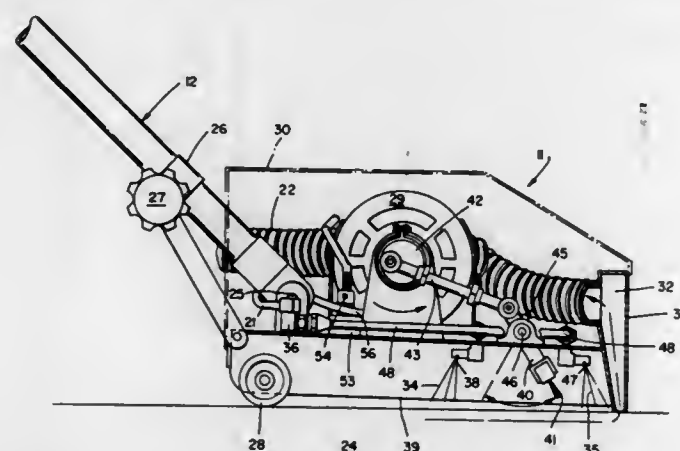
Charles Ross Bates, 1111 Morse Ave., No. 179, Sunnyvale, Calif. 94086

Filed June 20, 1975, Ser. No. 588,729

Int. Cl.<sup>2</sup> A47L 7/00

U.S. Cl. 15—320

10 Claims



1. A carpet cleaning implement useful for continuously washing and rinsing a floor fastened carpet in a single operation, comprising:

a head having a cover thereover, said head being adapted to be rolled along on said carpet upon roller means located adjacent a first end thereof, a bottom portion of said head facing said carpet, said head including adjacent to said bottom portion thereof first liquid delivery means for delivering a flow of a first liquid under pressure onto said carpet, a brush adjacent said first liquid delivery means for agitating said first liquid into said carpet, second liquid delivery means adjacent said brush and on an opposite side therefrom from said first liquid delivery means for delivering a flow of a second liquid under pressure into said carpet and a channel adjacent a second end of said head communicating with a vacuum source of at least about 100 inches of water, said channel being adjacent said second liquid delivery means and on an opposite side therefrom from said brush, said channel serving for picking up said first liquid and said second liquid as said head is rolled along said carpet in a direction whereby said first liquid delivery means first passes a portion of said carpet followed sequentially by said brush, said second delivery means and said channel;

motor means drivingly communicating with said brush to supply oscillatory forwards and backwards motion thereto alternately towards and away from said first and second ends of said head respectively;

a handle extending from said first end of said head for

operator control thereof, said motor means, head, first and second liquid delivery means, channel and handle being located so that said roller means supports the great majority of the weight of said implement, said head being normally rolled along said carpet by exertion of a pulling force on said handle;

valve means on said handle communicating with a liquid source for controlling flow of said first liquid through said first liquid delivering means and of said second liquid through said second liquid delivering means.

4,014,068

## BRUSH MOUNTING AND TORSION SPRING SUPPORT FOR POWERED NOZZLE

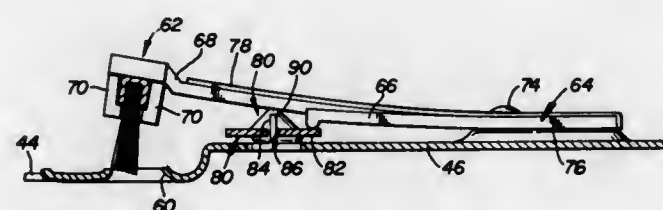
Rex E. Payne, and Henry F. Aegerter, Jr., both of Massillon, Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed Apr. 3, 1975, Ser. No. 564,808

Int. Cl.<sup>2</sup> A47L 9/06

U.S. Cl. 15—355

12 Claims



10. A rug and floor nozzle having;

- a. a downwardly opening housing,
- b. a bottom pan for said housing including a brush receiving aperture,
- c. a reciprocating flat bar lying against said bottom pan and movably attached to said bottom pan,
- d. tear shaped cams formed on said reciprocating flat bar,
- e. brush means mounted on said bottom pan and extending through said aperture and including means for mounting said brush means resiliently on said bottom pan, and
- f. said tear shaped cams being movably interposed between said mounting means and said bottom pan to thereby control the distance said brush means extends out of said aperture.

4,014,069

## PIVOTS FOR VENT WINDOW ASSEMBLIES

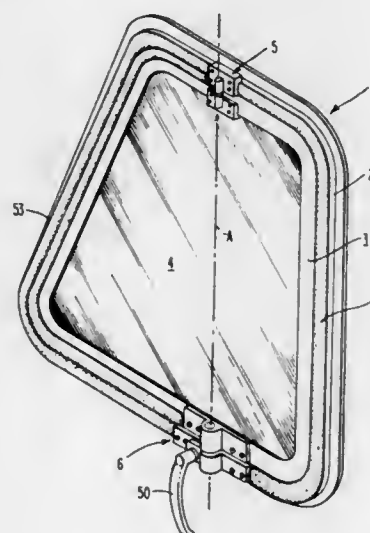
Gary S. Walker, Norristown, Pa., assignor to Young Windows Inc., Conshohocken, Pa.

Filed June 9, 1976, Ser. No. 694,133

Int. Cl.<sup>2</sup> E05D 11/08

U.S. Cl. 16—140

5 Claims



1. Pivot mechanism for vehicle vent window assembly comprising:

a first housing and a second housing, the housings being disposed one above the other;

a pivot stud fixed to the first housing;

a gripping cavity extending thru the second housing and receiving said stud, the axis of the pivot stud and the axis of the gripping cavity being co-axial;

a gripping slot extending thru said second housing in the same direction as said gripping cavity and also extending from the periphery of the second housing to said gripping cavity and the slot forming a moveable, resilient gripping arm on the second housing;

a clearance aperture formed in said gripping arm;

a locking slot extending thru said second housing in the same direction as said gripping slot;

a clearance aperture formed in the second housing in alignment with first said clearance aperture and extending between and open to said gripping slot and to said locking slot;

a gripping stud disposed in said clearance apertures and having a threaded end extending into said locking slot, the clearance apertures mounting the stud for rotation and for axial movement;

a shoulder on said gripping stud inwardly of said square end and bearing on said gripping arm;

a nut on the threaded end of the gripping stud and engaging the walls of the locking slot whereby rotation of the nut is restrained;

a control knob mounted on the gripping stud;

rotation of the knob in one direction causing the gripping stud to rotate in said nut and thereby move axially so that said shoulder exerts pressure on the gripping arm and moves the arm in a direction to collapse said gripping cavity and thereby exert a gripping force on the pivot stud and movement of the control knob in the opposite direction causing the gripping stud to rotate in said nut and thereby move axially in the opposite direction so that said shoulder relieves pressure on the gripping arm whereby the resiliency of the arm moves the same in the opposite direction to expand the cavity to relieve the gripping force on the pivot stud.

4,014,070

## PANEL ATTACHED GUIDES FOR TUB ENCLOSURES AND THE LIKE

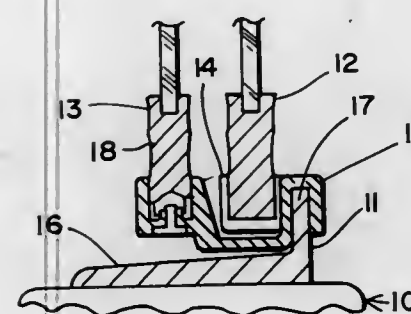
Morton S. Rifkin, Hialeah, Fla., assignor to Diston Industries, Inc., Hialeah, Fla.

Filed Aug. 25, 1975, Ser. No. 607,475

Int. Cl.<sup>2</sup> E05D 13/02

U.S. Cl. 16—90

4 Claims



1. A panel guide member for tub and shower enclosures and the like comprising a first web portion, a first leg portion extending from one edge of said first web portion, leg means extending from the other edge of said first web portion in substantially spaced relation to form a slot for receiving a panel, a second web portion extending from said leg means in substantially parallel relation with said first web portion, a second leg portion extending from said second web portion in a substantially parallel and opposite direction of said first leg portion and forming a slot with said leg means for receiving a track, a substantially pliable tab member extending from said

first web portion, a pin mounted on the free end of said tab member and an opening in said first web portion for receiving said pin whereby said panel guide member is secured to said panel received in said first named slot.

4,014,071

## CURTAIN SUSPENSION ASSEMBLY

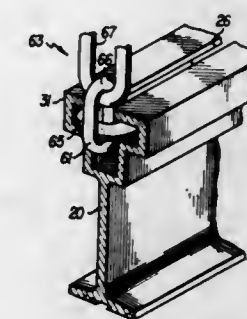
Richard W. Janson, Box 8110, Canton, Ohio 44711

Filed Sept. 29, 1975, Ser. No. 617,508

Int. Cl.<sup>2</sup> E05D 13/02

U.S. Cl. 16—93 R

4 Claims



1. A traverse rod for supporting curtains and the like in combination with supporting structure which includes a depending vertical part and a horizontal part connected thereto and spaced above the bottom of said vertical part, said rod comprising:

an upper rod support portion which comprises two spaced apart arms which define between them a groove, said groove having a vertical cross-section configuration substantially of an upright T, the upper ends of said arms defining a slot giving access centrally into said groove for receipt therein of said vertical part of said supporting structure for the rod, the bottom of said vertical part received in the vertical portion of said T-shaped groove, and said horizontal part received in the horizontal portion of said T-shaped groove; and

a lower curtain or the like carrier supporting portion extending downwardly from said upper portion, said lower portion being substantially of an inverted T shape in cross-section and comprising a central vertically disposed part and a lower horizontal flange centrally joining the lower aspect of said vertically disposed part, the upper surfaces of said flange on both sides of said vertically disposed part adapted to receive curtain or the like carriers for horizontal movement therealong, the upper aspect of said vertically disposed part joining with said arms and being substantially centered under said slot whereby a vertical plane containing said vertically disposed part passes through said slot.

4,014,072

## FASCIA AND TRACK FOR A SLIDING DOOR

William J. Schumacher, Downey, Calif., assignor to Acme General Corporation, San Dimas, Calif.

Filed Oct. 30, 1975, Ser. No. 627,046

Int. Cl.<sup>2</sup> A47H 1/04

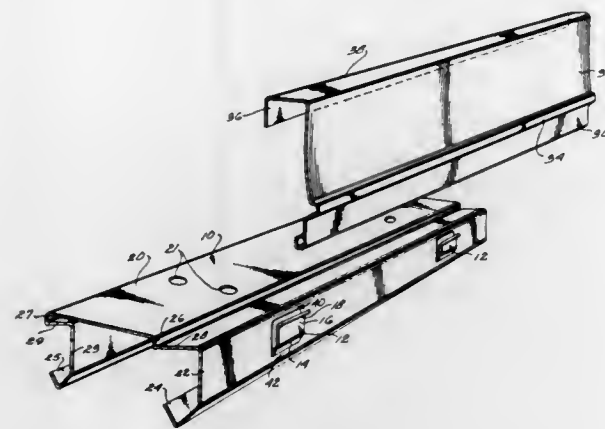
U.S. Cl. 16—95 R

4 Claims

1. A track assembly for supporting doors from an overhead horizontal surface, comprising: a longitudinal track member having a normally vertical surface along at least one side of the track, clip means spaced longitudinally on said surface, the clip means including upwardly projecting fingers integral with the side of the track forming slots between the fingers and said surface; and a fascia member having an elongated outer surface and an inverted lip along one margin, the lip extending downwardly and engaging said slots, the fingers of the clip



means clamping the inverted lip against the vertical surface of the track member to frictionally secure the fascia in position



so that the vertical position of the fascia can be adjusted relative to the track member.

4,014,073

# ADJUSTABLE ROLLER CONSTRUCTION FOR WINDOWS, DOORS OR THE LIKE

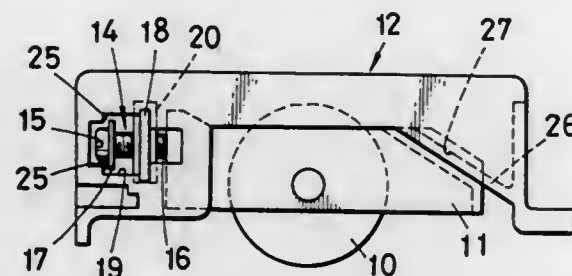
Takeo Uehara, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Nov. 11, 1974, Ser. No. 522,533

Claims priority, application Japan, Nov. 27, 1973, 48-137566[U]

Int. Cl.<sup>2</sup> E05D 15/06

U.S. Cl. 16-105



1. In a roller device of the type including a roller, a roller holder rotatably supporting said roller, and a mounting frame supporting said roller holder in such a manner that said roller holder is adjustably displaceable outwardly relative to said mounting frame when applied with a pressure in a predetermined direction, the combination comprising an inclined surface on said roller holder disposed for sliding engagement with an inclined surface on said mounting frame to guide said roller holder for movement outwardly relative to the mounting frame upon application to said roller holder of a pressure in said predetermined direction, an adjusting screw adapted to apply pressure to said roller holder in said predetermined direction to cause the outward displacement of said roller holder relative to said mounting frame, said adjusting screw having a flange fixedly mounted thereon just below its head, and stop means on said mounting frame positioned to limit the movement of said adjusting screw in its loosening direction by engaging said flange thereon, said roller being supported by said roller holder for rotation relative thereto about an axis fixed with respect to the roller holder and adjustable relative to said mounting frame in accordance with the position of said adjusting screw.

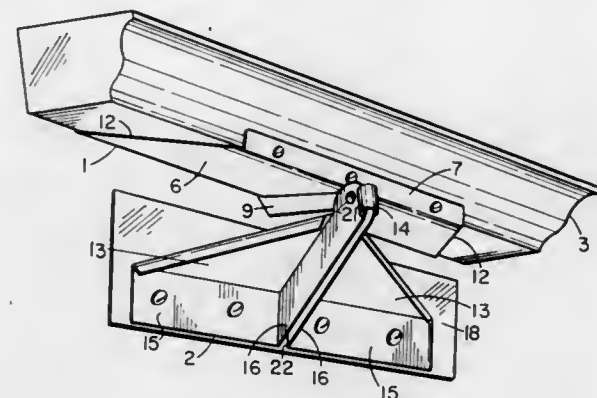
## 4,014,074 ADJUSTABLE HINGED BRACKET FOR A DRAIN TROUGH

Lloyd Henry Faye, 8821 Elm Road, Richmond, Va. 23235  
Filed Feb. 25, 1976, Ser. No. 661,322

Int. Cl.<sup>2</sup> E05D 5/06

U.S. Cl. 16-135

6 Claims



1. A hinge comprising a harness member comprising a seating portion, a flexible back portion, a front retaining lip extending substantially vertically above said seating portion, a rear retaining lip extending at a downward angle from the top of said back portion, and an aligning blade affixed to the underside of said seating portion and vertically positioned with respect to said seating portion and said back portion, and a support bracket member comprising a shelf extending horizontally forward, a mounting shoulder disposed perpendicularly to said shelf, and an open-bottomed slot located beneath said shelf and adapted to receive the aligning blade of said harness member, said harness member being pivotally joined to said support bracket member.

4,014,075

# LIBERATING MEAT FROM SLAUGHTERED ANIMALS, AND A PRESS FOR SEPARATING MEAT FROM BONES

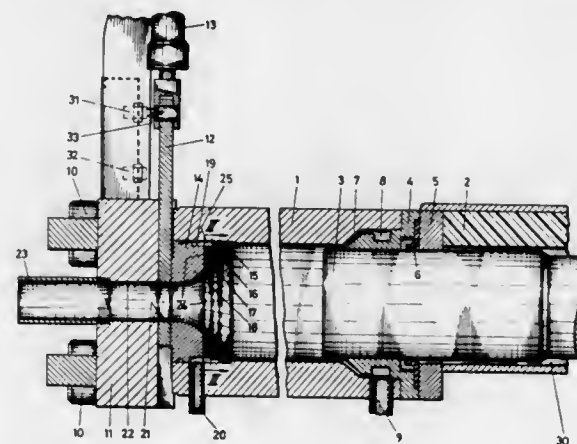
Theodorus M. van Bergen, Oss, Netherlands, assignor to Protecon B.V., Netherlands  
Filed Jan. 17, 1975, Ser. No. 541,849

Claims priority, application Netherlands, Apr. 24, 1974, 7405531; Aug. 30, 1974, 7411576

Int. Cl.<sup>2</sup> A22C 17/04

U.S. Cl. 17-1 G

5 Claims



1. A press for separating flesh from bones which comprises a chamber for receiving a charge of bones with flesh attached; a plunger moveable axially in said chamber to compress the bones and flesh therein and thereby liberate from the bones flesh in the form of a paste; means in said chamber defining restricted size passages allowing the exit from the chamber of said flesh paste and retaining in the chamber the bones; cover means connected to said chamber to define a passage for the discharge of compressed bones from the chamber; and valve means associated with said cover means and operable to select-

tively open and close said passage to allow discharge of the bones therefrom when open, and to seal the passage and thereby retain the bones in the chamber when closed.

## 4,014,076 HOUSING WITH GROOVE

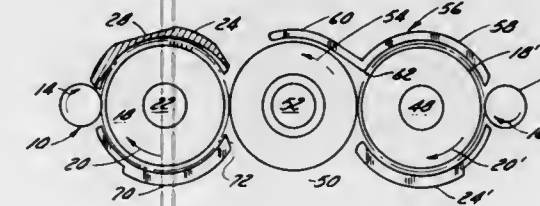
Josef Milan Slanik, Kirkland, Canada, assignor to The Bobtex Corporation Limited, Quebec, Canada

Filed Oct. 30, 1975, Ser. No. 627,365

Int. Cl.<sup>2</sup> D01G 9/16

U.S. Cl. 19-96

8 Claims



1. In a fiber drafting assembly comprising a rotatable opening roll, means for feeding fibrous material to said opening roll, the improvement comprising a housing member extending about at least a portion of the circumference of said opening roll, said housing member having a groove located interiorly thereof adapted to receive fibers doffed from said opening roll, said groove being open throughout its length to the circumferential surface of said opening roll having an initial relatively shallow and relatively wide portion tapering to a relatively deep and relatively narrow discharge portion in the direction of fiber advancement, said groove increasing in cross-sectional area in the direction of fiber advancement.

4,014,077

## CLIP

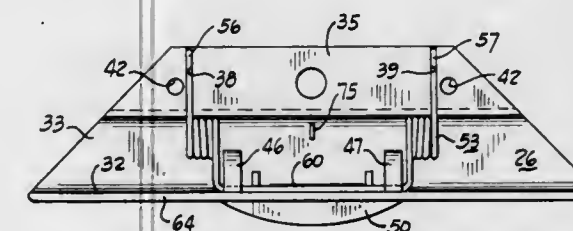
Morley Hitchcock, 8846 King Memorial Road, Mentor, Ohio 44060, and Maurice A. Lambrix, 6943 Post Lane, Hudson, Ohio 44236

Filed Oct. 15, 1975, Ser. No. 622,692

Int. Cl.<sup>2</sup> B42F 1/00

U.S. Cl. 24-67.5

7 Claims



1. The combination of a clipboard having a mounting surface and a plastic clip secured to the mounting surface, said clip including a one-piece unitary member having first and second sides and a connecting portion defining a generally U-shaped cross sectional configuration, a mounting wall extending laterally outwardly from said first side and having first and second spaced spring retaining grooves extending transversely thereacross, wall means defining spaced openings through said mounting wall with securing members extending therethrough to secure said clip to said mounting surface, first and second spaced spring retaining lugs formed on said second side of said unitary member, a lifting member on the outside of said second side of said unitary member to enable a user of the combination to lift said clip, a torsion spring residing within said U-shape of said unitary member and having first and second free ends and an interconnecting portion, said first and second free ends respectively residing in said first and second spring retaining grooves and held therein by the mounting surface of said clipboard, said interconnecting portion of said spring being secured by said first and second spring retaining

lugs, said second side of said unitary member having an engaging surface to hold paper on said mounting surface of said clipboard, said unitary member between said mounting wall and said first side being thinner than at other places so as to permit flexing of the unitary member at this position during operation of the clip, said engaging surface of said unitary member in its molded condition being a greater distance from said connecting portion than said mounting wall whereby when said clip is secured to said clipboard and said engaging surface and said mounting wall both lie on the same surface a force is created tending to hold said engaging surface against said mounting surface.

4,014,078

## CLAMPING DEVICE WITH ADJUSTING RING

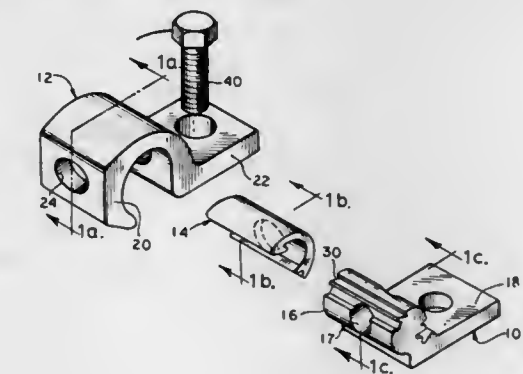
Paul V. Cornell, Amherst, Mass., and Paul A. Cornell, Knockanore, Ireland, assignors to Electro-Clamp Corporation, Beverly Hills, Calif.

Filed Jan. 16, 1976, Ser. No. 649,653

Int. Cl.<sup>2</sup> F16G 11/00

U.S. Cl. 24-132 R

7 Claims



1. A cable clamping device of the rotary jaw type comprising: a male member including a generally cylindrical head and a mounting tail extending therefrom, said male head having a transverse cable-receiving bore; a female member including a sleeve and a mounting tail extending therefrom, said sleeve having a cable-receiving bore; said female member adapted to receive said male head and to rotate thereon between open and closed positions, said male and female bores being generally aligned to receive a cable in said open position and offset to effect clamping forces on said cable in said closed position; and means disposed between said male head and said female sleeve for adjusting the cable-receiving and cable-clamping capability of said device to enable the use of said device with cables of varying diameters.

4,014,079

## BRACELET TYPE FASTENING DEVICE

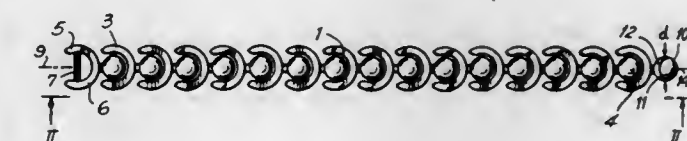
Joseph Camarda, Garden City Park, N.Y., assignor to Les Bernard, Inc., New York, N.Y.

Filed June 10, 1975, Ser. No. 585,526

Int. Cl.<sup>2</sup> A44B 17/00

U.S. Cl. 24-201 HE

5 Claims



1. A bracelet type fastening device for releasably affixing the ends of a bracelet type item to each other to secure the item around part of the body of a wearer, said bracelet type item having first and second opposite ends, said bracelet type fastening device comprising



a first fastening member pivotally affixed to the first end of a bracelet type item and having a substantially semicircular support part of predetermined diameter and a catch pin affixed to the support part and extending substantially diametrically thereacross, said first fastening member having a central plane therethrough and an axis in said plane, said pin being in said central plane; and

a second fastening member pivotally affixed to the second end of the bracelet type item and having a substantially spherical hook member having a diameter smaller than the predetermined diameter and a slot formed substantially radially therein for accommodating the pin of the first fastening member, said second fastening member having a central plane therethrough and an axis in said plane, said slot extending in a plane inclined at a predetermined angle of approximately 45° with said central plane and opening toward the item, the second fastening member on the part of the body of a wearer being pivotable relative to the item to an insertion and removal position in which the plane of the slot of the second fastening member is substantially perpendicular to the central plane of the first fastening member whereby the hook member is movable into and out of the support part of the first fastening member with the pin of the first fastening member being simultaneously moved into and out of the slot of the hook member, the second fastening member being further pivotable relative to the item to a secure position in which the item is normally worn on the part of the body of the wearer and in which the central planes of the first and second fastening members are substantially coplanar and the slot of the second fastening member extends at the predetermined angle with the central plane of the first fastening member whereby the portion of the hook member between the plane perpendicular to the central plane of the second fastening member and the plane of the slot prevents the removal of the hook member from the pin thereby securing the item around the part of the body of the wearer.

4,014,080

# DEVICE FOR AUTOMATICALLY SEPARATING TWO SECTIONS OF A STRAP

Alain Caradec, 183, Rue Paradis, 13006 Marseille, France

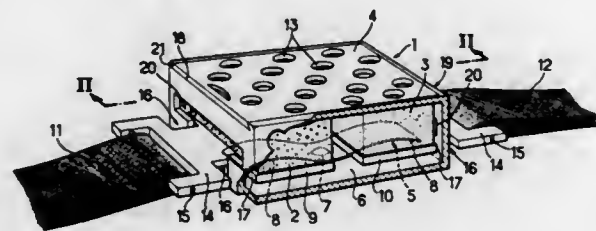
Filed Mar. 13, 1975, Ser. No. 558,152

Claims priority, application France, Mar. 20, 1974, 74.09501; Jan. 28, 1975, 75.02584

Int. Cl.<sup>2</sup> A44B 1/100

U.S. Cl. 24-230 R

6 Claims



1. Device for connecting two strap sections, each of which terminates in an end member, said device being adapted to permit the automatic separation of said sections and comprising:

- a box receiving said end members;
- blocking means blocking release of each end member when said blocking means and end member are in a first position relative to each other but permitting the release of either one of said end members when said one end member and said blocking means are in a second position relative to each other;
- spring means biasing one of said end members away from said first relative position toward said second relative position; and
- two tablets, one positioned to prevent movement of each

end member away from said first relative position, one of said tablets being adapted to disintegrate in response to a predetermined ambient temperature and the other in response to a predetermined degree of humidity, thereby permitting the end member associated with the disintegrated tablet to move away from said first position and be released from said box.

4,014,081

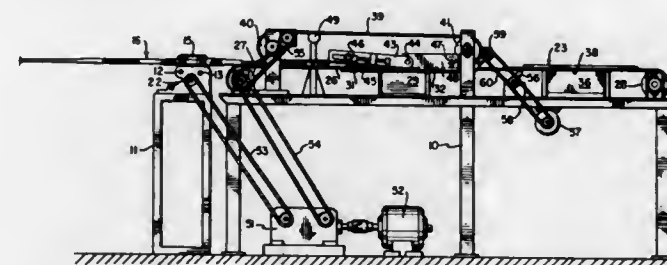
# METHOD FOR PROCESSING OF SWEATER SECTIONS AND THE LIKE

Clifford Chandler Bryan, Statesville, N.C., assignor to Samco Holding Corporation, Woodside, N.Y.

Continuation-in-part of Ser. No. 488,672, July 15, 1974, abandoned. This application July 10, 1975, Ser. No. 594,742 Int. Cl.<sup>2</sup> D06C 5/00, 27/00

U.S. Cl. 26-18.5

12 Claims



1. The method of processing tubular knitted sweater sections or the like having integrally connected body and cuff portions which comprises,

- a. delivering disconnected, individual sweater sections one at a time, in succession, in substantially dry condition,
- b. successively engaging each section by internal edge portions and simultaneously advancing and laterally distending each section by its said edges to a predetermined uniform width,
- c. maintaining the section free of externally applied moisture, during lateral distention of the section,
- d. successively discharging the distended sweater section onto endless supporting surfaces while disengaging said edge portions to accommodate differential lateral relaxation of the body and cuff portions of the sweater section.
- e. grippingly engaging, supporting and conveying both faces of the disengaged section,
- f. controlling the differential lateral relaxation of the sweater section by controlling the interval between the discharge of the distended section and the gripping engagement, support and conveying of both faces thereof,
- g. thereafter steaming the differentially relaxed section over its entire area while engaged between said supporting surfaces, including the cuff, to accommodate further relaxation and adjustment and
- h. removing residual moisture from said supporting surfaces prior to engagement of the sweater section thereby.

6. The method of processing tubular knitted sweater sections or the like having integrally connected body and cuff portions, which comprises

- a. delivering disconnected, individual sweater sections one at a time, in succession, in substantially dry condition,
- b. progressively distending each sweater section laterally to a flat form and to predetermined uniform width, by engagement of the section internally by its edges while advancing the section longitudinally,
- c. progressively disengaging and discharging the edges of the section and accommodating differential lateral relaxation of the body and cuff portions thereof,
- d. maintaining each portion of the sweater section free of externally applied moisture during lateral distention of the section,
- e. thereafter, progressively grippingly engaging the sweater section lightly over its upper and lower faces and over a substantial longitudinal extent thereof by endless support-

- ing surfaces and continuing to progressively advance the section,
  - f. controlling the differential lateral relaxation of the sweater section by controlling the interval between the discharge of the distended section and the gripping engagement, support and conveying of both faces thereof,
  - g. steaming the sweater section over its entire area while engaged between said supporting surfaces by progressively steaming the section in areas thus lightly gripped,
  - h. progressively releasing the steamed section and continuing to advance the section while supporting its lower face across the full width,
  - i. drying and cooling said section while continuing to support its lower face across the full width, and
  - j. removing residual moisture from said supporting surfaces prior to engagement of the sweater section thereby.
10. The method of processing tubular knitted sweater sections or the like having integrally connected body and cuff portions, which comprises
- a. delivering disconnected, individual sweater sections one at a time, in succession, in substantially dry condition,
  - b. progressively distending each sweater section laterally to a flat form and to predetermined uniform width, by engagement of the section internally by its edges while advancing the section longitudinally,
  - c. progressively discontinuing lateral distention of the sweater section to accommodate progressive differential lateral relaxation of the sweater section,
  - d. maintaining distended portions of the sweater section free of externally applied moisture,
  - e. thereafter lightly engaging and gripping both faces of the sweater blank by endless supporting surfaces,
  - f. controlled lateral relaxation of the sweater section occurring in the interval between the discharge of the distended section from the flat form and the engagement of such section by the endless supporting surfaces,
  - g. thereafter steaming the sweater section over its entire area while engaged between said supporting surface and while said section remains in a differentially laterally relaxed condition, and
  - h. removing residual moisture from said supporting surfaces prior to engagement of the sweater section thereby.

4,014,082

# METHOD AND EQUIPMENT FOR REMOVING REELING WASTE

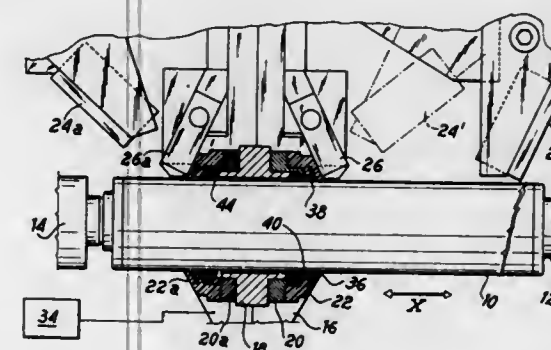
Mario Scaglia, Milan, Italy, assignor to M. Scaglia S.p.A., Italy Filed Dec. 19, 1975, Ser. No. 642,383

Claims priority, application Italy, Dec. 19, 1974, 30754/74; Sept. 17, 1975, 27308/75

Int. Cl.<sup>2</sup> D03D 45/58

U.S. Cl. 28-20

20 Claims



6. An equipment for removing reeling waste, left on a relatively elongated substantially cylindrical surface of a yarn support, for subsequent re-use of the yarn support, comprising, in combination, retaining, sintering and fastening means removably engageable with the yarn support at locations which do not interfere with such substantially cylindrical surface; a completely annular die ring having an inner diame-

ter corresponding to the outer diameter of the substantially cylindrical surface and having a forelip engageable with the substantially cylindrical surface upon telescoping of said die ring over the substantially cylindrical surface adjacent one end of the latter; and means operable to effect relative axial displacement of said die ring and the substantially cylindrical surface to cause said die ring forelip to slide along the substantially cylindrical surface in circumferentially complete tight engagement with the latter, to engage the reeling waste and draw the same axially beyond the opposite end of the substantially cylindrical surface to strip the reeling waste therefrom.

4,014,083

# DRAW-IN GRIPPER ASSEMBLY FOR DRAWING-IN WARP THREADS

John Heinz, Berneck, Switzerland, assignor to Lindauer Dornier Gesellschaft mbH., Germany

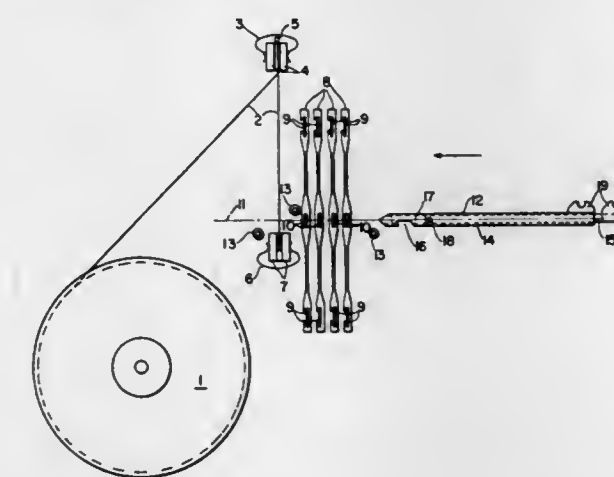
Filed Aug. 5, 1975, Ser. No. 602,084

Claims priority, application Germany, Sept. 18, 1974, 2444566

Int. Cl.<sup>2</sup> D03J 1/14

U.S. Cl. 28-46

7 Claims



1. A draw-in gripper assembly for drawing warp threads into weaving components comprising holding means mounted above one another for holding in place a plurality of warp threads fed off of a beam, each individual warp thread forming a loop outside of the clamping point of the upper holding means and being held in position by the lower holding means, draw-in gripper means mounted above the lower holding means, slider head means in said gripper means adapted to clamp a warp thread and pull it from said lower holding means during a draw-in stroke of said gripper means, said warp thread held in a loop in said upper holding means being released, after a short delay, and, due to the length of thread so released, said warp thread is pulled through eye means of a weaving component, and means for releasing said warp thread from the gripper means at the end of the draw-in stroke.

4,014,084

# TEXTURIZING OF FILAMENTS

Wolfgang Bauer, Heidelberg; Wolfgang Martin, Ludwigshafen, and Erwin Lehrer, Bad Duerkheim, all of Germany, assignors to BASF Farben &amp; Fasern Aktiengesellschaft, Hamburg, Germany

Filed Mar. 15, 1976, Ser. No. 667,090

Claims priority, application Germany, Mar. 21, 1975, 2512457

Int. Cl.<sup>2</sup> D02G 1/20, 1/16, 1/12

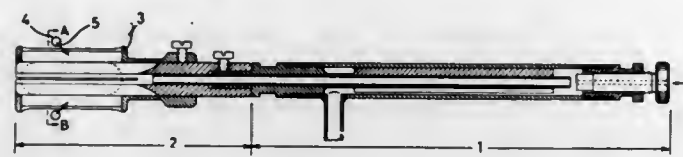
U.S. Cl. 28-72.11

6 Claims

1. A process for crimping filaments by treating these filaments, conveyed by a heated gas, in a first treatment chamber and crimping them in an elongate second treatment chamber,



the temperature of which is kept at from 60° to 160° C. from which second treatment chamber the heated gas medium issues through longitudinal slits, wherein the stream of rela-



tively cold gas is caused to impinge on the outside of a lower portion of the elongate second treatment chamber without allowing significant amounts of this relatively cold gas to enter the second treatment chamber.

4,014,085

# STRING UP AND SHUTDOWN PROCESS FOR A YARN TEXTURIZING APPARATUS

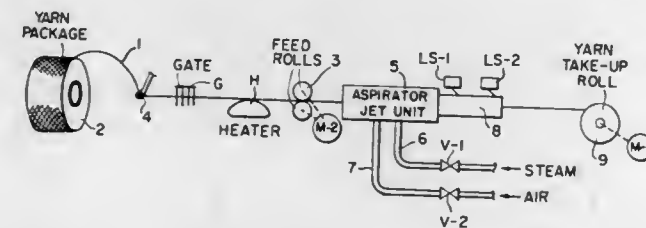
Roger H. Fink, and William D. Porter, both of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 24, 1974, Ser. No. 517,787

Int. Cl.<sup>2</sup> D02G 1/12

U.S. Cl. 28—72.14

16 Claims



1. In a method for texturizing synthetic thermoplastic yarn in a bulking apparatus wherein a heated, dry gas is employed to convey a yarn into an initial portion of a bulking chamber to form a compact mass of yarn therein, the improvement which comprises introducing into said initial portion of said bulking chamber an auxiliary gas in place of and at a lower temperature than said heated gas during a short period of operation other than normal, continuous operation of said bulking apparatus to avoid overheating and fusion of the yarn within the initial portion of said bulking chamber and to thereby prevent plugging of the apparatus.

11. A method for controlling a process for the texturizing of multifilament synthetic polymeric yarn wherein the yarn is fed by a yarn feeder means into an aspirator jet supplied with a heated, dry gas, the yarn is passed in a stream of the heated gas to a bulking chamber in which the yarn filaments are caused to impinge against each other and to thereby form a compact yarn mass, and the yarn is withdrawn from the bulking chamber in the form of a yarn bundle by a take-up means, which comprises drawing the yarn from the feeder means into the aspirator jet and passing the yarn through the bulking chamber by introducing a gas at a lower temperature than said heated gas into said aspirator jet; securing the end of the yarn received from said bulking chamber onto a take-up device; initiating start-up of said process by introducing said heated dry gas into the aspirator jet and by simultaneously initiating operation of said feeder means and said take-up means and subsequently stopping the introduction of the lower temperature gas; and effecting shutdown of said process by stopping the introduction of heated gas into said jet, by deactivating said feeder means and said take-up means, and by again introducing the lower temperature gas into said aspirator jet and bulking chamber for a predetermined short period of time to prevent overheating of said yarn and plugging of said apparatus.

16. In a method for texturizing synthetic thermoplastic yarn in a bulking apparatus wherein a heated, dry gas is employed to convey a yarn into an initial portion of a bulking chamber to form a compact mass of yarn therein, the improvement

which comprises introducing into said initial portion of said bulking chamber an auxiliary gas at a lower temperature than said heated gas to avoid overheating and fusion of the yarn within the initial portion of said bulking chamber and to thereby prevent plugging of the apparatus, said auxiliary gas being introduced into said initial portion of said bulking chamber during start-up and shutdown of said apparatus.

4,014,086

# SAFETY FEATURE FOR CHAIR CONTROLS

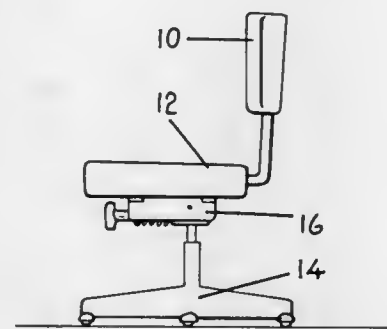
Frank Doerner, 138 Aberdeen Road, Kitchener, Ontario, Canada

Filed Aug. 4, 1976, Ser. No. 711,542

Int. Cl.<sup>2</sup> A47C 3/026

U.S. Cl. 297—303

6 Claims



1. In a chair control for a tiltable chair wherein a portion of the chair tilts rearward and downward when rearward pressure is applied to the back portion of the chair, said chair control comprising a fixed frame portion secured to the base portion of the chair, a moveable frame portion affixed to the undersurface of the seat portion of the chair and pivotally connected to said fixed frame portion, a biasing means adapted to return said moveable frame portion to a position of rest when the rearward pressure is released from the back portion of the chair, said biasing means comprising an elongated bolt with its head pivotally within said fixed frame portion and the shaft of said bolt extending through the moveable frame portion and marginally beyond, a helical spring inserted on the shaft of the bolt within the moveable frame portion, and a tension control means affixed to the peripheral end of the bolt, said tension control means comprising a pressure plate placed proximate the terminal end of the helical spring, a sheath encasing said elongated bolt between the pressure plate and the free end of the bolt and affixed to the pressure plate, the interior of said sheath being screw-threaded correspondingly to the peripheral end of said bolt, and a handwheel affixed to the end of the sheath exterior to the moveable frame portion, said tension control means adapted to control the tension in the helical spring, the improvement comprising the moveable frame portion having a downwardly depending plate on its front surface with an arch-shaped aperture centrally therein through which the sheath of the tension control means and the bolt of the biasing means extend and the sheath of the tension control means having a pair of ears on opposite sides thereof proximate said pressure plate, and a loosely fitting washer fitted around said sheath between the downwardly depending plate of the moveable frame portion and said ears.

4,014,087

# WIRE TERMINATION APPARATUS

William S. Cover, Glendale Heights, and Jacob S. Haller, Northbrook, both of Ill., assignors to TRW Inc., Elk Grove Village, Ill.

Division of Ser. No. 576,192, May 9, 1975, abandoned. This application June 10, 1976, Ser. No. 694,671

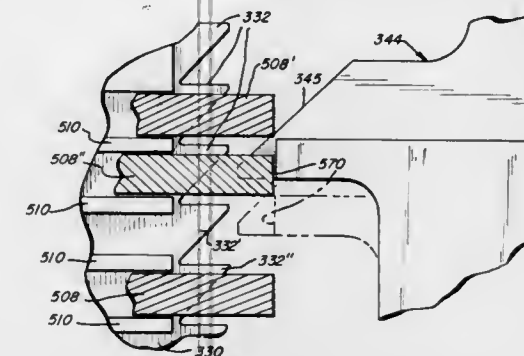
Int. Cl.<sup>2</sup> H01R 43/04

U.S. Cl. 29—721

15 Claims

1. In combination with wire termination apparatus for successively terminating conductor wires in terminals arranged in

a series along the length of a connector and wherein there is relative motion between the connector and the wire insertion means in a direction longitudinally of the connector, and means to interrupt such relative motion for effecting alignment between the insertion means and successive terminals



for inserting wires in said terminals, the improvement comprising means cooperable with said interrupting means for inactivating said interrupting means at predetermined alignment positions of said connector and said insertion means for skipping preselected terminals of said connector.

4,014,088

# METHOD OF MAKING DECORATIVE ARTICLES

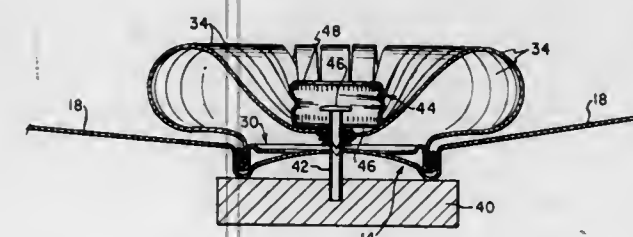
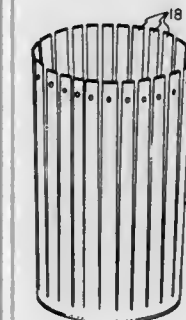
Jack A. Oshier, 36-16 Bell Blvd., Bayside, N.Y. 11361

Filed Jan. 27, 1976, Ser. No. 652,648

Int. Cl.<sup>2</sup> B23Q 17/00

U.S. Cl. 29—407

6 Claims



1. A method of making decorative articles such as Christmas tree ornaments, napkin holders, candle holders, artificial flowers, coasters, ash trays, centerpieces and the like from aluminum cans having a pair of end walls interconnected by a cylindrical wall, comprising the steps of

cutting off the top or bottom portion of a first can, punching a series of holes of predetermined number and spacing in the outer surface of the first can cylindrical wall adjacent to the cut edge of the can, cutting the cylindrical wall of the first can between the punched holes along the length of the can from the cut edge such that a predetermined number of strips of a predetermined size foldably connected to the remaining portion of the first can are formed, bending the cut strips into an arcuate shape, and fastening the cut strips together by means of a fastener extending through the punched holes in each of the cut strips.

4,014,089

# METHOD OF CONNECTING BEAMS AND COLUMNS OF STEEL FRAME CONSTRUCTION

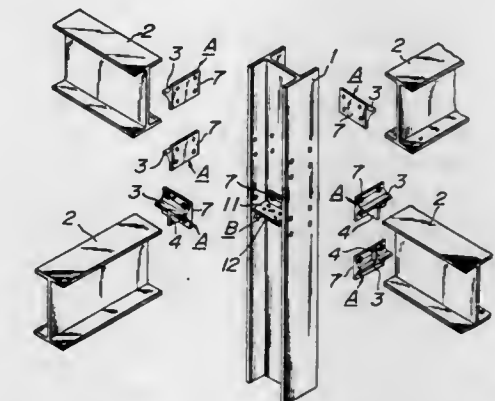
Kuniaki Sato, Hiratsuka; Kozo Toyama, Tokyo; Eiji Matsu-shita, Fujisawa; Akio Tomita, Tokyo, and Shuei Suzuki, Machida, all of Japan, assignors to Kajima Corporation and Hitachi Metals, Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 551,914, Feb. 21, 1975, Pat. No. 3,938,297. This application Dec. 8, 1975, Ser. No. 638,614

Int. Cl.<sup>2</sup> B23P 19/00

U.S. Cl. 29—526

9 Claims



1. A method of connecting beams having an H-shaped section to a column having an H-shaped section of a steel frame construction by means of upper and lower flange fittings each comprising a substantially rectangular base plate to be connected to the column having centrally a continuous thicker portion from which the base plate is tapered toward opposite ends of the base plate, a supporting plate projecting from the thicker portion for supporting an upper flange of the beam and a reinforcement on the base plate forming a T-shaped portion with said supporting plate, characterized in comprising steps of securing said supporting plate of said upper flange fitting to one end of the upper flange of the beam in end-to-end relationship, bolting the base plate of said lower flange fitting in position to the column, placing one end of a lower flange of the beam onto said supporting plate of said lower flange fitting such that said base plate of the upper flange fitting secured to the upper flange of the beam is in contact with a surface of said column, securing the lower flange of the beam to the supporting plate of the lower flange fitting and bolting the base plate of the upper flange fitting to the surface of the column.

4,014,090

# PATTERN PLATES AND METHOD OF MAKING SAME

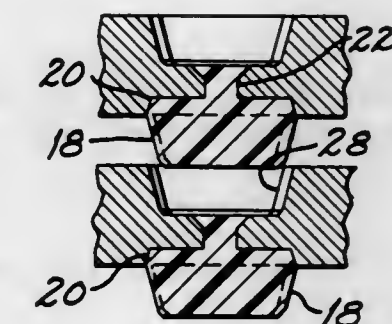
Gerald R. Rusk, Maumee, Ohio, and Robert E. Koch, Ottawa Lake, Mich., assignors to The Freeman Supply Company, Toledo, Ohio

Continuation of Ser. No. 416,099, Nov. 23, 1973, abandoned, which is a division of Ser. No. 257,930, May 30, 1972, Pat. No. 3,789,912. This application Mar. 10, 1975, Ser. No. 556,792

Int. Cl.<sup>2</sup> B22D 11/126; B23C 3/13

U.S. Cl. 29—527.4

13 Claims



1. A method of producing a plurality of pattern plates hav-



ing generally flat and parallel opposing faces each face of which has an imaginary center line formed by the intersection with said faces of an imaginary plane that is perpendicular to said faces, said method comprising: forming a valley in a first face of a first plate which valley has opposing side surfaces that are defined by concave surface indentations with the bottom of said indentations being aligned so that the cross section of the valley as defined by the aligned bottoms is an isosceles trapezoid, said side surfaces having ridges between the indentations which are irregularly spaced, forming a valley in the portion of the second face of the first plate as presented by rotation of the plate about a center line in the identical position as the valley in said first face and with an identical shape excepting that the ridges thereof do not correspond in position to those in said first face, repeating the forming steps in a number of plates, abutting the first face of a second plate with the second face of the first plate and with the center lines of the abutting faces in precise register so that the abutting face of one plate has a valley cover area overlying the valley in the abutting face of the other plate, providing a passageway communicating each valley or its cover area to an external plate surface, injecting a hardenable material through the passageways of the abutting plates into the valleys of the abutting faces and bonding the hardenable material onto the plate which covers the respective valleys, separating said plates, abutting the second face of the second plate with the first face of another plate and with the center lines of the abutting faces in precise register so that the abutting face of one plate has a valley cover area overlying the valley in the abutting face of the other plate, said plates having a passageway communicating each valley or its cover area to an external plate surface, injecting a hardenable material into the valleys of the abutting faces of said second and other plates and bonding the cast material onto the plate which covers the respective valley, and whereby objects cast from opposite sides of said plates have lugs with convex projections and have valleys with ridges in their side surfaces which projections and ridges engage each other when the objects are matched.

4,014,091

# METHOD AND APPARATUS FOR AN ELECTRET TRANSDUCER

Yoichi Kodera, and Tetsuo Toyoda, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

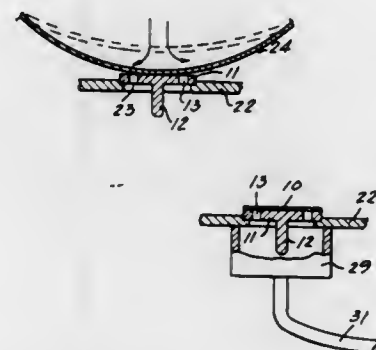
Filed Aug. 22, 1972, Ser. No. 282,765

Claims priority, application Japan, Aug. 27, 1971, 46-65679

Int. Cl.<sup>2</sup> H01S 4/00; H04R 31/00

U.S. Cl. 29—592

7 Claims



1. In an electret transducer including a backplate having a flat conductive surface and an electret film formed thereon, the improved method of making said backplate comprising the steps of heating said backplate; contacting a synthetic resin film selected from the group consisting of polytetrafluoroethylene and fluorinated ethylenepropylene copolymer with said flat conductive surface of said heated backplate to secure said film thereon, said synthetic resin film having a capability of forming electret, charging said synthetic resin film to form an electret, wherein said backplate has a plurality of holes and a plurality of holes are formed in said film in alignment with said

plurality of holes in said backplate and wherein said backplate is heated to the range 280°-400° C, and wherein contacting said resin film to said heated backplate is accomplished such that the film initially contacts a point on said backplate and from said point is progressively brought into contact with areas of said flat conductive surface.

4,014,092

# METHOD FOR MAKING MEMORY PLANE FOR MAGNETIC DECODER

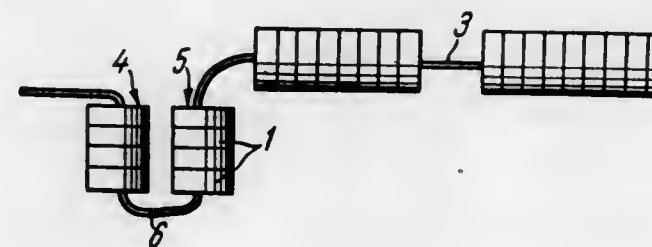
Jury Alexandrovich Burkin, Tsvetnoi proezd, 29, kv. 24, and Jury Valentinovich Metlyaev, ulitsa Ilich, 5, kv. 40, both of Novosibirsk, U.S.S.R.

Filed Nov. 25, 1975, Ser. No. 635,104

Int. Cl.<sup>2</sup> H01F 41/08

U.S. Cl. 29—604

1 Claim



1. A method of making a memory plane of a magnetic decoder comprising the steps of: taking toroidal ferrite cores in a quantity sufficient for wiring the entire memory plane; stringing said ferrite cores in a column on a wire which forms a bias winding of each transformer and is long enough to complete bias windings of all the transformers of a memory plane; separating a number of ferrite cores required for winding two transformers one by one from said column of cores; bending said wire threading the separated cores at a mid-point and folding it in two; threading a primary winding oriented in a first direction simultaneously for two transformers by a second wire which is long enough to complete all primary windings in one row of transformers extending in the first direction; making a primary winding oriented in the first direction for the next pairs of transformers using said second wire in the same manner; and producing a row of a specified length extending in the first direction out of these pairs of transformers; threading in the same way the primary row of the first direction through the cores of transformers of the next row and the entire number of rows extending in the first direction to form a strip of transformers; bending said strip of transformers in a zigzag manner at points between primary windings oriented in the first direction so as to form a memory plane of a decoder; threading pairs of transformers by a third wire in a direction transverse to said strips of transformers producing thereby primary windings oriented in the second direction; the third wire being long enough to complete all the primary windings of all the transformers oriented in the second direction; making secondary windings for each transformer separately and taking the ends of said windings outside a memory plane.

4,014,093

# HEDGE SHEARS

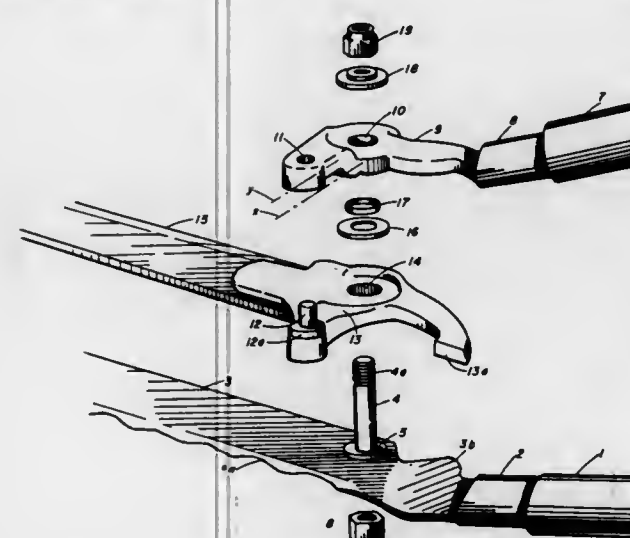
David H. Keiser, Jr., 53 Park Road, Wyomissing Hills, Pa. 19610

Filed Nov. 20, 1975, Ser. No. 633,703

Int. Cl.<sup>2</sup> A01G 3/04

U.S. Cl. 30—248

1 Claim



1. Hedge shears comprising a blade and integral handle in substantially linear relationship, a post integrally secured at right angles to the end of the blade portion closest to the handle, a second handle having, integrally secured to the end thereof, a driving element of angle shape having a central vertical hole into which said post projects to provide a pivot and having a vertically and upwardly offset end portion with a vertical hole, a second blade integrally connected to a driven element having, on a lateral extension thereof, an upstanding integral stud which loosely fits into said lastmentioned vertical hole and having a substantially central hole fitting over said post, a resilient washer located between said driving and driven elements and surrounding said post, and means attached to the extreme end of said post for holding said driving and driven elements and intermediate resilient washer close together, whereby said stud has a force applied thereto as the result of the moment arm from said vertically offset relationship of said end portion.

4,014,094

# DENTAL HINGE STRUCTURE

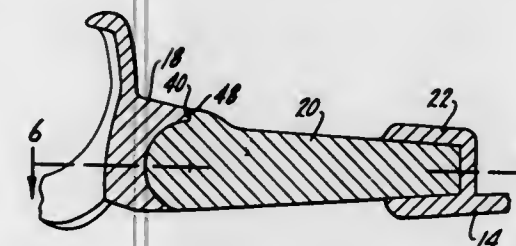
Allan H. Schumann, 3405 N. Countryside Drive, McHenry, Ill. 60050

Filed July 24, 1975, Ser. No. 598,792

Int. Cl.<sup>2</sup> A61C 13/22

U.S. Cl. 32—5

9 Claims



1. A hinge product assembly for use in constructing hinged connections between artificial partial dentures and supporting natural teeth; said assembly comprising a bar, a pivot member and an attachment member; said bar being of generally rectangular cross-section having a cylindrical end surface having an axis at right angles to the longitudinal axis of said bar; said surface terminating in a shoulder extending across the bar parallel to the axis of said surface; said pivot member comprising a generally three sided hood shaped structure having interior surfaces closely conforming to the shape of said cylindrical end surface of said bar and loosely assembled thereto;

the opposite end of said bar having securing means thereon and said attachment member surrounding said opposite end and in engagement with said means.

4,014,095

# RESILIENT ARTIFICIAL DENTURE TOOTH

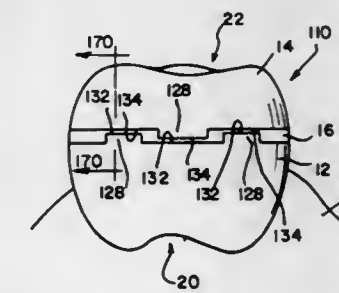
Henry C. Heimansohn, Danville, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Continuation-in-part of Ser. No. 532,513, Dec. 13, 1974, Pat. No. 3,958,334. This application Oct. 8, 1975, Ser. No. 620,251

Int. Cl.<sup>2</sup> A61C 13/00

U.S. Cl. 32—8

17 Claims



1. An artificial tooth for use in a denture, said tooth comprising a base portion, an occlusal portion and an intermediate portion, said base portion and occlusal portion each providing surfaces for securing said intermediate portion in sandwiched relation therebetween, said intermediate portion being resilient to permit said occlusal portion to move yieldably relative to said base portion, and a plurality of tabs for limiting movement of said occlusal portion relative to said base portion, said tabs projecting from at least one of said surfaces toward the other of said surfaces about the outer perimeter of one of said occlusal and base portions.

4,014,096

# METHOD AND APPARATUS FOR ORTHODONTIC TREATMENT

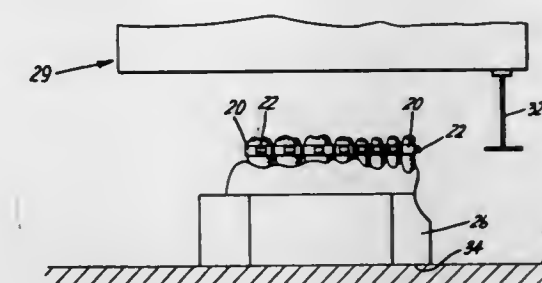
Eugene L. Dellinger, 1326 Old Lantern Trail, Fort Wayne, Ind. 46825

Filed Mar. 25, 1975, Ser. No. 561,697

Int. Cl.<sup>2</sup> A61C 7/00

U.S. Cl. 32—14 A

31 Claims



1. A method of orthodontics for correcting malocclusion comprising the steps:  
a. securing blank brackets in predetermined position to the teeth, respectively, in a patient's mouth,  
b. making an impression of the patient's teeth with the blank brackets in place,  
c. removing the blank brackets from the patient's mouth and placing them in the respective bracket portions in the impression,  
d. forming a working cast from the impression with the blank brackets in place,  
e. sectioning the teeth from the working cast, securing said cast teeth in a master matrix unit in the desired occlusion thereof,  
f. forming arch wire slots in said blank brackets mounted on the cast teeth in positions corresponding to the original



- positions on the patient's teeth while secured to said matrix unit in predetermined locations,  
g. replacing said slotted brackets onto the patient's teeth in the original positions thereof, and  
h. attaching an arch wire device to said brackets.

4,014,097

# METHOD AND APPARATUS FOR MEASURING AND RECORDING THREE-DIMENSIONAL CONDYLAR MOVEMENTS OF THE MANDIBLE

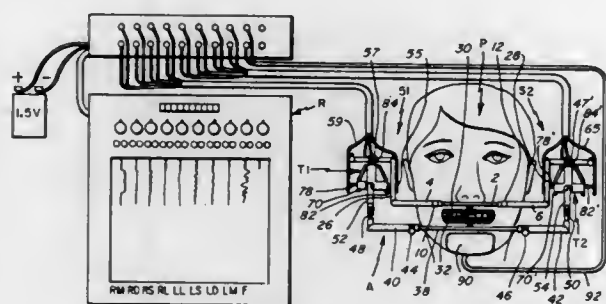
Cornelis H. Pameijer, Wakefield, Mass., assignor to Trustees of Boston University, Boston, Mass.

Filed Aug. 14, 1975, Ser. No. 604,785

Int. Cl.<sup>2</sup> A61C 9/00

U.S. Cl. 32-20

4 Claims



1. Apparatus for recording condylar movements of the mandible joints of a patient when the jaws and teeth are worked, said apparatus including a pair of pressure sensing housing units having sensing elements yieldably supported therein, an upper stationary U-shaped frame structure for supporting the housing units at either side of the head of the patient along a common axis of hinging of the mandible joints, means for securing the U-shaped frame structure to the maxillary teeth of the patient, a pair of pressure transmitting actuator units having contact elements adjustably supported therein; a lower U-shaped frame structure for supporting the actuator units in nested relationship in the housing units and lightly engaging the said contact elements with respective sensing elements of the housing units, means for securing the lower frame structure to the mandibular teeth of the patient, and means for recording displacement of the sensing elements by forces transmitted through the actuator contacts in response to condylar movements of the mandible.

4,014,098

# FIBER OPTICS ELEMENT AND DENTAL HANDPIECE CONTAINING THE SAME

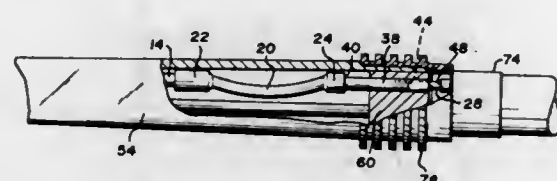
Leonard Scrivo, Tuckahoe, and Warren Charles Vetter, Glen-dale, both of N.Y., assignors to Vicon Products Corporation, Pelham Manor, N.Y.

Division of Ser. No. 360,919, May 16, 1973, Pat. No. 3,897,134. This application July 21, 1975, Ser. No. 597,191

Int. Cl.<sup>2</sup> A61C 1/08

U.S. Cl. 32-26

5 Claims



1. A dental drill handpiece comprising:  
a head member defining a turbine within said housing;  
a drive shaft extending outwardly from said turbine;  
a handle means comprising an elongated hollow shaft attached to said head member;  
A fiber-optics element comprising a fiber-optics bundle having first and second end portions, terminating in first

and second optical faces, respectively, a first tubular guide member disposed about a first portion of said fiber-optics bundle, a flexible tubular member disposed about a second portion of said fiber-optics bundle disposed adjacent to said first portion thereof, and a plunger assembly comprising a tubular plunger member disposed about a third portion of said fiber-optics bundle disposed adjacent to said second portion thereof, said third portion including said second optical face of said fiber-optics bundle, said plunger assembly further including a second tubular guide member comprising first and second end portions and being disposed about said tubular plunger member, said plunger member including a stop element disposed between said plunger member and said second tubular guide member, said first end portion of said second tubular guide member being of a diameter such that it cannot pass over said stop element, and said plunger assembly further comprises spring means disposed about said tubular plunger member and between said stop element and said first end portion of said second tubular guide member, and said flexible tubular member includes an overlapping end portion thereof which is disposed about said tubular plunger member such that said flexible tubular member is biased by said spring member into engagement with said first end portion of said second tubular guide member which first end portion thus serves as a stop for said flexible tubular member such that said fiber-optics element comprises a self-supported plunger assembly; said fiber-optics element being disposed in said handle means and head member in a manner such that said first optical face of said fiber-optics bundle is rigidly retained by said head member and said second optical face of said fiber-optics bundle extends rearwardly from said handle means whereby the second optical face can be depressed into said second tubular guide member by pressing a third optical face against said second optical face to compress said spring and bend said flexible tubular member to maintain a biasing force on said second optical face tending to force said second optical face out of said second tubular guide member and into engagement with said third optical face.

4,014,099

# DENTAL HANDPIECE

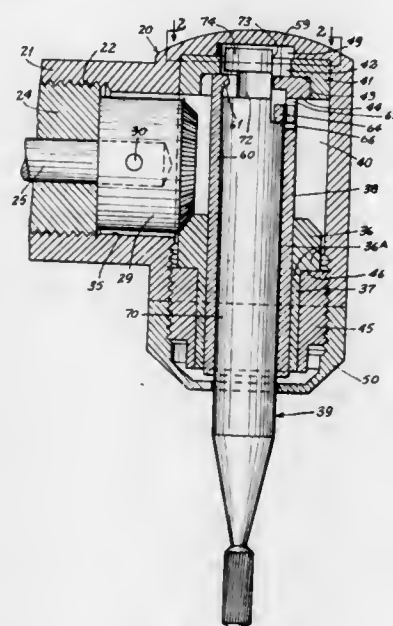
Ronald L. Bailey, St. Peters, Mo., assignor to Young Dental Manufacturing Company, Hazelwood, Mo.

Filed Jan. 29, 1975, Ser. No. 544,910

Int. Cl.<sup>2</sup> A61C 1/10

U.S. Cl. 32-27

18 Claims



1. In a dental handpiece comprising an instrument holder, having a tubular recess to receive a dental instrument with a

shaft insertable in the recess the holder having releasable holding means to secure the dental instrument in the recess of the instrument holder to prevent the instrument's removal but releasable to allow removal by a pull of the finger, the hollow also having a drive means for engagement with the instrument to rotate the dental instrument with the instrument holder, and the holder having additional means rendered operable by operation of the drive means to prevent the removal of the instrument while the instrument holder and instrument are in motion.

4,014,100

# ELECTRIC TOOTH POLISHER

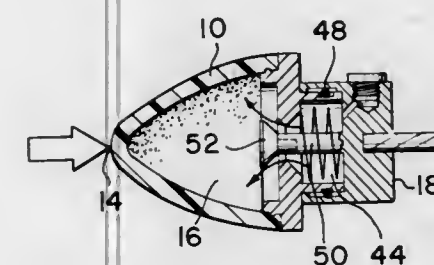
Frederick P. Spotteck, Middle Village, N.Y., assignor to The Raymond Lee Organization, Inc., a part interest

Filed Sept. 15, 1975, Ser. No. 613,125

Int. Cl.<sup>2</sup> A61C 3/06

U.S. Cl. 32-59

4 Claims



1. Tooth polishing apparatus comprising:  
a generally conically shaped hollow rigid polishing head, the base of the head having an orifice;  
a shallow hollow cylinder having a vent, said cylinder being secured to said base with the orifice communicating with the interior of the cylinder, said cylinder containing a liquid dentifrice;  
valve means disposed partially in the head and partially in the cylinder, said means having a normally closed position at which the orifice is sealed, said means opening the orifice to allow the dentifrice to flow into the head and out of the pores when the head is inverted and the head and cylinder are squeezed together; and including a hand held electrically operated means for rotating said head whereby teeth can be polished by the impregnated head.

4,014,101

# ELLIPSE DRAWING INSTRUMENT

Suehiro Mizukawa, Shijonawate, Japan, assignor to Shinichi Yamaoka, Japan

Filed Nov. 24, 1975, Ser. No. 634,734

Claims priority, application Japan, Dec. 4, 1974, 49-141294

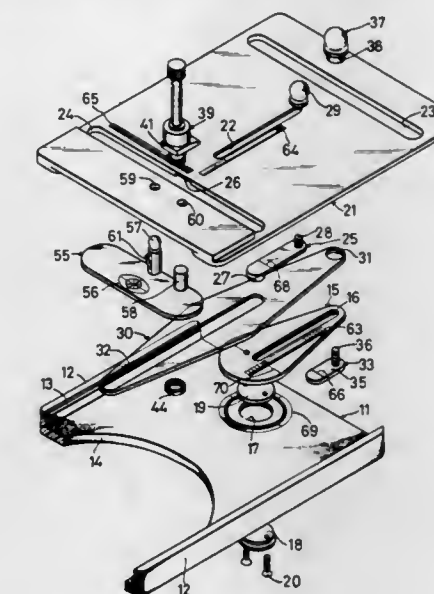
Int. Cl.<sup>2</sup> B43L 11/04

U.S. Cl. 33-30 R

1 Claim

1. An ellipse drawing instrument comprising:  
a base plate adapted to be placed on a surface on which an ellipse is to be formed, said base plate having upstanding side walls each having a guide groove therein,  
a swivel arm rotatably mounted on said base plate and having a longitudinal slit therein,  
a movable plate mounted above said swivel arm and slidable in said guide grooves so as to be movable in a longitudinal direction, said movable plate having a pair of parallel transverse slits suitably spaced from each other and a single longitudinal slit disposed between said transverse slits substantially midway between the sides of said movable plate,  
a fulcrum member having a fulcrum at one end thereof mounted on said movable plate at a position adjustable along said longitudinal slit therein,  
a swaying lever having a hole at one end thereof and a longitudinal slit therein extending from the other end thereof about halfway along its length and mounted be-

tween said movable plate and said swivel arm with said fulcrum fitting in said longitudinal slit in the swaying lever so as to be swayable around said fulcrum while moving longitudinally with said movable plate,  
an adjusting member having a shaft projecting upward from one end thereof, said shaft fitting in said longitudinal slit in the swivel arm, said hole in the swaying lever and said one transverse slit in the movable plate to couple these three members together, said swivel arm having a recess in under side thereof along said slit in which said adjusting member is received to permit adjustment of its position therealong,  
an ellipse forming implement carriage slidably mounted in said other transverse slit in the movable plate and in said longitudinal slit in the swaying lever, and



a positioning member having two studs projecting from the upper face thereof and turnably and removably mounted under said movable plate adjacent to said other transverse slit, said movable plate having two holes therein in which said studs are removably fitted,  
said positioning member having thereon a center mark to indicate the center position of an ellipse to be drawn at an intersecting point between said other transverse slit and an extension of said longitudinal slit in the movable plate, said swivel arm having thereon a graduation for the length of the major axis of the ellipse and extending in the direction along which the position of said adjusting member is adjustable, and  
said movable plate having thereon a graduation for the ellipse angle extending along said longitudinal slit therein.

4,014,102

# METHOD OF AND AN APPARATUS FOR MEASURING THE ELECTRODE LENGTH IN AN ELECTRIC FURNACE

Hideo Haga, Tokyo; Mitosi Kosugi, Ichikawa; Yoshiyuki Kimura, Funabashi, and Masakazu Takabatake, Ichikawa, all of Japan, assignors to Japan Metals and Chemicals Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1975, Ser. No. 606,452

Int. Cl.<sup>2</sup> G01B 5/18

U.S. Cl. 33-126.6

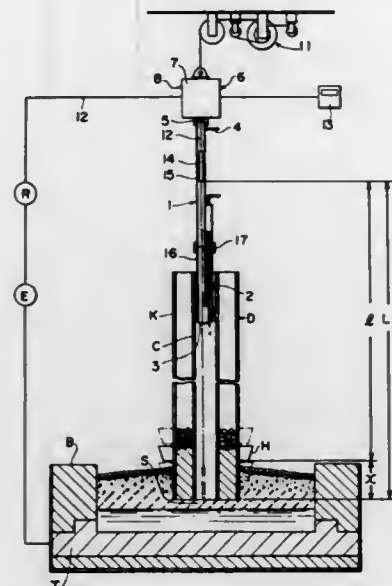
17 Claims

1. An apparatus for measuring the electrode length in an electric furnace, comprising:  
a hollow electrode having a lower portion buried in a layer of  
a process material within the electric furnace;  
a lead wire having one end portion suspended outside and above said hollow electrode;  
lead wire take-up means for lowering and raising said one end portion of said lead wire through the interior of said hollow electrode, said lead wire take-up means comprising a gas-tight box provided with a gas exhaust duct, a take-up roller disposed within said gas-tight box and



driven by a drive source to lower and raise the lead wire, a tensioning roller, a guide roller for guiding an end portion of the lead wire vertically into said hollow electrode, and a measuring roller disposed between the tensioning roller and the guide roller;

an electric circuit including said lead wire, a power supply and the process material within the electric furnace, said electric circuit being energized when said one end portion of said lead wire comes into contact with said process material within said furnace;



a hollow gas-tight unit having a cylindrical interior, the lower portion of said gas-tight unit being fitted in an upper portion of said hollow electrode and the upper end portion of said gas-tight unit being coupled with a lower portion of said gas-tight box in communication with the interior of said gas-tight box, said one end portion of said lead wire being passed through the interior of said gas-tight unit; and  
measuring means coupled with said wire take-up means for measuring the length of descent of said lead wire when said electric circuit is energized.

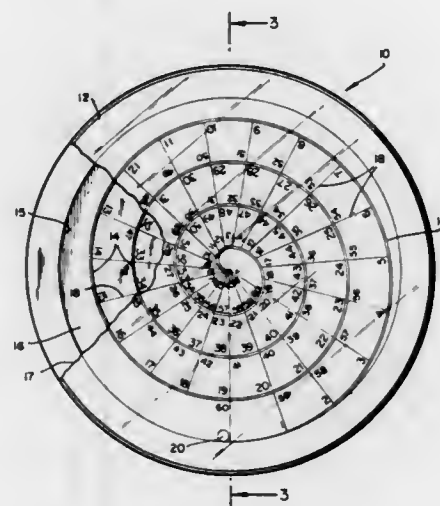
#### 4,014,103 MEASURING DEVICE

Leo Roth, 52-27 69th St., Maspeth, N.Y. 11377  
Filed Sept. 17, 1975, Ser. No. 614,859

Int. Cl.<sup>2</sup> G01B 3/12, 7/04

U.S. Cl. 33—141 R

2 Claims



1. A distance measuring device having a peripheral housing of circular configuration, a base member providing the bottom surface of the device and secured to said housing, a transparent cover disposed over said peripheral housing, a spiral guide supported on said base member under said cover, said guide winding spirally from said housing and terminating proximate

the axial center of said device and a ball marker confined by said cover and base member within the device and adapted to travel along the guide as the device is rolled from one point to another the distance between which measurement is desired.

#### 4,014,104

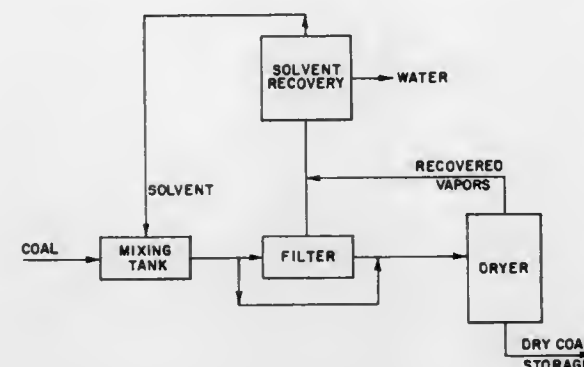
DRYING OF LIGNITE USING NONAQUEOUS SOLVENTS  
Charles L. Murphy, Smyrna, Ga., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 23, 1975, Ser. No. 589,096

Int. Cl.<sup>2</sup> F26B 3/00

U.S. Cl. 34—9

4 Claims



1. A process for drying particulate lignite having an interstitial moisture content of at least 38 percent by weight comprising:

- adding a nonaqueous solvent to said particulate lignite, said solvent having a heat of vaporization less than half that of water, a boiling point below 85° C, and being miscible with water, whereby a portion of said interstitial moisture is replaced by said solvent;
- applying heat to said lignite to which said nonaqueous solvent has been added to vaporize water and solvent therefrom with the amount of solvent vaporized being proportionally greater than the amount of water vaporized whereby the ratio of solvent to water in the lignite is reduced by said heating; and
- recovering said solvent.

#### 4,014,105

ARTICLE, APPARATUS AND METHOD FOR  
CONDITIONING FIBROUS MATERIALS WITH LIQUID  
CONDITIONING COMPOSITION

Henry P. Furgal, Bernardville, and Ingrid A. Larsen, Cranbury, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

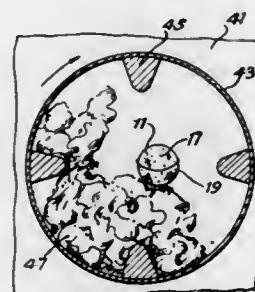
Continuation of Ser. No. 82,313, Oct. 20, 1970, abandoned.

This application Mar. 2, 1973, Ser. No. 337,352

Int. Cl.<sup>2</sup> F26B 7/00

U.S. Cl. 34—12

4 Claims



1. An apparatus for softening laundry during the drying thereof which comprises an automatic laundry dryer of the substantially horizontally rotating tumbling drum type, having means for heating air and means for circulating such air through the tumbling laundry and having therein a fabric softening article which comprises a dispensing container for a

liquid fabric softening composition, which container has a plurality of permanent and unvalved openings of cross-sectional areas in the range of 0.001 to 0.1 sq. cm. over at least a portion of the surface thereof, through which liquid fabric softening composition is gradually dispensable during tumbling of the container in contact with laundry to be softened during operation of the automatic laundry dryer, and a liquid fabric softening composition in the container which includes a softening agent selected from the group consisting of surface active synthetic organic anionic, nonionic, cationic, anionic-nonionic and cationic-nonionic fabric softening agents and is of a viscosity in the range of about 0.3 to 5 centipoises.

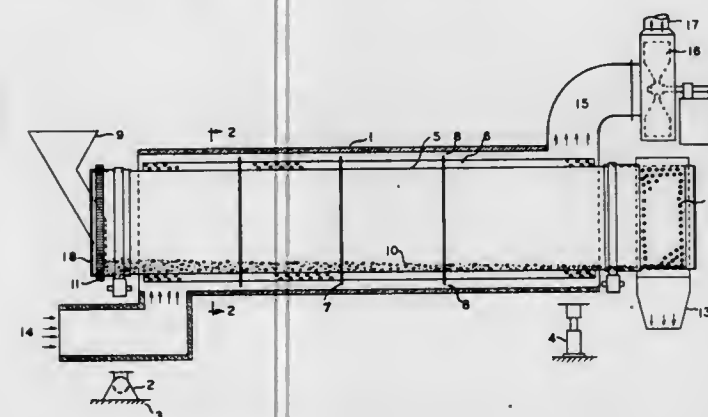
#### 4,014,106 DRYER

Wendell E. Bearce, Box 241, St. Clairsville, Ohio 43950  
Filed June 20, 1975, Ser. No. 588,673

Int. Cl.<sup>2</sup> F26B 11/04

U.S. Cl. 34—142

2 Claims



1. A dryer for drying wet coal particles and the like, comprising a stationary, insulating, substantially cylindrical shell, a cylindrical metallic tube coaxially mounted within said shell in spaced relationship therewith, means for feeding the wet coal particles through a relatively large opening in one end of said tube, means for rotating said tube about its axis, thereby distributing wet coal particles throughout the entire length of said tube, a cylindrical screen mounted on the other end of said tube, an outlet chute immediately below said screen, means for circulating hot air longitudinally through the space between said tube and shell including an exhaust fan, a plurality of radially outwardly extending fins integrally secured along spaced outer portions of said tube for more effectively transferring heat from the exterior to the interior surface of said tube, certain of said fins extending longitudinally throughout the entire length of said tube and being perforated throughout their length, and a plurality of metallic balls in said tube mixed with said particles whereby after said coal particles are dried, they are rotated in said screen and discharged by gravity through said outlet chute and screened from said balls.

#### 4,014,107

DRYING KILN FOR LUMBER

Jakob L. Bachrich, 3453 Wellington Crescent, North Vancouver, British Columbia, Canada (V7R 3B3)

Filed Apr. 7, 1976, Ser. No. 674,518

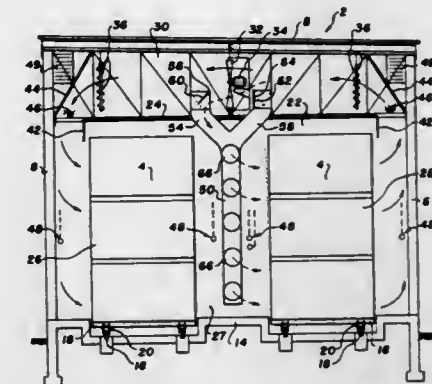
Int. Cl.<sup>2</sup> F26B 21/06

U.S. Cl. 34—191

10 Claims

1. A drying kiln for lumber comprising  
a drying chamber having two spaced drying sections each to receive a stack of lumber;  
a second chamber above the drying chamber;  
drivable, reversible, circulating means in the second chamber;  
heating means for air circulated by the circulating means;  
a first passageway permitting the circulating means to force heated air across the drying sections, across the space between them and back to the circulating means;

a second passageway extending downwardly into the space between the dryer sections;  
a first and second closable inlet for the second passageway, each inlet positioned on a side of the circulating means to receive a proportion of air forced towards it by the circulating means;



a plurality of outlets to said space in said second passageway; and  
means controlling the first and second inlets whereby if one is open the other is closed.

#### 4,014,108

VISUAL PERCEPTION TESTING METHOD

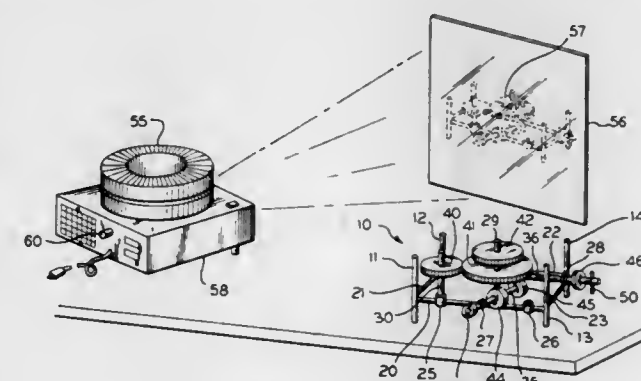
Edward J. Hester, Chicago, Ill., assignor to Goodwill Industries of Chicago and Cook County, Chicago, Ill.

Filed Nov. 5, 1975, Ser. No. 628,920

Int. Cl.<sup>2</sup> G09B 25/02

U.S. Cl. 35—13

2 Claims



1. A method of conducting tests for visual perception comprising the steps of:

- building a machine from modular parts which may be added, removed, or changed to alter the physical appearance of said machine;
- photographing said machine in each of its altered physical appearances and from a plurality of different angles and view points;
- setting said machine in one physical form adjacent a screen in view of the person being tested and
- projecting said photographed pictures on said screen in timed succession, whereby the person being tested must determine whether each projected picture depicts the same physical form or a different form that the adjacent machine.

#### 4,014,109

TEST APPARATUS FOR NUCLEAR IMAGING DEVICES  
Douglas Schramm, Winfield, Ill., assignor to Anasim, Inc., Aurora, Ill.

Filed Feb. 12, 1975, Ser. No. 549,166

Int. Cl.<sup>2</sup> G09B 23/28; G21K 3/00

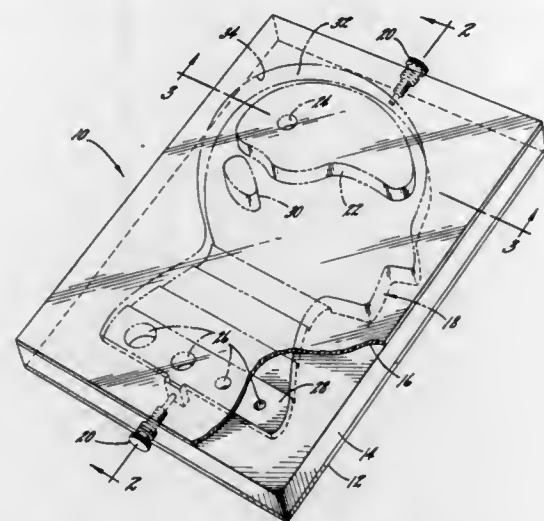
U.S. Cl. 35—17

7 Claims

1. A test phantom for evaluating the scan of a nuclear



imaging device which comprises a container having a sealed cavity therein, the outer walls simulating the outline of a human head and the cavity having a predetermined depth, a means for allowing injection of a radioisotope into the cavity, a first insert located in said cavity and at least substantially simulating the shape and location of the human brain, said first insert having a depth simulating, after addition of the



radioisotope to fill the cavity and on a scan of the test phantom, an area discernible on the scan substantially equivalent to the human brain, a second insert located adjacent the first insert and having a depth substantially equal to that of the cavity and simulating on a scan an area which is substantially white and said first insert having at least a partial void located therein simulating on a scan an area discernible from the remainder of said first insert.

4,014,110

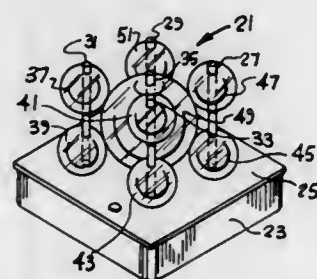
## CRYSTAL STRUCTURE MODEL

Ludwig A. Mayer, 4492 Thistle Drive, San Jose, Calif. 95136  
Continuation of Ser. No. 553,478, Feb. 27, 1975, abandoned.  
This application Sept. 21, 1976, Ser. No. 725,196

Int. Cl.<sup>2</sup> G09B 23/26

U.S. Cl. 35—18 A

7 Claims



I. A kit for demonstrating crystal structure models comprising,

a planar base defining a first number of fixed location holes therein, said fixed location holes at locations corresponding to superposed sphere center projections of tangent spheres of different sizes from all models to be demonstrated,

a multiplicity of templates, each template adapted for detachable joinder to said base and each template defining a unique hole pattern therein exposing a second number of holes in said base lesser than said first number when a template is detachably joined to said base, said hole locations in each template corresponding to sphere centers of tangent spheres of different sizes projected onto a plane parallel to the plane of said base wherein said sphere centers represent positions in a crystal structure,

a plurality of rods, each having a proximal end disposed in one of said exposed holes of said base, and a distal end projecting away from said base, and

a multiplicity of spheres, having at least first and second sizes having axial holes therethrough of a hole diameter slightly larger than the diameter of said rods mounted in movable relationship to said rods with each sphere size specifically correlated with exposed base holes to be tangent to at least one neighboring sphere.

4,014,111

## ORDNANCE TRAINING AID

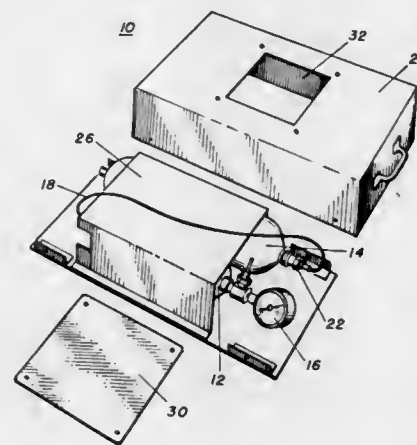
Ralph L. Miller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 9, 1975, Ser. No. 639,028

Int. Cl.<sup>2</sup> G09B 9/00

U.S. Cl. 35—25

1 Claim



1. A portable ordinance training aid comprising:  
a housing having a cover portion;  
a base portion removably attached to said cover portion;  
a pair of gas pressurized cylinders in said housing;  
a bulkhead for mounting said cylinders on said base portion;  
an inlet valve for pressurizing said cylinders;  
a tube connecting said pressurized cylinders to equalize pressures therein;  
a pressure gage attached to at least one of said cylinders; and  
an aperture in said housing for access to said tube.

4,014,112

## OPTICAL MOTION PICTURE FILM PRINTER

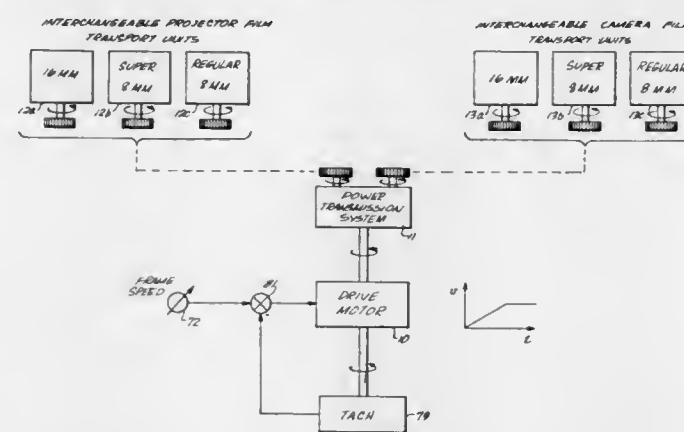
Rodger L. Christopherson, Chatsworth, and George J. Sorokin, Woodlands Hills, both of Calif., assignors to PSC Technology, Inc., Glendale, Calif.

Filed June 2, 1975, Ser. No. 582,602

Int. Cl.<sup>2</sup> G03B 27/48

U.S. Cl. 355—50

18 Claims



I. An optical motion picture film printer having a projector station, a camera station, drive motor means for transporting film at the stations, and means for projecting light from the projector station to the camera station, in which the improvement comprises, for at least one of the stations:

a plurality of interchangeable film transport units for handling different film formats, each film transport unit including an input gear, drive sprocket means driven by the input gear, and incremental film advance means driven by the input gear for handling the corresponding film format, thereby transporting film past an aperture through which the light passes as the input gear rotates; and  
means for individually and removably receiving any one of the film transport units at the station to couple the drive motor means to the drive sprocket means and the incremental film advance means of the received film transport unit so as to transport the film handled thereby, the receiving means having means for removably securing the received film transport unit at the station and an output gear that  
rotates responsive to the drive motor means,  
is engageable with the input gear of the received film transport unit when such unit is secured by the securing means, and  
is free to move out of engagement with the input gear of the received film transport unit as such unit is removed from the receiving means;  
the drive sprocket means and incremental film advance means of each unit transporting the same number of frames past the aperture per revolution of the output gear.

4,014,113

## COMPUTATION WORD BUILDER

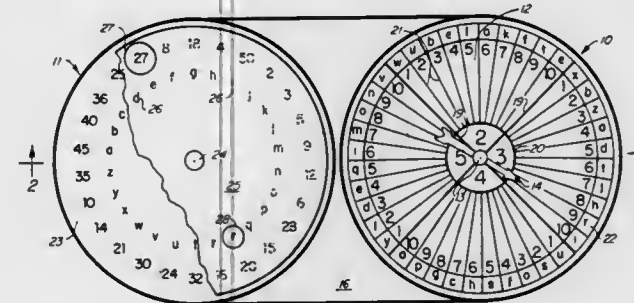
William T. Bowman, 2816 29th Ave. S., Minneapolis, Minn. 55406

Filed Jan. 12, 1976, Ser. No. 648,113

Int. Cl.<sup>2</sup> G09B 3/04

U.S. Cl. 35—74

15 Claims



I. Apparatus for improving the skills of mathematical computation and alphabet usage, comprising a computation selector in combination with an answer verifier,

i. said computation selector consisting essentially of a problem board member and a selector member, said problem board member having a central point, means uniting said computation selector members together for relative rotary movement of one with respect to the other about said central point of said problem board member, said problem board member carrying on it visible indicia arranged in circumscribing fashion about said central point, said indicia including an inner array of primary numbers and an outer array of secondary numbers, said inner array comprising at least two said primary numbers, each said primary number being separated from adjacent ones thereof by a primary radial line separator, whereby each said primary number lies within a radial primary segment about said central point, said outer array of secondary numbers being radially outward from said primary numbers and being arranged with at least three said secondary numbers within the arc ambit of each said radial primary segment, each said secondary number lying within a radial secondary segment defined by secondary radial line separators between said secondary numbers, substantially all of said secondary numbers having associated therewith a visible letter code, each said letter code being representative of the numerical value of the correct answer for a

predetermined mathematical computation between the said secondary number with which said letter code is associated and the primary number within the arc ambit of whose radial primary segment the said secondary number is located, different said correct answer numerical values being represented by a different said letter code.  
ii. said answer verifier comprising an answer board member and a visibly distinct identifier member, means uniting said answer verifier members together for relative indexing movement of one with respect to the other, said answer board member carrying on it indicia comprising each said letter code appearing on said computation selector, each said letter code on said answer board member having in uniform association with it the numerical value of said correct answer for the aforesaid predetermined mathematical computation, the said correct answer numerical value associated with each letter code on said answer board being visually apparent and identified by said identifier member when said identifier member is indexed to visually mark said letter code with which said correct answer numerical value is associated.

4,014,114

## SPIKE CLUSTER

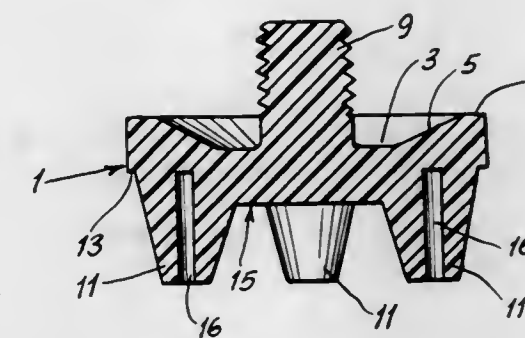
Ulice A. Jordan, and Governor V. Quinn, both of East St. Louis, Ill., assignors to Three Line Research & Development Co., Inc., Granite City, Ill.

Filed Nov. 28, 1975, Ser. No. 635,892

Int. Cl.<sup>2</sup> A43C 15/00

U.S. Cl. 36—67 D

11 Claims



1. A spike cluster adapted for attachment to the bottom of an athletic shoe, said cluster comprising a body portion, means on the body portion for attachment thereof to the bottom of a shoe, and a plurality of spikes extending downwardly from said body portion, each spike having a vertical bore therein open at the bottom of said spike.

4,014,115

## DECORATOR HEEL/SHOE COMBINATION

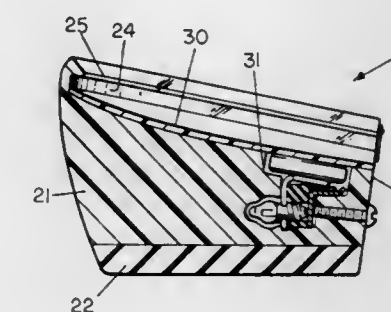
Robert J. Reichert, 118 Prospect St., Clyde, Ohio 43410

Filed June 9, 1975, Ser. No. 585,386

Int. Cl.<sup>2</sup> A43B 23/00

U.S. Cl. 36—137

1 Claim



I. A shoe comprising:

1. a principal body including a sole, an upper attached foot-enclosing member and a heel-engaging connector, and



2. a removable heel adapted to removably engage said connector, said heel being formed of a hardened translucent plastic, said heel having a vertical forward face and an upper horizontal face in flush engagement with said connector, said heel including two formed interconnecting recesses or cavities, one of said cavities being proximate said upper surface and containing at least one disk-type battery having a central planar terminal and an edge terminal, said lower cavity containing a bulb energizable by said battery and having two terminals, a first connector encircling said bulb base to contact one of said bulb terminals and extending to said upper cavity to engage said planar terminal of said battery, and a second connector extending upwardly to proximate said disk-type battery edge terminal and spaced therefrom, said second connector being shiftable into and out of contact with said other terminal of said bulb, a laterally movable screw extending from said forward face to said lower inner cavity and movably operative to shift said second connector against said other bulb terminal, said battery being shiftable by the weight of the shoe wearer to accomplish contact between said battery edge terminal and said second conductor and thereby illuminate said bulb only if said screw is holding said second connector against said other bulb terminal.

4,014,116

**LONG-DISTANCE SKI-TRACK PLOUGHING DEVICE**  
Anton R. Baechler, Seeburgstrasse 10, CH-6006 Lucerne, Switzerland

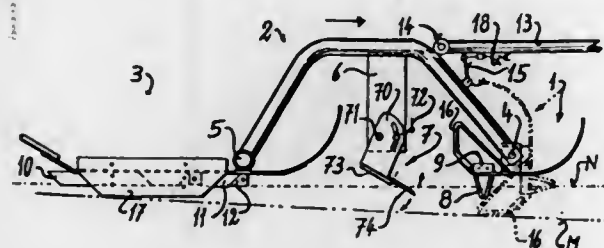
Filed Aug. 25, 1975, Ser. No. 607,604

Claims priority, application Switzerland, Aug. 28, 1974, 011708/74

Int. Cl.<sup>2</sup> E01H 4/00

U.S. Cl. 37-10

3 Claims



1. In a long-distance ski-track-ploughing device comprising a track sled adapted to be towed by a vehicle in the direction of the track, tracking elements on the underside of said sled oriented in the direction of the track, a forward sled jointed to the track sled by means of a connecting frame, means pivotally connecting each sled to said frame to swing about a horizontal axis perpendicular to the direction of the track, and a scraper carried by said connecting frame perpendicular to the direction of the track and located between the said sleds, the improvement which comprises a plurality of lateral guides on the track sled, a plurality of vertical blades fixed to the underside of the forward sled oriented in the direction of the track, and additional runners fixed to at least a portion of said forward sled, said runners being so positioned that when said forward sled is swung about the means pivotally connecting it to said frame, from an operative position which its blade-carrying portion is substantially parallel to the track to an inoperative position in which said blade-carrying portion is at an angle to the track, said blades and scraper lie above a plane containing the lowermost surfaces of said runners and said lateral guides.

4,014,117

**SPECTATOR FOOTBALL VISUAL AID**

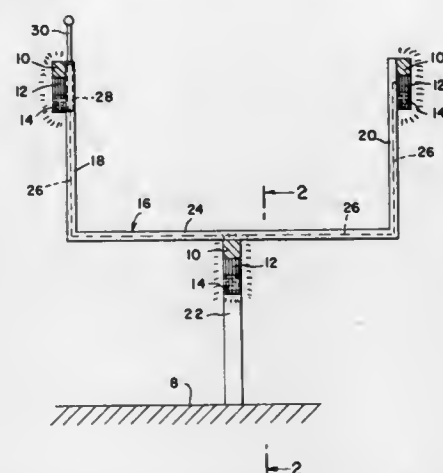
Robert G. Vallillee, 87 Glynn Ave., Ottawa, Ontario, Canada (K1K 1S7)

Filed Aug. 21, 1975, Ser. No. 606,578

Int. Cl.<sup>2</sup> A63B 71/00; G09F 19/00

U.S. Cl. 40-125 J

2 Claims



1. Football play status indicating apparatus responsive to a remote control radio signal, said apparatus comprising: a pair of portable first down measuring sticks; an electrical cable of a predetermined length being the only means interconnecting said sticks for enabling said sticks to define a predetermined distance when said sticks are spaced apart a distance for maintaining said cable taught therebetween; a pair of lamp means respectively carried on said pair of sticks for indicating the status of play; said pair of lamp means being electrically interconnected via said cable; radio receiver means, switch means and battery means carried by one of said sticks; said switch means being electrically interposed between said battery means and said pair of lamp means and being controlled by an output of said receiver means for selectively electrically coupling said battery means to said pair of lamp means in response to receipt of said remote control radio signal by said receiver means.

4,014,118

**INTERCHANGEABLE SIGN**

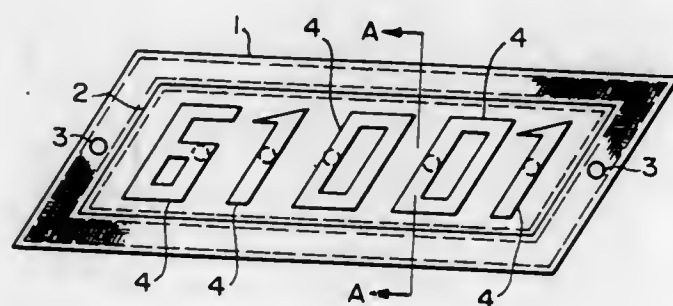
Jules P. Robinet, 2865 Virginia Park, and John Tamasovics, 2530 Todd Lane, both of Windsor, Ontario, Canada

Filed May 12, 1975, Ser. No. 576,667

Int. Cl.<sup>2</sup> G09F 7/06

U.S. Cl. 40-143

5 Claims



1. A sign made of plastic material and having replaceable and interchangeable components, comprising in combination a planar light reflecting frame which is provided with a plurality of holes for attaching said sign to a wall, and grooved interior rims on both sides of the frame so as to define front and rear cavities there within; a background panel to matingly press fit into said grooved rims of the frame, said panel being provided with a plurality of equally spaced apertures, located along the horizontal or vertical centerline of said panel, each aperture containing a readily severable thin film therein of the same plastic material as that of the panel; and various numbers, letters, or symbols which can be removably attached to the panel.

said panel to form single or multiple numbers or words, said letters or numbers each being provided with a central cylindrical pin within a corrugated cavity in the rear thereof, said pin being sized to matingly engage as by being press fitted into said panel apertures for attaching said letters or numbers to one of said panels after mating within said front cavity of the frame.

4,014,119

**VARIABLE FRAME FOR THE RECEPTION OF NATURALLY STIFF DISPLAY ARTICLES**

Karl Heinz Teufel, Stergweg 4, 79 Ulm, Germany

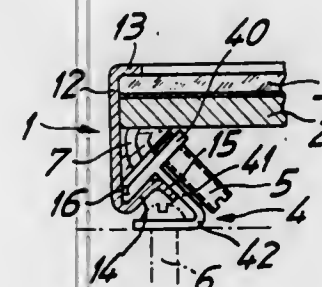
Filed Jan. 8, 1976, Ser. No. 647,304

Claims priority, application Germany, May 28, 1975, 2523557

Int. Cl.<sup>2</sup> G09F 1/12

U.S. Cl. 40-152

6 Claims



1. Apparatus for framing and displaying one or more sheets comprising in combination: at least one sheet having lateral edges, a generally U-shaped member for placement over at least one of the edges, the member having a center section and a pair of spaced-apart legs protruding from the center section, the spacing between the legs being greater than the thickness of the sheet so that sheets of varying thicknesses can be received in the U-shaped member, one of the legs depending at an acute angle from the center section towards the other one of the legs and having itself an L-shaped cross-section so that said one leg ends in a protrusion extending away from a remainder of said one leg and of the center section, the U-shaped member further including a longitudinally extending rib protruding from the center section, spaced from and extending towards said one leg; a tightening bar having a triangular cross-section and defining a pair of perpendicular sides and an angularly inclined side joining the perpendicular sides, the perpendicular sides engaging the sheet and the center section, respectively, so that the angularly inclined side faces said one leg of the U-shaped member, the perpendicular side engaging the center section being further disposed between the sheet and the rib; and clamping means for applying a force to the tightening bar for moving the bar parallel to the center section towards and into engagement with the sheet so that the sheet is clamped between the bar and said other one leg of the U-shaped member, the clamping means being defined by a clamp having a generally T-shaped cross-section in engagement with said one leg and the rib, a bolt threadably engaging the clamp and positioned to engage the tightening bar so that the bolt can be threaded against the bar for applying said force, the clamp further including an arm extending at an angle from a remainder of a bar and positioned to be generally parallel to the other leg of the U-shaped member, the arm including means for securing the arm and therewith the clamp, the U-shaped member and the sheet to an upright support wall.

4,014,120

**PICTURE MOUNT AND SUPPORT**

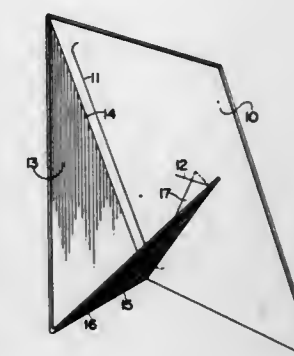
David S. Merz, Wellesley Hills, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 8, 1974, Ser. No. 522,141

Int. Cl.<sup>2</sup> G09F 1/12

U.S. Cl. 40-152.1

3 Claims



1. An easel backed frame for displaying and supporting a photograph or the like comprising:  
a. a rectangular frame comprising a panel which is centrally apertured to provide a window through which a photograph or the like placed behind said panel may be seen;  
b. an easel back comprising:  
i. a rectangular first substantially planar member having a perimeter coextensive with said frame and attached to said frame;  
ii. a first slit in said first planar member parallel to a first edge thereof and extending approximately ninety percent of the distance between the edges thereof forming said first edge;  
iii. a second slit in said first planar member said second slit comprising two obliquely intersecting slashes, the first of said two slashes being generally perpendicular to, but not intersecting said first slit, the intersection of said two slashes being approximately two-thirds of the perpendicular distance from said first edge of said first planar member;  
iv. a triangular second planar member, one edge of which is hinged to and coextensive with said first edge of said first planar member;  
v. a triangular third planar member, one edge of which is hinged to and coextensive with one edge of said second planar member other than its edge which is coextensive with said first edge of said first planar member; and  
vi. a fourth planar member, one edge of which is hinged to and common with a part of one edge of said third planar member other than its edge which is common with said second planar member, a portion of which is engageable with said second slit thereby forming a rigid structure capable of supporting a picture frame.

4,014,121

**PHOTOGRAPH HOLDER**

Robert D. Moser, 115 Aztek, Council Bluffs, Iowa 51501

Filed Aug. 29, 1974, Ser. No. 501,596

Int. Cl.<sup>2</sup> G09F 1/10

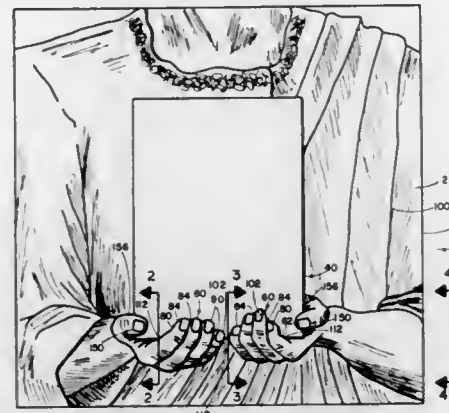
U.S. Cl. 40-158 R

9 Claims

1. A card holder comprising a base sheet of material having a forward side having a card-receiving area for receiving thereagainst a card having planar forward and rearward sides, right and left tab means sections disposed on said forward side of said base sheet, said tab means sections having inner and outer ends, each of said inner ends being further from a respective certain edge of said sheet than the outer end of the same tab means section, said tab means sections each having its said outer end attached to said base sheet and each tab means section being separate from said base sheet except at said attached outer end thereof whereby a card can be inserted between said tab means sections and said base sheet,



said tab means sections being horizontally spaced apart when said base sheet is held in vertical position, said tab means being of one piece of material with said sheet, said base sheet having a visible coating thereon on its forward side, said coating illustrating at least a portion of the figure of a human being



and each of said tab means sections having a portion of said coating thereon illustrating portions of the fingers of said human being, said respective certain edge being the closest edge of said sheet along a line extending from the said inner end of a respective tab means section to its said outer end.

4,014,122

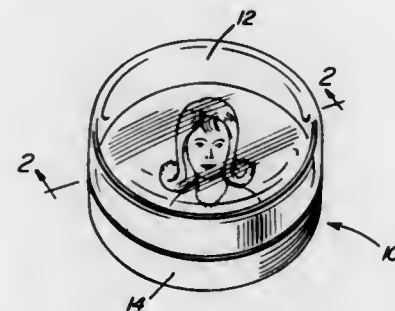
#### PAPERWEIGHT WITH SCREW THREADED BOTTOM CAP

Oscar J. Woods, 595 S. Mill Road, Vineland, N.J. 08360  
Filed Sept. 22, 1975, Ser. No. 615,469

Int. Cl.<sup>2</sup> B43M 9/00

U.S. Cl. 40—358

2 Claims



1. A paperweight device having a heavy, round in circumference, flat topped, transparent upper portion, a separable lower portion with means for securing the two portions together, the means for securing the two portions together are screw threads of 3/64 inch radius and 6 per inch, the separable lower portion is a standard production 63 millimeter G.C.M.I. thread cap, the upper outer side of the transparent upper portion have a 5° taper from the vertical towards the center of the portion and the upper edge having a corner of 1/4 inch radius, together with a display photo between the transparent upper portion and the lower cap, and cushioning means between the display photo and the lower cap to eliminate air space and distortion of the photo image from the top of the device when the cap is firmly screwed onto the transparent upper portion.

4,014,123

#### FIREARM SAFETY DEVICE

Coral C. Williams, 714 W. Lowden St., Fort Worth, Tex. 76110

Filed Sept. 17, 1975, Ser. No. 614,348

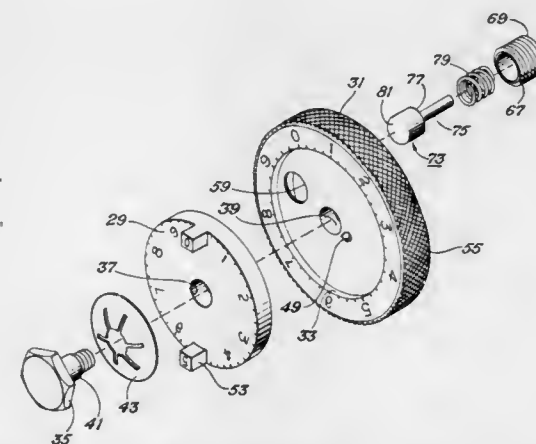
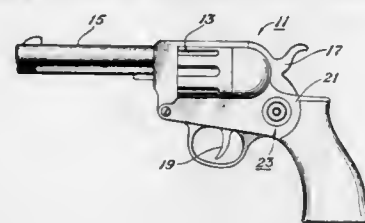
Int. Cl.<sup>2</sup> F41C 17/08, 27/00

U.S. Cl. 42—1 LP

9 Claims

1. A safety device for a firearm having a firing mechanism incorporating a moving part enclosed by a casing, comprising:

a first dial, rotatably attached to the casing, having an aperture located a selected radial distance from the center;  
a second dial, rotatably attached to the casing, concentric with and over the first dial, having a pocket at its inner side located at the same radial distance from the center as the aperture in the first dial;  
a plunger mounted within the casing at the same radial distance from the center as the aperture in the first dial and adjacent the moving part of the firing mechanism; the plunger being axially movable and spring biased in a



direction toward the dials; the plunger having a portion engageable with the moving part to prevent its movement; the plunger being of a configuration to be closely received in the aperture and pocket; and means for depressing the plunger axially within the casing into engagement with the moving part; whereby the firearm is fireable only when the first and second dials are rotated such that the aperture and pocket are in alignment with the plunger, allowing it to spring axially away from the moving part.

4,014,124

#### SAFETY MARKER FOR FIREARM

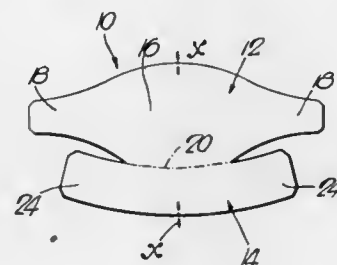
E. Ernest Oberst, Cheshire, Conn., assignor to The Marlin Firearms Company, North Haven, Conn.

Filed June 10, 1976, Ser. No. 694,590

Int. Cl.<sup>2</sup> F41C 27/10

U.S. Cl. 42—1 Y

2 Claims



1. A safety marker for a firearm with a trigger and a trigger guard, comprising a substantially flat and resiliently flexible shield having an elongated body part of an outline similar to that of human lips, and a rest part, of which said body part defines a center field with opposite sides and a bottom between said sides, and opposite arms continuous with and extending outwardly from said sides of the center field, and said rest part is continuous with said center field and depends from said bottom thereof, with said body part being of sufficient length to permit its distortion in resilient U-flexure for its

extension into and retention in a trigger guard with its arms on opposite sides of the trigger therein.

4,014,125

#### RESILIENT BAND-POWERED FISH AND ANIMAL SPEAR

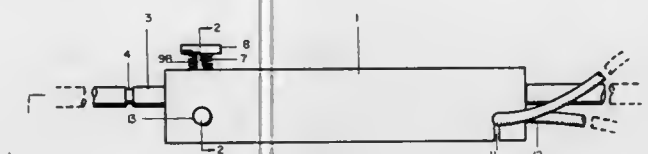
Daniel G. Baldi, 36 Crestfield Drive, Brockton, Mass. 02402, and James A. Baldi, 120 Sumner St., Newton Centre, Mass. 02159

Filed July 31, 1975, Ser. No. 600,883

Int. Cl.<sup>2</sup> A01K 81/04

U.S. Cl. 43—6

1 Claim



1. A device for spearing fish or animals that is easily manipulated with one hand in water, on the surface of water, or on land, said spearing device comprising, in combination, (1) a handgrip having a bore running lengthwise through it; (2) a spear shaft having a groove around it, slidably mounted in the bore running lengthwise through the handgrip; (3) a locking blade which moves up and down, entering and exiting the bore in the handgrip through a slot in the lower wall of said bore; (4) a trigger button attached to the locking blade by vertically moving side members; (5) a coil spring mounted under the trigger button; (6) a hole transversing the handgrip under the bore; (7) a resilient band formed into a loop attached to the spear shaft by any one of many existing ways, the resilient band being stretched and narrowed so as to snap into the hole transversing the handgrip under the bore so that, as the spear shaft is moved backward in the bore running lengthwise through the handgrip, the resilient band is stretched tight until the groove around the spear shaft passes over the locking blade which is pulled upward as the coil spring expands under the trigger button attached to the locking blade by vertically moving side members, causing the locking blade to lock and preventing the spear shaft from being fired until the trigger button is depressed, forcing the locking blade out of the groove around the spear shaft so that, as the resilient band contracts, the spear shaft is thrust forward.

4,014,126

#### SLINGSHOT-ACTION FISHING ROD

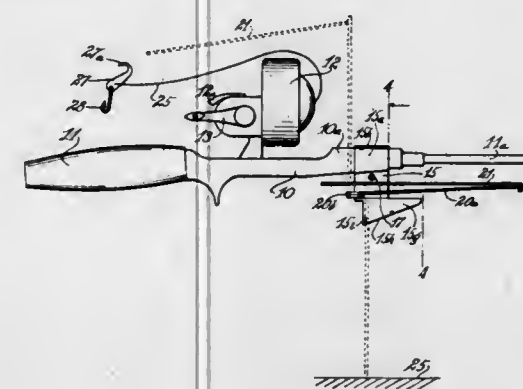
Wiley H. Samuels, Chicago, and James M. Murray, Oak Lawn, both of Ill., assignors to Wiley H. Samuels, Chicago, Ill.

Filed Mar. 26, 1976, Ser. No. 670,632

Int. Cl.<sup>2</sup> A01K 91/02

U.S. Cl. 43—19

10 Claims



1. A slingshot casting attachment for a fishing rod comprising a frame attachable to the rod, a sling with which a fishing line is engageable, a sling coupling receiving the ends of the sling and mounted in the frame to lie close alongside the rod, such coupling movable to a raised position disposing the sling

operatively, and means carried by the frame to lock the coupling when moved to said position.

4,014,127

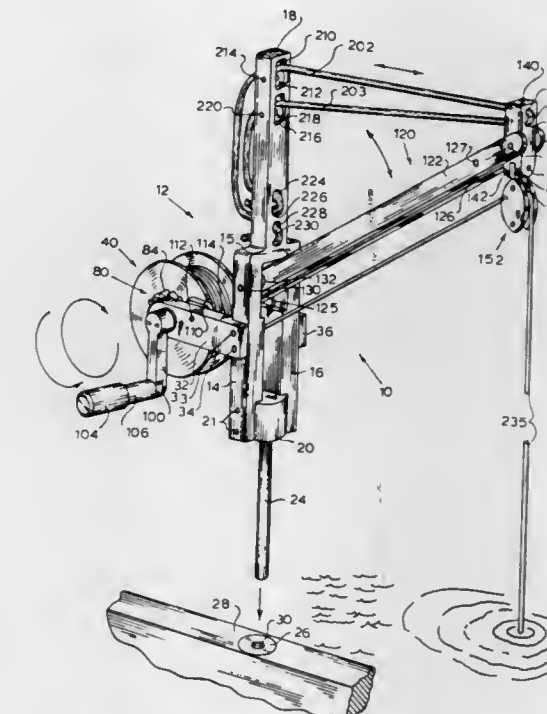
#### FISHING APPARATUS

Lenord H. Turner, 387 3rd St. North, Cocoa, Fla. 32931  
Filed June 9, 1975, Ser. No. 585,196

Int. Cl.<sup>2</sup> A01K 97/10

U.S. Cl. 43—27.4

15 Claims



1. A fishing apparatus comprising, in combination: a frame; reel means rotatably attached to said frame; means for rotating said reel means; an extending member pivotally attached to said frame; line guide means coupled to said extending member; elastic restraining means attached to said frame and to said extending member for providing a restoring force in response to rotation of said extending member relative to said frame, whereby said extending member smooths transient tension variations which occur when a fishing line is reeled or secured through said line guide means onto said reel means; and elastic restraining guide means rotatably attached to said frame for increasing the effective length of said elastic restraining means by movably folding said elastic restraining means thereover.

4,014,128

#### COMBINATION FISHING POLE HOLDER AND TACKLE BOX

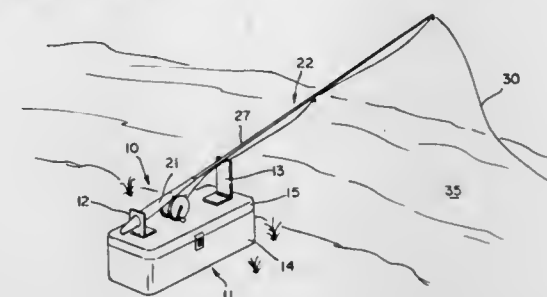
Theodore Frederick Hrdlicka, 6486 S. Crocker, Littleton, Colo. 80120

Filed June 25, 1976, Ser. No. 700,058

Int. Cl.<sup>2</sup> A01K 97/10

U.S. Cl. 43—21.2

3 Claims



1. A combination fishing pole holder and tackle box comprising, in combination: a conventional tackle box; and



- a fishing rod holding bracket consisting of a rectangular bottom plate attached on one end by means of a hinge to one end of a top plate, the bottom plate secured to the lid of said tackle box in any conventional way, with said fishing rod holding bracket disposed toward one end of said lid with its hinged portion positioned parallel to a narrow side or width of said lid, with said top plate being further provided with a round through hole with an inside diameter large enough to rest therein the handle portion of a fishing pole; and
- a fishing rod support bracket consisting of a bottom plate hingedly attached on one end to a top plate, the bottom plate being securely affixed to the lid of said tackle box and positioned on the opposite end of said lid as the fishing rod holding bracket with the top plates of both said brackets axially aligned and parallel with each other, with further the said top plate being longer than the top plate provided on said fishing rod holding bracket and further being provided with a circular notch in its end opposed to the hinge and centrally located thereon for resting therein a fishing pole rod.

4,014,129

## FISHING ROD STABILIZING HANDLE

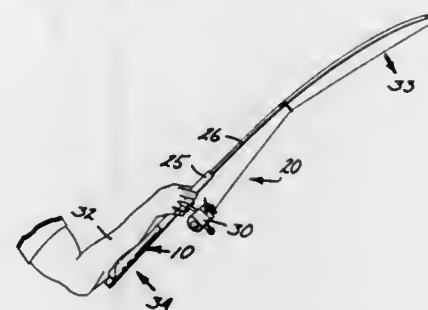
Gerald N. Capra, Minneapolis, Minn., assignor to Theodore Capra, New Brighton, Minn.

Filed Mar. 26, 1975, Ser. No. 562,020

Int. Cl.<sup>2</sup> A01K 87/00

U.S. Cl. 43—23

22 Claims



1. In combination with a spinning-type fishing rod having an elongate flexible rod portion, a forward hand gripping portion coaxial with and adjacent one end of said flexible rod portion, and a reel mounting portion coaxial with and adjacent said forward hand gripping portion for mounting a fishing reel in underslung manner thereto, a posterior rod stabilizing handle rearwardly continuously extending from said reel mounting portion and characterized by a broad upwardly directed elongate surface for alignment with and direct engagement of a substantial length of the underside of the forearm portion of that arm of a fisherman which operatively grasps said fishing rod at said forward hand gripping portion to provide stabilizing forces to said fishing rod which forces are distributed along the length of said posterior rod stabilizing handle to counterbalance opposing forces transmitted through said rod when landing a fish or reeling in an object, said elongate upper surface being disposed relative said rod so as to lie in a generally horizontal plane when said rod is horizontally operatively positioned and tapering from a substantially elongate broadened region near the butt end of said rod stabilizing handle to a relatively narrower region near said reel mounting portion for matingly accommodating the natural taper of the width of said forearm in the direction from elbow to wrist thereof.

4,014,130

## FISH HOOK EXTRACTION TOOL

Allen Roberts, 3006 NE. 19th St., Fort Lauderdale, Fla. 33305

Filed Feb. 20, 1976, Ser. No. 659,669

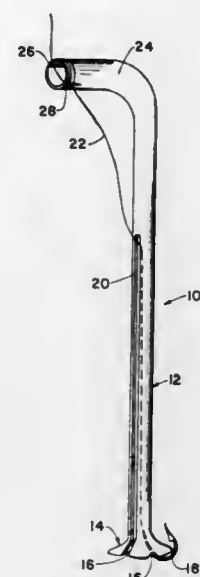
Int. Cl.<sup>2</sup> A01K 97/00

U.S. Cl. 43—53.5

1 Claim

1. A fish hook extraction tool comprising: a pipe having a

generally conical flare at one end; plural notches spaced about the periphery of said flare for engaging a fish hook; a longitudinally directed slot in said pipe communicating with said flare



for guiding said tool along a fishing line; the opposite end of said tool being bent to form a handle; and diametrically opposed notch means in said opposite end for securely engaging said fishing line.

4,014,131

## FISH HOOK EXTRACTOR

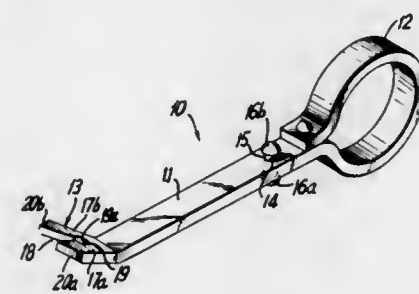
John Bendik, 2821 Schurz Ave., Bronx, N.Y. 10456

Filed Mar. 23, 1976, Ser. No. 669,693

Int. Cl.<sup>2</sup> A01K 97/00

U.S. Cl. 43—53.5

4 Claims



1. A fish hook extractor comprising:

an elongated member having a gripping means at one end and means for grasping the fishing hook at the other end thereof, said latter means being positioned at an angle to the plane of the elongated member and including at the other end thereof a slotted portion comprising a pair of legs each having tapered outer faces to facilitate entry of the extractor into a fish and tapered inner faces forming a slot of decreasing width therebetween to guide the fish hook into position within the slot, said outer and inner faces meeting at an acute angle at the end of said legs, and wherein said slot terminates in an enlarged arcuate base portion which catches the hook securely, and

a transverse member mounted adjacent the gripping portion for securing the fishing line thereabout to facilitate withdrawing of the hook.

4,014,132

## METHOD AND APPARATUS FOR HORTICULTURAL GRAFTING

Edward J. Cook, 12 Patton Drive, South Hamilton, Mass. 01982

Filed Jan. 29, 1976, Ser. No. 653,465

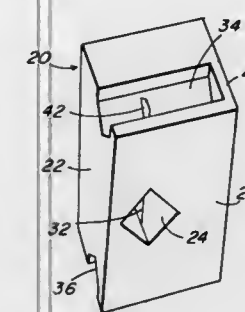
Int. Cl.<sup>2</sup> A01G 1/06

U.S. Cl. 47—6

11 Claims

1. A device for cutting away sectors from the facing ends of plant components to be grafted one to the other, comprising

- a. a body of rigid construction,
- b. said body being formed with a socket in one face thereof,
- c. a slit mounted to said body and through said socket,
- d. the plane of said slit disposed substantially along the longitudinal axis of said socket for making longitudinal slits at least twice the component diameter in components inserted therein,



- e. at least one channel formed along another face of said body in a direction perpendicular to the length of said socket and the plane of said slit,
- f. one end of said slit extending into said channel for severing sectors of slit components applied thereto.

4,014,133

## GREENHOUSE STRUCTURE

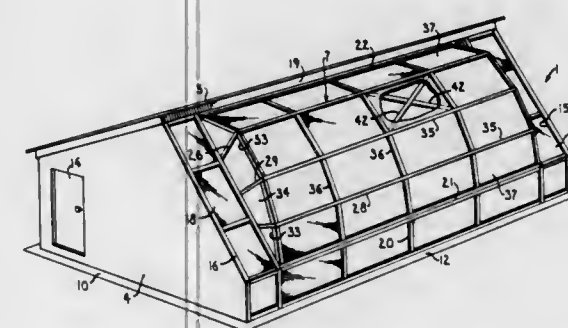
Howard P. Brown, 104 S. Nash St., Starkville, Miss. 39759

Filed Apr. 14, 1975, Ser. No. 567,744

Int. Cl.<sup>2</sup> A01G 9/00

U.S. Cl. 47—17

6 Claims



1. A greenhouse structure for growing plants and comprising:

a. a building structure having a rear wall and opposite end walls and roof means cooperating with said rear wall and said opposite end walls to define an enclosed space having a front side with an inclined portion and an upright portion, said front side inclined portion having end portions cooperating with said roof means and said upright portion of said front side to define an opening therebetween in said inclined portion of said front side, said front side upright portion having end portions, said upright portion of said building structure front side including a removable center portion extending between said end portions of said front upright portion and having the major area of said center portion formed of translucent material;

b. a closure member having a major area thereof formed of translucent material and pivoted on a horizontal axis and movable between open and closed positions respectively opening and closing said front side opening for controlling the entry of natural light and outside air for plants inside said building structure, said closure member having a cross sectional shape generally of a cylindrical segment;

c. an earth floor within said building structure for growing plants;

d. a plurality of translucent panels in said end portions of said front side inclined portion to permit sunlight to pass therethrough for substantially full utilization of the earth floor for growing plants;

- e. temperature responsive control means within said building structure; and
- f. drive means operatively connected to said closure member and controlled by said temperature responsive control means for moving said closure member between said open and closed positions in response to temperature changes within said building structure.

4,014,134

## PLANT PACKAGE

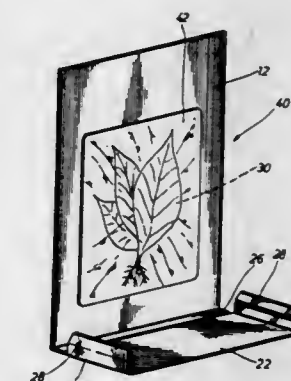
W. Victor Womack, Jr., P.O. Box 19091, Houston, Tex. 77024

Filed Aug. 27, 1975, Ser. No. 608,185

Int. Cl.<sup>2</sup> A01G 5/00, 13/00; B65D 85/52, 25/54

U.S. Cl. 47—84

24 Claims



1. A fluid tight plant package comprising:
- a. a substantially rectangular, fluid impervious base panel having a width dimension;
- b. a front panel substantially smaller in height than said base panel, said front panel being defined by a first portion of said base panel folded over along said width dimension, said front panel and a portion of said base panel defining a four-sided pocket which is closed along three sides and open along a fourth side; and
- c. a transparent member attached only to a second portion, other than said first portion of said base panel, in a fluid tight relationship to define a plant-receiving chamber having upper and lower regions, said front panel extending in front of a portion of said transparent member to thereby place said lower region within said pocket, wherein said smaller front panel defines a protector for said lower region, and said upper region provides unimpeded observation of a portion of a plant in said plant-receiving chamber.

4,014,135

## MODULAR CHANNEL CULTURE DEVICE

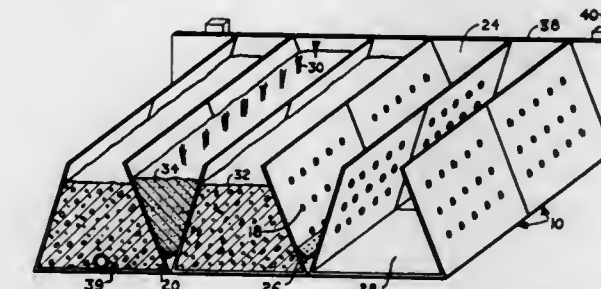
George Greenbaum, 790 Boylston St., Boston, Mass. 02199

Filed May 7, 1976, Ser. No. 684,465

Int. Cl.<sup>2</sup> A01G 9/02

U.S. Cl. 47—86

19 Claims



1. A modular channel culture device comprising, in combination:

a plurality of modules each comprising a horizontal base wall of rectangular form and a pair of side walls joining opposite lateral edges of said base wall, projecting upwardly therefrom, and being inclined toward one another



to define an opening therebetween above said base wall and narrower than said base wall, said base and side walls defining a channel of trapezoidal cross section extending parallel to said lateral edges through said module, said side walls being formed with a plurality of perforations; said modules being arranged in parallel rows, the modules in each row being aligned in end-to-end abutting relation to extend said trapezoidal-section channel continuously through the length of the row, said rows abutting one another laterally to define of adjacent rows, said trapezoidal and V-section channels each being adapted to contain plant-supporting medium, and said perforations connecting said trapezoidal and V-section channels in fluid-row communication.

4,014,136

# MEANS FOR THE OPENING AND CLOSING OF ANGULARLY MOVABLE PANELS

James Frederick Hemens, Billericay, and Alan John Easty, Shoeburyness, both of England, assignors to Teleflex Morse Limited, Basildon, England

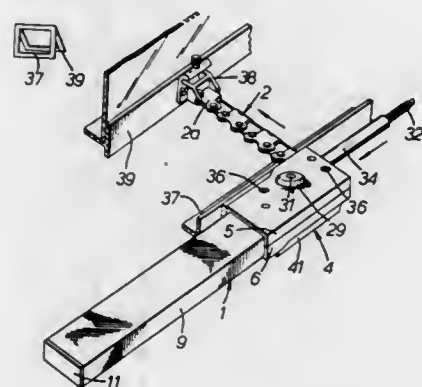
Filed July 10, 1975, Ser. No. 594,919

Claims priority, application United Kingdom, July 18, 1974, 31961/74; Mar. 7, 1975, 9675/75

Int. Cl.<sup>2</sup> E05F 11/03

U.S. Cl. 49—325

19 Claims



1. A mechanism for opening and closing an angularly movable panel, comprising a drive box for attachment to a fixed frame, the drive box housing a cable wheel rotatable upon translation of a control cable when in operative association therewith, a chaincase having a sprocket operatively connected with a chain located in a casing, the chain being for attachment at one end to an angularly movable panel, rotation of the sprocket effecting translation of the chain into, or out of, the casing in accordance with the sense of sprocket rotation, the chaincase having similar opposite connections for being mountable in any of four different positions on the drive box as is determined by use of the mechanism with

- a panel of the bottom hung type with a control cable approaching the mechanism from the right hand side,
  - a panel of the bottom hung type with a control cable approaching the mechanism from the left hand side,
  - a panel of the top hung type with a control cable approaching the mechanism from the right hand side,
  - a panel of the top hung type with a control cable approaching the mechanism from the left hand side
- and in each of these positions having its sprocket in drivable communication with the cable wheel without the necessity of disassembling the chaincase and reorienting the positions of the sprocket and chain.

4,014,137

# DROP ACTION PANEL ARRANGEMENT FOR OPERABLE PARTITIONS

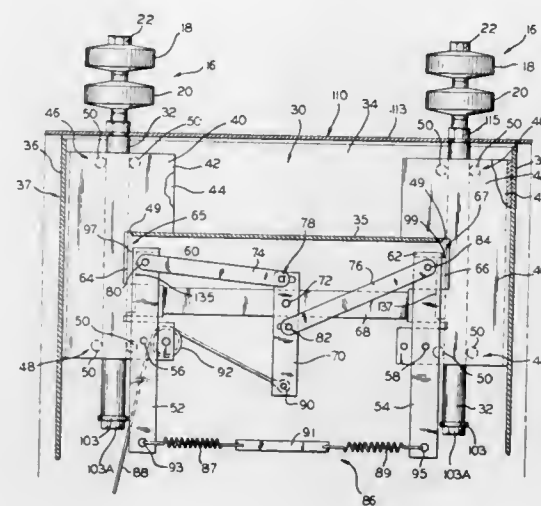
Charles E. Williams, Delavan, Wis., assignor to Hough Manufacturing Corporation, Janesville, Wis.

Filed Mar. 8, 1976, Ser. No. 664,440

Int. Cl.<sup>2</sup> E06B 7/28

U.S. Cl. 49—321

13 Claims



1. In an operable panel type partition arrangement including a plurality of discrete panel units an overhead tract defining the path of movement of the panel units over a support surface, and a pair of carriers for each panel unit riding on the track for movement of the respective panel units along the track, the improvement wherein said panel units each comprise:

- a panel vertically movable relative to the panel unit carriers, said panel including means for releasably supporting same on the panel unit carriers to suspend said panel from the track in a raised position above the support surface for movement along the track over the support surface,
- means for accommodating dropping of the panel under gravity onto the support surface on release of said supporting means to operatively dispose the panel between the track and the support surface,
- said panel including top seal means including a top seal for closing the gap between the panel and the track,
- said releasable supporting means comprising: each of said carriers of said panel carrying a detent in fixed relation thereto,
- said panel having adjacent each carrier a catch arm mounted on the panel for movement into engagement with the detent adjacent same for supporting the panel therefrom in said panel raised position,
- and means for moving said catch arms out of engagement with the respective detents to effect release of said supporting means.

4,014,138

# ANTI-RACK MEANS FOR DOORS

Clarence E. White, Kenosha, Wis., assignor to White Welding & Mfg. Inc., Kenosha, Wis.

Filed Apr. 7, 1975, Ser. No. 565,750

Int. Cl.<sup>2</sup> E05C 7/02

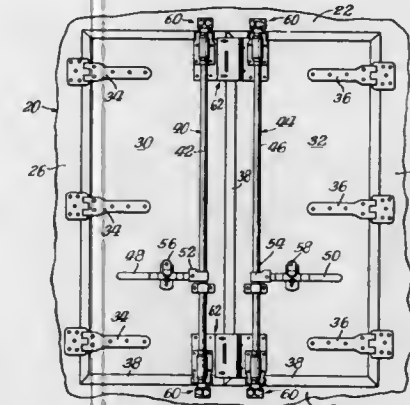
U.S. Cl. 49—367

2 Claims

1. In an anti-racking means for use with a door frame, a pair of doors vertically hinged to the frame and presenting free edges which are adjacently located when the doors are in closed position, and rotary bar door locking mechanism, said anti-racking means comprising a first bracket having a base portion secured to one of the doors and having a side portion adjacent the free edge of the door, a second bracket having a base portion secured to the other door and having a side portion adjacent the free edge of the door, said side portions of said brackets being provided with interengageable means,

said side portions of said brackets being disposed in overlapping relationship when the doors are in closed position, and said interengageable means being interengaged when the doors are in closed position for reinforcing the doors and the door frame, the improvement comprising:

- said side portion of said first bracket being formed with a vertically oriented tongue, and a pair of vertically spaced



horizontally oriented projections, extending perpendicular to the plane of the one door; said side portion of said second bracket being formed with a vertically oriented aperture; and said tongue of said first bracket being interengaged with said aperture of said second bracket, said side portion of said second bracket being interengaged with said projections of said first bracket, when the doors are in closed position.

4,014,139

# WHEEL BALANCE AND TRUING MACHINE

Donald H. Shooter, and Otto F. Colbert, both of 7913 Chatfield Ave., Whittier, Calif. 90605

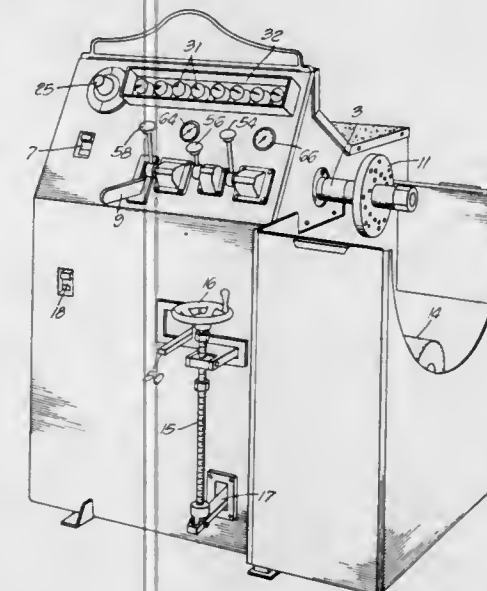
Division of Ser. No. 432,461, Jan. 11, 1974, Pat. No.

3,911,751. This application Sept. 11, 1975, Ser. No. 612,357

Int. Cl.<sup>2</sup> B24B 5/00

U.S. Cl. 51—5 R

6 Claims



1. A wheel balance machine for testing a tire/wheel combination for dynamic and static unbalances, said machine including: a frame; a drive shaft; a first bearing rotatably mounted one end of said drive shaft to said frame; a drive motor; means coupling said drive motor to said drive shaft; a hub mounted at said one end of said drive shaft adjacent said first bearing for supporting a tire/wheel combination for rotation by said shaft about the axis of rotation of said shaft; a second bearing rotatably mounting the other end of said shaft to said frame; control means coupled to said second bearing for causing said second bearing to maintain the other end of said shaft on the axis of rotation thereof for one condition of said control means, and said control means being adjustable to a second condition for causing said second bearing to permit

radial deflection of said other end of said shaft upon rotation of said shaft in the presence of dynamic unbalance of said tire/wheel combination; indicating means mounted at said other end of said shaft for indicating the angular position of said shaft at which such radial deflection occurs; an abrasive wheel rotatably mounted on said frame; a second drive motor coupled to said abrasive wheel to impart rotational motion to said abrasive wheel; and adjustable means coupled to said abrasive wheel for moving said abrasive wheel towards and away from the periphery of the tire/wheel combination mounted on said hub.

4,014,140

# HIGH-PRECISION CHAMFERRING APPARATUS

Sueo Aoki, and Nobumasa Amamoto, both of Fukuoka, Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

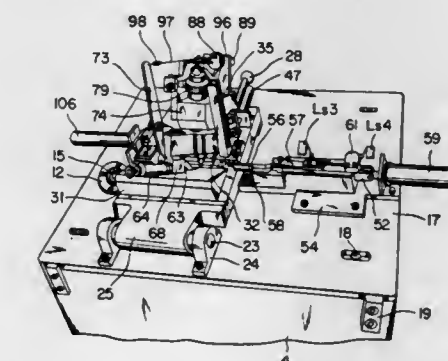
Filed Feb. 17, 1976, Ser. No. 658,521

Claims priority, application Japan, Feb. 19, 1975, 50-19877

Int. Cl.<sup>2</sup> B24B 7/00

U.S. Cl. 51—109 R

3 Claims



1. An apparatus for chamfering edges and corners of a rectangular article such as a throw-away tip with high precision comprising: grinding wheel means for chamfering a blank; guide means adjacent to said grinding wheel means; feeder means for transferring the blank along the guide means under chamfering of one edge of the blank; turning means for changing the orientation of the blank under chamfering of one corner of the blank; and discharge means for discharging the chamfered blank out of the apparatus.

4,014,141

# APPARATUS AND METHOD FOR CONTROLLING MAGNETIC HEAD SURFACE FORMATION

Stanley T. Riddle, and Gary G. Vair, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 450,137, March 11, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,843

Int. Cl.<sup>2</sup> B24B 49/00

U.S. Cl. 51—165 R

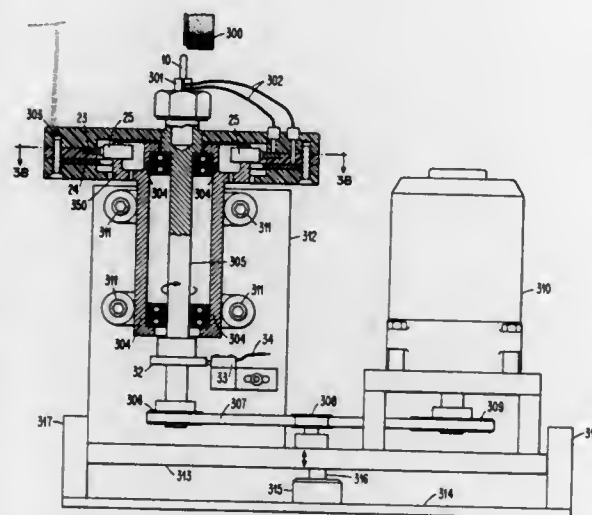
4 Claims

1. A system for controlling the formation of the surface contour of a multi-lead magnetic single-track head element having a portion, removed during surface formation, which has an electrical characteristic monitorable through said leads, wherein there are provided: a rotatable armature for fixedly retaining and continuously rotating the magnetic head about an axis passing through the surface contour, an abrasive material, relative motion between the armature and the abrasive material along the axis of the rotation of the armature bringing the head surface into contact with the abrasive material; and a stationary resistance detector, electrically connected to the rotatable magnetic head, for detecting the electrical characteristic of aforesaid head in terms of resistance; the invention being characterized by:

- a counter connected to the rotating armature for counting the number of rotations of the head and supplying a count signal upon the occurrence of a predetermined count;



means indicating a predetermined desired limit resistance amount;  
comparison means, associated with the indicating means, resistance detector and counter operable upon the occurrence of said count signal to generate a comparison signal if the detected resistance equals or exceeds the limit resistance amount;



means connected to said rotatable armature operable by an external start signal to initiate rotation and axial movement; and  
means connected to said rotatable armature and to said comparison means operable upon the occurrence of a comparison signal to terminate axial movement.

4,014,142

# METHOD AND APPARATUS FOR GRINDING AT A CONSTANT METAL REMOVAL RATE

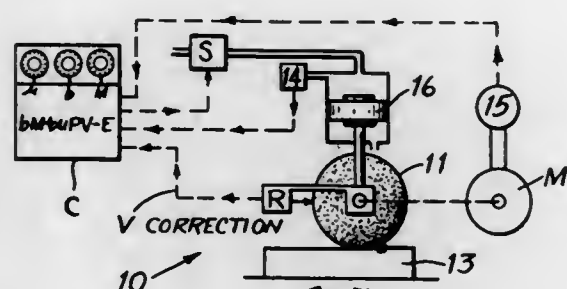
Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Filed Jan. 16, 1974, Ser. No. 433,890

Int. Cl.<sup>2</sup> B24B 49/00

U.S. Cl. 51—165.77

3 Claims



1. A method of grinding at constant metal removal rate comprising determining the difference between the power,  $E$ , drawn by the grinding wheel as indicated by a wattmeter, and the power required by a selected metal removal rate  $M$  for any wheel calculated as a function of the normal force between the wheel and the work,  $P$ , increasing the force,  $P$ , on the grinding wheel when the indicated power is less than the calculated power, and decreasing the force,  $P$ , on the grinding wheel when the indicated power is more than the calculated power, wherein the instantaneous values of normal force and power are observed on the EP plane in an oscilloscope, and the vertical force is adjusted manually whereby the point representing the instantaneous values of  $E$  and  $P$  falls on a predetermined straight line representing  $E$  as a function of  $P$  for a predetermined fixed metal removal rate for wheels of varying grinding grade.

2. A device adapted to serve as the anchoring base of a screw-type anchor wherein the base is adapted to be embedded in the earth with a rod extending from the base to the earth's surface, comprising:

- a generally helical-shaped flight having a length which includes at least one full turn;
- an axial opening along the center of the flight, said opening having a diameter slightly larger than the diameter of the anchor rod; and
- a generally horizontal collar permanently fixed to the flight and extending radially from the axial opening toward the periphery of the flight, with said collar terminating on its inner end at a location to receive the L-shaped foot of an anchor bolt, with at least a portion of the flight lying above the horizontal collar in a location to bear against the anchor bolt's shank and prevent rotation

4,014,143

# BUILDING STRUCTURAL SYSTEM

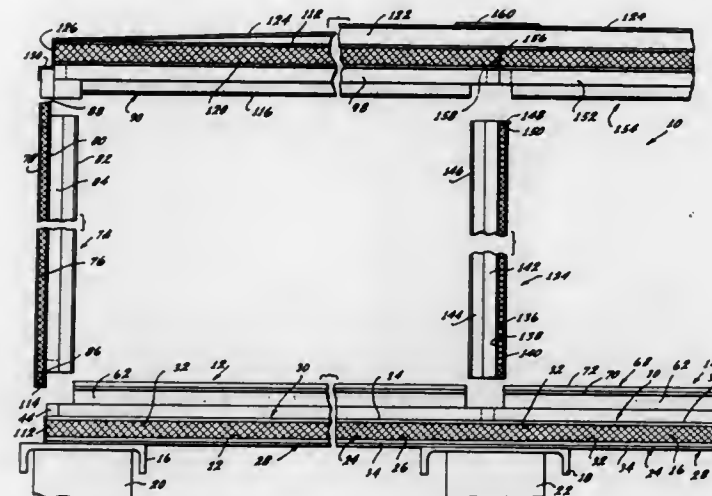
Kenneth G. Purcell, 807 S. Catalina Ave., Redondo Beach, Calif. 90277

Filed Apr. 23, 1976, Ser. No. 679,562

Int. Cl.<sup>2</sup> E04B 7/02

U.S. Cl. 52—90

10 Claims



1. A building panel construction comprising:
  - a laminated member including a pair of skins each having an outer surface and an inner surface, and a core of honeycomb material bonded to said inner surfaces of said skins, said laminated member having a pair of sides and a pair of ends;
  - a rectangular frame affixed to said laminated member along a perimeter defined by said sides and said ends; and fasteners affixed to said frame for connecting the frames of abutting panels together.

4,014,144

# ADAPTOR FOR CONVERTING AN L-SHAPED ROD INTO AN EARTH ANCHOR

Jack D. Gale, Crowley, Tex., assignor to Clare P. Tubbs, Richardson, Tex.

Division of Ser. No. 435,224, Jan. 21, 1974, Pat. No. 3,896,890. This application July 28, 1975, Ser. No. 599,763

Int. Cl.<sup>2</sup> E04D 5/80

U.S. Cl. 52—157

3 Claims



of the foot within the collar, whereby the anchor bolt may be rigidly held so that its longitudinal axis coincides with the axis of the flight.

4,014,145

# ROOF SADDLE

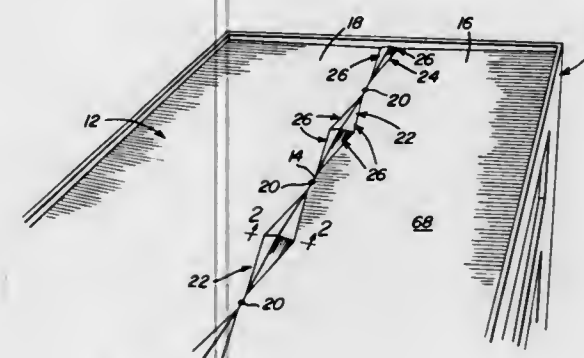
John L. Groves, 5260 N. Genesee Road, Flint, Mich. 48506

Filed Feb. 19, 1976, Ser. No. 659,550

Int. Cl.<sup>2</sup> E04D 13/40; E04B 7/00

U.S. Cl. 52—199

9 Claims



1. In combination, a roof structure including an upper surface, a plurality of upwardly opening drain openings spaced apart in a straight line extending along the roof, a roof saddle including at least one section of triangular plan shape including base, height and slant height edges with said base and height edges disposed at generally right angles relative to each other, a plurality of first constant thickness panels and second panels of tapering thickness positioned on said roof and disposed in superposed relation to define a generally planar upper surface inclined upwardly away from the upper surface of said roof structure toward the juncture between the base and height edges of said saddle, said height edge being disposed along said line and the apex of said height and slant height edges projecting toward and disposed adjacent one of said drain openings, and flexible roof sheeting secured over said saddle and adjacent upper surface portions of said roof.

4,014,146

# JAMB MOUNTING ASSEMBLY

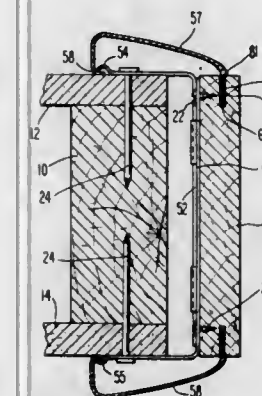
Paul S. DiMascio, R.D. No. 2, Boyertown, Pa. 19512, and John D. DiMascio, No. 2 Sylvan Drive, Pottstown, Pa. 19464

Filed Aug. 28, 1975, Ser. No. 608,443

Int. Cl.<sup>2</sup> E06B 1/02

U.S. Cl. 52—211

8 Claims



1. A jamb mounting assembly for securing a jamb in spaced relation to an edge member of a rough opening in a structure, comprising:

- a slide plate including first and second legs disposed at substantially right angles to one another;
- a jamb plate having first and second legs, said first leg comprising at least one raised element extending substantially transversely to said first leg and defining apertures at

either side thereof for slidably receiving said second leg of said slide plate, said legs of said jamb plate being disposed at substantially right angles to one another; the distal ends of said second legs of said slide plate and jamb plate having a substantially semicircular bend so that the extremities thereof face toward a plane generally coextensive with said second legs to form a detent; and an elongate molding adapted to extend over ones of said second legs and having an inwardly-turned lip thereof, said lip being substantially flat to extend substantially parallel to said second legs and being receivable beneath said detent means.

4,014,147

# HEAT-INSULATING CONSTRUCTION ELEMENT FOR REINFORCING DOUBLE-WALLED PRESSURE TANKS

Ludwig Wesch, Goerrest. 54, 6900 Heidelberg, Germany

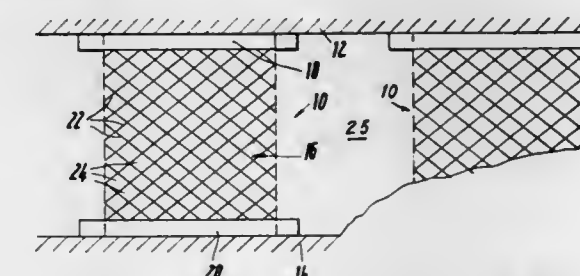
Filed Mar. 31, 1976, Ser. No. 672,057

Claims priority, application France, Apr. 2, 1975, 75.10232

Int. Cl.<sup>2</sup> E04B 1/74

U.S. Cl. 52—249

9 Claims



8. A heat-insulating reservoir comprising a tank, an exterior, tank-enclosing structure, and means interposed between the outer wall of the tank and said structure for heat-insulating the two from each other and for securing the tank in place with respect to the outer wall, the tank and its enclosing structure having two spaced substantially parallel walls, a plurality of heat-insulating construction elements interposed between said two parallel walls to maintain them a predetermined distance apart, each of said construction elements having a perforated tubular wall formed of a winding of heat-insulating filamentary material reinforced by a cured resin, and an annular element forming an end abutment for the body attached to each end of the body, and a heat-insulating packing filling the space presented between the two substantially parallel walls and within the construction elements.

4,014,148

# SEALING ELEMENT FOR CORRUGATED PANEL ASSEMBLIES

James W. Harter, Independence, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Dec. 17, 1975, Ser. No. 641,679

Int. Cl.<sup>2</sup> E04B 1/68

U.S. Cl. 52—403

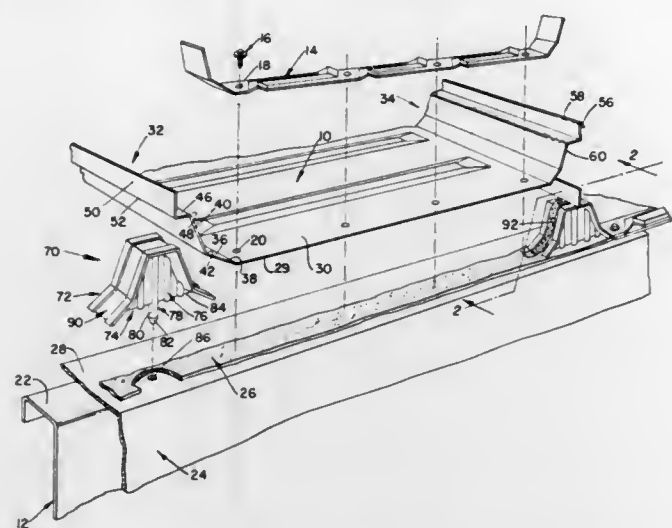
8 Claims

1. A sealing element for use with corrugated roof panels to seal voids between the roof panels and a building structural member adjacent the ends of the panel corrugations, comprising:

- a support member which approximately corresponds in shape and size to the transverse cross-sectional shape and size of one of the corrugation ends, which includes a plurality of reinforcing ribs integral therewith and an alignment element integral therewith for cooperation with alignment means in the building structural member to align said support member in the end of a panel corrugation so that said reinforcing ribs and said alignment element are oriented transversely of the corrugation; and



a flange element on said support member for engaging the



corrugation to close and seal the void between the roof panel and the corrugation end.

4,014,149

#### PANELED DOOR CONSTRUCTION

Yukio Yamamoto, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

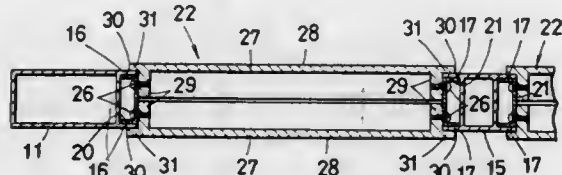
Filed Oct. 9, 1975, Ser. No. 620,936

Claims priority, application Japan, Oct. 11, 1974, 49-123444[U]

Int. Cl.<sup>2</sup> E04C 2/38

U.S. Cl. 52—456

3 Claims



1. A paneled door construction comprising:

- a first pair of stiles having exposed outer surfaces;
- top and bottom rails having exposed outer surfaces connecting said stiles together; and
- a block assembly disposed between said stiles, said block assembly including:
  - A pair of inner stiles spaced apart horizontally from each other and extending vertically between said top and bottom rails, and disposed in and concealed by said first pair of exposed stiles,
  - alternate externally exposed blocks and exposed block-parting members sandwiched between and engaging said inner stiles, the periphery of each block overhanging said first exposed stiles and the adjacent block-parting members or rail, and
  - screws extending through said inner stiles into the blocks and the block-parting members.

4,014,150

#### INSULATION SYSTEM FOR BUILDING STRUCTURES

David Lee Wells, Adrian, Mich., and Ronald Buxton Raab, Perrysburg, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Dec. 19, 1975, Ser. No. 642,507

Int. Cl.<sup>2</sup> E04C 1/34

U.S. Cl. 52—461

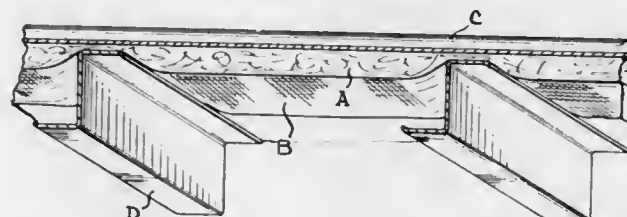
7 Claims

1. An insulation system for a building structure having structural members and a covering material spanning the exterior portions of said structural members, both having a relatively high coefficient of thermal conductance, comprising:

- a first insulation means for isolating said covering mate-

rial from said structural members, said first insulation means being located between said structural members and said covering material and said first insulation means having a relatively low coefficient of thermal conductance;

- a second insulation means in the form of a board-like sheet or layer of material, said second insulation means having at least one edge resting on a portion of at least one of said structural members and at least almost spanning the distance between two adjacent structural members, an opposite edge being at least near an adjacent



structural member, said second insulation means having a relatively low coefficient of thermal conductance;

- a third insulation means located between said second insulation means and said covering material, said third insulation means having a higher insulating value than said second insulation means; and
- a fourth insulation means fastened to most or all of the structural members, said fourth insulation means being of a configuration and location to completely insulate the structural member to which it is fastened from the interior of said building.

4,014,151

#### COUPLING STRUCTURE WITH ANCHORING IN STONE PARTS

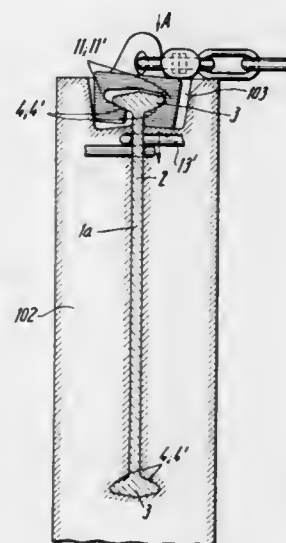
Dieter Erhart, Memmingerberg, Germany, assignor to Mannesmann Leichtbau, GmbH, Munich, Germany

Continuation of Ser. No. 582,675, June 2, 1975, abandoned, and a continuation of Ser. No. 372,155, June 21, 1973, abandoned. This application June 1, 1976, Ser. No. 691,334

Int. Cl.<sup>2</sup> E04G 21/12

U.S. Cl. 52—587

11 Claims



1. Coupling structure, wherein part of the coupling is an anchoring member being embedded in an artificial stone part such as a siding or a plate made of concrete or other stone material that permits embedding of anchoring members, comprising:

- an anchoring member constructed as profiled section extending in a first direction and having similarly contoured cross-sections in planes transverse to the first direction, the member having a flat stem portion with flatness also extending in the first direction and longer than the stem portion is thick, the stem portion being partially embed-

ded in the stone part material and projecting above a flat surface portion of the stone part, the member having a head extending lengthwise in the first direction as well as laterally from the flat stem in a profiled contour in the said planes, the head having convex surface portion where laterally extending from the stem, the head being on a portion of the stem that projects above the said stone part surface;

- a coupling member constructed as a profile bar with C-shaped cross-section and extending in a particular direction and having a base, a pair of side flanges having also lengthwise extension in the particular direction but extending from the base, transverse to the particular direction, and edges extending from the flanges towards each other, but leaving clearance space wider than the said stem portion is thick thereby defining a straight slot with predominant extension in the particular direction, for passage of the said stem portion of the anchoring member as the head of the anchoring member is being received by the C-space as defined by the base and the side flange, whereby the first direction runs parallel to the particular direction, each of the edges having a flat lower, outer surface extending from the slot to the respective flange from which the edge extends;

said coupling member as receiving the head being capable of limited angular displacement in said transverse planes and with a tilt axis parallel to said first and particular directions upon tilting one or the other of said edges abutting said stem laterally from one or the opposite side, limiting said angular displacement accordingly, the head of the anchoring member extending above the said stone part surface only, so that upon application of skewed pulling force upon the coupling member the lower outer surface portion of the one edge bearing against said flat surface portion of the stone material, as the one edge abuts the stem, while the lower outer surface of the edge which does not abut the stem, is raised above said surface portion; and

- the edges having concavely shaped inner shoulders corresponding to the convex surface portion of the head and extending lengthwise in the particular direction, but for an angle larger than 90° from the respective flanges in a plane transverse to the particular direction, the said two concave shoulders being always respectively in engagement with the said convex surface portions of the head when the anchoring member is suspended from the coupling member, the head extending from the stone part so that the said lower edge surfaces clear the said surface portions of the stone part.

4,014,152

#### SHEET METAL ROOFING SYSTEM

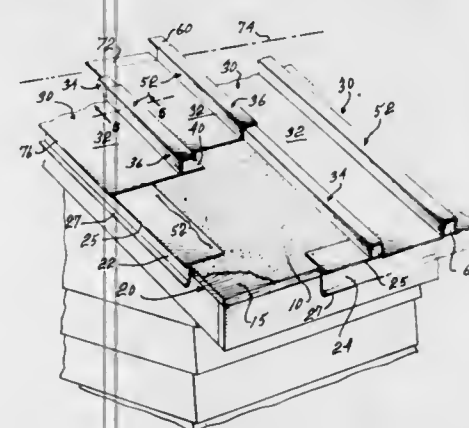
Louis Léonce Vallee, 6392 Maubourg Ave., Montreal, Quebec, Canada H1M2C8

Filed Dec. 4, 1975, Ser. No. 637,597

Int. Cl.<sup>2</sup> E04D 1/00

U.S. Cl. 52—588

5 Claims



1. For use in a metal roofing system of the batten type, a

series of pan sections, each formed of a simple piece of pre-folded sheet metal having an elongated central region and two parallel upstanding side walls, a first of said upstanding side walls extending upwardly at right angles to the central region of the pan section and then outwardly in a plane parallel to the central region of the pan section, and the second of said upstanding side walls extending upwardly at right angles to said central region, outwardly parallel to said central region and then downwardly a distance short of the plane of the central region of the pan section to form a hollow partial rectangle and then folded back on itself to lie against the upwardly, outwardly and downwardly extended portions to form double walls of the second upstanding side wall, a terminal portion of the sheet metal forming the said second side wall being extended outwardly from the upwardly extending portion of the second side wall in the plane of the central region of the pan section beyond the downwardly extending portion of the second side wall to form a narrow margin to receive fasteners for holding the pan sections to an underlying roof structure.

4,014,153

#### FLUID DISPLACEMENT OF NONCONDENSIBLE GAS FROM VOIDS IN PRODUCTS

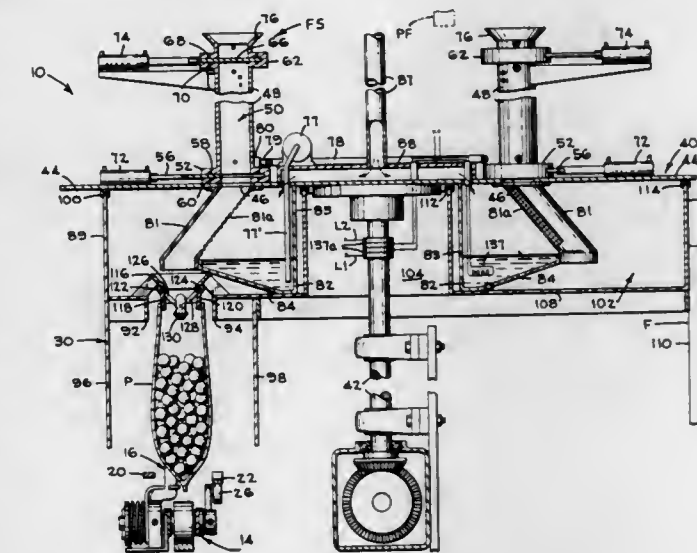
Donald C. Wilson, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 19, 1976, Ser. No. 650,345

Int. Cl.<sup>2</sup> B65B 31/02

U.S. Cl. 53—21 FC

28 Claims



17. A method of displacing a noncondensable gas from a particulate product in a degassing chamber and thereafter packaging the product comprising the steps of: moving a liquid through the product and through at least a portion of the degassing chamber to displace a noncondensable gas from the voids between particles of the product, precluding the reentry of noncondensable gases into said voids, draining the liquid from the product, and loading the product into a substantially air-free container.

4,014,154

#### PACKAGING METHOD AND APPARATUS

Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Division of Ser. No. 336,560, Feb. 28, 1973, Pat. No. 3,965,653, and a continuation-in-part of Ser. No. 139,453, May 3, 1971, Pat. No. 3,815,318. This application Apr. 23, 1975, Ser. No. 570,784

The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> B65B 5/00, 7/02, 43/36

U.S. Cl. 53—29

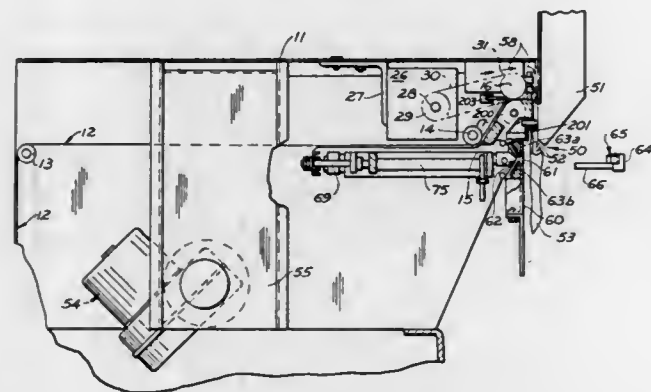
4 Claims

1. A method of packaging comprising the steps of:

- positioning a portion of a plastic web including a container to be sealed in a sealing station including a spaced pair of gripper bars and a heater bar therebetween;



- b. isolating a part of the web to be sealed from external forces after the container has been loaded by bringing the gripper bars while in canted relationship into engagement with the web and clamping the web against the gripper bars;
- c. effecting a heat seal in such isolated part while such portions are clamped against the gripper bars; and,



- d. separating the container from the web while the web is clamped to isolate said part, such separation being effected along a line of weakness in the web outside such isolated part by moving the loaded container together with the heater bar and the gripper bars relative to the remainder of the web to exert separation forces along the line of weakness.

4,014,155

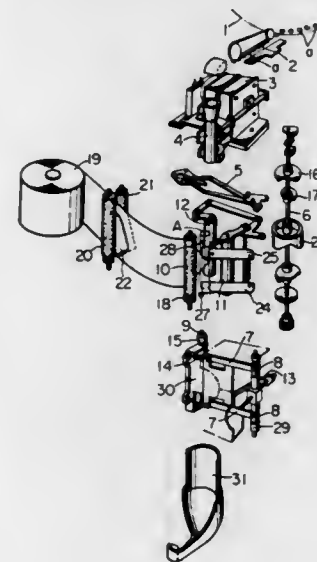
## COIN WRAPPING METHOD

Tsuyoshi Izawa, and Masaru Itoda, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan  
Continuation of Ser. No. 363,104, May 23, 1973, abandoned.  
This application Mar. 10, 1975, Ser. No. 557,011

Claims priority, application Japan, June 6, 1972, 47-56320  
Int. Cl.<sup>2</sup> B65B 11/04

U.S. Cl. 53-32

1 Claim



1. In a method for wrapping a coin-stack to form a coin-roll having end faces, wherein a coin-stack held between wrapping rolls adapted for holding and rotating the coin-stack is wrapped with a resinous sheet and projecting upper and lower lateral edges of the sheet are crimp-folded in over respective ends of the coin-stack to provide a coin-roll, the improvement comprising the steps of providing, as the wrapping sheet, a polyethylene sheet which is unidirectionally pre-drawn in a direction coinciding with the peripheral direction of the coin-stack and fed from a supply source to between the wrapping rolls and the coin-stack, holding the polyethylene sheet under tension during wrapping of the sheet about the coin-stack, wrapping the polyethylene sheet around the coin-stack so that the axial direction of the unidirectional drawing of the sheet is

caused to coincide with the coin surface plane of the coin-stack, and effecting tucking of the projecting lateral edges of the sheet in a direction parallel to the axial direction of the unidirectional drawing of the sheet.

4,014,156

## METHOD OF PRODUCING INDIVIDUALLY WRAPPED CONFECTIONS AND APPARATUS FOR PERFORMING THE SAME

Uwe Klahn, and Klaus Oberwelland, both of Halle, Westfalen, Germany, assignors to August Storck KG, Halle, Westfalen, Germany

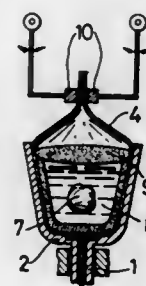
Filed Feb. 24, 1975, Ser. No. 552,063

Claims priority, application Germany, Mar. 8, 1974, 2411093

Int. Cl.<sup>2</sup> B65B 11/34

U.S. Cl. 53-34

2 Claims



1. In a method of continuously producing a series of confections by spinning flowable confectionery mass in a series of open top molds into which the mass has been introduced and to which rotation about a vertical axis is imparted by drive means for a limited period of time, the rotation being stopped when the mass has set in each mold and the confection then being removed from the mold, the improvement comprising: providing said molds in series with a generally cupshape with the mouth of each mold constituting the widest portion of said mold; inserting through the mouth of each said mold a wrapper material which will not tightly adhere to the confection to line the interior of said mold and form a partly finished single casing for a confection to be cast therewithin, the ends of the wrapper freely extending vertically through the mouth and above the height of the mold; retaining said wrapper within the mold by vacuum pressure and without supporting the wrapper above the mouth of the mold; casting a flowable confectionery mass into the upwardly open wrapper and permitting the flowable mass to become level; rotating the mold to distribute the flowable confectionery mass over the bottom and sides of the wrapper and to thereby form a cavity within said confectionery mass; completing the confection comprising at least providing said cavity in said confectionery mass with a filling; gripping the edges of said wrapper together from above the confectionery mass to close over said mass and holding the edges stationary while rotating the mold to complete the wrapping of the finished confection; and removing said confection from the mold.

4,014,157

## TRASH BAGGER

Richard Elmer Pearce, 3410 N. 66th, Lincoln, Nebr. 68507

Filed Apr. 30, 1976, Ser. No. 682,111

Int. Cl.<sup>2</sup> B65B 1/04, 67/12

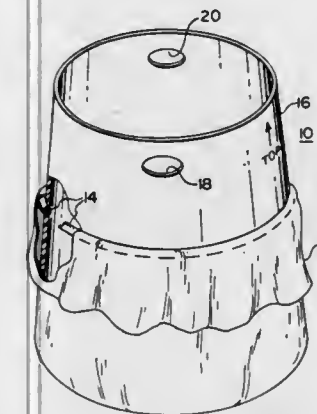
U.S. Cl. 53-35

7 Claims

1. A method of filling bags comprising steps of: pulling the bag to be filled over a hollow bag holder having open bottom and top and at least one tapered side between the open bottom and top with the bottom of the

bag covering the open bottom and the open end of the bag circumscribing said side, the top being smaller than the bottom;

placing over the bag a retainer which contacts the bag and presses it against the bag holder at least at three points along the bag which are spaced sufficiently far apart so as to subtend at least 180° of an angle having its center at a point along the longitudinal axis of the bag holder;



- folding the end of the bag over the retainer;
- applying the materials to be packaged through the open top of the bag holder and permitting them to fall against the bottom of the bag;
- pulling the retainer upwardly to remove it from the bag when the desired amount of material is already in the bag; and
- pulling the bag holder upwardly to remove it from the bag.

4,014,158

## APPARATUS FOR FILLING AND SEALING PREFORMED PACKAGING CONTAINERS UNDER ASEPTIC CONDITIONS

Hans A. Rausing, Lund, Sweden, assignor to AB Ziristor, Lund, Sweden

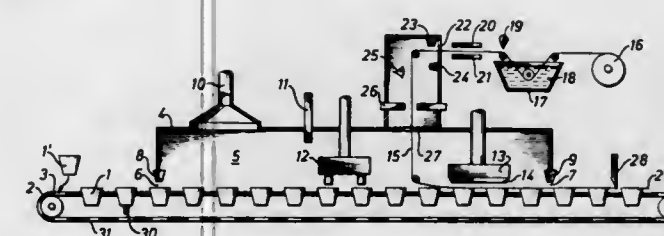
Continuation of Ser. No. 495,285, Aug. 6, 1974. This application Jan. 5, 1976, Ser. No. 646,500

Claims priority, application Sweden, Aug. 24, 1973, 7311516

Int. Cl.<sup>2</sup> B65B 55/10, 55/18, 31/02

U.S. Cl. 53-167

1 Claim



1. Apparatus for filling and closing packing containers under aseptic conditions comprising a movable conveyor belt for supporting a plurality of containers longitudinally thereof, a tunnel member having downwardly extending longitudinal side walls, the outer portions of said side walls being inwardly sloping, the longitudinal side edges of said conveyor belt bending angularly from the horizontal to engage the inwardly sloping outer portions of the longitudinal side walls of said tunnel member to constitute an outer wall of a chamber by forming a substantial seal with said tunnel member, means for maintaining a sterile atmosphere in said chamber, means within said sterile chamber for filling said containers and means within said sterile chamber for sealing said filled containers as they are moved through said sterile chamber.

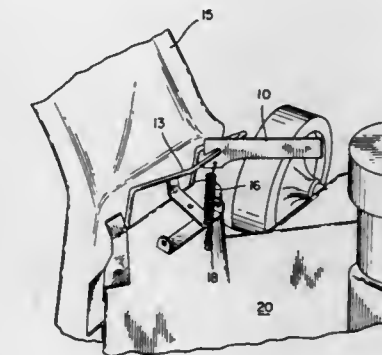
4,014,159  
SPRING BRACKET FOR LAWN MOWER GRASS CATCHER

Charles J. Piazza, 6 Elizabeth Place, Wallington, N.J. 07057  
Filed Mar. 17, 1976, Ser. No. 667,614

Int. Cl.<sup>2</sup> A01D 35/22

U.S. Cl. 56-202

1 Claim



1. A spring bracket for securing a lawn mower grass catcher assembly to the base of a lawn mower proper in which the catcher assembly includes a loop element extending as an integral part of said assembly, wherein spring bracket comprises:

- a handle having a notch-like recess therein, said recess adapted for three-sided slide-fittable inclusion about said loop element;
  - tension means having two ends, one of said ends being affixed to said handle at a point proximate to said recess; and
  - a nut and bolt combination, said bolt being secured to the second end of said tension means in which said nut and bolt combination is itself secured to the base of the lawn mower proper,
- wherein a rotational movement of the handle will result in a selectable decrease or increase in the force of said tension means which changes may be utilized in order to accomplish respective attachments of the present bracket to said loop element of said grass catcher assembly.

4,014,160

## FOLIAGE AGITATING MEANS FOR HARVESTING MACHINES

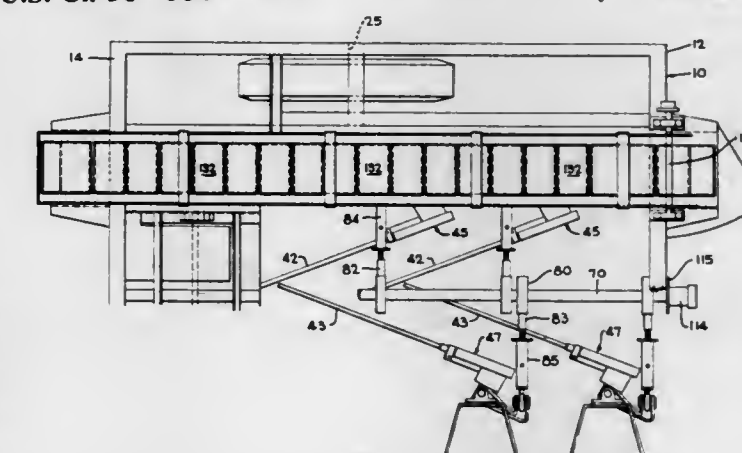
Vito M. Mecca, North Collins, N.Y., assignor to Mecca Bros. Inc., North Collins, N.Y.

Filed May 8, 1975, Ser. No. 575,520

Int. Cl.<sup>2</sup> A01D 46/00

U.S. Cl. 56-330

9 Claims



1. A harvesting machine for row crops comprising:
- a frame movable along a row of plants in a manner straddling the row;
  - shaker means carried by said frame and including a plurality of elongated finger elements;
  - oscillating means carried by said frame for oscillating each of said finger elements about an axis generally perpendicular to the longitudinal axis of the finger element;



- d. a corresponding plurality of connecting means for connecting each of said finger elements to said oscillating means, each of said connecting means comprising a hollow element of resilient material into which the corresponding finger element is fitted and a connector element fixed to said oscillating means and receiving said resilient element and said finger element in a manner providing some play in the connection of each of said finger elements to said oscillating means; and
- e. said finger elements being of sufficient length to enable said resilient elements to impart a whipping motion to said finger elements upon oscillation thereof to shake the crops off the plants.

4,014,161

## STOP-MOTION DEVICE FOR AUTOMATIC DOFFER APPARATUS

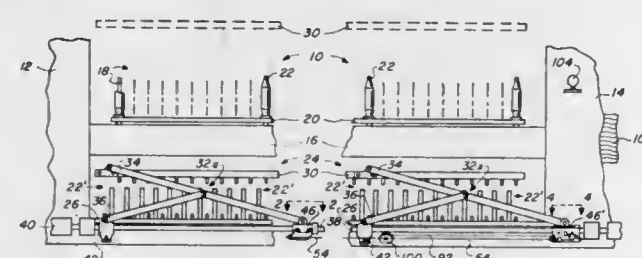
William L. Cox, Pickens, S.C., assignor to Platt Saco Lowell Corporation, Greenville, S.C.

Filed May 26, 1976, Ser. No. 690,214

Int. Cl.<sup>2</sup> D01H 9/04, 13/14

U.S. Cl. 57—52

11 Claims



1. In an automatic bobbin doffing apparatus servicing a textile spinning frame or like machine having a plurality of upstanding bobbin receiving spindles mounted in a row extending longitudinally of the machine, said apparatus including an elongate bobbin grasper member extending in generally parallel adjacent relationship to said row of spindles, an elongate draw bar mounted in generally parallel underlying relationship to said bobbin grasper member for linear reciprocatory movement, and linkage means innerconnecting said bobbin grasper member and said draw bar for movement of said bobbin grasper member between elevated and lowered positions relative to said row of spindles in response to reciprocatory movement of said draw bar, the improvement comprising: said linkage means including at least one linkage mechanism having a lower end portion connected to said draw bar for linear movement in unison therewith during normal operation of said apparatus and for relative linear movement between said draw bar and said lower end portion of said linkage mechanism upon impedance of said movement of said bobbin grasper member; and stop-motion means actuable in response to said relative linear movement between said lower end portion of said linkage member and said draw bar for, upon actuation, halting operation of said apparatus.

4,014,162

## FIBER SUPPLY DUCT FOR AN OPEN-END SPINNING UNIT

Hans Stahlecker, Sussen, Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Germany

Filed Oct. 24, 1975, Ser. No. 625,713

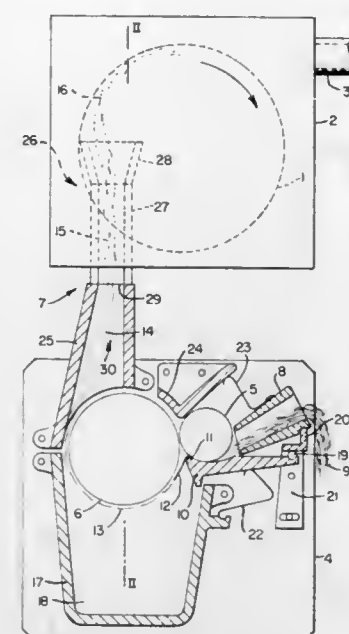
Int. Cl.<sup>2</sup> D01H 1/12

U.S. Cl. 57—58.95

10 Claims

1. Fiber supply duct for an open-end spinning unit with an opening device, especially an opening roller, for the opening up of continuously fed fiber material, this opening device being followed by the fiber supply duct terminating in a spinning rotor, an air current effecting a conveyance of the fibers being generated in this fiber supply duct by means of a negative

pressure ambient in the zone of the spinning rotor, characterized in that the fiber supply duct is provided with a steadily widening flaring mouth, and characterized in that the supply



ply duct comprises a tapering section beginning at the opening means and tapering in the conveying direction of the fibers, and a flaring section constituting the flaring mouth.

4,014,163

## CLOCKWORK FOR DESIGNATING TIME AND TIDE

Otto Wisser, Ludwig Uhlandstr. 12, 7745 Schonach, Germany

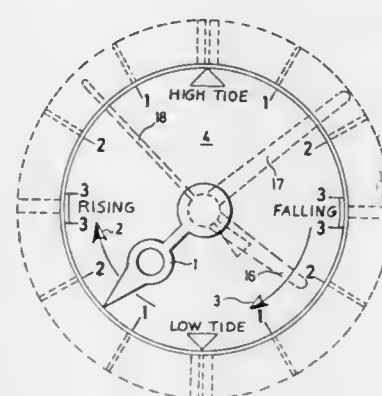
Filed Aug. 18, 1975, Ser. No. 605,650

Claims priority, application Germany, Nov. 19, 1974, 2454761

U.S. Cl. 58—3

Int. Cl.<sup>2</sup> G04B 19/26

2 Claims



1. A clockwork comprising
- a casing having a front face with time indications and tide indications,
  - a driven hour hand shaft journaled in said casing and having an hour hand thereon movable around said face,
  - a first gear rotatable on said shaft,
  - a slip clutch connected between said first gear and said shaft arranged to normally drive said gear with said shaft but allowing adjustable rotation relative thereto,
  - a second gear secured on said shaft for rotation therewith,
  - a tide hand secured to said second gear and movable around said face,
  - a connecting gear in common mesh with said first and second gears for connecting said gears in unitary rotation,
  - Said second gear having a different number of teeth than said first gear whereby to operate said tide hand at a different speed to proportion the rise and fall of the tides with the hours of the day,
  - and means secured to said connecting gear for manually rotating it to set said tide hand by slippage of said first gear on said shaft.

4,014,164

## ELECTRONIC TIMEPIECE INCLUDING BATTERY MONITORING ARRANGEMENT

Kinji Fujita, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

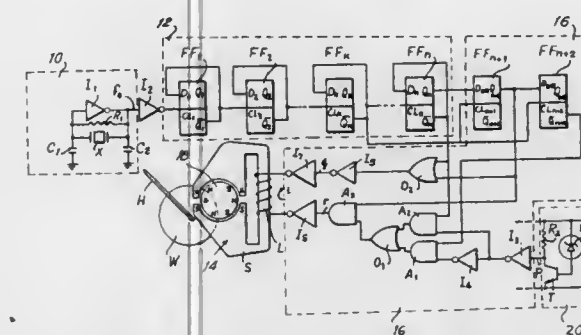
Filed Mar. 27, 1975, Ser. No. 562,517

Claims priority, application Japan, Mar. 27, 1974, 49-34241

U.S. Cl. 58—23 BA

Int. Cl.<sup>2</sup> G04C 3/00

12 Claims



1. In an electronic timepiece having a battery monitoring arrangement and including oscillator means for producing a high frequency time standard signal, divider means including a plurality of series-connected divider stages adapted to produce low frequency signals in response to said high frequency signal applied thereto, a battery coupled to said oscillator means and said divider means for energizing same, a stepping motor including a rotor adapted to be rotated in response to each driving pulse applied to the step motor, and a display means including at least one hand adapted to be rotated in response to each rotation of said rotor, the improvement comprising detection means coupled to said battery for detecting the potential thereof, said detecting means producing a signal in response to detecting a potential below a predetermined level, and monitoring circuit means coupled to said detection means and to said divider means for receiving said low frequency signals and in response thereto, applying periodic drive pulses to said step motor to effect a first periodic rotation of said rotor and thereby effect a first periodic advancing of said hand, said monitoring circuit means being further adapted to apply different periodic drive pulses to said step motor in response to a signal applied from said detection means to effect a second and different periodic rotation of said rotor and thereby effect a second and different advancing of said hand to indicate said battery potential being below a predetermined level.

4,014,165

## DC-DC CONVERTER IN WATCH SYSTEM

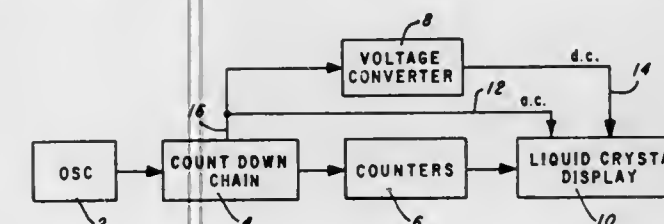
Troyce D. Barton, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 454,052, March 25, 1974, Pat. No. 3,919,625. This application July 14, 1975, Ser. No. 595,975

Int. Cl.<sup>2</sup> G04C 3/60; G05F 1/58

U.S. Cl. 58—23 BA

10 Claims



1. A solid state electronic watch comprising an oscillator providing a relatively high frequency signal, frequency divider means coupled to said oscillator for providing a plurality of relatively low frequency signals including a one Hertz signal, a plurality of interconnected counters responsive to said one

Hertz signal for providing a plurality of time signals representative of time information, a liquid crystal display coupled to said counters having a plurality of digits for displaying time information and powered by a relatively high DC supply voltage, and a voltage converter coupled to receive a relatively low DC supply voltage and responsive to one of said low frequency signals for generating relatively high DC supply voltage to said liquid crystal display, said voltage converter being comprised of one shot multivibrator means coupled to a switching regulator, said one shot multivibrator means being responsive to said one low frequency signal and said switching regulator providing said relatively high DC supply voltage.

4,014,166

## SATELLITE CONTROLLED DIGITAL CLOCK SYSTEM

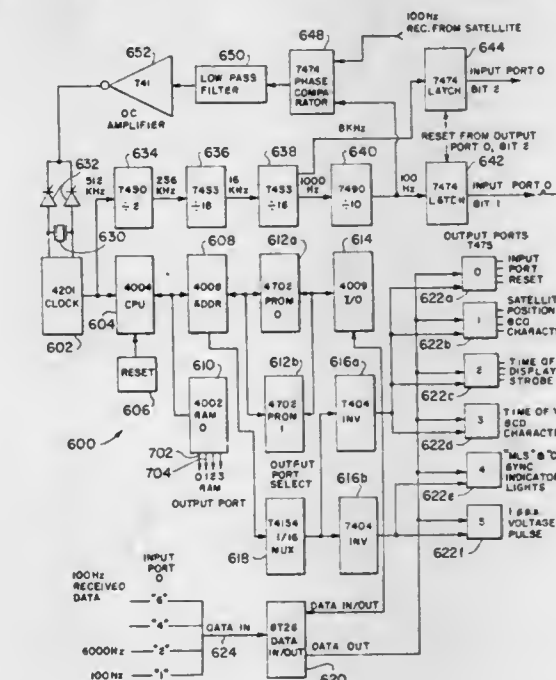
Joseph V. Cateora; Dicky D. Davis, and D. Wayne Hanson, all of Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Feb. 13, 1976, Ser. No. 657,918

Int. Cl.<sup>2</sup> G04C 13/08; H04B 7/00

U.S. Cl. 58—26 R

10 Claims



1. A digital clock system in which a data stream is transmitted at a precise data rate, the data stream comprising a plurality of contiguous data records, each data record comprising a plurality of data blocks, each of said blocks having a data synchronization segment and a message code segment, the message code segments within a data record forming a time code message and said message including a message synchronization portion and a time-of-year portion, said clock system comprising:

receiver means for receiving the transmitted data stream; a clock means for generating clock pulses at regular intervals; phase lock loop means for phase locking said clock means to the precise data rate of said data stream; and logic means for detecting the data synchronization segment of a data block so as to determine the position of each following message code segment in the received data stream, for detecting the message synchronization portion of the time code message so as to determine the beginning of the time code message, for assembling the complete time code message from the individual received message code segments, for keeping time by counting said clock pulses, for comparing each complete time code message with the time represented by said counted clock pulses so as to provide a determination of whether said time coincides with the complete time code message, and for correcting the time represented by said counted clock pulses so that said time coincides with the complete time



code message, responsive to a predetermined number of determinations of non-coincidence between said time and said complete time code message.

4,014,167

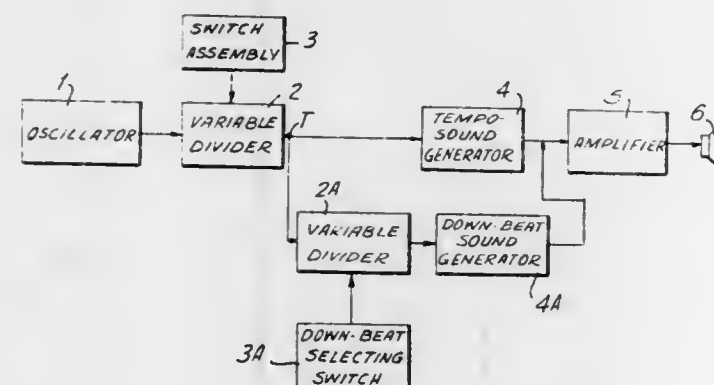
**ELECTRONIC METRONOME**

Ryozo Hasegawa, 6-2-10, Nakano, Nakano, Tokyo, Japan, and Yasuhiro Saito, 4-38-17, Kitakoiwa, Edogawa, Tokyo, Japan  
Continuation-in-part of Ser. No. 342,082, March 19, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,564  
Claims priority, application Japan, Mar. 21, 1972, 47-27445

Int. Cl.<sup>2</sup> G04F 5/02; G10H 5/06

U.S. Cl. 58—130 E

9 Claims



1. An electronic metronome comprising an oscillator for producing a signal of predetermined frequency, a first variable divider connected to said oscillator for variably dividing the frequency of said signal to a lower frequency, tempo selecting means for selecting the frequency of an output signal from said first variable divider, light emitting elements, a scanning circuit connecting to said first variable divider for energizing said light emitting elements in succession in response to the output signal generated by said tempo selecting means thereby to display a tempo in a flow of light, said scanning circuit generating at an output terminal thereof a tempo signal to be obtained, a tempo-sound generator connected to said scanning circuit and responsive to said tempo signal for generating a tempo-sound signal, a second variable divider connected to said scanning circuit for variably and further dividing the frequency of the signal obtained thereby to a lower frequency, down-beat selecting means for selecting the frequency of an output signal from said second variable divider to be equal to that of a down-beat sound to be obtained, a down-beat sound generator connected to said second variable divider and responsive thereto for generating said down-beat sound, and means for audibly displaying said tempo-sound obtained by said tempo-sound generator and said down-beat sound obtained by said down-beat sound generator to generate a regularly accentuated tempo-sound.

4,014,168

**ELECTRICAL TECHNIQUE**

Donald G. Carpenter, Box 62 A, North Granby, Conn. 06060  
Continuation of Ser. No. 95,754, Dec. 7, 1970. This application  
May 30, 1974, Ser. No. 474,379

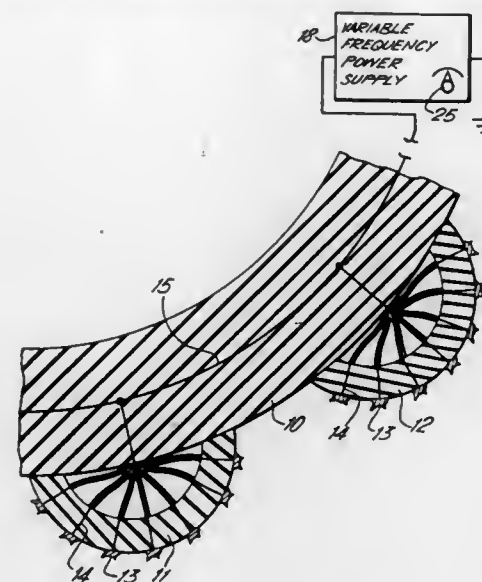
Int. Cl.<sup>2</sup> F02K 9/00

U.S. Cl. 60—202

10 Claims

1. An ionization system comprising an electrically insulating

dome, a plurality of electrodes embedded in said dome and having protruding hemispherical portions, a plurality of cones



protruding from each of said hemispherical portions, and conductor means for coupling power to said electrodes.

4,014,169

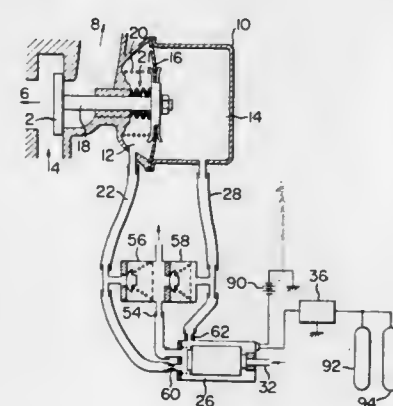
**ANTI-AFTERBURN DEVICE FOR ENGINE HAVING AIR PUMP**

Hideo Umno, Nagaokakyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 7, 1975, Ser. No. 565,966

Int. Cl.<sup>2</sup> F02B 75/10

U.S. Cl. 60—290

6 Claims



1. An anti-afterburn device for an engine having an air pump, comprising a control valve for controlling air supply, a pressure differential means dividing a housing into first and second chambers and being connected to said control valve, a spring urging said control valve in one direction, first and second conduits connecting respectively said chambers with an intake manifold of the engine, a first orifice provided in one of said conduits, a separate air pressure source, and a first three-way valve provided in said first conduit and connected to said first chamber to urge the pressure differential means opposite to that of the spring by supply of an air pressure to the first chamber, said first three-way valve being adapted to selectively supply an intake manifold negative pressure or the air pressure from the separate pressure source into said first chamber, said control valve being operable to reduce the air supply upon abrupt pressure change in said intake manifold or upon supply of the air pressure from the separate pressure source, said first orifice being provided in said second conduit, and a first check valve is located in parallel with said first orifice, said check valve permitting a communication only from said second chamber to the intake manifold.

4,014,170

**THERMAL ENGINE**

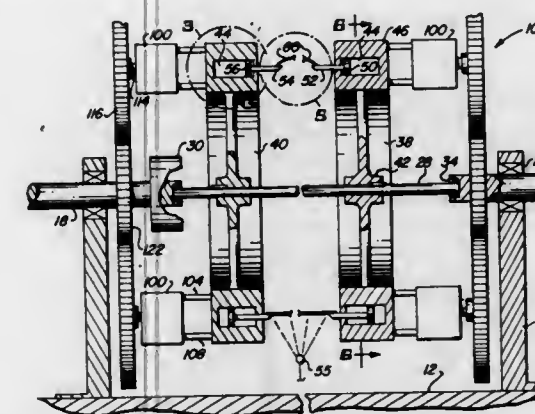
Roger L. Kitterman, Star Rte. Box 644, Tonopah, Ariz. 85354

Filed Jan. 8, 1976, Ser. No. 647,621

Int. Cl.<sup>2</sup> F03G 7/06

U.S. Cl. 60—529

8 Claims



1. A thermal motor for converting heat energy to mechanical energy comprising:

- a rotor defining a plurality of cylinder chambers each having a reciprocable piston therein;
- heat-responsive means which mechanically move in response to a temperature change operatively connected to said pistons;
- a hydraulic circuit including a hydraulic motor having an output shaft, said circuit interconnecting said cylinder chambers with said motor whereby reciprocation of said piston actuates said motor; and
- means for rotating said rotor a predetermined rotational speed to selectively expose said heat-responsive means to a heat source.

4,014,171

**HYDRAULIC BRAKE BOOSTER**

Uichiro Kobashi, Okazaki, Japan, assignor to Aisin Seiki Co., Ltd., Japan

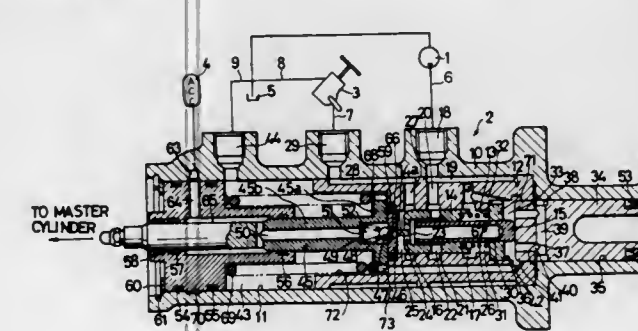
Filed June 10, 1975, Ser. No. 585,682

Claims priority, application Japan, June 10, 1974, 49-65047

Int. Cl.<sup>2</sup> F15B 7/00

U.S. Cl. 60—547

9 Claims



1. A hydraulic brake booster comprising:

- a fluid pressure source;
- a booster having a bore therein;
- stepped power piston means, slidably disposed within said bore of said booster housing, operatively connected at one end thereof with a master brake cylinder means and forming at the other end thereof a fluid chamber the hydraulic fluid pressure of which actuates said power piston means for in turn actuating said master cylinder means;
- a guide member provided within said bore of said booster housing at the opposite side of said fluid chamber for guiding the sliding movement of a small diameter portion of said stepped power piston means;
- first fluid passage means provided within said guide member and said small diameter portion of said stepped power

4,014,172

**DIFFERENTIAL AIR PRESSURE DRIVEN ENGINE**

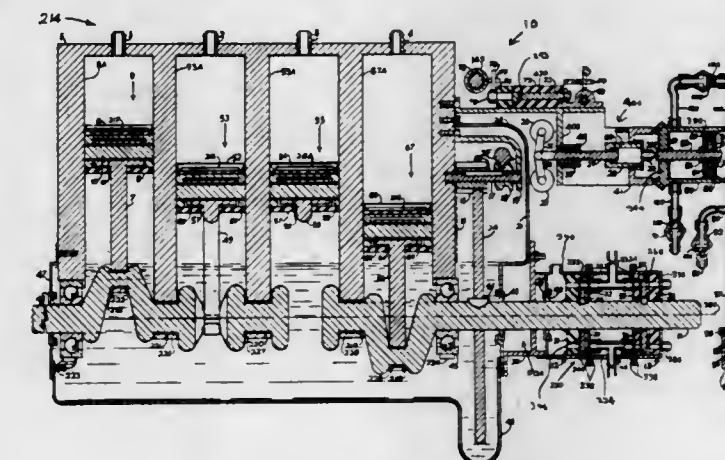
Thomas Jones, 5633 S. Loomis, Chicago, Ill. 60636

Filed Nov. 3, 1975, Ser. No. 628,519

Int. Cl.<sup>2</sup> F01K 25/00; F02G 1/00

U.S. Cl. 60—650

13 Claims



1. An air driven engine apparatus comprising:

- an engine block having a plurality of cylinders each having a piston reciprocally mounted therein and connected in cranking relation to a crank shaft journaled in the engine,
- a source of heated air under pressure,
- a source of vacuum under refrigerated conditions,
- a cylinder air flow input timer,
- air pressure conduit means connecting the source of air under pressure to said input timer including valve means for controlling the volume rate of air flow to said timer,
- a cylinder air flow output timer,
- air vacuum conduit means connecting said output timer to the source of vacuum including a vacuum timer,
- said cylinders each having a separate conduit communicating between same and said timers,
- said timers being oriented to, for each cylinder, sequentially connecting such cylinder only to the source of air under pressure on the power stroke of the piston thereof, and sequentially connecting such cylinder only to the source of vacuum on the return stroke of the piston thereof.



4,014,173

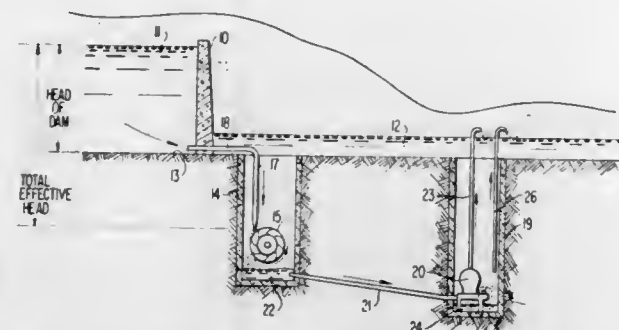
# SYSTEM FOR INCREASING THE EFFECTIVE HEAD OF A DAM WITHOUT PHYSICALLY INCREASING THE HEIGHT OF THE DAM

Walter William Keeling, R.F.D. No. 1, Troutville, Va. 24175  
Filed Nov. 5, 1975, Ser. No. 628,936

Int. Cl.<sup>2</sup> E02B 9/00

U.S. Cl. 61-19

4 Claims



1. A hydroelectric power generating system comprising a man-made dam of predetermined fixed height above a water stream bed forming an elevated head of water behind the dam, a first subterranean well pit somewhat downstream from the base of the dam and extending for a substantial distance below the base of the dam to increase substantially the effective head of the dam, said well pit being substantially closed at its sides and bottom, hydroelectric generating means near the bottom of the first well pit, means delivering dam head water to said generating means near the bottom of the well pit, a second subterranean well pit downstream from the first pit hydraulic ram means in the second well pit adapted to cleave water therein to the tailwater downstream from said dam, and gravity flow conduit means interconnecting said well pits whereby discharge water from said generating means in the first well pit is delivered to said hydraulic ram means in the second well pit continuously.

4,014,174

# METHOD OF SIMULTANEOUSLY STRENGTHENING THE SURFACE OF A BOREHOLE AND BONDING CEMENT THERETO AND METHOD OF FORMING CEMENTITIOUS PILINGS

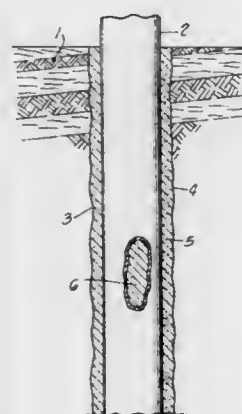
Thomas C. Mondshine, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,469

Int. Cl.<sup>2</sup> E02D 5/42, 5/62

U.S. Cl. 61-53.52

10 Claims



1. A method for simultaneously consolidating the surface of a borehole and bonding cement to the surface of said borehole, which comprises:

- placing an aqueous salt solution containing at least 0.5% of a multivalent cation salt into a borehole;
- forcing said salt solution into the formation surrounding said borehole;
- displacing said salt solution from said borehole;
- placing an alkali metal silicate solution which has a pH

less than 12.0 containing at least 12 percent by weight silica within said borehole;

- forcing said silicate solution into said formation;
- displacing said silicate solution from said borehole;
- placing an aqueous cement slurry containing at least 2 percent by weight of a water soluble multivalent cation salt within said borehole; and
- forcing said cement to contact said surface of said borehole.

4,014,175

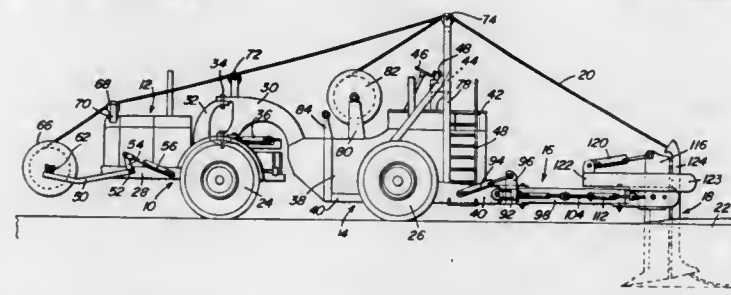
# CABLE AND PIPE LAYING MACHINE

Douglas F. Brink, P.O. Box 1186, Rapid City, S. Dak. 57701  
Filed May 5, 1975, Ser. No. 574,321

Int. Cl.<sup>2</sup> F16L 1/00

U.S. Cl. 61-72.6

6 Claims



1. A cable and pipe laying machine for direct underground burial of flexible cables, pipes, lines and the like comprising a front powered unit, a rear powered unit and means articulately interconnecting the front and rear powered units, each of said units including a prime mover and driven traction means, only said rear powered unit including an operator's station thereon by which the machine may be controlled, a drawbar assembly attached to the rear of the rear powered unit and a cable laying plow attached to said drawbar assembly in position for observation from the operator's station, said articulate connecting means including power means to vary the angular relation between the front powered unit and rear powered unit for steering control of the machine, said operator's station being disposed rearwardly of the interconnecting means to enable forward observation of the front unit and the angular relation between the units for effective steering control of the machine by a single operator, said drawbar assembly including an elongated boom, an adapter in the form of a body connected to the forward end of the boom by a vertical pivot pin to enable swinging movement of the boom about a vertical axis, transverse pin means connecting the body to the frame of the rear powered unit for pivotal movement about a transverse axis, said cable plow being connected to the rearward end of the boom, and an adapter in the form of a block interconnecting the rearward end of the boom and the cable plow, a vertical pin connecting the block to the boom to enable pivotal movement of the block about a vertical axis and a transverse pin connecting the cable plow to the block enable pivotal movement of the cable plow about a transverse horizontal axis, said cable plow including a vertically disposed share having guide means thereon for guiding a cable downwardly into a trench formed by the plowshare, and power operated means for varying the body, boom, block and cable plow about their various axes of movement.

4,014,176

# METHODS AND APPARATUS FOR APPLYING BUOYANT FORCES TO OFFSHORE TOWER LEGS AND PROVIDING AND ENCLOSING BUOYANCY CHAMBERS

Jay B. Weidler, Jr., Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed Sept. 4, 1975, Ser. No. 610,277

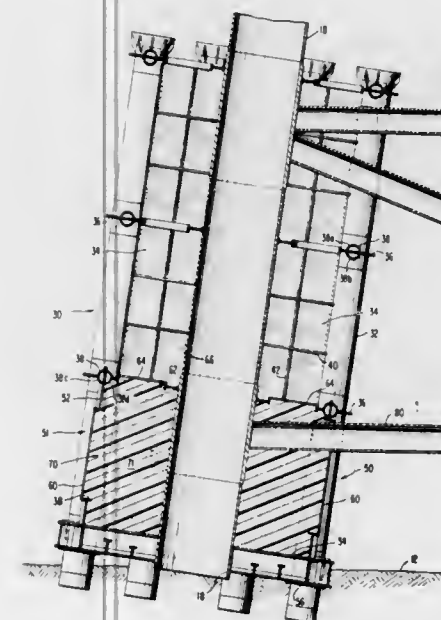
Int. Cl.<sup>2</sup> E02B 17/00

U.S. Cl. 61-87

16 Claims

1. An offshore tower assembly having a support frame structure arranged to be disposed on the bed of a body of water, said support frame structure comprising:

a plurality of legs;  
a plurality of piling guides disposed around and connected to at least one of said legs, said piling guides being operable to telescopically receive piling members for anchoring said frame structure to said bed of said body of water; and  
a buoyancy unit disposed at a lower portion of at least said one of said legs, said buoyancy unit comprising walls means defining a chamber encircling said one of said legs, and  
a plurality of generally upright fins extending generally radially outwardly from said one of said legs to divide said chamber into a plurality of circumferentially displaced buoyancy cells arranged about said one of said legs for the reception of a buoyant medium



said fins being connected to said piling guides and operable to transmit forces in a generally uniform manner between said one of said legs and said piling guides connected thereto by way of said fins

said plurality of buoyancy cells  
being contiguous with and radiating outwardly from said one of said legs,  
being individually operable to define separate, buoyancy medium containing chambers,  
being circumferentially interspersed between said piling guides;  
said plurality of fins  
defining force transmitting means extending directly between said one leg and said piling guides, and  
circumferentially alternating with and separating said plurality of buoyancy cells.

4,014,177

# MARINE PIER HAVING DEEPLY SUBMERGED STORAGE CONTAINER

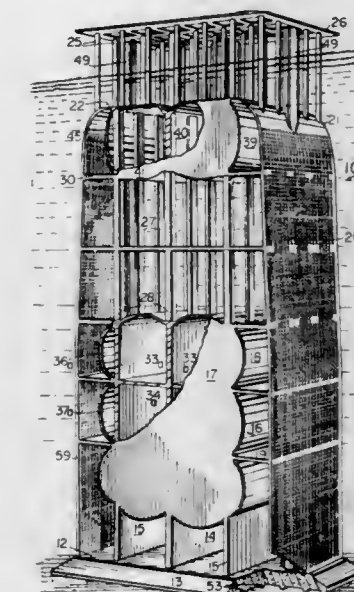
Gerard Eugene Jarlan, Versailles, France, assignor to Canadian Patents and Development Limited, Ottawa, Canada  
Continuation-in-part of Ser. No. 503,079, Sept. 6, 1974. This application Sept. 26, 1975, Ser. No. 617,091  
Int. Cl.<sup>2</sup> B65G 5/00; B63B 35/00; E02D 17/00

U.S. Cl. 61-87

50 Claims

1. A marine pier structure for sited in the sea on a seabed in depth at least 400 feet, comprising a base slab of rectangular plan form, spaced parallel upright load-carrying walls rising from the base, a container body having parallel plane end walls and a convexly-lobed side wall integrally joined with said end walls and together enclosing a space, said upright walls extending through said container body and supporting said container body in spaced relation above said base and terminating in the sidewall at its upper surface, a system of tubular

vertical columns arrayed in parallel files along said terminations of said upright walls and extending to a height near the sea surface, a pair of upright flanking load-carrying walls spaced symmetrically to either side of and parallel with said upright walls a distance about 60 feet from the container side wall, a top wall joining the upper extremities of said flanking walls and a series of tiers of tubular brace members orthogonally disposed to said flanking walls and to said vertical columns



umns and monolithically joined therewith, said flanking walls being extensively perforated by a large multiplicity of regularly distributed transverse jet-guiding channels opening through the walls, having a combined cross-sectional channel area at least about 30% of the elevational area of the walls, a deckwork supported on said upright walls and vertical columns above the sea, and an enclosed chamber integral with said vertical columns having an internal space intersected by said tubular vertical columns.

4,014,178

# REFRIGERATOR TEMPERATURE CONTROLS

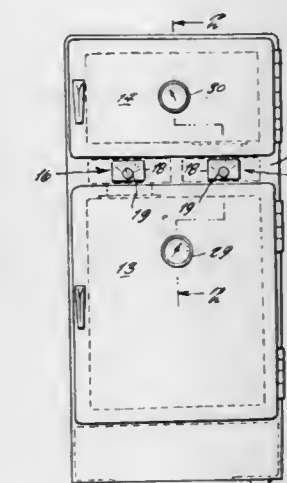
John D. Kells, 1678 71st St., Brooklyn, N.Y. 11204

Filed May 3, 1976, Ser. No. 682,569

Int. Cl.<sup>2</sup> F25B 21/02, 49/00; F25D 11/02, 13/02

U.S. Cl. 62-3

3 Claims



1. In a refrigerator incorporating exterior temperature control means, the combination of a refrigerator having a cool compartment and a freezer compartment, a front door for each said compartment, a control panel for each said compartment located on an exterior wall of said refrigerator, each said control panel including a fixed, temperature calibrated dial with rotatable knob having an attached indicating needle,



constituting means to select and maintain a desired temperature level for its respective compartment in conjunction with a thermo electric mechanism, a temperature insulated space embodied in the refrigerator, convenient to the cool compartment and freezer compartment thereof, said space divided into two chambers, temperature insulated from each other, said chamber housing an externally controlled thermostatic element, each chamber having an air conduit, opening into its respective compartment.

4,014,179

## AIR CONDITIONING SYSTEM FOR AIRCRAFT

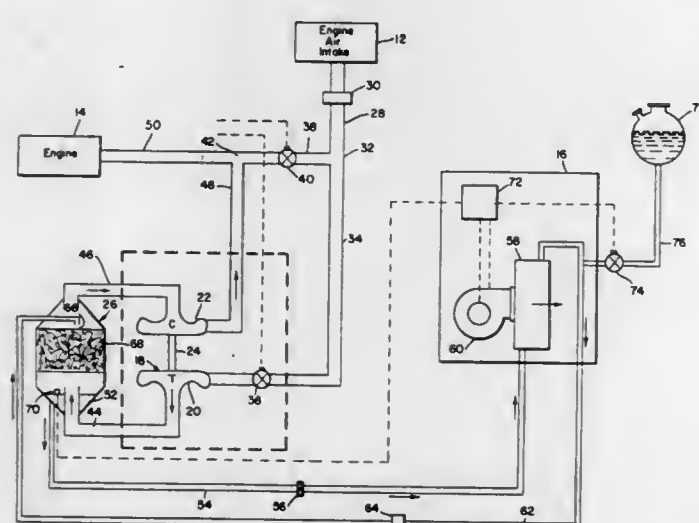
Thomas L. Iles; Kwang-Chou Hwang, both of Rancho Palos Verdes, and Robert C. Kinsell, Los Angeles, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 29, 1975, Ser. No. 609,127

Int. Cl.<sup>2</sup> F25B 9/00

U.S. Cl. 62—88

14 Claims



1. In combination:  
an enclosure containing air;  
an engine having an air intake source of air at substantially ambient pressure;  
turbine means for receiving air from the source and expanding the air to reduce its temperature and pressure;  
a first heat exchanger means for receiving air from the turbine means for cooling a working fluid in the heat exchanger;  
compressor means driven by the turbine means for compressing air from the heat exchanger and feeding the air to the engine air intake;  
a second heat exchanger;  
means for circulating working fluid between the first and second heat exchangers; and  
means for circulating air from the enclosure through the second heat exchanger.

4,014,180

## METHOD FOR MAKING A REMOTE CONTROLLED SUB-SEA PIPE CONNECTION

James A. Kelly; Thomas J. Ames, both of Houston, Tex.; Glen E. Lochte, Asker, Norway, and Burlie R. Bowen, Houston, Tex., assignors to Hydro Tech International, Inc., Houston, Tex.

Filed Nov. 21, 1975, Ser. No. 633,965

Int. Cl.<sup>2</sup> B23K 37/04; F16L 23/00

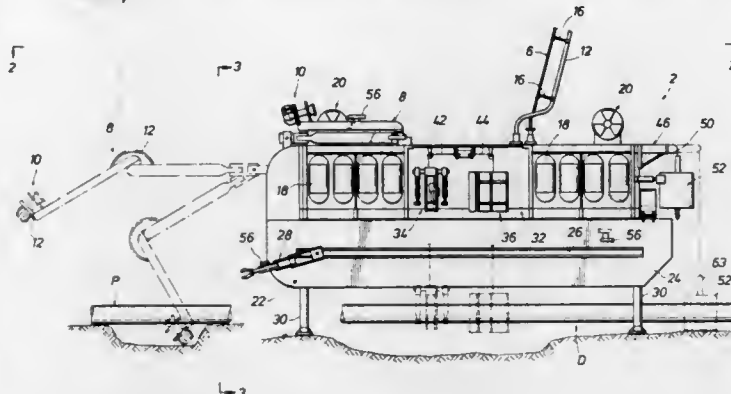
U.S. Cl. 61—110

9 Claims

1. A method of repairing a damaged section of a pipeline on a sea bottom remotely controlled from the sea surface comprising the steps of:

supporting a pipe cutter on a remote controlled first vehicle;  
lowering said first vehicle toward said damaged pipeline section with said pipe cutter supported thereon;  
cutting said pipeline on opposite sides of said damaged pipe section by remotely operating said pipe cutter via said first vehicle;

lowering a remote controlled second vehicle toward said damaged pipe section;  
removing said damaged pipe section with said second vehicle to thereby expose a pair of spaced pipe ends;  
lowering with said second vehicle a pipe spool-piece having opposed ends disposable adjacent to said spaced pipe ends;



providing two pairs of mateable coupling halves, each pair being capable of connecting together respective ends of said pipe and said spool-piece;  
installing a coupling half of each pair onto respective ends of said pipe and said spool-piece, and  
connecting said coupling halves of each pair together and to the respective ends of said pipe and said spool-piece by remotely operating said second vehicle to thereby effect said pipe connection between said spaced pipe ends.

4,014,181

## AIR CONDITIONING METHODS AND APPARATUS

Manfred Rolf Burger, Wolfratshauser Strasse 45/1, 8023 Pulach, Germany

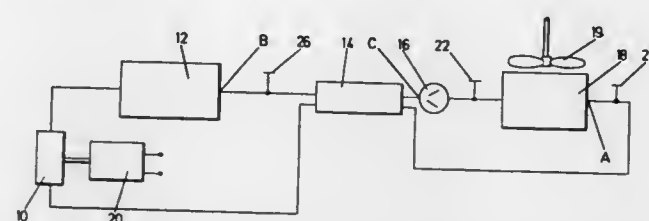
Filed Oct. 22, 1975, Ser. No. 624,893

Claims priority, application Germany, Nov. 5, 1974, 2452508; May 23, 1975, 2522967

Int. Cl.<sup>2</sup> F25B 45/00

U.S. Cl. 62—114

13 Claims



1. In a closed-circuit cooling process in which a working fluid is successively compressed, condensed through the removal of heat, expanded, and vaporized by take-up of heat from a fluid to be cooled, before being again compressed, the improvement comprising the steps of providing a working fluid by mixing a refrigerant, having a boiling point within the range 0° to 60° C at atmospheric pressure, with air having a partial pressure prior to use and throughout at least a major part of the volume of the circuit, of not less than 0.05 atmospheres absolute.

4,014,182

## METHOD OF IMPROVING REFRIGERATING CAPACITY AND COEFFICIENT OF PERFORMANCE IN A REFRIGERATING SYSTEM, AND A REFRIGERATING SYSTEM FOR CARRYING OUT SAID METHOD

Eric G. U. Granryd, Slatthalsvagen 2, S-183 64 Taby, Sweden

Filed Oct. 7, 1975, Ser. No. 620,364

Claims priority, application Sweden, Oct. 11, 1974, 7412825

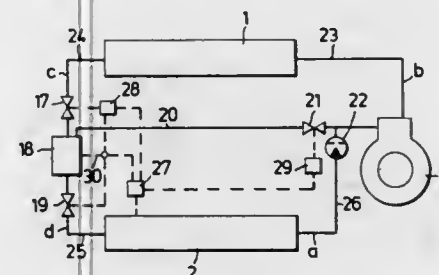
Int. Cl.<sup>2</sup> F25B 5/00, 41/00, 1/10

U.S. Cl. 62—117

16 Claims

1. A method of improving refrigerating capacity and coefficient of performance in a refrigerating system comprising an

cient of performance in a refrigerating system comprising an evaporation apparatus, a condenser apparatus, and a compressor apparatus the latter being adapted for sucking in via a first conduit means and compressing refrigerant evaporated in the evaporation apparatus for transferring the compressed refrigerant via a second conduit means to the condenser apparatus, from which a regulated amount of condensed refrigerant is transferred to at least one closed vessel, said amount not being sufficient to fill the vessel, the closed space above the liquid level in the vessel being connected via a third conduit



means to the suction side of the compressor, there being a fourth conduit means for supplying refrigerant to the evaporation apparatus from the vessel, characterized in that communication through said third conduit means is opened for a regulated period of time to lower the pressure in the vessel and to cause the refrigerant therein to boil, that communication through said first conduit means is kept closed during the main portion of this period of time and that thereafter communication through said third conduit means is closed and communication through said first conduit means is opened.

4,014,183

## ABSORPTION REFRIGERATOR OF NATURAL CIRCULATION TYPE

Toshihiro Ishibashi, and Satoshi Naito, both of Kosai, Japan, assignors to Yazaki Sogyo Kabushiki Kaisha, Tokyo, Japan

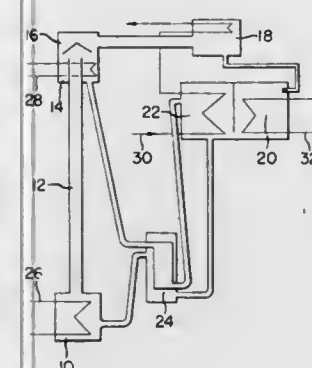
Filed June 11, 1975, Ser. No. 586,041

Claims priority, application Japan, July 2, 1974, 49-75020

Int. Cl.<sup>2</sup> F25B 15/00, 33/00

U.S. Cl. 62—476

1 Claim



1. An absorption refrigerator of natural circulation type employing water as a refrigerant and lithium salt as an absorbing medium comprising generating means for expelling water vapor from an aqueous solution of lithium salt, a separator for separating the expelled water vapor from the concentrated lithium salt solution, a condenser for condensing the water vapor separated in said separator; an evaporator having a second refrigerant flowing therethrough for vaporizing the water condensed in said condenser and thereby cooling the secondary refrigerant flowing therethrough by the latent heat of vaporization of water; and an absorber for reintroducing the water vapor vaporized in said evaporator into the concentrated lithium salt solution, characterized in that the generating means comprises a first generator for expelling water vapor from the aqueous solution of lithium salt to lift the lithium salt solution through a gas-liquid lift according to the principle of an air lift pump for the purpose of causing the

natural circulation of the lithium salt solution, a second generator connected by said gas-liquid lift to said first generator for concentrating the lithium salt solution fed thereto by heating it so as to expel additional water vapor therefrom to concentrate said lithium salt solution to the predetermined concentration, and wherein the ratio between the quantity of heat  $Q_1$  applied to said dilute lithium salt solution in said first generator and the total quantity of heat  $Q_2$  applied to the system is selected to be equal to the ratio  $(\epsilon_2 - \epsilon_1)/(\epsilon_3 - \epsilon_1)$ , where  $\epsilon_1$  is the original concentration of said dilute lithium salt solution,  $\epsilon_2$  is the concentration of said lithium salt solution heated to boil in said first generator, and  $\epsilon_3$  is the concentration of said concentrated lithium salt solution.

4,014,184

## PROPELLER SHAFT LINER AND INSERTING APPARATUS

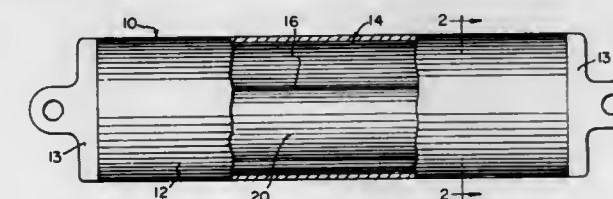
Martin H. Stark, 109 N. Wheeler, Saginaw, Mich. 48602

Filed Jan. 27, 1975, Ser. No. 544,236

Int. Cl.<sup>2</sup> F16C 1/00

U.S. Cl. 64—1 V

11 Claims



1. A liner for a hollow, cylindrical member having a bore of predetermined diameter, said liner comprising a tube of flexible material and of substantially uniform wall thickness, said tube having an outside diameter greater than that of said bore, the entire cross section of the wall of said tube being radially deformed to provide a plurality of longitudinally extending, circumferentially spaced, concavo-convex grooves which enable a resiliently resisted, radial compression of said tube at said grooves to a lesser outside diameter sufficient to permit insertion of said tube in said bore.

4,014,185

## METHOD OF MANUFACTURING KNITTED LONG-PILE FABRICS AND FABRICS MADE BY THE METHOD

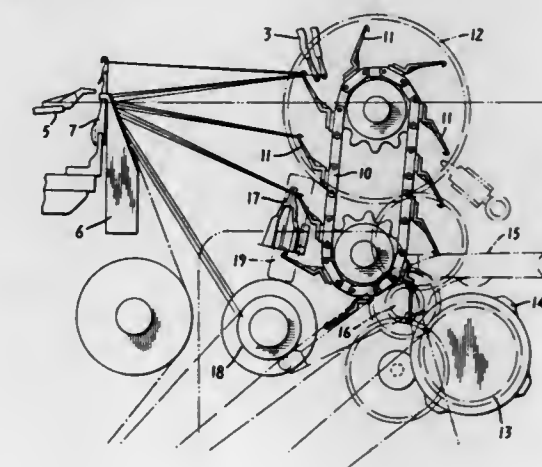
Tsutomu Kaido, Sakai; Seiichi Asahi, Ashiya, and Sinjiro Nishikawa, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Sept. 19, 1974, Ser. No. 507,612

Int. Cl.<sup>2</sup> D04B 23/06, 23/08, 23/10, 23/12

U.S. Cl. 66—84 R

8 Claims



1. A Warp knitting machine for knitting long-pile fabrics, comprising means for knitting ground stitches including latch needles and guide bars for ground yarn, guide bars for pile yarn provided separately from the guide bars of said means for knitting ground stitches, and means for cutting pile loops



provided at a variable distance in front of said means for knitting ground stitches and including a pile cutting device and a hook needle unit comprising a plurality of hook needle blocks attached to endless conveyer chains and movable in an endless intermittent revolution, said guide bars for pile yarn being movable in a swinging motion back-and-forth between the rear of the position where ground stitches are formed and the front of a hook needle block of said hook needle unit so as to dispose pile yarns between the latch needles of the means for knitting ground stitches and the hook needles on the hook needle block thus to incorporate the pile yarns into the ground stitches in the form of pile loops, said hook needle unit being operable to hang said pile yarns on hook needles on a hook needle block and to shift one pitch after a knitting cycle is completed to set the next hook needle block in position, and said pile cutting device being operable to cut the pile loops under a tension-free condition at least one cycle later than the loop formation.

4,014,186

#### METHOD OF FORMING A CLOSED END ON A KNITTED TUBULAR FABRIC

Luigi Ferraguti, Condove (Turin), Italy, assignor to Matec S.p.A., Scandicci (Florence), Italy

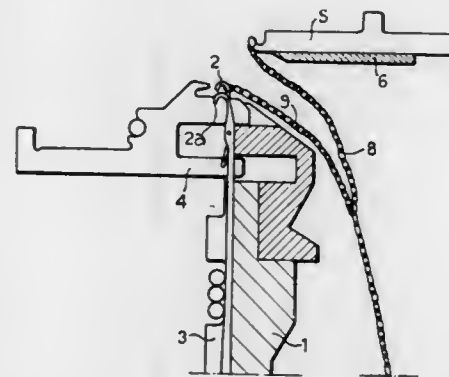
Filed Jan. 2, 1976, Ser. No. 646,104

Claims priority, application Italy, Mar. 12, 1975, 67621/75

Int. Cl.<sup>2</sup> D04B 15/02, 9/54, 9/56

U.S. Cl. 66—95

4 Claims



3. A method for forming a closed end on a tubular knitted fabric, particularly on a stocking, on a circular knitting machine having a single cylinder and a cooperating circular dial, wherein, after the last row of tubular fabric has been formed by the needles slidably assembled in grooves in the lower cylinder, an inner and an outer annular tubular layer are formed as continuations of the tubular fabric, the loops at the free edge of the inner layer are held on support members arranged in a circle and the free edge of the outer tubular layer is held by the needles of the said cylinder until a relative rotation of at least 180° between the said circle of support members and the said cylinder has been effected, when the loops held on the said support members are transferred to the needles of the said cylinder for the making of a final few turns or rows of substantially runproof close knitting before the fabric is cast-off from the needles,

wherein the improvement consists in forming the double fabric of the toe by the use of the needles carried by the said cylinder successively in two sections, the inner layer being formed first by some of the needles of said cylinder, the outer layer then being formed by the remaining needles of the said cylinder whilst the free edge of the inner layer remains held on the support members arranged in a circle above said cylinder.

#### 4,014,187 FABRIC SPREADER FOR CIRCULAR KNITTING MACHINE

Rudolf Bandoch, Bilovice; Miroslav Marecek, and Otto Rotkerl, both of Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

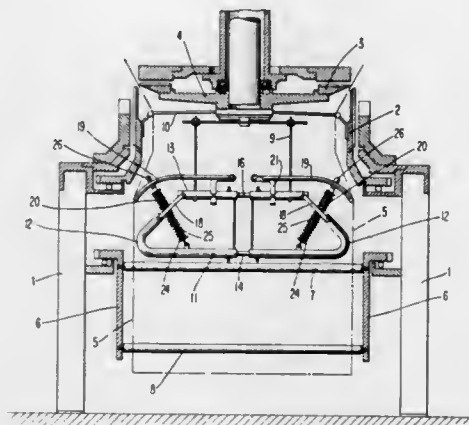
Filed Sept. 11, 1974, Ser. No. 505,002

Claims priority, application Czechoslovakia, Sept. 12, 1973, 6301/73

Int. Cl.<sup>2</sup> D04B 35/00

U.S. Cl. 66—147

5 Claims



1. In a fabric spreader for goods knitted on a circular knitting machine, said machine having a system of main knitting elements and means for taking up the knitted goods under tension, the fabric spreader being disposed between the main knitting elements and the take-up means, the fabric spreader comprising a flat expanding frame adjustable in width, a plurality of flat expanding wings carried by the frame and situated transverse to the taken-up knitted goods, means coupled to an inner portion of each wing for slidably mounting the associated wing for transverse movement on the frame, additional means associated with the slidable mounting means for pivotally supporting the associated wing on the frame, and means individually connected to respective portions of each wing and independent of the slidable mounting means and the pivotal supporting means for adjustably spring-loading the associated wing on the frame against the force exerted on such wing by the taken-up goods.

4,014,188

#### PANTY HOSE WITH IMPROVED WAIST OPENINGS

Paolo Conti, Via Neri di Bicci 14, and Massimo Bianchi, Via Bisenzio 33, both of Florence, Italy

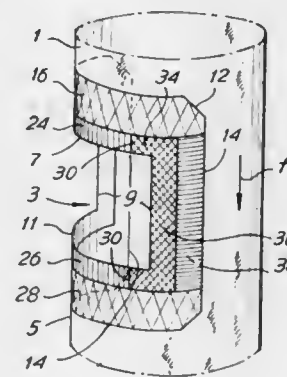
Filed Apr. 12, 1974, Ser. No. 460,582

Claims priority, application Italy, Apr. 13, 1973, 9420/73

Int. Cl.<sup>2</sup> A41B 9/14; D04B 1/00

U.S. Cl. 66—177

5 Claims



1. A knit construction for the waist portion of a one-piece panty hose comprising a tubular knit portion of body yarn having a generally rectangular waist opening including upper and lower transverse edges and a pair of longitudinal side

edges therein, said body yarn being sheared longitudinally along said longitudinal side edges, said waist opening extending partially around the circumference of said tubular portion, an additional yarn comprising an elastic yarn knitted in selected courses in an outer transverse edge zone above and below each transverse edge of said opening, an inner transverse edge zone immediately adjacent each transverse edge of said opening having selected courses with stitches alternated with tuck stitches whereby the fabric along the edges of said opening offers a high degree of elasticity and a tendency to roll up, and longitudinal outer edge zones including courses having stitches with both elastic and non-elastic yarns alternated with courses having a first non-elastic yarn and a supplementary reinforcing yarn.

4,014,189

#### HOSE KNITWORK HAVING A CLOSED TOE PORTION

Pavel Uhlir, Trebic, Czechoslovakia, assignor to Elitex, Zavody textilniho strojirenstvi, generalni reditalstvi, Liberec, Czechoslovakia

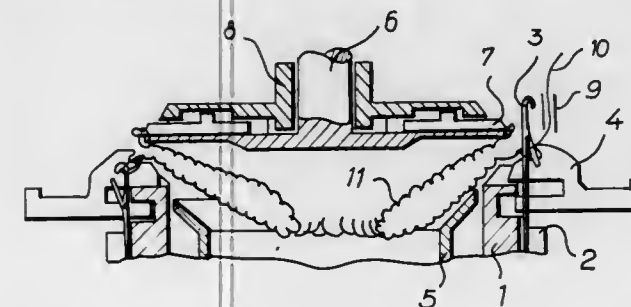
Filed June 25, 1974, Ser. No. 482,851

Claims priority, application Czechoslovakia, June 29, 1973, 4723/73

Int. Cl.<sup>2</sup> D04B 9/54, 9/56

U.S. Cl. 66—187

5 Claims



1. In a knitwork hose, a closed toe portion consisting of a generally symmetrically shaped pocket formed by a pair of marginal end sections and a central section each having a combination of courses of loop wales less than the number in the remainder of the knitwork hose, each of said marginal end sections having an equal number of loops in the same course section, said central section having a higher number of loops in some of said wales and a lower number of loops in the other of said wales in the same course length whereby the stitch density of the central section is less than the stitch density of the marginal sections, said toe being constricted about substantially the center of said central section to close the same and one of said end sections being doubled over the other and secured together the edges thereof to form said pocket.

4,014,190

#### WARP KNITTED FOUNDATION FOR SLIDING CLASP FASTENERS

Fumio Terada; Yoshio Matsuda, and Yoshiharu Yamaguchi, all of Uozu, Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 202,083, Nov. 26, 1971, Pat. No.

3,848,556. This application Oct. 1, 1973, Ser. No. 402,379

Claims priority, application Japan, Dec. 4, 1970, 45-108006; Dec. 4, 1970, 45-108007

Int. Cl.<sup>2</sup> D04B 21/16

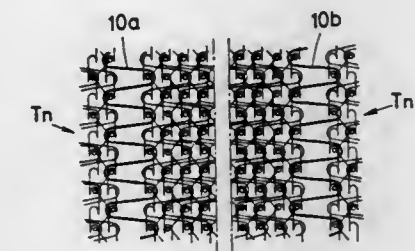
U.S. Cl. 66—195

7 Claims

1. A fabric having a warp-knitted structure including a plurality of seams joined by a plurality of water-soluble synthetic fibers disposed in a transverse direction of the fabric at predetermined intervals and extending longitudinally of the fabric, said plurality of water-soluble synthetic fibers comprising first fibers soluble at a first temperature and second fibers soluble at a second temperature higher than the first tempera-

ture, ones of said first and said second fibers being alternately disposed in a transverse direction of the fabric.

4. A composite fabric structure comprising, in combination:  
a. a plurality of elongated fabric webs each having a pair of opposed longitudinal edges;  
b. a plurality of soluble threads soluble at a first temperature joining pairs of said elongated fabric webs together along



adjacent parallel longitudinal edges of said elongated fabric webs; and  
c. a plurality of soluble threads soluble at a second temperature higher than said first temperature joining said pairs of joined elongated fabric webs together along adjacent parallel longitudinal edges of said pairs of joined elongated fabric webs.

#### 4,014,191 COMBINATION LOCK

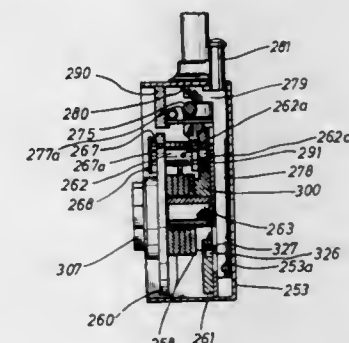
Richard P. Harrington, and Russell J. Harrington, both of P.O. Box 474, Mountainburg, Ark. 72946

Continuation-in-part of Ser. No. 479,164, June 13, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,450

Int. Cl.<sup>2</sup> E05B 37/06

U.S. Cl. 70—25

24 Claims



13. A combination lock comprising a housing, a U-shaped bolt having its legs extending into the housing when in its locked position and having one end clear of the housing when in its unlocked position, means holding the bolt in its locked position, fence means including a fence, said fence means being movable between a first position in which the bolt is in its locked position and a second position moving the bolt holding means out of holding engagement to allow the bolt to move to the unlocked position, a plurality of disc-shaped tumblers mounted in side-by-side relationship for rotation around a common axis, each tumbler having a protrusion on its periphery and a gate to receive the fence when the tumbler is in a preselected position, a rotatable dial with a circular, graduated face, means mounting the dial for rotation around an axis perpendicular to the face, a ratchet drum extending across the tumblers and movable by the dial along the outer periphery of the tumblers as the dial is rotated, a plurality of pairs of lugs spaced longitudinally along the ratchet drum with each pair in alignment with one of the tumblers, each pair having one lug in alignment along the drum with one lug of all of the other pairs so that in one position of the ratchet drum one lug of each pair will engage the protrusions and all tumblers will be rotated with the dial to allow the rotation of the dial to bring all tumblers to a predetermined relative predial-



ing position, said other lug of each pair being spaced circumferentially around the ratchet drum different distances from the first lug, means to rotate the ratchet drum on its axis each time the dial is moved in one direction back to a preselected position to position the lugs with the first lug of each pair in position to engage the tumbler with which it is aligned to allow the tumblers to be rotated to said preselected relative predialing position and then successively rotate each tumbler individually in accordance with the combination of the lock to allow the gates of the tumblers to be positioned to receive the fence of the fence means and allow the fence means to move to its second position and move the bolt holding means out of holding engagement with the bolt.

4,014,192

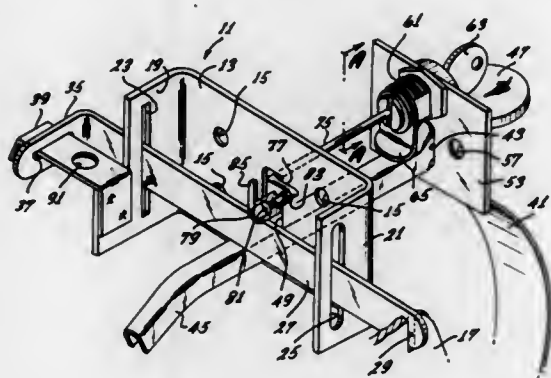
## KEYED GATE LATCH

James C. Dillon, Santa Ana, and Milton Robins, Marina del Rey, both of Calif., assignors to PTI-DOLCO, Los Angeles, Calif.

Filed Dec. 12, 1975, Ser. No. 640,181  
Int. Cl.<sup>2</sup> E05B 65/00

U.S. Cl. 70—77

12 Claims



1. A gate latch for cooperation with a latch strike comprising
  - a latch body having
    - means thereon about which a latch bolt may be pivotally moved to engage the bolt and the latch strike,
    - a latch bolt pivotally supported therein and extending beyond at least one end of said body for cooperation with a latch strike,
    - lever means extending into said body for selective actuation of said latch bolt to disengage the latter from the latch strike, said lever including
      - means for actuating said lever means from the side of the gate opposite to that upon which said body is mounted,
  - means for selectively prohibiting actuation of said actuating means without limiting actuation of said latch bolt, and
  - means for selectively prohibiting actuation of said latch bolt from the side of the gate opposite to that upon which said latch body is mounted including
    - lock means which may be locked and unlocked from the side of the gate opposite to that upon which said latch body is mounted, and
    - means actuated by said lock means into abutment with said latch bolt when said lock means is locked for prohibiting disengagement therefrom from the latch strike including
      - abutment means mounted for rotation, about an axis, in the plane of said latch bolt,
      - means for supporting said abutment means for such rotation and for movement out of the plane of said latch bolt, and
      - biasing means for urging said abutment means into the plane of said latch bolt.

4,014,193

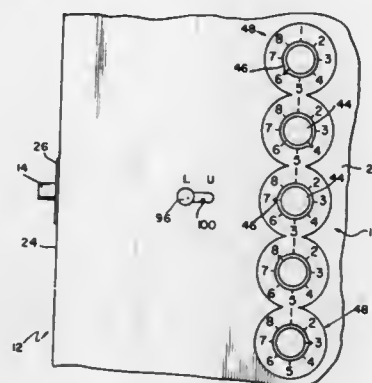
## LOCKING MECHANISM

Clinton L. Carter, 9510 E. Southport Road, Indianapolis, Ind. 46259

Continuation-in-part of Ser. No. 494,080, Aug. 2, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,152  
Int. Cl.<sup>2</sup> E05B 37/16

U.S. Cl. 70—288

7 Claims



1. A locking mechanism for releasably locking closure apparatus, comprising a plurality of shafts each mounted for rotation about its own axis and for axial movement along its own axis, said shafts each having one end accessible from the outside of the apparatus and a portion inaccessible from the outside of the apparatus; a plurality of disk members each having a radial passage formed therein and mounted on the inaccessible portion of said shafts for rotational and axial movement therewith, each of said disk members having a plurality of disk sections with each of said disk sections having a plurality of radially open shallow recesses and one of said sections having said radial passage formed therein, and means for releasably retaining said sections together in a predetermined rotational and axial relation; dial means connected to the accessible end of each of said shafts and associated with radial indicia and axial indicating means to allow selective rotational and axial positioning of the passages in said disk members; a carriage slidably mounted adjacent said disk members and inaccessible from the outside of the apparatus; a plurality of pins mounted on said carriage and slidably receivable simultaneously into the passages in said disk members when said passages are rotationally and axially aligned therewith; a locking bolt carried on said carriage; and lever means connected to said carriage and operable from the outside of the apparatus to slidably move the carriage between a locked position with said bolt disposed to lock said apparatus and an unlocked position with said pins each received in the radial passage in one of said disk members.

4,014,194

## MECHANICAL PUSH BUTTON LOCK

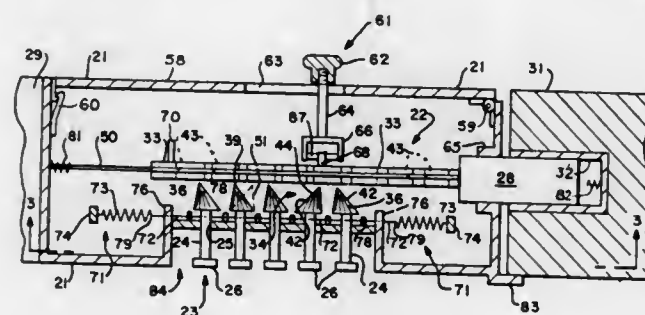
Susan Nilson Hartman, 20 Binnacle Hill, Oakland, Calif. 94618

Filed Jan. 7, 1976, Ser. No. 647,045

Int. Cl.<sup>2</sup> E05B 37/16

U.S. Cl. 70—313

5 Claims



1. A mechanical push button lock including a housing, a lock bolt slidably mounted to said housing for reciprocation to and from a locked position and an unlocked position, a plural-

ity of push buttons mounted to said housing and extending outwardly thereof, said push buttons each being mounted for inward displacement with respect to said housing when manually pressed, lock bolt actuating means movably mounted to said housing and coupled to said bolt for the transmission of motion thereto, and a plurality of motion inducing elements with one of said elements being connected to each of said plurality of push buttons, each of said elements being formed for cooperative engagement with said bolt actuating means upon inward displacement of said push buttons and formed to cause movement of said bolt actuating means in a direction causing movement of said bolt, wherein the improvement in said lock comprises:

each of said elements being formed as a conical member having a longitudinally skewed axis, and  
said bolt actuating means being formed as a plate-like member having openings formed therein for receipt of and cooperative engagement of said conical member with a bearing surface defining said opening.

2. A mechanical push button lock including a housing, a lock bolt slidably mounted to said housing for reciprocation to and from a locked position and an unlocked position, a plurality of push buttons mounted to said housing and extending outwardly thereof, said push buttons each being mounted for inward displacement with respect to said housing when manually pressed, lock bolt actuating means movably mounted to said housing and coupled to said bolt for the transmission of motion thereto, and a plurality of motion inducing elements with one of said elements being connected to each of said plurality of push buttons, each of said elements being formed for cooperative engagement with said bolt actuating means upon inward displacement of said push buttons and formed to cause movement of said bolt actuating means in a direction causing movement of said bolt, wherein the improvement in said lock comprises:

spring biasing means coupled to each of said push buttons and formed to bias said push buttons to an outermost position, said spring biasing means being further formed to prevent displacement of more than one push button at any one time.

4. A mechanical push button lock including a housing, a lock bolt slidably mounted to said housing for reciprocation to and from a locked position and an unlocked position, a plurality of push buttons mounted to said housing and extending outwardly thereof, said push buttons each being mounted for inward displacement with respect to said housing when manually pressed, lock bolt actuating means movably mounted to said housing and coupled to said bolt for the transmission of motion thereto, and a plurality of motion inducing elements with one of said elements being connected to each of said plurality of push buttons, each of said elements being formed for cooperative engagement with said bolt actuating means upon inward displacement of said push buttons and formed to cause movement of said bolt actuating means in a direction causing movement of said bolt, at least two of said elements being formed for cooperative engagement with said bolt actuating means to cause movement of said bolt toward said unlocked position, and the remainder of said elements being formed to cause movement of said bolt toward said locked position, wherein the improvement in said lock comprises:

said push buttons being mounted to said housing in at least two rows with one of the elements causing movement of said bolt toward the unlocked position being positioned in each of said rows of push buttons,

said bolt actuating means is formed as a slide plate having a plurality of openings formed therein, said openings being positioned in said slide plate in at least two rows, and at least one row of one of said rows of push buttons and said rows of openings being laterally displaced with respect to the remaining row to require sequential inward displacement of said push buttons to effect movement of said bolt to said unlocked position.

4,014,195

## PILLAR LOCK

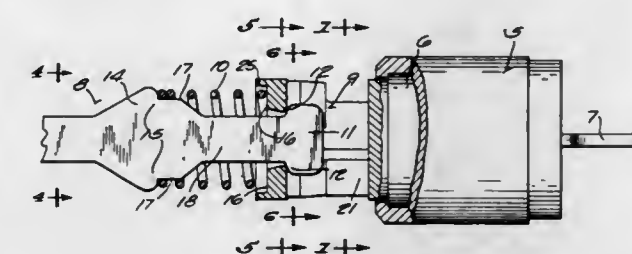
Robert D. Grogan, Brookfield, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed June 14, 1976, Ser. No. 695,990

Int. Cl.<sup>2</sup> E05B 17/04

U.S. Cl. 70—379 R

5 Claims



1. A lock mechanism of the type comprising a lock cylinder rotatable in a casing by means of a proper key that is axially insertable into the cylinder from a front end thereof, and a shaft projecting rearwardly from the cylinder for transmitting rotation of the cylinder to a latch mechanism, said lock mechanism being characterized by:

- A. the shaft being substantially flat and having
  1. an enlarged head at a front end thereof that has edge portions spaced to opposite sides of the axis of the shaft to define rearwardly facing shoulders,
  2. another enlargement spaced to the rear of said head and having edge portions spaced to opposite sides of the shaft axis to define forwardly facing shoulders, and
  3. an elongated neck portion connecting said other enlarged portion with said head;
- B. socket means fixed on the rear end portion of the cylinder and having a rear face formed to provide a spring seat, said socket means also having
  1. a concentric bore opening to said rear face and in which said neck portion is rotatably receivable,
  2. a cavity spaced forwardly of said rear face, to which said bore opens at its front end and in which said head is rotatably receivable,
  3. radially extending grooves at opposite sides of the bore which open forwardly to said cavity and endwise into said bore and in which said head is receivable in one position of rotation of the shaft relative to the socket means, said rearwardly facing shoulders being cooperable with the bottoms of said grooves to confine the shaft against rearward movement relative to the socket means, and said grooves being cooperable with said head to confine the shaft in said one position of rotation relative to the socket means while permitting the shaft to have limited flatwise and edgewise swinging motion, and
  4. an axially extending groove opening to said bore along the whole length thereof and which is in angularly offset relation to said radially extending grooves, said axially extending groove providing for insertion of the shaft into the socket means, to enable said head to be inserted into the cavity when said shaft is in another position of rotation relative to the socket means; and
- C. a coiled expansion spring surrounding said neck portion and reacting between said spring seat on the socket means and said forwardly facing shoulders to confine the head in said radially extending grooves.

4,014,196

## STRAIGHTENING APPARATUS

Axel E. Ogren, 855 S. 12th Ave., La Grange, Ill. 60525

Filed Apr. 6, 1976, Ser. No. 674,120

Int. Cl.<sup>2</sup> B21D 3/16

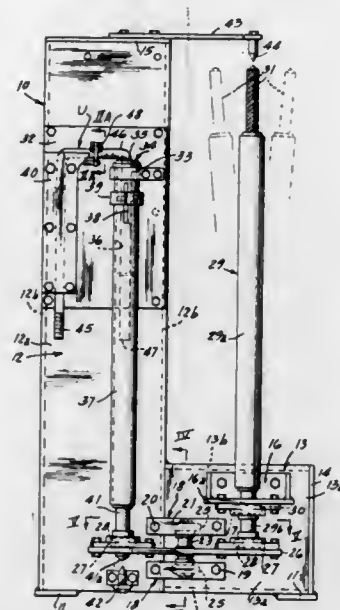
U.S. Cl. 72—316

15 Claims

1. An apparatus for bending metal components into exact desired shapes which comprises a frame, a lever fulcrumed on said frame for tilting in all directions, a fixture on said frame



sized for receiving one end portion of a component to be bent, a socket tube on said frame adjacent said fixture for receiving an opposite end portion of the component to be bent, means on said frame tiltably suspending said socket, and a link con-



necting said lever with said socket to tilt the socket relative to the fixture and thereby bend the end portion of the component in the socket relative to the end portion of the component in the fixture.

4,014,197

## BALL ROUNDING APPARATUS

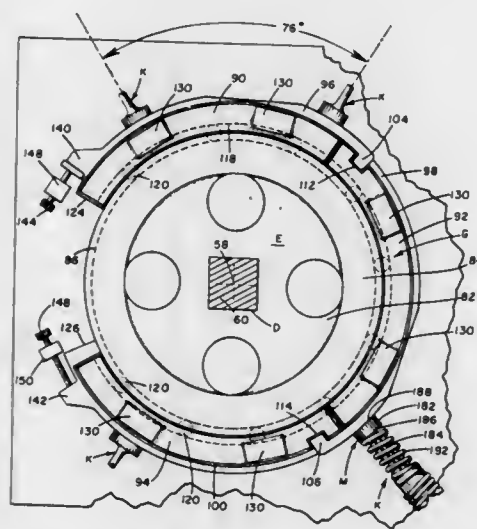
Arthur W. Lupia, El Paso, Tex.; Jesus Gonzalez, Juarez, Mexico, and Garrett Thurman, El Paso, Tex., assignors to Border Steel Mills, Inc., El Paso, Tex.

Filed Feb. 19, 1976, Ser. No. 659,336

Int. Cl.<sup>2</sup> B21H 1/14

U.S. Cl. 72-92

17 Claims



1. Ball rounding apparatus comprising: cooperating inner and outer dies having a path therebetween of generally circular cross-sectional shape lying generally on the periphery of a circle, one of said dies being circumferentially continuous and being rotatable relative to the other of said dies about a longitudinal axis, said other die extending over an arc greater than 180° and less than 360° and being circumferentially segmented for movement toward and away from said axis, biasing means for biasing said other die toward said one die and acting generally radially of said axis, said biasing means including a plurality of circumferentially-spaced spring loaded devices, each said spring loaded device including a reciprocable one-piece plunger having an enlarged generally cylindrical head with an outer substantially flat surface engaging a peripheral surface of said other die, an elongated generally cylindrical shaft extending integrally from said head and having a diame-

ter substantially smaller than said head, said shaft merging into said head at a small smoothly curved radius, guide means for guiding said shaft, a coil spring surrounding said shaft between said head and guide means for yieldably biasing said plunger in a direction for engaging said flat surface of said head with said other die, and adjustment means for adjusting said guide means toward and away from said other die to vary the force with which said spring biases said plunger.

4,014,198

## DRIVE MECHANISM OF A PAIR OF FORGING OR STRETCHING ROLLERS

Karl-Heinz Herrmann, Coburg, Germany, assignor to Langenstein & Schemann Aktiengesellschaft, Coburg, Germany

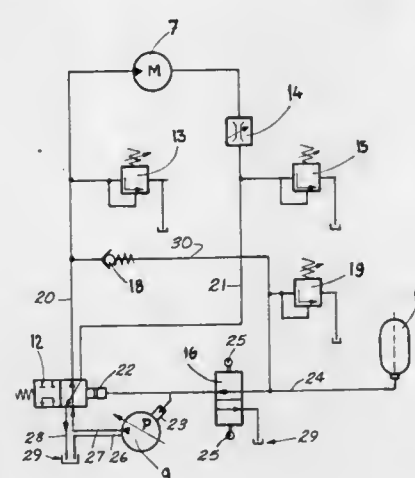
Filed Jan. 12, 1976, Ser. No. 648,020

Claims priority, application Germany, Jan. 10, 1975, 2500756

Int. Cl.<sup>2</sup> B21B 35/00

U.S. Cl. 72-249

5 Claims



1. In a drive mechanism for a pair of rollers comprising a pair of rollers operatively connected with each other; a main drive shaft upon which is mounted one of said rollers; a hydraulic motor engaging said shaft; a flowrate-adjustable axial piston hydraulic pump adjusted by tilting; means for adjusting the flowrate of said pump; pressure fluid; a first connecting means for connecting said hydraulic pump with said hydraulic motor; a fluid reservoir; a second connecting means for connecting said hydraulic motor with said fluid reservoir; a third connecting means for connecting said fluid reservoir with said hydraulic pump; a first switching means interposed in said first and second connecting means for controlling said hydraulic motor; and a main motor operatively connected to and driving said hydraulic pump; the improvement comprising:

said means for adjusting the flowrate of said pump comprises a first hydraulic cylinder; hydraulic means for actuating said first switching means; a fourth connecting means connecting said first connecting means between said first switching means and said hydraulic motor with said fluid reservoir; a check valve in said fourth connecting means; a second switching means operated by means of contacts for simultaneously operating said first hydraulic cylinder and said hydraulic means, said second switching means being interposed in said fourth connecting means between said check valve and said fluid reservoir; a hydraulic accumulator in said fourth connecting means between said check valve and said second switching means; and

said first switching means being arranged so that when said motor is operating, said pressure fluid flows from said pump through said first connecting means to said motor and from said motor back to said fluid reservoir, and when said motor is stopped said pressure fluid only flows from said pump directly to said fluid reservoir, said first and second connecting means being positively isolated from the fluid flow and from each other.

4,014,199

## APPARATUS AND METHOD FOR PROVIDING AN ELECTRICAL CONTACT WITH A TIP PORTION SUBSTANTIALLY FREE OF BURRS

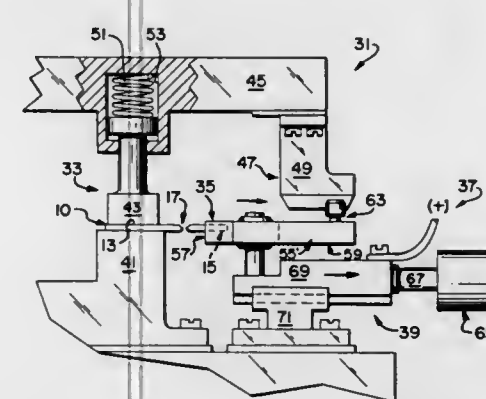
Robert Arthur Coons, Pittsfield; Richard Earl Gipe, and Richard Lee Marks, both of Warren, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 26, 1976, Ser. No. 652,400

Int. Cl.<sup>2</sup> B21D 31/00

U.S. Cl. 72-294

17 Claims



1. A method of providing an electrical contact with a tip portion substantially free of burrs wherein said contact is produced from an elongated strip of metallic material having a substantially uniform cross-sectional area, said method comprising:

positioning said metallic strip on a base member; clamping said metallic strip positioned on said base member at a first location with a movable clamping member; clamping said metallic strip at a second location substantially adjacent said first location with at least two clamping members pivoted about a common axis, each of said clamping members having first and second end portions located on opposing sides of said clamping members from said common pivot axis, said first end portions of each of said clamping members including a jaw portion for engaging said strip, said clamping achieved by engaging each of said second end portions of said clamping members with a movable engagement arm to provide separation thereof causing said jaw portions to engage said strip; heating said metallic strip to an established temperature for a predetermined time period at a third location substantially between said first and second locations; and withdrawing said movable clamping members away from said base member to separate said first and second locations of said metallic strip a pre-established distance to elongate said heated third location and reduce the cross-sectional area thereof until said third location is completely severed, said severed third location defining said tip portion of said electrical contact.

4,014,200

## CLEAT EDGE FORMING MACHINE

Oswald H. Wolters, Rte. 3, Sparta, Ill. 62286

Filed Oct. 24, 1975, Ser. No. 625,543

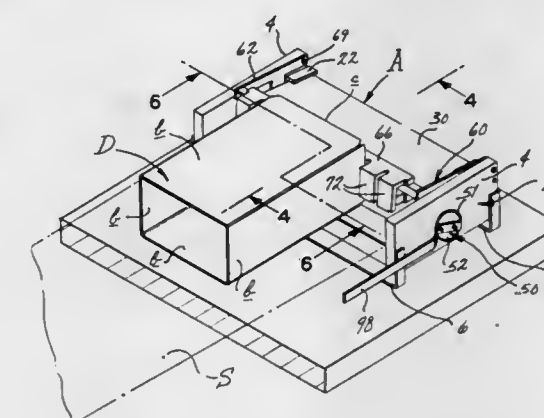
Int. Cl.<sup>2</sup> B21D 25/02

U.S. Cl. 72-315

24 Claims

1. A machine for forming a reversely bent cleat edge on sheet metal, said machine comprising: a frame, an anvil sup-

ported on the frame, the anvil having free edge and being relatively thin in cross-section adjacent to the edge, the anvil providing a first surface against which the sheet metal is positioned with a portion projected over the free edge and also a second surface which is located on the opposite side thereof; a deforming beam supported on the frame and having a forward end located adjacent to the free edge of the anvil and a rear end located remote from the anvil, the beam being movable from an initial position to a final position, the beam when in the initial position having its forward end spaced from the free edge and first surface of the anvil so that the sheet metal when projected over the free edge will be generally between the free edge and the forward end of the beam, the beam when



in its final position having its forward end located generally opposite the second surface of the anvil; and actuating means for moving the beam from its initial to its final position with the forward end being continually presented toward the anvil and the rear end being always located further from the anvil than the forward end, the actuating means moving the beam such that the beam movement is characterized by combined translation and rotation and such that the forward end of the beam passes by the free edge and then along the second surface of the anvil, whereby the portion of the sheet metal projected beyond the free edge of the anvil will be bent over the free edge and then reversely behind the anvil along the second surface thereof to form the cleat edge on the sheet metal.

4,014,201

## APPARATUS AND METHOD FOR FORMING TRUSS TUBULAR WEB COMPONENTS HAVING FLAT SYMMETRICALLY BIFURCATED ENDS

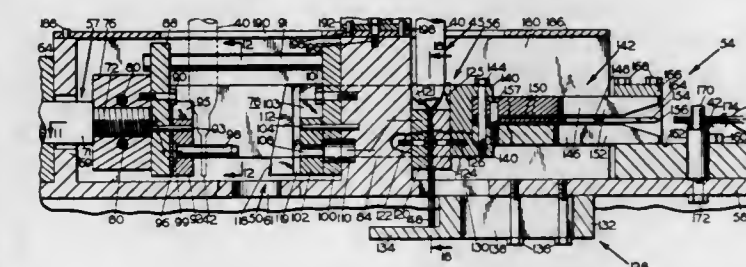
Arthur L. Troutner; Clifford R. Johnson, both of Boise, and Stanley J. Willmorth, Eagle, all of Idaho, assignors to Trus Joist Corporation, Boise, Idaho

Filed Apr. 9, 1976, Ser. No. 675,494

Int. Cl.<sup>2</sup> B21D 28/00

U.S. Cl. 72-332

7 Claims



1. An apparatus for forming a symmetrically bifurcated terminal portion on an existing truss web component having a tubular medial portion and flattened web ends defining medial coupling pin holes, comprising

a. a frame, b. shearing and flattening means located on the frame and configured for shearing the tubing skin from the longitudinal margins of one of the web ends forming two unsupported side walls without flattening of the web ends, and sequentially thereafter flattening the just formed side walls,



- c. splitting means located on the frame configured for indexing the unsupported side walls and separating them relative to one another forming a symmetrically bifurcated terminal portion, and
- d. drive means operatively engaging the shearing means and the splitting means for the activation thereof.

4,014,202

## CRIMPING APPARATUS

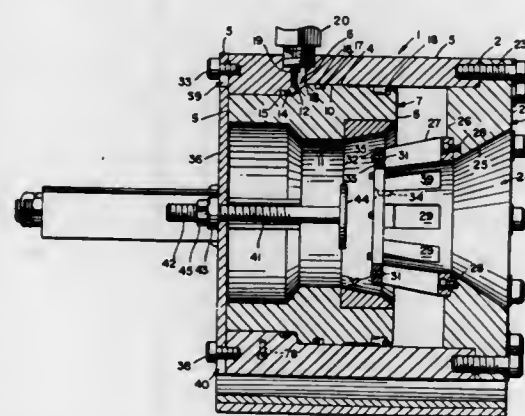
Richard Van Allen, Cary, and Raymond M. Wylie, Wildwood, both of Ill., assignors to Anchor Coupling Co. Inc., Libertyville, Ill.

Filed June 4, 1975, Ser. No. 583,636

Int. Cl.<sup>2</sup> B21J 9/06

U.S. Cl. 72-402

17 Claims



1. Apparatus for crimping a fitting onto an elongated member comprising:

- a cylindrical housing having forward and rear ends and inner and outer walls, said inner wall being offset inwardly at an intermediate point between said forward and rear ends,
- a tubular piston in said cylindrical housing having forward and rear ends and inner and outer walls, said outer wall being offset outwardly complementally to the offset inner wall of said cylindrical housing and said piston being movable longitudinally in said housing from a retracted position in which said offset areas of (a) and (b) are adjacent one another to a forward position in which said offset area of (b) is moved forwardly with respect to the offset area of (a),
- a plurality of crimping dies moving radially together and apart, said tubular piston having means associated therewith to move said dies radially together when the piston moves forward longitudinally, and said piston providing a central passageway to receive said elongated member and a fitting,
- means for introducing and withdrawing a fluid under pressure through the outer wall of said cylindrical housing and the inner wall of said cylindrical housing in the area where said inner wall is offset inwardly so that said fluid will impinge on the offset portion of said outer wall of said piston and cause said piston to move forward longitudinally,
- means for causing said piston to retract and return to its initial retracted position after it has moved forwardly and actuated said dies, and
- mounting means for said cylindrical housing, said apparatus having a detachable stop plate connected to the rear end of said cylindrical housing extending in a plane which intersects the path of said elongated member and fitting when the latter are positioned between the crimping dies.

4,014,203

## EJECTOR MECHANISM FOR EJECTING PRESSED PARTS FROM THE BOTTOM DIE OF PRESS

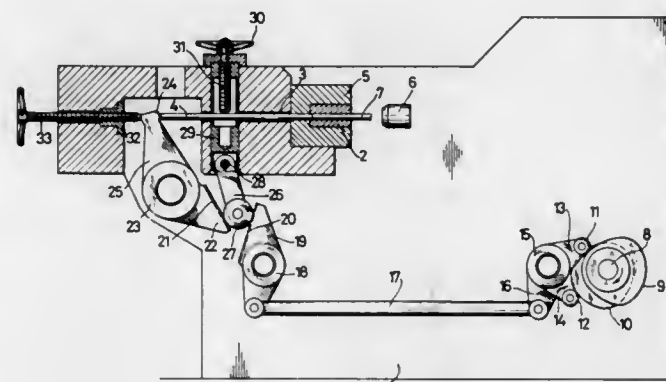
Friedrich-Karl Koch, and Hugo Schneiders, both of Krefeld, Germany, assignors to Peltzer & Ehlers, Krefeld, Germany

Filed June 20, 1975, Ser. No. 588,665

Int. Cl.<sup>2</sup> B21D 45/00

U.S. Cl. 72-427

3 Claims



1. An ejector mechanism for ejecting pressed parts from the die of a machine having a frame, said mechanism comprising, in combination:

- an ejector bolt slidable within the frame of the machine between an initial position and an eject position;
- an ejector lever pivotally mounted on the machine frame and having a first arm that engages a rear end of said ejector bolt so as to cause the latter to slide from said initial position to said eject position when the lever is rocked in one direction, said ejector lever having a second arm with a generally radially extending planar surface provided thereon;
- an intermediate lever pivotally mounted on the machine frame adjacent said ejector lever and rotatable within substantially the same plane as the ejector lever, said intermediate lever having a first arm extending alongside said second arm of the ejector lever and having a generally radially extending planar surface provided thereon on the side facing said planar surface on said second arm of the ejector lever, the planar surface on said first arm of said intermediate lever converging at an acute angle with the planar surface on said second arm of said ejector lever when said ejector bolt is in said initial position;
- said intermediate lever also having a second arm projecting from the pivot axis;
- a coupling rod connected to one end to said second arm of said intermediate lever;
- cam means for reciprocating said coupling rod;
- a slide member slidably mounted on the machine frame for movement toward or away from the converging planar surfaces;
- roller means swingably suspended from said slide member, said roller means riding on both of said planar surfaces and serving to provide a movable pressure contact point between said first arm of said intermediate lever and said second arm of said ejector lever;
- adjustable means engaging a back side of said first arm of the ejector lever; and
- means on the frame of the machine for slidably adjusting the position of said slide member, thereby moving said roller means along said planar surfaces so as to increase the effective moment arm of one of the levers while decreasing the effective moment arm of the other lever.

4,014,204

## MACHINE FOR PROCESSING METAL IN SHEET OR PLATE FORM

Eduard Alexander Hanni, Zofingen, and Vaclav Fraubisik Zbornik, Oftringen, both of Switzerland, assignors to Haemmerle, A.G., Zofingen, Switzerland

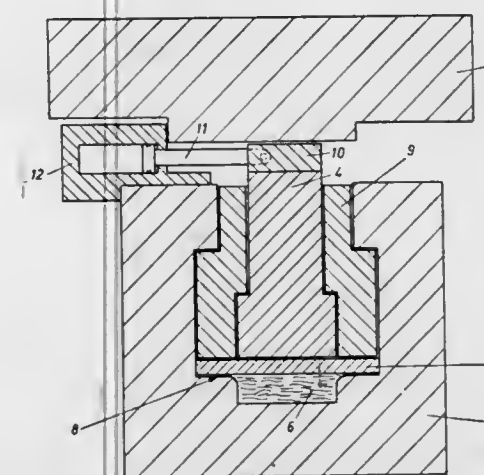
Filed May 27, 1975, Ser. No. 580,741

Claims priority, application Austria, May 27, 1974, 4330/74

Int. Cl.<sup>2</sup> B21D 5/01

U.S. Cl. 72-465

1 Claim



1. A machine for bending metal in sheet or plate form comprising:

- a machine frame;
- a table base on said frame having a cross section in the form of a U defining a confined oil-filled supporting space;
- a ram vertically displaceable in relation to said table base;
- an upper tool mounted on said ram;
- a lower tool disposed on said table base;
- said upper and lower tools cooperating for bending said metal sheet therebetween;
- flexible supporting means for one of said tools comprising an elastic diaphragm and a plurality of individual elements thereover, side by side, in the U of said work table and in the confined oil-filled supporting space of said U section to provide an elastic and compliant supporting of the tool;
- said plurality of individual elements being disposed tightly beside each other and each being independently displaceable in a vertical direction so that, in bending operation, only certain elements are displaced;
- each of said individual elements comprising a lower part resting on said elastic diaphragm and an upper part resting on said lower part, said upper parts being adapted to support the tool and being independently displaceable in a horizontal direction from a working position where it rests on said lower part to a rest position where it is out of the path of movement of said lower part; and,
- a plurality of piston-cylinder-units connected one to each of said upper parts of said individual elements by a connecting rod and being so connected to the piston so that an actuation of the piston of the piston-cylinder-unit removes said upper part from its position between said tool and said lower part.

4,014,205

## ELECTRONIC CLOCK REGULATOR

Larry L. Wells, 7841 Austin Road, Jacksonville, Fla. 32210, and William G. Finkenbiner, 2137 W. Alabama, Houston, Tex. 77098

Filed May 17, 1976, Ser. No. 686,836

Int. Cl.<sup>2</sup> G04D 7/12

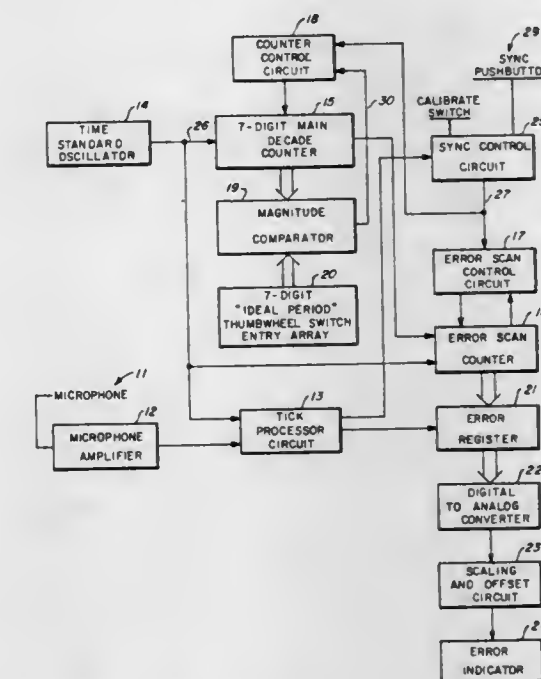
U.S. Cl. 73-6

10 Claims

1. Apparatus for regulating the performance of mechanical or electromechanical clocks, comprising:

956 O.G.—61

- means for preselecting a continuously variable ideal period of the clock being regulated and for providing a digital count representation thereof;
- means for providing electrical pulse representations of acoustic ticks made by the clock being regulated;
- means responsive to said acoustic tick pulses for counting said precision timing pulses to measure with precision the number of such timing pulses occurring between said



- acoustic tick pulses to generate a count measurement of the actual period of the clock being regulated; and
- means for comparing said count measurement with the count representation of said preselected ideal period to derive an error count measurement as a function of any time discrepancy between the actual measured period and the preselected ideal period of the clock being regulated.

4,014,206

## APPARATUS AND METHOD FOR MONITORING AIR EMBOLI DURING EXTRACORPOREAL CIRCULATION

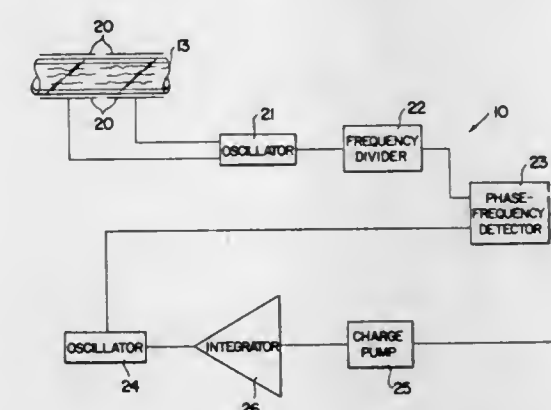
Bruce C. Taylor, Wayland, Mass., assignor to Akron City Hospital, Akron, Ohio

Filed Mar. 31, 1975, Ser. No. 563,856

Int. Cl.<sup>2</sup> G01N 27/22

U.S. Cl. 73-19

7 Claims



4. Apparatus for detecting at least one embolism contained in a fluid during extracorporeal circulation of the fluid in a tubing comprising:

- means to monitor the electrical impedance of the tubing, fluid and any emboli contained therein having an output signal whose voltage is proportional to the electrical impedance of the tubing, fluid and any emboli contained therein,
- first oscillator means receiving the output signal from said



means to monitor and providing at least one output signal whose frequency is proportional to the electrical impedance of the tubing, fluid and any emboli contained therein,

second oscillator means having an output signal whose frequency is proportional to the electrical impedance of the fluid and tubing,

detector means receiving the output signals from said first and second oscillator means and providing an output signal the duration of which is indicative of the difference between the frequencies of the output signals of said first and second oscillator means, and

control means receiving the output signal of said detector means and providing a plurality of output signals including an actuation signal indicative of the presence of at least one embolism, said control means including counter means and accumulation circuit means,

said counter means receiving an output signal of said detector means and a frequency signal of said first oscillator means, said frequency signal incrementing said counter means only when said counter means receives a signal from said detector means,

said accumulation circuit means including multivibrator means receiving a first signal of said counter means and providing a periodic output signal as long as it is receiving the first output signal, and second counter means having a predetermined accumulation of emboli stored therein and counting each periodic signal from said multivibrator means to provide an output signal when said predetermined accumulation is reached indicative of said predetermined accumulation,

said counter means providing a second signal being indicative of the presence of a single embolism of predetermined size, and

gate means receiving the output signal of said second counter means and said second signal from said counter means and selectively providing the actuation signal.

4,014,207

#### SECTOR SCANNING ULTRASONIC INSPECTION APPARATUS

Edward P. Meyer, Boulder, and William L. Wright, Longmont, both of Colo., assignors to Picker Electronics, Inc., Northford, Conn.

Division of Ser. No. 62,143, Aug. 7, 1970, Pat. No. 3,924,452, which is a continuation of Ser. No. 801,882, Oct. 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 373,312, June 8, 1964, abandoned. This application Apr. 28, 1975, Ser. No. 572,058

The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> G01N 29/04

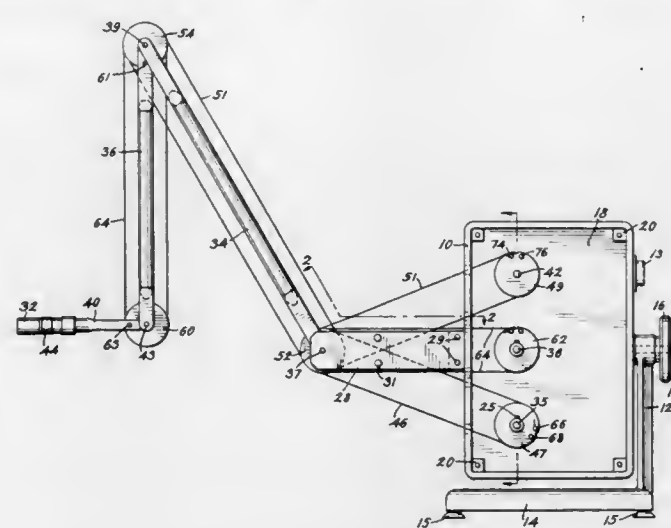
U.S. Cl. 73—67.8 S

10 Claims

10. In an ultrasonic apparatus for investigating the internal structure of an object having an electro-acoustic transducer having a face for transmitting through an object to be investigated a beam of ultrasonic energy having an axis and for receiving reflected ultrasonic signals, an ultrasonic generator connected to said transducer, a readout device for translating reflected acoustic signals received by said transducer to a visible reproduction of reflections from and within such object, the combination comprising:

- a base;
- articulated arm structure comprising a plurality of joints and being connected to the base for constrainingly supporting the transducer for rocking movement for rotating the beam while constraining the beam axis substantially in a single plane while the transducer face is in contact with the surface of such subject;
- signal generating means operatively associated with the articulated arm structure for producing first and second electrical signals respectively corresponding to direction

of emission of said ultrasonic beam and to X and Y coordinate positions of said transducer, said signal generating means including a plurality of resolvers respectively associated with the plurality of joints, one resolver being for monitoring the rocking movement of said transducer for generating the first electrical signal; and



- means for transmitting said first and second electrical signals to said readout device for producing a visual representation of the location of said transducer and of the direction of emission of said ultrasonic signals from said transducer means in said predetermined plane.

4,014,208

#### ULTRASONIC SYSTEM FOR MEASURING DIMENSIONAL OR STRESS CHANGE IN STRUCTURAL MEMBER

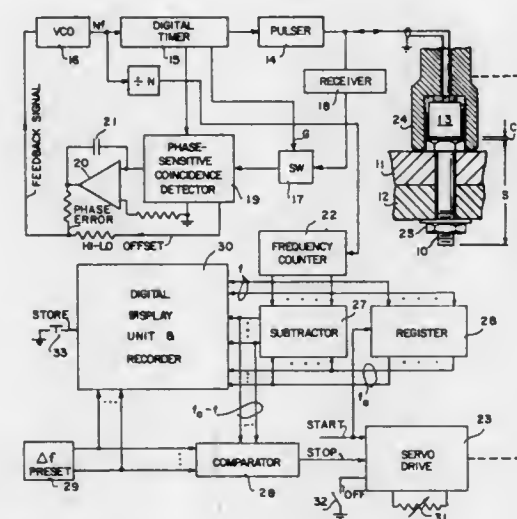
John F. Moore, Marina del Rey, and Forrest M. Coate, Hawthorne, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 1, 1976, Ser. No. 672,692

Int. Cl.<sup>2</sup> G01N 29/00

U.S. Cl. 73—67.9

18 Claims



10. A method for measuring the ultrasonic transit time of a pulse through a structural member without regard to the transit time through coupling media comprising the steps of double pulsing an ultrasonic transducer coupled to a structural member at a pulse pair rate adjusted so that the second reflected echo of the first pulse of a pair coincides with the first reflected echo of the second pulse of the pair, whereby the pulse rate so adjusted is an accurate measure of the round trip transit time of an ultrasonic pulse through said member.

4,014,209

#### AIR FILTER CONDITION INDICATING DEVICE

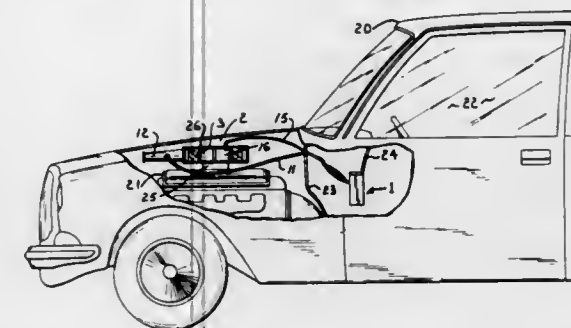
Wayne L. Emerick, Rte. 20, Box 2006, Springfield, Mo. 64803

Filed Dec. 15, 1975, Ser. No. 641,692

Int. Cl.<sup>2</sup> G01N 15/00; G01M 19/00

U.S. Cl. 73—119 R

2 Claims



2. An air flow condition indicating device for continuously sensing and indicating the flow conditions of an air induction system and filter of an internal combustion engine and comprising in combination:

- an air filter housing having an air intake portion and a central cavity communicating with a carburetor of an internal combustion engine, said air filter housing being positioned in an air induction system of an internal combustion engine;
- a generally cylindrical air filter having an exterior surface and a central cavity therein, said air filter being positioned in said central cavity of said air filter housing and sealingly engaged therewith between the air intake portion and the communication with the carburetor;
- a gauge housing mounted on an automobile dashboard in spaced relation with said air filter housing, said gauge housing having walls defining a chamber therein, one of said gauge housing walls having an observation aperture therein;
- a tubular member positioned in said gauge housing and arranged to define a generally U-shaped path having a first leg and a second leg each having an upper end portion, said first leg of said tubular member having a transparent portion positioned adjacent and visible through said observation aperture in said gauge housing;
- a colored liquid in said tubular member and positioned in said first and second legs;
- indicia means positioned to be exposed and visible through said observation aperture in said gauge housing upon movement of the colored liquid from said first leg of said tubular member;
- first flow means having one end thereof connected to the upper end portion of said first leg of said tubular member and communicating between said air intake portion of said air filter housing and said tubular member first leg;
- second flow means having one end thereof connected to the upper end portion of said second leg of said tubular member and communicating between said central cavity of said air filter and said tubular member second leg whereby reduced pressure in said air filter central cavity effects movement of the colored liquid in said tubular member first leg to expose said indicia means.

4,014,210

#### DEVICE FOR USE IN THE ULTRASONIC MEASUREMENT OF MASS FLOW OF GAS

Massimo Husse, and Mauro Lagonigro, both of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Apr. 8, 1976, Ser. No. 675,017

Claims priority, application Italy, Apr. 30, 1975, 68095/75

Int. Cl.<sup>2</sup> G01F 1/66

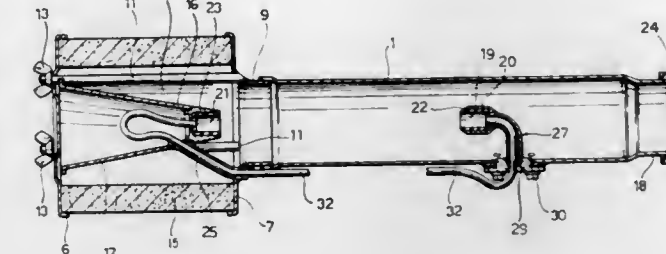
U.S. Cl. 73—194 A

3 Claims

1. Device for the ultrasonic measurement of the flow of gas, particularly the rate of flow of air in the induction duct of an internal combustion engine, of the type comprising a measure-

ment duct, and respective upstream and downstream piezo-electric ultrasonic transducers mounted adjacent the ends of said measurement duct adapted to provide signals for measuring flow rate, wherein the improvement consists in:

- means defining a plenum chamber situated at the inlet end of the measurement duct;



- a frusto-conical element within said chamber, the vertex of which element faces towards said measurement duct,
- an upstream seating supporting the upstream transducer at the said vertex of said frusto-conical element, and
- a downstream seating supporting said downstream transducer, said downstream seating having a tapered end facing the inlet end of the said measuring duct.

4,014,211

#### ULTRASONIC FLOW METER

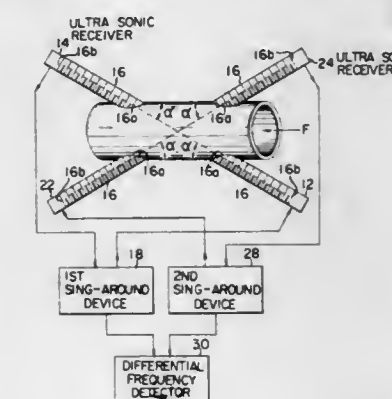
Hitoshi Araki, and Yoshihiro Matsunaga, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1975, Ser. No. 624,576

Int. Cl.<sup>2</sup> G01F 1/66

U.S. Cl. 73—194 A

4 Claims



1. An ultrasonic flow meter device comprising a pipe through which a fluid the velocity of which is to be measured flows, first ultrasonic transmitter and receiver means disposed on the outer wall surface of said pipe and including a propagation path for an ultrasonic wave running within said fluid in the direction of flow thereof to produce a first sing-around frequency, second ultrasonic transmitter and receiver means disposed on the outer wall surface of said pipe and including a propagation path for an ultrasonic wave running within said fluid in a direction opposite to the direction of flow of the fluid to produce a second sing-around frequency, detector means coupled to said first and second transmitter and receiver means for detecting a difference between said first and second sing-around frequencies to measure a flow rate of the fluid, each of said first and second ultrasonic transmitter and receiver means having an ultrasonic transmitter element and an ultrasonic receiver element, a guide rod for each of said elements on one end of which the corresponding element is mounted, each guide rod having on the outer peripheral surface thereof a plurality of ridges for causing ultrasonic waves reflected from the ridged surface of said guide rod to cancel one another out, means securing the other end of each said guide rod to the outer wall surface of pipe, and a thin sheet of a metallic material selected from the group consisting of gold, platinum, gold alloys and platinum alloys between said other end of each guide rod and the outer wall surface of said pipe.



4,014,212

## THREE-CHAMBER GAS METER

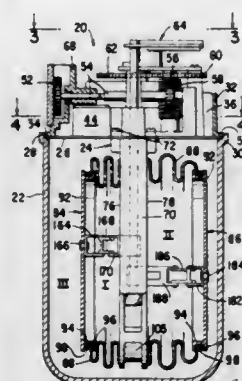
Robert Ritson Douglas, Philadelphia, Pa., assignor to The Singer Company, New York, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,517

Int. Cl.<sup>2</sup> G01F 3/20

U.S. Cl. 73-267

7 Claims



1. A three-chamber gas meter comprising:
  - a. a hollow casing having an open top,
  - b. a two chamber cartridge having a transverse valve plate detachably secured to enclose the casing top upon the cartridge being inserted into the casing to form a third chamber within the casing surrounding the two cartridge chambers,
  - c. a cover detachably secured to the casing over the valve plate to form an inlet chamber,
  - d. an inlet connected to the cover to communicate with the inlet chamber,
  - e. an outlet connected to the cover,
  - f. an outlet aperture formed in the valve plate in communication with the outlet,
  - g. a pair of diaphragms connected to the cartridge, one to each of the cartridge chambers thereof to independently expand and contract responsive to gas flow through the valve plate,
  - h. a rotary valve connected to the valve plate to control the flow of gas to and from the three chambers sequentially from the inlet to the outlet of the gas meter,
  - i. a crank assembly connected to rotate the rotary valve,
  - j. an index mounted in the casing and connected to the crank assembly to indicate the volume of gas flowing through the meter,
  - k. a pair of flag assemblies separately internally connected within the cartridge at one end thereof to one or the other of the diaphragms, and at the other end to actuate the crank assembly responsive to expansion and contraction of the diaphragms
1. a pair of flag rods journaled internally within the cartridge, one for each flag assembly, with each flag rod extending above the valve plate whereby the flag assemblies connect to the crank assembly within the inlet chamber.

4,014,213

## ACCUMULATOR WARNING SYSTEM

Donald James Parquet, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 1, 1975, Ser. No. 636,688

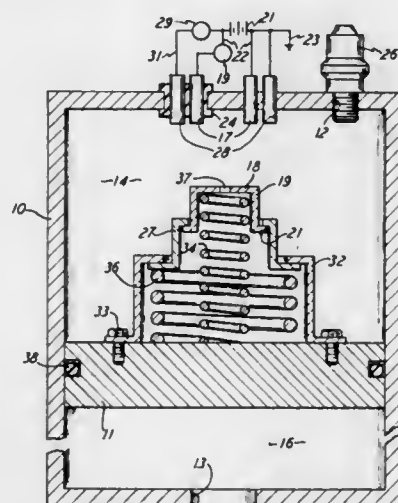
Int. Cl.<sup>2</sup> G01F 23/18; B60T 11/10; F16L 55/04; H01H 35/34

U.S. Cl. 73-290 R

3 Claims

1. An accumulator warning system comprising a fluid container having fluid passageways at opposite ends thereof, a divider member movably and fluid-tightly disposed in said container for dividing said container into two compartments in fluid-flow communication with respective ones of said passageways, electric conductors disposed in one of said compartments and being spaced apart and disposed in the path of movement of said divider member, an electric system connected with said conductors and including an electric power

source and an electric signal, an electrically conductive member movably mounted on said divider member and extending therefrom toward said conductors and having a span at least equal to the spacing between said conductors and being movable on said divider member in the direction of movement of said divider member, a spring operatively associated with said conductive member for yieldingly urging said conductive member toward said conductors for yielding to the movement of said divider member toward said conductors after said conductive member is in contact with said conductors to thereby permit said divider member to move further toward said conductors after said conductive member is in contact with said conductors for energizing said signal, said conductive member being hat-shaped and having a crown portion and a brim portion, said crown portion being disposed toward said conductors and said brim portion being disposed toward said



divider member, a flanged cylinder mounted on said divider member and having an end opening for telescopically receiving said crown portion and having a flange surrounding said end opening and being of a size smaller than the extent of said brim portion to overlap the latter and thereby movably restrain said conductive member relative to said divider member, an additional hat-shaped conductive member telescoped with and extending beyond and being smaller than the first said hat-shaped conductive member, additional said electric conductors disposed in said one compartment and spaced apart less than the spacing between the first said electric conductors and at a distance to match the span of said additional hat-shaped conductive member, a spring disposed to yieldingly urge said additional hat-shaped conductive member toward said additional conductors, and an additional electric signal connected to said additional conductors and to said electric system.

4,014,214

## LIQUID LEVEL INDICATOR

Robert A. Pontefract, Chelmsford, Mass., assignor to Jerguson Gage and Valve Company, Burlington, Mass.

Filed Jan. 19, 1976, Ser. No. 650,280

Int. Cl.<sup>2</sup> G01F 23/02

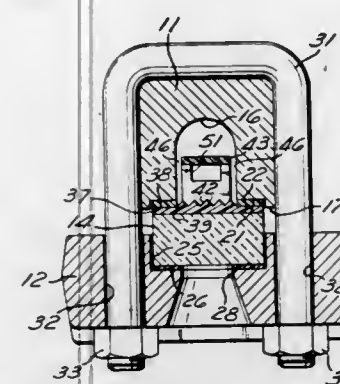
U.S. Cl. 73-330

8 Claims

1. A reflex glass assembly for a liquid level gauge comprising an elongated, transparent body, an inner face of said body having a plurality of parallel, longitudinally extending reflex prisms, a background element spaced inwardly of said inner body face, said background element displaying a high visual contrast to the characteristic reflex appearance of the reflex body at a nonwetted area thereof, and means extending between said background element and said body and supporting

said background element on said reflex body, said background element support means being adapted to be disposed within a

means connecting the sample container to the rest of the system, said means comprising a plug adapted to connect



4,014,215

## CLINICAL GLASS THERMOMETER HAVING A STEM AND A BULB INTEGRALLY FORMED THEREWITH

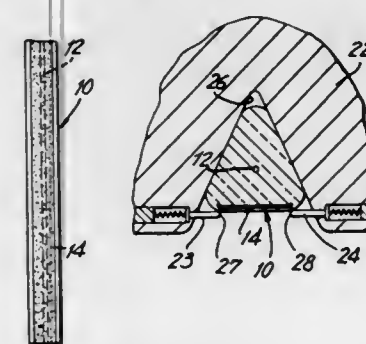
Seymour N. Blackman, 284 E. Palisades Ave., Englewood, N.J. 07603

Division of Ser. No. 453,324, March 21, 1974, Pat. No. 3,884,666, which is a continuation-in-part of Ser. No. 219,308, Jan. 20, 1972, abandoned. This application Feb. 12, 1975, Ser. No. 549,325

Int. Cl.<sup>2</sup> G01K 5/02

U.S. Cl. 73-371

2 Claims



1. A clinical glass thermometer having a stem of triangular cross-section, a capillary bore extending lengthwise within said stem, an opaque strip embedded within said stem and extending longitudinally thereof, and a bulb of circular cross-section, said bulb having side walls and a bottom wall formed integrally with said stem from a single piece of glass, a portion of said opaque strip extending into a side wall of said bulb, said portion of said strip in said side wall being a straight continuation of the balance of said strip in said stem, said side walls of said bulb having a thickness approximately equal to the thickness of said bottom wall, said side walls of said bulb joining said stem with no abrupt reduction of wall thickness.

4,014,216

## APPARATUS FOR SAMPLING GAS MIXTURES

Joseph Scott Thornton, 5902 W. Bee Caves Road, Austin, Tex. 78746, and Edward Dale Golla, 5112 N. Lamar Blvd., Austin, Tex. 78751

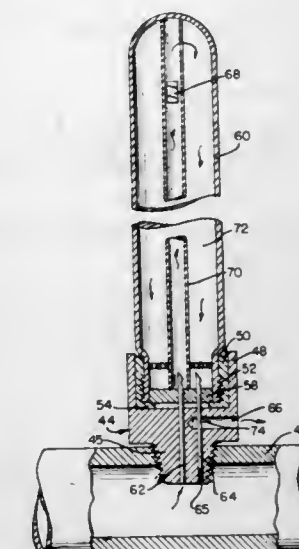
Filed Mar. 22, 1976, Ser. No. 669,121

Int. Cl.<sup>2</sup> G01N 1/22

U.S. Cl. 73-421.5 R

9 Claims

1. A sampling system for taking gas samples, vapor and solid particulates therein which includes in combination:
  - a gas sample container;
  - means to connect said sample container with a pressurized source of gas to be analyzed;
  - a filter section operatively connected to said pressurized gas;
  - a flow measuring section operatively connected to said pressurized gas; and



to said pressurized gas and having a minute passage through which gas to be sampled can flow into said sample container.

4,014,217

## TACTILE PICK-UP

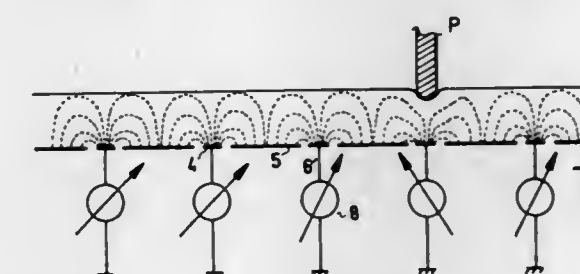
Jean Lagasse, Toulouse; Jean Clot, Saint-Orens de Gameville; Jean Falipou, Escalquens; Andre Loubieres, Ramonville Saint-Agne; Pierre Rabischong, Montpellier; Jean-Pierre Richard, Ramonville Saint-Agne, and Ai Bui, Toulouse, all of France, assignors to Agence Nationale de Valorisation de la Recherche Etablissement Public de Droit, Neuilly-sur-Seine, France

Filed Nov. 28, 1975, Ser. No. 635,956

Int. Cl.<sup>2</sup> H01C 10/10

U.S. Cl. 73-432 R

10 Claims



1. A tactile pick-up for contacting an object and emitting electric signals associated with the deformation caused by the object, said pick-up comprising:
  - a thin supple layer having a variable electrical conductivity as a function of its state of compression,
  - a matrix of electrodes comprising a large number of conductive measuring electrodes distributed on a side of said supple layer,
  - electricity supply means for producing in said supple layer a distribution of weak power currents which are repeated in a substantially identical manner straight above or below each said measuring electrode when said supple layer is at rest,
  - said supply means comprising an electrical source having a reference potential and conducting elements distributed on the same side of said supple layer as said measuring electrodes so as to imbricate with these without electrical contact,
  - said conductive elements comprising protective rings around said measuring electrodes and being connected to one terminal of said source thereby fixing them at a uniform potential,
  - a plurality of output lead means, each connected to a said measuring electrode for emitting an electric signal repre-



sentative of the electrical state of its said measuring electrode, and  
processing means connected to said output lead means for transforming the emitted signals into a unit of values that can be used or scanned.

4,014,218

# APPARATUS FOR TRANSMISSION-THROTTLE CONTROL

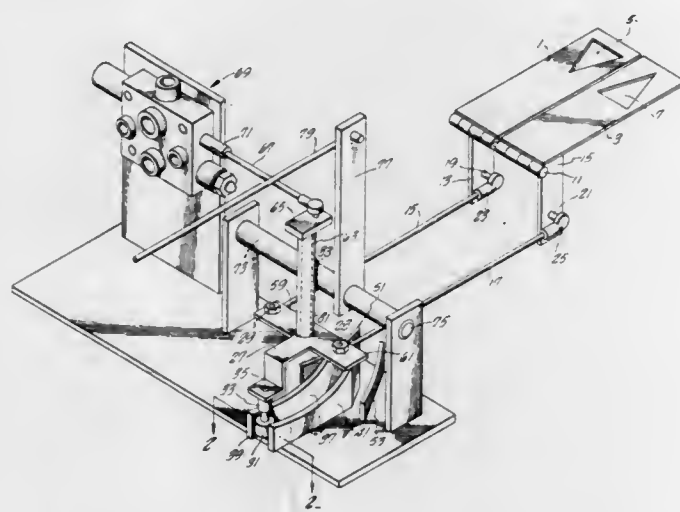
Vernon Brandt, Reedley, Calif., assignor to Brandt Manufacturing Co., Reedley, Calif.

Filed June 30, 1975, Ser. No. 591,714

Int. Cl.<sup>2</sup> G05G 13/00, 9/08, 11/00

U.S. Cl. 74—474

6 Claims



1. A transmission-throttle control apparatus comprising:  
a swingable and rotatably moveable control rod;  
a transmission control lever oppositely reciprocable from a neutral position to forward and reverse displacement positions coupled and responsive to the movement of said control rod in first and second translational passageways;  
a throttle control lever oppositely reciprocable to open and close a throttle responsive to the movement of said control rod in said first and second translational passageways and in a third translational passageway;  
said third translational passageway being defined by first and second wall members, said first passageway being defined by said first wall member and a fourth wall member, and said second passageway being defined by said second wall member and a third wall member, said first, second and third passageway being adjacent said control rod and adopted to allow said control rod to traverse along the path of said passageways; and  
linkage means coupling first and second control means to said control rod whereby actuation of said first control means causes said control rod to move along said first passageway, actuation of said second control means causes said control rod to move along said second passageway and activation of both said first and second control means causes said control rod to move along third passageway.

4,014,219

# STEERING SHAFT COUPLING

James R. Feustel, Ann Arbor, and Alex Rhodes, Orchard Lake, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 10, 1975, Ser. No. 630,568

Int. Cl.<sup>2</sup> B62D 1/18; F16D 1/02

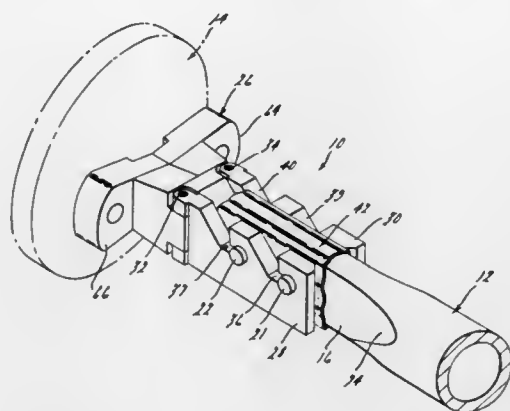
U.S. Cl. 74—492

5 Claims

1. A shaft coupling having a first coupling part, a second coupling part and an interconnecting member constructed to transmit torque from said first coupling part to said second coupling part;

said first coupling part having abutment means;  
said interconnecting member releasably engaging said abutment means of said first coupling part;

pivot means connecting said member to said second coupling part;  
spring means exerting a spring force tending to maintain said interconnecting member in engagement with said abutment means;  
said first shaft part being axially displaceable toward said second shaft part in response to an axial load;



said abutment means being disengageable from said interconnecting member in response to axial displacement of said first shaft part;  
said spring means exerting a spring force tending to axially separate said first and second coupling parts.

4,014,220

# TRACTIVE EFFORT SELECTOR

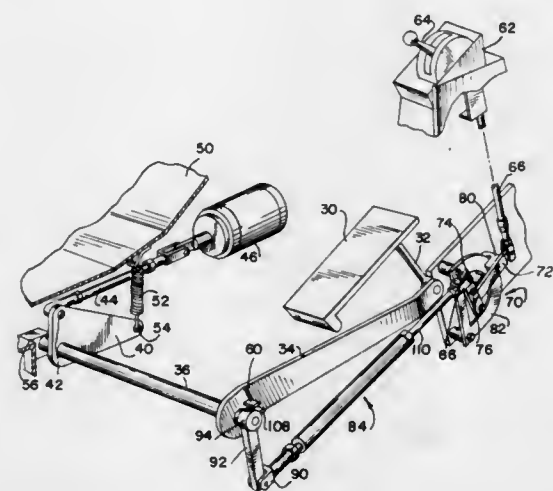
Norman J. Feigel, Libertyville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed June 13, 1975, Ser. No. 586,821

Int. Cl.<sup>2</sup> G05G 1/04

U.S. Cl. 74—522

7 Claims



1. A tractive effort selector for use on a vehicle having a clutch control means capable of being controlled through a clutch linkage including a clutch engagement control pedal, a pedal rod, a first lever arm pivotally attached to the pedal rod, a transverse shaft, a first bell crank and a clutch controlling plunger rod comprising:

a tractive effort selector means;  
a self-locking control head;  
link means providing communication between said tractive effort selector means and said self-locking control head whereby movement of said selector means results in movement of said control head;  
a tractive effort control bell crank having a first arm and a second arm;  
a spring loaded overtravel device linking said self-locking control head to said tractive effort control bell crank whereby movement of said control head results in movement of said bell crank;  
a tab included in said clutch linkage positioned to interact with said second arm of said tractive effort control bell crank.

4,014,221

# TRANSFER BOX FOR FOUR-WHEEL DRIVE VEHICLES

Thomas Eastwood, Huddersfield, England, assignor to David Brown Tractors Limited, Huddersfield, England

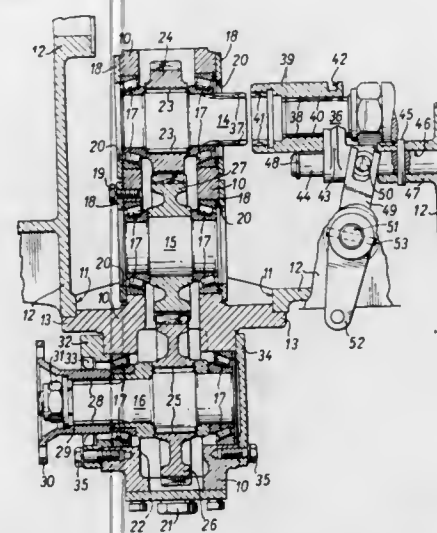
Filed Oct. 28, 1975, Ser. No. 626,536

Claims priority, application United Kingdom, Dec. 18, 1974, 54584/74

Int. Cl.<sup>2</sup> F16H 37/06, 3/22, 57/00

U.S. Cl. 74—665 GA

6 Claims



1. Transfer gearing for converting a vehicle with a single power-driven axle to four-wheel drive adapted for mounting upon and operative connection to a power actuated vehicle gearbox assembly that has a driven output shaft drive connected to one vehicle drive axle, said gearbox assembly comprising a housing having an aperture through which an end of said output shaft within the housing is accessible, and said transfer gearing comprising a casing adapted to be partially inserted through said aperture and having means whereby it may be secured to said gearbox housing in a partially inserted position, a gear train comprising a plurality of gears rotatably mounted within said casing on vertically spaced axes, the uppermost and lowermost of said gears being non-rotatably mounted on shafts rotatably supported in said casing, with the uppermost gear being located within the gearbox assembly housing and the lowermost gear being located externally of the gearbox assembly housing upon securing the partially inserted casing on the gearbox assembly, means on the shaft carrying said lowermost gear for coupling to another drive axle on the vehicle, and cooperating clutch means on said shaft carrying the uppermost gear and said end of the output shaft within the gearbox housing for selectively drive connecting said gear train to said output shaft for driving said other drive axle.

4,014,222

# VARIABLE SPEED AND DIRECTION TRANSMISSION PRIME MOVER SYSTEM

James B. Brandt, P.O. Box 21, Sullivan, Wis. 53178

Filed Jan. 8, 1975, Ser. No. 539,276

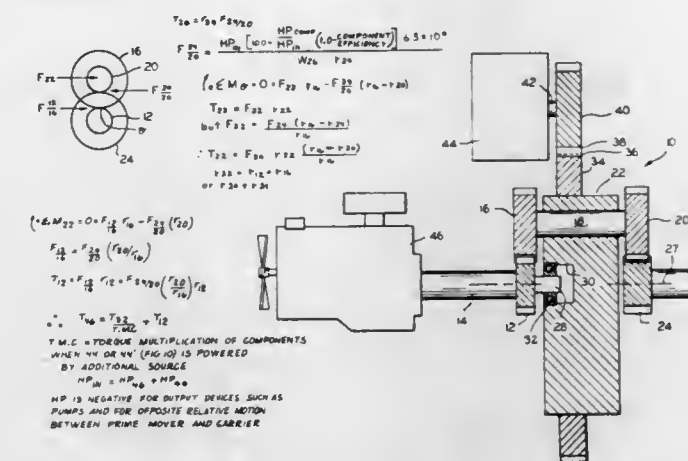
Int. Cl.<sup>2</sup> F16H 47/04, 57/10

U.S. Cl. 74—687

12 Claims

1. Power transmission apparatus adapted to transmit power between a source of power and an output element including:  
first gear means operably connected to said source of power;  
second gear means operable connected to said output element;  
planetary gear carrier means operably disposed between said first and second gear means, said carrier mounted for rotation about its central axis;  
shaft means associated with said planetary carrier;  
planetary gear means connected to said shaft means and adapted for rotative movement in a circular path about said central axis of said planetary carrier as well as rotative motion about said shaft means;

control means associated with said planetary carrier means, said control means adapted to control rotative movement of said planetary carrier, whereby movement of said second gear means and said output shaft is determined by the rotative movement of said carrier and said first gear means;



wherein said control means is adapted to alternatively hold said planetary carrier immobile or to rotate said planetary carrier about its central axis, whereby the speed and direction of said second gear means and said output shaft is determined by the speed and direction of rotation of said planetary carrier.

4,014,223

# MULTIPLE RATIO HYDROKINETIC SPLIT TORQUE TRANSMISSION

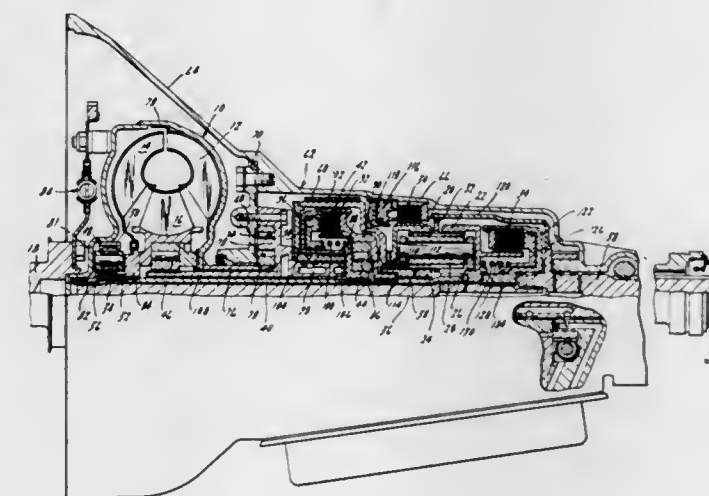
Stanley L. Pierce, Jr., West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 22, 1975, Ser. No. 580,072

Int. Cl.<sup>2</sup> F16H 47/08; F16D 33/00

U.S. Cl. 74—688

8 Claims



1. A multiple ratio hydrokinetic transmission mechanism comprising a planetary gear system having two torque input gear elements, a torque output element and a reaction element, brake means for anchoring the reaction element to effect forward drive operation in a first and second forward drive ratio, a hydrokinetic unit comprising an impeller and a turbine, the impeller being connected to a source of torque, a turbine shaft and a torque splitter planetary gear unit having an input element connected to a source of torque, a second element connected to the turbine shaft and a third element cooperating with the first and second elements to effect a torque balance, first clutch means for connecting the turbine shaft to a first of said torque input gear elements of said planetary gear system and second clutch means for selectively connecting said third element of said torque splitter gear unit to the said second of said torque input gear elements.



4,014,224

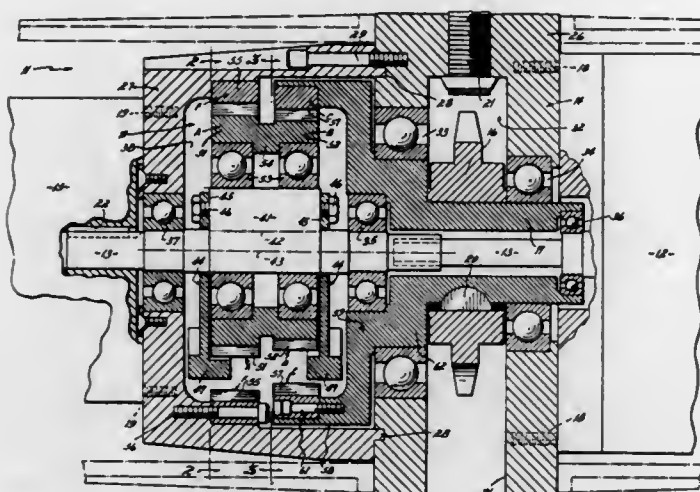
**SPEED DIFFERENTIAL PLANETARY GEAR TRAIN**  
Dallas L. Pitts, Wynne, Ark., assignor to Pitts Drive, Inc.,  
Wynne, Ark.

Continuation-in-part of Ser. No. 405,753, Oct. 12, 1973,  
abandoned, which is a continuation-in-part of Ser. No.  
217,739, Jan. 14, 1972, abandoned. This application May 12,  
1975, Ser. No. 576,284

Int. Cl.<sup>2</sup> F16H 1/28

U.S. Cl. 74-805

14 Claims



1. A speed differential planetary gear train comprising,  
a first rotatable shaft connected to an eccentric for rotation  
therewith, the eccentric rotating about the axis of the first  
shaft.  
a two gear cluster comprising a first external gear and a  
second external gear, said cluster being journaled on said  
eccentric for rotation about the axis of the eccentric;  
said first external gear meshing and rotating within a first  
internal gear disposed around it, thereby forming a first  
gear system,  
said second external gear meshing and rotating within a  
second internal gear disposed around it, thereby forming a  
second gear system,  
means preventing rotation of one of said internal gears,  
and means connecting the other of said internal gears to a  
second shaft for rotation therewith, said second shaft  
having an axis of rotation which is colinear with the axis  
of rotation of the first shaft,  
the two said systems both being standard involute systems  
with  $N = PD$  for each gear,  
said external gears having different numbers of teeth,  
the gears of the said train being further related substantially  
in accordance with the following equations:

$$1) E = (D_{int} - D_{ext}) / 2$$

$$2) F_{FA} = E_{BA}$$

$$3) 0.84 D_{int} = D_{ext}$$

$$4) \text{ speed ratio} = \frac{1}{1 - \left(1 - \frac{2E}{D_c}\right) \left(1 + \frac{2E}{D_A}\right)}$$

wherein

$N$  is an integer equal to the number of teeth on the respec-  
tive gear;  
 $P$  is the diametral pitch of the respective gear;  
 $D$  is the gear diameter;  
 $E$  is the offset between the center of the eccentric and the  
axis about which the eccentric rotates;  
the non-rotating internal gear is designated as  $F$ ;  
the external gear which meshes with the non-rotating inter-  
nal gear is designated as  $A$ ;  
the other external gear is designated as  $B$ ;

and the other internal gear is designated as  $C$ .

4,014,225

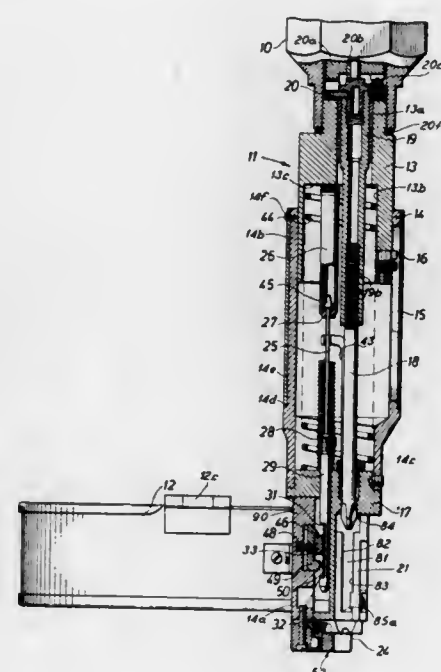
**POWER-DRIVEN SCREWDRIVER**

Sixten H. Lejdegård, Ramnas, and Nils E. Henriksson, Hall-  
stahammar, both of Sweden, assignors to Bulten-Kanthall  
Aktiebolag, Sweden

Continuation-in-part of Ser. No. 438,720, Feb. 1, 1974,  
abandoned. This application Mar. 24, 1975, Ser. No. 561,287  
Claims priority, application Sweden, Feb. 2, 1973, 7301423  
Int. Cl.<sup>2</sup> B25B 23/02

U.S. Cl. 81-57.37

41 Claims



1. A power-driven screwdriver for use with an assemblage  
of screws affixed to a strip-like screw-carrying medium, com-  
prising:  
a. a body engageable with a workpiece;  
b. a screwdriver bit mounted in said body for rotational and  
axial movement therein, and having drive means by which  
said bit may be rotatably driven;  
c. stationary guide means on said body for guiding an end  
portion of the assemblage of screws remotely from the  
axis of said bit such that the next-to-be driven screw is  
guided and supported only by the strip-like medium in  
registration with said bit to be detached therefrom and  
driven into the workpiece by said bit; and  
d. automatic index means on said body for normally holding  
said end portion of the assemblage of screws against  
movement in either direction in said guide means, and  
operative on the screw-carrying medium to apply an  
indexing force thereto, only after and under the control of  
the axial retractive movement of the bit, for the distance  
needed to advance the next of the screws into said regis-  
tration.

4,014,226

**PLIERS WITH MODIFIED JAWS FOR USE IN AUTO  
BODY REPAIR**

John Karamarkovich, Pittsburgh, Pa., assignor to The Ray-  
mond Lee Organization, Inc., a part interest

Filed May 4, 1976, Ser. No. 683,017

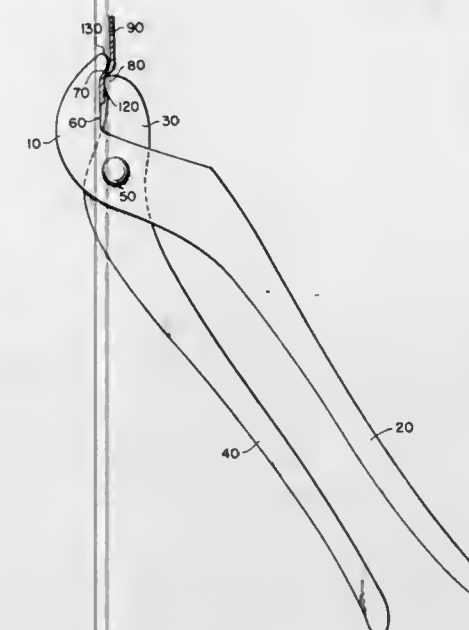
Int. Cl.<sup>2</sup> B25B 7/02

U.S. Cl. 81-426

3 Claims

1. A pair of pliers with specially shaped jaws designed for  
indenting sheet metal comprising a conventional pair of pliers  
with elongated handles and first and second opposed jaws  
pivotally secured together so that squeezing the handles to-  
gether causes the jaws to be squeezed together, the first jaw  
having an inner working surface with a first flat section and a  
shorter second flat working section that is attached to the

front of the first section and makes an obtuse angle with  
respect to it, and the second jaw having an inwardly extending



sharply defined peak that touches the point of connection of  
the two sections of the inner working surface when the jaws  
are closed.

4,014,227

**WIRE GUIDED ROLL CROWNING ATTACHMENT FOR  
LATHES**

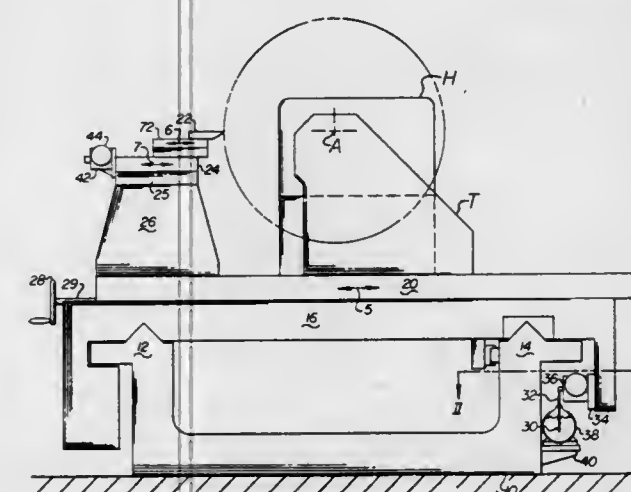
Richard J. Adams, Beloit, Wis., assignor to Beloit Corporation,  
Beloit, Wis.

Filed Mar. 19, 1976, Ser. No. 668,684

Int. Cl.<sup>2</sup> B23B 3/00

U.S. Cl. 82-1 R

18 Claims



1. Apparatus for compensating for lateral deviations in the  
straightness of a longitudinally extending bed of a machine  
tool, which includes a carriage mounted on the bed for travel  
axially therealong and a toolholding tool slide for movement  
perpendicular to the direction of the carriage travel, compris-  
ing, in combination:

a wire means mounted to coextend parallel to the direction  
of travel of the carriage on the bed;  
motor means mounted to effect relative movement between  
the tool and carriage;  
sensor means mounted on the machine tool and arranged in  
horizontally spaced adjacency relative to the wire means;  
control means for reciprocating the sensor means and tool,  
including means for signaling the motor means to (a)  
initially move the sensor means toward the wire means at  
a predetermined rate and, (b) to move the tool away from  
the center of the bed at a corresponding equal rate until  
the sensor means is activated by its proximity to the wire  
means whereupon the control means reverses the motor

means to move the sensor means and the tool toward  
center of the bed at a predetermined rate to complete a  
cycle whereby the tool movement has been compensated  
for any lateral deviations in the straightness of the bed.

4,014,228

**METHOD AND APPARATUS FOR TRIMMING  
CYLINDRICAL ARTICLES**

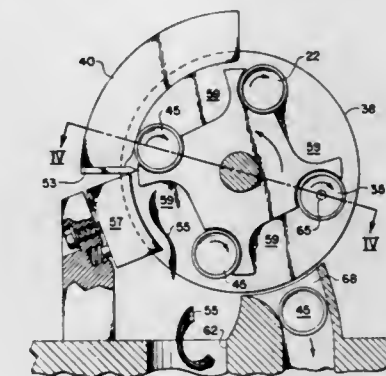
Geoffrey J. Dean, Denver, Colo., assignor to Ball Corporation,  
Muncie, Ind.

Filed Sept. 10, 1975, Ser. No. 612,159

Int. Cl.<sup>2</sup> B23B 1/00, 37/00, 3/04

U.S. Cl. 82-47

22 Claims



1. Apparatus for trimming cylindrical articles to a predeter-  
mined length comprising: at least one cylindrical mandrel  
having an axis and extending from a rotatable mandrel support  
for rotation around an axis spaced from the axis of the man-  
drel a greater distance than the mandrel diameter, the man-  
drel further being journaled to the mandrel support for rota-  
tion around its own axis, means for rotating the mandrel and  
mandrel support around the spaced axis at a given rate and for  
rotating the mandrel around its own axis with a peripheral  
velocity speed equal in magnitude and opposite in sense to  
that produced by rotation around the spaced axis, a circular  
cutting member defined circumferentially around the mandrel  
and spaced from an end of the mandrel a distance equal to the  
desired length of the trimmed cylindrical article, a fixed,  
arcuate blade positioned adjacent the path of travel of the  
mandrel to engage the circular cutting member defined  
around the mandrel, a circular support portion of the mandrel  
adjacent the cutting edge defined in the mandrel, a cutting  
edge defined longitudinally in the circular support portion, a  
fixed splitting blade disposed perpendicular to the arcuate  
blade and adapted to engage the cutting edge, a support shoe  
adjacent the splitting blade having an arcuate surface posi-  
tioned to engage the circular support portion of the mandrel in  
a rolling motion, a chamber defined in the mandrel support  
adjacent the circular support portion, means for placing a can  
onto the mandrel, and means for removing the can from the  
mandrel whereby an untrimmed cylindrical article may be  
positioned on and rotated with the mandrel with the circular  
cutting member defined in the mandrel engaging the fixed  
arcuate blade to shear an annulus from the article, the fixed  
splitting blade in conjunction with the cutting edge severing  
the annulus into a strip and the circular support portion enga-  
ging and rolling the strip against the support shoe as the man-  
drel rotates to deposit the rolled, straight strip in the chamber  
for conveyance to a depository for the strip, and the trimmed  
cylindrical article then being removed from the mandrel.

4,014,229

**FILM DISPENSER AND CUTOFF**

William C. Lynch, Brecksville, Ohio, assignor to Clamco Cor-  
poration, Cleveland, Ohio

Filed Mar. 21, 1975, Ser. No. 560,814

Int. Cl.<sup>2</sup> B26D 7/10

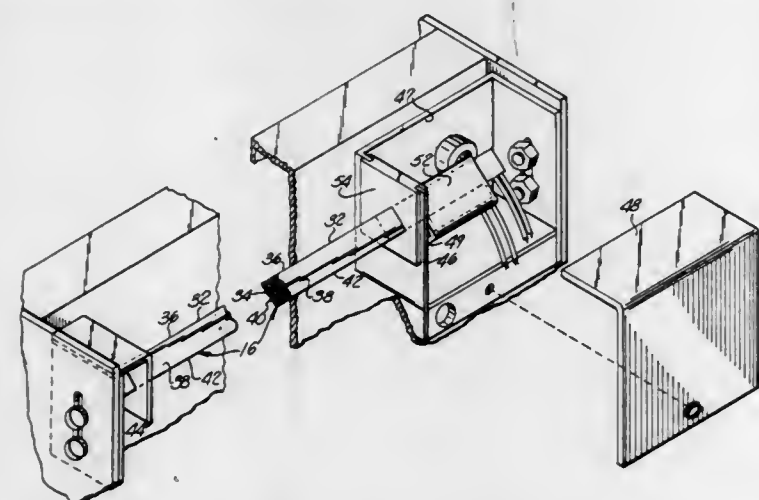
U.S. Cl. 83-16

14 Claims

1. Apparatus for severing sheets of film from a roll of plastic



film, said apparatus comprising a cutoff element for severing the film when the film is moved against the cutoff element under tension and a pressure established between the cutoff element and the film, said cutoff element including means defining diverging walls extending at acute angles with respect to the plane of the film as the film is moved thereagainst and defining a corner edge for engaging the film to be severed and for concentrating stresses applied to the film substantially along a line of severance, said cutoff element being made of sheet metal having high heat conductivity, an elongated electric heating unit extending substantially the length of said cutoff element and disposed between said wall portions to effect a heating of said cutoff element including said corner edge, means for electrically insulating said elongated electrical heating unit from said cutoff element, and thermostat means disposed in good heat transfer relationship with said cutoff element to be sensitive to changes in temperature of said cutoff element, said thermostat means including means for automatically controlling said heating element to heat said cutoff element and maintain the temperature of said diverging walls and said corner edge at a temperature lower than the melting point of said film.



14. A method of severing polyvinyl chloride film comprising the steps of providing a cutoff element having wall portions defining a corner edge, bringing the plane of the film to be severed into engagement with the cutoff element with the wall portions disposed at acute angles with respect to the plane of the film to concentrate stresses applied to the film substantially along a line of severance, heating the cutoff element by applying electrical power to an electrical heating unit disposed in heat transferable and electrically insulated relationship with said cutoff element, sensing the temperature of the cutoff element with a temperature sensing device which is in heat transferable relationship with said cutoff element and automatically reducing the application of electrical power to the heating unit in response to the temperature of the cutoff element when the temperature sensed by the temperature sensing device reaches about 260°, automatically controlling application of electrical power to the heating element to heat the cutoff element in response to the temperature of the sensing element when the temperature of the cutoff element is below a predetermined minimum temperature which is below 260°, the application of electrical power to said heating unit being capable of heating the electrical heating element to a temperature considerably about 260°.

4,014,230

#### SHEET METAL SHEARS FOR METAL SHEETS AND PLATES WITH A HIGHLY SENSITIVE SURFACE

Franz Eisele, Kuchen, Germany, assignor to Württembergische Metallwarenfabrik, Geislingen, Germany

Filed Dec. 11, 1975, Ser. No. 639,965

Claims priority, application Germany, Dec. 11, 1974, 2458655

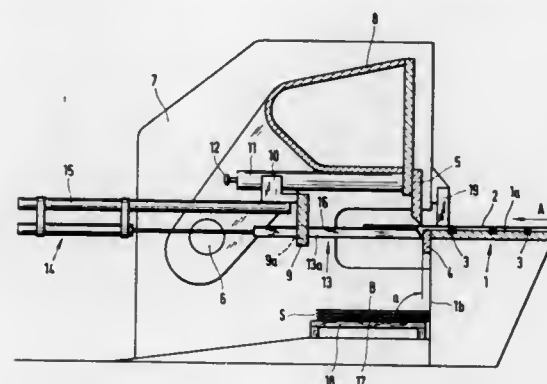
Int. Cl.<sup>2</sup> B26D 7/06

U.S. Cl. 83—86

7 Claims

1. Sheet metal shears for metal sheets and plates with a highly sensitive surface comprising: a sheet metal infeed

platen with a lower blade secured to the edge thereof extending transversely to the direction of sheet advance, a sheet stop disposed in spaced relation from the lower blade in the direction of sheet advance, a movable top blade which in cooperation with the lower blade cuts sheet metal strips from the metal sheet which is advanced over the lower blade up to the sheet stop, a support means including a support table for the



sheet metal strips which supports said strips horizontally prior to and during the cutting operation in a horizontal support plane which is a continuation of the surface of the sheet metal infeed platen, and said support means further including drive means for reciprocating said support table horizontally in said horizontal support plane into and out of the space between said lower blade and said sheet stop.

4,014,231

#### METHOD AND APPARATUS FOR CUTTING TOW

Frits Hutzezon, Arnhem, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

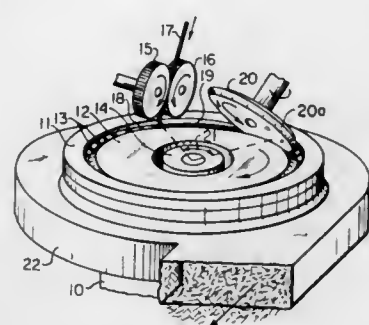
Filed Dec. 4, 1975, Ser. No. 637,806

Claims priority, application Netherlands, Dec. 6, 1974, 7415905

Int. Cl.<sup>2</sup> D01G 1/04

U.S. Cl. 83—100

9 Claims



1. Apparatus for cutting tow in short lengths of staple comprising a frame having a rotatably mounted ring of blades spaced apart a determined distance, the cutting edges of said blades facing inwardly and uniformly forming a selected angle with the axis of rotation of the ring of blades; a rotatably mounted pressure roll having an axis of rotation intersecting the axis of rotation of said ring of blades, and an outer surface of rotation parallel and adjacent to but a fixed determined distance away from the cutting edges of said blades; means for feeding said tow from a supply source to between said cutting edges and pressure roll; and means for rotating said ring of blades.

4,014,232

#### DIE-SET ASSEMBLY

David W. Mauger, Thiensville, Wis., assignor to Clevepak Corporation, New York, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,671

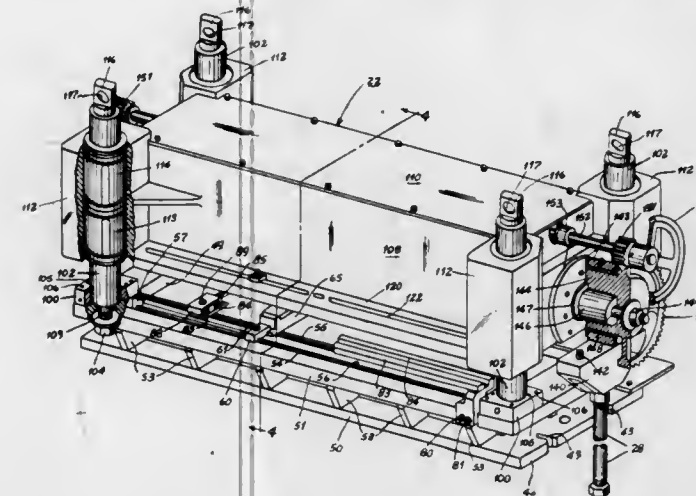
Int. Cl.<sup>2</sup> B26D 7/18, 5/08

U.S. Cl. 83—144

12 Claims

1. In a unitary punch and die unit separable as a unit from and adapted to be mounted on a machine on which machine

there is power operated drive means, the separable unit comprising: a base; die-holding means extending across the base to support dies in different selected positions across the base; a press head overlying the base and having punch holding means also extending across the base to support punches adjustably to register with the dies; connecting and guiding means to connect the base and press head together as parts of the unit



for movement toward and from each other to enable a punching operation to be performed; means in the unit for selectively moving the press head toward and from the base; means on the press head for connection with the power operated drive means for moving the press head when the unit is mounted onto the machine, the said means for connecting being readily disconnectable; and connecting parts for use in quickly mounting the unit onto a machine.

4,014,233

#### APPARATUS FOR SEVERING A SHEET OF MATERIAL FROM A WEB

Arthur Wölflinger, Wiesbaden, and Klaus Nicolay, Massen-heim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

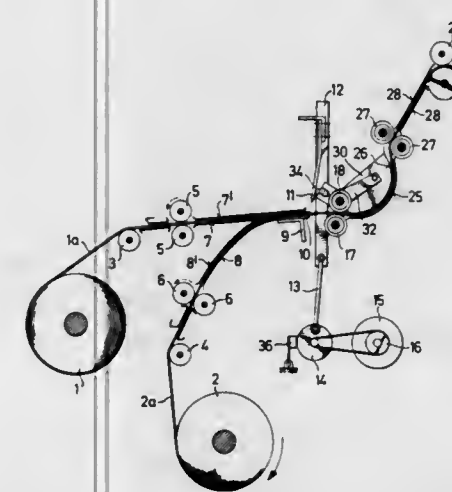
Filed Mar. 19, 1976, Ser. No. 668,621

Claims priority, application Germany, Mar. 21, 1975, 2512540

Int. Cl.<sup>2</sup> B26D 7/14

U.S. Cl. 83—156

7 Claims



1. In an apparatus for cutting a sheet from a web of material, including a magazine roll for the web of material, a cutting station, at least one feeding device for the web upstream of the cutting station and which is stationary during a cutting operation, a feeding device downstream of the cutting station and which is in operation during a cutting operation, movable curved guide means between the cutting station and the downstream feeding device, which guide means provides a shorter path for the web of material between the cutting station and the feeding device downstream thereof during the cutting operation,

the improvement comprising separate drive means for the movable curved guide means, additional feeding means for the web including at least one rotary element means positioned between the cutting station and the movable guide means, said rotary element means being adapted to rest against a web of material with a frictional force lower than that of the other feeding devices, and means adapted to drive said rotary element means at a circumferential speed exceeding the speed of the web of material.

4,014,234

#### CUTTING APPARATUS

Ernst M. Spengler, Heusenstamm, Germany, assignor to Stanz-technik GmbH Roeder & Spengler, Bergen-Enkheim, Germany

Continuation-in-part of Ser. No. 338,342, March 5, 1973, Pat. No. 3,859,879. This application Nov. 13, 1974, Ser. No.

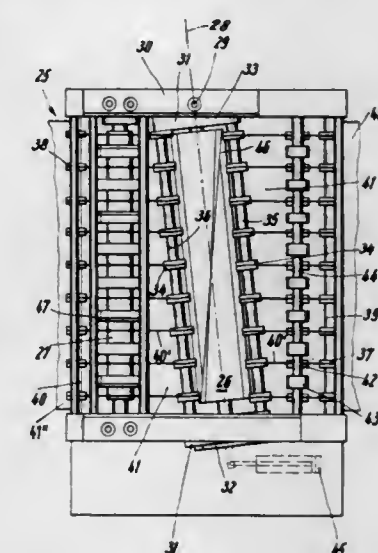
523,546

Claims priority, application Germany, Mar. 8, 1972, 2211118; Nov. 20, 1973, 2357820

Int. Cl.<sup>2</sup> B26D 1/36, 1/40

U.S. Cl. 83—162

25 Claims



1. In an apparatus for cutting sheet material advancing in a given direction, including a frame structure, a cutting roller for cutting the sheet material substantially across said advancing direction and a counter pressure roller, each roller having a rotational axis and an outer surface, means rotatably supporting both of said rollers in said frame structure for cooperation with each other, strip steel knife means, means securing said strip steel knife means to said cutting roller, whereby said strip steel knife means extend substantially radially away from said cutting roller, said strip steel knife means following a helix around the cutting roller which extends with its longitudinal axis at an angle ( $\alpha$ ) relative to a line extending perpendicularly to said given direction, said angle ( $\alpha$ ) compensating for the fact that the strip steel knife means follow a helix, the improvement wherein, said securing means comprise a plurality of individual holding blocks releasably secured in holes in the outer surface of said cutting roller, and means releasably holding said strip steel knife means in each of said holding blocks, in which holes said holding blocks are rotatable in their released condition for adjusting the knife position, each hole having a radially extending axis which extends in the plane of said strip steel knife means when the latter are secured to the cutting roller, said apparatus further comprising journal means having a journal axis held in said frame structure, said cutting roller having frame means secured to said journal means for tilting said cutting roller about said journal axis extending substantially perpendicularly to the rotational axis of said cutting roller.



4,014,235

# APPARATUS FOR BANDSAWING OPERATION WITH PROFILING MECHANISM CAPABLE OF AUTOMATIC COPYING OF A MODEL

Toshihiro Fukami, Toyohashi, Japan, assignor to Fukami Co.,  
Ltd., Toyohashi, Japan

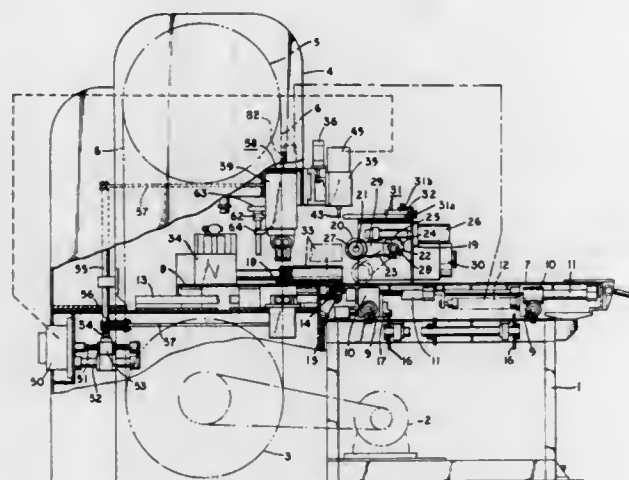
Division of Ser. No. 367,568, June 6, 1973, Pat. No. 3,882,742.  
This application Mar. 10, 1975, Ser. No. 556,778

Claims priority, application Japan, June 15, 1972,  
47-059873

Int. Cl.<sup>2</sup> B26D 1/54

U.S. Cl. 83—565

13 Claims



1. In a band sawing machine, the improvement comprising a profiling mechanism having a profile sensing member for sensing the profile of a work model, means for converting into an electrical signal the displacement of the sensing member by the model profile, the blade-twisting means responsive to the signal for twisting a short length of the band saw blade, including the cutting region thereof, about the cutting edge by an amount proportional to the displacement of the sensing member.

4,014,236

# PORTABLE, STRAIGHT AND SQUARE, VARIABLE ANGLE OR MULTI-ANGLE SAWING GUIDE

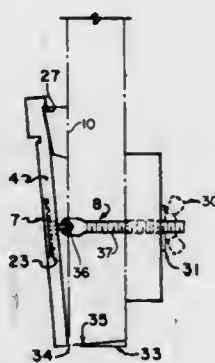
Edwin S. Neal, 1514 Maryland Ave., Charlotte, N.C. 28209

Filed Feb. 8, 1974, Ser. No. 435,527

Int. Cl.<sup>2</sup> B27B 9/04

U.S. Cl. 83—745

7 Claims



1. A sawing guide for guiding a circular saw having a flat base plate during the sawing of an object comprising guide plate means for engaging said circular saw to control the line of cut and angle of cut made by the saw, angle controlling means adapted to engage said object and extend between said object and said guide plate means, and mounting means to secure said guide plate means to said object and to maintain said guide plate means in contact with said object, said mounting means being adapted to allow pivotal movement of said guide plate means relative to said object to maintain a first portion of said guide plate means in contact with said object while permitting said angle controlling means to vary the

distance between a second portion of said guide plate means and said object.

4,014,237

# MUSICAL NOTE DETECTING APPARATUS

Karl F. Milde, Jr., 198 Baltic St., Brooklyn, N.Y. 11201

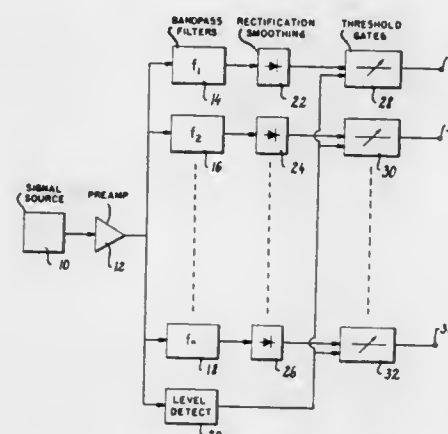
Continuation of Ser. No. 231,016, March 1, 1972, abandoned,  
which is a continuation of Ser. No. 79,044, Oct. 8, 1970,  
abandoned, which is a continuation-in-part of Ser. No.

756,857, Sept. 3, 1968, abandoned. This application Aug. 28,  
1975, Ser. No. 608,707

Int. Cl.<sup>2</sup> G10G 1/00

U.S. Cl. 84—1.12

8 Claims



1. In apparatus for automatically detecting the pitch of individual notes of music comprising input means for receiving an electrical signal representing said music in analog form; frequency detecting means, coupled to said input means, for detecting the presence of musical note frequencies in said electrical signal; and musical note determining means, coupled to said frequency detecting means, for determining the notes of said music represented in said electrical signal in response to presence of said frequencies; said pitch-detecting apparatus having a sensitivity of detection such that the determination of the presence of a note is dependent upon the strength of said electrical signal; the improvement wherein said pitch-detecting apparatus further comprises means, coupled to said input means, for varying the sensitivity of said pitch-detecting apparatus in inverse relation to the strength of said signal, thereby reducing the sensitivity of the apparatus with an increase in the loudness and increasing the sensitivity of the apparatus with a reduction in the loudness of said notes; whereby said pitch-detecting apparatus is operative to determine the presence of musical note fundamentals, but not harmonics, notwithstanding variations in the loudness of said notes.

4,014,238

# TONE SIGNAL WAVEFORM CONTROL NETWORK FOR MUSICAL INSTRUMENT KEYING SYSTEM

James S. Southard, Union, Mich., assignor to C.G. Conn, Ltd.,  
Elkhart, Ind.

Continuation-in-part of Ser. No. 496,943, Aug. 13, 1974, and  
a continuation-in-part of Ser. No. 561,970, March 26, 1975,  
Pat. No. 3,955,460. This application June 23, 1975, Ser. No.

589,370

Int. Cl.<sup>2</sup> G10H 1/02

U.S. Cl. 84—1.13

13 Claims

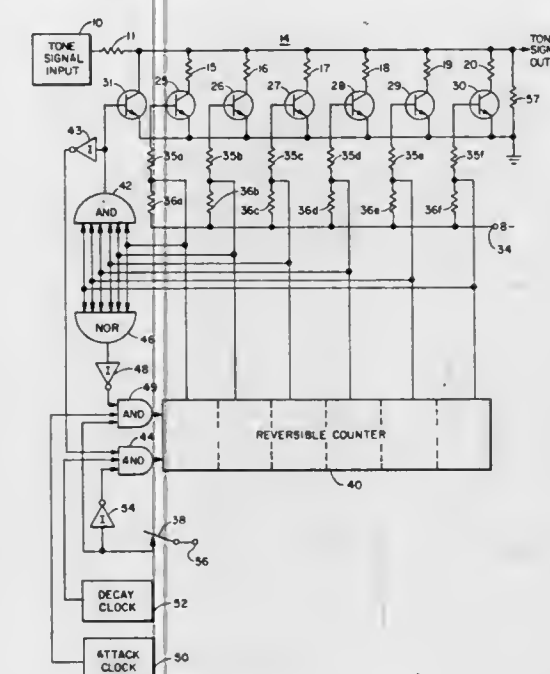
1. A keying system for shaping tone signals in an electronic musical instrument in which key operation information is digitally multiplexed data, said system including in combination:

latching circuit means coupled to receive said multiplexed data and having a predetermined number of stages, said latching circuit means responsive to the application of a strobe pulse to each stage thereof to store in such stage the data received thereby at the time of application of such strobe pulse;

means for applying strobe pulses to the stages of said latching circuit means;

an attenuator matrix including a plurality of variable attenuator networks corresponding to the number of stages of said latching circuit means;

scanning circuit means coupled with the outputs of each stage of said latching circuit means for sequentially producing signals representative of the state of the data stored in each stage of said latching circuit means;



a tone signal input terminal for receiving tone input signals coupled with each variable attenuator network;  
a tone signal output terminal coupled with each variable attenuator network for supplying tone signals therefrom;  
and  
control circuit means coupled with said scanning circuit means and with said attenuator matrix for controlling the operation of each of said variable attenuator networks according to the output signals from said scanning circuit means.

4,014,239

# GUITAR STRING TUNING DEVICE

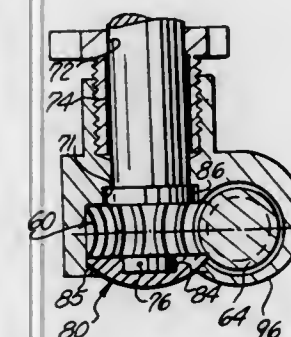
Robert J. Spercel, 3214 W. 139th St., Cleveland, Ohio 44120

Filed Mar. 12, 1975, Ser. No. 557,817

Int. Cl.<sup>2</sup> G10D 3/14

U.S. Cl. 84—306

29 Claims



1. A device for use in tuning the strings of a stringed musical instrument, said device comprising a rotatable shaft adapted to be connected with a string of the musical instrument, a pinion gear connected with said shaft for rotation therewith about a common central axis, a rotatable worm gear disposed in meshing engagement with said pinion gear, fixed surface means disposed in a predetermined position relative to the central axis of said worm gear for rotatably supporting one side portion of said pinion gear, movable surface means for rotatably supporting another side portion of said pinion gear, means for rotating said worm gear about its central axis to

effect rotation of said pinion gear and shaft about their common central axis, and adjustment means for moving said movable surface means relative to said fixed surface means to move said pinion gear and vary the meshing relationship between said pinion and worm gears.

4,014,240

# STRAP HOLDER ASSEMBLY

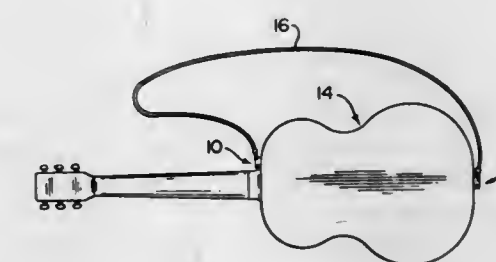
Charles E. Pullen, Pebble Hill Plantation, Thomasville, Ga.  
31792

Filed Dec. 17, 1975, Ser. No. 641,520

Int. Cl.<sup>2</sup> G10D 3/00; G10G 5/00

U.S. Cl. 84—327

10 Claims



1. A strap holder means of the type primarily used for attachment of a strap to a musical instrument or like device, said strap holder means including at least one holder assembly comprising: base means mounted on the instrument and comprising an upstanding flange having a curvilinear configuration along at least a portion of the length thereof, said flange extending outwardly relative to the surface of the instrument, socket means defined substantially on the interior of said base means, swivel means movably connected to said base means, said swivel means movably mounted within said socket means in substantially surrounded relation relative to said flange, said swivel means including a strap connector element attached thereto and extending substantially outwardly from said base means, said strap connector element including attachment means disposed in strap engaging position relative to said strap connector element, whereby the strap is movably connected to the instrument at least at one end thereof.

4,014,241

# SYNTHETIC WOODWIND REED

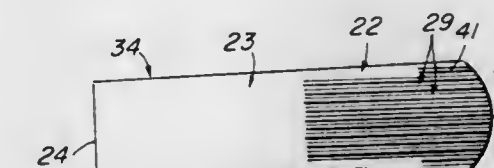
George W. Gamble, One Phlox Lane, Acton, Mass. 01720

Filed Feb. 11, 1976, Ser. No. 657,077

Int. Cl.<sup>2</sup> G10D 9/02

U.S. Cl. 84—383 A

11 Claims



1. A reed for a woodwind instrument comprising a strip of material having a non-convex surface, a convex surface curved in the transverse direction, a tip end, and a root end, said non-convex surface and said convex surface forming a vamp region and a root region, said vamp region extending from the tip end to some distance between the tip end and root end, the inter-surface distance between said convex surface and said non-convex surface increasing exponentially as a function of longitudinal distance from said tip end for the length of said vamp region, said convex surface having a first set of longitudinal channels therein extending from said tip end along at least a portion of said vamp region, said non-convex surface having a second set of longitudinal channels therein aligned with said first set of channels and extending



from said tip end along at least a portion of said vamp region, whereby any transverse cross-section of at least that portion of the vamp region near said tip end comprises a plurality of alternating thicker and thinner regions, said thinner regions being near but not necessarily on the center of gravity of the cross-section.

4,014,242

# APPARATUS FOR USE IN THE TUNING OF MUSICAL INSTRUMENTS

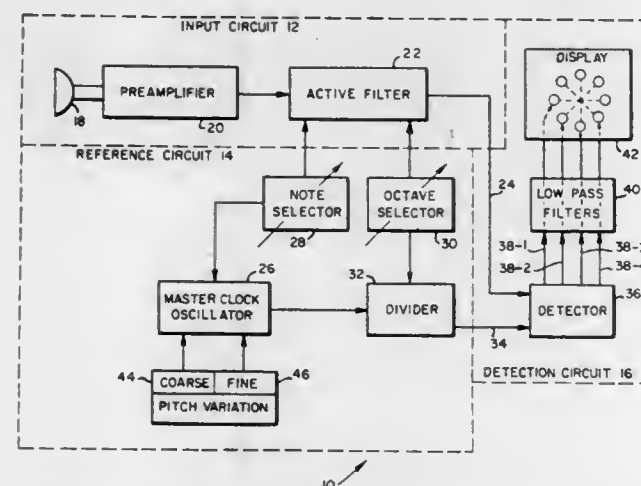
Albert E. Sanderson, Carlisle, Mass., assignor to Inventronics, Inc., Carlisle, Mass.

Continuation of Ser. No. 399,923, Sept. 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 249,942, May 3, 1972, abandoned. This application May 22, 1975, Ser. No. 579,946

Int. Cl.<sup>2</sup> G10G 7/02

U.S. Cl. 84—454

24 Claims



1. A tuning aid for musical instruments comprising:
  - A. an input circuit with means for detecting an audio signal in a selected range of frequencies and generating a note signal;
  - B. a reference circuit for transmitting a reference signal; and
  - C. comparison and display circuit means including:
    - i. means responsive to the reference signal for producing a plurality of spaced phase reference signals at a known frequency, said reference signals including a first phase reference signal, and a second phase reference signal that is other than a complement of the first phase reference signal,
    - ii. a phase difference detector including a logical combination means connected to receive each phase reference signal, each of said logical combination means combining the note signal and corresponding phase reference signal for transmitting a logical output signal which has a duty cycle that varies in accordance with the phase relationship between the note signal and the corresponding phase reference signal, and
    - iii. a plurality of display means, each display means responsive to one of the output signals for displaying the phase relationship between the note signal and the corresponding one of the phase reference signals, said plurality of display means providing a continuous display of the direction of and rate of the note signal phase change.

4,014,243

# EXPANDING BOLT

Illar Toomingas, Enskede, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

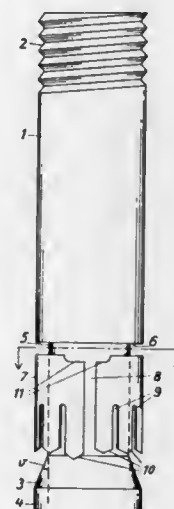
Filed Nov. 28, 1975, Ser. No. 635,927

Claims priority, application Sweden, Dec. 11, 1974, 7415535

Int. Cl.<sup>2</sup> F16B 13/04

U.S. Cl. 85—74

2 Claims



1. An expanding bolt for attachment to the walls of a cavity, comprising: a shank portion having a threaded outer end for the reception thereof of a nut for tightening; an inner end formed as a cone coaxial with said outer end, said cone having a narrow part directed toward said outer end; a cylindrical transition portion between said cone and said shank portion having a diameter less than said shank portion; and an expanding sleeve surrounding said cylindrical transition portion, said expanding sleeve having an axial slit formed along the length thereof for facilitating the expansion thereof, a continuous edge directed toward said outer end of said shank portion, a plurality of slots formed about the circumference of said expanding sleeve, each slot extending from the edge directed toward said inner end toward said continuous edge directed toward said outer end, and a plurality of straight tips formed between said plurality of slots, some of said plurality of straight tips having a length longer than other ones of said plurality of straight tips, each of said plurality of straight tips having a pointed end for easy penetration of said expanding sleeve into the walls of said cavity; said expanding sleeve having a circumferential shape such that parts thereof extend beyond the circumference of said shank portion as measured in a plane taken perpendicular to the length of said shank portion, so that said parts thereof contact the walls of said cavity upon insertion of said bolt into said cavity to thereby afford initial holding of the expanding sleeve therein, said edge of said circumference of said expanding sleeve directed toward said outer end comprising a plurality of notches extending partly along the length of said expanding sleeve toward said inner end so that material rubbed off from said expanding sleeve as said expanding sleeve enters into said cavity falls into the area defined between said expanding sleeve and said cylindrical transition portion to thereby prevent any obstruction of said shank portion of said bolt from entering into said cavity, whereby said straight tips of said expanding sleeve are caused to engage the walls of said cavity by pulling on said outer end of said shank portion which thereby causes said cone to enter into said sleeve and expand outwardly said plurality of straight tips.

4,014,244

# FLATTENED ROUND END STAPLE

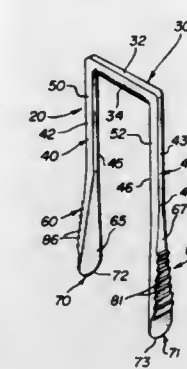
Charles O. Larson, Sterling, Ill., assignor to Charles O. Larson Co., Sterling, Ill.

Filed Oct. 22, 1975, Ser. No. 624,657

Int. Cl.<sup>2</sup> F16B 15/06

U.S. Cl. 85—49

1 Claim



1. A staple formed without waste from a length of metallic rod stock material having a given cross-sectional area, for insertion into a telephone pole or like grained object, the staple comprising a straight bight portion having opposed flat top and bottom surfaces and opposed rounded side surfaces defining a bight cross-section of given area substantially equal to the rod stock material cross-sectional area, and a pair of tines extending substantially perpendicularly from the bight portion, each tine being defined by opposed outer and inner flat surfaces and opposed rounded side surfaces over a mediate portion defining a tine cross-section of given area substantially equal to the staple bight cross-sectional area, each tine including a tapering tongue at least partly defined by an outer and an inner flat surface extending from the mediate portion surfaces and diverging unnotched, straight side surfaces, the inner flat surface tapering toward the outer flat surface to intersect the outer flat surface in a line lying in the same plane as the extended outer flat surface of the tine mediate portion and tine tongue portion, and a tongue tip at the terminal end having an elongate, substantially rectangular cross-sectional area substantially equal to the staple bight and tine cross-sectional areas and an elongate cutting edge of substantially semi-circular configuration, each tine tongue tip lying in a plane parallel to the plane of the other tine tongue tip and perpendicular to the plane of the staple itself, for insertions between telephone pole grain striations, and a plurality of ratchet teeth formed only on the outer flat tine tongue surface, the teeth on each tine extending between said diverging side surfaces, thereby forming a series of teeth, each tooth having a greater length than the previous tooth from the tine mediate portion to the tine tongue tip, each tooth extending out of the plane of the outer flat tine tongue surface and being at least partly defined by a first substantially planar surface extending perpendicularly to the outer flat tine tongue surface and by another substantially planar surface extending obliquely to the first tooth surface, and said other surface of the lowermost tooth extending obliquely to the tine terminal elongate cutting edge, thereby forming a series of sturdy, aggressive, ratchet-like teeth extending outwardly of the tine tongue.

4,014,245

# FASTENER

John S. Frye, 3098 Trafalgar Way, Chamblee, Ga. 30341, and James B. Fuss, 3245 Enon Road, Atlanta, Ga. 30349

Filed May 28, 1975, Ser. No. 581,700

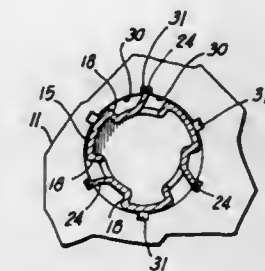
Int. Cl.<sup>2</sup> F16B 19/00

U.S. Cl. 85—5 P

4 Claims

1. A fastener for fastening together two sheets of metal having mutually aligned apertures defined by generally annular walls having a plurality of radially spaced notches therein, said fastener comprising a metallic tube having a plurality of tabs projecting said tube and being substantially axially

aligned with said tube and positioned along chord extensions of said tube and of sufficient length to be seated in the aperture defining wall notches of the two sheets and bent off said chord extensions of said tube into locking engagement with the aperture defining wall notches to fasten the two sheets of metal to the fastener and thereby to each other, and wherein



said metallic tube is formed with a first set of cylindrical segments of first radius unitarily joined together by a second set of cylindrical segments of second radius smaller than said first radius with said tabs positioned on said second set of cylindrical segments and being of sufficient length to project radially beyond said first set of cylindrical segments when bent.

4,014,246

# ROCKET-POWERED APPARATUS FOR LAUNCHING A FLYING DEVICE

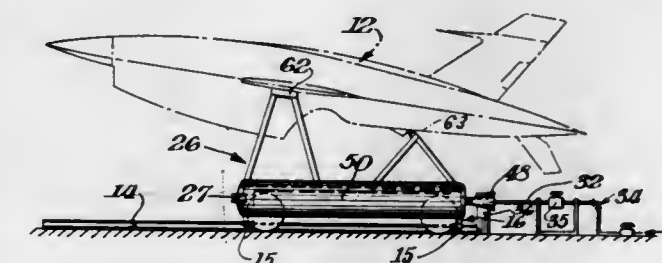
William J. Nissley, Jr., Wilmington, Del., assignor to All American Industries, Inc., Wilmington, Del.

Filed July 2, 1975, Ser. No. 592,394

Int. Cl.<sup>2</sup> F41F 7/02

U.S. Cl. 89—1.819

7 Claims



1. A rocket-powered launching apparatus for a flying device comprising a guide track having starting and terminal ends, a rocket-powered vehicle operatively engaged with the guide track, at least one rocket casing on the rocket-powered vehicle, an exhaust nozzle in the rear of the rocket casing, an arresting device disposed at the terminal end of the guide track for terminating the movement of the rocket-powered vehicle, a source of pressurized fluid at the starting end of the guide track, a latching device at the starting end of the guide track for preliminarily restraining movement of the rocket-powered vehicle, pressurized fluid loading probe means on the source of pressurized fluid for loading the pressurized fluid into the rocket casing through the nozzle while the rocket-powered vehicle is maintained latched to the starting end of the track, sealing means between the pressurized fluid probe means and nozzle whereby the generation of pressure in the casing is facilitated, and release means on the latching means for releasing the rocket-powered vehicle and allowing it to move down the guide track toward the terminal end for launching a flying device connected to it.



4,014,247

## GAS-OPERATED SHOTGUN

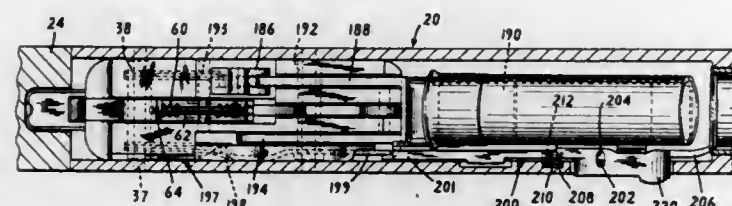
James Tollinger, Ithaca, N.Y., assignor to Ithaca Gun Company, Inc., Ithaca, N.Y.

Filed Nov. 19, 1974, Ser. No. 525,072

Int. Cl.<sup>2</sup> F41C 13/00

U.S. Cl. 89—191 A

11 Claims



1. In a gas operated firearm having a barrel, a receiver, a magazine for supplying shells in succession to the receiver, a carrier within the receiver for moving shells received from the magazine to chambering position, bolt means for chambering shells and closing the breech end of the barrel, shell feed control means for coordinating the feeding of shells from the magazine, the movement of the carrier, and the chambering movement of the bolt, slide means for driving the bolt means, and gas operated means for operating the slide means, the improvement in the shell feed control means comprising:

- a carrier latch lever, said firearm having a single shell stop which is formed integrally on said lever, said lever being pivotally mounted in said receiver for
- a. latching the shell carrier in a lowered, shell-receiving position,
- b. releasing a single shell from the magazine to be moved rearward under the action of the magazine spring onto the shell carrier,
- c. stopping the following shell in the magazine immediately after the previous shell has left the magazine, and
- d. releasing the shell carrier for subsequent pivoting movement thereof into chambering position.

4,014,248

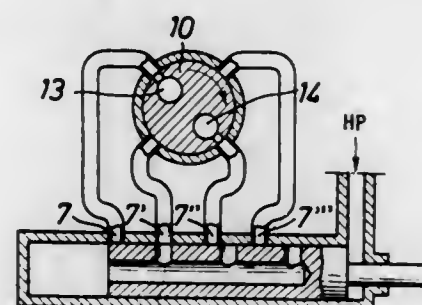
SERVOMECHANISM CONTROLLED STEP BY STEP  
Luc Cyrot, Mission Viejo, Calif., assignor to D.B.A., Clichy, France

Continuation of Ser. No. 346,328, March 30, 1973, abandoned. This application June 6, 1975, Ser. No. 584,286  
Claims priority, application France, Apr. 4, 1972, 72.11722; Nov. 15, 1972, 72.40477

Int. Cl.<sup>2</sup> F15B 15/17, 9/02

U.S. Cl. 91—19

5 Claims



1. Step by step controlled servomechanism adapted to resist an external force comprising

- a. a cylinder (2);
- b. a drive element (1) movable in said cylinder in first and second opposed directions, said drive element driving said cylinder into two chambers, (3,4) said drive element being provided with a plurality of spaced receiver ports (6) opening into one of said chambers (3);
- c. a high pressure supply (HP) continuously applied to the other one of said chambers (4);
- d. a high pressure source (13) and a low pressure source (14);
- e. a distributor (9) for providing selective communication

between said high pressure (13) and low pressure (14) sources and said receiver ports (6), said distributor (9) including a number of spaced transmitter ports (7) in the wall of said cylinder (2) at least equal to three but independent of the number of said receiver ports, the distance between adjacent receiver ports (6) being different than the distance between adjacent transmitter ports (7), said receiver ports (6) adapted to communicate with said transmitter ports (7), said distributor (9) further including means (10) for connecting said transmitter ports (7) by permutation, in succession and in pairs, respectively, to said low pressure source (14) and to said high pressure source (13),

- f. at least some of said receiver ports being located adjacent a pair of said transmitter ports in such a position that said adjacently located receiver ports communicate neither with one nor with the other of said pair of transmitter ports, said pair of transmitter ports being coupled by said connecting means (10) to said high and low pressure sources, respectively, whereby a displacement in said first or second directions of said drive element due to the external force thereon puts one of said adjacently located receiver ports in communication with one or the other of said pair of transmitter ports to resist the external force thereby effecting a hydraulic locking of said drive element, and
- g. another of said receiver ports being in communication with one of the transmitter ports of a next pair of transmitter ports to be coupled by said connecting means (10) with said high and low pressure sources, respectively, to thereby effect a step by step displacement of said drive element

4,014,249

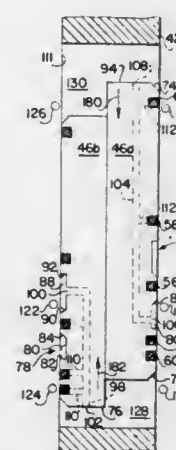
PNEUMATICALLY ACTUATED SANDING TOOL  
James O. Taylor, Manalapan, Fla., assignor to Florida Pneumatic Manufacturing Corporation, Boynton Beach, Fla.

Filed Sept. 18, 1975, Ser. No. 614,677

Int. Cl.<sup>2</sup> F01L 21/02

U.S. Cl. 91—32

5 Claims



1. A fluid actuated portable sanding tool comprising:

- a housing having a cylinder with a bore therein, means for supplying a pressurized fluid to a supply port in communication with said bore, and means for exhausting at least a first vent port and a second vent port in communication with said bore at corresponding first and second ends of said cylinder;
- a double-ended piston slidably mounted for reciprocal movement within said cylinder, said piston having first circumferential main sealing means, a second circumferential main sealing means and a third circumferential main sealing means axially mounted along said piston at one end portion thereof for providing three slidable, fluid tight seals between said piston and the inner surface of said cylinder, thereby defining at said one end portion of said piston a first annular region and a second annular region respectively, said piston further having a first

annular slot between said first and said second main sealing means and a second annular slot between said second and said third main sealing means, the walls of said first slot proximate said first main sealing means and the wall of said second slot proximate said third sealing means each extending substantially vertically radially inwardly, and the walls of said first and second slot proximate said second sealing means beveled angularly radially inwardly away from each other, a first port in communication with said first annular slot, a second port in communication with said second annular slot, a third port in communication with said cylinder bore at said first end of said cylinder, a fourth port in communication with said bore at said second end of said cylinder, a first passage in said piston in communication with said first port and said third port, and a second passage in said piston in communication with said second port and said fourth port, and wherein said fluid supply means supplies pressurized fluid at a central portion of said bore for alternate communication with said first port and said second port;

- a first circumferential end sealing means and a second circumferential end sealing means respectively mounted at the first and second ends of said piston for providing slidable fluid tight seals between said piston and the inner surface of said cylinder and wherein said first vent port and said second vent port have a size and are spaced apart a distance such that each port is alternately blocked by the respective end sealing means when said piston is being forced away from said port by the pressurized fluid; and wherein said piston has an annular radially inwardly beveled edge at each end, said first and said second end seals being mounted axially inward from and adjacent to the corresponding beveled edge;
- starter means for displacing said piston towards one end of said cylinder such that one of said first and second ports is in communication with said fluid supplying means;
- a mounting plate mounted for reciprocal motion on said housing;
- and means for connecting said piston at a location between said third main sealing means and said second end sealing means to said mounting plate for reciprocally driving said mounting plate;
- wherein said piston is reciprocally driven by said fluid which has been alternately delivered from said supply means to the respective ends of said bore by said first port, first passage and third port and by said second port, second passage and fourth port.

4,014,250

CYLINDER BLOCK POSITIONING ARRANGEMENT FOR A HYDRAULIC AXIAL PISTON MACHINE

Paul Bosch, Ludwigsburg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

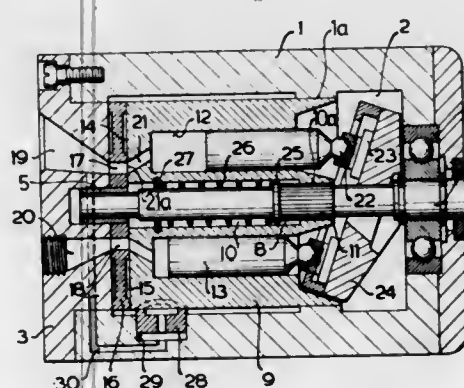
Filed Mar. 31, 1972, Ser. No. 240,253

Claims priority, application Germany, Apr. 5, 1971, 2116619

Int. Cl.<sup>2</sup> F01B 1/22

U.S. Cl. 91—487

14 Claims



1. In a hydraulic axial piston machine, a combination com-

prising a rotary cylinder block mounted for angular displacement about an axis of rotation and having a longitudinal axis which is intended to coincide with said axis of rotation, a block end face normal to said longitudinal axis, and a circumferential surface adjacent said end face, said cylinder block being provided with cylinders located along a circle concentric with said longitudinal axis and having a first radius, and cylinder ports communicating with said cylinders, respectively, and located on said block end face along a circle concentric with said longitudinal axis and having a second radius smaller than said first radius; a stationary body having a control face normal to said axis of rotation and being in sliding contact with said block end face, said stationary body being provided with high pressure conduit means and low pressure conduit means respectively opening in a high pressure control port and in a low pressure control port on said control face, said control ports being located along a circle concentric with said axis of rotation and having said second radius so as to communicate with said cylinder ports, whereby a tilting moment acts on said cylinder block in a sense tending to incline said longitudinal axis with respect to said axis of rotation and said block end face with respect to said control face; and positioning means for counteracting said tilting moment and the inclination of said longitudinal axis with respect to said axis of rotation including a positioning cylinder member and a positioning piston member in said positioning cylinder member, one of said positioning members engaging a portion of said circumferential surface of said cylinder block axially adjacent said block end face, and being movable in a direction normal to said axis of rotation toward and away from the same whereby to restore the coincidence of said longitudinal axis with said axis of rotation.

4,014,251

CRAFT DEVICE FOR MAKING AERIAL PROJECTILES FROM SHEET MATERIAL

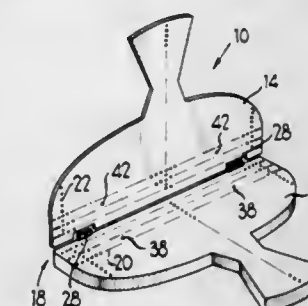
Burton C. Meyer, Downers Grove, and Leigh Copeland, Chicago, both of Ill., assignors to Marvin Glass &amp; Associates, Chicago, Ill.

Filed Nov. 10, 1975, Ser. No. 630,720

Int. Cl.<sup>2</sup> B31D 5/02

U.S. Cl. 93—1 R

9 Claims



- 1. A method for making aerial projectiles from sheet material such as paper, or the like, comprising the steps of: providing a press having complementary means on the respective portions thereof for deforming the sheet material in a predetermined manner to define a set of fold lines;
- placing the sheet material in the press;
- pressurizing the press to deform the sheet material;
- folding the sheet material along said predetermined fold lines to define the shape of a projectile having desired aerodynamic characteristics to sustain the projectile in flight; and
- trimming the sheet material about the outline of the press.



4,014,252

## METHOD OF MANUFACTURING BAGS

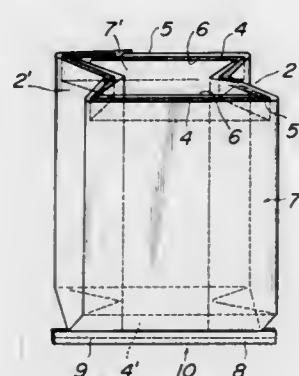
Akio Saito, Tokorozawa, Japan, assignor to Show Seitai Kogyo Kaisha Ltd., Tokyo, Japan

Filed Sept. 2, 1975, Ser. No. 609,731

Int. Cl.<sup>2</sup> B31B 49/04

U.S. Cl. 93—35 R

5 Claims



1. In a method of manufacturing a bag which comprises the steps of:

- continuously playing out a continuous web of a blank;
- bonding together the side edges of the blank to form a tubular body;
- cutting the tubular body along spaced cutting lines into a plurality of sections each having a length substantially equal to the length of the completed bag;
- the improvement comprising:
- bonding reinforcing members to said blank, the intermediate portions of said reinforcing members being aligned with said cutting lines;
- cutting said blank together with said reinforcing members along said cutting lines to form said sections;
- flattening the bottom end of each section;
- bending up a portion of said bottom end at right angles;
- separating the opposite sides of the bent up end portion;
- folding back the separated sides toward each other, said reinforcing member facing outwardly; and bonding another reinforcing member to said first mentioned reinforcing member.

4,014,253

## ADJUSTABLE DIFFUSERS

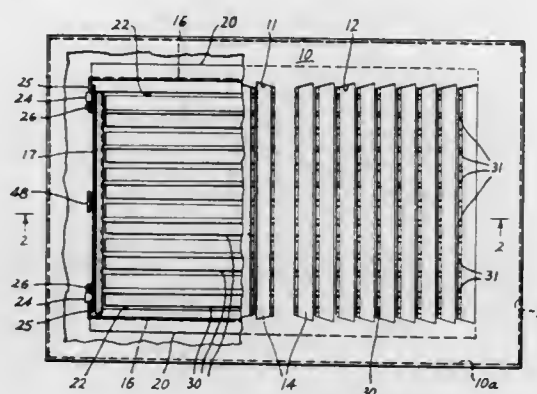
Hal Dry, Winters, Tex., assignor to Wallace-Murray Corporation, New York, N.Y.

Filed Nov. 14, 1975, Ser. No. 631,887

Int. Cl.<sup>2</sup> F24F 13/08

U.S. Cl. 98—121 A

8 Claims



1. Diffuser, comprising a plurality of side by side parallel vanes, each said vane having in line with the plane of the vane a longitudinal central pivot extending from an intermediate point of each of its ends, means for pivotally supporting each said vane at each of its said central pivots whereby said vane is rotatable about an axis defined by its said central pivots, said vanes each having at the same ends thereof and in line with the

plane of the vane a longitudinal offset pivot shorter than the central pivot at that end of the vane, slotted plate means supported for reciprocal movements along the line of said same ends of said vanes, said slotted plate means having at the end of each vane a J-slot having a straight slot portion parallel to said line of said same ends of said vanes and having a hook-shaped slot portion at one end thereof, said central and offset pivots of said vanes being disposed slidably movably in said J-slots, means beyond the ends of said offset pivots for restraining each said central pivot against lateral movements, and means for reciprocatingly moving said slotted plate means to move said central and offset pivots of said vanes along said slots thereof and to move said offset pivots between said straight portions of the slots and the curved portions thereof to rotate said vanes between open and closed positions.

4,014,254

## DEVICE FOR WRAPPING SHEETS AROUND FOOD IN ROLLED FORM AND OTHER FOOD PROCESSING DEVICES

Nobuyoshi Ohkawa, Amagasaki City, Japan, assignor to Daiei-giken, Inc., Amagasaki, Japan

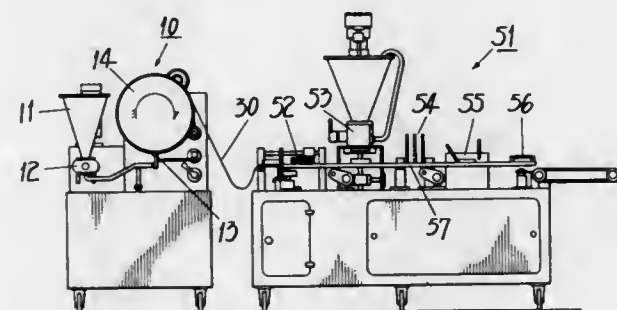
Filed Mar. 12, 1974, Ser. No. 450,489

Claims priority, application Japan, Mar. 12, 1973, 48-29192; Mar. 12, 1973, 48-29193; Mar. 12, 1973, 48-29194

Int. Cl.<sup>2</sup> A21C 9/06

U.S. Cl. 99—450.6

6 Claims



1. A device for wrapping previously made pre-cut dough sheets around a mixture of minced vegetables, meat and the like, to make rolled food, comprising, in combination: a first device for supplying the mixture to the dough sheets; a second device for doubling the filled dough sheets; and a third device for folding over the filled and doubled dough sheets; wherein said second device includes a stationary cradle having substantially parallel teeth with at least one cut-out in said cradle; at least two bending arms in respective planes that are substantially perpendicular to that of said cradle, movable at least partly through said cut-out about an arc-shaped path; at least one lateral pressing bar extending over and at least partly across said cradle, for holding down the sheets to the upper surface of said cradle, after they have been folded; and a shaping member pivotable toward and away from said cradle, for securing the mixture to the doubled dough sheets while on said cradle.

4,014,255

## APPARATUS FOR USE IN DETERMINING THE CHARACTER OF FINELY DIVIDED OR PARTICULATE SOLID MATERIAL

Edward James Fox, Derby, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Nov. 19, 1974, Ser. No. 525,200

Claims priority, application United Kingdom, Dec. 14, 1973, 58022/73

Int. Cl.<sup>2</sup> B30B 15/00

U.S. Cl. 100—99

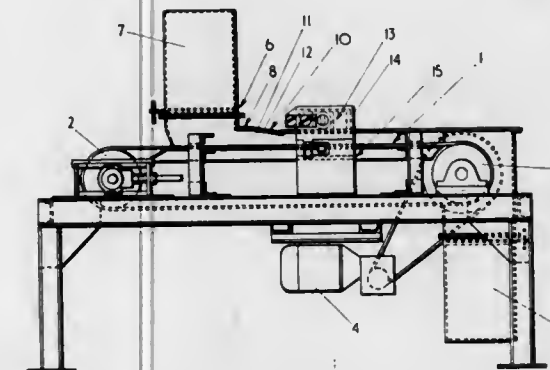
7 Claims

1. Apparatus for continuously presenting a uniform bed of finely divided or particulate solid material to a beam of electro-magnetic radiation to determine a characteristic of the material, comprising:

a linear conveyor having a flat material conveying surface, means for driving said conveyor at a substantially continuous and uniform speed,

a feed hopper positioned adjacent the upstream end of said conveyor for delivering the material onto the moving conveying surface,

a stationary inverted trough shaped guide assembly extending from beneath the downstream side of said feed hopper with its longitudinal axis substantially parallel to the conveyor and having a first zone with substantially parallel walls for defining the upper and side boundaries of the bed of material being conveyed and a second zone with



- all walls inclined toward the conveying direction to provide compaction of the material passing therethrough so that the bed of material is of a substantially constant bulk density,
- a sampling section having a source and detector of electro-magnetic radiation positioned adjacent said guide assembly in which the bed of material is presented to a beam of electro-magnetic radiation for determining a characteristic of said material, and
- a collection means positioned adjacent the downstream end of said conveyor into which the sampled material is discharged and collected.

4,014,256

## CAN CRUSHER DELIVERY MECHANISM

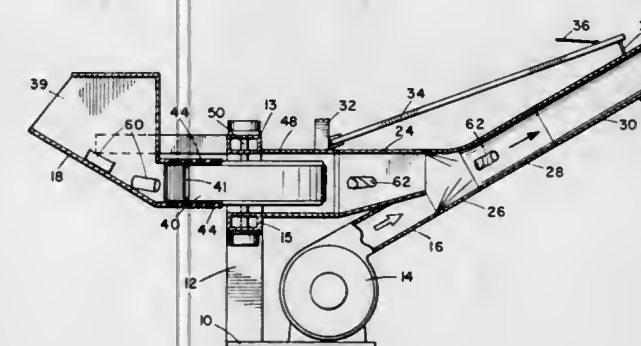
Charles McRea Davis, Jr., 5209 Nannette St., Bonita, Calif. 92002

Filed Mar. 26, 1976, Ser. No. 671,018

Int. Cl.<sup>2</sup> B30B 3/04

U.S. Cl. 100—159

5 Claims



1. A can crusher comprising:
- a pair of wheels with at least one wheel having a resilient tire,
- frame means for holding said wheels rotatably in horizontal orientation and in abutting alignment for rotational contact,
- means for rotating at least one of said wheels,
- hopper means for receiving cans and positioning the cans to be moved into the intersecting contact of said wheels to be crushed in passage between said wheels,
- a tube being aligned with the intersecting contact of said wheels, on the discharge side thereof, for receiving crushed cans,

a second tube being angled upwardly, and joining the open end of the first tube, whereby said cans, being discharged at a high velocity from said intersecting wheels move upwardly in said second tube,

blower means for providing air under pressure, the lower end of said second tube, being connected to said blower whereby air passes upwardly through said second tube for contacting cans moving at a velocity up said tube, for moving the cans through said second tube to a point of discharge.

4,014,257

## APPARATUS FOR DIE CUTTING INDICIA ON A MULTILAYER TAPE

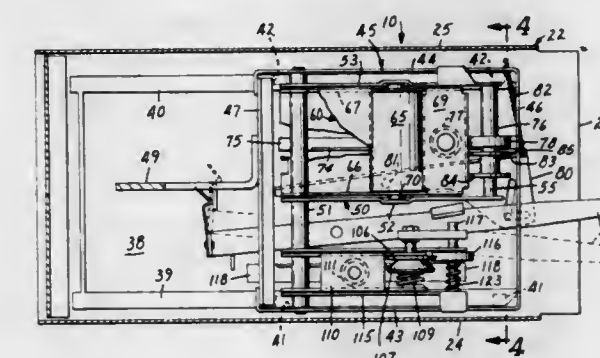
Larry A. Bettenhausen, West Lakeland Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 28, 1975, Ser. No. 599,357

Int. Cl.<sup>2</sup> B44B 5/00

U.S. Cl. 101—26

9 Claims



1. A machine for cutting one layer of a multilayer tape to form indicia from said one layer for forming messages, said indicia corresponding to indicia formed on one or more die plates having a raised cutting ridge formed thereon to define the outline of the indicia, said machine comprising:
- a main frame having a longitudinal axis,
- tape guide means for guiding a said tape along a path transversely across said main frame and oblique to said longitudinal axis, said guide means including a plate supported rigidly on said main frame and having a flat surface area defining a cutting platen,
- means for receiving a die plate adjacent said cutting platen with the cutting ridge extending away from the cutting platen,
- feed means for incrementally advancing said tape along said guide means and past said cutting platen,
- a first movable frame supported for movement along said main frame parallel to said longitudinal axis,
- a second movable frame pivotally mounted on said first movable frame and movable therewith,
- a roller rotatably mounted on said second movable frame and supported, with its axis transverse to said longitudinal axis, by spring means to urge said roller toward said cutting platen,
- cam means on said main frame and said second frame for urging said second frame toward said cutting platen and said roller into pressure contact toward said cutting platen when said first movable frame is moved in a first direction along said longitudinal axis and across said path of a said tape and to retract said second frame and said roller relative to said cutting platen when said first frame is moved in the opposite direction.



4,014,258

## HIGH SPEED PRINTING APPARATUS

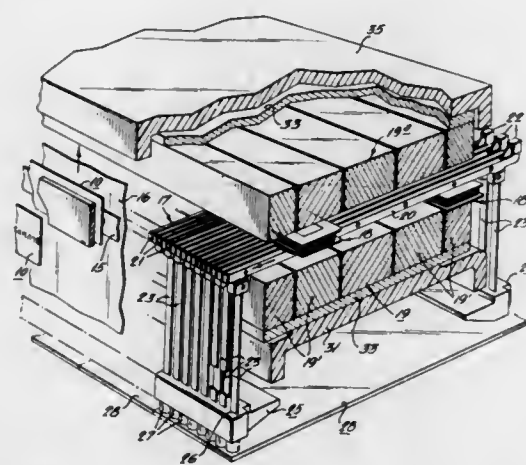
Carl I. Wassermann, 45 Hill Park Ave., Great Neck, N.Y. 11021

Filed Aug. 29, 1975, Ser. No. 608,902

Int. Cl.<sup>2</sup> B41J 9/38

U.S. Cl. 101-93.29

16 Claims



1. In a printer or the like, a plurality of hammers each having an elongated shank with an impact tip adjacent one end, means mounting said hammers for movement in side-by-side parallel paths along the longitudinal axes of said shanks whereby impressions are made on a surface adjacent the tips, a coil on each hammer shank for receiving electrical impulses, said coil being positioned with the turns lying in planes which are parallel to the plane containing said parallel paths of hammer movement, magnetic field generating means for generating fields in continuous zones extending transversely of said plurality of hammers with field portions extending normally to the plane which contains said parallel paths of hammer movement, and means mounting said coils within said magnetic field portions whereby said electrical impulses in said coils interact with said field portions to propel said hammers along said parallel paths.

4,014,259

## DRIVE FOR MULTICOLOR SHEET-FED ROTARY PRINTING PRESSES WITH TANDEM-MOUNTED PRINTING UNITS

Willi Jeschke, Heidelberg-Boxberg, Germany, assignor to Heidelberg Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

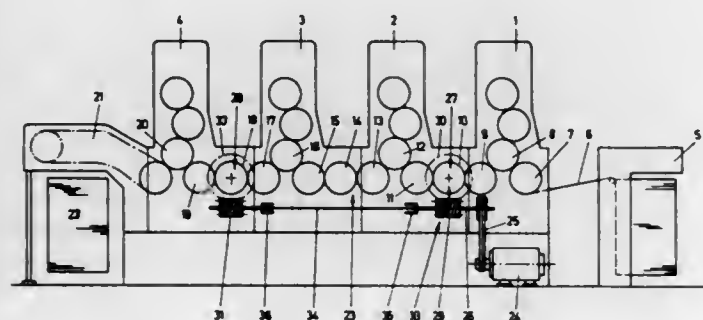
Filed Aug. 9, 1974, Ser. No. 496,168

Claims priority, application Germany, Aug. 9, 1973, 2340343

Int. Cl.<sup>2</sup> B41F 5/02

U.S. Cl. 101-183

2 Claims



1. In a drive for a multicolor sheet-fed rotary printing machine with tandem-mounted printing units driven by a closed gear train and including a drive motor, a drive train driven by the motor and extending parallel to the closed gear train, at least two force input locations connecting the closed gear train to said drive train, said drive train comprising n-1 torque

limiters for limiting the amount of torque applied respectively at said input locations, wherein n is equal to the number of force input locations being provided in said drive train, one of said force input locations being disposed in a path of direct power flow between the motor and the gear train, a respective torque limiter being located between the respective force input locations and having soft transmission means for yieldably transmitting a moment up to a given maximum to said closed gear train at the other of said force input locations, the printing machine being of the four-color type and said drive train being constructed as a main drive shaft and including a first and a second worm transmission, said gear train including a first gear on an intermediate transfer cylinder located between a first and a second printing unit of the printing machine, and a second gear on an intermediate transfer cylinder located between a third and a fourth printing unit of the printing machine, said main drive shaft being connected through said first worm transmission to said first gear, and through said second worm transmission to said second gear, said soft transmission means forming part of said main drive shaft and being constructed at least partly as a torsion rod between said first and second worm transmissions.

4,014,260

## REMOVABLE GUARD ON CYLINDERS OF PRINTING PRESSES

Wilhelm Schröter-Dommies, Ludwigshafen, and Wilfried Vogt, Walldorf, both of Germany, assignors to Heidelberg Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

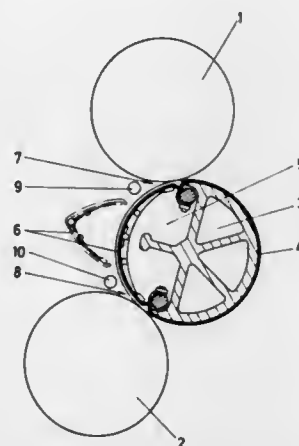
Filed Nov. 13, 1975, Ser. No. 631,682

Claims priority, application Germany, May 10, 1975, 2520920

Int. Cl.<sup>2</sup> B41F 13/08

U.S. Cl. 101-212

6 Claims



1. Manually removable guard on a printing press cylinder formed with a cylinder gap and having end plates at the axial ends thereof, comprising a pair of arcuate cover plates having respective concave and convex faces, means forming an articulating connection of said cover plates along respective mutually adjacent longitudinal sides thereof so that said cover plates are foldable concave face-to-concave face along said adjacent longitudinal sides thereof, and a leaf spring extending from one to the other of said cover plates transversely to said longitudinal sides thereof and adjacent the respective concave faces thereof, said leaf spring prestressing said plates into a substantially circular arcuate configuration corresponding to that of the cylindrical surface of the printing press cylinder, said cover plates being manually yieldingly foldable concave face-to-concave face along said adjacent longitudinal sides thereof and together with said leaf spring against the prestressing biasing force of the latter and engageable with the end plates of the printing press cylinder so as to cover and bridge the cylinder gap.

4,014,261

## CONVERSION DEVICE OF A STORAGE DRUM FOR SHEET TRANSFER

Willi Becker, Bammatal, Germany, assignor to Heidelberg Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

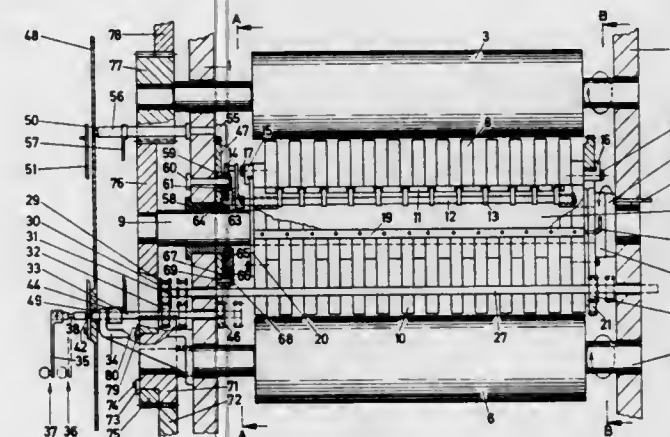
Filed Dec. 22, 1975, Ser. No. 642,695

Claims priority, application Germany, Dec. 20, 1974, 2460503

Int. Cl.<sup>2</sup> B41F 5/02, 21/04

U.S. Cl. 101-230

17 Claims



1. In an assembly of a sheet-transfer drum, a sheet-turning drum and a storage drum mounted on a shaft and located therebetween for transporting a sheet between individual printing units of a rotary printing press, a change-over mechanism for converting the printing press from single-side sheet printing to double-side perfecting printing and conversely as well as to different format sizes, the change-over mechanism comprising a control shaft axially displaceable from a non-controlling position to a single control position, a first control pinion mounted on said control shaft, first adjusting means for adjusting format size for double-side perfecting printing, said first control pinion being forcibly coupled to said first adjusting means, a second control pinion mounted on said control shaft, second adjusting means mounted for rotation about the shaft of the storage drum, drive gear means for converting the rotary printing press from single-side sheet printing to double-side perfecting printing, first cam means for adjusting the printing press from single-side sheet printing to double-side perfecting printing and conversely, second cam means for adjusting the format size for double-side perfecting printing, said first control pinion in said single control position of said control shaft, being in meshing engagement with said drive gear means, and said second control pinion, simultaneously in said single control position of said control shaft, being selectively couplable by said second adjusting means alternatively with said first cam means and with said second cam means.

4,014,262

## BLAST SIMULATOR

Robert E. Betts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1975, Ser. No. 546,980

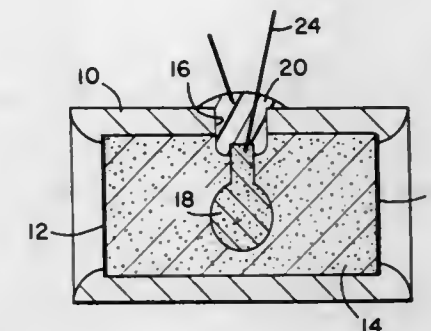
Int. Cl.<sup>2</sup> F42B 4/18

U.S. Cl. 102-28 R

1 Claim

1. A blast simulator for a noise environment tester in a simulated missile launcher, said blast simulator comprising: a cylindrical tube provided with openings at the ends thereof, said tube provided with an opening between said ends; a pyrotechnic charge disposed within said tube and between said ends; a disc disposed in each end to enclose said charge, an electric squib disposed in said opening between the cylinder ends; means for protecting said pyrotechnic charge against

moisture, said protecting means including a sealant placed over said opening to seal said pyrotechnic charge and wires



4,014,263

## CASELESS PROJECTILE

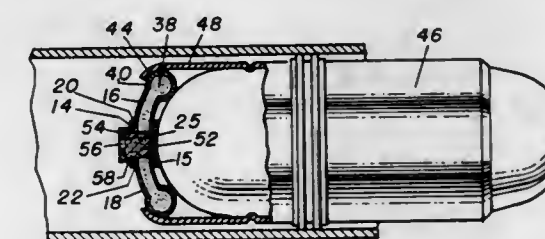
Roy D. Plumer, Santa Barbara, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,074

Int. Cl.<sup>2</sup> F42B 5/00

U.S. Cl. 102-38

4 Claims



1. A caseless high pressure chambered projectile which comprises: a toroidally shaped hollow tubular chamber having a pair of diametrically disposed spoke holes located in the inner wall of said tubular chamber and a plurality of gas vent orifices positioned in the rear side of said tubular chamber; a propellant material disposed in said tubular chamber; means for covering the gas vent orifices of said tubular chamber after said propellant has been loaded in said tubular chamber, said means keeping said propellant sealed in said tubular chamber and free from ambient contamination when said projectile is in an unfired state; spider means operatively positioned in said pair of spoke holes of said tubular chamber for igniting said propellant material located in said tubular chamber; and retaining sheath means for fixedly holding said integrally connected spider means and tubular chamber to said projectile so that said gas vent holes in said high pressure chamber are positioned to vent rearwardly of said projectile into a low pressure cavity of a launcher when said projectile is fired from said launcher.

4,014,264

## COMBINED IGNITER CAP

Hellmut Bendler, Nurnberg, and Heinz Gawlick, Furth, Bayern, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Aug. 21, 1975, Ser. No. 606,448

Claims priority, application Germany, Sept. 13, 1974, 2443793

Int. Cl.<sup>2</sup> F42C 19/10, 19/12

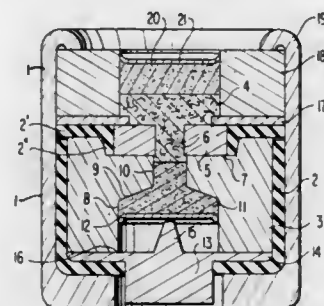
U.S. Cl. 102-46

25 Claims

1. A combined igniter cap comprising an electrically conductive housing having a unitary one-piece pole piece arranged therein, a first primer charge arranged on a first side of



said pole piece, said pole piece being provided with a recess and means providing a first communicating path through said pole piece between said recess and said first primer charge, a second ignition system being arranged in said recess and being ignitable from a second side of said pole piece which is disposed oppositely to said first side, and insulating element means formed of an electrically nonconductive material being disposed between said first side of said pole piece and said first primer charge, said insulating element means including first and second electrical contact members and an electrical igni-



tion means formed therebetween, said electrical ignition means being arranged immediately adjacent a surface of said nonconductive material facing said first primer charge, said first contact member being electrically conductively connected with said pole piece and said second contact member being electrically conductively connected with said housing, said insulating element means further including second communicating path means for providing a communicating path between said first communicating path means and said first primer charge.

#### 4,014,265 VEHICLE INCAPACITATOR

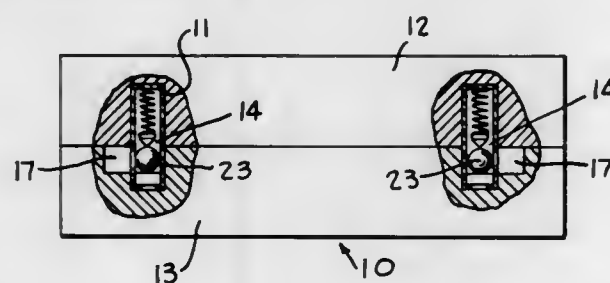
Irving L. Kintish, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 5, 1964, Ser. No. 410,050

Int. Cl.<sup>2</sup> F42C 15/22

U.S. Cl. 102—70 S

2 Claims



1. A vehicle incapacitator comprising a rotatable body of cast explosive having at least one cavity therein, a container seated in said cavity and having a flexible sidewall construction, said sidewall having an opening, a detonator within said container contacting said explosive, a firing pin having a conical forward surface for initiating said detonator, and means larger than said opening and normally engaging said forward surface for preventing said firing pin from initiating said detonator until a predetermined centrifugal force is imparted to said preventing means to thereby laterally displace said preventing means through said opening and release said firing pin to impinge on and initiate said detonator.

#### 4,014,266 TRANSPORT TRACK AND SLIDING CARRIAGE FOR MOVING HEAVY LOADS

Sören Näsland, Lidköping, and Gösta Martin Bohm, Vasteras, both of Sweden, assignors to Paul Anderson Industrier AB, Vasteras, Sweden

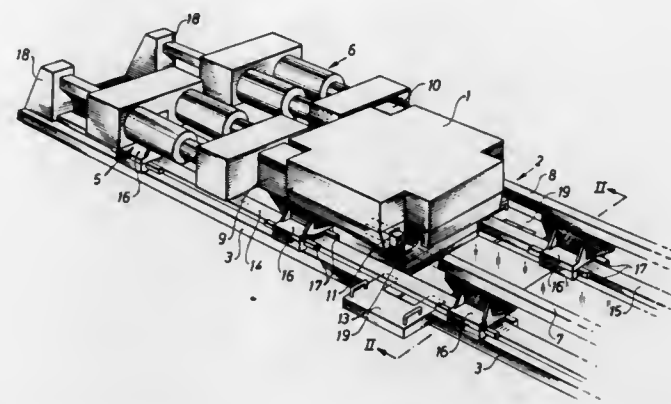
Filed Sept. 25, 1975, Ser. No. 616,531

Claims priority, application Sweden, Oct. 4, 1974, 7412554

Int. Cl.<sup>2</sup> B61B 13/08

U.S. Cl. 104—162

7 Claims



1. A transport system comprising: a track, a sliding carriage movable along the track for transporting heavy loads in a substantially horizontal direction, said track having a bottom plate positioned loosely on a support capable of bearing heavy loads, said bottom plate having an upper surface designed so as to provide minimum resistance to the movement of the sliding carriage over the upper surface; at least one rod attached to the bottom plate and extending in the longitudinal direction of the transport track; said rod guiding said carriage and removable while a load is present on said bottom plate; a climbing jack intended for moving said sliding carriage; and, means for transferring axial forces arising in said rod to said bottom plate.

#### 4,014,267 CONVEYOR CHAIN STRUCTURE

Harold G. Fitch, Clarkston, Mich., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

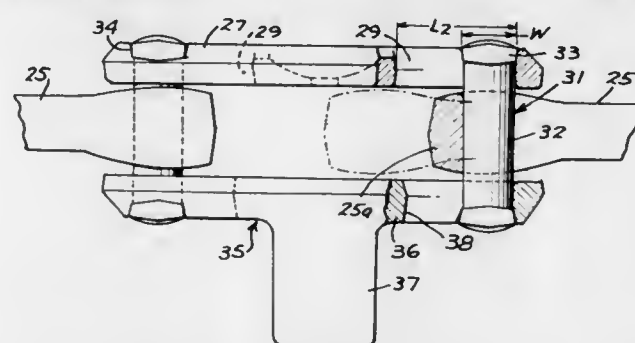
Continuation of Ser. No. 378,506, July 12, 1973, abandoned.

This application June 30, 1975, Ser. No. 591,873

Int. Cl.<sup>2</sup> B61B 13/00

U.S. Cl. 104—172 C

8 Claims



1. In a power and free conveyor system, the combination comprising load supporting means along which carriers are moved in a predetermined path, supporting means mounted along said load supporting means defining a conveyor chain supporting structure, and a conveyor chain supported by said supporting means comprising a plurality of substantially identical alternate main links, alternate pairs of substantially identical upper and lower links between said main links, each of said main and upper and lower links having longitudinally extending openings adjacent their ends having a

greater length than width such that each opening has an axis extending longitudinally of its respective link, and a pivot pin interconnecting the main links and upper and lower links and comprising a central portion extending through the opening in the main links and an enlarged transverse portion extending transversely of the upper and lower links, said transverse portion having a longer dimension and a shorter dimension, said chain being disengageable without tools by rotation of the pin with respect to the openings in the links so that the enlarged end can be removed by relative movement of the opening in the links, at least some of said links having an integral pusher member extending outwardly intermediate the ends thereof, the length of each opening in the link having the pusher dog thereon being less than the longer dimension of the enlarged portion of the pin such that the pin can be removed with respect to the pusher dog only by a swinging movement with respect to the axis of its respective opening.

#### 4,014,268 STEERING CONTROL MECHANISM

Yukiyoichi Hatori, Tokyo, and Hiroshi Sugiyama, Hiratsuka, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

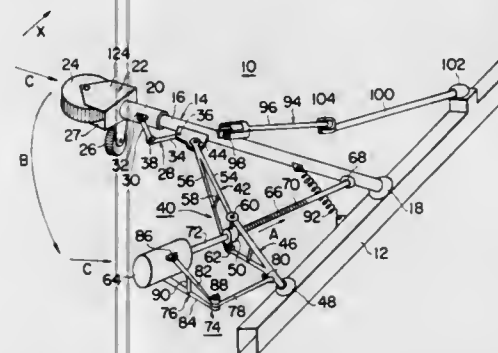
Filed Aug. 14, 1975, Ser. No. 604,781

Claims priority, application Japan, Aug. 16, 1974, 49-93967

Int. Cl.<sup>2</sup> B61B 12/02

U.S. Cl. 104—247

21 Claims



1. A steering control mechanism for a vehicle comprising, a support structure, a guide arm, means for connecting said guide arm to said support structure for universally swinging movement, a guide element supported on said guide arm for engagement with a guide wall of a guideway for a vehicle, said guide arm being swingable between an operative position in which said guide element is positioned in use for engagement with said guide wall to guide the direction of travel of said vehicle along said guide wall and an inoperative position in which said guide element is out of engagement with said guide wall, a first control arm foldable at its mid portion, means for connecting said first control arm to said support structure for universally swinging movement, means for connecting said first control arm to said guide arm for pivotal movement, operating means for folding and unfolding said first control arm for swinging said guide arm toward and away from said support structure, a second control arm, means for connecting said second control arm to said support structure for universally swinging movement, said guide arm being located between said first and second control arms, and means for connecting said second control arm to said guide arm and for lifting said guide arm from said operative position into said inoperative position when said guide arm is swung toward said supporting structure by said first control arm and for lowering said guide arm from said inoperative position into said operative position when said guide arm is swung away from said support structure by said first control arm.

#### 4,014,269 SAFETY STOP FOR OVERHEAD TRACK SWITCH

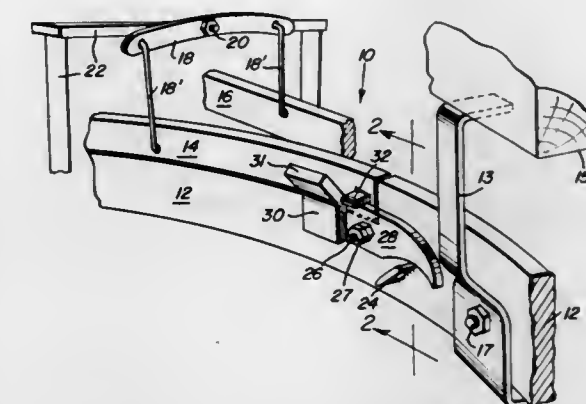
Beryl A. Bedford, 701 Hurlingame Ave., Redwood City, Calif. 94063

Filed Oct. 29, 1975, Ser. No. 627,014

Int. Cl.<sup>2</sup> B61K 7/20

U.S. Cl. 104—250

3 Claims



1. A safety stop for an overhead track switch comprising; a mounting means for attachment of the stop to a conventional overhead track, a safety stop member pivotally mounted on said mounting means, a weight for moving the stop to the safety position, the safety stop member having a cam portion for engagement with a track being switched to prevent the safety stop from functioning, the mounting means includes a bolt for attachment to an overhead track and the head of the bolt has a beveled portion for guiding a track to be switched to its normally closed position.

#### 4,014,270 KNOCK-DOWN CONSTRUCTION

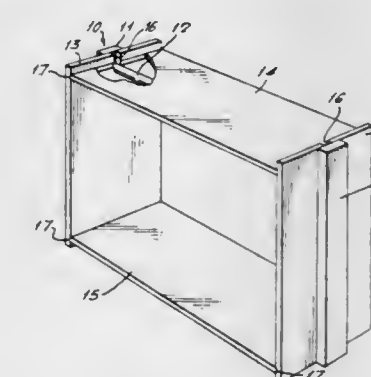
Paul Anstee Frank King, 7 Victoria St., Paddington, New South Wales 2021, Australia

Filed Feb. 9, 1976, Ser. No. 656,843

Int. Cl.<sup>2</sup> A47B 3/00

U.S. Cl. 108—111

7 Claims



1. A knock-down furniture component comprising first and second parallel panels positioned in facing relationship so as to have inwardly facing surfaces and outwardly facing rectangular frame means engageable with the outwardly facing surfaces of said first and second parallel panels for preventing outward movement of said panels away from each other and structural means positioned between and engaging other inwardly facing surfaces of said panels for preventing inward movement of said panels toward each other.



4,014,271

## LIQUID MANURE SYSTEM

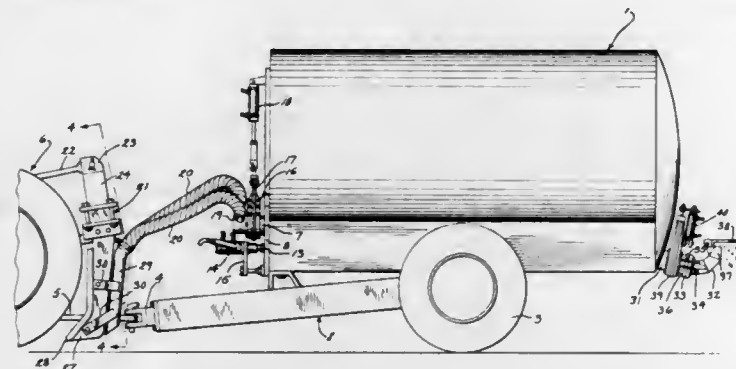
Vincent E. Rohlf, Sturgeon Bay; Karl R. Kratz, and Richard F. Hucek, both of Algoma, all of Wis., assignors to The Calumet Co., Inc., Algoma, Wis.

Filed Nov. 5, 1975, Ser. No. 628,988

Int. Cl.<sup>2</sup> A01C 23/02

U.S. Cl. 111—7

7 Claims



1. An apparatus for distributing liquid manure beneath the ground surface, comprising a mobile chassis, a tank to contain the liquid manure and mounting on the chassis, said tank having an outlet opening in an end wall thereof, a frame to be connected to a vertically movable hitch of a vehicle and adapted to be raised and lowered in accordance with operation of said hitch, a plurality of soil penetrating members mounted on the frame and adapted to penetrate the soil when the frame is lowered, conduit means for conducting liquid manure from the tank and including a delivery tube mounted immediately behind each soil penetrating member whereby the liquid manure will be discharged below the surface of the soil, an auger assembly including a housing located on the inside of the tank and connected with an outlet therein, said auger assembly also including an auger disposed within the housing and disposed to convey liquid manure through said housing to said outlet, said auger assembly having a length substantially less than the length of the tank, the outer end of the auger extending through said end wall and the inner end of the auger terminating within the interior of the tank, the axis of the outlet being offset from the axis of the auger, and drive means mounted on said end wall of the tank and located on the outside of the tank and operably connected to the outer end of the auger for driving the same.

4,014,272

## CULTIVATORS

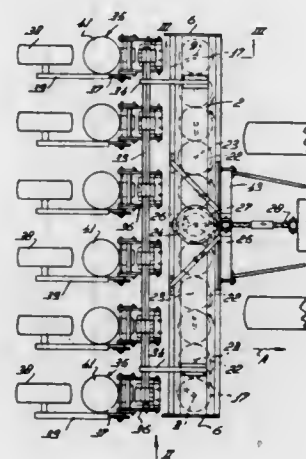
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland  
Filed May 2, 1975, Ser. No. 574,248

Claims priority, application Netherlands, May 3, 1974, 7405945

Int. Cl.<sup>2</sup> A01B 33/00

U.S. Cl. 111—65

10 Claims



1. A cultivator comprising a frame movable over the ground

and a plurality of rotatable soil-working members supported on a portion of said frame and said members being positioned in a row that extends transverse to the direction of travel, said soil-working members each including a downwardly extending tine and driving means connected to rotate said members and the corresponding tines about substantially vertical axes, said tine of each soil-working member being driven through a circular path about its axis of rotation to work a strip of land during travel, the spacing between the axes of rotation of adjacent soil-working members exceeding the working widths of the tines of adjacent members and said members being positioned to work strips of land spaced apart from one another between unworked strips, devices for depositing material on the worked strips being supported on said cultivator and each of said devices being positioned to the rear and in line with each said member, with respect to the direction of travel.

4,014,273

## MATTRESS COVERING SEWING MACHINE

Tamajiro Kosakai, Musashimurayama, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

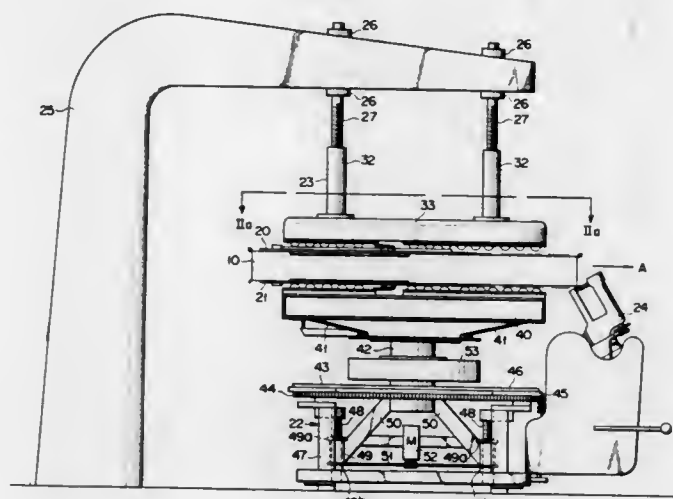
Filed Dec. 23, 1975, Ser. No. 643,929

Claims priority, application Japan, Dec. 27, 1974, 50-522

Int. Cl.<sup>2</sup> D05B 11/00

U.S. Cl. 112—3 R

14 Claims



1. A mattress covering sewing machine comprising:  
a pair of upper and lower support means each having a flat variable width support assembly and adapted to sandwich therebetween a cushion covered on all sides with outer covers, the widths of the variable width support assemblies being adjustable so as to correspond to the width of a mattress to be formed;  
compressing means for substantially uniformly compressing the covered cushion, in the direction of the thickness of the covered cushion, through at least one support assembly;  
sewing means for sewing together the outer marginal edge portions of the adjacent outer covers in such a compressed state to form a mattress; and  
feeding means for supportingly feeding said sewing means around the entire outer marginal edge portions of the outer covers.

4,014,274

## METHOD AND MACHINE FOR SEWING TOGETHER MATTRESS COVERS

Tamajiro Kosakai, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,825

Claims priority, application Japan, Dec. 27, 1974, 50-519

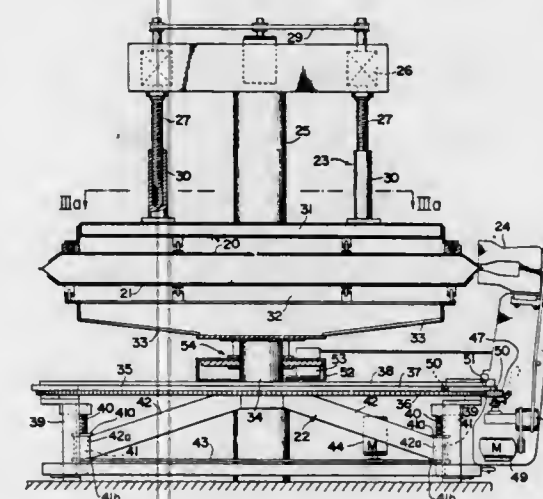
Int. Cl.<sup>2</sup> D05B 11/00

U.S. Cl. 112—3 R

15 Claims

1. A mattress covering sewing machine comprising:

a pair of upper and lower support means supportingly sandwiching therebetween a cushion wrapped with a pair of outer covers, said paired support means each having a variable width support plate, the outer peripheral portions of the support plates extending toward each other and being shaped to correspond to the outer peripheral portion of the wrapped cushion and coming into contact with the outer peripheral portion of the wrapped cushion, the widths of the variable width support plates being adjustable so as to correspond to the width of a mattress to be formed;



compression means for compressing the wrapped cushion, through at least one support plate, in the direction of the thickness of the cushion to cause the outer marginal edge portions of the outer covers to be projected outward;  
sewing means for sewing together the outer marginal edge portions of the outer covers to form a mattress; and  
carrier means for supportingly carrying said sewing means around the entire outer marginal edge portions of the outer covers.

4,014,275

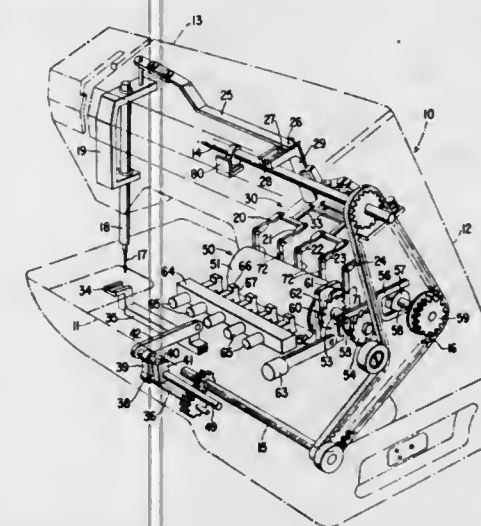
SEWING MACHINE RE-PROGRAMMABLE MEMORY  
John Addison Herr, Garwood, and Wolfgang Jaffe, Roselle Park, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,776

Int. Cl.<sup>2</sup> D05B 3/02

U.S. Cl. 112—158 E

11 Claims



1. In a sewing machine operative to form successive stitches having stitch forming instrumentalities including an endwise reciprocating and laterally jogging needle means, and work feeding means for transporting work relative to said needle means, the relative positions of said needle means and said work feeding means defining stitch position coordinates for

each endwise reciprocation of said needle means, at least one control device for influencing the stitch position coordinates of said successive stitches in the formation of a pattern of stitches, an electronic read-only-memory unit in said sewing machine for storing stitch pattern data, logic means electrically connected with said read-only-memory unit for extracting stitch position coordinate pattern data from said read-only-memory unit and actuating means for said control device responsive to said stitch pattern data extracted by said logic means, the improvement which comprises a re-programmable memory unit operatively associated with said sewing machine for storing operator generated stitch position coordinate pattern data, programming means accessible to an operator at said sewing machine for entering operator generated stitch position coordinate pattern data into said programmable memory unit, and operator influenced means for selectively electrically connecting said re-programmable unit to said logic means in place of said read-only-memory unit.

4,014,276

## MACHINE FOR PROCESSING DRAPERY MATERIAL

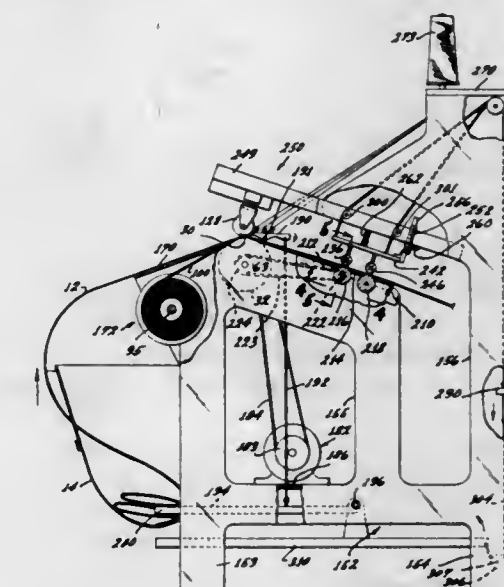
Enrique Soto, 1638 W. Washington Blvd., Los Angeles, Calif. 90007

Continuation-in-part of Ser. No. 390,332, Aug. 22, 1973, Pat. No. 3,884,747. This application Jan. 6, 1975, Ser. No. 538,788

Int. Cl.<sup>2</sup> D05B 27/10

U.S. Cl. 112—214

5 Claims



1. A machine for tabling and processing fabric material, the said machine having means providing a surface constructed to have a relatively wide strip of fabric material pass through it from the front to the back of the machine, means for causing the material to pass through the machine over the said surface, means for processing an edge part of the fabric material at one side of the machine, said processing means including a source of a strip of stiffening material positioned for juxtaposing the stiffening material against an edge part of the fabric material and moving it with the fabric material, said processing means including a power driven sewing machine positioned to stitch an edge part of the fabric material to the strip of stiffening material, tangent roller means having axis positioned normally to the direction of movement of the fabric material and to have the edge part of the fabric material and attached stiffener material pass between them, and manually actuable means for moving one of said tangent rollers away from the other whereby to allow threading of the fabric material and stiffener strip between them.



4,014,277

**CONTROL APPARATUS FOR SEWING MACHINE WITH AUTOMATIC NEEDLE STOPPING MEANS**

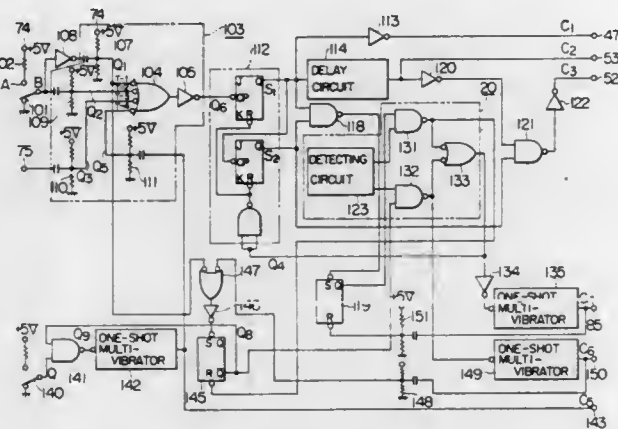
Shigeki Morinaga, and Kazuo Onishi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed May 12, 1975, Ser. No. 576,600

Claims priority, application Japan, May 15, 1974, 49-53326  
Int. Cl.<sup>2</sup> D05B 69/18

U.S. Cl. 112-219 A

6 Claims



1. A control apparatus for sewing machine with automatic needle stopping means, comprising a motor for supplying a driving force to a sewing machine, a speed control device for controlling the rotational speed of said motor by controlling a driving thyristor connected to said motor, a position detector unit for detecting the position of a needle of said sewing machine, a braking unit for applying a braking force to said motor to stop said motor and said sewing machine, and a pedal manipulated by an operator for manipulating said sewing machine, said speed control device including a command unit having at least one counter means which produces central command signals to perform a predetermined sequence control, the input of said counter means being set by electrical signals generated in response to a speed detector means for detecting the speed of said motor and in response to the position of said pedal, and said counter means being reset by an output of said position detector unit.

4,014,278

**NEEDLE BARS FOR TUFTING MACHINES**

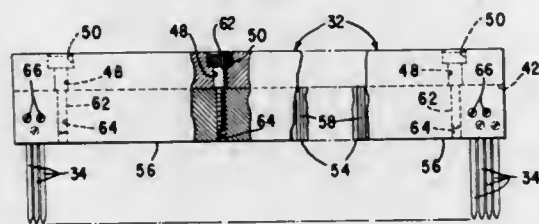
Paul E. Jolley, Chattanooga, Tenn., and Harvey M. Wooten, Rising Fawn, Ga., assignors to The Singer Company, New York, N.Y.

Filed Sept. 8, 1976, Ser. No. 720,484

Int. Cl.<sup>2</sup> D05B 55/02; D05C 15/00

U.S. Cl. 112-226

3 Claims



1. A needle bar for a tufting machine or the like for supporting a multiplicity of needles for reciprocable movement toward and away from a backing, each of which needles includes a shank portion, said needle bar comprising a longitudinally extending body portion having an open faced channel extending longitudinally therein and facing said backing, an insert secured in said channel spaced from at least one longitudinally extending wall thereof, said insert having a multiplicity of needle shank accommodating grooves extending in the direction of reciprocation of said needle and facing said longitudinally extending wall, and means for securing each shank intermediate a respective groove and said wall.

4,014,279

**DYNAMIC POSITIONING SYSTEM FOR A VESSEL CONTAINING AN OCEAN THERMAL ENERGY CONVERSION SYSTEM**

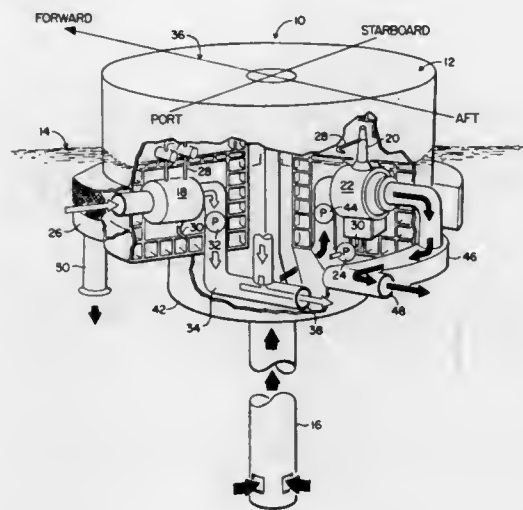
Russell O. Pearson, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Apr. 28, 1976, Ser. No. 681,003

Int. Cl.<sup>2</sup> B63B 35/00

U.S. Cl. 114-270

12 Claims



1. In combination with a vessel containing a system for an ocean thermal energy conversion process in which heat is extracted from warm ocean surface waters to vaporize a working fluid liquid and heat is rejected to cold waters collected from the lower depths of the ocean to condense the working fluid vapor, the improvement in a dynamic positioning means utilizing the sea water effluents resulting from said energy conversion process for positioning the vessel, said dynamic positioning means comprising:

- a. means aboard said vessel for collecting said sea water effluents resulting from said energy conversion process; and
- b. means aboard said vessel for controllably directing the discharge of said collected effluents in a plurality of different horizontal directions to attain a resultant net propulsive force acting in a preferred direction upon said vessel.

4,014,280

**ATTITUDE CONTROL SYSTEM FOR SEAGOING VEHICLES**

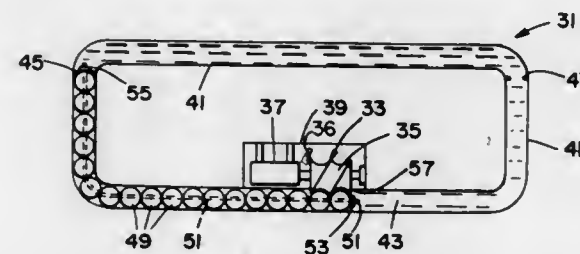
Darryl E. Laxo, Novato, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 2, 1976, Ser. No. 646,135

Int. Cl.<sup>2</sup> B63B 39/02

U.S. Cl. 114-124

3 Claims



1. An apparatus to control the center of gravity of an object comprising:

- a. a cylindrical tube;
- b. a plurality of solid spheres located inside of said tube;
- c. said spheres having a diameter slightly less than the inside diameter of said tube in order to allow said spheres to slidably move within said tube along the axis of symmetry of said tube;

- d. said spheres being comprised of a first end sphere, a second end sphere, and remaining spheres lying in-between said first end sphere and said second end sphere;
- e. a cable;
- f. a length of said cable passing through the center of each of said spheres;
- g. a first end clamp and a second end clamp;
- h. the fixed attachment of said first end clamp to said cable and the fixed attachment of said second end clamp to said cable with each of said spheres abutting another of said spheres and said first end sphere also abutting said first end clamp and said second end sphere also abutting said second end clamp; whereby
- i. said spheres are held abutting each other;
- j. a driving screw having threads of a width about equal to the diameter of said spheres;
- k. a motor, with said motor being rotatably connected to said driving screw;
- l. an opening in said tube;
- m. said driving screw being partially inserted through said opening into said tube with its axis of rotation lying parallel to the axis of symmetry of the length of said tube in which said opening is located and with said axis of rotation of said driving screw lying outside of said tube;
- n. said driving screw being threadably engaged with said spheres; whereby
- o. the rotation of said driving screw caused by said motor forces said spheres to move axially within said tube.

4,014,281

**STEERING UNIT**

James Frederick Hemens, Billericay, England, assignor to Teleflex Morse Limited, Basildon, England

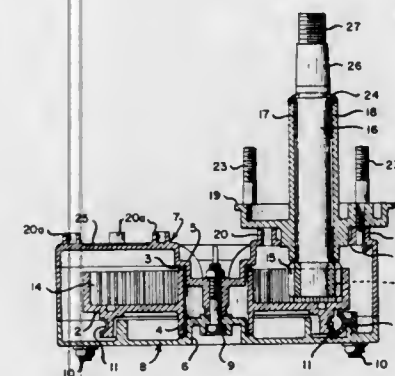
Division of Ser. No. 504,483, Sept. 10, 1974, Pat. No.

3,954,022. This application Mar. 17, 1975, Ser. No. 558,752

Int. Cl.<sup>2</sup> B63H 25/10

U.S. Cl. 114-144 R

14 Claims



1. A ship's steering system motion transmitting unit comprising a housing, a cable wheel mounted within said housing, a shaft with a pinion thereon which makes driving engagement with said cable wheel, means connecting the shaft to a ship steering device, and a one-piece body which serves as a bearing support for said shaft and which also has a shroud portion providing a mounting means for mounting said unit to a support surface whereby when said unit is orientated with its housing lowermost, the shroud portion and mounting means are spaced below the upper region of said shaft and said bearing support therefor.

4,014,282

**EXHAUST TUBE MOUNTING APPARATUS FOR OUTBOARD MOTORS**

Delhardt K. Kollman, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sept. 4, 1975, Ser. No. 610,305

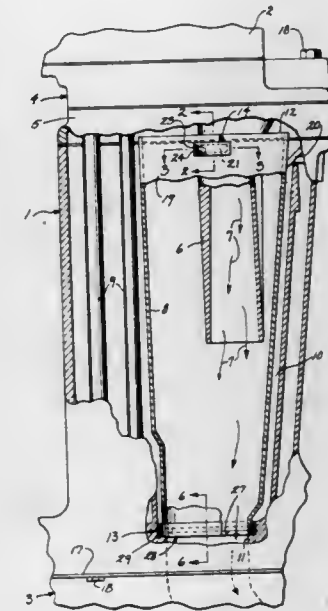
Int. Cl.<sup>2</sup> B63H 21/34

U.S. Cl. 115-5 E

11 Claims

1. In an outboard motor having a power head attached to

the upper end of a drive shaft housing and a lower propeller unit attached to the lower end of the drive shaft housing, said drive shaft housing having a bottom discharge opening in the lower end thereof, an exhaust tube mounted in said drive shaft housing with the lower end located within said drive shaft housing and in alignment with the discharge opening of said drive shaft housing, the upper end of the exhaust tube and the drive shaft housing having mating projections and receptacles,



said drive shaft housing including a horizontal support wall upon which the exhaust tube rests to support the upper end of the exhaust tube on the drive shaft housing, said powerhead having means resting on said exhaust tube and clamping said tube to said support wall, and a resilient mount secured within said discharge opening and locating the lower end of the exhaust tube in upwardly spaced relation to the lower propeller unit.

4,014,283

**WATERCRAFT, PARTICULARLY FOR WATERSPORTS**

Ferdo Crnogorac, Marsala Tita 105, Bosanski Brod, Yugoslavia

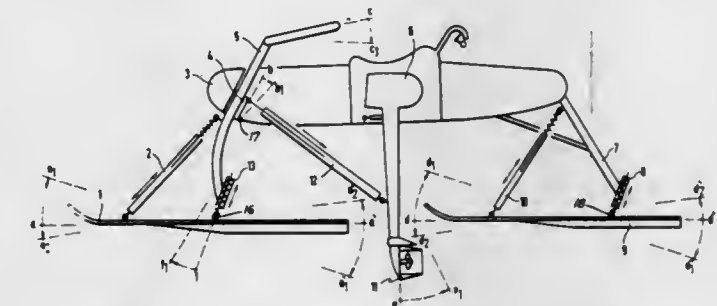
Filed Nov. 18, 1975, Ser. No. 632,986

Claims priority, application Yugoslavia, Nov. 19, 1974, 3067/74

Int. Cl.<sup>2</sup> B63B 35/72

U.S. Cl. 115-70

5 Claims



1. A watercraft comprising, in combination: an elongated displacement flotation body having at least one seat thereon for a rider, said body having its longitudinal axis extending generally parallel to the direction of forward travel; front and rear skis disposed below said body in tandem arrangement, said front ski being steerable; spring means connecting said rear ski to said body so as to provide a cushioned connection between them; a bushing pivotally mounted on said body near the front end thereof, said bushing being tiltable about a transverse horizontal axis; a steering column extending downwardly and forwardly through said bushing and rotatable therein, the bottom



end of said steering column being pivotally attached to said front ski intermediate the ends thereof, whereby the ski can swing through an arc between a first position generally parallel to the direction of travel, and a second position inclined forwardly and upwardly;

a resilient strut connected at one end to said front ski near the forward end thereof, and at its other end to said steering column so as to maintain the front ski at a more-or-less constant angle of attack when the craft is running on the surface of the water; and

a motor mounted in said body and having a downwardly extending drive shaft that drives a propeller located below the bottom surfaces of said skis;

said front ski being movable from said first position to said second position at the time the craft is being launched, by a rearward pull on the top end of said steering column, causing said bushing to tilt about its pivot axis and thereby raising the front end of the front ski.

4,014,284

## DIFFERENTIAL PRESSURE INDICATORS

Brian Read, Chester, England, assignor to Fawcett Engineering Limited, Bromborough, England

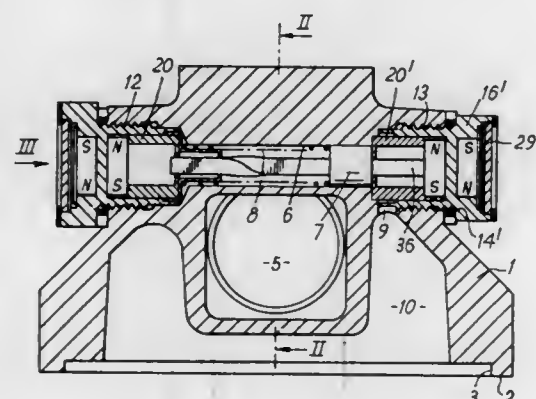
Filed Apr. 30, 1976, Ser. No. 681,954

Claims priority, application United Kingdom, May 6, 1975, 19051/75

Int. Cl.<sup>2</sup> G01L 7/16

U.S. Cl. 116—114 PV

5 Claims



1. A differential pressure indicator including a piston mounted for sliding movement in a bore, the differential pressure to be measured being in use supplied across the opposite faces of the piston, and resilient biasing means urging the piston in the direction of decreasing differential pressure, wherein the indicator further comprises an angularly moveable member interconnected with the piston so that movement of the piston in the bore causes angular movement of said member, and angularly moveable indicator element, and a fluid-tight wall between the angularly moveable member and the indicator element, the angularly moveable member and the indicator element being magnetically coupled so that angular movement of the angularly moveable member in response to a change in the differential pressure causes an appropriate angular movement of the indicator element.

4,014,285

## MEMO DEVICE

Charles W. Davis, Ontario, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 13, 1976, Ser. No. 686,231

Int. Cl.<sup>2</sup> G09F 19/06

U.S. Cl. 116—131

1 Claim

1. A memo device, comprising

a substantially plate-like member;

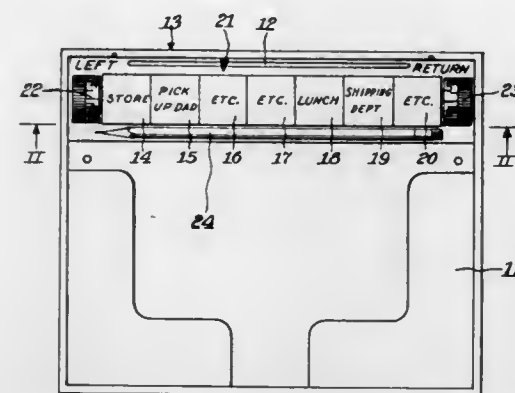
guide means along an edge of the member;

a plurality of blocked spaces on the member extending alongside the guide means;

a pointer movably mounted in the guide means for manually selecting a desired one of the blocked spaces;

a first knob rotatably mounted on the member on one side of the blocked spaces in a plane substantially perpendicular to the plane of the member, said knob having marks around its circumference indicating the hours and minutes of a day;

a second knob rotatably mounted on the member on the opposite side of the blocked spaces in a plane substantially perpendicular to the plane of the member, said



second knob having marks around its circumference indicating the hours and minutes of a day; and

a writing instrument on the member for writing messages in the blocked spaces whereby the pointer is movable to a selected blocked space bearing a pertinent message, the first knob is settable to indicate a time of departure relative to the pertinent message and the second knob is settable to indicate a time of return relative to said pertinent message.

4,014,286

## HOT PRODUCT MARKING SYSTEM

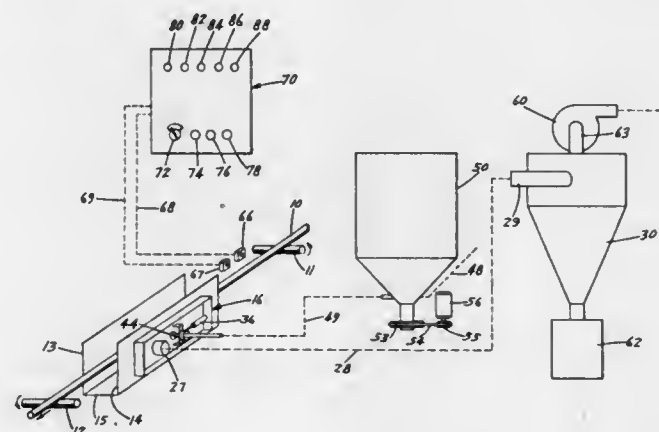
Donald E. De Zurik, 17325 N. 25th Ave., Wayzata, Minn. 55391

Filed Apr. 25, 1975, Ser. No. 571,631

Int. Cl.<sup>2</sup> B05C 19/00

U.S. Cl. 118—2

10 Claims



1. An apparatus for marking hot elongated longitudinally traversing rolled metal products of varying sizes for identification as said products emerge from a previous hot processing operation, said apparatus comprising:

A. a marking station immediately adjacent to the flow path of hot metal traveling from a previous hot processing operation, said marking station being disposed downstream from said previous operation and including:

1. wall means partially enclosing the sides of said flow path, the resulting partial enclosure being open at the ends and substantially unobstructed at the top,

2. spray means directed through said wall means at said flow path, and

3. an exhaust duct through said wall means,

B. a supply vessel adapted to contain a quantity of thermosensitive powdered marking material, said vessel including powder propelling means,

C. means for connecting said propelling means to a source of gas under pressure,

D. means for connecting said spray means to said supply vessel,

E. suction means for withdrawing excess marking material connected to said exhaust duct, and

F. sensor actuated automatic control means to operate said spray means and exhaust means upon demand, including sensor means disposed adjacent to said flow path upstream from said marking station and operatively connected to control means to intermittently operate said spray means and suction means.

4,014,287

## HIGH SPEED FLUID APPLICATOR

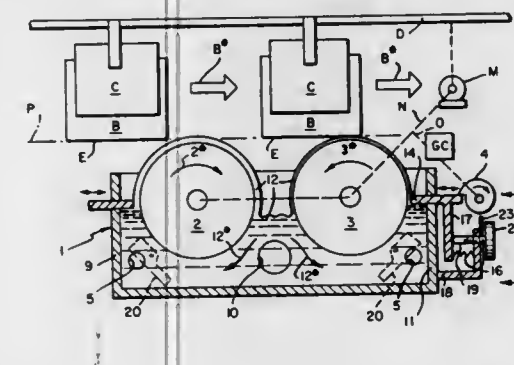
Harold W. Green, Framingham, Mass., assignor to Comstock & Wescott, Inc., Cambridge, Mass.

Filed Aug. 4, 1975, Ser. No. 601,649

Int. Cl.<sup>2</sup> B05C 1/02

U.S. Cl. 118—7

6 Claims



1. Apparatus for applying adhesive to the parallel edges of sheets fed by a conveyor through a gluing station plane, comprising

an adhesive container with parallel sidewalls extending from opposite endwalls,

two applicator rolls for transporting adhesive from the container to the gluing plane, the rolls substantially completely spanning the sidewalls to bar adhesive flow between the ends of the rolls and the sidewalls,

each roll rotating counter to the other and through the adhesive toward an end wall and being the sole means to pump a head of adhesive between the roll sidewalls and end wall, the second roll rotating counter to the feed of the sheets,

a doctor blade extending from each end wall and spanning the sidewalls, the blade being movable between a position substantially in contact with the full length of the roll and a position spaced from the roll, the blade substantially doctoring the roll dry of adhesive in its roll contacting position and in its retracted position allowing transport of adhesive by the roll from the head directly to the gluing plane, and

timing means linked to at least one of the doctor blades for retracting the one blade from contacting position to spaced position as the sheets are just past the gluing station, so that the leading end of the sheet edges is substantially dry of adhesive and a film of adhesive with a clearly defined leading edge is applied to the sheet edges rearwardly of the dry end.

4,014,288

## PADDING MACHINE

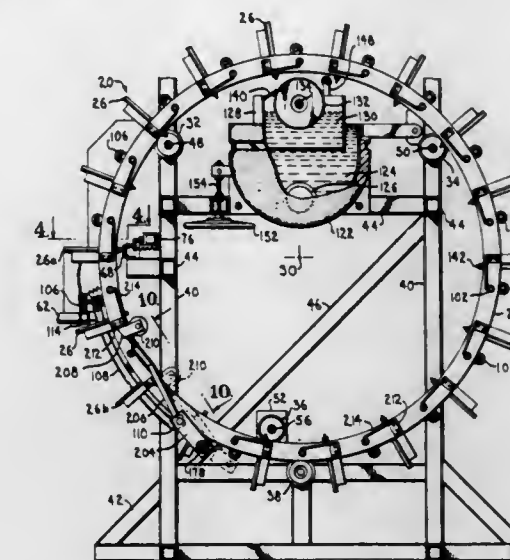
Lorren F. Ludlum, Fredonia, Kans., assignor to William J. Falstad; Kenneth L. Mellon and Russel Spohn, all of Fredonia, Kans., part interest to each

Filed June 2, 1975, Ser. No. 582,682

Int. Cl.<sup>2</sup> B05C 1/02

U.S. Cl. 118—6

14 Claims



1. A padded machine comprising:

a carrier rotatable about a generally horizontal axis;

a plurality of feeder units each adapted to receive a multi-leaved product such as a pad or book, said units being mounted on said carrier, radially spaced from said axis, and spaced from one another at angular intervals about said axis;

drive means coupled with said carrier for incrementally rotating the latter to advance individual units in succession in a circular path from a loading position to a delivery position and back to said loading position,

each of said units being provided with means for releasably holding a product loaded thereto in a disposition in which an edge of the product to be glued extends substantially parallel to said axis of the carrier;

control means operably coupled with said drive means and responsive to loading of the unit at said loading position for actuating the drive means to cause said carrier to rotate one increment and advance the next unit to the loading position;

means adjacent said path for applying glue to said edge of the product in each unit after advancement from said loading position; and

means for operating the holding means of each unit to release the glued product when the unit reaches said delivery position,

said glue applying means comprising a gluing station located between a pair of adjacent, successive positions of said units, said station including an applicator having an elongated zone of contact for engagement by said edge of each product as said units pass in succession between said pair of positions, and means supporting said applicator with said zone thereof extending substantially parallel to said axis, whereby the entire length of the advancing edge to be glued simultaneously engages the applicator at said zone,

said applicator being a rotatable roll having an outer surface presenting said zone and over which glue is spread, and said supporting means mounting said roll with its axis of rotation extending substantially parallel to said axis of the carrier,

said gluing station further including an elongated stripper wire extending parallel with said axis of the roll and spaced from said zone in the direction of advancement of said units, and means mounting said wire in closely spaced relationship to the glued edge of each advancing product for removal of excess glue therefrom.



4,014,289

## DEVICE FOR TREATING A WEB

Johannes Zimmer, Ebentalerstrasse 133, A-9020 Klagenfurt, Austria

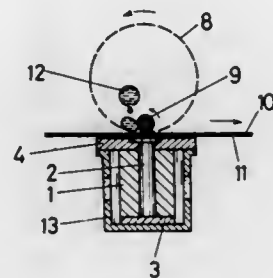
Filed Sept. 12, 1975, Ser. No. 612,742

Claims priority, application Austria, Sept. 12, 1974, 7400/74

Int. Cl.<sup>2</sup> B05C 17/04

U.S. Cl. 118—213

2 Claims



1. In a device for treating a web of material, said device being of the type including at least one roller-shaped element formed of magnetically attractable material, said roller-shaped element being positioned on one side of a web of material to be treated and comprising means for applying a treating substance to said one side of said web of material, and a magnetic element positioned on the opposite side of said web of material, said magnetic element comprising means for attracting said roller-shaped element and thereby forcing said roller-shaped element against one side of said web of material; the improvement comprising:

means connected to said electromagnets for selectively reversing the direction of current through the coils of at least a portion of said electromagnets to selectively change the polarity alignment of said electromagnets from a first polarity alignment of alternating polarity between adjacent said electromagnets and a second polarity alignment wherein two adjacent electromagnets are of the same polarity.

4,014,290

## COATING APPARATUS FOR BOTTLES

Kunio Obara, and Masaru Sanda, both of Chiba, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan

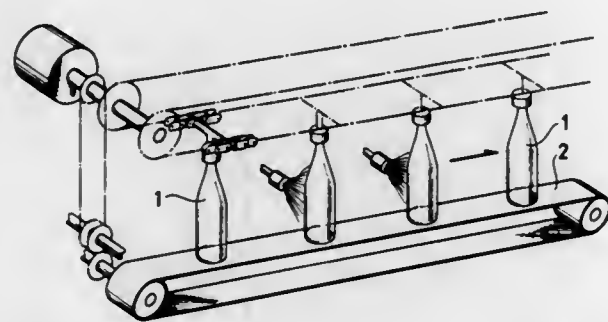
Filed Feb. 27, 1974, Ser. No. 446,463

Claims priority, application Japan, Feb. 28, 1973, 48-25316[U]

Int. Cl.<sup>2</sup> B05C 5/00

U.S. Cl. 118—301

2 Claims



1. Coating apparatus for bottles, comprising means for successively feeding suspended bottles along a predetermined path, moving belt means provided in a position near but spaced directly below the bottoms of said suspended bottles, means moving said belt means in the same direction and at the same speed as said bottles, and means for spraying a coating

material onto the exterior sidewalls of said bottles as said bottles and said belt means move together along said path, whereby said belt means acts to prevent the application of said sprayed material to said bottoms of said bottles, said moving belt means being sufficiently close to said bottle bottoms that moving of said belt means in said direction at a different speed than said bottles would result in wiping of sprayed paint from said belt means onto said bottles.

4,014,291

## IMAGE DEVELOPING SYSTEM

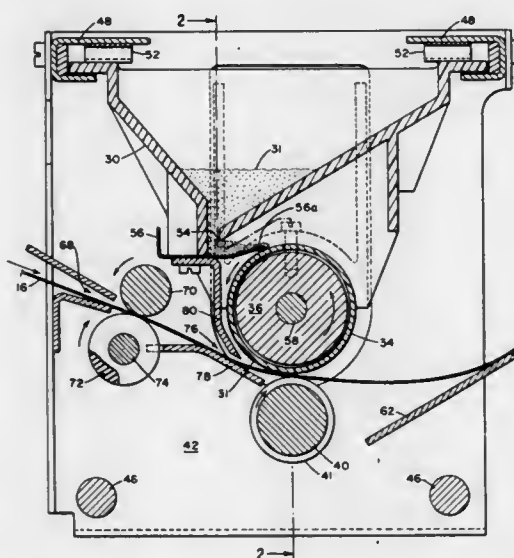
Austin E. Davis, Nashua, N.H., assignor to Nashua Corporation, Nashua, N.H.

Filed Jan. 26, 1976, Ser. No. 652,172

Int. Cl.<sup>2</sup> G03G 13/00

U.S. Cl. 118—657

13 Claims



1. Apparatus for developing with a polarized, magnetically attractable, one component toner material a latent electrostatic image formed on a coated photoconductive paper, comprising, in combination,

a toner support member having a smooth outer surface, means for generating a substantially longitudinally uniform magnetic field at said outer surface of said support member,

means for dispensing a layer of said toner material of substantially uniform thickness on said outer surface of said support member,

means for preventing an electrical flow between said support member and said paper, and

means for moving said layer of toner material from said dispensing means to a deposit zone where said support member is spaced from said paper so that an electrostatic attractive force between said toner material and the latent electrostatic image exceeds the force of said magnetic field that tends to hold the toner material on the outer surface of said support member thereby causing said toner material to deposit selectively on said latent image,

said spacing being sufficiently large to avoid contact between said paper and said layer of toner material disposed on said support member, and

said electrical flow prevention means eliminating electrical flow induced variations in the deposit of said toner material from said support member to said latent image.

4,014,292

## COLLAPSIBLE AND DISPOSABLE SANITARY PET LITTER CONTAINER

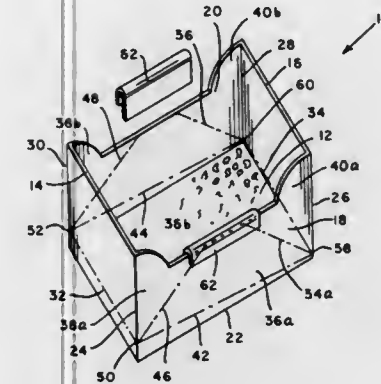
Warren J. Coughlin, 600 Old Stamford Road, New Canaan, Conn. 06840, and Renato D. Fecci, 587 High Ridge Road, Stamford, Conn. 06905

Filed May 7, 1976, Ser. No. 684,155

Int. Cl.<sup>2</sup> B65D 5/08

U.S. Cl. 119—1

7 Claims



1. A collapsible and disposable sanitary pet litter container comprising:

a carton of sheet material having an open rectangular configuration for receiving pets and a closed wedge-shaped configuration for storage and disposal, said carton including

A. a bottom;

B. first and second end walls foldable inwardly toward each other over said bottom on mutually parallel end fold lines also parallel to said bottom; and

C. first and second side walls, each being joined to one end wall at two corners, and each having

1. a central portion which is foldable inwardly toward the other side wall central portion over said bottom on a lateral side fold line parallel to the other lateral side fold line but not parallel to said bottom, and

2. two wing portions, each being foldable outwardly against said central portion on one fold line corresponding to one corner and on an acute side fold line originating at the intersection of said one corner with said lateral side fold line and bisecting the angle defined by said intersection.

4,014,293

## FISH EGG INCUBATOR

Frederick H. Salter, Juneau, Alaska, assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed July 24, 1975, Ser. No. 598,909

Int. Cl.<sup>2</sup> A01K 61/00

U.S. Cl. 119—3

10 Claims

1. A fish egg incubator comprising:

a. a trough having two ends and containing a rugose layer at its bottom;

b. a screen or screens in said trough located directly above said rugose bottom layer and spaced therefrom and adapted to have fish eggs placed thereon;

c. the said trough and screens forming a first trough and screen assembly;

d. the screen having openings slightly smaller than the fish eggs whereby the latter are retained in said screen;

e. first housing means having sides capable of substantially shielding out light for housing said trough and screen combination; and

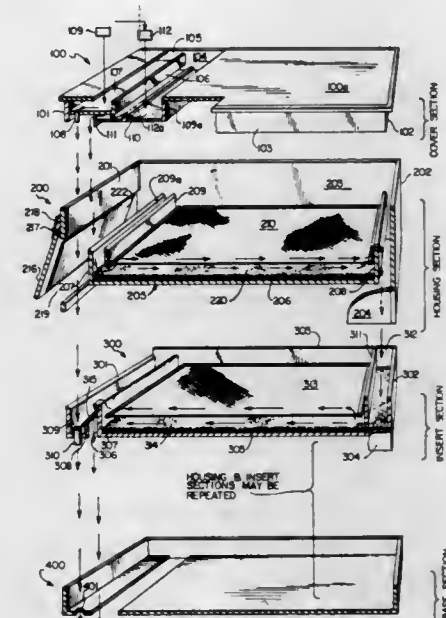
f. access means in one of the sides of said housing means for providing access to its interior;

g. baffle means near one end of said trough to direct a flow of water through and along said rugose layer and whereby water flows through and along said screen;

h. water overflow means at the other end of said trough,

whereby fry resulting from the incubated eggs pass over the water overflow means;

i. means for directing a further flow of water on said fry; and



4,014,294

## CATTLE OILER

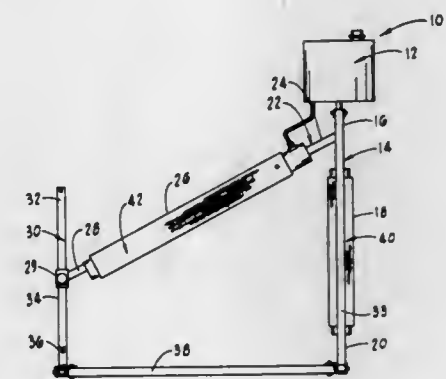
William P. Hovorak, 1023 W. 16th, Wellington, Kans. 67152

Filed Mar. 17, 1976, Ser. No. 667,490

Int. Cl.<sup>2</sup> A01K 29/00

U.S. Cl. 119—157

11 Claims



1. A cattle oiler for the treating of livestock, the oiler comprising:

a vertical support having an upper portion, a center portion, and a lower portion;

an angular support having an upper portion, a center portion, and a lower portion, the upper portion of said angular support attached to the upper portion of said vertical support, said angular support extending outwardly and downwardly from said vertical support;

a vertical slide support, the lower portion of said angular support mounted on said slide support;

first rubbing means tiltably mounted on said vertical support;

second rubbing means tiltably mounted on said angular support;

an oil reservoir mounted on said vertical support;

first valve means attached to the upper portion of said vertical support and disposed adjacent said first rubbing means, said first valve means communicably connected to said reservoir for feeding oil therefrom to said first rubbing means, said first valve means held in a closed position, said first valve means in use held in an open position



when said first rubbing means is tilted on said vertical support; and  
second valve means attached to said second rubbing means and disposed adjacent the upper portion of said angular support, said second valve means communicably connected to said reservoir for feeding oil therefrom to said second rubbing means, said second valve means held in a closed position, said second valve means in use held in an open position when said second rubbing means is tilted on said angular support.

4,014,295

## STEAM GENERATOR

Noël Lions, Manosque, France, assignor to Commissariat à l'Energie Atomique, Paris, France

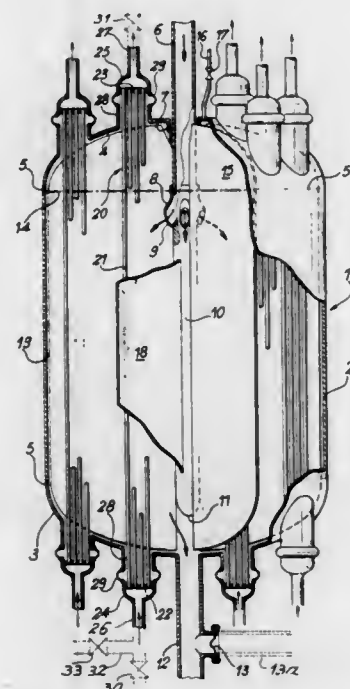
Filed Feb. 4, 1976, Ser. No. 655,243

Claims priority, application France, Feb. 12, 1975, 75.04334

Int. Cl.<sup>2</sup> F22B 1/06

U.S. Cl. 122—32

13 Claims



1. A steam generator comprising a closed outer casing of revolution about an axis and containing liquid metal which is circulated within said casing, and a plurality of tube bundles traversed by water in the liquid state to be converted to steam by exchange of heat with the liquid metal, the tubes in each bundle being adapted to pass through the casing and connected at the end of said casing by means of tube-plates to two separate headers respectively for the admission of water and discharge of steam, said tube bundles being arranged in spaced relation within the casing so as to constitute independent modules extending parallel to the axis of said casing, liquid metal being supplied to the casing along its axis through a single central tube so as to fill said casing to a given level, wherein said supply tube is provided with distribution orifices for the flow of liquid metal into adjacent compartments formed in the casing by means of radial partitions extending from the central tube in planes which contain the axis of the casing, each compartment being traversed by at least one tube bundle, the radial partitions being such as to form with the internal surface of the casing a small gap in order to permit a communication between the adjacent compartments and to equalize the level of liquid metal within said compartments.

4,014,296

## PLANT FOR BURNING FUELS PRODUCING A LIQUID COMBUSTION RESIDUE

Ingmar Astrom, Stenungsund, Sweden, assignor to Gotaverken Angteknik AB, Goteborg, Sweden

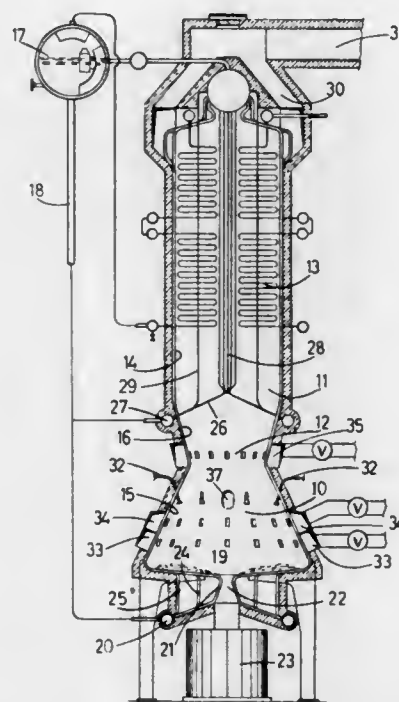
Filed Sept. 30, 1975, Ser. No. 618,161

Claims priority, application Sweden, Oct. 23, 1974, 7413315

Int. Cl.<sup>2</sup> F22B 21/00; F23G 7/04

U.S. Cl. 122—235 P

5 Claims



1. A plant for burning fuels which produce a liquid combustion residue, which plant includes a furnace having a basically circular cross section and a vertical axis, and being defined by a tube-membrane shell formed by water cooled tubes interconnected by welded fins, the improvement of a lower furnace chamber being upwardly defined by a truncated conical surface

an upper final combustion chamber, aligned with said lower combustion chamber and being downwardly defined by a reversed, truncated conical surface,

a restricted gas passage formed by the merging of said truncated conical surface and said reversed, truncated conical surface,

a bottom structure in said lower combustion chamber formed by tubes of said shell membrane being bent radially inwards,

a discharge opening, located centrally in said bottom and formed by some of said radially directed tubes being further bent back towards said shell and

a screen of tubes within said final combustion chamber, just upstream of said restricted gas passage, the tubes of said screen being sparse along the shell of the final combustion chamber, but very close together in the centre thereof, just above the discharge opening, nozzles for the supply of final combustion air being located adjacent to the restricted gas passage and arranged to impart a forceful rotary movement to the arising gases.

4,014,297

## ROTARY ENGINE COMBUSTION CONTROL ARRANGEMENT

Edward A. Rishavy, Warren, and James H. Currie, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 7, 1975, Ser. No. 575,211

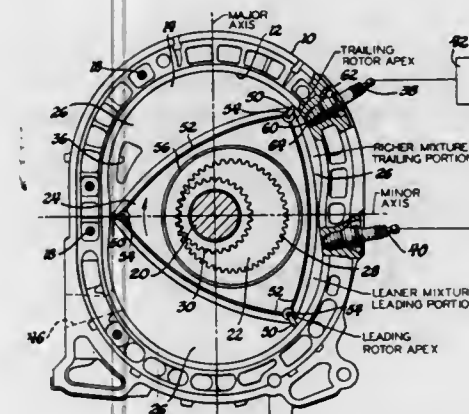
Int. Cl.<sup>2</sup> F02B 53/12

U.S. Cl. 123—8.09

10 Claims

1. A rotary internal combustion engine comprising housing means having an inner peripheral wall and oppositely facing

side walls, a rotor rotatably mounted in said housing means between said side walls with apexes that remain adjacent said peripheral wall as said rotor rotates, said rotor and said walls cooperatively defining a plurality of chambers spaced around said rotor between leading and trailing apexes that expand and contract while moving with said rotor, an apex seal mounted on each said rotor apex for engaging said inner peripheral wall to provide sealing between adjacent chambers, said housing means having an intake port for delivering a combustible mixture to said chambers as they expand in an intake phase prior to their contraction in a compression phase, said housing means having an exhaust port for receiving exhaust gases from said chambers as they contract in an exhaust phase following



their expansion in a power phase, a spark plug mounted on said housing means with its spark electrode located in an ignition opening in said peripheral wall so as to be exposed to a trailing portion of the passing chambers at the beginning of their power phase, said ignition opening further being located in a zone where the trailing apex seal of the passing chambers experiences a pressure differential which increases in the direction of rotor rotation and is substantially below the peak pressure differential reached and an ignition system providing said spark plug with an arc of prolonged duration approximating the time available from start of ignition to when the trailing apex seal of the passing chambers reaches the ignition opening.

4,014,298

## CONCENTRIC ROTARY ENGINE

John E. Schulz, 10707 Moorpark, Apt. 204, North Hollywood, Calif. 91602

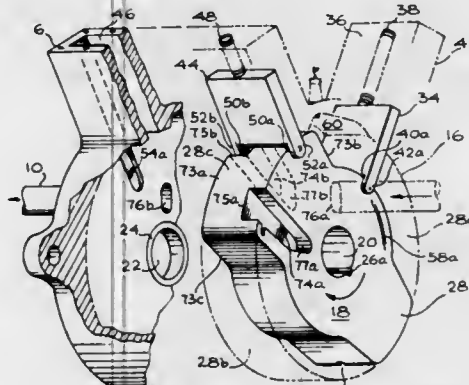
Continuation-in-part of Ser. No. 505,062, Sept. 11, 1974, Pat. No. 3,921,596. This application Mar. 17, 1975, Ser. No.

558,845

Int. Cl.<sup>2</sup> F02B 53/00

U.S. Cl. 123—8.27

30 Claims



1. A rotary engine of the internal combustion type, comprising:

a rotor housing having an inner surface which defines a hollow, cylindrical chamber;

a rotor concentrically disposed within said cylindrical chamber;

956 O.G.—62

said rotor having oppositely disposed sidewalls and a perimetrical cam surface which defines, in the direction of axial rotation, power lobe means, inlet pocket means, operating lobe means and combustion pocket means, with the transverse width of said cam surface being substantially equilevel;

said rotor being in slidable, sealable and rotatable engagement with the inner surface of said rotor housing except for said inlet and combustion pocket means which are in spaced relationship to said inner surface;

power transfer means secured to said rotor and extending beyond said housing;

a leading gate system and a trailing gate system, said leading and trailing gate systems being in correlative spaced relationship and, including, respectively, leading and trailing gate means and leading and trailing gate housings therefor, said leading and trailing gate housings being integrated with said rotor housing and in open mouth communication with the transverse width of the rotor cam surface, said leading and trailing gate means being yieldably, sealingly and slidably disposed within their respective housings and provided with substantially equilevel rotor engaging surfaces for sealingly slidably and fully engaging the substantially equilevel transverse width of the rotor cam surface, with the opposing lateral sidewalls of each of the leading and trailing gates being sealingly and slidably engageable with their laterally adjacent, inner surfaces of the rotor housing;

combustion chamber means recessed in the inner surface of said rotor housing between said leading and trailing gate means;

operative section means delimited by the leading and trailing gate means and the combustion chamber means disposed therebetween;

intake reservoir means defined by the portion of the rotor inlet pocket means in cyclic cooperation and communication with the operative section means;

expansion receiver means defined by the portion of the rotor combustion pocket means in cyclic cooperation and communication with the operative section means;

intake passage means for conveying fluid to the intake reservoir means and exhaust passage means for withdrawing fluid from the expansion receiver means;

said intake and exhaust passage means being disposed in spaced relationship to provide sequential and substantially mutually exclusive fluid flow systems;

said intake passage means comprising: (a) intake port means disposed in the rotor housing within the minimum radius defined by the rotor pocket means and (b) entrance conduit means in the rotor for extending fluid communication from the intake port means to the intake reservoir means;

said exhaust passage means comprising: (a) exhaust port means disposed in the rotor housing within the minimum radius defined by the rotor pocket means and (b) exit conduit means in the rotor for extending fluid communication from the expansion receiver means to the exhaust port means; and

means for initiating combustion of combustible fluid in said combustion chamber means.

4,014,299

## METHOD AND DEVICE FOR RESTRAINING NITROGEN OXIDE PRODUCTION IN COMBUSTION GAS OF INTERNAL COMBUSTION ENGINES

Hidetsugu Kubota, No. 4-9, 3-chome, Motomachi, Kameda, Naka Kanbara, Niigata, Japan

Filed Jan. 20, 1976, Ser. No. 650,671

Claims priority, application Japan, Jan. 23, 1975, 50-10304

Int. Cl.<sup>2</sup> F02D 18/00, 47/00

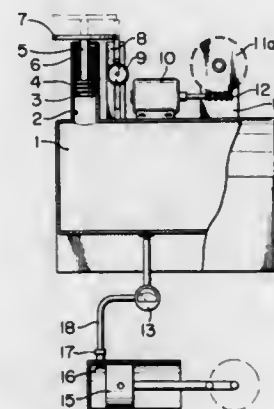
U.S. Cl. 123—25 P

3 Claims

1. In combination with at least one cylinder of an internal combustion engine, an apparatus for substantially preventing



the formation of nitrogen oxides when a mixture of fuel and air is combusted in the cylinder, the apparatus comprising a tank for containing water, water evaporating and ejecting means communicating with the interior of the cylinder below the dead bottom position of the piston in the cylinder for injecting steam into the cylinder, a conduit communicating between the tank and the evaporating and ejecting means for providing water to the evaporating and ejecting means for conversion to steam and injection into the cylinder and means for regulating the water pressure in the tank in a range so



related to the pressures developed in the cylinder of the engine that simultaneously with the drawing into the cylinder of the mixture of fuel and air, steam is injected into the cylinder and mixes with the mixture of fuel and air, then the injection of steam into the cylinder ceases due to the increased pressure produced in the cylinder by the combustion of the mixture and, to complete the cycle, steam is again injected into the cylinder beginning during the exhaust stroke and continuing during the intake of the fuel and air mixture due to the lower pressure in the cylinder during these stages.

4,014,300

# **RICH-CORE STRATIFIED CHARGE SPARK IGNITION ENGINE WITH RICH MIXTURE SCOOP**

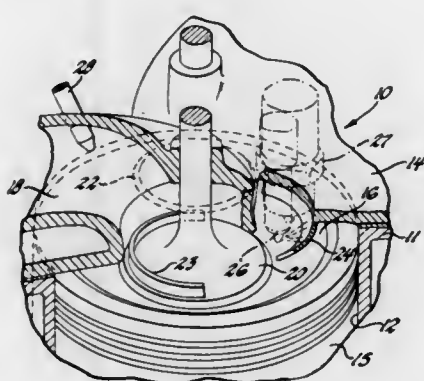
Edward D. Klomp, Mount Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1975, Ser. No. 636,748

Int. Cl.<sup>2</sup> F02B 17/00, 31/02

U.S. Cl. 123—30 C

3 Claims



1. The combination in a four-stroke cycle internal combustion engine of means defining a closed end cylinder a piston reciprocable in said cylinder and defining therewith a variable volume combustion chamber at said cylinder closed end inlet and exhaust ports connecting with said cylinder at said closed end inlet and exhaust valves respectively associated with said ports and operable to close and open their connections with said cylinder, said inlet port and its associated inlet valve being arranged to direct incoming air in a swirling motion around the axis of said cylinder, a scoop extending downwardly from said cylinder closed end toward said piston, said scoop being spaced between

the axis and wall of said cylinder and curved in a manner generally parallel with the curvature of said wall from a point adjacent said inlet valve toward said exhaust valve in the direction of inlet air flow, thus separating the swirling air mass into central core and annular peripheral portions,

a spark plug in said cylinder defining means and having a spark gap in said combustion chamber adjacent the inner side of said scoop in said central core portion and means to establish in said central core portion of the combustion chamber a rich combustible fuel-air mixture for ignition by said spark plug.

4,014,301

# **EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINE WITH IGNITION CHAMBER**

Robert Happel, Waiblingen-Bittenfeld, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

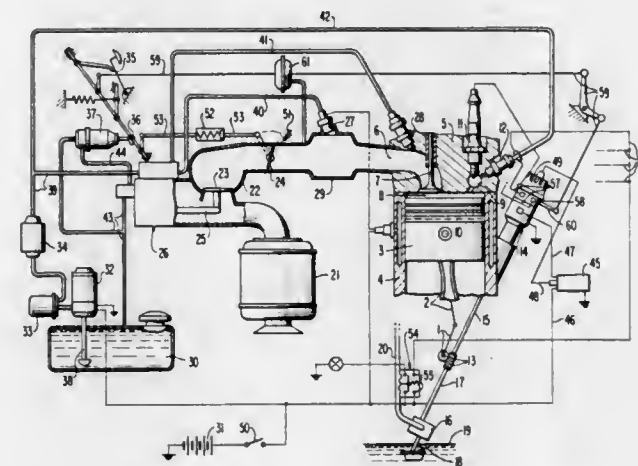
Filed Apr. 14, 1975, Ser. No. 567,945

Claims priority, application Germany, Apr. 17, 1974, 2418475

Int. Cl.<sup>2</sup> F02B 19/10, 19/16

U.S. Cl. 123—32 SP

24 Claims



1. An internal combustion engine with applied ignition which includes an ignition distributor housing means, an ignition distributor shaft, at least one main combustion space means and one ignition chamber means each coordinated to a respective main combustion space means and connected therewith by way of an overflow channel means, the ignition chamber means being provided with a spark plug means and an injection valve means, a fuel supply means for supplying fuel to the main combustion space means including control means for controlling the quality of fuel supplied to the main combustion space means over a relatively large load range of the internal combustion engine, a further fuel supply means for supplying fuel to the ignition chamber means independent of the fuel supply means for the main combustion space means, said further fuel supply means is operable so as to inject a fuel into the associated ignition chamber means during a low pressure phase of the corresponding main combustion space means, said further fuel supply means including injection line means and electromagnetically actuatable valve means coordinated to the injection line means and electrically controllable according to the ignition sequence of the internal combustion engine, characterized in that the injection valve means arranged at an ignition chamber means includes an actuating magnet means, the electric control of the actuating magnet means takes place by way of a separate switch means coordinated to each injection valve means, a cam means is arranged on the ignition distributor shaft and rotates at a speed proportional to the engine rotational speed for actuating said switch means, all of said switch means are arranged in the ignition distributor housing means circumferentially substantially uniformly distributed in the sequence of the ignition sequence of the engine about the axis of rotation of the cam

means, each of the switch means includes a fixed contact means and a movable contact means movable by the cam means and provided with a cam follower means, the movable contact means being displaced in the direction toward the cam surface in the closing sense and being under a spring prestress in the closing direction, the cam means includes over about 290° to 390° of its circumference a substantially uniform raised cam portion lifting the movable contact means from the fixed contact means by engagement with the cam follower means and is provided within an area of the remaining cam circumference with an approximately V-shaped notch enabling the movable contact means to drop onto the fixed contact means, each of said switch means is variable in its spacing to the cam surface by a switch adjusting means such that a change in the distance of the switch means takes place as a function of a load of the engine in such a manner that with an increasing load the corresponding injection valve means electromagnetically controlled by the corresponding switch means is open for a shorter period of time, the switch adjusting means is so constructed that with an increasing load, at least the fixed contact means of the switch means is adjustable in a direction toward the cam surface, the switch adjusting means is rotatably supported concentrically to the axis of rotation of the cam means and is operatively connected with a load adjusting lever of the internal combustion engine such that said switch adjusting means uniformly adjusts the switch means during rotation of the switch adjusting means, and in that a vacuum operated means is arranged in the flow of power of an adjusting linkage for the switch adjusting means, which is held in one extreme position by a spring force and is adapted to be moved away from said extreme position by vacuum, said vacuum means being operatively connected with a suction pipe downstream of a throttle valve in such a manner that with an increasing vacuum, the switch means are displaced in the direction toward smaller closing periods.

4,014,302

# **DEVICE TO REDUCE THE NITROGEN OXIDE CONTENT IN THE EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE**

George F. Houston, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

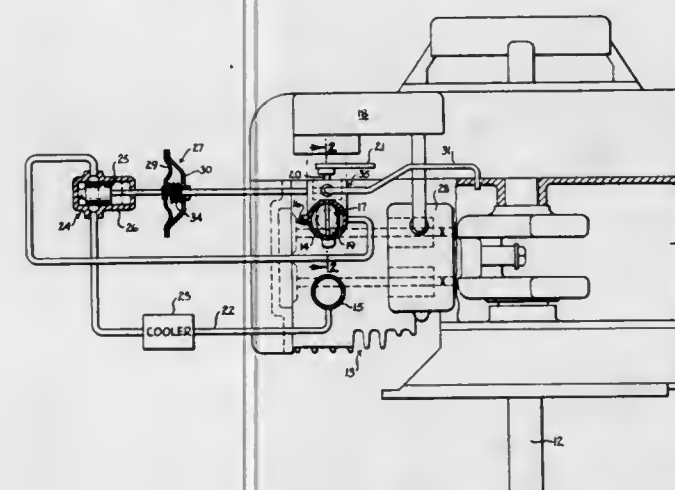
Continuation of Ser. No. 558,205, March 14, 1975,

abandoned, which is a continuation-in-part of Ser. No. 453,647, March 21, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 648,119

Int. Cl.<sup>2</sup> F02M 25/06

U.S. Cl. 123—119 A

14 Claims



1. In combination with an internal combustion engine having a fuel mixture inlet, an exhaust gas outlet and a crankcase in which, when the engine is running, a pulsating negative pressure exists that varies in magnitude with changes in engine speed, said pulsating negative pressure providing a power source of correspondingly varying magnitude, means for reducing the nitrogen oxide content of the exhaust gas emitted by the engine, comprising:

- A. duct means through which said fuel mixture inlet is communicable with said exhaust gas outlet;
- B. adjustable flow metering means associated with said duct means to regulate communication of said fuel mixture inlet means with said exhaust gas outlet; and
- C. power translating means operatively connected with said power source to be responsive thereto and with said adjustable flow metering means to adjust the latter in accordance with the response of said power translating means to changes in the magnitude of said power source and thereby coordinate the admission of exhaust gas to said fuel mixture inlet with changes in the operating condition of the engine.

4,014,303

# **DEVICE FOR IMPROVED EFFICIENCY IN INTERNAL COMBUSTION**

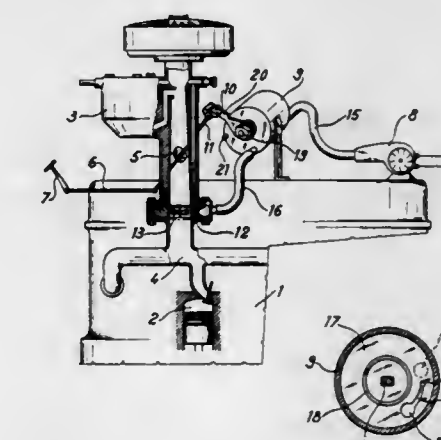
Guglielmo Aiti, Via Fratelli Spazzoli 33, Forlì, Italy

Filed Apr. 23, 1975, Ser. No. 570,793

Claims priority, application Italy, May 7, 1974, 22386/74 Int. Cl.<sup>2</sup> F02M 23/04

U.S. Cl. 123—124 R

4 Claims



1. In a device for improved efficiency in internal combustion engines of the type having a carburetor adapted for supply of an air-fuel mixture to the intake manifold of the cylinders and of throttle valve between the carburetor and the intake manifold, the improvement comprising an air compressor, a passage for admitting air from the compressor into the intake manifold of the engine downstream of the carburetor, regulator means having a variable opening for controlling the air flow from the compressor to said passage, and means rotatably connected to the throttle and acting upon said regulator means for controlling the degree of opening thereof, said regulator means and said means acting thereon being constructed and arranged to provide flow of a predetermined amount of air to said passage when the throttle valve is at a minimum open position, then to provide to said passage a decreased flow of air to an amount less than the predetermined amount as the throttle valve is opened and then to provide a gradually increasing amount of air as the throttle is further opened reaching an amount greater than said predetermined amount and then providing a substantially increased flow of air at maximum opening of the throttle valve.

4,014,304

# **INJECTION PUMPS FOR DIESEL ENGINES**

Pier Franco Rivolo, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy

Filed June 24, 1975, Ser. No. 589,812

Claims priority, application Italy, Sept. 2, 1974, 69666/74 Int. Cl.<sup>2</sup> F02M 37/00

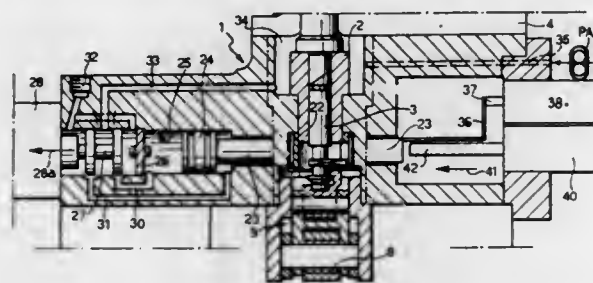
U.S. Cl. 123—139 E

6 Claims

1. Injection pump for diesel engines of the type comprising a pump body having a fuel inlet and a seating in which a rotatably adjustable pumping element is slidable, an auxiliary pump, a feed chamber operatively associated with said seating



and adapted to receive fuel under pressure from said auxiliary pump, a control rod for regulating rotation of said pumping element, proportional electrohydraulic actuator means carried on the pump body for displacing the control rod longitudinally, said actuator means including an actuator cylinder, a distributor valve controlling the feed and exhaust of the fluid under pressure selectively to and from the actuator cylinder,



an electromagnet controlling said distributor valve, a piston slidable in said cylinder and connected to the control rod, wherein the improvement consists in that the actuator cylinder and the seating of the distributor valve are machined directly in the pump body in which the said at least one pumping element seating is formed, and in that the control rod is rigidly attached to the piston of the actuator cylinder.

4,014,305

## FUEL INJECTION PUMPING APPARATUS

Robert Thomas John Skinner, High Wycombe, and Stanislaw Jan Antoni Sosnowski, London, both of England, assignors to C.A.V. Limited, Birmingham, England

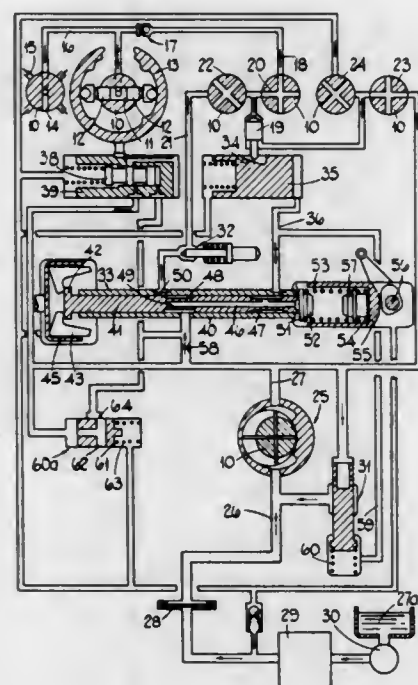
Filed Jan. 28, 1975, Ser. No. 544,785

Claims priority, application United Kingdom, Feb. 1, 1974, 04681/74

Int. Cl.<sup>2</sup> F02M 59/20; F04B 23/12

U.S. Cl. 123—139 AQ

8 Claims



1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising an injection pump for supplying fuel in timed relationship to an associated engine, a fluid pressure operable element for controlling the timing of delivery of fuel to the engine, a feed pump, a conduit connecting the feed pump and the injection pump, the feed pump supplying fuel to the injection pump during the filling strokes of the injection pump, throttle means in said conduit for controlling the amount of fuel supplied by the feed pump to the injection pump, a first orifice disposed in said conduit upstream of said throttle means, a passage branching off said conduit from intermediate said first orifice and said throttle means, a second orifice disposed in said

passage, valve means disposed in said passage downstream of said second orifice for controlling the pressure of fuel downstream of the second orifice so that it varies in accordance with the square of the speed at which the injection pump is driven, passage means through which the pressure intermediate said first and second orifices is applied to said element, a relief valve means for controlling the output pressure of the feed pump so that it varies substantially in accordance with the law  $(N^2 + K)$  where N represents the speed at which the injection pump is driven and K is a constant, and further valve means including a variable orifice connected in parallel with said first orifice, said further valve means including a member responsive to the output pressure of the feed pump and arranged so that as the output pressure of the feed pump increases the effective size of the variable orifice is decreased.

4,014,306

## GASOLINE VAPORIZER APPARATUS

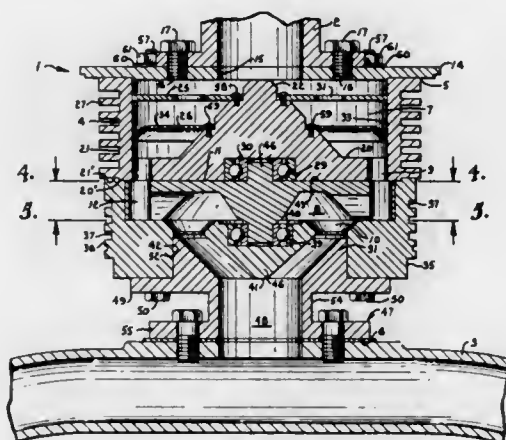
Elmer Wayne Ingersoll, Paola, Kans., assignor to Glenn L. Brown, Osawatomie, Kans.

Filed Apr. 14, 1975, Ser. No. 567,741

Int. Cl.<sup>2</sup> F02M 29/00

U.S. Cl. 123—141

12 Claims



1. A gasoline vaporizer apparatus to be interposed between a carburetor and an intake manifold of a combustion engine and comprising:

- a carburetor support member adapted to have a carburetor mounted thereon, said support member having a passage therethrough adapted to receive gasoline from the carburetor;
- a first housing portion in engagement with said carburetor support member and having an end wall spaced from said carburetor support member and having an end wall spaced from said carburetor support member and a side wall extending therefrom to define a first chamber, said end wall of said first housing having a plurality of passages therethrough;
- a second housing portion in engagement with said first housing portion and having an end wall spaced from said end wall of said first housing portion and a side wall extending therefrom to define a second chamber, said end wall of said second housing having a plurality of passages therethrough;
- a mounting member in engagement with said second housing portion and adapted to be connected to an intake manifold of a combustion engine, said mounting member having a passage therethrough adapted to receive vaporized gasoline from the second chamber; and
- a rotor having an axis of rotation and mounted in the second chamber for rotation in response to at least a partial vacuum effected by a combustion engine, said rotor having a plurality of passages therethrough adapted to receive gasoline from the passages through said end wall of said first housing and direct vaporized gasoline into the second chamber, said passages through said rotor each being radially outwardly spaced from the axis of rotation of said rotor, said passages through said rotor

each having an entrance portion alignable with a respective one of said passages through said end wall of said first housing portion, said passages through said rotor each having an exit portion intersecting said respective entrance portion and extending inwardly from said entrance portion thereof and communicating with said second chamber, said exit portion of each of said passages through said rotor being outwardly of said passages through said end wall of said second housing portion, said passages through said rotor each being generally L-shaped.

4,014,307

## BARREL FOR BALL THROWING MACHINE

Tibor Horvath, 1877 E. 27th St., Brooklyn, N.Y. 11229

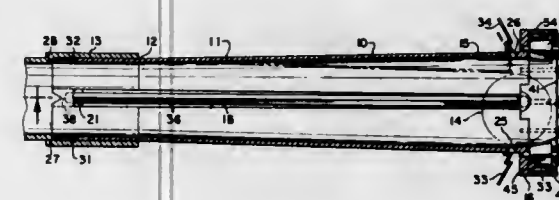
Continuation-in-part of Ser. No. 543,554, Jan. 23, 1975,

abandoned. This application Apr. 12, 1976, Ser. No. 675,824

Int. Cl.<sup>2</sup> A63B 69/40; F41B 11/00; F41F 17/02, 17/06

U.S. Cl. 124—81

13 Claims



1. A barrel for a ball throwing machine which blows table tennis balls from said barrel comprising, in combination, a tubular barrel having a muzzle which flares laterally, one upper ball contact strip and one lower ball contact strip extending into said barrel and along said barrel to said muzzle, at least one of said contact strips elastically extending into said barrel, said contact strips contacting table tennis balls passing therebetween through said barrel so that said balls may randomly slip laterally from between said contact strips on reaching said laterally flared muzzle, and rigid deflectors disposed on each side of said laterally flared muzzle and projecting inward so that balls randomly slipping from between said contact strips in one lateral direction strike one of said deflectors to bounce and be deflected to a greater extent in the opposite lateral direction.

4,014,308

## IGNITION SYSTEM AND APPARATUS AND METHOD FOR GENERATING TIMING SIGNALS THEREFOR

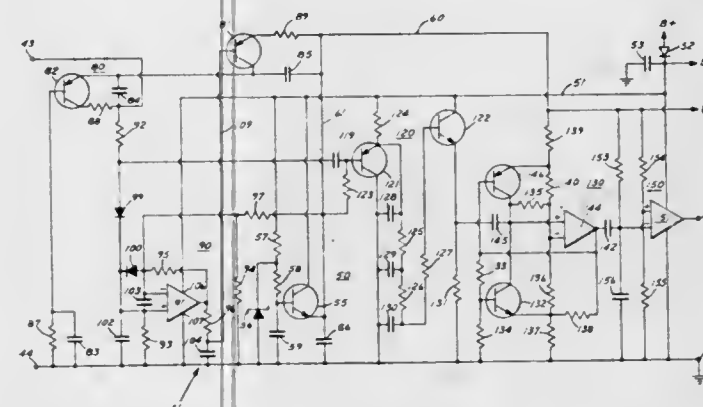
John C. Schweitzer, Grand Junction, Colo., assignor to Delta Products, Inc., Grand Junction, Colo.

Filed Oct. 3, 1974, Ser. No. 511,580

Int. Cl.<sup>2</sup> F02P 1/00; H03F 1/00; H02K 11/00

U.S. Cl. 123—148 E

16 Claims



1. Apparatus for generating timing signals for an engine ignition circuit or the like comprising:  
inductive pickup means for generating an electrical signal corresponding to the movements of an engine or the like;  
oscillator means operable to generate a carrier signal of a

selected reference frequency and responsive to said electrical signal for producing an amplitude modulated output signal representative of the movements of an engine with which said apparatus is associated, said amplitude modulated output signal being said carrier signal amplitude modulated by said electrical signal, said oscillator means having an inductive-capacitive resonance circuit, said pickup means forming at least a part of the inductive portion of said resonance circuit;

means for controlling the operation of said oscillator means operable to bias said oscillator means in a linear mode of operation; and

means responsive to said modulated output signal for generating a series of uniform timing pulses corresponding to the movements of an engine with which said apparatus is associated to actuate an ignition circuit associated therewith, including means for inhibiting the outputting of said uniform timing pulses for a selected period of time following energization of said apparatus, said selected period of time corresponding in length to the time period necessary for the operation of said oscillator means to stabilize after energization.

4,014,309

## CAPACITOR DISCHARGE TYPE CONTACTLESS IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Masao Nagasawa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

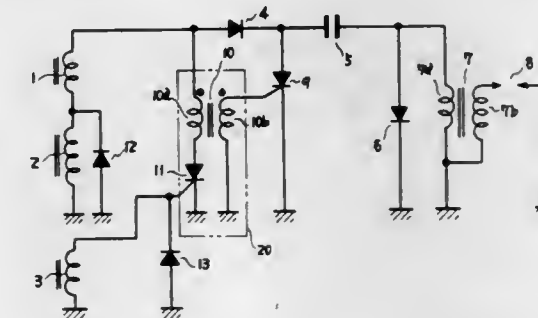
Filed Oct. 16, 1974, Ser. No. 515,247

Claims priority, application Japan, Oct. 17, 1973, 48-117120

Int. Cl.<sup>2</sup> F02P 1/00

U.S. Cl. 123—148 CC

23 Claims



1. A capacitor discharge type contactless ignition system for an internal combustion engine comprising:

- a magneto generator including a stator, a rotor rotated in synchronism with rotation of an engine, a plurality of magnets mounted on and symmetrically disposed about said rotor for rotation therewith, a trigger magnet mounted on said stator, and a trigger core and at least one reversion core disposed adjacent said trigger magnet and rotated in synchronism with the rotation of the engine;
- capacitor charging coil means mounted on said stator adjacent said rotor for generating alternating current having a first polarity half wave and a second polarity half wave in synchronism with the rotation of an engine in response to passage of said plurality of magnets past said capacitor charging coil means, one of said polarities being positive and the other polarity being negative during rotation produced by normal running of said engine and said one polarity being negative and said other polarity positive during reverse rotation of said engine;
- capacitor means connected in series with said capacitor charging coil means for storing said first half waves of said alternating current;
- switching means having a control gate and connected to said capacitor means;
- an ignition coil having a primary winding connected in series with said capacitor means and said switching means and a secondary winding;



a spark plug connected to said secondary winding; trigger coil means mounted on said stator adjacent said trigger magnet for generating reversion protecting signals and ignition signals in response to passage of said trigger and reversion cores past said trigger magnet; and thyristor control means connected to said gate of said switching means, to said capacitor charging coil means and to said trigger coil means for rendering said switching means conductive to complete a discharge path through said ignition coil for discharging said capacitor means in response to said ignition signals and said first half waves during a normal running of said engine and for responding to said reversion protecting signals and said second half waves to cause said switching means to become conductive during a reverse rotation of said engine in order to prevent said reverse rotation.

4,014,310

**TRANSPORTABLE TARGET THROWING APPARATUS**  
Jean-Michel Laporte, and Jean-Claude Laporte, both of Pont de la Brague, 06603 Antibes, France

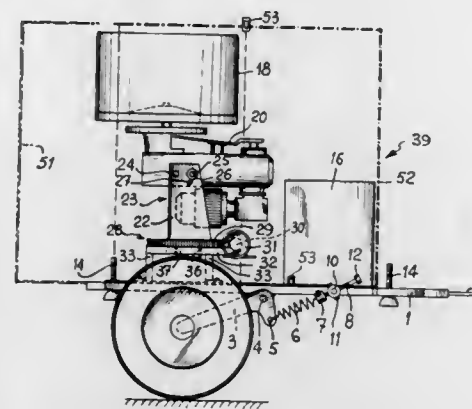
Filed Mar. 27, 1975, Ser. No. 562,649

Claims priority, application France, Mar. 29, 1974, 74.11238

Int. Cl.<sup>2</sup> F41B 3/04

U.S. Cl. 124-6

14 Claims



1. Target throwing apparatus comprising:

a frame;  
a pair of wheels;  
axle means mounted from said frame for supporting said wheels;

means for mounting each of said wheels on said axle means, said mounting means permitting adjustment of said wheels between two positions, said mounting means each comprising:

a crank, said crank being pivotally mounted on said axle means and having a pair of arms extending outwardly from said pivot connection to said axle means, the free end of a first of said crank arms being connected to a wheel whereby said wheel is rotatably coupled to said crank first arm; and

elastic means for coupling the second arm of said crank to said frame, said elastic coupling means permitting upward retraction of said wheel to a non-ground engaging position;

target throwing means for launching frangible targets into the air, said target throwing means being mounted on said frame, said target throwing means including a throwing arm and means for delivering targets to the throwing arm, said throwing means further including means for controlling the operation of said throwing arm to cause targets to be released for flight;

means mounted on said frame for immobilizing said frame with respect to the ground; and

protective cover means for said target throwing means, said protective cover means being of rigid construction and supported on said frame, said protective cover means functioning as a complete cover during transportation,

and being partly removable from the frame for unobstructed operation of the apparatus.

#### 4,014,311 HYDRAULIC BLADE MOUNT

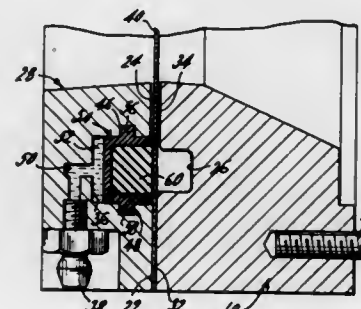
Robert E. Steere, Jr., Boonton, N.J., assignor to Silicon Technology Corporation, Oakland, N.J.

Filed Aug. 19, 1975, Ser. No. 605,856

Int. Cl.<sup>2</sup> B28D 1/04

U.S. Cl. 125-15

9 Claims



1. An improvement in a blade mounting and tensioning apparatus, said apparatus including first and second annular clamping members, means for clamping the periphery of a blade between said clamping members, an annular fluid channel within said first clamping member located radially inward of said clamping means and having an opening therein confronting one side of said blade, an annular recess channel within said second clamping member radially aligned with said annular fluid channel and having an opening therein confronting the other side of said blade, a deformable gasket within said annular fluid channel opening, a fluid within said annular fluid channel, said gasket being constructed and arranged to seal said fluid within said annular fluid channel against contact with said blade and further constructed and arranged to bear against a clamped blade upon pressure being exerted on said fluid whereby said pressure uniformly deforms said gasket against said blade thereby uniformly deforming said blade into said recess channel and uniformly tensioning said blade, said improvement comprising said gasket including an outer sleeve and an inner filler ring located within said outer sleeve, said outer sleeve and said inner filler ring including means being constructed and arranged to permit relative movement between said outer sleeve and said inner filler ring.

4,014,312

#### OVEN DOOR WINDOWS

Harold E. McKelvey, and Leonard B. Maciejewski, both of Plymouth, Mich., assignors to Shatterproof Glass Corporation, Detroit, Mich.

Filed Dec. 1, 1975, Ser. No. 636,635

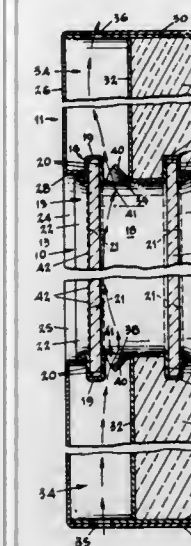
Int. Cl.<sup>2</sup> F24C 15/04

U.S. Cl. 126-198

10 Claims

1. A window unit for oven doors, comprising at least two spaced parallel glass panels, a frame surrounding the peripheral edges of said glass panels for maintaining them spaced from one another, said frame comprising two spaced channels for receiving the peripheral edges of the glass panels and a spacer portion between and integral with said channels, and

louvers provided in the spacer portions at the top and bottom of said frame and extending substantially the entire width of



said glass panels and being provided with passages for the circulation of air through the space between the glass panels.

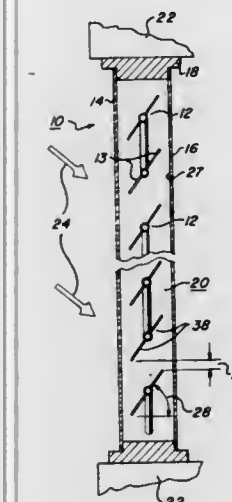
#### 4,014,313 APPARATUS AND METHOD FOR COLLECTING SOLAR ENERGY AT AN UPRIGHT SURFACE

David William Pedersen, P.O. Box 1241, Telluride, Colo. 81435  
Filed June 9, 1975, Ser. No. 585,100

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126-270

13 Claims



1. A solar energy collector adaptable for use at an exterior generally upright surface of a building comprising:  
a compartment having spaced apart exterior and interior covers of essentially transparent characteristics, and means for retaining the compartment at an exterior generally upright surface of a building;  
at least one energy receiving element comprising at least one solar radiant energy receiving and absorbing surface generally oriented at an angle to the plane of the generally upright building surface for efficiently receiving solar radiant energy according to the position of retention of said compartment at the exterior surface of the building, each energy receiving element also comprising a conduit means connected in heat conductive relationship with each solar energy receiving and absorbing surface, each energy receiving element being retained within said compartment between the interior and exterior cover members with a space on each side of each energy receiving element, the space on each side of each energy receiving element in conjunction with the angular orientation of the solar radiant energy receiving and absorbing surface providing a substantial sight path directly and angularly through said compartment; and

means connecting the conduit means for passing a fluid medium through the conduit means and for transporting energy away from each energy receiving element and out of said compartment.

11. A method for collecting solar radiant energy at an exterior generally upright surface of a building, comprising the steps of:

providing a plurality of solar radiant energy receiving elements at a transparent exterior generally upright surface of a building, each element having an energy receiving surface and a conduit in heat conductive relationship with the energy receiving surface;

orienting each energy receiving surface generally at an angle to the exterior generally upright surface of the building for effectively receiving radiant energy;

separating each solar radiant energy receiving element by a space on each side of each energy receiving element to allow a sight path directly and angularly through the transparent exterior surface of the building between adjacent energy receiving elements;

passing a fluid medium through each conduit in each energy receiving element; and

transporting energy from each energy receiving element and to a remote area of the building for use.

4,014,314

#### SOLAR ENERGY COLLECTOR PANEL

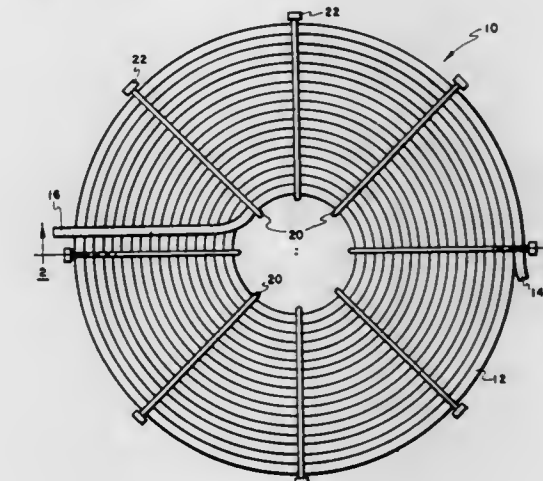
T. Lawrence Newton, Atherton, Calif., assignor to Sunburst Solar Energy, Inc., Menlo Park, Calif.

Filed May 8, 1975, Ser. No. 575,978

Int. Cl.<sup>2</sup> F24J 3/02

U.S. Cl. 126-271

6 Claims



1. A solar heating panel for fluid heat transfer media, comprising:

an elongated, tubular flow channel of flexible, cylindrical tubing for said media, wound into a planar, continuous spiral substantially toroidal in outline and having an outer and inner diameter;

a plurality of radially disposed, angularly spaced apart, elongated clamps, restraining said flow channel in said planar configuration, each said clamp being U-shaped and having parallel arms and a connection between said arms, the internal spacing between said arms corresponding to the outer diameter of said channel, the connection of each said clamp engaging said channel at the inner diameter of said spiral, one said arm extending over the top of said spiral and the other said arm extending below said spiral; and

inlet and outlet connections, communicating with either end of said channel, at the inner and outer peripheries thereof, respectively, for the admission and discharge of fluid heat transfer medium;

said panel having no enclosure for said channel other than said clamps.



4,014,315

## COVER FOR COOKING KETTLES

Carlos Lagunilla, Francisco del Paso y Troncoso No. 324B6

Unidad Kennedy, Mexico 9, D. F., Mexico

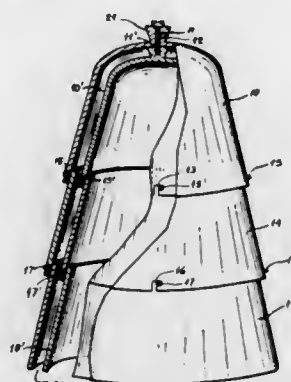
Filed Nov. 3, 1975, Ser. No. 628,254

Claims priority, application Mexico, Nov. 18, 1974, 155020

Int. Cl.<sup>2</sup> F24C 1/16

U.S. Cl. 126—275 R

3 Claims



1. A double-walled telescopeable and demountable cover for cooking ovens having inner and outer walls parallel spaced forming a thermal insulating chamber therebetween, each of said walls being formed by a plurality of partially overlapping frustoconical elements, said overlapping elements having the outside diameter of the uppermost portion of one element slightly less than the inside diameter of the lowermost portion of the adjacent overlaying element, said adjacent frustoconical elements being overlapped at their ends and engaged by a bayonet coupling, said walls having a bell-shaped uppermost section with an external central protrusion having a central threaded bore, said protrusion on each of said bell-shaped sections being coupled in a superimposed manner by fixing means.

4,014,316

## SYSTEMS FOR HEATING FLUIDS

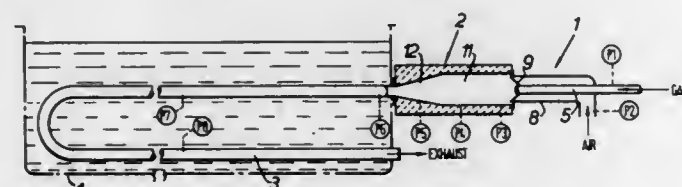
Derek Arthur Jones, and Robert William Cox, both of Solihull, England, assignors to British Gas Corporation, London, England

Filed Nov. 10, 1975, Ser. No. 630,505

Int. Cl.<sup>2</sup> F24H 1/28

U.S. Cl. 126—360 R

2 Claims



1. Gas-fired apparatus for the direct firing of an immersion tube for heating liquid in a vat or tank, including in combination, a burner of the nozzle-mixing type having a burner head comprising a gas supply tube closed at its inner end, the closed end of the gas tube being provided with equally spaced gas outlet ports inclined at an angle of between 40° and 50° to the tube axis, an air tube of greater diameter than the gas tube and disposed concentrically about it, and an annular perforate member of conical form subtending an angle of revolution of between 40° and 50° and fixed to said gas tube behind said gas outlet ports with its outer peripheral edge spaced slightly forwardly from the inner cylindrical surface of said air tube so as to project into said combustion chamber, disposed substantially across the annular space defined between the outlet ends of the gas and air tubes with its inner peripheral edge located behind the gas outlet ports, means for supplying air and gas separately to the burner head above atmospheric pressure, means for igniting a combustible gas/air mixture adjacent said burner head, a combustion chamber disposed downstream of

the burner external to the vat or tank, the combustion chamber consisting of a hollow cylindrical cavity formed in a block of refractory material, the diameter of the cavity over the greater proportion of its length being greater than the diameter of the air tube and tapering inwardly towards its end which communicates with the immersion tube, and an immersion tube for immersion in a liquid to be heated, said immersion tube being of small bore and of predetermined length and communicating the combustion chamber and an outlet for exhaust gases.

4,014,317

## MULTIPURPOSE CARDIOCIRCULATORY ASSIST CANNULA AND METHODS OF USE THEREOF

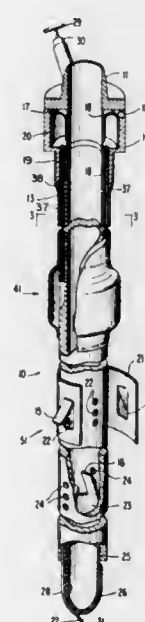
Anthony M. Bruno, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Feb. 18, 1972, Ser. No. 227,399

Int. Cl.<sup>2</sup> A61M 25/00; A61B 19/00

U.S. Cl. 128—1 D

18 Claims



1. A multipurpose cardiocirculatory assist device comprising:

a hollow elongated cannula having a diameter sufficiently small for insertion into a human artery leading to the aorta, said cannula having a leading tip at the upstream end and a trailing end at the downstream end thereof, wherein upstream and downstream relate to the direction of blood flow during arterial usage;

electrode means at the leading tip of said cannula for pacing the heart;

blood pump means to pump blood from the left ventricle during cardiac systole and into the aorta during cardiac diastole, including inlet valve means along said cannula and adapted to be disposed within the left ventricle during usage for allowing blood to pass into said blood pump means, and outlet valve means along said cannula downstream from said inlet valve means and adapted to be disposed within the aorta during usage for allowing blood to pass out of said blood pump means; and

supplementary heart pumping assist means comprising balloon pump means including a balloon connected to said cannula disposed downstream from said outlet valve means, said balloon pump means causing inflation of said balloon during cardiac diastole and deflation of said balloon during cardiac systole.

4,014,318

## CIRCULATORY ASSIST DEVICE AND SYSTEM

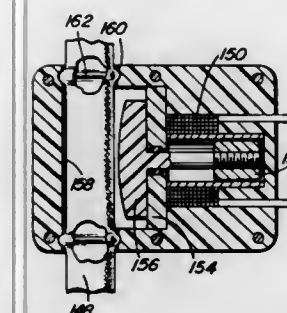
James M. Dockum, 206 E. Marion St., Monroe, Iowa 50170, and Norman H. Nitzkowski, La Salle Building, Mankato, Minn. 56001

Continuation-in-part of Ser. No. 389,438, Aug. 20, 1973, abandoned. This application May 22, 1975, Ser. No. 579,892

Int. Cl.<sup>2</sup> A61M 1/03; A61F 1/24

U.S. Cl. 128—1 D

8 Claims



1. A miniaturized heart substitute implantable into the body of a living animal comprising a first tubular prosthesis adapted to be incorporated into the pulmonary artery with an inlet end thereof adapted to be communicated with the superior vena cava and the inferior vena cava, a second tubular prosthesis adapted to be incorporated into the aorta with an inlet end adapted to be communicated with the pulmonary vein, said prostheses being arranged in parallel, side-by-side relation, each tubular prosthesis being flexible and resilient and including a pair of longitudinally spaced valve means for one way flow therethrough, and a circulatory assist device associated with said tubular prostheses for sequentially and cyclically collapsing portions of each tubular prosthesis from an inlet end toward the discharge end for pumping blood through the prostheses in a manner equivalent to the pumping action of a natural heart, said device including a pair of parallel, spaced, elongated stationary abutments receiving the tubular prostheses therebetween, movable members positioned between the tubular prostheses in opposed relation to the stationary abutments, and independent magnetically actuated means independently moving said movable members sequentially toward and away from the abutments for pumping blood through each tubular prosthesis, said magnetically actuated means including a solenoid for each movable member, each solenoid including a housing, a coil winding in said housing, a magnetic member connected to the movable member and associated with the coil winding for reciprocation of the movable member, said abutments being rigid with said housing and interconnected by an extension integral with the housing and disposed at one edge of the abutments, the opposite edges of the abutments being free, each movable member having an extension thereon parallel to the extension on the housing and extending over the free edge of the abutment adjacent the magnetic member and connected to the magnetic member, said magnetic members being generally in alignment with the longitudinal center of the tubular prosthesis, said valve means including a valve ring and disc flap assembly disposed interiorly of the prosthesis, said housing including annular recess means receiving said valve ring, said valve ring having a diameter greater than the prosthesis for anchoring the valve means and prosthesis in said recess means.

4,014,319

## INTERCRANIAL PRESSURE TRANSDUCER

Robert Favre, Lausanne, Switzerland, assignor to Etat de Vaud, Switzerland

Filed Feb. 28, 1975, Ser. No. 554,030

Claims priority, application Switzerland, Mar. 7, 1974, 3250/74

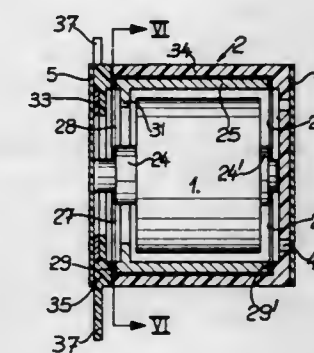
Int. Cl.<sup>2</sup> A61B 5/00

U.S. Cl. 128—2 R

10 Claims

1. An intercranial pressure transducer of the passive type,

including: a sealed capsule adapted to be housed in the thickness of a skull; a movable permanent magnet within said capsule; guide means for guiding displacement of said magnet axially within said capsule; and said capsule including means for subjecting said magnet to a hydrostatic force generated by



the intercranial pressure within said skull, whereby said magnet is displaceable by an external magnetic field applied thereto and which is sufficiently strong to overcome said hydrostatic force applied to said magnet and whereby the strength of the external magnetic field required to displace said magnet is a measure of said intercranial pressure.

4,014,320

## AUDIOMETRIC APPARATUS

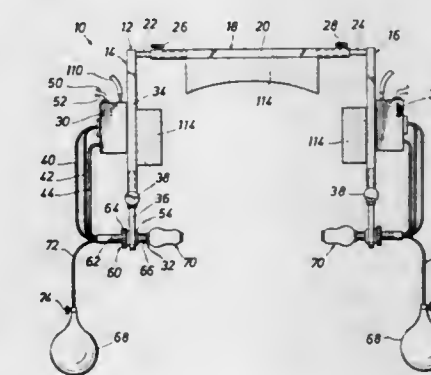
George Benton Richards, 804 Harmon, Longview, Tex. 75601

Filed May 14, 1975, Ser. No. 577,451

Int. Cl.<sup>2</sup> A61B 5/12

U.S. Cl. 128—2 Z

2 Claims



1. Apparatus for sequenced contralateral testing of intra-aural muscle reflex, said apparatus comprising:

first probe means sealably positionable in a first auditory canal of a patient for isolating a first volume therein;

first inflatable bladder means carried by said first probe means for circumferentially expanding when pressurized fluid is introduced into said first bladder means;

said first probe means being operable to carry:

first pressure control means for controlling a pressure in the first volume;

first audio stimulus generating means for selectively producing an audio stimulus in the first auditory canal;

first response detecting means for detecting in the first auditory canal a response to the stimulus of said first audio stimulus generating means;

second probe means operably connectable to said first probe means, said second probe means being positionable in a second auditory canal of a patient for isolating a second volume therein;

second inflatable bladder means carried by said second probe means for circumferentially expanding when pressurized fluid is introduced into said second bladder means;

said second probe means being operable to carry:

second pressure control means for controlling a pressure in the second volume;



second audio stimulus generating means for selectively producing an audio stimulus in the second auditory canal;

second response detecting means for detecting in the second auditory canal a response to the stimulus of said second audio stimulus generating means;

said first pressure control means, said first audio stimulus generating means, and said first response detecting means being cooperable to displace an eardrum in the first auditory canal to a position having a first predetermined compliance;

said second audio stimulus means carried by said second probe means being operable when the first predetermined compliance is achieved to stimulate the eardrum in the second auditory canal and produce a reflex in the eardrum in the first auditory canal, said first pressure control means being operably responsive to the reflex of the first eardrum;

said second pressure control means, said second audio stimulus generating means, and said second response detecting means being cooperable to displace an eardrum in the second auditory canal to a position having a second predetermined compliance;

said first audio stimulus means carried by said first probe means being operable when the second predetermined compliance is achieved to simulate the eardrum in the first auditory canal and produce a reflex in the eardrum in the second auditory canal, said second pressure control means being operably responsive to the reflex of the second eardrum.

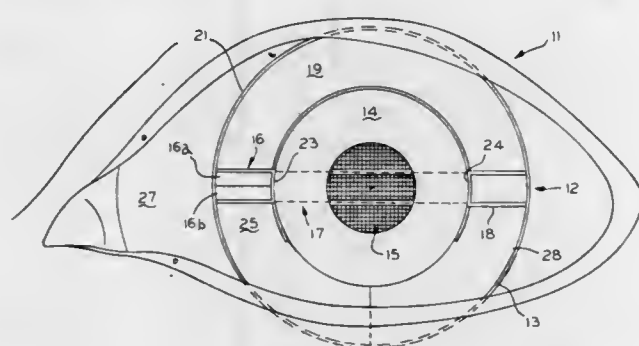
4,014,321

## NON-INVASIVE GLUCOSE SENSOR SYSTEM

Wayne F. March, 2517 Rugby Road, Dayton, Ohio 45406  
Continuation-in-part of Ser. No. 526,581, Nov. 25, 1974, Pat. No. 3,958,560. This application Oct. 6, 1975, Ser. No. 619,954  
Int. Cl.<sup>2</sup> A61B 5/00

U.S. Cl. 128-2 A

15 Claims



1. A non-invasive glucose sensor system for determining the sugar content in a user's blood, said system comprising radiation emitting means for emitting radiation of certain wavelengths, radiation detecting means for detecting the emitted radiation, said radiation detecting means spaced apart from but in line with said radiation emitting means, means for mounting said radiation emitting means and radiation detecting means so that said radiation is capable of being transmitted through the cornea of the user's eye, and enabling means for enabling said detecting means to determine the optical rotation of the radiation occurring in the cornea.

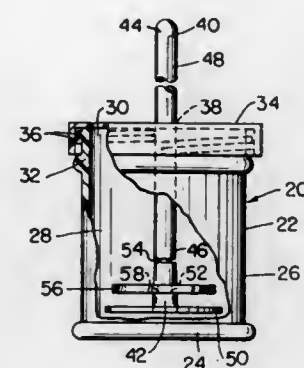
4,014,322  
SPECIMEN COLLECTING DEVICE AND METHOD  
Nayan S. Shah, Carpentersville, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Oct. 23, 1975, Ser. No. 625,294

Int. Cl.<sup>2</sup> A61B 10/00

U.S. Cl. 128-2 F

36 Claims



1. A device for collecting aseptic liquid specimens, comprising:  
a container having wall means defining a chamber and an opening communicating with the chamber;  
liquid sampling means comprising, compressible liquid absorption means for receiving the liquid specimen, and handle means for supporting the absorption means while receiving the specimen and placing the specimen containing absorption means in said chamber through the container opening; and  
means for compressing the absorption means in the container chamber after receipt of the specimen to release the specimen into the chamber, said compressing means comprising spaced plate means being movable toward each other with the absorption means supported by the handle means between the plate means to squeeze the absorption means and release the specimen.

4,014,323

## ELECTROTHERAPY SYSTEM

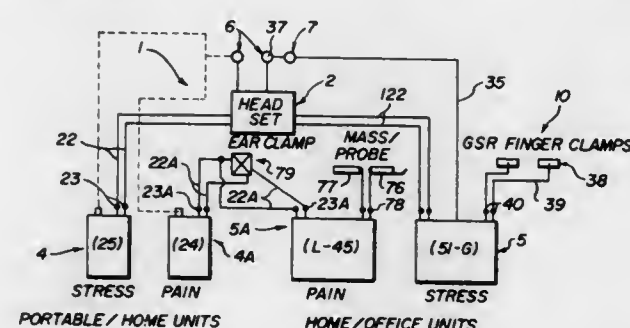
James Ray Gilmer, 510 Nesbitt Drive, Garland, Tex. 75041;  
Harry Alvin Bowers, 305 Edgefield, Garland, Tex. 75040,  
and Robert Earl Day, 1502 Hiawatha Drive, Garland, Tex. 75041

Filed June 30, 1975, Ser. No. 591,402

Int. Cl.<sup>2</sup> A61B 5/05; A61N 1/36

U.S. Cl. 128-2.1 Z

3 Claims



1. An electrotherapy system comprising: pulse train generating means for providing a series of bursts of low level electrical energy, including output terminal means; patient-engaging means, including input terminal means connectable in electrical circuit with said output terminal means and further including electrodes in circuit with said input terminal means for transmitting said bursts of electrical energy to a patient needing therapeutic treatment; control means for manually adjusting the relative level of electrical energy produced by said pulse train generating means; and passive, measuring means for indicating the patient's emotional stress state and changes therein, simultaneously with treatment using said bursts of energy, including galvanic skin electrical resistance sensing means.

4,014,324  
ROTARY MASSAGING DEVICE AND METHOD OF USING SAME

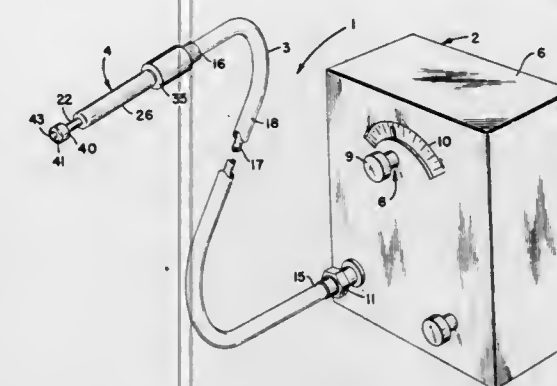
Warren G. Cellers, 127 N. Summit, Arkansas City, Kans. 67005

Filed Apr. 26, 1976, Ser. No. 680,517

Int. Cl.<sup>2</sup> A61H 7/00

U.S. Cl. 128-46

8 Claims



1. A rotary massaging device comprising:  
a. power means for producing rotary motion;  
b. a massaging element including an eccentrically attached knob adapted for orbitally kneading a patient;  
c. a rotary power transmission means operably connecting said power means to said massaging element to rotate same; and  
d. means for varying the speed of said power means rotary motion whereby an operator of said device sets said speed to correspond with the pulse rate of said patient.

4,014,325

## UNIQUE MECHANICAL FOOT MASSAGER

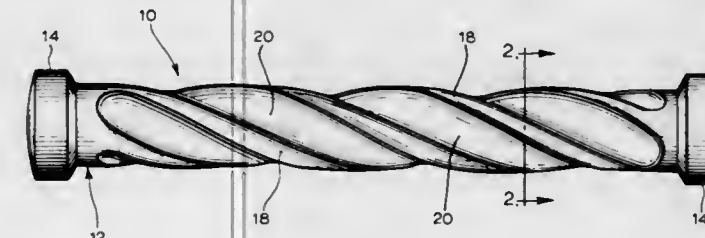
Charles W. Clarke, 207 N. Main, Morton, Ill. 61550

Filed Dec. 22, 1975, Ser. No. 643,017

Int. Cl.<sup>2</sup> A61H 15/00

U.S. Cl. 128-57

2 Claims



1. The massaging device of claim 5 wherein said cylindrical member has a diameter between about 0.75 and 2.00 inches and said spiral ridges are spaced between about 0.5 and 1.60 inches on the circumference of said member.

4,014,326

## RESPIRATOR SYSTEM

Robert Müller, Taby, Sweden, assignor to Cameco AB, Enebyberg, Sweden

Filed Apr. 21, 1976, Ser. No. 678,861

Claims priority, application Sweden, Apr. 30, 1975, 7505099

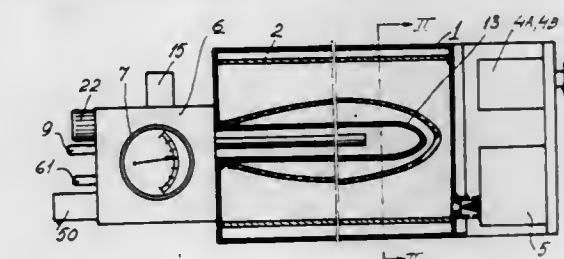
Int. Cl.<sup>2</sup> A61M 16/00

U.S. Cl. 128-145.6

7 Claims

1. A respirator system comprising  
a. a pressure chamber,  
b. a breathing bladder,  
c. a pulse transmitter,  
d. a pressure pulse generator,  
e. a valve block means,  
f. a pilot valve,  
g. an automatic valve means, and  
h. an expiratory valve.

i. patient communication means, wherein said breathing bladder contains breathing gas for substantially constant pressure and is disposed in said pressure chamber for being squeezed together and for expanding, respectively, as the result of the exterior of said breathing bladder intermittently being set under pressure of atmospheric air and being relieved, respectively, said pressure pulse generator being connected to said pressure chamber and being responsive to said pulse transmitter,  
said valve block means being connected to said breathing bladder for supplying breathing gas to the interior of said bladder from a source of breathing gas and for discharging said gas from the interior of said bladder to said pilot valve, said patient communication means being connected to said pilot valve,  
said valve block means being detachably connected to the



pressure chamber and including said automotive valve means for connecting the pressure chamber to said pilot valve,  
said pilot valve including said expiratory valve communication with said patient communication means, and  
said automotive valve means including spring-loaded pin means adapted for being depressed by said pressure chamber when said valve block is connected to said pressure chamber and including means for retaining open a pilot pressure channel supplied from said pressure chamber to said expiratory valve simultaneously with breathing gas being conveyed from the breathing bladder to one patient, whereas said pin means is extended when said valve block means is disconnected from said pressure chamber, thereby retaining the pilot pressure channel under pressure from the interior of the breathing bladder for simultaneously providing breathing gas to the patient by manual actuation of the breathing bladder.

4,014,327

## TENNIS ELBOW SPLINT

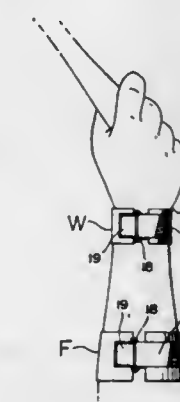
Irving Spiro, 7925 West Drive, North Bay Village, Fla. 33141

Filed Apr. 16, 1976, Ser. No. 677,831

Int. Cl.<sup>2</sup> A61F 13/00

U.S. Cl. 128-165

1 Claim



1. A splint for the prevention of tennis elbow and for the relief from its pain comprising a pair of pliable bands adapted to be positioned about the wrist and forearm of a person, a loop secured at one end of each of said bands, a strap secured to the other end of each of said bands, said straps having interengaging fastening surfaces whereby upon said straps extending through said loops and being folded upon them-



selves for interengagement, said pliable bands are held firmly in position about said wrist and forearm, an elongated and pliable member forming a pocket extending between said bands and an elongated and substantially slightly resilient member received in said pocket extending along and pressing against said forearm.

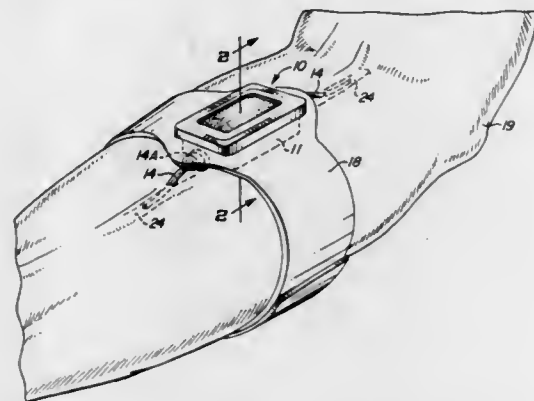
4,014,328

**BLOOD SAMPLING AND INFUSION CHAMBER**

Kenneth C. Cluff, 443 N. 600 East, Oren, Utah 84057, and Larry L. Bruce, 4029 S. 45th Place, Phoenix, Ariz. 85040  
Filed June 23, 1975, Ser. No. 589,018  
Int. Cl.<sup>2</sup> A61M 5/00

U.S. Cl. 128—214 R

9 Claims



1. Apparatus for blood sampling and infusion comprising: a chamber formed from a fluid impervious material having an opening surrounded with an outwardly flared edge, an entry port and an exit port, said ports each being contoured for connection to a cannula for insertion into a patient's bloodstream to permit the flow of blood through said chamber, a resilient plug means for snugly fitting into said opening and extending part way into said chamber to define a given cavity in said chamber, said plug means being provided with a flange extending laterally of its length for seating on said edge of the opening of said chamber, said resilient plug means being formed of a nontoxic sterilizable material pierceable by a needle and self-sealing upon withdrawal of the needle to afford removable communication with said cavity by means of a hollow needle supplying or withdrawing fluids between said cavity and a patient, a cover for said opening of said chamber, said cover extending over the part of said plug means extending outwardly of said opening and overlapping the edges of said plug means seated on said flared edges of said opening in said chamber and fastened to the outside of said chamber, and clamping means for engaging the outside of the chamber for fastening the apparatus to the patient, the outer periphery of said chamber being provided with a groove within which said clamping means extends in a snug fitting arrangement for firmly holding said chamber to a patient.

4,014,329

**METHOD AND APPARATUS FOR AUTOTRANSFUSION OF BLOOD**

Joseph D. Welch, Galveston, Tex.; Barbara J. Doyle, Rochester (now by change of name Barbara J. Gutterman); Harvey A. Weintraub, Rochester, both of N.Y., and Ludovico Cerulli, Lucca, Italy, assignors to The Rochester General Hospital, Rochester, N.Y.

Filed July 3, 1975, Ser. No. 593,163

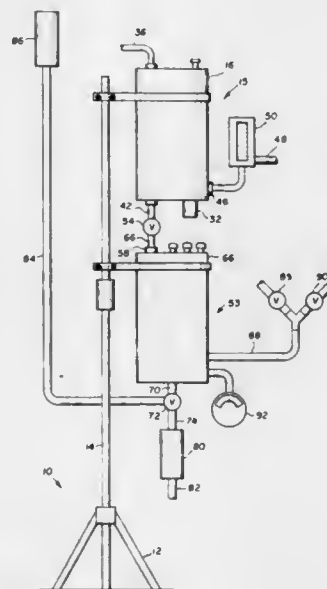
Int. Cl.<sup>2</sup> A61M 5/14, 1/02

U.S. Cl. 128—214 R

10 Claims

1. A device for infusing blood from a patient wherein the blood may be continuously retrieved from and infused into the patient, comprising:

- a. a vacuum chamber including means for applying a vacuum thereto;
- b. a separate receiving vessel located within said chamber;
- c. throttling means associated with said vacuum means for applying a differential vacuum to said chamber and said receiving vessel whereby the vacuum applied to said chamber is greater than the vacuum applied to said receiving vessel;
- d. a pick-up line connected to said receiving vessel and of sufficient length to extend to the source of blood to be drawn into said receiving vessel;
- e. a second vessel located outside said chamber and at a lower elevation than said chamber;
- f. a fluid connection from said receiving vessel to said second vessel including valve means independent of the action of said pick-up line whereby said blood may flow by gravity from said receiving vessel to said second vessel while maintaining said vacuum applied to said receiving vessel so that additional quantities of said blood may be drawn into said receiving vessel as said blood flows into said second vessel;



- g. means engaging said second vessel for expelling said blood from said second vessel for delivery to said patient; and
  - h. filter means in said device for cleaning the blood and removing impurities.
10. The method of infusing blood from a patient comprising the steps of:
    - a. retrieving the blood continuously from the patient by suction into a receiving vessel located within a vacuum chamber;
    - b. providing a differential vacuum between said receiving vessel and said vacuum chamber such that said vacuum chamber is under a greater vacuum than said receiving vessel;
    - c. transferring said blood from said receiving vessel to a second vessel outside of said vacuum chamber without interrupting the flow of said blood to said vacuum chamber;
    - d. transferring said blood from said second vessel to said patient; and

- e. filtering said blood before returning said blood to said patient for cleaning said blood and removing impurities.

4,014,330

**DISPOSABLE TWO-COMPARTMENT SYRINGE**

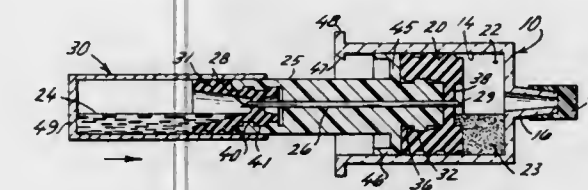
Joseph Nicholas Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1975, Ser. No. 626,020

Int. Cl.<sup>2</sup> A61M 5/00

U.S. Cl. 128—218 M

10 Claims



1. A prefilled, readily activated syringe comprising: a barrel member defining a substantially tubular chamber having an internal wall section; means defining a nozzle member communicating with said tubular chamber for attachment with a cover in one instance, and a hypodermic needle in another instance; a puncturable sealing element in sealing engagement with the internal wall section of said barrel member and spaced from said nozzle member to provide a compartment for a medicinal material; a slidable piercing member disposed in said syringe barrel and spaced from said puncturable sealing element, said piercing member comprising: a piercing tubular member having oppositely disposed piercing points; force fitment means carried by said piercing member and said puncturable sealing element to position one of said piercing points in nonpiercing contact with said sealing element and upon slidable movement of said slidable piercing member toward said puncturable sealing element, to lock said piercing member in pierceable engagement and in communication with said compartment; a stoppered container containing a fluid material constructed and arranged to be engaged by another piercing point of said piercing member and pierced thereby to provide communication with the contents of said container; protective covers in sealing engagement with said nozzle member and said other piercing point, whereby with said piercing member and said one piercing point spaced from said puncturable sealing element, movement of said slidable piercing member toward said sealing element will effect a first piercing of said puncturable sealing element and locking engagement with said sealing element as well as communication with said compartment and with positioning of said stoppered container in a second independent piercing engagement with said other piercing point of said piercing member, fluid communication between said stoppered container and said compartment is established with movement of said container toward said piercing member effecting a flow of said fluid material into said compartment with a resulting mixing thereof and further movement of said vial toward said puncturable sealing element will effect an expelling of said mixture from said nozzle member.

4,014,331

**SYRINGE BARREL WITH PROTECTIVE PLASTIC COVER**

James E. Head, R.R. 5, Hereford, Tex. 79045

Filed Dec. 30, 1975, Ser. No. 645,479

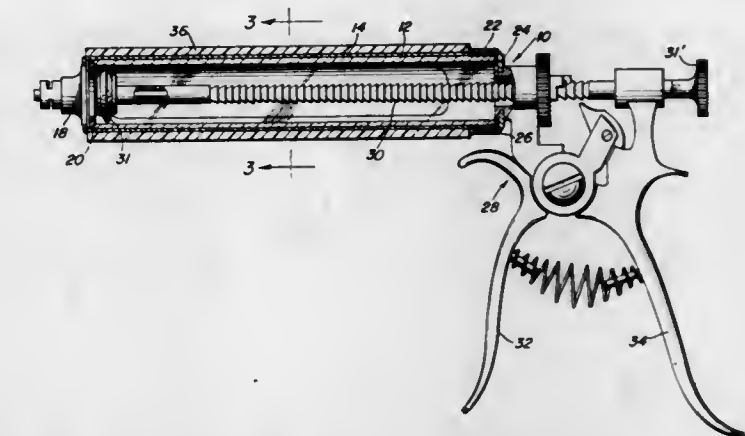
Int. Cl.<sup>2</sup> A61M 3/00

U.S. Cl. 128—224

6 Claims

1. In combination with a syringe assembly of the type in-

cluding a frangible open ended tubular barrel snugly received within a longitudinally slotted tubular body including at least partial end walls between which said barrel is received, a thick walled cylindrical sleeve constructed of plastic material expandable upon heating and shrinkable upon subsequent cooling.



ing, said sleeve being telescoped over and tightly shrunk about said body to cover the slotted portions thereof from the exterior of said body, said sleeve serving to protect said barrel from breakage as a result of impact with an object through said slotted portions and said body against impact with an object.

4,014,332

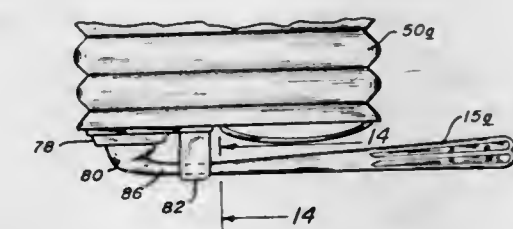
**DISPOSABLE SYRINGES**

Vincent R. Sneider, 3422 Hillcrest Drive, Atlanta, Ga. 30319  
Continuation-in-part of Ser. No. 389,506, Aug. 20, 1973, abandoned. This application June 30, 1975, Ser. No. 592,037

Int. Cl.<sup>2</sup> A61M 3/00

U.S. Cl. 128—227

7 Claims



1. A syringe for vaginal douche and enemas and the like, said syringe including: (a) a flexible container having an accordion configuration; (b) a discharge conduit adapted for fluid-tight connection to the container; (c) a manipulative shutoff valve associated with said discharge conduit, said valve when open permitting the flow of fluid from the container, said conduit being semiflexible and having a substantially circular cross section, the conduit having at least one stiffening rib locally formed as a part of the outer surface of the conduit and providing an assist to insure bending of the conduit into a pinch configuration to provide fluid-flow cutoff when the conduit is bent substantially at a right angle to and away from the stiffening rib whereby in this bent condition the sides of the conduit are brought together to inhibit flow there-through; (d) means for releasably retaining this conduit in the bent condition during storage and shipment until the conduit is straightened for fluid flow and use, and (e) a discharge nozzle attachably associated with the outlet end of the conduit.



4,014,333

# INSTRUMENT FOR ASPIRATING AND IRRIGATING DURING OPHTHALMIC SURGERY

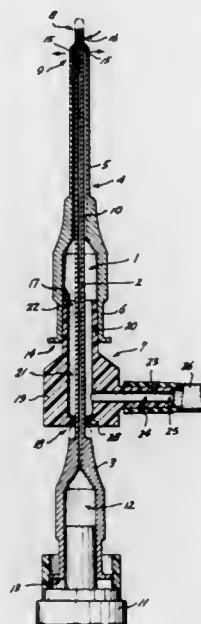
David J. McIntyre, 20245 Redmond-Fall-City Road, Redmond, Wash. 98052

Filed Sept. 22, 1975, Ser. No. 615,216

Int. Cl.<sup>2</sup> A61M 3/00

U.S. Cl. 128—240

15 Claims



1. An instrument for effecting aspiration and irrigation during ophthalmic surgery comprising:

- an elongated inner cannula telescopically disposed within a shorter outer cannula, the cannulae being rigid and substantially coaxial and defining a first passage therebetween, each cannula having an insertable end adjacent to the insertable end of the other, the first passage extending from the insertable end of the outer cannula to the remote end of the outer cannula remote from its insertable end, the inner cannula defining a second passage extending from its insertable end to the remote end of the inner cannula remote from its insertable end, the insertable end of the outer cannula having an exterior orifice communicating with the first passage, the insertable end of the inner cannula having an exterior orifice communicating with the second passage; and connector means interconnecting and forming a fluid-tight seal with each of the cannulae at locations remote from their insertable ends, the connector means having an interior cavity communicating with first and second ports spaced apart on its exterior, the cavity communicating via the first port with the first passage at the remote end of the outer cannula, the second port being accessible for connection to a source of liquid, and the inner cannula passing through the connector means and having its remote end accessible for connection of the second passage to a vacuum source.

4,014,334

# LAMINATED OSMOTIC SYSTEM FOR DISPENSING BENEFICIAL AGENT

Felix Theeuwes, Los Altos, and Atul D. Ayer, Belmont, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Feb. 2, 1976, Ser. No. 654,194

The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.

Int. Cl.<sup>2</sup> A61M 31/00

U.S. Cl. 128—260

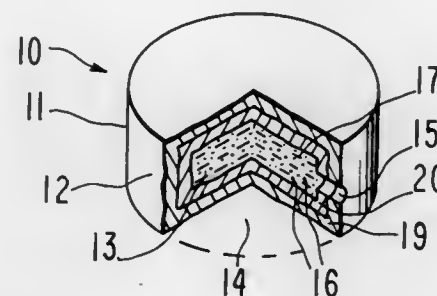
36 Claims

1. An osmotic system for the controlled and continuous dispensing of a beneficial agent to an environment of use, said system comprising:

- a. a shaped wall comprising a laminate, said laminate comprising a semipermeable lamina that is permeable to the passage of an external fluid and which lamina substantially maintains its physical and chemical integrity in the

environment of use; and a semipermeable lamina that is permeable to the passage of an external fluid, substantially impermeable to the passage of agent and which lamina substantially maintains its physical and chemical integrity in the presence of fluid and agent, said wall surrounding;

- b. a compartment containing the beneficial agent;
- c. a passageway in the wall communicating with the compartment and the exterior of the system for dispensing agent from the system; and



- d. wherein in operation when the system is in the environment of use, fluid from the environment is continuously imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby continuously dissolving agent that is dispensed through the passageway at a controlled and continuous rate over a prolonged period of time.

4,014,335

# OCULAR DRUG DELIVERY DEVICE

Randall K. Arnold, San Jose, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 569,953, April 21, 1975, Pat. No.

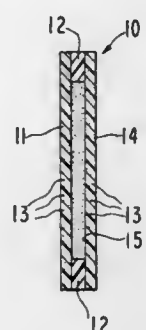
3,961,628, which is a continuation-in-part of Ser. No. 493,819, Aug. 1, 1974, abandoned, which is a continuation of Ser. No. 227,051, Feb. 17, 1972, abandoned. This application Mar. 25, 1976, Ser. No. 670,267

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> A61M 31/00

U.S. Cl. 128—260

27 Claims



- 1. An ocular device for the administration of drug comprising a three layered laminate having a pair of separate and discrete first and third walls formed of a material insoluble in tear fluid with one of the walls formed of a drug release rate controlling material permeable to the passage of drug and the other wall formed of a material impermeable to the passage of drug, a second wall interposed between the first and third walls and formed with an inwardly disposed hole with the second wall sealingly engaging the first and third walls to form a reservoir containing a drug selected from the group consisting of antibiotic, antibacterial, antiviral, antiallergenic, anti-inflammatory, miotic, anticholinesterase, mydriatic and sympathomimetic drugs, and wherein drug is administered from the device at a controlled and continuous rate by passage through the rate controlling wall over a prolonged period of time.

4,014,336

# INHALATION DEVICE

Stanley Mathes, Mountain View, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, P.R.

Continuation-in-part of Ser. No. 540,917, Jan. 13, 1975, Pat. No. 3,938,516. This application Nov. 20, 1975, Ser. No.

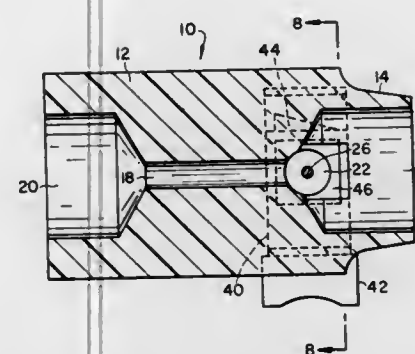
633,780

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> A61M 13/00, 15/06

U.S. Cl. 128—266

28 Claims



- 1. An inhalation device comprising an elongate housing having a passageway for the movement of air therethrough, one end of said housing being an output end adapted for insertion into the mouth or nasal passages of a user thereof; said passageway terminating in an emptying chamber adjacent the output end of said housing, the cross-sectional area of said passageway being less than the cross-sectional area of said emptying chamber; means for receiving a closed medicament-holding container as the container is inserted into said container receiving means; and hollow means for directing a stream of air drawn therethrough during inhalation into an opened medicament-holding container positioned within said container receiving means, whereby air drawn through said passageway and through said hollow means cooperate to cause the medicament in the medicament-holding container to be dispensed therefrom.

4,014,337

# EVACUATOR DEVICE

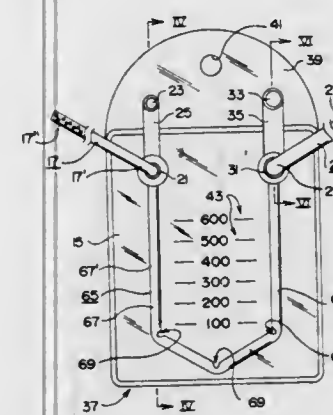
Harry T. Treace, Forest Hill, Tenn., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Filed Mar. 26, 1976, Ser. No. 671,005

Int. Cl.<sup>2</sup> A61M 1/00

U.S. Cl. 128—278

11 Claims



- 1. A closed wound evacuation device for drawing waste fluid from a closed wound in a patient's body, said evacuation device comprising:

- a. a substantially collapsible pouch formed of an air- and liquid-impermeable material having a first opening therethrough for allowing a first end of a first hollow tube to be selectively attached thereto adjacent said first opening

therethrough and in operative communication with the interior of said pouch; and

- b. expansible means enclosed within said pouch so that when the first end of the first hollow tube is attached to said pouch and when the second end of the first hollow tube is positioned within a closed wound in a patient's body and when said expansible means is compressed and subsequently released, the expansion of said expansible means will cause suction to be applied to the wound through the second end of the hollow tube to draw any waste fluid in the wound into the interior of said pouch, said expansible means being formed of a hydrophilic sponge material so that when waste fluid is drawn into the interior of said pouch and contacts said expansible means, said expansible means will swell thereby applying further suction to the wound.

4,014,338

# DIAPER WITH ELASTIC MEANS

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 519,493, Oct. 31, 1974, Pat. No.

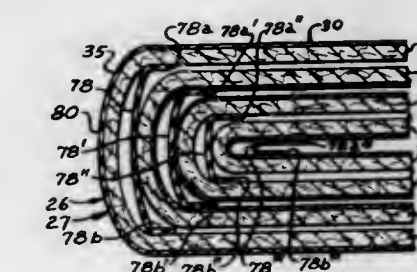
3,951,150. This application Jan. 14, 1976, Ser. No. 648,981

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> A61F 13/16

U.S. Cl. 128—287

8 Claims



- 1. A disposable diaper, comprising: an absorbent pad assembly having an absorbent pad, a pair of waistline portions, a crotch portion intermediate said waistline portions, a front surface, a back surface, a pair of side edges, a pair of end edges connecting said side edges, a plurality of longitudinally extending folds defining an inverted pleat configuration of the pad assembly, said pad assembly having a first pair of fold lines defining a longitudinally extending central panel, a second pair of fold lines defining a pair of intermediate back panels underlying the back surface of the central panel and a pair of side panels extending from said second fold lines around said first fold lines, and side panels having a pair of outer back panels underlying said intermediate back panels and a pair of outermost panels overlying the front surface of said central panel, said pad assembly having a fold in said crotch region along a lateral fold line and defining end sections of the pad assembly with the back surfaces of the outer back panel end sections facing each other, and said pad assembly having an elastic band extending across said lateral fold line and having opposed ends secured on opposite sides of the lateral fold line to the back surface of the outer back panel.

4,014,339

# DIAPER WITH COLLAPSIBLE ADHESIVE TAB FASTENER

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 12, 1976, Ser. No. 666,274

Int. Cl.<sup>2</sup> A61F 13/16

U.S. Cl. 128—287

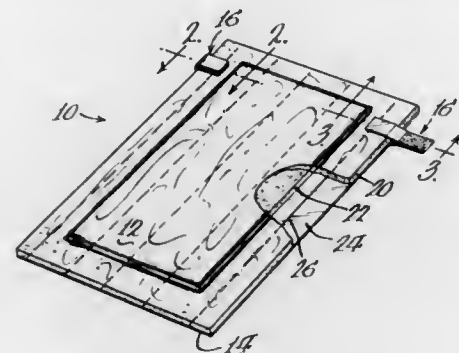
10 Claims

- 1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-imperious backing sheet substantially coextensive with



said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

an integral tape ribbon folded to form a plurality of articulated segments including a backing-anchoring segment which is secured to said backing sheet, a release-bearing segment connected at one end to an adjacent end of said backing-anchoring segment and having an opposite end, a securing segment connected at one end to said opposite end of said release-bearing segment and having an opposite end, and a facing-anchoring segment connected at one end to said opposite end of said securing segment and



having an opposite distal end which is secured to said facing sheet, each segment having an inner face and an outer face;  
a first pressure-sensitive adhesive means on the outer face of said securing segment; and  
release means on the outer face of said release-bearing segment contiguous to and protecting said first pressure-sensitive adhesive means when the tab fastener is in a storage position, said first pressure-sensitive adhesive means being removable from said release means to assume a working position wherein said first pressure-sensitive adhesive means is available for securing the diaper about an infant.

4,014,340

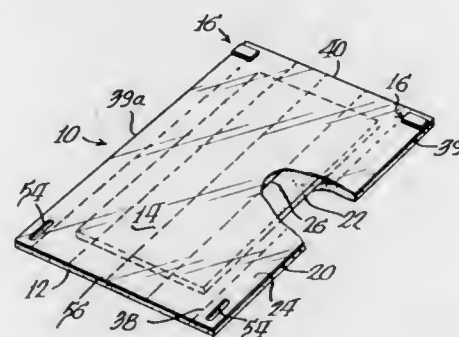
**TAPE CLOSURE HAVING A SLOT FOR RECEIVING A DIAPER CORNER THERE THROUGH**  
Ernest Cheslow, Glencoe, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 12, 1976, Ser. No. 666,275

Int. Cl.<sup>2</sup> A61F 13/16

U.S. Cl. 128—287

7 Claims



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-imperious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means comprising an integral elongated tape segment having a fixed end permanently attached to a first corner of said diaper along a side margin and one transverse margin of said diaper, and a free working end having a pressure-sensitive adhesive coating on one face thereof, said diaper having an opening at a second corner of said diaper along said side margin and an opposite

transverse margin of said diaper, whereby said first corner and said free working end can be inserted through said opening and said free working end can be adhered to said backing sheet to secure said diaper about an infant.

4,014,341

**ABSORBENT ARTICLE AND METHOD**

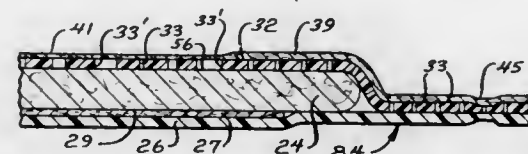
Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 552,463, Feb. 24, 1975, Pat. No. 3,994,299. This application Aug. 2, 1976, Ser. No. 710,966

Int. Cl.<sup>2</sup> A61F 13/18; A41B 13/02

U.S. Cl. 128—287

2 Claims



1. An absorbent article comprising, an absorbent pad having a front surface, a fluid pervious top sheet covering at least a portion of the front surface of the pad, and a film of thermoplastic material intermediate the top sheet and pad, said film being fused to said top sheet in a region of said film over said pad, said film having a plurality of openings extending through the film in at least a portion of said region to define a fluid receiving area of the article.

4,014,342

**VITREOUS CUTTER**

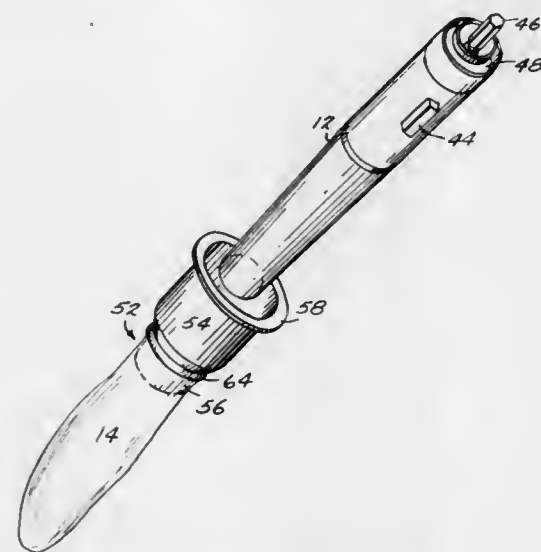
David Edward Staub, Clearwater; Carl Leroy Foltz, Holiday, and Raymond Walter Simmons, Pinellas Park, all of Fla., assignors to Concept, Inc., Clearwater, Fla.

Filed Apr. 11, 1975, Ser. No. 567,087

Int. Cl.<sup>2</sup> A61B 17/32

U.S. Cl. 128—305.1

18 Claims



1. A surgical instrument comprising a housing, motor means mounted in said housing and contained in said housing, said motor means being connected to a source of power, a removable sheath means mounted over said housing and surrounding said housing to protect said housing from external materials and contamination, said sheath means defining annular lip means which is securely held between a cutter means and said housing to prevent contamination materials from entering said housing, said cutter means comprising a body, a tube projecting from said body, a blade means positioned in said tube and drive transfer means mounted in said cutter means body, said drive transfer means connecting said blade means to said motor means for movement of said blade means when said motor means is activated, said tube defining an aperture, said

blade means in combination with the walls defining said aperture being adapted to shear tissue entering said hole and a passage means formed in said cutter body and communicating with said tube to allow pressure differentials to be exerted to said tube.

4,014,343

**DETACHABLE CHUCK FOR ELECTRO-SURGICAL INSTRUMENT**

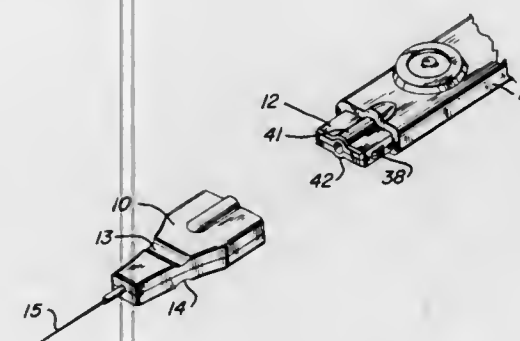
Janet M. Estly, Boulder, Colo., assignor to Neomed Incorporated, Boulder, Colo.

Filed Apr. 25, 1975, Ser. No. 571,517

Int. Cl.<sup>2</sup> A61B 17/40; A61N 3/06

U.S. Cl. 128—303.14

7 Claims



1. A detachable chuck adapted for removable attachment to a substantially flat elongated electrically insulating handle, the handle having a main body with a probe of reduced width and thickness relative to the main body at one end thereof, an electro-surgical signal generator connected to the other end of the handle and a receiving electrical connector contained within the probe extending from the said one end of the handle with the probe being of the same substantially flat configuration as the main body of the handle, said chuck comprising:

a housing of electrically insulating material having external dimensions conforming to the external dimensions of the handle main body and having a chamber opening into one end with the internal dimensions of said chamber conforming to the external dimensions of the handle probe for frictional engagement therebetween,

an elongated electrical conductor having an electrosurgical electrode on one end and a shank on the other end, said conductor being permanently and sealably retained by said housing so that said shank extends at least partially into said housing chamber while said electro-surgical electrode extends externally from said housing on the end opposite said chamber, said shank being positioned within said chamber so as to be in alignment with the electrical connector within the handle probe for wiping engagement therewith whenever the handle probe is inserted into said housing chamber, said housing chamber being dimensioned for closely fitting non-rotatable insertion of said handle-probe therein so as to prevent rotation of said electro-surgical electrode during use and effectively isolate said shank and the receiving connector in the probe from the external surface of said handle and chuck.

4. In an electro-surgical device, the combination comprising: a substantially flat electrically insulating handle having a main body with a narrow rectangular cross-section and a probe extending from one end of said main body and terminating in an extreme end surface wherein the probe likewise has a rectangular cross-section of reduced width and thickness relative to the main body, a port in the extreme end surface of the probe at least one electrical connector positioned within the probe parallel to the longitudinal axis thereof and in alignment with said port in the extreme end surface of the probe, said connector adapted to be connected in electrical communication with an electro-surgical generator through the handle, the probe including alignment tabs extending outwardly from the external surfaces of the probe,

a housing composed of electrically insulating material having a cross-section at a first end thereof corresponding in external dimensions to the cross-section of the main body of the handle and having a chamber extending thereto from said first end with internal dimensions corresponding to the external dimensions of the probe, said chamber receiving said probe and further having slots extending along the inner surfaces of said chamber receiving the tabs of said probe thereby effecting a releasable locking juncture, said housing having a conductor-receiving channel extending axially therethrough from said chamber to the opposite end of said housing, and

an electrical conductor having an electrosurgical electrode end and a shank end, said conductor being sealed within said housing channel so that said shank extends into said chamber and axially entering the port in said probe to effect positive electrical communication with the connector in said probe by the wiping action between the probe connector and said shank, said electro-surgical electrode end of said conductor protruding externally from said housing from said opposite of said channel, said housing chamber being dimensioned for close fitting non-rotatable insertion of the handle probe therein for forming a locking mechanical support for said housing between the inner wall surfaces of said chamber and the external wall surfaces of said probe to isolate said handle port from the external environment.

4,014,344

**DECOMPRESSION BEDS FOR CHILDBIRTH AND METHOD FOR USING THEM**

Moises Hernandez Gutierrez, Avenida de las Americas 932, Guadalajara, Jalisco, Mexico

Continuation-in-part of Ser. No. 404,910, Jan. 11, 1973,

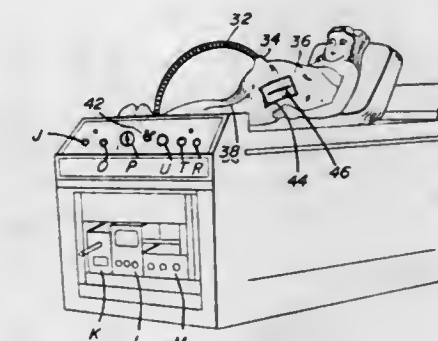
abandoned, which is a continuation-in-part of Ser. No.

322,720, Oct. 10, 1973, abandoned. This application Dec. 16, 1975, Ser. No. 641,357

Int. Cl.<sup>2</sup> A61B 17/42; A61G 07/06

U.S. Cl. 128—361

8 Claims



1. An obstetric apparatus including an elongated bed for use by an expectant mother, the bed comprising: a frame element; a bed surface movably mounted on said frame element and comprising a head section and a foot section; first power means for pivotally raising and lowering said head section about a first axis transverse to the major length axis of the bed; second power means for pivotally raising and lowering said foot section about a second axis parallel to but spaced from said first axis; third power means for pivotally moving said frame element, with said head and foot sections, about a central third axis parallel to the major length axis of the bed for producing up to an approximately 15° right side inclination and up to an approximately 15° left side inclination; and vacuum means integral with and mounted on said bed, for developing a vacuum about the lower body of the expectant mother after said frame element has been pivotally moved about said third axis to maximize the safety of the fetus and the comfort of the mother, said vacuum means including means for developing a vacuum in said vacuum-tight chamber according to a predetermined rhythm coinciding with the







4,014,351

# NOVEL TOBACCO FLAVORING AND AROMA COMPOSITIONS AND TOBACCOS CONTAINING ALPHA-SUBSTITUTED ACETALDEHYDE

Alan Owen Pittet, Atlantic Highlands; Erich Manfred Klaiber, Neptune; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Joaquin Vinals, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 507,412, Sept. 19, 1974, Pat. No. 3,940,499. This application July 24, 1975, Ser. No. 598,652

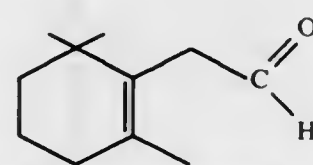
The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> A24B 3/12

U.S. Cl. 131—17 R

3 Claims

3. A smoking tobacco flavoring composition comprising from 0.25 up to 1.5% of 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde having the structure:



and the remainder of the composition a flavor adjuvant compound selected from the group consisting of ethyl butyrate, ethyl valerate and maltol.

4,014,352

# APPARATUS FOR AUTOMATICALLY CONTROLLING THE INITIATION AND/OR TERMINATION OF FUNCTIONS OF APPARATUS OR PROCESSES USING A CLOCK PULSE GENERATOR

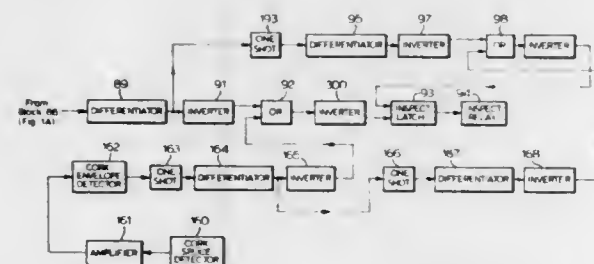
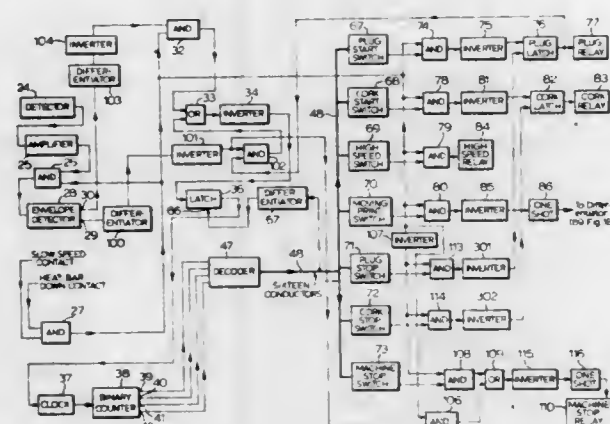
Patrick J. Jamieson, Bramalea, Canada, assignor to Rothmans of Pall Mall Canada Limited, Toronto, Canada

Division of Ser. No. 504,549, Sept. 9, 1974, Pat. No. 3,911,331. This application May 2, 1975, Ser. No. 573,918

Int. Cl.<sup>2</sup> A24B 7/14; A24C 5/32, 5/34

U.S. Cl. 131—21 R

18 Claims



1. In combination with a cigarette machine of the type having the following work stations in the following order: a cigarette making work station at which cigarette paper and tobacco are formed into cigarettes, a plug feeding work station at which plugs are fed into said machine and are arranged

end to end with said cigarettes and a cork tip paper feeding work station at which cork tip paper is fed into said machine and wrapped around said plugs and said cigarettes: apparatus for controlling the initiation of various machine functions in timed relationship to the occurrence of an event, said apparatus comprising a clock pulse generator for providing, when activated, a train of clock pulses which occur one after the other in sequential, spaced apart relationship; means responsive to cigarettes being made at said cigarette making work station in a normal fashion for activating said clock pulse generator; means having a plurality of output terminals for translating said train of clock pulses into a plurality of pulse signals that are derivable from individual ones of said output terminals, one such pulse signal being derivable at each of said output terminals and the pulses of different ones of said pulse signals occurring at different points in time; first and second networks, said first network including a first two state device, said first two state device controlling the supply of plugs to said plug feeding work station, said first two state device initiating said supply of plugs when said state thereof changes from one state to a second state thereof and terminating said supply of plugs when said state thereof changes from said second state to said one state thereof, said second network including a second two state device, said second two state device controlling the supply of cork tip paper to said cork tip paper feeding work station, said second two state device initiating said supply of cork tip paper when said state thereof changes from one state to a second state thereof and terminating said supply of cork tip paper when said state thereof changes from said second state to said one state thereof, said first and second networks being connected to at least one of said output terminals and each being responsive to the occurrence of a pulse at said output terminal to which said network is connected for changing the state of said two state device of said network from said one state to said second state thereof.

4,014,353

# FLUID-COOLED SMOKING DEVICE

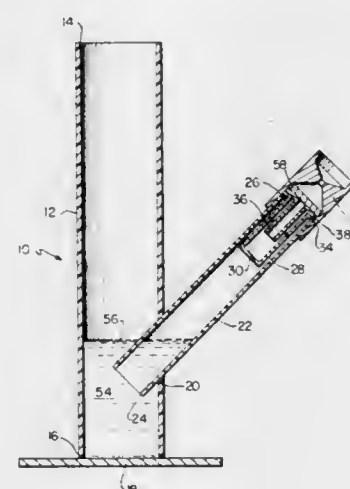
Richard W. Kahler, Rte. 1, Box 61, Rock Cave, W. Va. 26234

Filed May 14, 1976, Ser. No. 686,418

Int. Cl.<sup>2</sup> A24F 1/30

U.S. Cl. 131—173

30 Claims



1. A fluid-cooled smoking device comprising: housing means for containing a volume of fluid; means for containing a supply of tobacco to be smoked; means operatively connected to said tobacco container means for introducing smoke into said housing; means operatively connected to said housing for withdrawing said smoke from said housing; and means disposed within said smoke introduction means for defining a first elongated serpentine flow path for said smoke upstream of said fluid, whereby said smoke is cooled due to the travel of the same through said elongated path and said fluid.

4,014,354

# DENTAL FLOSSING TOOL

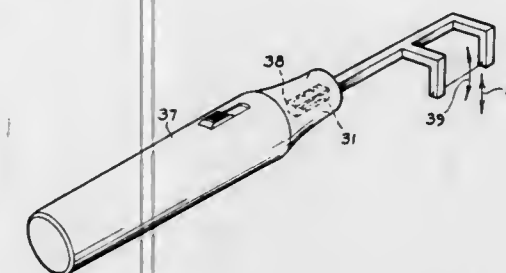
Terry N. Garrett, 2725 Dundee Court, Fort Collins, Colo. 80521

Filed Oct. 3, 1975, Ser. No. 619,443

Int. Cl.<sup>2</sup> A61C 15/00

U.S. Cl. 132—90

11 Claims



1. A dental flossing tool comprising: a handle having a longitudinal axis and first and second ends; and a pair of spaced-apart arms disposed on said handle at said first end thereof, said arms each having a first portion extending laterally from said handle in a first direction and a second portion extending from said first portion in a second direction, said first and second portions forming substantially an L-shaped geometry; the second portions of said arms being disposed for holding a length of dental floss between said arms in parallel alignment to the axis of said handle.

4,014,355

# BIDET AND HYGIENIC CLEANSING ARRANGEMENT

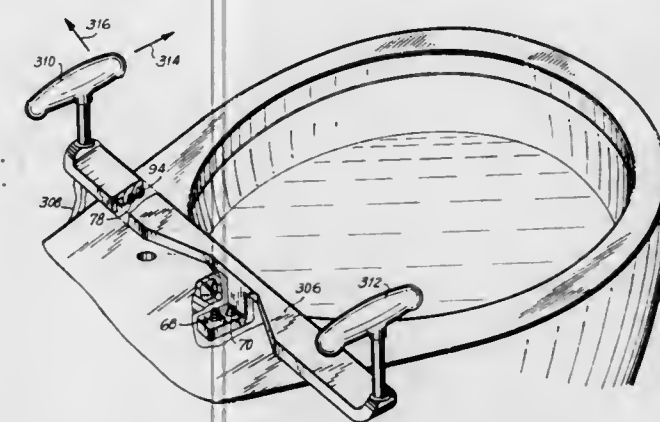
Paul L. DiMatteo, Huntington; Henry V. Diaferia, Brentwood, and Robert M. Segnini, Stonybrook, all of N.Y., assignors to Dynell Electronics Corporation, Melville, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,743

Int. Cl.<sup>2</sup> A47K 10/48; A61H 33/00; B08B 3/02, 3/10

U.S. Cl. 134—30

17 Claims



1. A cleansing method comprising the steps of: moving a spray of cleansing fluid over a predetermined area and moving thereafter a stream of air over said area to dry said area after having been wetted by said cleansing fluid; said spray of cleansing fluid and stream of air being moved over said area beneath the top rim opening of a receptacle; heating said cleansing fluid and said stream of air; applying pressure to said cleansing fluid and said stream of air, said pressure being applied selectively and separately for said fluid and said air; said steps of moving said spray of cleansing fluid and said stream of air comprising further moving said spray and said stream of air reciprocatingly along an axis traversing said area, the path of motion traced by said spray and said stream of air with respect to said axis having a predetermined amplitude and frequency; said spray and said stream of air being movable along a line relative to the rim of said receptacle.

4,014,356

# CLEANING SYSTEM FOR DISHWARE AND RELATED ITEMS

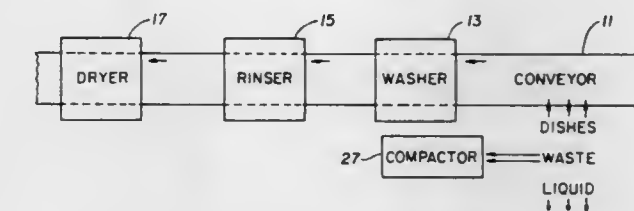
Carl R. Carieri, 64 Autumn Ridge Road, Trumbull, Conn. 06611

Filed Aug. 27, 1975, Ser. No. 608,224

Int. Cl.<sup>2</sup> B08B 3/10, 1/00, 5/00

U.S. Cl. 134—63

4 Claims



1. In a system for cleaning dish ware and related items which system includes cooperative conveying, washing, rinsing and drying means, the improvement comprising in combination with the said means a trough for receiving refuse located upstream from said washing means, a screw conveyor located in said trough and compacting means located downstream from said trough to receive material conveyed by said screw conveyor thereto for compacting of the same, said trough having a foraminous sub-floor located below the screw conveyor and the openings in the sub-floor are sized to permit passage into said trough of only relatively fine solid particulate matter and liquid matter and including pneumatic means located along the periphery of the trough directed downward through said screw toward the foraminous sub-floor for forcing refuse against the flights of the screw and for agitating the relatively fine particulate and liquid through the foraminous sub-floor material.

4,014,357

# BEAKER STEAMER

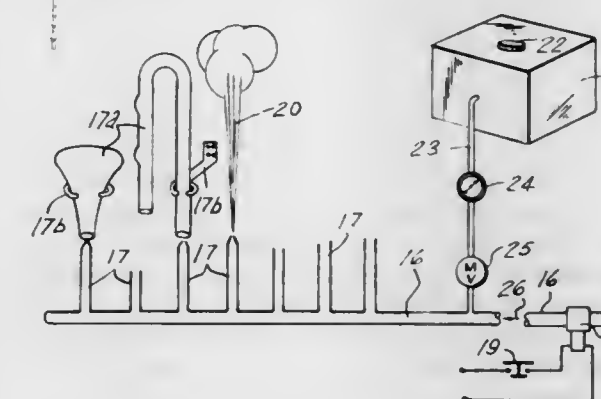
Allen L. Sneed, Lot 59 Woodville Manor, Magnolia, Del. 19962

Filed Dec. 15, 1975, Ser. No. 640,763

Int. Cl.<sup>2</sup> B08B 3/02, 9/08

U.S. Cl. 134—102

1 Claim



1. A beaker steaming device, comprising a safety solenoid valve secured within a horizontal pipe carrying steam and having plunger type safety switch means, said switch means is actuated to stop the high pressure steam flow within said horizontal pipe and said horizontal pipe is provided with a plurality of spaced apart jets for directing a mixture of steam and solvent, into the openings of vessels to be cleaned, said vessels being received removably within bracket means fixedly secured to the back wall of a housing, and line means from a solvent tank is secured fixedly to said horizontal pipe and has secured therein metering gauge means for controlling the flow of said solvent to said pipe carrying said steam.



4,014,358

**LOADING AND UNLOADING OF COMBUSTIBLE LIQUIDS ON, AND FROM TANKER SHIPS**

Louis Andersson, Gatgatan 73 IV, S-116 72 Stockholm, Sweden

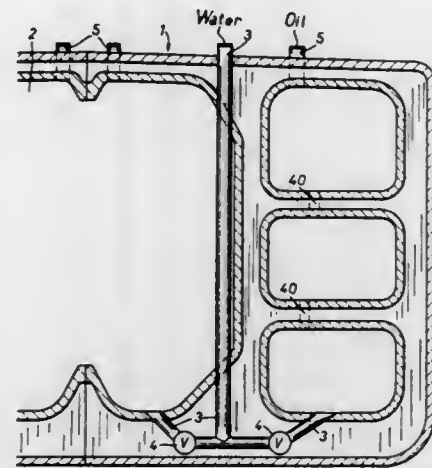
Continuation of Ser. No. 431,873, Jan. 9, 1974, abandoned.

This application July 11, 1975, Ser. No. 595,029

Int. Cl.<sup>2</sup> B63B 25/08

U.S. Cl. 137-1

2 Claims



1. Method of unloading oil from the tank holds of a tanker and replacing it with ballast water, by exchanging oil located in the tank holds of a tanker ship and water located in a storage tank on land, comprising the steps of:

simultaneously withdrawing oil from the tank hold while supplying water from said storage tank to the tank hold by removing, by differential pressure, oil from the upper level of the tank hold while simultaneously introducing water into the same tank hold at the lower level of the tank hold, the introduction of the water comprising the following sequence of steps:

- first filling a tank hold of the tanker ship completely with water;
  - subsequent to filling that tank hold with water, transferring a portion of the water from the filled tank hold into a second tank hold and then adding more water until the second tank hold is completely filled;
- repeating the steps of (a) completely filling a tank hold with water and then (b) partially withdrawing water from the filled tank hold, until all of the tank holds of the tanker have been completely filled with water and are at least partially filled with water.

4,014,359

**SPRINKLER FLOW CONTROL SYSTEMS**

George E. Sanner, P.O. Box 10707, Towson, Md. 21204

Continuation-in-part of Ser. No. 466,693, May 3, 1974, which is a continuation-in-part of Ser. No. 272,793, June 18, 1972, Pat. No. 3,848,616, which is a continuation-in-part of Ser. No. 18,829, Feb. 12, 1970, abandoned, which is a division of Ser. No. 456,787, May 18, 1965, Pat. No. 3,500,844. This

application Oct. 23, 1975, Ser. No. 625,350

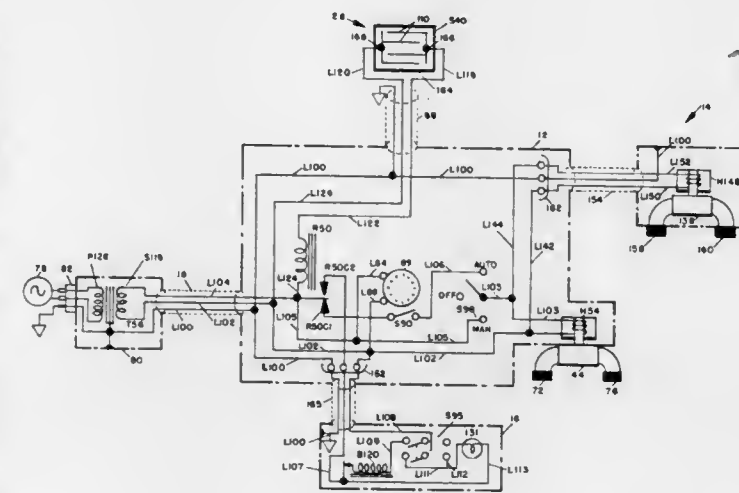
Int. Cl.<sup>2</sup> A01G 25/16

U.S. Cl. 137-78

53 Claims

1. A flow control for a fluid flow system having a fluid conduit with an electrically actuated flow control valve therein, comprising: a step-down transformer providing means for reducing a source of operating voltage to a source of low operating voltage; a first circuit means for connecting the said source of low operating voltage to the valve actuator; a first switching means comprising timing means for automatically completing said first circuit means to energize the said valve actuator and thereby open the said valve and allow a flow of fluid through said conduit for a predetermined period of time, and upon completion of the said time period, said first switch-

ing means interrupts said first circuit means continuity causing said valve actuator to be de-energized, said valve to close, and terminate said fluid flow through said conduit; a second switching means comprising an electrically actuated, single pole, double contact, switch with a switch actuator, which when energized, causes a first contact to open and a second contact is closed, and when said switch actuator is de-energized, said first contact is closed and said second contact is opened; said first contact connected in series with said source of low operating voltage, said first switching means, and said valve actuator all in said first circuit means, and, upon energization of said switch actuator, causes said first contact to open, continuity of said first circuit means is interrupted, thereby, overriding said first switching means, de-energizing said valve actuator, causing said valve to open, and terminating said fluid flow therethrough; said series connected circuit which, upon de-energization of said switch actuator, causes said first contact to close, restoring control of said first switching means, completing continuity of said first circuit means, energizing said valve actuator, causing said valve to open, and said fluid to flow therethrough; said second contact of said second switching means connected in series with a second circuit means and said source of low operating voltage, such that when said switch actuator is energized, the said second contact closes energizing the said second circuit means with



the said source of low operating voltage, and when the said switch actuator is de-energized, said second contact opens removing the said source of low operating voltage from the said second circuit means; a third circuit means comprising said switch actuator, third circuit conductor means, and said source of low operating voltage all in series with a planimetric rain switch which, when closed, completes the continuity of said third circuit means, and when said rain switch is open, continuity of said third circuit means is interrupted; said planimetric rain switch comprising an insulated member having a surface which is adapted to be oriented to receive rain thereon, with first and second spaced apart conductor means disposed on said surface and connected to said third circuit conductor means which are adapted to be electrically connected by rain on said insulating surface, completing the continuity in said third circuit means, energizing said switch actuator, causing said first contact to open, overriding said first switching means, interrupting said first circuit means, de-energizing said valve actuator, closing said valve, terminating said fluid flow therethrough; and, upon cessation of said rain on said insulating surface, interrupting said third circuit means, de-energizing said switch actuator, causing said first contact to close, and restoring control of said valve actuator to said first switching means substantially continuously with said rain cessation.

4,014,360

**PLURAL-SERVICE HYDRAULIC SYSTEM**

Frederick John Adams, Campton, England, assignor to TRW Inc., Cleveland, Ohio

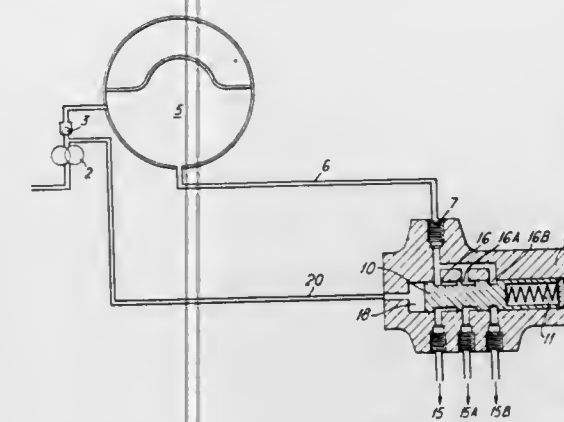
Filed May 31, 1974, Ser. No. 475,119

Claims priority, application United Kingdom, May 31, 1972, 25981/72

Int. Cl.<sup>2</sup> G05D 11/02

U.S. Cl. 137-118

9 Claims



1. A hydraulic system in which a source of pressure-fluid charges a pressure accumulator and the accumulator supplies pressure fluid to first and further slave services with preselected priority of supply, characterized by the provision of valve means connected between the accumulator and the slave services and operated by the source pressure in opposition to resilience, a first line connecting the valve means to the contents of the accumulator and a second line connecting the valve means to the source of pressure-fluid whereby the valve means is acted upon directly by the source of pressure-fluid to operate the valve, the position of the valve means when so operated determining which of the further slave services receives pressure-fluid from the accumulator so that the selection of slave services to be supplied is dependent upon the source pressure.

4,014,361

**AUTOMATIC ANTI-SIPHON VALVE**

Chester C. Rodieck, P.O. Box 1329, Porterville, Calif. 93257

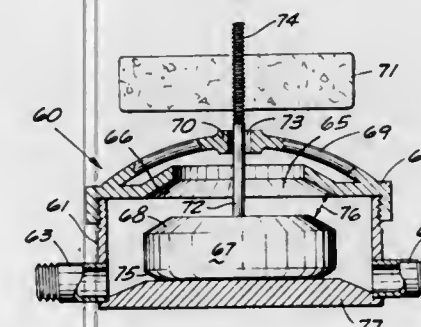
Division of Ser. No. 269,145, July 5, 1972, Pat. No. 3,951,163.

This application Nov. 24, 1975, Ser. No. 634,905

Int. Cl.<sup>2</sup> F16K 31/22; E02B 13/00

U.S. Cl. 137-122

1 Claim





below said base portion, said lower arm terminating in said annular valve seat, said valve rod extending from said valve disc through said valve seat and axially through both arms, said means operatively connecting said float to said valve disc comprising a float arm fixed at one end to said float and fixed at the other end to a body yoke encompassing said T-shaped pipe, and body yoke being pivotally coupled to said pipe and to said vertically extending valve actuator rod, and wherein said tubular bellows is sealably, fixedly mounted at its upper end to said pressure balancing plate and its lower end to the upper end of said T-shaped pipe upper arm;

whereby, the pressures acting on the valve disc in valve closed position are balanced to reduce the power necessarily exerted by the float on the valve disc to move the valve disc to valve open position.

4,014,363

#### WATER AND CONCENTRATE SUPPLY VALVES FOR PROPORTIONING MIXER-DISPENSER

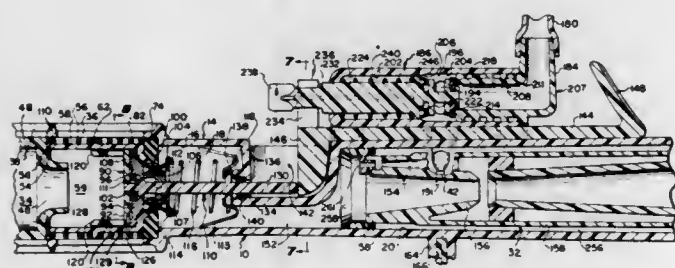
Valentine Hechler, IV, 26 Meadow View Road, Northfield, Ill. 60093

Division of Ser. No. 443,831, Feb. 27, 1974, Pat. No. 3,933,179. This application Apr. 17, 1975, Ser. No. 568,786

Int. Cl.<sup>2</sup> F16K 19/00

U.S. Cl. 137—218

11 Claims



10. A flow control valve comprising a housing for receiving liquid under pressure, defining a valve compartment receiving liquid under pressure, and valve port means defining a major outflow port area from said compartment;

main valve means closing said major flow port in the direction of the flow therethrough and defining a pilot valve flow port area through it;

pilot valve means coaxing with said pilot valve port to close said pilot valve in the direction of flow and opening against said pressure;

valve stem means for opening said pilot valve means to lower the pressure drop across the main valve means;

lost motion means interconnecting said valve means for sequentially opening the main valve means when extended after opening the pilot valve means to dispose them in spaced relation with a flow space therebetween in communication with said pilot valve port, and means to lower the pressure on the liquid flowing between the valves relative to the upstream pressure against the main valve means to collapse said lost motion means and further open said main valve.

4,014,364

#### UNIVERSAL CIRCUIT-DEFINING DEVICE

Pierre Matrot, Fontenay-sous-Bois, France, assignor to Martonair Limited, Twickenham, England

Filed May 29, 1975, Ser. No. 581,736

Claims priority, application France, May 29, 1974, 74.18664

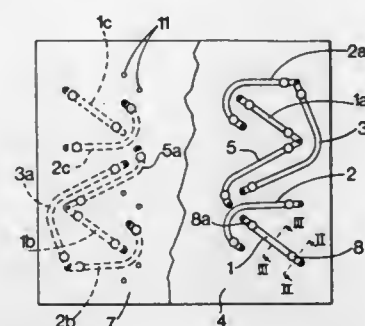
Int. Cl.<sup>2</sup> F15C 1/06

U.S. Cl. 137—271

4 Claims

1. A universal circuit-defining device with which logical or other component elements or modules of component elements are to be connected, the device including a base plate having opposed faces, open channels provided in one of said

opposed faces and sockets formed in said open channels, a deformable seal engaging said one face and by which said open channels are closed, and a cover plate by which said deformable seal is held against said one face, said channels



constituting pre-established circuit elements, the device also including interchangeable plugs constituting means for the interruption of the circuit and insertable in and removable from said sockets, said plugs removable to bring corresponding parts of the circuit into operation.

4,014,365

#### VALVE

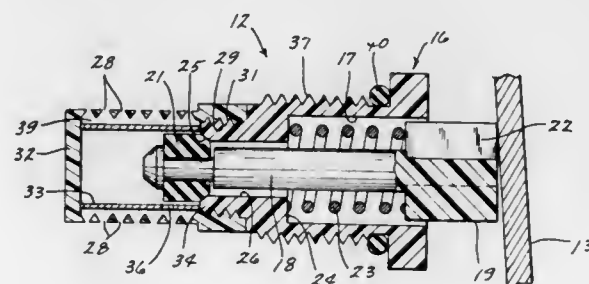
Jerry D. Peterson, Conrad, and Gerald L. Knief, Grundy Center, both of Iowa, assignors to Ritchie Industries, Inc., Conrad, Iowa

Filed Oct. 10, 1975, Ser. No. 621,468

Int. Cl.<sup>2</sup> E03B 3/18

U.S. Cl. 137—549

2 Claims



1. A valve comprising:

a valve body having a fluid passageway therethrough said fluid passageway being disposed about a longitudinal axis, one end of said passageway forming a fluid inlet port and the other end of said passageway forming an outlet port; a valve seat disposed at said one end of said passageway; a valve stem extending through said passageway; a valve head disposed on one end of said valve stem adjacent to said valve seat;

means for biasing said valve stem to a first position whereby said valve head is in sealing engagement with said valve seat, said valve stem having a second position when said biasing means is overcome whereby the valve head is spaced from the valve seat to allow flow through the valve;

screening means connected to said one end of said valve body and encompassing said valve head for filtering fluids passing through the valve, said screening means being substantially cylindrical and having sidewalls which are pervious to fluid flow and having one end wall which is impervious to fluid flow; and

a cylindrical sleeve member disposed within said screening means, said cylindrical sleeve member having a single hole in the side thereof positioned directly adjacent to said valve head when said valve head is in said first position whereby said valve head will slide past said hole when moving between said first and second positions to prevent the build-up of mineral deposits in said hole, said cylindrical member having one end thereof in sealing engagement with said flow impervious one end of said screening means and the other end of said cylindrical

member being in sealing engagement with a portion of said housing surrounding said valve seat, said hole being intermediate the ends of said cylindrical member.

4,014,366

#### ORIFICE FITTING CONVERSION APPARATUS

Morris K. Critendon, P.O. Box 1639, Houston, Tex. 77001

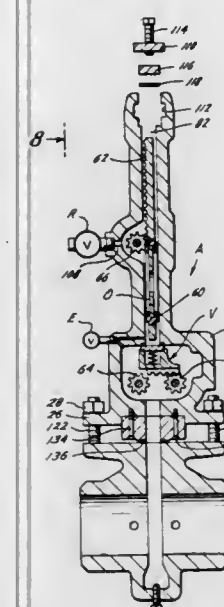
Continuation of Ser. No. 451,934, March 18, 1974,

abandoned. This application July 28, 1975, Ser. No. 599,381

Int. Cl.<sup>2</sup> F16D 1/00

U.S. Cl. 138—44

9 Claims



1. An apparatus for mounting with and converting a junior or simplex orifice fitting in a pressurized fluid line to a senior fitting so that an orifice plate in the junior fitting is thereafter removable therefrom for service and repair without loss of pressure in the line, comprising:

an adapter housing having:

an upper portion; a lower portion having a lower portion surface; a vertical upper chamber formed in said upper portion and having an upper end and a lower end; a lower chamber formed in said lower portion and having an upper end and a lower end; said lower end of said upper chamber adjoining said upper end of said lower chamber by a passage formed therebetween; and said lower chamber formed having a slot extending between said lower portion surface and said lower end of said lower chamber, said slot being substantially vertically aligned with said vertical upper chamber and said passage;

an adapter plate having:

an upper surface for engaging said lower portion surface of said adapter housing; a central member extending downwardly from said upper surface of said adapter plate; and said central member formed having an opening therein, said opening in substantial vertical alignment with said slot, said passage and said upper chamber; fastening means for mounting said adapter plate with said adapter housing;

an orifice plate carrier mounted for movement in said adapter housing from a lower position wherein said orifice plate carrier extends from said lower chamber through said slot and said opening to an upper position wherein said orifice plate carrier is entirely disposed within said upper chamber;

lower moving means for moving said orifice plate carrier vertically between the lower position and an intermediate position between the lower position and the upper position, said lower moving means mounted with said lower chamber;

upper moving means for moving said orifice plate carrier to and from the upper position, said upper moving means moving said orifice plate carrier vertically between the intermediate position and the upper position, said upper moving means mounted with said upper chamber; a closure valve movably mounted in said lower chamber for movement to and from a closed position adjacent said passage;

means for moving said closure valve in said lower chamber between an open position when said orifice plate carrier is in the intermediate position and the closed position when said orifice plate carrier is in the upper position or the lower position;

vent valve means mounted with said upper chamber for relieving fluid pressure from said upper chamber when said closure valve is in the closed position and said orifice carrier plate is in the upper position; and,

a service opening adjacent said upper end of said upper chamber of said upper portion to provide access to said orifice plate carrier for service and repair thereof when said orifice plate carrier is in the upper position in said upper chamber.

4,014,367

#### PIPE CAP

August Milo, 1015 Schleifer Road, Hillside, N.J. 07205

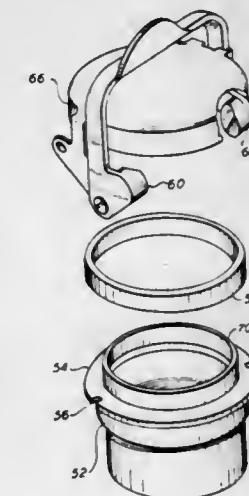
Division of Ser. No. 516,324, Oct. 21, 1974, Pat. No.

3,949,787. This application May 6, 1975, Ser. No. 574,999

Int. Cl.<sup>2</sup> F16L 55/10

U.S. Cl. 138—89

5 Claims



1. a pipe capping system for capping the end of the pipe, said system comprising:

a pipe end having an exterior, circular rim section of major diameter  $D_r$ , said rim section including flat upper and lower surfaces thereon, said rim section further including two slots located on said diameter  $D_r$ , said slots being separated by a distance  $D_s$ ; and,

a pipe cap including a cover for sealing said pipe end an extended arm, and a handle pivotally connected to the face of said extended arm by a pivot means, said handle including a rim section engaging lug means for locking said cover in a locking position against said flat lower surface of said rim section when said handle is rotated in a first direction and for unlocking said cover to an unlocked position when said handle is rotated in a second direction, said lug means being located a distance  $D_l$  apart, where

$D_s > D_l$  for all values for  $D_r$  and  $D_l$ ,

said lug means comprising a pair of inwardly facing, opposing lugs, said lugs including at least one substantially flat surface thereon, said lug means being located between said pivot means and said rim section when said handle is in said locking position.



4,014,368

## FLANGE PROTECTOR

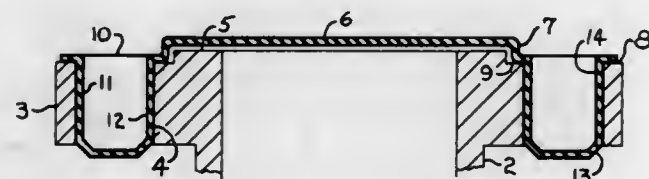
John E. Nelsen, Fairview, Pa., assignor to Alliance Plastics, Inc., Erie, Pa.

Filed Feb. 13, 1976, Ser. No. 657,734

Int. Cl.<sup>2</sup> B65D 59/06

U.S. Cl. 138—109

3 Claims U.S. Cl. 138—144



1. A flange of the type having an inner annular machined surface surrounded by an outer surface with bolt holes extending through said flange, and a protector comprising a single piece of flexible impact resistant material having

- a. a cover extending over and around said inner surface with an edge of the cover engaging said outer surface
- b. an outer section integral with the cover and extending over the bolt holes and engaging said outer surface of the flange
- c. hollow thinlike fasteners having
  - i open upper ends
  - ii hollow body portions depending from said outer section and received in said holes by finger pressure on said upper ends and making a fastening by friction contact with the bores of said holes
  - iii and the lower ends of said body portions when received in said holes being accessible to finger pressure for pushing the fasteners out of the holes, said fasteners when received in said holes pulling the flange protector into conforming contact with the outer surface of the flange.

4,014,370

## OUTER WRAP FOR PIPELINES

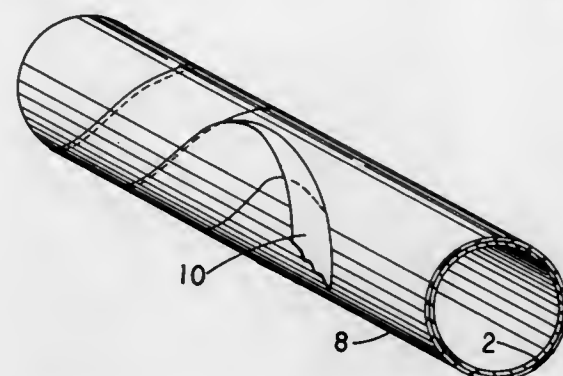
Frank E. McNulty, R.R. No. 1, Box 113, Siloam Springs, Ark. 72761

Filed Sept. 22, 1975, Ser. No. 615,388

Int. Cl.<sup>2</sup> F16L 9/02, 9/14, 9/16

3 Claims U.S. Cl. 138—144

10 Claims



1. The combination comprising a section of metal conduit coated with a layer of a cold flowable, adherent, waterproofing material over which is wound a continuous strip of a porous fabric woven of essentially flat thermoplastic fibers, said fabric having substantially uniform openings that provide approximately 15 to 20 percent of the total area of said fabric.

4,014,371

## MATTRESS MAKING MACHINERY

Bertram Walker, Long Eaton, and Harold Fred Beviss, Ilkeston, both of England, assignors to Elson &amp; Robbins Limited, Long Eaton, England

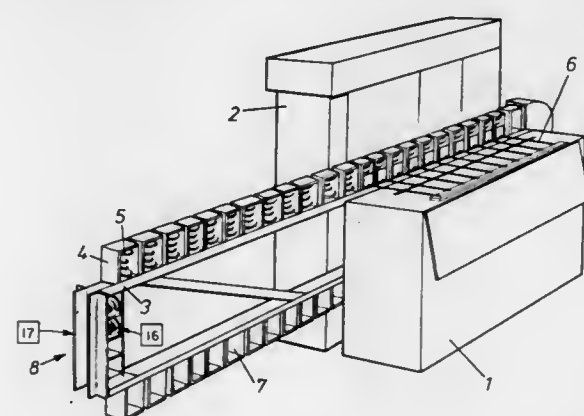
Filed Dec. 30, 1974, Ser. No. 537,465

Claims priority, application United Kingdom, Jan. 10, 1974, 1158/74

Int. Cl.<sup>2</sup> B21F 27/00, 45/16

U.S. Cl. 140—3 CA

6 Claims



1. Apparatus for the manufacture of spring interior units from a coil of wire which comprises in combination more than one conventional hour-glass forming spring machine, means for feeding the springs so formed from each of said spring forming machines alternatively one from each side to opposite sides of a conveyor having individual pocket members for locating individual hour-glass springs, means for feeding the springs in the conveyor to a station whereat a predetermined plurality of the springs may be displaced from the conveyor simultaneously, means for simultaneously displacing the predetermined plurality of springs from the conveyor, means for positioning the plurality of springs in a first row relative to another plurality of springs in a second row between an upper and lower press member each having a lateral groove in their opposing flat faces and means for moving one of said press members toward the other to simultaneously compress said first and second rows of hour-glass springs with the end convolutions of springs in each row adjacent said lateral grooves in position to wind a convoluted spring around the end convolution of adjacent springs as said convoluted spring is passed

4,014,369

## TRIPLE PIPE LOW TEMPERATURE PIPELINE

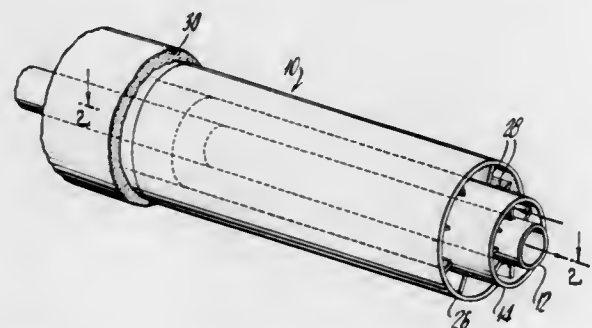
Adolph Kobres, Jr., Glen Rock, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 31, 1975, Ser. No. 645,676

Int. Cl.<sup>2</sup> F16L 9/00

U.S. Cl. 138—112

9 Claims



1. A pipe section for use in a pipeline system comprising: a first pipe, a second pipe radially spaced from said first pipe in coaxial relation and connected therewith to define a first annulus therebetween, a third pipe connected in coaxial radially-spaced relation with said second pipe for restraining movement thereof and defining a second annulus therebetween, radial rib means connected between said first and second pipes and between said second and third pipes respectively, for interlocking said coaxial pipes to minimize thermal movement of said system and substantially eliminate axial differential thermal movement between said pipes, and insulation means disposed in said second annulus.

from a convoluted die through said lateral groove with said hour-glass springs in compressed condition and means for repeating the operation until a plurality of rows have been joined together at their end convolutions.

4,014,372

## BOTTLING MACHINE, FILLING VALVE BELL AND SEALING GASKET

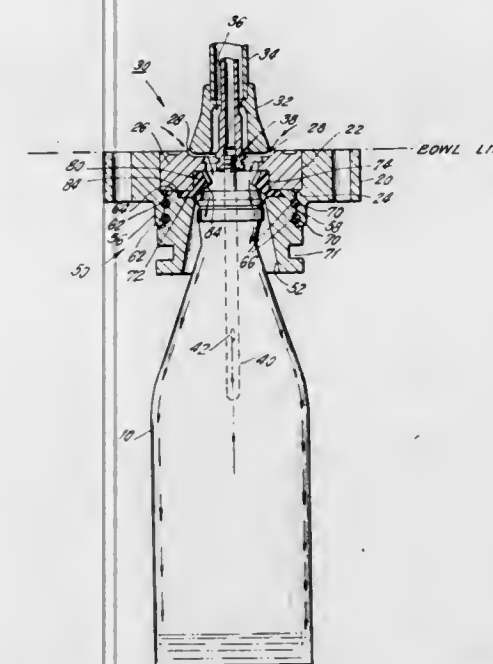
Anthony J. Dichiaro, 10 St. Paul's Crescent, Garden City, N.Y. 11530

Filed Sept. 8, 1975, Ser. No. 611,463

Int. Cl.<sup>2</sup> B65B 3/18

U.S. Cl. 141—392

33 Claims



1. A bottle filling apparatus comprising: a bottle filling valve assembly, a bottle centering bell and a bottle lip sealing gasket;

said bottle filling valve assembly comprising: a retainer element; liquid flow passage means communicating through said retainer element; a liquid inlet valve in said retainer element flow passage means; said flow passage means and said valve being shaped so as to direct liquid passing through and past them into a bottle positioned beneath said flow passage means;

said bell being located beneath said retainer element and beneath said flow passage means; said bell comprising a body having a first opening therethrough, and first side walls defining said first opening; said first side walls being shaped such that said bell is able to pass over a bottle placed in said first opening and said first side walls being so positioned and shaped as to direct a bottle whose upper end is in said first opening to be beneath said flow passage means;

cooperating snap fastening means on said bell and said retainer element for holding said bell beneath said retainer element and for enabling snap-in connection and disconnection of said bell and said retainer element; said bottle lip sealing gasket being positioned and adapted for engaging the lip of a bottle whose upper portion is in said bell first opening; said gasket being located in said first opening of said bell; means in at least one of said bell and said retainer element for supporting said gasket.

4,014,373

## VEHICLE FOR REMOVING AND COMMUNUTING STANDING TREES

Stuart L. Smith, 506 N. Center Ave., Merrill, Wis. 54452

Filed Feb. 13, 1976, Ser. No. 657,890

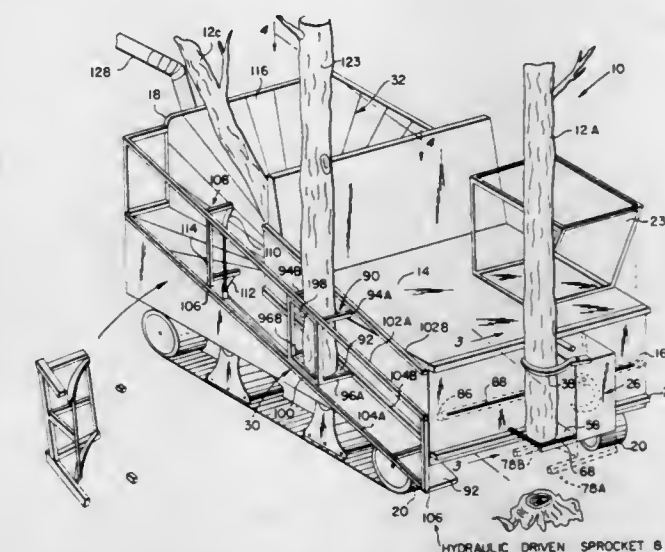
Int. Cl.<sup>2</sup> A01G 23/08

U.S. Cl. 144—3 D

11 Claims

1. An apparatus for harvesting and communuting entire standing trees comprising:

a vehicle comprising a body having forward and rear ends and sides and ground engaging traction means;  
tree removing means on the forward end of said vehicle comprising:  
grip means to engage and hold a tree to be harvested in a vertical position;  
shear means for severing and supporting a harvested tree;  
means to index said tree removing means from a shearing



position proximate one side of said body to a transfer position proximate the other side of said body;  
inclined conveying means on said other side of said body and operable between a forward position at the forward end of said body and a rearward position at the rearward end thereof to convey and elevate trees therebetween;  
communiting means at said rearward end including means to receive an entire tree and crush its branches while feeding the entire tree under positive drive thereto.

4,014,374

## ANTI-THEFT CARRYING BAG

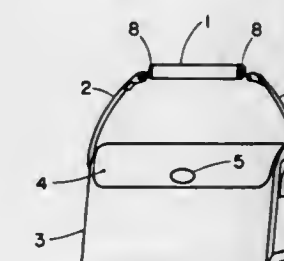
Aubrey Franklin Douglas, Sr., Rte. 1, Box 182B2, Petersburg, Va. 23803

Filed May 17, 1976, Ser. No. 687,254

Int. Cl.<sup>2</sup> A45C 3/06, 13/18

U.S. Cl. 150—33

6 Claims



1. In a carrying bag comprising a container and carrying means therefor, the improvement comprising an anti-theft device associated with said carrying means, said anti-theft device comprising a tubular housing, a line stored in a rapidly deployable configuration within said housing, closure means engaged with at least one end of said housing, said closure means being attached to both an end of said line and said container, said closure means being removable from said housing by a force exceeding the weight of said container and its contents.



4,014,375

THRUST-APPLYING MECHANISM FOR TIRE  
CHANGING APPARATUS

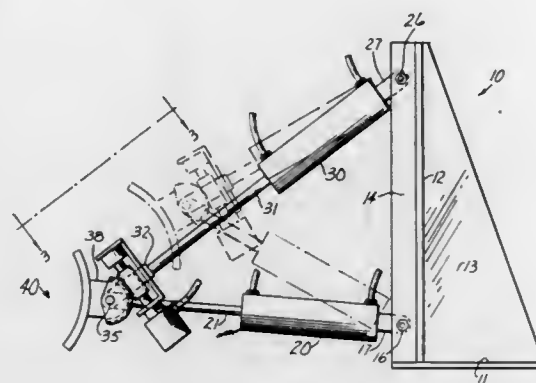
S. W. Malinski, Tamaroa; Thomas L. Mueller, and Jerome A. Gross, both of St. Louis, all of Mo., assignors to S. W. Malinski, Tamaroa, Ill.

Filed Nov. 5, 1975, Ser. No. 629,017

Int. Cl.<sup>2</sup> B60C 25/06

U.S. Cl. 157-1.17

7 Claims



7. Thrust-applying mechanism comprising thrust-reacting means having a pair of pivot mounting points on parallel axes, a pair of linear actuators, one end of each being mounted to one of said pivot mounting points, the other ends of said actuators having bored fittings, a common shaft through the bored fittings of said actuators, whereby said common shaft and pivot mounting points hold said actuators in a plane and whereby the intersection of the shaft with said plane is moveable therein on extending and retracting said actuators relative to each other, a thrust-applying shoe pivot-mounted on said shaft, and controllable rotation-resisting means, operably connected between said shoe and one of said actuators, to fix and vary the angle at which said thrust-applying shoe is held relative to said actuator.

4,014,376

## WINDOW BLINDS

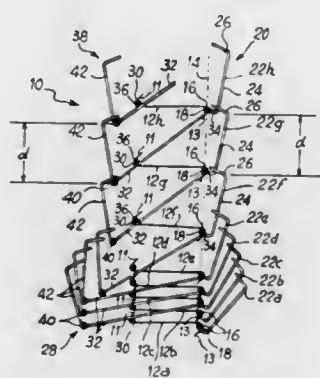
Paul Plom, and Jean-Paul Plom, both of Route Nationale 7, Pougues-les-Eaux 58320, France

Filed Dec. 15, 1975, Ser. No. 640,988

Int. Cl.<sup>2</sup> E06B 9/30

U.S. Cl. 160-172

8 Claims



1. Window blind construction comprising similarly shaped thin elements, each of which is in a pivotable and slidable relationship by one of its opposed rectilinear edges to at least two parallel side grooves, a fastening system connecting to one another the rectilinear edges of the different thin elements associated with the grooves so as to allow regular unfolding of these latter starting from a position of storage where they are arranged adjacent each other, and an operating system controlling the unfolding and storing of the thin elements, and an adjusting system connected to each of the free remaining

rectilinear edges of the different elements to control the inclination of these latter and/or their mutual interconnection when these elements are provided along the length of their rectilinear edges with two oppositely directed flanges, the adjusting system including at least one group of rigid supporting elements each mounted to pivot about a swivel pin extending from the rectilinear edge associated with the groove of one of the thin elements to cooperate with an abutment extending from the free edge of the lower adjacent thin element, and a connecting means fastening the free ends of these supporting elements to one another to control simultaneously their pivoting and inclination and/or the mutual interconnection of the thin elements each time these latter are in an unfolded position.

4,014,377

STRUCTURE FOR SLIDABLE DOORS HAVING  
SNAP-MOUNTED GLIDE RETAINER

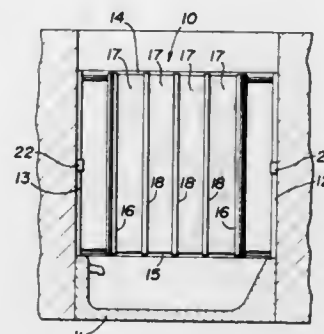
George A. Kochanowski, Lake Forest, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Aug. 9, 1976, Ser. No. 712,618

Int. Cl.<sup>2</sup> E05D 15/50

U.S. Cl. 160-186

19 Claims



1. A resiliently mountable panel structure for slidable doors comprising:

A. A door panel having an elongated opening therethrough,  
B. Resilient mounting means on said panel and engageable with a rail for moving the panel on the rail comprising:

1. A glide comprising:

a. A body disposed on one side of said panel,  
b. Projecting means on said body engageable with said rail for movement of said glide thereon, and  
c. A shank on said body extending through said panel opening and moveable therein for relative movement of said glide and said panel, said shank being provided at each end with latch-engaging means,

2. A glide retainer mounted on the reverse side of said panel comprising a generally C-shaped body and latching means at each end engaging the latch-engaging means of said shank and maintaining said glide in position on said panel, and

3. Resilient means interposed between said glide and said panel for tensioning said projecting means into engagement with said rail.

4,014,378

STRUCTURE FOR SLIDABLE DOORS HAVING GLIDE  
RETAINER INTEGRAL WITH DOOR PANEL

George A. Kochanowski, Lake Forest, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Aug. 9, 1976, Ser. No. 712,619

Int. Cl.<sup>2</sup> E05D 15/50

U.S. Cl. 160-186

7 Claims

1. A resiliently mountable panel structure for slidable doors comprising:

A. A door panel having an elongated opening therethrough,  
B. Resilient mounting means on said panel and engageable with a rail for moving the panel on the rail comprising:

1. A glide comprising:

4,014,380

## AIR CONDITIONING PROCESS

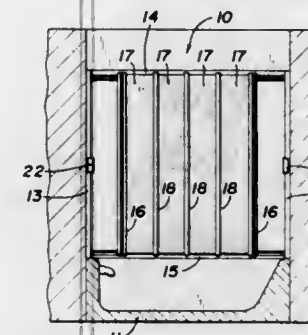
William F. Rush, Arlington Heights; Jaroslav Wurm, N. Riverside, and Raymond J. Dufour, Wheaton, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 415,323, Nov. 13, 1973, Pat. No. 3,889,742. This application Nov. 4, 1974, Ser. No. 520,616

Int. Cl.<sup>2</sup> F23L 15/02

U.S. Cl. 165-2

9 Claims



2. A glide retainer comprising a pair of flanges integral with said door panel extending from the sides of said elongated opening at an angle with respect to said door panel and slidably engaging the latch-engaging means of said shank and maintaining said glide in position on said panel, and

3. Resilient means interposed between said glide and said panel for tensioning said projecting means into engagement with said rail.

4,014,379

METHOD OF FORMING INGOT IN PROCESS OF  
CONTINUOUS AND SEMI-CONTINUOUS CASTING OF  
METALS

Zinovy Naumovich Getselev, prospekt Metallurgov, 73, kv. 29, Kuibyshev, U.S.S.R.

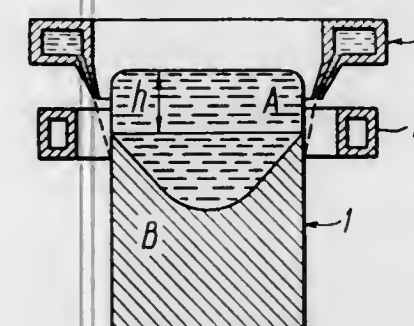
Continuation of Ser. No. 44,752, June 9, 1970, abandoned.

This application July 3, 1972, Ser. No. 268,689

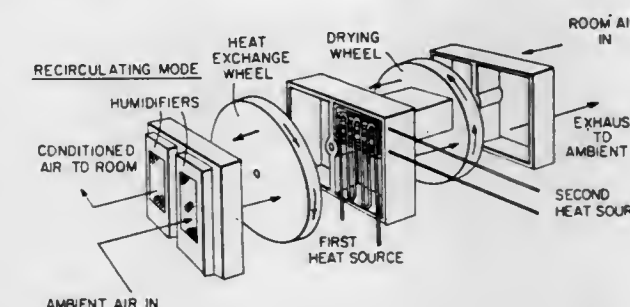
Int. Cl.<sup>2</sup> B22D 11/02, 27/02

U.S. Cl. 164-4

2 Claims



1. A method of forming an ingot in the process of continuous and semi-continuous casting of metals, which method comprises the steps of shaping the molten metal by an electromagnetic field of an inductor; adjusting the current flowing through the inductor depending on the deviations of the height of the liquid zone of the ingot from a prescribed level to maintain the prescribed transverse dimensions of the liquid zone wherein the level of said liquid zone of the ingot is measured, and the obtained magnitude is converted into an electrical signal which acts to adjust the current flowing through the inductor in the direction providing for the maintenance of the prescribed transverse dimensions of the liquid zone of the ingot; and thereafter cooling the molten metal until the molten metal is at least partially solidified.



1. An open-cycle air conditioning process for cooling air wherein air to be cooled is passed through a treatment passageway and a regeneration air stream is passed through a separate regenerative air passageway comprising the steps: passing air to be cooled through a treatment air passageway and in sequence adiabatically drying the treatment stream by a desiccant means, transferring sensible heat resulting from the adiabatic drying by a sensible heat exchanger means for the treatment air stream to the regeneration air stream and evaporatively cooling the treatment air stream with water to provide conditioned air having desired temperature and humidity; and passing a regeneration air stream through a separate regeneration air passageway countercurrent to said treatment air stream and in sequence regenerating said sensible heat exchanger means by absorbing heat in the regenerative air stream, the entire regenerative air stream from said heat exchanger means being further heated by passing a low temperature heater means between said sensible heat exchanger means and said desiccant means supplying heat to the entire regenerative air stream, splitting said regenerative air stream into a first and a second portion, said first portion passing directly through a segment of said desiccant means to partially regenerate said segment and said second portion being further heated by passing a high temperature heater means and then passing said second portion through the segment of said desiccant means partially regenerated by said first stream at a sufficient temperature to complete regeneration of said desiccant means segment.

4,014,381

## AIR CONDITIONING SYSTEM

William E. Clark, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 527,991, Nov. 29, 1974, Pat. No. 3,952,795. This application Jan. 20, 1976, Ser. No. 650,660

Int. Cl.<sup>2</sup> F25B 29/00

U.S. Cl. 165-2

1 Claim

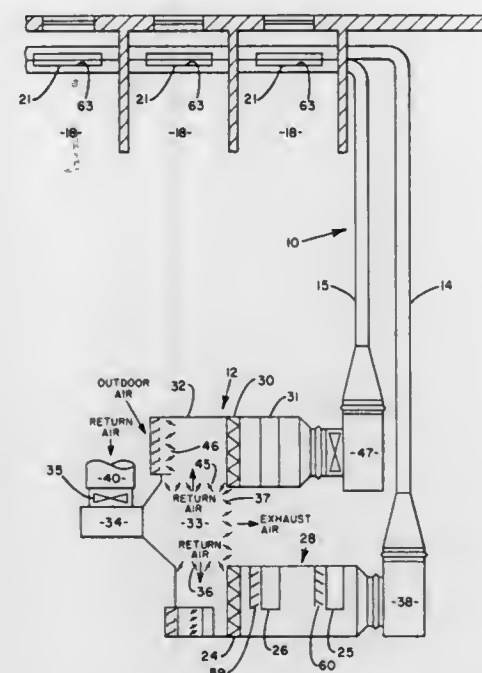
1. A method of operating an air conditioning system for conditioning air in a plurality of enclosed areas in a building, each of the enclosed areas having a peripheral portion requiring conditioned air having a variable temperature, and an interior portion requiring conditioned air at a constant temperature, comprising the steps of:

delivering a first conditioned air stream to a terminal serving the peripheral portion of said area, the temperature of said conditioned air being varied in accordance with the temperature of the ambient air;

delivering a second conditioned air stream to a terminal serving the interior portion of said area, the temperature of said air being maintained at a relatively constant level;



regulating the quantity of the relatively constant temperature conditioned air discharged from said terminal to said area in accordance with the temperature conditions within the area;  
generating a control signal, the magnitude of the signal varying in accordance with the quantity of constant temperature conditioned air supplied to the area;  
sensing the temperature of the first conditioned air supply; delivering the control signal, when the temperature of the first conditioned air supply is relatively warm, to a control



operable to regulate the quantity of said relatively warm conditioned air discharged into said area from the first terminal portion;  
increasing the quantity of relatively warm air discharged into said area when the magnitude of the control signal varies to indicate that the quantity of said constant temperature air discharged into said area is decreasing; and decreasing the quantity of relatively warm air discharged into said area when the magnitude of the control signal varies to indicate that the quantity of said constant temperature air discharged into said area is increasing.

4,014,382

## TEMPERATURE AND/OR RELATIVE HUMIDITY CONTROL SYSTEM

Walter I. Heath, Monrofford, Okla., assignor to Basil E. De-meur, Chicago, Ill.

Filed May 21, 1975, Ser. No. 579,322

Int. Cl.<sup>2</sup> F24F 3/14

U.S. Cl. 165—60

19 Claims

1. A device for controlling the relative humidity of a gas utilized in connection with a lift support system comprising, in combination,

a chamber bounded by a bottom wall, peripheral side walls, and a top wall, and adapted to receive and hold a quantity of fluid for humidifying a gas therein,

said chamber provided with a gas inlet and a gas outlet, gas spider means associated with said gas inlet, said gas spider means providing gas passageways for segregating portions of said gas provided to said system through said gas inlet,

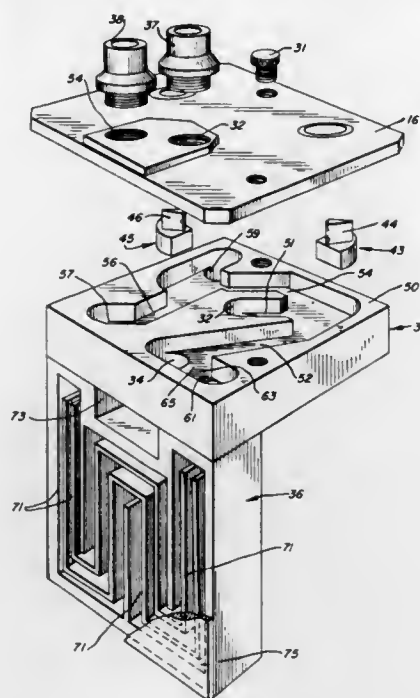
gas proportioning valve means positioned in association with said gas spider means and in line with said gas inlet thereby to permit the independent variable proportioning of gas to at least two down line gas passageways,

at least a first passageway traversing said gas spider means and terminating at said gas outlet, and at least a second gas passageway traversing said gas spider means and in fluid communication with said chamber,

said gas outlet being in fluid communication with said

chamber and with said first passageway in said gas spider means,

whereby gas introduced into said system through said gas inlet may be variably adjusted to direct a portion of said gas through said gas spider means to said gas outlet and



another portion of said gas directed to a second passageway for introduction into said chamber to humidify the same and exiting said humidified gas into a passageway to mix with said first gas portion thereby forming a gas mixture having a controlled relative humidity.

4,014,383

## METHOD OF HEATING HEAT EXCHANGER UNIT

Nils Lennart Stolt, Lund, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

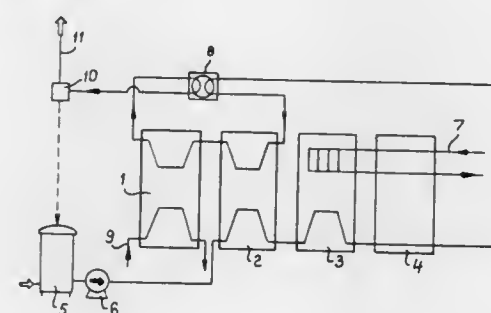
Filed Jan. 20, 1975, Ser. No. 542,590

Claims priority, application Sweden, Feb. 25, 1974, 74024548

Int. Cl.<sup>2</sup> F28F 27/02

U.S. Cl. 165—95

1 Claim



1. In the operation of a heat exchanger unit having a heating section for heating a product and also having a regenerative section through which the product passes for preheating it before reaching the heating section and through which the product again passes to recover heat therefrom after leaving the heating section, the method which comprises passing the product countercurrently through the regenerative section as the product flows to and from the heating section, and heating the unit, as for cleaning or sterilizing, by passing a liquid other than said product in a first flow through the regenerative section to and through the heating section and thence back through the regenerative section in a second flow which is concurrent to said first flow.

4,014,384

## BREATHING GAS HEATER FOR USE BY A DIVER COMPRISING DOUBLE WALLED CYLINDER AND INNER CONTAINER FILLED WITH HOT LIQUID PRIOR TO USE

Douglas Larry Marcus, 2814 Smith Ave., Baltimore, Md. 21209

Continuation-in-part of Ser. No. 457,204, April 2, 1974, Pat. No. 3,898,978. This application Mar. 31, 1975, Ser. No. 563,410

Int. Cl.<sup>2</sup> F28D 13/00

U.S. Cl. 165—104 S

5 Claims



1. A portable gas heating apparatus for attachment to a pressurized gas source to help maintain diver comfort in a cold aqueous environment by producing heated breathing gas, comprising:

a heat exchanger comprising metal tubing in an insulated walled chamber adapted to contain a hot liquid used to heat the breathing gas which circulates through said metal tubing;

a heated liquid at 124°–160° F in said chamber which is charged to said chamber just preceding a dive by the diver, said liquid selected from the group consisting of fresh water, seawater, glycerol, ethylene glycol and mixtures of glycerol or said glycol with water;

the volume of said liquid based upon the kind of breathing gas which is selected from the group consisting of air, oxygen, helium-air mixture and helium-oxygen mixture and delivering for every three pounds of heated fluid at 124° F a breathing temperature of between about 75° to 90° F for at least 90 minutes; and,

inlet and outlet tubes to supply compressed gas to the heater and lead heated breathing gas from said metal tubing from said heat exchanger to the diver.

4,014,385

## PLATE HEAT EXCHANGERS

Felix William Wright, Copthorne Bank, near Crawley, England, assignor to The A.P.V. Company Limited, Crawley, England

Filed May 21, 1975, Ser. No. 579,451

Claims priority, application United Kingdom, May 24, 1974, 23405/74

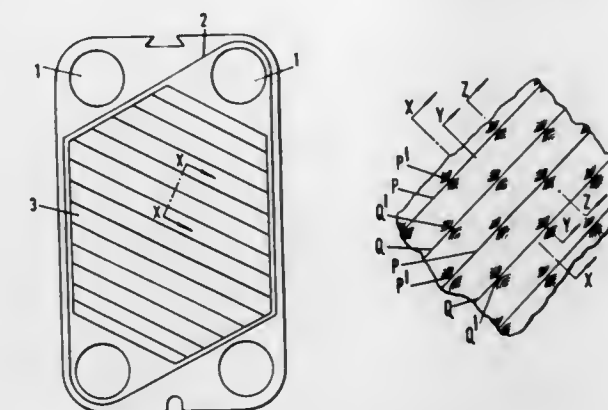
Int. Cl.<sup>2</sup> F28F 3/08

U.S. Cl. 165—167

3 Claims

1. A plate heat exchanger comprising a pack of plates arranged in spaced, face-to-face relationship, the said plates each including a principal heat exchange zone, a pattern of corrugations in the heat exchange zone, the said pattern of corrugations crossing and abutting with the corresponding pattern of corrugations on an adjacent plate to provide inter-plate support and turbulence in liquid flowing in a flow space formed by said plates, in which the corrugations are locally increased in stiffness at longitudinally spaced locations along

the corrugations and on at least one of said plates at the points of abutment with an adjacent plate by varying the cross-section



tion to sharpen the curvature of the corrugations at these locations.

4,014,386

## SUBSURFACE SAFETY VALVE APPARATUS

Joseph L. Johnson, Houston, and Shelby L. Guidry, Conroe, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,619

Int. Cl.<sup>2</sup> E21B 43/12

U.S. Cl. 166—321

17 Claims



1. Valve apparatus adapted for use in a production conduit of a well, comprising: a valve body having a flow passage, valve means movable between open and closed positions with respect to said flow passage; control means including a dome charged with a selected amount of pressure that tends to cause said valve means to move to said closed position; and hydraulic means responsive to the pressure of a control fluid and to the pressure of fluids flowing in said conduit for preventing closing of said valve means.

4,014,387

## APPARATUS AND PROCESS FOR DRAWING WATER FROM A WATER-BEARING STRATA

Leonhard Fink, Frankfurt, Germany, assignor to Thyssen Plastik Anger KG, Munich, Germany

Filed Jan. 10, 1975, Ser. No. 540,002

Claims priority, application Germany, Jan. 11, 1974, 2401327

Int. Cl.<sup>2</sup> E03B 3/18; E21B 43/08

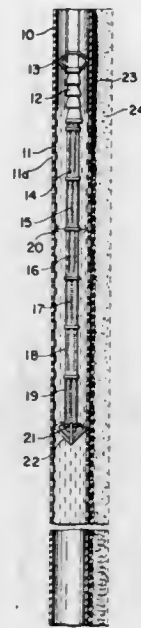
U.S. Cl. 166—314

10 Claims

1. A process for drawing water free from sand from a well bored into a water-bearing strata and preventing water from



being drawn into a pump at high speed, the steps of flowing the water into the well from a water-bearing strata through a plurality of openings distributed over a surface of a predetermined length of a wall of the well, the water flowing into the well under natural flow characteristics and below the inertia force of any sand in the strata, flowing the water within the well through a permeable body into a restricted space in the interior of the well, controlling the rate of flow of water



through the permeable body such that the quantity of water flowing into the restricted space corresponds to the natural flow of water from the strata and to the pumping capacity of a pump connected to the permeable body such that the quantity of water to be pumped will flow into the restricted space without any force by the pump, and distributing the pump action of the water from the restricted space over the entire length of the permeable body and over the predetermined length of the perforated wall of the well.

4,014,388

**CONCEALED SPRINKLER ASSEMBLY**

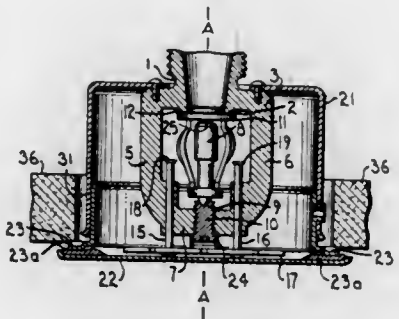
James R. Anderson, Berwyn, Pa., assignor to Central Sprinkler Corporation, Lansdale, Pa.

Filed June 21, 1976, Ser. No. 698,479

Int. Cl.<sup>2</sup> A62C 37/12, 37/30

U.S. Cl. 169—37

12 Claims



1. A sprinkler of the flush mounted type which comprises:
- a sprinkler body having a nozzle therein,
  - a bracket attached to the sprinkler body,
  - an outer cover plate attached to the bracket by means of a bonding material having a relatively low softening point,
  - a deflector which rests against the cover in a normally retracted position and which is also positioned to intercept and divert a stream of liquid discharged from the nozzle, the deflector being slidable away from the nozzle with respect to the discharge axis thereof, and
  - urging means whereby said deflector is continuously pressed against the cover for aiding the detachment thereof from the bracket upon softening of the bonding

material, and whereby the deflector is slid into an operating position upon detachment of the cover.

4,014,389

**ENDLESS BALLAST CONVEYOR CHAIN**

Josef Theurer, Vienna, and Karl Folser, Linz-Urfahr, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

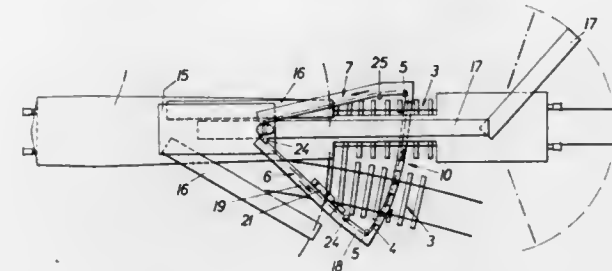
Filed July 21, 1975, Ser. No. 597,414

Claims priority, application Austria, Aug. 14, 1974, 6688/74

Int. Cl.<sup>2</sup> E01B 27/00

U.S. Cl. 171—16

11 Claims



1. A track working machine comprising a frame, an endless conveyor chain mounted on the frame, the chain including a first stringer arranged to extend transversely of the track and therebelow, and two stringers arranged laterally of the machine frame and extending from respective ends of the first stringer, guide rollers mounted at the ends for guiding the stringers in a polygonal path, and a chain tensioning device including a chain guide assembly comprising a first, transverse chain guide on which the first stringer is mounted and two longitudinally extending chain guides rising from the transverse chain guide on which the laterally arranged stringers are mounted, at least one of the chain guides comprising an upper and a lower part movable in relation to each other in the direction of chain elongation, a drive for moving the two chain guide parts in relation to each other to adjust the effective length of the one chain guide and thus effectively to shorten or lengthen the effective circumference of the chain guide assembly for tensioning or loosening the endless chain mounted thereon, and means for pivoting the longitudinally extending chain guides with respect to the machine frame.

4,014,390

**BEACH CLEANER APPARATUS**

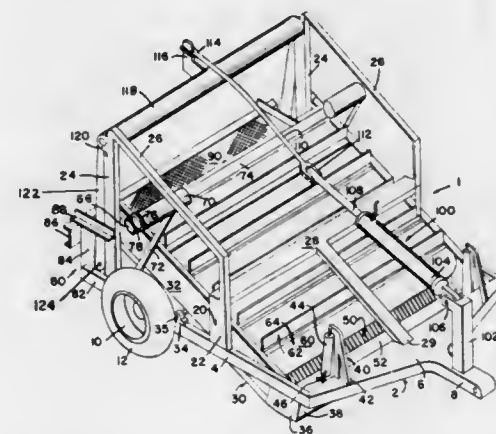
Antone S. Teixeira, 4050-F Keanu St., Honolulu, Hawaii 96816

Filed Feb. 13, 1974, Ser. No. 442,193

Int. Cl.<sup>2</sup> A01D 17/00

U.S. Cl. 171—124

26 Claims



1. A beach cleaner apparatus comprising
- a wide vehicular chassis for moving across a surface of sand,
  - a wide continuous conveyor, attached to the vehicular chassis and extending across the chassis, for carrying sand

- and debris removed from a surface of sand along a conveyor run in the vehicular chassis,
  - a sifting deck having lateral beams attached to the vehicular chassis and lying below the prescribed path through which the sand and debris are carried by the continuous conveyor, which sifting deck is formed with a plurality of apertures of sufficient dimensions to permit grains of sand to fall through to the beach and of sufficient dimension to block the passage of debris; and
  - a sand lifting blade, attached to a lower end of the sifting deck and extending forward beyond the conveyor, which sand lifting blade extends downward from the vehicular chassis into the sand at an oblique angle with respect to the surface of the sand such that a lifting edge of the sand lifting blade is pointed in a direction of forward motion of the vehicular chassis;
  - a transverse medial pivot rod connected to pillow blocks on the dependent chassis and to lugs on lateral beams of the sifting deck for pivoting the sifting deck and the attached lifting blade from front to rear at an approximate central area of the deck, and hydraulic actuators connected between the sand lifting edge and the chassis to raise and lower the sand lifting edge to adjust a depth of entry of the cutting edge into a surface of sand;
- whereby, a thin layer of sand and debris is shaved from the surface of the sand by the sand lifting blade; and whereby, debris is separated from the sand by the subsurface sand lifting blade; and whereby, debris is separated from the sand by the sifting deck over which the sand and debris are drawn by the continuous conveyor, the sand being returned to the beach, and the debris being collected.

4,014,391

**COMBINATION DIGGER, TRIMMER, AND EDGER TOOL**

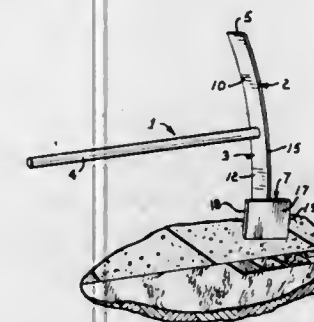
Olin P. McWhirter, P.O. Box No. 5, Greenville, Tex. 75401

Filed Jan. 2, 1976, Ser. No. 646,360

Int. Cl.<sup>2</sup> A01B 1/20; A01G 3/06

U.S. Cl. 172—13

8 Claims



7. A combination digger, trimmer, and edger tool comprising:
- an elongated handle member having opposite end portions;
  - a blade member mounted on one end portion of said handle member, said blade member having a first portion extending laterally from said one end portion of said handle member and having a free end with a cutting edge thereon, said blade member having a second portion extending laterally from said one end portion of said handle member and having a free end with a cutting edge thereon, said second portion being in opposed relation with said first portion of said blade member, said second portion of said blade member having opposite side edges and a first surface and a second surface, one of said side edges of said second portion of said blade member having a recess therein; and
  - a side blade member mounted on and extending laterally from said blade member and having a cutting edge thereon for cutting vegetation, said side blade member being received in said recess in said one side edge of said blade member second portion, said side blade member having one surface thereof flush with the one side edge of

said second portion of said blade member, said side blade member having opposite ends, said side blade member having, at least one of said opposite ends thereof spaced from a respective one of said first and second surfaces of said second portion of said blade member.

4,014,392

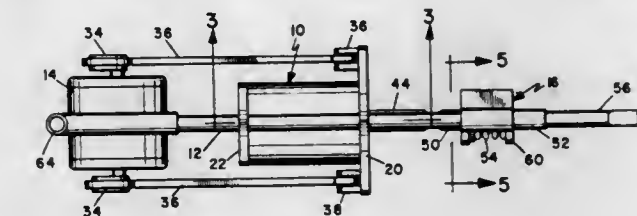
**STABILIZED PISTON-CYLINDER IMPACT DEVICE**

Frederick W. Ross, 755 Klamath Drive, Del Mar, Calif. 92014  
Continuation of Ser. No. 337,127, March 1, 1973, which is a continuation-in-part of Ser. No. 95,008, Dec. 4, 1970, abandoned. This application Dec. 19, 1974, Ser. No. 534,626

Int. Cl.<sup>2</sup> B25D 11/16

U.S. Cl. 173—118

34 Claims



1. An impact device comprising:

- a frame,
- a crankshaft rotatably mounted on said frame,
- exciter means operatively mounted to rotate said crankshaft,
- a body mounted for reciprocation along a selected straight path on said frame,
- at least two connecting rods operatively connected to said crankshaft in a spaced relation for actuation thereby in substantially the same rotational phase and operatively connected to reciprocate said body along said selected path upon rotation of said crankshaft,
- ram means mounted on said body and free for reciprocation relative thereto substantially parallel to reciprocation of the body,
- resilient means interposed between said body and said rams means for converting reciprocating motion of said body to impacting motion of said ram means,
- impact tool means operatively mounted on said frame for impact by said ram means during each reciprocation thereof,
- reciprocative guide means operatively interposed between said frame and said body and comprising a body guide element and a frame guide element and guiding said body in substantially linear reciprocation along said selected path substantially free of extraneous rotations from torques imposed on the body by angular thrust of the connecting rods,
- said body guide element operatively engages the frame guide element at least at one point closer to the axis of said crankshaft than the location with respect to said crankshaft of the end of said at least two connecting rods which is more remote from said axis with said end in the most remote position from said axis during operation.

4,014,393

**CORE RECEIVER AND METHOD OF USE THEREOF**

Wilber M. Hensel, Jr., Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Filed Jan. 8, 1976, Ser. No. 647,476

Int. Cl.<sup>2</sup> E21B 25/00, 49/02

U.S. Cl. 175—58

14 Claims

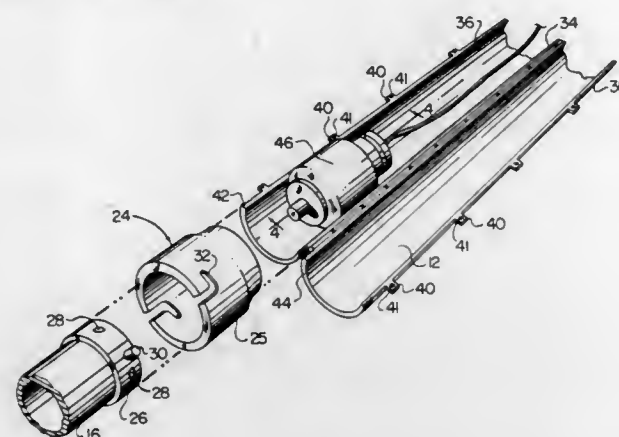
8. A method of collecting a core sample from a core barrel suspended above a drilling rig floor in generally vertical positioning, said method comprising:
- supporting the core sample in the core barrel with a slidable bulkhead positioned in the end thereof;
  - coupling a core receptacle beneath the barrel in general vertical alignment therewith for receiving the core sample therefrom;



allowing the bulkhead to emerge into and downwardly through the core receptacle; and disengaging the receptacle from the barrel for removal of the core sample therefrom.

12. Apparatus for collecting a generally vertically positioned columnar mass from a containment barrel positioned therearound, comprising:

a tubular housing;



means adapting said tubular housing for coupling to the lower end of the containment barrel and receiving the contents thereof;

a slidable bulkhead adapted for positioning within said housing and the barrel for the underlying support of the mass therein; and

means for controlling the position of said bulkhead in the barrel and said housing and the rate of axial movement therein for controlling the receipt of the columnar mass from the barrel into said housing.

4,014,394

#### RESTORING LOST CIRCULATION

Daniel F. Bailey, Midland, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 19, 1975, Ser. No. 579,120

Int. Cl.<sup>2</sup> C09K 7/02; E21B 33/138

U.S. Cl. 175-72

9 Claims

1. A method for decreasing the permeability of a zone of lost circulation located in a formation penetrated by a well bore, which method comprises introducing into said well and into said zone an aqueous slurry having a pH no greater than about 9.6 and comprising bentonite suspended in sufficient water to render said slurry initially pumpable and a small amount of magnesium oxide, within the range of from 0.37 to 10 weight percent based on the weight of said bentonite, which is sufficient to cause controlled gelation of said slurry to a set gel after placement thereof in said zone.

4,014,395

#### ROCK DRILL BIT INSERT RETAINING SLEEVE ASSEMBLY

Bernard A. Pearson, Bothell, Wash., assignor to Smith-Williston, Inc., Seattle, Wash.

Continuation of Ser. No. 530,019, Dec. 5, 1974, abandoned, which is a continuation of Ser. No. 303,334, Nov. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 232,695, March 8, 1972, abandoned. This application Oct. 14, 1975, Ser. No. 621,751

Int. Cl.<sup>2</sup> E21C 13/08

U.S. Cl. 175-410

2 Claims

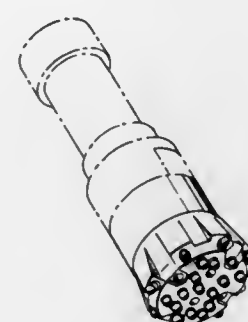
1. A button and sleeve assembly adapted for use in a cylindrical hole in a drilling head, said hole having a cylindrical side wall of given diameter and having a given depth from an open outer end to an inner end, said assembly comprising,

a continuous hollow elastic metal sleeve having an inner tapered surface and an exterior cylindrical surface extending between axial inner and outer ends spaced apart by a length as great as said given depth, the diameter of

said exterior surface when the sleeve is relaxed being slightly less by a uniform first amount than said given diameter,

and a solid button mated with the sleeve and having an outer tapered surface extending between axial inner and outer ends spaced apart by a length exceeding said length of the sleeve,

said inner surface of the sleeve and outer surface of the button having matching tapers sloping outwardly to their said inner ends from their said outer ends, said matching tapers being of uniformly diminishing diameters with the uniformly diminishing diameter of the button being greater than the relaxed uniformly diminishing diameter of the sleeve by a uniform second amount which is slightly



greater than said first amount whereby a force fit will be provided between the sleeve and the cylindrical side wall of a said hole when the button is centered and seated with its inner ends against the inner end of the hole and the sleeve is then press-fitted its entire length onto the button, the metal material of said sleeve and said first and second amounts being such that the sleeve is adapted to enter well into a said hole without engaging the side wall of the hole as a consequence of radial stretching of the sleeve over the seated button exceeding said first amount and the elastic limit of the sleeve will not then be exceeded and plastic deformation will not then occur when the sleeve is press-fitted on the seated button to the extent necessary to move the sleeve axially until the inner end thereof reaches the inner end of the hole.

4,014,396

#### WEIGHING APPARATUS

Ernst Lohmann, Duisburg, and Hans-Joachim Sacht, Duisburg-Rahm, both of Germany, assignors to Berkel GmbH, Duisburg, Germany

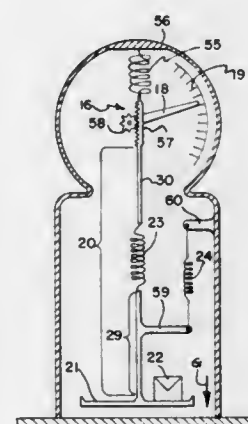
Filed July 31, 1975, Ser. No. 600,899

Claims priority, application Germany, Aug. 1, 1974, 2437058

Int. Cl.<sup>2</sup> G01G 23/14, 23/26

U.S. Cl. 177-169

23 Claims



1. In a weighing scale with a movement and indication assembly having a movement means to measure a load and an indication means to indicate the weight of the load, wherein the movement means exhibits hysteresis between weighing

operations with increasing and decreasing loads, a weighing platform, a bar linkage mechanism connected between the movement means and weighing platform, and counterforce means connected to the bar linkage mechanism, the improvement in the bar linkage mechanism which includes an extension means between the connection to the counterforce means and the connection to the movement means which increases the path difference of the hysteresis effect, and said extension means having a direction of elongation opposed to the force of the counterforce means.

4,014,397

#### ELECTRICAL COUNTING SCALE

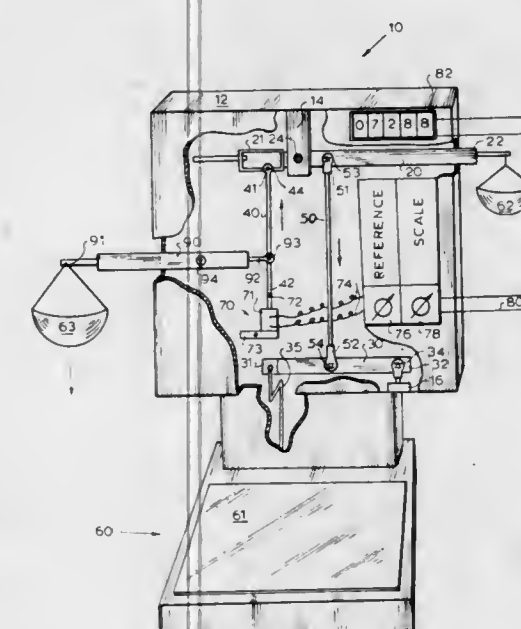
Donald R. Langevin, 3117 SE. 19th Ave., Cape Coral, Fla. 33904

Filed May 7, 1976, Ser. No. 684,151

Int. Cl.<sup>2</sup> G01G 19/00

U.S. Cl. 177-200

14 Claims



1. An electrical counting scale comprising in combination: a sample receiver for receiving an unknown number of pieces of like weight; a first commodity receiver for receiving therein an unknown number of said pieces to be counted representative of a primary load force; a first lever pivoted about a first fulcrum for coupling in a first fixed ratio said sample receiver to said first commodity receiver; load transducer means coupled to said first lever for generating a load signal representative of a load force transmitted thereto responsive to a rotation of said first lever about said first fulcrum; load indicating means electrically coupled to said load transducer for receiving said load signal and displaying a representation thereof; load reduction means coupled between said commodity receiver and said first lever for reducing in a fixed second ratio said primary load force transmitted therebetween; said load reduction means comprises: a second lever pivotally coupled about a second fulcrum and having said first commodity receiver attached thereto; and means for coupling said second lever to said first lever for producing a rotation of said first lever about said first fulcrum responsive to said reduced primary load force therebetween.

4,014,398

#### WEIGHT DISTRIBUTION MEASURING INSTRUMENTS

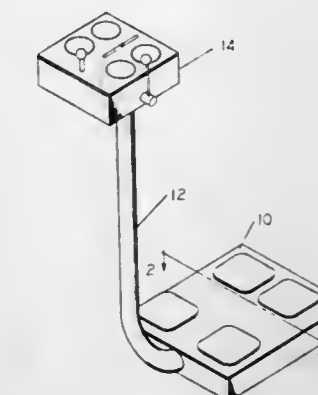
William Gresko, 17837 107th Ave., Sun City, Ariz. 85351

Filed July 7, 1975, Ser. No. 593,429

Int. Cl.<sup>2</sup> G01G 5/04; A61B 5/10

U.S. Cl. 177-208

3 Claims



1. A weight distribution measuring device comprising a base, first and second pairs of foot pads mounted on said base, adjustable means for horizontally positioning the first pair of foot pads with respect to said second pair of foot pads on said base, weight responsive means operatively connected to each of the foot pads for independently measuring the amount of weight present on each of the foot pads, and metering means for presenting simultaneously the amount of weight present on each of the foot pads, the first pair of foot pads being in fixed position with respect to the base and the second pair of foot pads being mounted on the base for forward and rearward movement with respect to the first pair of pads, each of the pads being operatively disposed on the piston of a hydraulic cylinder, which said cylinder is hydraulically connected through locking means to a gage mounted on a display panel and calibrated to give a direct read-out of the weight presented to the respective pad, and the locking means including a four way hydraulic control valve adapted for establishing hydraulic communication between the cylinder of each pad and the respective gage when the control valve is in the "open" position and for retaining the reading presented to each gage when the control valve is in the closed position.

4,014,399

#### MOUNT FOR HEAVY SERVO MECHANISMS

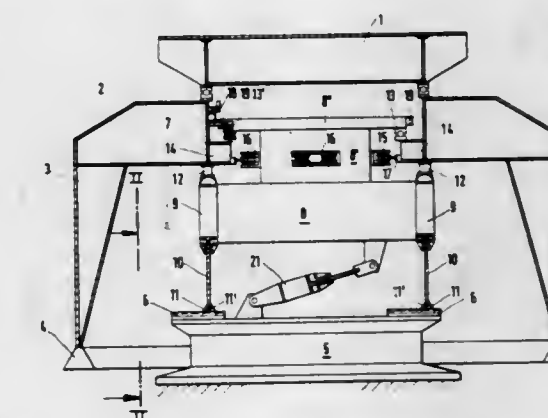
Joachim Ruder, Duisburg, Germany, assignor to Demag Aktiengesellschaft, Duisburg, Germany

Filed Oct. 20, 1975, Ser. No. 623,796

Int. Cl.<sup>2</sup> B62D 57/02

U.S. Cl. 180-8 C

7 Claims



1. A mounting providing linear and rotary feed for heavy duty equipment, characterized by

- a. an annular main support;
- b. a secondary support rotatably disposed on said main support and coaxial therewith;
- c. a plurality of vertical reversible fluid pressure cylinders



each having a cylinder head and piston rod end fixedly disposed on said secondary support and spaced circumferentially therearound;

- d. a ground support plate;
- e. the cylinder heads of said plurality of cylinders resting against said annular main support;
- f. swingable slide blocks connected to the end of each piston rod of each of said plurality of fluid pressure cylinders;
- g. a guide track fixedly disposed on said ground support plate for slidably receiving each of said piston rod slide blocks;
- h. at least one substantially horizontal secondary reversible fluid pressure cylinder connected between said secondary support and said ground support plate, said secondary cylinder being mounted to move in the direction of said guide tracks; and
- i. said reversible fluid pressure cylinders being interconnected between said ground support plate and said annular main support to provide a direct vertical support between the ground support plate and the annular main support.

4,014,400

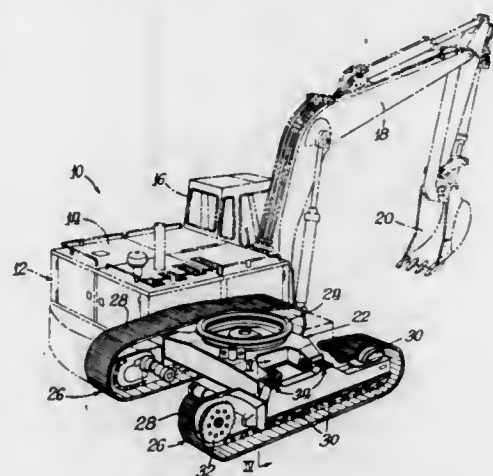
#### MOUNTING ARRANGEMENT FOR DETACHABLY COUPLING A VEHICLE FRAME TO A GROUND-ENGAGING UNDERCARRIAGE

Lawrence R. Cline, Oswego, and Theodore B. Hogg, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.  
Filed Dec. 22, 1975, Ser. No. 643,457

Int. Cl.<sup>2</sup> B62D 55/00

U.S. Cl. 180-9.2 R

9 Claims



1. A mounting arrangement for supporting a vehicle superstructure comprising;

- a pair of laterally opposite track roller frames individually having a longitudinally extending support bracket thereon, each of said support brackets including upright bearing surface means thereon and a lower hook laterally inwardly disposed thereon;
- a pair of laterally opposite frame mounting members on the vehicle superstructure and individually including lower bearing means interlockingly received within said hooks for transferring downward forces thereto and resisting lateral separating forces therebetween, and bearing surface means disposed in facing engagement with said bearing surface means of said support brackets for transferring lateral thrust forces therebetween;
- removable fastening means for positively clamping said bearing surface means of said track roller frames and frame mounting members together; and
- laterally interengaging projection and recess means on said frame mounting members and said support brackets for interlockingly resisting longitudinal shear forces therebetween while permitting free vertical movement therebetween.

4,014,401

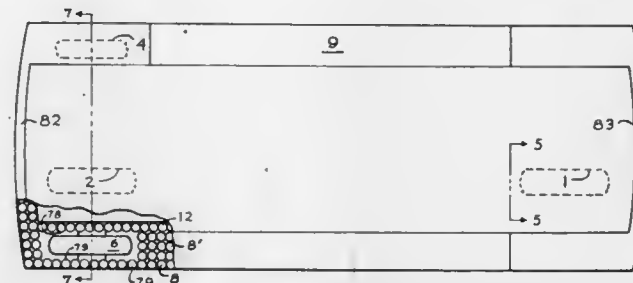
#### LOW-COST, RUGGEDLY SIMPLE, OVERTURN-PREVENTING VEHICLE

Alvin Edward Moore, Manini Way, Diamondhead, Rte. 1, Bay St. Louis, Miss. 39520

Continuation-in-part of Ser. No. 462,734, April 22, 1974, Pat. No. 3,944,008. This application July 7, 1975, Ser. No. 593,716  
Int. Cl.<sup>2</sup> B62D 61/12

U.S. Cl. 180-22

11 Claims



1. A land vehicle comprising: a framework including a floor, front, rear and side walls; buffer means extending along the outside of said side walls, said buffer means comprising a plurality of rows of tubular members, and means for covering and holding said tubular members together; a forward, normally ground-engaging steerable wheel, means mounting said steerable wheel on one side of a fore-and-aft center line of said framework; a rearward, normally ground-engaging, driving wheel; means for mounting said driving wheel on said one side of said center line; forward and rearward wheel wells formed between some of said tubular members and the said side wall on the other side of said fore-and-aft center line; a rearward side wheel; bearing means for freely rotatably mounting said rearward side wheel about a horizontal axis in said rearward wheel well; a forward side wheel; and bearing means for freely rotatably mounting said forward wheel about a horizontal axis and for freely swivelly mounting said forward wheel about a substantially vertical axis in said forward well.

4,014,402

#### BICYCLE ENGINE

Goro Muto, Funabashi, Japan, assignor to Tanaka Kogyo Kabushiki Kaisha, Yatsumachi, Japan

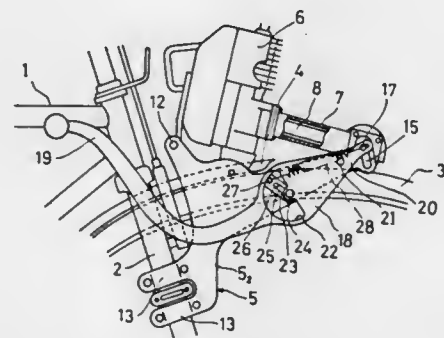
Filed Apr. 30, 1976, Ser. No. 682,063

Claims priority, application Japan, May 2, 1975, 50-58939

Int. Cl.<sup>2</sup> B62K 11/12

U.S. Cl. 180-33 D

16 Claims



1. A bicycle engine arrangement comprising: a forwardly extending drive shaft (8) driven by said engine (6); a transmission roller (9) at the end of said forwardly extending shaft (8) and having an axis of rotation substantially perpendicular to the rotation axis of said driving shaft; an engine frame (5) including means for fixedly mounting same to a bicycle; means (12) for pivotally mounting said engine (6) to said frame (5) such that said engine may be inclined freely relative to said engine frame (5); and a lever means (18,19) turnably coupled to said engine

frame (5), said lever means including an operating member (18) pivotally connected to said engine and said operating member (18) being further coupled to said transmission roller (9) via a pin (17) such that upon turning movement of said lever means relative to said engine frame said engine is selectively inclined to selectively engage said transmission roller with a tire of the bicycle.

4,014,403

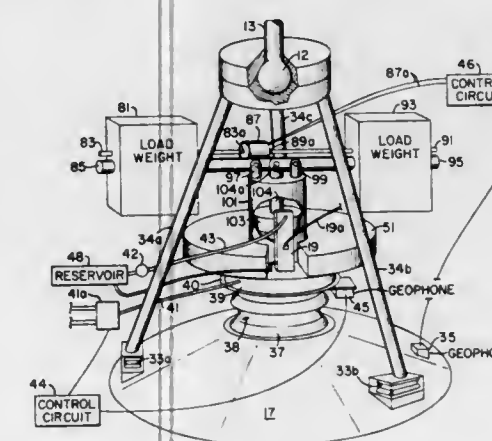
#### VIBRATORY APPARATUS FOR USE IN SEISMIC EXPLORATION

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 415,095, Nov. 12, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,918  
Int. Cl.<sup>2</sup> G01V 1/04

U.S. Cl. 181-114

15 Claims



1. In a variable frequency seismic vibrator wherein seismic energy is coupled to the ground by means of a coupling plate, said coupling plate being reciprocally driven relative to a reaction impedance by the driving member of a piston and cylinder assembly including a piston member and a cylinder member, the improvement comprising:

- a reaction mass; and
- spring means coupling said reaction mass to the member of said piston and cylinder assembly other than the driving member; and
- means responsive to changes in the vibratory motion of said member of said piston and cylinder assembly other than the driving member for varying the stiffness of said spring means so as to maintain said vibratory motion substantially at a minimum.

4,014,404

#### SAW HORSE

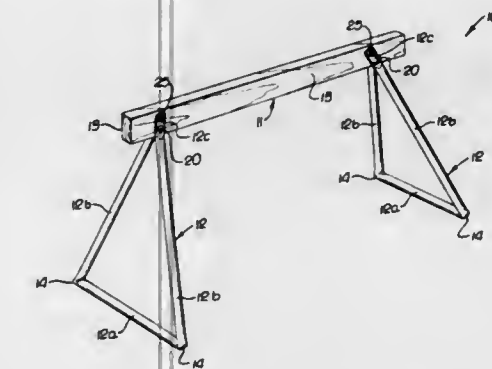
Edgar D. Jackson, Alta Loma, Calif., assignor to Steel Web Corporation, Alta Loma, Calif.

Filed Sept. 10, 1975, Ser. No. 612,044

Int. Cl.<sup>2</sup> F16M 11/00

U.S. Cl. 182-155

1 Claim



1. A saw horse construction comprising

- a. a horizontally elongated and relatively narrow work beam, and
- b. first and second like support members for the beam,
- c. each support member comprising elongated tubing defining a transverse base and two legs extending upwardly from the base, the legs having upper end portions with pivotal first connection to the work beam to accommodate pivoting of the support member relative to the beam and bringing the base into adjacency to the beam,
- d. said base and legs of each support member having triangular configuration, said support member comprising only a  $\Delta$  shaped single and continuous elongated metallic tube defining folded bends between said base and legs, said leg upper end portions defined by flattened upper terminals of the tubing which engage and guide against the beam opposite sides during said pivoting, the support members having collapsed positions relative to the beam and in which their bases extend, respectively closely above and closely below the beam, said flattened upper end portions extending substantially entirely adjacent the beam sides in said collapsed positions of the support members,
- e. said leg flattened upper end portions of each support member also having releasable second connection with the beam to block said pivoting and to retain the support member extending downwardly and longitudinally relative to the beam in beam supporting position, each releasable second connection defined by a removable fastener extending transversely through the beam and through said flattened upper terminals and proximate the pivotal connection of the member to the beam, said second connection spaced from the first connection in the general direction of elongation of the associated leg,
- f. said first and second connections being the only connections of the legs to the beam.

4,014,405

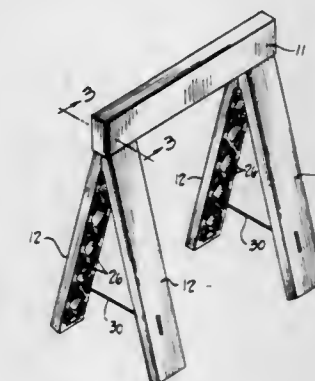
#### KNOCK-DOWN SAWHORSE

John H. Breisch, 2103 Arthur Ave., Lakewood, Ohio 44107  
Filed June 30, 1975, Ser. No. 591,429

Int. Cl.<sup>2</sup> F16M 11/00

U.S. Cl. 182-181

2 Claims



1. A sawhorse comprising a horizontal, hollow cross beam open at the underside thereof having a plurality of spaced laterally-extending partitions which define a plurality of rectangular-shaped vertical recesses; and at least two pairs of hollow legs, each leg having a wedge-shaped upper portion with a flat vertical side and a flat, non-parallel, angled side, the width of said vertical side and said angled side being essentially the same as the spacing between said partitions, said vertical sides being hollow and provided with a vertical integrally-formed reinforcing strut forming a bearing surface thereon, each leg also having a lower portion extending at an obtuse angle from said upper portion, said lower portion also being hollow from its inner side and provided with a plurality of integrally-formed diagonal reinforcing struts, each pair of legs being removably secured to said beam by juxtaposing said vertical sides of said pair of legs and inserting said upper ends of said pair of legs together into one of said recesses, the maximum thickness of said juxtaposed pair of upper ends



being slightly greater than the corresponding interior width of the recess, whereby said upper portions form a wedging engagement with said recess; said cross beam and said legs formed of structural foam polypropylene having a specific gravity of between 0.68 and 0.72, a compressive strength of between 1,400 and 1,600 psi, a tensile strength of between 1,800 and 2,000 psi, and a flexural modulus of 95,000 to 105,000 psi.

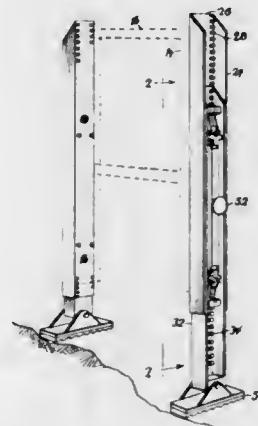
4,014,406

## LADDER LEVELING DEVICE

James Fred Easton, 19 John St., Wellsville, N.Y. 14895  
Filed May 13, 1976, Ser. No. 685,736

Int. Cl.<sup>2</sup> E06C 7/44

U.S. Cl. 182—204



1 Claim

1. A ladder leveling device for extending a leg of a ladder having elongate side legs joined by spaced cross pieces, said leveling device comprising a first U-shaped channel member having side walls normal to an elongate web mounted on one of said legs, a longitudinal series of projections integral with said channel and extending inward from the web thereof, a second U-shaped channel member sized to fit in the first channel member and form a telescopic extension therefor, a longitudinal series of projections integral with the second channel member extending outward from the web thereof into intermeshing relationship with the projections of the first channel member, an elongate slot extending longitudinally through the web of the second channel member adjacent the projections thereon, means for drawing the web of the first channel member adjacent the web of the second channel member comprising at least two spaced projections affixed to the web of the first channel member to extend through the slot of the second channel member to permit longitudinal movement of the first channel member with reference to the second channel member, a cross-pin normal to said stud, oppositely inclined wedge means adjacent each stud means, means movable into the space between the cross-members and the web of the second channel to forcibly move the projections of the second channel into a state of interference with the projections of the first channel, and lever means connected to spaced wedge means requiring a single movement to simultaneously move the wedges oppositely to clamp the channel members together at a plurality of points.

4,014,407

## CONCEALED SECURITY TRANSPORT SYSTEM

Perry J. Painter, Mabelton, Ga., assignor to The Citizens and Southern National Bank, Atlanta, Ga.

Filed July 7, 1975, Ser. No. 593,435

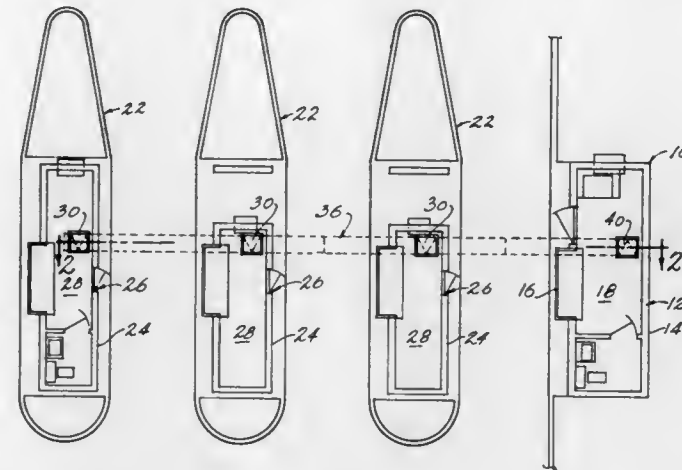
Int. Cl.<sup>2</sup> E04H 3/04

U.S. Cl. 186—1 C

9 Claims

1. In a concealed security transport system for drive-in banks or the like which have remote cashiers windows: a main building and a plurality of remote stations spaced substantially in a row from said main building, a concealed passage extending substantially in a horizontal elongated straight line from

said main building beneath the floor thereof across and beneath the surface in each of said remote stations, an access door in said main building and said remote stations, an open money and valuables carrier container supported for movement in said passage, and having support wheels on opposite sides thereof, elongated straight rails having said support



wheels thereon, a flexible drive member having one end attached to said carrier and extending in an endless manner therefrom and having the other end attached to the opposite and rear end of said carrier, a drive pulley mounted within said main building, said flexible drive member being around said drive pulley for operation thereby, and guide means for said flexible drive member on opposite ends of said passage.

4,014,408

## VARIABLE-LEVERAGE BRAKES FOR BICYCLES

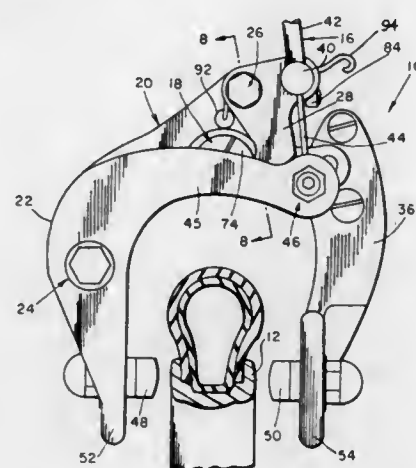
Allen E. Armstrong, 34 Robinson Road, Lexington, Mass.  
02173

Filed Aug. 7, 1975, Ser. No. 602,668

Int. Cl.<sup>2</sup> B62L 1/16

U.S. Cl. 188—24

15 Claims



1. In combination with a force applying device, a brake assembly for an element rotatably mounted on a frame, comprising a pair of calipers, brake pads fixed to the calipers and engageable with said rotatable element, linkage means separately connected to the calipers for pivotal displacement thereof relative to each other by the force applying device, guide track means connected to said linkage means for slidably guiding movement of one of the calipers, and force transmitting means connecting the force applying device to the linkage means and the other of the calipers for sequentially displacing the calipers relative to the element at different leverage ratios.

4,014,409

## MULTI-BRAKE SHOE MEANS FOR A MULTI-BRAKING SURFACE BRAKED ASSEMBLY

Andrew G. Haydu, Swisshelm Park, and Robert B. Morris,  
North Huntingdon, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 17, 1975, Ser. No. 587,861

Int. Cl.<sup>2</sup> F16D 49/16

U.S. Cl. 188—58

4 Claims



1. Multi-brake shoe means for transmitting braking force to multi-braking surfaces formed on an element to be braked, said multi-brake shoe means comprising:

- a member movable toward and away from the multi-braking surfaces on the element to be braked,
- a plurality of brake heads carried by said movable member, each of said brake heads having a shank extending from one side thereof the end of which shank is provided with a concave surface,
- a plurality of brake shoes, each having a braking face via which a braking force is transmitted to a corresponding braking surface when moved into braking contact therewith and being carried on the other side of one of said plurality of brake heads, and wherein the improvement comprises:
- a pair of levers, each of which is so pivotally mounted intermediate its ends on said movable member as to form two arms, the end of each arm being provided with an arcuate surface for sliding abutting contact with the concave surface on the end of the shank of a corresponding one of said plurality of brake heads whereby the braking face of the brake shoe carried by each brake head is maintained in contact with its corresponding braking surface without tilting with respect thereto notwithstanding the rate of wear of any one of said plurality of brake shoes exceeding that of another.

4,014,410

## DISC BRAKE WITH FLUID COOLED ACTUATOR

Clyde C. Bryant, 1920 Forrest Ave., East Point, Ga. 30344

Continuation-in-part of Ser. Nos. 361,633, May 18, 1973,

abandoned, Ser. No. 416,010, Nov. 15, 1973, Pat. No.

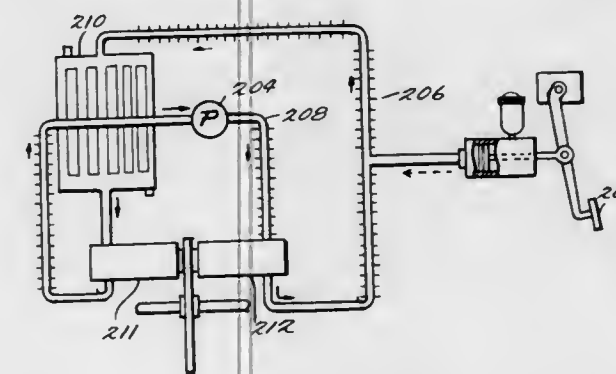
3,918,558, and Ser. No. 503,151, Sept. 4, 1974, Pat. No.

3,983,966. This application Sept. 26, 1975, Ser. No. 617,151

Int. Cl.<sup>2</sup> F16D 65/84

U.S. Cl. 188—71.6

3 Claims



1. A friction disc brake apparatus comprising in combination a rotating member, a disc immovably mounted on said rotating member, said disc being adapted to rotate when said member rotates, a plurality of piston-cylinder means opposite

each other on opposite sides of said disc, a friction pad fixed to the end of each of said pistons, fluid circuit means interconnecting said piston-cylinder means series with each other and a master cylinder, heat radiation means mounted in series with said circuit means, a pump mounted in series with said fluid circuit means external to said rotating member adapted to continuously pump fluid through said unit and heat radiation means thereby cooling the fluid contained within said circuit means, and brake pedal means connected to a piston mounted in said master cylinder adapted to expell fluid from said master cylinder into said fluid circuit causing the friction pads of the pistons to engage said disc.

4,014,411

## MECHANICALLY ACTUATED DISC BRAKE WITH SELF ADJUSTING FEATURE

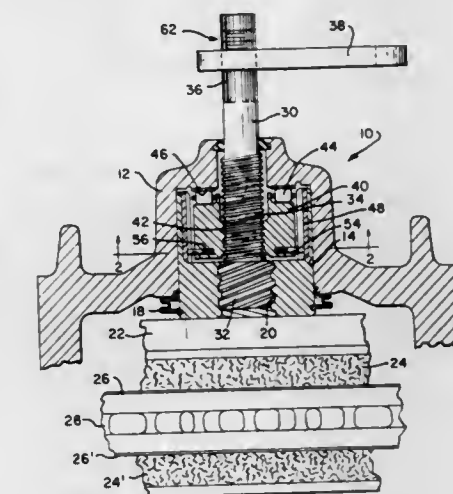
Thomas F. Troester, Dayton, Ohio, assignor to Dayton-Walther Corporation, Dayton, Ohio

Filed June 4, 1976, Ser. No. 693,095

Int. Cl.<sup>2</sup> F16D 55/02, 65/56

U.S. Cl. 188—71.9

10 Claims



1. In a mechanically actuated disc brake assembly including means for pressing a brake pad against a face of a brake disc, power threads carried by said pressing means, an actuating shaft rotatable about the longitudinal axis thereof, and power threads on a first section of said shaft complementary to and in engagement with said pressing means power threads, whereby braking rotational movement of said shaft about said axis thereof with said shaft restrained against axial movement away from said pressing means will cause said pressing means to press a brake pad against a face of brake disc, the improvement comprising:

- a means defining a fine thread on a second section of said shaft,
- an actuating nut,
- means defining a fine thread on said nut complementary to and in engagement with said fine threads on said second section of said shaft,
- means defining a recess within which said nut is received,
- cooperating ratchet means on opposing portions of said nut and a wall of said recess,
- frictional forces due to friction between contacting surfaces of said nut and said second section of said shaft being greater than frictional forces between contacting surfaces of said nut and portions of said assembly other than said shaft, and
- said ratchet means permitting unlimited rotational movement of said nut in unison with said shaft during said braking rotational movement of said shaft but limiting the degree of rotational movement of said nut with said shaft during retracting rotational movement of said shaft,
- whereby said nut will rotate with said shaft except as limited by said ratchet means and said ratchet means may limit rotation of said adjuster nut with said shaft during retracting rotational movement thereof to cause relative



rotational movement between said nut and said shaft to advance said shaft toward a face of a brake disc with which said shaft is associated.

4,014,412

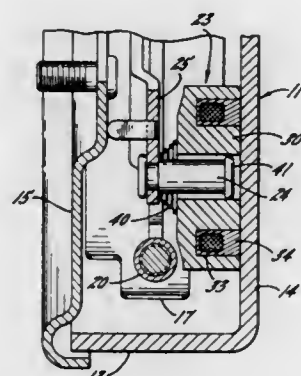
**ELECTRICALLY CONTROLLED BRAKE WITH IMPROVED ANTI-ROTATION BRACKET FOR MAGNET**  
David L. Swanson, Rockford, Ill. and Robert C. Walter, South Bend, Ind., assignors to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Feb. 17, 1976, Ser. No. 658,376

Int. Cl.<sup>2</sup> B60T 7/12

U.S. Cl. 188—138

8 Claims



1. An electrically controlled brake comprising a support having two sides and having a hole extending therethrough, a pin projecting from one side of said support, and an electro-magnet telescoped with said pin, the improvement in said brake comprising a bracket for restricting rotation of said magnet on said pin and for permitting limited axial floating of the magnet on the pin while restricting axial removal of the magnet from the pin, said bracket comprising a strip of resiliently yieldable material having a leg extending generally parallel to said pin and secured at one end portion to said magnet to float axially with said magnet, said leg having an opposite end portion projecting slidably through said hole to restrict rotation of said magnet on said pin, and a tang integral with and extending substantially perpendicular to said opposite end portion of said leg and engageable with the other side of said support to restrict axial removal of said magnet from said pin.

4,014,413

**BRAKES FOR VEHICLES**

Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

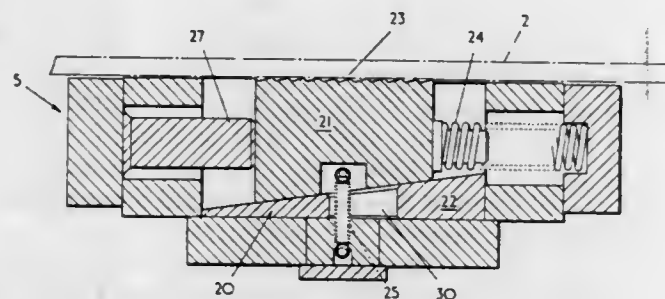
Filed May 16, 1975, Ser. No. 578,028

Claims priority, application United Kingdom, June 21, 1974, 27729/74

Int. Cl.<sup>2</sup> B60T 13/10

U.S. Cl. 188—170

15 Claims



1. Brake equipment for a vehicle which is in use moves along a path adjacent to an anchored rail, comprising a number of co-acting brake elements slidable along the rail, resilient means for urging at least one of the brake elements into contact with the rail and fluid actuated means for urging the said brake element out of braking contact with the rail, at least

one of the brake elements including a wedge assembly having a brake pad which upon contacting the rail is urged by relative movement of wedge components in the wedge assembly to increase the braking force of the brake equipment on the rail, wherein the brake equipment comprises a first relatively moveable jaw and a second relatively fixed jaw for contacting the rail, and wherein the relatively fixed jaw includes the wedge assembly and wherein the first and second jaws are mounted on opposite sides of the rail.

4,014,414

**POWER PARKING FAILSAFE DISC BRAKE**

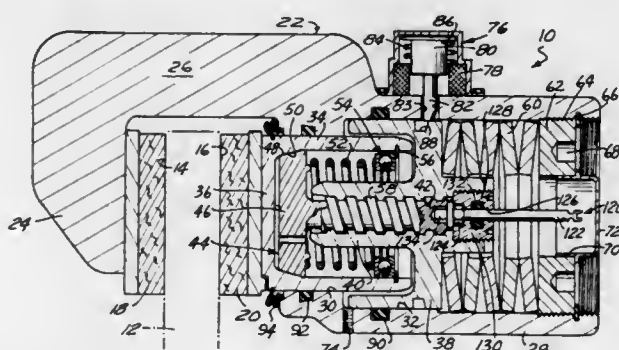
Mayjue A. Yamamoto, 3235 N. "F" St., San Bernardino, Calif. 92405, and Daniel G. Durfee, 5051 Crescent St., San Bernardino, Calif. 92407

Filed July 7, 1975, Ser. No. 593,770

Int. Cl.<sup>2</sup> F16D 65/20

U.S. Cl. 188—170

7 Claims



1. A power parking, failsafe disc brake for an automotive vehicle, comprising, in combination:

- a rotatable disc having friction faces on opposite sides thereof, a pair of friction pads engaging respective friction faces, and a caliper housing operably connected to each of said friction pads for urging the same into braking engagement with said disc when the brake is actuated, said caliper housing having a pair of axially aligned cylinder bores provided therein;
- a first piston slidably disposed within one of said cylinder bores and having an end portion bearing against the adjacent friction pad;
- a second piston slidably disposed within the other cylinder bore;

clearance adjusting means having a screw thread connection to said second piston and a frictional clutch connection with said first piston, and including a spring acting to extend said adjusting means;

compression spring means bearing against one side of said second piston in the direction to apply the brakes;

means for introducing fluid pressure into said cylinders, said first piston being actuated by said fluid pressure to operate the brakes for normal service operation and said second piston being urged by fluid pressure in the direction to compress said spring means;

a solenoid-operated locking detent that seats in a cavity in said second piston, the solenoid having a coil that is continuously energized while the system is in normal operation, thereby holding the locking detent down into engagement with said second piston; and said solenoid having its coil connected to a normally closed switch that is opened whenever a failure occurs in the normal service hydraulic brake system, whereby the solenoid is de-energized to release said second piston and allow said compression spring means to apply the brakes automatically responsive to failure of the service brakes.

4,014,415

**ADJUSTING DEVICE FOR HYDRAULIC WORKING PISTONS**

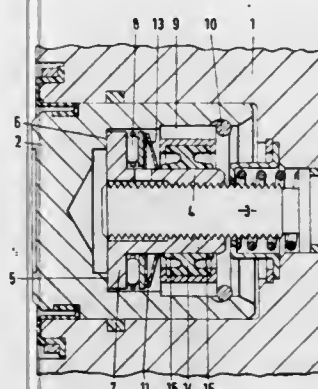
Hajo Pickel, Hachenburg, Germany, assignor to IIT Industries, Inc., New York, N.Y.

Filed Sept. 10, 1975, Ser. No. 612,063

Int. Cl.<sup>2</sup> F16D 65/38

U.S. Cl. 188—196 D

5 Claims



1. An automatic adjusting device for a hydraulic working piston comprising:

- a threaded spindle;
- an adjusting nut threaded on said spindle to limit the return movement of said working piston;
- a frictional-engagement turning mechanism in association with said nut, the operation of said turning mechanism being dependent on the stroke of said working piston;
- a resilient connection between said turning mechanism and said working piston; and
- a brake associated with said nut to prevent a turning movement thereof, the operation of said brake being dependent on a predetermined hydraulic pressure actuating said working piston, said brake including

a sealing arrangement having two seal lips extending in opposite directions with respect to each other, said sealing arrangement being stationarily connected to said working piston and said seal lips abutting against said adjusting nut in a sealed friction torque relationship in the presence of said predetermined hydraulic pressure;

said sealing arrangement including

- a single seal having said seal lips sealed against said adjusting nut; and
- said single seal is disposed in a gear sleeve connected to said working piston by a disengageable circlip remote from said working piston.

4,014,416

**ATTACHE CASES**

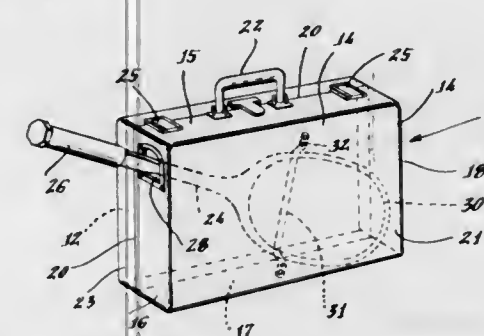
Harold Golden, 107 3616 Barham Blvd., Los Angeles, Calif. 90068

Filed Jan. 20, 1976, Ser. No. 650,625

Int. Cl.<sup>2</sup> A45C 3/00

U.S. Cl. 190—42

10 Claims



1. An attache case having an aperture extending through and substantially totally surrounded by an uninterrupted portion of the top region of one of its end panels, and means inside said case which is integral with said end panel and is moveable into and out of a position of closure of said aperture.

4,014,417

**CONDUCTOR RAIL**

Tibor Kugler, Thayngen, and Hans Wolfhart Rieger, Beringen, both of Switzerland, assignors to Swiss Aluminium Ltd., Neuhausen am Rheinfall, Switzerland

Division of Ser. No. 275,519, July 27, 1972, Pat. No.

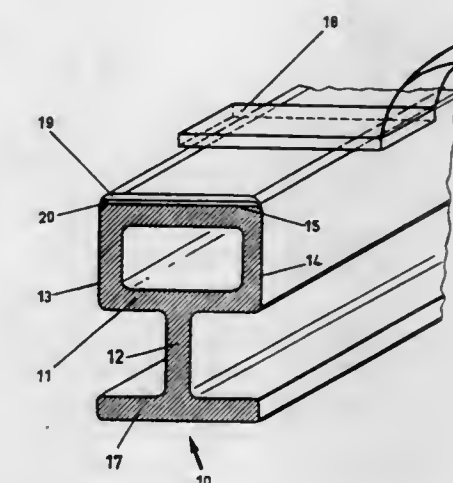
3,873,577. This application Aug. 7, 1974, Ser. No. 495,435

Claims priority, application Switzerland, July 29, 1971, 11215/71; Germany, Sept. 22, 1971, 2147410

Int. Cl.<sup>2</sup> B32B 15/18

U.S. Cl. 191—29 DM

2 Claims



1. A conductor rail comprising a load-bearing body of aluminum or an aluminum alloy, and a preformed layer of steel having a thickness of at least 0.3 millimeter metallurgically united to said body on the part of the rail to which electrical contact is to be made during use thereof, said metal uniting establishing electric conductivity between said layer and body.

4,014,418

**TIRE WITH EMBEDDED CURRENT COLLECTOR**

Ryo Ikeda; Toshihiko Hori, both of Hiratsuka, and Susumu Nakamura, Tokyo, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

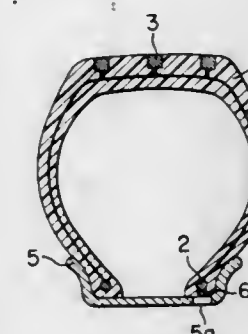
Filed Sept. 9, 1974, Ser. No. 504,494

Claims priority, application Japan, Sept. 11, 1973, 48-101690; Aug. 19, 1974, 49-94863

Int. Cl.<sup>2</sup> B60L 5/38

U.S. Cl. 191—45 R

2 Claims



1. A current-collecting and power transmitting elastic tire for a vehicle comprising a non-pneumatic tire made of elastomer and being of toroidal shape in radial section and including a tire body, a plurality of electrodes of conductive material embedded in the tire body and extending in the circumferential direction of the tire tread portion, said electrodes being exposed at one end thereof from the tire tread surface and being electrically connected at the other end thereof to electrical wiring extending to a radially inner portion of the tire for connection to a suitable portion of the vehicle, said electrodes being suitably grouped and adapted to be electrically connected to the vehicle by said electrical wiring so as to constitute at least two separate current transmitting circuits, each of which includes a flexible annular conductive band extending



circumferentially of the tire and positioned in the tire tread portion.

4,014,419

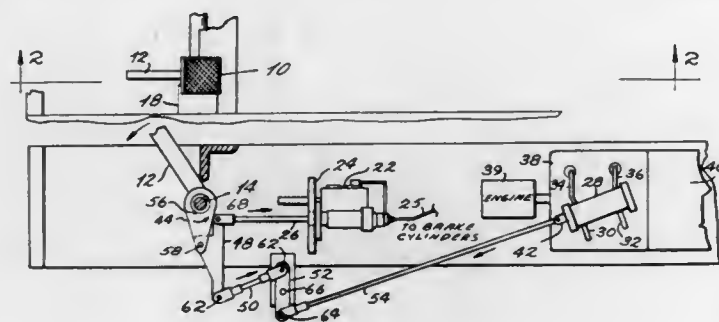
**SEQUENTIAL OPERATOR FOR CLUTCH AND BRAKE**  
Jimmy McKnight, Wadley, Ga., assignor to Fulghum Industries, Inc., Wadley, Ga.

Filed Aug. 30, 1973, Ser. No. 393,225

Int. Cl.<sup>2</sup> B60K 29/00

U.S. Cl. 192—13 R

2 Claims



2. A control system for actuating a vehicle brake system and an inching valve assembly which engages and disengages a driving connection between the vehicle engine and the vehicle transmission, said control system comprising an operator actuated operating element and a mechanical linkage including a ratio arm connected at one point to said operating element so that initial movement of the latter applies a force to said ratio arm; said ratio arm being connected at a second point to said inching valve assembly and connected at a third point to said brake system for applying braking force upon initial movement of said operating element and responsive to the resistance to the application of further braking force to operate said inching valve in a mode to disengage said driving connection and thereafter apply further braking force.

4,014,420

**BRAKED AUTOMOTIVE FRICTION CLUTCH**  
Hans-Walter Riese, Dittelbrunn, Germany, assignor to Fichtel & Sachs A.G., Schweinfurt am Main, Germany

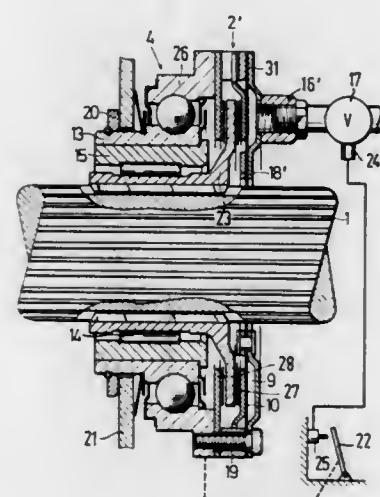
Filed Nov. 24, 1975, Ser. No. 634,837

Claims priority, application Germany, Dec. 16, 1974, 2459403

Int. Cl.<sup>2</sup> F16D 67/04

U.S. Cl. 192—13 R

5 Claims



1. A braked clutch arrangement comprising:
  - a. a support including a housing;
  - b. a clutch shaft rotatable relative to said support about an axis;
  - c. a brake member enveloped by said housing and axially movable on said shaft in angularly secured relationship;
  - d. a friction member secured on said support in said housing against rotation about said axis;
  - e. pressure-fluid operated moving means for moving said brake member into engagement with said friction member,

1. said moving means including a pressure member axially movable in said housing in angularly secured relationship and engageable with said brake member for pressing the brake member axially against said friction member;
- f. clutch release means for releasing said shaft from a driven clutch portion, said clutch release means including a clutch control member mounted for movement between an inoperative position and a clutch releasing position; and
- g. fluid control means responsive to said further movement for controlling flow of pressure fluid to said moving means.

4,014,421

**CLUTCHING MEANS ADAPTED FOR USE IN TAPPING ATTACHMENTS**

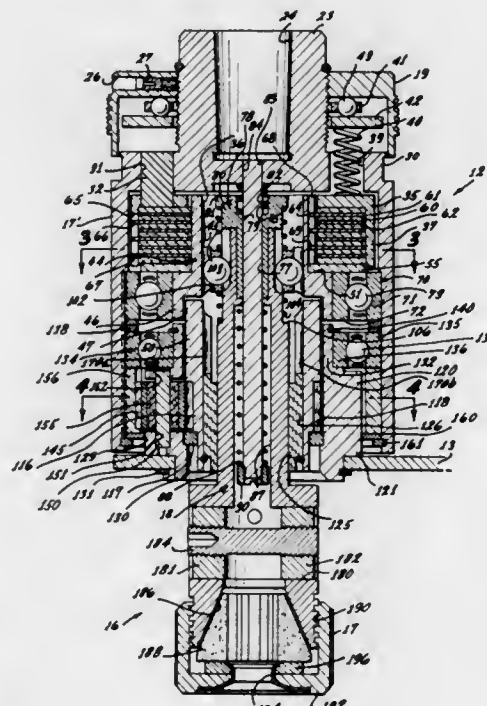
Allan S. Johnson, Newport Beach, Calif., assignor to Tapmatic Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 520,409, Nov. 4, 1974, Pat. No. 3,946,844, and Ser. No. 508,344, Sept. 23, 1974, abandoned. This application July 28, 1975, Ser. No. 599,783

Int. Cl.<sup>2</sup> F16D 11/00, 21/06

U.S. Cl. 192—48.91

13 Claims



1. In coupling means for transmitting torque in combination of first rotating member, a second axially aligned rotating member, said members being relatively movable axially, means for transmitting rotary drive from one member to another, said means including at least one ball member positioned between the members, and both members having configurations engageable with the ball member whereby drive is transmitted through the ball member, a circular holder for the ball member carried to be movable axially, a third axially aligned rotating member rotating in a reverse direction and having configurations that can engage the ball member, said circular holder being movable whereby the ball member can engage one or the other of oppositely rotating members.

4,014,422

**REEL MECHANISM**

Yasomatsu Morishita, Kure, Japan, assignor to Ryobi, Ltd., Fuchu, Japan

Filed Nov. 7, 1975, Ser. No. 629,829

Claims priority, application Japan, Nov. 7, 1974, 49-135401[U]; Nov. 7, 1974, 49-135402[U]

Int. Cl.<sup>2</sup> F16D 11/10; A01K 89/015

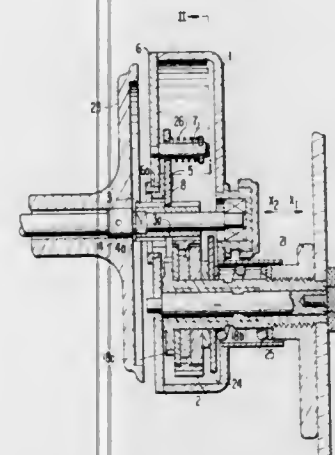
U.S. Cl. 192—67 R

6 Claims

1. In a reel mechanism, a clutch apparatus for selectively

engaging and disengaging a pinion and a main rod in an axial direction, whereby said pinion and rod are locked to rotate simultaneously in the engaged position and are free to rotate separately when in the disengaged position, said reel mechanism being the type having a housing and handle for imparting rotation to said pinion via a main toothed wheel, said clutch apparatus comprising:

- a. spring biased clutch lever means for imparting axial motion to said pinion, said clutch lever means being engaged with said pinion to permit relative rotation therebetween and having paired arms extending radially from opposite



sides of said pinion, said clutch lever means being connected to said housing to prevent rotational movement thereof and permit axial movement thereof,

- b. cam means, positioned in said housing, and having at least a cam surface acting on each arm of said clutch lever means, for imparting an axial force to said clutch lever means when said cam means is rotated from a first position to a second position in opposition to said bias, and
- c. switching lever means for rotating said cam means from said first position to said second position to force said clutch and said pinion to move axially whereby said pinion is disengaged from said rod.

4,014,423

**CLUTCH PLATE FOR A FRICTION CLUTCH**

Karl-Heinz Werner; Gerhard Baron, and Kurt Fädler, all of Schweinfurt am Main, Germany, assignors to Fichtel & Sachs A.G., Schweinfurt am Main, Germany

Filed July 30, 1973, Ser. No. 383,615

Claims priority, application Germany, Aug. 4, 1972, 2238947

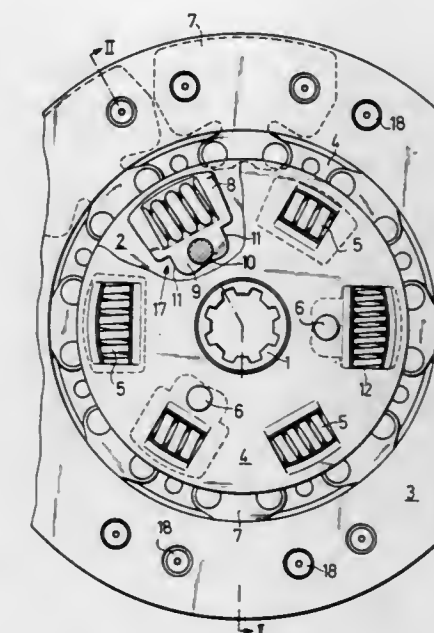
Int. Cl.<sup>2</sup> F16D 3/14, 47/02

U.S. Cl. 192—106.2

4 Claims

1. A clutch plate for a friction clutch comprising:
  - a. a hub unit including a tubular hub member having an axis, and a flange member projecting from said hub member in a radially outward direction and fixedly fastened to said hub member;
  - b. a disc/unit including a first radial disc member and a second radial disc member coaxially rotatable relative to said hub unit and offset from said flange member in opposite axial directions, and a plurality of spacer members axially connecting said disc members for joint movement,
    1. said flange member and said disc members being each formed with a plurality of openings extending axially therethrough, a portion of each opening in said flange member being circumferentially coextensive with respective openings in said disc members and constituting a set of three openings with the circumferentially coextensive openings in said disc members; and
    - c. a helical compression spring simultaneously received in the three openings of each set, and extending tangentially relative to a circle about said axis,

1. said spacer members passing through respective openings in said flange member in radially outwardly offset



relationship to the springs received in the same openings.

4,014,424

**DEVICE FOR TESTING THE FLATNESS, SIZE AND SHAPE OF COIN-TOKENS**

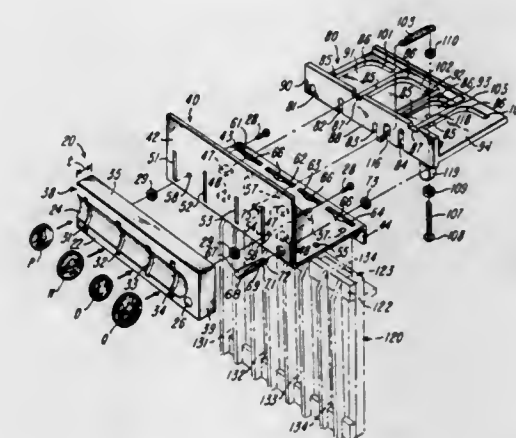
Mitchell A. Hall, Ft. Thomas, Ky., assignor to Monarch Tool & Manufacturing Company, Covington, Ky.

Filed June 9, 1975, Ser. No. 584,773

Int. Cl.<sup>2</sup> G07F 3/02

U.S. Cl. 194—102

19 Claims



1. A device for testing coin-tokens for flatness, diameter, thickness and roundness, and for advancing, turning, and then depositing acceptable coin-tokens into a discharge aperture comprising:

- a. an upstanding first member having a substantially vertical elongate slot therethrough, dimensioned to accept coin-tokens which do not exceed a predetermined standard of flatness, diameter and thickness;
- b. a second member projecting at substantial right angles from said first member and having a support surface over which a coin-token introduced through said slot is gravitationally advanced on-edge and having a substantially horizontal coin-token receptive discharge aperture there-through at a location remote from said first member and lying in a plane angularly disposed relative to the slot;
- c. a third member disposed above and in spaced, substantially parallel relationship with said second member, wherein said third member includes means engageable by the upper peripheral-adjacent edge of an acceptable on-edge coin-token supported on the second member for guiding it toward and then turning it relative to and in vertical alignment with said horizontal aperture; and



d. means mounting said third member for pivotal movement relative to said second member.

4,014,425

## RECORDING ELEMENT FOR A MATRIX PRINTER

Wilhelmus Adrianus Henricus Gijzen, and Theodorus Gerhardus Potma, Rijswijk, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 467,616, May 6, 1974, abandoned.

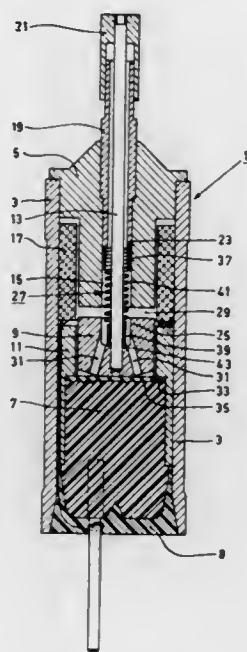
This application Nov. 20, 1975, Ser. No. 633,579

Claims priority, application Netherlands, May 30, 1973, 7307525

Int. Cl.<sup>2</sup> B41J 3/04

U.S. Cl. 197—1 R

4 Claims



1. A recording element for a matrix printer which comprises a casing, a stylus carried for longitudinal motion with respect to said casing, a coil spring, having first and second ends, biasing said stylus in one direction, and means responsive to electric energization to bias said stylus in a direction opposite to said one direction, said spring being disposed around said stylus and within said casing, said coil spring having a plurality of turns at said first end disposed in axial abutting relationship in compressed and uncompressed modes of the entire spring and having means for preventing relative axial motion between said first end and said stylus, said means including the inside diameter of said plurality of coils of said first end being sized for sufficiently tight fitting engagement with said stylus to prevent relative axial movement between said stylus and said first end during operation of said recording element, said coil spring having an axial section intermediate said first end and said second end, said axial section having a plurality of coils disposed in axial spaced relation and having an inside diameter greater than the outside diameter of said stylus disposed within said axial section.

4,014,426

## PAPER SUPPORT ROLL MECHANISM FOR USE IN A TELETYPEWRITER OR OTHER SUCH PRINTING DEVICE

Manfred Neufeld, Baierbrunn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany  
Filed Mar. 4, 1976, Ser. No. 663,741

Claims priority, application Germany, Mar. 20, 1975, 2512274

Int. Cl.<sup>2</sup> B41J 15/00

U.S. Cl. 197—133 R

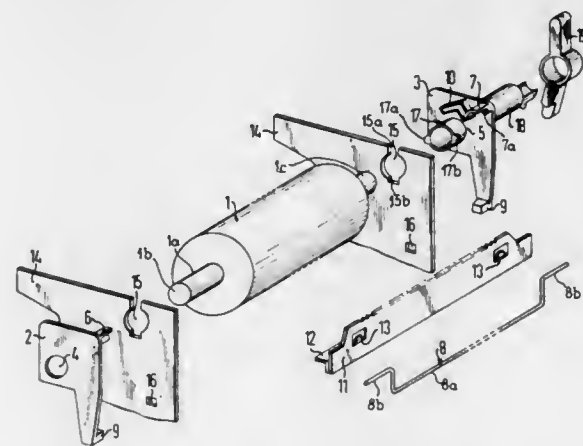
3 Claims

1. A paper support roll mechanism for use in and carried by a printing device such as a teletypewriter comprising:

- a. a first and second vertical support member being separated to form a space therebetween, said members being

carried by said printing device and having a respective first aperture respectively prepared to receive a locking sleeve in one of said apertures and a shaft in the other of said apertures, and a second respective aperture having a rectangular configuration and prepared to receive a bearing support bracket nipple,

- b. a roll means comprising a solid elongated cylindrically-shaped roll and a shaft axially disposed and aligned with the longitudinal axis of said roll, and having end portions extending outwardly from said roll, said roll positioned between said support member with said shaft end portions being disposed in said first aperture respectively,
- c. a first and a second bearing support bracket respectively comprising a flat inverted L-shaped body having an upper horizontal leg portion and a vertical leg portion connecting thereto, an elastic wedge-shaped nipple carried by said vertical leg portion and extending inwardly, said nipple prepared for disposition in said second aperture in said support member with a friction fit, a circular bearing hole through said horizontal leg portion prepared to support the end portion of said shaft, an elongated cylindrically shaped sleeve carried by and protruding inwardly from said first bracket, said sleeve being axially aligned with said bearing hole in said bracket, a second circular aperture through said body prepared to receive a wire spring, and a spring biasing bracket carried by said body adjacent to said spring aperture to engage said spring, said first bracket joined to said first support member by



the insertion of said sleeve into said first aperture in said support member and said nipple into said second aperture, to form a friction joint, and said second bracket joined to said second support member by the insertion of said nipple in said second aperture, said one end portion of said shaft disposed in said sleeve of said first bracket and said other end of said shaft inserted through said first aperture of said second support member and disposed in said bearing hole in said second bracket,

- d. a cutting blade to maintain said paper in close contact with said roll comprising a flat elongated body having an upper horizontal cutting edge for cutting said paper, two offset spring retention tabs located adjacent to respective ends of said body, and an elongated reinforcing angle carried by said blade, said end portions of said blade being disposed in said blade retention bracket of said bearing support bracket respectively with a loose fit,
- e. a pan-shaped blade spring comprising a wire formed having end portions aligned parallel to a middle portion, and intermediate portions joining with said end portion and middle portion at a right angle, said middle portion disposed in said offset tabs of said blade and said end portions disposed in said second aperture in said bearing support bracket respectively with a rotational fit, and said intermediate portions engaging said spring engagement brackets respectively,

wherein said blade is held against said roll by said spring to form a pressure joint between said roll and said blade.

4,014,427

## VARIABLE BOTTOM-EDGE MARGIN INDICATOR AND METHOD FOR TYPEWRITER PAPER AND THE LIKE

Carol M. Rines, 65 India Wharf, Boston, Mass. 02110

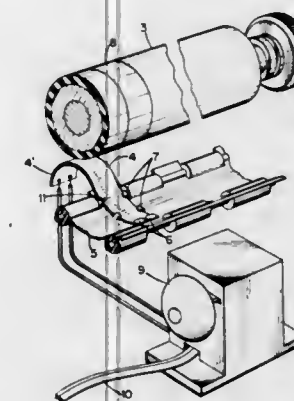
Continuation of Ser. No. 383,709, July 30, 1973, abandoned.

This application July 15, 1975, Ser. No. 596,145

Int. Cl.<sup>2</sup> B41J 29/44

U.S. Cl. 197—189

1 Claim



1. A variable bottom-edge margin indicator for typewriter paper and the like having, in combination with a typewriter of the type having a ball printing head, a cylindrical typewriter platen rotatable about its axis, immobile along its axis, and around the cylindrical surface of which the paper is advanced in a transverse path during typewriting, and a cylindrical-section paper shield beneath the platen; sensor means mounted beneath the platen inwardly of and adjacent to one end of the platen in the region of the paper shield and the path of advancement of the adjacent-side margin of the paper and disposed to receive said side margin of the paper between the sensor means and the platen at said region, said sensor means having means for discriminating between the presence and absence of said paper at said region and producing an electrical signal indicative of the advent of said absence corresponding to the advancement of the bottom edge of the side margin of the paper out of said region, said discriminating means comprising a pair of insulated electrical contacts closely separated at substantially the same circumferential region of said platen and cooperative with juxtaposed conductive band means circumferentially carried by the platen; indicator means connected to said sensor means and responsive to said signal and comprising audible signal means; means for adjusting the position of said sensor means transversely circumferentially about the platen correspondingly to vary the location of said region, said adjusting means comprising insulating band means carrying said contacts at its forward end, housing therein conductors for connecting said contacts to a power source, and adjustably disposed transversely within guide means provided under and adjacent said platen and upon said paper shield, said band means extending rearwardly of said platen to provide exposed tab means for enabling the circumferential adjustment of the band means within said guide means and along said paper shield and to provide an exposed region at which said conductors housed in said band means are connected to further conductors leading to said power source, and calibration setting means cooperative with said adjusting means and disposed external to said platen and sensor means to enable viewing of said calibration setting means by the operator for controlling the tab means of said adjusting means in order to vary the region, correspondingly to set different-dimensional desired bottom-edge margins of the paper.

4,014,428

## MODULAR ARTICLE CONVEYOR

Carl Gilbert Richard Ossbahr, Risbrinksvagen 36, 58244 Linköping, Sweden

Division of Ser. No. 465,629, April 30, 1974, Pat. No.

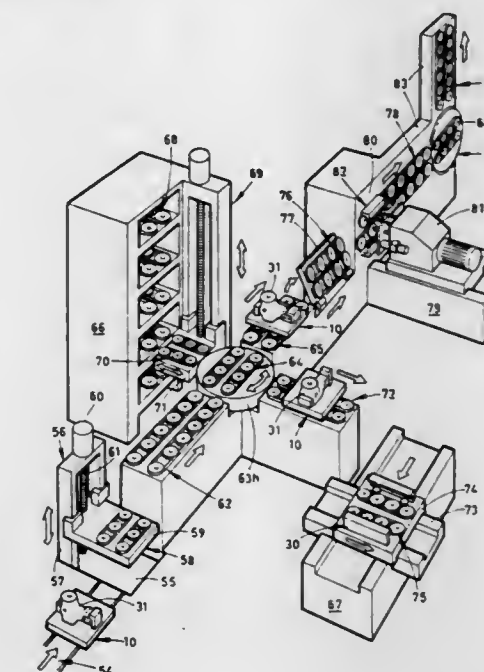
3,931,882. This application May 21, 1975, Ser. No. 579,613

Claims priority, application Sweden, May 4, 1973, 7306328

Int. Cl.<sup>2</sup> B65G 15/12

U.S. Cl. 198—345

4 Claims



1. A conveyor system whereby an article can be transported along a defined path in which the article undergoes a change in the direction of its transporting movement, said conveyor system comprising:

- A. a pair of supporting members, one which is movable in opposite directions relative to the other, each of said supporting members having thereon

1. a pair of elongated endless belt elements;
2. two pairs of pulley-like members, one pair for each of said belt elements and around which the belt element is trained;
3. means on each supporting member constraining its pulley-like members to rotate on spaced apart substantially parallel axes and fixing their locations in such relation to one another and to the supporting member that

- a. each of said belt elements has straight inner and outer stretches extending lengthwise between its pulley-like members,
- b. all portions of the two belt elements are disposed substantially in a single plane, and
- c. at least one stretch of each belt element is parallel to its corresponding stretch of the other belt element and is laterally spaced a substantial distance therefrom; and

4. means for rotatably driving one of the pulley-like members of each of said pairs thereof, said means constraining said driven pulley-like members to rotate at substantially equal circumferential speeds but in opposite directions so that said parallel stretches of the two belt elements move lengthwise in the same direction;

- B. means for moving said one supporting member to and from a position relative to the other at which said parallel stretches of the belt elements on the respective supporting members are in endwise adjacent lengthwise aligned relationship with one another; and

- C. a carriage comprising

1. a carrier portion that is at least as wide as the distance between the inner stretches of laterally adjacent belt elements and which is substantially entirely spaced in one direction from said plane and has means thereon for carrying an article at its side remote from said plane, and

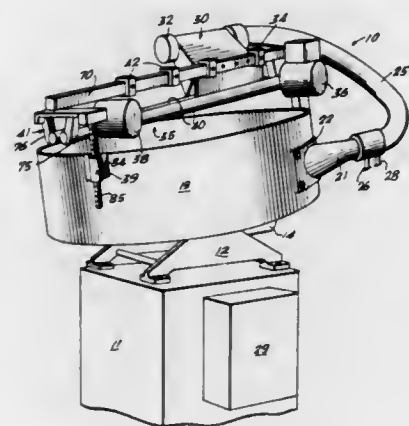


2. opposite elongated belt engaging portions on said carrier portion projecting therefrom in the direction toward said plane and across said plane and defining oppositely opening grooves in which said parallel stretches of the belt elements are receivable, said belt engaging portion being cooperable with one another and said parallel stretches of the belt elements to support the carrier portion in spaced relation to the belt elements, confine it against substantial motion in all directions transverse to said parallel stretches, and enable it to be frictionally driven by said parallel stretches in the direction of their movement, each of said belt engaging portions having a length substantially greater than the diameter of said pulley like members so that the carriage can pass smoothly from the belt elements on one of said supporting members to those on the other when said one supporting member is in its said one position relative to the other

**4,014,429**  
**PARTS FEEDER AND ORIENTER WITH INDUCTION RING FEED NOZZLE**  
Irwin Walle, Clearwater, Fla., assignor to Tange Drives, Inc., Clearwater, Fla.

Filed Nov. 17, 1975, Ser. No. 632,234  
Int. Cl.<sup>2</sup> B65G 47/14  
U.S. Cl. 198—396

6 Claims



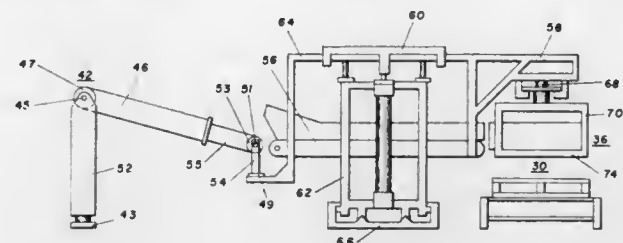
1. A parts feeder comprising, in combination: delivery means for delivering parts in random fashion and unoriented with feed pressure to a pick up point, means to said pick up point for directing said parts into an induction ring, an induction ring having pneumatic means for accelerating and decelerating said parts in predetermined timed relationship to the passage therethrough, said induction ring having a plurality of jets, one area of said jets being directed forwardly for transport of the parts, reverse jets being directed rearwardly for the unjamming of parts, said jets being in spaced relationship to each other with the reverse jet being upstream of the flow, and the moving jet being downstream of the flow, means for confining said parts and transferring the same to a location in spaced relationship with the induction ring, means for transferring the parts from the confining means to orientation means for thereafter delivering the unoriented transported parts in oriented fashion for further processing.

**4,014,430**  
**AUTOMATIC PALLETIZER METHOD AND APPARATUS**  
Thomas Beaty, Jr., Northville; Asib S. Samander, Roseville, both of Mich., assignors to B & K Hydraulic Co., Livonia, Mich.

Division of Ser. No. 101,529, Dec. 28, 1970. This application May 30, 1972, Ser. No. 257,715  
Int. Cl.<sup>2</sup> B65G 57/24

U.S. Cl. 198—588

1 Claim



1. A system for delivering articles from a fixed area to a receiving point on a loading device, the loading device being of a type that is selectively movable in three perpendicular planes, said system comprising:

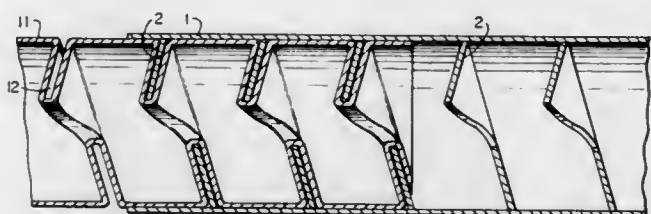
a telescoping conveyor means extending between the fixed area and the receiving point of said loading device for moving articles placed on the conveyor at the fixed area end to the receiving point of said loading device; first means for mounting the fixed area end of said conveyor means for simultaneous pivotal movement about intersecting horizontal and vertical axes; and second means for mounting the other end of said conveyor means to said loading device at said receiving point such that said other end of said conveyor means is movable with said receiving point as said loading device is selectively moved in said three perpendicular planes said other end of said conveyor means being pivotably mounted about intersecting horizontal and vertical axes at said receiving point; whereby the articles conveyed by said system will be moved from said fixed area to said receiving point of said loading device irrespective of the position of said receiving point while said loading device is moved in said three perpendicular planes.

**4,014,431**  
**SPIRAL TUBE CONVEYOR**  
Eugene Angeletti, and Eugene Angeletti, Jr., both of R.D. No. 1, Marianna, Pa. 15345

Filed Aug. 29, 1975, Ser. No. 608,974  
Int. Cl.<sup>2</sup> B65G 33/12

U.S. Cl. 198—660

18 Claims



1. An extendable and retractable conveyor system which comprises a main spiral-type tube conveyor which includes a cylindrical shell containing a screw element which is integral with the cylindrical shell and extends radially from said shell toward the center thereof and at least one additional spiral-type tube conveyor which includes a cylindrical shell containing a screw element which is integral with the cylindrical shell and extends radially from said shell toward the center thereof, said additional spiral-type tube conveyor being slightly smaller than the main spiral-type tube conveyor, one of said conveyors being provided with a male screw element and the other of said conveyors being provided with a female screw element, said male screw element being in screw engagement with said female screw element, whereby rotation of one cylindrical

shell with respect to the other causes extension or retraction of the conveyor system.

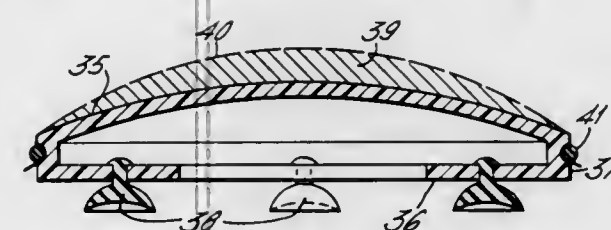
**4,014,432**  
**PRODUCT FOR TREATING FABRIC**  
George Ernest Clothier, Clwyd, Wales; Robert Lewis Davies; John Albert Hockey, Wirral, England, and John Leonard Metcalfe, all of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,337  
Claims priority, application United Kingdom, Apr. 9, 1975, 14533/75

Int. Cl.<sup>2</sup> B44D 1/46

U.S. Cl. 206—0.5

12 Claims



1. A product for the treatment of fabric in a tumble drier, comprising a perforated membrane pressure-generating means for exuding a conditioning agent through the perforations onto the surface of the product from which the conditioning agent can be removed by the fabric during use, said conditioning agent being normally solid but softenable upon application of heat during usage, and said membrane being heat shrinkable whereby to effect said pressure generation and exuding of the conditioning agent during use.

**4,014,433**  
**PACKAGE FOR MOISTURE SENSITIVE SUTURES AND METHOD FOR MAKING SAME**  
Robert J. Cerwin, Pittstown, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed May 27, 1975, Ser. No. 581,057  
Int. Cl.<sup>2</sup> A61L 17/02

U.S. Cl. 206—63.3

26 Claims



1. A substantially water vapor impervious package for moisture sensitive materials comprising two panels of a water vapor impermeable material coated on at least the edge margins of adjacent interior surfaces with a heat sealable polymer, said panels being joined through said edge margins about the periphery of said package by a continuous seal to enclose the moisture sensitive material within the central space, of said package, said seal being characterized by having a square seal integrity of at least about 90 percent.

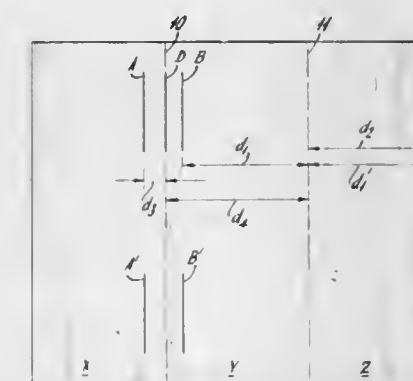
20. In a method for packaging moisture sensitive suture materials by enclosing said suture material in a hermetically sealed package formed by two panels of metal foil coated on at least the end margins of adjacent interior surfaces with a heat sealable polymer, said panels being joined through said heat sealable polymer in a continuous seal around the periphery of said panels to enclose the moisture sensitive suture material in the central space thereof, the improvement comprising increasing the storage stability of said suture material by sealing said package with a seal having a square seal integrity of at least about 90 percent.

**4,014,434**  
**FOLDERS AND INTEGRAL LOCK THEREFOR**  
Eberhard H. Thyen, Middlesex, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Sept. 3, 1975, Ser. No. 610,011  
Int. Cl.<sup>2</sup> A61L 17/02

U.S. Cl. 206—63.3

6 Claims



1. A folder of a stiff, foldable material comprising at least three adjacent panels foldably connected and including a center panel and two end panels, said end panels being folded inwardly over said center panel to provide an outer end panel partially overlapping an underlying end panel, and integral locking means for maintaining said panels in said folded construction, said locking means comprising a tab on the outer end panel extending beyond the edge of said panel, a locking slot in the underlying end panel underlying said tab and adapted to receive said tab, and a relief slot in the center panel substantially aligned with the tip of said tab whereby said tab may be forced to bypass the opposing edge of said locking slot and gain entry to said slot by displacing the edges of the locking slot and the relief slot in a direction normal to the plane of the folder.

**4,014,435**  
**COLLAPSIBLE RACK FOR SHIPPING AND/OR STORING GLASS SHEETS**

James R. Rowley, Freeport, and Paul D. Majesky, Upper St. Clair, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 493,440, July 31, 1974, abandoned. This application May 12, 1975, Ser. No. 576,916  
Int. Cl.<sup>2</sup> B65D 85/48

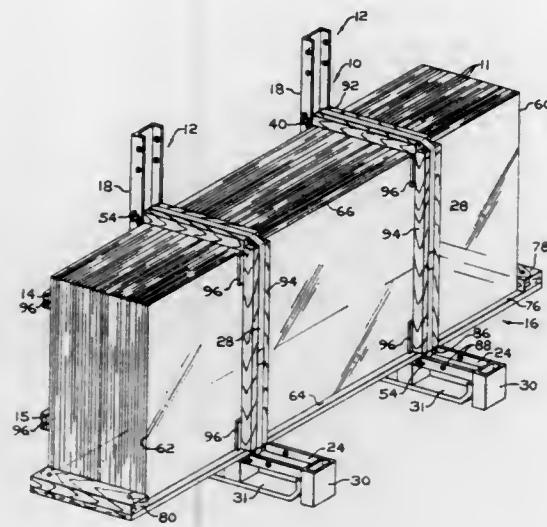
U.S. Cl. 206—386

20 Claims

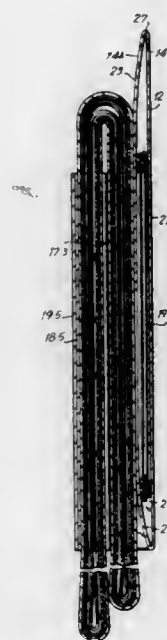
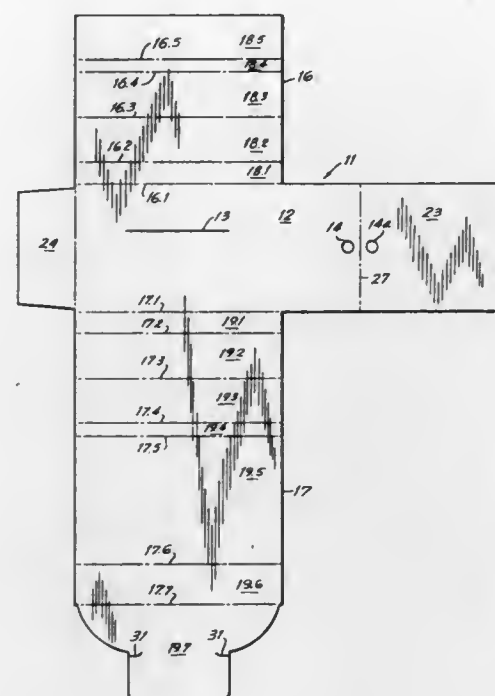
1. A collapsible rack for shipping and storing a plurality of flat sheets comprising: at least two L-shaped supports made of a rigid material, each of said L-shaped supports comprising a vertical arm and a horizontal arm; means for supporting said horizontal arm in spaced relation to a supporting surface; and means detachably secured to said at least two L-shaped



supports for maintaining at least two L-shaped supports in spaced relation, said maintaining means including a base and third vertical strips form a first flap inside said container, said fourth vertical strip forms a first side wall of a second



having means on the underside engaging said horizontal arms for limiting movement of said horizontal arms.



4,014,436

# DISPLAY CONTAINER FOR FOLDED BELT-LIKE OBJECTS

Philip Tunis, Port Chester, N.Y., assignor to Ben Tunis Company, Inc., Rye, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,824

Int. Cl.<sup>2</sup> B65D 85/54

U.S. Cl. 206-492

7 Claims

1. Point-of-purchase display container for a folded belt-like object having front and back walls and a pair of sidewalls, said object having a principal fold dividing same into first and second segments and said container being so shaped that it can be fashioned from a single flat blank, said container back wall comprising a first vertical section having two vertical sides, a top edge and one of said container side walls comprising and a bottom edge, a first horizontal section extending outwardly essentially at right angles from one of said vertical sides, said first horizontal section having five vertical scores thereon to facilitate folding, the first of said scores being the junction of said first horizontal section and one of said vertical sides of said first vertical section, said five score marks dividing said first horizontal section into five vertical strips, and, numbering said strips outwardly from said first vertical section, on folding said first horizontal section, said first vertical strip forms a first side wall of a first compartment, said second

compartment and said fifth vertical strip said container front wall.

4,014,437

# DISPLAY UNITS MORE PARTICULARLY FOR CASSETTES, TAPE CARTRIDGES AND THE LIKE

Clive St. John Rumble; Richard Roy Rumble, both of 47 Orchard Court, Portman Square, London W.1., England, and Patrick Joseph Henderson, Coastguard Road, Larne, Ireland

Filed Aug. 27, 1975, Ser. No. 608,385

Claims priority, application United Kingdom, Aug. 30, 1974, 38032/74

Int. Cl.<sup>2</sup> E05B 73/00; A47F 5/02

U.S. Cl. 211-4

9 Claims

1. A display unit for cassettes and the like comprising a base, a spindle extending vertically from said base, a plurality of vertically stacked trays rotatably and axially movably mounted on said spindle, adjacent said trays cooperating to provide outwardly open receiver chambers for supporting cassettes, vertically directed flange means on said trays for blocking outward movement of said cassettes from said chambers in said stacked position of said trays, upper and lower fixed stop means on said spindle adjacent the uppermost and

lowermost of said stacked trays, respectively, for preventing spreading movement of said trays from said stacked condition, and spacer cam assembly means interposed between at least one adjacent pair of said trays, said cam assembly means including two relatively rotatable hub sections, said cam assembly means being shiftable between an axially elongated

one piece from a material which (a) is relatively stiff yet (b) has enough resiliency and flexibility to function as a spring member.

4,014,439

# ECCENTRIC POSITIONING DEVICE FOR TOOLS AND WORKPIECES

Adolf Kochsiek, Leopoldshöhe, and Franz Wilhelm, Remscheid-Lennep, both of Germany, assignors to Wikotool-Systemtechnik Maschinenbau GmbH & Co. KG, Leopoldshöhe, Germany

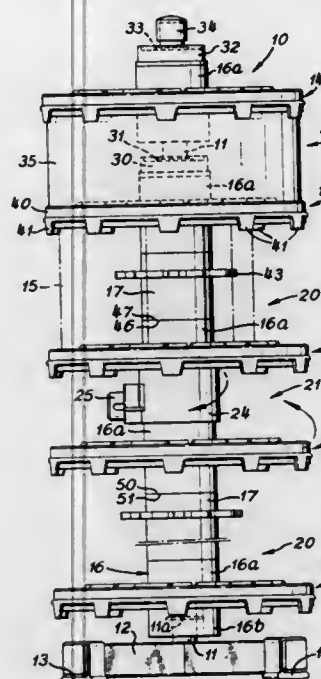
Filed Jan. 12, 1976, Ser. No. 648,110

Claims priority, application Germany, Jan. 10, 1975, 2500748

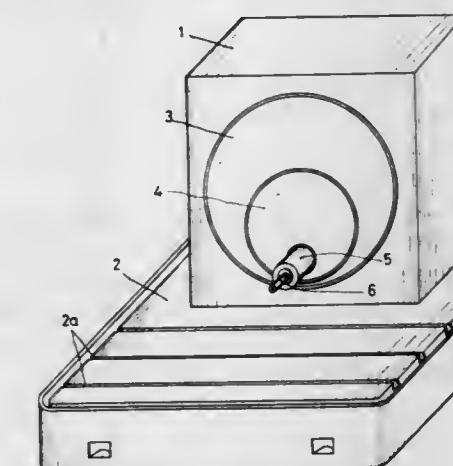
Int. Cl.<sup>2</sup> B65G 61/00

U.S. Cl. 214-1 R

9 Claims



locking position at a first relatively rotated position of said hub sections, and an axially foreshortened releasing position at a second relatively rotated position of said hub sections, and releasable locking means on said unit for selectively locking said sections against or releasing said sections for relative rotation to said second position.



1. A device for eccentrically moving and positioning a tool, or a workpiece, or a measuring instrument in connection with machining or measuring operations, for example, the device comprising in combination:

a stationary headstock, serving as a housing for the device; an outer drum received inside a large bore in the headstock, in a rotatable bearing relationship therewith;

a smaller inner drum received inside a matching bore in the outer drum, in a rotatable bearing relationship therewith, the rotational axes of the outer and inner drum being arranged in parallel alignment, but eccentrically offset from one another by a first eccentricity;

a carrier member for said tool, workpiece, or measuring instrument received inside a matching bore in the inner drum in an axially movable relationship therewith, the rotational axis of the inner drum and the longitudinal axis of the carrier member being likewise arranged in parallel alignment, but eccentrically offset from one another by a second eccentricity;

means for rotating the outer drum in relation to the headstock;

means for rotating the inner drum in relation to the outer drum, so that the carrier member axis can be moved to any position within an annular positioning range whose small radius equals the difference between the two eccentricities and whose large radius equals their sum; and means for axially moving the carrier member.

4,014,440

# HIGH CAPACITY HARVESTING APPARATUS

William F. Millier, Ithaca; Gerald E. Rehkgugler, Dryden; Roger A. Pellerin, Freeville, and James A. Throop, Brooktondale, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

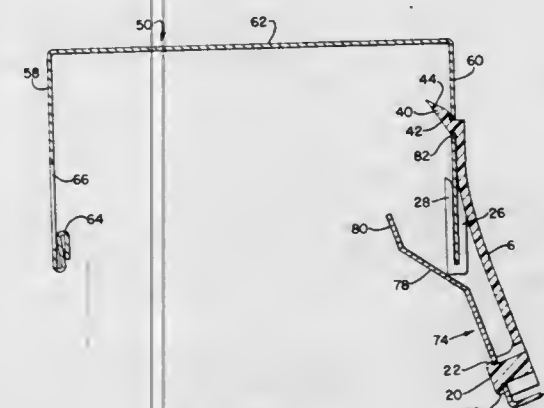
Filed Apr. 1, 1975, Ser. No. 564,149

Int. Cl.<sup>2</sup> B65G 57/18

U.S. Cl. 214-6 H

21 Claims

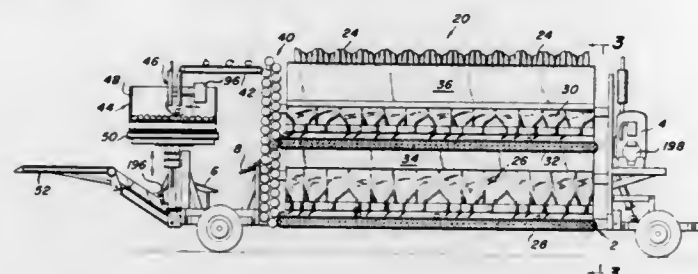
1. Apparatus for filling an open topped storage bin with generally spherical articles having generally the same dimensions comprising



1. A fastener for use in connecting together two members comprising a body section, a pair of spring clip means at one margin of said body section for mounting said fastener to a first member, a tongue extending away from said one margin beyond said spring clip means, said pair of spring clip means being located on each at opposite sides of said tongue, each of said spring clip means comprising a first leg that is co-planar with said tongue and a second leg with one end connected to said first leg and another end extending close to and resisting flexing away from said first leg, and a projection with oppositely directed lips at the outer end of said tongue for securing said tongue to a second member, said fastener being formed in



- a. a frame;  
b. rotary platform means connected for vertical movement relative to said frame, said platform means being rotatable about its vertical axis and adapted to support said bin in a position in which the vertical axis of the bin is coincident with the vertical axis of said platform means;  
c. means for rotating said platform about its vertical axis;  
d. article supply means connected with said frame above said platform means for discharging the articles generally



successively adjacent the central bottom portion of the rotating bin, whereby the articles are centrifugally displaced radially outwardly of the bin to form a first layer on the bottom thereof; and  
e. means operable upon completion of the formation of the article layer in said bin to vertically separate said rotary platform and said article supply means by an incremental distance generally equal to the vertical dimension of the articles, thereby to initiate the formation of a second article layer upon the first article layer.

4,014,441

**BRICK TIE SETTING MACHINE**

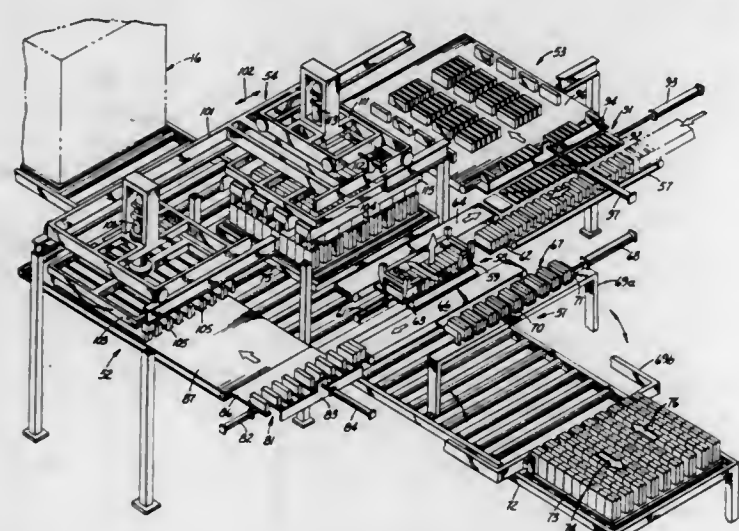
William P. Osborn, Whittier, and Frank S. Pearne, Solano Beach, both of Calif., assignors to Aircraft Mechanics, Inc., Downey, Calif.

Filed May 14, 1975, Ser. No. 577,184

Int. Cl.<sup>2</sup> B65G 57/26

U.S. Cl. 214-6 A

18 Claims



1. A machine for forming stacks of brick or the like having grids including intermixed first rows of lengthwise aligned brick and second rows of lengthwise aligned brick extending perpendicular to said first rows comprising first means for forming first patterns of first rows with longitudinal lanes between at least some of said first rows, second means for forming second patterns of said second rows with at least one lateral lane between the end faces of brick and said second rows, said first means operating to produce a plurality of different patterns which are combinable with related patterns formed by said second means to form grids including first and second rows, and transfer means operable to grip an entire pattern of rows along said lanes and to transfer and deposit such patterns at a stacking location, said transfer means thereafter operating to grip an entire related pattern of rows along its lane and to transfer and deposit such pattern in a prior pattern of rows with the lane thereof along one of the lanes of such prior pattern, without interfering with the brick in such prior pattern adjacent to said one of said lanes.

4,014,442

**STACKER CRANE FOR STOREHOUSES**

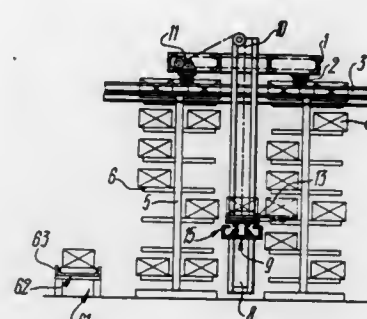
Jury Abramovich Adelson, prospekt Karla Marxa 21, kv. 57, and Oleg Antonovich Tamkovich, Moskovsky prospekt, 153, kv. 141, both of Leningrad, U.S.S.R.

Filed Apr. 18, 1975, Ser. No. 569,386

Int. Cl.<sup>2</sup> B65G 47/00

U.S. Cl. 214-16.4 A

2 Claims



1. A stacker crane for use in storehouses where piece loads (a) are kept on racks, (5) having shelves (6) thereon, comprising: a frame (1) for moving horizontally across the racks; said frame carrying columns (8) secured on said frame at a certain distance from the side ends of said racks; said columns being provided with a handler (9) mounted thereon with provision for moving along them, and including a crosshead (12) located between said columns along the racks; said handler carrying a plurality of telescopic load-supporting platforms (13) arranged on said crosshead throughout its length at a certain distance from one another and interacting with the shelves in the course of load placing and removal; guides (16) positioned parallel to said crosshead and practically of the same length as said crosshead; and a device (15) for rearranging the piece loads on said handler, said device being provided with load-carrying elements (18) for receiving the piece loads from said load-supporting platforms, and installed movably with relation to said guides; wherein the latter are rigidly mounted to said crosshead, and said rearranging device includes a carriage (17) installed in said guides; said load-carrying elements being in the form of bars (18) arranged at the sides of said carriage parallel to said guides, below said load-supporting platforms, and being kinematically linked with said carriage by means of articulated link mechanisms (19) which include a drive (20) for moving said bars vertically above said load-supporting platforms, while rearranging the piece loads on said handler and below said platforms while stacking them on the racks.

4,014,443

**DELIVERY DEVICE FOR HEATING FURNACES**

Akira Asari, Osaka; Takashige Yamamura, and Kenzou Tatsuno, both of Kobe, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Aug. 13, 1975, Ser. No. 604,122

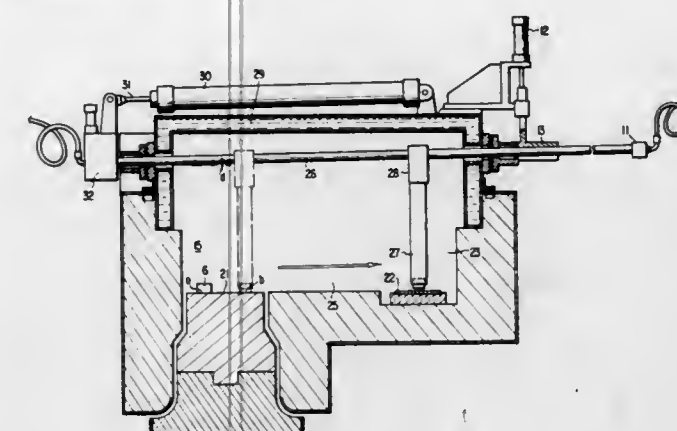
Int. Cl.<sup>2</sup> B65G 25/04

U.S. Cl. 214-27

11 Claims

1. A device for delivering articles to be heated within a compound furnace which includes at least two furnace chambers wherein the articles are to be delivered from one furnace chamber to another furnace chamber, comprising:  
clamping means being capable of, reciprocating within a delivery passage defined within said compound furnace, and, clamping and unclamping said articles to be heated; running rod means, upon which said clamping means are fixed, movable along and within said delivery passage and having one end thereof projecting outwardly through a wall of said compound furnace;  
primary drive means disposed exteriorly of said compound furnace and operatively connected to said one end of said running rod means for driving said running rod means and said clamping means;

secondary linear drive means also disposed exteriorly of said compound furnace and operatively connected to said one end of said running rod means for performing said clamping and unclamping operations of said clamping means;



movement converting transmission means for converting the linear driving force of said secondary drive means to a rotary driving force for rotating said running rod means so as to actuate said clamping means in order to perform said clamping and unclamping operations; and clamp-positioning means for determining the stopping position of said clamping means within said passage.

4,014,444

**SNOWMOBILE TRAILER**

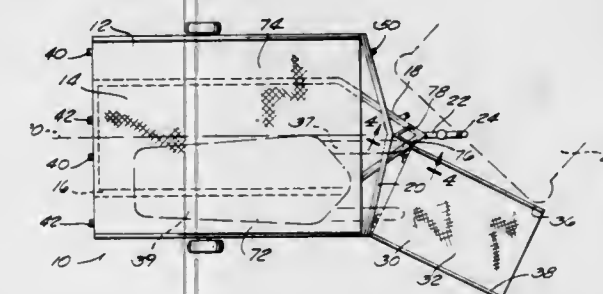
Paul A. Jakel, Reeseville, Wis., assignor to Jakel Company, Inc., Reeseville, Wis.

Filed Sept. 11, 1975, Ser. No. 612,612

Int. Cl.<sup>2</sup> B65G 67/02

U.S. Cl. 214-85

4 Claims



1. A snowmobile trailer comprising a platform and frame assembly said frame assembly including a tongue and hitch for connection to a tow vehicle, wheel means for supporting the frame and platform for travel along the ground, a loading and unloading ramp, and means for selectively connecting said ramp to the rear end of said platform and frame assembly for loading vehicles on said assembly and for connection to the forward end of said platform and frame assembly with the longitudinal centerline of said ramp at an angle extending away from the centerline of said platform and frame assembly to afford unloading of snowmobiles from the forward end of said assembly and with clearance with said tongue and including a deflector located above the platform of said trailer and forwardly of said platform, said deflector being oriented along a line parallel to the centerline of said ramp when said ramp is connected to the forward end of said platform and frame assembly to guide snowmobiles onto said ramp.

4,014,445

**CATHODE PLATE TRANSFER APPARATUS**

Toshinori Hirata, and Takahiro Kikkawa, both of Gifu, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

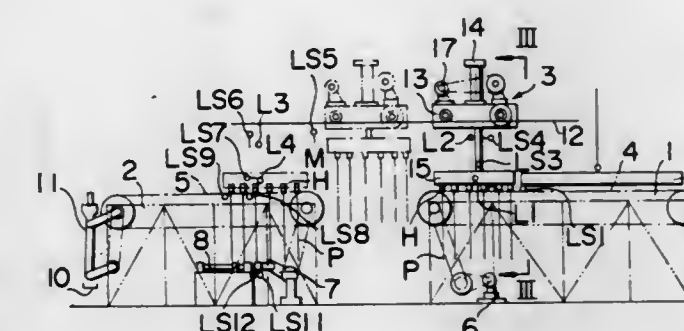
Filed Mar. 15, 1976, Ser. No. 666,946

Claims priority, application Japan, Mar. 18, 1975, 50-32606; Mar. 18, 1975, 50-32607

Int. Cl.<sup>2</sup> B65G 47/52

U.S. Cl. 214-89

2 Claims



1. An apparatus for transferring cathode plates, which comprises: a first conveyor which is for the purpose of conveying a bunch of cathode plates consisting of a plural number of cathode plates arranged at regular intervals upon receiving them on the rear end thereof; a second conveyor which is so disposed as to make its rear end confront the fore end of the first conveyor and is for the purpose of conveying said bunch of cathode plates consisting of a plural number of cathode plates arranged at regular intervals upon receipt thereof and sending them out one at a time from the fore end thereof; a shifting means which is devised to be capable of reciprocating between above the cathode plate discharging position in the fore end portion of the first conveyor and above the cathode plate supplying position in the rear end portion of the second conveyor and is equipped with a hanger provided on the lower part thereof to hang up a bunch of cathode plates consisting of plural number of cathode plates arranged at regular intervals from said discharging position on the first conveyor and transfer them to said supplying position on the second conveyor; the first sensor which senses a receipt of a bunch of cathode plates by the first conveyor and actuates the first conveyor to advance said bunch of cathode plates up to the discharging position; a second sensor which senses the arrival of a bunch of cathode plates suspended by the hanger at the discharging position; a third sensor, which senses the passage of the rearmost cathode plate of the bunch of cathode plates through the discharging position and, during a time equivalent to the time required for the advance of said cathode plate by a prescribed distance from the supplying position, moves the shifting means to a position above the supplying position to see that the suspended bunch of cathode plates be put on the supplying position on the second conveyor in the arrangement that the foremost cathode plate is disposed at a prescribed distance behind the foregoing rearmost cathode plate, and also actuates the hanger; and a fourth sensor which senses the cathode plate whenever it is taken out of the fore end portion of the second conveyor one by one, and intermittently actuates the second conveyor at regular intervals.

4,014,446

**PADDLE-TYPE LOADING MECHANISM FOR REFUSE TRANSPORT**

Robert N. Stedman, Chillicothe, Ill., and Raymond L. Moser, Hot Springs, Ark., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 22, 1975, Ser. No. 624,793

Int. Cl.<sup>2</sup> B65F 3/00

U.S. Cl. 214-520

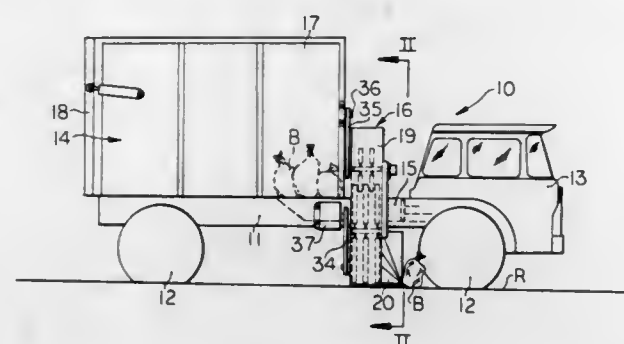
11 Claims

6. In a wheeled refuse transport vehicle having a hopper provided with a compaction chamber portion, the improvement comprising:



ramp means carried by said vehicle at one side thereof for picking up refuse adjacent the path of movement of the vehicle;

a rotary paddle mounted adjacent said ramp means for lifting refuse from said ramp means, said paddle being



rotatable about an axis parallel to said path of movement; and  
means for transferring the lifted refuse transversely to said path of movement from said rotary paddle through said inlet into said hopper.

4,014,447

#### GRAPPLER SPREADER WITH OVERHEAD GRAPPLING ARM STORAGE

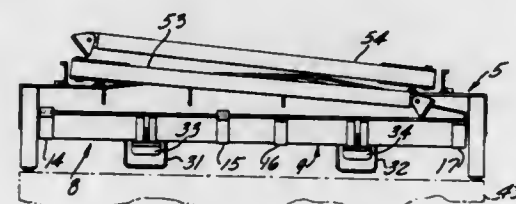
Donald R. Whiteman, Medina, Ohio, and Dale H. Guthrie, High Point, N.C., assignors to RPC Corporation, Roxboro, N.C.

Filed Nov. 20, 1974, Ser. No. 525,399

Int. Cl.<sup>2</sup> B66F 9/18

U.S. Cl. 214—620

8 Claims



1. A grapple spreader for handling cargo containers and piggyback trailers comprising:

a base frame arranged along a rectangle having horizontal, longitudinal and transverse axes or directions and comprising downward projecting latch means located immediately within each of four corners of said rectangle approximately outlining the outer extremities of the frame and projecting downwardly below any other portion of the spreader for detachably interlocking with a cargo container, said frame comprising rigid means at opposite ends thereof for transversely spacing said latch means; four grapple arms and supporting means therefor, said supporting means being mounted atop said frame and extending transversely inwardly thereover, said supporting means for each of two arms at one side of said longitudinal axis comprising a first portion fixed to said base frame in transversely inserted relation to the periphery of said rectangle, and a second portion connected directly to the arm and movably connected with said first portion in guide relation therewith for movement relative to the first portion in a direction transversely of said base frame, said second portion comprising means rotatable relative to the first portion about a crosswise axis extending transversely of the base frame through at least 90 degrees to enable rotation of the arm attached thereto from a vertically extending alignment position to an approximately horizontally extending alignment position generally parallel to said longitudinal axis above the base frame;

said second portion being laterally retractable on said first portion to dispose both of said two arms transversely inwardly within a vertical projection of said rectangle;

said two arms at said one side of said longitudinal axis being in overlapping relationship to one another in said horizontally extending alignment position;

said supporting means for said two arms at said one side of said longitudinal axis including means for moving said two arms toward and away from said longitudinal axis with said two arms in said vertically extending alignment position for gripping and releasing containers.

4,014,448

#### FIRE CERAMIC BOTTLE HAVING THREADED NECK

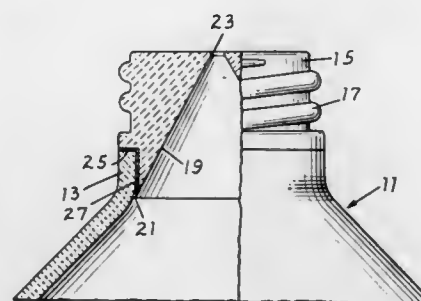
Jerome S. Greenberg, Chicago, Ill., assignor to Regal China Corporation, Antioch, Ill.

Filed Nov. 21, 1974, Ser. No. 525,813

Int. Cl.<sup>2</sup> B65D 13/02

U.S. Cl. 215—31

8 Claims



1. A fired ceramic bottle having a ceramic body portion with an opening therein, a ceramic adapter having an opening therein, said adapter having screw threads integral therewith on the outer surface thereof, said adapter being ceramically integrated with said body portion as a single unitary ceramic piece said adapter being so positioned with respect to said body as to provide closure of said bottle upon engagement of said threads by a threaded closure cap, said adapter having been separately formed from said body portion and then applied thereto and fired to integrate said adapter and said body portion ceramically into said unitary piece.

4,014,449

#### SAFETY CAP

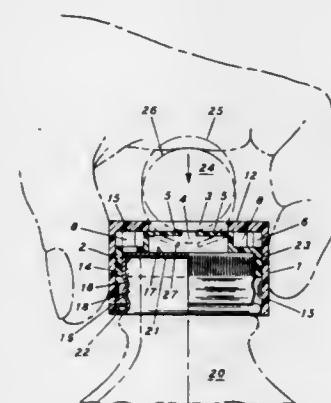
John R. Hadley, San Rafael; Michel A. LeBrun, Jr., Sebastopol; John W. McRoskey; Leonard H. McRoskey, both of Los Angeles, and Delbert D. Swartz, Torrance, all of Calif., assignors to Republic Tool & Manufacturing Corporation, Los Angeles, Calif.

Filed May 14, 1976, Ser. No. 686,411

Int. Cl.<sup>2</sup> B65D 55/02, 85/56; A61I 1/00

U.S. Cl. 215—215

7 Claims



1. Safety closure for a container having an externally threaded neck comprising:

a. an inner cap member having a top portion and a cylindrical collar portion extending axially therefrom, said cylindrical collar portion having internal threads mating with the threads on the neck of the container, said top of the

inner cap member having a central longitudinal extending recess adapted to receive a key device;

b. an outer cap member having a top portion and a cylindrical collar portion extending axially therefrom, said collar portion fitting concentrically about said collar portion of the inner cap member, the outer cap member being freely rotatable relative to the inner cap member in the direction of loosening the inner cap member from the neck of the container, the outer cap member and inner cap member having cooperable locking means for unidirectional coupling for simultaneous rotary movement to tighten the inner cap member on the neck of the container, the top of the outer cap member having a central longitudinal extending opening adapted to receive said key device, and adapted to be moved into and out of alignment with said recess of the inner cap member by rotation of the outer cap member relative to the inner cap member, and  
c. means to prevent insertion of a key device into the aligned said opening and said recess without the application of pressure on the key device.

4,014,451

#### BREAD PAN FOR BAKING MINIATURE LOAVES

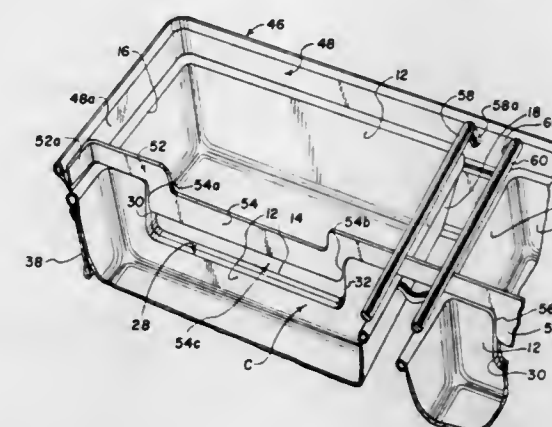
Sidney E. Cannon; Billy M. Keith; Charles E. Cannon, and Joseph H. Caldwell, all of Dallas, Tex., assignors to Campbell Taggart, Inc., Dallas, Tex.

Filed Nov. 3, 1975, Ser. No. 628,394

Int. Cl.<sup>2</sup> B65D 85/00

U.S. Cl. 220—20.5

13 Claims



1. In a device for baking bread: a pan having end walls transversely disposed between sidewalls joined by a bottom; spaced divider walls each having a recess on the upper edge thereof, said divider walls being secured to the bottom and the sidewalls, dividing said pan into a plurality of sections; a top removably disposed on the pan; a plurality of spacers depending from the top, each spacer having a downwardly extending portion aligned with one of the divider walls and arranged to enter one of the recesses, said downwardly extending portions being spaced from the bottom of the recesses to form a passage between each section.

4,014,450

#### PACKAGING CONTAINER

Floriano Girotti, Milan, and Mauro Gasparini, Segrate (Milan), both of Italy, assignors to Montefibre S.p.A., Milan, Italy

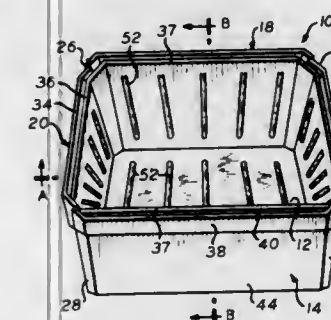
Filed Aug. 2, 1971, Ser. No. 168,313

Claims priority, application Italy, Aug. 10, 1970, 28464/70

Int. Cl.<sup>2</sup> B65D 43/06, 7/02

U.S. Cl. 220—4 E

8 Claims



1. A housing for storing items of desired size and shape comprising:

a. a container of symmetrical regular polygon configuration having a floor and side walls upstanding therefrom at all the same distance;

b. one group of alternate side walls including outwardly extending elongate grooveless flanges at the tops thereof including elongate fingers extending above the tops of said one group of walls along the entire width thereof; and

c. the other group of alternate side walls including outwardly extending elongate fingerless flanges at the tops thereof having elongate grooves therein complementary to said fingers and extending along the entire width of said walls of said other group for receiving said elongate fingers of said first group of walls, whereby two such housings may be brought together with their tops in confronting relation with one group of walls of one such housing in juxtaposition with the other group of walls of the other of such housings, and vice versa, to form a single closed container of about twice the volume of said housing.

4,014,452

#### PLASTIC LIDS AND PAILS

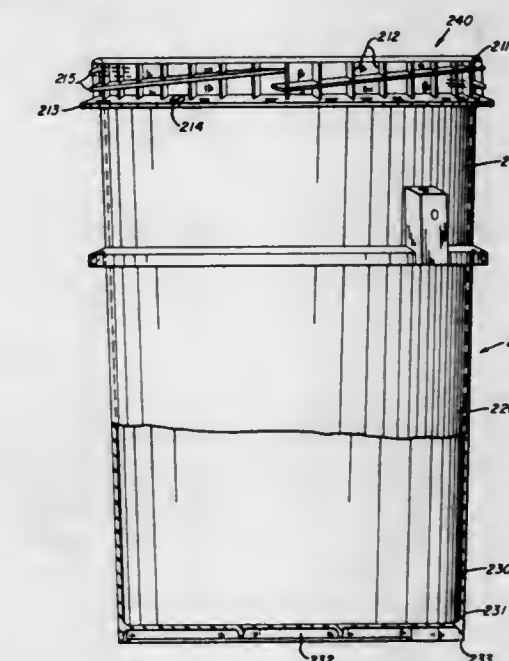
Herbert W. Galer, Pine Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1975, Ser. No. 564,944

Int. Cl.<sup>2</sup> B65D 25/00

U.S. Cl. 220—74

5 Claims



1. In a molded flexible thermoplastic open top pail having a top section, a middle section and a bottom section, said top section having engagement means for assembly with a lid having an inverted U-shaped rim portion that contains mating engagement means in the outer leg of said rim, said middle section being the predominant volumetric portion of said pail, the improvement comprising a top section with a plurality of integrally molded reinforcement members disposed about the



circumference of said pail, said members projecting outwardly from the sidewall of said pail and extending downwardly from the open end of said pail a distance sufficient to transfer vertical deflection to said middle section, the number of said members and the width to depth ratio of said members being sufficient to stiffen said top section without a material increase in the mass of said top section and wherein said engagement means are in the form of screw threads, said threads extending outwardly from the sidewall of said top section for engagement with said lid at positions outwardly of the inner face of the outer leg of said inverted U-shaped rim, said threads being integrally molded with said reinforcing members whereby the free edge of said threads is stiffened.

4,014,453

## PAINT BRUSH HOLDER

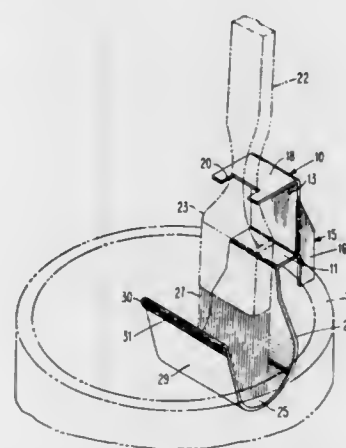
Edward Joseph Tarnacki, 408 Hudson St., Jermy, Pa. 18433

Filed May 20, 1976, Ser. No. 688,377

Int. Cl.<sup>2</sup> B44D 3/12; B65D 25/00

U.S. Cl. 220-90

5 Claims



1. A holder for paint brushes consisting of a platform to rest over the rim of a paint can, clamping members extending downwardly from the outer edge of said platform and over the outer side of said can, a wall extending upwardly from said platform having a portion bent at a right angle extending over said can, means in said portion for securing the handle of a brush and a curvilinearly-shaped portion extending from the inner edge of said platform downwardly into said can and engaging the same and forming a trough accepting the bristles of said brush, said trough having an upwardly-extending portion terminating in a rim adapted for the removal of excess paint from said brush, the cooperation of the clamping members and curvilinear-shaped portion securing the holder to the can.

4,014,454

## FLOATING ROOFS FOR LIQUID STORAGE TANKS

Irene Mary Nayler, Dudley, and Michael Stalker, Manchester, both of England, assignors to Greengate Industrial Polymers Limited, Salford and Nayler Limited, Dudley, both of, England

Filed Oct. 28, 1975, Ser. No. 626,537

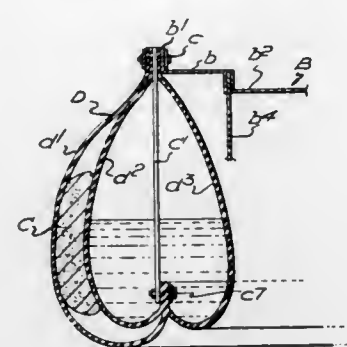
Int. Cl.<sup>2</sup> B65D 87/20

U.S. Cl. 220-225

3 Claims

1. A liquid storage tank having a floating roof adapted to rise and fall with changes in level of the liquid in the tank, said tank and roof having coextensive radially spaced side walls, and a seal mounted on the roof to depend between said side walls, said seal being an annular bag having flexible inner and outer sides in contact with the respective side walls and a flexible internal wall separating the bag into radially inner and outer annular chambers, fastening means securing the top of said bag to the roof and allowing the bag to be suspended

therefrom between said side walls with its outer flexible side in sliding contact with the tank side wall, an annular body of



liquid in the inner chamber and an annular pad of synthetic foam within said outer chamber.

4,014,455

## ACCURATE FLOW CONTROL CONTAINER MEANS

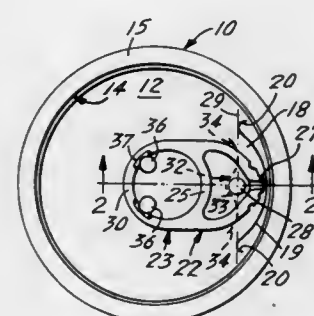
Leonard Thomas LaCroce, Paramus, N.J., assignor to American Can Company, Greenwich, Conn.

Filed June 21, 1976, Ser. No. 698,221

Int. Cl.<sup>2</sup> B65D 41/32

U.S. Cl. 220-269

28 Claims



1. An accurate pour-guiding and flow-controlling end closure of the partial-open, pull-tab type well suited for directional discharge handling of relatively non-viscous fluids, said closure comprising:

a generally flat central panel portion;

means associated with said central panel portion for securing said closure as an end cover for a container to be sealed therewith;

a rupturable peripheral score line in said central panel which defines and circumvents a displaceable portion of said central panel which displaceable portion is bendable inwardly upon rupture of said peripheral score line to form an opening in said central panel;

said rupturable peripheral score line having curled terminal increments which delimit the length of the score line and inhibit panel tearing therebeyond when said displaceable portion is inwardly bent and disposed upon rupture to form said opening of said score line; and

an opening tab attached to said displaceable portion of said panel at a point at least substantially proximate a line extending at least generally between the areas of said curled terminal increments of said peripheral score line on said panel;

said opening tab having a nose portion at one of its ends and a handle portion at its other end permitting situation of the nose portion so as to be disposed proximate the rupturable peripheral score line in said central panel;

said pull ring of the opening tab being disposed radially inwardly from its point of attachment on said cover and extending substantially beyond said point;

said opening tab adapted upon application of upraising leverage thereto to rupture said peripheral score line and inwardly bend said displaceable portion to form an open-

ing in said panel with said tab then extending vertically upwardly from said panel to stop in at least a substantially perpendicular disposition with respect to the plane of said central panel in which situation said tab is capable of a baffle and pour-guide function for fluid material issuing from and through said opening.

4,014,456

## INSULATED SANDWICH AND SALAD KEEPER

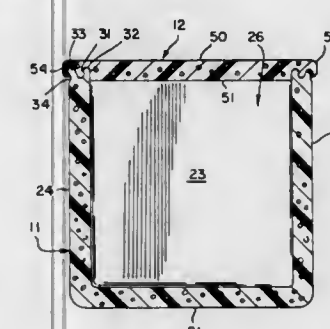
Mary Louise Echtle, Star Rte., Box 5, Castroville, Tex. 78009

Filed Oct. 31, 1975, Ser. No. 627,780

Int. Cl.<sup>2</sup> B65D 43/10

U.S. Cl. 220-306

2 Claims



1. An insulated salad and sandwich keeper comprising, in combination

a hollow box shaped receptacle of a hollow rectangular box-shaped configuration having a horizontal flat bottom surface, a pair of opposed vertically extending parallel front and back wall surfaces, and a pair of vertically extending parallel side wall surfaces, the surfaces defining interiorly thereof a compartment open at its top to provide ingress and egress thereof;

a cover of said receptacle consisting of a flat rectangularly shaped solid member having an exterior surface and interior surface, opposed flat front and back edges, and opposed flat side edges, the cover being of a width and length to completely overlap the open top of said receptacle compartment and engage the top edges of the wall surfaces in an air tight manner for sealing the receptacle compartment when the cover is in place thereon;

said receptacle and cover manufactured of insulating material;

said receptacle being characterized by a longitudinally extending groove of a semi-circular cross section disposed in the top edge of each of the wall surfaces of the receptacle, a pair of rib members formed on the top edges of wall members with each rib member being disposed on an opposite side of the groove and extending longitudinally therealong, an annular recess of a semi-circular configuration disposed completely about the exterior surfaces of the wall surfaces to define a plane parallel to the receptacle bottom surface and disposed immediately adjacent the bottom portion of one of the rib members, and with said cover member including a pair of parallelly extending grooves disposed in the interior surface completely about the edge surfaces and of a size and configuration to receive the receptacle ribs therein, a rib extending between the cover grooves and adapted to be received in the receptacle groove whereby the cover is snap-fitted to the receptacle for sealing the receptacle compartment.

4,014,457

## TRASH CONTAINER LID SYSTEM

Allan M. Hodge, 5852 Lomond Drive, San Diego, Calif. 92120

Filed May 20, 1976, Ser. No. 688,167

Int. Cl.<sup>2</sup> B65D 43/14, 51/04

U.S. Cl. 220-331

5 Claims

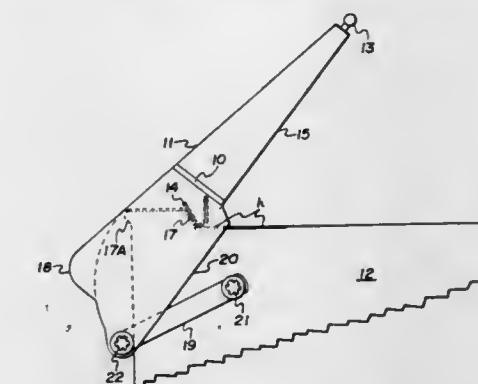
1. A trash container lid system for use with large industrial trash bins in which the lid is rotatably coupled to the trash bin by means of a lever arm and is slidably coupled to the trash bin by means of a roller on the lid, comprising:

a trash bin having an upper edge;

a lid section having a lower edge dimensioned for cooperation with said trash bin upper edge;

first and second lever arms, said first and second lever arms each being rotatably coupled at one end to first and second pivot points on said trash bin and rotatably coupled at their other end to third and fourth pivot points on said lid section;

first and second slide members carried by said lid section;



first and second slide tracks on the top of opposite edges of said trash bin, said first and second slide tracks slidably carrying said first and second slide members; and

a raised portion at the back termination of said first and second slide tracks, to stop the rearward movement of said lid section when it is raised rearwardly for the purpose of opening said bin to receive trash; whereby said lid can remain in a stabilized partially opened position.

4,014,458

## THREE-FUNCTION CONTAINER

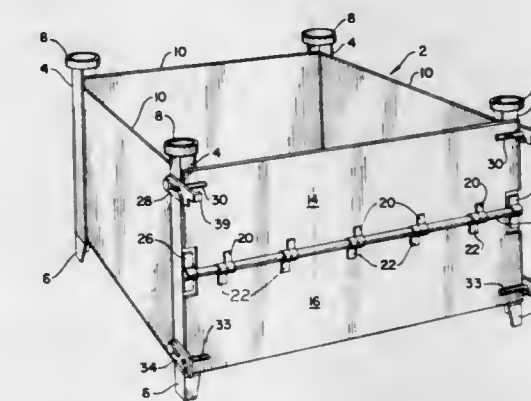
Timothy J. Berges, Mansfield, Ohio, assignor to Sanchez Enterprises, Inc., Mansfield, Ohio

Filed Mar. 19, 1976, Ser. No. 668,694

Int. Cl.<sup>2</sup> B65D 43/24

U.S. Cl. 220-335

3 Claims



1. A three-function material handling container comprising, a bottom section,

a wall structure extending upwardly from said bottom section and including extending side edge portions and a lateral opening therebetween,

upper and lower doors extending across said lateral opening in said wall structure,

hinge means for each door disposed on an axis substantially parallel to said bottom section, each of said hinge means pivotally connecting its associated door to said upwardly extending side edge portions of said wall structure at a level intermediate said bottom section and the top of said wall structure,

a first latch means engageable between said lower door and at least one of said side edge portions beneath said hinge means so as to hold said lower door in a lowered position and said upper door being rotatable about said hinge means to a lowered position so as to leave an upper lateral



opening in said container and enable said container to function as a hopper into which material may be laterally conveyed,

a second latch means engageable between said upper door and at least one of said side edge portions above said hinge means so as to hold said upper door in a raised position so that said upper and lower doors held in their respective raised and lowered positions form with said wall structure a laterally closed material storage box, and said first latch means being detachable from its engagement between said lower door and said side edge portion so that said lower door is rotatable upwardly and outwardly about said hinge means so as to leave a lower opening in said container and enable said container to function as a gravity-feed material dispenser.

4,014,459

## CONTAINER CLOSURE

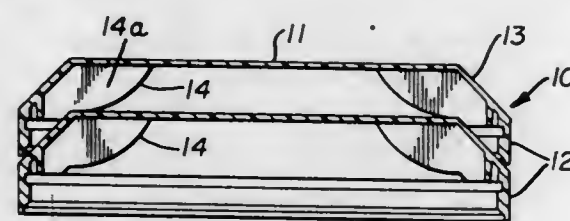
Ronald L. Robinson, Stow, Ohio, assignor to Go-Jo Industries, Inc., Akron, Ohio

Filed Oct. 8, 1975, Ser. No. 620,563

Int. Cl.<sup>2</sup> B65D 55/00, 43/08, 41/18

U.S. Cl. 220—380

1 Claim



1. A container closure for removable placement over the open end of a container body, comprising:
  - A. a substantially flat top portion;
  - B. a substantially vertical side wall portion;
  - C. an intermediate wall portion interconnecting said side wall portion and said top portion;
  - D. said top portion
    1. having a circumferential dimension less than the circumferential dimension of said side wall portion, and
    2. having a midpoint lying in a plane that is in substantial alignment with the midpoint of the area bounded by said side wall portion;
  - E. said intermediate wall portion being disposed at an angle with respect to the vertical;
  - F. said top portion having upper and lower planar faces; and
  - G. a plurality of radially inwardly extending reinforcement ribs interconnecting said side wall portion, said intermediate wall portion, and said lower planar face of said top portion; and
  - H. said reinforcement ribs having an edge configuration complementary to the outer configuration of said top and intermediate portions.

4,014,460

## SPIKE ORIENTING AND POSITIONING SYSTEM

John F. Bryan, Jr., 3212 Mapleleaf Circle, Dallas, Tex. 75233

Filed Jan. 2, 1975, Ser. No. 538,115

Int. Cl.<sup>2</sup> B65G 47/24

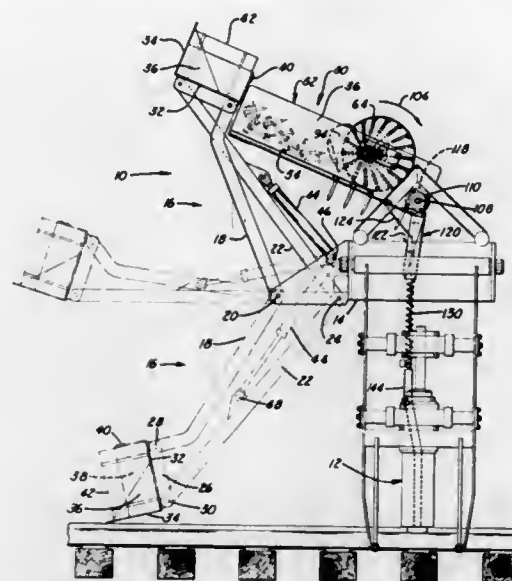
U.S. Cl. 221—156

56 Claims

1. A spike orienting and positioning system comprising: means forming an inclined surface for receiving a plurality of randomly oriented spikes each having a head and a shank and having at least one spike receiving slot formed therein defined by spaced, parallel surfaces positioned to receive spike shanks therethrough and to support received spikes by engagement with the spike heads; means for agitating spikes comprising the plurality of randomly oriented spikes received on the surface so that spikes from the plurality fall into the slot formed in the surface; means for normally retaining spikes in the slot formed in the

surface and for selectively discharging individual spikes from the slot;

a helix for receiving individual spikes from the slot with the heads of the spikes randomly oriented relative to the spike axes and for rotating each received spike through at



least one complete rotation about its axis and thereby positioning the head of the spike in a predetermined orientation relative to the spike axis regardless of the original orientation of the spike; and means for receiving each spike from the helix and for positioning the spike to be driven.

4,014,461

## AUTOMATIC CHANGE-OVER DEVICE FOR LIQUID DISPENSING SYSTEM

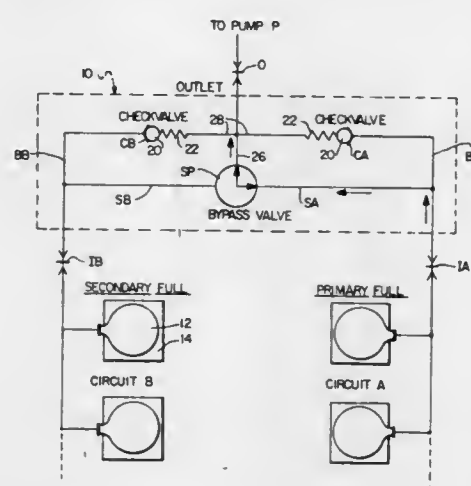
William Andrew Harvill, Decatur, Ga., assignor to The Coca-Cola Co., Atlanta, Ga.

Filed Mar. 10, 1976, Ser. No. 665,973

Int. Cl.<sup>2</sup> B65D 35/22

U.S. Cl. 222—94

8 Claims



1. An automatic change-over device for a liquid dispensing system comprising:
  - first and second sets of at least one collapsible bag for containing a liquid to be dispensed, each of said collapsible bags having a first volume when full and deflating to a second volume when empty;
  - pump means for drawing said liquid out of said first or second sets of collapsible bags when in circuit with said first or second sets, respectively;
  - first pressure sensitive valve means in circuit between said first set of bags and said pump means, said first pressure sensitive valve means being normally closed and being opened in response to a pressure change created by said second volume of said second set of bags;
  - second pressure sensitive valve means in circuit between

said second set of bags and said pump means, said second pressure sensitive valve means being normally closed and being opened in response to a pressure change created by said second volume of said first set of bags; and bypass valve means for selectively connecting either said first or second sets of bags to said pump means in parallel with either said first or second pressure sensitive valve means, respectively.

4,014,462

## SCRAP RECOVERY AND FEED SYSTEM

Joseph D. Robertson, 980 Swathmore Drive, NW., Atlanta, Ga. 30327

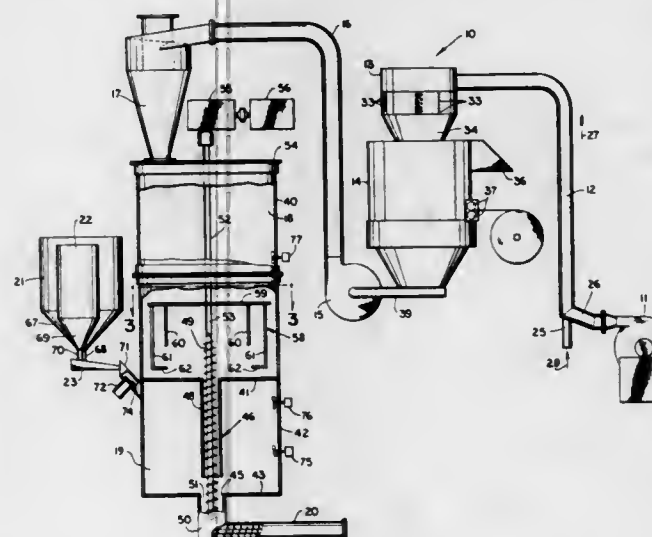
Continuation of Ser. No. 439,029, Feb. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 128,973, March 29, 1971, Pat. No. 3,797,702. This application Nov. 5, 1975, Ser. No. 629,070

The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.<sup>2</sup> B01F 7/24

U.S. Cl. 222—136

11 Claims



6. A blend system for blending a mixture of a relatively flowable base material and a relatively non-flowable material comprising a hopper with an inlet opening for receiving the non-flowable material and an outlet opening at its lower portion, a chamber positioned below said hopper and including an inlet opening for receiving the flowable base material and an outlet opening at its lower portion whereby the flowable base material moves under the influence of gravity toward and accumulates in said chamber, and a conveyor in said hopper extending from within said hopper in a downward direction from said hopper to the outlet opening of said chamber and exposed along its lower portion inside said chamber for urging said non-flowable material from the hopper in a downward direction into the chamber and with the base material toward the outlet opening of said chamber whereby the base material and the nonflowable material are combined and are discharged through the outlet opening of the chamber.

4,014,463

## PLURAL COMPONENT DISPENSER

Paul F. Hermann, Andover, Mass., assignor to Kenics Corporation, North Andover, Mass.

Filed Nov. 28, 1975, Ser. No. 636,156

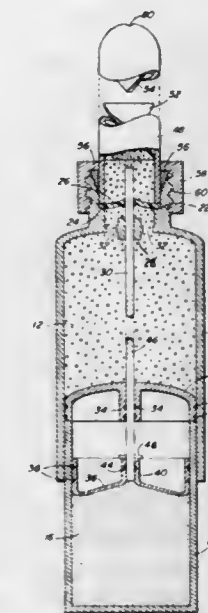
Int. Cl.<sup>2</sup> B67D 5/60

U.S. Cl. 222—145

7 Claims

1. A plural component dispenser comprising:
  - a. two rigid chambers each having a uniform transverse area along its operable length;
  - b. a rigid piston spanning said transverse area in each of said chambers, each piston being movable along said chamber throughout said operable length;
  - c. common operating means related to both of said pistons and adapted to move both of said pistons synchronously along their respective chambers;

- d. each of said chambers containing a fluid to be dispensed;
- e. each of said chambers being provided with an exit port through which its fluids are ejected upon motion of the piston in said chamber;
- f. a mixer connected to said dispenser, said mixer having an input end and a discharge end;
- g. said ports being located closely adjacent said input end of said mixer;



- h. said mixer comprising a hollow conduit containing a plurality of serially disposed of helical sheet-like elements, each of which has its trailing edge at a substantial angle with respect to its leading edge, the leading and trailing edges of adjacent elements being at a substantial angle with respect to each other and successive elements being curved in opposite senses.

4,014,464

## HOT MELT DISPENSER AND METHOD OF MAKING ITS MELT BODY

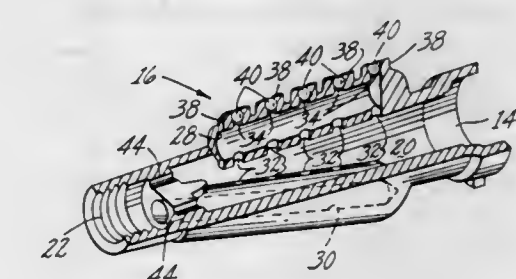
Albert Eugene Newton, and Richard Montgomery Elliott, both of Beverly, Mass., assignors to USM Corporation, Boston, Mass.

Filed Dec. 9, 1975, Ser. No. 639,074

Int. Cl.<sup>2</sup> B67D 5/62

U.S. Cl. 222—146 HE

9 Claims



1. In apparatus for progressively melting and dispensing thermoplastic material, an elongated body, the body having a generally frusto-conical hot melt chamber extending substantially from an inlet for the material in its solid form and toward a relatively smaller outlet for the material when liquefied, said chamber being defined by an essentially smooth wall, the body being constructed for heat transfer relation to a heater, at least one manifold by-pass extending generally parallel to the chamber wall, at least one axially drilled auxiliary channel in the body interconnecting the smaller end of the melt chamber to the body outlet, and a plurality of radially drilled holes spaced along the chamber substantially in a line to bleed off and conduct the material as melted into the by-pass.



4,014,465

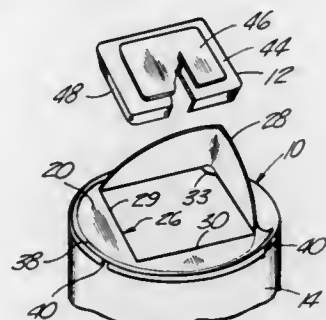
## PAINT CAN POUR SPOUT

John C. Ritter, 12645 Duchess, Detroit, Mich. 48224

Filed Sept. 2, 1975, Ser. No. 609,383

Int. Cl.<sup>2</sup> B65D 25/48

U.S. Cl. 222-563



1. A pour spout lid for fluid containers comprising:
- a circular planar member having a square aperture with two edges thereof defining the edges of a spout extending upwardly and outwardly therefrom, the planar member having inner and outer radially spaced circular flanges which define therein between a channel adapted to snap lockingly engage a rim of a conventional fluid-holding container; said planar member being provided with a peripheral bead extending along the edge of said planar member circumscribing said square opening and terminating in integral connection with said pour spout such that said pour spout and said peripheral bead completely surround said square opening;
  - means defining an opening in said outer circular flange to permit the insertion of a removing means cooperating with said can rim to facilitate the removal of said lid from said container;
  - a plurality of circumferentially spaced, downwardly extending members disposed at the corners of said square aperture on the bottom side of said planar member to prevent the overflow of fluid from within said container onto the top of said planar member when the fluid contents of said container are tangentially stirred;
  - a cover having a top wall with inwardly inclined depending side walls of a square configuration, said side walls matingly engaging said square aperture to enclose said aperture; and
  - a handle formed on the top of said top wall to permit the removal of said cover from said square aperture.

4,014,466

## CARRYING FRAME FOR FISHING POLES

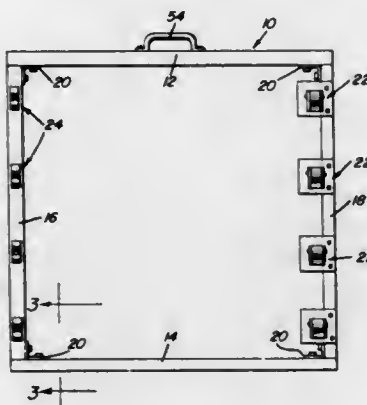
Kenneth F. Wess, 3106 Lindenwood Drive, and Charles Day, Ratliff Road, both of San Angelo, Tex. 76901

Filed Oct. 20, 1975, Ser. No. 624,267

Int. Cl.<sup>2</sup> B65D 71/00

U.S. Cl. 224-45 R

2 Claims



1. A hand carrying device for supporting a plurality of elongated structures therefrom, said device including spaced

portions thereof from which support structures comprising clamp holding members are mounted adapted to engage longitudinally spaced portions of elongated structures for removable support of the latter from said support structures, said carrying device comprising an upstanding rectangular frame including a pair of vertically spaced upper and lower elongated members and a pair of opposite end upstanding elongated members extending and interconnected between corresponding ends of said upper and lower members, said upstanding members comprising said spaced portions, said upper, lower and upstanding members comprising channel members of generally C-shape cross section with the free ends of the legs thereof each terminating in successive right angled in-turned first and second flanges, threaded nut sleeves mounted in the ends of each of said elongated members including inner heads underlying the corresponding second flanges and non-circular shank portions slidably received between the opposing surfaces of the corresponding second flanges with the latter preventing rotation of said sleeves, and angle braces connecting pairs of adjacent ends of said elongated members by means of threaded bolts secured through said angle braces and threadedly engaged in said sleeves.

4,014,467

## DISHWASHER AND COUPLING

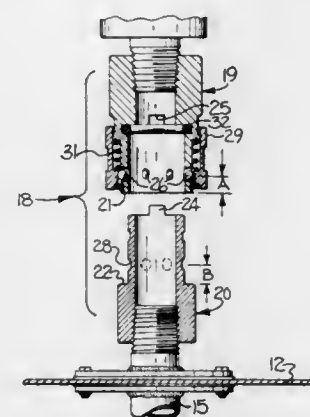
George R. Ferguson, Clover, S.C., assignor to Duff-Norton Company, Inc., Charlotte, N.C.

Filed Nov. 3, 1975, Ser. No. 628,507

Int. Cl.<sup>2</sup> B05B 3/06; F16L 37/22

U.S. Cl. 239-261

9 Claims



9. In a dishwasher having housing means for enclosing dishes to be washed and means for circulating fluid within said housing means for washing dishes and including fluid conduit means having portions extending within said housing means, an improvement which comprises manually disengagable coupling means interposed between two of said conduit means portions for joining the same together while resisting rotational and angular displacement therebetween, and wherein said coupling means comprises first and second telescoping tubular coupling members each having a radially directed abutment shoulder and axially directed rotation locking surfaces; locking members carried by one of said coupling members for radial movement relative thereto at a predetermined distance from said shoulder thereof; locking recess means for receiving said locking members and formed in the other of said coupling members at a distance from said shoulder thereof less than said predetermined distance; and manually operable means for selectively (a) releasing said locking members to freely move radially in accommodation of telescopic relative movement between said coupling members and (b) urging said locking members radially toward said other coupling member and into engagement with said locking recess means; the configuration of said locking members and said locking recess means and the spacing thereof one relative to the other being such that said locking members extend into said locking recess means for less than the full radial depth thereof and wedge thereagainst for exerting therebetween a force directed axially of said coupling members, said locking

members and said locking recess means functioning when in engagement for urging said shoulders into abutment so as to prevent angular displacement between said coupling members and for positioning said rotational locking surfaces for engagement so as to prevent rotational displacement between said coupling members.

4,014,468

## SQUEEZE BOTTLE DISPENSER WITH IMPROVED DIP TUBE AND METHOD OF ASSEMBLING SAME

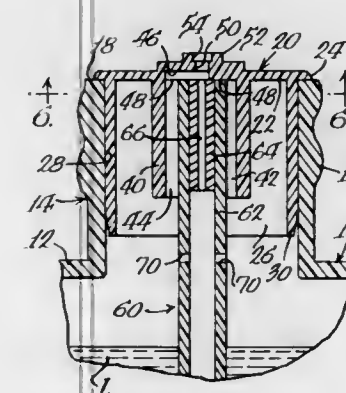
Paul Silverman, and William R. Bartuska, both of Skokie, Ill., assignors to Helene Curtis Industries, Inc., Chicago, Ill.

Filed May 5, 1975, Ser. No. 574,605

Int. Cl.<sup>2</sup> B65D 1/32

U.S. Cl. 239-327

5 Claims



1. A squeeze bottle assembly comprising: a resilient squeeze bottle having a main body portion and a neck, a plug insert sealingly seated in said neck, said plug insert comprising an upper flange defining a discharge orifice at its outer surface through which contents of said bottle may be discharged, and a depending skirt for receiving a dip tube assembly, said flange defining at least one laterally extending metering slot in its lower surface in communication with said discharge orifice, said slot terminating laterally outwardly adjacent said skirt, and a dip tube assembly disposed and held within said depending skirt, said dip tube assembly comprising an elongate hollow dip tube extending downwardly from said skirt to adjacent the bottom of said main body portion and a short tube element positioned against lower surface of said flange and defining a passageway which is in flow communication with said metering slot at one end and which is in flow communication with the hollow in said dip tube at its other end, said skirt and said dip tube assembly defining air passage means therebetween which is also in flow communication with said laterally extending slot, thereby to provide for the mixture of air with bottle contents conveyed through the dip tube assembly adjacent the upper end of the dip tube assembly and wherein the passageway through said short tube element is from about 0.014 to about 0.040 inch in diameter, which diameter is substantially less than the diameter of the hollow in said dip tube, wherein said short tube element is from about one-sixteenth to about 1 inch in length, and wherein said short tube element is disposed within said elongate dip tube and the upper ends of said element and said dip tube lie in a common plane and are flush with each other and with said lower surface of said flange.

4,014,469

## NOZZLE OF GAS CUTTING TORCH

Kozo Sato, No. 7-12, Minami-3-chome, Yamamoto-cho, Yao, Osaka, Japan

Filed Nov. 17, 1975, Ser. No. 632,220

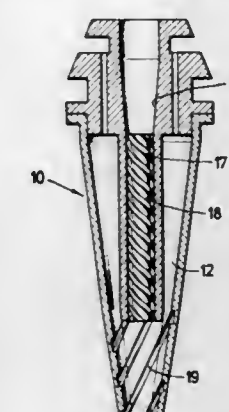
Int. Cl.<sup>2</sup> B05B 1/34

U.S. Cl. 239-404

4 Claims

1. A nozzle of a gas cutting torch comprising an inner cutting gas passage tapered towards an outlet thereof with helical

grooves extending to the outlet thereof, and a heating gas passage tapered towards an outlet thereof and annularly sur-



4,014,470

## CONICAL SPRAY NOZZLE

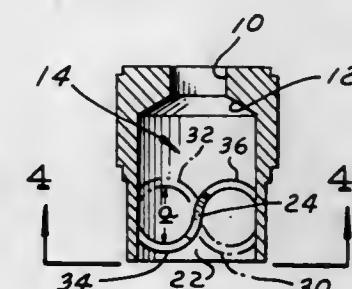
Richard C. Burnham, Greenfield, Mass., assignor to Bete Fog Nozzle, Inc., Greenfield, Mass.

Filed Mar. 1, 1976, Ser. No. 662,834

Int. Cl.<sup>2</sup> B05B 1/34

U.S. Cl. 239-472

7 Claims



1. Full cone spray nozzle comprising a fluid conduit having an outlet orifice, vane means within said conduit for imparting a vortical component of motion to liquid flowing therethrough, said vane means having an opening therethrough transversely of the conduit which is substantially smaller than the outlet orifice and is in axial alignment therewith, said vane means including sinusoidal portions in edge-to-edge relation spanning adjacent semi-circular segments of the conduit, each sinusoidal portion including convex and concave lobes interconnected by axially extending leg portion, said convex lobes being disposed toward the inlet end of the conduit and the concave lobes being offset axially from the convex lobes a distance at approximately equal to the diameter of said orifice, said convex and concave lobes being in alternate circumferential sequence in said conduit.

4,014,471

## HOSE NOZZLE DIVERTER

George M. McGrane, 1017 Loma Verde St., Monterey Park, Calif. 91754

Filed Nov. 17, 1975, Ser. No. 632,816

Int. Cl.<sup>2</sup> B05B 1/26

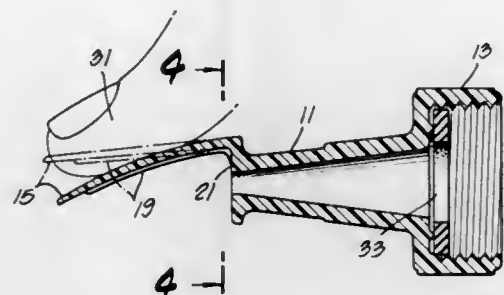
U.S. Cl. 239-510

10 Claims

1. Nozzle means for selectively converting a stream from a hose into a spray, comprising:



a. a first end adapted for coupling to said hose, and



4,014,472

## DISCHARGE NOZZLE STRUCTURE

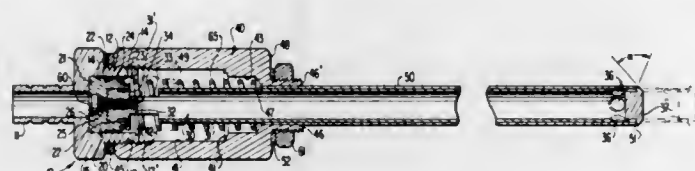
Richard Nelson Bennett, Arbutus, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

Filed Aug. 18, 1975, Ser. No. 605,331

Int. Cl.<sup>2</sup> B05B 1/30

U.S. Cl. 239—533.1

18 Claims



1. A nozzle structure for use with high-speed filling machines operable to fill containers with a product discharged under pressure, which comprises first means defining a cylinder section of a first diametric dimension adjoined by a space section of larger diametric dimensions and including further means for admitting a product under pressure into the space section by way of the cylinder section, an outer sleeve means securely connected near one end thereof to said first means and extending therefrom towards its other end in a direction opposite to the cylinder section, second means including a piston section of complementary dimensions to and slidable within said cylinder section and hollow inner sleeve means fixedly connected at one end thereof with said piston section and in continuously open communication with said space section, said hollow inner sleeve means being provided with discharge hole means near its other end, said second means having a first position in which said discharge hole means are closed off by said outer sleeve means and the space section is substantially closed off with respect to the further means for admitting the product under pressure so that the latter acts substantially exclusively on the exposed piston surface of the piston section, and a second position in which, after displacement of the second means by the product under pressure, the discharge hole means are free of the outer sleeve means and the further means for admitting the product under pressure is in communication with said space section so as to enable the discharge of the product from the further means by way of said space section, the hollow inner sleeve means and the discharge hole means, and spring means urging said second means into the first position thereof.

4,014,473  
FLUID-FLOW CONTROL DEVICES PARTICULARLY  
USEFUL AS DRIPPER NOZZLES IN TRICKLE  
IRRIGATION

Peretz Rosenberg, Moshav Beit Shearim, Israel  
Continuation-in-part of Ser. No. 364,049, May 25, 1973, Pat.  
No. 3,938,552. This application Dec. 15, 1975, Ser. No.

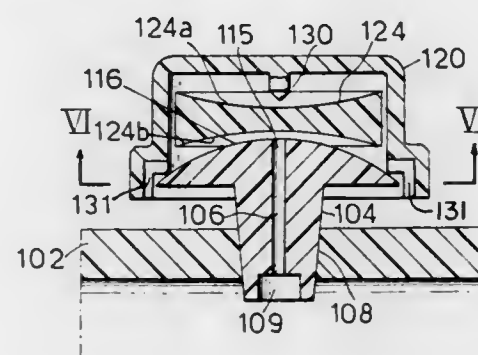
640,856

Claims priority, application Israel, June 11, 1975, 47455

Int. Cl.<sup>2</sup> B05B 15/00

U.S. Cl. 239—542

6 Claims



1. A fluid-flow control device comprising a conduit member connectable to a source of pressurized fluid and formed with an axial passageway having an inlet and an outlet, a housing enclosing the passageway outlet and formed with a housing outlet, and a regulating member disposed within the housing in axial alignment with the passageway outlet and freely movable axially of the conduit member and its passageway to open and close its outlet, the face of the conduit member in which the passageway is formed, and the face of the regulating member closing the passageway outlet, being such that when the two faces are in contact to close the passageway outlet, the faces diverge from each other to provide a space between the two which space increases from the passageway outlet, whereby during the flow of fluid through the axial passageway the regulating member is set into rapid oscillating movement axially of the conduit member passageway to rapidly open and close its outlet and thereby to control the flow of fluid there-through; characterized in that the conduit member face formed with the passageway outlet is of convex configuration, and that both faces of the regulating member are of concave configuration of a slightly larger radius of curvature, the inner surface of the housing including a depending boss adapted to engage the center of the confronting concave face of the regulating member.

4,014,474

METHOD FOR TREATING PARTICULATE MASSES  
FROM COMPLEX ORES OR ORE PRODUCTS BY FROTH  
FLOTATION

Lars Alrik Anttila, Malmberget; Per Anders Herman Henningsson Fahlström, Akers Runo; Ernst Olov Fålgremo, Boliden; Verner Herbert Hedman, Boliden, and Sven Göran Åberg, Boliden, all of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

Filed Sept. 24, 1973, Ser. No. 400,146

Claims priority, application Sweden, Sept. 26, 1972, 12414/72

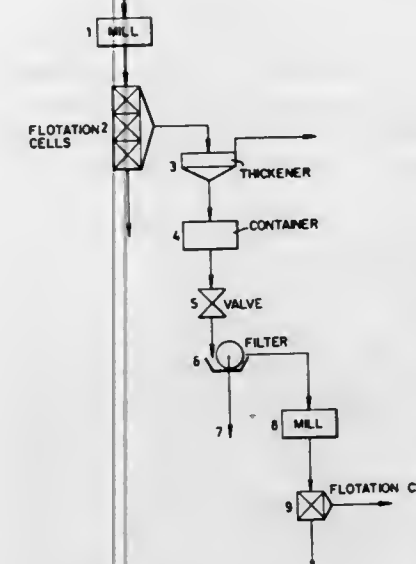
Int. Cl.<sup>2</sup> B02C 23/12

U.S. Cl. 241—20

7 Claims

1. A method of treating a flotation concentrate pulp containing at least two different minerals, the minerals having been floated by means of collector reagents in a previous flotation step and being capable of separation by further flotation, comprising adding to a pulp having a density exceeding 20% by volume of solid material a reagent nullifying the effect of the previous used collectors on at least one of the minerals; using an average stay-time for the particles in contact with the reagent of at most 30 minutes; filtering the pulp so that formed reaction products and unreacted nullifying reagent is removed

with the liquid; reslurrying the filtered pulp obtained by means of water; subjecting the pulp obtained to a mechanochemical treatment step comprising chemical conditioning of the surfaces of the mineral particles and grinding whereby fresh



surfaces are formed on the mineral particles, controlling the grinding efficiency by the quantity of material supplied during said grinding and floating the pulp in at least one flotation step while suppressing at least one but not all the minerals present by means of suppressing agent addition.

4,014,475

COMBINED MANWAY AND COLLECTION TANK FOR  
SEWAGE GRINDER

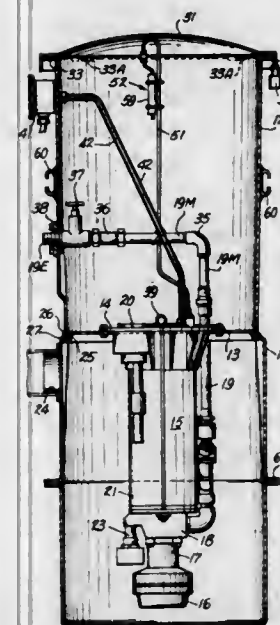
Richard C. Grace, Carlisle, and Kenneth H. Rochow, Ballston Lake, both of N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,708

Int. Cl.<sup>2</sup> B02C 13/18

U.S. Cl. 241—36

24 Claims



1. A new and improved sewage grinder pump and access manway assembly comprising a lower collection tank having a watertight and airtight top cover plate and at least one sewage grinder pump unit suspended from the top cover plate and extending into the tank for grinding and pumping under pressure sewage collected in the tank, an integral manway housing member defining an enclosed space for accommodating a workman and supported over said collection tank, said manway housing member having a bottom area with cross-sectional dimensions slightly less than the cross-sectional dimensions of the upper portion of said collection tank and having enlarged openings in the bottom and top ends thereof, said

collection tank having an upper peripheral wall section coacting with a lower peripheral wall section on the bottom of the manway housing member that defines the enlarged opening in the bottom end thereof for securely supporting said manway housing member on the top of the collection tank, means for securing the peripheral wall section defining the opening in the bottom end of said manway housing member around the upper peripheral wall section of said collection tank in a substantially airtight and watertight manner, a substantially weatherproof removeable top cover closing the top end of said manway housing member, means for venting the upper end of said manway housing member to a source of atmospheric pressure with the top cover in place without impairing the weatherproof characteristics of the enclosure, said sewage grinder pump unit suspended from the top cover plate of said collection tank having a substantially airtight and watertight control housing within which an electric motor for driving the grinder pump and controls therefor are mounted, and a breather vent pipe means connected to the interior of the control housing of said grinder pump unit and extending to the upper end of said manway housing member for venting said control housing to a source of atmospheric pressure.

4,014,476

APPARATUS FOR WINDING CONTINUOUS THREADS  
OR YARNS

Herbert Turk, Remscheid, and Herbert Schiminski, Huckeswagen, both of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

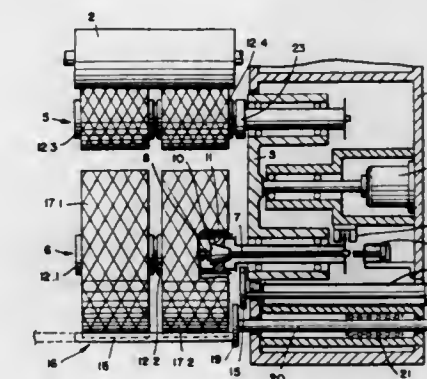
Filed Nov. 19, 1975, Ser. No. 633,455

Claims priority, application Germany, Nov. 21, 1974, 2455116

Int. Cl.<sup>2</sup> B65H 75/32, 67/04

U.S. Cl. 242—19

8 Claims



1. An apparatus for winding continuous threads or yarns, said apparatus comprising:  
a rotatable chuck having a stop mounted thereon;  
a removable spool sleeve slidably mounted on said chuck for thread take-up, a spacing lug on the end surface of said sleeve engaging said stop for spacing said end surface from said stop; and  
a means for cutting said thread located on said chuck in the space formed between said sleeve end surface and said stop.

4,014,477

## KITE REEL

Terry C. Hyun, 3421 Rivera St., San Francisco, Calif. 94116  
Filed Oct. 9, 1975, Ser. No. 620,951

Int. Cl.<sup>2</sup> B65H 75/48

U.S. Cl. 242—96

6 Claims

1. A kite reel for controlling the winding and unwinding of a line comprising:  
a. a spool member having an inner and an outer end, said spool member adapted for reception of a length of line about the spool, the outer end of said spool permitting unobstructed winding and unwinding of line;  
b. an elongate handle having a length substantially greater



than the axial length of said spool member, said handle extending from the inner end of said spool at a generally central location, said handle defining a neck portion adjacent the inner end of said spool, said spool member and handle having a center of balance in the said neck area at which center of balance the user can balance the



reel extending the handle substantially along the user's forearm to stabilize the reel; and  
c. at least one crank handle associated with said spool and extending from the outer end of said spool and radially offset from the axis of the handle, said crank being rotative independently of said spool whereby the winding and unwinding of line is manually facilitated.

4,014,478

## SECURITY WINCH FOR DIVERS

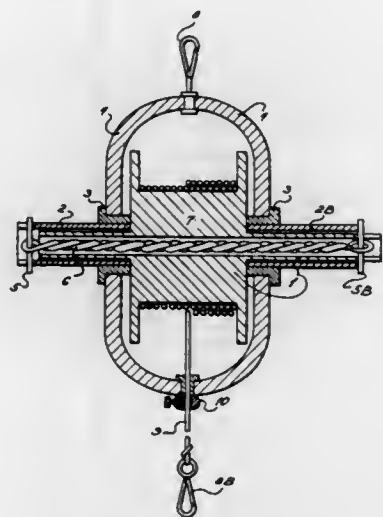
Jean-Claude Bonacina, 42 Rue Arson, 06 300 Nice, France  
Filed Feb. 13, 1975, Ser. No. 549,825

Claims priority, application Monaco, Feb. 18, 1974,  
10931001

Int. Cl.<sup>2</sup> B65H 75/48

U.S. Cl. 242-107

3 Claims



1. A winch comprising a housing having means for securement to a buoy, a drum located within said housing, a pair of hollow tubes extending outwardly of said housing along an aligned axis, a movable bushing interposed between said hollow tubes and said housing having an inner end engaging said drum, said bushings being axially adjustable relative to each other to position said drum within said housing, said drum having a hollow central shaft freely journaled concentrically within the tubes, one end of said shaft extending outwardly of one tube, the other end of said shaft terminating within the other tube, an elongated line secured at one end to the drum and wound about its surface, the other end of said line extending out of said housing, a continuous annular elastic band arranged along the axis of said hollow shaft, a first slot formed at the one end of said shaft extending from the associated tube, a pin received in said slot passing through the elastic band in engagement with said tube, a second slot formed in the tube adjacent the other end of said shaft, a pin received in said second slot and passing through said elastic band, thereby fixing said band to said housing, said drum being free movable

on winding or unwinding of said line to torsionally bias said elastic band by a pull on said line providing motive power for the automatic return of said drum on release of said line.

4,014,479

## SAFETY BELT SYSTEM WITH PYROTECHNICALLY DRIVEN TURNING DEVICE

Karl Erik Nilsson, Röntgenstr. 30, and Günter Herrmann, Röntgenstr. 24, both of, 8012 Ottobrunn, Germany

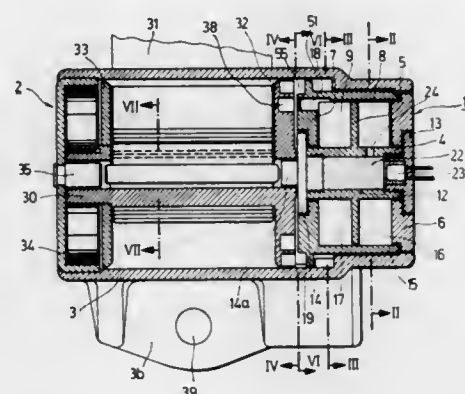
Filed Mar. 5, 1976, Ser. No. 664,313

Claims priority, application Germany, Mar. 11, 1975,  
2510514

Int. Cl.<sup>2</sup> A62B 35/02; B65H 75/48

U.S. Cl. 242-107.4 R

13 Claims



1. A winding assembly for a vehicle safety belt system comprising a belt rolling device having a safety belt arranged in winding engagement therewith, a high speed turning device adapted to be driven by pyrotechnical gases, means for generating said pyrotechnical gases to drive said turning device when said vehicle is decelerated at a given rate, and interconnecting means for connecting said high speed turning device with said belt rolling device to effect winding therein of said safety belt when said pyrotechnical gases are generated, said high speed turning device comprising: a rotatably mounted shaft; means defining a pair of annular chambers about such shaft; a pair of vanes affixed to said shaft, said vanes extending radially from said shaft, one into one of said annular chambers and the other into the other of said annular chambers; a first fixed blade extending into one of said annular chambers and arranged to engage one of said vanes to stop rotation thereof; a second blade extending into the other of said annular chambers and arranged to be engaged by the other of said vanes, said second blade being mounted in operative relationship with said interconnecting means to impart driving rotation of said shaft therethrough; and means for introducing said generated pyrotechnical gases into said annular chambers to effect rotation of said shaft; said blades and vanes being arranged to permit rotation of said shaft by the propellant force of said pyrotechnical gases against said vanes and thereby to effect winding of said safety belt until said one vane engages said first fixed blade.

4,014,480

## INERTIA LOCKING SEAT BELT RETRACTOR

Robert C. Fisher, 580 E. Long Lake Road, Bloomfield Hills, Mich. 48013

Filed Aug. 3, 1973, Ser. No. 385,315

Int. Cl.<sup>2</sup> A62B 35/02; B65H 75/48

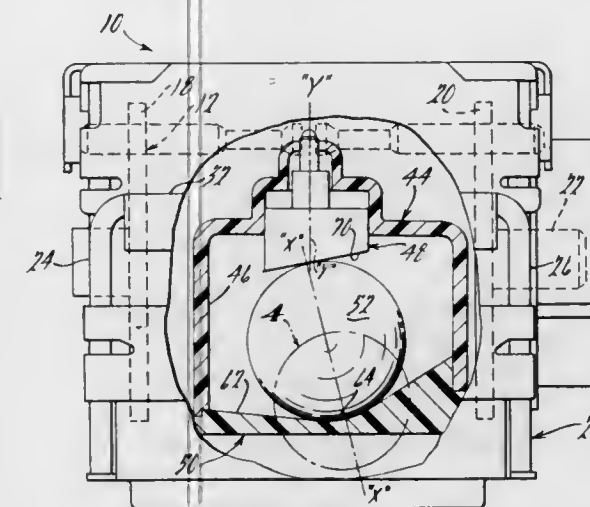
U.S. Cl. 242-107.4 A

2 Claims

1. In a mechanism for locking a safety belt retractor against belt protraction, said retractor comprising a frame, a belt spool mounted for rotation on said frame, movable means for locking said spool against protraction, and a spherical inertia responsive member for moving said means to a locked condition, an improved seat for the direct support of said spherical member comprising a conical portion having a spherical portion at the apex thereof, the radius of said spherical portion

being larger than the radius of said spherical member whereby said inertia member engages said seat in point contact only at all times.

2. In a safety belt retractor comprising a frame, a belt spool having a ratchet thereon mounted for rotation on said frame about an axis extending at an angle to a horizontal plane, a pawl supported on said frame for movement between a locked position wherein it is engaged with the ratchet on said spool and an unlocked position wherein it is disengaged from the ratchet on said spool, a spherical inertia member, and a generally conical seat for said inertia member generated about a



vertical axis so as to substantially equalize the response of said inertia member to acceleration or deceleration in any direction parallel to said horizontal plane, the improvement comprising means engagable with said inertia member and reciprocable along an axis extending at an angle relative to the vertical equal to the angle of said spool axis relative to the horizontal, said reciprocable means being engagable with said pawl to bias said pawl into engagement with the ratchet on said spool, said reciprocable means having a surface engagable with said inertia member which is generated about a vertical axis.

4,014,481

## TOWED CRAFT FOR REPRESENTING AERIAL TARGETS

Wolfgang Daikeler, Friedrichshafen, and Klaus Uwe Exner, Immenstaad, both of Germany, assignors to Dornier GmbH, Germany

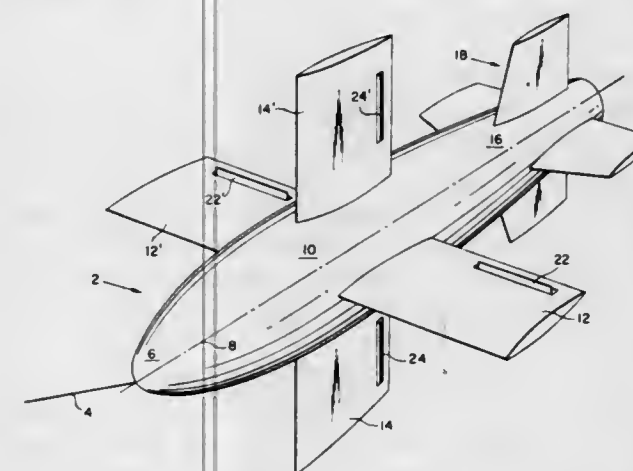
Filed July 11, 1975, Ser. No. 595,111

Claims priority, application Germany, Sept. 26, 1974,  
2445938

Int. Cl.<sup>2</sup> B64C 13/28; F41J 9/10

U.S. Cl. 244-3

1 Claim



1. A target aircraft adapted to be towed by an airplane, comprising a fuselage, means for connecting a towing cable to the nose of said fuselage in the rolling axis thereof, a tail assembly, two pairs of wings mounted on said fuselage in a cross-like configuration,  
a pair of spoiler means mounted in each pair of wings on hollow shaft means,

lever means connected to said hollow shaft means and having a free end thereof positioned between two electromagnet means,

and said hollow shaft means being connected with torsion rod means positioned inside said hollow shaft means, whereby said spoiler means return to an initial position thereof when said electromagnet means are currentless.

4,014,482

## MISSILE DIRECTOR

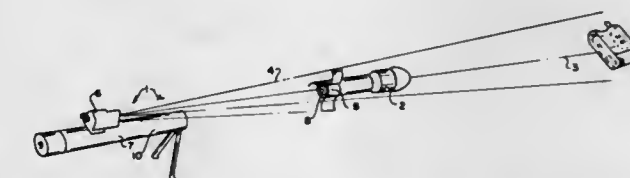
Andrew T. Esker, Florissant; John L. Manche, Bridgeton, both of Mo., and Robert M. Siler, Anaheim, Calif., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 18, 1975, Ser. No. 569,445

Int. Cl.<sup>2</sup> F41G 1/46; F42B 15/10; G02B 27/00

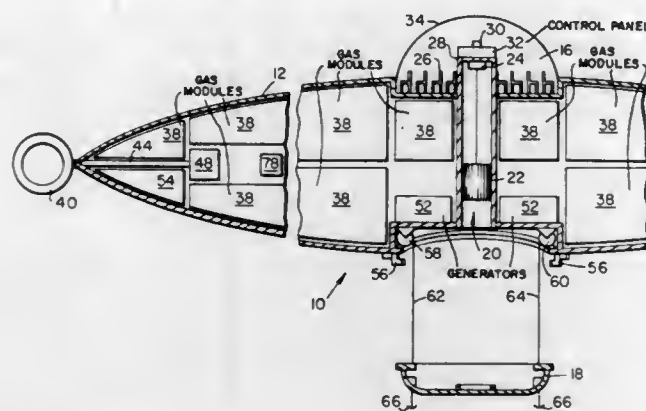
U.S. Cl. 244-3.13

26 Claims





and a plurality of ailerons distributed about the periphery of said lower hull portion, said ailerons being selectively



movable relative to said hull portions to provide variable control surfaces for changing the orientation of said craft in flight.

4,014,484

### VIBRATION ATTENUATING SUSPENSION SYSTEM FOR ROTARY-WING AIRCRAFT ROTORS

René Louis Mouille, Aix-en-Provence (Bouches du Rhone), France, assignor to Societe Nationale Industrielle Aerospatiale, Paris (Seine), France

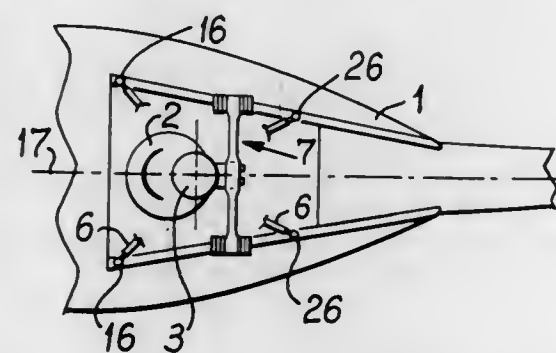
Filed Apr. 25, 1975, Ser. No. 571,863

Claims priority, application France, May 9, 1974, 74.16012

Int. Cl.<sup>2</sup> B64C 27/00

U.S. Cl. 244—17.27

12 Claims



1. A suspension system for an aircraft, having a frame, a rotary wing supported on a vertical shaft and a motor/transmission unit for said rotary wing, said motor/transmission unit having a motor and gear box aligned in the direction of said shaft and being linked by a set of guy rods to said frame, comprising a single elongated beam member arranged transversely to the direction of the shaft supporting the rotary wing, said beam being rigidly secured at a middle portion between the ends of said beam to one side of the casing of said motor/transmission unit and extending at each of its ends into vertical supporting engagement with the frame of said aircraft so that said beam is rotatable in a plane perpendicular to and conjointly with the shaft, and means for resiliently securing each of the ends of said beam member to said frame to dampen the torque created by movement of said beam in said perpendicular plane.

4,014,485

### GAS COOLING SYSTEM FOR HYPERSONIC VEHICLE NOSETIP

Laird D. Kinnaird, and Seth B. Moorhead, Jr., both of Orlando, Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Apr. 14, 1975, Ser. No. 567,673

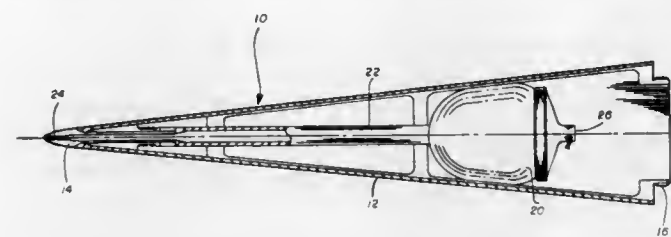
Int. Cl.<sup>2</sup> B64C 1/38

U.S. Cl. 244—117 A

12 Claims

1. An arrangement for protecting the nosecone of a vehicle during travel at hypersonic velocities, comprising a nosecone

provided with a nosetip having orifice means, gas generator means in said vehicle in which comparatively large quantities of gases can be generated, said gas generator means containing a solid propellant, duct means for delivering such gases



from said gas generator means to said orifice means, and means for bringing about on occasion, the generation of gases in said generator means, and consequently the flow of such gases from said orifice means.

4,014,486

### DOOR ACTIVATED AIRBORNE STAIR STRUCTURE

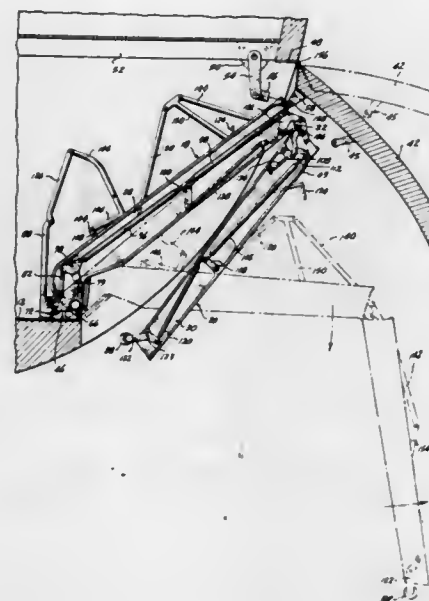
Neal A. Nelson, Bellevue, and Clarence E. Jacobus, Des Moines, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 7, 1975, Ser. No. 629,865

Int. Cl.<sup>2</sup> B64C 1/24

U.S. Cl. 244—129.6

7 Claims



1. An airborne stair and door structure for installation in an aircraft fuselage comprising:

- a door opening in said fuselage defined by a top, a sill and sides;
- a door having a hinge means at its upper edge engaging said aircraft fuselage, said door adapted to close said door opening;
- stair means carried by a support means mounted for rotation about a pivot on a frame means attached to said fuselage at said sill said stair means adapted to rotate outwardly through said door opening to provide access to and from said aircraft;
- at least one operating rod engaging said door at a pivot point spaced inwardly of said fuselage from said hinge means and mounted for reciprocation induced by rotation of said door about said hinge means, first downwardly upon initial movement of said door from a closed position, then past an over-center point and then upwardly upon continued rotation of said door toward an open position;

stair actuator means operated by said operating rod causing rotation of said stair means inwardly of said fuselage upon downward movement of said operating rod and outward

rotation of said stair means upon upward movement of said operating rod; and yoke means engaging said support means and said operational rod adapted to convert reciprocative motion of said rod to rotative motion of said support means, said yoke means permitting continued upward reciprocation of said rod without continued rotation of said support means upon engagement of said stair means with the ground or other support surface;

whereby initial outward rotation of said door from a closed position to an intermediate position whereat said stair can rotate outwardly without engaging said door is accomplished without substantial outward rotation of said stair means and continued outward rotation of said door toward an open position rotates said stair means outwardly and then downwardly of said fuselage toward a ground engaging position; the stair means and the door being mechanically interconnected to counterbalance each other whereby power necessary to operate the door and stair means is minimized.

4,014,487

### WEB THREADING SYSTEM

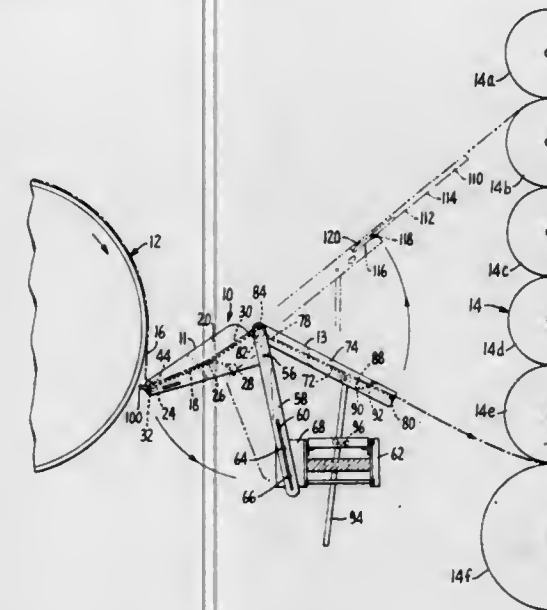
Imants Reba, Vancouver, Wash., and Gerald Hugh Hogland, Estacada, Oreg., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Mar. 31, 1976, Ser. No. 672,172

Int. Cl.<sup>2</sup> B65H 17/32

U.S. Cl. 226—5

19 Claims



12. A method of directing the tail of a moving web of flexible material to a predetermined location comprising the steps of:

- positioning a flow path for gas adjacent to said web tail;
- flowing a pressurized gas through at least one restricted opening communicating with said gas flow path in a direction differing from the direction of said gas flow path;
- changing the direction of the pressurized gas after it flows through said restricted opening through utilization of the Coanda effect so that it flows along the first gas flow path; entraining ambient air with said pressurized gas so that a combined gaseous flow of pressurized gas and entrained ambient air flows along the gas flow path;
- placing the web tail into engagement with the gaseous flow whereby the tail is entrained and propelled thereby along the gas flow path; and
- diverting the direction of a substantial portion of the gaseous flow away from said web tail through utilization of the Coanda effect while physically restraining said web tail in such a manner that the web tail is prevented from moving with said substantial portion of said gaseous flow but is not prevented from moving toward said predetermined location.

956 O.G.—64

4,014,488

### FASTENER FEED APPARATUS AND METHOD

Frank R. Potucek, Des Plaines, and Allen R. Obergfell, Park Ridge, both of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

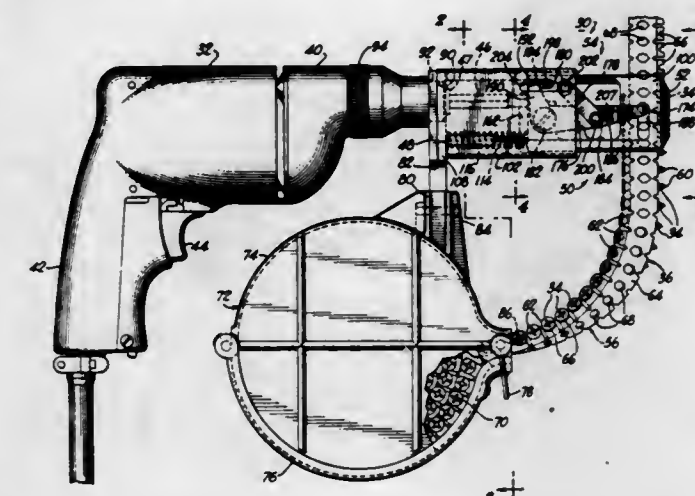
Division of Ser. No. 412,684, Nov. 5, 1973, Pat. No. 3,930,297.

This application July 10, 1975, Ser. No. 594,761

Int. Cl.<sup>2</sup> B65H 17/40

U.S. Cl. 226—6

6 Claims



1. A method of controlling the movement of a strip of fasteners in increments to locate individual fasteners of the strip sequentially at a drive position, said method comprising: periodically advancing the strip a distance equal to the space between fasteners; deforming the strip after each said advancing step to provide a deformed portion of the strip; and moving the deformed portion of the strip into engagement with a stop to prevent reverse movement.

4,014,489

### VARIABLE YARN FEED DEVICE

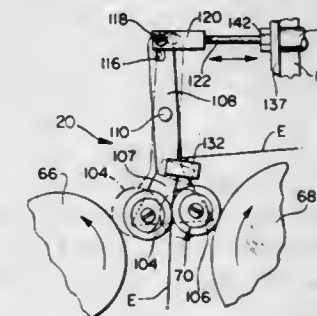
Stephen M. Bialek, Barrington, R.I., assignor to Providence Pile Fabric Corporation, Fall River, Mass.

Filed Dec. 1, 1975, Ser. No. 636,552

Int. Cl.<sup>2</sup> B65H 17/20, 17/52

U.S. Cl. 226—9

18 Claims



1. A device for feeding strand at varying rates comprising, rotatable drive means for continuously gripping said strand, a first speed-control member rotatable at a first relatively slow surface speed in one direction, a second speed-control member spaced from said first member and rotatable at a second relatively fast surface speed in the opposite direction, means for supporting said drive means between said first and second members with said gripped strand always being maintained out of contact with said members, and means for selectively moving said drive means into operative association with said first or said second member so as to alternatively rotate said drive means at said first or said second speed, and accordingly vary the rate at which said strand is fed.



4,014,490

# **APPARATUS FOR FEEDING AND APPLYING FEATURES TO CONTINUOUS WEBS OR ITEMS THEREON**

Donald James Joyce, London, England, assignor to Consort Project Development Limited, London, England

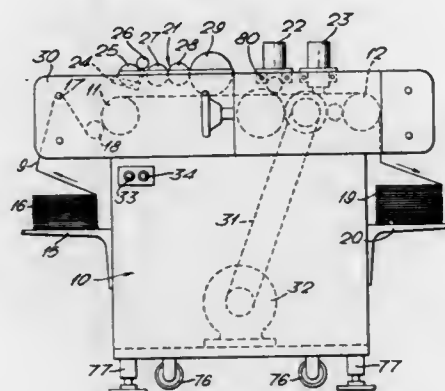
Filed Jan. 2, 1975, Ser. No. 537,866

Claims priority, application United Kingdom, Jan. 3, 1974, 00257/74

Int. Cl.<sup>2</sup> B65H 17/22

U.S. Cl. 226—76

11 Claims



1. Apparatus for feeding continuous web material or items thereon to be processed, the apparatus comprising:

- a machine bed,
- drive means for feeding the web material over the machine bed,
- a framework adapted for mounting at least one of a range of units above the machine bed whereby a variation of processing steps may be carried out on the web material or said items,
- said drive means including a clutch for disconnecting the drive to the web material to provide a dwell period during which at least one processing unit may be operated while the web material is stationary,
- means variable at will for operating the clutch at regular intervals to provide an operating cycle including at least one moving period and at least one dwell period,
- whereby at least one selected processing step may be carried out on the web material or at least one of said items during each operating cycle,
- said variable operating means comprising a disc which is rotatable by said drive means and carries at least one pair of projections spaced apart circumferentially on the disc for engagement in turn with a stationary member, and
- means responsive to each said engagement to effect operation of the clutch.

4,014,491

# **ARRANGEMENT FOR ADJUSTING AND MEASURING WEB TENSION LEVELS**

Hans Gref, Cologne; Wolfgang Schweicher; Hans Frenken, both of Leverkusen; Heinz Bussmann, Opladen; Karl Voss, Leverkusen; Helmut Schaffer, Opladen, and Willi Junkersdorf, Monheim, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 6, 1974, Ser. No. 521,500

Claims priority, application Germany, Nov. 9, 1973, 2356009

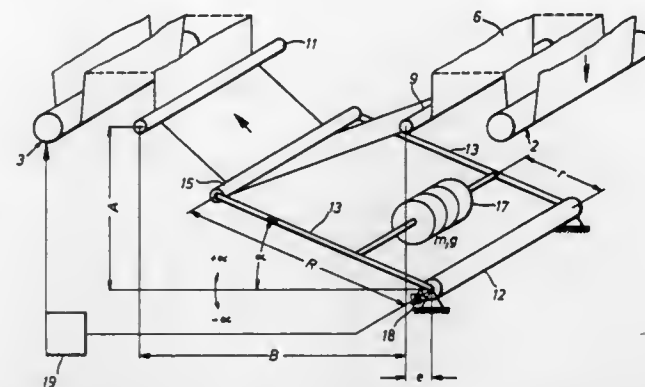
Int. Cl.<sup>2</sup> B65H 17/42

U.S. Cl. 226—113

5 Claims

1. An arrangement for adjusting and regulating the tension level of a moving web of material, comprising at least one guide roller disposed in contact with the moving web of material, which turns around the guide roller, the guide roller being mounted for rotation on two substantially parallel torsion-resistant swing arms, the swing arms being disposed of an

angle  $\alpha$  with the horizontal, wherein  $\alpha$  is situated in an angular range of  $\pm 15^\circ$  relative to an angle  $\alpha_m$  which is defined by the



position of the guide roller or rollers at which the tension in the web is a minimum.

4,014,492

# **SURGICAL STAPLE**

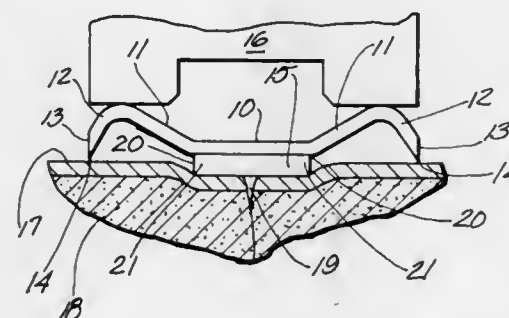
Robert G. Rothfuss, Bellevue, Ky., assignor to Senco Products, Inc., Cincinnati, Ohio

Filed June 11, 1975, Ser. No. 585,804

Int. Cl.<sup>2</sup> B25C 5/10, 5/16; A61B 17/10

U.S. Cl. 227—19

8 Claims



1. In combination with a stapling tool having a forming anvil and a cooperating forming die, a surgical staple for joining the severed skin or fascia of a patient, said staple, prior to emplacement, being configured with a straight central portion of a length approximately equal to the width of said forming anvil, a straight portion extending upwardly and outwardly from each end of said central portion at an obtuse angle, and a relatively short straight portion extending downwardly and outwardly from the uppermost end of each of said upwardly and outwardly extending portions, said downwardly and outwardly extending portions terminating in vertical outer surfaces producing sharp points at the lowermost ends of said downwardly and outwardly extending portions, the upper corners of said forming anvil, about which said staple is formed by said die during emplacement of the staple, having a small radius of curvature, the points of said staple prior to emplacement, lying approximately in a horizontal plane passing through the centers of curvature of said small radii, said staple, when emplaced by said tool, having a box-like configuration, with the skin or fascia being joined thereby, everted within said box-like configuration.

3. A surgical staple for joining the severed skin or fascia of a patient, said staple, prior to emplacement, being configured with a straight central portion, a straight portion extending upwardly and outwardly from each end of said central portion at an obtuse angle, and a relatively short straight portion extending downwardly and outwardly from the uppermost end of each of said upwardly and outwardly extending portions, said downwardly and outwardly extending portions terminating in outer vertical surfaces producing sharp points at the lowermost ends of said downwardly and outwardly extending portions

4,014,493

# **HOUSING FOR A STAPLER**

Maynard Frank Wolfe, Hong Kong, Hong Kong, assignor to Prodev Limited, Hong Kong, Hong Kong

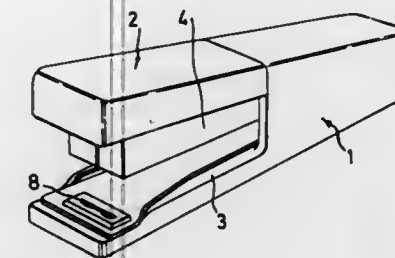
Filed July 11, 1975, Ser. No. 595,261

Claims priority, application United Kingdom, July 29, 1974, 33479/74; Feb. 13, 1975, 6184/75

Int. Cl.<sup>2</sup> B25C 5/02

U.S. Cl. 227—156

8 Claims



1. A housing for a stapler having a head which incorporates a staple magazine, and a base carrying a die, the head and the base being pivotally attached to one another, the housing comprising a first housing part attached to the base and extending over a portion of the head, and a second housing part attached to the head, relative pivoting movement of the head and the base being limited by the extension of the said first housing part over the said portion of the head.

4,014,494

# **COLD BUTT-WELDING MACHINE**

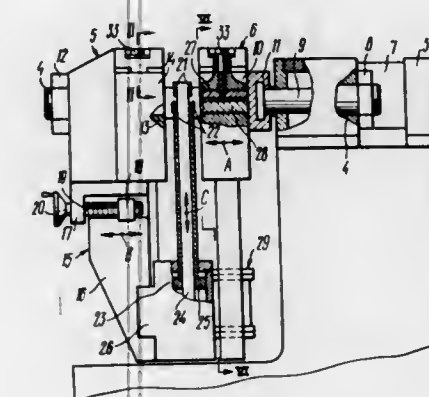
Nikolai Alexeevich Glagolev, ulitsa Tagil'skaya, 20a; Gennady Alexeevich Klimenko, ulitsa 1, Izhakevicha, 7/10, kv. 71; Anatoly Ivanovich Chvertko, Bulvar Lesi Ukrainki, 2, kv. 39, all of Kiev; Boris Ivanovich Kononets, ulitsa Ostrovskogo, 2, Brovary Kievskoi oblasti; Pavel Ivanovich Gursky, Bulvar Lesi Ukrainki, 2, kv. 58, Kiev; Vladimir Alexandrovich Nosachev, ulitsa Vavilova, 19, kv. 5, Zaporozhie; Leonid Grigorievich Kravchenko, ulitsa Admiral'skaya, 7, kv. 8, Zaporozhie; Valentin Georgievich Basov, ulitsa Ulyanova, 19, Zaporozhie; Larisa Evgenievna Bogomolova, ulitsa Krasnoarmeiskaya, 129, kv. 16, Kiev; Viktor Andreevich Ivanov, ulitsa Vesnina, 11, kv. 1, Zaporozhie, and Konstantin Konstantinovich Khrenov, ulitsa Cheljuskinskaya, 15, kv. 11, Kiev, all of U.S.S.R.

Filed July 5, 1974, Ser. No. 486,206

Int. Cl.<sup>2</sup> B23K 21/00

U.S. Cl. 228—3.1

6 Claims



1. A machine for cold butt welding of metal blanks, comprising: a machine bed; a mechanism for upsetting blanks, installed on said bed and including a power drive and a housing, the latter being installed on said bed with means for possible set turning in at least one vertical plane in relation to the direction of a substantially horizontal upsetting force; substantially horizontal guide members single-endedly fixed in said housing; two devices for clamping the blanks, with respective

housings, installed on said guide members, so that one device is stationary while the other device is displaceable in the direction of the substantially horizontal upsetting force by means of said power drive; a carriage installed on said housing of the one clamping device; including movable and stationary portions, the former displaceable in the direction of the upsetting force; blades for cutting off the ends of the blanks, installed on portions of said carriage protruding between said housing of the clamping devices; a drive for displacing said blades in a vertical plane perpendicular to the direction of the upsetting force; two half-dies to accommodate one of the blanks to be welded, respectively positioned in said clamping devices; and individual drives for closing said half-dies.

4,014,495

# **AUTOMATIC WELDING APPARATUS**

Tatsuharu Oda, Toyonaka; Yukio Iwasaki; Hideo Koyama, both of Takarazuka; Shigeo Maruyama; Takashi Matsubara, both of Nishinomiya; Keiichi Hozumi, Takarazuka, and Hiroya Kano, Ashiya, all of Japan, assignors to Shin Meiwa Industry Co., Ltd., Japan

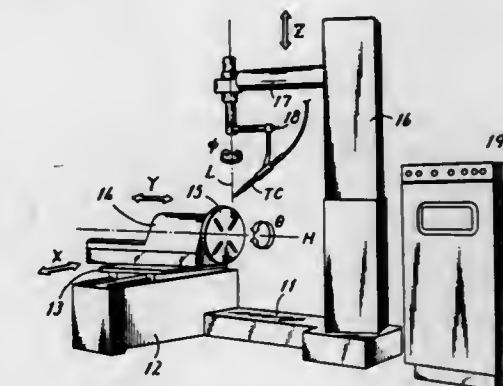
Filed Sept. 6, 1974, Ser. No. 503,879

Claims priority, application Japan, Feb. 22, 1974, 49-21824[U]; May 14, 1974, 49-54131; June 6, 1974, 49-64672

Int. Cl.<sup>2</sup> B23K 37/02, 5/02, 11/30

U.S. Cl. 228—7

16 Claims



1. An automatic welding apparatus comprising: a workpiece fixture for securing a workpiece thereto, said workpiece fixture being rotatable about an axis, a welding torch, means for holding said welding torch, means for movably mounting said welding torch holding means including: a guide extending in a first, horizontal direction, a first sliding member mounted on said guide for sliding movement in said first, horizontal direction, a second sliding member mounted on said first sliding member for sliding movement in a second, vertical direction, and a third sliding member mounted on said second sliding member at an extremity thereof for sliding movement in a third, horizontal direction orthogonal to said first and second directions, said welding torch holding means being carried by said third sliding member for rotation about an axis parallel to said second, vertical direction, means for mounting said workpiece fixture for rotation about an axis extending parallel to said first, horizontal direction, and means controlling the respective rotations of said workpiece fixture and said torch holding means and for controlling said movable mounting means for adjusting the relative positional relationship in said three directions of said workpiece fixture and said torch holding means.

5. An automatic welding apparatus in accordance with claim 1, which further comprises an adaptor detachably mounted at the end of said torch, said adaptor comprising a needle for indicating a welding point by the pointed end thereof and an elastic member for carrying said needle.



4,014,496

**CUP FORMED CONTAINER HAVING EDGE FLANGE**  
Od Wikar Christensson, Stockholm, Sweden, assignor to Asseltopac Aktiebolag, Jarfalla, Sweden

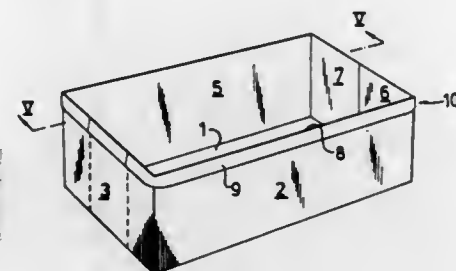
Filed Nov. 24, 1975, Ser. No. 634,771

Claims priority, application Sweden, Dec. 10, 1974, 7415448

Int. Cl.<sup>2</sup> B65D 5/24, 5/40

U.S. Cl. 229—31 R

15 Claims



1. Cup formed container made of a plain punched container blank of cardboard or similar stiff material and comprising a bottom (1), two opposite side pieces (2) which are coherent with the said bottom, and which are wider than the side of the bottom (1) with which they are connected, and two opposite joint flaps (3) which are of the same or less width than the side of the bottom (1) with which they are connected, characterized in that each side piece (2) with a central side part (5) forms a complete container side and with an outer side part (6,7) on each side of said central side part (5) forms part of an adjacent container side, so that the outer side parts (6,7) of the two side pieces (2) jointly form at least partially the intermediate container sides, whereby the joint flaps (3) serve to complete the said intermediate container sides and keep the parts thereof together, and that the container round the complete upper edge, including the corners, is formed with a downwards directed narrow edge flange, which is made of and folded from the same piece of material as the container sides and which forms an angle to the container sides, said flange being continuous and unbroken along said central side parts and said outer side parts of said side pieces, and hence around the corners of the container upper edge.

4,014,497

**VERTICAL CENTRIFUGE**

Leonhard Spiewok, Wallisellen, and Albert Bucher, Kriens, both of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

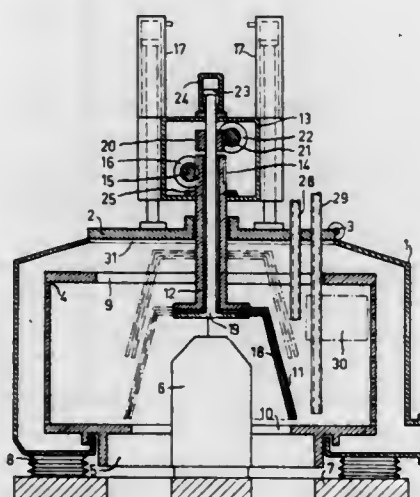
Filed Apr. 13, 1976, Ser. No. 676,466

Claims priority, application Switzerland, Apr. 22, 1975, 005137/75

Int. Cl.<sup>2</sup> B04B 11/04

U.S. Cl. 233—20 R

10 Claims



1. A vertical centrifuge comprising

- a. a housing provided with a cover which closes its upper end;
- b. a centrifuge drum mounted in the housing for rotation about a vertical axis and having a top inlet opening and a bottom discharge opening;
- c. means for leading material through the cover and the inlet opening to a region of the drum located at one side of said axis;
- d. stripping means in said region for separating centrifuged material from the drum and thereby facilitating its discharge through the discharge opening;
- e. a shielding wall located inside the drum above the discharge opening and extending around only a portion of the circumference of that opening;
- f. a shaft extending vertically into the drum through the cover and the inlet opening and connected with the shielding wall; and
- g. means for rotating the shaft between positions in which the shielding wall is disposed at opposite sides of said axis, the shielding wall serving selectively to impede passage of material from said region to the discharge opening when positioned at the same side of the axis as that region, and to permit free passage of material from said region to the discharge opening when positioned at the opposite side of the axis.

4,014,498

**METHOD AND APPARATUS FOR CENTRIFUGING SLUDGE-CONTAINING LIQUIDS**

Edward Broadwell, Isleworth, and William Charles Thompson, Great Bookham, both of England, assignors to Alfa-Laval AB, Tumba, Sweden

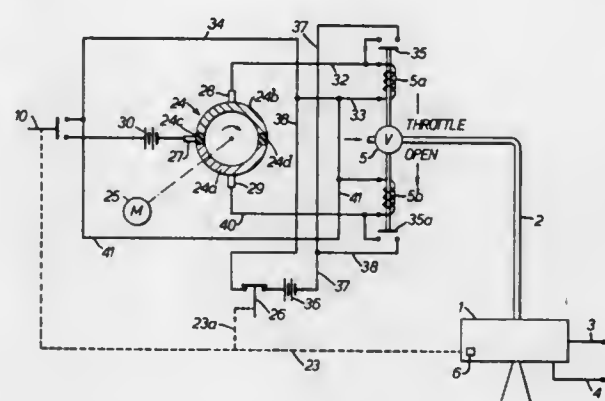
Filed Feb. 23, 1976, Ser. No. 660,730

Claims priority, application United Kingdom, Feb. 21, 1975, 1746/75

Int. Cl.<sup>2</sup> B04B 11/02

U.S. Cl. 233—20 R

11 Claims



1. In the separation of different components from a fluid mixture by means of a centrifugal separator, the method which comprises feeding the mixture into the rotor of said separator, sensing when a predetermined amount of a separated heavy component has been collected within the rotor, opening outlets at the periphery of the rotor in response to each said sensing operation so that the separated heavy component is discharged, measuring the actual period of time between consecutive sensing operations, and controlling the rate of the mixture feed to the separator as a function of the measuring operation.

4,014,499

**TEMPERATURE CONTROL APPARATUS**

William L. Hamilton, 9365 Euclid-Chardon Road, Kirtland, Ohio 44094

Filed Oct. 30, 1975, Ser. No. 627,047

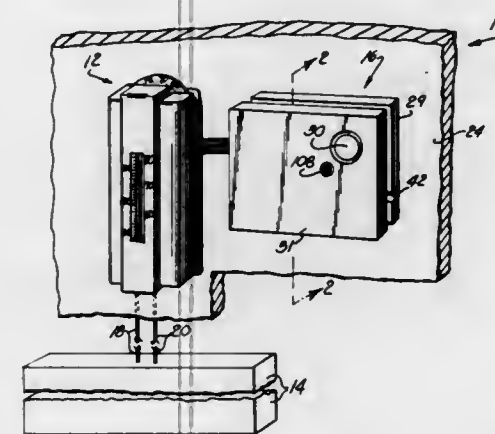
Int. Cl.<sup>2</sup> G05D 23/32

U.S. Cl. 236—46 R

20 Claims

1. Temperature control apparatus for effecting operation of

an air conditioning system to maintain the temperature in a room at either a relatively high temperature or a relatively low temperature, said apparatus comprising a first thermoelectric control means for effecting operation of the air conditioning system to maintain the relatively low temperature, second thermoelectric control means for effecting operation of the air conditioning system to maintain the relatively high temperature, and circuit means for activating said first thermoelectric control means to maintain the relatively low temperature for a predetermined time period and for effecting activation of said



second thermoelectric control means to maintain the relatively high temperature after the predetermined time period has elapsed, said circuit means including storage means for holding an electrical charge, means for varying the charge in said storage means from a first magnitude to a second magnitude in said predetermined time period, and means for effecting activation of said second thermoelectric control means to maintain the relatively high temperature upon a change in the magnitude of the charge in said storage means to said second magnitude.

4,014,500

**TEMPERATURE SET BACK**

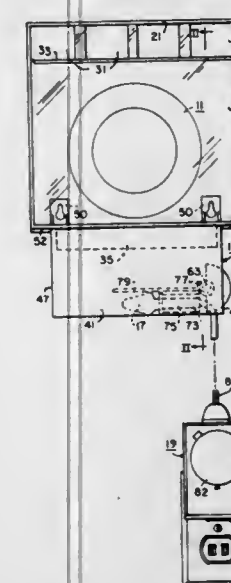
Charles S. Galtz, 2863 Beechwood Blvd., Pittsburgh, Pa. 15217

Filed Sept. 8, 1975, Ser. No. 611,078

Int. Cl.<sup>2</sup> G05D 23/30

U.S. Cl. 236—46 R

8 Claims



1. Temperature set-back control apparatus for setting back, during set-back intervals, the temperature of a region whose temperature is under the control of a thermostat at a position in said region sensing the temperature in said region at said position, the flow of ambient air in said region being directed towards said thermostat, the said apparatus including an enclosure enclosing said thermostat, providing a protective heated environment for said thermostat not susceptible to prevailing ambient air currents, said enclosure having an air

inlet on one side of said thermostat and an air outlet on another side of said thermostat, said air outlet being transverse to the path of direct flow of said ambient air to said thermostat, switch means, operative during each of said set-back intervals to define each of said set-back intervals, and means, operable, only on said operation of said switch means during each set-back interval, connected to said enclosure, for pre-heating the air flowing into said inlet during said set-back intervals, thereby increasing the temperature in said enclosure and causing said thermostat to sense temperature higher than the ambient temperature in said region and to produce a set-back in said ambient temperature.

4,014,501

**CONTAINER FOR AIR TREATING MATERIAL**

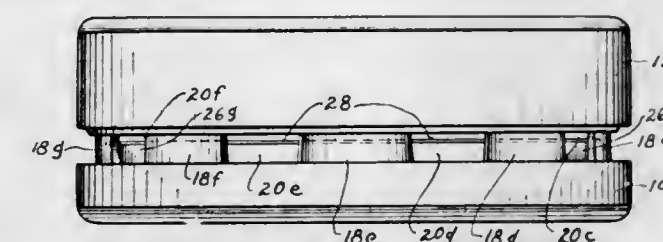
Robert H. Buckenmayer, Stanhope, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.

Filed Feb. 24, 1976, Ser. No. 660,910

Int. Cl.<sup>2</sup> A61L 9/00

U.S. Cl. 239—58

11 Claims



1. A dispenser for volatile materials comprising a base part for said volatile material, said base having a plurality of sidewall segments with apertures therebetween, projections extending from the exterior surface of at least two opposing sidewall segments and support means positioned within the area defined by said sidewall segments for suspending a layer of said volatile material in an elevated position intersecting said apertures; and

a cover for said base having at least one oblique groove on the interior of the side wall thereof, said groove engaging said projections facilitating rotation and corresponding raising and lowering of said cover to conceal or partially or totally expose said apertures.

4,014,502

**LAWN, FARM, AND ORCHARD SPRINKLERS**

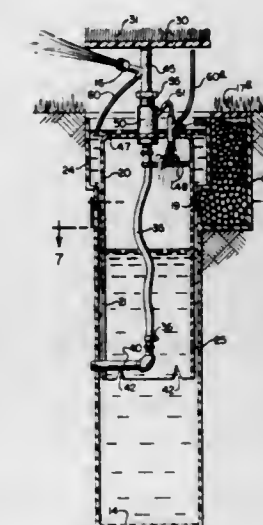
Kerney T. Sheets, Duplessis, La., assignor to Kerney T. Sheets, Duplessis, La.

Division of Ser. No. 439,323, Feb. 4, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,457

Int. Cl.<sup>2</sup> B05B 15/10

U.S. Cl. 239—206

43 Claims



1. A projectable lawn, farm, and orchard sprinkler comprising:  
a. housing means having a top end and a bottom end;



- b. projectable float means located in said housing means;
- c. sprinkler head means connected to said projectable float means for spraying fluids, said sprinkler head means having first pump means connected thereto for removing liquids from said housing means;
- d. second pump means rigidly connected to said projectable float means for conveying air and liquids to the interior of said projectable float means to float said projectable float means upward within said housing means; and,
- e. liquid supply means connected to said second pump means for supplying liquids under pressure to said second pump means and to said sprinkler head means.

4,014,503

# **METHOD AND APPARATUS FOR CONTROL OF CENTRAL SPACING OF TRACK-OPERATED VEHICLES** Juergen Raimer, Linden, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

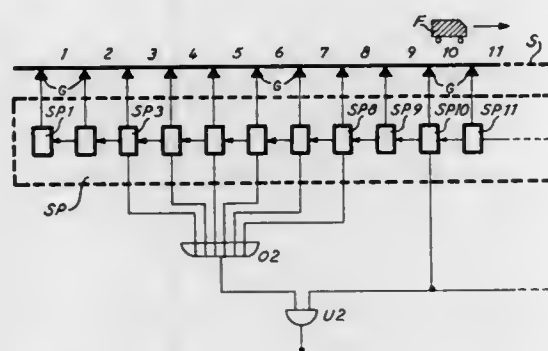
Filed Mar. 31, 1975, Ser. No. 563,299

Claims priority, application Germany, May 17, 1974, 2424161

Int. Cl.<sup>2</sup> B61L 21/10

U.S. Cl. 246—34 R

7 Claims



1. A method for central spacing control of track-operated vehicles, particularly railroad vehicles, along paths which are subdivided into individual track sections for the positioning of the vehicles, which sections are continuously monitored as to occupation, in dependence upon the instantaneous position of the vehicles, preferably utilizing stationary information systems, particularly for railroad systems with a dense train succession and small track section lengths, and without continuous information systems between vehicles and a main office, comprising the steps of continuously monitoring in the main office, for the track sections indicated as being occupied by a vehicle or a series of coupled vehicles, a group of sections behind and a group of sections ahead thereof, defining a predetermined minimum distance between successive vehicles or series of coupled vehicles, to determine whether such groups of sections ahead of and behind the occupied sections are free of vehicles, and actuating a signal for initiating a forced braking of the following vehicle or vehicles when a section, in either of said groups, is indicated as occupied and thus is within the path range defined by such minimum distance.

4,014,504

# **CABLE HOOKING DEVICE**

Isaac Sachs, 2065 Chartier Ave., Dorval, Quebec, Canada (H9P 1H3)

Filed Feb. 2, 1976, Ser. No. 654,577

Int. Cl.<sup>2</sup> E21F 17/02

U.S. Cl. 248—61

20 Claims

1. A hooking device for holding a cable from a suspended wire comprising:

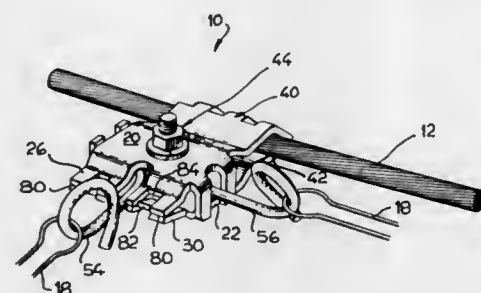
- a. a pair of substantially identical plates opposingly disposed, each plate comprising:
  - first and second end edges,
  - first and second lateral edges,

said first end edge being bent to provide a jaw means for gripping said suspended wire and having teeth asymmetrically formed therein,

said second end edge being bent to provide a hinging means and having:

1. first receiving means comprising a notch centrally located therealong,
  2. guide means comprising:
    - i. a projection along one portion,
    - ii. a second notch at a second portion thereof, and
- said first lateral edge having second receiving means comprising spaced fingers projecting therefrom;

b. releasable coupling means operable to bias said plates



toward one another for securing said wire between said jaw means, and

- c. at least one hooking member for holding said cable; whereby said asymmetrically formed teeth of said first end edges of two opposingly disposed plates interdigitate, said projection along said one portion of a second end edge of one plate is inserted in said second notch at said second portion of a second end edge of a second plate thereby preventing relative lateral movement of the plates, and said central notches of the two plates together from the first receiving means and said fingers form the second receiving means, adapted to receive a hooking member perpendicular to and parallel to said wire, respectively.

4,014,505

# **NURSING BOTTLE SUPPORT**

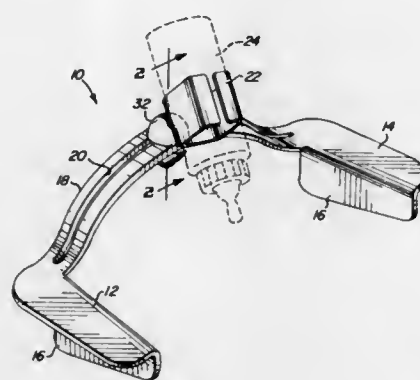
Harry J. Dowd, Phoenix, Ariz., assignor to Dowd &amp; Holbrook Enterprises, Inc., Tempe, Ariz.

Filed June 16, 1976, Ser. No. 691,281

Int. Cl.<sup>2</sup> A47D 15/00

U.S. Cl. 248—105

10 Claims



1. A nursing bottle support comprising:
  - a base having a pair of lateral support stretches and a transversely extending, slotted stretch interconnecting said lateral stretches, said slotted stretch being convexly curved and adapted to overlie the torso of an infant;
  - a holder adapted and configured to removably receive and hold a nursing bottle; and
  - a pivotal, shiftable connector means extending through the slot of said slotted stretch to releasably secure said holder on a corresponding portion of said slotted stretch, said connector means permitting pivoting of said holder in a pair of mutually perpendicular planes one of which ex-

tends substantially perpendicular to the plane of said corresponding portion of the slotted stretch, said connector means and holder being shiftable as a unit along said slot of the convexly curved, slotted stretch,

said connector means including a pair of hemispherical elements disposed on opposite upper and lower sides of said slotted stretch with surfaces frictionally engaging said upper and lower sides, said elements having narrow, through apertures therein and relatively arranged with said apertures aligned and lying in said one of the mutually perpendicular planes.

4,014,506

# **SUPPORT COLLAR ASSEMBLY FOR FLOWER POTS AND THE LIKE**

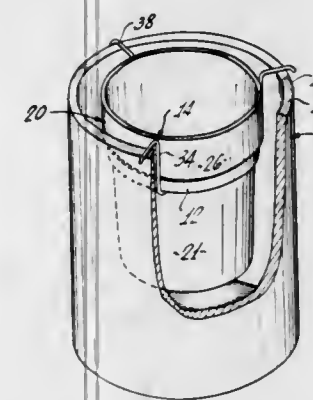
Jack D. Hanson, Garden Grove, Calif., assignor to Hanson House, Inc., Long Beach, Calif.

Filed Apr. 25, 1975, Ser. No. 571,641

Int. Cl.<sup>2</sup> A47K 1/08

U.S. Cl. 248—311.1

10 Claims



1. In combination with a container having an outer marginal flange adjacent to the upper edge thereof and having a central vertical axis, a support collar assembly comprising:
  - a support collar member adaptable to be attached immediately below the flange of said container; and
  - a hanger assembly including a plurality of spaced mounting means each of which are pivotally attached to said support collar member and a plurality of hanger members each of which are affixed to each one of said plurality of mounting means, said hanger members each being rotatable about an axis generally parallel to said container axis said support collar member in an arc of approximately 180°, said hanger members extending upwardly and outwardly with respect to said support collar member, each said hanger member terminating in a cantilevered support arm having a free end adaptable to be supported on a larger outer container.

4,014,507

# **SEAT SUPPORTING ASSEMBLY**

Richard F. Swenson, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Jan. 12, 1976, Ser. No. 648,137

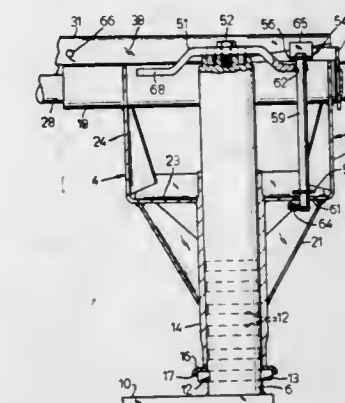
Int. Cl.<sup>2</sup> F16M 11/00, 13/00

U.S. Cl. 248—407

7 Claims

1. A seat assembly for a mobile vehicle and for rotatably and slideably supporting a seat, said assembly comprising:
  - a carriage for supporting said seat;
  - a rigid, stationary and generally vertical shaft securable to said vehicle;
  - a support frame rotatably supported by said shaft and vertically slideable on said shaft, said carriage slideably mounted on said frame for reciprocating movement relative thereto and between fore and aft positions; and
  - latch means for selectively preventing rotational movement of said support frame with respect to said shaft and operably connected between said shaft and said support frame

and a releasing member operably connected to and carried by said carriage for disengaging said latch means when said carriage is moved to said aft position thereby permitting rotational movement of said support frame after said carriage has been slid to said aft position, said latch means including a stationary latch member fixed to



said vertical shaft and a shiftable latch member including a swingable member pivotally supported by said frame, and an elongated latch shaft positioned vertically and supported by said swingable member for swingable movement about a vertical axis spaced from said elongated latch shaft for engagement with said stationary latch member.

4,014,508

# **BOOK HOLDING DEVICE**

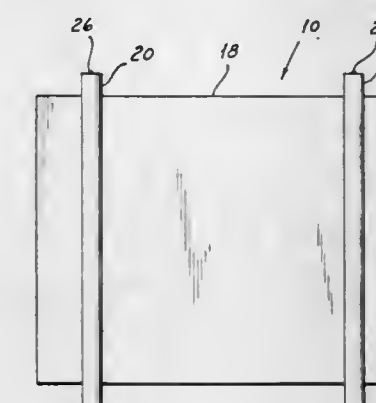
Adelle Weiss, 214 Carol Ave., Pelham, N.Y. 10803

Filed Nov. 13, 1975, Ser. No. 631,511

Int. Cl.<sup>2</sup> A47B 97/04

U.S. Cl. 248—451

6 Claims



1. A book holding device, which comprises:
  - a. a board for supporting said book, said board having a front face and a rear face;
  - b. a pair of elongated relatively inflexible retaining members for retaining the respective left-hand and right-hand halves of said book against the front face of said board;
  - c. a pair of elastic cords for elastically securing said retaining members to said board, each of said elastic cords extending across the rear face of said board between the ends of one of said members; and
  - d. means located on said rear face of said board forming a pair of channels for respectively receiving and substantially enclosing a portion of said elastic cords for horizontal sliding movement between inner limits adjacent to the vertical centerline of said board and outer limits adjacent to and spaced from the outer periphery of said board.



4,014,509

**PROPORTIONAL ELECTROMAGNETIC-TYPE  
DIRECTION- AND THROTTLE-CONTROLLING VALVE**  
Susumu Yoshino; Masaru Kikuchi, both of Fujisawa, and  
Hisakazu Ichioka, Yokohama, all of Japan, assignors to  
Yuken Kogyo Company Limited, Fujisawa, Japan

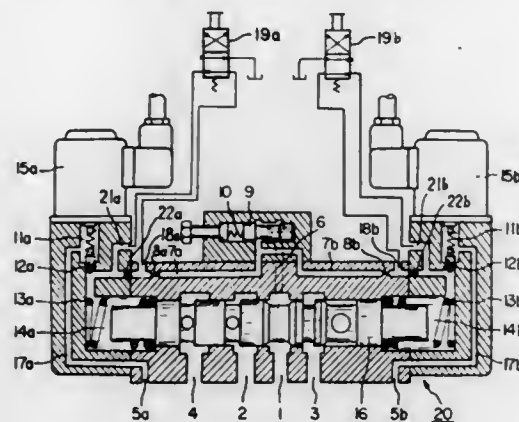
Filed May 28, 1975, Ser. No. 581,684

Claims priority, application Japan, May 31, 1974, 49-60785

Int. Cl.<sup>2</sup> F16K 31/42; F15B 13/043

U.S. Cl. 251-26

4 Claims



1. A proportional electromagnetic type direction and throttle control valve comprising a body with a plurality of ports, a spool slidable in said body for controlling communication between said ports, said body having chambers at opposite ends of said spool, springs in said chambers acting on said spool at the ends thereof, one of said ports being a pilot pressure port, a pressure reducing valve connected to said pilot pressure port, two pilot pressure passages being provided in said body connected to the output of said pilot pressure valve to receive pilot pressure flow therefrom, a flow restricting orifice in each pilot passage, each pilot pressure passage being connected downstream of said orifice with a respective said chamber, a discharge outlet being provided in each said passage between the associated orifice and chamber, a poppet valve for selectively closing each discharge outlet, a further spring acting on each poppet valve to urge the same to closed position and a D-C solenoid acting on each said poppet valve in series with the respective said spring for exerting an additional force on said poppet valve to urge said valve to close said discharge outlet in proportion to the input current to said solenoid.

4,014,510

**PILOT VALVE**

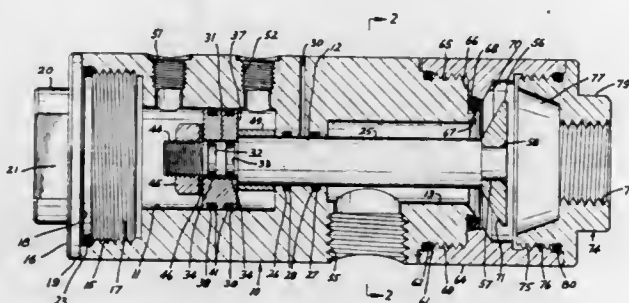
Carl K. Smith, Mathis, Tex., assignor to Midcon Pipeline  
Equipment Co., Fort Worth, Tex.

Filed Sept. 5, 1975, Ser. No. 610,777

Int. Cl.<sup>2</sup> F16K 1/46

U.S. Cl. 251-63

7 Claims



1. Pilot valve, comprising a valve body having a cylindrical piston chamber opening thereinto from one of its ends and having a cylindrical passage opening thereinto from the other of its ends, said chamber and passage being coaxially aligned, a cylindrical shaft passage extending coaxially between said chamber and said passage through said valve body, a ring

member having one of its ends concentrically disposed around said other end of said valve body and sealingly connected thereto, said ring member having an inwardly projecting annular formation therearound one side of which is engaged with said other end of said valve body and the other side of which forms a valve seat, said other end of said valve body having an annular inward portion aligned with said valve seat and forming a continuation thereof, a cylindrical valve shaft sealingly but slidably disposed through said shaft passage and extending into said chamber at one end and into said passage at the other end and fixed to a piston sealingly but slidably disposed in said chamber at its said one end and to a valve at its said other end, said valve being sealingly seatable against said valve seat and being moved to seat thereagainst by movement of said shaft in one axial direction and being moved away from said valve seat by movement of said shaft in the other axial direction, a first removable closure closing the open end of said chamber, a second removable closure having a fluid flow inlet there-through closing the other end of said ring member, a first fluid port to said chamber through said valve body at one side of said piston and a second fluid port to said chamber through said valve body at the other side of said piston, and a fluid outlet through said valve body extending from said passage to the exterior of said valve body.

4,014,511

**BUTTERFLY VALVE**

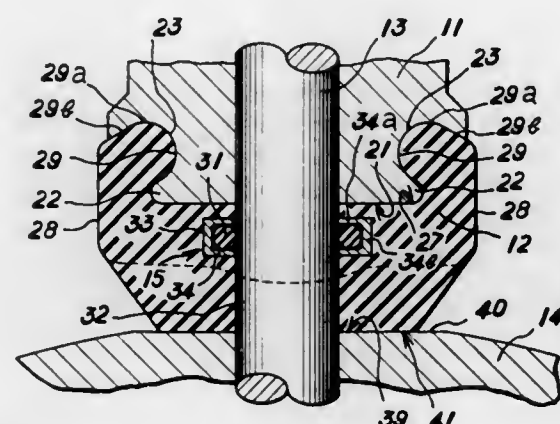
Takayoshi Uno, Osaka, Japan, assignor to Tomoe Technical  
Research Company, Osaka, Japan

Filed Mar. 1, 1976, Ser. No. 662,446

Int. Cl.<sup>2</sup> F16K 1/226

U.S. Cl. 251-306

2 Claims



1. A butterfly valve having an axially extending flow passage comprising:

- a tubular valve body having a flat inner circumferential surface and a pair of radially extending end faces extending transversely to the flow axis,
- an annular valve seat of resilient material having an outer circumferential surface engaging the inner circumferential surface of the valve body and an inner circumferential surface providing a seating surface and defining the axially extending flow passage,
- a valve stem extending transversely through the valve body and the valve seat and being rotatably supported therein,
- a valve disc supported by the valve stem inside the valve seat and having a peripheral edge engageable with the seating surface of the valve seat,
- sealing means positioned in the valve seat around the valve stem for providing a seal between the valve stem and the valve seat,

the improvement characterized by the valve body having a groove adjacent the juncture of each of the end faces and the flat inner circumferential surface of the valve body, each of the grooves extending radially outwardly from the inner surface and axially inwardly from the end face to provide the valve body with a radially inwardly extending dovetail projection which terminates in said flat inner

circumferential surface and a pair of arcuate end edges, each of said grooves having a radially outwardly and axially inwardly extending first arcuate surface which extends from one of the edges of the dovetail projection, a radially outwardly and axially outwardly extending second arcuate surface which extends from said first arcuate surface and a radially inwardly and axially outwardly extending flat surface which extends from said second arcuate surface to one of the end faces of the valve body, the outer circumferential surface of the valve seat having a flat central portion which engages the flat inner surface of the dovetail projection of the valve body, a pair of projections which are shaped complementarily to the arcuate end edges of the dovetail projection and the annular grooves in the valve body and which are received in the annular grooves whereby the maximum transverse dimension of each of the projections is spaced axially inwardly from the adjacent end face of the valve body, each of the projections of the valve seat terminating in a radially extending end face which is positioned axially outwardly and radially inwardly of the adjacent end face of the valve body, said flat surface of each of said grooves in said valve body extending at an angle of about 15° to 20° to the axis of the valve body.

and a hollow nut which is in the shape of a cup with a side wall in encircling, spaced relationship to the end portion of the valve plug, an opening in the bottom of the cup which has teeth engaging a thread formed in said cylindrical extremity, and a frustoconical skirt at the forward margin of the cup which has an internal shoulder bearing on the inner peripheral portion of the washer close to the inner ends of the washer teeth and a rim bearing on the crown of the washer, whereby said shoulder sets the washer teeth and said rim flexes the washer across said crown after the lower marginal portions of the washer seat on the planar base of the valve body.

4,014,513

**CYLINDRICAL PLUG VALVE**

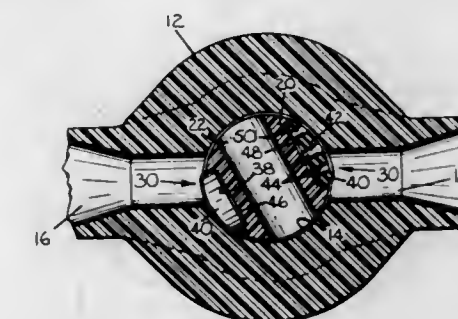
Earl A. Bake, Pittsburgh, and E. Frederick Schoeneweis,  
Coraopolis, both of Pa., assignors to Rockwell International  
Corporation, Pittsburgh, Pa.

Filed Dec. 2, 1975, Ser. No. 636,874

Int. Cl.<sup>2</sup> F16K 5/04

U.S. Cl. 251-317

5 Claims



4,014,512

**TAMPERPROOF PLUG VALVE**

Douglas L. Cheever, Dubuque, and Faye L. Knodle, Newton,  
both of Iowa, assignors to A. Y. McDonald Mfg. Co., Du-  
buque, Iowa

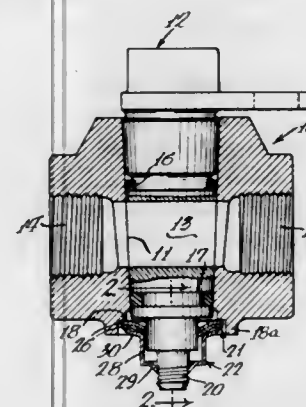
Continuation-in-part of Ser. No. 566,785, April 10, 1975,  
abandoned, which is a continuation-in-part of Ser. No.  
475,447, June 3, 1974, abandoned. This application Aug. 23,

1976, Ser. No. 716,386

Int. Cl.<sup>2</sup> F16K 5/16

U.S. Cl. 251-309

4 Claims



1. A tamperproof plug valve comprising, in combination:  
a valve body which has a through bore, a planar base surrounding one end of said through bore, and an uninterrupted annular boss surrounding said planar base so the latter is recessed;  
a valve plug rotatable in the through bore, said valve plug having cylindrical end portion that projects from said one end of said through bore, and there being a cylindrical extremity of reduced diameter on said end portion;  
a substantially annular spring steel washer surrounding said end portion, said washer having an inner peripheral portion provided with slits that define teeth which snugly engage the end portion and slide thereon as the washer is moved toward the valve body, and which bite into said end portion to effectively prevent reverse movement of said end portion through the washer, and said washer having an outer peripheral portion and being transversely arched so that it has a crown portion flanked by lower marginal portions which seat on said planar base of the valve body with the periphery of the washer so close to the annular boss as to preclude insertion of a prying tool beneath the washer;

1. A valve comprising:  
a valve body having a circular cylindrical bore with a first axis;  
a pair of circular cylindrical passages formed in said valve body and intersecting said bore along a common second axis substantially normal to said first axis;  
a circular cylindrical valve plug disposed in said bore and having a lesser diameter than said bore;  
a circular port formed diametrically through said plug and aligned with said passages when said plug is in an open position and misaligned with said passages when said plug is in a closed position;  
axially spaced annular sealing rings between said plug and said bore above and below said port and said passages establishing an annular fluid chamber therebetween, said sealing rings preventing fluid from escaping outwardly thereof;  
a pair of diametrically opposed circular recesses formed in said plug along a third axis normal to said first axis and said second axis, said recesses being aligned with said passages when said plug is in said closed position, said recesses having diameters larger than said passages and each being defined by a circular cylindrical side wall and an annular flat bottom surface lying in a plane parallel to the first axis;  
a cavity formed in said bottom surface coaxial with said third axis;  
an annular resilient sealing member received in each recess, said sealing member having an outer surface engaging said side wall and a continuous bottom surface engaging periphery of the bottom surface of said recess with a center portion thereof defining a clearance space with the opposed surface of said cavity;  
a circular cylindrical front surface on the sealing member having a diameter larger than said bore so as to be compressively engageable therewith in operative relationship in said recess;  
a circular recess formed in said sealing member having a cylindrical surface coaxial with the front surface and



substantially the same diameter as said plug and peripherally outwardly defining a continuous constant height, constant thickness annular sealing lip constituting the engaging surface with said bore whereby the pressure in said annular fluid chamber is uniformly applied around the periphery of the lip to prevent a force imbalance thereon; and

an opening formed axially in said sealing member between said second mentioned cylindrical surface member and said bottom wall to define a fluid passage for communicating said clearance with said chamber thereby avoiding a pressure differential thereon tending to cause the sealing member to move into the passage as the plug is rotated to the closed position.

4,014,514

## HIGH PRESSURE DIAPHRAGM VALVE

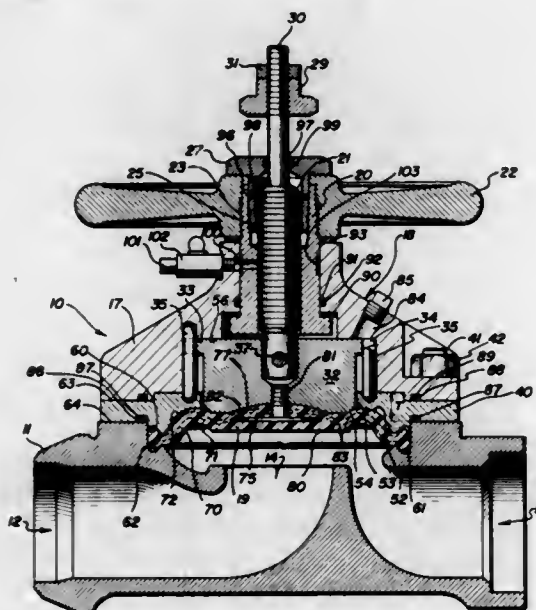
Werner K. Priese, Barrington, and Wayne David Hayes, Mt. Prospect, both of Ill., assignors to Hills-McCanna Company, Carpentersville, Ill.

Filed June 27, 1975, Ser. No. 591,175

Int. Cl.<sup>2</sup> F16K 7/16

U.S. Cl. 251-331

15 Claims



10. In a valve comprising a valve body defining inlet and outlet ports and a closure port communicating therewith, a valve bonnet fixed on the valve body over the closure port, a compressor reciprocable toward and away from the closure port, a flexible diaphragm overlying the closure port and movable by the compressor into engagement with the closure port to block fluid flow through the closure port and alternatively movable away from the closure port to permit progressively greater fluid flow through the closure port, the improvement comprising an annular limit plate secured between said valve bonnet and said valve body against which said compressor engages to limit movement thereof, said limit plate and said valve body including means to receive and retain an annular enlarged edge of said diaphragm, inwardly of the periphery of said limit plate, said limit plate including an annular extension which defines the periphery thereof, which extension is clamped between said valve body and said bonnet thereby to preclude rocking of said valve components, while firmly retaining said diaphragm in position.

4,014,515

## SNUBBER FOR ONE END LIFT JACKS

Richard S. Graafsma, Benton Harbor, Mich., assignor to Auto Specialties Manufacturing Company, St. Joseph, Mich.

Filed Nov. 24, 1975, Ser. No. 634,923

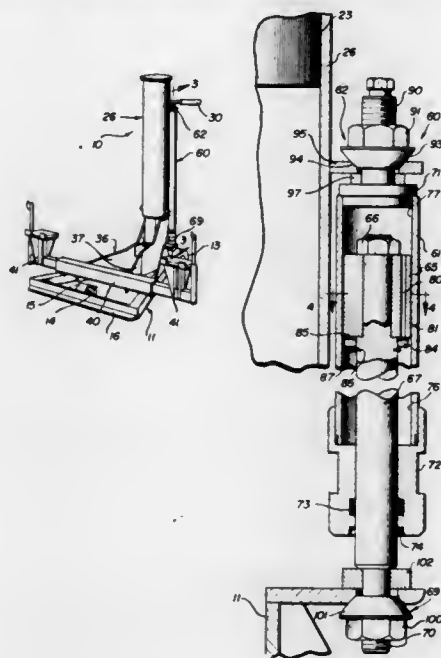
Int. Cl.<sup>2</sup> B66F 3/24

U.S. Cl. 254-2 B

13 Claims

1. A lifting jack operated by a gas comprising: a headed

cylinder member, a piston slidable in the cylinder to define a closed chamber between the cylinder head and piston, a piston rod member attached to the piston for relative slidable motion at least partly into and out of the cylinder, and a snubber, comprising, in combination, a headed snubber cylinder affixed relative to one of the cylinder and piston rod members, a snubber piston slidable in the snubber cylinder to define a first closed chamber between the cylinder head and



piston, the snubber including a first, selective, bleed port having a piston defining bleed port means in fluid communication with the closed snubber chamber, a snubber piston rod affixed relative to the other of the piston rod and cylinder members, and selective one way fluid flow check means cooperable with the piston bleed port, whereby fluid flow in one direction through the piston bleed port means is relatively free, and rapid fluid flow in the opposite direction through the bleed port means is relatively inhibited.

4,014,516

## SPAN TROLLEY

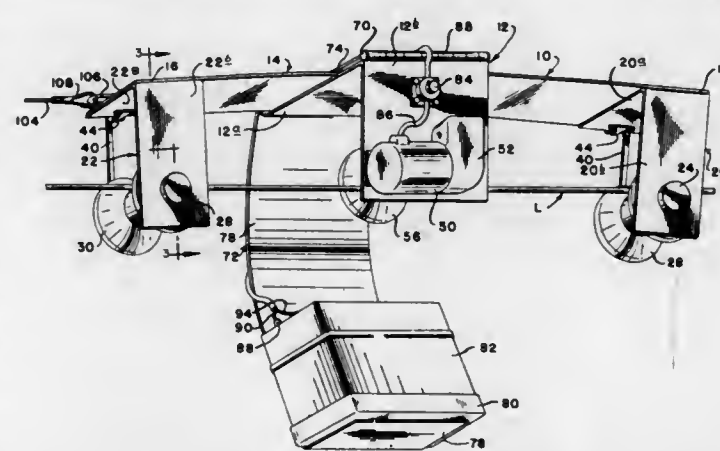
Kenneth R. Jacks, 2117 Ruby, Irving, Tex. 75060

Filed May 6, 1976, Ser. No. 683,731

Int. Cl.<sup>2</sup> H02G 1/02

U.S. Cl. 254-134.5

10 Claims



1. A span trolley to move a cord between two points of suspension parallel to an existing line comprising: a chassis; a driven wheel; means rotatably securing the driven wheel to the chassis; means to drive the driven wheel; a pair of guide wheels; means rotatably securing the guide wheels on opposite sides of the chassis; resilient means adapted to urge the guide wheels upwardly against the line such that the line is urged against the driven wheel; means attaching a cord to the carrier such that as the driven wheel is rotated the carrier moves along the line to draw the cord from a first point of suspension of the second point of suspension of the line.

4,014,517

## VARIABLE HEIGHT STAND

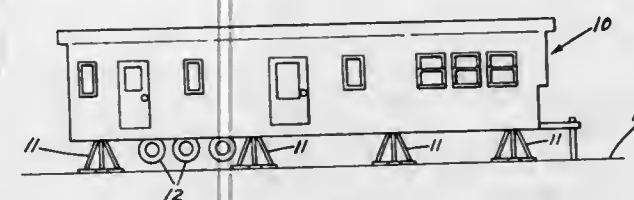
Walter S. Keagle, Collins, Iowa 50055

Filed Dec. 10, 1975, Ser. No. 639,450

Int. Cl.<sup>2</sup> B66F 7/26; F16M 11/00

U.S. Cl. 254-45

22 Claims



1. A stand for support of a structure, comprising:  
a generally flat base;  
at least three symmetrically orientated, linear legs extending generally upward from the base;  
a support platform supportively engageable with a part of the structure;  
a first end of each leg being pivotally assembled to the support platform for rotation about a horizontal axis with respect to the platform;  
assembly means movably assembling a second end of each leg to the base positioning said second ends on the base so that the legs extend from the base to the platform in converging relationship toward said platform, the second end of each leg being slidably movable on the base in a first direction toward one another to move the platform away from the base, and a second direction away from one another to move the support platform toward the base;  
said assembly means including guide means on the base to guide movement of the second end of each leg in said first and second directions; and  
releasable lock means to releasably secure the second end of each leg from movement on the base.

4,014,518

## CABLE TENSIONING DEVICE

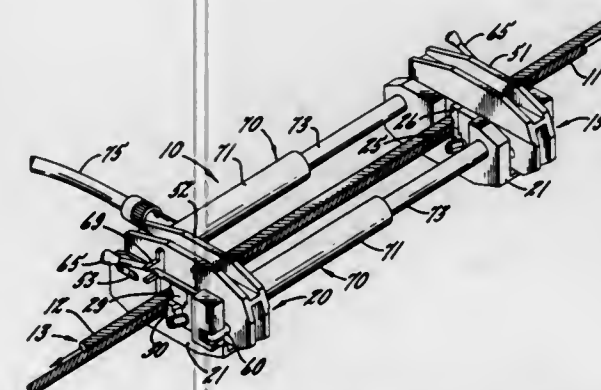
Ellsworth W. Lapp, c/o Lapp Engineering 6060 S. 11th St., Rockford, Ill. 61109

Filed Feb. 23, 1976, Ser. No. 660,368

Int. Cl.<sup>2</sup> B66F 1/00

U.S. Cl. 254-69

4 Claims



1. A device for tensioning a cable having first and second lapped end portions, said device comprising first and second members spaced from one another along said cable, a plurality of reversible linear actuators spaced symmetrically around said cable and connected to said members for changing the spacing between said members, said first and second members having first and second cable-receiving openings, respectively, each adapted to accept said first and second cable end portions, means attached to and movable in unison with said first and second members and disposed within said first and second openings for gripping and pulling said first and second cable end portions, respectively, and thereby tension the cable when said actuators are actuated to change the spacing between said

members, said gripping and pulling means in one of said openings retaining its grip on the gripped cable end portion and substantially retaining the latter in its pulled position when said actuators are reversed and reversely change the spacing between said members, said device further including means within said one opening for automatically gripping the other cable end portion and substantially retaining the latter in its pulled position when said actuators are reversed, and mechanism for enabling the gripping and pulling means in the other opening to be released from the gripped cable end portion whereby the spacing between said members may be changed reversely to enable said cable end portions to be again gripped and pulled upon the next actuation of said actuators while substantially retaining the previous tension placed in said cable.

4,014,519

## HYDRAULIC JACK WITH MECHANICAL LOCKING DEVICE

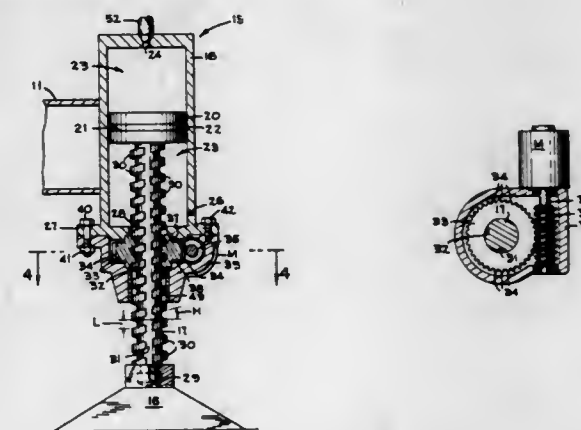
Theodore M. Leigh, Cedar Rapids, Iowa, assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 30, 1976, Ser. No. 653,877

Int. Cl.<sup>2</sup> B66F 3/16

U.S. Cl. 254-86 H

9 Claims



1. In a jack of the type having a cylinder, a piston slidably received within the cylinder, and a piston rod projecting from the piston outwardly of the cylinder, the improvement comprising a worm wheel nut that is threadedly engaged upon the piston rod, a rotatable worm that is engaged with the worm wheel nut, and a motor to rotate the worm, said worm wheel nut being held at a fixed location relative to the cylinder but being rotatable about the piston rod to enable the rod to travel axially of the cylinder said cylinder being a single acting hydraulic cylinder and the threads between the piston rod and the worm wheel nut having a helix angle that is greater than the angle of friction so that in response to loading thereon the worm wheel nut will rotate on the piston rod to enable retraction of the rod within the cylinder.

4,014,520

## RAILING ASSEMBLY AND METHOD

Donald H. Walters, 493 Stanford Drive, Arcadia, Calif. 91006

Filed Dec. 22, 1975, Ser. No. 643,363

Int. Cl.<sup>2</sup> B21F 27/00; E04H 17/14

U.S. Cl. 256-22

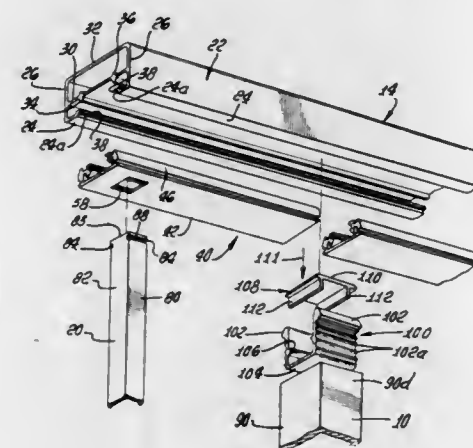
18 Claims

1. A grid structure, said structure comprising  
a. a top rail assembly, said assembly including  
i. an inverted U-shaped channel member of a predetermined length and fabricated of a rigid but resilient material, said member having a top wall, a pair of sidewalls joined to and extending down from the top wall, the lower portion of each of said sidewalls being bent over at a right angle toward the other sidewall thereby to be spaced from the top wall by a first predetermined distance, with the edges of both said bent over portions being spaced from each other by a second predetermined distance edge, and a pair of down-



wardly extending rails integral with the top wall, spaced from each other by said second predetermined distance, said rails having altitudes less than said first predetermined distance and being disposed in vertical alignment with said sidewall edges; and

ii. a U-shaped channel member constituting a locking cover plate of a predetermined extent, of a width slightly greater than said second predetermined distance, and comprising a bottom wall and a pair of sidewalls joined to and extending upwardly from said bottom wall for approximately said first predetermined distance, the outer sides of said sidewalls being slightly convexed to arch towards each other, and longitudinal recesses being provided along the lines of joinder of said bottom wall and said sidewalls, said recesses being located and configured to receive the inwardly extending edges of the bent over portions of the sidewalls of the inverted U-shaped channel member; and said sidewalls further having flanges inwardly extending towards each other, but spaced from each other by a third predetermined distance, each of said flanges being capped by an L-shaped receiving channel element with the open side facing the open side of the other corresponding L-shaped channel element; the said bottom wall being orificed at predetermined spaced locations, said orificing being of a polygonal configuration with two opposite sides of the polygon being parallel to each other and to the sidewalls of said U-shaped channel



member, and said opposite sides being disposed in each instance in vertical alignment with the open sides of said L-shaped receiving channel elements;

b. a bottom rail, said bottom rail comprising an inverted U-shaped rigid channel element of the same predetermined length as said locking cover plate of the top rail assembly and having a top wall from the side edges of which extend downwardly a pair of sidewalls, said top wall being orificed to the same polygonal configuration as the orificing in the planar bottom wall of said locking cover plate and with the same spaced locations, said sidewalls each having a pair of flanges spaced from the top wall and from each other and extending towards the corresponding flange on the opposite sidewall, the flanges more proximate to said top wall having angular opposed projecting edges, the last said edges being spaced from each other by substantially the same distance as separates the said hooking projections in the open sides of said L-shaped receiving elements in said locking cover plate; and the flanges most remote from said planar top wall extending inwardly towards each other further than the other flanges, thereby to provide a pair of shelves inwardly of said angular opposed projecting edges of the other flanges; and said bottom rail being disposed parallel to said top rail assembly in rectangular alignment therewith and spaced therefrom by a predetermined distance;

c. a plurality of rigid elements, each of said elements having a polygonal cross section corresponding to the orificing in both said locking cover plate of the top rail assembly and

said top wall of said bottom rail, and extending through both of said orificings to where, in the case of the bottom rail, the end of said element rests on the pair of shelves provided by said most remote flanges; and in the case of the top rail assembly the end of said element seats in said L-shaped receiving channel elements in said locking cover plate; and said locking cover plate being inserted, with the ends of said elements so disposed in said L-shaped receiving channel elements, between the spaced edges of the lower portions of the sidewalls of the inverted U-shaped channel member of the top rail assembly to where the upper edges of its sidewalls seat against its top wall and abut the opposing faces of said rails, and said spaced edges seat in said longitudinal recesses; each of said rigid elements being grooved slightly inwardly from each of its ends transversely along the sides which, in the case of the top rail assembly seat in said L-shaped channel receiving elements and, in the case of the bottom rail, seat on said shelves; and upon both such seatings, said hooking projections in said L-shaped channel receiving elements, and said opposed angular edges of the bottom rail, enter said grooves, thereby locking said rigid elements within the top rail assembly and within said bottom rail respectively to prevent withdrawal therefrom.

4,014,521

## DIVIDER NET WITH REPLACEABLE BOTTOM PANEL

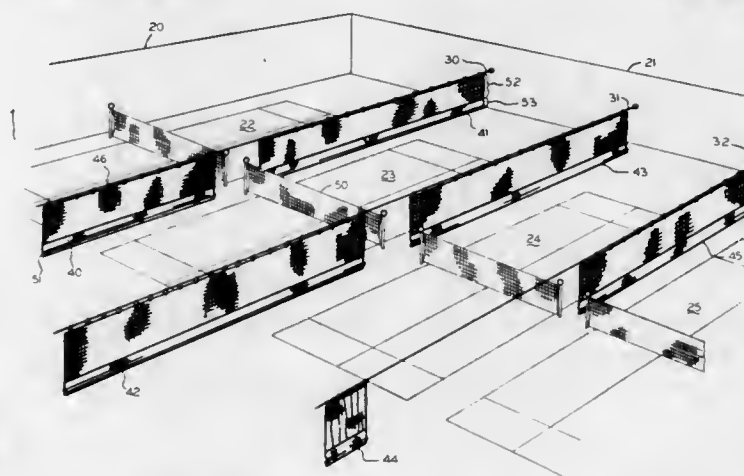
Alan M. Berman, 949 Sutton Drive, Northbrook, Ill. 60062

Filed Sept. 29, 1975, Ser. No. 617,418

Int. Cl.<sup>2</sup> E04H 17/00; A63B 61/00

U.S. Cl. 256—1

16 Claims



1. A divider net having an upper portion and an easily replaceable lower panel, means for attaching the lower panel to the upper portion by fasteners, whereby said panel may be replaced on site, preferably without having to remove the upper portion from its support, and an additional plurality of means for periodically binding the upper portion to the panel at spaced points distributed along substantially the entire length of the nets where they are joined together by said attaching means.

4,014,522

## PERMANENTLY FIXED END RAILS ON TELESCOPIC BLEACHER SEATS

David L. Sutter, Kennebunkport, Maine, assignor to Hussey Manufacturing Company, Inc., North Berwick, Maine

Filed Nov. 17, 1975, Ser. No. 632,401

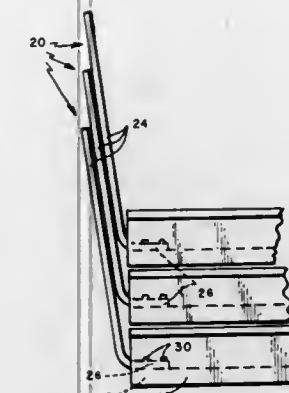
Int. Cl.<sup>2</sup> E04H 17/14

U.S. Cl. 256—59

5 Claims

1. A telescoping bleacher stand comprising a plurality of sections arranged to be stacked for storage in a vertical column, one above another, and for movement therefrom to an open position in which they are extended from one another in stepped relation, and a free-standing guard rail fixed to each end of each section so that it stands upwardly therefrom and inclines outwardly relative to the end of the section to which

it is fixed so that when the sections are moved from their extended positions to their stored positions, the guard rails at



the ends of the stacked sections will nest one within another in spaced, parallel, noninterfering relation.

4,014,523

## ARENA AISLE RAILING

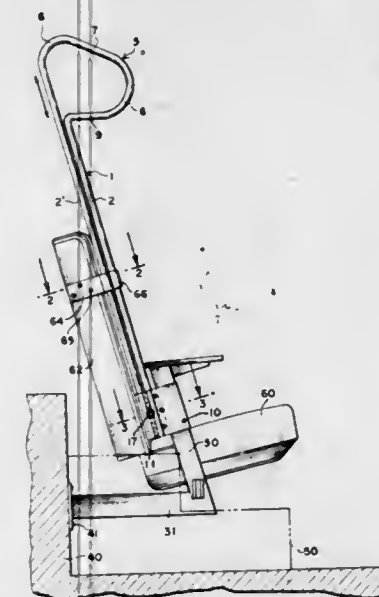
Arthur J. Reader, 293 Pepperidge Road, Hewlett Harbor, N.Y. 11557

Continuation-in-part of Ser. No. 577,378, March 14, 1975, abandoned. This application Dec. 12, 1975, Ser. No. 640,313

Int. Cl.<sup>2</sup> E04H 17/14

U.S. Cl. 256—59

6 Claims



1. An arena aisle railing for connection to the frame of an arena seat comprising:

a bracket including an extension and having thereon means for attaching said bracket to the frame of the arena seat; and

a U-shaped longitudinal bar having a pair of leg portions and a base defining a loop for gripping at a top thereof, said bar being longitudinally adjustably mounted in said bracket, the cross section of said longitudinal bar being oval; and

said bracket forming a cooperating oval surface in which said longitudinal bar is mounted.

4,014,524

## DISPERSING APPARATUS

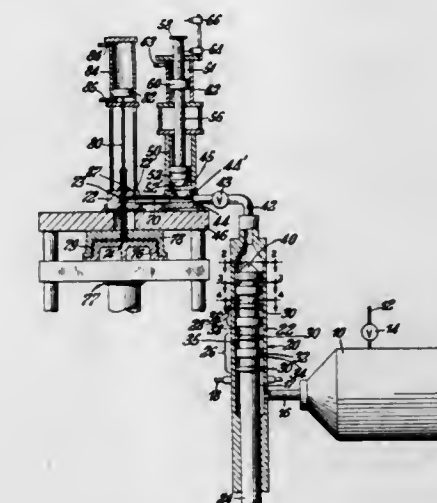
Ward John Klingebiel, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 487,250, July 10, 1974, abandoned, which is a division of Ser. No. 42,316, June 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 704,639, Feb. 12, 1968, abandoned. This application Nov. 19, 1975, Ser. No. 633,361

Int. Cl.<sup>2</sup> B01F 7/26, 13/10

U.S. Cl. 259—6

4 Claims



1. Apparatus for dispersing a low viscosity fluid throughout a high viscosity polymer-containing mass comprising: conveying means for continuously passing a gross pre-mixture of said high viscosity polymer-containing mass and said lower viscosity fluid in simultaneous co-current flow to and in a single direction through mixer means having a cylindrical barrel and a plurality of spaced, commonly-rotatable dispersion discs positioned therein as alternately-spaced perforated and solid rotating discs; said perforated discs providing first mixing zones through their perforations and having outer edge surfaces in close rotating clearance with the inner walls of said barrel; said solid rotating discs having their outer edge surfaces spaced from the inner walls of said barrel to there form second mixing zones wherein said fluid is mixed after passage through said first mixing zones and is intimately dispersed throughout the polymer-containing mass when passed through said second mixing zones; said plurality of perforated and solid discs being arranged so that the first and last discs are perforated.

4,014,525

## HORIZONTAL TYPE CONTINUOUS PUG MILL FOR HIGH VISCOUS MATERIAL

Chikao Oda, and Morihisa Maruko, both of Kudamatsu, Japan, assignors to Hitachi, Ltd., Japan

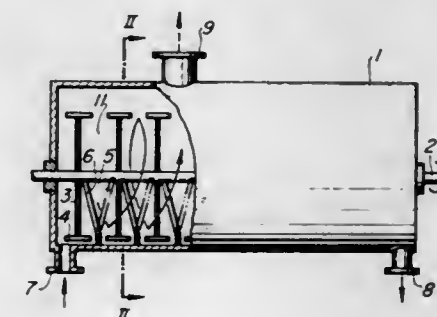
Filed Sept. 22, 1975, Ser. No. 615,680

Claims priority, application Japan, Sept. 25, 1974, 49-109537

Int. Cl.<sup>2</sup> B01F 7/02, 9/00; A21C 1/00; A23G 1/00

U.S. Cl. 259—9

4 Claims



1. A horizontal type continuous pug mill for a higher viscous



material comprising a body provided at its one end with an inlet nozzle for the material to be treated and at its other end with an outlet nozzle, a rotary shaft extending through said body and driven to be rotated, a plurality of spaced agitating blades secured to said rotary shaft and formed with through holes and means provided in spaces defined by said body and adjacent agitating blades to endow the material with feeding function in cooperation with said agitating blades, said means comprising a plurality of compressing plates provided at the upstream sides of the agitating blades respectively, the upper end of each of said plates being inclined towards the adjacent agitating blade, a plurality of scraping plates provided at the downstream sides of the agitating blades respectively, and the upper end of each of said scraping plates being inclined towards the adjacent agitating blade whereby the compressing plates squeeze the viscous material through said through holes and the scraper plates scrape said squeezed viscous material from said agitating blades thus causing the viscous material to be advanced through said pug mill.

4,014,526

## LIQUID MOVING AND MIXING APPARATUS

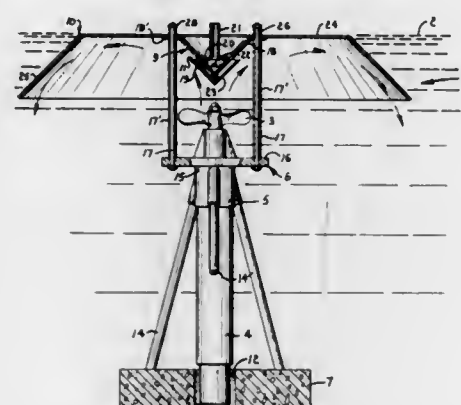
Roy A. Cramer, Jr., 8100 Paseo, Kansas City, Mo. 64131

Filed Apr. 26, 1976, Ser. No. 680,519

Int. Cl.<sup>2</sup> B01F 7/22, 15/02

U.S. Cl. 259—24

15 Claims



1. A liquid moving apparatus comprising:

- a ballast member;
- a frame structure mounted on said ballast member and extending upwardly therefrom and having an upper end portion;
- a submersible motor mounted on said frame structure and positioned adjacent the upper end portion thereof;
- a propeller rotated by said submersible motor to effect an upwardly directed flow in a body of liquid;
- a diffusing member mounted on said frame structure and positioned above said propeller, said diffusing member being cone-shaped to diffuse the flow upwardly and outwardly; and
- a deflector member mounted on said frame structure and positioned above said diffusing member, said deflector member having a top wall and a side wall extending outwardly and downwardly from said top wall to deflect the flow outwardly and downwardly.

4,014,527

## CHEMICAL BLENDING SYSTEM

Wilson D. Watson, Jr., Midland, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 426,843, Dec. 20, 1973, Pat. No. 3,902,558. This application Jan. 23, 1975, Ser. No. 543,394

Int. Cl.<sup>2</sup> B28C 5/06

U.S. Cl. 259—151

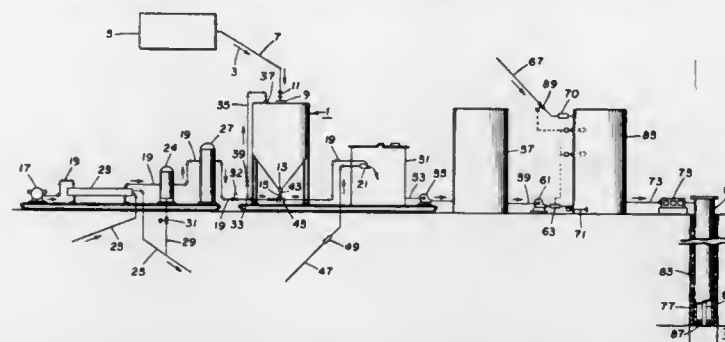
7 Claims

1. A system for blending a dry chemical and a liquid comprising, the combination of:

- a hopper adapted for receiving and feeding said dry chemical, said hopper being adapted for having a positive

pneumatic pressure applied thereto and for maintaining therein said positive pneumatic pressure;

- a conduit communicating with a lower portion of said hopper;
- a means for applying said positive pneumatic pressure to an upper location of said hopper;
- a means for applying a negative pneumatic pressure to the lower portion of said hopper to feed said dry chemical into said conduit;
- a means for supplying gas under pressure to an upstream end of said conduit to transport said dry chemical;



- a means for dehumidifying said gas connected into said conduit upstream of said hopper;
- a means for forming a free-falling sheet of liquid;
- a means for supplying liquid to said means for forming a free-falling sheet of liquid; and
- a means for directing the flow of said gas and said dry chemical from the downstream end of said conduit into a free-falling sheet of liquid formed by said means for forming a free-falling sheet of liquid to blend said dry chemical and said liquid.

4,014,528

## GAS CUTTING MACHINE

Noboru Sugiyama; Yoshitugu Watanabe, and Hiroshi Yamamoto, all of Tokyo, Japan, assignors to Koike Sanso Kogyo Co., Ltd., Tokyo, Japan

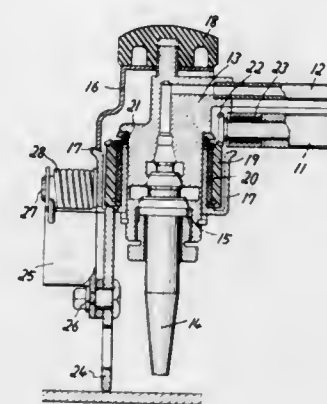
Filed Dec. 11, 1975, Ser. No. 639,711

Claims priority, application Japan, Apr. 22, 1975, 50-48162; June 18, 1975, 50-73161; June 23, 1975, 50-75464

Int. Cl.<sup>2</sup> B23K 7/10

U.S. Cl. 266—66

5 Claims



1. A gas cutting machine for cutting a steel plate comprising, a motor, a transmission axis connected to said motor, a first gear connected to said transmission axis, a device head having a gas cutting nozzle, a second gear mounted around said device head and rotatable in a horizontal direction by rotation of said first gear, a driving wheel rotatable in a vertical direction and adapted to move along the steel plate to be cut, a bracket means for supporting said driving wheel adjacent to said gas cutting nozzle whereby the driving wheel is pressed against the lower surface of said second gear for rotation thereby, control means for actuating said motor and transmission axis, and pipe means for supplying oxygen preheated, preheated oxygen, and fuel gas to said gas cutting nozzle.

4,014,529

## DEVICE FOR VACUUM-REFINING OF MOLTEN METAL

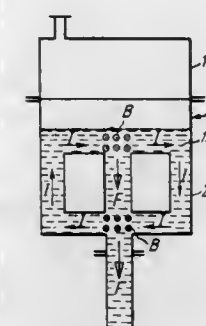
Leonid Petrovich Puzhailo, pereulok Kremenetsky, 5a, kv. 2; Vitaly Petrovich Polischuk, prospekt Vernadskogo, 85, kv. 122, and Viktor Konstantinovich Pogorsky, ulitsa Poligraficheskaya, 24a, kv. 247, all of Kiev, U.S.S.R.

Filed Jan. 15, 1975, Ser. No. 541,143

Int. Cl.<sup>2</sup> C21C 7/10

U.S. Cl. 266—210

16 Claims



1. A device for vacuum-refining of molten metal, comprising: a vacuum chamber; an electromagnetic pump disposed under said vacuum chamber to feed metal thereto; an annulus-section line of said electromagnetic pump composed of central and side portions and communicating with said vacuum chamber; a metal feed pipe line for feeding metal into said vacuum chamber, said metal feed pipe line communicating with said annulus-section line; a metal discharge pipe line for discharging metal from said vacuum chamber, said metal discharge pipe line being connected from below to the central portion of said annulus-section line of said electromagnetic pump; said electromagnetic pump further comprising two inductors, each having an electric coil and a closed magnetic circuit embracing said side portion of said annulus-section line and a third inductor having electric coils with an open magnetic circuit of which the gaps are disposed in the areas of communication between said central portion and said side portions of said annulus-section line.

4,014,530

## PROTECTIVE NOZZLE FOR METALLURGIC VESSELS, PARTICULARLY FOR STEEL MILL CONVERTERS

Karlheinz Langlitz, Mulheim, and Günter Schmitz, Duisburg, both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

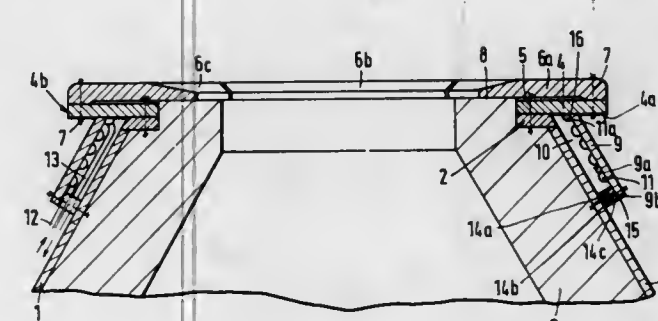
Filed July 23, 1976, Ser. No. 708,225

Claims priority, application Germany, Aug. 1, 1975, 2534331

Int. Cl.<sup>2</sup> C21C 5/46

U.S. Cl. 266—241

3 Claims



1. A protective nozzle for metallurgic vessels such as steel mill converters, comprising
- a vessel shell;
  - a frontal ring connected to the end face of said vessel shell opening;
  - a plurality of semi-annular nozzle ring segments forming an annular nozzle ring; the improvement characterized by
  - a solid annular supporting ring disposed between said

- frontal ring and said annular nozzle ring, said supporting ring supporting said segments;
- said supporting ring extending radially beyond said vessel shell to form an annular radial extension;
- an annular shield depending from said supporting ring and spaced from said vessel shell to form a hollow space therebetween;
- cooling water circulation means disposed in said hollow space, said circulation means connected to said shield; and
- means for attaching said segments to said annular radial extension, said attaching means being accessible at the bottom surface of said supporting ring.

4,014,531

## TUNDISH FOR THE CONTINUOUS CASTING OF STEEL

Masaru Takashima, Komae, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

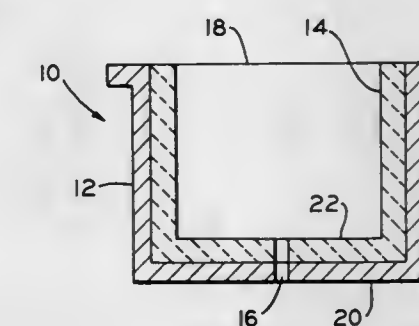
Filed Apr. 28, 1975, Ser. No. 572,012

Claims priority, application Japan, May 15, 1974, 49-53194

Int. Cl.<sup>2</sup> F27D 1/00

U.S. Cl. 266—280

4 Claims



1. A tundish for the continuous casting of steel characterized by having an inner lining of a moulding which comprises from 50 to 80 percent by weight of a siliceous refractory, based on silicic anhydride, having a particle size less than 100 mesh, from 2 to 10 percent by weight of a refractory clay, from 8 to 20 percent by weight of a refractory fibrous material, and (d) from 4 to 10 percent by weight of an organic binder, with the surface of said moulding which is adapted to be in contact with molten metal being impregnated with at least one material selected from the group consisting of colloidal silica, water glass, aluminum phosphate, a suspension of zircon sands, a suspension of alumina, and a suspension of silicic anhydride.

4,014,532

## LADLE REFRACTORY LINING PREHEATER

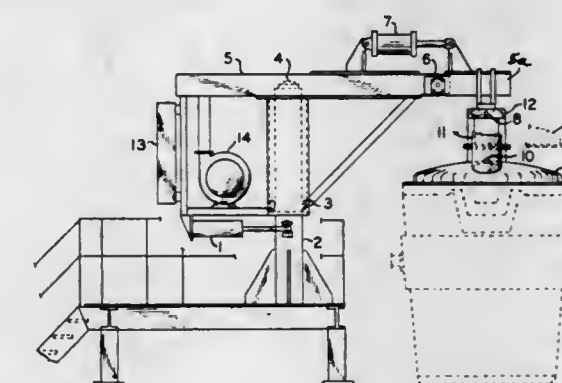
Carl A. Holley, 116 Marian Ave., Glenshaw, Pa. 15116

Filed Jan. 2, 1976, Ser. No. 646,407

Int. Cl.<sup>2</sup> F27B 14/00

U.S. Cl. 266—287

4 Claims



1. In combination with a ladle having an inner lining of refractory material, a preheater for uniformly heating said lining prior to introduction, into the ladle, of molten metal,



comprising a ladle cover having a burner for projecting a flame into the cover in the direction of the ladle lining to preheat said lining, a vertical flue extending into the ladle cover for exhausting fumes developed therein, a boom including a horizontal pivot for pivotally suspending said cover and burner so that the cover will automatically remain in a horizontal plane irrespective of both lifting and lowering movements, and means for pivoting said boom in a vertical direction to effect selective lifting and lowering movements of said cover, means for effecting lateral movements of said boom about a vertical axis, throughout which movements said cover will always extend in a horizontal plane to enable tightly closing of said ladle by said cover.

4,014,533

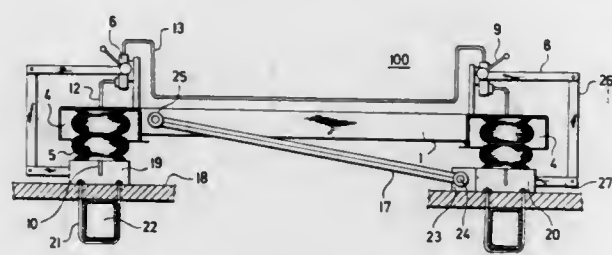
**RESILIENT LOAD-BEARING SUPPORT FOR A VEHICLE**  
Oldrich Krejcir; Miroslav Bures, and Alois Jerábek, all of Liberec, Czechoslovakia, assignors to Vysoka skola strojni a textilni, Liberec, Czechoslovakia

Filed July 11, 1975, Ser. No. 595,180

Int. Cl.<sup>2</sup> F16F 5/00

U.S. Cl. 267—120

10 Claims



1. In a vehicle having a carrier surface, a position-controllable, load-bearing resilient support associated with the carrier surface and substantially isolated from forces imparted to the carrier surface during the movement of the vehicle, the support comprising, in combination, a stiff frame, a plurality of independently and externally adjustable pneumatic springs individually interconnecting spaced portions of the frame for maintaining each of said frame portions in a continually selectable vertical position relative to the underlying carrier surface portion in accordance with the amount of fluid in the springs, means coupled to the frame and operable independently of the springs for limiting vertical displacements of the springs during movement of the vehicle, and means including at least one arm extending between a first predetermined frame portion and the carrier surface portion underlying a second predetermined frame portion spaced from the first predetermined frame portion for oscillating the frame about the last-mentioned carrier surface portion.

4,014,534

**CHAIN REPAIR WORKBENCH**

Melvin J. Ahlquist, Sioux City, Iowa, assignor to City of Sioux City, Iowa, Sioux City, Iowa

Filed Sept. 10, 1975, Ser. No. 611,986

Int. Cl.<sup>2</sup> B25B 11/02

U.S. Cl. 269—47

9 Claims

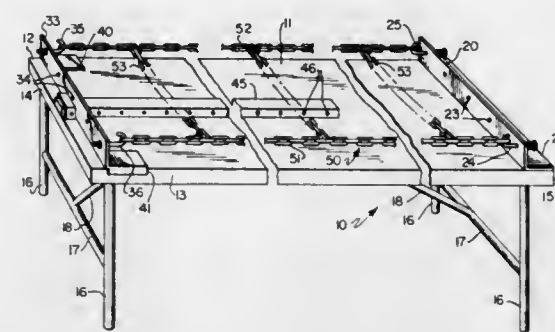
1. An apparatus for holding chain assemblies to be repaired, the chain assemblies being of the type having at least two longitudinal chain sections and a plurality of transverse chain sections extending between said longitudinal sections, the apparatus comprising

- a table having a substantially flat top surface and parallel side edges;
- a first upstanding wall extending transversely across said surface near one end thereof;
- means for supporting said first wall on said top surface;
- first hook means attached to said first wall at transversely spaced apart locations for engaging one end of each of the longitudinal chain sections;
- a second upstanding wall;

guide means fixedly attached to said second wall for engaging the side edges of said table and for movably retaining said second wall for longitudinal movement along said surface while maintaining said second wall substantially parallel to said first wall;

second hook means attached to said second wall for engaging the other ends of the longitudinal chain sections, said second hook means being attached at locations spaced apart by a distance substantially equal to the spacing of said first hook means; and

means for locking said second wall at any one of a plurality of longitudinal positions to establish a predetermined spacing between said first and second walls, said means for locking including



a bar extending longitudinally on said top surface from one end thereof parallel to said side edges, said bar having means defining a plurality of openings at longitudinally spaced intervals;

means in said second wall defining an opening therethrough dimensioned to mate with said bar;

a flange attached to and movable with said second wall along said bar, said flange being adjacent said opening in said second wall and having an opening therethrough alignable with a selected one of said openings in said bar; and

a locking pin insertable into said openings in said flange and said bar to establish a longitudinal position of said second wall.

4,014,535

**CONTINUOUS SHEET COLLATING METHOD AND APPARATUS**

Robert E. Kleid, Fairfield; Donald J. Illk, Stamford, and Ferris Gene Keyt, Trumbull, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

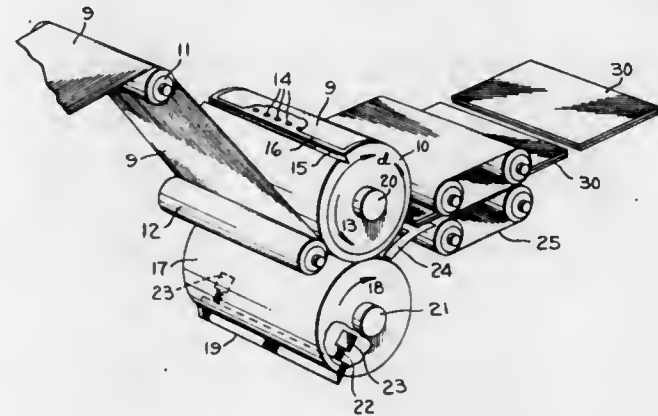
Continuation of Ser. No. 585,849, June 11, 1975, abandoned.

This application May 25, 1976, Ser. No. 689,956

Int. Cl.<sup>2</sup> B41F 13/64

U.S. Cl. 270—19

15 Claims



1. A continuous sheet collating at least two discretely method for collating printed sheets which are initially printed on a web and subsequently cut from the web and collated, comprising the steps of:

- a. feeding a continuous web of printed, sheet-like material

4,014,537

**AIR FLOATATION BOTTOM FEEDER**

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 636,015

Int. Cl.<sup>2</sup> B65H 3/04, 3/48

U.S. Cl. 271—166

5 Claims

towards a continuously, uninterrupted rotating collating drum;

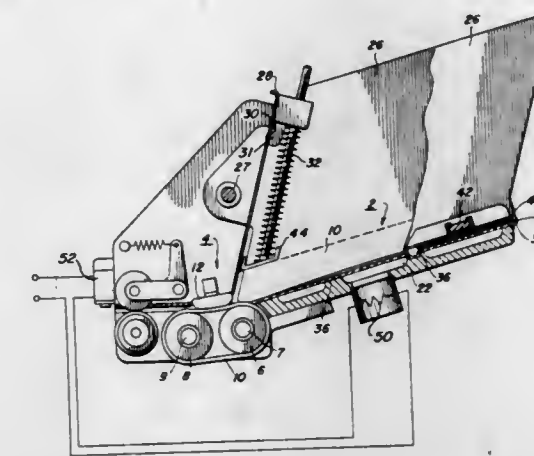
b. wrapping said web around the continuously rotating collating drum a number of times which is one less than a desired number of sheets to be collated, to provide a number of wraps of printed sheet;

c. severing the wraps of printed sheet disposed upon the rotating collating drum to provide the desired number of individual printed sheets while the collating drum continues to rotate;

d. selectively controlling the severing of the wraps, whereby severing of the wraps takes place at any desired number of rotations of the collating drum;

e. supplying one additional printed sheet from the web of material, and collating said additional sheet together with the desired number of individual printed sheets from the collating drum; and

f. discharging said number of individual printed sheets from said rotating collating drum and said additional printed sheet from the web, as a unitized mass of collated printed sheets to provide a bundle of printed sheets in textual context.



4,014,536

**FEEDING APPARATUS FOR X-RAY FILM AND THE LIKE**

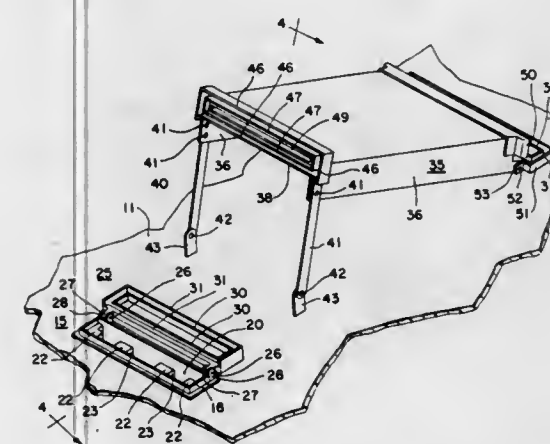
Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Road, Willow Grove, Pa. 19090

Filed Aug. 18, 1976, Ser. No. 715,623

Int. Cl.<sup>2</sup> B65H 1/00

U.S. Cl. 271—162

6 Claims



1. Apparatus for feeding film or the like to a processing machine which comprises

an entrance portion mounted on the top to the machine and communicating with the interior thereof,

said entrance portion having a horizontally elongated throat with a downwardly extending wall along side thereof and of a width to receive a sheet of predetermined width, said throat along the opposite side thereof having a plurality of spaced downwardly extending wall portions of lesser width than the width of said throat for the reception of sheets of lesser width,

said wall portions on opposite sides of said throat being in converging relation toward their lower margins,

closure means movably mounted with respect to said entrance portion for selective disposition in a position in covering relation to said entrance portion or in a position permitting free access to said entrance portion, and

auxiliary means for disposition for supplying material in sheet form to said throat,

said auxiliary means comprising a plurality of enclosing walls providing a chute,

said chute having an end portion for engagement with said entrance portion.

1. A sheet feeding device adapted for feeding sheets individually from the bottom of the stack of sheets comprising:

means forming an air plenum adapted for connection to a source of pressurized air,

a sheet support plate associated with said plenum, said sheet support plate having a plurality of fine bores formed therein adapted for communication with the interior of said air plenum for passage of air from said air plenum through said bores, said bores terminating at the sheet support surface of said plate in sharp edged orifices, passage of air from said plenum through said bores producing jets of air adapted for penetration through the bottom sheet in the stack, passage of air through the bottom sheet in the stack causing the air jets to be diffused to provide an air cushion between the bottom sheet in the stack and the sheets immediately thereabove;

sheet feeding means mounted adjacent said sheet support plate adapted for contact with the bottom sheet in the stack for feeding the bottom sheet therefrom;

a front edge abutment plate associated with said sheet support plate, said abutment plate being spaced from said sheet support plate to allow passage of sheets separated from the stack to pass beneath said abutment plate;

adjustable side guides adapted for cooperation with said abutment plate and said sheet support plate, said side guides being adjustable to a plurality of positions to accommodate a plurality of sheet stack sizes, said side guides having outwardly projecting flanges thereon overlying said sheet support plate, the outer periphery of the lower surface of said flanges having sealing material attached thereto to provide fluid tight engagement between said flanges and said perforated plate, said side guides being formed to provide a space between the lower edge of the side guides and said sheet support plate, air passing through the bores in said sheet support plate beneath said flanges escaping from beneath said side guides into the sheet stack on said sheet support plate for riffing the lower sheets in the stack to increase the air cushion effect between the lower sheets in the stack.



4,014,538

**SHEET SEPARATING DEVICE IN ELECTROSTATIC RECORDING APPARATUS**

Mitsuo Akiyama, Higashi-Murayama, and Masamitsu Kasuya, Nagareyama, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

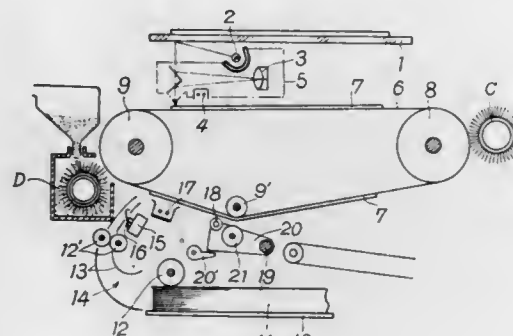
Filed Oct. 23, 1975, Ser. No. 625,045

Claims priority, application Japan, Oct. 28, 1974, 49-124588

Int. Cl.<sup>2</sup> B65H 43/00

U.S. Cl. 271-176

2 Claims



1. A sheet separating apparatus for use in an electrophotographic recording system of the type having a belt, means for driving the belt and a photosensitive surface carried by said belt, and means for feeding a transfer sheet into contact with said photosensitive surface, the improvement comprising:

- a pair of rollers arranged on each side of said belt downstream of the transfer sheet feeding means, one of said rollers being movable from a first position spaced from the belt to a second position in contact with said transfer sheet, the movable roll when in contact with said sheet cooperating with the other said roll to separate said sheet from the photosensitive surface;
- means for detecting the presence and absence of transfer sheet feed to said photosensitive surface, and
- means for moving the said movable roll from said first position to said second position when the detecting means detect the presence of sheet feed.

4,014,539

**ANGULAR PATH SHEET CONVEYING**

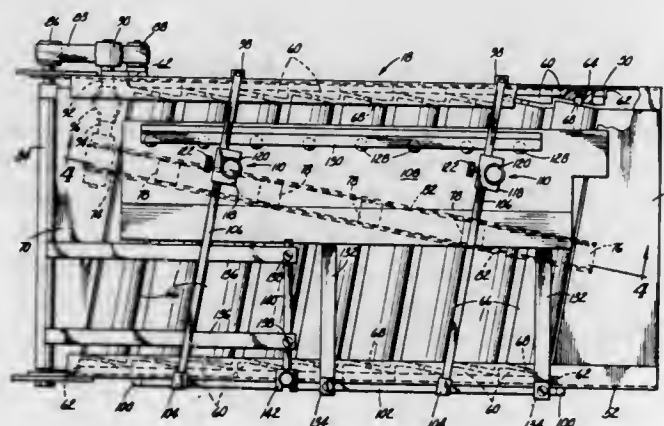
Eber Lyle Goodwin, Arlington Heights, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Aug. 14, 1975, Ser. No. 601,008

Int. Cl.<sup>2</sup> B65H 29/20

U.S. Cl. 271-184

3 Claims



2. A conveyor for receiving a sheet moving in a first direction and changing its motion to a second direction substantially normal to said first direction, comprising:

- a frame including two longitudinal frame members;
- an array of parallel, closely spaced rollers extending between said longitudinal frame members generally normal thereto but canted slightly in one direction;
- power means for driving the rollers; and

d. sheet control and guide means cooperating with said rollers comprising:

- overhead supports mounted on said frame and including at least one beam extending parallel to said rollers;
- a guide plate and register bar supported on and depending from said beam and adjustable therealong, said guide plate having a raised sheet entrance portion;
- a series of balls carried by said guide plate and register bar, each ball resting on one of said rollers to urge a sheet into driving engagement therewith; and
- a second beam mounted on said overhead supports and extending along one side of the conveyor, and a sheet deflector mounted cantilever-fashion on said beam and extending towards said guide plate with its free end at a lower level than the raised entrance portion of the guide plate to guide incoming sheets therebeneath.

4,014,540

**SWING MOUNT FOR PLAYGROUND EQUIPMENT**

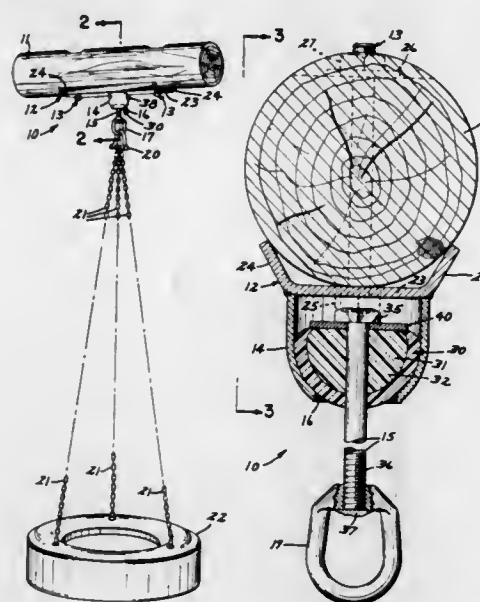
Ted L. Caulkins, Hillsdale, Mich., assignor to Game Time, Inc., Litchfield, Mich.

Filed Mar. 31, 1975, Ser. No. 563,775

Int. Cl.<sup>2</sup> A63B 31/00

U.S. Cl. 272-85

6 Claims



1. A ball and socket playground swing suspension mount, comprising:

- a member defining a socket having an aperture therein, said socket having an inner portion shaped substantially as a portion of the inner surface of a hollow sphere;
- means for attaching said member to a swing support frame;
- A ball positioned within the socket, said ball having a portion of its surface comprising a segment of a sphere, said segment having a shape and size to conform to said inner portion of said socket, and another portion thereof generally planar and positioned away from said aperture, said ball having a bore therethrough along an axis generally perpendicular to said generally planar side;
- a load supporting bolt positioned within said bore having its head adjacent said generally planar side and its opposite end extending through said aperture in the socket, said opposite end being adapted for attachment to a playground swing; and
- a retainer member, having a bore therein and positioned along said bolt between the head of said bolt and said generally planar side of said ball, said retainer member being dimensioned larger than said aperture to prevent said bolt from dropping through said aperture in case of breakage of the ball.

4,014,541  
GOLF TEE

Armand J. Desmarais, New Castle, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 26, 1974, Ser. No. 464,390

Int. Cl.<sup>2</sup> A63B 57/00; C05C 9/02

U.S. Cl. 273-33

5 Claims



1. A golf tee consisting essentially of water-soluble thermoplastic hydroxypropyl cellulose having an M.S. of 2 to 10 and dispersed therein from about 1 to about 30% by weight, based on the weight of the golf tee, of a slow release nitrogenous fertilizer.

4,014,542

**BAT USED IN BASEBALL**

Yukio Tanikawa, No. 7203, Fukumitsumachi, Nishitonamigun, Toyama, Japan

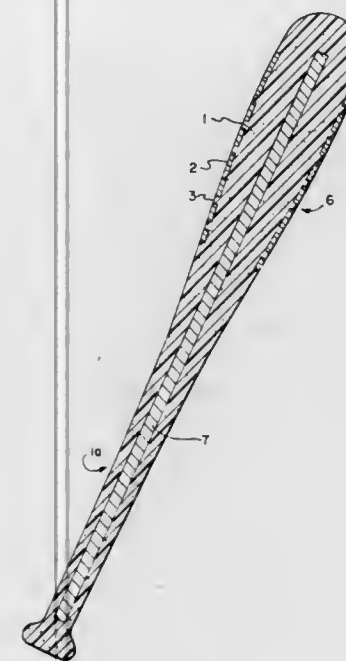
Filed Mar. 14, 1974, Ser. No. 451,377

Claims priority, application Japan, Mar. 22, 1973, 48-32952

Int. Cl.<sup>2</sup> A63B 59/06

U.S. Cl. 273-72 R

6 Claims



1. A bat used in baseball, said bat comprising:  
a main member having a barrel portion for hitting a baseball and a grip portion joined to said barrel portion for holding the bat, said main member being formed from materials selected from the group consisting of urethane foam, wood, or a combination of urethane foam and wood;  
a metal tubular portion having a plurality of openings there-through fitted only around said barrel portion of said main member;  
urethane foam foamed through the openings through said metal tubular portion joining said metal tubular portion to said barrel portion of said main member;  
glass cloth surrounding said metal tubular portion and said main member; and  
a coating of synthetic resin paint over said glass cloth.

4,014,543

**AIR ACTION GAME**

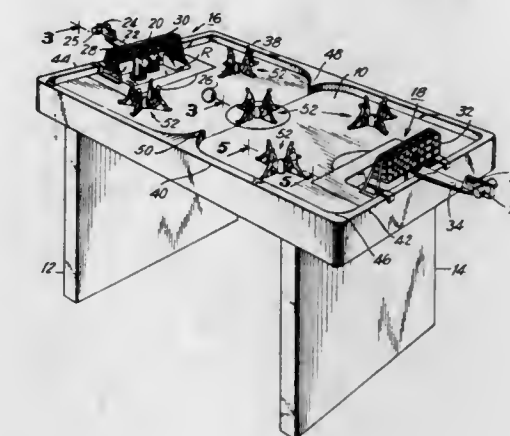
Avi Arad, New York, N.Y., assignor to Innovisions Enterprises, Inc., New York, N.Y.

Filed Dec. 9, 1975, Ser. No. 638,986

Int. Cl.<sup>2</sup> A63F 7/06

5 Claims

11 Claims



1. An air action game comprising a table, said table having a flat horizontal top and peripheral side walls, said side walls extending above the level of the table top, said table top being provided with opposed recesses adjacent the central portions of at least two opposed side walls, means to project air in a substantially horizontal stream from above each recess and across the upper surface of the table top, means to mount each air projecting means for rotation about an associated vertical axis, a plurality of clusters of vertical air stream rotated baffles disposed on the upper surface of said table top, means mounting each cluster for free rotation about an associated vertical axis when contacted by an air stream, and a low density game piece, said game piece being disposed on said table top whereby the projected air streams move said game piece about on said table top under the control of opposing players manipulating the directions of said streams, said game piece being from time to time blocked and trapped by a cluster and thereafter flung along the table top by the trapping cluster when the cluster is freely rotated by an air stream.

4,014,544

**ELECTRIFIED AMUSEMENT DEVICE**

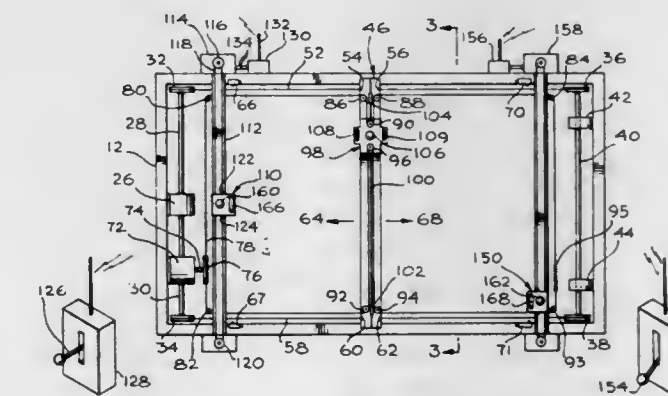
Torazo Kimura, 1-8-10, Wakabayashi, Setagaya, Tokyo, Japan

Continuation-in-part of Ser. No. 581,908, May 29, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,827

Int. Cl.<sup>2</sup> A63F 9/00

U.S. Cl. 273-85 R

10 Claims



1. An electrified amusement device including:  
a frame, said frame having first and second extremities;  
ball-lamp carriage driving means;  
a ball-lamp carriage mounted in said frame and coupled to said driving means for movement along a resultant path made up of simultaneous oscillatory motions of said carriage along first and second mutually perpendicular paths



throughout the period of operation of said amusement device, said ball-lamp carriage having a centrally mounted ball lamp and first and second magnets supported on said ball-lamp carriage on opposite sides of said ball lamp towards said first and second extremities of said frame;

- a first rail mounted in said frame proximate to said first extremity thereof;
- a first paddle-lamp carriage slidably supported on said first rail, said first paddle-lamp carriage having mounted thereon a first paddle lamp and a first magnetically actuable switch;
- a second rail mounted in said frame proximate to said second extremity thereof;
- a second paddle-lamp carriage slidably supported on said second rail, said second paddle-lamp carriage having mounted thereon a second paddle lamp and a second magnetically actuable switch;
- first and second player controls for generating first and second paddle-lamp-carriage-positioning control signals, respectively;
- a first paddle-lamp-carriage drive motor assembly mechanically coupled to said first paddle-lamp carriage and coupled to be responsive to said control signals from said first player control to position said first paddle-lamp carriage along said first rail;
- a second paddle-lamp-carriage drive motor assembly mechanically coupled to said second paddle-lamp carriage and coupled to be responsive to said control signals from said second player control to position said second paddle-lamp carriage along said second rail;
- said ball-lamp carriage having portions of said resultant path of motion proximate to said first and second rails;
- a first electrical circuit including said first magnetically actuable switch;
- said first magnetically actuable switch being responsive to said first magnet when said ball-lamp carriage is moving along one of said portions of said resultant path and said first paddle-lamp carriage is positioned adjacent said portion, to close said first electrical circuit;
- a second electrical circuit including said second magnetically actuable switch;
- said second magnetically actuable switch being responsive to said second magnet when said ball-lamp carriage is moving along one of said portions of said resultant path and said second paddle-lamp carriage is positioned adjacent said portion, to close said second electrical circuit;
- and
- sounding means responsive to the closure of said first or said second electrical circuits to produce a sound representing the hitting of a ball by a paddle.

4,014,545

## RING TOSS GAME

Roy L. Keim, 1156 N. St. Francis St., Wichita, Kans. 67214  
Filed Feb. 6, 1976, Ser. No. 655,976

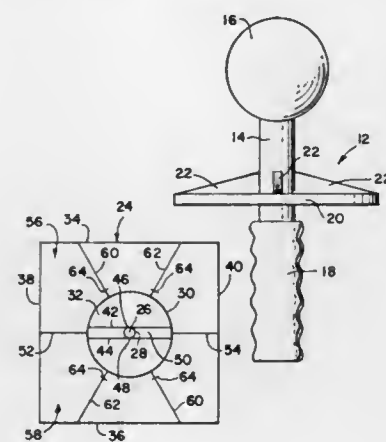
Int. Cl.<sup>2</sup> A63B 67/06

U.S. Cl. 273—95 H

3 Claims

1. An aerial game for play by two opposing teams comprising: a playing court; an annular ring for throwing within said playing court; a scoring zone at the center of said playing court; a pair of mutually exclusive regions on said playing court about said scoring zone for said respective opposing teams to throw said ring towards said scoring zone; a ring catching means for each member of said opposing teams comprising a shaft having a spherical head at an upper end of said shaft dimensioned for sliding passage through the inside diameter of said ring; a handgrip at a lower end of said shaft

and a flange intermediate said upper and lower ends projecting radially of said shaft for supporting said ring when caught;



4,014,546

## SCORING APPARATUS

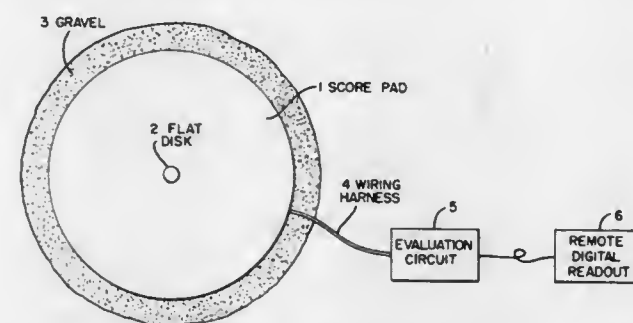
Jeffrey H. Steinkamp, 1225 Maine St., Quincy, Ill. 62301

Filed May 29, 1975, Ser. No. 581,776

Int. Cl.<sup>2</sup> A63B 67/00

U.S. Cl. 273—102.2 S

5 Claims



1. A scoring apparatus comprising:

an elastically deformable target structure upon which an object is to impact, said target structure containing first and second spaced-apart members, each of which is made of pliable material, normally physically separated from one another in the absence of the impact of an object by a net-like sheet of pliable insulator material, capable of supporting said spaced-apart members relative to each other in the absence of the impact of an object while permitting said spaced-apart members to elastically deform and come into physical and electrical contact with one another upon impact by an object on either of said members of pliable material; and

means, connected to said spaced-apart members, for generating an electrical signal representative of the position on said target structure upon which an object impacts and thereby causes physical and electrical contact between said spaced-apart members; and wherein said first member is a sheet of pliable material which is at least partially conductive, said second member is a pliable sheet of partially conductive material, and said means comprises

- a first source of reference potential connected to a first selected location on said pliable sheet of partially conductive material,
- a second source of reference potential connected to a second selected location spaced-apart from said first selected location on said pliable sheet of partially conductive material, thereby establishing a voltage gradient across said second member between said first and second spaced-apart locations,
- a conductor connected to said pliable sheet of at least partially conductive material, and

voltage conversion circuit means, connected to said conductor, for storing a voltage lying within said gradient supplied to said conductor in response to the impact of an object on said target structure and for converting said stored voltage to an electrical output representative of the distance between the position of impact of said object and one of said first and second selected locations on said pliable sheet of partially conductive material.

4,014,547

## MATHEMATICAL BOARD GAME

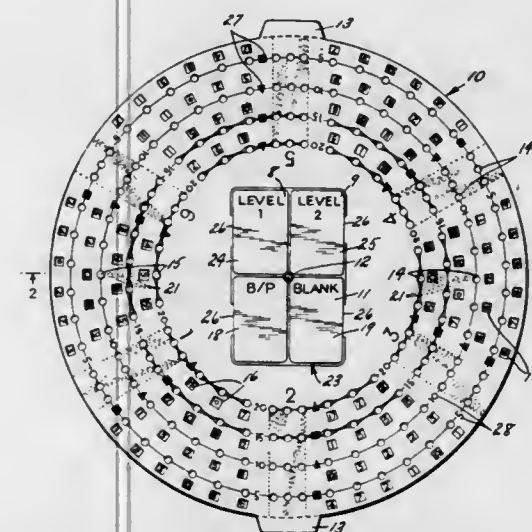
Edward Gomez, and Charles Gomez, both of 2071 Union Blvd., Bayshore, N.Y. 11706

Filed Oct. 7, 1975, Ser. No. 620,296

Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273—134 C

9 Claims



1. A mathematical board game to be played with playing pieces and playing cards comprising a circular playing board superimposed on, and axially interconnected with, a circular number board in relatively rotatable relation, said playing board being provided with integral holders in designated circular pathways for receiving said playing pieces, each holder being associated with an adjacently disposed opening alignable with viewable indicia disposed on said number board; and an integral card container centrally located on said playing board for receiving at least one deck of mathematical operation cards.

4,014,548

## WORD GAME HAVING SINGLE AND MULTIPLE LETTER TILES

Minnie Hess Trilling, 21 E. Drive, Marvin Gardens, Margate, N.J. 08402

Filed Oct. 9, 1975, Ser. No. 621,155

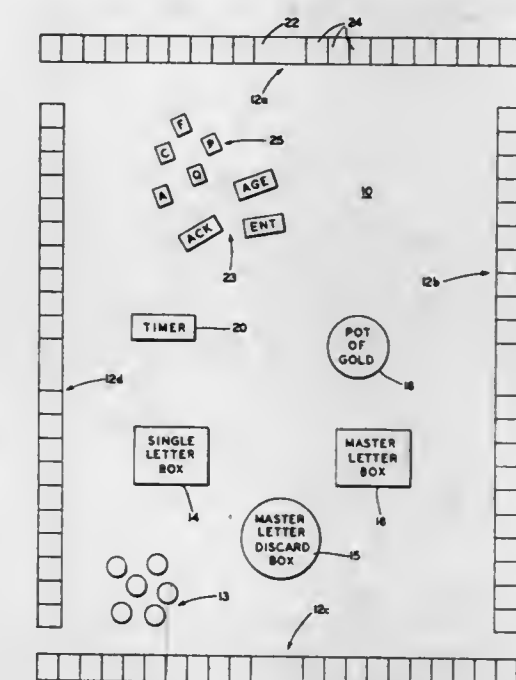
Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273—135 D

7 Claims

1. A word game comprising a first number of single-letter alphabetic tiles; a second number of multiple-letter alphabetic tiles; at least two discrete playing boards located in a playing area, each of said boards having a single row of letter spaces, one of said letter spaces being a multiple-letter space arranged to receive one of said multiple letter tiles and the remaining spaces being single-letter spaces, successive single-letter tiles placed in successive single-letter spaces and said multiple-letter tile placed in said multiple-letter space forming a word, the score value of said word corresponding to the length thereof with respect to said multiple-letter tile, wherein the score

values corresponding to said single-letter spaces are printed on the playing boards at respective single-letter spaces, said



score values increasing in both of opposite directions with respect to said multiple-letter space.

4,014,549

## BLACKJACK CARD DECK

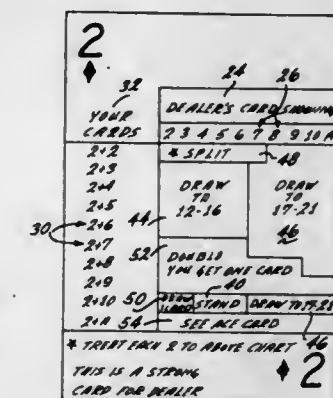
Sigmund Cywar, 2196 Vista Grande, Vista, Calif. 92083

Filed Apr. 2, 1975, Ser. No. 564,265

Int. Cl.<sup>2</sup> G09B 19/22

U.S. Cl. 273—152.41

5 Claims



1. A deck of cards for learning and improving in blackjack, comprising:

- a. a deck including fifty-two cards having markings indicating four conventional suits of spades, hearts, diamonds and clubs and each suit having thirteen conventional serially ranking cards including ace, king, queen, jack and numbers ten to two, and
- b. each card having printed thereon information arranged horizontally and vertically in correlating rows and files, the margins of said rows and files being serially marked, one with various card values and with indicia that these values are assigned to the dealer's card showing and the other being marked with the value of the player's card on which the information is printed plus the value of each other card that could be associated as the second card of the player, and at the intersecting areas of rows and files there being course of action indicia as to the action the player should take in blackjack, whether to stand, split, double or draw to some named level.

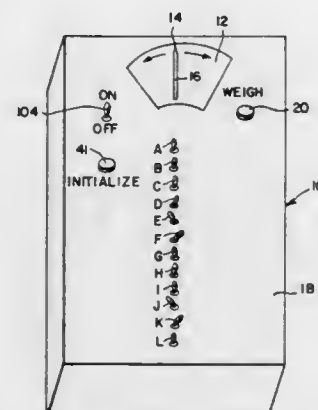


4,014,550

**ELECTRONIC ODD BALL GAME**

Orvin Wilcox, Box 3, Kapuskasing, Canada  
 Filed Nov. 20, 1975, Ser. No. 633,627  
 Int. Cl.<sup>2</sup> A63F 9/06  
 U.S. Cl. 273-153 R

4 Claims



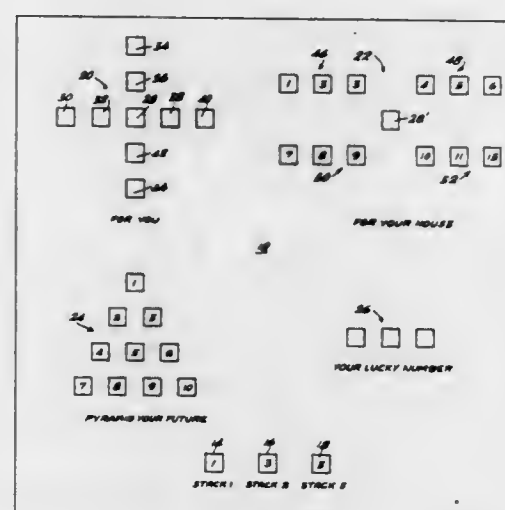
1. A game apparatus determining which one of plural items is different comprising: a plurality of single pole, double throw, center-off switches respectively representative of each of said items; each of said switches having a wiper associated with first and second contacts; random generator means coupled to said wipers for placing a first electrical signal on a random one of said wipers and a second electrical signal on each of the other wipers; electrical comparator means having two input terminals for receiving two input signals; said comparator means being configured for indicating whether said input signals are equal, and if not equal which is the greater in magnitude; first and second adder means respectively fed by each of said first and second contacts, each of said adder means having an output terminal; and means for coupling the output terminal of one of said adder means to one of said input terminals and for coupling the output of the other of said adder means to the other of said input terminals.

4,014,551

**FORTUNE-TELLING GAME**

Armando Alfonso, 417 E. 39th St., Hialeah, Fla. 33013  
 Filed Apr. 26, 1976, Ser. No. 679,897  
 Int. Cl.<sup>2</sup> A63F 9/18  
 U.S. Cl. 273-161

1 Claim



1. An amusement game comprising: a gameboard having a game surface and indicia on the surface defining areas, a first area, a second area, a third area, a fourth area, and a fifth area, the fifth area being composed of three separate indicia defining rectangular zones, said first area being composed of a plurality of indicia defining rectangular zones arranged in a cross with a vertical line of five of said zones and a horizontal line of five of

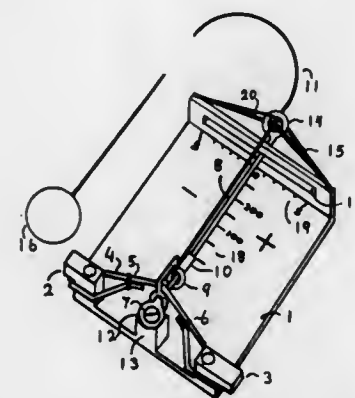
said zones with the middle zone of each line being common to both lines and an indicia in each of the zones of the cross except the middle zone designated by a numeral between one and eight in a predetermined order; said second zone being composed of a plurality of indicia defining rectangular zones in a pattern composed of four groups of three zones equispaced from one another with each group being arranged in a line and with the groups radiating outwardly generally from a central zone defined by a rectangular outline and indicia on each of the zones of each of the groups designated by a numeral between one and twelve and arranged in a predetermined order; said third area comprising ten indicia defining rectangular zones with each of the zones being arranged in a pattern defining a pyramid of zones, said pattern being composed of ten zones; and said fourth area comprising three indicia defining rectangular zones in a line, said gameboard comprising a selection board; and a plurality of forty cards of similar size, each having an upper end and a lower end and each of said cards being arranged in a deck and each of said cards displaying thereon a distinctive symbol indicia representing a suit, there being four suits, and each of said cards carrying indicia comprising a printed message at the upper end of the card and a different printed message at the lower end of the card, each of said zones being similarly sized and congruent to that of the cards of said deck, whereby when the cards are selected in a prescribed fashion, and positioned on the board, a message or reading will result when the indicia on the cards are read.

4,014,552

**TETHERED GOLF BALL METER**

Thomas Arthur Watts Knott Watson, Box 546 Mount Royal  
 Post Office, Montreal P.Q., Canada (H3P 3C7)  
 Filed Oct. 20, 1975, Ser. No. 624,271  
 Int. Cl.<sup>2</sup> A63B 69/36  
 U.S. Cl. 273-185 C

1 Claim



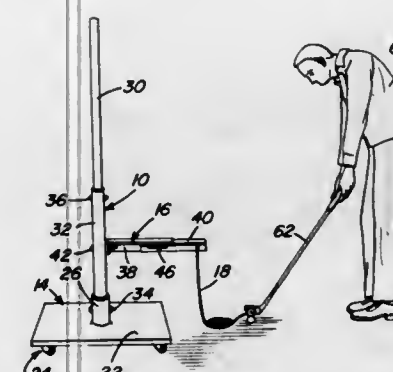
1. A tethered golf ball distance and angular measuring device comprising, a tether having one end attached to a golf ball, a horizontal rod pivoted at one end about a vertical axis, said rod having an eyelet at its other end remote from the pivoting point, said tether threaded through the eyelet, said tether's other end attached to a distance measuring means, means for indicating the angular position of the rod, a first elastic cord and a second elastic cord threaded through the eyelet, and the elastic cords mounted in a substantially horizontal plane perpendicular to the rod, the elastic cords threaded through the eyelet in a manner such that they cross over inside the eyelet, wherein the axis which is perpendicular to the eyelet and runs through the center of the eyelet is inclined away from the horizontal and passes through an imaginary upward extension of the rod's pivoting axis.

4,014,553

**COMBINED GOLF BALL TETHER AND ANCHOR STRUCTURE**

Minoru Sakamoto, 3911 Nioi Place, Honolulu, Hawaii 96816  
 Filed Nov. 24, 1975, Ser. No. 634,654  
 Int. Cl.<sup>2</sup> A63B 69/36  
 U.S. Cl. 273-200 R

10 Claims



1. A golf ball tether structure comprising an upright standard including first means carried by its lower end for support of said standard from a support surface from which a golf ball may be driven, a low horizontally outwardly projecting arm stationarily support from the lower end portion of said standard at an elevation spaced above said first means, said arm including an outer free end portion spaced outwardly of said standard a greater distance than the spacing of said outer free end portion above said first means, an elongated flexible tether member having one end thereof anchored to the outer free end portion of said arm, a ball anchored to the other end of said tether member, the length of said tether member being at least one and one-half the effective length of said arm and greater than the spacing of said outer free end portion of said arm above said first means, said standard projecting above said arm a distance equal to at least the effective length of said tether member.

4,014,554

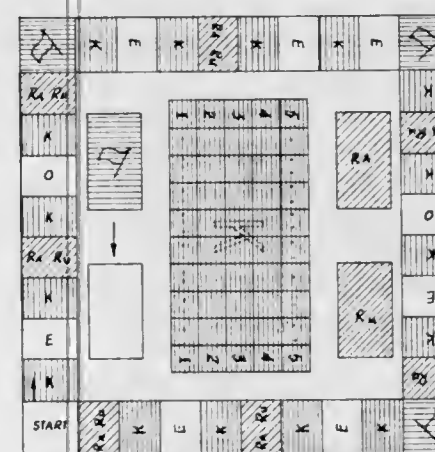
**BOARD GAME APPARATUS**

Gottfried Krummacker, Friedrich-Gauss-Strasse 2, 5205 St.  
 Augustin/Sieg-3, Germany  
 Filed Mar. 31, 1975, Ser. No. 563,391  
 Claims priority, application Germany, Apr. 17, 1974,  
 2418266

Int. Cl.<sup>2</sup> A63F 3/00

U.S. Cl. 273-134 AD

7 Claims



1. An instructional game for learning the interrelations of a free-market economy comprising a board having a closed circuit of individual serially arranged playing spaces, a plurality of playing pieces movable over said closed circuit, the individual playing spaces each having a marking with a number of different markings being provided for said playing spaces, a market area provided on the board and enclosed by said closed circuit of said playing spaces, said market area

having a marking and being subdivided into a plurality of subsidiary areas, a plurality of counters sufficient to provide one said counter for each said subsidiary area, said counters being removably positionable on said subsidiary areas, at least one pack of cards positionable on said board and consisting of a plurality of play variation cards, each of said cards having a front and a back with the same marking on the backs of the cards in said pack and the marking being different from the marking of said market area, a partial number of the playing spaces having a marking which corresponds with the marking of said market area and another partial number of the playing spaces having a marking corresponding to the back marking of said at least one pack of cards, and means operable by a player for determining the number of playing spaces to be moved by the player's playing piece.

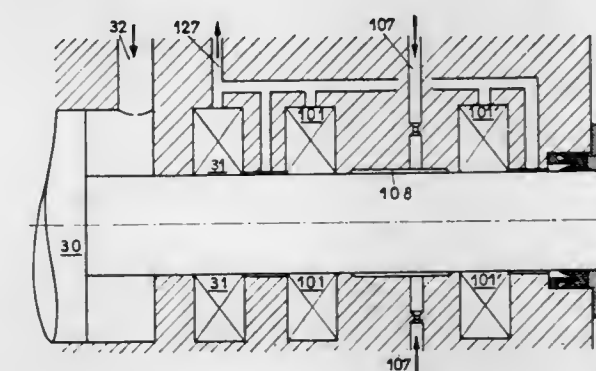
4,014,555

**HYDROSTATIC SEALING DEVICE**

Jean Louis Jacotet, 7/7 Bis, Rue Jean-Mermoz, 78 003 Versailles, France  
 Filed Feb. 3, 1976, Ser. No. 654,769  
 Int. Cl.<sup>2</sup> F16J 15/40

U.S. Cl. 277-3

16 Claims



1. In a hydrostatic sealing device which effects a seal by means of a high pressure acting upon surfaces which are in mutual contact and perform relative motions, said device comprising at least one segment split into a certain number of elements having lateral faces, said elements bearing against one another through flat surfaces contained in axial planes, when the contacting surfaces are cylindrical, and contained in mutually parallel planes when the contacting surfaces are flat, said elements being individually hydrostatically balanced, both in relation to the direction of relative motion between the surfaces which are in contact with each other, and in relation to the direction perpendicular thereto, an improvement characterized in that in the direction perpendicular to the direction of motion, that face of the element which is opposite to the surface that is in contact, is subjected to the action of a piston in communication with said high pressure whose area of contact with said opposite surface is isolated from the high pressure by a seal.

4,014,556

**SEALING RING MEANS FOR PIPE COUPLINGS**

Richard H. Anderson, Dover, Ohio, assignor to Clow Corporation, Oak Brook, Ill.  
 Filed Mar. 3, 1976, Ser. No. 663,255  
 Int. Cl.<sup>2</sup> F16J 15/10

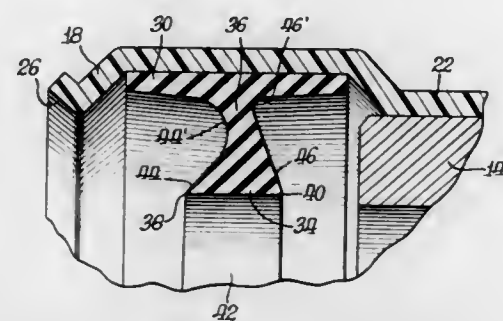
U.S. Cl. 277-181

10 Claims

1. A sealing gasket for use in effecting a liquid tight seal between a first annular member and a second annular member adapted to be coaxially disposed within said first annular member in radially spaced relation therefrom, said gasket including an annular flange portion adapted to be secured to the inner peripheral surface of said first annular member, said gasket further having an annular sealing portion secured to and extending radially inwardly from said flange portion, said sealing portion having a substantially triangular transverse



section configuration when said sealing portion is in a relaxed condition, said sealing portion being secured to said flange portion at one corner edge of said substantially triangular section and defining a pair of resilient parallel annular sealing edges of substantially equal diameter, said gasket having a radial thickness greater than the radial spacing between said first and second annular members when disposed in said coax-



ial relation so that placement of said first and second annular members in said coaxial relation with said flange portion of said sealing gasket secured to the inner peripheral surface of said first annular member will effect resilient biasing of said sealing portion against the peripheral surface of said second annular member with at least one of said annular sealing edges forming a liquid tight lip seal against said peripheral surface of said second annular member.

4,014,557

## COLUMN PACKING

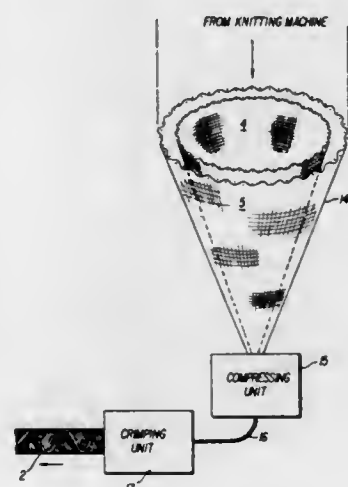
Edward J. Bragg, Somerville, N.J., assignor to Metex Corporation, Edison, N.J.

Filed June 4, 1975, Ser. No. 583,770

Int. Cl.<sup>2</sup> F16J 15/08

U.S. Cl. 277—230

6 Claims



1. Column packing comprising a first layer and a second layer adjacent said first layer, each said layer comprising an inner knitted flattened tubular mesh element formed of inner filaments and having 8 to 14 counts per inch, an outer knitted flattened tubular mesh element formed of outer filaments, surrounding said inner element and in contact therewith and having 4½ to 6½ counts per inch, the axes of said inner element and said outer element being substantially parallel or coincident, at least one of said layers being crimped in wave form, the crests of said waves being at an angle of 20° to 45° to a line perpendicular to said axes, a surface of said first layer being generally in contact with a surface of said second layer, the diameter of said inner filaments being from 29 to 75% of the diameter of said outer filaments.

4,014,558  
CHUCK-CLOSING MECHANISM FOR AUTOMATIC  
SCREW MACHINE

Earl W. Brinkman, Rochester, N.Y., assignor to Davenport Machine Tool Co., Inc., Rochester, N.Y.

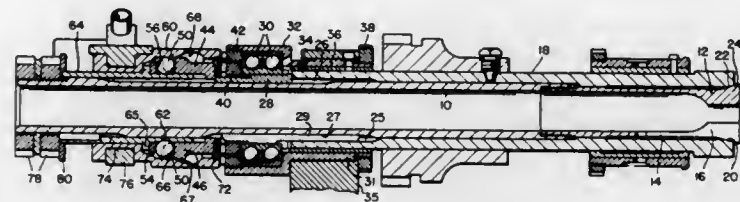
Continuation of Ser. No. 491,308, July 24, 1974, abandoned.

This application Mar. 8, 1976, Ser. No. 664,518

Int. Cl.<sup>2</sup> B23B 31/20

U.S. Cl. 279—50

9 Claims



1. A chucking mechanism comprising an inner spindle, a split tubular collet secured to the forward end of said spindle and having thereon a plurality of flexible, angularly spaced fingers, each of which has an external conical surface, a chuck-closing spindle surrounding said inner spindle and collect and having an internal conical surface complementary to and engaging the external surfaces of said fingers, and means for moving said chuck-closing spindle axially on said inner spindle in a direction to move said collet fingers to clamping position, comprising an annular ball cage axially slidable on said inner spindle rearwardly of said chuck-closing spindle and operatively connected to said chuck-closing spindle coaxially thereof, said cage having in one end a plurality of arcuate pockets of substantially semi-cylindrical configuration angularly spaced about the axis of said inner spindle, and extending radially through the annular wall of said cage about axes which intersect the axial centerline of said cage at right angles, a plurality of balls movably mounted in said pockets for limited movement radially of said cage, and actuating means removably mounted on said one end of said inner spindle in engagement with said balls and operable to transmit motion through said balls and said cage to said chuck-closing spindle, and in the direction to move said collet fingers to clamping position, the radii of said pockets and said balls being approximately equal, whereby each ball contacts the surface of its associated pocket along an arcuate line, and said ball cage being removable from said one end of said inner spindle independently of said chuck-closing spindle, when said actuating means is removed from said inner spindle.

4,014,559

## SKI POLE ASSEMBLY

Peter Funke, Munich, Germany, assignor to ISPOW AG, Chur, Switzerland

Filed Feb. 17, 1976, Ser. No. 658,834

Claims priority, application Germany, Feb. 20, 1975, 2507352

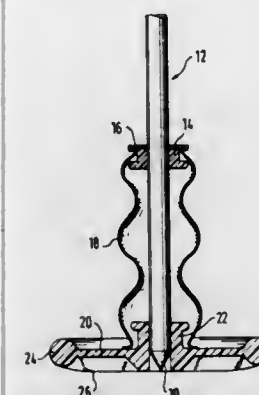
Int. Cl.<sup>2</sup> A63C 11/24

U.S. Cl. 280—11.37 N

15 Claims

1. A ski pole assembly comprising:  
a. an elongated pole member having a longitudinal axis, an axial main portion, and an axial free end portion shaped for axially penetrating a snow surface;  
b. a snow engaging member formed with an aperture axially extending therethrough for movably receiving a portion of said pole member,  
1. said snow engaging member having a snow engaging face transverse to said axis and directed axially away from said main portion;

c. an axially compressible, resilient tubular mounting member having two axially terminal parts,  
1. said terminal parts being annular about said axis and being fastened to said pole member and to said snow engaging member respectively, whereby said snow engaging member is secured to said pole member for relative axial movement between an operative position and a rest position of said snow engaging member,



2. said end portion projecting from said face in the operative position of said snow engaging member,  
3. said snow engaging member in said rest position covering said free end portion,  
4. said mounting member biasing said snow engaging member toward said rest position.

4,014,560

## TRAFFIC BARRICADE DOLLEY

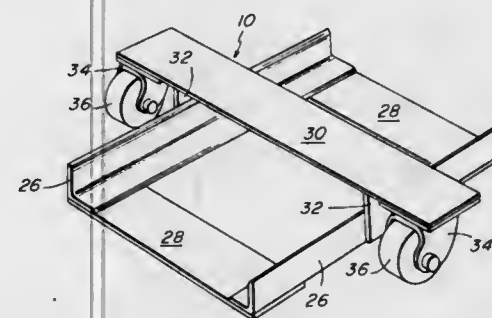
Robert L. Hughes, 24 White Birch Drive, Stockholm, N.J. 07460

Filed Apr. 8, 1976, Ser. No. 675,042

Int. Cl.<sup>2</sup> B60P 3/40

U.S. Cl. 280—47.13 R

1 Claim



1. A symmetrical dolley frame structure for use in the local movement of traffic barricades; said dolley structure being capable of receiving either end of the base of a traffic barricade or the abutting ends of two adjacent barricades, comprising:

two parallel, longitudinally oriented, complementarily paired, L-shaped angle members, each having one side vertically oriented and one side horizontally oriented inward;  
two transverse end plates, each secured to and connecting the respective ends of said paired angle members, such that said angle members are in a spaced apart relationship slightly greater than the width of the base of a traffic barricade to be inserted therein;  
two vertical plate members, one of each mounted medially on the exterior side of the vertical portion of each of said angle members midway between the ends thereof, and extending upward from said angle members;  
a horizontal plate secured to said vertical plates along the latitudinal axis of said dolley structure and extending beyond the exterior edges of said angle members, serving to divide said dolley structure into two symmetrical transverse portions.

sit seats, each of which is capable of accommodating one end of the base of a traffic barricade;  
at least one castor mounted to the underside of each end of said horizontal plate such that said castors extend below the horizontal plane of said transverse end plates and permit the movement of said dolley.

4,014,561

## SUSPENSION MECHANISM FOR FOUR-WHEELED VEHICLE

Ryuichi Tomiya; Koji Kaki, both of Sagami, and Yoshitomo Tezuka, Hachioji, all of Japan, assignors to Aida Engineering Kabushiki Kaisha, Sagami, Japan

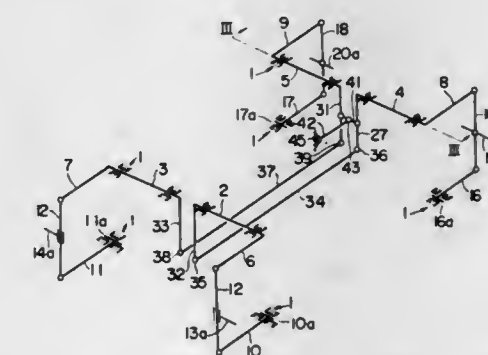
Filed Mar. 12, 1976, Ser. No. 666,379

Claims priority, application Japan, June 27, 1975, 50-90076

Int. Cl.<sup>2</sup> B60B 19/02

U.S. Cl. 280—104

6 Claims



1. A suspension mechanism for a four-wheeled vehicle body, comprising a pair of horizontal front torsion bars rotatably supported by a front part of the vehicle body and aligned in a direction transverse to the front-to-rear direction of the vehicle body, a pair of front arms extending forwardly of the vehicle body and secured to the transversely outer ends of the front torsion bars, respectively, said front arms carrying front vehicle wheels, respectively, a pair of front vertical arms having their upper ends secured to the transversely inner ends of the front torsion bars, respectively, a pair of horizontal rear torsion bars rotatably supported by a rear part of the vehicle body and aligned in a direction transverse to the front-to-rear direction of the vehicle body, a pair of rear arms extending rearwardly of the vehicle body and secured to the transversely outer ends of the rear torsion bars, respectively, said rear arms carrying rear vehicle wheels, respectively, a pair of rear vertical arms having their upper ends secured to the transversely inner ends of the rear torsion bars, respectively, a pair of links extending in said front-to-rear direction and having their front ends pivotally connected to the lower ends of said front vertical arms and their rear ends pivotally connected to the lower ends of said rear vertical arms, respectively, and a transversely extending lever pivotally supported at its middle part by the vehicle body and pivotally connected at its both ends to intermediate parts of one of said pairs of the front and rear vertical arms.

4,014,562

## COUPLING HOOK FOR A THREE-POINT CONNECTION ON A TRACTOR

Dieter Kunze, Siegburg, Germany, assignor to Jean Walter-scheid GmbH, Lohmar, Germany

Filed Jan. 30, 1976, Ser. No. 654,001

Claims priority, application Germany, Mar. 11, 1975, 2510490

Int. Cl.<sup>2</sup> B60D 1/10

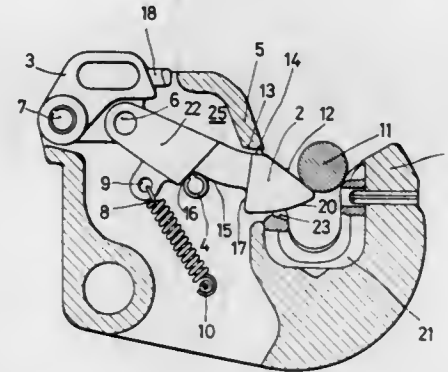
U.S. Cl. 280—508

4 Claims

1. A coupling hook for a three-point connection on a tractor comprising a hook body portion and a jaw extending therefrom to define a jaw opening for receiving a coupling pin on an implement and the like, said hook body portion having a



pocket therein and an opening in said pocket, an operating lever pivotally mounted in said pocket, a latch within said pocket having one end pivotally connected to said operating lever and its other end extending through said pocket opening toward said jaw, said latch having open and locked positions with respect to a coupling pin in said jaw opening, a supporting pin within said pocket and said latch having a first supporting surface pivotable and slidable on said pin, said latch having a second supporting surface engagable with an edge of said



pocket opening and the other end of said latch having an unlocking surface and a locking surface such that a coupling pin acting upon said latch unlocking surface during the coupling operation will slide said latch upon said supporting pin into said pocket and when a coupling pin is locked within said jaw opening said coupling pin acts upon said latch locking surface to urge said latch second supporting surface against said pocket opening edge to produce a moment acting upon said latch and operating lever urging said latch into said jaw opening.

4,014,563

## RUN-AWAY PREVENTING DEVICE FOR SKIS

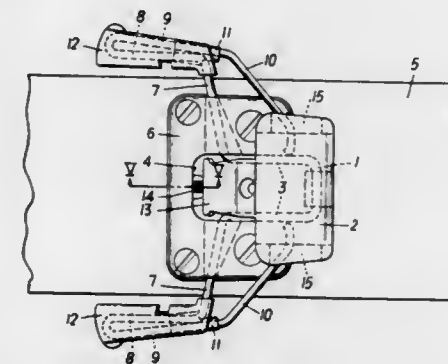
Erwin Weigl, Brunn am Gebirge, and Josef Svoboda, Schwachat, both of Austria, assignors to Gertsch AG, Baar, Zug, Switzerland

Filed Dec. 10, 1975, Ser. No. 639,385

Claims priority, application Austria, Mar. 7, 1975, 1803/75  
Int. Cl.<sup>2</sup> A63C 7/10

U.S. Cl. 280—605

7 Claims



1. In a run-away preventing device for a ski having a bar with brake legs supported on said ski, said bar being movable automatically under spring action into a braking position wherein said brake legs project downwardly from said ski on opposite sides thereof, the improvement comprising a holding plate secured to said ski and a stepping plate pivotally secured to said holding plate, said bar having two extensions extending from each of said brake legs, one of which is pivotally supported on said holding plate and thereafter extends to said stepping plate and the other extension extends directly to said stepping plate.

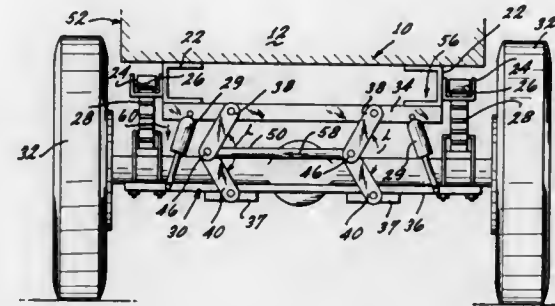
4,014,564  
VEHICLE STABILIZING APPARATUS  
Ralph A. Coble, San Diego, Calif., assignor to Coble Incorporated, San Francisco, Calif.

Filed Oct. 16, 1975, Ser. No. 623,057

Int. Cl.<sup>2</sup> B60G 19/02

U.S. Cl. 280—689

5 Claims



1. Improved lateral stabilizing apparatus for a surface supported vehicle having a sprung frame and body portion attached thereto and an unsprung wheel and axle surface contacting portions comprising:

- an upper support bar attached to said frame transversely thereof,
- a lower support bar attached to said axle parallel to said first bar,
- suspension and vertical dampening means connected between said sprung and unsprung portions,
- two upper pairs of links connected to the upper bar, the pairs being spaced along the bar,
- the links of each pair being parallel and pivotally connected to the respective forward and rearward sides of the bar,
- two lower pairs of links connected to the lower bar, the lower pairs being spaced along the lower bar,
- the links of each lower pair being parallel and pivotally connected to the respective forward and rearward sides of the lower bar,
- a pivot pin connected between the parallel links of each pair of one of the upper and lower pairs,
- a resilient bushing surrounding each of said pivot pins and extending between the links connected thereby,
- a rigid bushing about each of said resilient bushing, said resilient bushing being pivotally mounted in openings in the parallel links of the other of the upper and lower pairs respectively,
- and a rigid member securing the rigid bushings together, the pivotally connected upper and lower links of all the pairs forming equal included angles between them.

4,014,565

## SAFETY BELT INSTALLATION FOR MOTOR CAR

Walter Fieni, Paris, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Aug. 21, 1974, Ser. No. 499,291

Claims priority, application France, Aug. 24, 1973, 73.30777

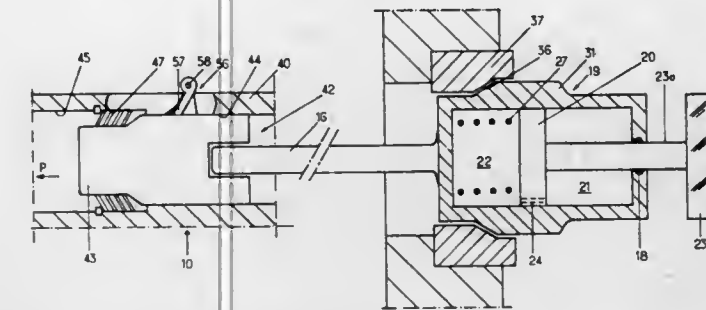
Int. Cl.<sup>2</sup> B60R 21/10

U.S. Cl. 280—744

11 Claims

1. An installation to protect an occupant of a motor vehicle in case of a collision of said vehicle, said installation comprising a deformable vehicle structure, at least one strap type safety belt, means for anchoring said belt at its ends to said vehicle structure, a movable mechanical connection between one of said anchoring means and a part of said vehicle structure which is deformed upon said vehicle undergoing a collision, said mechanical connection being adapted to tension said belt when it is moved in a predetermined manner in response to a collision deforming said vehicle structure, and means for sensing collisions as to their force, said sensing means being connected to said mechanical connection to

prevent movement thereof in said predetermined manner when the force of a collision is less than a predetermined



value, said sensing means comprising at least one elastic member disposed between a fixed part of the vehicle and a part of said mechanical connection.

4,014,566

## POCKET-SIZED CHECKBOOK

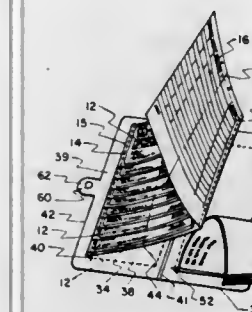
Sally H. Cantrell, and Bob I. Cantrell, both of P.O. Box 724, Newport, Oreg. 97365

Continuation-in-part of Ser. No. 520,661, Nov. 4, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,965

Int. Cl.<sup>2</sup> B41L 1/20

U.S. Cl. 282—8 R

3 Claims



1. A compact, pocket-sized checkbook assembly adapted for recording a check-writing transaction automatically while a check is being written comprising:

- a. a plurality of checks of elongate rectangular shape, having identically positioned spaces on the respective faces thereof designated as spaces for writing information, each said designated space having indicia printed on the face of the respective check indicating the information to be written in said designated space, said checks being detachably connected in a vertically-offset, overlapping relation to one another;
- b. a flap underlying said checks having one edge to which said checks are detachably connected, said vertically-offset checks being arranged such that each successive check in a downward sequence partially underlies its predecessor;
- c. a record sheet, having a plurality of vertically-arranged spaces on the face of said sheet, detachably connected at one edge thereof to an edge of said flap other than said edge where said checks are connected such that said respective spaces on said record sheet are alignable in underlying relation to the respective designated spaces on the faces of said plurality of checks and such that said record sheet may be selectively inserted between different respective pairs of successive checks and selectively detached from said flap, each said space on the respective faces of said checks which is designated for the writing of information being located below the top edge of the next underlying check;
- d. duplicating means associated with said checks for reproducing the images written in said respective designated check spaces on respective ones of said spaces of said record sheet; and
- e. a register-type pocket-sized checkbook cover of generally rectangular shape foldable along a central line running

from the top edge of said cover to an opposite bottom edge thereof so as, when folded, to form a closed cover of elongate shape having its longitudinal dimension extending between top and bottom, connecting means disposed upon said cover and adjacent said one edge of said flap for connecting said plurality of checks to said cover, at least a portion of said connecting means being located adjacent an outside edge of said cover which is parallel to said fold line, said detachable connection of said checks along said one edge of said flap being adjacent said outside edge of said cover such that the longitudinal dimension of each said check crosses said fold line in a direction perpendicular thereto, said checks and record sheet respectively both being folded along said line for compact storage within said cover.

4,014,567

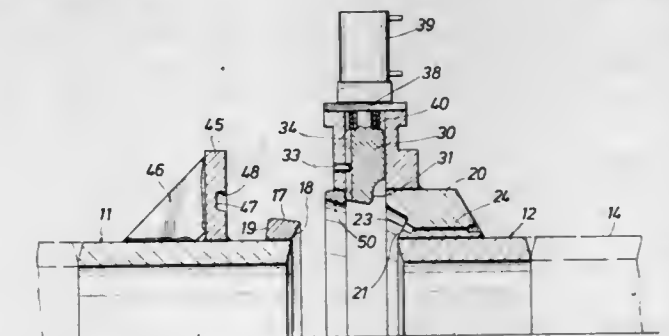
## APPARATUS FOR COUPLING PIPE OR THE LIKE

James F. Arnold, Houston, Tex.; Glen E. Lochte, Asker, Norway, and Anthony B. Duncan, Missouri City, Tex., assignors to Hydro Tech International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 466,039, May 1, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,406  
Int. Cl.<sup>2</sup> F16L 55/00

U.S. Cl. 285—24

16 Claims



1. Apparatus for connecting the ends of a pair of pipes comprising:  
a pair of coupling members, each mountable at one end thereof to the end of one of said pipes;  
one of said coupling members including, at the opposite end thereof, an annular outwardly extending flange having forward and rearward sides;  
the other said coupling member including, at the opposite end thereof, a housing for receiving said flange in locking engagement therewith, said housing having a base mateable with the forward side of said flange in said locking position;  
means axially spaced from said base for releasably tying said housing to said one coupling member to restrain said housing against radially outward movement when said flange is in locking engagement therewith;  
a plurality of cam members carried by said housing in said spacing between said tie means and base, said cam members being movable between a retracted position in which said flange is receivable by said housing and an extended position in which said cam members are engageable with the rearward side of said flange to drive the latter into locking engagement with said housing;  
and means for moving said cam members between said retracted and extended positions.



#### 4,014,568 PIPE JOINT

J. Warne Carter, Wichita Falls, and Martin Duane Neher, Burkburnett, both of Tex., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

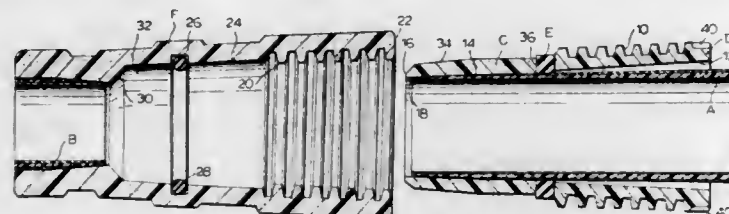
Continuation of Ser. No. 462,574, April 19, 1974, abandoned.

This application Feb. 27, 1976, Ser. No. 662,081

Int. Cl.<sup>2</sup> F16L 35/00

U.S. Cl. 285—39

7 Claims



1. A joint for pipe comprising a first pipe section, a first sleeve surrounding and bonded to the end of the pipe section, a second sleeve on the pipe section rearward of the first sleeve, the second sleeve being externally threaded and having an internal diameter greater than the diameter of the pipe section, an elastomeric spacer ring surrounding the pipe section intermediate the sleeves, the first sleeve and spacer ring preventing removal of the second sleeve from said end of the pipe section, a second pipe section, and a collar bonded to and extending from an end of the second pipe section, the collar having an internally threaded portion adjacent the forward end thereof for engagement with said externally threaded second sleeve, the collar having a second portion rearward of the threaded portion adapted to receive the portion of the first pipe section having said first sleeve and spacer ring thereon, the second portion having an internal annular groove, and a sealing ring in the groove for engagement by said first sleeve, the first sleeve and said second portion of the collar having cooperable means whereby when the parts are connected a ball and socket arrangement of predetermined angular capability will be provided and said first sleeve will remain in engagement with the sealing ring throughout predetermined angular misalignment of the pipe sections.

#### 4,014,569

##### FLEXIBLE DUCTING JOINT

Peter Thorp, Hampton, and George William Bycroft, Doncaster, both of England, assignors to Coal Industry (Patents) Limited, London, England

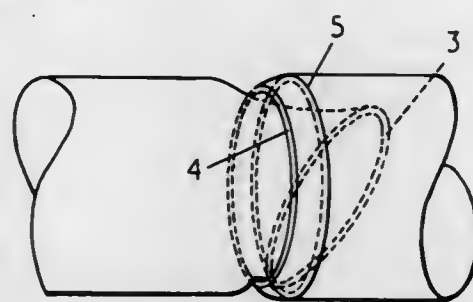
Filed Jan. 2, 1973, Ser. No. 320,552

Claims priority, application United Kingdom, Jan. 24, 1972, 03325/72

Int. Cl.<sup>2</sup> F16L 31/00

U.S. Cl. 285—260

5 Claims



1. A length of flexible ducting having open ends, a pair of rings secured to a first one of the ends, a first of the rings being attached at an extremity of the first end of the ducting and the second of the rings being attached to the ducting parallel to the first ring and at a predetermined distance from said extremity of the first end, the first ring of the pair of rings having a smaller diameter than the second ring of the pair of rings, whereby the said predetermined distance is such that a resilient ring attached to an end of a second length of flexible

ducting can be retained between said first and second rings when positioned therebetween.

#### 4,014,570

##### KNOT TYING ASSISTANCE CONTRIVANCE

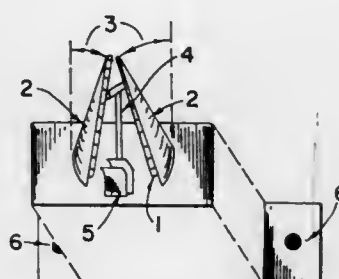
Charles F. Ruggles, 2982 Crooked Creek Drive, Diamond Bar, Calif. 91765, and Stenton A. Baruch, 2624 Midwickhill Drive, Alhambra, Calif. 91803

Filed Apr. 5, 1976, Ser. No. 673,653

Int. Cl.<sup>2</sup> D03J 3/00

U.S. Cl. 289—17

3 Claims



1. A device that permits an inner half knot of a granny, reef, square or like knot to be brought to tension and secured with an outer half knot when the ends of the outer half knot are pulled, and is a knot tying assistance contrivance of original type consisting of curved and tapering surfaces comprising a loop-separator structure means keeping half knots of granny, square, reef or similar knots untied; with a means for transferring tension from the pulled line ends through an outer half knot, through the loop formed around the loop-separator, through the inner half knot to the line around the item, with said means being connected to the loop-separator structure; having a means for controlling the size of the loop eye between the outer and inner said half knots with said means connected to said loop-separator structure; and having a means for releasing the combination of the half knots and the loop-structure with said means connected to the loop-separator structure, thereby tying the line as tensioned with said knots; whereby the knot tying assistance contrivance functions as an assistant for tying of the specified knots leaving a secured knot and a tensioned tied line.

#### 4,014,571

##### LOCKING MEANS FOR DOORS AND WINDOWS

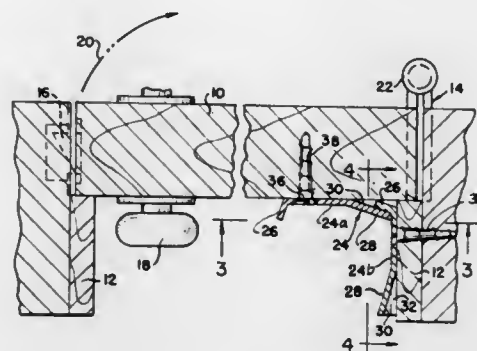
Rollo G. Ellis, 6409 War Eagle Lane, Charlotte, N.C. 28214

Filed Nov. 28, 1975, Ser. No. 636,135

Int. Cl.<sup>2</sup> E05C 19/00

U.S. Cl. 292—300

2 Claims



1. A locking device for a door or window disposed in a jamb and provided with hinging means having a removable pin, said device comprising a first plate mounted on said door or window proximate and opposite to said hinging means, a first angled end portion on said first plate, a second plate mounted on said jamb, a second angled end portion on said second plate engageable behind the first angled end portion of said first plate upon closure of said door or window for preventing said door or window from being removed from said jamb after

removal of said pin said first and second plates being identical and each having one of said angled portions on each end thereof, the first of said angled portions being at a first angle of less than 45° relative to said plate and the second being at a second angle complementary of said first angle.

#### 4,014,572

##### LATCHING APPARATUS FOR A TRUCK DOOR

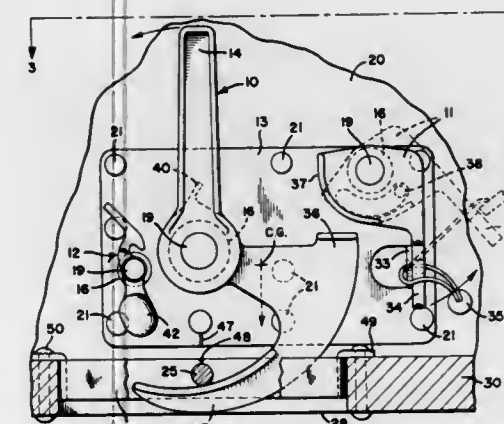
John W. Binns, 1010 Champagne Drive, Marion, Ohio 43302

Filed Dec. 1, 1972, Ser. No. 311,310

Int. Cl.<sup>2</sup> E05C 19/10

U.S. Cl. 292—108

1 Claim



1. In a truck comprising an upwardly acting overhead door, a latch mounted on a support plate at the base of said door, and a catch pin mounted in the bed of said truck for engagement with said latch, the improvement wherein said latch comprises:

- a latch bolt comprising an integral actuating arm and an integral hook and being pivotally mounted on said door whereby the weight of said latch bolt urges said hook self-adjustingly against said catch pin when said hook is in engaging relation therewith,
- a keeper mounted on said support plate in position for abuttingly preventing disengagement of said hook from said catch pin, said keeper being pivotally movable from said position to another position whereby said disengagement is permitted, the rotation of said keeper from said position to said another position being limited by a stop peg mounted on said support plate and engageable with an arc shaped channel on the inner surface of the keeper, and
- means for locking said keeper in said disengagement preventing position.

#### 4,014,573

##### THUMBTURN AND ASSEMBLY AND METHOD OF PROVIDING A THUMBTURN

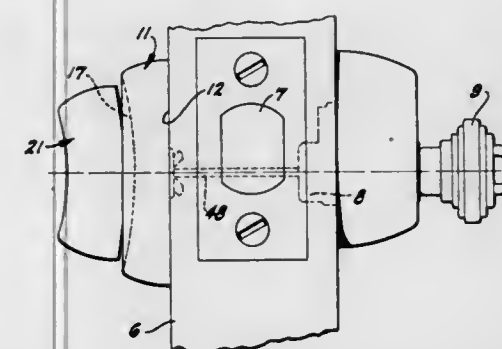
Hans F. Lehnhoff, Moraga, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Nov. 7, 1975, Ser. No. 629,881

Int. Cl.<sup>2</sup> E05B 1/00

U.S. Cl. 292—347

7 Claims



1. A thumbturn and assembly comprising a rose body including a hub concentric with an axis, including a face wall

approximately normal to said axis, and including a bearing ring merging with said face wall and said hub and projecting axially from said face wall; a thumbturn including individual side walls disposed on opposite sides of said axis, including a pair of separate journal walls concentric with said axis, and including thrust walls merging with said side walls and said journal walls and facing said bearing ring; and means for transmitting force between said journal walls and said hub in a direction to urge said thrust walls toward said bearing ring.

#### 4,014,574

##### MINING MACHINE HAVING RECTANGULAR THRUST TRANSMITTING CONVEYOR COLUMN

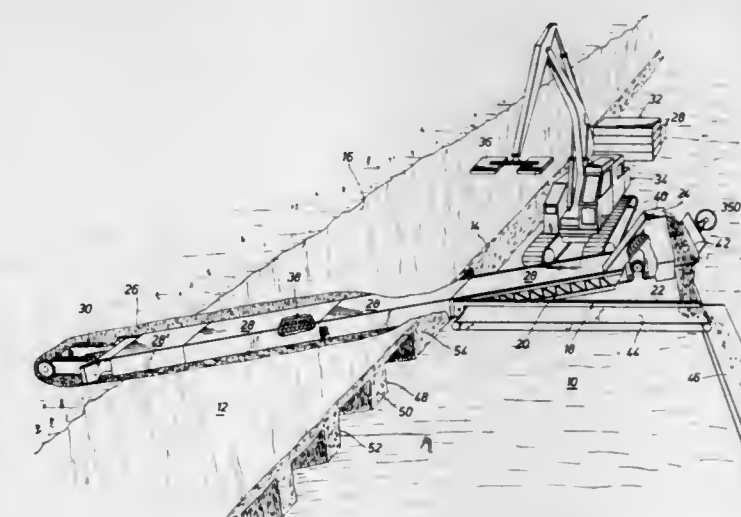
Robert E. Todd, Houston, Tex., assignor to Browning & Bushman, Houston, Tex.

Filed Apr. 10, 1975, Ser. No. 566,986

Int. Cl.<sup>2</sup> E21C 27/24, 29/02, 35/24

U.S. Cl. 299—1

29 Claims



1. A mining machine comprising:  
a cutting head including means for cutting an earth formation, the dimension of said cutting head from side to side being substantially greater than its vertical dimension;  
a thrust-transmitting column connected to said cutting head and extending rearwardly therefrom, the dimension of said column from side to side being substantially greater than its vertical dimension, and said column having a non-thrust-transmitting column conveyor carried thereby and extending along substantially the entire length of said column;  
and a power head connected to said column rearwardly of said cutting head and operative to thrust said cutting head forward into an earth formation by means of said column.

#### 4,014,575

##### SYSTEM FOR FUEL AND PRODUCTS OF OIL SHALE RETORT

Gordon B. French, Rifle; William J. Bartel; Richard D. Ridley, both of Grand Junction, all of Colo.; Chang Yul Cha, La Verne, Calif., and Robert S. Burton, III, Grand Junction, Colo., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed July 26, 1974, Ser. No. 492,599

Int. Cl.<sup>2</sup> E21C 41/10; E21B 43/00

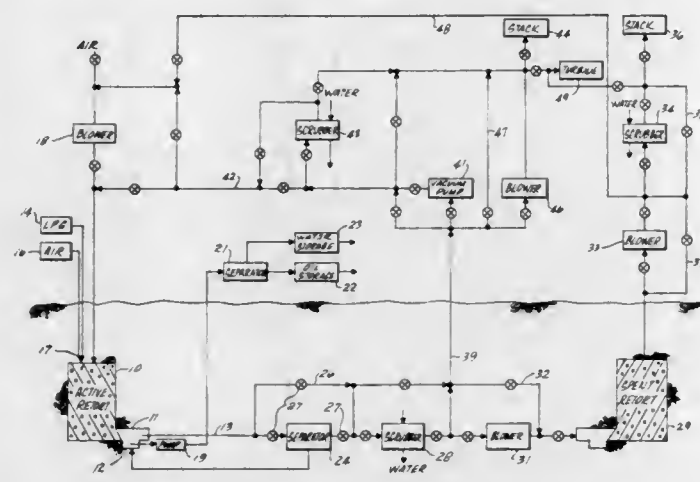
U.S. Cl. 299—2

10 Claims

1. An in situ oil shale retorting system comprising:  
an active underground retort comprising a room in substantially undisturbed shale containing a bed of fragmented oil shale particles with a sufficient void volume distributed therethrough to permit gas flow;  
an air blower having an air inlet and an outlet connected to the top of the active retort for forcing air downwardly therethrough and sustaining a combustion zone in the retort;  
a sump at the bottom of the active retort for collecting oil and water from the retort;  
separator means connected to the sump for separating oil and water;



means for withdrawing flue gas from the bottom of the active retort;  
separator means connected to the means for withdrawing flue gas from the retort for separating entrained oil or water from the flue gas;



means connected to the means for withdrawing flue gas for selectively mixing flue gas with the inlet air for recycling a portion of the flue gas through the retort;  
gas scrubber means connected to the means for withdrawing flue gas for reducing content of aerosols in the flue gas; and  
a vent stack connected to the gas scrubber means for venting a portion of the flue gas.

4,014,576

## ARTICLE CARRIER

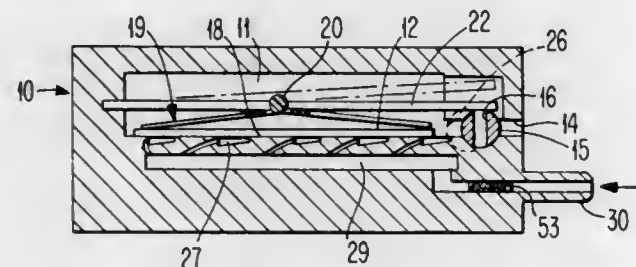
William O. Druschel, Granite Springs; Bayard G. Gardineer, Jr., Patterson; Stanley A. Manning, Yorktown Heights, and Bela Musits, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 19, 1975, Ser. No. 588,530

Int. Cl.<sup>2</sup> B65Q 51/02

U.S. Cl. 302—31

12 Claims



1. A device for supplying an article to and receiving an article from an air slide or the like including:  
a portable carrier having a chamber in which the article is supported;  
means to detachably connect said carrier to the air slide;  
said carrier having means to receive pressurized air to selectively move an article between said carrier and the air slide when said detachably connecting means connects said carrier to the air slide;  
said receiving means including an air slide base in said chamber, said air slide base receiving pressurized air to support the article in suspended relation within said chamber when the article is to be moved into or out of said carrier;  
said chamber having a port;  
means to seal said port;  
and means to prevent said sealing means from being rendered ineffective unless said detachably connecting means has connected said carrier to the air slide.

4,014,577

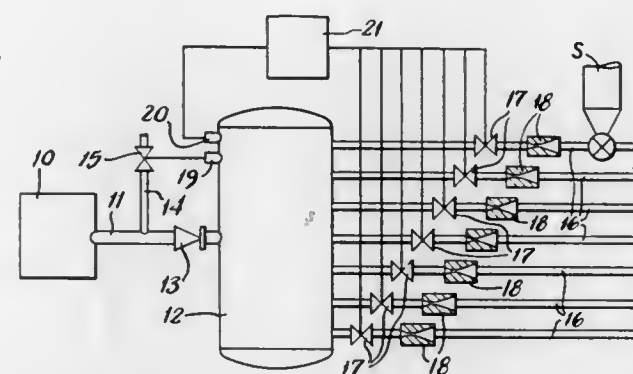
## PNEUMATIC CONVEYING SYSTEMS

James Roger Clancy, and Kenneth Cook, both of Stockport, England, assignors to Henry Simon Limited, Cheshire, England

Continuation-in-part of Ser. No. 489,470, July 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 311,242, Dec. 1, 1972, abandoned. This application Mar. 1, 1976, Ser. No. 662,867  
Int. Cl.<sup>2</sup> B65G 53/66

U.S. Cl. 302—35

7 Claims



1. A pneumatic conveying system comprising a compressed air storage tank, a compressor of predetermined output capacity connected to deliver compressed air to said tank, a plurality of separate output conveying lines connected to said tank, means for supplying to each of said lines materials to be conveyed, an air nozzle in each line having convergent and divergent wall forms upstream and downstream respectively of a nozzle throat for maintaining substantially constant mass flow rate of air through said nozzle, a valve in each said line connecting same to said tank, and control means for selectively opening and closing each of said valves, the lines being sufficient in number that if all of said valves were open at the same time, the pressure required to meet the collective air volume demand thereof would be greater than can be provided by said compressor, further means being provided for sensing a condition when a plurality of said lines are operating such that introduction of a further line could cause the capacity of said compressor to be exceeded, and for transmitting a signal accordingly to said control means to prevent the valves in further of said lines from being opened until at least one of said operative lines becomes inoperative.

4,014,578

## VARIABLE METERING DROP VALVE

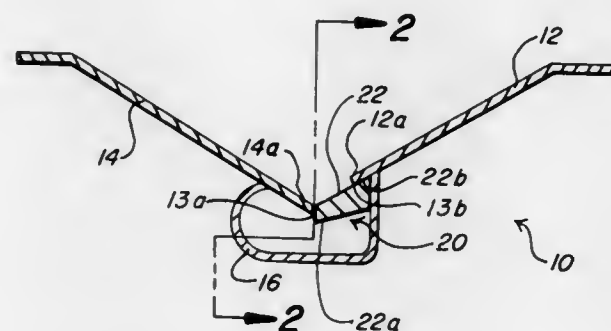
Charles N. Grott, St. Louis, and Dallas W. Rollins, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed June 24, 1975, Ser. No. 589,942

Int. Cl.<sup>2</sup> B65G 53/46

U.S. Cl. 302—52

34 Claims



1. A pneumatic hopper outlet comprising: spaced outlet slope sheets inclined downwardly toward each other; said outlet slope sheets being spaced from one another at the lower ends thereof to define a discharge opening; side sheets joining

said outlet slope sheets at opposite sides of said outlet; an outlet conduit engaging the lower portion of each of said outlet slope sheets and said side sheets; a rigid valve member including valve portions on each side of the outlet located within said conduit and being movable within said conduit in a generally vertical direction; said valve member in one position engaging the lower ends of said outlet slope sheets and closing the discharge opening entirely across said outlet; said valve member being movable to a plurality of open positions to unload said outlet, and being movable to a closed position on a first side of the outlet and to a plurality of open positions on a second side of the outlet opposite to said first side, while said valve member is maintained in the closed position on the first side of the outlet; the extent to which said valve member is opened on said second side varying linearly to the extent that the valve portion on said second side is lowered from said ends of said outlet slope sheets on said second side; operating means located on each side of the outlet for raising and lowering the valve portion on the adjacent side of the outlet; and translating means located externally of said conduit extending across the outlet for raising and lowering the valve portion on the opposite side of the outlet from the adjacent side of the outlet.

4,014,579

## SPRING ACTUATED BRAKE CYLINDER WITH RELEASE PISTON LOCKOUT MEANS

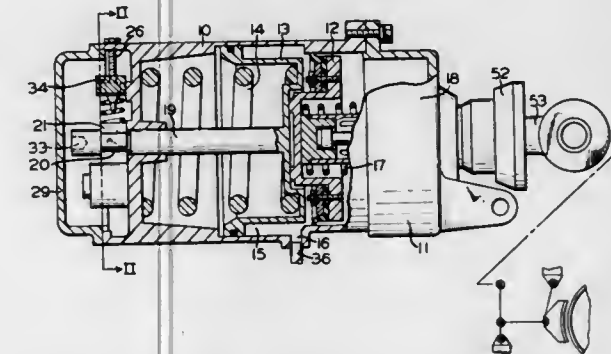
Claude Jacque Dubois, Paris, France, assignor to WABCO Westinghouse GmbH, Freinvill-Sevran, France

Filed Dec. 17, 1975, Ser. No. 641,596

Int. Cl.<sup>2</sup> B60T 13/22

U.S. Cl. 303—3

10 Claims



1. A brake cylinder device for railway type vehicle brakes, said brake cylinder device comprising:

- a casing;
- a release piston reciprocally disposed in said casing;
- a piston rod connected to said release piston;
- force generating means acting on and biasing said release piston for exerting an emergency brake-applying force in one direction;
- second piston means reciprocally disposed in said casing in axially aligned and oppositely facing relation to and abuttingly engageable by said release piston for transmitting said emergency brake-applying force in said one direction;
- said release piston and said second piston means cooperating with said casing to form therebetween a pressure chamber subjectable to variable fluid pressure acting on opposing pressure areas of said release piston and said second piston means, respectively, for moving said release piston in a direction opposite to said one direction in counteraction to said emergency brake-applying force and for exerting a service brake-applying force in said one direction through said second piston means according to the resultant differential between the two braking forces;
- a locking member pivotally disposed in said casing in transverse relation to said piston rod and biasingly engageable, upon movement of said release piston to a release position in a direction opposite to said one direc-

tion in response to fluid pressure in said pressure chamber at a certain high degree, with a groove formed in said piston rod for locking said release piston and piston rod against axial movement in a locked position coinciding with said release position and in which said emergency brake-applying force is neutralized during service brake-applying action effected by fluid pressure at a degree less than said certain high degree; and

- unlocking means operable responsively to subsequent restoration of fluid pressure to said certain high degree for causing operation of said locking member to an unlocking position in which said release piston is freed for exerting said emergency brake-applying force.

4,014,580

## EMERGENCY BRAKE VALVE DEVICE FOR RAILWAY VEHICLES

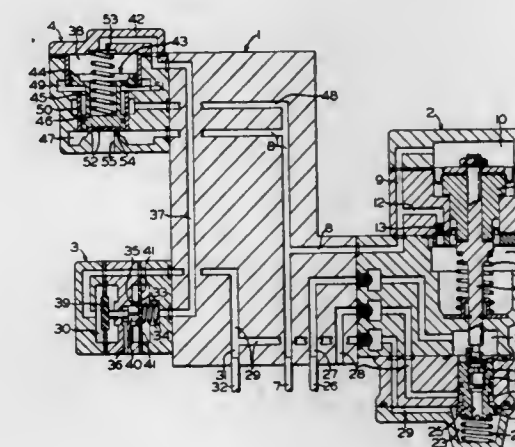
Robert J. Bridgum, Plum Borough, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 28, 1976, Ser. No. 700,383

Int. Cl.<sup>2</sup> B60T 17/04

U.S. Cl. 303—82

7 Claims



1. An emergency brake valve device for railway vehicles of a train having a brake pipe normally charged with fluid at a certain pressure and effective upon reduction of the fluid pressure therein for initiating a brake application on the train, said emergency brake valve device comprising:

- a source of fluid under pressure;
  - a vent valve portion connected to the brake pipe and having therein a control chamber normally charged with the fluid pressure of said brake pipe and including vent valve means operable, in response to release of the fluid pressure from said control chamber, from a normally closed position to an open position for venting the brake pipe to atmosphere;
  - a logic valve portion having therein an actuating chamber normally vented to atmosphere and including relief valve means communicating with said control chamber of said vent valve portion and operable, in response to charging of said actuating chamber with fluid pressure from said source, from a normally closed position to an open position for venting said control chamber to atmosphere; and
  - a relay valve portion including differential pressure means and control valve means for effecting alternative communication of said actuating chamber of said logic valve portion with atmosphere or said source of fluid under pressure, said differential pressure means also having oppositely disposed pressure sides of different dimensions communicated in parallel relation to the brake pipe, the larger side being subjected to the brake pipe pressure unrestrictedly and the smaller side being subjected to the brake pipe pressure restrictedly through a choke member via which said brake pipe pressure may be equalized on said oppositely disposed pressure sides.
- e. said differential pressure means and said control valve means normally occupying, as a unit, an exhaust position in which said actuating chamber is cut off from said



source of fluid under pressure and communicated with atmosphere, and being operable responsively to a pressure differential across the two pressure sides effected by a brake pipe pressure reduction at a rate exceeding the flow rate capacity of said choke member, to a supply position in which said actuating chamber is cut off from atmosphere and communicated with said source of fluid under pressure.

4,014,581

## SHOE ASSEMBLY

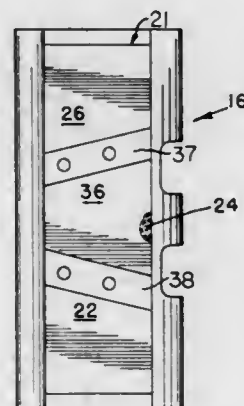
Eugene R. Groff, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 14, 1975, Ser. No. 622,204

Int. Cl.<sup>2</sup> B62D 55/28

U.S. Cl. 305-54

8 Claims



1. In a shoe of a continuous track of a crawler type vehicle, the improvement comprising:

a vibration damping assembly substantially covering a surface of the shoe, said vibration damping assembly having at least first and second laterally spaced apart plates extending over said surface of the shoe and a viscoelastic material positioned between and being bonded to said surface of the shoe and said plates for connecting the plates to the shoe, said first and second plates being separated one from the other by first and second intervening preselected areas for attaching links to the shoe.

4,014,582

## VEHICLE BUMPER SYSTEM

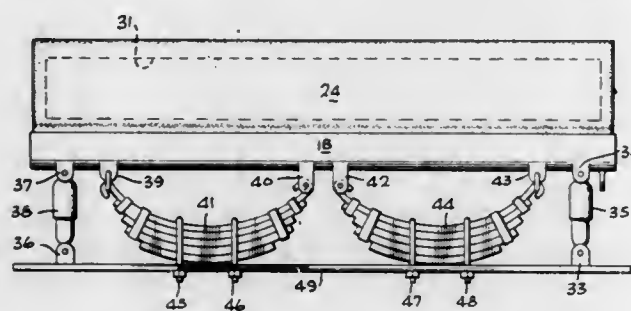
Kenneth W. MacKenzie, 27945 Honeycomb Drive, Saugus, Calif. 91350

Filed June 30, 1975, Ser. No. 591,824

Int. Cl.<sup>2</sup> B60R 19/08

U.S. Cl. 293-84

4 Claims



1. A bumper system and apparatus therefor to be carried on a chassis of a vehicle, the combination comprising:

an impact receiving member;  
articulated resilient means mounting said impact receiving member to said chassis;  
said articulated resilient means providing both hydraulic and spring shock absorption and said impact receiving member provides pneumatic shock absorption;  
said impact receiving member is an elongated inflatable member and said resilient means includes a pair of leaf spring assemblies;

said impact receiving member further includes a pair of piston and cylinder assemblies separated by said leaf spring assemblies;  
a holder releasably carrying said inflatable member and said articulated resilient means pivotally interconnecting said holder to said vehicle chassis; and  
said inflatable member includes a carcass having a pair of grooves provided on opposite sides thereof adjacent an elongated bead and said holder includes a slot for slidably receiving said inflatable member whereby opposing edges of said holder defining said slot slidably engage with said grooves and said bead respectively.

4,014,583

## AUTOMOBILE BUMPER PROTECTOR

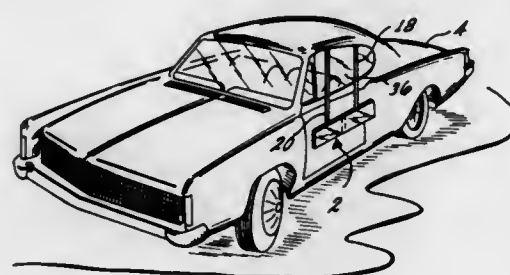
Arthur A. Forbes, 14030 Chadron, Apartment 116, Hawthorne, Calif. 90250

Filed Mar. 1, 1976, Ser. No. 662,526

Int. Cl.<sup>2</sup> B60J 11/00; B60R 19/00

U.S. Cl. 293-62

16 Claims



1. An automobile bumper protector comprising:

a plurality of force-absorbing body portions;  
said body portions being flexibly joined together with the portions being foldable relative to each other to form a compact package;  
said body portions in their unfolded state providing a side area which has a length and a width which is sufficient to shield the bump area of an automobile side panel;  
a plurality of hanger straps connected to said body portions such that said portions may be hung in an unfolded state adjacent an automobile side panel to shield the bump area of the side panel from physical contact;  
magnetic members associated with each of said body portions, and  
the magnetic members of adjacent body portions positioned to provide mutual attraction between adjacent body portions when the body portions are folded together to form a compact package,  
whereby the body portions in an unfolded state while hung from an automobile by the hanger straps are attracted to a metallic automobile side panel by the magnetic members with a sufficient force to prevent shifting or dislodgment of the bumper protector from the automobile by wind forces.

4,014,584

## DEVICE FOR RETRIEVING ANIMAL WASTE

Marcel Bau, 89 Van Ness Court, Maplewood, N.J. 07040

Filed Nov. 24, 1975, Ser. No. 634,821

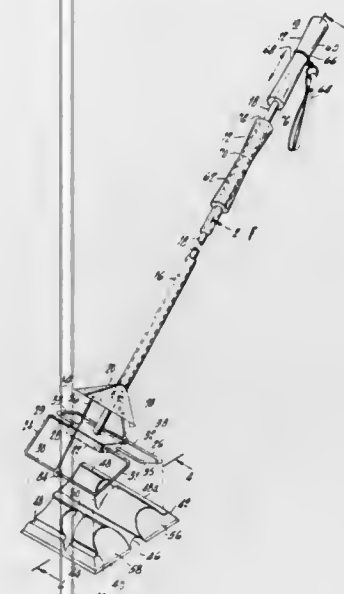
Int. Cl.<sup>2</sup> A47F 13/06

U.S. Cl. 294-19 R

2 Claims

1. Device for retrieving waste material comprising first tubular shaft having a distal handle end portion and a proximal end portion terminating in a first stop means, a second shaft concentrically disposed within said first shaft and extending outwardly of said proximal end portion and terminating in a second stop means, said second shaft being movable longitudinally with respect to said first shaft, a pair of opposed frame members each having a first transverse member rotatably attached to said second stop means and a second transverse

member pivotally attached to said first stop means said frame members being oppositely rotatable about said first transverse members upon longitudinal movement of said second shaft, longitudinal movement of said second shaft toward said proximal end portion causing said frame members to oppositely rotate to an open position wherein said frame members are mutually angularly displaced, longitudinal movement of



said second shaft toward said distal end portion causing said frame members to oppositely rotate to a closed position wherein said frame members are substantially adjacently positioned in which said first shaft terminates distally in a first-handle means and said second shaft terminates distally in a second-handle means positioned outwardly of said first-handle means, said first and second handle means comprising separate members.

4,014,585

## AUTOMOBILE BODY CONSTRUCTION

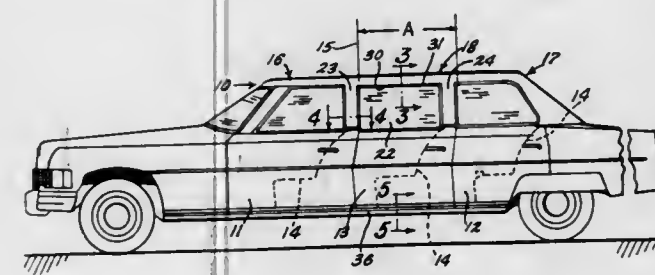
Thomas P. Earnhart, Fort Smith, Ark., assignor to Armbruster/Stageway, Inc., Fort Smith, Ark.

Filed Aug. 19, 1975, Ser. No. 605,902

Int. Cl.<sup>2</sup> B60P 3/26

U.S. Cl. 296-16

3 Claims



1. In combination with a passenger conveying, automobile body having a central side door opening therein bounded by longitudinally spaced apart, upstanding posts and a top body extending section having its end portions joined to the top end portions of the posts to define said opening, a door hinged to one said post and adapted to be latched to the other said post and closing the bottom portion of said central opening, a window glass mounted in the door for movement between open and closed positions in that portion of the central opening above said door, a continuous, inverted U-shaped weatherstrip positioned along the top body extending section and down the confronting faces of the door posts to the top portion of the door, the side portions of the weatherstrip continuously engaging and guiding the window glass, and the top edge of said door glass engaging the weatherstrip across the top body extending section when the glass is in closed position.

4,014,586

## COMBINED TRAILER-CAMPER UNIT

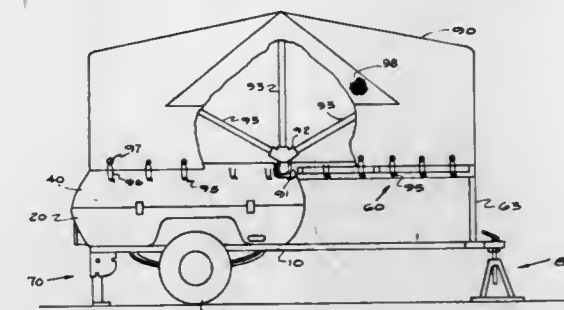
Aubrey L. Swofford, Greenwood, S.C., assignor to Engineering Concepts, Inc., Greenwood, S.C.

Filed June 26, 1975, Ser. No. 590,640

Int. Cl.<sup>2</sup> B60P 3/34

U.S. Cl. 296-23 A

13 Claims



1. A trailer-camper combination comprising:

a. a wheeled frame;  
b. a tongue secured to said frame and extending forwardly therefrom;  
c. a body secured to said frame, said body having a pair of mating sections cooperating to define an enclosure therebetween, a top section of said pair of sections being securable to a bottom section of said pair of sections along at least one edge thereof;  
d. a luggage rack associated with said body, said luggage rack having a planar bottom, said luggage rack being movable forwardly and inverted to provide a planar surface extension of the top section of said enclosure, and cooperating with said top section to define a floor for a camper system; and  
e. collapsible camper cover means erectable above said floor and securable around at least a position of the periphery of said floor to provide a habitable compartment atop said floor.

4,014,587

## CAR PLATFORM STRUCTURE

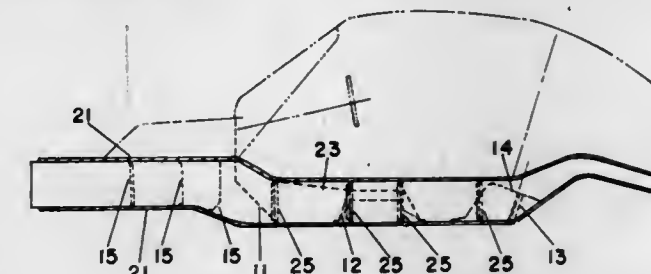
Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Oct. 8, 1975, Ser. No. 620,529

Int. Cl.<sup>2</sup> B62D 27/00

U.S. Cl. 296-28 F

8 Claims



1. A car platform structure adapted to receive thereon a body balloon assembly, comprising in combination, plain open-sided main side sills of a length to extend past the wheel well zones, cross-members secured to the main side sills, a floor pan secured beneath the cross bearers, an auxiliary outer side sill of a length to be disposed in the door-passenger space between wheel-well zones secured to the outer sides of said main side sills, a plurality of longitudinally spaced transverse vertical baffles secured to the outer sides of said main side sills in the door-passenger zone between wheel well zones, and said outer auxiliary side sills being secured to said main side sills over said spaced baffles.



4,014,588

**MOUNTING DEVICE FOR ELASTICALLY MOUNTING CAB**

Yoshimasa Kohriyama, Machida, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

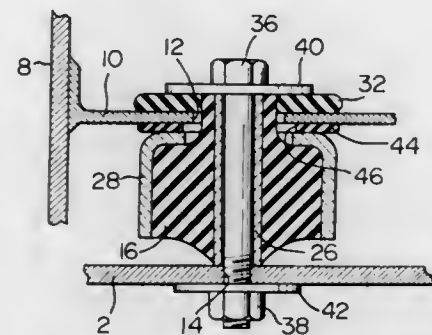
Filed Apr. 10, 1975, Ser. No. 566,870

Claims priority, application Japan, Apr. 15, 1974, 49-40999

Int. Cl.<sup>2</sup> B62D 23/00

U.S. Cl. 296—35 R

7 Claims



1. A mounting device elastically supporting an upper structure on a frame to isolate the transmission of vibratory energy therebetween comprising

a first elastic member having a hole formed axially therethrough, and including a generally cylindrical first portion and a generally cylindrical second portion, said second portion extending through a hole formed in said upper structure, and having a diameter less than that of said first portion and separated from said first portion by an annular shoulder portion,

a tubular first rigid member disposed within the hole formed through said first elastic member and being substantially co-extensive therewith axially,

a generally cylindrical second rigid member circumventing the first portion of said first elastic member and being substantially co-extensive therewith axially, a lower end of said second rigid member spaced-apart axially from said frame at a predetermined distance and a lower end of the second portion of said first elastic member extending axially therebeyond,

an annular flange secured on an upper end of said second rigid member and extending radially inwardly therefrom between the annular shoulder portion of said first elastic member and said upper structure,

an annular second elastic member disposed in circumventing relationship about the second portion of said first elastic member and further disposed on an outer side of said upper structure,

an annular third elastic member disposed in circumventing relationship about the second portion of said first elastic member and further disposed between an inner side of said upper structure and the annular flange secured to said second rigid member, and

bolt means extending through said upper structure, said frame and said first rigid member to thereby universally support said upper structure elastically on said frame.

4,014,589

**PORTABLE WINDSHIELD FOR A RIDING TYPE GOLF CART**

Elton C. Yerkey, P.O. Box 2545, Tuscaloosa, Ala. 35401

Filed Oct. 2, 1975, Ser. No. 618,743

Int. Cl.<sup>2</sup> D62J 17/00

U.S. Cl. 296—78 R

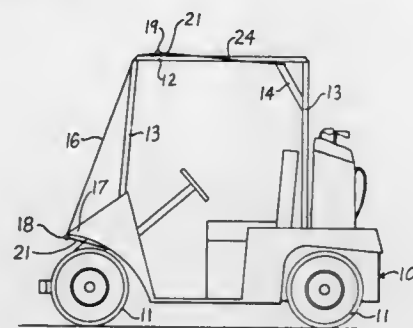
4 Claims

1. In a portable windshield for a riding type golf cart having a roof extending thereover and spaced from a lower front portion of the cart,

a transparent, flexible sheet of a size to extend across the forward end of the cart with the lower edge of said sheet extending under said lower front portion of the cart and the upper edge of said sheet extending over the front portion of the roof of the cart,

b. a first rigid, rod-like member attached to said sheet adjacent said lower edge thereof in position to extend transversely of the cart under said lower front portion of the cart,

c. a second rigid, rod-like member attached to said sheet adjacent said upper edge thereof in position to extend transversely of the cart and over said front portion of the roof of said cart,



d. an elongated flexible member attached at one end to each end of said first and second rod-like member beyond the adjacent edge of said sheet with the other end of each said flexible member being attachable to said golf cart, and

e. said sheet being adapted to be rolled on one rod-like member to the other rod-like member so that said rod-like members extend alongside and adjacent each other for portability.

4,014,590

**REMOVABLE TRUCK BOX COVER**

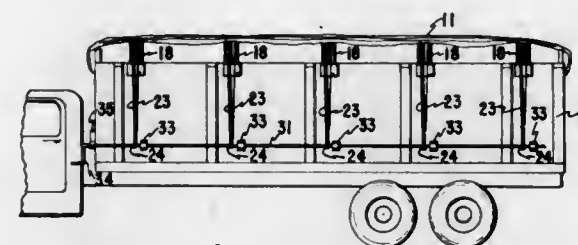
Chris E. Schulz, Jr., Corwith, Iowa 50430

Filed Nov. 3, 1975, Ser. No. 627,975

Int. Cl.<sup>2</sup> B60J 11/00

U.S. Cl. 296—100

6 Claims



1. A cover for a truck box, said box having opposite longitudinal edges, the cover comprising cover means adapted to cover said box attached at one longitudinal edge to said box, spaced apart track means attached at opposite longitudinal edges to said box and adapted to support said cover means, and pulling means connected to said cover means, at least some of said track means defining a pair of parallel channels, said pulling means being adapted to run in said channels, and pulley means between said channels at one end of each of the channelled track means around which said pulling means run so as to provide for opposite directions of motion of said pulling means in adjacent channels.

4,014,591

**COLLAPSIBLE CHAIR**

Robert S. Gittings, Tiburon, Calif., assignor to Gold Medal, Inc., Racine, Wis.

Filed Sept. 19, 1976, Ser. No. 706,509

Int. Cl.<sup>2</sup> A47C 4/00

U.S. Cl. 297—55

4 Claims

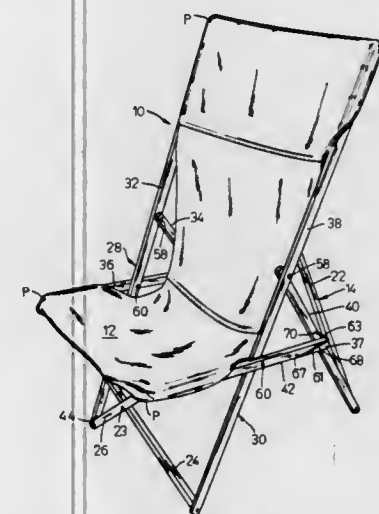
1. A collapsible chair foldable from an unfolded position into an elongated compact structure and being simultaneously collapsible in two dimensions, the collapsible chair comprising:

a front pair of crossed brace legs, each of said brace legs having an upper end and a lower end and being pivotally connected to each other intermediate their ends;

a rear pair of crossed brace legs, each of said rear brace legs having an upper end and a lower end being pivotally connected to each other intermediate their ends;

a pair of laterally spaced apart side assemblies connecting the front and rear pairs of crossed brace legs, each of said side assemblies including (1) a first brace leg having an upper end and a lower end, said upper end being pivotally connected to an upper end of one of said cross brace legs of said rear pair of crossed brace legs and said lower end pivotally connected to a lower end of one of said cross brace legs of said front pair of crossed brace legs, (2) a second brace leg having an upper end pivotally

below said frame when the frame is in the extended position to a storage position near said frame when the frame is in the retracted position, a seat back, means pivotally connecting said seat back to said seat independently of said links to enable said back to be moved between a generally upright position and a lower position immediately above and adjacent to said seat, and a safety catch movable between a position engageable with the table top when said frame is extended to aid in supporting said frame and said seat from the table top, and a retracted position out of engagement with the table top when the frame is in the retracted position.



connected to said first brace leg intermediate the length of the latter and also having a lower end pivotally connecting to a lower end of one of said crossed brace legs of said rear pair of crossed brace legs, (3) a third brace leg having opposite ends, one of said opposite ends being pivotally connected to said upper end of one of said crossed brace legs of said front pair of crossed brace legs and (4) a pivotable stop link pivotally connected between the other of said opposite ends of said third brace leg and said second brace leg intermediate the length of the latter, and

a fabric seat supported in suspended relationship by said brace legs.

4,014,592

**RETRACTABLE CHAIR FOR SMALL CHILDREN**

Lanny J. Gist, 840 Pearl St., Bowling Green, Ohio 43402

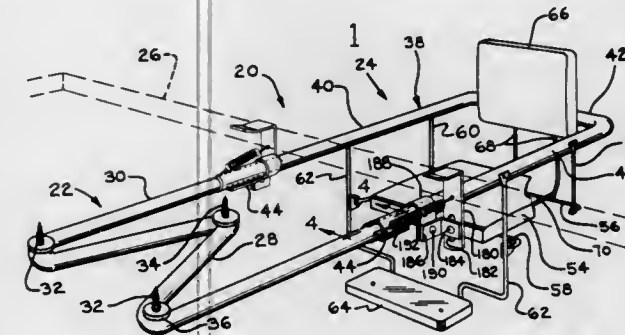
Continuation of Ser. No. 437,070, Jan. 28, 1974. This

application Jan. 22, 1975, Ser. No. 542,942

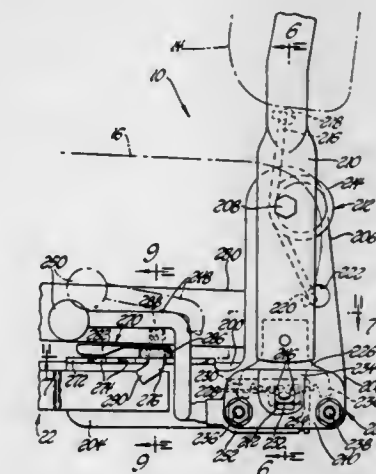
Int. Cl.<sup>2</sup> A47C 9/04

U.S. Cl. 297—143

8 Claims



1. A retractable chair for small children comprising a frame having two parallel legs, means for slidably supporting said legs below a top of a table for movement of said frame between a retracted position below the table top and an extended position in which a substantial portion of said frame extends beyond an edge of the table top, a seat, two parallel links connecting said seat to one of said frame legs and two parallel links connecting said seat to the other leg of said frame to enable said seat to be pivoted from a seating position



1. In a vehicle seat including a seat cushion component and a generally vertically extending seat back component mounted for tilting movement in an adjusting manner with respect to the seat cushion component, a recliner mechanism for positioning the seat back component in tilted positions thereof, the recliner mechanism comprising:

a keeper fixedly mounted with respect to one of the seat components and having an edge portion with latch surfaces thereon;

a pair of support portions fixedly mounted with respect to the other seat component in spaced relationship to each other with the keeper received therebetween, each support portion including a mounting opening;

a pawl extending between and received within the mounting openings of the support portions so as to be slidably mounted on the support portions for movement between latching and nonlatching positions with respect to the latch surfaces of the keeper, the pawl being disengaged with the latch surfaces of the keeper while in the non-latching position to permit tilting of the seat back component, the pawl being engaged with the latch surfaces of the keeper while in the latching position so as to prevent tilting of the seat back component, and forces applied to the pawl by the keeper being transferred to the support portions within the mounting openings thereof in a balanced manner due to positioning thereof on opposite sides of the keeper; and

means for moving the pawl between the latching and non-latching positions.



4,014,594

**HEADREST FOR OPERATORY CHAIR**

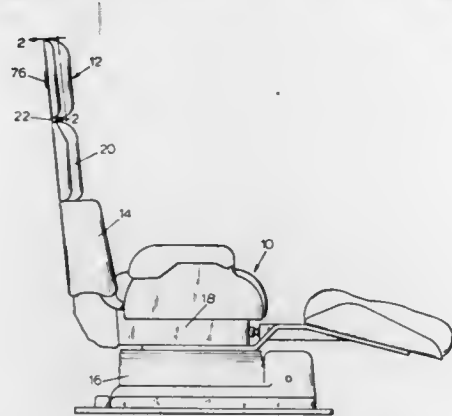
Larry A. Hain, Columbia, Pa., assignor to Dentsply Research & Development Corporation, Milford, Del.

Filed Jan. 2, 1976, Ser. No. 646,303

Int. Cl.<sup>2</sup> A47C 1/10

U.S. Cl. 297-408

10 Claims



1. A headrest for an operatory chair comprising in combination:

- a. an elongated support member adapted to be attached to the back member of an operatory chair,
- b. a headrest panel member of predetermined area,
- c. a transverse journal bearing fixed to the normally upper end of said support member,
- d. a shaft mounted within said bearing for rotatable and axial movement with respect thereto,
- e. means on said shaft operable to prevent rotation thereof relative said panel member,
- f. additional bearings on said panel member coaxial with said journal bearing and respectively receiving and supporting opposite end portions of said shaft for axial movement therein,
- g. a pair of co-engageable frictional clutch members disposed coaxially upon said shaft,
- h. means fixing said frictional clutch members respectively to said transverse journal bearing and said shaft, said frictional clutch members being disposed between one end of said transverse journal bearing and one of said additional bearings on said panel members,
- i. elastic means engaging one of said frictional clutch members and normally urging the same into engagement with the other clutch member,
- j. combination crank and shaft means supported by said panel member and operable to engage one end of said aforementioned shaft to move the same axially in a direction to disengage said frictional clutch members and thereby permit pivotal movement of said panel member relative to said elongated support, and
- k. a manually engageable member supported by said panel member substantially centrally between the side edges thereof for equal accessibility from either edge of said panel member and engageable with said combination crank and shaft means to activate the same as aforesaid.

4,014,595

**DRILL BIT WITH SEAL RING COMPENSATOR**

George Edward Dolezal, Laurel, Miss., assignor to Hughes Tool Company, Houston, Tex.

Filed May 30, 1975, Ser. No. 582,492

Int. Cl.<sup>2</sup> F16C 19/00

U.S. Cl. 308-8.2

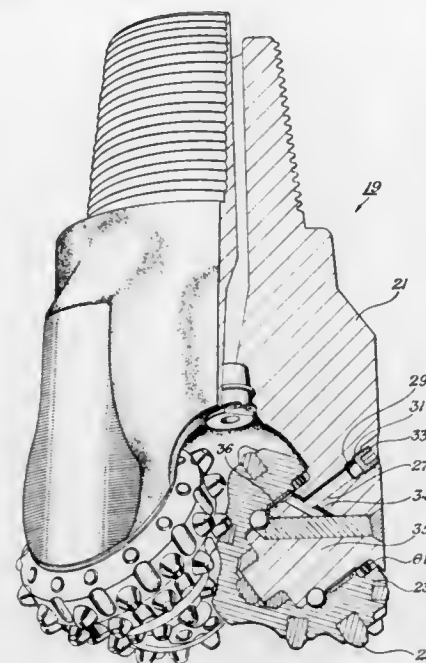
8 Claims

1. In an earth boring drill bit having a rotatable cutter sealingly retained on mating surfaces of a bearing shaft, and a lubrication system, the improvement comprising:

the lubrication system having passages and spaces filled with lubricant of predetermined potential change in volume responsive to temperature and pressure changes to be encountered during drilling;

seal means between the rotatable cutter and bearing shaft

capable of displacement responsive to volume change of the lubricant;



the potential change in lubricant volume being correlated with the potential displacement of the seal means to provide sufficient displacement of the seal to limit the pressure differential across the seal means.

4,014,596

**SELF-CENTERABLE BEARING**

Hachiro Kazama, Tokyo, Japan, assignor to Kabushikikaisha Ochiai Seisakusho, Tokyo, Japan

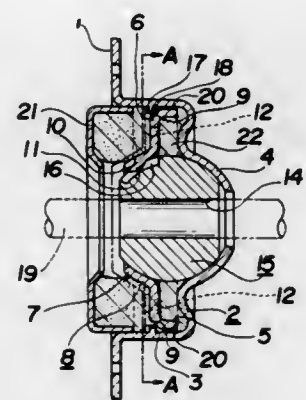
Filed Sept. 30, 1975, Ser. No. 618,230

Claims priority, application Japan, Jan. 29, 1975, 50-12702

Int. Cl.<sup>2</sup> F16C 9/06, 23/00

U.S. Cl. 308-72

3 Claims



1. A self-centering bearing assembly including a housing and a pressure plate connected together by a binder means and receiving a single spherical bearing of porous material, the bearing being held by a spherical section of a receiving portion of the housing and an annular supporting portion of the pressure plate, the annular supporting portion having a peripheral wall loosely fitted to the receiving portion of the housing, a plurality of projections on the annular supporting portion engageable with a corresponding plurality of grooves on the spherical bearing, the receiving portion having an annular flange engageable with the peripheral edge of the pressure plate, and a plurality of projections on the annular flange engageable with a plurality of inclined recesses provided on the peripheral edge of the pressure plate.

4,014,597

**SPEAKER ENCLOSURES**

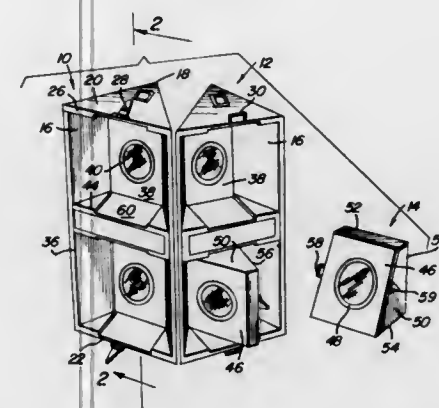
Timothy L. Griffin, Jr., Shutesbury, Mass., assignor to Amnita Sound, Incorporated, Easthampton, Mass.

Filed Aug. 27, 1975, Ser. No. 608,234

Int. Cl.<sup>2</sup> A47B 81/06, 43/00; H05K 5/00

U.S. Cl. 312-7 R

19 Claims



1. In combination with at least two speaker enclosures having acoustical properties and a plurality of auxiliary speaker components, means for holding said speaker enclosure assembled to form a carrying case and to internally define at least one closed chamber extending therebetween, two of said auxiliary speaker components when abutting in predetermined relation to each other forming an external configuration dimensioned to fit within said closed chamber, and means mounted within said enclosures for preventing the auxiliary speaker components stored in said predetermined abutting relationship within the closed chamber from being displaced relative to each other.

4,014,598

**COMPONENT CABINET**

Anthony Donald Stalley, Fleet, and Alan Martin Bishop, Newbury, both of England, assignors to Quantel Limited, England

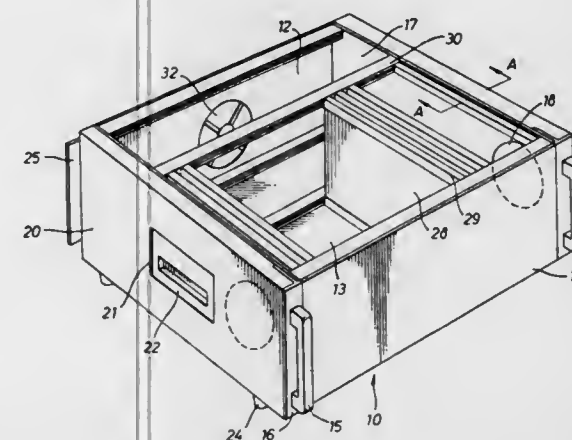
Filed May 5, 1975, Ser. No. 574,841

Claims priority, application United Kingdom, May 6, 1974, 19846/74

Int. Cl.<sup>2</sup> A47B 77/08, 81/00

U.S. Cl. 312-236

2 Claims



1. A free standing component cabinet capable of being rapidly reconverted to allow rack mounting thereof, said cabinet comprising:

- a. a frame capable of being mounted in a rack and including front, rear and side walls and front mounting flanges affixed to said frame and extending laterally beyond said side walls and having holes therein for securing said frame to a rack when mounted therein, at least one of said side walls having a vent hole therein;
- b. detachable top and bottom panels enclosing said frame;
- c. detachable hollow face plates mounted one on each side

of the frame and providing outside walls spaced from said side walls and abutting and lying flush with the lateral edges of said front mounting flanges to form with the side wall an air duct to allow air to pass from the frame interior through said vent hole, the rear of said hollow face plates being open to permit air to discharge to the rear of said cabinet;

d. a fan mounted on said rear panel to assist the passage of air through said cabinet;

e. a detachable front handle on each of said front mounting flanges, said handle being attached thereto by fixing means passing through the holes normally used for rack mounting; and

f. rear guards extending from the rear of said side walls to provide protection for components projecting from said rear wall and to outwardly deflect exhaust air from said face plates to prevent recirculation of said air via the cooling fan.

4,014,599

**DEVICE FOR ELECTRICAL COUPLING OF GENERATOR AND EXCITER ROTOR CURRENT LEADS**

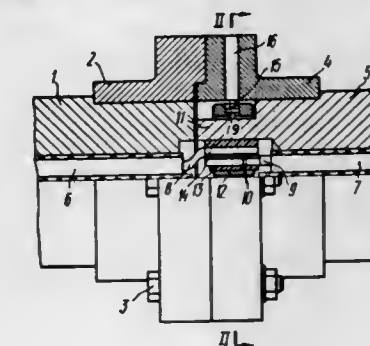
Nikolai Ivanovich Bogdanov, ulitsa 2 Komsomolskaya, 12, kv. 24; Vladimir Stepanovich Vitchenko, Vitebsky prospekt, 29, korpus 2, kv. 142; Gennady Konstantinovich Smirnov, ulitsa Prazhskaya, 20, kv. 132, and Vladimir Grigorievich Shalaev, prospekt Novoizmailovsky, 55, kv. 92, all of, Leningrad, U.S.S.R.

Filed July 11, 1975, Ser. No. 595,216

Int. Cl.<sup>2</sup> H01R 39/00

U.S. Cl. 339-5 R

2 Claims



1. A device for electrical coupling of generator and exciter rotor current leads comprising flexible busbars located in the area of mechanical coupling between said rotor current leads, a shaft with end face having a projection under which said flexible busbars form an overlapping joint, said busbars being placed parallel to the axis of said shaft, a clamp embracing said busbars, said busbars being attached to said shaft by means of said clamp embracing said busbars, said clamp embracing said busbars and projection in a cross-sectional plane of the shaft.

4,014,600

**SELF-CLEANING DEVICE FOR DETACHABLY CONNECTING ELECTRICAL CONDUCTOR WIRES**

Karl-Robert Gisewsky, Ascheberger Str. 75, Plon, Germany

Continuation of Ser. No. 491,376, July 24, 1974, abandoned.

This application Dec. 11, 1975, Ser. No. 639,838

Int. Cl.<sup>2</sup> H01R 31/02

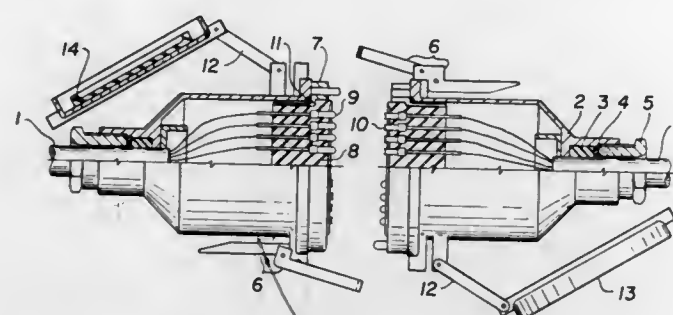
U.S. Cl. 339-48

3 Claims

1. In an electrical connector for detachably connecting electrical conductor wires consisting of two coupling halves with a plurality of contact elements in a coupling half making contact with a corresponding plurality of contact elements in the other coupling half when said coupling halves are mated, the combination therewith of mounting said contact elements into an elastically resilient insulator to permit lateral movement of said contact elements, the contact elements in one coupling half having a spherical contact surface and the contact elements in the other coupling half having a trough-shaped contact surface for mating contact with said contact elements having a spherical contact surface, said trough-



shaped contact surface being unitarily inclined at an angle deviating from a perpendicular to the direction of contact pressure applied with introduction of said mating contact element to permit upon insertion of a mating contact element



having a spherical contact surface into said unitarily inclined trough-shaped contact surface lateral relative motion of said two mating contact elements with rubbing action of the contact surfaces cleaning the contact surfaces and with pushing away dirt particles contained in the trough.

4,014,601

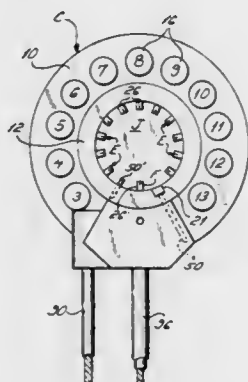
**TUBE SOCKET AND METHOD OF USING SAME**  
Robert B. Pittman, River Edge, N.J., assignor to Industrial Electronic Hardware Corporation, New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 625,927

Int. Cl.<sup>2</sup> H01R 5/04

U.S. Cl. 339—275 B

23 Claims



1. A socket for mounting a tube having a plurality of conductive contact elements disposed about the neck thereof comprising:

- A. a housing defining a front surface, a back surface and an aperture extending therethrough for receipt of a tube neck;
- B. spaced conductive contacts mounted on said housing having first end portions spaced from said housing front surface and adjacent said aperture for engagement with conductive contact elements disposed about the tube neck, and second end portions projecting from said housing; and
- C. a member of uniform given composition having a first portion disposed within said housing and a second portion extending across and substantially completely obstructing said aperture intermediate said first contact end portions and the plane of said housing front surface; said first and second member portions being readily separably connected to one another;

whereby said second member portion blocks the passage of solder from the front of said aperture to said first contact end portions, but is easily removable from said housing to enable passage of a tube neck through said aperture.

#### 4,014,602 IDENTIFICATION CARD HAVING A HOLOGRAM SUPERIMPOSED ON PRINTED DATA

Hartwig Ruell, Otterfing, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

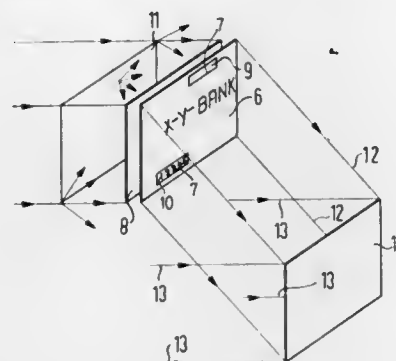
Filed Jan. 5, 1976, Ser. No. 646,842

Claims priority, application Germany, Jan. 16, 1975, 2501604

Int. Cl.<sup>2</sup> G03H 1/04; B44F 1/12

U.S. Cl. 350—3.5

26 Claims



1. A falsification-proof identity card comprising: a transparent first layer being visible printed data on a first surface thereof;
- a second layer connected to said first layer and covering said first surface; and
- a hologram carried by said second layer on a first surface thereof which faces said first surface of said first layer, said hologram covering said entire first surface of said second layer and containing identification data, including at least the visible data of said first layer, and said hologram responsive to light to visibly reconstruct said identification data.

4,014,603

#### METHOD OF HOLOGRAPHIC RECORDING

Roland Moraw; Günther Schädlich, both of Naurod, and Klaus Horn, Höchst, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 519,585, Oct. 31, 1974, Pat. No.

3,970,357. This application Jan. 2, 1976, Ser. No. 646,174

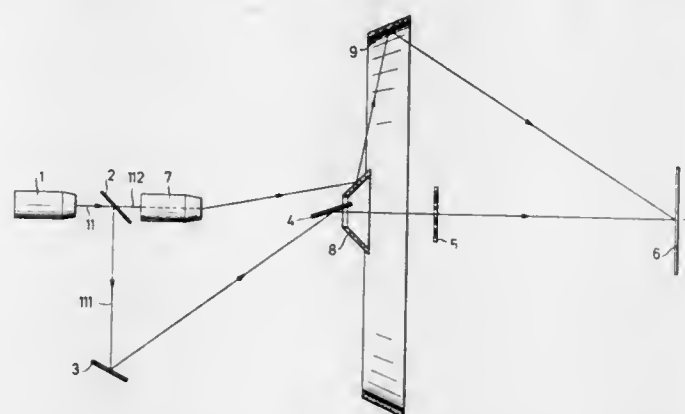
Claims priority, application Germany, Nov. 5, 1973, 2355136

The portion of the term of this patent subsequent to July 20, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> G03H 1/28, 1/26

U.S. Cl. 350—3.5

6 Claims



1. A method of recording a plurality of holographic images upon the same region of a recording medium comprising the steps of:

- a. directing a radiation beam from a coherent radiation source along an optical axis of said apparatus,
- b. splitting said radiation beam to provide a single reference beam on said optical axis and an object beam off of said optical axis,

- c. deflecting said reference beam in a direction divergent with respect to said optical axis,
- d. after deflecting said reference beam, reflecting said reference beam in a convergent direction with respect to said optical axis,
- e. reflecting said object beam from said off optical axis direction to a direction substantially along said optical axis,
- f. positioning an object on said optical axis for altering said object beam,
- g. recording the interference pattern developed by the interference of said altered object beam and said reference beam, and
- h. repeating steps (a)–(g) by deflecting said reference beam in a different divergent direction with respect to said optical axis whereby a plurality of holographic images are superimposed on said recording medium.

4,014,604

#### SOUND SLIDE

Morris Schwartz, Plainville, Conn., assignor to Kalart Victor Corporation, Plainville, Conn.

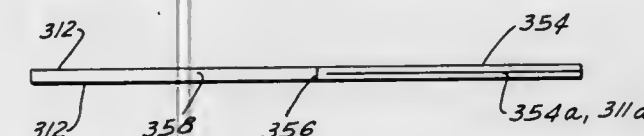
Continuation-in-part of Ser. No. 402,168, Oct. 1, 1973, Pat. No. 3,897,145. This application May 14, 1975, Ser. No.

577,224

Int. Cl.<sup>2</sup> G03B 21/00, 31/06; G11B 21/02

U.S. Cl. 353—120

1 Claim



1. A sound slide assembly comprising: a substantially rectangular plate-shaped frame body made of rigid material, said body incorporating an image-bearing section and a magnetic sound track section, said image-bearing section including four side portions defining one opening adapted to receive and maintain in fixed position a photographic transparency, one of said side portions having a crosswise width larger than the other side portions, said one side portion constituting a support base for said sound track section, said support base being covered on its opposite surfaces with magnetic recording material for receiving on said material on each of said surfaces a sound track, and a hinge section joining the image-bearing section and the sound track section for varying the angle between the plane of said image-bearing section relative to the plane of said sound track section, said hinge being disposed perpendicular to the long dimension of the rectangular body.

4,014,605

**TRANSFER SYSTEM WITH TAILORED ILLUMINATION**  
Gerald M. Fletcher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 421,179, Dec. 3, 1973, Pat. No. 3,846,020. This application Aug. 20, 1974, Ser. No.

498,900

Int. Cl.<sup>2</sup> G03G 15/00

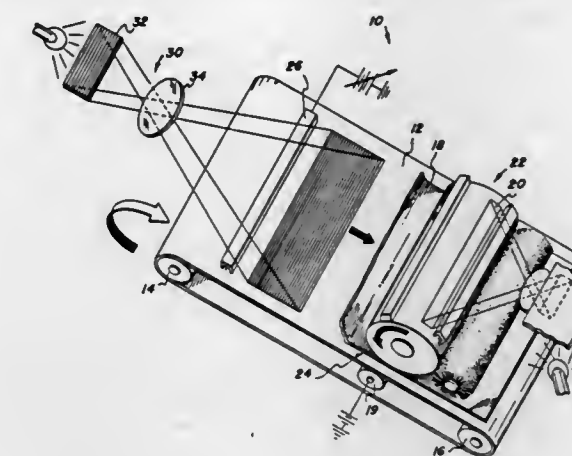
U.S. Cl. 355—3 R

17 Claims

1. In an electrostatographic copying system in which an image is formed on an imaging surface and electrostatically transferred at a transfer station to a copy surface, the improvement comprising:

- a copy transport belt having a copy supporting surface and an opposite surface,
- said belt comprising a photoconductive layer;
- means for moving said copy supporting surface of said belt into and out of engagement with said imaging surface at said transfer station to from pre-nip, nip, and post-nip areas therewith, respectively;
- electrically biased transfer electrode means for applying an image transfer field to said imaging surface through said

photoconductive layer of said belt at said transfer station in said pre-nip, nip and post-nip areas; and illumination means for illuminating only said nip and post-



nip areas of said photoconductive layer and rendering them conductive for tailoring said image transfer field for a relatively lower pre-nip transfer field than post-nip transfer field.

4,014,606

#### REPRODUCTION MACHINE WITH TEXTURED TRANSFER ROLLER

Donald A. Seanor, Pittsford; James A. Lentz, Penfield, and Thomas Meagher, West Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

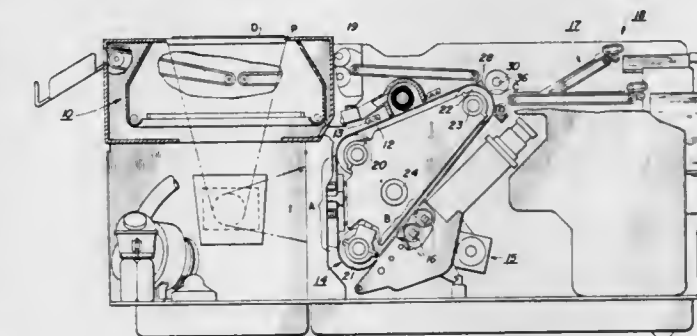
Continuation of Ser. No. 410,063, Oct. 24, 1973, abandoned.

This application Aug. 13, 1975, Ser. No. 604,514

Int. Cl.<sup>2</sup> G03G 15/16

U.S. Cl. 355—3 R

1 Claim



1. A reproduction machine comprising: means defining a surface, the surface being mounted for movement around a closed path;
- means for forming a developed electrostatic image on the surface;
- a transfer roller in contact with the surface and mounted for rotation about an axis;
- means for feeding a sheet of support material between the surface and the transfer roller so that transfer of the developed electrostatic image from the surface to the sheet can be effected as the sheet is moving therebetween; and
- means formed on the peripheral surface of the transfer roller for preventing the sheet from electrostatically tacking itself to the transfer roller during transfer while simultaneously causing the sheet to electrostatically tack itself to the surface.



4,014,607

**REMOVABLE SCREENING SYSTEM FOR A TRANSPARENCY REPRODUCTION MACHINE**

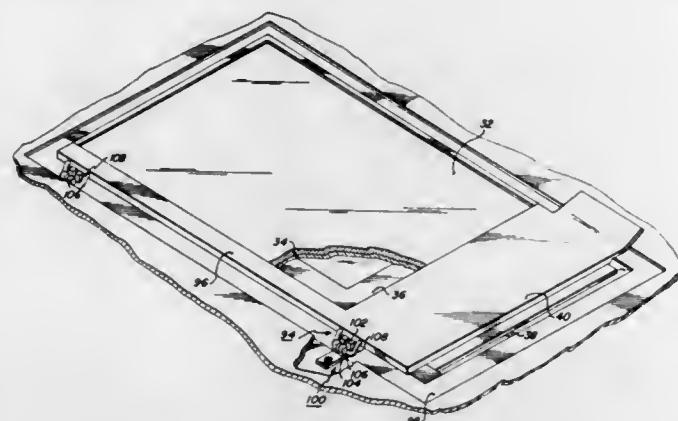
Abraham Cherian, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1976, Ser. No. 663,388

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-3 R

11 Claims



1. An electrophotographic printing machine for reproducing a transparency or opaque original document, including: a transparent platen; a photoconductive member; means for charging said photoconductive member to a substantially uniform level; means for forming a light image of the transparency; and means, mounted movably on said transparent platen, for modulating the light image, said modulating means being movable from a first position remote from the transparency light image path for reproducing the opaque original document to a second position in the transparency light image path for reproducing the transparency, said forming means projecting the transparency light image through said modulating means onto the charged portion of said photoconductive member to selectively dissipate the charge recording thereon a modulated electrostatic latent image of the transparency.

4,014,608

**DEVELOPING APPARATUS FOR ELECTROPHOTOGRAPHIC COLOR COPYING APPARATUS**

Isamu Terashima, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

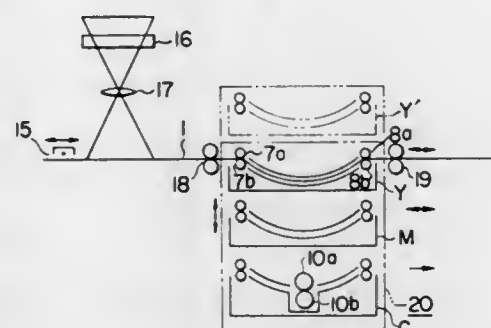
Filed June 13, 1975, Ser. No. 586,820

Claims priority, application Japan, June 26, 1974, 49-72307

Int. Cl.<sup>2</sup> G03G 15/01

U.S. Cl. 355-4

2 Claims



1. A developing apparatus for a color picture comprising a plurality of developing means each moving relative to a recording medium with electrostatic latent images thereon, each developing means being provided at the intake and the exit with rollers, means for reciprocally moving said recording medium, according to the order of the successively arranged colors to be developed, relative to said respective developing means and also for moving said recording medium in a unidirectional mode relative to said developing means corresponding to the last color to be developed; said developing means

corresponding to the last color to be developed being provided therein with means for temporarily removing the degraded developer on the surface of said recording medium.

4,014,609

**PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES**

Gerald C. VerSchage, Henrietta, N.Y.; Bernard C. Fisk, Dallas, Tex., and James M. Donohue, Los Alamitos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 496,664, Aug. 12, 1974, Pat. No. 3,944,359. This application Nov. 3, 1975, Ser. No. 628,672

Int. Cl.<sup>2</sup> G03G 15/00

U.S. Cl. 355-14

5 Claims

1. In a reproduction system including an electrostatic type reproduction machine for producing copies from originals, the combination of:

control means for programming the reproduction system to produce one or more copy reproduction runs; program storage means for storing the reproduction run program generated by said control means pending use by said reproduction system; and program ordering means for placing the reproduction run program generated by said control means in predetermined order in said program storage means irrespective of the order in which said reproduction runs are programmed into said control means.

4,014,610

**LINE LASER BEAM PRODUCTION AND ITS USE IN SCANNING DENSITOMETERS**

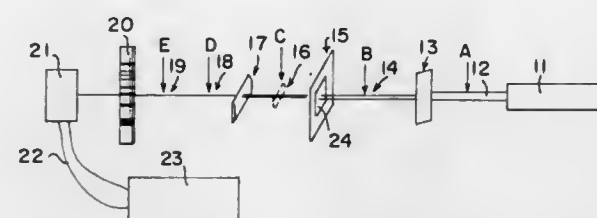
Rashid A. Zeineh, and William P. Nijm, both of 5742 W. Dakin St., Chicago, Ill. 60634

Filed Feb. 3, 1975, Ser. No. 546,514

Int. Cl.<sup>2</sup> G01N 21/22

U.S. Cl. 356-201

4 Claims



1. A light source for a soft laser scanning densitometer/spectrophotometer comprising a laser light source emitting a spot laser beam, a sharp edge movable to intercept part or all of the spot laser beam, the direction of said laser beam being perpendicular to the plane of said sharp edge and the movement of the sharp edge being in a plane perpendicular to the laser beam, a restrictor having an opening positioned in the path of the laser beam after said sharp edge, said restrictor opening passing a segment of that part of the laser beam produced by diffraction effects at said straight edge through a single cylindrical focusing means having its axis perpendicular to the sharp edge and in the path of said beam, said focusing means being positioned so that it focuses said laser beam to a thin line laser beam at an object to be scanned.

4,014,611

**APERTURE MODULE FOR USE IN PARTICLE TESTING APPARATUS**

Ronald O. Simpson, Miami, and Thomas J. Godin, West Hollywood, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Apr. 30, 1975, Ser. No. 573,265

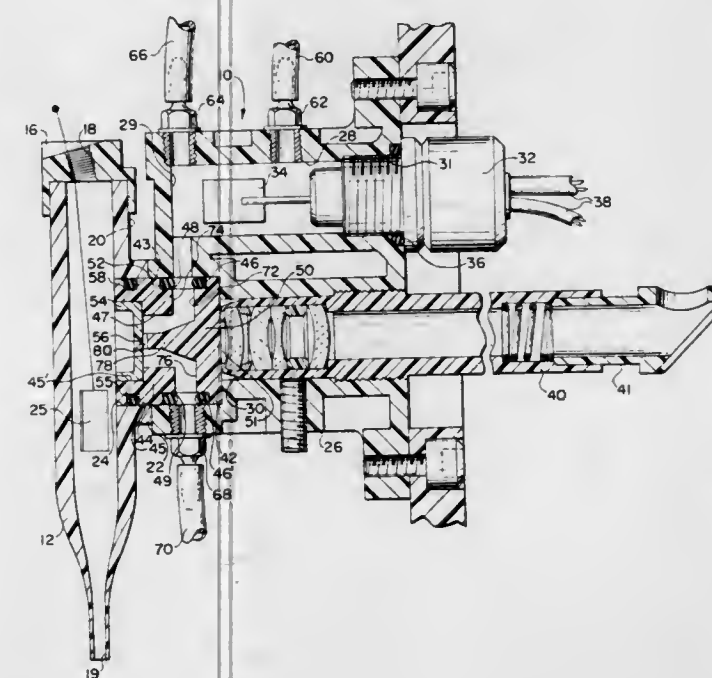
Int. Cl.<sup>2</sup> G01N 21/00, 27/00

U.S. Cl. 356-72

16 Claims

1. An aperture module for use in particle testing apparatus including a container of particulate liquid suspension to be tested, said module comprising, a housing having a first chamber and a second chamber, an aperture holder formed of optically clear material disposed in the second chamber and

having an aperture provided therein, the aperture holder having a closed end and the closed end forming a wall in the second chamber, the aperture holder extending into the container with the aperture in communication on one side thereof with the liquid suspension, a passageway in the module connecting the chambers and passing through the aperture holder, the aperture being in communication on the side opposite said one side with the passageway, a first electrode in the container and a second electrode in the first chamber to establish an electrical field in the aperture between the container and the aperture module, there being a zone in the passageway proximate to the aperture in which spurious signals may normally be produced, means for connecting the passageway at an entrance thereof to a source of particle free liquid and means for connecting the passageway at an exit thereof to fluid moving means to move the particle free liquid through the passageway and simultaneously move the suspension from the container through the aperture into the spurious



signal producing zone, means including electrical leads connected to said electrodes and adapted to extend connections to a detector to respond to electrical measuring signals produced across said electrodes with passage of particles through said aperture, the aperture holder having a projection formed on the closed end of the aperture holder and extending into the passageway to form a restriction therein proximate the aperture to cause the flow velocity of the particle free liquid to increase in the spurious signal producing zone and continuously wash the zone simultaneously with passage of the suspension through the aperture such that particles which have passed through the aperture immediately are swept out of the spurious signal producing zone by the particle free liquid and moved to the exit of the passageway, and an objective lens assembly positioned in the second chamber adjacent said well formed by the closed end of the aperture holder on the side thereof opposite that having said projection for visually examining the aperture during movement of the suspension there-through.

4,014,612

**PHOTOMETRIC MEASURING APPARATUS**

John G. Atwood, Redding; Hamilton W. Marshall, Jr., Ridgefield; Charles F. Demey, II, West Redding, and Wilson P. Ralston, Stamford, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 22, 1974, Ser. No. 499,855

Int. Cl.<sup>2</sup> G01J 3/42

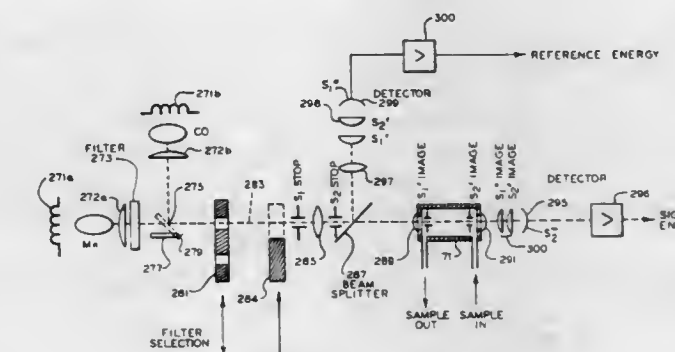
U.S. Cl. 356-88

6 Claims

1. In photometric apparatus for the type wherein absor-

bance through a sample cell in one of two radiation paths is determined by directing light from a source of predetermined wavelength contemporaneously along both paths, the improvement comprising:

a first PIN diode disposed at the end of the path with the sample cell to detect intensity of radiation thereat; a second PIN diode disposed at the end of the other path to detect intensity of radiation thereat; a field stop, a lens, and an aperture stop sequentially aligned along an axis to receive light from the source and to pass a beam of uniform intensity over the cross-sectional area thereof; means for proportionally distributing said beam to the paths; means for focusing light from said beam distributing means to symmetrically image said field and aperture stops



substantially at the entrance and exit respectively of the sample cell; means for focusing light that passes from the sample cell to symmetrically image said aperture stop wholly on the sensitive area of said first PIN diode; means for focusing light from said beam distributing means to symmetrically image one of said field and aperture stops wholly on the sensitive area of said second PIN diode; first and second parametric amplifiers separately disposed to receive the outputs from said first and second PIN diodes respectively; and circuit means for deriving signals logarithmically proportional to the output from each said parametric amplifier and for determining the difference between said logarithmic signals.

4,014,613

**METHOD AND APPARATUS FOR DETERMINING CHANGES IN SPACING BETWEEN TWO POSITIONS OF INTEREST**

William N. Sharpe, Jr., Ingham County, Mich., and Glenn W. Hollenberg, Benton County, Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 10, 1975, Ser. No. 612,070

Int. Cl.<sup>2</sup> G01B 9/02

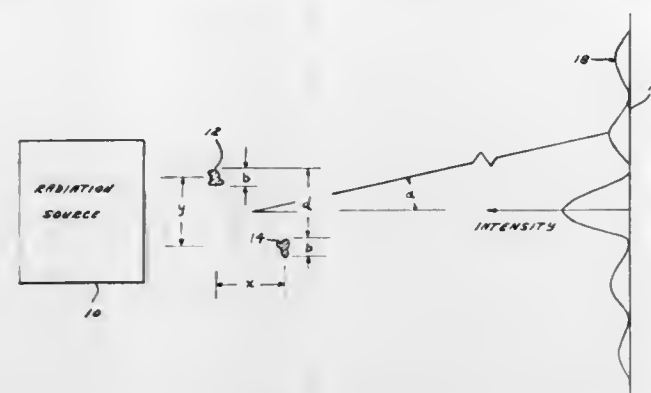
U.S. Cl. 356-106 R

3 Claims

3. The method of determining the changes of relative lengths between a test bar of material and a standard bar specimen, having a length slightly different than the length of the test bar specimen, on a support within a furnace; securing a first linear polycrystalline alumina fiber scatterer to the end, of the test bar specimen, remote from said support; securing a second linear polycrystalline alumina fiber scatterer to the end, of the standard bar specimen, remote from said support; directing a beam of coherent monochromatic light past the



two linear scatterers; measuring the movement of interference fringes, past a predetermined point, resulting from the



changes in spacing between the linear scatterers in response to changes in the temperature within the furnace.

4,014,614

# HIGH RESOLUTION, HIGH CONTRAST FABRY-PEROT SPECTROMETER

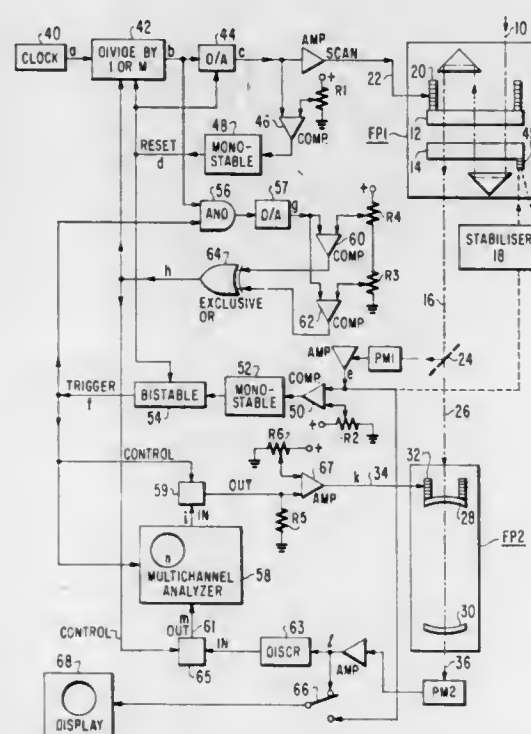
John Riddle Sandercock, Affoltern a.A., Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,819

Int. Cl.<sup>2</sup> G01B 9/02

U.S. Cl. 356—106 S

12 Claims



1. In combination:

a plane mirror Fabry-Perot interferometer of the type including a pair of spaced plane mirrors which can be translated with respect to each other,

first mirror translating means for cyclically shifting the separation of said plane mirrors at a first rate and means for shifting the separation of said plane mirrors during a portion of each cycle at a second rate slower than said first rate, said plane mirror interferometer providing an output signal having a synchronizing portion and a data portion in each cycle, said data portion occurring during said slower cycle portion,

a spherical mirror Fabry-Perot interferometer disposed to receive said output signal as an input thereto, said spherical mirror interferometer including a pair of spaced spherical mirrors, and

second mirror translating means responsive to said output signal synchronizing portion applied as an input thereto for changing the spacing of the spherical mirrors to a given spacing during each said cycle, and for shifting the

spacing of said spherical mirrors to a different mirror spacing for each successive cycle whereby said spherical mirror interferometer scans at least said data portion in a plurality of successive cycles.

4,014,615

# DETECTION OF FAULTS IN A PREDETERMINED AREA OF A SURFACE

Graham Morley Clarke, Edinburgh, Scotland, assignor to Ferranti, Limited, Hollinwood, England

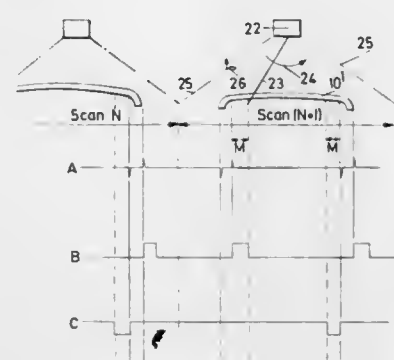
Filed May 27, 1975, Ser. No. 580,567

Claims priority, application United Kingdom, May 28, 1974, 23570/74

Int. Cl.<sup>2</sup> G01N 21/16, 21/32

U.S. Cl. 356—200

12 Claims



1. A detector of faults in a surface movable relative to the detector, the detector comprising a source of a beam of optical radiation, means operable to scan the beam repetitively across the surface between leading and trailing edges of the surface transversely to the direction of motion of the surface, and detection means operable to collect optical radiation reflected from, or transmitted by, the surface to produce, in response to a change in the radiation collected, a detection signal indicative of the presence of a fault, and a circuit arrangement including edge detection means for producing edge signals in response to the detection of the leading- and trailing-edges of the surface, control means operable to produce a first signal in response to the detection of the leading-edge, and a second signal in response to the detection of the trailing-edge, said second signal defining in relation to the traverse speed of the beam a trailing-edge margin the width of which is greater than any anticipated variation in the position of the trailing-edge of the surface between successive scans, and output means responsive to a detection signal occurring in the time interval between a first signal and the subsequent second signal to indicate the presence of a fault.

4,014,616

# DISPOSABLE PRODUCT APPLICATOR AND DISPENSING PACKAGE THEREFOR

John George Mast, Jr., and Paul James Green, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 18, 1976, Ser. No. 668,254

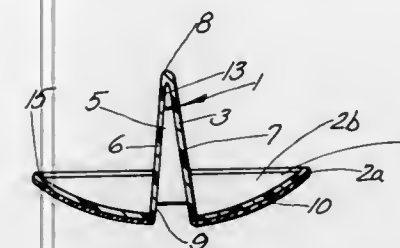
Int. Cl.<sup>2</sup> B65H 1/08; A47F 1/04

U.S. Cl. 401—292

28 Claims

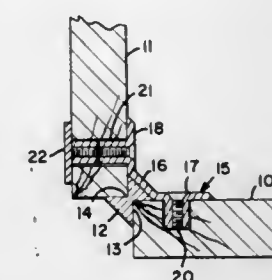
1. A hand-held, generally T-shaped disposable product applicator comprising a body portion and a handle portion, said body portion having product-applying bottom surface and a top surface, said handle being located on said top surface and extending transversely thereof and upwardly therefrom, said handle portion having upwardly and inwardly sloping side walls and upwardly and inwardly sloping side edges, said side walls providing finger-grip surfaces, said handle portion being

hollow, said bottom surface of said body portion having an opening therein leading to the interior of said hollow handle each of the recesses to bear against the inner surfaces of the panels to be assembled at a corner, said projections being



portion, said applicator being stackable with a similar applicator with their handle elements in telescoped relationship.

designed so that they can be attached to the panels by suitable fastening means.



4,014,617

# COUPLING ASSEMBLIES

Spencer Davidson Meston, Bristol, England, assignor to British Aircraft Corporation Limited, London, England

Filed Sept. 26, 1975, Ser. No. 617,163

Claims priority, application United Kingdom, Sept. 28, 1974, 42260/74

Int. Cl.<sup>2</sup> F16D 3/50

U.S. Cl. 403—111

4 Claims

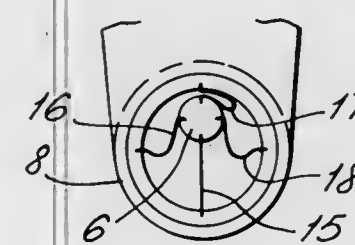
RETAINER RING AND SPLINED MEMBER ASSEMBLY  
William K. Good, Pontiac, and Wilson J. Harbage, Birmingham, both of Mich., assignors to Koppy Corporation, Ferndale, Mich.

Filed Sept. 29, 1975, Ser. No. 617,814

Int. Cl.<sup>2</sup> F16B 21/18

U.S. Cl. 403—359

3 Claims



1. A coupling assembly, comprising:  
an outer annular coupling member;  
an inner coupling member extending axially within the outer annular coupling member with a substantial radial clearance therebetween, perimetrically thereof; and  
a plurality of at least three flexible, substantially inextensible ligaments each connected at two respective connection sites axially spaced along the length thereof to the outer annular coupling member at angularly spaced locations on the outer coupling member and to the inner coupling member;

the distance along each ligament between said two sites thereof being substantially greater than the length of said radial clearance but insufficiently great as to permit the inner coupling member to contact the outer annular coupling member, whereby the outer annular and inner coupling members are loosely interconnected for substantial relative rotational movement and substantial relative oscillatory movement, limited by tautening of at least one of the ligaments.

1. In combination: a splined member and a snap type retaining ring, said splined member having a plurality of splines each having a root section and being disposed about the periphery of said splined member; a slot disposed in said splined member for receiving said snap ring, said slot being defined by a series of individual lances disposed in the root section of each spline, said lances being disposed in parallel pairs and the material between said individual pairs of lances being disposed in a plane spaced away from said root sections a distance equal to the depth of said root sections whereby said pairs of lances and said displaced material form said slot for receiving said snap type bearing ring.

4,014,620

# VIBRATORY TAMPER

Gülertan Vural, Emmelshausen, and Udo Carle, Hohn-Grenzhausen, both of Germany, assignors to Koehring GmbH - Bomag Division, Boppard (Rhine), Germany

Filed Aug. 28, 1975, Ser. No. 608,772

Claims priority, application Germany, Aug. 28, 1974, 2441180

Int. Cl.<sup>2</sup> E01C 19/34

U.S. Cl. 404—133

13 Claims

1. In a vibratory tamper comprising a crank case, a motor unit laterally mounted on said crank case, a gear unit, a crankshaft driven by said motor unit through said gear unit, a movable intermediate member, a crank arm connecting said intermediate member to said crankshaft for reciprocation of said intermediate member, guide means for guiding said intermediate member linearly when said intermediate member is reciprocated, a movable tamping foot, and at least two oppositely acting springs mounted between said intermediate member and said tamping foot whereby motion is transmitted to said tamping foot from said intermediate member, the improve-

4,014,618

# CORNER STRUCTURE

Kai Hestbech Kristiansen, Vilh Kyhnsalle 3, Højbjerg, Denmark

Filed July 3, 1975, Ser. No. 593,147

Claims priority, application Denmark, July 8, 1974, 3646/74

Int. Cl.<sup>2</sup> F16B 12/00

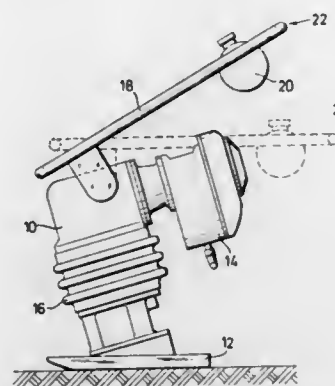
U.S. Cl. 403—205

4 Claims

1. A corner structure for use in shelves, cabinets, boxes and similar boxshaped objects, which are made from rectangular panels, said corner structure comprising a recessed rod-shaped junction of substantially hourglass-shaped cross-section into the recesses of which the borders of the panels are received, said junction having projections extending from



ment wherein said gear unit is a planetary gear comprising an inner wheel, a hollow intermediate shaft connected to said crankshaft and having a hollow portion, means journalling said inner wheel in said hollow portion, an outer wheel rigidly attached to said crank case, and at least one intermediate



planet wheel coupled to said intermediate shaft and engaging between said inner and outer wheels, said tamper including means drivingly connecting said motor unit to said inner wheel, and wherein said oppositely acting springs overlap at least partially in the axial direction.

#### 4,014,621 GAUGE

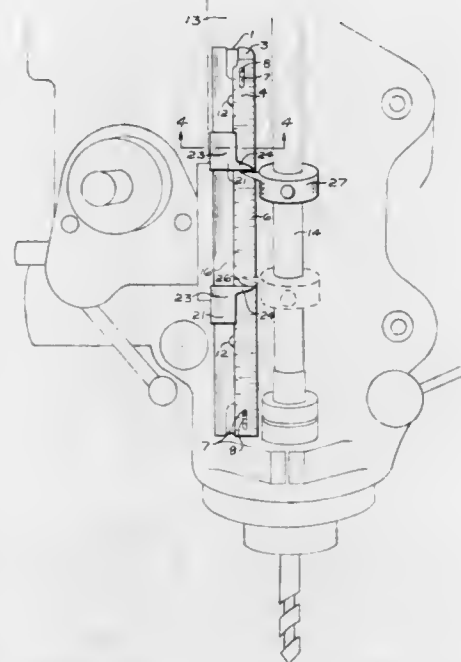
Ray W. Johnson, and David L. Gordon, both of Wichita, Kans., assignors to David L. Gordon, Wichita, Kans.

Filed Jan. 22, 1976, Ser. No. 651,415

Int. Cl.<sup>2</sup> B23B 49/00

U.S. Cl. 408—16

7 Claims



1. A gauge comprising a scale element having a scale longitudinally marked thereon, a gauge body having a longitudinal bottom adapted to be placed on a surface and a longitudinal top spaced from said bottom accommodating said scale element thereon, a longitudinal guide rail extending laterally along said body, a pair of spaced pointer members, each member comprising a pointer body slidably supported along said guide rail and being selectively positioned thereon, a pointer finger projecting from each pointer body over said scale for indicating a predetermined distance between adjusted positions of said pointer members, and means to detachably secure said scale on said longitudinal top of said gauge body.

#### 4,014,622 REAMER

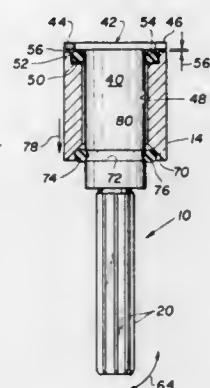
Robert E. Lotz, c/o Aboton Machine & Tool Co., Inc., 727 Mount Ave., North Babylon, N.Y. 11704

Filed Oct. 24, 1975, Ser. No. 625,766

Int. Cl.<sup>2</sup> B23B 31/08

U.S. Cl. 408—127

3 Claims



1. An improved reamer having a select extent of pivotal movement during reaming service, said improved reamer comprising a cylindrical bushing having a central through bore therein terminating in opposite front and rear openings, an elongated reamer body adapted to be projected through said rear opening of said through bore of said cylindrical bushing in the direction of said front opening thereof to provide an operative mounting of said reamer within said cylindrical bushing, a key of a generally rectangular shape extending generally perpendicularly of said reamer body so as to present opposite key arms extending laterally of one end of said reamer body limiting said projecting movement of said reamer body relative to said cylindrical bushing, said cylindrical bushing having a wall bounding a counterbore at the end thereof adjacent said key forming a seat at said bushing end, said cylindrical bushing wall having two cut-outs spaced 180° apart forming key ways therein cooperating with said key for holding said reamer body against rotation during reaming service thereof, each said cut-out adapted to receive a cooperating one of said key arms, and an elastomeric ring mounted in encircling relation about said reamer body adjacent said key having an operative position located in said seat, whereby said non-rotative reamer body nevertheless has a canting degree of movement during said reaming service which is permitted by compression of said elastomeric ring.

#### 4,014,623 BORING ROD EXTENSION WITH TWO COUNTER-ROTATING BORING TOOL CARRIERS

Otto Eckle, Lochgau, Germany, assignor to KOMET Stahlhalter-und Werkzeugfabrik, Robert Breuning GmbH, Besigheim, Germany

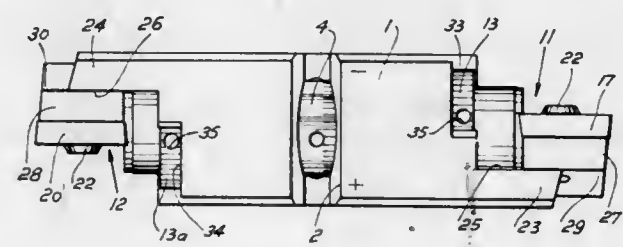
Filed Nov. 26, 1974, Ser. No. 527,225

Claims priority, application Germany, Dec. 1, 1973, 2360000

Int. Cl.<sup>2</sup> B23B 29/034, 51/00

U.S. Cl. 408—183

10 Claims



1. A boring rod extension, comprising: elongated housing means having an opening extending therethrough; a first tool carrier mounted in said opening and having a portion thereof extending axially outwardly of said open-

ing, said portion having a first cutting tool mounted thereon and a first supporting surface spaced from said first cutting tool;

first projection means on at least one end of said elongated housing means and projecting outwardly of said housing means in a direction parallel to the axis of said opening, said projection means having a second supporting surface thereon engaged by said first supporting surface on said first tool carrier;

first adjustable coupling means for axially adjustably and fixedly coupling said first tool carrier in said opening of said housing means and maintaining the engagement between said first and second supporting surfaces for effecting a transfer of forces acting on said first tool carrier directly to said projection means to thereby strengthen the connection of said first tool carrier to said housing means;

a second tool carrier mounted in said opening and having a portion thereof extending axially outwardly of said opening but in a direction opposite to said first tool carrier, said portion of said second tool carrier having a second cutting tool mounted thereon and a third supporting surface spaced from said second cutting tool;

second projection means on an end of said housing means and projecting outwardly of said housing means in a direction parallel to the axis of said opening and opposite to said first projection means, said second projection means having a fourth supporting surface thereon engaged by said third supporting surface on said second tool carrier; second adjustable coupling means for axially adjustably and fixedly coupling said second tool carrier in said opening of said housing means and maintaining the engagement between said third and fourth support surfaces for effecting a transfer of forces acting on said second tool carrier directly to said second projection means to thereby strengthen the connection of said second tool carrier to said housing means, said first and second adjustable coupling means including an adjusting bushing mounted in said opening and has a pair of axially spaced first connecting means thereon and said first tool carrier and said second tool carrier each have second connecting means thereon for connectingly cooperating with said first connecting means, a chuck socket encircling each of said first and second tool carriers, each of said chuck sockets having an external conical surface separated by a region extending over more than 180° in relation to a cutting edge on each of said cutting tools; and securing means for securing each of said chuck sockets against rotation relative to said housing means.

#### 4,014,624

##### METHOD AND DEVICE FOR STARTING PUMP

Mituo Takase, Mito; Hisao Inoue, Hitachi; Takeo Hachiya, Hitachi, and Katsumi Seno, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 15, 1975, Ser. No. 604,946

Claims priority, application Japan, Aug. 16, 1974, 49-93341

Int. Cl.<sup>2</sup> F01D 17/00

U.S. Cl. 415—1

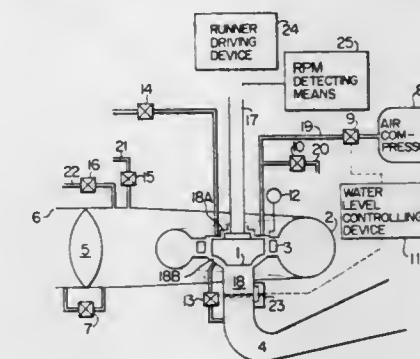
13 Claims

1. In a method for starting a pumping operation of a pump device which includes a runner; a runner driving device; a runner chamber housing therein said runner; a plurality of openable guide vanes provided along the outer periphery of said runner chamber; a casing surrounding said guide vanes; a discharge tube coupled to said casing; a main valve; a by-pass valve, said main valve and said by-pass valve being provided in said discharge tube; a drain valve discharging from said runner chamber leaking water introduced therein; a compressed air feeding device connected to said runner chamber; an exhaust valve for discharging compressed air from the runner chamber; and a leaking water supply valve connected to said casing; the improvements comprising the steps of:

closing the main valve, by-pass valve and guide vanes, open-

ing the drain valve, and feeding compressed air to said runner chamber until said runner chamber is filled with compressed air and said runner is exposed to compressed air;

energizing said runner driving device, thereby rotating the runner, closing said drain valve when said runner reaches a specified r.p.m. and opening said exhaust valve after



said drain valve has been completely closed, thereby discharging compressed air from said runner chamber; and bringing said main valve, by-pass valve and guide vanes to an open position according to rise of water pressure in the vicinity of said runner periphery in said runner chamber, and closing said leaking water supply valve connected to the casing as well as said exhaust valve.

#### 4,014,625 TRANSVERSE FLOW FAN

Teruo Yamamoto, 974 Hohjoh, Himeji, Hyogo, Japan

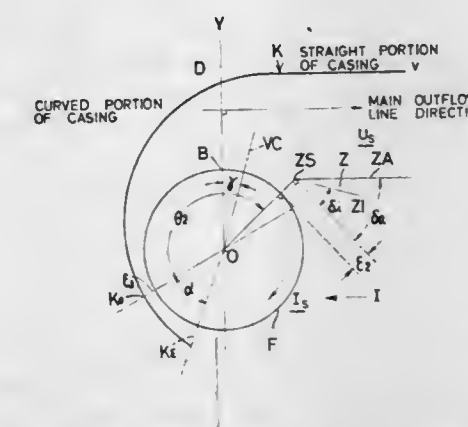
Continuation-in-part of Ser. No. 389,512, Aug. 20, 1973,

abandoned. This application Oct. 31, 1974, Ser. No. 519,787

Int. Cl.<sup>2</sup> F04D 5/00

U.S. Cl. 415—54

7 Claims



1. A transverse flow fan having a casing with an inlet and an outlet, an annular impeller rotatably mounted in said casing between said inlet and said outlet and having outwardly curved blades therein with an inner blade angle  $\beta_1$  at the inner periphery of the impeller and an outer blade  $\beta_2$  at the outer periphery of the impeller, at least one hand-shaped annular member on said impeller around the outer periphery thereon for partial control of the flow, the casing having end walls generally parallel with the end faces of the annular impeller, a curved outer wall between said end walls and curving around said impeller and to said outlet, and a tongue forming an inner wall having an inflow space side extending from said inlet to a point adjacent said impeller and an outflow space side at an angle of less than 180° to said inflow space side and extending from said impeller to said outlet, the inflow space side of said tongue and said end walls defining an inflow space, said outflow space side of said tongue, said end walls and said outer wall defining an outflow space, the angle  $\delta_1$  on the inlet space side of said tongue between the surface of the said tongue and a line intersecting the tip of the tongue and parallel to a tangent to the impeller adjacent said tip of said tongue being in



the range  $(\beta_2 - 15^\circ)$   $\delta_1$   $(\beta_2 + 15^\circ)$  and the distance  $\epsilon_2$  between the impeller and the tip of the tongue in the radial direction of the impeller being  $0.03 F_D$  to  $0.15 F_D$ , wherein  $F_D$  is the outside diameter of the impeller.

4,014,626

## CENTRIFUGAL PUMP MEANS

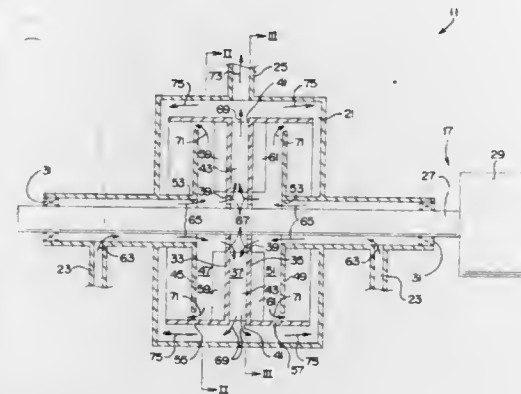
James F. Grenn, Rte. 2, Bogue Chitto, Miss. 39629

Filed Sept. 8, 1975, Ser. No. 611,427

Int. Cl.<sup>2</sup> F04D 17/00

U.S. Cl. 415-102

1 Claim



1. Centrifugal pump means for pumping liquid, said pump means comprising:

- housing means including a hollow interior, including centrally located inlet means for allowing liquid to enter said interior, and including peripherally located outlet means for allowing liquid to exit said housing means;
- drive means including a drive shaft extending into said interior of said housing means centrally thereof and including a motor means for selectively rotating said drive shaft;
- impeller means positioned within said interior of said housing means, said impeller means including first and second plate members fixedly attached to said drive shaft, said first and second plate members being spaced apart from one another to form a chamber-like portion therebetween, said impeller means including centrally located inlet means for allowing liquid to enter said chamber-like portion and including peripherally located outlet means for allowing liquid to exit said chamber-like portion, said impeller means including a plurality of vane members positioned between said first and second plate members and fixedly attached to said drive shaft for creating a centrifugal force when said drive shaft rotates to cause liquid to enter said chamber-like portion through said inlet means of said impeller means and to exit said chamber-like portion through said outlet means of said impeller means; and
- seal means for preventing the liquid exiting said chamber-like portion of said impeller means through said outlet means of said impeller means from reentering said chamber-like portion of said impeller means through said inlet means of said impeller means, said seal means including first and second disklike members fixedly attached to said interior of said housing means substantially aligned with said first and second plate members of said impeller means, said first disklike member being spaced away from said first plate member of said impeller means to form a chamber-like portion therebetween, said second disklike member being spaced away from said second plate member of said impeller means to form a chamber-like portion therebetween, each of said first and second disklike members including a centrally located opening for allowing liquid to enter said respective chamber-like portions from said inlet means of said housing means, said seal means including a first annular flange member attached to the periphery of said first plate member of said impeller means and extending over and spaced above the periph-

ery of said first disklike member, said seal means including a second annular flange member attached to the periphery of said second plate member of said impeller means and extending over and spaced above the periphery of said second disklike member, said seal means including a plurality of vane members positioned in each of said chamber-like portions thereof and fixedly attached to said first and second plate member of said impeller means for rotation therewith to force liquid in said first and second chamber-like portion to exit said first and second chamber-like portion through the space between said first and second disklike member and said first and second annular flange member respectively thereby preventing the liquid exiting said chamber-like portion of said impeller means from entering said first and second chamber-like portions of said seal means.

4,014,627

## COMPRESSOR STATOR HAVING A HOUSING IN ONE PIECE

Bernard Heurteux, Verviers, Belgium, assignor to Shur-Lok International S.A., Petit-Rechain, Belgium

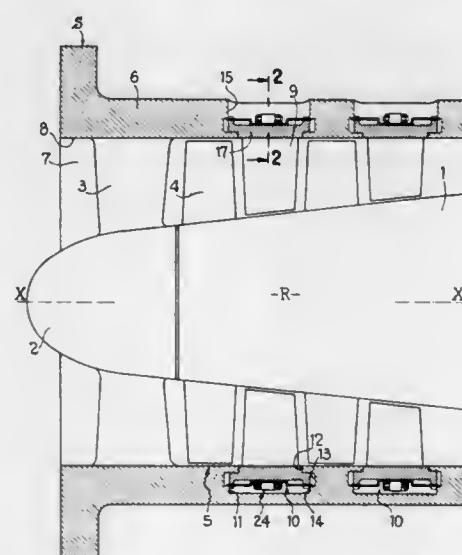
Filed July 22, 1975, Ser. No. 598,027

Claims priority, application France, Aug. 21, 1974, 74.28742

Int. Cl.<sup>2</sup> F01D 1/02

U.S. Cl. 415-189

11 Claims



1. A compressor stator comprising in combination: a housing wall of revolution about an axis which wall is in one piece and defines an inner surface of revolution and an outer surface, means defining an annular groove in said wall extending radially outwardly from said inner surface and terminating short of said outer surface, the groove having a radially outer annular part and a radially inner annular part of smaller width axially of said wall than said outer part, said outer and inner annular parts of the groove defining therebetween radially outwardly fixing shoulder means, means defining in said wall at least one radial opening putting the groove in communication with said outer surface of said wall; at least one row of vanes, each of said vanes having a base which is mounted in the groove and has a width axially of said wall which is larger than the width of said inner part of the groove, the bases being in abutting relation to said shoulder means, the radial opening being of a size permitting the vane bases to be inserted one by one into the groove by way of the radial opening, the vane bases being in contiguous relation to each other, the groove defining with the vane bases an annular gap encompassing the row of vane bases; and annular fixing means disposed in said annular gap for clamping the vane bases radially against said shoulder means, the fixing means comprising a chain having chain links and pivotal connecting means interconnecting the links, and tightening means for tightening the chain round the vane bases, and the fixing means being capable of exerting a radial force on each one of the vane bases through the chain links.

4,014,628

## SUPERCHARGED THREE-SECTION PUMP

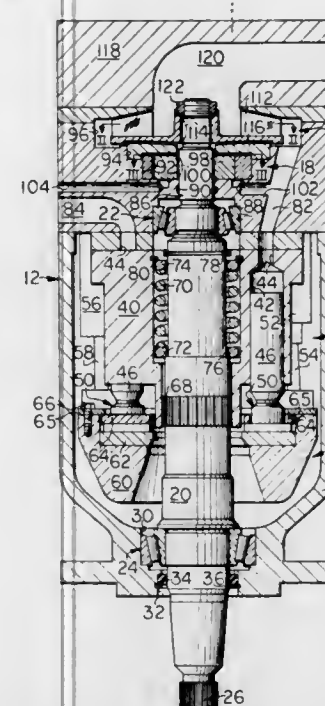
Walter Zdzislaw Russett, New Lenox, and Gilbert Tribley, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 15, 1975, Ser. No. 577,808

Int. Cl.<sup>2</sup> F04B 23/10, 23/14; F01B 13/04

U.S. Cl. 417-203

6 Claims



1. A three-section pump assembly comprising a pump body a variable displacement piston pump arranged generally toward one axial end of the body and having a stationary head unit formed by a portion of pump body, a drive shaft for the piston pump extending in cantilevered fashion through the head unit, a supercharging centrifugal pump and an additional positive displacement rotary pump being arranged in axial alignment with the piston pump and having rotary portions mounted in driving relation upon the cantilevered end of the common drive shaft, the positive displacement rotary pump disposed between the centrifugal pump and the piston pump, each of the centrifugal and positive displacement rotary pumps including respective fluid inlets and fluid outlets, the fluid outlet for the supercharging centrifugal pump being in communication with an inlet for the variable displacement piston pump, and the fluid inlet for the positive displacement rotary pump in communication with the fluid outlet of the supercharging centrifugal pump, the head unit portion of the pump body formed with three stepped counterbores, the positive displacement rotary pump being arranged within a first one of the counterbores and the centrifugal pump being arranged with the third one of the stepped counterbores, a spacer means being arranged within the second stepped counterbore in order to separate the centrifugal pump from the gear pump.

4,014,629

## PUMP FOR PUMPING BOTH LOW VISCOSITY AND HIGH VISCOSITY FLUIDS

Robert M. Elsworth, Loudonville, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jan. 5, 1976, Ser. No. 646,320

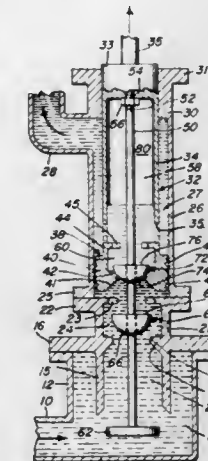
Int. Cl.<sup>2</sup> F04B 7/00

U.S. Cl. 417-259

11 Claims

1. An improved pump for pumping fluids with a viscosity ranging from 1 to 1 million centipoise at 25° C without any mechanical adjustments comprising a body having therein a first cavity, a second cavity connecting to said first cavity and a third cavity connecting to said second cavity, a hollow cylin-

der with a closed end and an open end positioned within said first cavity such that said open end is totally within said first cavity, a cylinder head with a fourth cavity therein connected to the open end of said hollow cylinder, a shaft having a first end and a second end connected to said closed end of said hollow cylinder at its first end and passing through said first,



second, third and fourth cavities, a first valve means positioned about said shaft and positioned to move in said fourth cavity, a second valve means positioned about said shaft and positioned to move in said second cavity and kick plate means connected at said second end of said shaft and positioned to move within said third cavity.

4,014,630

## POWER STEERING PUMP

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

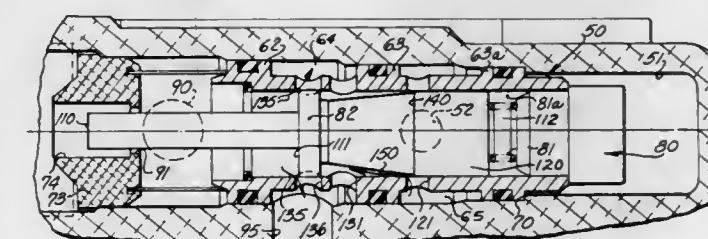
Continuation-in-part of Ser. No. 475,783, June 3, 1974,

abandoned. This application Dec. 9, 1975, Ser. No. 639,068

Int. Cl.<sup>2</sup> F04B 49/00

U.S. Cl. 417-283

14 Claims

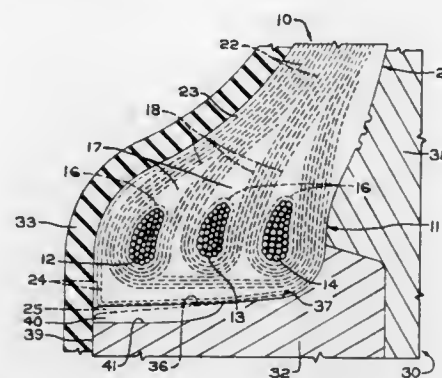


1. A vehicle power-steering pump for supplying fluid to a power-steering system, said pump comprising, a housing having an inlet and an outlet and defining a pumping chamber, pumping means in said pumping chamber operable to pump fluid from said inlet to said outlet, said pumping means including pumping elements which define a series of pumping pockets which expand and contract to effect pumping of fluid, means for providing an increasing fluid flow to the system in proportion to increases in pump speed during a first range of pump speed and for providing a substantially constant flow of fluid to the system during a second range of pump speed immediately following said first range, said means comprising, a cheek plate having a sealing position with one axial side thereof blocking fluid communication between said pumping pockets during said first speed range with the pressure in said outlet acting to urge said cheek plate out of sealing position, means defining a cavity on the other axial side of said cheek plate, means defining a passage directing fluid from said outlet to said cavity, the pressure in said cavity urging said cheek plate toward sealing position,



valve means including a valve member movable to vent said cavity upon said pump reaching said second speed range and operable to control the pressure in said cavity during said second speed range to enable the forces on said cheek plate to move said cheek plate and create a fluid bypass across said one axial side of said cheek plate from said outlet to said inlet, and means for stabilizing said valve member by creating a fluid flow past said valve member during venting of said cavity by said valve member.

edge, and an annular bead flat surface for shaping a bead area of a tire, the improvement wherein said toe portion comprises



support means projecting radially outwardly from said flat bead surface.

4,014,631

**HEAT PIPE COOLING OF A ROTARY ENGINE ROTOR**

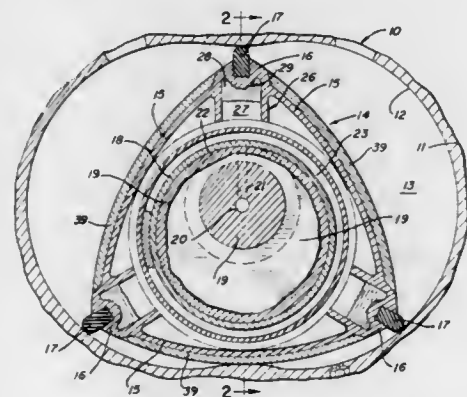
Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1975, Ser. No. 636,783

Int. Cl.<sup>2</sup> F01C 21/06; F04C 29/04

U.S. Cl. 418-85

3 Claims



1. In a rotary engine hollow rotor defined by arciform side walls converging to a plurality of angularly spaced outer apices, improved structure for cooling said rotor, comprising: heat transfer means within the rotor comprising a rigid tubular wall concentrically within said side walls and having inwardly opening circumferentially extending helical groove means and outwardly opening circumferentially extending groove means; heat pipe means extending inwardly from each of said apices to said heat transfer means and provided with a vaporizable fluid for transferring heat inwardly from said apices to said heat transfer means within said outwardly opening grooves means for apical cooling of said rotor; and means for flowing a lubricant heat transfer fluid in the helical path defined by said inwardly opening groove means.

4,014,632

**PNEUMATIC TIRE MOLD**

Reinhard Heinz Golz, and William James Johnson, both of Akron, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed June 14, 1976, Ser. No. 695,944

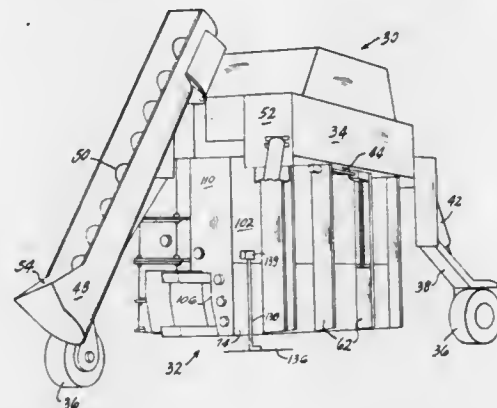
Int. Cl.<sup>2</sup> B29H 5/02

U.S. Cl. 425-28 R

7 Claims

1. In a pneumatic tire mold having an annular bead molding ring, said bead molding ring comprising a toe edge for positioning adjacent a bladder, a toe portion adjacent said toe

edge, and an annular bead flat surface for shaping a bead area of a tire, the improvement wherein said toe portion comprises support means projecting radially outwardly from said flat bead surface.



4,014,633

**ADJUSTABLE SLIP FORM**

Roy Robert Goughnour, Mason, Mich., assignor to A. C. Aukerman Co., Jackson, Mich.

Division of Ser. No. 268,159, June 30, 1972, Pat. No.

3,792,133. This application July 5, 1973, Ser. No. 376,718

Int. Cl.<sup>2</sup> B28B 13/02

U.S. Cl. 425-63

7 Claims

4,014,634

**POWDER MOLDING PRESS**

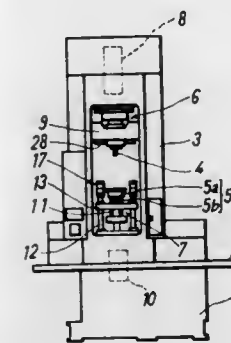
Masayuki Hoshino, Shizuokaken, Japan, assignor to Iwatani & Co., Ltd., Osaka, Japan

Filed May 26, 1976, Ser. No. 690,180

Int. Cl.<sup>2</sup> B30B 15/18

U.S. Cl. 425-78

10 Claims



1. A compression-molding press comprising: a machine frame; a first metal mold securing device slideably secured to said machine frame; a second metal mold securing device secured to said machine frame; a driving means for slideably advancing said first metal mold securing device towards said second metal mold securing device; a first metal mold coupled to said first metal mold securing device; a second metal mold coupled to said second metal mold securing device; stopper means, positioned between said first and second metal mold securing devices, and impinging upon one of said metal mold securing devices when said first metal mold securing device is advanced a predetermined distance toward said second metal mold securing device; detecting means positioned between said stopper means and said one of said metal mold securing devices for detecting impingement of said stopper means upon said one of said metal mold securing devices; and a means, included in said detecting means, for cutting off said driving means advancing said first metal mold securing device towards said second metal mold securing device, upon detection of impingement by said detecting means, thereby preventing a strong driving force acting on said impinging stopper means and said one of said metal mold securing devices, saving said stopper means and said one of said metal mold securing devices from breakage and deformation.

4,014,635

**APPARATUS FOR THE DEPOSITION OF A UNIFORM LAYER OF DRY FIBRES ON A FORAMINOUS FORMING SURFACE**

Karl Kristian Kobs Kroyer, Banegardsplads 4, DK-8100 Arhus C., Denmark

Filed Oct. 29, 1975, Ser. No. 626,973

Claims priority, application United Kingdom, Oct. 31, 1974, 47182/74

Int. Cl.<sup>2</sup> B29C 13/00; B29J 5/00

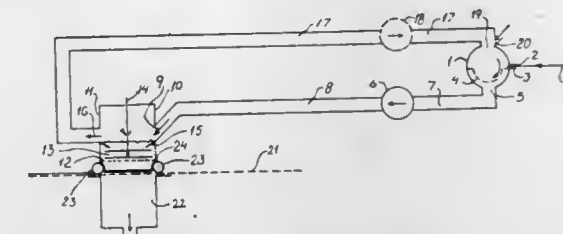
U.S. Cl. 425-82

8 Claims

1. An apparatus for the deposition of a uniform layer of dry fibres on a foraminous forming surface, said apparatus comprising in combination:

1. a hammer mill comprising a lower perforated wall, inlet means for fibrous material to be disintegrated, and inlet means for recycled fibrous material;
2. a conduit for transporting disintegrated fibrous material from the hammer mill to a fibre distributor;
3. a fibre distributor comprising a housing having a perforated plane-surfaced bottom wall, at least one stirring

device having at least one impeller disposed for rotation a short distance above and in non-contacting relationship with the upper surface of said perforated bottom wall, at least one plate member located above said impeller and extending inwardly from the inside of the side walls of the housing so as to form a partition between a lower part and



an upper part of said housing, inlet means for disintegrated material opening into said upper part of the housing, said upper part of the housing also comprising outlet means for fibrous material to be recycled to the hammer mill; and

4. a conduit connecting the outlet means of said housing with said inlet means of said hammer mill.

4,014,636

**SYNTHETIC PLASTICS FILM MANUFACTURING PLANT INCLUDING A MULTIPLE-ROLL CALENDER**

Werner Pawelczyk, Hannover, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

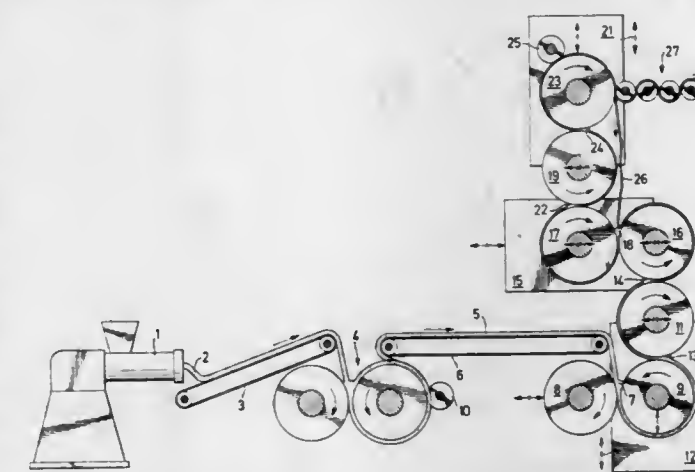
Filed Dec. 19, 1975, Ser. No. 642,442

Claims priority, application Germany, Dec. 21, 1974, 2460873

Int. Cl.<sup>2</sup> B29D 7/14

U.S. Cl. 425-224

3 Claims



1. Synthetic plastics film manufacturing plant comprising a multiple-roll calender and material feed means for charging the multiple-roll calender, wherein the multiple-roll calender has seven rolls comprising four bottom rolls disposed in an L-shape, one of which of said four bottom rolls, provided in the foot of the L, is an input feed roll, and three rolls disposed one above the other with their axes disposed substantially in the same vertical plane, the lowest roll of said three other rolls being disposed in a horizontal juxtaposition and in rolling contact with the topmost roll of said four bottom rolls and on the same side thereof as said input feed roll.

4,014,637

**CATALYST GENERATOR**

Kenneth R. Schena, Silvermine Road, West Boxford, Mass. 01855

Filed Mar. 1, 1976, Ser. No. 662,829

Int. Cl.<sup>2</sup> F23J 7/00

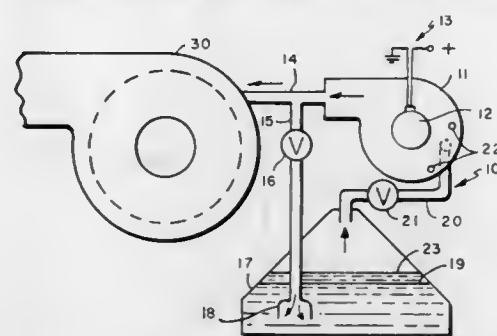
U.S. Cl. 431-4

11 Claims

1. Apparatus for supplying catalyst to the blower of a liquid fuel combustion device, comprising gas impeller means for



moving gas under pressure, a first conduit means connecting the output of the gas impeller means to the blower, second conduit means connected to said first conduit means at one end, and connected at the other end to a chamber means for



contact of the gas carried by said second conduit means with a liquid, and third conduit means connected between said chamber means and said gas impeller means for feeding the gas treated in said chamber means into said gas impeller means.

4,014,638

### PHOTOFLASH LAMP WITH ELECTROSTATIC PROTECTION AND METHOD OF MAKING PHOTOFLASH UNITS

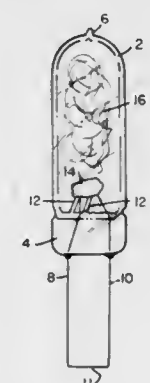
John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Montoursville, Pa.

Filed Nov. 10, 1975, Ser. No. 630,581

Int. Cl.<sup>2</sup> A23L 1/20

U.S. Cl. 431—95 R

4 Claims



1. A photoflash lamp comprising:  
an hermetically sealed, light-transmitting envelope;  
a quantity of filamentary combustible material located within said envelope;  
a combustion-supporting gas in said envelope;  
an ignition means disposed in said envelope in operative relationship with respect to said filamentary combustible material, said ignition means including a pair of lead-in wires extending into said envelope in a spaced relationship, said pair of lead-in wires comprising the two legs of a generally hairpin-shaped wire, a mass of primer material bridging said lead-in wires within said envelope, and the bight of said hairpin-shaped wire being outside of said envelope for electrically interconnecting the external portions of said pair of lead-in wires to effect a short circuit thereacross, whereby the lamp is disabled until ready for assembly or use.

4,014,639

### RECIRCULATING VORTEX BURNER

Harold E. Froehlich, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 10, 1975, Ser. No. 566,712

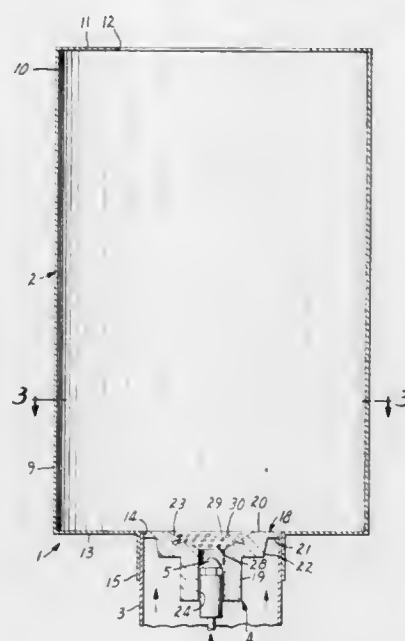
Int. Cl.<sup>2</sup> F23D 15/02

U.S. Cl. 431—353

11 Claims

1. A recirculating vortex burner comprising in combination:  
a substantially cylindrical combustion chamber having an

intake port forming a portion of one end and at least one exhaust port at or near an opposite end;  
a conduit means leading to the intake port of said chamber; a swirl member disposed in the intake port of the combustion chamber to restrict air flow from said conduit means to said chamber, said swirl member having a central opening and a plurality of spaced apart inlet orifices circumferentially disposed around said opening and directed through said swirl member tangentially to said opening and at an incline to the longitudinal axis of said



central opening to communicate between said conduit means and said combustion chamber whereby air can be directed through said orifices in said swirl member into said combustion chamber; and  
a fuel nozzle disposed in the central opening of said swirl member for providing a conical fuel spray that intersects the air flow entering said combustion chamber through said swirl member orifices, said fuel nozzle and said swirl member cooperating together to seal off the intake port of said combustion chamber whereby air from said conduit enters said chamber solely through said orifices.

4,014,640

### PIPE BELLING AND CHAMFERING MACHINE

Vernon V. Emery, Sun Valley; Charles W. Howe, Pasadena, and Joseph Marcella, Sun Valley, all of Calif., assignors to Vern Emery Company, Inc., Pacoima, Calif.

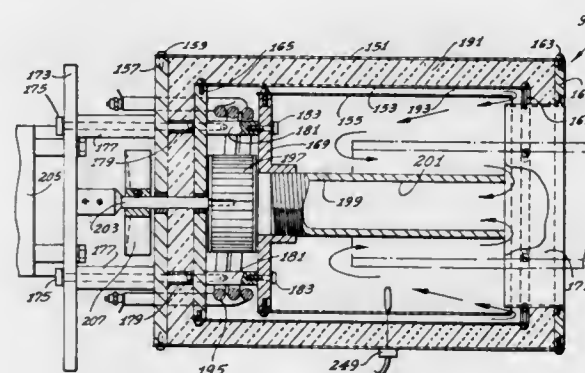
Division of Ser. No. 62,100, Aug. 7, 1970, Pat. No. 3,923,443.

This application Oct. 16, 1975, Ser. No. 622,814

Int. Cl.<sup>2</sup> F27D 5/00; F24J 3/00

U.S. Cl. 432—10

3 Claims



1. The method of heating an end of a length of pipe to be belled comprising the steps of  
passing air from the exhaust side of a fan across heating coils,  
heating the air as it crosses the heating coils,  
passing the heated air over the outer surface of the wall of an end of the length of pipe,

turning the heated air as it flows past the end of the length of pipe,  
passing the heated air over the inner surface of the wall of the end of the length of pipe, and  
returning the heated air to the suction side of the fan.

4,014,641

### APPARATUS FOR CALCINING POWDERED CEMENT MATERIAL

Miyamoto Shigeyoshi; Yamashita Kosuke; Fujiwara Kunihisa, and Utsumi Tatsuo, 02, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

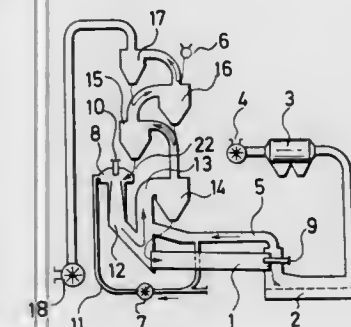
Filed Aug. 15, 1975, Ser. No. 604,910

Claims priority, application Japan, Sept. 30, 1974, 49-112550

Int. Cl.<sup>2</sup> F27B 15/00

U.S. Cl. 432—58

8 Claims



1. Apparatus for calcining powdered cement material comprising: a kiln having an entrance; a suspension preheater including a plurality of cyclones arranged in vertical juxtaposition with at least a lowermost and a second lowermost cyclone being provided, said cyclones operating to separate cement material from gases when a mixture thereof is introduced therein, said lowermost cyclone having an upper inlet and a lower outlet connected to said kiln to introduce separated cement material thereinto; a gas duct connected at one end to the entrance of said kiln and at its opposite end to said upper inlet of said lowermost cyclone; a gas producer located beneath said second lowermost cyclone and having a bottom opening into said gas duct at a point below where said opposite end of said gas duct is connected to said upper inlet of said lowermost cyclone; means for supplying cement material from said second lowermost cyclone to said gas producer; means for supplying fuel and primary air to said gas producer; and secondary air supplying means located adjacent the point where said bottom of said gas producer opens into said gas duct.

4,014,642

### SHAFT COOLER

Bernd Helming, Enniger, Germany, assignor to Polysius AG, Neubeckum, Germany

Filed Jan. 21, 1976, Ser. No. 650,847

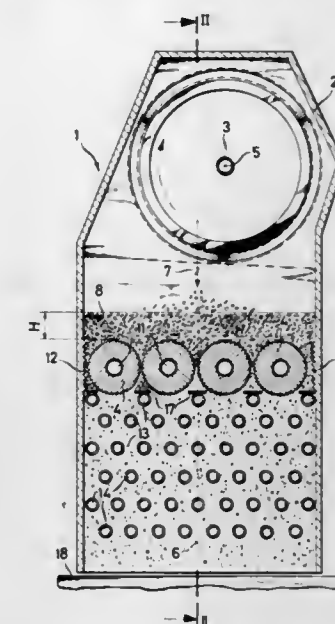
Claims priority, application Germany, Feb. 5, 1975, 2504782

Int. Cl.<sup>2</sup> F27D 15/02

U.S. Cl. 432—77

10 Claims

1. A shaft cooler comprising a plurality of power-driven adjacent horizontal hollow perforated comminuting rolls, a material — holding upper shaft section immediately above said rolls, said upper section having a height of 50 to 100 cm., means for delivering material at the upper end of said upper section, an aftercooling shaft section immediately below said rolls, the height of which is several times that of the upper section, means for withdrawing material at the lower end of said aftercooling section as material is delivered at the upper end of the upper section, thereby maintaining both sections substantially full of material, means in the aftercooling section



to flow upward through the layer of material in the upper shaft section.

4,014,643

### ROTARY KILN

Keijiro Musha, Matsudo, and Hajime Maeda, Yokohama, both of Japan, assignors to Almer Sangyo Kaisha, Ltd., Tokyo, Japan

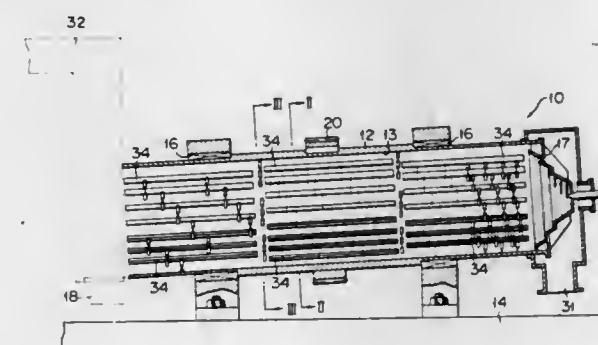
Filed June 9, 1975, Ser. No. 585,122

Claims priority, application Japan, July 15, 1974, 49-80907

Int. Cl.<sup>2</sup> F27B 7/18

U.S. Cl. 432—118

12 Claims



1. A rotary kiln comprising a rotary drum having a throwing-in port, the rotary drum being rotated while a heated gas is passed therethrough for drying a slurry or the like containing therein water and thrown through the throwing-in port of the rotary drum, wherein said rotary drum includes a large number of lifters which are disposed in a manner circumferentially spaced from each other and extending axially of the rotary drum along the inner wall thereof, the lifters having bent end portions projecting internally of the rotary drum and being bent in the rotational direction of the rotary drum, and wherein the rotary drum further includes a large number of metal-made chain-like first fittings attached to the bent end portion of each of said lifters, said first fittings having a length at least as great as the maximum distance between the bent end portion of one of said lifters and the lower face of another lifter adjacent said one lifter in the direction of the drum rotation but less than the distance between the bent end portions of said one lifter and said adjacent lifter, so as to prevent the first fitting of said one lifter from becoming entangled with the bent end portion of said adjacent lifter while permitting sliding movements by the first fitting of said one lifter on the lower face of said adjacent lifter.



# CHEMICAL

4,014,644

## TOLANE COMPOUNDS

Hans Rudolf Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

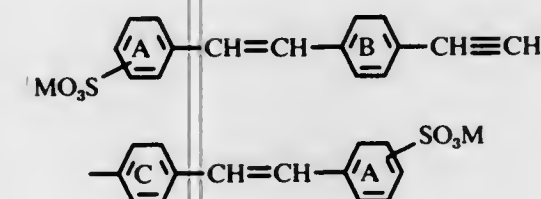
Filed June 10, 1975, Ser. No. 585,543

Claims priority, application Switzerland, June 12, 1974, 8031/74; June 12, 1974, 8037/74

Int. Cl.<sup>2</sup> D06P 1/38

U.S. Cl. 8-1 W

1. A tolane compound of the formula



wherein

M denotes hydrogen or a salt-forming cation and the benzene nuclei A, B and C can contain non-chromophoric substituents selected from the group consisting of alkyl having 1 to 4 carbon atoms, chlorine, alkoxy having 1 to 4 carbon atoms, phenoxy, alkylmercapto having 1 to 4 carbon atoms, phenylmercapto, sulfo, trimethylene and tetramethylene, said trimethylene and tetramethylene substituents being attached to two adjacent carbon atoms of the benzenoid ring.

4. In a process for optically brightening organic materials, the improvement which comprises incorporating in the materials to be optically brightened or applying to the surface of the materials to be optically brightened a tolane compound as defined in claim 1.

4,014,645

## DYEABLE POLYOLEFIN BACKING FOR TUFTED SURFACE COVERINGS

Francis X. Chandler, Southampton, and Vincent J. Moser, Hatboro, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 8, 1975, Ser. No. 620,904

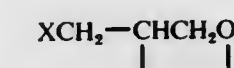
Int. Cl.<sup>2</sup> D06P 7/00

U.S. Cl. 8-17

18 Claims

1. As a surface covering, a dyed carpet or upholstery fabric comprising a polyolefin backing material having a polymeric coating thereon, and face yarns tufted to said backing, said coating being selected from:

A. homopolymers and copolymers of a quaternary monomer prepared by reacting an epihalohydrin of the formula



with an amine salt of the formula  $H_2C=C(R)C(O)O-A-N(CH_3)_2HY$ ; and

B. the reaction product of homopolymers or copolymers of said amine salt and said epihalohydrin;

wherein R is hydrogen or methyl, X is iodine, bromine or chlorine, A is a  $(C_2-C_6)$  alkylene group having at least two carbon atoms in a chain between adjoined O and N atoms or A may be a polyoxyethylene group of the formula  $(CH_2CH_2O)_xCH_2CH_2$  wherein x is at least 1, and Y is an anion.

4,014,646

## HARD WATER-TOLERANT DYE SOLUTIONS

Victor Tullio, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

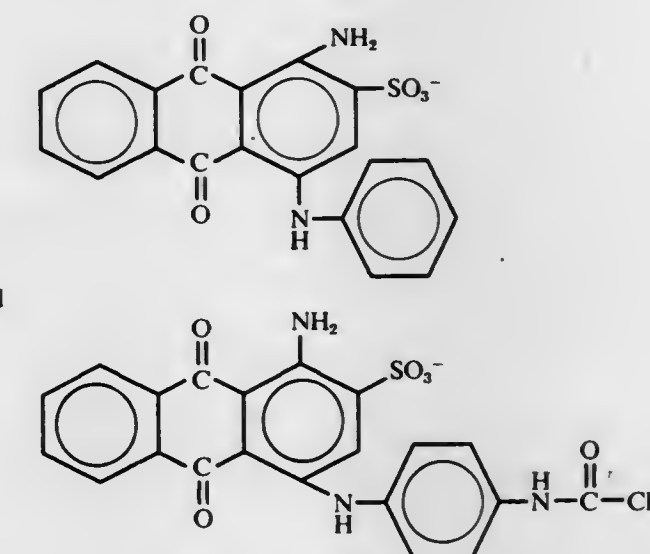
Continuation-in-part of Ser. No. 473,662, May 28, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,470

Int. Cl.<sup>2</sup> C09B 1/00, 5/62; D06P 1/20

U.S. Cl. 8-39 R

7 Claims

1. In a dye solution comprising about 10% to 20% by weight of anionic monosulfonated anthraquinone dye, the cations including alkanolammonium cations, the dye being dissolved in a mixed solvent of water and an inert organic cosolvent, the improvement comprising the addition thereto of about 0.03 to 0.20 part by weight, per part of dye, of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, or N-hydroxyethylethylenediaminetriacetic acid, said dye solution containing no more than about 0.2 percent, based on total weight of the dye solution, of cations other than alkanolammonium cations, the anthraquinone dye being selected from at least one member of the group



4,014,647

## EXHAUST PROCESS FOR THE DYEING OF SYNTHETIC FIBRE MATERIALS

Rütger Neeff, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 416,867, Nov. 19, 1973, which is a continuation of Ser. No. 161,282, July 9, 1971, abandoned.

This application Feb. 14, 1975, Ser. No. 549,899

Claims priority, application Germany, July 10, 1970, 2034264; May 18, 1971, 2124495; May 18, 1971, 2124496 The portion of the term of this patent subsequent to Sept. 14, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> D06P 1/68, 5/00; C09B 5/62

U.S. Cl. 8-174

7 Claims

1. A process for dyeing synthetic fiber material by exhaustion comprising introducing synthetic fiber material into a dyebath which is a dispersion consisting essentially of

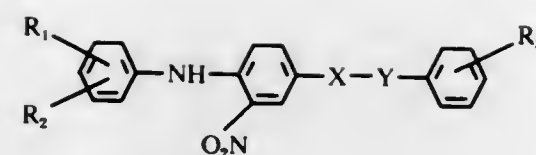
A. organic solvent;

B. nitro dyestuff containing 1 to 3 sulfonamide groups and largely insoluble in said dyebath; and

C. up to 1% by weight of said organic solvent of water; said organic solvent consisting of water immiscible aliphatic halogenated hydrocarbon; and dyeing at a temperature of 60° to 170° C for 10-60 minutes until the dyebath is exhausted;

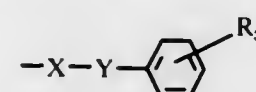
said nitro dyestuff free of reactive groups, acid groups and carboxamide groups having the formula





in which

R<sub>1</sub> means hydrogen, a halogen atom, a trifluoro, cyano, hydroxy, C<sub>1</sub>-C<sub>4</sub>-alkyl or -alkoxy, a hydromethyl or -ethyl, a hydroxy-ethylene-oxy, acylamino, alkylsulphonylamino, alkylsulphone, carboxamido, aminosulphonylalkylene-amino or sulphonamide group;  
R<sub>2</sub> means hydrogen or a C<sub>1</sub>-C<sub>4</sub>-alkoxy group;  
R<sub>3</sub> means hydrogen, a halogen atom, a hydroxy, hydroxy-ethylene-oxy, carboxamido, aminosulphonyl-alkylene-oxy or sulphonamide group;  
X stands for the group —SO<sub>2</sub>— or —CO—; and  
Y stands for —NH— or —O—,  
with the proviso that one of the radicals R<sub>1</sub>, R<sub>2</sub> or

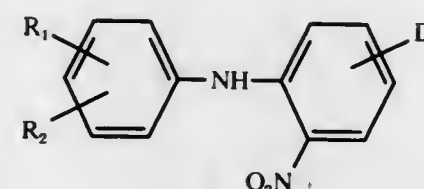


is a sulphonamide group or a radical containing a sulphonamide group.

3. Process for dyeing synthetic fiber material by exhaustion comprising introducing synthetic fiber material into a dyebath which is a dispersion consisting essentially of

- organic solvent;
- nitro dyestuff containing 1 to 3 sulfonamide groups and largely insoluble in said dyebath; and
- up to 1% by weight of said organic solvent of water; said organic solvent consisting of water immiscible aliphatic halogenated hydrocarbon; and dyeing at a temperature of 60° C to 170° C for 10-60 minutes until the dyebath is exhausted;

said nitro dyestuff free of reactive groups, acid groups and carboxamide groups having the formula



in which

R<sub>1</sub> means hydrogen, a C<sub>1</sub>-C<sub>4</sub>-alkyl or -alkoxy group, halogen, a trifluoromethyl, nitro, hydroxymethyl, hydroxyethyl, phenyl, phenoxy, phenylazo, benzyloxy, carboxy, C<sub>1</sub>-C<sub>4</sub>-alkoxycarbonyl, C<sub>1</sub>-C<sub>4</sub>-acylamino, C<sub>1</sub>-C<sub>4</sub>-alkylsulphonyl or sulphonamide group;  
R<sub>2</sub> means hydrogen, halogen or a C<sub>1</sub>-C<sub>4</sub>-alkoxy group; and  
D means a sulphonamide group.

4,014,648

#### IN-LINE FLOCK CUTTING PROCESS

David I. Walsh, Barrington, R.I.; James P. Casey, Seekonk, Mass.; George E. Corneau, Central Falls, R.I., and William F. Laird, Kingston, Canada, assignors to Microfibres, Inc., Pawtucket, R.I.

Filed Nov. 8, 1974, Ser. No. 522,044

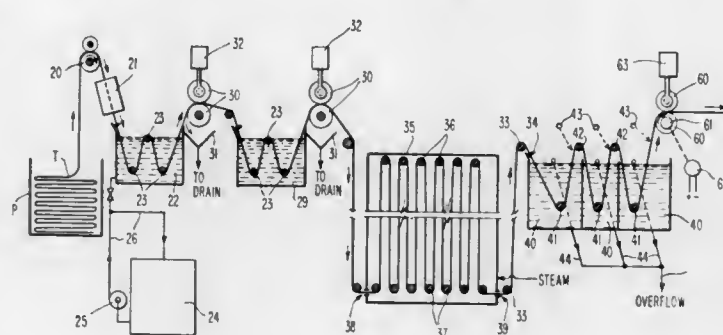
Int. Cl.<sup>2</sup> D06B 15/00; D06L 1/22; D06M 9/00

U.S. Cl. 8-138

8 Claims

1. In a continuous in-line method for making flock from a tow selected from the group consisting of rayon, nylon, polyester and acrylic which comprises a plurality of filaments and which contains a lubricant which is detrimental to said flock, the steps which comprises:

- continuously feeding the tow and said lubricant as a running tow,
- continuously scouring said tow by contacting it with a liquid scouring agent for removal of said lubricant from said tow,
- continuously squeezing excess scouring liquid from said tow,
- continuously rinsing said tow with water,



- continuously applying a predetermined pressure to squeeze excess rinse water from said rinsed tow,
- continuously applying a liquid finish to said tow,
- continuously applying another predetermined pressure of from about 60 to 100 lbs./square inch to said tow to remove a portion of the applied finish,
- continuously cutting the resulting tow into flock,
- continuously drying the resulting wet flock wherein the drying step is controlled to moisture regain values of:

	% Regain	
	AC Flocking	DC Flocking
for rayon	6-8	10-12
for nylon	2-2.4	3-5
for polyester	1-2	1-2
for acrylic	1-2	1-2

to produce a moist, hot air by-product, and wherein said by-product is continuously diverted from said flock,

- continuously beating the resultant dried flock with the admission of air, wherein the temperature of said admitted air is below about 100° F, and
- packaging the flock.

4,014,649

#### METHOD AND APPARATUS FOR DELIVERING BLOOD OXYGEN ASSOCIATION CURVE INFORMATION

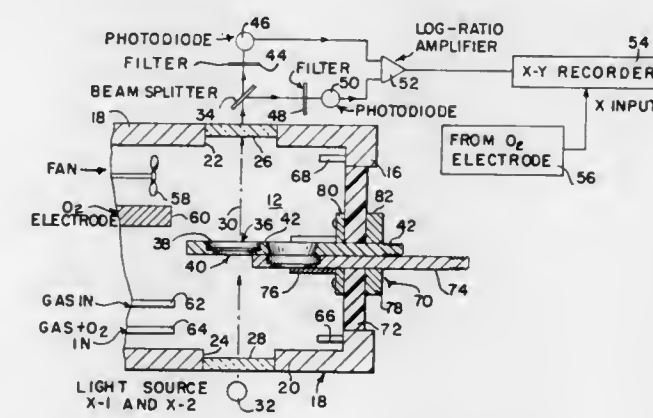
Lutz A. Kiesow, Bethesda, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 12, 1976, Ser. No. 675,703

Int. Cl.<sup>2</sup> G01N 21/24, 33/16

U.S. Cl. 23-230 B

7 Claims



1. Method of measuring the oxygen association state of blood samples, which includes the steps of disposing a blood

4,014,652

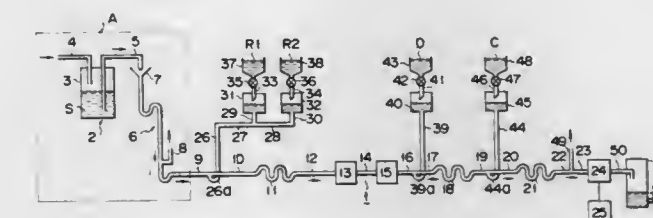
**AUTOMATIC ANALYTIC APPARATUS OF LIQUIDS**  
Wataru Ishibashi, Kunitachi; Shigenobu Taira, and Ken Migita, both of Kawasaki, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 18, 1975, Ser. No. 614,763

Claims priority, application Japan, Sept. 27, 1974, 49-111055; Dec. 26, 1974, 50-148373; Dec. 27, 1974, 50-532 Int. Cl.<sup>2</sup> G01N 1/10, 33/00

U.S. Cl. 23-253 R

10 Claims



4,014,650

#### ULTRASONIC COAGULATION TIMER

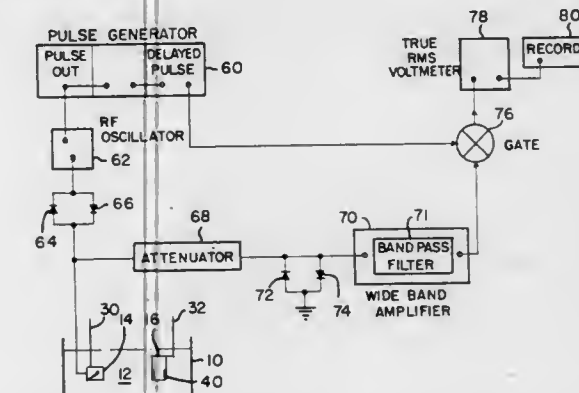
Rubens A. Sigelmann, Seattle, Wash., assignor to Research Corporation, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,507

Int. Cl.<sup>2</sup> G01N 33/16

U.S. Cl. 23-230 B

17 Claims



1. A method of measuring the coagulation time of a solution containing whole blood or blood plasma, comprising: directing ultrasound toward said solution and receiving the scattered ultrasound; mixing a predetermined quantity of thrombin with said solution; examining the scattered ultrasound for an indication that said solution has coagulated; and measuring the elapsed time between the mixing of thrombin with said solution and the coagulation of said solution.

4,014,651

#### METHOD FOR DETERMINING THYROID FUNCTION AND REAGENT COMPOSITION THEREFOR

Ella M. Bettinger, St. Louis, Mo., and Everett K. Mincey, Vancouver, Canada, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 360,660, May 14, 1973, abandoned. This application May 15, 1975, Ser. No. 577,859

Int. Cl.<sup>2</sup> G01N 33/16

U.S. Cl. 23-230.6

6 Claims

1. A diagnostic reagent composition for use in the in vitro determination of thyroid function comprising a buffered aqueous suspension containing:

- finely divided, amorphous silicon dioxide;
  - a thyroid hormone substance tagged with radioactive iodine; and
  - a nonionic surfactant;
- the weight to weight ratio of said amorphous silica to said nonionic surfactant being in the range of approximately 10:1 to 50:1.

4,014,653

#### MICRO-FILTER

Edward A. Gianos, Cos Cob, Conn.; H. Eric Hunter, Westwood, Calif., and Edgar A. Lazo-Wasem, New Canaan, Conn., assignors to Denver Chemical Manufacturing Company, Stamford, Conn.

Filed Dec. 26, 1974, Ser. No. 536,632

Int. Cl.<sup>2</sup> G01F 15/12

U.S. Cl. 23-259

5 Claims

1. In a micro-filter for filtering microliter quantities of liquid which comprises a flow passageway having inlet and outlet portions and a middle portion, said outlet portion including an



orifice, means for holding filter material in the middle portion of said passageway, a bulb-type collapsible micro-syringe with a single terminal nozzle opening through which liquid is drawn into the bulb portion thereof and discharged therefrom, said inlet portion of said passageway and the nozzle being complementarily shaped so that the nozzle can be inserted into the inlet portion of the passageway in liquid tight engagement, whereby liquid from said micro-syringe can be forced into the



passageway by finger pressure and the pressure maintained until the desired amount of liquid has passed through the filter material, the improvement wherein the middle portion has a larger cross-section than the inlet, the outlet portion tapers from said middle portion to said orifice, and wherein the outlet portion of the passageway has a volume not greater than about fifty microliters and the diameter at the orifice thereof is not greater than about two millimeters.

4,014,654

## APPARATUS FOR PRODUCING CARBON BLACK

Ronald Lee Howell, Baytown, Tex., assignor to J. M. Huber Corporation, Locust, N.J.

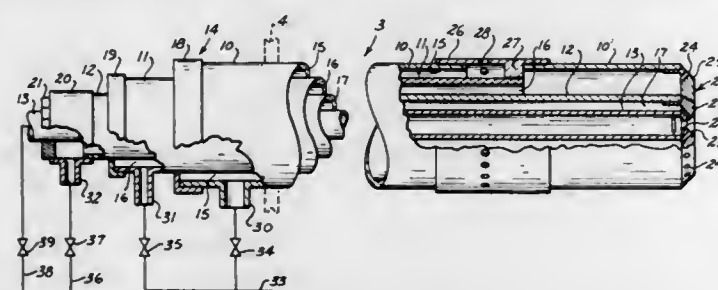
Continuation of Ser. No. 316,764, Dec. 20, 1972, abandoned.

This application Feb. 18, 1975, Ser. No. 550,323

Int. Cl.<sup>2</sup> C09C 1/48; F23C 7/00

U.S. Cl. 23—259.5

6 Claims



# 1. Apparatus for producing carbon black comprising:

## I. a furnace having a chamber;

## II. a burner assembly within said chamber including:

A. a plurality of co-extensive conduits including first, second and third conduits of successively smaller sizes, defining annular passages therebetween;

B. means for spraying feedstock oil into said chamber of said furnace, including means for mixing said feedstock oil with a vaporizing medium, including:

1. nozzle means at the end of said assembly within said chamber for spraying said feedstock oil and communicating with said third conduit, said conduit having an inlet remote from said nozzle,

2. means for mixing an atomizing medium with said feedstock oil including a fourth conduit within said third conduit and communicating with said nozzle,

3. means for flowing a vaporizing medium for said feedstock oil through said fourth conduit,

4. means for flowing said carbon black producing feedstock through the annulus between said third conduit and said fourth conduit;

C. first means for flowing a first stream of fuel gas around the sprayed feedstock oil from a location adjacent the location from which the feedstock oil is sprayed including a first passage means having an outlet adjacent said nozzle means for flowing fuel gas around the sprayed feedstock oil in an annular pattern and an inlet remote from said nozzle, said first means including:

1. a first, fuel gas outlet in close proximity to said nozzle and communicating with said first passage means comprising an annular passage between said second conduit and said third conduit, including a plurality of discharge ports extending around said nozzle,

2. means for flowing a fuel gas through said annulus between said second conduit and said third conduit,

3. means for separately controlling the flow of fuel gas from said first means forming said first stream, including first valve means connected to the annular passage between said first and second conduits for controlling the flow of fuel gas through said annular passage from said location adjacent the location from which the feedstock oil is sprayed;

D. second means upstream from said first means for flowing an air stream toward said first means and the sprayed feedstock oil, including means for flowing air from a location upstream of said first stream;

E. means for flowing a second stream of air and fuel gas around said first stream of fuel gas, including:

1. third means for flowing additional fuel gas into said air stream from a location upstream of said first stream and downstream of said air stream to mix air with said additional fuel gas to form said second stream,

a. said third means including a second passage means having an outlet upstream from said nozzle opening into said chamber for flowing fuel gas into said air stream and an inlet remote from said nozzle,

b. said third means being located between said first and second means and including a second fuel gas outlet means between said first outlet means and said inlet and remote from said first outlet means, said second fuel gas outlet means communicating with a second annular passage, said annular passage being between said first and second conduits and including a plurality of discharge ports extending around said burner assembly,

2. means for flowing a fuel gas through said annular passage between said first conduit and said second conduit; and

F. means for separately controlling the flow of said additional fuel gas from said third means into said air stream including second valve means connected to the annular passage between said second and third conduits for controlling the flow of fuel gas through said annular passage.

4,014,655

## PLANT FOR CONTINUOUS PRODUCTION OF EXPLOSIVE CONTAINING EXPLOSIVE OIL

Bernt Brunnberg, Nora, Sweden, assignor to Nitro Nobel A.B., Gytterp, Sweden

Filed Mar. 27, 1975, Ser. No. 562,662

Claims priority, application Sweden, Apr. 10, 1974, 7404839

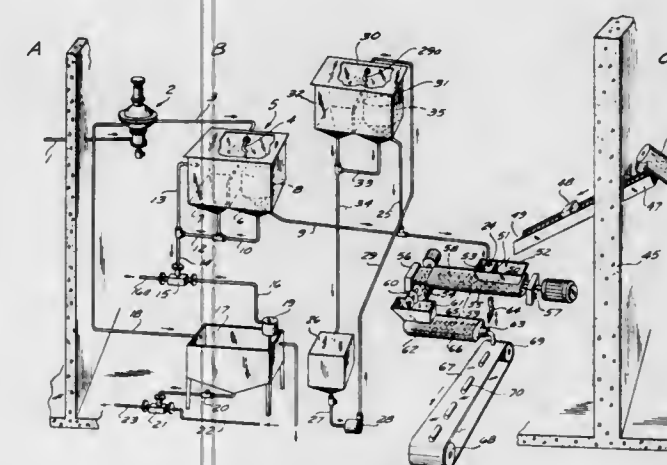
Int. Cl.<sup>2</sup> C06B 21/00

U.S. Cl. 23—266

12 Claims

1. An apparatus for continuously producing explosive made up of a mixture of explosive liquid and solid ingredients com-

prising: a first station having means for storing emulsified explosive liquid, and first means for transporting said explosive liquid to a second station; a second station for mixing the explosive liquid and the solid ingredients; and a third station having a first means for mixing said solid ingredients, and second means for transporting said mixed solid ingredients from said third station to said second station, said second station being positioned between said first and third stations; said second station comprising means for separating said explosive liquid from the water contained therein, a second means for mixing said solid ingredients with said dewatered explosive liquid, said second means for mixing having a first inlet for receiving and storing said solid ingredients after having been transported to said second station by said second means for transporting of said third station, and a second inlet



spaced from said first inlet toward said first station for receiving and storing therein said dewatered explosive liquid delivered by said first means for transporting of said first station, said second means for mixing having a wall separating said first and second inlets so that said dewatered explosive liquid and said solid ingredients do not contact each other prior to being mixed, said second means for mixing further having a mixer mounted below said first and second inlets for mixing said solid ingredients and said explosive liquid delivered thereto from said first and second inlets, and said second station further comprising third means for transporting connected to said first and second means for transporting of said first and third stations, respectively, so that the dewatered explosive liquid and the solid ingredients may be supplied to said second and first inlets, respectively.

4,014,656

## MONITORING DEVICE FOR CRYSTAL PULLING APPARATUS

Siegfried Leibenzeder, Erlangen, and Klaus-Dieter Schwarzmichel, Erlangen-Grossdehendorf, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 30, 1974, Ser. No. 510,631

Claims priority, application Germany, Oct. 3, 1973, 2349736

Int. Cl.<sup>2</sup> B01J 17/18

U.S. Cl. 23—273 SP

4 Claims

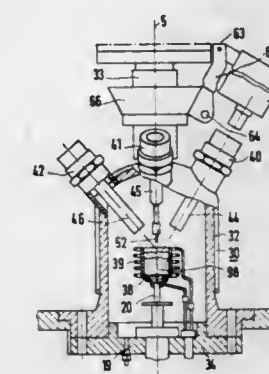
1. In a monitoring device for crystal pulling equipment in which crystals are pulled from a melt in a crucible disposed on a stand inside a high pressure drawing chamber and through the cover of which the drawing spindle of a crystal mount is led and in which the equipment stand, the high pressure drawing chamber and crystal mount are disposed one above each other symmetrical to the drawing axis, the upper portion of the high pressure drawing chamber forming a bulb which is provided with a plurality of observation windows which may be viewed using a common television camera the improvement in said observation windows comprising:

a. a cooled tapped nipple in the drawing chamber;

b. a high pressure-tight mount inserted in said cooled tapped nipple;

c. a high pressure window sealed in the outside end of said mount; and

d. a quartz rod sealed into said mount and extending through the inside end thereof, said quartz rod projecting freely into the drawing chamber with its end in the imme-



diately vicinity of the melt in the zone of the drawing chamber where there is no substantial temperature drop relative to the temperature of the melt.

4,014,657

## CATALYTIC-REACTOR FOR CARRYING OUT CONJUGATE CHEMICAL REACTIONS

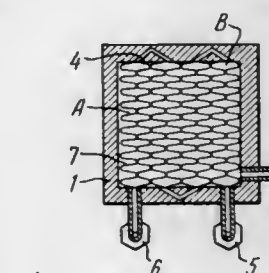
Vladimir Mikhailovich Gryaznov, Leninsk gory M.G.U. zona L, kv. 11; Viktor Sergeevich Smirnov, Kutuzovsky prospekt 26, kv. 555; Alexandr Petrovich Mischenko, Khersonskaya ulitsa 7, korpus 4, kv. 515, and Sergei Ivanovich Aladyshev, ulitsa Grimau 7/2, korpus 4, kv. 77, all of Moscow, U.S.S.R.

Filed May 25, 1972, Ser. No. 256,935

Int. Cl.<sup>2</sup> B01J 8/00

U.S. Cl. 23—288 R

1 Claim



1. A catalytic reactor for carrying out conjugate chemical reactions, comprising a hollow body of rectangular cross-section covers for said body and a plurality of thin membranes within said body arranged parallel to one another and made of a material selectively permeable to hydrogen and having catalytic activity with respect to the conjugated reactions, said membranes being made in the form of plates whose edges are hermetically sealed into the body and covers of the reactor and which separate the reactor space into two groups of chambers interconnected in an alternate pattern by V-shaped channels formed in the side walls of the body, each group of said chambers having pipes for feeding in initial reactant and removing reaction products respectively and said plates being corrugated with a corrugation of one plate located opposite and bearing against the nearest corrugation of the adjacent plate.

4,014,658

## SOLVENT VAPOR VENTING DUST COVER UNIT FOR FRACTION COLLECTOR TURNTABLE

David Lloyd Arendsen, Libertyville, and Carl William Nordeen, McHenry, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 28, 1975, Ser. No. 572,696

Int. Cl.<sup>2</sup> B01L 1/00

U.S. Cl. 23—292

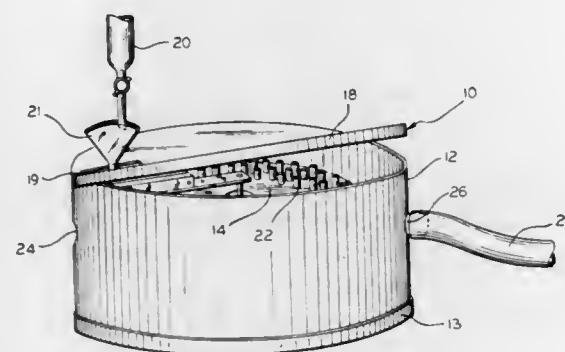
3 Claims

1. A solvent vapor venting dust cover unit for a fraction collector turntable comprising:

enclosure means housing said fraction collector turntable;



said fraction collector turntable having a base plate;  
said enclosure means supported on said base plate;  
removable cover means positioned over and in an abutting relationship with said enclosure means, and wherein said removable cover means is split to provide two separate and distinct sections, each of said sections having a rolled edge and an offset lap joint;  
said removable cover means having an opening therein;  
said opening providing means for a solvent to be dropped into test tubes within said fraction collector turntable;



said enclosure means having spaced apart air intake means and air exhaust means;  
said air exhaust means including an outwardly extending hose extending from said air exhaust means and said hose being connectable to an adjacent hood whereby air flow is drawn out of said unit through said air exhaust means through a ventilation system within said hood; and  
said air intake means and said air exhaust means located opposite each other in said enclosure whereby any solvent vapors within said enclosure means are drawn out of said enclosure means.

4,014,659

# IMPREGNATED COMPOUND METAL AS CONTACT MATERIAL FOR VACUUM SWITCHES AND METHOD FOR ITS MANUFACTURE

Heinrich Hassler, Wendelstein, and Horst Kippenberg, Nurnberg-Weiherhaus, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 31, 1974, Ser. No. 519,678

Claims priority, application Germany, Nov. 16, 1973, 2357333

Int. Cl.<sup>2</sup> B22F 3/00, 1/04; C22C 33/02

U.S. Cl. 29—182.1

5 Claims

1. Impregnated compound metal as a contact material for vacuum switches, comprising a sintered metal matrix impregnated with an impregnating metal or impregnating metal alloy, the melting point of said metal matrix being higher than that of the impregnating metal or alloy, wherein the metal matrix comprises a metallic main constituent having a melting point above 1400° C and a metallic embrittlement additive; wherein brittle, intermetallic phases or mixed crystals are formed between said metallic main constituent and said embrittlement additive at temperatures above about 1200° C; wherein the embrittlement additive comprises between 0.5 and 10 weight-percent relative to the main constituent; wherein the melting point of the impregnating metal or alloy is between 850° C and the sintering temperature of said matrix; and wherein the boiling points of the main constituent, embrittlement metal or alloy and impregnating substance are above 2000° C, based on a pressure of 760 Torr.

4,014,660

# HOT-TINNED WIRE FOR ELECTROTECHNICAL PURPOSES AND METHOD FOR ITS PRODUCTION

Horst Schreiner, Nurnberg, and Dieter Friedrich, Wendelstein, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 31, 1974, Ser. No. 519,680

Claims priority, application Germany, Nov. 12, 1973, 2356351

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B32B 15/00; C23C 1/04

U.S. Cl. 29—183.5

5 Claims

1. A hot-tinned wire of copper or copper alloys having a two-layer coating of tin or tin alloys, wherein the first inner coating is of a thickness between 0.5 and 2 μm and consists of a SnBi alloy containing between 2 and 10 percent by weight of Bi or of a SnNi alloy containing between 0.2 and 1 percent by weight of Ni and a second outer coating of a thickness between 1 and 4 μm consisting of pure tin or a SnPb alloy.

4,014,661

# FUEL MAKING PROCESS

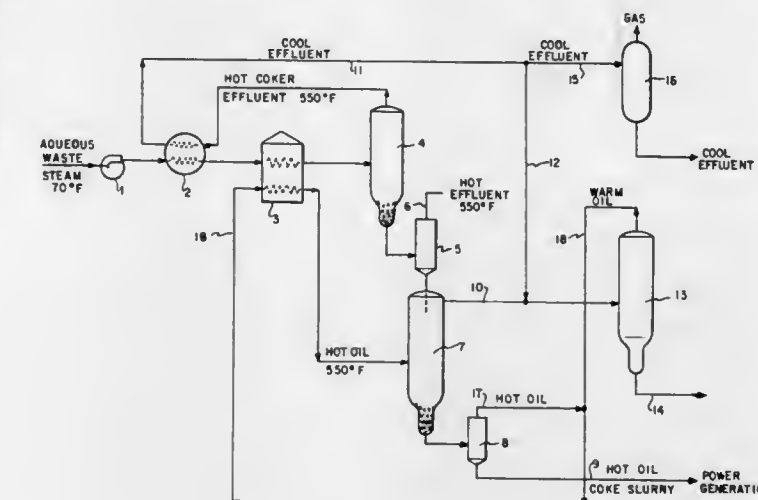
Howard V. Hess, Glenham; William F. Franz, Gardiner, and Edward L. Cole, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,870

Int. Cl.<sup>2</sup> C10L 1/32

U.S. Cl. 44—51

5 Claims





and an aqueous liquid barrier in contact with said film, said liquid barrier having dissolved therein a complex-forming, silver-containing ion component having silver essentially in solution, and hydrogen peroxide in an amount sufficient to retard reduction of the ions in said ion component.

4,014,666

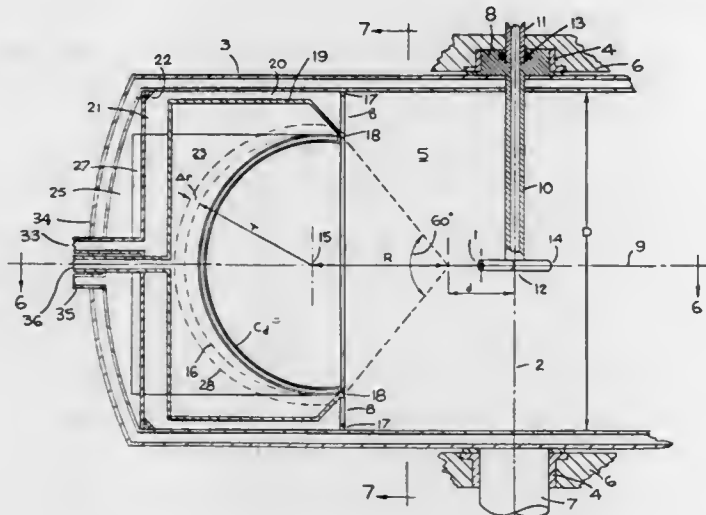
## SEPARATION OF GASES

Chia-Gee Wang, Peekskill, N.Y., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 514,679, Oct. 15, 1974, abandoned. This application Nov. 29, 1974, Ser. No. 528,128 Int. Cl.<sup>2</sup> B01D 45/14

U.S. Cl. 55—17

11 Claims



1. A time of flight process for separating gaseous mixtures of molecules of different mass comprising the steps of: causing a rotating means to eject, in a plane normal to the axis of rotation of said rotating means, a contiguous plurality of successive groups of molecules into an evacuated space to form a continuous stream of said mixture; allowing the molecules of each said group of molecules to move in accordance with their thermal velocities for a predetermined period of time following ejection, thereby to allow each said group of molecules to form a generally spherical configuration the outer radius of which will be enriched, in molecules of lighter mass, relative to lesser radii; and using a collector means co-rotating with said rotating means to collect molecules, which have been allowed to move for said predetermined period of time in accordance with their thermal velocities, from at least one desired portion of said stream, said collector means also serving as a pump to evacuate said evacuated space.

4,014,667

## ANTIFREEZE RECOVERY SYSTEM

Franklin T. Barber, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 16, 1975, Ser. No. 587,180 Int. Cl.<sup>2</sup> B01D 3/38

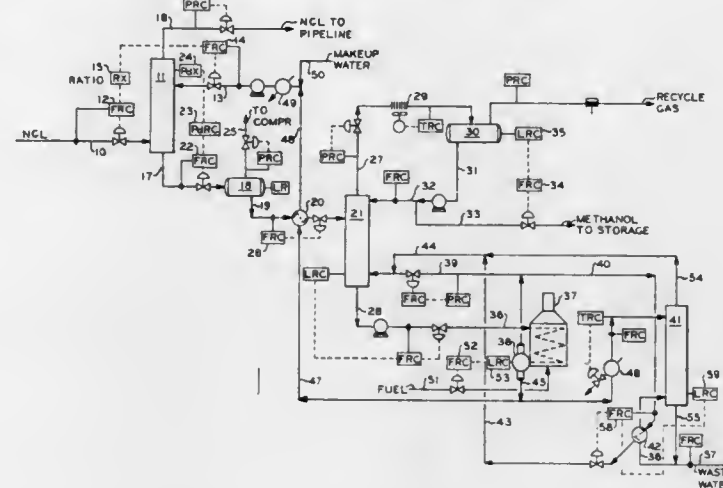
U.S. Cl. 55—32

7 Claims

1. A process for the recovery of methanol used as an anti-freeze agent in hydrocarbon-containing streams which also contain moisture and have a tendency to form hydrates and ice which comprises

- contacting said stream containing moisture and methanol with water in an extraction zone under liquid-liquid extraction conditions to separate a bottoms stream comprising water and methanol and an overhead hydrocarbon-containing stream substantially free of the methanol,
- passing said bottoms stream separated in (a) to a fractionation zone having direct reboiler heat and operated under conditions sufficient to separate methanol overhead as product for reuse and a bottoms water stream containing residual amounts of methanol,

- heating said bottoms water stream obtained in (b) to an elevated temperature and then flashing same under conditions to vaporize controlled quantities of said heated bottoms and form a vapor stream comprising steam and residual amounts of methanol and a liquid stream comprising water and residual amounts of methanol,
- passing a portion of the vapor thus formed directly to said direct reboiler heat and utilizing the remainder of said vapor stream as an indirect source of reboiler heat for a stripping zone and then passing same to said fractionation zone in (b) as at least a part of said direct reboiler heat,



- recycling a portion of said liquid water stream containing residual amounts of methanol obtained in (c) to said extraction zone in (a) for said contacting and passing the remainder of said liquid water stream to a stripping zone,
- subjecting the remainder of said liquid water stream in (e) to stripping conditions to said stripping zone so as to remove as bottoms a water stream substantially free of methanol for reuse or safe disposal, as desired, and an overhead vapor stream comprising methanol, and
- passing said overhead vapor stream obtained in (f) directly to said fractionation zone as at least a part of said direct reboiler heat therefor.

4,014,668

## WASTE DISPOSAL STRUCTURE AND SYSTEM

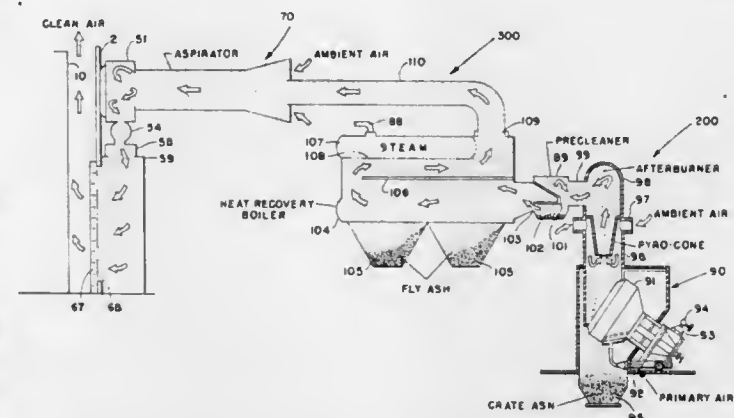
C. George Riester, 10397 S. Lake Blvd., Parma, Ohio 44130

Filed June 5, 1972, Ser. No. 259,835

Int. Cl.<sup>2</sup> B01D 47/12

U.S. Cl. 55—90

22 Claims



1. A method for disposing of trash within a building of the type including a downwardly sloping roof at least partly supported on a hollow central support and a plenum chamber beneath the roof separated from the main building chamber, comprising the steps of: processing trash within said main building chamber, burning the trash within the main building chamber to produce waste gases, directing said gases through said central support to said plenum chamber, and discharging the gases from said plenum chamber to atmosphere through openings in the roof.

6. A building for enclosing and forming part of a trash disposal system comprising: a hollow central core, a roof extending downwardly and outwardly from said central core, said roof including overlapping sections which overlap in a direction outwardly from said central core and having generally vertical gaps between the overlapped end portions thereof, separating means spaced downwardly from said roof for separating a main building chamber from a plenum chamber beneath said roof, and exhaust passage means for exhausting gases produced in said main building chamber through said central core to said plenum chamber for exhaust to atmosphere through said gaps.

4,014,669

## SELF-LOCKING DRIFT ELIMINATOR

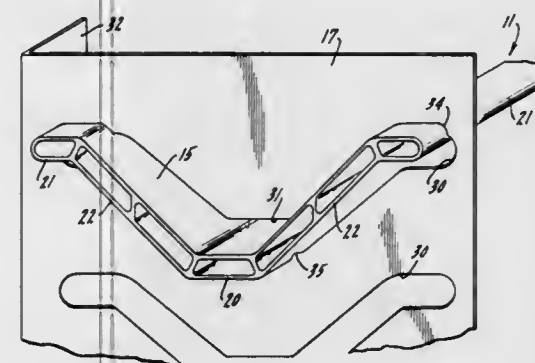
Stanley E. Thompson, and Joseph Michael Schwinn, both of Healdsburg, Calif., assignors to Ecodyne Corporation, Lincolnshire, Ill.

Filed Dec. 24, 1975, Ser. No. 644,273

Int. Cl.<sup>2</sup> B01D 45/06

U.S. Cl. 55—257 PV

10 Claims



1. A liquid cooling tower having means for delivering liquid and for causing such liquid to fall within said tower, an air inlet, an air outlet, means for causing air to flow from said inlet to said outlet so as to intersect the liquid falling within the tower, and an improved drift eliminator assembly within the tower that removes droplets of liquid entrained in the air before discharge of the air through said outlet, comprising:

- a plurality of longitudinally extending drift eliminator blades of predetermined cross-sectional shape made from a resilient material that is sufficiently rigid to enable each blade to support its own weight, yet is sufficiently flexible to permit each blade to be deflected into a temporary, distorted shape during attachment in said assembly, and each blade having notches therein;
- support means of rigid material for receiving said blades having slots that are larger than said cross-sectional shape so as to permit passing of a blade through each slot when such blade is deflected into said temporary, distorted shape; and
- said notches being aligned with and receiving the material defining said slots so as to form an interference fit between said support means and said blades upon return of said blades toward said predetermined shape after deformation and insertion of said blades through said slots.

4,014,670

## HAZARD NEUTRALIZING CONTAINER

Arch L. Young, El Segundo, Calif., assignor to A & J Manufacturing Co., Los Angeles, Calif.

Filed Jan. 22, 1976, Ser. No. 651,656

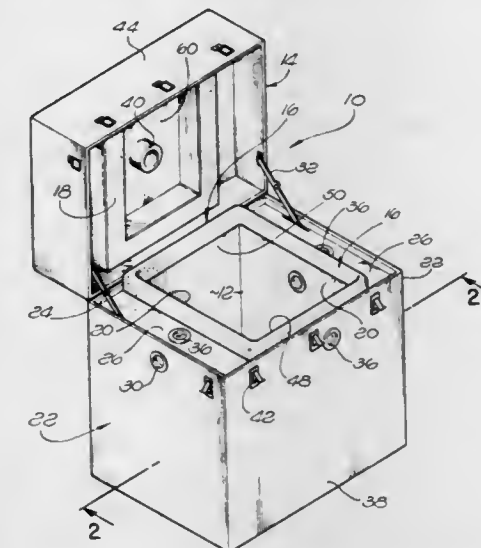
Int. Cl.<sup>2</sup> B01D 53/04

U.S. Cl. 55—274

9 Claims

1. An apparatus for containing and neutralizing the harmful effects of a hazardous material, comprising: a rigid housing adapted to receive the hazardous material, said housing having a pair of double walls; a filter medium container mounted between each pair of double walls;

a filter medium packed within said medium containers, said filter medium being adapted to neutralize the harmful effects of the hazardous material to be inserted in the housing; a vent from the top of each filter medium container to the interior of the housing; a vent from the bottom of each filter medium container to the atmosphere; means for closing and hermetically sealing said housing except for said vents; and



a one way valve connected to each of said bottom vents to the atmosphere, said valves being operable only when the pressure within the housing exceeds atmospheric pressure, whereby unconfined hazardous material escapes to the atmosphere only through the filter medium contained within the filter medium containers thereby neutralizing the harmful effects of the hazardous material prior to such material escaping to the atmosphere.

4,014,671

## DEVICE FOR SEPARATING DROPS OF LIQUID CONTAINED IN A GAS STREAM

Jean Andro, La Celle St-Cloud, and Jean-Pierre Peyrelongue, Issy-les-Moulineaux, both of France, assignors to Stein Industrie S.A., Velizy-Villacoublay, France

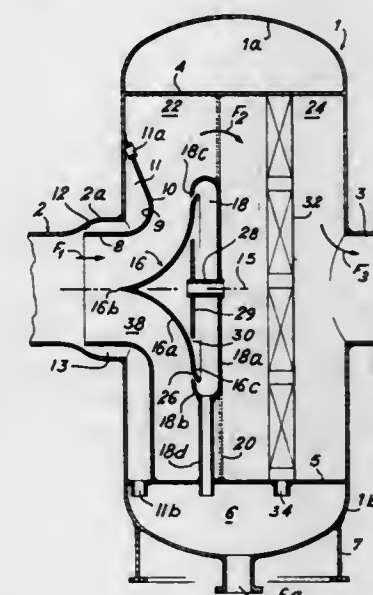
Filed June 19, 1975, Ser. No. 588,621

Claims priority, application France, June 21, 1974, 74.21612

Int. Cl.<sup>2</sup> B01D 50/00

U.S. Cl. 55—325

7 Claims



1. A device for separating drops of a liquid contained in a gas stream, comprising: a closed casing provided with a horizontal inlet duct for the introduction of a gas stream to be treated and an outlet



duct for the discharge of the treated gas stream, the interior of said casing being divided by a vertical grid into a first compartment into which said inlet duct has its opening and a second compartment in a wall of which said outlet duct is provided;

said inlet duct being connected to said casing by an enlarged terminal portion of said inlet duct;

a first deflecting means having flaring curved surfaces in coaxial alignment with said inlet duct and having its upstream end in tubular shape, located in said enlarged portion of said inlet duct and spaced from said inlet duct by an annular gap;

a first collecting chamber bounded by said casing and a continuation of said flaring curved surfaces of said first deflecting means and connected to said inlet duct by said gap for collecting liquid drops to be separated which flow in contact with the inlet duct walls and having a drain for discharging said drops to a reservoir located at the bottom of said casing;

a second deflecting means in the shape of a flaring surface of revolution coaxial with said first deflection means and having a projecting and tapered upstream end projecting into the space encircled by the flaring downstream end of said first deflecting means;

a second collecting chamber on the side of said second deflecting means away from said first deflecting means and being positioned with respect to said second deflecting means to define an annular entrance slit adjacent to the downstream end of said second deflecting means, for collecting drops flowing off said second deflecting means and having a drain for discharging the collected drops of liquid to said reservoir;

and fine-separation means located in said second compartment and interposed between said grid and said outlet duct.

4,014,672

## GAS FILTER TUBE LOCKING APPARATUS

Staffan Jansson, Vaxjo, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

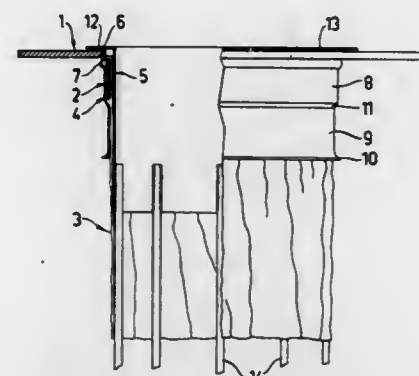
Filed Jan. 8, 1976, Ser. No. 647,306

Claims priority, application Sweden, Jan. 13, 1975, 7500294

Int. Cl.<sup>2</sup> B01D 46/00

U.S. Cl. 55—357

10 Claims



1. In a filter assembly comprising a wall having an opening therethrough; socket means adjacent and aligned with said opening and supported by said wall; bag filter means having an open end and a circumferential thickened portion extending about said end; said thickened portion being positioned in, and around the interior of, said socket means; and tubular means extending through said opening into said open end inside said socket means, for holding said end between it and the interior of said socket means, the improvement wherein: said tubular means has a substantial axially-extending portion and is slidably insertable into, and slidably removable from, said end of said bag filter means while it is positioned within said socket means, said tubular means comprises stop means extending radially outwardly of said opening above said wall for limiting the

extent of insertion thereof into said end, and gripping means on said tubular means for inserting and removing said tubular means,

the interior of said socket means having a section, located adjacent the axially-inner end of said thickened portion of said bag means, which section converges toward the exterior of said axially-extending portion of said tubular means, along the direction toward the other end of said bag filter means, so that tensioning of said bag filter means wedges said thickened portion into said converging section to form a substantially gas-tight seal.

4,014,673

## AIR PRECLEANER

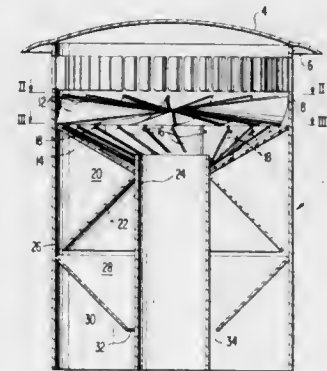
Daniel E. Kinnison, 215 E. 2nd St., Kimball, Nebr. 69145

Filed Feb. 2, 1976, Ser. No. 654,697

Int. Cl.<sup>2</sup> B01D 45/12

U.S. Cl. 55—396

5 Claims



1. An air pre-cleaner for use with an internal combustion engine, said pre-cleaner comprising:

a. a housing having an inlet in the upper portion thereof adapted to admit air to be cleaned, and an outlet in the lower portion thereof;

b. vane means mounted within the upper portion of said housing below the inlet for imparting a circular motion to air entering the inlet and passing downwardly through said vane means, such that heavy particles in said air are projected from the axis of said housing by the centrifugal force thereon caused by the circular motion;

c. tube means positioned within said housing below said vane means, said tube means defining an axial passage through the central and lower portions of said housing;

d. separator means positioned within said housing between the wall of said housing and said tube means, and below said vane means, said separator means having a plurality of louver means therein, wherein the heavy particles in said air pass through said louver means, fall away from said separator means under the influence of gravity, and exit said housing through the outlet therein; and

e. control means positioned in said housing between said separator means and the outlet for limiting the upward flow of air through the outlet, into said housing, and toward said separator means whereby air entering said outlet will not restrict the separation of heavy particles from the inlet air in said separator means so that air entering the inlet will pass through said vane means as a circular flow into said separator means wherein the heavy particles separated therein will fall through the outlet and the cleaned air will be directed through said tube means for use in said internal combustion engine.

4,014,674

## TURBOEXPANDER

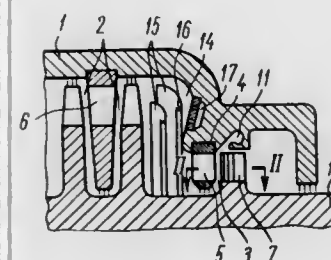
Ivan Ivanovich Kirillov, ulitsa Politekhnicheskaya, 29, 2 korpus, kv. 67, Leningrad; Alexandr Petrovich Agishev, ulitsa Danilevskogo, 32a, kv. 14, Kharkov; Vladimir Nikolaevich Ameljushkin, ulitsa Dekabristov, 58/28, kv. 6, Leningrad; Sabir Yakubovich Bogdanovich, prospekt Lenina, 41/43, kv. 156, Knarkov; Chingiz Saibovich Guseinov, Krasnoshkolnaya naberezhnaya, 18, kv. 249, Kharkov; Valentin Valentinovich Medvedev, ulitsa Zernovaya, 53a, kv. 33, Kharkov; Igor Petrovich Faddeev, prospekt Raevskogo, 9, kv. 35, and Viktor Sergeevich Rozin, ulitsa Korzuna, 5, kv. 204, both of Leningrad, all of U.S.S.R.

Continuation of Ser. No. 543,545, Jan. 23, 1975, abandoned, which is a continuation of Ser. No. 445,791, Feb. 25, 1974, abandoned, which is a continuation of Ser. No. 292,837, Sept. 27, 1972, abandoned. This application Dec. 5, 1975, Ser. No. 638,053

Int. Cl.<sup>2</sup> F25J 3/06

U.S. Cl. 62—38

7 Claims



1. A turboexpander preferably for cooling natural gas, comprising a casing set on a shaft; at least one operating stage with blades, which is arranged on the shaft in said casing; at least one separating stage arranged on the shaft in said casing in the direction of the gas-liquid flow; a guiding device with blades, which is provided in said separating stage, the blade pitch being smaller than that of said operating stage; a runner arranged in succession with said guiding device in said separating stage, the profile of the blades of said guiding device having an extended inlet portion; said inlet portion of the blade having spouts provided on its back; said casing being provided with a ring chamber disposed along the periphery of said runner, said ring chamber having a slit for collection of the separated liquid and a branch pipe located in the lower part of said casing.

4,014,675

## FERTILIZER STICK

George E. Osburn, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 5, 1974, Ser. No. 529,645

Int. Cl.<sup>2</sup> C05C 9/02

U.S. Cl. 71—28

8 Claims



1. A fertilizer stick consisting essentially of water-soluble hydroxypropyl cellulose having an M.S. of 2-10 and dispersed therein about 10 to about 80% by weight of fertilizer material, based on the weight of the total composition, said stick having

substantially the same cross-sectional area throughout its length except for the end portion adapted to be inserted into the soil.

4,014,676

## WATER TREATMENT FOR CONTROLLING THE GROWTH OF ALGAE EMPLOYING BIGUANIDES

Graham Carter, and Anthony John Hinton, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 17, 1973, Ser. No. 425,285

Claims priority, application United Kingdom, Dec. 18, 1972, 58289/72

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> A01N 9/20

U.S. Cl. 71—67

3 Claims

1. A method for controlling the growth of algae in the water of swimming pools which comprises adding to the water poly(-hexamethylene biguanide) hydrochloride, in an amount to provide a concentration of from 1 to 200 parts per million.

4,014,677

## 5-NITROPYRIMIDINE DERIVATIVES AND THEIR USE IN AGENTS FOR INFLUENCING PLANT GROWTH

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 7, 1975, Ser. No. 575,308

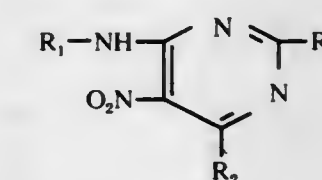
Claims priority, application Switzerland, May 10, 1974, 6426/74

Int. Cl.<sup>2</sup> A01N 9/22; C07D 239/30

U.S. Cl. 71—92

8 Claims

1. A 5-nitro-pyrimidine derivative of the formula I



wherein R<sub>1</sub> represents an alkyl radical of 2 to 7 carbon atoms, an alkenyl radical of 3 to 5 carbon atoms, or a cycloalkyl radical of 3 to 6 carbon atoms, R<sub>2</sub> represents an alkyl radical of 2 to 6 carbon atoms, an alkoxy or an alkylthio radical of 1 to 6 carbon atoms, an alkenyloxy or alkenylthio radical of 2 to 4 carbon atoms, a cyloalkoxy or cycloalkylthio radical of 3 to 6 carbon atoms, R<sub>3</sub> represents hydrogen, an alkyl, haloalkyl, alkoxy or alkylthio radical of 1 to 4 carbon atoms or a di-(C<sub>1</sub>-C<sub>4</sub>-alkyl)-amino radical, and the addition salts thereof with inorganic or organic acids selected from the group consisting of hydrochloric acid, hydrobromic acid, phosphoric acid, sulfuric acid, nitric acid, fluoroboric acid, perchloric acid, methyl sulfuric acid, ethylsulfuric acid, halobenzoic acids, trichloroacetic acid, methane sulphonic acid and p-toluene sulfonic acid.

4,014,678

## 1-(3,7-DIMETHYLOCTYL)-1(2-PROPENYL)-AND 1(2-PROPENYL)-PIPERIDINIUM BROMIDES AS PLANT GROWTH REGULANTS

Gerhard Huppi, Gockhausen; Wijitha De Silva, Schofflisdorf, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 9, 1974, Ser. No. 531,134

Claims priority, application Switzerland, Dec. 14, 1973, 17546/73

Int. Cl.<sup>2</sup> A01N 9/22

U.S. Cl. 71—94

4 Claims

1. A composition for the regulation of plant growth containing an effective amount of 1-(3,7-dimethyloctyl)-1(2-



propenyl)piperidinium bromide, in association with a compatible agriculturally acceptable carrier.

4,014,679

## NOVEL CROTONANILIDES

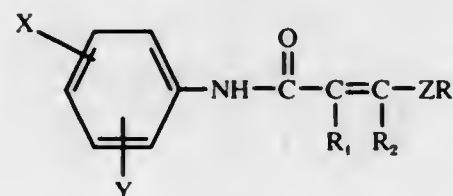
Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel-UCLAF, Paris, France  
Continuation-in-part of Ser. No. 398,415, Sept. 18, 1973, abandoned. This application May 30, 1975, Ser. No. 582,270  
Claims priority, application France, Apr. 16, 1975, 75.11784; Sept. 26, 1972, 72.33960

Int. Cl.<sup>2</sup> C07C 103/133, 103/365, 103/76

U.S. Cl. 71-118

17 Claims

1. A crotonanilide of the formula



wherein Z is selected from the group consisting of —O— and —S—, R is selected from the group consisting of alkyl of 1 to 6 carbon atoms and phenyl, X and Y are individually selected from the group consisting of hydrogen, halogen, lower alkyl of 1 to 6 carbon atoms optionally substituted with at least one halogen, alkoxy of 1 to 3 carbon atoms, alkylthio and alkylsulfinyl of 1 to 6 carbon atoms, acyl of an organic carboxylic acid of 1 to 6 carbon atoms, —NO<sub>2</sub> and —CF<sub>3</sub>, R<sub>1</sub> is selected from the group consisting of hydrogen, chloride, bromine, alkoxy-carbonyl with 1 to 6 alkyl carbon atoms, nitro and alkylthio, alkylsulfinyl and alkylsulfonyl of 1 to 3 alkyl carbon atoms and R<sub>2</sub> is alkyl of 1 to 6 carbon atoms, said compounds existing in the form of their E or Z isomers or mixtures thereof.

4,014,680

## PREALLOYED STAINLESS STEEL POWDER FOR LIQUID PHASE SINTERING

Orville W. Reen, Lower Burrell, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 542,986, Jan. 22, 1975, Pat. No. 3,980,444. This application June 25, 1976, Ser. No. 699,827  
Int. Cl.<sup>2</sup> C22C 33/02, 38/44, 38/54

U.S. Cl. 75-5 BA

4 Claims

1. A pre-alloyed stainless steel powder consisting essentially of, by weight, up to 0.05% carbon, 22 to 26% chromium, 10 to 24% nickel, 2.7 to 5% molybdenum, 0.1 to 1% boron, up to 2.0% manganese, up to 2.0% silicon, balance iron and residuals.

4,014,681

## VEHICLE RECYCLING PROCESS

Paul E. Rhinehart, P.O. Box 184, Mountain Falls Rt., Winchester, Va. 22601

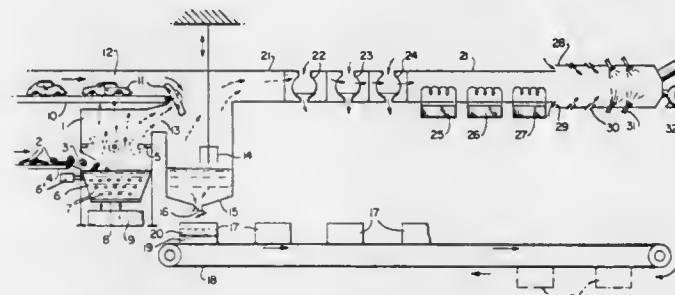
Division of Ser. No. 478,377, June 11, 1974, Pat. No. 3,917,239. This application Mar. 5, 1975, Ser. No. 555,577  
Int. Cl.<sup>2</sup> C21C 5/52

U.S. Cl. 75-12

10 Claims

1. A method for recovering distinct products from scrap vehicles, said vehicles comprising steel vehicle bodies, nonferrous and cast iron vehicle parts, combustible materials including tires and noncombustible materials including glass, which comprises stripping and separating said parts, tires and glass from said scrap bodies to obtain a stripped steel vehicle body, conveying said stripped vehicle bodies adjacent a furnace, burning a fuel in said furnace to produce a heated furnace gas as well as radiant heat which preliminarily heats said stripped body, further heating the preheated bodies in a cupola by means of said heated furnace gas to produce a steel melt and a slag, which are recovered therefrom, as well as a cupola

exhaust gas, said exhaust gas from said furnace and said cupola combining to form a heated flue gas, drawing said heated flue gas through a substantially horizontal flue and in heat exchange relationship with a plurality of smelters and heat recovery units for recovering and using the heat from said



heated flue gas, introducing ambient air into the flue gas downstream of said heat recovery units to further reduce the temperature of said flue gas, subsequently scrubbing the flue gas with water to substantially remove any particulate matter disposed in the flue gas and exhausting the cooled and cleaned flue gas to the atmosphere.

4,014,682

## PROCESS FOR THE PRODUCTION OF ELEMENTAL PHOSPHORUS AND IRON FROM PHOSPHATE ROCK

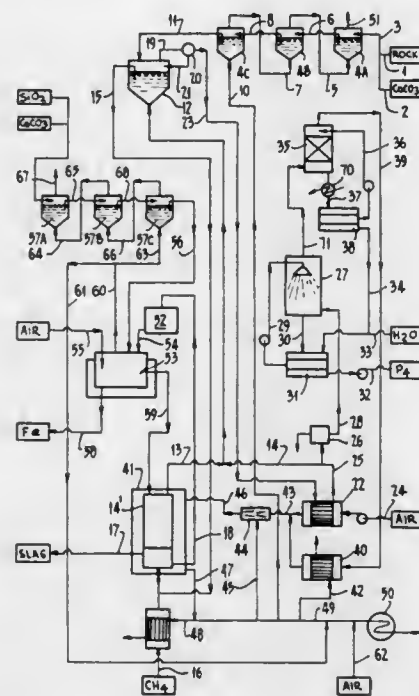
Edward Adam Majewski, Geelong, Australia, assignor to The Phosphate Co-operative Company of Australia Ltd., Melbourne, Australia

Continuation-in-part of Ser. No. 444,242, Feb. 20, 1974, abandoned. This application Jan. 6, 1976, Ser. No. 646,883  
Claims priority, application Australia, Feb. 14, 1974, 65625/74

Int. Cl.<sup>2</sup> C21B 3/04, 5/04

U.S. Cl. 75-29

11 Claims



1. A process for the production of elemental phosphorus from low-grade phosphate rock containing at least 5% by weight of iron and at least 5% by weight aluminum calculated as ferric and aluminum oxides respectively as major impurities which comprises:

1. mixing the low-grade phosphate rock with calcium oxide as a flux additive, the amount of calcium oxide being sufficient to produce, after the reaction of step (2), a calcium aluminate slag composition which is liquid at the reaction temperature;
2. introducing the mixture of phosphate rock and calcium oxide simultaneously with a carbonaceous reductant into a reaction chamber and heating said mixture in said chamber at a temperature of from about 1400°C to about

1600°C, thereby to produce reaction products which are molten at said temperature and contain ferrophosphorus and said liquid calcium aluminate slag composition and gaseous reaction products containing elemental phosphorus;

3. withdrawing said gaseous reaction products from the reaction chamber and recovering the elemental phosphorus from gaseous reaction products;
4. separately withdrawing said calcium aluminate slag composition and said ferrophosphorus from the reaction chamber and discarding the calcium aluminate slag composition;
5. transferring the molten ferrophosphorus to a recovery unit;
6. adding calcium oxide to the ferrophosphorus in the recovery unit and oxidizing the ferrophosphorus in the molten condition and in the presence of the calcium oxide, thereby to produce metallic iron and calcium phosphate;
7. withdrawing the metallic iron and the calcium phosphate separately from the recovery unit; and
8. recycling the calcium phosphate to the reaction chamber.

4,014,683

## METHOD OF MAKING DRAWING QUALITY STEEL

Robert S. Miltenberger, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1974, Ser. No. 535,213

Int. Cl.<sup>2</sup> C21C 7/00

U.S. Cl. 75-49

12 Claims

1. A process for producing drawing quality steel having an exceedingly low carbon, aluminum and oxygen contents and consisting essentially of less than 0.02% carbon, less than 0.023% aluminum, less than 125 parts per million oxygen, less than 0.015% silicon, 0.20% to 0.35% manganese and the remainder iron and incidental impurities, the process comprising the steps of; preparing a heat of steel consisting essentially of not greater than 0.035% carbon, oxygen in an amount greater than 350 parts per million, less than 0.015% silicon, less than 0.20% manganese and the remainder iron and incidental impurities, adding to the heat a manganese addition to increase the manganese content of the steel in the range of 0.20% to 0.35%, vacuum degassing the molten steel, during vacuum degassing adding a non-silicon bearing deoxidizing agent consisting essentially of carbon, aluminum and the remainder binder and sinker substances and continuing the vacuum degassing after this addition, and wherein the amounts of carbon and aluminum added are limited such that the resulting steel after the vacuum degassing will contain carbon in an amount less than 0.02% and aluminum in an amount less than 0.023% while at the same time being sufficient to reduce the amount of oxygen to less than 125 parts per million.

4,014,684

## MANUFACTURE OF STEEL

Evan Thomas Richard Jones, and Robert Anthony Fishburn, both of Birmingham, England, assignors to Fosco International Limited, Birmingham, England

Filed Nov. 14, 1974, Ser. No. 523,835

Claims priority, application United Kingdom, Nov. 27, 1973, 54995/73; Apr. 29, 1974, 18713/74

Int. Cl.<sup>2</sup> C21C 7/02; C22B 9/10

U.S. Cl. 75-51

15 Claims

1. A flux composition for use in desulphurising molten metal, which composition comprises, by weight, at least 60% of lime, from 1 to 20% of sodium carbonate, from 5 to 30% of a fluoride selected from alkali metal and alkaline earth metal fluorides and mixtures thereof, from 0 to less than 2% by weight of metallic reducing agent and from 5 to 20% of alumina.

4,014,685

## MANUFACTURE OF STEEL

Evan Thomas Richard Jones, and Robert Anthony Fishburn, both of Birmingham, England, assignors to Fosco International Limited, Birmingham, England

Filed Nov. 14, 1974, Ser. No. 523,836

Claims priority, application United Kingdom, Nov. 27, 1973, 54996/73; Apr. 29, 1974, 18712/74

Int. Cl.<sup>2</sup> C21C 7/02; C22B 9/10

U.S. Cl. 75-51

12 Claims

1. A flux composition for use in desulphurising molten steel in a furnace, which composition comprises 50 to 80% by weight of lime, from 1-20% by weight of sodium carbonate, from 5-30% by weight of a fluoride selected from alkali metal and alkaline earth metal fluorides and mixtures thereof, 5-30% by weight of alumina and from 2-15% by weight of a metallic reducing agent.

4,014,686

## DEOXIDATION OF OPEN TYPE STEELS FOR IMPROVED FORMABILITY

James G. Bassett, Jr., Franklin Township, Westmoreland County, and Saul Gilbert, Pittsburgh, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 660,568

Int. Cl.<sup>2</sup> C21C 7/02

U.S. Cl. 75-58

9 Claims

1. In the manufacture of low carbon steel strands, wherein the precursor molten steel therefor is produced by "open" methods, in which the desired degree of mold rimming action is controlled by the addition of deoxidizers to the molten steel, both in the ladle and in the mold,

a method for improving the formability of said steel strands, in which the deoxidation in the ladle is effected by the addition of deoxidizers substantially devoid of Al and wherein the deoxidizer added to the mold consists essentially of Mg in an amount of 0.5 to 10 oz./ton of steel.

4,014,687

## PROCESS FOR MAKING MAGNESIUM METAL

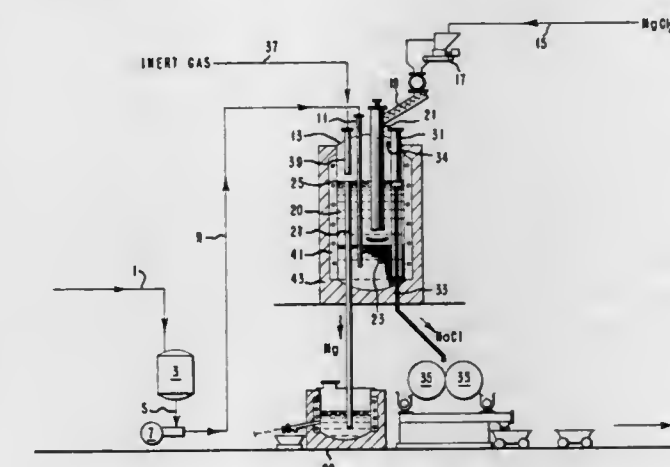
Norval D. Clare, Niagara Falls, N.Y., and Charles H. Lemke, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 13, 1976, Ser. No. 648,761

Int. Cl.<sup>2</sup> C22B 29/00

U.S. Cl. 75-67 R

8 Claims



1. A process for the manufacture of magnesium metal comprising

- a. forming a pool of magma from MgCl<sub>2</sub> and NaCl, the surface of which is blanketed with inert gas and in which the weight ratio of MgCl<sub>2</sub> to NaCl is from about 0.5 to about 2;
- b. injecting sodium metal beneath the surface of the magma; and
- c. withdrawing molten magnesium metal from the surface of the magma.



4,014,688

**CONTACT MATERIAL FOR HIGH-POWER VACUUM CIRCUIT BREAKERS**

Horst Schreiner, Nurnberg, Austria, and Heinrich Hässler, Wendelstein, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 251,889, May 10, 1972, Pat. No. 3,948,652. This application Sept. 17, 1975, Ser. No. 614,225 Int. Cl.<sup>2</sup> C22C 38/12

U.S. Cl. 75—123 B

3 Claims

1. A contact material for high-power vacuum circuit breakers comprising an alloy consisting essentially of a base metal iron and at least one alloying metal bismuth, characterized by containing at least one auxiliary metal boron forming a eutectic with said base metal, said eutectic comprising about 15% to about 50% of the total volume of said alloy, said eutectic surrounding crystals consisting mainly of said base metal, said alloying metal being contained in said crystals and comprising not more than 5% by weight of said crystals and being dispersed in said eutectic to an extent of less than 5% by weight of said eutectic, and said alloy having an alloying formulation consisting essentially of 0.3% by weight of bismuth and 1% by weight of boron, with the balance being the iron base metal.

4,014,690

**GOLD-COLORED ALLOY SOLDERS**

Ronald P. Dudek, River Grove; Peter Kosmos, Alsip, and John A. Tesk, Woodridge, all of Ill., assignors to Howmedica, Inc., New York, N.Y.

Filed May 14, 1976, Ser. No. 686,347 Int. Cl.<sup>2</sup> C22C 5/02

U.S. Cl. 75—165

5 Claims

1. A gold-colored alloy solder consisting essentially of the following constituents in the indicated percentages by weight:

Constituent	Proportional Range
Gold	60 - 70%
Platinum	0 - 10%
Palladium	0 - 10%
Copper	10 - 25%
Gallium	5 - 10%
Iridium	0 - 0.01%

with the proviso that the total of said platinum and palladium is from about 5-10%.

4,014,691

**DENTAL BRIDGE ALLOY**

M. Hamdi A. Mohammed, 50 Ranger Lane, West Hartford, Conn. 06117

Continuation-in-part of Ser. No. 316,272, Dec. 18, 1972, abandoned. This application Mar. 22, 1974, Ser. No. 453,845 Int. Cl.<sup>2</sup> C22C 19/00

U.S. Cl. 75—171

8 Claims

1. A highly ductile cobalt-chromium-nickel dental alloy having a ductility of about 20 percent or more elongation, a yield strength of about 35,000 or less and low work hardening characteristics suited for crown and bridge applications requiring deformation by hand burnishing in the mouth of a patient, said alloy having no more than 0.02 percent carbon and being essentially free of boron, molybdenum, titanium, aluminum and tungsten to prevent the formation of hardening precipitates thereof in the alloy and having an alloy base consisting essentially of, by weight, about 10 to 60 percent cobalt, 17 to 24 percent chromium, and 20 to 75 percent nickel as the essential major alloying elements, and an element of the group consisting of tantalum and niobium alloyed therewith to promote a high rate of crystallization and provide uniformity and fineness of crystal size, said alloying element being present in an amount of up to about 4 percent tantalum or an equivalent atomic weight of niobium.

4,014,692

**PLATINUM-RHODIUM ALLOYS HAVING LOW CREEP RATES**

Darryl J. Costin, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 9, 1976, Ser. No. 647,690 Int. Cl.<sup>2</sup> C22C 5/04

U.S. Cl. 75—172 R

9 Claims

1. A composition consisting essentially of rhodium in an amount within the range of from about 10 to about 40 weight percent, boron in an amount within the range of from about 0.01 to about 0.5 weight percent, zirconium in an amount within the range of from about 0.015 to about 1.25 weight percent, the balance of said composition being platinum.

4,014,689

**METHOD OF FABRICATING A CONTACT MATERIAL FOR HIGH-POWER VACUUM CIRCUIT BREAKERS**

Schreiner Horst, Nurnberg, Austria, and Heinrich Hässler, Wendelstein, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 251,889, May 10, 1972, Pat. No. 3,948,652. This application Dec. 11, 1975, Ser. No. 639,708 Int. Cl.<sup>2</sup> C22C 1/02, 33/04

U.S. Cl. 75—129

5 Claims

1. A method of fabricating a contact material for high-power vacuum circuit breakers, comprising the steps of: melting under vacuum, at a temperature between about 1000° C and about 1800° C, an alloy consisting essentially of a base metal having a melting point above about 1000° C and below about 1800° C, selected from the group consisting of copper, nickel, iron, cobalt and titanium, at least one alloying metal which will not form a solid solution with said base metal, selected from the group consisting of bismuth, tellurium and lead, and at least one auxiliary metal which forms a eutectic with said base metal; slowly cooling said molten alloy so as to form fine grain crystals of said base metal and auxiliary metal in solid solution in said eutectic while said eutectic is a liquid and transfer gases expelled from said crystals during said cooling to said liquid eutectic to increase the concentration of gases in said liquid eutectic above an equilibrium concentration, cause an evacuation of said gases from said liquid eutectic and remove said gases from said alloy, said eutectic comprising about 15 to about 50% of the total volume of said alloy, said eutectic surrounding said crystals and said crystals consisting mainly of said base metal, and further cooling said alloy to rapidly solidify said liquid eutectic and precipitate said alloying metal as a fine dispersion in said eutectic, said alloying metal being contained in said crystals and comprising not more than 5% by weight of said crystals and being dispersed in said eutectic to an extent of less than 5% by weight of said eutectic.

4,014,693

**ELECTROVISCOUS RECORDING**

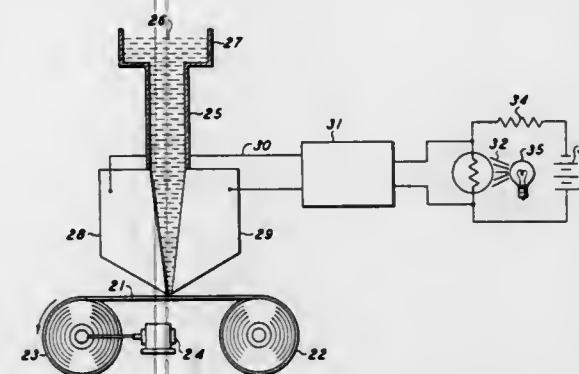
Harold E. Clark, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 563,313, April 21, 1966, abandoned. This application May 1, 1972, Ser. No. 249,430

Int. Cl.<sup>2</sup> G03G 13/10, 13/22

U.S. Cl. 96—1 R

5 Claims



3. The method of recording information comprising the steps of: forming a latent electrostatic image on a xerographic member; providing colored electroviscous liquid for forming images; establishing electrical fields between said electrostatic image on said xerographic member and a conductive member and across said electroviscous liquid whereby the viscosity of said electroviscous liquid is varied in accordance with said latent electrostatic image, and effecting relative intermittent and recurrent movement in said electroviscous liquid to produce breaks in contact between said electroviscous liquid and the image areas between said xerographic and conductive members whereby electroviscous liquid is formed in image configuration on one of said members.

4,014,694

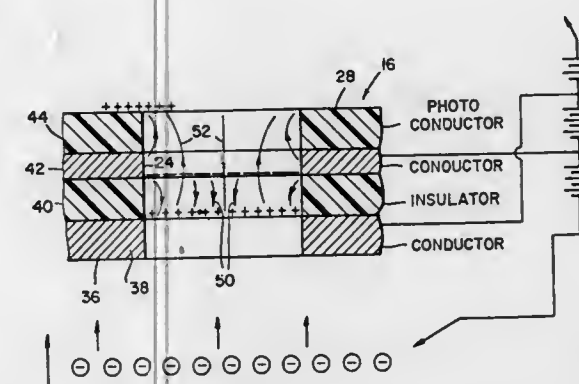
**METHOD AND APPARATUS FOR FORMING A POSITIVE ELECTROSTATIC IMAGE**

Hewitt D. Crane, Portola; Gerald L. Pressman, Cupertino, and George J. Eilers, Redwood City, all of Calif., assignors to Electroprint, Inc., Cupertino, Calif.

Division of Ser. No. 281,605, Aug. 17, 1972, Pat. No. 3,867,673. This application Feb. 18, 1975, Ser. No. 550,406 Int. Cl.<sup>2</sup> G03G 13/052

U.S. Cl. 96—1 R

5 Claims



1. The method of electrostatic printing or copying which includes controlling the flow of electrostatically charged particles through apertures which comprises the steps of forming a first field within said apertures that is so polarized and of a magnitude sufficient to block passage of the flow of the electrostatically charged particles through the apertures, forming a second field within said apertures that has a polarity opposite from and a magnitude greater than said first field so as to counteract said first field within said apertures, selectively discharging said second field in accordance with the image to be printed or copied, and modulating the flow of the electrostatically charged particles in accordance with that image by passing them through the apertures.

4. A method for electrostatically modulating the flow of a stream of charged particles through a multi-layer apertured member comprising the steps of:

establishing a coplanar array of a first plurality of bipolar electrostatic fields substantially confined within the apertures of the apertured member, uniformly oriented, and having substantially uniform strength sufficient for blocking the flow of a stream of charged particles directed through the array; and selectively superimposing over said first array a second coplanar array of a second plurality of bipolar electrostatic fields, said second fields being uniformly oriented in the opposite direction from said first plurality of fields, and having selected magnitude for selectively counteracting the first plurality of fields in the configuration of an image to be reproduced.

4,014,695

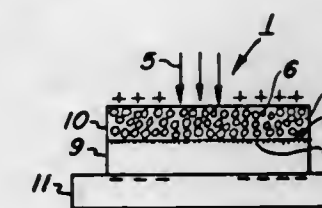
**MIGRATION IMAGING METHOD EMPLOYING MIGRATION MEMBER HAVING A SURFACE SKIN**

David A. Buckley, Rochester, and Frank G. Belli, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 499,716, Aug. 22, 1974, Pat. No. 3,979,210. This application July 23, 1975, Ser. No. 598,309 Int. Cl.<sup>2</sup> G03G 13/22

U.S. Cl. 96—1 PS

12 Claims



1. A imaging method comprising:

- providing an imaging member comprising:
  - a first layer of softenable material containing migration material, said first layer of softenable material overlaying a second layer of softenable material, said second layer of softenable material being substantially free of migration material, at least one of said layers of softenable material containing a surface skin located at the entire surface of at least one of said softenable layers and at the interface between said layers of softenable material, said surface skin formed by exposing said surface of at least one of said layers of softenable material to hardening radiation sufficient to form said surface skin having a thickness from about 0.01 to about 0.5 micron, said layers of softenable material capable of being softened sufficiently to allow migration of migration material in depth in said layers of softenable material;
  - forming an electrical latent image on said imaging member;
  - developing said imaging member softening both of said first and second layers of softenable material at least sufficient to allow imagewise migration of migration material at least in depth in both of said first and second layers of softenable layers whereby said migration material migrates in image configuration through said first layer of softenable material and said interface and in depth in said second layer of softenable material; and
  - removing unmigrated migration material by splitting said member at said interface.



4,014,696

**MULTICOLORED XEROGRAPHIC TRANSPARENCY UTILIZING AN ALIPHATIC ESTER COATING**

Richard A. Parent, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 5, 1975, Ser. No. 547,295

Int. Cl.<sup>2</sup> G03G 13/16, 13/22

U.S. Cl. 96—1.4

8 Claims

1. A method of xerographically preparing a color transparency copy comprising the sequence of:

- forming a single color xerographic powder image of a multicolored original to be reproduced;
- transferring the powder image to a transparency comprising a thermoplastic film sheet, said sheet having at least one surface having been coated with a nonvolatile long chain aliphatic ester having a melting point above 40° C wherein said long chain aliphatic ester is selected from the group consisting of glycol monostearate sorbitan tristearate, sorbitan monopalmitate, sorbitan monostearate, ethylene glycol monostearate and mixtures thereof; and
- then, repeating said sequence in steps (a) and (b), where each sequence corresponds with the formation of a different color to effect multicolor reproduction, said transfer of each developed electrostatic image taking place in registration on the transparency;
- fixing the powder image on the transparency.

4,014,697

**ELECTROSTATOGRAPHIC IMAGING MEMBER**

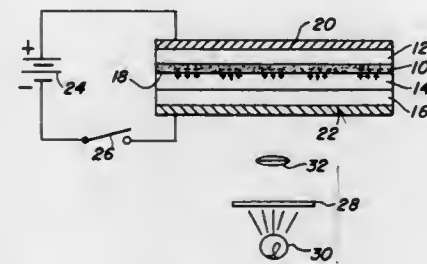
Fred W. Schmidlin, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 392,599, Aug. 29, 1973, Pat. No. 3,890,040, which is a division of Ser. No. 212,220, Dec. 27, 1971, abandoned. This application Mar. 19, 1975, Ser. No. 560,283

Int. Cl.<sup>2</sup> G03G 5/04

U.S. Cl. 96—1.5

1 Claim



- An electrostatographic imaging member comprising a layer of transparent electrically insulating material carrying a thin film of transparent electrically conductive material which carries a thin film of transparent electrically insulating material which carries a layer of photoreceptor material;
- a layer of developer material including electrophotographic marking particles residing on a substrate and arranged adjacent to said photoreceptor layer, said substrate including a layer of recording material carrying a thin layer of electrically conductive material which carries a thin layer of electrically insulating material, said developer material layer being adjacent said thin electrically insulating material layer of said substrate; and
- means for establishing a blocking layer for inhibiting the exchange of electrical charge between said developing material and said photoreceptor material.

4,014,698

**METHOD FOR PROCESSING SILVER DYE BLEACH MATERIALS**

Max Marthaler, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed June 30, 1975, Ser. No. 591,803

Claims priority, application Switzerland, July 10, 1974, 9506/74

Int. Cl.<sup>2</sup> G03C 7/00

U.S. Cl. 96—53

8 Claims

1. In the method for processing silver dye bleach material wherein the process measures of

- silver developing,
- dye bleaching,
- silver bleaching and
- silver fixing

are carried out in the sequence (1) to (4) with separate appropriate preparations for the individual stages, the step which comprises employing for silver bleaching an aqueous preparation (3) which contains

- a strong acid,
- a water-soluble iodide,
- a water-soluble organic nitro compound,
- a diazine compound in an amount of 0.2 to 5 gram per liter of preparation (3) and
- an anti-oxidant, only preparation (3) containing a nitro compound.

4,014,699

**PREPARATION FOR THE PROCESSING OF PHOTOGRAPHIC MATERIALS**

Matthias Schellenberg; Christoph Chylewski, both of Marly, and Max Meier, Fribourg, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 468,837, May 10, 1974, Pat. No. 3,957,516. This application Oct. 8, 1975, Ser. No. 620,677

Claims priority, application Switzerland, May 17, 1973, 7061/73

Int. Cl.<sup>2</sup> G03C 5/30

U.S. Cl. 96—66.4

5 Claims

1. Liquid developer preparation for a photographic silver halide material, which substantially consists of an oil-in-water emulsion which comprises, in the aqueous phase as an active substance capable of exerting its action on the photographic material, at least one silver halide developing agent, and which further comprises in the oily phase an antioxidant which is sparingly soluble in the aqueous phase and selected from the group consisting of an alkyl mercaptan with at least 10 carbon atoms, and a triarylphosphine.

4,014,700

**FURAN CONTAINING AZO DYE DEVELOPERS**

Shinsaku Fujita; Yukio Maekawa; Kazuya Sano, and Seiki Sakanoue, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 22, 1974, Ser. No. 526,188

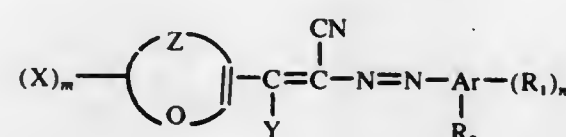
Claims priority, application Japan, Nov. 22, 1973, 48-131494

Int. Cl.<sup>2</sup> G03C 7/00, 1/40, 1/76, 1/10

U.S. Cl. 96—73

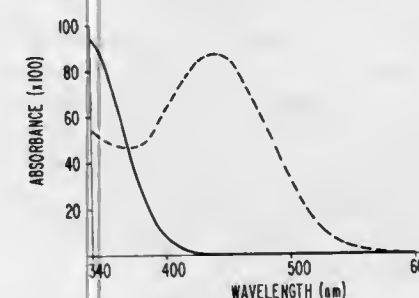
12 Claims

1. A light-sensitive material for the diffusion transfer process comprising a support having coated thereon a blue-sensitive silver halide emulsion and an associated yellow dye developer represented by the following formula (I)



wherein X represents a hydrogen atom, a halogen atom, a

nitro group, a hydroxyl group, an alkyl group having 1 to 4 carbon atoms, or an acylamino group having 1 to 4 carbon atoms; Z represents an atomic group necessary for completing a furan ring or benzofuran ring; Y represents a hydroxyl group, an acyloxy group having 1 to 4 carbon atoms or an alkoxyacyloxy group having 2 to 4 carbon atoms; Ar represents an aromatic ring, represents a hydrogen atom, a halogen atom, an acyl group having 1 to 4 carbon atoms, or an



alkyl group having 1 to 5 carbon atoms; R<sub>2</sub> represents a hydroxyl group, an acyloxy group having 1 to 4 carbon atoms, or an alkoxyacyloxy group having 2 to 4 carbon atoms; R<sub>2</sub> being at the ortho-position to the azo group; and m and n each represents an integer of 1 to 4; at least one of said Z and Ar being bonded directly or through an atom or divalent group to a polyhydric phenol moiety having a silver halide development activity.

4,014,701

**PROCESS OF MAKING DIAZO-SENSITIZED FILM PRODUCTS USING HALOGEN CONTAINING PHENOLS AS COATING AID**

Margaret Loudon Clachan; David Rankine Kennedy, both of Manningtree, England; Basil Robert Shephard, deceased, late of Manningtree, England, and by Doreen Shephard, executrix, Colchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 307,529, Nov. 17, 1972, abandoned, which is a continuation of Ser. No. 647,642, June 21, 1967, abandoned. This application Mar. 22, 1974, Ser. No. 453,960

Claims priority, application United Kingdom, June 27, 1966, 28738/66; Sept. 8, 1966, 40209/66

Disclosure was also published under second Trial Voluntary

Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> G03C 1/80, 1/52

U.S. Cl. 96—75

5 Claims

1. A process for the production of a diazo-sensitized film product, which comprises the successive steps of:

- treating a self-supporting film of synthetic linear polyester by applying to at least one surface thereof a solution consisting of:
  - a liquid solvent which is volatile in the temperature range 30°–120°C, and
  - 0.5–20% by weight of halogen-containing phenolic substance in solution therein, the molecules of the said substance containing one benzenoid ring and one or two hydroxyl groups and one or more chlorine or bromine atoms all of which are attached directly to carbon atoms belonging to the benzenoid ring;
- heating the treated film for 1–15 minutes at 30°–120°C to remove the volatile solvent;
- superimposing on a treated surface of the film a layer consisting essentially of one of the following:
  - a vinyl chloride-vinyl acetate copolymer or partially hydrolyzed vinyl chloride-vinyl acetate copolymer,
  - a vinylidene chloride-acrylonitrile copolymer or a copolymer of vinylidene chloride with an acrylic or methacrylic ester,
  - a polymer of acrylic or methacrylic acid or ester, or a copolymer of these acids or esters with other vinyl unsaturated monomers;
- and thereafter applying over the said layer

(1), (2), or 3 (4) one of the following:

- a layer of cellulose acetate, cellulose acetate butyrate, polyvinylacetate, polyvinyl acetate or partially hydrolyzed polyvinyl acetate which layer comprises a light-sensitive diazonium compound,
- a layer of cellulose acetate, cellulose acetate butyrate, polyvinylacetate, polyvinyl acetate or partially hydrolyzed polyvinyl acetate followed by impregnation of the said layer with a light-sensitive diazonium compound, or
- a layer of cellulose acetate or cellulose acetate butyrate, followed by surface hydrolysis of said layer and impregnation of said hydrolyzed surface with a light-sensitive diazonium compound.

4,014,702

**SILVER HALIDE PHOTOGRAPHIC EMULSION**

Masanao Hinata; Masanaga Ohki; Hartuo Takei; Akira Sato, and Akira Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 491,187, July 24, 1974, abandoned. This application July 21, 1975, Ser. No. 597,606

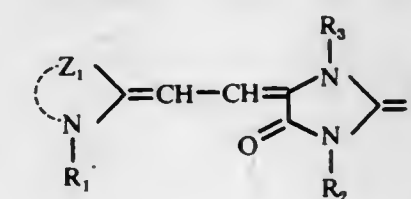
Claims priority, application Japan, July 24, 1973, 49-83339

Int. Cl.<sup>2</sup> G03C 1/08

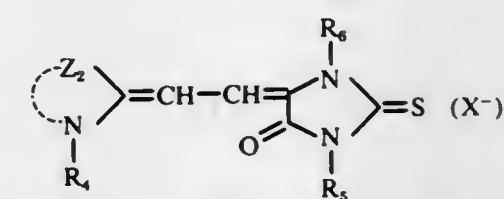
U.S. Cl. 96—122

11 Claims

1. A silver halide photographic emulsion containing a spectrally sensitizing amount of a sensitizing dye represented by the general formula (I)



and a sensitizing dye represented by the formula (II)



wherein Z<sub>1</sub> and Z<sub>2</sub> each is an atomic group necessary to complete a benzoxazole ring or a naphthoxazole ring; R<sub>1</sub> is an alcohol group or an allyl group; R<sub>2</sub> is an alkyl group, or an allyl group; R<sub>3</sub> is an unsubstituted lower alkyl group, a hydroxyalkyl group or a carboxyalkyl group; R<sub>4</sub> is same as R<sub>1</sub>; R<sub>5</sub> is an alkyl group, an allyl group or a phenyl group; R<sub>6</sub> is an alkoxy-carbonylalkyl group, an hydroxyalkoxyalkyl group, an acyloxyalkoxyalkyl group, an N-(N,N-dialkylaminoalkyl) carbamoylalkyl group, an N-(N,N,N-trialkylammonium) carbamoylalkyl group or an N,N,N-trialkylammoniumalkyl group; X<sup>-</sup> is an acid anion, an n is 0 or 1.

4,014,703

**ONE PACKAGE COATING COMPOSITION**

Hossein Hayati, and Russell S. Towers, both of Adrian, Mich., assignors to Stauffer Chemical Company, Adrian, Mich.

Filed Apr. 4, 1975, Ser. No. 565,301

Int. Cl.<sup>2</sup> C09D 5/10

U.S. Cl. 106—1

12 Claims

1. A vehicle for a single package coating composition consisting essentially of a hydrolyzed alkyl polysilicate having a hydrolysis level of from 50 to 65 percent, an organic solvent and from 3 to 5.5 percent by weight of zinc chloride based on the total weight of the hydrolysate, said hydrolysate is obtained by hydrolyzing the alkyl polysilicate containing about 40 percent SiO<sub>2</sub> in the presence of an organic solvent, and



water in an amount of from about 0.08 to about 0.21 mole per mole of alkoxy present on the alkyl polysilicate at a pH of from 1.0 to 6.5.

4,014,704

**INSULATING REFRACTORY FIBER COMPOSITION AND ARTICLES FOR USE IN CASTING FERROUS METALS**  
William Clyde Miller, Denver, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 512,786, Oct. 7, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,318  
Int. Cl.<sup>2</sup> B28B 7/36

U.S. Cl. 106—38.22

13 Claims

1. In a refractory composition suitable for use for containment of molten ferrous metal in casting operations, which comprises, in percentage by weight, 30% to 50% refractory fiber, 5% to 45% inorganic binder, 2% to 10% organic binder, and 5% to 35% refractory filler, and wherein more than half of said refractory fiber component is alumino-silicate fiber, the improvement which comprises further incorporating into said composition 1% to 35% by weight granular silicon carbide.

4,014,705

GLASS COMPOSITIONS

Brian Yale, Ormskirk, England, assignor to Pilkington Brothers Limited, St. Helens, England

Continuation-in-part of Ser. No. 302,462, Oct. 31, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,746  
Claims priority, application United Kingdom, Nov. 3, 1971, 51177/71

Int. Cl.<sup>2</sup> C03C 13/00, 3/04; C04B 31/06

U.S. Cl. 106—50

5 Claims

1. Continuously-drawn alkali-resistant glass fibres having a glass composition consisting essentially of, in molar percentages on the oxide basis:

SiO <sub>2</sub>	67 to 82
ZrO <sub>2</sub>	7 to 10
R <sub>2</sub> O	9 to 22.5
F <sub>2</sub>	3 to 9
Al <sub>2</sub> O <sub>3</sub>	0 to 5
(computed as AlO <sub>1.5</sub> )	

where R = Na, up to 5 mol.% of which may be replaced by Li or K, and the fluorine is included in substitution for oxygen in one or more of the oxides, the maximum value of the molar percentage represented by SiO<sub>2</sub> + ZrO<sub>2</sub> + AlO<sub>1.5</sub> being on a sliding scale dependent on the content of ZrO<sub>2</sub> ranging, when F<sub>2</sub> = 9 mol.%, from 89 mol.% when the ZrO<sub>2</sub> content is 7 mol.% to 88 mol.% when the ZrO<sub>2</sub> content is 8.5 mol.% down to 87 mol.% when the ZrO<sub>2</sub> content is 10 mol.% the said maximum value being reduced by a further 5 mol.% over the whole scale when F<sub>2</sub> = 3 mol.%, the glass having a fiberizing temperature not exceeding 1350° C and a liquidus temperature at least 40° C below the fiberizing temperature.

4,014,706

SOLID SOLUTION CERAMIC MATERIALS

Robert D. Waldron, Scottsdale, Ariz., assignor to Research Enterprises Corporation, Phoenix, Ariz.

Continuation of Ser. No. 252,659, May 12, 1972, abandoned.  
This application Apr. 21, 1975, Ser. No. 569,834

Int. Cl.<sup>2</sup> C04B 35/00, 35/48, 35/50

U.S. Cl. 106—55

19 Claims

1. A composition of matter consisting essentially of a solid solution of

- a. a plurality of compounds, each containing one or more metallic elements, at least one of which elements is polyvalent, in combination with one or more elements selected from the group consisting of oxygen and fluorine,
- b. at least 0.1 mole percent compounds selected from the

group consisting of alkaline earth halides, yttrium earth halides and complex halides, as a binder aid; said solid solution containing oxygen and fluorine in an atomic ratio of about 0.5:1 to about 5:1.

4,014,707

CERAMIC DIELECTRIC COMPOSITION

Hitoshi Tanaka; Hitoshi Masumura, and Shinobu Fujiwara, all of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed July 8, 1975, Ser. No. 594,017

Claims priority, application Japan, July 11, 1974, 49-79397

Int. Cl.<sup>2</sup> C04B 35/46; H01B 1/06

U.S. Cl. 106—73.31

10 Claims

1. A dielectric ceramic composition which comprises as principle constituents, 86–99.6 mole % of barium titanate, 0.2–10 mole% of niobium pentoxide and 0.2–4 mole% of cerium oxide.

4,014,708

LIQUID STOVING-LACQUER SYSTEMS BASED ON OIL-FREE POLYESTERS

Bernd-Ulrich Kaiser; Rolf Dhein; Rolf Kuchenmeister, and Hans-Michael Fischler, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 528,088, Nov. 29, 1974, abandoned. This application Nov. 4, 1975, Ser. No. 628,777

Claims priority, application Germany, Dec. 6, 1973, 2360710

Int. Cl.<sup>2</sup> C07C 69/34; C08K 5/10

U.S. Cl. 106—287 R

5 Claims

1. Liquid stoving-lacquer systems based on oil-free polyesters of polybasic carboxylic acids, and/or their anhydrides and polyhydric alcohols which polyesters have an acid number of from 1 to 40 and a hydroxyl number of from 50 to 400, characterized in that the alcohol starting components of said polyesters consist of

- A. 30–100 mol.%, based on the sum of components A and B, of 2-ethylpropane diol-1,3,
- B. 70–0 mol.%, based on the sum of components A and B, of alcohols having from 2 to 6, preferably from 3 to 4, hydroxyl groups and optionally
- C. 0–30, preferably 0–20, mol.%, based on component A, of other diols.

4,014,709

OPACIFYING PIGMENTS AND METHODS FOR MAKING SAME

Franz R. Dykstra, Haverford, Pa.; Aldo P. Allegrini, Westfield, N.J.; Miller B. Mallary, Macon, Ga., and Tom A. Cecil, Highland Park, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Menlo Park, Edison, N.J.

Filed June 8, 1976, Ser. No. 693,751

Int. Cl.<sup>2</sup> C09C 1/36, 1/28

U.S. Cl. 106—300

8 Claims

1. A pigment having a color ranging from tan to light dun and useful in the manufacture of paints and plastics as an opacifier, said pigment comprising a mixture composed predominantly of a major weight proportion of particles of iron-bearing titania impurity originally contained in sedimentary clay and a minor weight proportion of particles of thermally dehydrated kaolin clay.

4,014,710

MAGNETIC PIGMENTS WITH IMPROVED ORIENTABILITY AND A PROCESS FOR THEIR PRODUCTION

Peter Woditsch, Krefeld; Franz Hund; Gunter Buxbaum, both of Krefeld-Bockum; Volker Hahnkamm, Krefeld, and Ingo Pflugmacher, Meerbusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 18, 1974, Ser. No. 489,665

Claims priority, application Germany, Aug. 2, 1973, 2339142

Int. Cl.<sup>2</sup> C09C 1/24

U.S. Cl. 106—304

10 Claims

1. In the production of an acicular, magnetic iron oxide pigment by forming acicular iron oxide hydroxide seeds, growing said seeds, dehydrating, reducing and reoxidizing, the improvement which comprises contacting said precursor pigment as  $\alpha$ -FeOOH,  $\beta$ -FeOOH or  $\gamma$ -FeOOH before hydration either in dry form or in suspension with about 0.05 to 5% its weight of an organo silicon compound.

4,014,711

SEPARATION OF FRUCTOSE FROM A MIXTURE OF SUGARS

Hiroyuki Odawara; Yoshio Noguchi, and Masaji Ohno, all of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

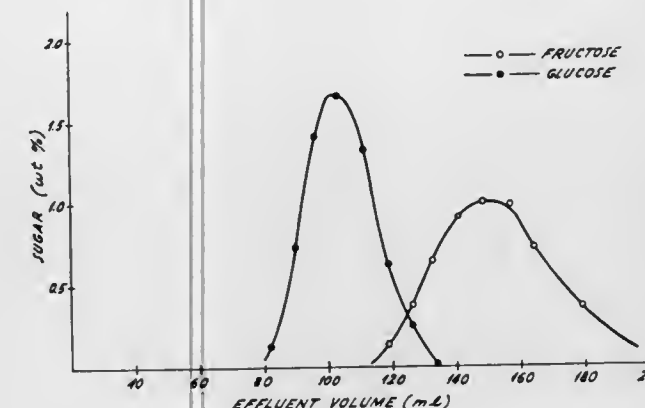
Filed Feb. 18, 1976, Ser. No. 658,910

Claims priority, application Japan, Feb. 21, 1975, 50-20892

Int. Cl.<sup>2</sup> C13D 3/12; C13K 3/00, 11/00

U.S. Cl. 127—46 B

9 Claims



1. A method for separation of fructose from a mixture of sugars essentially containing fructose and glucose, which method comprises contacting an aqueous solution of said mixture of sugars with crystalline alumino-silicate having an average pore diameter greater than about 5 Å, desorbing the adsorbed sugars with water and separating the fructose-rich fraction obtained.

4,014,712

CATHODE-DEPOLARIZER MIX CONTAINING A POLYACRYLAMIDE BINDER

Richard J. Bryndal, Russell Township, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 27, 1974, Ser. No. 509,819

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> H01M 6/00, 10/00

U.S. Cl. 429—57

11 Claims

1. A galvanic cell having an anode; a cathode-depolarizer mix containing manganese dioxide, a carbonaceous conductive material and an electrolyte; and a separator interposed between said anode and said cathode-depolarizer mix and also containing a portion of the electrolyte; the improvement comprising discrete particles of polyacrylamide in said cathode-depolarizer mix in an amount ranging between about 0.1% to about 1.5% based on the weight of the cathode-depolarizer mix.

4,014,713

THERMOELECTRIC GENERATOR

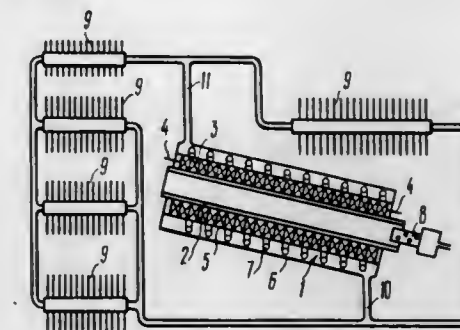
Mikhail Abramovich Markman, ulitsa Shirokaya, 1, korpus 2, kv. 264; Leonid Mikhailovich Simanovsky, ulitsa 3 Mytischinskaya, 14, kv. 18; Nikolai Vasilievich Kolomoets, Kastanaevskaya ulitsa, 61, korpus 1, kv. 22, all of Moscow; Vyacheslav Tikhonovich Kamensky, Sovetsky prospekt, 26, kv. 112, Ivanteevka Moskovskoi oblasti; Igor Mikhailovich Matskov, ulitsa Festivalnaya, 22, korpus 3, kv. 263, Moscow; Valentin Prokofievich Protchenko, ulitsa Arbat, 30, kv. 72, Moscow; Boleslav Viktorovich Sporyshev, Festivalnaya ulitsa, 53, korpus 6, kv. 617, Moscow, and Valentina Sergeevna Baby, ulitsa Junykh Lenintsev, 75, korpus 3, kv. 28, Moscow, all of U.S.S.R.

Filed Aug. 15, 1975, Ser. No. 605,203

Int. Cl.<sup>2</sup> H01V 1/30

U.S. Cl. 136—210

4 Claims



1. A thermo-electric generator comprising: a tubular thermo-electric module formed by a tubular inner heat conductor, a tubular thermo-electric battery enclosing said heat conductor, and an outer heat conductor enclosing said battery; means for burning fuel and applying heat to said inner heat conductor; a cooling system including a hollow radiator in heat-transfer contact with the ambient air, a cooling jacket enclosing said outer heat conductor and forming therewith an annular channel for the flow of a cooling liquid, and inlet and outlet pipes to connect said jacket with said radiator; said cooling system being filled completely with the cooling liquid; said jacket being arranged at an angle to said inlet pipe; and said outlet pipe having an ascending portion.

4,014,714

METHOD OF PRODUCING A MONOLITHIC SEMICONDUCTOR DEVICE

Helmuth Murrmann, Ottobrunn, and Ulrich Schwabe, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

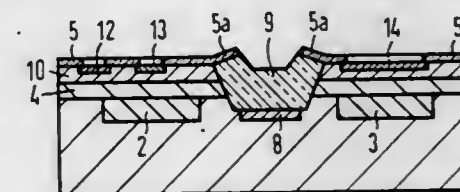
Filed Aug. 1, 1975, Ser. No. 601,222

Claims priority, application Germany, Aug. 8, 1974, 2438256

Int. Cl.<sup>2</sup> H01L 21/265

U.S. Cl. 148—1.5

9 Claims



1. A method of fabricating a monolithic silicon semiconductor device having a surface zone exhibiting a first conductivity from a silicon crystal doped differently from said surface zone, the steps comprising:

- applying a silicon nitride layer consisting of at least two separate areas onto a free face of said surface zone for use as an etching mask;
- etching a groove-like cavity between said silicon nitride layer areas;
- guiding a dopant ion beam substantially perpendicularly to the



a centralized base area of said cavity while using said silicon nitride layer areas as an implantation mask so that only such cavity base area becomes doped; oxidizing the resultant doped cavity base area while using said silicon nitride layer areas as an oxidation mask so that a silicon dioxide layer forms only in said groove-like cavity and completely separates said surface zone into at least two separate sections; and treating said separate surface zone sections with a second dopant ion beam having sufficient energy to penetrate said silicon nitride layer areas and implant dopant within said separate surface zone sections so as to fabricate an element of a semiconductor device in each of said separate surface zone sections.

4,014,715

**SOLDER CLEANING AND COATING COMPOSITION**  
John M. Preston, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Dec. 8, 1975, Ser. No. 638,829

Int. Cl.<sup>2</sup> C23F 7/12, 7/08; C11D 7/08

U.S. Cl. 148—6.17

4 Claims

1. A cleaning and coating composition comprising 200–500 ml. of an acid selected from the group consisting of sulfuric, hydrochloric and fluoboric, 38–567 ml. of a phosphoric acid concentrate having a  $P_2O_5$  content of 72–80%, 55–76 grams of thiourea, 0.1–1.0 grams of a dicarboxylic acid and 3.8–7.5 ml of a wetting agent, together with enough water to make one gallon of the composition.

4. A process of removing oxidation and foreign contaminants from a solder plated printed circuit and the deposition of a phosphate film on the solder surface which comprises:

- preparing a cleaning and coating bath from a solution containing an acid selected from the group consisting of 200–500 ml. of sulfuric acid, 200–400 ml. of fluoboric acid and 200–375 ml. of hydrochloric acid, 38–567 ml. of a phosphoric acid concentrate prepared by reacting 2–5% of a monosaccharide or polysaccharide and 54% of phosphoric acid heated at 300° F to concentrate the mixture to 72–80% of  $P_2O_5$ , 0.1–1.0 grams of a dicarboxylic acid, 3.8–7.5 ml. of a wetting agent, 55–76% of thiourea and sufficient water to make one gallon of the composition;
- agitating the composition at room temperature;
- and applying the composition to a solder surface to remove the contaminants and produce a phosphate coating on the solder surface.

4,014,716

**WROUGHT BRASS ALLOY HAVING A LOW SPRING BACK COEFFICIENT AND SHAPE MEMORY EFFECT**  
Amado Cabo, and Horace Pops, both of Pittsburgh, Pa., assignors to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 107,118, Jan. 18, 1971, abandoned.

This application Sept. 20, 1974, Ser. No. 508,098

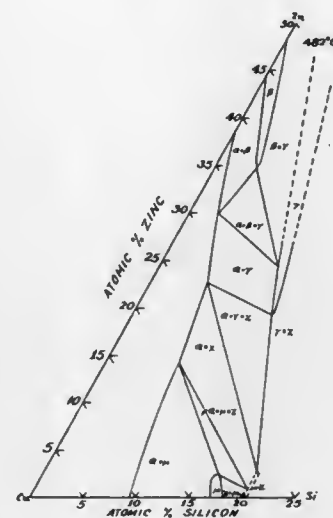
Int. Cl.<sup>2</sup> C22F 1/08

U.S. Cl. 148—11.5 C

6 Claims

1. An improved method of manufacture for a wrought, polycrystalline brass alloy having a shape memory characteristic and a low spring back coefficient comprising the steps of providing a mixture of constituents consisting essentially of about 0.56 to 6.6, atomic % silicon, 23.5 to 40.5, atomic % zinc and the balance copper, combining said constituents in a substantially homogeneous alloy composition to provide an alloy having a stable beta phase above 454° C. and having a Martensite transformation temperature defined approximately by the formula  $M_s(^{\circ}K) + 3280 - 80Zn - 120Si$  where  $M_s(^{\circ}K)$  is the Martensite transformation temperature in °K, Zn is atomic percent zinc, and Si is atomic percent silicon, and where the Martensite transformation temperature is substantially at or below the temperature of normal use of said alloy, fabrication of said alloy by working said alloy to insure a polycrystalline structure, heating to effect betatizing wherein

essentially all of said alloy is in the beta phase and subsequently quenching said alloy to a temperature at or below the



temperature of normal use of said alloy to retain beta phase in said alloy.

4,014,717

**METHOD FOR THE PRODUCTION OF HIGH-PERMEABILITY MAGNETIC STEEL**

Mario Barisoni, Albano Laziale; Massimo Barteri, Rome; Roberto Ricci Bitti, Lanuvio; Pietro Brozzo, Albano Laziale, and Edmondo Marianeschi, Terni, all of Italy, assignors to Centro Sperimentale, Metallurgico S.p.A. and Terni Società per l'Industria e l'Elettricità S.p.A., both of Rome, Italy

Filed Sept. 16, 1975, Ser. No. 613,956

Claims priority, application Italy, Oct. 9, 1974, 53432/74

Int. Cl.<sup>2</sup> H01F 1/04

U.S. Cl. 148—111

3 Claims

1. A method for the production of oriented-grain high magnetic permeability steel sheet, comprising the steps of continuously casting a steel slab having a weight % composition within the range of 2.5–3.5 Si, 0.01–0.04 S, less than 0.07 C, less than 0.15 Mn, and an acid-soluble aluminum in an amount between 0.01 and 0.05, at a feed rate ranging from 700 to 1000 kg/minute, into an ingot mold of a length over 1200 mm and cooling it in said ingot mold with a quantity of water ranging from 2.8 to 4 m<sup>3</sup> per ton of steel, wherein said cooling is undertaken at a rate such that the slope of the cooling curve attains the minimum possible value; heating the slab so obtained to 1300°–1400° C and immediately thereafter hot-rolling it to a thickness in the range between 2 and 3.1 mm, annealing the strip so obtained at a temperature in the range between 1050° and 1150° C, keeping it at said temperature for a duration between 5 and 30 seconds; cooling it to 750°–850° C at a temperature at which austenite is still present in it, and keeping the strip at this temperature for a deviation ranging from 30 to 200 seconds; and finally quenching it from the initial quenching at a mean cooling rate from the starting to 400° C at a cooling rate ranging between 10° C/second and 100° C/second thereby resulting in an optimum austenite content and thus an optimum amount of high hardness microstructural component which is, in a volume ratio from between 1 to 20%; cold-rolling the strip so obtained with a reduction at ranging from 80 to 90% and subjecting it finally to decarburization and recrystallization annealing operations.

4,014,718

**METHOD OF MAKING INTEGRATED CIRCUITS FREE FROM THE FORMATION OF A PARASITIC PNPN THYRISTOR**

Akihiro Tomozawa, Hinode; Takanori Nishimura, Kokubunji, and Takashi Yamaguchi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

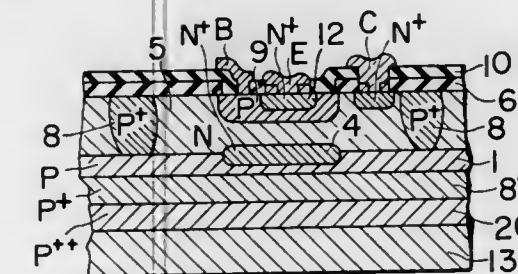
Filed Sept. 2, 1975, Ser. No. 609,604

Claims priority, application Japan, Sept. 4, 1974, 49-100905

Int. Cl.<sup>2</sup> H01L 21/22

U.S. Cl. 148—187

1 Claim



1. In an integrated circuit having at least one or more NPN transistors using a semiconductor substrate of one conductivity type, a method of making integrated circuits free from the formation of a parasitic PNPN thyristor characterized in that a layer of the second conductivity type is formed on said substrate, an isolation region of the first conductivity type is formed in said layer, a layer of the first conductivity type having a high impurity concentration is formed on the back face of said substrate, a diffusion layer of the first conductivity type which serves as a base region of said NPN transistor is formed in said layer of the second conductivity type, a layer of the first conductivity type having a high impurity concentration is formed on the back face of said substrate, an insulation layer is formed on the back face of said substrate and on the substrate, and a diffusion layer of the second conductivity type which serves as an emitter region of said NPN transistor is formed with said insulation layer as a mask.

4,014,719

**FLEXIBLE EXPLOSIVE COMPOSITION COMPRISING PARTICULATE RDX, HMX OR PETN AND A NITROSTARCH BINDER PLASTICIZED WITH TEGDN OR TMETN**

Franklin B. Wells, Memphis, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1975, Ser. No. 625,211

Int. Cl.<sup>2</sup> C06B 45/10

U.S. Cl. 149—19.7

7 Claims

1. A flexible, self-supporting explosive composition of high power and brisance composed essentially entirely of explosive ingredients and consisting essentially of:

- from 60 to 80 weight percent of a particulate high explosive selected from the group consisting of cyclotrimethylenetrinitramine, cyclotetramethylenetrinitramine and pentaerythritol tetranitrate and mixtures thereof having an average particle size not exceeding about 25 microns; and
- from 20 to 40 weight percent of a binder system consisting essentially of nitrostarch of from 12.6 to 13.3 percent nitrogen content and a plasticizer therefor selected from the group consisting of trimethylolmethane trinitrate and triethyleneglycol dinitrate and mixtures thereof, wherein the weight ratio of the nitrostarch to the plasticizer is about from 0.7/1 to 1.4/1, respectively.

4,014,720

**FLEXIBLE EXPLOSIVE COMPOSITION COMPRISING PARTICULATE RDX, HMX, OR PETN AND A HIGH VISCOSITY INTROCELLULOSE BINDER PLASTICIZED WITH TEGDN**

Franklin B. Wells, Memphis, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 625,978

Int. Cl.<sup>2</sup> C06B 45/10

U.S. Cl. 149—19.8

3 Claims

1. A flexible, self-supporting explosive composition of high power and brisance composed essentially entirely of explosive ingredients and consisting essentially of

- about from 50 to 90 weight percent of a particulate high explosive selected from the group consisting of cyclotrimethylenetrinitramine, cyclotetramethylenetrinitramine and pentaerythritol tetranitrate and mixtures thereof having an average particle size not exceeding about 25 microns; and
- about from 10 to 50 weight percent of a binder system consisting essentially of high viscosity nitrocellulose containing about from 12.1 to 12.5 percent nitrogen, and triethyleneglycol dinitrate plasticizer; wherein the amount of said nitrocellulose is about from 1 to 8 weight percent of the composition and the weight ratio of said plasticizer to said nitrocellulose is about from 4:1 to 7:1, respectively.

4,014,721

**IGNITION MIXTURE FOR INITIATING UNDERGROUND IN-SITU COMBUSTION**

Günter Pusch, Celle, and Rudolf Gedenk, Ovelgonne, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Continuation of Ser. No. 427,158, Dec. 21, 1973, abandoned.

This application July 11, 1975, Ser. No. 595,266

Claims priority, application Germany, Dec. 29, 1972, 2263960

Int. Cl.<sup>2</sup> C06B 25/02; C10L 1/18; C10J 5/00; E21B 43/24

U.S. Cl. 149—108.6

8 Claims

1. An ignition mixture for initiating insitu combustion in an underground formation, said mixture based on an unsaturated organic compound and ignited by a free oxygen-containing gas, containing:

- from about 2 to about 30 parts by weight of the total weight of said mixture of olefinic hydrocarbons or unsaturated fatty acids,
- from about 0.1 to about 15 parts by weight of an organic peroxide,
- from about 0.001 to about 0.1 parts by weight of a heavy metal salt.

4,014,722

**METHOD OF MAKING ELECTRIC CONDUCTOR**

Lawrence R. Deardurff, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 322,311, Jan. 10, 1973, Pat. No. 3,818,412. This application June 17, 1974, Ser. No. 480,438

The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> H01B 1/04, 5/16

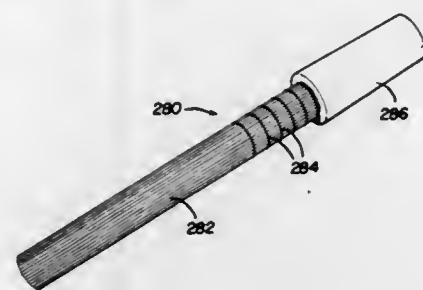
U.S. Cl. 156—52

4 Claims

1. In a method of making an electrically conductive roving, including uniformly spirally wrapping in spaced relation a non-conductive binding element around a bundle of electrically conductive filaments forming a cylindrical bundle of conductive filaments having windings of binding element thereon and forming a uniform semi-conductive overcoat around said roving in good electrical contact with said bundle of conductive filaments, the improvement comprising the



steps of impregnating the spaces between the windings of said binding element and said conductive filaments by dipping said roving in a liquid polymeric dispersion of conductive particles, partially curing the polymer coating by heating the roving,



cooling the partially cured polymeric coating, overcoating the partially cured polymeric coating with an overcoat integral with said coating by dipping said roving in said liquid polymeric dispersion and fully curing said coating and integral overcoat by heating said roving.

4,014,723

## COMPOSITE CONTAINERS

Ulpian Robin Edward Frost Jones, St. Albans, England, assignor to The Metal Box Company Limited, Reading, England

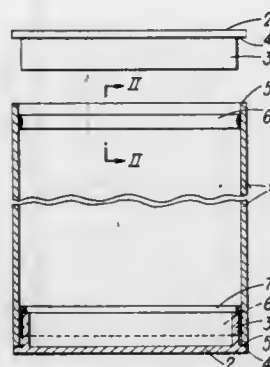
Filed Mar. 30, 1972, Ser. No. 239,564

Claims priority, application United Kingdom, Apr. 14, 1971, 9377/71

Int. Cl.<sup>2</sup> B29C 27/00

U.S. Cl. 156—69

3 Claims



1. The method of making a container of the type including an open ended tubular body and a closure member having a plug portion receivable in one end of said body, said method including the steps of applying a thick continuous band of softened thermoplastics material to the interior of the body at a position spaced from an adjacent end face of the body, smearing the thermoplastics material along the interior of the body by pressing the plug portion of the closure member axially of the body into closing relation with the body and with concomitant formation at the inner end of the plug portion of a bead of the thermoplastics material to caulk the leak path between the body and the plug portion to the rim adjacent to the end face of the body, and cooling the thermoplastics material to create a bond between the plug portion and the body, the thermoplastics material being applied to the body in a molten state immediately prior to the application of the end closure member to the body with the thermoplastics material being applied in the form of a jet during relative rotation between the jet and body.

4,014,724

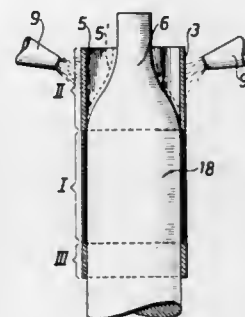
## BOTTLE-SHAPED CONTAINERS OF THE ONE-WAY TYPE AND A METHOD FOR THE MANUFACTURE OF THE SAME

Ruben A. Rausing, Via Kenia 22-24, Rome, Italy  
Filed Dec. 15, 1975, Ser. No. 640,861

Claims priority, application Switzerland, Jan. 3, 1975, 2/75  
Int. Cl.<sup>2</sup> B29C 27/29

U.S. Cl. 156—86

4 Claims



1. A method for making a container from a blank of a laminate material, said laminate having two layers of a heat-shrinkable foamed plastic material and an intermediate layer disposed between the layers of foamed plastic material intermediate the longitudinal ends of the blank to form two end zones and an intermediate contiguous transverse zone, said intermediate layer comprising a material selected from the group consisting of a homogeneous plastic material, metal foil, glass film, and paper said method comprising bending the blank around a first cylindrical mandrel, the axis of which extends transversely of the blank, with the longitudinal ends of the blank overlapping, heat sealing the overlapping longitudinal ends of the blank to form a tube-like element, removing said tube-like element from the first mandrel, placing the tube-like element on a second mandrel having a cylindrical portion for receiving the intermediate transverse zone of the tube-like element and a portion of reduced cross-sectional area at one end thereof adjacent one end zone of the tube-like element, heating the last mentioned end zone of the tube-like element to shrink the end zone to conform with the portion of the second mandrel having a reduced cross-sectional area to form a bottle necked top opening of the container and closing the opposed end zone of the tube-like element to form a liquid tight bottom seal for the container.

4,014,725

## METHOD OF MAKING CARBON CLOTH FROM PITCH BASED FIBER

David Arthur Schulz, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,777

Int. Cl.<sup>2</sup> D03D 25/00; D01F 9/12; B32B 3/06

U.S. Cl. 156—148

8 Claims

1. A process for producing carbon cloth which comprises spinning a carbonaceous fiber from a nonthixotropic carbonaceous pitch having a mesophase content of from 40 percent by weight to 90 percent by weight which under quiescent conditions forms a homogeneous bulk mesophase having large coalesced domains; heating the spun fiber in an oxygen-containing atmosphere at a temperature of from 250° to 500° C. for a time sufficient to oxidize the fiber to an oxygen content of from 17 percent by weight to 30 percent by weight; processing the oxidized fiber into a cloth by a process selected from this group consisting of knitting and weaving; and carbonizing the cloth produced in this manner by heating in an inert atmosphere.

4,014,726

## PRODUCTION OF GLASS FIBER PRODUCTS

Harland E. Fargo, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 18, 1974, Ser. No. 452,293

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B32B 17/04, 27/42

U.S. Cl. 156—167

6 Claims

1. A method of preparing a bonded glass fiber product comprising the steps of:

- forming glass fibers from molten streams of glass;
- combining the glass fibers with a heat curable aqueous binder composition comprising
  - 60-95 percent by weight of a complex polymeric component formed from a reaction mixture consisting of phenol, formaldehyde, a modifier selected from the group consisting of starch and compounds which are degradation products of starch, and urea, wherein said polymeric component is produced by:
    - charging a reactor with a mixture of formaldehyde and phenol in a mole ratio of formaldehyde/phenol of from 2.9-4.2/1;
    - reacting the mixture in the presence of a condensing agent until it has a free formaldehyde content of from 7-15 percent of the total weight of formaldehyde, phenol and water;
    - adding to the reactor the starch or starch decomposition product in an amount ranging from 5 to 50 percent of the phenol charged; and
    - cooling the reactor contents;
  - 10-80 percent of urea, based upon the weight of the phenol originally charged to produce the polymeric component, with the proviso that at least 5 percent of urea, based upon the weight of the phenol originally charged to produce the polymeric component is dissolved in the polymeric component for at least fifteen minutes at a temperature of at least 90°F.
  - 0.5-25 percent of a lubricant based upon the total weight of the complex polymeric component and any unreacted urea,
  - 0.1-1 percent of a silane, based on the total weight of the complex polymeric component and any unreacted urea,
  - 0.2-3.0 percent of an ammonium salt of a strong acid based on the total weight of the complex polymeric component and any unreacted urea,
  - water, to dilute the binder to a desired solids content of from 1-40 percent,
- consolidating the fibers and heat curable aqueous binder composition into a loosely packed mass on a foraminous conveyor; and
- curing the heat curable binder composition in situ on the glass fiber product.

4,014,727

## CORRUGATING ADHESIVE COMPOSITION

Camillus B. Musselman, Chesterfield, and Edward M. Bovier, St. Louis County, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Division of Ser. No. 477,326, June 7, 1974, Pat. No. 3,912,531, and a continuation-in-part of Ser. No. 264,868, June 21, 1972, abandoned, and a continuation-in-part of Ser. No. 368,109, June 8, 1973, abandoned. This application July 18, 1975, Ser. No. 597,396

Int. Cl.<sup>2</sup> B31F 1/22

U.S. Cl. 156—205

7 Claims

1. A method of making multiwall thickness corrugated board at high speeds comprising the steps of

- preparing an adhesive mix having modified waxy starch in the carrier portion, said starch having a fluidity of about 25 to about 90 mls,
- applying said mix to a corrugator, and

c. forming a multiwall board on said corrugator at a higher than normal rate of speed.

4,014,728

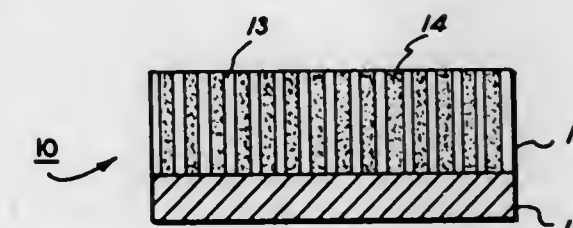
## METHOD OF MAKING AN IMAGING MEMBER

Peter F. Erhardt, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 527,664, Nov. 27, 1974, Pat. No. 3,979,495. This application Mar. 29, 1976, Ser. No. 671,239  
Int. Cl.<sup>2</sup> B29D 7/18

U.S. Cl. 156—244

1 Claim



1. A method of forming an imaging member comprising a photoconductive layer having plural photoconductive paths oriented substantially perpendicular to a surface of said layer and a conductive substrate, said method consisting essentially of:

- preparing a photoconductive block copolymer by anionic copolymerization of a polynuclear condensed aromatic vinyl compound selected from the group consisting of 3-vinylpyrene, 2-vinylanthracene, 2-propenyl-2-anthracene and 2-vinyl-N-alkyl carbazoles with a monomer selected from the group consisting of 1,3-butadiene, 1,3-pentadiene (piperylene), 2-methyl-1,3-butadiene (isoprene) 2,3-dimethyl-1,3-butadiene and cyclic octamethyl tetrasiloxane;
- extruding and cooling a melt of said copolymer to form an extrusion having lamellae of at least two phases, one phase being photoconductive and the other phase being elastomeric, said lamellae being disposed in a direction lying substantially parallel to the direction of extrusion, and cutting said extrusion transversely to form said layer; and
- placing said layer upon a conductive substrate, with said lamellae being disposed in a direction substantially normal to the horizontal plane of said substrate to form an imaging member.

4,014,729

## METHOD FOR BONDING AND PLATING WITH EXPLODING FOIL

Gay Leon Dybwad, Emmaus, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 362,191, May 21, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,775

Int. Cl.<sup>2</sup> B23K 11/26; C03C 27/08; C23C 13/08

U.S. Cl. 156—275

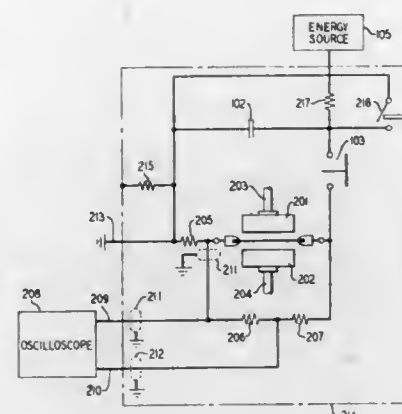
10 Claims

1. A method of bonding a pair of workpieces comprising the steps of

- cutting at least one slit in a metal foil slab along a surface thereof to form at least two strips of said foil separated by said slit,
- pressing said foil between said workpieces in an area to be bonded, and
- exploding said foil by the rapid application of a high inten-



whereby said strips are drawn together by said current during said explosion.



sity current thereto in a direction parallel to said slit and said strips,

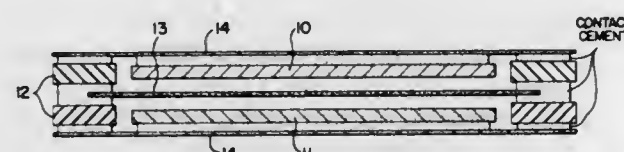
4,014,730

# POLYMER DENSIFIED GRAPHITE SHEET AS IMPERVIOUS CONNECTOR FOR AN ELECTRICAL CAPACITOR

Theodore B. Selover, Jr., Shaker Heights; Donald L. Boos, Garfield Heights, and Thomas H. Hacha, Willoughby, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio Continuation-in-part of Ser. No. 385,435, Aug. 3, 1973, which is a continuation-in-part of Ser. No. 251,225, May 8, 1972, abandoned. This application July 31, 1974, Ser. No. 493,278 Int. Cl.<sup>2</sup> B05D 7/24

U.S. Cl. 156—331

5 Claims



1. A process for preparing an electron-conducting, ion-insulating connector for use in an electrical capacitor comprising the following steps in sequence:

- a. coating a single surface of a thin, flexible, porous, sheet of graphite having a thickness within the range of about 0.3 to 10 mils with a viscous paste of an elastomer containing a vulcanizing agent, said elastomer being a member selected from the group consisting of butyl rubber, copolymers of butadiene-urethane and vinylidene fluoride-hexafluoropropylene;
- b. covering the elastomer-coated surface on the graphite with a second sheet of the graphite, forming a composite;
- c. compressing the composite formed in (b) under sufficient pressure to impregnate the two sheets of graphite with elastomer and to exude any excess elastomer from therebetween so as to form a laminate of essentially the two sheets of elastomer-impregnated graphite; and
- d. vulcanizing the elastomer-impregnated laminate obtained in (c) at a temperature of from about 25° to 220° C and a pressure of from about 15 to 15,000 psi.

4,014,731

# APPARATUS FOR BINDING ARTICLES WITH TAPE

Iwao Muto, Minami-ashigaramachi, Japan, assignor to To-shiba Seiki Kabushiki Kaisha, Japan Filed Mar. 9, 1976, Ser. No. 665,311 Claims priority, application Japan, July 3, 1975, 50-81406 Int. Cl.<sup>2</sup> G05G 15/00; B65B 13/30

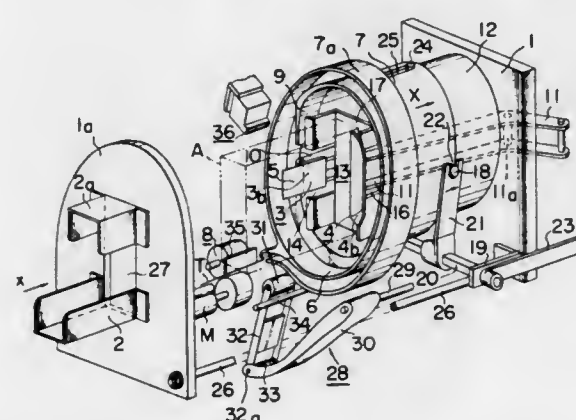
U.S. Cl. 156—350

12 Claims

1. Apparatus for binding articles with tape comprising: an article receiving structure for guiding an article into and positioning the same in binding position; tape roller mean for feeding a specific length of a free end portion of a tape from a tape supply and subsequently drawing back the tape;

a tape guide for guiding said free end portion of the tape into a voluted and looped state of a number of turns around a part of the article thus positioned and movable in a manner to separate from and leave the tape in said state;

clamping means comprising an actuating mechanism and a pair of clamping members for clamping and holding the article in the binding position from opposite sides thereof, one clamping member having an extension for holding the leading extremity of the tape free end portion against the article, the tape in said state thereupon being drawn



back by the tape roller means and thereby being bound tight around the article;

cutting means for cutting off the tape free end portion thus bound, thereby forming a trailing extremity thereof; securing means for securing the tape trailing extremity to the tape portion thus bound; and control and actuating means operating upon reception of the article by the article receiving structure to operate in appropriate sequence the tape roller means, the tape guide, the clamping means, the cutting means, and the securing means.

4,014,732

# DEVICE FOR DRYING AND SETTING THE ADHESIVE ON BACKS OF BOOKS

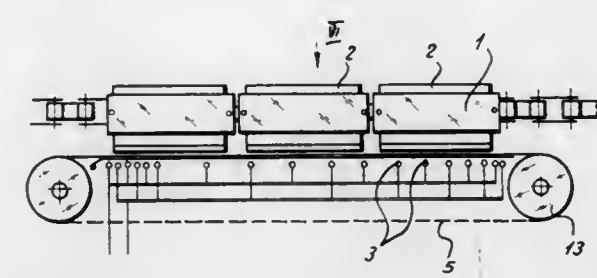
Alexander Beckert, Vienna, Austria, and Karl-Heinz Knobbe, Ellerbeck, Germany, assignors to Firma Mohndruck, Rein-hard Mohn oHG, Gutersloh, Germany Filed May 29, 1975, Ser. No. 581,616

Claims priority, application Germany, June 1, 1974, 2426704; Nov. 29, 1975, 2553816

Int. Cl.<sup>2</sup> B29C 19/02

U.S. Cl. 156—380

9 Claims



1. A device for drying and setting of adhesive on backs of book blocks, in particular of backing adhesive material applied to backs of books, comprising:

- a book binding machine including adjacent thereto a feed-ing means including a conveyor belt on which said backs of said books are disposed and a gripper means for hold-ing said books in a feeding and clamping range;
- a plurality of HF-electrodes positioned opposite to said backs of the book blocks and laterally with respect to a longitudinal axis relative to and under said conveyor belt, said electrodes being mounted in said feeding and clamp-

ing range for said gripper means of said feeding means adjacent to said book binding machine, said HF-electrodes being spaced apart at different distances with respect to each other, the distance of the electrodes with respect to each other is substantially close together at a starting range of said conveyor belt, said HF-electrodes being spaced farther apart at a center range of said conveyor belt, and said HF-electrodes being spaced close with respect to each other in a spacing which substantially corresponds to their distance spacing at said starting range of said conveyor belt at an end of the conveyor belt; and an exhaust means for removing evaporation leaving said backing adhesive material.

4,014,733

# APPARATUS FOR PRODUCING MULTIPLE PANE WINDOWS

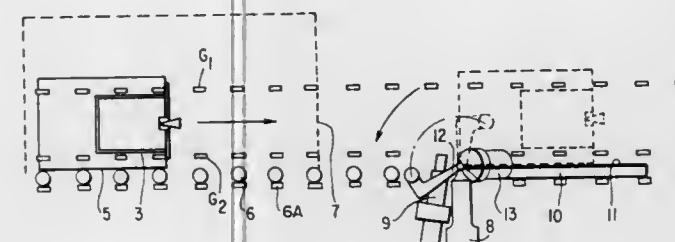
Jacques Charles Loubet, Montmorency, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France Continuation of Ser. No. 335,016, Feb. 23, 1973, abandoned. This application Oct. 16, 1974, Ser. No. 515,368

Claims priority, application France, Mar. 2, 1972, 72.07230 Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> B32B 31/12

U.S. Cl. 156—446

5 Claims



1. Apparatus for the manufacture of multiple pane windows of polygonal shape, said apparatus comprising means defining a rectilinear path of travel for a pair of edges of a pair of transparent sheets supported parallel to, in fixed position, and substantially in register with respect to each other, means disposed adjacent an upstream portion of said path to heat said edges upon passage thereof along said portion, a nozzle having an orifice disposed downstream of said heating means to inject a sealant between said edges, cooling means disposed along said path downstream of said heating means and nozzle to abstract heat from said sealant, crank means pivoted about a fixed axis transverse of said path and substantially intersecting the orifice of said nozzle, and means on said crank means to grip said sheets upon arrival of the trailing end of said edges substantially at said axis, whereby said sheets may be rotated by said crank means in the plane thereof about said axis with said axis substantially intersecting the trailing end of said edges to present another pair of the edges of said sheets to said path.

4,014,734

# TUBE FORMING DEVICE

Richard A. Patterson, Woodbury, Minn., assignor to Minne-sota Mining and Manufacturing Company, St. Paul, Minn. Continuation of Ser. No. 479,671, June 17, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,761

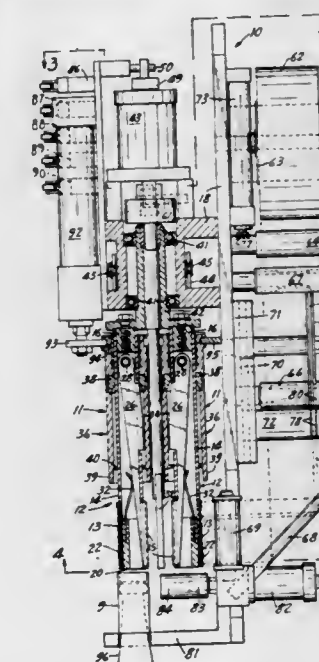
Int. Cl.<sup>2</sup> B31F 7/00

U.S. Cl. 156—459

10 Claims

1. A device for forming a predetermined length of adhesive coated tape having opposite first and second ends into a tube, said device comprising: a mandrel comprising a support member having an axis and a multiplicity of flexible resilient bristles, each of said bristles attached at one end to said support member and

projecting radially outwardly therefrom and the outer tips of said bristles defining a peripheral surface around said axis in the shape and size of a said tube to be formed so that a said length of tape may be wrapped around the peripheral surface and its first and second ends overlapped to form a tape tube with a seam running axially from end to end; and



means mounted for movement axially along the support member and adapted to engage an end of a said tube formed around said peripheral surface and to move the tube axially off the mandrel; said means also deflecting said bristles and breaking the contact between the tips of the bristles and the pressure sensitive adhesive on the inner surface of the tube.

4,014,735

# CONCENTRATION AND SEPARATION OF CORROSIVE LIQUID MIXTURES

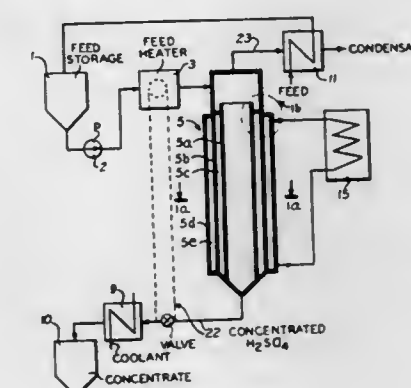
Hans Guth, Berg, Neukirchen; Hans-Joachim Kaiser; Klaus Kleine-Weischede, both of Leverkusen; Hermann Wieschen, Cologne, all of Germany, and Hans L. Kühnlein, Fullinsdorf, Switzerland, assignors to HCH. Bertrams Aktiengesellschaft, Basel, Switzerland and Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 442,937, Feb. 15, 1974, Pat. No. 3,933,575. This application Aug. 15, 1975, Ser. No. 605,365 Claims priority, application Germany, Mar. 6, 1973, 2311085

Int. Cl.<sup>2</sup> B01D 1/22, 3/00, 1/00

U.S. Cl. 159—13 A

4 Claims



1. An apparatus for processing a corrosive liquid comprising first, second and third concentric upright tubes defining first, second and third concentric spaces, said first tube being made of heat resistant material inert relative to the corrosive liquid, means for passing said corrosive liquid in the form of a film over the wall of said first tube remote from said second space, a molten material in said second space, a further molten mate-



rial in said third space, external heating means for said further molten material, and means for recirculating said further molten material in said third space and to said external heating means.

4,014,736

# PROCESS FOR TREATING A SLURRY OF CELLULOSIC MATERIAL

Ernest Arthur Sexton, St. Catharines, Canada, assignor to The Ontario Paper Company Limited, Thorold and Canadian International Paper Company, Montreal, both of, Canada  
Filed Dec. 17, 1974, Ser. No. 533,692  
Int. Cl.<sup>2</sup> D21C 9/06, 9/18

U.S. Cl. 162—38

21 Claims

1. A process for treating a slurry of cellulosic material including application of a treating liquid to a mat of the cellulosic material which comprises:

- a. diluting the slurry to reduce its consistency to a flowable level;
- b. depositing the diluted slurry on a surface permeable to the liquid and solid phase thereof but which is substantially more permeable to the liquid phase;
- c. subjecting the deposited slurry to a pressure differential, whereby more of the liquid phase thereof than the solid phase passes through the permeable surface to increase the consistency of the slurry to a value between the consistency of the diluted slurry deposited on the surface and the consistency of the slurry prior to its dilution, thereby forming a mat of cellulosic material on said surface;
- d. recycling substantially all of the liquid and solids which pass through the surface for use as the slurry diluent in step (a); and then
- e. applying the treating liquid to the mat of cellulosic material on said surface.

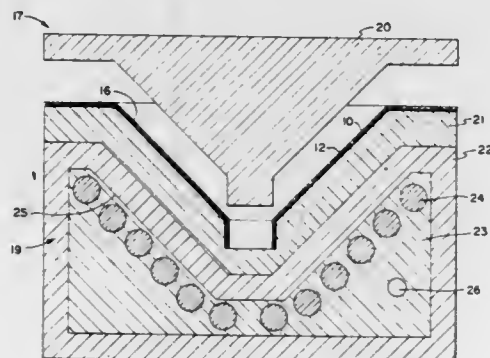
4,014,737

# METHOD OF MOLDING PREFORM HAVING 600% BY WEIGHT WATER

Robert M. Brennan, R.R. 8, Columbia City, Ind. 45725  
Filed May 19, 1975, Ser. No. 578,933  
Int. Cl.<sup>2</sup> D21J 3/12

U.S. Cl. 162—226

15 Claims



1. A method of forming a molded cellulosic article comprising:

- forming a pre-form comprising a wet layer of cellulosic fibers, having at least about 600% by weight water, on a water-pervious wire net by contacting the wire net with a water slurry of cellulosic fibers and drawing the fibers onto the wire net by suction through said wire net.
- disposing the pre-form having at least about 600% by weight, while water on said wire net, onto a first die surface of a mold,
- contacting the pre-form, having at least about 600% by weight water, with a second die surface of said mold, and
- drying the pre-form having at least about 600% by weight water to less than about 5% by weight water in a heated press by pressing said wet layer of cellulosic fibers on said wire net in said heated press between said die surfaces at

a pressure less than about 400 p.s.i., while allowing resulting steam to escape from said mold through said wire net and through said cellulosic fibers.

4,014,738

# SIFTING DRUM PAPER MACHINE WHEREIN THE DILUENT WATER IS CONTROLLED

Klaus Prechtel, Heidenheim, Germany, assignor to J. M. Voith GmbH, Heidenheim (Brenz), Germany  
Filed Sept. 18, 1974, Ser. No. 507,166  
Claims priority, application Germany, Sept. 20, 1973, 2347369

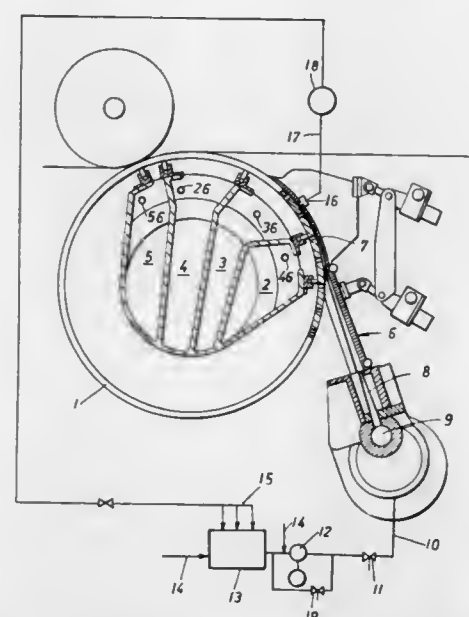
Disclosure was also published under second Trial Voluntary

Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> D21F 1/06, 1/08

U.S. Cl. 162—258

2 Claims



1. A sifting drum paper machine having a sifting drum with a pulp material inlet located at the outside thereof and suction chambers disposed in the interior thereof and with means for measuring pressure in vicinity of a paper web-forming part on the surface of the drum, said pressure measuring means operatively connected with means controlling the quantity of diluent water to the supply of pulp material to said pulp material inlet in accordance with said measured pressure.

4,014,739

# MOLD CONSTRUCTION HAVING REMOVABLE BASE MEMBER

Frederick M. Granberg, Knoxville, Tenn., assignor to International Paper Company, New York, N.Y.

Filed May 9, 1974, Ser. No. 468,421

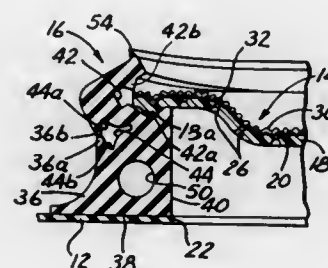
Disclosure was also published under second Trial Voluntary

Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B41B 1/160; D21J 7/00

U.S. Cl. 162—274

13 Claims



1. A mold for use with a molded pulp product making apparatus and the like, said mold comprising, in combination, base member means having a deposit surface adapted to receive a layer of pulp thereon and having a peripheral marginal

edge, support frame means including a unitary resilient body member defining wall means circumscribing said base member and having interior and exterior surfaces, first circumferential groove means formed in the interior surface of said wall means receiving at least a portion of said marginal edge of said base member means in supporting relation, second circumferential continuous groove means of a predetermined transverse cross-sectional configuration formed in said exterior surface of said wall means, and elongated retainer means releasably received within said second groove means and having a length substantially equal to the circumferential length of said second groove means, said body member being made of a material capable of selective manipulation when said retainer means is removed from said second groove means to allow said marginal edge of said base member to be inserted and removed from said first groove means, said body member and said retainer means cooperating to substantially prevent removal of said base member from said first groove means when said retainer means is disposed within said second groove means.

4,014,740

# STRUCTURE FOR TRANSFERRING A WEB FROM THE PRESS SECTION TO THE DRYING SECTION OF A PAPER MACHINE

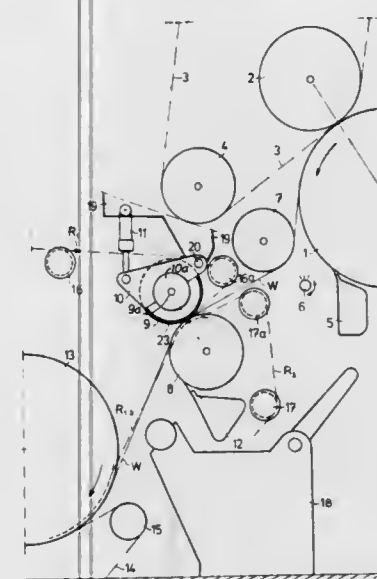
Martti Koponen, and Lassi Veijonen, both of Jyväskylä, Finland, assignors to Valmet Oy, Helsinki, Finland  
Filed Sept. 8, 1975, Ser. No. 611,423

Claims priority, application Finland, Sept. 12, 1974, 742670

Int. Cl.<sup>2</sup> D21F 7/00

U.S. Cl. 162—289

11 Claims



1. In a paper machine, a press section having a last press roll from which a web travels beyond the press section, a drying section having a first drying roll for receiving the web traveling beyond said last press roll from said press section, roll means situated between said last press roll and said first drying roll for guiding and supporting the web as it travels from said last press roll to said first drying roll, said roll means including a pair of rolls situated along the path travelled by the web from said last press roll to said first drying roll, weighting roll means cooperating with that one of said pair of rolls which is nearer to said first drying roll for defining with said one of said pair of rolls a nip through which the web travels least when a web initially travels from the press section to the drying section, and control means cooperating with said weighting roll means for controlling the pressure between the latter and said one of said pair of rolls at least during travel of an initial portion of the web from the press section to the drying section and for displacing said weighting roll means away from said one roll when the travel of the web from the press section to the drying section while supported and guided by said pair of rolls has become stabilized, said one of said pair of rolls and the nip defined between the latter and said weighting roll means being

situated substantially midway between the other of said pair of rolls and said first drying roll.

4,014,741

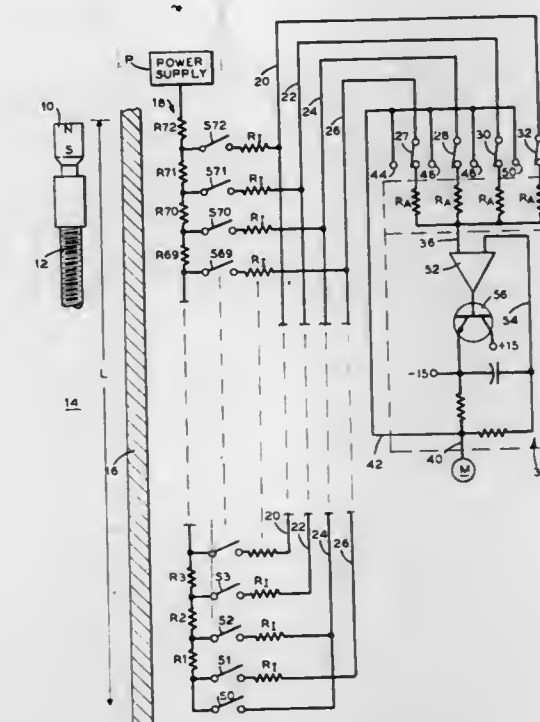
# NUCLEAR CONTROL ROD POSITION INDICATING ASSEMBLY

Milton Kearney Foxworthy; John Timothy Huston, and Burton Davis Ziels, all of Lancaster, Ohio, assignors to Diamond Power Specialty Corporation, Lancaster, Ohio  
Filed July 11, 1975, Ser. No. 594,999

Int. Cl.<sup>2</sup> G21C 7/00

U.S. Cl. 176—19 EC

9 Claims



1. A position indicator circuit comprising:  
a voltage divider circuit;  
a series of reed switches connected to different points of said voltage divider circuit;  
four output lines sequentially connected to every fourth one of said series of reed switches for receiving output signals from said voltage divider circuit through said series of reed switches; and  
indicating means connected to said output lines for indicating the output of said divider circuit.

4,014,742

# PRODUCTION OF CITRIC ACID IN SLACK WAX MEDIA

Robert C. Nubel, Wantagh, N.Y., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 3, 1976, Ser. No. 663,347

Int. Cl.<sup>2</sup> C12D 1/04

U.S. Cl. 195—28 R

5 Claims

1. A process for producing citric acid which comprises aerobically propagating a citric acid accumulating strain of yeast of the genus *Candida* in an aqueous nutrient medium containing enough readily assimilable source of carbon to promote growth but insufficient to permit the accumulation of citric acid; introducing slack wax as the principal source of assimilable carbon together with a solubilizing agent into the aqueous nutrient medium after at least 50% of the readily assimilable source of carbon has been utilized, continuing the aerobic propagation until a level of at least about 1 gram of citric acid has been accumulated per liter of aqueous medium and recovering citric acid, said solubilizing agent being selected from the group consisting of alkanols having 4 to 10 carbon atoms in each alkyl moiety, lower alkyl esters of alkanic acids having 2 to 6 carbon atoms, alkenes and alkanes having 8 to 19 carbon atoms, turpentine, mineral oil and mixtures thereof.



4,014,743

## METHOD FOR CONTINUOUS PREPARATION OF COOKED THINNED STARCH PASTES

William C. Black, Cedar Rapids, Iowa, assignor to Penick &amp; Ford, Limited, Cedar Rapids, Iowa

Filed Jan. 10, 1973, Ser. No. 322,362

Int. Cl.<sup>2</sup> C12D 13/02

U.S. Cl. 195—31 R

6 Claims

1. Method for continuous preparation of cooked thinned starch paste ready for application as a starch size or starch adhesive, comprising in combination the steps of:

- continuously introducing a feed into a single chamber converting zone provided with agitation means, said feed consisting essentially of a water slurry of raw granule starch containing from 10 to 45% by weight starch on a dry solids basis;
- also continuously introducing into said chamber a starch thinning enzyme consisting essentially of alpha amylase;
- maintaining in said converting zone for an average residence time of five minutes or longer a continuously agitated and substantially uniformly mixed body of starch suspended in water containing said alpha amylase in active condition for thinning said starch said agitation causing continual backmixing from the lower to the upper portion of said zone, said body being at a temperature which is above the gelatinization temperature of the starch to gelatinize the incoming granule starch and at which said alpha amylase is active, and to subject the gelatinized starch, consisting of a blend of starch molecules of different degrees of enzyme conversion, to further enzyme conversion for viscosity reduction, said body of starch being maintained at a predetermined substantially uniform viscosity of not over 5000 centipoises, as determined by a Brookfield Viscometer at 100 rpm and 190° F., and having a reducing sugar content corresponding to a dextrose equivalent (D.E.) of below 3%;
- continuously withdrawing from said chamber, in proportion to the volume of said feed, a stream of completely gelatinized thinned starch paste consisting of said blend of starch molecules of different degrees of enzyme conversion at substantially the same viscosity and D.E. as the body of starch maintained in said chamber; and
- inactivating the alpha amylase enzyme in said withdrawn paste without substantial further enzyme conversion of said withdrawn paste.

4,014,744

## PROCESSES FOR MEASURING TRI-, DI- AND MONOGLYCERIDES

Eppie Sheng Chang, Elkhart, Ind., assignor to Miles Laboratories Inc., Elkhart, Ind.

Filed Jan. 30, 1975, Ser. No. 545,703

Int. Cl.<sup>2</sup> G01N 31/14

U.S. Cl. 195—103.5 R

8 Claims

1. In a process for measuring glycerides in a fluid in which substantially all of the glycerides are saponified to glycerol with an ethanol-potassium hydroxide saponifying reagent, the improvement which consists of effecting saponification by incubating a combination of the fluid and the saponifying reagent at a temperature between 35 and 40° C. until said saponification is substantially complete.

4,014,745

## APPLICATION OF LUCIFERASE ASSAY FOR ATP TO ANTIMICROBIAL DRUG SUSCEPTIBILITY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Emmett W. Chappelle, Baltimore; Grace L. Picciolo, Tantalion, both of Md.; Hillar Vellend, Newton Upper Falls, Mass.; Stephanie A. Tuttle, Watertown, Mass.; Michael J. Barza, Boston, Mass., and Louis Weinstein, Newtonville, Mass.

Filed Apr. 30, 1975, Ser. No. 572,991

Int. Cl.<sup>2</sup> C12K 1/04

U.S. Cl. 195—103.5 K

15 Claims

1. A method for determining the sensitivity of bacteria to antimicrobial agents by measurement of the ATP index indicating sensitivity, which comprises:

- culturing bacterium in a growth medium;
- developing a uniform inoculum;
- preincubating the inoculum for a period sufficient to initiate growth;
- aliquoting at least three test portions, at least one test portion having an antibiotic added and at least two test portions without antibiotic added;
- assaying the amount of bacterial adenosine triphosphate in the test portions, one assay on a test portion without antibiotic being made prior to any incubation, the other assays being made after incubation;
- determining the ATP index to indicate sensitivity of the bacterium to the antibiotic;
- the ATP index being determined according to the formula:

$$\text{ATP index} = B_t - A_t/A_0 - A_0$$

where

$B_t$  represents a light reading for a test portion treated with antibiotic and allowed to incubate for a time  $t$ ;

$A_t$  represents a light reading for a test portion not treated with antibiotic and allowed to incubate for a time  $t$ ; and

$A_0$  represents a light reading for a test portion not treated with antibiotic and which is not allowed to incubate, at time zero.

4,014,746

## METHOD OF AND APPARATUS FOR COLLECTING CULTURES

Donald J. Greenspan, Riverside, N.J., assignor to U.S. Medical Research and Development, Inc., Riverside, N.J.

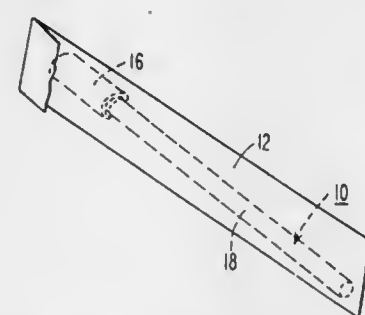
Continuation-in-part of Ser. No. 358,350, May 8, 1973, Pat. No. 3,890,954. This application June 23, 1975, Ser. No. 589,521

The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C12K 1/00

U.S. Cl. 195—103.5 R

22 Claims



- Apparatus for collecting cultures and the like comprising: a hollow tubular container having a closed end, an open end and sides extending therebetween;
- a culture-sustaining liquid positioned within the tubular container adjacent the closed end;
- a swab including an elongated member and an absorbent tip; and
- a barrier member extending across said tubular container so as to form a substantially leak-proof barrier between the

4,014,748

## ANAEROBIC CULTURE COLLECTING AND TRANSPORTING APPARATUS

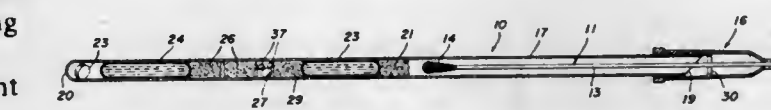
Ernest Elliott Spinner, Grandview, Mo., and Myron Norton Slotsky, Overland Park, Kans., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Dec. 22, 1975, Ser. No. 643,260

Int. Cl.<sup>2</sup> C12K 1/00

U.S. Cl. 195—127

26 Claims



- A culture collecting and transporting apparatus comprising: an elongated tube having an open end with a removable closure thereon and an opposite closed end;
- a swab having an absorbent swabbing tip located within said tube and having an elongated stem located adjacent the open end of the tube;
- a first frangible ampoule disposed within said tube adjacent said swabbing tip, said ampoule containing a liquid nutrient medium which, when released from said ampoule, moistens said swabbing tip;
- a gas producing agent located within said tube between the tube closed end and the nutrient medium ampoule;
- a second frangible ampoule located within said tube adjacent said gas producing agent, said second ampoule containing an activating liquid which, when released from said second ampoule, flows into reactive contact with said gas producing agent to cause hydrogen to be generated within said tube; and
- said tube being made of flexible material to enable the liquids in said ampoules to be released by squeezing the tube inwardly to rupture the ampoules; and
- a filter located between said ampoules, said filter being gas permeable and liquid impermeable.
- A culture collecting and transporting apparatus comprising: a closable container having a collected culture receiving depot therein,
- in the container a frangible rupturable ampoule containing a liquid nutrient medium to be supplied to a culture placed on the depot, and
- chemical means in the container selectively activated after a culture is placed on the depot, said chemical means when activated supplying gaseous carbon dioxide, and a reducing agent system effective for reducing oxygen, at least in the container space surrounding the collected culture.

4,014,749

## TUBE FURNACE FOR THE CRACKING OF ORGANIC FEED STOCK

Armin Dorner, and Walter Kreuter, both of Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Apr. 22, 1974, Ser. No. 463,103

Claims priority, application Germany, Apr. 25, 1973, 2320872

Int. Cl.<sup>2</sup> C10G 9/20; F22B 21/24, 37/12

U.S. Cl. 196—116

4 Claims

- A tube furnace for the thermal cracking of hydrocarbon comprising a combustion chamber, a plurality of duct systems traversing said chamber for conducting a hydrocarbon there-through, each duct system having an inlet side and an outlet side, each duct system comprising at said inlet side at least two tubes in said chamber of undulating configuration each with a plurality of loops in mutually parallel vertical planes for conducting said hydrocarbon in parallel and, at said outlet side, a common pipe in said chamber of undulating configuration with a plurality of loops in a vertical plane parallel to the

closed end and the open end, said barrier member including an opening adapted to permit said absorbent tip to pass therethrough into said liquid and form a seal around said elongated member.

21. An improved method of collecting cultures in a live condition utilizing an apparatus comprising a collection tube having sides and a bottom, a culture-sustaining liquid adjacent the bottom of said tube, a swab including an elongated member having an absorbent tip, and barrier means extending across said tube above said liquid, said barrier means having a self-closing opening therein, the improved method comprising the steps of:

- swabbing an area of culturable material with the absorbent swabbing tip of the swab;
- inserting the swab into the tube;
- forcing the absorbent tip of the swab through the self-closing opening of the barrier means so as to permit the liquid to saturate the tip; and
- forming a seal at said self-closing opening around said elongated member so as to substantially prevent the passage of air through said barrier means to said absorbent tip.

4,014,747

## CARTRIDGE FOR A BACTERIA SCREENING DEVICE FOR CONTINUOUSLY MONITORING AND RECORDING THE EXISTENCE OF AIR BORNE BACTERIA AND OTHER MICROORGANISMS

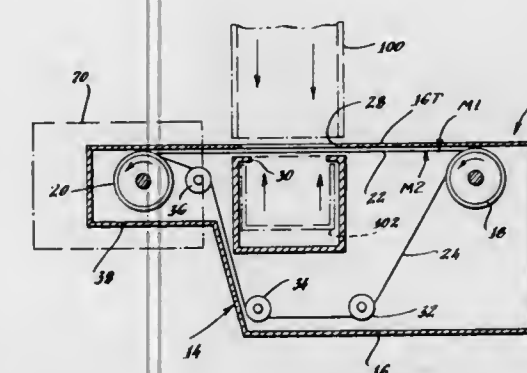
Charles L. Kenyon, 15 MacArthur Drive, Old Greenwich, Conn. 06870

Filed Dec. 4, 1975, Ser. No. 637,832

Int. Cl.<sup>2</sup> C12B 1/02; C12K 1/04, 1/06

U.S. Cl. 195—127

9 Claims

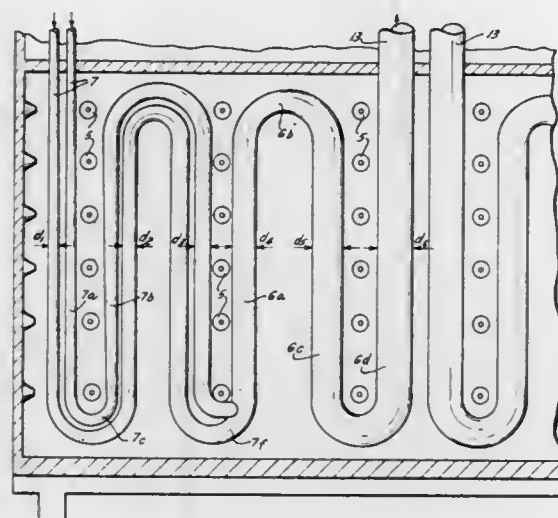


1. A cartridge for removable mounting in a screening device that detects and records the existence of bacteria and other microorganisms present in a gaseous medium, said cartridge comprising:

- an outer casing;
- a supply reel and a take up reel within said casing, at least one of said reels comprising means for engaging with and being driven by means on said screening device;
- a strip comprising active culture medium on a surface thereof, said strip mounted to translate from said supply reel to said take up reel;
- an exposure window permitting contact of said gaseous medium with a limited portion of said active culture when said cartridge is mounted in said screening device;
- separating means for preventing contact between exposed portions of said active culture; and
- shaped means coacting with heating means in said screening device to permit incubation heating of exposed portions of said strip.



vertical planes of said tubes and communicating with said tubes, said tubes opening into and connected to said pipe and forming a junction therebetween, said pipe being of a flow cross section at least equal to that of said tubes at their junction with said pipe, said tubes and said pipes having substantially vertical stretches constituting the major part of their respective lengths, said chamber being of double-T cross



section in a horizontal plane and comprises a central compartment and a pair of end compartments lying transverse to said central compartment, two such duct systems being provided in said chamber with their respective tubes disposed in said end compartment and their respective pipes lying in said central compartment, said chamber being formed by vertical walls, burners being mounted on said walls, said loops lying in planes parallel to said walls.

4,014,750

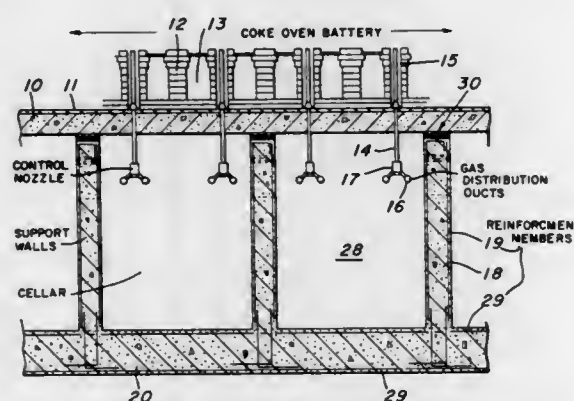
# SUPPORT APPARATUS FOR A BATTERY OF COKE OVENS

Wolfgang Franzer, Wattenscheid, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany  
Filed Jan. 22, 1975, Ser. No. 543,155  
Claims priority, application Germany, Jan. 24, 1974, 2403266

Int. Cl.<sup>2</sup> C10B 1/06, 1/00; E04B 1/68

U.S. Cl. 202-139

5 Claims



1. In a battery of underjet coke ovens having battery decking positioned above a cellar within which ducts extend for supplying gaseous combustion media to the heating flues of the heating walls for the coking chambers forming said coke ovens, the cellar having ducts with nozzle members therein to control the flow of combustible gaseous media in the individual ducts to said flues, a support apparatus to carry said battery decking above said cellar comprising:

concrete support walls extending along only in a parallel direction with respect to the heating walls for the coke oven chambers, said concrete support walls including reinforcement members therein and providing the sole supports for said decking located there above;

a foundation slab including reinforcement members projecting into said concrete support walls, and expansion joints including slip plates between said concrete support walls and said battery decking.

4,014,751

# VAPOR GENERATING AND RECOVERING APPARATUS

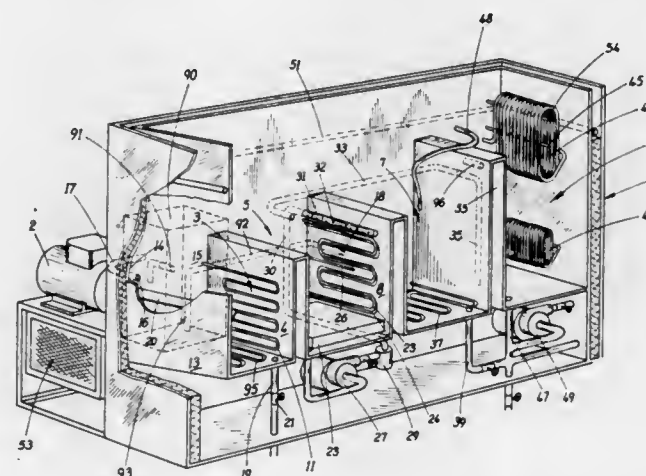
James W. McCord, 9829 Timberwood Circle, Louisville, Ky. 40223

Filed June 13, 1975, Ser. No. 586,494

Int. Cl.<sup>2</sup> B01D 3/42

U.S. Cl. 202-160

16 Claims



1. A vapor generating and recovering apparatus comprising: a housing including at least two chambers therein, a first chamber for vaporizing a first component from a liquid solution containing at least two components therein and a second chamber for recovering said vapor in the form of a liquid;

heat emitting means disposed in heat emitting relation with said first chamber, said heat emitting means being disposed along and contiguous to a vertically extending first wall of said first chamber;

said first chamber having an opposed vertically extending second wall non-parallel to said vertically extending first wall with a third wall disposed therebetween and connecting said first wall with said second wall, said third wall extending the maximum dimension between said first and second walls;

a fluid flow outlet disposed at a preselected vertical position substantially at the juncture of said third wall with said second wall;

a first heat absorbing means disposed around the periphery of the housing at a preselected distance above said chambers;

a second heat absorbing means disposed in heat absorbing relation with said second chamber, said second chamber being disposed to collect said condensed vapors; means to provide heat to said heat emitting means; and, means to absorb heat from said heat absorbing means.

4,014,752

# PROCESS AND ARRANGEMENT FOR VAPORIZING OF LIQUIDS

Gundolf Rajakovics, Vienna; Heinz Gabernig, Graz, and Günter Peter Klein, Vienna, all of Austria, assignors to Vereinigte Edelstahlwerke AG, Vienna, Austria

Filed Jan. 30, 1973, Ser. No. 328,065

Claims priority, application Austria, Feb. 2, 1972, 842/72

Disclosure was also published under second Trial Voluntary

Protest Program on Mar. 30, 1976

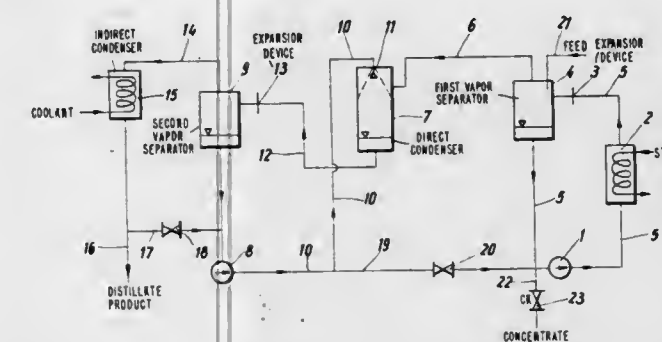
Int. Cl.<sup>2</sup> B01D 3/00, 3/06

U.S. Cl. 202-185 A

4 Claims

1. In a process for vaporizing a radioactive liquid by a two-step vaporization technique employing first and second flash vaporization stages, wherein liquid is introduced to the first

vaporization stage to be circulated, heated and flash-evaporated and wherein vapor resulting from the flash evaporation of the liquid in the first vaporization stage is condensed in a first direct condenser, the improvement wherein the condensing step is accomplished by means of enriched liquid obtained from the second vaporization stage and applied via a circulation pump to the first condenser to form therein a



mixture of the enriched liquid obtained from the second vaporization stage and the condensate of the vapor from the first vaporization stage, and wherein the process further comprises the steps of the flash-evaporating said mixture in the second vaporization stage, and recycling a portion of the liquid emerging from the pressure side of the circulating pump to the first vaporization stage.

4,014,753

# PROPYLENE OXIDE RECOVERY BY AZEOTROPIC DISTILLATION OF METHYL FORMATE-2-METHYLPENTANE

Werner Fuchs, Ludwigshafen; Rolf Platz; Norbert Rieber, both of Mannheim, and Andreas Scholz, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 21, 1973, Ser. No. 361,954

Claims priority, application Germany, May 26, 1972, 2225657

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> B01D 3/34

U.S. Cl. 203-1

5 Claims

1. A process for the recovery of propylene oxide from a liquid mixture containing from 60 to 99% of propylene oxide, up to 10% of acetaldehyde, up to 25% of methyl formate and up to 3% of 2-methylpentane in addition to minor amounts of other low-boiling impurities by distillation, wherein

- the relative amounts of methyl formate and 2-methylpentane in the liquid mixture are determined,
- the methyl formate content is corrected in such a way as to give a ratio of at least 4 parts by weight of methyl formate to each part by weight of 2-methylpentane,
- the mixture is supplied to the feed point of a column having from 100 to 200 theoretical trays, which feed point is spaced by from 30 to 60 theoretical trays from the ends of the column, and
- propylene oxide is recovered at the bottom of said column.

4,014,754

# RECOVERY OF LACTAM SOLVENT FROM VINYL POLYMER SOLUTION

Rene P. Berni, Cliffside Park; Donald H. Lorenz, Basking Ridge, both of N.J., and Earl Pierce Williams, Pen Argyl, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,716

Int. Cl.<sup>2</sup> B01D 3/34; B08B 7/04; C07D 210/00, 207/12

U.S. Cl. 203-64

19 Claims

1. A method for the recovery of N-lower alkyl lactam solvent in which the lower alkyl group contains from 1 to about 7 carbon atoms from a solution of vinyl polymer in such solvent which comprises:

- adding to said solution a plasticizer for said polymer, said plasticizer having a boiling point at least about 25° C above the boiling point of the lactam; and
- then recovering said lactam from said solution by distillation.

4,014,755

# METHOD OF REFINING PYROMELLITIC ACID DIANHYDRIDE

Günther Richter, Eichenkamp, Germany, assignor to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed Feb. 11, 1974, Ser. No. 441,543

Claims priority, application Germany, Feb. 16, 1973, 2307570

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07D 307/89

U.S. Cl. 203-73

11 Claims

1. Process for purification of crude pyromellitic acid dianhydride produced by vapor oxidation of 1,2,4,5-tetraalkylbenzene with an oxygen containing gas, having a purity of more than about 95% pyromellitic acid dianhydride, which comprises the following steps:

- distilling said crude pyromellitic acid dianhydride at pressure of about 90-160 Torr, and temperature of about 290°-350°C to distill overhead an impurities-containing fraction amounting to less than about 20% of the crude introduced into step (a), and provide a residue enriched in pyromellitic acid dianhydride,
- distilling the residue of step (a) at lower pressure which is 70 - 120 Torr and at temperature of about 290°-325°C to distill overhead the purified pyromellitic acid dianhydride, and provide and impurities-containing residue of less than about 12% of the crude introduced into step (a).

4,014,756

# PROCESS FOR MAKING METAL POWDERS

Howard A. Fromson, 15 Rogues Ridge Road, Weston, Conn. 06880

Filed Jan. 21, 1976, Ser. No. 651,020

Int. Cl.<sup>2</sup> C25D 1/00, 1/20

U.S. Cl. 204-10

5 Claims

1. Process for making metal powders which comprises:

- electrolytically depositing discrete metal particles in the pores of a porous surface of an anodized aluminum article; and thereafter
- liberating the metal particles from said pores by contacting the article from (a) with a substance that will attack the porous oxide surface but not the metal particles.

4,014,757

# METHOD FOR PREPARING FIBROUS METAL MATERIALS BY ELECTROLYTIC DEPOSITION AND THE RESULTING FIBROUS METAL MATERIAL

Lucette Frechin, Darnac, France, assignor to Office National d'Etudes et de Recherches Aérospatiales (O.N.E.R.A.), Châtillon sous Bagneux, France

Filed Sept. 5, 1975, Ser. No. 610,762

Claims priority, application France, Sept. 17, 1974, 74.31399

Int. Cl.<sup>2</sup> C25D 7/00, 17/16, 17/24

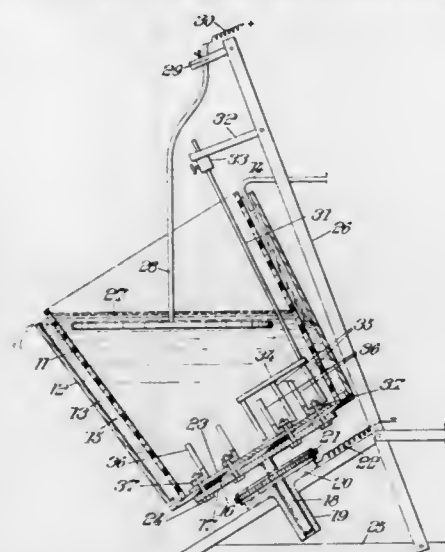
U.S. Cl. 204-27

6 Claims

1. In a process for preparing fibrous metal material wherein the metal is electrolytically deposited on conductive fibres forming a skeleton, the improvement comprising continuously



carding the fibres during deposition of the metal thereof, said carding comprising subjecting said fibres to the action of at



least two sets of teeth in relative movement with respect to each other.

4,014,758

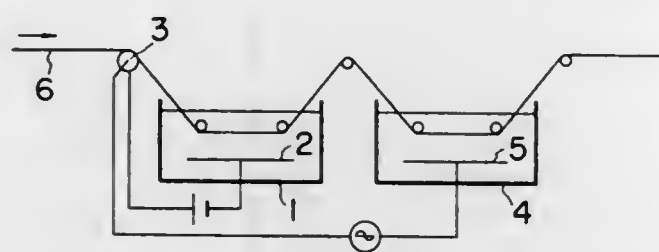
#### CONTINUOUS ELECTROLYTICAL TREATMENT OF ALUMINUM OR ITS ALLOYS

Satoshi Kawai; Yoichi Yamagiwa, both of Chigasaki; Masashi Mizusawa, Fujisawa; Hiroshi Watanabe, Hiratsuka; Yoshio Ando, and Masaaki Takahashi, both of Tokyo, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha and Toyo Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan  
Filed Apr. 22, 1975, Ser. No. 570,376

Claims priority, application Japan, Apr. 23, 1974, 49-46209  
Int. Cl.<sup>2</sup> C25D 7/06

U.S. Cl. 204—28

9 Claims



1. A process for electrolytically treating aluminum or its alloy in the form of a strip, wire or foil material in a continuous manner which comprises continuously passing the material through an anodic oxidation treatment cell and an electrolytic coloring cell to carry out electrolysis in said cells to anodize and color the material in a continuous manner, characterized in that just prior to the anodizing stage, a circuit is formed by commonly connecting to the aluminum material a power source for anodizing and a power source for electrolytically coloring, said power source for anodizing being further connected to the anodizing cell and said power source for electrolytically coloring being further connected to the electrolytic coloring cell; said power source for anodizing being DC and the power source for electrolytically coloring being AC, or the power source for both of them being a single AC-superimposed direct current, whereby a current having an alternating wave form rich in positive component is supplied to the electrode of the electrolytic coloring cell.

#### 4,014,759 ELECTROPLATING IRON ALLOYS CONTAINING NICKEL, COBALT OR NICKEL AND COBALT

Warren H. McMullen, East Brunswick, and Thomas J. Mooney, Edison, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Filed July 9, 1975, Ser. No. 594,214

Int. Cl.<sup>2</sup> C25D 3/56

U.S. Cl. 204—43 T

18 Claims

1. In a process for the preparation of an iron alloy electrodeposit which contains nickel, cobalt, or nickel and cobalt, which comprises passing current from an anode to a cathode through an aqueous acidic plating solution containing at least one ferrous compound and at least one nickel compound, at least one cobalt compound, or a combination of nickel and cobalt compounds, providing ions for electrodepositing nickel-iron alloy, cobalt-iron alloy, or nickel-cobalt-iron alloy, the improvement comprising in combination:

- 1 gram per liter to 15 grams per liter of at least one member selected from the group of cooperating additives consisting of ascorbic acid, isoascorbic acid, and erythorbic acid; and
- 0.01 gram per liter to 10.0 grams per liter of at least one compound exhibiting the formula



wherein R and R' are each, independently, selected from the group consisting of hydrogen, alkyl, aralkyl, aryl, alkaryl and alkali metal derivatives thereof.

4,014,760

#### ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

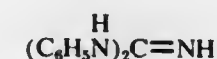
Continuation of Ser. No. 525,714, Nov. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Feb. 17, 1976, Ser. No. 658,267

Int. Cl.<sup>2</sup> C25D 3/38

U.S. Cl. 204—52 R

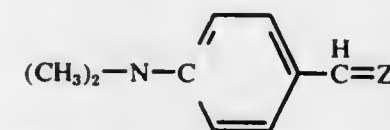
14 Claims

1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:  
A. 0.005 gram per liter to 40 grams per liter of a aryl an selected from those exhibiting the formulae:



I.

and its reaction product with 3 moles of propane sultone per mole of amine,



II.

wherein Z is selected from the group consisting of oxygen and  $-\text{NCH}_2-\text{C}_6\text{H}_5$ ; and

B. sulfoalkyl sulfide compounds containing the grouping  $-\text{S}-\text{Alk}-\text{SO}_3\text{M}$  where M is one gram-equivalent of a cation and  $-\text{Alk}-$  is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms in an amount of 0.1 milligrams per liter to 1000 milligrams per liter.

4,014,761

#### BRIGHT ACID ZINC PLATING

Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Filed Jan. 6, 1975, Ser. No. 538,602

Int. Cl.<sup>2</sup> C25D 3/22

U.S. Cl. 204—55 R

22 Claims

12. An aqueous acidic plating solution containing at least one zinc compound providing zinc cations for electroplating zinc said zinc compound selected from the group consisting of zinc sulfate, zinc chloride and zinc sulfamate; chloride anions added as salts of bath compatible cations excepting ammonium; in the absence of complexing or chelating agents of organic nature; and containing as cooperating additives from 1 to 30 grams per liter of at least one polyether surfactant, 0.025 to 1.0 gram per liter of at least one aromatic carbonyl compound, and, as a luster and leveling development agent, 0.1 to 2.0 grams per liter of sulfonated castor oil.

4,014,763

#### CATHODE AND HANGER BAR ASSEMBLY AND ELECTROLYSIS THEREWITH

Bryan Wilfred Hodson Lowe, Sutton Coldfield, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

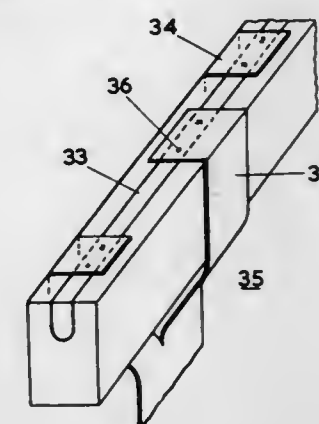
Filed Nov. 3, 1975, Ser. No. 628,557

Claims priority, application United Kingdom, Nov. 8, 1974, 48421/74

Int. Cl.<sup>2</sup> C25C 1/12, 7/02

U.S. Cl. 204—106

13 Claims



1. A cathode and hanger bar assembly comprising a two-component hanger bar having a substantially central core of a film forming metal selected from the group consisting of titanium, niobium, zirconium, tantalum, hafnium and alloys thereof and an outer sheath of aluminum or copper metallurgically bonded to the core, the aluminum or copper being relieved along the length of the hanger bar to reveal the film forming metal core and a continuous sheet of a film forming metal welded along one edge only to at least part of the film forming metal core.

9. An electrolytic cell incorporating a cathode and hanger bar assembly as claimed in claim 1.

10. A method of carrying out an electrolytic process which comprises the steps of locating an anode and a cathode in a solution containing ions of an electro-depositable metal, connecting the cathode negatively with respect to the anode and passing a current through the anode and cathode to deposit the metal on the cathode and remove the deposited metal from the cathode, characterized in that the cathode is in the form of a cathode and hanger bar assembly as claimed in claim 1.

4,014,762

#### PROCESS FOR THE PREPARATION OF HEXAFLUOROPROPENE EPOXIDE

Hans Millauer, Eschborn, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

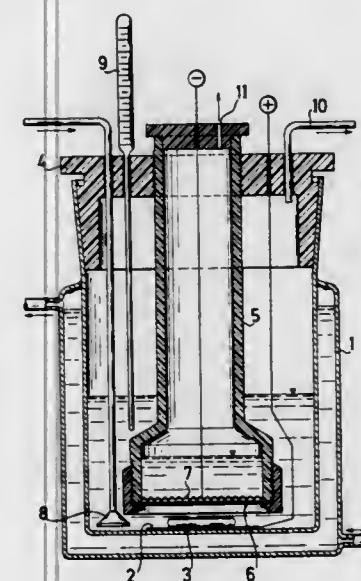
Filed Dec. 18, 1975, Ser. No. 641,930

Claims priority, application Germany, Dec. 20, 1974, 2460468

Int. Cl.<sup>2</sup> C25B 3/02

U.S. Cl. 204—79

3 Claims



1. A process for preparing hexafluoropropane epoxide by oxidation of hexafluoropropene, which comprises submitting hexafluoropropene to anodic oxidation in an electrolytic cell having an anode space containing an electrolyte consisting essentially of a solution of glacial acetic acid and/or of acetonitrile with from about 2-40% by volume of water and about 1-10 weight %, calculated on the total solution, of at least one compound for improving the conductivity of the electrolyte, said compound being selected from alkali perchlorates, hexafluorosilicates, tetrafluoroborates, hexafluorophosphates nitrates, the free acids of such salts and mixtures of such compounds, the anode being composed of a metal of the platinum group or of its alloys or of  $\text{PbO}_2$ , the cathode being composed of a metal or graphite, and the cell being maintained at a temperature of from about  $-30^\circ$  to  $+50^\circ$  C.

4,014,764

#### PROCESS FOR DESILVERING USED BLEACH FIX BATHS

Adolf Seiler, Hittorf; Heinz Meckl, Schildgen, and Helmut Haseler, Leverkusen, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Apr. 17, 1972, Ser. No. 244,512

Claims priority, application Germany, July 8, 1971, 2134071

Int. Cl.<sup>2</sup> C25C 1/22

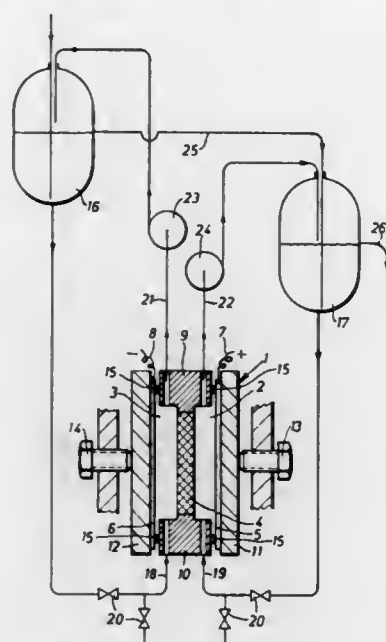
U.S. Cl. 204—109

5 Claims

1. A method for electrolytically recovering silver from spent aqueous bleach-fix photographic processing solution containing ions of both silver and iron III comprising introducing into said processing solution a chemical compound characterized by the ability to reduce iron III to iron II, impressing a direct electrical current between a cathode which is immersed in a first pool of such processing solution and an anode which is



immersed in a second pool of anolyte solution, thereby plating silver onto said cathode, said first and second pools being



separated from one another by a non-porous cation permeable barrier or a porous barrier, and excluding air from said pools.

4,014,765

#### METHOD FOR THE ELECTROLYTIC POLISHING OF THE INSIDE SURFACE HOLLOW NIOBIUM BODIES

Arthur Roth, and Otto Schmidt, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany  
Filed Feb. 28, 1974, Ser. No. 446,956

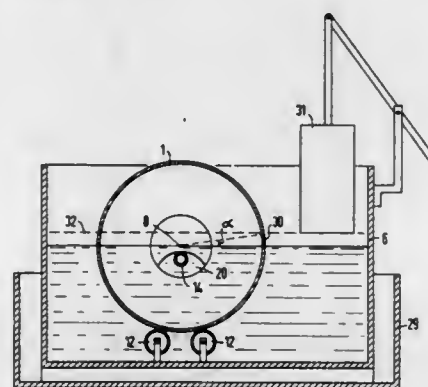
Claims priority, application Germany, Mar. 15, 1973, 2313026

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C25F 3/30, 7/00

U.S. Cl. 204—129.43

9 Claims



1. A method for the electrolytic polishing of the inside surface of a hollow niobium body, having at least one opening, in which method the hollow niobium body is partially immersed in an electrolyte, containing  $H_2SO_4$ , HF and  $H_2O$ , the niobium body being the anode in the electrolyte and supported for rotation about an axis of rotation extending through the opening such that for any position of the hollow niobium body, a coherent empty space in communication with the outside environment through the opening is present, said empty space being formed between the surface level of the electrolyte and all parts of the inside surface of the hollow niobium body located above the electrolyte level, in which method a cathode is introduced through the opening in the hollow niobium body and arranged in electrolyte relative to the hollow niobium body such that in the region of the electrolyte in which gases formed at the cathode during the flow of current are free to rise to the surface of the electrolyte and escape from the inside surface of the hollow niobium body without contacting any parts of the inside surface of the hollow niobium body immersed in the electrolyte, the steps of

polishing including applying a constant electric voltage between the hollow niobium and the cathode such as to obtain damped oscillations imposed on the electrolyte current, switching off the voltage no later than at the point of complete decay of the current oscillations, maintaining the niobium body at rest until the oxide layer built up during the current oscillations is dissolved, rotating the niobium body and repeating these steps with the individual parts of the inside surface successively immersed in the electrolyte but such that no part of the inside surface remains continuously in the electrolyte, wherein the improvement comprises slowly rotating the hollow niobium body during a period of constant voltage application of approximately 0.7 to 4 minutes about its axis of rotation at a speed which is sufficiently low so that the width of the zone of the inside surface which has emerged by the time the voltage is switched off is at most 5 mm so as to not disturb the development of the damped oscillations, and raising the level of the electrolyte after the voltage is switched off to cover at least the zone which has emerged during application of voltage whereby the full oxide layer formed will be dissolved.

4,014,766

#### ELECTROLYTIC TREATMENT OF WASTE WATER

Yoshihisa Watanabe, and Naohiro Nojiri, both of Amimachi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

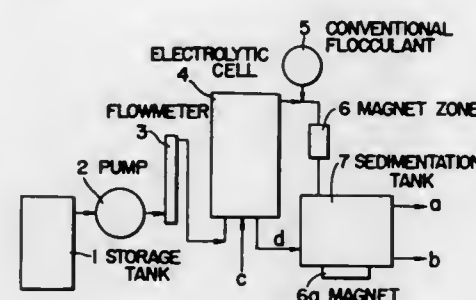
Filed Oct. 23, 1975, Ser. No. 625,099

Claims priority, application Japan, Oct. 28, 1974, 49-124145; June 18, 1975, 50-73106; June 18, 1975, 50-73107

Int. Cl.<sup>2</sup> C02C 5/12; C25C 1/10

U.S. Cl. 204—152

13 Claims



1. In the treatment of waste water which comprises subjecting the waste water to electrolysis with iron as anode thereby to cause impurities in the waste water to aggregate within a floc resulting from the formation of iron hydroxide by electrolytic dissolution of the anode and separating the floc containing the impurities from the waste water, the improvement wherein the iron anode comprises an insoluble electrode material and a body of iron pieces in electrical contact therewith, and the floc containing the impurities is subjected to oxidation processing thereby to convert the iron hydroxide into a magnetic iron compound.

4,014,767

#### SELF-CONTAINED WASTE DISPOSAL SYSTEM INCLUDING SELF-CLEANING FILTER

Ferenc J. Schmidt, Ardmore, Pa., assignor to Ametek, Inc., New York, N.Y.

Filed Oct. 18, 1974, Ser. No. 515,915

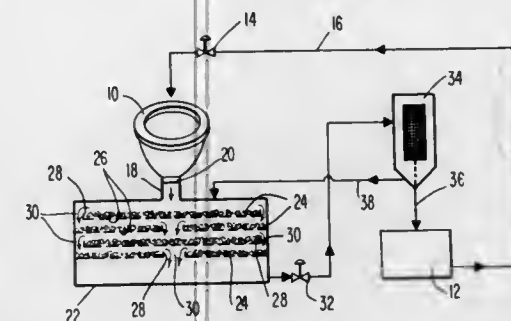
Int. Cl.<sup>2</sup> C02B 1/82; C25B 1/100

U.S. Cl. 204—152

10 Claims

1. In a self-contained toilet and waste treatment system consisting of a toilet, a water flushing means and a waste treatment chamber comprising a comminuted redwood waste filter and digestion medium, the improvement comprising a final filter for further filtering the liquid effluent from said waste treatment chamber, said final filter consisting of first and second porous sheet electrically conductive elements

spaced apart from one another with a gas bubble impervious porous non-metallic spacer material between said elements, housing and channeling means for causing an electrolytic liquid to be filtered to flow successively through said first conductive element, said porous non-metallic spacer material



and said second conductive element, and means for causing an electrolytic current to flow between said elements with said first element as cathode and said second element as anode and thereby causing gas bubbles to be generated at said first element.

4,014,768

#### PROCESS FOR PREPARATION OF SOLID PHASE DISPERSION OF PHOTOCONDUCTIVE MATERIALS

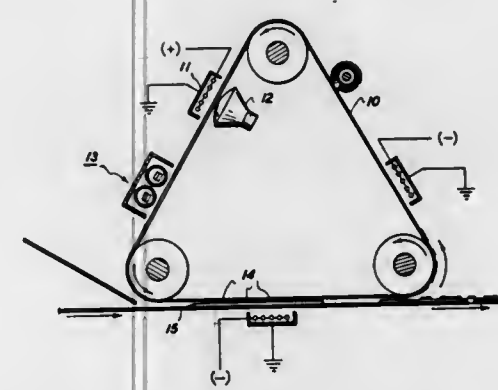
Joseph Y. C. Chu, Fairport, and W. H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 454,896, March 26, 1974. This application Jan. 15, 1976, Ser. No. 649,444

Int. Cl.<sup>2</sup> B01J 1/10

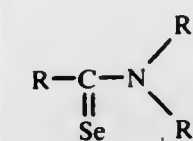
U.S. Cl. 204—158 R

1 Claim



1. A process for preparation of a solid phase dispersion of inorganic photoconductive materials in an insulating polymeric matrix comprising:

- forming a polymeric composition from a film forming insulating polymeric resin and at least one organoselenium compound of the formula



wherein R, R', and R'' are independently selected from hydrogen, alkyl of 1 to 10 carbon atoms, phenyl, substituted phenyl, benzyl and substituted benzyl; and

- subjecting said polymeric composition to sufficient energy to decompose said organoselenium compound whereby elemental selenium is deposited within the polymeric composition in substantial conformity with the distribution of said energy throughout the composition.

4,014,769

#### PRODUCTION OF COFORMYCIN AND INTERMEDIATES THEREFOR

Hamao Umezawa; Kenji Maeda, both of Tokyo, and Shinichi Kondo, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

Division of Ser. No. 518,030, Oct. 24, 1974, Pat. No.

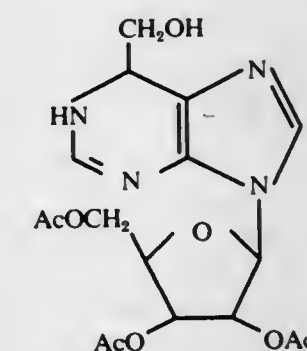
3,959,257. This application Jan. 21, 1976, Ser. No. 651,095  
Claims priority, application Japan, Nov. 14, 1973, 48-127174

Int. Cl.<sup>2</sup> B01J 1/10

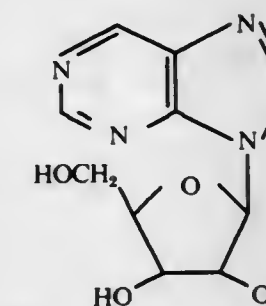
U.S. Cl. 204—158 R

3 Claims

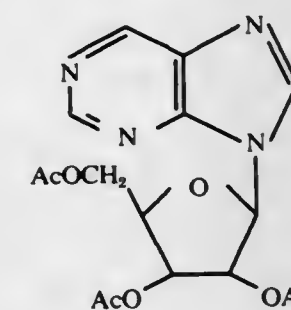
1. A process for the preparation of a compound of the formula:



in which Ac represents acetyl which comprises acetylating 9-β-D-ribofuranosylpurine of the formula:



with an acetylating agent to give the compound of the formula:



in which Ac represents acetyl and then reacting that compound with methanol under irradiation with ultra-violet light.

4,014,770

#### FOAM AND FLAME-BREAKABLE RESIN COMPOSITION

Kazuo Suzuki; Tsutomu Nanao, and Hiroshi Miyazaki, all of Otsu, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 9, 1975, Ser. No. 584,826

Claims priority, application Japan, June 8, 1974, 49-65247

Int. Cl.<sup>2</sup> C08F 8/00, 2/54; C08L 23/08

U.S. Cl. 204—159.14

3 Claims

1. A foam and flame-breakable resin composition employed in an ordinarily unfoamed state, comprising a blend of polyvinyl chloride and a copolymer of ethylene and vinyl acetate, said copolymer having a high melt



viscosity, a molecular weight of more than 200,000 and having a vinyl acetate component of from 40 to 80 weight percent of said copolymer, and said blend having a polyvinyl chloride to copolymer ratio of from 8:2 to 3:7; a non-inflammable agent selected from the group consisting of diantimony trioxide and metal borate; an auxiliary non-inflammable agent selected from the group consisting of chlorinated paraffin and ammonium salt of polyphosphoric acid; an ash coagulating agent selected from the group consisting of boron compounds and lead compounds; and a foaming agent selected from the group consisting of hydrazine sulphate, aluminum hydroxide, magnesium carbonate, calcium carbonate, and other inorganic compounds having water of crystallization which is released at temperatures higher than 200°C, whereby contact of the normally unfoamed composition with fire causes said foaming agent to react and to expand and said composition to become foamed.

4,014,771

# **HIGHLY REACTIVE RESIN COMPOSITIONS HARDENABLE BY UV-LIGHT**

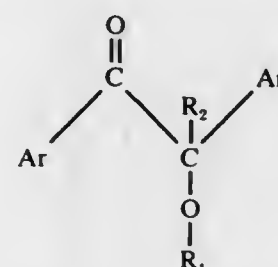
Hans Jürgen Rosenkranz, Krefeld; Hans Rudolph, Krefeld-Bockum, and Artur Haus, Overath, all of Germany, assignors to Bayer Aktiengesellschaft, Germany  
Continuation of Ser. No. 510,466, Sept. 30, 1974, abandoned.  
This application Feb. 17, 1976, Ser. No. 658,405  
Claims priority, application Germany, Oct. 4, 1973, 2349979

Int. Cl.<sup>2</sup> C08F 2/48, 4/32

U.S. Cl. 204—159.23

3 Claims

1. A mixture hardenable by UV light comprising
  - A. 30–95% by weight of the reaction product of at least one epoxide having more than one epoxide group per molecule and acrylic acid, said reaction product containing about 0.6 to 1 mol of carboxyl groups per epoxide group;
  - B. 5–70% by weight of at least one tris-, tetra-, penta- or hexaacrylic or tris-, tetra-, penta- or hexamethacrylic acid ester of at least one trihydric, tetrahydric, pentahydric or hexahydric alcohol and
  - C. 0.2–10% by weight, based on the weight of (A) and (B), of a photoinitiator of the formula



wherein Ar is phenyl or said phenyl mono-substituted by alkyl, alkoxy or halogen; R<sub>1</sub> is alkyl having from 1 to 12 carbon atoms, cyclohexyl, tetrahydropyranyl or 1-methoxyethyl and R<sub>2</sub> is allyl, benzyl, halobenzyl or —CH<sub>2</sub>—CH<sub>2</sub>—X wherein X is CN, CONH<sub>2</sub>, or COOR<sub>3</sub> wherein R<sub>3</sub> is hydrogen or alkyl having 1 to 10 carbon atoms.

4,014,772

# **METHOD OF RADIATION HARDENING SEMICONDUCTOR DEVICES**

Murray Henderson Woods, Los Gatos, Calif., and Richard Williams, Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,261

Int. Cl.<sup>2</sup> C25D 1/12; G01N 27/00

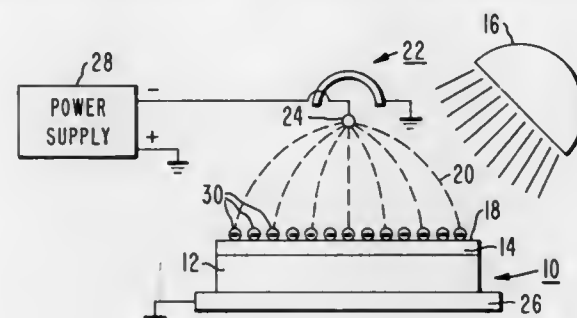
U.S. Cl. 204—180 R

9 Claims

1. A method for enabling a metal-dielectric-semiconductor device, having alkali metal as atoms or compounds, and alkali

metal ions in the dielectric to avoid ionization of the alkali metal atoms or compounds by ionizing radiation comprising the steps of:

- exposing the device to a flux of ionizing electromagnetic radiation sufficient to create alkali metal ions from the alkali metal atoms or compounds in the dielectric;



charging a surface of the dielectric with a negative charge; and  
removing ions which have drifted to the surface of the dielectric.

4,014,773

# **APPARATUS FOR ELECTROLYTIC TREATMENT**

Kiyoto Furuya, Yokohama, Japan, assignor to Daiichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

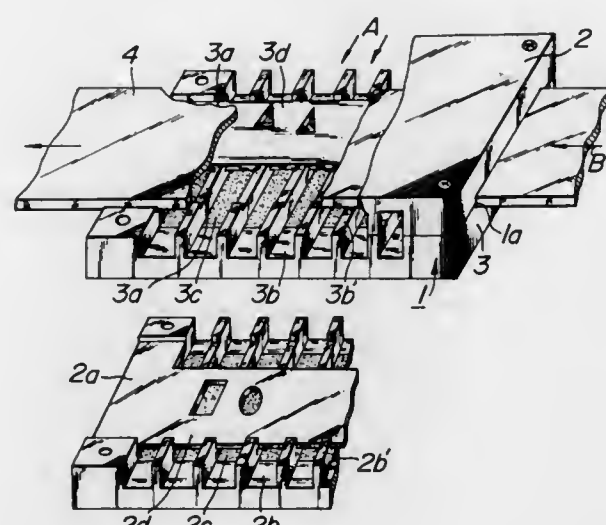
Filed July 15, 1975, Ser. No. 596,184

Claims priority, application Japan, July 31, 1974, 86911/74

Int. Cl.<sup>2</sup> C25D 17/00, 17/06, 7/06, 5/02

U.S. Cl. 204—206

17 Claims



1. An apparatus for electrolytic treating elongated materials such as hoop materials, rods and wires comprising: a casing having an opening for feeding the material to be treated; a treatment unit consisting of first and second unit halves one upon the other and enclosed in said casing; said unit halves including a through passage for feeding said material to be treated; at least one insulating passage for flowing a treating liquid onto surfaces of said material to be treated as it is transferred through said through passage; said insulating passage being made as a plurality of passages substantially perpendicular to said through passage and extending transversely across said material; electrodes for causing electric current to flow between the electrodes and said material; and at least one insulating shield between said insulating passages and said material for shielding portions of said material from being treated.

4,014,774

# **PLASTIC ELECTROPLATING BARREL WITH RIBBED PERFORATE MODULAR PANELS**

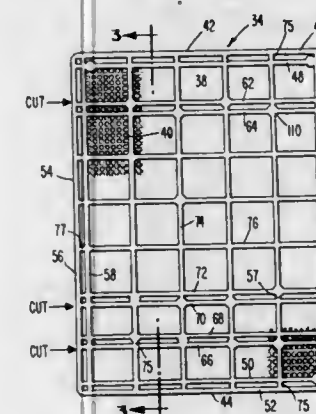
Walter F. Noonan, Wallingford, Pa., assignor to Westlake Plastics Co., Lenni, Pa.

Division of Ser. No. 481,220, June 20, 1974, Pat. No. 3,953,633. This application Dec. 31, 1975, Ser. No. 645,643

Int. Cl.<sup>2</sup> C25D 17/20

U.S. Cl. 204—213

10 Claims



1. A polyhedral electroplating barrel having longitudinal rails forming the corners thereof, perforate panels forming the sides thereof and end heads, grooves in the rails receiving and retaining the longitudinal edges of adjacent perforate panels, interconnected recesses and grooves in the end heads receiving the end edges of the rails and panels and means securing the heads to the rails to form the rails, panels and heads in a tight assembly, said rails, heads and perforate panels being made of a thermoplastic resin, said perforate panels formed of separate substantially rectangular modules having a flat relatively thin perforate plate and intersecting reinforcing ribs upstanding therefrom, the lateral edges of the adjacent modules abutting each other in the final assembly.

4,014,775

# **DIAPHRAGM CELL HAVING UNIFORM AND MINIMUM SPACING BETWEEN THE ANODES AND CATHODES**

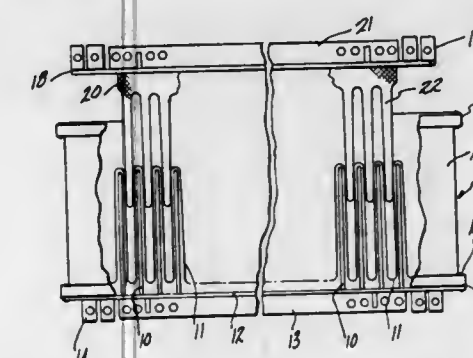
Morton S. Kircher, Oakville, Canada, and Maynard F. Engler, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 547,062, Feb. 4, 1975, Pat. No. 3,960,697. This application Apr. 21, 1976, Ser. No. 678,896

Int. Cl.<sup>2</sup> C25B 1/10, 1/26, 9/00

U.S. Cl. 204—252

19 Claims



1. An electrolytic diaphragm cell comprising a cell body; an anode assembly having a plurality of foraminous metal anodes, a first section, and means of attaching said anodes to said first section; a cathode assembly having a plurality of foraminous metal cathodes, a second section, and means of attaching said cathodes to said second section; a diaphragm covering said cathodes; said first section and said second section sealingly attached to said cell body; and a continuous net interposed between and contacting said anodes and said

diaphragm, said net spacing apart said anodes from said diaphragm by a uniform distance.

4,014,776

# **ELECTROLYTIC APPARATUS**

Umberto Giacomelli, Rosignano-Solvay Leghorn, Italy, assignor to Solvay & Cie, Belgium

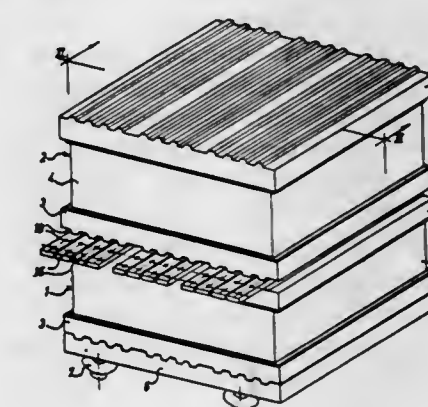
Filed July 1, 1974, Ser. No. 484,881

Claims priority, application Belgium, July 11, 1973, 133339

Int. Cl.<sup>2</sup> C25B 1/24, 9/02

U.S. Cl. 204—257

16 Claims



1. Electrolytic apparatus comprising upper and lower vertically stacked but separate monopolar electrolytic cells, each of said cells comprising side walls, generally vertical and parallel spaced cathodes supported by said side walls and generally vertical and parallel anode plates alternating with said cathodes, separator and collector means disposed generally horizontally between said cells and fluid-tightly segregating said cells from one another, means for feeding an electrolyte to each of the cells and for removing products of electrolysis from said cells, said separator and collector means comprising a current collector for feeding electric current to anode plates of both of said stacked cells, lower ends of anode plates of said upper cell and upper ends of anode plates of said lower cell being connected to said current collector, and means for connecting said current collector to an electric current supply means.

4,014,777

# **WELDING**

Yull Brown, 182 Auburn Road, Auburn, New South Wales, Australia

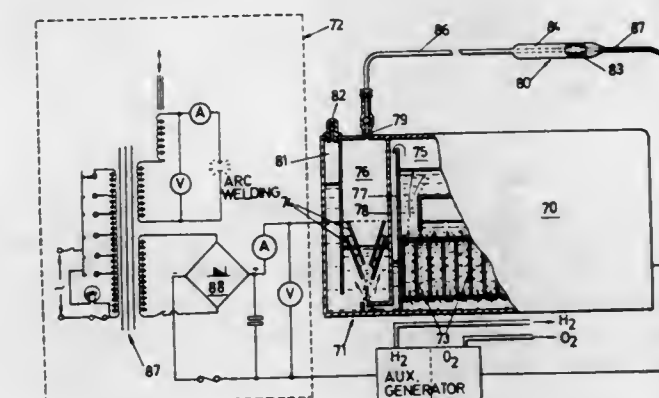
Filed July 19, 1974, Ser. No. 489,921

Claims priority, application Australia, July 20, 1973, 4159/73; May 2, 1974, 7418/73; Aug. 3, 1973, 4341/73

Int. Cl.<sup>2</sup> C25B 1/02, 1/04

U.S. Cl. 204—270

6 Claims



1. Apparatus for generating a supply of hydrogen gas and oxygen gas in proportion to consumption of said gases comprising,

a. an electrolytic cell means for electrolytic generation of



said gases, said cell being enclosed to entrap said generated gases,

b. a gas outlet carried by said cell to allow a portion of said generated gases to discharge from said cell,

c. a source of electrical power connected to said cell by a suitable circuit, and

d. an electrical power regulating means for controlling the amount of power to said cell including:

a first chamber having a selected cross-sectional area and an upper and lower inlet, said upper inlet connected with said gas outlet of said cell,

a second chamber having a selected cross-sectional area at least one half less than that of said first chamber and a lower inlet, said inlet connected to said lower inlet of said first chamber by a suitable passage,

a first and second inverted conically-shaped and concentrically aligned resistant electrode carried in a vertical relationship in said first chamber, said electrodes connected in said circuit between said power source and said cell, and

a quantity of electrolytic solution carried in said chambers to partially fill said chambers and interface with said electrodes to close said circuit,

wherein an increase in the pressure of said entrapped gases depresses the level of said electrolytic solution in said first chamber to cause an increase in resistance of said electrodes thereby reducing the amount of power to said cell.

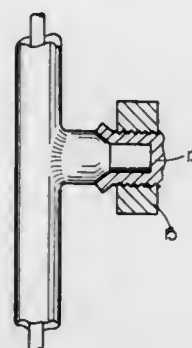
#### 4,014,778 PLATING JIGS

Norman Harrison, Sabden, England, assignor to The Lucas Electrical Company Limited, Birmingham, England  
Filed Oct. 9, 1975, Ser. No. 621,141  
Claims priority, application United Kingdom, Oct. 16, 1974, 44790/74

Int. Cl.<sup>2</sup> C25D 17/06

U.S. Cl. 204—297 W

2 Claims



1. A plating jig comprising a metal frame, an impervious covering of an electrically insulating material on the frame, at least one part of the frame being bare of such covering to permit contact being made with a component to be held by the jig for plating and a contact piece enclosing said bare part and being formed of a non-conductive resiliently compressible matrix containing conductive particles such that a conductive path is established through the matrix wherever this is compressed, the contact piece being arranged to be compressed by contact with a component on the jig so as to establish an electrically conductive path between the frame and the component.

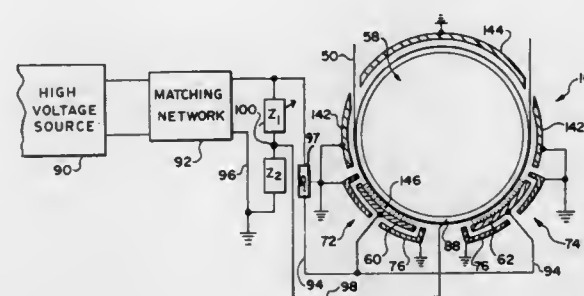
#### 4,014,779

##### SPUTTERING APPARATUS

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.  
Continuation-in-part of Ser. No. 519,781, Nov. 1, 1974, and a continuation-in-part of Ser. No. 612,859, Sept. 12, 1975, said Ser. No. 519,781, is a division of Ser. No. 322,133, Jan. 12, 1973, Pat. No. 3,884,787, said Ser. No. 612,859, is a division of Ser. No. 436,444, Jan. 25, 1974, Pat. No. 3,905,887, which is a division of Ser. No. 322,968, Jan. 12, 1973, Pat. No. 3,829,373. This application Dec. 17, 1975, Ser. No. 641,481  
Int. Cl.<sup>2</sup> C23C 15/00

U.S. Cl. 204—298

19 Claims



1. A sputtering apparatus comprising:
  - A. a vessel with an entrance and having cathode mounting means secured therein adapted to have sputtering target means mounted thereto,
  - B. a closure for the vessel adapted to have its interior surface moved into sealing engagement with the entrance whereby to provide a sealed pressure chamber on the interior of the vessel when said closure is fully seated,
  - C. a rotary anode mounted on the said interior surface and flexible strip substrate transport means also mounted on the said interior surface and adapted to move substrate over said rotary anode on the interior of the vessel for sputtering material of the target means onto said substrate when said sputtering apparatus is in operation,
  - D. the closure and vessel walls being made of metal and adapted to be grounded,
  - E. groundable shielding means surrounding at least said target means when mounted on said cathode mounting means whereby to leave a sputtering opening facing the anode,
  - F. means for establishing and maintaining a sputtering plasma condition within the chamber between the target means and the anode and including a high voltage source coupled to the cathode mounting means, anode and ground in a circuit which maintains the cathode mounting means and the sputtering target means which may be mounted thereon at maximum negative voltage and the anode at a negative voltage which is a fraction of said maximum,
  - G. said anode having a generally cylindrical formation including a metallic outer skin over which the substrate is adapted to travel as the anode rotates, at least the said outer skin being insulated from said closure and vessel walls and there being a coaxially arranged contact ring carried by said anode and electrically connected with said at least outer skin, and
  - H. said apparatus including wiper contact means in sliding electrical contact with said ring at least when said closure is so engaged on said entrance and connected to said high voltage source to supply said fractional negative voltage to said anode.

#### 4,014,780

##### RECOVERY OF OIL FROM REFINERY SLUDGES BY STEAM DISTILLATION

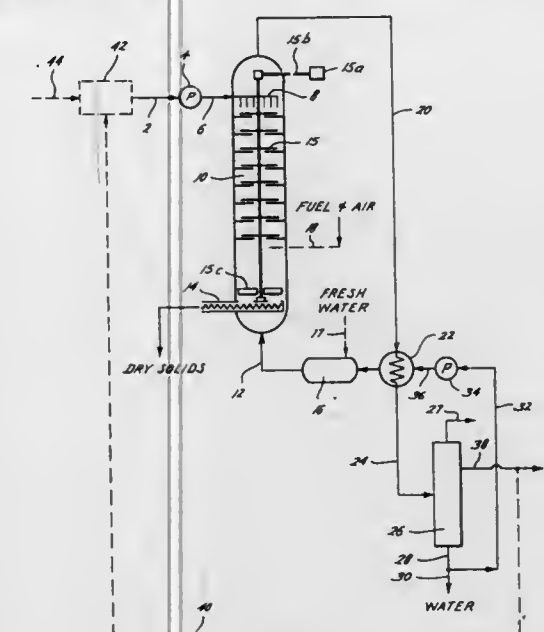
Drew E. McCoy, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,585

Int. Cl.<sup>2</sup> C10G 31/08

U.S. Cl. 208—13

5 Claims



1. A continuous process for deoiling and dewatering refinery sludges which comprises:
  - a. introducing the sludge into a heating zone,
  - b. contacting the sludge in the said heating zone with steam thereby effecting separation of the sludge into an oil-water vapor phase and a dry, free-flowing solids phase,
  - c. withdrawing from the upper part of the said heating zone the oil-water vapor phase and from the lower part the dry, free flowing solids phase,
  - d. condensing the said oil-water vapor phase thereby forming a mixture of oil and water,
  - e. separating and recovering water and oil from the said mixture, and wherein prior to introducing the sludge into the heating zone in step (a) about 0.5 to about 2.0 volumes of hydrocarbon oil are mixed with each volume of the sludge.

#### 4,014,781

##### METHOD FOR PRODUCING PITCH AND COKE

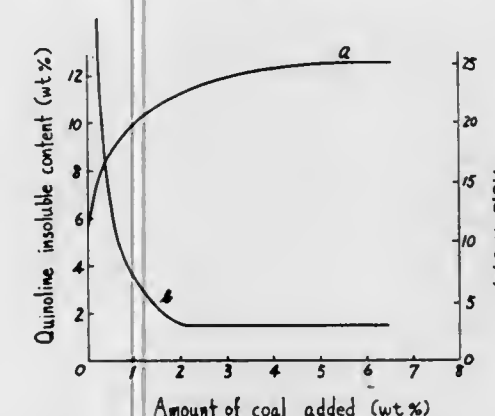
Kozo Ueda, Kyoto, Japan, assignor to Osaka Gas Company, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 306,050, Nov. 13, 1972, abandoned. This application May 1, 1975, Ser. No. 573,423  
Claims priority, application Japan, Nov. 27, 1971, 46-95570

Int. Cl.<sup>2</sup> C10B 55/00; C10G 9/00

U.S. Cl. 208—40

9 Claims



1. A method for producing high yields of coke and pitch without coking trouble by direct heat-treatment of a distillation residue of crude oil, said pitch having a high softening

point and a high Conradson carbon residue and said pitch and coke being useful as an additive to coking coal charge for producing coke which method comprises heating a starting feed selected from the group consisting essentially of a distillation residue of crude oil alone or together with a minor amount of recycle oil produced by the method having a boiling point not lower than 350° C in the presence of a powdery carbonaceous substance at a temperature of 350° to 600° C under an increased pressure of 5 to 50 kg/cm<sup>2</sup> gauge to produce pitch, coke and oil and separating the pitch and coke from the oil, said starting oil material being distillation residue of crude oil having a Conradson carbon residue of 1 to 25 weight percent and containing 20 to 80 weight percent of substances boiling at a temperature of at least 600° C and less than 10 weight percent of substances boiling at a temperature lower than 350° C, said powdery carbonaceous substance having a Conradson carbon residue of at least 50 weight percent and being added to the starting oil material in such an amount that Conradson carbon residue of the carbonaceous material is in the range of one-tenth to ten times that of the starting oil material.

#### 4,014,782

##### RESIDUAL FUEL DERIVING FROM PETROLEUM CRUDE BY THERMAL SHOCK CRACKING

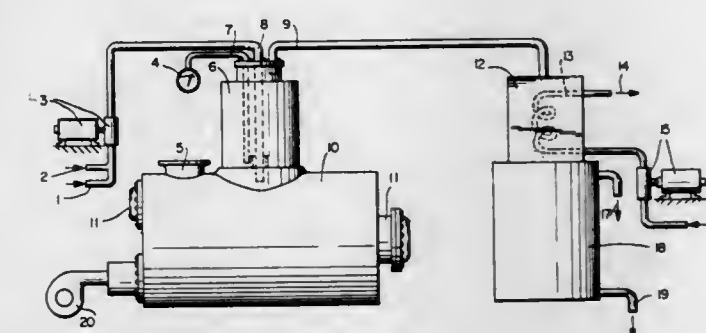
Gregorio Cardenas Armas, Calle Paraguay 7, Las Palmas de Gran Canaria, Spain

Filed Jan. 23, 1975, Ser. No. 543,769

Claims priority, application Spain, Apr. 20, 1974, 425544  
Int. Cl.<sup>2</sup> C01G 9/34

U.S. Cl. 208—130

6 Claims



1. A process for improving a residual fuel derived from the distillation of petroleum crude, said process comprising: heating a residual fuel derived from the distillation of petroleum crude to a temperature near its boiling point while maintaining said residual fuel in the liquid state; injecting water only, in the liquid state and at a pressure equal to or slightly greater than atmospheric pressure, into the heated liquid residual fuel, thereby causing a thermal shock and violent gasification and expansion of said residual fuel and water only; passing directly into a gas expansion chamber the gas formed by said thermal shock of said residual fuel and water only without having added thereto any other components or without having added thereto any other components or without undergoing any additional heating treatment; immediately thereafter continuously cooling said gas in a heat exchanger to form liquified gas without having added thereto any other components or without undergoing any additional heating treatment; and withdrawing said liquified gas as improved fuel free of impurities.



4,014,783

## HYDROPROCESSING OF HYDROCARBONS

Richard E. Rausch, Mundelein, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 585,265, June 9, 1975, which is a continuation-in-part of Ser. No. 480,793, June 19, 1974, Pat. No. 3,898,154, which is a continuation-in-part of Ser. No. 376,841, July 5, 1973, Pat. No. 3,846,283, which is a continuation-in-part of Ser. No. 201,576, Nov. 23, 1971, Pat. No. 3,745,112, which is a continuation-in-part of Ser. No. 807,910, March 17, 1969, Pat. No. 3,740,328. This application June 14, 1976, Ser. No. 696,165

Int. Cl.<sup>2</sup> C10G 23/04; B01J 23/58

U.S. Cl. 208—255

3 Claims

1. A process for hydrogenating a coke-forming hydrocarbon distillate containing di-olefinic and mono-olefinic hydrocarbons, and aromatics, which process comprises reacting said distillate with hydrogen, at a temperature below about 500° F., in contact with a catalytic composite of an alumina-containing refractory inorganic oxide, a platinum or palladium component, a rhodium component, a tin component and an alkali metal component, and recovering an aromatic/mono-olefinic hydrocarbon concentrate substantially free from conjugated di-olefinic hydrocarbons.

4,014,784

## SORTING APPARATUS

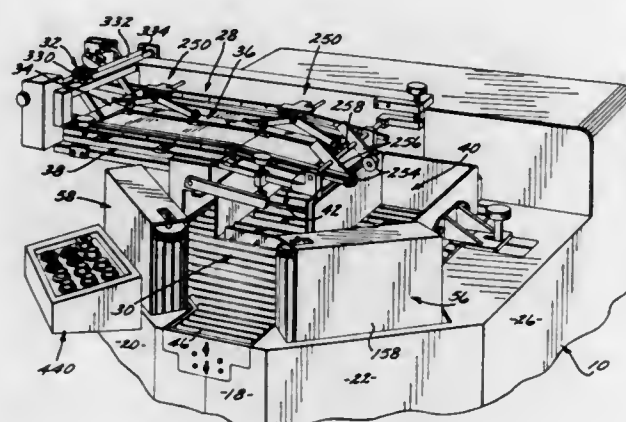
Clifford E. Dunlap, Pasadena, Calif., assignor to W. A. Krueger Co., Scottsdale, Ariz.

Division of Ser. No. 457,367, May 2, 1974. This application Dec. 4, 1975, Ser. No. 637,526

Int. Cl.<sup>2</sup> B07C 5/344

U.S. Cl. 209—73

11 Claims



1. Automatic stacking apparatus for converting a generally continuous stream of generally flat objects into a series of successive stacks of said objects in response to a corresponding series of successive electrical shift signals, which comprises input means for receiving said stream of objects, first and second stacking bins adapted to alternately have said successive stacks dispensed therein, diverter means operatively disposed between said input means and said first and second bins, said diverter means being alternately shiftable between first and second positions wherein it directs said objects to the respective first and second bins, a source of a series of electrical shift signals, electrical diverter actuating means connected to said diverter means and to said source of shift signals for alternately shifting said diverter means between its said first and second positions in response to successive shift signals, means to remove completed stacks from said bins, and means responsive to said shift signals for controlling the operation of said stack removing means in correlation to the operation of said diverter.

4,014,785

## NOVEL LIQUID MEMBRANE FORMULATIONS AND USES THEREOF

Norman N. Li, Edison; Gopal H. Singhal, Westfield, both of N.J.; Richard M. Minday, St. Paul, Minn., and Martin L. Gorbaty, Fanwood, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 492,616, July 29, 1974, Pat. No. 3,959,173. This application Oct. 9, 1975, Ser. No. 620,966

Int. Cl.<sup>2</sup> B01D 13/00

U.S. Cl. 210—22 D

17 Claims

1. A process for removing the salt of a weak acid and a weak base from aqueous solution which comprises contacting said solution with an emulsion, said emulsion comprising an exterior phase, said exterior phase being characterized as immiscible with said solution and permeable to said weak base, and said exterior phase comprising (a) an ethylene vinyl alkanoate copolymer, wherein the alkanoate group has from 1 to 20 carbons, comprising at least 25% by weight ethylene and (b) a solvent for said copolymer, the solvent having a boiling point of greater than 85° C and selected from the group consisting of petroleum distillates and paraffinic solvents including paraffinic solvents bearing substituents selected from the group consisting of halogens and aromatics, and an interior phase, said interior phase comprising a strong acid which is capable of converting said weak base to an impermeable form whereby said weak base permeates through said exterior phase into said interior phase wherein it is converted to a nonpermeable form, and removing said weak acid by passing an inert gas through said solution or subjecting the system to subatmospheric pressures, said removal being carried out at a temperature of from 75°–220° F.

4,014,786

## CARBON SEPARATION

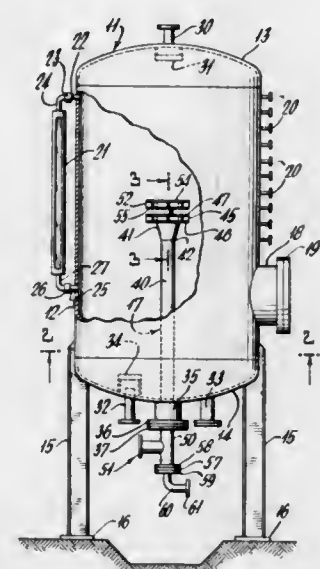
Clyde E. Potter, Bellflower, and George N. Richter, San Marino, both of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,704

Int. Cl.<sup>2</sup> B01D 43/00

U.S. Cl. 210—22 R

13 Claims



1. In a continuous process for producing clean synthesis gas, fuel gas, or reducing gas by the partial oxidation of a hydrocarbonaceous fuel with a free-oxygen containing gas in the presence of a temperature moderator in a gas generating zone to produce an effluent gas stream comprising H<sub>2</sub>, CO, CO<sub>2</sub>, H<sub>2</sub>O, unreacted particulate carbon and at least one gas from the group H<sub>2</sub>S, COS, CH<sub>4</sub>, N<sub>2</sub> and Ar; contacting said hot effluent gas stream with water in a gas contacting zone to cool said effluent gas stream and to remove at least a portion of said particulate carbon, thereby producing a dispersion of particulate carbon and water; mixing a liquid organic extractant which is substantially immiscible with water with said particulate carbon-water dispersion in a mixing zone, thereby pro-

ducing a liquid feed mixture of particulate carbon, water and liquid organic extractant; and separating said liquid feed mixture by gravity into clarified water and a dispersion of particulate carbon and liquid organic extractant, which dispersion floats on said clarified water at the interface level; the improvement for separating said liquid feed mixture into said clarified water and said dispersion of particulate carbon and liquid organic extractant comprising:

1. introducing said liquid feed mixture of particulate carbon, water and liquid organic extractant into a closed vessel substantially filled with liquid by way of a horizontal radial nozzle located along the vertical axis of said vessel below said interface level and with said radial nozzle uniformly distributing said liquid feed 360°, wherein said vessel has a horizontal circular cross-section and is at a temperature in the range of about 212° to 650° F. and at a pressure high enough to keep said liquid organic extractant in liquid phase;
2. simultaneously with the introducing of said liquid feed mixture in (1), continuously separating by gravity the liquid feed mixture within said vessel into two liquid phases comprising a bottom layer of said clarified water and a top layer comprising said particulate carbon-liquid organic extractant dispersion, thereby substantially filling said vessel, wherein said top layer floats on and contacts said bottom layer at the interface level, and said top layer has a carbon content in the range of about 0.5 to 9.0 weight percent;
3. simultaneously with the separating that takes place in (2), removing a continuous stream of said clarified water from an outlet in the bottom of said vessel and separate continuous stream of particulate carbon-liquid organic extractant dispersion from an outlet in the top of said vessel;
4. recycling said clarified water to said gas contacting zone to cool said effluent gas stream and to produce said dispersion of particulate carbon and water;
5. mixing said particulate carbon-liquid organic extractant dispersion from (3) with heavy hydrocarbonaceous fuel oil and introducing the resulting mixture into a distillation zone;
6. distilling off liquid organic extractant and recycling same to said mixing zone to produce said liquid feed mixture of particulate carbon, water and liquid organic extractant; and
7. introducing a bottoms slurry of carbon and heavy hydrocarbonaceous fuel from said distillation zone into said gas generating zone as a portion of the feed.

4,014,787

## WASTEWATER TREATMENT

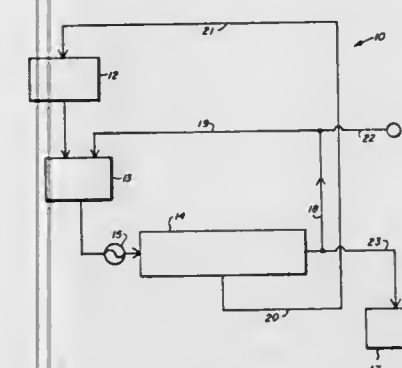
Jacob Shorr, Lexington, Mass., assignor to Systems Engineering &amp; Manufacturing Corporation, Stoughton, Mass.

Continuation-in-part of Ser. No. 429,510, Jan. 2, 1974, abandoned. This application Sept. 5, 1975, Ser. No. 610,688

Int. Cl.<sup>2</sup> B01D 13/00

U.S. Cl. 210—23 F

24 Claims



1. A method of removing small particle size material in the form of heavy metal ions and contaminants of metal finishing and plating operations from wastewater feed containing no

greater than about 4000 ppm of said heavy metal ions and contaminants, said method comprising,

combining said small particle size material with a combining agent at a pH of from 7.1 to 14 to form bound material having a particle size of at least 10 angstroms, said combining agent being an inorganic metal hydroxide with the metal being selected from the group consisting essentially of iron, aluminum, tin, copper, zinc, cadmium, nickel, cobalt, silicon, lead, barium, calcium, manganese and chrome, said combining agent being present in an amount of at least 1700 ppm and in a molar ratio of from 1:1 and above with respect to moles of the small particle size material yet in an amount permitting pumping of said wastewater, and subsequently filtering said wastewater through an ultra-filtration skinned membrane at a flux at least as high as 30 gfd under pressure at least as high as 9 psig to separate said bound material from said wastewater.

4,014,788

## REMOVING OF BARK FINES FROM AQUEOUS SUSPENSIONS

George Richard Bell, Larkspur, and Richard Seyb Lamar, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed May 9, 1975, Ser. No. 576,079

Int. Cl.<sup>2</sup> C02B 1/20

U.S. Cl. 210—42 R

10 Claims

1. In a hydraulic process for removing bark from logs which comprises removing the bark from the logs in the form of bark fines and flushing the bark fines away from the logs with water, such that an aqueous suspension of bark fines is formed, the improvement which comprises:

removing essentially all of said bark fines from said aqueous suspension by filtering said suspension with a rotary vacuum filter, wherein there is deposited on the outer surface of the drum of said rotary vacuum filter a filter aid layer comprising diatomite, and wherein said rotary vacuum filter also has rotating blade means for removing the layer of bark fines which is deposited on the surface of said filter aid layer, and wherein platy talc particles are added to said aqueous suspension prior to the filtration of said suspension, said talc particles being present in a concentration of about 2 to 10 weight percent talc based on the weight of dry bark fines in said suspension.

4,014,789

## SEPARATION OF LIQUID PHASES

Walter R. Marshall, Bloomfield; Richard A. Gregory, Jr., Belle Mead, and Richard H. Handwerk, South Somerville, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

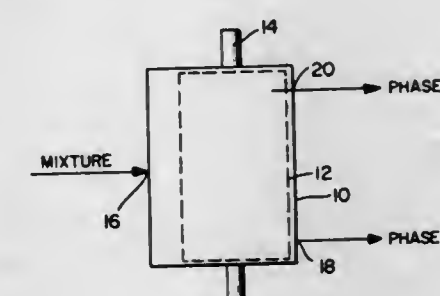
Filed May 2, 1973, Ser. No. 356,470

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> B01D 21/26

U.S. Cl. 210—84

4 Claims



1. The process for effecting phase separation of relatively high and low viscosity immiscible liquids comprising: providing and maintaining, between inner means in relative rota-



tional movement with outer sleeve means, at least one zone of increased pressure constriction and of decreased pressure constriction; feeding a multi-phase mixture of relatively high viscosity and relatively low viscosity liquids to the interior of said sleeve means between said zones of increased and decreased pressure constriction; and withdrawing said high viscosity liquid and said low viscosity liquid from the vicinities of said zones of increased and decreased pressure constriction, respectively.

4,014,790

**APPARATUS FOR RECYCLING FILTRATION MEDIA**  
Kostas Savas Arvanitakis, 14945 S. Dogwood Ave., Orland Park, Ill. 60462

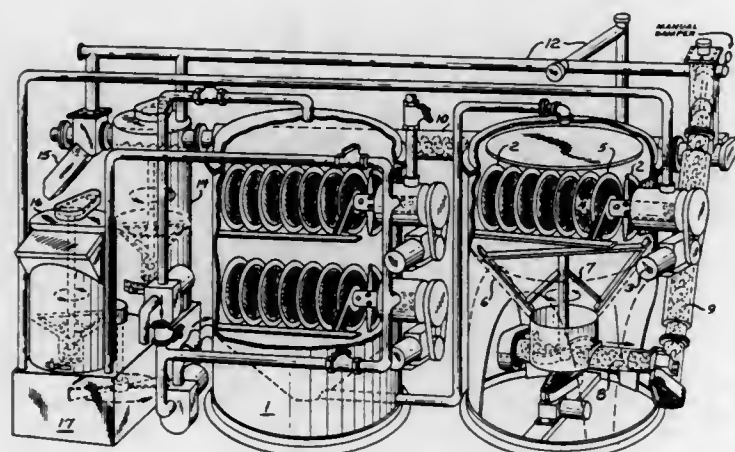
Filed Sept. 30, 1975, Ser. No. 618,138

The portion of the term of this patent subsequent to Dec. 12, 1989, has been disclaimed.

Int. Cl.<sup>2</sup> B01D 23/24

U.S. Cl. 210-107

10 Claims



1. An apparatus for clarifying a liquid having suspended solids material therein and reusing the filter cake material comprising

- means for passing contaminated liquid having suspended solids material therein through a first filter cake material bearing filtration means,
- means for interrupting the passing of the contaminated liquid upon the accumulation of a predetermined amount of solids material,
- means for removing the filter cake material and the accumulated solids into suspension in the contaminated liquid,
- means for withdrawing the contents of the primary filter chamber into a secondary filter chamber and through a second filtration means,
- second filtration means carried within a secondary filter chamber for removing the suspended filter cake material and solids material from said clarified liquid,
- means for interrupting the passing of liquid from said primary filter chamber into said secondary filter chamber,
- means actuatable upon the interruption of liquid passing into said secondary filtration chamber to remove the collected suspended filter cake material and suspended solids into said secondary filter chamber,
- conveyor means for removing said suspended filter cake materials and suspended solids materials from said secondary filter chamber,
- means for removing liquid from said suspended filter cake material and suspended solids material, and discharging said dried materials, and
- means for conveying said dried materials for introduction into said primary filter chamber.

4,014,791

OIL SEPARATOR

Ralph L. Tuttle, 7135 Hollywood Blvd., Hollywood, Calif. 90028

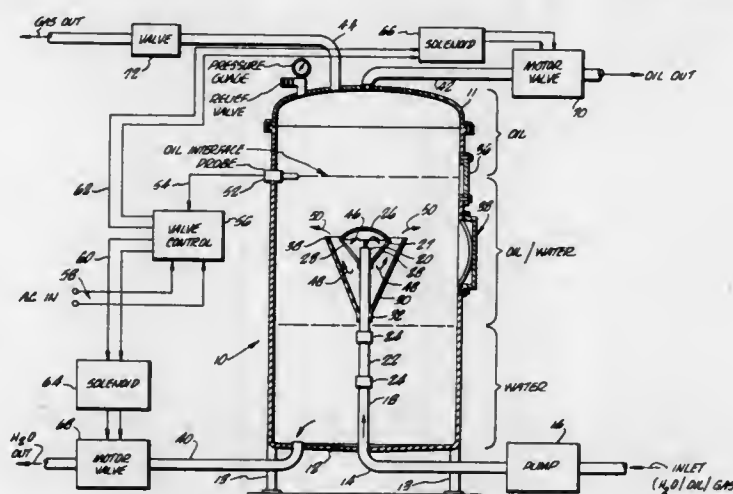
Continuation-in-part of Ser. No. 291,725, Sept. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 221,915, Jan. 31, 1972, abandoned. This application Sept. 27, 1973, Ser. No. 401,221

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> B01D 21/24

U.S. Cl. 210-114

11 Claims



1. Apparatus for separating oil and water from an oil-water mixture, comprising: a vessel, an inlet conduit extending upwardly into said vessel, said inlet conduit having a discharge port at the terminus thereof, deflector means stationed within said vessel in juxtaposition to said discharge port, said deflector means comprising means for intercepting fluid discharged from said port including first intercepting means stationed opposite said discharge port and second intercepting means stationed opposite said first means whereby fluid directed against said first means is once reversed and directed against said second means whence said fluid is again reversed in direction, a first outlet port near the bottom of said vessel for drawing off separated water from said vessel, a second outlet port near the top of said vessel for drawing off separated oil from said vessel, and control means coupled to said outlet ports for independently controlling the rate of outflow therefrom.

4,014,792

**AIR AND LIGHT IMPERVIOUS WATER PURIFICATION AND PRODUCT DISPENSING SYSTEM**

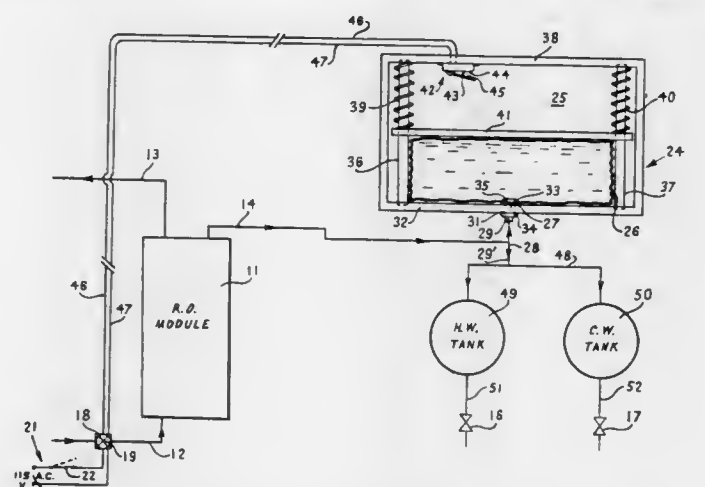
Charles W. Gossett, 14025 Crenshaw Blvd., Hawthorne, Calif. 90250, and William J. Dauenhauer, P.O. Box 487, Gualala, Calif. 95445

Filed June 14, 1976, Ser. No. 695,367

Int. Cl.<sup>2</sup> B01D 31/00

U.S. Cl. 210-123

5 Claims



1. An air and light impervious water purification and prod-

uct distribution system comprising, in combination with a water supply line and with a reverse osmosis module connected into said line for recurrently receiving water from said water supply line and for removing impurities therefrom to provide a nearly pure water product at its outlet orifice, a faucetcontrolled water distribution line in communication with the nearly pure water product outlet orifice of said reverse osmosis module for dispensing the water product thereof, a box having an interior chamber therein, a reservoir within said box for storing the water product of said module, an inlet means establishing communication between said water distribution line and said reservoir for transmitting to and storing in said reservoir repetitive volumes of said nearly pure water product of said reverse osmosis module, a spring-loaded floating plate confined with such chamber, an electrical circuit, a switch connected into said circuit and secured to the top of said box within said chamber, said switch being adapted to be recurrently closed and opened by said floating plate upon the complete filling of said reservoir and emptying thereof, and solenoid-actuated valve connected into said water supply line for controlling the flow of water therein in response to the closing and opening of said electrical circuit in which the solenoid of said solenoid-actuated valve is connected.

4,014,793

**DETECTING APPARATUS FOR LIQUID CHROMATOGRAPHY**

Karel Tesarik, and Milos Krejci, both of Brno, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia

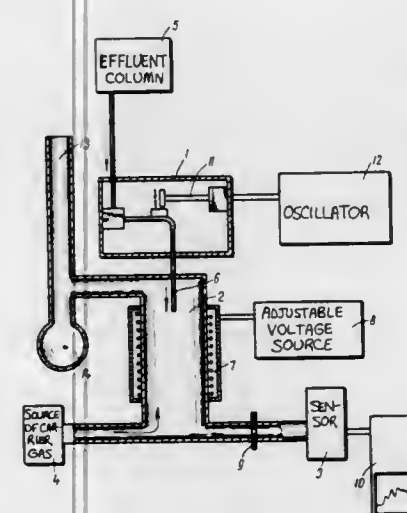
Filed May 21, 1975, Ser. No. 579,683

Claims priority, application Czechoslovakia, May 21, 1974, 3601/74

Int. Cl.<sup>2</sup> B01D 15/08

U.S. Cl. 210-198 C

5 Claims



1. In a liquid chromatography detection apparatus for analyzing a selected non-volatile phase of a liquid effluent, comprising a sensor for the selected phase to be analyzed, conveying means for separating the selected phase from the effluent and for passing the separated selected phase to the sensor and means for introducing effluent into the conveying means, the improvement wherein the conveying means comprises, in combination, means coupled to the effluent source for atomizing the effluent, means including a separating column having a first end communicating with the atomizing means for volatilizing the non-selected components of the atomized effluent, a control valve, and means including a carrier gas source isolated from the introducing means and communicating with the separating column for propelling the non-volatilized selected phase from the separating column to the sensor through the control valve.

4,014,794

OIL FILTER ADAPTER

William Dein Lewis, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

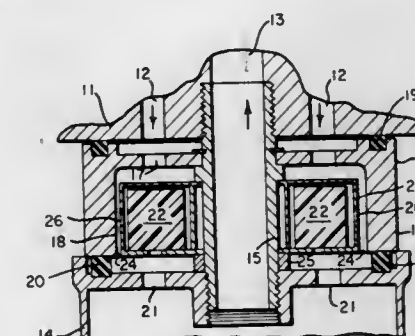
Filed Mar. 11, 1974, Ser. No. 449,988

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> B01D 35/00; C10M 7/02

U.S. Cl. 210-199

4 Claims



1. In combination with an oil filter, for use with an internal combustion engine using circulating oil, the improvement comprising an oil filter adapter, coaxial with and adjoining the oil filter, placed between the oil filter and the engine, said adapter comprising a casing having at least one opening to permit flow of oil from said engine to said adapter and at least one opening to permit flow of oil from said adapter to said filter and disposed in said casing in the path of the flowing oil and oil-soluble, solid oil viscosity index modifier and means in association with said modifier to limit contact of the surface of the modifier with the flowing oil wherein the solid copolymer is toroidal in shape and is encased in a perforated, oil insoluble metal shield.

4,014,795

**OIL BOOM FOR COLLECTING AND SKIMMING OIL ON A WATER SURFACE**

Cornelis in 't Veld, Vlaardingen, Netherlands, assignor to National Marine Service, Inc., St. Louis, Mo.

Filed Nov. 24, 1975, Ser. No. 634,505

Int. Cl.<sup>2</sup> E02B 15/04

U.S. Cl. 210-242 R

11 Claims



1. An oil boom for collecting and skimming surface oil floating on a body of water, the boom comprising at least two generally parallel, elongated surface barrier screens having a density sufficient to cause the screens to float in water with a draft at least slightly greater than the maximum thickness of the floating oil layer; means for supporting the barrier screens within a surface current of water flowing towards the barrier screens in a direction generally transversely of their longitudinal direction; and flow diverter means located beneath the barrier screens for diverting at least a portion of said surface current towards one end of the boom and between said barrier screens, said flow diverter means comprising at least a single inclined flow diverting deflector element having at least a



portion thereof angularly oriented relative to the principal horizontal and vertical axes of the oil boom, whereby oncoming surface current flowing towards the deflector element is diverted upwardly and laterally towards one end of the boom.

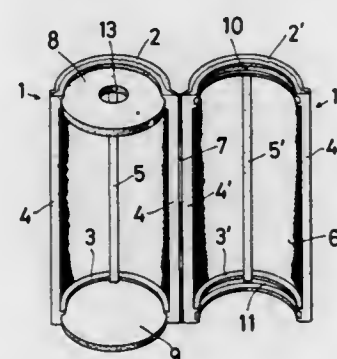
#### 4,014,796 STRAINER

Masaaki Sugiyama, Fuji; Takuo Yuda, Sagamihara, and Akira Mizusawa, Fujisawa, all of Japan, assignors to Yamakawa Industry Company Ltd., Fuji and Nifco Inc., Tokyo, both of Japan

Filed June 6, 1975, Ser. No. 584,664  
Claims priority, application Japan, June 8, 1974, 49-65378  
Int. Cl.<sup>2</sup> B01D 35/28

U.S. Cl. 210-437

5 Claims



1. A strainer comprising:
  - a. a filter net,
  - b. a semi-cylindrical male shell having a pair of end supporters and a center supporter, top and bottom male frames of semi-circular shape connected with each other by said supporters and top and bottom boards of circular shape connected to said top and bottom frames and each presenting a substantially semi-circular lateral extension, the top board having a through hole adapted to complementarily accept a suction pipe therethrough,
  - c. a semi-cylindrical female shell having a pair of end supporters and a center supporter, and top and bottom female frames of semi-circular shape connected with each other by said supporters and groove means on the inside surface of each female frame,
- the top and the bottom female frame grooves being adapted to cooperatively accept said lateral extensions of said top and said bottom boards therein respectively, said top and bottom boards closing the top and bottom frames of said male and female shells respectively, said male and female shells being movably connected with each other adjacent respective end supporters by suitable hinge means, said net being integrally attached to the peripheries of said male and female shells, said connected male and female shells adapted to be made to come closely into contact with each other by rotation about said hinge means and means for connecting the other said end supporters positioned remote from said hinge means.

#### 4,014,797

#### INTRAVENOUS INJECTION APPARATUS AND NEEDLE ADAPTER WITH FILTER AND METHOD OF MAKING SAME

Kenneth Raines, and George K. Burke, both of Bethlehem, Pa., assignors to Burrin Medical Products, Inc., Bethlehem, Pa. Division of Ser. No. 423,682, Dec. 11, 1973, Pat. No. 3,970,084, which is a continuation-in-part of Ser. No. 299,268, Oct. 20, 1972, abandoned. This application May 20, 1975, Ser. No. 579,199

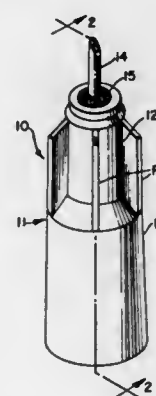
Int. Cl.<sup>2</sup> C02C 1/14

U.S. Cl. 210-446

6 Claims

1. A needle adapter and filter therefor, comprising: a tubular housing having opposite ends and having a stepped axial bore therethrough defining an axially facing annular shoulder

between the ends thereof; a tubular insert having opposite ends and having an axial bore therethrough and fitted coaxially within the bore through the housing, with the bore in the insert in axial alignment and registry with the bore in the housing, and one of said insert ends defining a flat, annular, surface normal to the axis of the insert, and substantially commensurate in size and shape with the shoulder; and a mesh filter having a generally dome-shaped central surface surrounded by a flat annular marginal section sealed and secured to said one end of the insert prior to positioning of the insert



in the bore of the housing for assembly of the insert and filter as a unit within the housing, the flat annular section of said filter coinciding with said flat annular surface of the insert, said annular section of said filter sealed to said flat annular surface of said insert, and said annular section of said filter further clamped between the insert end surface and the shoulder, thereby defining a relatively large annular seal area to effect a leakproof structure, whereby the filter filters contaminants or particulate matter from materials or solutions flowing through said adapter.

#### 4,014,798

#### INSOLUBLE POLYELECTROLYTE AND ION-EXCHANGE HOLLOW FIBER IMPREGNATED THEREWITH

Alan Rembaum, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Apr. 4, 1974, Ser. No. 457,849

Int. Cl.<sup>2</sup> B01D 31/00, 13/00

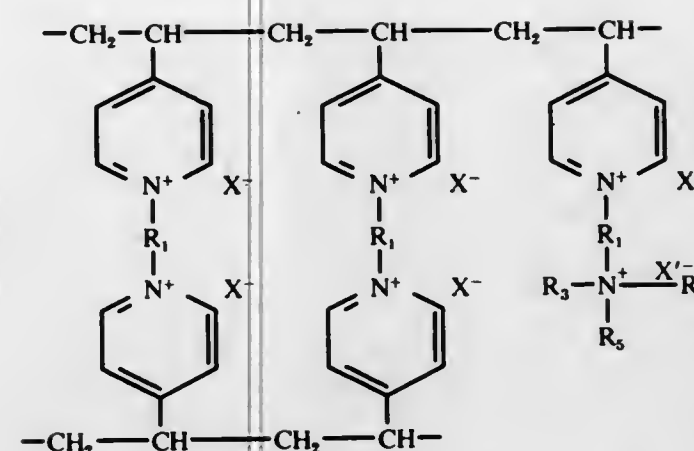
U.S. Cl. 210-500 M

10 Claims

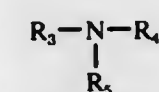
1. An ion-exchange medium comprising a hollow, annular, thin-walled microporous fiber having particles of polymer embedded and constrained within said pores, said particles being smaller than the diameter of said pores and said polymer comprising polyquaternary, water-insoluble, cross-linked polymer of vinyl pyridine and a dihalo organic compound of the formula:



where X is halo selected from the group consisting of bromo, chloro and iodo and R<sub>1</sub> is a divalent organic group; said polymer containing a structure of the formula:



where R<sub>3</sub> and R<sub>4</sub> are selected from lower alkyl of 1 to 10 carbon atoms, aryl, cycloalkyl of 1 to 10 carbon atoms, lower alkenyl, lower alkoxy or R<sub>3</sub> and R<sub>4</sub> are combined in a single aliphatic divalent group; R<sub>5</sub> is selected from hydrogen, R<sub>3</sub> or  $\text{---R}_6\text{---N(R}_3)_2$  where R<sub>6</sub> is a divalent aliphatic or aromatic group of 2-10 carbon atoms and X<sup>-</sup> and X'<sup>-</sup> are selected from chloro, bromo or iodo said X<sup>-</sup> and X'<sup>-</sup> being ionized halo derived from X<sup>-</sup>---R<sub>1</sub>---X with X<sup>-</sup> groups ionized by quaternization with vinyl pyridine and X'<sup>-</sup> groups ionized by post polymerization quaternization of said polymer with



#### 4,014,799

#### BROMOTRIFLUOROMETHANE-CONTAINING FIRE EXTINGUISHING COMPOSITION

Robert J. Owens, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 9, 1975, Ser. No. 566,423

Int. Cl.<sup>2</sup> A62D 1/00

U.S. Cl. 252-8

5 Claims

1. A fire extinguishant comprising and from about 4% to 10%, by weight, of an organic additive having a heat of combustion of from 8 to 13.5 kilocalories per gram, the remainder being bromotrifluoromethane said extinguishant being useful for extinguishing fires fueled by substances having heats of combustion between about 2.5 to 5 kilocalories per gram.

#### 4,014,800

#### FIBER-LUBRICATING COMPOSITIONS

Rolf Kleber, Neu-Isenburg, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 22, 1974, Ser. No. 472,224

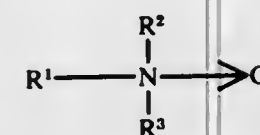
Claims priority, application Germany, May 26, 1973, 2326966

Int. Cl.<sup>2</sup> D06M 13/36

U.S. Cl. 252-8.8

1 Claim

1. A fiber-lubricating composition consisting essentially of a paraffin oil or silicone oil, an emulsifier and an amine oxide of the formula



in which R<sup>1</sup> is alkyl of 5 to 22 carbon atoms, R<sup>2</sup> is alkyl of 1 to 22 carbon atoms or a polyglycol group of the formula



in which n is a number of 1 to 5, and R<sup>3</sup> is alkyl of 1 to 5 carbon atoms, or a polyglycol group of the formula



in which m is a number of 1 to 10, the sum of n and m being not more than 10, with the proviso that R<sup>3</sup> is said polyglycol group if R<sup>2</sup> is alkyl of more than 5 carbon atoms.

#### 4,014,801

#### PROCESS FOR BREAKING POLYMER-CONTAINING EMULSIONS

James H. Fullinwider, Englewood, Colo., and Bruce L. Knight, Findlay, Ohio, assignors to Marathon Oil Company, Findlay, Ohio

Filed Sept. 30, 1974, Ser. No. 510,190

Int. Cl.<sup>2</sup> B01D 17/04

U.S. Cl. 252-8.55 D

20 Claims

1. In a process of breaking an emulsion containing hydrocarbon, water, surfactant, and a high molecular weight polymer, the step comprising incorporating in the emulsion an aqueous solution comprising at least about 1,000 ppm of a chloride salt hydrate or a mixture thereof of a divalent cation wherein the cation is calcium, cadmium, manganese or magnesium fluoride is chloride, bromide, iodide or fluoride and at least about 1,000 ppm of a strong oxidizing agent selected from the group consisting of lithium, sodium, potassium and ammonium hypochlorites and hypobromites.

#### 4,014,802

#### OIL-IMPREGNATED SINTERED PRODUCT AND METHOD OF PRODUCING SAME

Hiroshi Seino, Yokohama; Norio Yamada, Yokosuka; Shigeo Kimura, Fujisawa; Hideaki Kosugi, and Koreyuki Yamamoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 18, 1973, Ser. No. 380,137

Claims priority, application Japan, July 19, 1972, 47-71573  
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976Int. Cl.<sup>2</sup> C10M 5/00; F16D 69/00; C10M 7/00

U.S. Cl. 252-12.2

3 Claims

1. A shaped product of a sintered metal powder subject to rotational movement at relatively high speeds about an axis of rotation extending through the product, comprising an oil-impregnated layer which is circumferentially disposed about said axis of rotation; said oil-impregnated layer having an exposed and self-lubricating surface directed toward said axis of rotation and extending therealong; and a resin-impregnated layer contiguous to said oil-impregnated layer and encompassing the same except along the exposed surface thereof; whereby a movement of oil, outward and away from said oil-impregnated layer, due to centrifugal forces caused by the high speed rotation of the product is prevented.

#### 4,014,803

#### LUBRICANT ADDITIVE

Hugh E. Romine, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

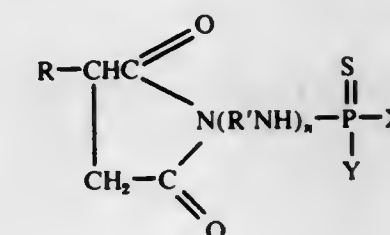
Continuation-in-part of Ser. No. 484,024, June 28, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 607,158

Int. Cl.<sup>2</sup> C10M 3/42

U.S. Cl. 252-32.7 R

22 Claims

1. Compounds represented by the formula

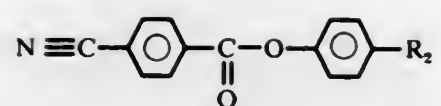


wherein









said component B being present in an amount of not more than about 30% by weight based on the total amount of the composition.

#### 4,014,812 METHOD OF PREPARING RARE EARTH PYROHAFNATE PHOSPHORS

Paul V. Kelsey, Jr., Blacksburg, Va., and James E. Mathers, Ulster, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 509,286, Sept. 25, 1975, abandoned. This application May 19, 1975, Ser. No. 578,763

Int. Cl.<sup>2</sup> C09K 11/46

U.S. Cl. 252—301.4 F

1 Claim

1. A method of making a luminescent composition of matter having the general formula  $(A_{1-x}RE_x)_2Hf_2O_7$ , wherein A is selected from the group consisting of yttrium, gadolinium, lanthanum, scandium, and lutetium and RE is selected from the group consisting of praseodymium, samarium, europium, terbium, dysprosium, holmium, erbium, and thulium, and x is from about 0.001 to 0.10, which comprises the steps of: dissolving effective amounts of an oxide of A and an oxide of RE in hydrochloric acid to form a first solution, said effective amounts being sufficient to achieve luminescence in the finished composition; dissolving  $HfOC_2$  in water to form a second solution; combining said first and second solution to form a third solution; adding to said third solution an oxalic acid precipitating agent to form a precipitate; separating said precipitate and washing with water to a neutral pH; filtering and drying said precipitate; first firing said precipitate at a temperature of about 950° C for about 2 hours in a high density alundum crucible; and, mortaring and refiring at about 1480° C for about 8 hours to produce said luminescent composition.

#### 4,014,813 HAFNIUM PYROPHOSPHATE PHOSPHORS AND METHODS OF PREPARATION

Igal Shidlovsky, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 439,541, Feb. 4, 1974, abandoned. This application Jan. 13, 1975, Ser. No. 539,906

Int. Cl.<sup>2</sup> C09K 11/08; C01B 25/26

U.S. Cl. 252—301.4 P

14 Claims

1. A luminescent material consisting essentially of hafnium pyrophosphate, wherein 0 to 20 mole percent of said hafnium is replaced with at least one member of the group consisting of zirconium, germanium and silicon, said luminescent material exhibiting a peak luminescence in the range of 2600 to 3000 Å.

9. A method for preparing a luminescent material comprising mixing together a hafnium compound and a phosphate compound, heating said mixture in air at temperatures between 400° and 1000° C whereby said mixture reacts, cooling said reacted mixture to room temperature, and then heating said reacted mixture at temperatures between 1000° and 1300° C in air for at least 30 minutes thereby forming a luminescent hafnium pyrophosphate having a peak luminescence in the range of 2600 to 3000 Å.

#### 4,014,814 CORROSION INHIBITOR COMPOSITION

David C. Zecher, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 30, 1975, Ser. No. 600,755

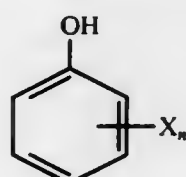
Int. Cl.<sup>2</sup> C09K 3/00; C23F 11/00

U.S. Cl. 252—389 A

14 Claims

1. A corrosion inhibitor composition for water systems consisting essentially of:

a. a water-soluble phenolic resin prepared by reacting a phenol having the ortho and/or para position blocked and of the general structural formula



wherein n is 1–3 and each X is in the ortho or para position and is independently selected from the group consisting of —OH, —COOH, hydrogen, —SO<sub>3</sub>H, —NH<sub>2</sub> and alkyl and alkylene radicals which have up to 8 carbon atoms and an aldehyde of the formula



wherein R is selected from the group consisting of hydrogen and lower aliphatic groups having less than 5 carbon atoms; and

b. a polyphosphate selected from the group consisting of inorganic polyphosphates having a molar ratio of at least one of alkali metal oxide, alkaline earth metal oxide, zinc oxide to P<sub>2</sub>O<sub>5</sub> of about 0.4/1–2/1, and their corresponding acids having a molar ratio of water to P<sub>2</sub>O<sub>5</sub> of about 0.4/1–2/1 and polyfunctional acid phosphate esters of a polyhydric alcohol, said esters having the formula R—(O—PO<sub>3</sub>H<sub>2</sub>)<sub>x</sub> wherein R is the organic residue of a polyhydric alcohol and x is a number from 2 to 6.

#### 4,014,815 REMOVAL OF CARBON AND VANADIUM OR LEAD FROM SPENT CATALYSTS BY MEANS OF CONTROLLED HIGH TEMPERATURE TREATMENT WITH SULFUR

Fred R. Gamble, Jr., Murray Hill, N.J., and Ricardo B. Levy, Los Altos, Calif., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 19, 1975, Ser. No. 588,401

Int. Cl.<sup>2</sup> B01J 37/00

U.S. Cl. 252—412

24 Claims

1. A process for selectively removing vanadium and carbon contamination from supported metal catalyst systems, which supported metal catalyst systems are selected from the group consisting of Group VI metals, Group VIII metals and bi and tri combinations thereof on a refractory oxide support, which process comprises the steps of:

a. contacting the contaminated supported metal catalyst system with an elemental sulfur vapor atmosphere at a temperature between 400° to 825° C, and a sulfur pressure of at least 0.10 atmospheres for a time sufficient to selectively form volatile vanadium and carbon sulfides; b. removing the volatile vanadium and carbon sulfides from the supported metal catalyst system.

17. A process for selectively removing vanadium and carbon contamination from supported metal catalysts, which supported metal catalysts are selected from the group consisting of Group VI metals, Group VIII metals and bi and tri combinations thereof on a refractory oxide support, which comprises the steps of:

a. contacting the contaminated supported catalyst system with liquid sulfur at a temperature of between 300°–825° C; b. forming soluble carbon and vanadium sulfides on the supported metal catalyst; c. dissolving the soluble carbon and vanadium sulfides in the liquid sulfur; d. removing the dissolved soluble carbon and vanadium sulfides from the supported metal catalyst system.

#### 4,014,816 SILANE ADJUVANT FOR CHROMIUM OXIDE CATALYST

John P. Hogan; Benny E. Nasser, both of Bartlesville, and Joseph A. Delap, Dewey, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 526,158, Nov. 22, 1974, Pat. No.

3,939,137. This application Oct. 16, 1975, Ser. No. 623,123

Int. Cl.<sup>2</sup> B01J 31/02; C08F 210/00, 110/02

U.S. Cl. 252—430

6 Claims

1. A catalyst which is prepared by mixing a calcined support containing chromium in the form of chromium oxide at least a part of said chromium being in the hexavalent state and a silane of the formula R<sub>n</sub>SiH<sub>3-n</sub> wherein n is an integer from 0 to 3 and R is a saturated or unsaturated hydrocarbon group containing from 1 to about 10 carbon atoms per molecule selected from alkyl, alkenyl, aryl, aralkyl, alkaryl, and cycloalkyl.

#### 4,014,817 MANUFACTURE OF ACTIVATED CARBON FROM SIZED COAL

Bruce C. Johnson, Grand Forks, N. Dak.; Rabindra Kumar Sinha, Coraopolis, and John Emery Urbanic, Pittsburgh, Pa., both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 3, 1975, Ser. No. 564,929

Int. Cl.<sup>2</sup> B01J 21/18, 37/00; C10B 53/04

U.S. Cl. 252—445

7 Claims

1. An improved method of making granular activated carbon comprising (a) crushing and separating to a size in the range of 2 × 40 U.S. Sieve Series, a coal having an ASTM rank of High Volatile C Bituminous, Subbituminous and Lignite, and having greater than 10 percent by weight bed moisture and greater than 10 percent by weight oxygen content; (b) heating said crushed and separated coal in air at a temperature of from about 150° C. to about 215° C. for a period of from 30 minutes to 18 hours, whereby from about 1 percent to about 3 percent by weight of oxygen is added to the coal; and (c) activating the thus oxidized coal at a temperature between about 540° and 1,100° C. in a controlled oxygen atmosphere; wherein the improvement comprises the step of contacting the coal starting material with a mineral acid in amount and for a time sufficient to result in an activated carbon produced by the remaining steps which has significantly higher Iodine and Carbontetrachloride Numbers, followed by the step of removing said acid from said coal, said steps being carried out prior to heating said coal in air.

#### 4,014,818 HIGH SURFACE AREA CATALYST COMPOSITIONS

Johannes H. Tebben, Maastricht, and Cornelis A. M. Weterings, Stein, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 26, 1974, Ser. No. 527,285

Claims priority, application Netherlands, Nov. 28, 1973, 7316235

Int. Cl.<sup>2</sup> B01J 21/08, 29/10

U.S. Cl. 252—451

3 Claims

1. A supported nickel catalyst composition for hydrogenating oils, fats and fatty acids, comprising (a) silica as a supporting material and (b) free metallic nickel as the catalytically

active material which is supported by said silica, wherein said silica is prepared by providing an alkali water glass; adding acid to said water glass to form a precipitate of silica and drying the silica by spray drying to form said supporting material; mixing said carrier with water and a water-soluble salt of said nickel; forming an insoluble salt of said nickel on said carrier, by increasing the concentration of hydroxyl ions in the solution; and reducing the nickel compound on said carrier to form the nickel metal catalyst on said carrier.

#### 4,014,819 NICKEL CATALYST

Johannes H. Tebben, Maastricht, and Cornelis A. M. Weterings, Stein, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 26, 1974, Ser. No. 527,284

Claims priority, application Netherlands, Nov. 28, 1973, 7316234

Int. Cl.<sup>2</sup> B01J 29/10

U.S. Cl. 252—459

10 Claims

1. A process for preparing a nickel catalyst which is precipitated on a silica carrier, wherein the specific nickel surface area is between 120 and 180 m<sup>2</sup>/g, comprising measuring the pH of a mixture of a silica carrier in water; adding, with stirring, (1) a water soluble salt of nickel to the mixture and (2) urea to precipitate a composition comprising the insoluble nickel salt deposited on said carrier, at temperatures above 50° C.; and reducing said composition to form a metal catalyst deposited on said carrier; wherein the amount of urea added to the mixture of silica, water and water soluble nickel salt, satisfies the equation

$$U = f \sqrt{Ni} \quad (1)$$

where:

U = urea concentration in grams per liter;  
Ni = nickel ions concentration in grams per liter of water;  
f = a factor varying between 75/pH and 175/pH, in which pH = the pH value of the suspension of the silica in the water.

#### 4,014,820 METHOD OF MAKING A RANEY COPPER CATALYST AND THE CATALYST SO MADE

Jerry J. Svarz, La Grange; Louis A. Goretta, Naperville, both of Ill., and Virgil L. Seale, Houston, Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 458,435, April 5, 1976, Pat. No. 3,920,740, which is a continuation-in-part of Ser. No.

408,238, Oct. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 280,686, Aug. 14, 1972, abandoned. This application Apr. 17, 1975, Ser. No. 569,308

Int. Cl.<sup>2</sup> B01J 23/00, 23/72, 25/02; C07C 103/10

U.S. Cl. 252—463

10 Claims

1. In a process for making a Raney copper catalyst which contains from about 2 to 45% by weight on a 100 weight percent total catalyst weight basis of aluminum, said catalyst having a relative activity of at least about 2.0 and having been prepared by contacting an aqueous medium containing dissolved therein alkali metal solution to a group of copper/aluminum alloy particles, the improvement which comprises conducting such contacting by incrementally adding aqueous dissolved alkali metal hydroxide to said medium during said contacting over said time interval,

A. said aqueous alkali metal hydroxide solution containing from 0.5 to 40 weight percent dissolved alkali;  
B. said group having an average particle size diameter in the range from about 0.002 to 0.5 inch;  
C. said copper/aluminum alloy having initially a copper to aluminum weight ratio of from about 30:70 to 70:30;  
D. said contacting being accomplished over a total time interval of from about 2 to 30 hours;  
E. the addition rate of such alkali metal hydroxide contact-



ing being from about 0.01 to 7 moles of alkali metal hydroxide per mole of aluminum initially present in said alloy particles per hour;

F. the total quantity of alkali metal hydroxide so added being in the range of from about 0.5 to 20 moles of alkali metal hydroxide per mole of aluminum initially present in said alloy particles; and

G. the resulting aqueous medium produced in such contacting being maintained at a temperature in the range from about 32 to 180° F.

4,014,821

## HEAVY CRUDE CONVERSION CATALYST

Glen P. Hamner, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 440,315, Feb. 7, 1974, abandoned. This application Dec. 16, 1974, Ser. No. 533,301

Int. Cl.<sup>2</sup> B01J 23/84, 23/88

U.S. Cl. 252-470

11 Claims

1. A catalyst having enhanced selectively suitable for the conversion and demetallization of feeds which contain large quantities of 1050° F.+ hydrocarbon materials comprising a composite of from about 5 to about 50 percent of a Group VIB metal, or compound thereof thermally decomposable to an oxide, or from about 1 to about 12 percent of a Group VIII metal, or compound thereof thermally decomposable to an oxide, or a composite which comprises an admixture of said Group VIB and Group VIII metals, or compounds thereof thermally decomposable to oxides, measured as oxides, and a porous inorganic oxide support, said catalyst comprising, when the catalyst is of size ranging 1/500 to 1/50 inch average particle size diameter, at least about 20 percent of its total pore volume of absolute diameter within the range of about 100A to about 200A; when the catalyst is of size ranging from about 1/50 inch up to 1/25 inch average particle size diameter, at least about 15 percent of its total pore volume of absolute diameter within the range of about 150A to about 250A; when the catalyst is of size ranging from about 1/25 inch to about 1/8 inch average particle size diameter, at least about 15 percent of its total pore volume of absolute diameter within the range of about 175A to about 275A; surface areas ranging at least about 200 m<sup>2</sup>/g to about 600 m<sup>2</sup>/g and pore volumes ranging from about 0.8 cc/g to about 3.0 cc/g.

4,014,822

## SEMICONDUCTOR CERAMIC COMPOSITION

Nagao Fujikawa, Takatsuki, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 225,219, Feb. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 849,775, Aug. 13, 1969, abandoned. This application Apr. 26, 1974, Ser. No. 464,576

Claims priority, application Japan, Aug. 13, 1968, 43-57578

Int. Cl.<sup>2</sup> H01B 1/06

U.S. Cl. 252-520

21 Claims

1. A ceramic composition for making a semiconductor, said composition consisting essentially of 83.95 to 98.65 mol% of a basic composition composed of 47.0 to 50.0 mol% of barium oxide and 50.0 to 53.0 mol% of titanium dioxide, 0.13 to 0.45 mol% of manganese oxide, 0.2 to 15 mol% of silicon dioxide and 0.23 to 1.65 mol% of one or more oxides selected from the group consisting of oxides of rare earth elements, bismuth and antimony, the content of said one or more oxides being 0.10 to 120 mol% greater than the content of manganese oxide.

4,014,823  
π-TRICYCLEN-9-ALKANONE PERFUMES  
Braja Dulal Mookherjee, Holmdel; Venkatesh Kamath, Red Bank, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

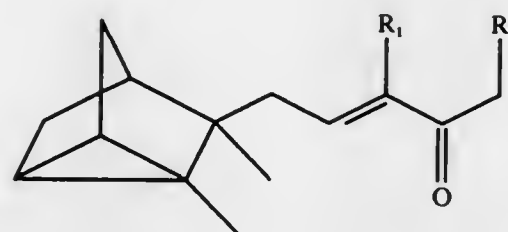
Continuation-in-part of Ser. No. 556,862, March 10, 1975, Pat. No. 3,944,621. This application Jan. 5, 1976, Ser. No. 646,608

Int. Cl.<sup>2</sup> L11B 9/00

U.S. Cl. 252-522

4 Claims

1. A perfume composition comprising a tricyclic compound having the structure:



wherein R<sub>1</sub> and R<sub>2</sub> are each selected from the group consisting of hydrogen or methyl, at least one of R<sub>1</sub> or R<sub>2</sub> being hydrogen and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, other ketones, nitriles, esters, lactones and hydrocarbons.

4,014,824

## TRIGLYCIDYL COMPOUNDS AND THEIR USE

Friedrich Stockinger, Therwil, and Friedrich Lohse, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

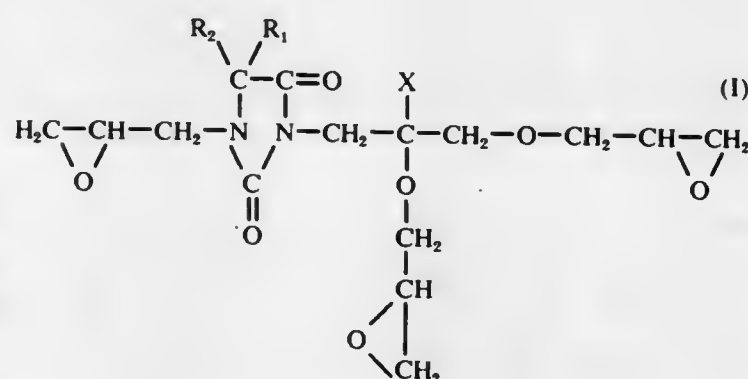
Division of Ser. No. 509,876, Sept. 27, 1974, Pat. No. 3,925,407. This application Sept. 22, 1975, Ser. No. 615,742

Int. Cl.<sup>2</sup> C08G 59/32

U.S. Cl. 260-2 EC

6 Claims

1. A curable mixture which is suitable for the manufacture of moldings or castings, comprising a triglycidyl compound of the formula I



wherein X is hydrogen, or methyl, and R<sub>1</sub> and R<sub>2</sub> independently of one another each is hydrogen, alkyl, alkenyl, cycloalkyl or phenyl, which can be substituted, or wherein R<sub>1</sub> and R<sub>2</sub> together denote tetramethylene or pentamethylene; and a curing agent for epoxy resins.

4,014,825  
TERTIARY ALCOHOL-BEARING ORGANOSILICONE POLYMERS

Bernard Kanner, West Nyack, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

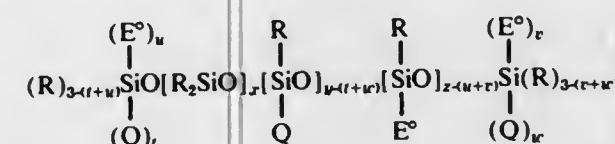
Filed Dec. 29, 1975, Ser. No. 644,840

Int. Cl.<sup>2</sup> C08J 9/00

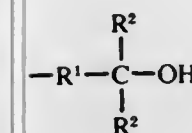
U.S. Cl. 260-2.5 AH

29 Claims

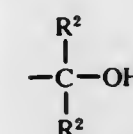
1. A tertiary alcohol-substituted organosiloxane polymer having the average formula,



wherein: R is an alkyl radical having from one to ten carbon atoms; E° is hydrogen or a polyoxyalkylene block; Q is a tertiary alcohol group having the formula,



wherein R' represents a bivalent hydrocarbon radical selected from the class consisting of alkylene radicals having from 2 to 8 carbon atoms, alkenylene radicals having from 2 to 8 carbon atoms and dialkylene ether radicals having from 4 to 10 carbon atoms; wherein each R<sup>2</sup> radical taken individually represents a monovalent hydrocarbon radical having from 1 to 10 carbon atoms or where taken together form a cycloaliphatic radical with the tertiary carbon atom of the



group, wherein t, u, v, w, the sum t+u and the sum v+w are independently zero or one, and each of the sums t+w and u+v is independently zero, one or two; x is zero or a positive number having an average value up to about 200; y has an average value from about 2 to about 100; and z has an average value from about 2 to about 30.

4,014,826  
PROCESS FOR PREPARING REBONDED FOAM STRUCTURES

Malak E. Yunan, Boonton Township, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 452,568, March 19, 1974, Pat. No. 3,894,973. This application Mar. 13, 1975, Ser. No. 558,020

Int. Cl.<sup>2</sup> C08G 18/14; C08J 9/22

U.S. Cl. 260-2.5 AK

1 Claim

1. The process of preparing a molded cushioning structure which comprises the steps of:

- shredding or otherwise subdividing pneumacel batting into particles of substantially single-fiber dimensions,
- mixing 1-50 parts by weight of the subdivided pneumacel batting of step (a) with 99-50 parts by weight of shredded elastomeric foam,
- wetting the resulting mixture with from 5-50 parts by weight of elastomeric binder progenitor, and
- curing the mixture resulting from steps (a) through (c) under conditions which result in conversion of the progenitor into an elastomeric adhesive, thereby bonding the mixture into a unitary elastomeric structure.

4,014,827  
SUBSTRATE REINFORCED RUBBER STRUCTURE AND COMPOUND FOR FORMING SAME

David R. Hart, and Wade K. Cunningham, both of Birmingham, Ala., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Mar. 10, 1975, Ser. No. 556,693

Int. Cl.<sup>2</sup> C08L 7/00

U.S. Cl. 260-3

6 Claims

1. In a substrate reinforced rubber structure wherein the substrate is selected from the group consisting of cotton, rayon, nylon, fiberglass, steel and polyester, the improvement which comprises compounding the rubber with a methylene acceptor selected from the group consisting of resorcinol and precondensed resorcinolformaldehyde resin and as a donor, the reaction product of phenol and hexamethylenetetramine.

4,014,828  
THERMOSETTABLE FRICTION PARTICLES FOR USE IN FRICTION ELEMENTS

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed June 23, 1975, Ser. No. 589,636

Int. Cl.<sup>2</sup> C08L 1/28

U.S. Cl. 260-16

26 Claims

1. A process for preparing improved friction particles for use in friction element compositions wherein said particles are infusible with like friction particles and undergo no substantial softening at elevated temperatures, said process comprising the steps of polymerizing a cashew nut shell oil suspended in a liquid medium to form a resin and crosslinking the suspended resin in the presence of a suspension stabilizer.

4,014,829  
FLAME RESISTANT FIBER BLENDS

Bennett Ray Baird, Camden, S.C., and Leander Adair Sherbeck, Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 30, 1974, Ser. No. 519,355

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C08L 1/02

U.S. Cl. 260-17.2

9 Claims

1. A flame-resistant blend of textile fibers comprising (a) from about 20 to 40% by weight of a normally flammable textile fiber aesthetically suitable for wearing apparel and (b) from about 60 to 80% by weight of poly(metaphenylene isophthalamide) fiber containing distributed substantially throughout its whole interior a finely divided cross-linked reaction product of a tetrakis hydroxymethyl phosphonium compound selected from the group consisting of tetrakis hydroxymethyl phosphonium chloride, tetrakis hydroxymethyl phosphonium oxide and reactive derivatives thereof and a resin containing active hydrogen selected from the group of melamine formaldehyde, phenolformaldehyde and hexamethylol melamine, the phosphonium compound being present in an amount of from 5-20% by weight (unreacted basis) of the poly(metaphenylene isophthalamide) fiber.

4,014,830  
ACRYLATE OR METHACRYLATE MODIFIED ALKYD RESINS AND EPOXY ESTERS

Robert D. Rumfield, Louisville, Ky., assignor to Celanese Coatings & Specialties Company, Louisville, Ky.

Filed Oct. 30, 1975, Ser. No. 627,447

Int. Cl.<sup>2</sup> C08G 63/12; C08K 5/01

U.S. Cl. 260-22 CB

10 Claims

1. A coating composition comprising an air-drying unsaturated fatty acid alkyd resin or epoxy ester blended with about 1 weight percent to about 10 weight percent, based on the total weight of the blend, of a polyacrylate or polymethacrylate ester of a polyol.



4,014,831

## NOVEL IONIC POLYMER COMPOSITIONS

Jan Bock, Piscataway; Neville G. Thame, Edison, both of N.J., and Lowell Westerman, Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed May 21, 1975, Ser. No. 579,496

Int. Cl.<sup>2</sup> C08F 8/42

U.S. Cl. 260—23 H

25 Claims

1. An improved process for forming a neutralized sulfonated polymer having a hydrocarbon backbone from an acid form of the sulfonated polymer having about 0.2 to about 25 mole percent SO<sub>3</sub>H groups, wherein the improvement comprises the following steps:

- adding a first neutralizing agent to said acid form of said sulfonated polymer to neutralize at least about 50% of said SO<sub>3</sub>H groups, said first neutralizing agent being selected from the group consisting essentially of Groups I-A, II-A, II-B, III-A, IV-A or ammonium derivatives of fatty acids, to form a mixture of a partially neutralized sulfonated polymer and said fatty acid formed from said derivative of said fatty acid; and
- adding a second neutralizing agent to form a metallic salt of said fatty acid, said metallic salt of said fatty acid having a higher melting point than said fatty acid and further neutralizing said SO<sub>3</sub>H groups of said partially neutralized sulfonated polymer to at least about 95%, said second neutralizing agent being selected from about consisting essentially of hydroxides, lower alkoxides, and lower alkanoates of Group I-A, II-A and II-B metals, at least 25% of the fatty acid being converted into the higher melting salt.

4,014,832

## HEAT RESISTANT RESIN SOLUTION AND METHOD FOR PREPARATION THEREOF

Yasuhiro Suzuki; Toshihide Okamoto; Yuzuru Noda, and Makoto Kojima, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Apr. 18, 1975, Ser. No. 569,427

Claims priority, application Japan, May 1, 1974, 49-48277

Int. Cl.<sup>2</sup> C08G 51/24

U.S. Cl. 260—29.2 N

13 Claims

1. A method for the preparation of heat resistant resin solutions comprising preparing a polymer having a residual acid value of about 5 to 40% by heat reacting 1,2,3,4-butanetetracarboxylic acid, an aromatic tricarboxylic acid anhydride and a diamine in the presence of a polyhydric alcohol, and dissolving the polymer in aqueous ammonia and at least one solvent selected from the group consisting of monohydric alcohols, polyhydric alcohols, polyhydric alcohol derivatives, ketones, ethers and esters.

4,014,833

## AQUEOUS PRINTING INK WITH POLYETHYLENE OXIDE

Augustus L. Story, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 28, 1975, Ser. No. 635,819

Int. Cl.<sup>2</sup> C09D 11/10

U.S. Cl. 260—29.2 EP

8 Claims

1. A method for improving the transfer characteristics of an aqueous printing ink which comprises adding to the ink polyethylene oxide having an average molecular weight of from 100,000 to 350,000.

4,014,834

## AQUEOUS SOLUTIONS OF POLYAMIDE ACIDS WHICH CAN BE PRECURSORS OF POLYIMIDE POLYMERS

Thomas Patrick Concannon, Newtown Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 4, 1975, Ser. No. 546,998

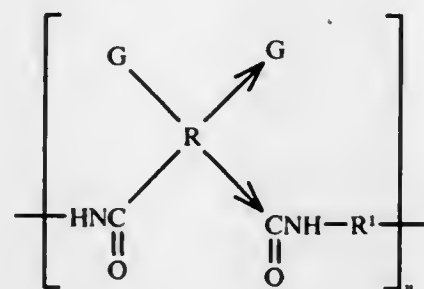
Int. Cl.<sup>2</sup> C08J 3/06; C08L 79/08

U.S. Cl. 260—29.2 N

11 Claims

1. A composition consisting essentially of an aqueous solution of

A. 20 to 70% by weight, based on the solution, of a salt of a polyamide acid with a tertiary amine, wherein the polyamide acid is of the general formula



wherein one or both G radicals are hydrogen or a carboxyl; atoms and groups wherein → denotes isomerism so that in any recurring unit within the polymeric structure the groups to which the arrows point may exist as shown or in an interchanged position; wherein R is an organic tetravalent radical containing at least two carbon atoms and no more than two carbonyl groups of each polyamide acid unit are attached to any one carbon atom; wherein R' is a divalent radical containing at least two carbon atoms, the amide groups of adjacent polyamide acid units are attached to separate carbon atoms of said divalent radical; and wherein n is an integer sufficient to provide a polyamide acid having an inherent viscosity of 0.1–5.0, as measured as a 0.5% solution in N,N-dimethylacetamide at 30° C., and wherein said tertiary amine is present in at least a stoichiometrically equivalent amount to the free carboxylic acid groups in said polyamide acid;

B. 5 to 25% by weight, based on the solution, of a viscosity reducing agent which is miscible with water and has a solubility parameter range of 10–20.4 wherein said solubility parameter has a dispersion component in the range of 7.0–10.0, a polar component in the range of 2.0–11.0, and a hydrogen bonding component in the range of 7.0–14.0;

C. 5 to 35% by weight, based on the solution, of a coalescing agent, wherein said coalescing agent is at least one member selected from the group consisting of N-methylpyrrolidone, dimethyl formamide, dimethyl acetamide, dimethyl sulfoxide, cresylic acid, sulfolane, formamide; and wherein water comprises 30–80% by weight of the solution.

4,014,835

## COMPOSITION COMPRISING A BLEND OF A RESORCINOL-ALDEHYDE RESIN; AN ELASTOMER AND AN ORGANO SILICON COUPLING SYSTEM

Frank Paul McCombs, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 354,980, April 27, 1973, Pat. No. 3,900,661. This application Apr. 14, 1975, Ser. No. 567,660

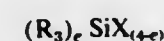
Int. Cl.<sup>2</sup> C08G 51/24

U.S. Cl. 260—29.3

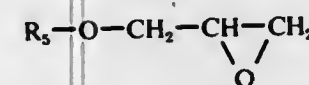
26 Claims

1. A composition for use in the treatment of glass fibers comprising (A) an aqueous dispersion having a solids content comprising 2 to 10 parts by weight of a resorcinol-aldehyde resin and 20 to 100 parts by weight of at least one elastomer and (B) from 0.1 to 25% of total solids of a combination of organo silicon compounds comprising (1) 1 to 30% by weight of an amino-substituted organo silane or its hydrolysis product

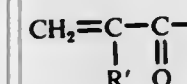
and (2) 99 to 70% by weight of an organo silicon compound containing at least one beta-haloalkoxy group in the form of the reaction product of (a) a halosilane



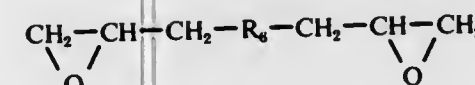
wherein R<sub>3</sub> is an organic group, X is halogen and e is 0 or an integer from 1 to 2, (b) an alkylene oxide containing 1 to 6 carbon atoms and (c) an epoxide selected from the group consisting of a monoepoxide of the formula



wherein R<sub>5</sub> is an aryl group substituted with an amino group, a halogen group, an alkyl group containing 1 to 20 carbon atoms and substituted derivatives thereof, an alkenyl group containing 2 to 8 carbon atoms, a



group wherein R' is hydrogen or methyl, a diepoxide of the formula



wherein R<sub>6</sub> is a divalent organic radical group and a cyclohexane diepoxide; with (b) and (c) being in the ratio of from 1 to 3 epoxide equivalents of (b) to from 0.5 to 3 epoxide equivalents of (c).

4,014,836

## FIRE RETARDANT POLYMERIC ADDITIVES

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 397,515, Sept. 17, 1973, Pat. No. 3,948,842, which is a continuation-in-part of Ser. Nos. 49,204, June 23, 1970, Pat. No. 3,725,509, and Ser. No. 160,905, July 8, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,086

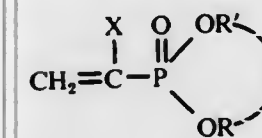
Int. Cl.<sup>2</sup> C08L 43/02, 27/00

U.S. Cl. 260—29.6 TA

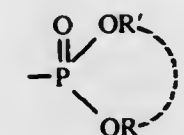
10 Claims

1. An aqueous emulsion comprising particles of an emulsion polymer consisting essentially of:

- from about 10 to 98% by weight of a vinyl or vinylidene halide;
- from about 1% to 89% by weight of at least one bis(hydrocarbyl)vinyl phosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C<sub>1</sub>–C<sub>18</sub> alkyl and



wherein R and R' are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint; and

- from about 1 to 45% by weight of at least one third comonomer selected from the vinyl esters of carboxylic acids.

4,014,837

## FIRE RETARDANT POLYMERIC ADDITIVES

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 397,515, Sept. 17, 1973, Pat. No. 3,948,842, which is a continuation-in-part of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509, and a continuation-in-part of Ser. No. 160,905, July 8, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,228

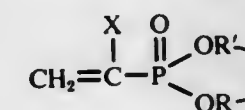
Int. Cl.<sup>2</sup> C08L 43/02, 27/00

U.S. Cl. 260—29.6 TA

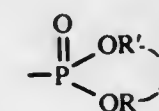
8 Claims

1. An aqueous emulsion comprising particles of an emulsion polymer consisting essentially of:

- from about 10 to 98% by weight of a vinyl or vinylidene halide;
- from about 1% to 89% by weight of at least one bis(hydrocarbyl)vinyl phosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C<sub>1</sub>–C<sub>18</sub> alkyl and



wherein R and R' are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint; and

- from about 1% to 45% by weight of at least one third comonomer selected from the ethylenically unsaturated dicarboxylic acids, anhydrides and the C<sub>1</sub>–C<sub>20</sub> mono- and dialkyl esters thereof.

4,014,838

## FIRE RETARDANT POLYMERIC ADDITIVES

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 397,515, Sept. 17, 1973, Pat. No. 3,948,842, which is a continuation-in-part of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509, which is a continuation-in-part of Ser. No. 160,905, July 8, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,122

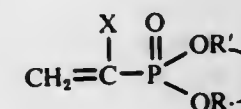
Int. Cl.<sup>2</sup> C08L 43/02, 27/00

U.S. Cl. 260—29.6 TA

9 Claims

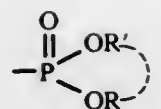
1. An aqueous emulsion comprising particles of an emulsion polymer consisting essentially of:

- from about 10 to 98% by weight of a vinyl or vinylidene halide;
- from about 1% to 89% by weight of at least one bis(hydrocarbyl)vinyl phosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C<sub>1</sub>–C<sub>18</sub> alkyl and





wherein R and R' are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint; and  
3. from about 1% to 45% by weight of at least one third comonomer selected from the C<sub>1</sub>-C<sub>20</sub> alkyl vinyl ethers.

4,014,839

## FIRE RETARDANT POLYMERIC ADDITIVES

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

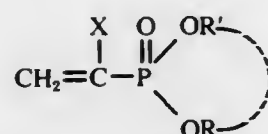
Division of Ser. No. 397,515, Sept. 17, 1973, Pat. No. 3,948,842, which is a continuation-in-part of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509, and a continuation-in-part of Ser. No. 160,905, July 8, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,121

Int. Cl.<sup>2</sup> C08L 43/02, 27/00

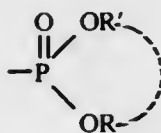
U.S. Cl. 260—29.6 TA

8 Claims

1. An aqueous emulsion comprising particles of an emulsion polymer consisting essentially of:  
1. from about 10 to 98% by weight of a vinyl or vinylidene halide;  
2. from about 1% to 89% by weight of at least one bis (hydrocarbyl) vinyl phosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C<sub>1</sub>-C<sub>18</sub> alkyl and



wherein R and R' are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint; and  
3. from about 1% to 45% by weight of at least one third comonomer selected from the alpha olefins.

4,014,840

## NON-DISTRESSING ACCELERATED HEAT CURE OF PORTLAND CEMENT CONCRETE SYSTEMS

Gale L. Emig, Midland; Robert H. Anspaugh, Bay City, and R. Douglas Eash, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 12, 1974, Ser. No. 478,480

Int. Cl.<sup>2</sup> C08L 27/08

U.S. Cl. 260—29.6 S

2 Claims

1. A process for non-distressing accelerated heat cure of portland cement concrete systems said process consisting of the sequential steps of (1) admixing portland cement concrete with a vinylidene chloride polymer latex said latex being present in an amount sufficient to provide from about 5 to about 20 percent by weight of latex solids based on the weight of portland cement in said portland cement concrete and wherein said vinylidene chloride polymer is composed of about 75 parts by weight of vinylidene chloride, about 5 parts by weight of ethyl acrylate, about 2 parts by weight of methyl methacrylate and about 20 parts by weight of vinyl chloride, then (2) heating said admixture to temperatures of from at least about 100° F to about 250° F under less than about 80

percent relative humidity for a period of at least about 4 hours.

4,014,841

## AEROSOL LATEX PAINT CONTAINING CATIONIC SURFACTANTS

Bernard Taub, Williamsville, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

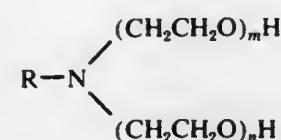
Filed Apr. 24, 1975, Ser. No. 571,126

Int. Cl.<sup>2</sup> C08L 31/04

U.S. Cl. 260—29.6 MN

11 Claims

1. An aerosol latex paint composition comprising an emulsion of a pigmented aqueous dispersion of a waterinsoluble vinyl acetate-acrylic copolymer resin in a liquid propellant containing a cationic surfactant having an HLB value of between 5 and 10, wherein the liquid propellant comprises 30 to 70 weight percent of the composition and is a hydrocarbon having 3 to 4 carbon atoms, a halogenated hydrocarbon having 1 to 4 carbon atoms, or mixtures thereof, and wherein the cationic surfactant has the formula



wherein R is a straight chain alkyl, or a straight or branched chain alkyl or aralkyl, containing 7 to 24 carbon atoms, said R can contain a nitrogen atom as an amine linkage and up to two oxygen atoms as ester or ether linkages or as -OH groups, and m and n are integers of 0 to 4, with the sum of m and n equal to at least 1 and not greater than 4.

4,014,842

## VINYL CHLORIDE RESIN COMPOSITIONS

Takumi Kosugi; Shigeki Yasunaga, both of Kobe; Yutaka Tanaka, Akashi, and Yoshihiko Hashimoto, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 363,478, May 24, 1973, abandoned. This application Aug. 22, 1975, Ser. No. 606,766

Int. Cl.<sup>2</sup> C08L 27/06, 51/00

U.S. Cl. 260—29.6 RB

8 Claims

1. A vinyl chloride resin composition consisting essentially of a blend of 30 to 97 parts by weight of a vinyl chloride homopolymer or a copolymer derived from 70% or more vinyl chloride and 30% or less one or more monomers copolymerizable therewith and 3 to 70 parts by weight of a graft polymer prepared by graft polymerizing 80 to 20 parts by weight of a monomer mixture of 10 to 100% by weight alkyl methacrylate selected from the group consisting of methyl methacrylate, ethyl methacrylate, propyl methacrylate, isopropyl methacrylate, isobutyl methacrylate, sec-butyl methacrylate, tert-butyl methacrylate, and mixtures thereof; 0 to 80% by weight of a vinyl aromatic compound selected from the group consisting of styrene, vinyl toluene, alpha substituted styrene, benzene-(substituted) styrene and its derivatives, vinyl carbazole, vinylbiphenyl and mixtures thereof; and 0 to 35% by weight unsaturated nitrile selected from the group consisting of acrylonitrile and methacrylonitrile; onto a substrate polymer of alkyl acrylate selected from the group consisting of ethyl acrylate, propyl acrylate, n-butyl acrylate, isobutyl acrylate, pentyl acrylate, hexyl acrylate, n-octyl acrylate, 2-ethyl-hexyl acrylate and mixtures thereof and an allyl ester of vinyl or vinylidene unsaturated alpha-carboxylic acid selected from the group consisting of allyl acrylate, allyl methacrylate, monoallyl itaconate, diallyl itaconate and mixtures thereof, said substrate polymer being in an aqueous dispersion and said allyl ester being in an amount of 0.1 to 8% by weight of said substrate polymer and the particles size of said dispersion being between 0.05 to 0.2 microns and the gel content being at least 50%.

4,014,843

## LATEX COMPOSITIONS

Valentino George Xanthopoulos, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 367,504, June 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 141,433, May 7, 1971, abandoned. This application Apr. 30, 1975, Ser. No. 573,114

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> C08L 9/00, 9/04, 9/08, 25/14

U.S. Cl. 260—29.7 T

9 Claims

1. A process of producing a high solids latex foamable to a stable froth which comprises polymerizing 100 parts by weight of a monomer mixture of (a) 30–100% by weight of an aliphatic conjugated C<sub>4</sub>-C<sub>6</sub> diolefin and (b) 0–70% by weight of at least one copolymerizable compound, said monomer mixture being emulsified in less than 140 parts by weight of an aqueous phase containing less than 6 parts by weight of (A) a polymerization promoting emulsifier system consisting of (1) an alkali metal salt of an alkyl sulfate, alkoxyalkyl sulfate or alkoxyalkyl phosphate having a critical micelle concentration from about 0.002% to about 0.15% or (2) an alkali metal salt of sulfosuccinic acid or an amine derivative of sulfosuccinic acid having a hydrocarbyl substituent attached to an oxygen atom or a nitrogen atom, or a partial alkali metal salt of N-alkyl beta imino dicarboxylic acid, said salt (2) having a critical micelle concentration from about 0.01% to about 1.0% and (B) from about 0.001 to less than 0.1 part by weight of a water dispersible agglomerating system comprising the reaction product of a polyoxyalkylene glycol having a molecular weight of at least 5,000 with the polyepoxide obtained by reacting epichlorohydrin with a polyhydric phenol, said reaction product having a molecular weight of about 15,000–20,000, said polymerization being carried out to at least 65% conversion to form a stable fluid latex and concentrating said latex to a solids level of at least 55%.

4,014,844

## PROCESS FOR GRAFTING POLYMERS ON CARBON BLACK THROUGH FREE RADICAL MECHANISM

Alain Vidal; Gerard Riess, and Jean-Baptiste Donnet, all of Mulhouse, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation of Ser. No. 157,672, June 28, 1971, abandoned.

This application Apr. 2, 1975, Ser. No. 564,477

Claims priority, application France, June 26, 1970, 70.23691

Int. Cl.<sup>2</sup> C08K 3/04

U.S. Cl. 260—31.2 R

10 Claims

1. A process for grafting polymers on carbon black through a transfer reaction free radical mechanism which comprises (1) forming a reaction mixture consisting of carbon black and at least one polymer containing a tertiary hydrogen atom, (2) degassing said mixture under vacuum at approximately room temperature, (3) adding at least one substance that is a solvent for said polymer to said degassed mixture, under vacuum, to form a solution of the said polymer containing the carbon black and (4) heating said solution to a temperature of at least 50° C at which said reaction takes place and continuing the reaction until the desired carbon black bearing polymer graft is obtained.

4,014,845

## FUGITIVE VEHICLE SYSTEM

John D. Grier, Temperance, and Lynn J. Taylor, Haslett, both of Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 23, 1971, Ser. No. 174,197

Int. Cl.<sup>2</sup> C08K 5/01, 5/03, 5/12

U.S. Cl. 260—31.8 R

6 Claims

1. As a composition of matter, a fugitive vehicle system comprising at least two organic components, at least one

component being a solid polymeric material at ambient temperature, said polymeric material being a copolymer, terpolymer, or quadpolymer of oxygen and at least one monomer of alkyl methacrylate with the alkyl containing 1 to 6 carbon atoms and being capable of pyrolyzing in a non-oxygen containing environment at an elevated temperature of about 250° C to about 450° C without leaving a carbonaceous residue, and at least one other component being a solvent for the polymer material, said solvent being selected from the group consisting of dimethyl phthalate; diethyl phthalate; di-n-butyl phthalate; di-n-butyl succinate; dimethyl sebacate; dibenzyl ether; butyl benzoate; acetyl triethyl citrate; glyceryl triacetate; beta-ethoxy ethyl benzoate; isoamyl benzoate; benzyl benzoate; isobutyl salicylate; isoamyl salicylate; benzyl salicylate; ethyl laurate; butyl oleate; ethyl myristate; butyl benzyl phthalate; dimethyl sebacate; diethyl sebacate; diethyl azelate; di-n-butyl adipate; diisobutyl adipate; dibutyl sebacate; dibutyl tartrate; glyceryl tributyrate; diethyl isophthalate; butyl palmitate; dodecylbenzene; tetradecylbenzene; pentaethylbenzene; diphenylmethane; 1,1-diphenylethane; 1-chloronaphthalene; 1-bromonaphthalene; dimethylnaphthalene; 1-methoxy naphthalene; an n-alkane containing 14 to 20 carbon atoms; diphenyl ether; bis(alpha-methylbenzyl) ether; tetraethylene glycol dimethyl ether; 2-benzoyloxyethanol; phenyl n-hexyl carbinol; triethylene glycol; 1,5-pentanediol; hexanophenone; 1-naphthyl methyl ketone; p-n-pentylphenol; N-cyclohexyl-2-pyrrolidone, glutaronitrile; and p-methoxyphenylacetoneitrile; and having a boiling or decomposition temperature below the pyrolyzing temperature of the polymeric material, said temperature being in the range of about 100° C to about 400° C.

4,014,846

## LOW-VISCOUS, STABLE POLYMER DISPERSIONS AND POLYURETHANES PREPARED THEREFROM

Gerhard G. Ramlow, East Windsor, N.J.; Louis C. Pizzini, Trenton, Mich.; John T. Patton, Jr., Wyandotte, Mich., and John R. Murphy, Trenton, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Apr. 29, 1974, Ser. No. 465,072

The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> C08G 18/14, 18/62

U.S. Cl. 260—33.2 R

28 Claims

1. A low-viscous, stable polymer dispersion prepared by blending:

- from 45 to 95 weight percent of a liquid polyol having a hydroxyl equivalent weight of from 500 to 10,000 with
  - from 55 to 5 weight percent of a hydroxycontaining finely-divided solid polymer obtained by polymerizing in the presence of a free radical catalyst and an organic solvent:
- from about 55% to 95% by weight of an ethylenically unsaturated monomer or mixture of monomers and
  - from about 45% to 5% by weight of a hydroxy-terminated organic compound having from one to eight hydroxyl groups, a hydroxyl equivalent weight of from 500 to 10,000 and containing a polymerizable carbon-to-carbon double bond, said weight percents being based on the total weight of (1) and (2).



4,014,847

**IONIC POLYMER PLASTICIZED WITH PREFERENTIAL PLASTICIZERS**

Robert D. Lundberg, Somerville; Henry S. Makowski, Scotch Plains, both of N.J., and Lowell Westerman, Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 11, 1974, Ser. No. 487,467

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C08K 5/05, 5/20, 5/43, 5/49

U.S. Cl. 260—33.4 R

18 Claims

1. A composition of matter comprising an ionically cross-linked polymer in combination with from about 0.2 to 50 parts per hundred parts ionically crosslinked polymer of a preferential plasticizer wherein said plasticizer is a normally liquid, non-volatile compound having a solubility parameter of at least nine, a boiling point of at least 150°C, and containing functional groups exhibiting a bond moment of at least 0.6 Debye, wherein the ionically crosslinked polymer is a sulfonated polymer.

4,014,848

**NON-HARDENING HIGH MOLECULAR WEIGHT TRANS-POLYPENTENAMERS**

Friedrich Haas, Cologne-Buchheim; Karl Nützel, Opladen, and Hans-Joachim Jahn, Cologne-Flittard, all of Germany, assignors to Bayer Aktiengesellschaft, Germany  
Continuation of Ser. No. 330,641, Feb. 8, 1973, abandoned, which is a continuation of Ser. No. 164,137, July 19, 1971, abandoned, which is a continuation of Ser. No. 813,688, April 4, 1969, abandoned. This application May 17, 1974, Ser. No. 470,945

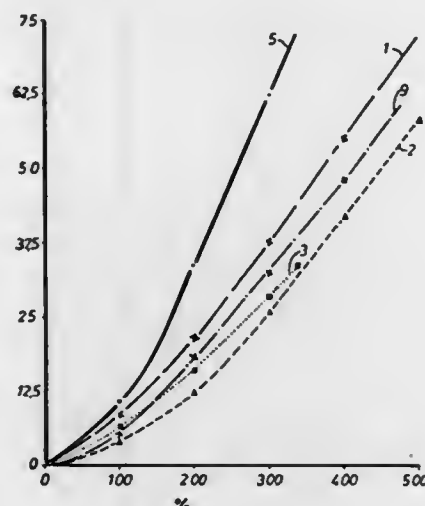
Claims priority, application Germany, Apr. 11, 1968, 1769149

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C08F 32/04; C08K 5/01

U.S. Cl. 260—33.6 AQ

6 Claims



1. A composition of matter consisting essentially of (a) a high molecular weight polypentenamer having more than 50% of its double bonds in the trans-configuration obtained by ring-opening polymerization of cyclopentene and having a Mooney viscosity ML 4' (100°C.) of from 50 to 200 and (b) from 20 to 100 parts by weight of a plasticizer per 100 parts by weight of said polypentenamer, said plasticizer being a paraffinic, naphthenic or aromatic hydrocarbon having a molecular weight of from 200 to 1500.

4,014,849

**SELF-EXTINGUISHING REINFORCED POLYCARBONATE MOLDING COMPOSITIONS**

Peter Horn, Ludwigshafen, and Cai von Rumohr, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 4, 1974, Ser. No. 520,878

Claims priority, application Germany, Nov. 5, 1973, 2355211

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> C08L 69/00

U.S. Cl. 260—37 PC

7 Claims

1. Self-extinguishing reinforced organic polycarbonate molding compositions comprising:  
a. an organic polycarbonate;  
b. from 0.5 to 15% by weight of particulate red phosphorus based on the weight of the polycarbonate, said red phosphorus having an average particle diameter of from 0.001 to 0.5 mm; and  
c. from 5 to 50% by weight of a reinforcing agent based on the weight of the polycarbonate.

4,014,850

**FRICTION ELEMENTS CONTAINING NOVEL FRICTION PARTICLES**

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed June 23, 1975, Ser. No. 589,637

Int. Cl.<sup>2</sup> C08L 61/06

U.S. Cl. 260—38

15 Claims

1. In a friction element which comprises a filamentous friction material, a thermosettable resin friction binder, and a friction particle, the improvement wherein the friction particle is a particulate product prepared by polymerizing a cashew nut shell oil suspended in a liquid medium to form a resin and crosslinking the suspended resin with a crosslinking agent in the presence of a suspension stabilizer.

4,014,851

**POLYOLEFIN-FILLED VINYLORANOPOLYSILOXANE COMPOSITION AND METHOD OF PREPARATION**

Ben A. Bluestein, Schenectady, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,009

Int. Cl.<sup>2</sup> C08K 3/00

U.S. Cl. 260—42.26

25 Claims

1. A stable polymer-filled vinylorganopolysiloxane dispersion comprising two phases:  
i. a continuous phase comprising an essentially ungrafted vinylorganopolysiloxane fluid and intimately dispersed therein  
ii. a discontinuous phase comprising finely divided solid particles of an ungrafted polymer prepared from an organic monomer having aliphatic unsaturation or a mixture of such monomers polymerized in the presence of said vinylorganopolysiloxane.

4,014,852

**COVULCANIZATION OF CONJUGATED DIENE-CONTAINING BUTYL WITH HALOBUTYL AND BUTYL RUBBER**

Albert M. Gessler, Cranford, and Francis P. Baldwin, Summit, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 393,349, Aug. 31, 1973, abandoned. This application Mar. 28, 1975, Ser. No. 562,827

Int. Cl.<sup>2</sup> C08K 3/04

U.S. Cl. 260—42.35

15 Claims

1. A tire inner liner which comprises a curable blend of from 5 to 95 weight percent (wt.%) conjugated diene-containing butyl rubber and from 95 to 5 wt.% of a rubber selected

from the group consisting of butyl or halogenated butyl rubber, carbon black, oil, and a vulcanization system.

4,014,853

**STABILIZED POLYMERIC COMPOSITION AND PRODUCT USING SAME**

Ray Lawson Hartless, Lopatcong Township, Warren County, and Anthony Marion Trozzolo, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 27, 1974, Ser. No. 500,959

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C08K 5/00

U.S. Cl. 260—45.8 NZ

7 Claims

1. Article including at least one metallic portion in intimate contact with a plastic portion, said metallic portion including at least one element which accelerates the oxidative degradation of at least a component of the said plastic portion, the said plastic portion including a polymeric composition which is at least 90 percent by weight polymer, exclusive of filler, the said plastic portion containing a metal deactivator to lessen the acceleration of oxidative degradation due to the said metallic portion; characterized in that the said metal deactivator may be produced as the condensation product of two reactants: oxalyl dihydrazide and a furyl carbonyl compound selected from the group consisting of substituted and unsubstituted furyl aldehydes and furyl ketones.

4,014,854

**LINEAR COPOLYMERS OF GLYCIDOL**

Violette L. Stevens; Arthur R. Sexton, and Frederick P. Corson, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 20, 1974, Ser. No. 444,078

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C08G 23/22

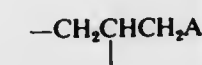
U.S. Cl. 260—47 EQ

8 Claims

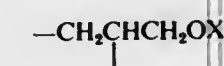
1. Compounds of the formula



wherein R is the residue left by the removal of n active hydrogen atoms from an initiator compound, RH<sub>n</sub>; each R' independently is an alkylene radical selected from the group consisting of ethylene, trimethylene, tetramethylene, 1,2-butylene, 2,2-bis(halomethyl)-1,3-propylene, and groups of the formula



each A independently is H, Cl, Br, or OX; each X independently is H or the acyl radical of a carboxylic acid with the proviso that at least one R' is 3-hydroxy-1,2-propylene and at least one is a group of the formula



wherein X is the acyl radical of an  $\alpha,\beta$ -unsaturated carboxylic acid; and m and n are integers such that the total number of R'O groups is at least 2, n being 1-8.

**4,014,855  
POLYHALOGENATED AROMATIC COMPOUNDS AND POLYMERS THEREOF**

Robert L. Wear, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

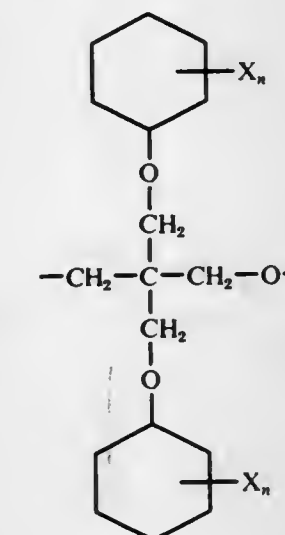
Filed Nov. 14, 1974, Ser. No. 523,670

Int. Cl.<sup>2</sup> C08G 63/66

U.S. Cl. 260—47 C

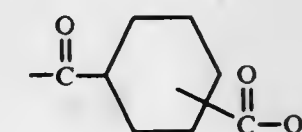
12 Claims

1. A copolyester of (a) and (b) units, and optionally (c) units wherein  
a. represents units of the formula



wherein each X is halogen selected from Br and Cl and each n is 3 to 5;

b. represents diacid units of the formula



and  
c. represents —RO— wherein R is a lower aliphatic group containing from 2 to 10 carbon atoms, provided that the copolyester contains at least about five percent of halogen which is contained in the (a) units.

4,014,856

**LIQUID ELECTROPHOTOGRAPHIC DEVELOPERS**

Yvan Karel Gilliams, Berchem; Jozef Leonard Van Engeland, St. Katelijne-Waver, and Noel Jozef De Volder, Edegem, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed July 5, 1973, Ser. No. 376,749

Claims priority, application United Kingdom, July 12, 1972, 32656/72

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

Int. Cl.<sup>2</sup> G03G 9/00

U.S. Cl. 252—62.1 L

14 Claims

1. A liquid toner composition for the development of electrostatic charge patterns comprising an electrically insulating carrier liquid having a volume resistivity of at least 10<sup>9</sup> Ohm.cm and a dielectric constant below 3, and a pigment or coloring agent suspended in the said carrier liquid, wherein the said liquid composition comprises dissolved in the carrier liquid (1) a bivalent or trivalent metal salt of an oxyacid derived from phosphorus containing at least one organic residue and (2) one or more members selected from the group consisting of amines, polyurethans and alkylated polymers of a heterocyclic N-vinyl monomer.



4,014,857

## FLUORINATED OILY SOIL RELEASE AGENTS

Ronald W. Schmoyer, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Dec. 6, 1974, Ser. No. 530,437

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C08G 9/36

U.S. Cl. 260—67.6 R

4 Claims

1. An adduct prepared by condensing, in the presence of an acid catalyst and under temperature and pressure conditions that result in the removal of alcohol formed by the condensation of

A. an alcohol of the formula

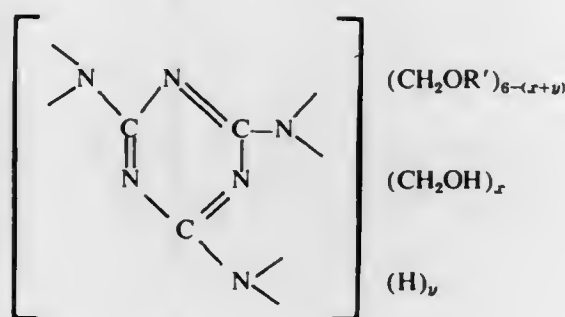
1  $R_f(CH_2)_nOH$  wherein  $R_f$  is perfluoroalkyl of from 4 through 16 carbon atoms, and  $n$  is an integer from 1 through about 16;

B. ethylene glycol;

C. a polyalkylene glycol of the formula

2  $HO(CH_2-CHR-O)_mH$  wherein  $R$  is hydrogen or methyl; and  $m$  is an integer of about from 4 to 450; and having a molecular weight of about from 200 to 20,000; and

D. at least one poly(alkoxymethyl)melamine of the formula



wherein

$R'$  is alkyl of 1 to 5 carbon atoms;

$x$  has a value of 0 to 2; and

$y$  has a value of 0 to 3 with the limitation that  $x + y$  cannot exceed a value of 3; wherein the equivalents ratio of A to B + C is about from 1/20 to 20/1, the equivalents ratio of A + B + C to D is about from 0.5/1 to 1.5/1, and the equivalents ratio of B to C is about from 10/1 to 1/10.

4,014,858

## POLYBUTYLENE TEREPHTHALATE

Gary R. Chipman, Naperville; Michael G. Henk, Wheaton; Jacob A. De Boer, Western Springs, and Eli W. Blaha, Wheaton, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 12, 1975, Ser. No. 576,478

Int. Cl.<sup>2</sup> C08G 63/14

U.S. Cl. 260—75 R

20 Claims

1. The process of carrying out a first stage polyesterification which comprises reacting a polyhydric alcohol and a polycarboxylic acid compound in a concentration of 1.1 to 4 hydroxyl equivalents per carboxyl equivalent under polyesterification conditions at about 180° to 250° C. in the presence of a catalytic concentration of a tetraivalent tin compound having one organo to tin linkage, per tin atom wherein 1,4-butane diol provides from 75 to 100 equivalent percent of the hydroxyl groups of the polyhydric alcohol compound, a terephthalic acid compound provides from 75 to 100 equivalent percent of the carboxyl groups of the polycarboxylic acid compound and at least 50 percent of the carboxyl equivalents are provided by terephthalic acid.

4,014,859

## PRODUCTION OF POLYETHYLENE

Richard Roy Cooper, St. Albans, and Kenneth Stephenson Whiteley, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 29, 1974, Ser. No. 456,384

Claims priority, application United Kingdom, Mar. 29, 1973, 15156/73

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> C08F 10/02, 10/08, 11/02, 21/08

U.S. Cl. 526—65

15 Claims

1. A process for the polymerization or copolymerization of ethylene, in at least two reaction zones comprising:

a. passing a product mixture of ethylene, an ethylene polymer, and at least one further component selected from the group consisting of comonomer, chain transfer agent and inert diluent at a pressure in the range 300 to 3000 kgm/cm<sup>2</sup> from a reaction zone into a separator maintained at a pressure below the pressure of the product mixture, effecting separation into a gas phase and a liquid phase, said liquid phase comprising the ethylene polymer and dissolved gas;

b. passing said liquid phase to a low pressure hopper maintained at a pressure below that of said separator and removing the major portion of the dissolved gas from the polymer and low pressure hopper;

c. compressing the gas removed from said low pressure hopper to an intermediate pressure;

d. providing a stream of fresh ethylene and passing it to a compressor;

e. compressing the gas stream of fresh ethylene and passing it to the first zone of the polymerization reactor,

f. optionally mixing the gas phase from the separator with either a chain transfer agent, a stream of fresh ethylene or both which stream of fresh ethylene optionally contains comonomer, inert diluent or both,

g. passing the resulting gas phase to a compressor and compressing this gas phase, and passing this gas phase to at least one zone, other than the first zone of the polymerization reactor;

h. mixing the compressed gas from the low pressure hopper with either

1. the stream of fresh ethylene which is compressed and passed to the first stage of the polymerization reactor, or

2. the gas phase from the separator which is compressed and passed to the polymerization reactor; and

i. introducing a polymerization catalyst into at least the first zone of the polymerization reactor.

4,014,860

## PLASMINOSTREPTIN (ENZYME INHIBITOR) AND METHOD FOR PRODUCING IT FROM STREPTOMYCES

Atsushi Kakinuma, Kyoto; Hiromu Sugino, Toyonaka; Norihiko Moriya, Ikeda, and Masao Isono, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 30, 1973, Ser. No. 328,077

Claims priority, application Japan, Feb. 8, 1972, 47-14132

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C12D 13/06; C07G 7/00

U.S. Cl. 260—112 R

4 Claims

1. Plasminostreptin, capable of inhibiting the proteolytic activity of plasmin and trypsin, characterized by the following properties:

a. a molecular weight of  $26,000 \pm 2,000$  as determined in 0.1 M sodium chloride by Archibald's ultracentrifugal method, and  $25,000 \pm 2,000$  as determined in 0.05 M Tris-HCl buffer-0.1 M potassium chloride by Andrews' gel filtration method,

b. sedimentation constant ( $S_{20,w}$ ), by ultracentrifugation, of  $2.5 \pm 0.3$  S in 0.1 M sodium chloride and  $1.2 \pm 0.3$  S in 4 M guanidine hydrochloride,

c. elemental analysis indicating C,  $51.48 \pm 2.0\%$ ; H,  $6.96 \pm 0.5\%$ ; N,  $16.63 \pm 1.0\%$ ; and S,  $1.84 \pm 0.5\%$ ,

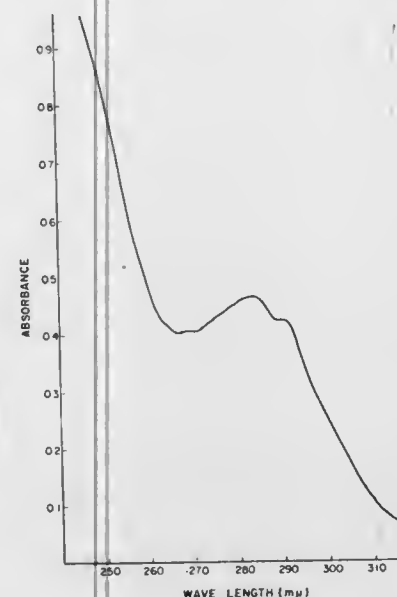
d. specific rotation  $[\alpha]_D^{25}$  of about  $-90^\circ$  ( $C=1$ , in a weakly alkaline solution),

e. isoelectric point of about 6.3 as determined by the isoelectric focussing method,

f. 0.05% solution thereof in 0.1 M sodium chloride gives a maximum absorption at 283 mμ, a minimum absorption at 267 mμ and a shoulder at 288 to 291 mμ,

g. significant infrared absorption bands at wave numbers ( $cm^{-1}$ ) 3280, 3070, 2960, 1670, 1640, 1530, 1400, 1240 and 1160.

h. contains alanine, valine, glycine, threonine, aspartic acid, glutamic acid, leucine, phenylalanine, arginine, proline, serine, cystine or cysteine, lysine, tyrosine, histidine, methionine and tryptophan, and does not contain isoleucine,



i. positive to hypochlorite reagent and Folin-Ciocalteu reagent,

j. soluble in water and aqueous ammonia; slightly soluble in pyridine; sparingly soluble in glacial acetic acid, alcohols, acetone, chloroform, ether and hexane; substantially completely precipitated by ammonium sulfate at 60% saturation and solubility dropping in the neighborhood of pH 6,

k. more than 50% of the initial activity thereof remains intact after treatment for 30 minutes at pH 4-9 and 100°C, and

l. dialytic behavior indicating substantially all the activity thereof remains in the internal solution, when dissolved in water having a pH of 8.0 to a concentration of 10 mg./ml and dialyzed in a cellophane bag against ten times as much volume of water having a pH of 8.0 to 4°C for 24 hours.

4,014,861

## PROCESS FOR THE MANUFACTURE OF INSULIN, ANALOGS AND DERIVATIVES THEREOF

Rolf Geiger, Frankfurt am Main, and Rainer Obermeier, Hattersheim am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 10, 1975, Ser. No. 585,604

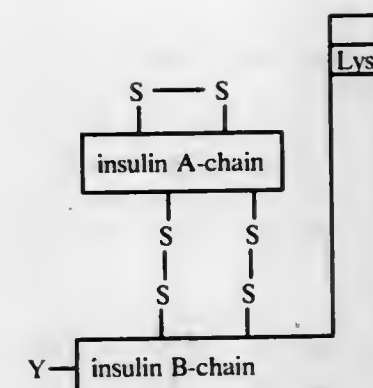
Claims priority, application Germany, June 12, 1974, 2428412

Int. Cl.<sup>2</sup> C07C 103/52; C07G 7/00

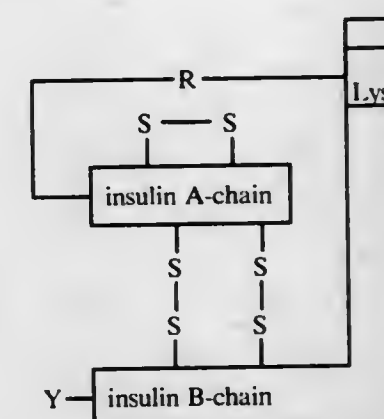
U.S. Cl. 260—112.7

2 Claims

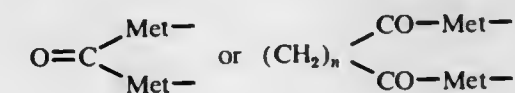
1. A method for making an insulin compound of the formula



and biologically-active analogs thereof in which one or more amino acids have been exchanged for other, preferably simpler, amino acids or in which the chains are modified, preferably shortened, and in which Y is hydrogen or acyl, which method comprises treating a compound of the formula



or an analog thereof as hereinbefore defined, wherein R is



Met is methionine,  $n$  is an integer from 1 to 4, and one  $-(CH_2)-$  may be replaced by oxygen, with cyano bromide in an acid medium.

4,014,862

## PRODUCTION OF HARDENED GELATIN LAYERS BY THE ADDITION OF QUATERNARY CARBAMOYL PYRIDINIUM COMPOUNDS

John Douglas Ballantine, and Norman Alfred Smith, both of Ilford, England, assignors to Ilford Limited, Ilford, England

Filed July 6, 1973, Ser. No. 377,139

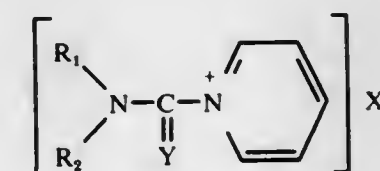
Claims priority, application United Kingdom, July 12, 1972, 32491/72

Int. Cl.<sup>2</sup> C09H 5/00

U.S. Cl. 260—117

5 Claims

1. A method of producing a hardened gelatin layer which comprises treating an aqueous gelatin solution with an aqueous solution of a hardening agent of the formula



wherein  $X^-$  is a perchlorate or fluoroborate anion, Y is an oxygen atom,  $R_1$  and  $R_2$  are each a lower alkyl or aryl group which is optionally substituted, or  $R_1$  and  $R_2$  taken together



with the nitrogen atom form a non-aromatic ring system, which is optionally substituted, the pyridinium nucleus being unsubstituted or substituted by 1 to 4 members selected from the group consisting of lower alkyl and amino, and coating the resultant gelatin solution as a layer on a base.

4,014,863

## WATER-INSOLUBLE AZO-PYRIMIDINE PIGMENTS

Günter Stephan, Schildgen, and Karl Heinz Schünderhütte, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 9, 1974, Ser. No. 513,486

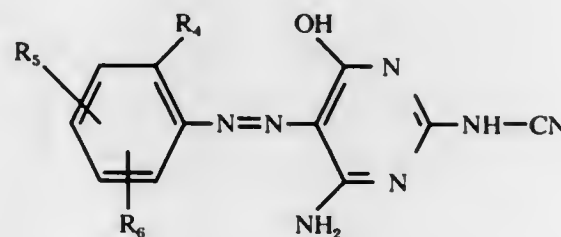
Claims priority, application Germany, Oct. 12, 1973, 2351294

Int. Cl.<sup>2</sup> C09B 29/36; C04B 7/02; D06P 3/26, 3/54

U.S. Cl. 260—154

7 Claims

1. An azo pigment which is free from groups conferring solubility in water of the formula



wherein

R<sub>4</sub> represents carbo-C<sub>1</sub>-C<sub>4</sub>-alkoxy or C<sub>1</sub>-C<sub>4</sub>-alkoxy;  
R<sub>5</sub> represents hydrogen, chlorine, methyl, ethyl, methoxy, ethoxy, cyano, carbo-C<sub>1</sub>-C<sub>4</sub>-alkoxy or carbonamide unsubstituted or mono- or disubstituted by methyl or phenyl; and  
R<sub>6</sub> represents hydrogen, chlorine, methyl or methoxy.

4,014,864

## HETEROCYCLIC SUBSTITUTED AZO DYESTUFF

Ved Parkash Kubba, Bombay, India, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 13, 1976, Ser. No. 657,776

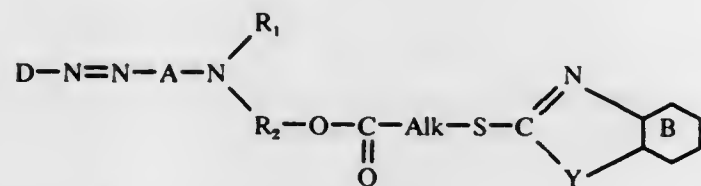
Claims priority, application Switzerland, Feb. 25, 1975, 2374/75

Int. Cl.<sup>2</sup> C07D 277/04; C09B 29/36, 49/06; C07D 233/02

U.S. Cl. 260—157

16 Claims

1. An azo compound that is free from sulphonic acid groups of the formula



in which D represents the radical of a diazo component, A represents an optionally substituted, 1,4-phenylene radical, R<sub>1</sub> represents an optionally substituted alkyl radical, R<sub>2</sub> represents an optionally substituted alkylene radical, Alk represents an alkylene radical of 1-4 carbon atoms and Y represents an imino group, a sulphur atom or an oxygen atom and ring B may be substituted by bromine, fluorine, chlorine atoms, cyano, nitro, trifluoromethyl, alkyl, alkoxy, acylamino, acyloxy, carbalkoxy, optionally N-alkylated carbamoyl and optionally N-alkylated sulphamoyl groups and by a benzo residue.

4,014,865

## GOLDEN-YELLOW FIBER-REACTIVE WATER-SOLUBLE MONOAZO DYESTUFFS

Fritz Meininger, Frankfurt am Main, and Ludwig Schlafer, Fischbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 26, 1975, Ser. No. 590,576

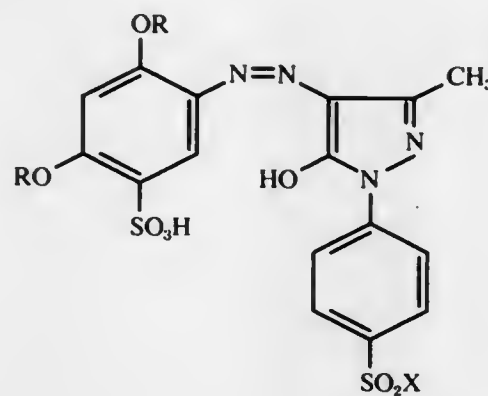
Claims priority, application Germany, June 29, 1974, 2431343

Int. Cl.<sup>2</sup> C09B 29/38

U.S. Cl. 260—163

2 Claims

1. Monoazo compound being in the form of the free acid of the formula



in which R is alkyl of 1 to 4 carbon atoms and X is vinyl or β-sulfatoethyl.

4,014,866

## BARIUM LAKED PHENYLAZONAPHTHALENE DYE CONTAINING SULFONIC ACID GROUPS

Georg Henning, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhein), Germany  
Continuation-in-part of Ser. Nos. 297,198, Oct. 13, 1972, abandoned, and Ser. No. 414,715, Nov. 12, 1973, abandoned.

This application May 29, 1975, Ser. No. 581,714

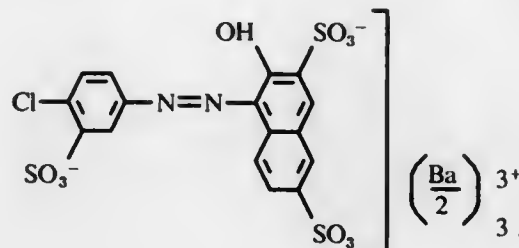
Claims priority, application Germany, Oct. 20, 1971, 2152190

Int. Cl.<sup>2</sup> C09B 29/16; C09D 11/00; D06P 1/06, 3/00

U.S. Cl. 260—200

1 Claim

1. The pigment of the formula:



4,014,867

## PRODUCTION OF HEXAMETHYLENEIMINE FROM CAPROLACTAM

Chuen Y. Yeh, Succasunna, and Harry E. Ulmer, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 23, 1975, Ser. No. 616,105

Int. Cl.<sup>2</sup> C07D 295/02

U.S. Cl. 260—239 B

20 Claims

1. A method of preparing hexamethyleneimine which comprises the steps of:

- forming a solution of ε-caprolactam in a solvent selected from the group consisting of linear and cyclic ethers and polyethers having a boiling point of at least about 100°C., said solution having a concentration of about 1 to 40 percent by weight;
- contacting said solution with gaseous hydrogen in the

presence of a catalyst comprising copper chromite and at a temperature of about 185° to 215° C. and a pressure of at least about 1,000 psig, whereby a solution containing hexamethyleneimine is formed; and  
c. recovering hexamethyleneimine from said hexamethyleneimine-containing solution.

4,014,868

## PREPARATION OF β-LACTAM ANTIBIOTICS

Antony Rodney Berry, and Ian David Camburn, both of Worthing, England, assignors to Beecham Group Limited, Great Britain

Filed Sept. 2, 1975, Ser. No. 609,620

Claims priority, application United Kingdom, Sept. 25, 1974, 41610/74

Int. Cl.<sup>2</sup> C07D 499/68

U.S. Cl. 260—239.1

9 Claims

1. A process for the preparation of the sodium salt of amoxycillin which consists essentially of (a) forming a slurry of amoxycillin in a mixture of dichloromethane and methanol; (b) bringing about the dissolution of the amoxycillin by the addition of sodium methoxide at a temperature below 0° C.; (c) precipitating the resulting salt by the addition of an organic solvent; and (d) isolating the precipitated sodium salt of amoxycillin.

4,014,869

## CEPHALOSPORIN DERIVATIVES

Gordon Ian Gregory, Chalfont St. Peter; Michael Gregson, London, and Godfrey Basil Webb, Greenford, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Dec. 2, 1974, Ser. No. 528,944

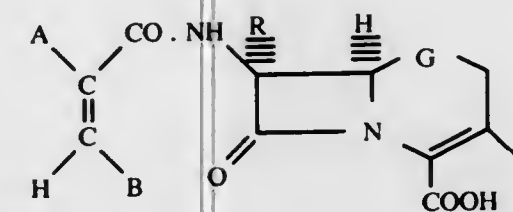
Claims priority, application United Kingdom, Dec. 5, 1973, 56460/73

Int. Cl.<sup>2</sup> C07D 501/20

U.S. Cl. 260—240 J

7 Claims

1. A 7β-acrylamidoceph-3-em-4-carboxylic acid of the formula:



wherein A is phenyl; naphthyl; thenyl; furyl; optionally substituted by a cyano group; B is a group as defined for A; or alkyl, alkenyl or alkynyl of up to 7 carbon atoms or said alkyl, alkenyl or alkynyl substituted by a group as defined for A, C<sub>1-4</sub> alkoxy, or D<sub>1-4</sub> acyloxy; R is hydrogen; G is >S; P is a group of the formula -CH<sub>2</sub>Y wherein Y is -O.CO.R<sup>d</sup>, wherein R<sup>d</sup> is C<sub>1-7</sub> alkyl; C<sub>1-7</sub> alkyl substituted by cyano, carboxy, C<sub>1-4</sub> alkoxy, carbonyl, hydroxy, carboxycarbonyl, chlorine, bromine, iodine or amino; C<sub>2-7</sub> alkenyl; phenyl; phenyl substituted by hydroxy; chloro; fluoro, methyl, nitro, amino, methoxy or methylthio; thienyl; pyridyl; cyclohexyl; cyclopentyl; cyclopropyl; syndnone; naphthyl or 2-ethoxynaphthyl; or -O.CO.Q.R<sup>d</sup> wherein R<sup>d</sup> is as defined above, or hydrogen and Q is O, S or NH; or a physiologically acceptable salt thereof.

4,014,870

## STILBENE COMPOUNDS

Hans Rudolf Meyer, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 10, 1975, Ser. No. 585,539

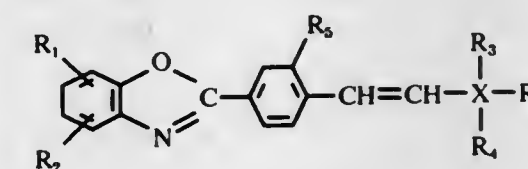
Claims priority, application Switzerland, June 12, 1974, 8031/74; June 12, 1974, 8035/74

Int. Cl.<sup>2</sup> C07D 263/54

U.S. Cl. 260—240 CA

8 Claims

1. A stilbene compound of the formula



wherein

X denotes a 4-biphenyl radical,  
R<sub>1</sub> denotes hydrogen, alkyl having 1 to 4 carbon atoms, chlorine, cyclohexyl, carbalkoxy having 2 to 5 carbon atoms, carboxyl or sulfo,  
R<sub>2</sub> denotes hydrogen or alkyl having 1 to 4 carbon atoms,  
R<sub>3</sub> denotes hydrogen or sulfo,  
R<sub>4</sub> denotes hydrogen,  
R<sub>5</sub> denotes hydrogen, or sulfo, and  
R<sub>6</sub> denotes hydrogen or sulfo, the molecule containing at least one but not more than two sulfo groups.

4,014,871

## STILBENE COMPOUNDS

Géza Kormány, Allschwil; Guglielmo Kabas, Aesch; Hans Schläpfer, and Adolf Emil Siegrist, both of Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 6, 1975, Ser. No. 601,882

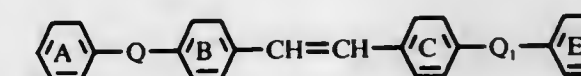
Claims priority, application Switzerland, Aug. 14, 1974, 11109/74

Int. Cl.<sup>2</sup> C07D 413/10

U.S. Cl. 260—240 C

12 Claims

1. Stilbene compounds of the formula



wherein

Q denotes the 1,3,4-oxadiazol-2,5-ylene or 1,2,4-oxadiazol-3,5-ylene radical and  
Q<sub>1</sub> denotes one of the radicals



and the rings A, and E can each contain up to 2 non-chromophoric substituents.

4,014,872

## SUBSTITUTED 3-HYDROXY- OR 3-OXO-CEPHAMS

John Derek Cocker, Chalfont St. Peter, England, assignor to Glaxo Laboratories Limited, Greenford, England

Filed Jan. 3, 1974, Ser. No. 430,386

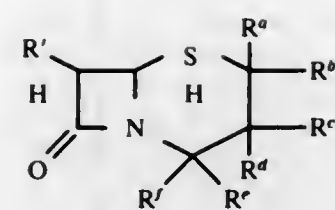
Int. Cl.<sup>2</sup> C07D 501/14

U.S. Cl. 260—243 C

4 Claims

1. 3-Hydroxy and 3-oxo-7-amino and protected amino-(6R, 7R)-cephams having the formula:





wherein  $R^1$  represents a free or protected amino group;  $R^a$ ,  $R^b$ ,  $R^c$  and  $R^d$  each represent a hydrogen atom, and either  $R^c$  represents a hydroxy group and  $R^d$  represents a hydrogen atom or  $R^c$  and  $R^d$  together represent an oxygen atom.

4,014,873

# PROCESS FOR THE PRODUCTION OF 7-ACYLAMIDOCEPHALOSPORINS

Burton G. Christensen, Scotch Plains; Lovji D. Cama, Edison; Meyer Sletzing, North Plainfield, and Sandor Karady, Mountainside, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

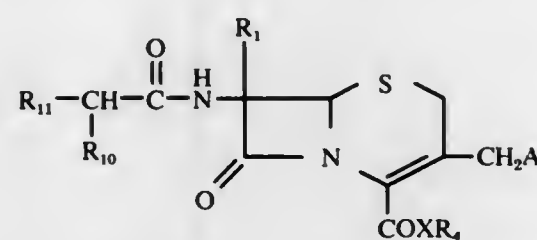
Division of Ser. No. 356,873, May 3, 1973, abandoned, which is a continuation-in-part of Ser. Nos. 149,364, June 2, 1971, abandoned, and Ser. No. 223,005, Feb. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 149,364, June 2, 1971. This application Nov. 29, 1974, Ser. No. 528,109

Int. Cl.<sup>2</sup> C07D 501/04

U.S. Cl. 260—243 C

7 Claims

1. The process for preparing the compound of the formula:



wherein  $R_1$  is hydrogen or methoxy;

$A$  is loweralkanoxy of 2-6 carbon atoms or carbamoyloxy;

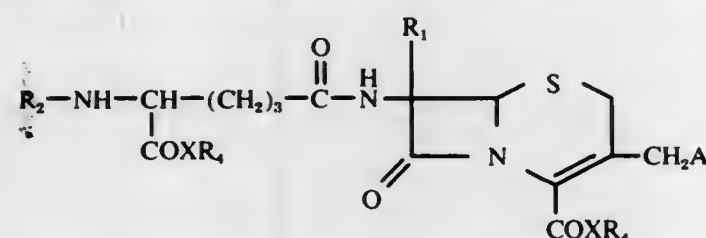
$R_{10}$  is hydrogen, azido, carboxy, or hydroxy;

$R_{11}$  is phenyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, 3-isothiazoyl, 4-isothiazoyl, 5-isothiazoyl, 1,2,5-thiadiazoyl, 4-pyridyl, tetrazoyl, or chlorophenyl;

$X$  is oxygen or sulfur; and

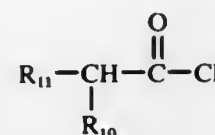
$R_4$  is hydrogen, or methyl, ethyl, tertiary butyl, phthalimidomethyl, succinimidomethyl, phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, 2-methylthioethyl, 2-(p-methylphenyl)ethyl, 2-(p-methylphenyl)-sulfonyl, 2-methylaminoethyl, 2-chloro(or bromo)ethyl, benzyl, p-nitrobenzyl, p-methoxybenzyl, 3,5-dinitrobenzyl, 2,4,6-trimethylbenzyl, 3,5-dichloro-4-hydroxybenzyl, benzhydryl, p-methoxybenzhydryl, phenyl, acetoxymethyl, pivaloyloxymethyl, methoxymethyl, p-nitrophenyl or 3,5-dinitrophenyl;

which comprises mixing the compound of the formula:



in which  $R_2$  is trichloroethoxycarbonyl, tertiary butoxy carbonyl, benzoylmethoxycarbonyl, trimethylsilyl, p-methoxybenzyloxy, 2-nitrophenylsulfenyl, 2,4-dinitrophenylsulfenyl, chloroacetyl, or o-nitrophenylthio; and  $R_1$ ,  $A$ ,  $X$  and  $R_4$  are as above defined,

with an approximately equimolar amount of the acylating agent having the formula



where  $R_{11}$  and  $R_{10}$  are as defined above and with a molecular excess of the silylating agent which is N-(trimethylsilyl)acetamide, N-(tripropylsilyl)acetamide, N-(tributylsilyl)acetamide, N-(triphenylsilyl)acetamide or N-(tribenzylsilyl)acetamide, N,O-bis(trimethylsilyl)acetamide, N,O-bis(triphenylsilyl)acetamide, N,O-bis(tribenzylsilyl)acetamide, N-(trimethylsilyl)trifluoroacetamide, N-(tributylsilyl)trifluoroacetamide, N-(trimethylsilyl)benzoamide, N-(trimethylsilyl)diphenylurea, N-(trimethylsilyl)ethylcarbamate, N-triphenylsuccinimide or N-(trimethylsilyl)phthalimide, N-(trimethylsilyl)benzene sulfonamide, N-trimethylsilyl urethane, N-trimethylsilyl phthalimide, monosilyltrifluoroacetamide or bis(ethoxycarbonylamino)dimethyl silane in an inert solvent at a temperature of between about 25° C and about 70° C. for a duration of 3-65 hours, and then optionally adding loweralkanol or loweralkylthiol, alkyl having 1-6 carbon atoms benzylalcohol, 2.5N HCl or aqueous sodium bicarbonate; and recovering the product.

4,014,874

# PROCESS FOR THE MANUFACTURE OF 3-SUBSTITUTED THIOMETHYL-7-AMINO-2-CEPHEM-4-CARBOXYLIC ACID COMPOUND

Heinrich Peter, Binningen; Beat Müller, Reinach, both of Switzerland; Walter Sibrat, Tulln, Austria, and Hans Bickel, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,442

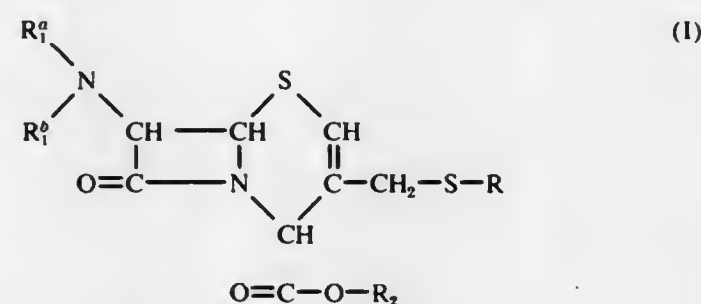
Claims priority, application Switzerland, Feb. 5, 1974, 1555/74

Int. Cl.<sup>2</sup> C07D 501/06

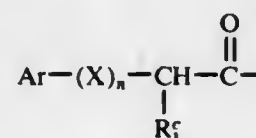
U.S. Cl. 260—243 C

5 Claims

1. Process for the manufacture of a member selected from the group consisting of 7-N- $R_1$ -2-N- $R_2$ -amino-3-R-thiomethyl-2-cephem-4 carboxylic acid compounds of the formula

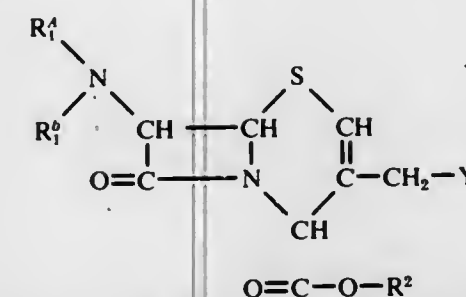


wherein  $R$  represents methyl, thiadiazolyl, tetrazolyl, methyl-substituted thiadiazolyl, or methyl-substituted tetrazolyl,  $R_1$  is hydrogen,  $R_2$  represents hydrogen, cyanoacetyl or an acyl radical of the formula



wherein  $Ar$  is phenyl or tetrazolyl,  $X$  is oxygen,  $n$  denoted 0 or 1 and  $R_1$  denotes hydrogen or, if  $n$  represents 0, denotes  $\alpha$ -poly-branched lower alkoxy-carbonylamino, phenyl-lower alkoxy-carbonylamino or phenyl-lower alkoxy-carbonylamino

substituted by lower alkoxy, nitro, or hydroxyl,  $\alpha$ -poly-branched lower alkoxy-carbonyloxy, 2-halogeno-lower alkoxy-carbonyloxy, or formyloxy, or represents a 5-amino-5-carboxyvaleryl radical, wherein the amino and/or carboxyl group are optionally present, as lower alkanoylamino, dichloro-acetyl, or phthaloylamino, or as phenyl-lower alkoxy-carbonyl, and  $R_2$  denotes hydrogen, lower alkyl,  $\alpha$ -poly-branched lower alkyl, or 2 halogeno-lower alkyl, nitrobenzyl, diphenylmethyl or lower alkoxy-substituted diphenylmethyl, and salts of such compounds with alkali and alkaline earth metals, ammonia or organic amines, if  $R_2$  represents hydrogen, or with inorganic acids or organic sulfonic acids, if  $R_1$  and  $R_2$  both represent hydrogen or inner salts of such compounds, if  $R_2$ ,  $R_1$  and  $R_2$  all represent hydrogen, wherein a 7-(N- $R_1$ -N- $R_2$ -amino)-3-Y-methyl-2-cephem-4-carboxylic acid compound of the formula



wherein  $R_1$  and  $R_2$  have the above-mentioned meanings,  $R_1$  represents trityl, tri-lower alkyl silyl, phenylglycyl, phenylacetyl or phenoxyacetyl, and  $Y$  represents hydroxy, lower alkanoyloxy or halogeno acetoxy, is reacted with a compound of the formula  $R-SH$  (III), in the presence of trifluoroacetic acid with the proviso that when  $Y$  represents trifluoroacetoxy, the reaction can be carried out in the absence of trifluoroacetic acid.

4,014,875

# PROCESS OF MAKING DI OR TRIBROMOMETHANESULFONAMIDES

Christian T. Goralski, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 326,609, Jan. 26, 1973, Pat. No. 3,892,743. This application Apr. 11, 1975, Ser. No. 567,455

Int. Cl.<sup>2</sup> C07D 265/30

U.S. Cl. 260—247.1 R

1 Claim

1. A process for making dibromo- and tribromomethanesulfonamides by reacting a diamide of sulfoacetic acid having two  $NR_2$  amide groups wherein  $NR_2$  is a heterocyclic ring which may contain one oxygen atom and 1 to 2 lower alkyl substituent groups with excess bromine in the presence of aqueous alkali metal hydroxide and recovering product dibromo- and tribromomethanesulfonamide having the said  $NR_2$  amide group by fractional recrystallization from a solvent in which the tribromomethanesulfonamide is less soluble than the dibromomethanesulfonamide.

4,014,876

# ISOXAZOLE DERIVATIVES

Shinzaburo Sumimoto, Osaka; Yoshihiro Tochino, Habikino, and Manabu Fujimoto, Nagaokakyo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 88,987, Nov. 12, 1970, abandoned. This application Jan. 19, 1973, Ser. No. 325,115

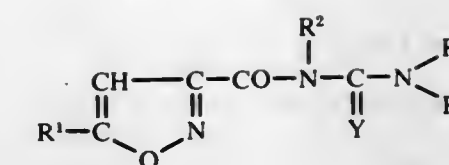
Claims priority, application Japan, Nov. 12, 1969, 44-90619

Int. Cl.<sup>2</sup> C07D 295/00, 261/06

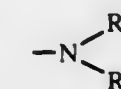
U.S. Cl. 260—247.2 A

34 Claims

1. A compound of the formula



wherein each of  $R^1$  and  $R^2$  is hydrogen, alkyl of 1 to 8 carbon atoms or cycloalkyl of 3 to 10 carbon atoms, each of  $R^3$  and  $R^4$  is hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 10 carbon atoms or phenyl, or the group



(II) is morpholino, and  $Y$  is oxo.

4,014,877

# SUBSTITUTED BENZO[L]QUINOLIZINE-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

John F. Gerster, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 303,254, Nov. 2, 1972, Pat. No. 3,896,131, which is a continuation-in-part of Ser. No. 214,409, Dec. 30, 1971, abandoned. This application Jan. 22, 1975, Ser. No. 543,144

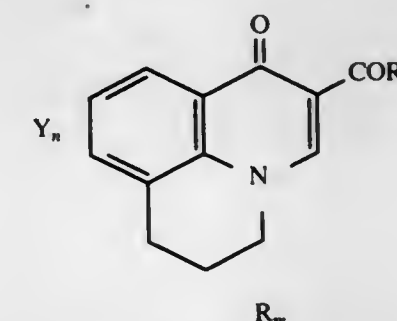
The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C07D 413/06

U.S. Cl. 260—247.5 GP

5 Claims

1. A compound having the formula



wherein  $Y$  is lower alkyl, lower alkoxy, halogen, hydroxy, nitro, cyano, trifluoromethyl, amino, lower alkanamido, trifluoroacetamido or N,N-lower dialkylamino;  $R$  is methyl, ethyl or trifluoromethyl;  $n$  is zero, one or two;  $m$  is zero, one or two, and when  $R$  is trifluoromethyl,  $m$  is one; and  $R^1$  is halogen, amino, lower alkylamido, N,N-lower dialkylamino hydrazino, morpholino or piperidino.

4,014,878

# 2-(3-MORPHOLINOPROPYL)-5,6-DIMETHOXYINDAZOLE

Thomas J. Schwan; Charles S. Davis, both of Norwich, and LeRoy J. Honkomp, Oxford, all of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 472,719, May 23, 1974, Pat. No. 3,966,760. This application Feb. 25, 1976, Ser. No. 661,344

Int. Cl.<sup>2</sup> C07D 413/06

U.S. Cl. 260—247.5 EP

1 Claim

1. The compound 2-(3-morpholinopropyl)-5,5-dimethoxyindazole dihydrochloride.



4,014,879

**CONTINUOUS PROCESS FOR THE PRODUCTION OF 2-ALKYL OR CYCLOALKYL-4-METHYL-6-HYDROXY-PYRIMIDINES**  
David E. Balke; Donald E. Perez, both of Mobile, Ala., and Yel S. Sury, Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

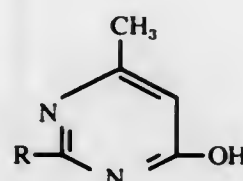
Filed July 3, 1975, Ser. No. 593,100

Int. Cl.<sup>2</sup> C07D 239/26

U.S. Cl. 260—251 R

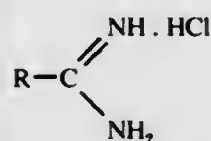
2 Claims

1. A continuous ring-closure/neutralization process for the preparation of a 2-alkyl or 2-cycloalkyl-4-methyl-6-hydroxy-pyrimidine of the formula



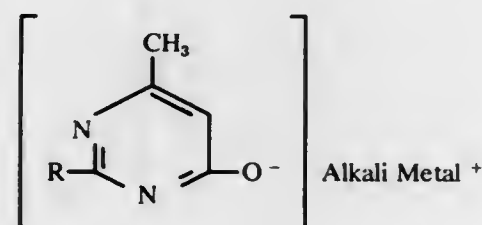
wherein R represents alkyl of 1 to 4 carbon atoms and cycloalkyl of 3 to 6 carbon atoms, which process comprises

1. a continuous ring-closure step in two stages wherein:  
a. an amidine of the formula



wherein R has the same meaning as given above, is fed continuously into a first-stage reactor simultaneously with methylacetacetate and an aqueous alkali solution for pH control, for a retention time of about one hour at a temperature of 40° to 45° C, and

- b. the reaction mass is then continuously fed to a second-stage reactor simultaneous with another amount of an aqueous alkali solution for pH control for a further retention time of about one and a half hours at a temperature of 40° to 45° C, and 2. a continuous neutralization step wherein the resulting slurry of alkali oxypyrimidine of the formula



wherein R has the same meaning as given above, is continuously fed with simultaneous addition of an inorganic or organic acid to the neutralizer, wherein the continuous neutralization is performed at a pH between about 6 and 7, at a temperature ranging between about 0° to 10° C and a retention time of about 30 minutes.

4,014,880

**PROCESS FOR MAKING IMIDAZOLINES AND TETRAHYDROPYRIMIDINES FROM OXAZOLINES AND ALKYLENEDIAMINES**

William Dowd, and Peter W. Owen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 9, 1976, Ser. No. 656,558

Int. Cl.<sup>2</sup> C07D 239/00

U.S. Cl. 260—251 R

9 Claims

1. In the method of preparing a 2-imidazoline or a 1,4,5,6-tetrahydropyrimidine by reacting (a) a 2-oxazoline with (b)

1,2-alkylenediamine or a 1,3-alkylenediamine in liquid-phase, the improvement comprising conducting the reaction in the presence of a small but sufficient amount of a Lewis acid to catalyze the reaction between (a) and (b).

4,014,881

**1-OXO-1H-6-PIPERIDINOPYRIMIDO[1,2-a]QUINOLINE-2-CARBOXYLIC ACIDS AND ESTERS**

Saul B. Kadin, and Peter F. Moore, both of New London, Conn., assignors to Pfizer Inc., New York, N.Y.

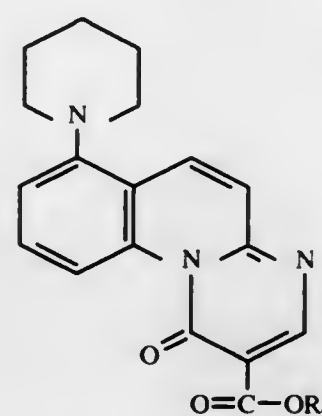
Filed July 10, 1975, Ser. No. 594,766

Int. Cl.<sup>2</sup> C07D 401/04

U.S. Cl. 260—256.4 Q

3 Claims

1. A compound having the formula



wherein R<sub>2</sub> is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms, the pharmaceutically-acceptable acid addition salts thereof, and the pharmaceutically-acceptable cationic salts of those compounds wherein R<sub>2</sub> is hydrogen.

4,014,882

**TRIFLUOROMETHYL SUBSTITUTED PYRIMIDINE DERIVATIVES USEFUL AS INSECTICIDES**

Stuart Peter Sharpe, Yateley, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 456,383, March 29, 1974., This

application Jan. 5, 1976, Ser. No. 646,832

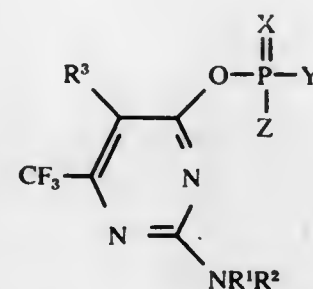
Claims priority, application United Kingdom, May 25, 1973, 25207/73

Int. Cl.<sup>2</sup> C07D 239/30, 239/46

U.S. Cl. 260—256.5 R

8 Claims

1. A compound of formula:



wherein X is oxygen or sulphur; Y and Z are alkoxy having from one to four carbon atoms; R<sup>1</sup> and R<sup>2</sup> are alkyl having from one to four carbon atoms; and R<sup>3</sup> is hydrogen or halogen.

4,014,883

**INDOLOQUINOLINES, INTERMEDIATES AND PROCESSES**

Rodney Ian Fryer, North Caldwell; Robert Ye-Fong Ning, West Caldwell; Leo Henryk Sternbach, Upper Montclair, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

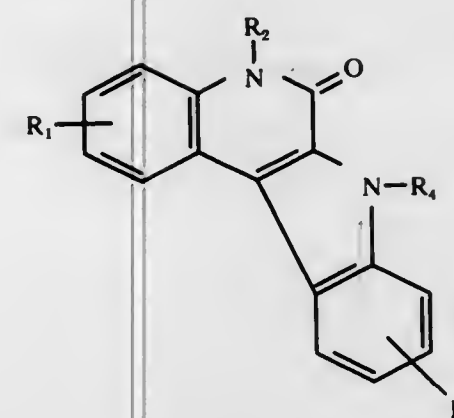
Continuation of Ser. No. 395,871, Sept. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 292,193, Sept. 25, 1972, abandoned. This application July 16, 1975, Ser. No. 596,684

Int. Cl.<sup>2</sup> C07D 471/04

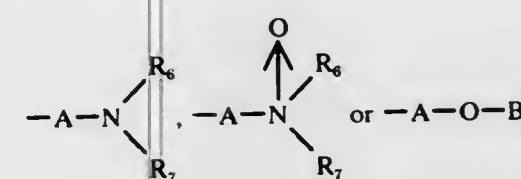
U.S. Cl. 260—288 CF

15 Claims

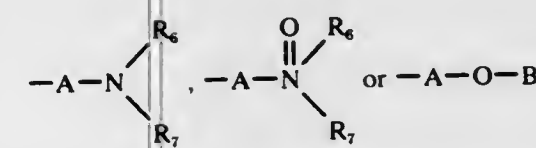
1. A compound of the formula



wherein R<sub>1</sub> and R<sub>5</sub>, independently, are hydrogen, halogen, trifluoromethyl, lower alkyl of 1 to 7 carbon atoms, lower alkoxy of 1 to 7 carbon atoms, amino, cyano or nitro; R<sub>2</sub> and R<sub>4</sub>, independently, are hydrogen, lower alkyl of 1 to 7 carbon atoms, cyano-lower alkyl wherein lower alkyl is of 1 to 7 carbon atoms, dihydroxy-lower alkyl of 1 to 7 carbon atoms, 2,3-epoxy-propyl, lower alkenyl of 2 to 7 carbon atoms,

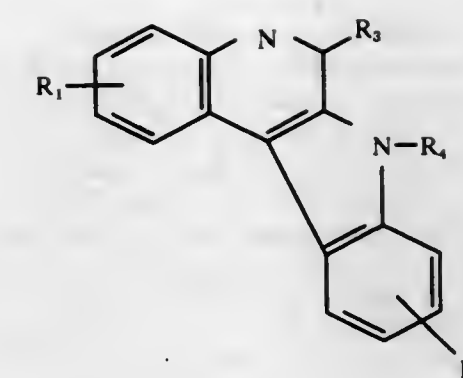


wherein A is a straight chain lower alkylene of 1-7 carbon atoms or a straight chain lower alkylene of 1 to 7 carbon atoms mono-substituted by lower alkyl of 1-7 carbon atoms, R<sub>6</sub> and R<sub>7</sub>, independently, are hydrogen, lower alkyl of 1 to 7 carbon atoms, hydroxy-lower alkyl of 1 to 7 carbon atoms or halo-lower alkyl of 1 to 7 carbon atoms, or taken together with the nitrogen atom, are piperidino, piperazino, pyrrolidino, morpholino, imidazoline, 4-lower alkylpiperazino wherein lower alkyl is of 1-7 carbon atoms or methylpiperidino, and B is hydrogen, lower alkyl of 1 to 7 carbon atoms or lower alkanoyl of 1 to 7 carbon atoms; provided that at least one of R<sub>2</sub> or R<sub>4</sub> is

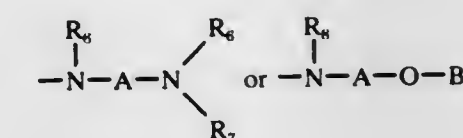


or an addition salt thereof with a pharmaceutically acceptable acid.

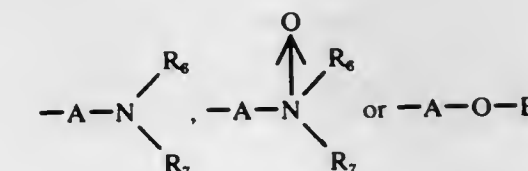
11. A compound of the formula



wherein R<sub>1</sub> is hydrogen, halogen, trifluoromethyl, lower alkyl of 1 to 7 carbon atoms, lower alkoxy of 1 to 7 carbon atoms, amino, cyano or nitro; R<sub>3</sub> is hydrogen, halogen, trifluoromethyl, hydrazino, lower alkyl of 1 to 7 carbon atoms, amino, lower alkylamino of 1 to 7 carbon atoms, di-lower alkylamino of 1 to 7 carbon atoms, lower alkoxy of 1 to 7 carbon atoms, lower alkoxyamino of 1 to 7 carbon atoms,



wherein A is a straight chain lower alkylene of 2-7 carbon atoms or a straight-chain lower alkylene of 2 to 7 carbon atoms mono-substituted by lower alkyl of 1 to 7 carbon atoms, R<sub>6</sub> and R<sub>7</sub>, independently, are hydrogen, lower alkyl of 1 to 7 carbon atoms, hydroxy-lower alkyl of 1 to 7 carbon atoms or halo-lower alkyl of 1 to 7 carbon atoms, or taken together with the nitrogen atom, are piperidino, piperazino, pyrrolidino, morpholino, imidazoline, 4-lower alkylpiperazino wherein lower alkyl is of 1-7 carbon atoms or methylpiperidino, R<sub>8</sub> is hydrogen or lower alkyl of 1 to 7 carbon atoms and B is hydrogen, lower alkyl of 1 to 7 carbon atoms or lower alkanoyl of 1 to 7 carbon atoms; R<sub>4</sub> is hydrogen, lower alkyl of 1 to 7 carbon atoms,



or -A-O-B, wherein A is a straight chain lower alkylene of 2-7 carbon atoms or a straight chain lower alkylene of 2-7 carbon atoms mono-substituted by lower alkyl of 1-7 carbon atoms, R<sub>6</sub> and R<sub>7</sub>, independently, are hydrogen, lower alkyl of 1 to 7 carbon atoms, hydroxy-lower alkyl of 1 to 7 carbon atoms or halo-lower alkyl of 1 to 7 carbon atoms, or taken together with the nitrogen atom, are piperidino, piperazino, pyrrolidino, morpholino, imidazoline, 4-lower alkylpiperazino wherein lower alkyl is of 1-7 carbon atoms an methylpiperidino, and B is hydrogen, lower alkyl of 1 to 7 carbon atoms or lower alkanoyl of 1 to 7 carbon atoms; and R<sub>8</sub> is halogen, lower alkyl of 1 to 7 carbon atoms, lower alkoxy of 1 to 7 carbon atoms, amino, cyano or nitro; provided that at least one of R<sub>3</sub> or R<sub>4</sub> is a basic amino side chain or -A-O-B, or an addition salt thereof with a pharmaceutically acceptable acid.



4,014,884

## BASICALLY SUBSTITUTED

## 3,4-DIHYDRO-2H-ISOQUINOLIN-1-THIONES

Rudolf Kunstmann, Breckenheim, and Joachim Kaiser, Bad Soden, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 12, 1975, Ser. No. 603,931

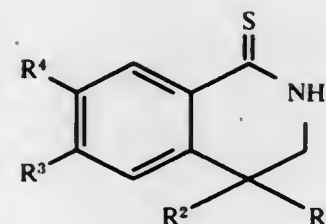
Claims priority, application Germany, Aug. 14, 1974, 2438965

Int. Cl.<sup>2</sup> C07D 217/22

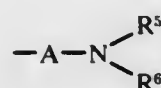
U.S. Cl. 260—288 CE

5 Claims

1. A 3,4-dihydroisoquinoline of the formula I



wherein R<sup>1</sup> is hydrogen, saturated straight-chained or branched alkyl having 1 to 6 carbon atoms or phenyl, R<sub>2</sub> is dialkylaminoalkyl of the formula



wherein A is straight-chained or branched low molecular alkylene having 2-3 carbon atoms and R<sup>5</sup> and R<sup>6</sup> are identical or different and are straight-chained or branched, low molecular alkyl having 1-4 carbon atoms and may form together with the nitrogen atom a 5- or 6-membered ring, R<sup>3</sup> and R<sup>4</sup> are identical or different and are hydrogen or lower alkoxy having 1 to 4 carbon atoms as well as the physiologically tolerable salts thereof.

4,014,885

ANTI-LEUKEMIC OXYGENATED  
BENZO[C]PHENANTHRIDINE COMPOUNDS

Kwang Yuen Zee-Cheng, and Chia-Chung Cheng, both of Kansas City, Mo., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 446,896, Feb. 28, 1974, Pat. No.

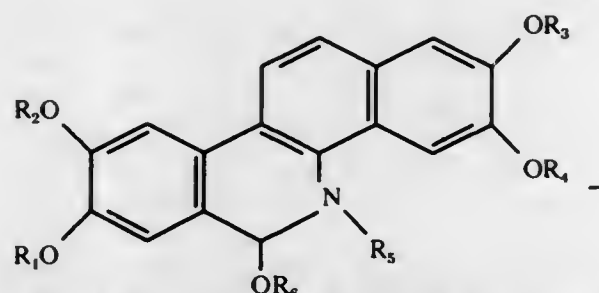
3,912,740. This application Mar. 10, 1975, Ser. No. 557,183

Int. Cl.<sup>2</sup> C07D 217/16

U.S. Cl. 260—289 A

3 Claims

1. 5,6-Dihydro-6-alkoxyindoline compounds of the formula



wherein R<sub>1</sub> and R<sub>2</sub> are selected independently from the group consisting of C<sub>1</sub>-C<sub>6</sub> alkyl groups, H and benzyl or R<sub>1</sub> and R<sub>2</sub> taken together are methylene and R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub> are selected independently from the group consisting of C<sub>1</sub>-C<sub>6</sub> alkyl groups, H and benzyl.

4,014,886

## 2-SUBSTITUTED-5,6-DIMETHOXYINDAZOLES

Thomas J. Schwan; Charles S. Davis, both of Norwich, and LeRoy J. Honkomp, Oxford, all of N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 472,719, May 23, 1974, Pat. No.

3,966,760. This application Feb. 25, 1976, Ser. No. 661,392

Int. Cl.<sup>2</sup> C07D 401/04

U.S. Cl. 260—293.6

2 Claims

1. The compound 2-(2,6-dimethylpiperidino)-5,6-dimethoxyindazole.

4,014,887

## SUBSTITUTED PIPERIDIN-4-OLS

Donald Richard Randell, Stockport; Brian Holt, Royton, and Alan Geoffrey Virgin, Swinton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 19, 1973, Ser. No. 408,123

Claims priority, application United Kingdom, Oct. 21, 1972, 48601/72

Disclosure was also published under second Trial Voluntary

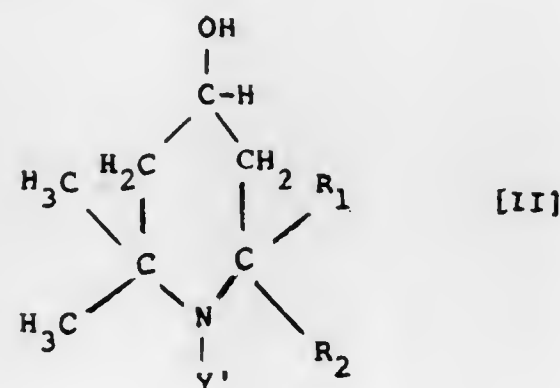
Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C07D 211/46

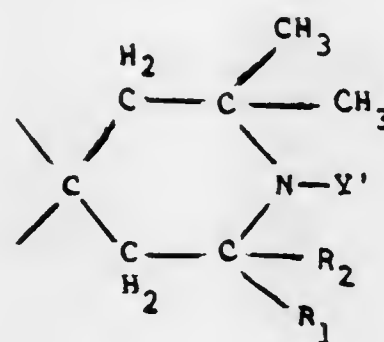
U.S. Cl. 260—293.84

7 Claims

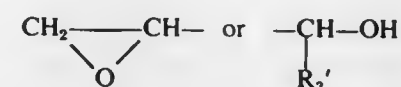
1. A compound of the formula



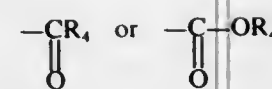
wherein R<sub>1</sub> and R<sub>2</sub> are the same or different and each is a straight- or branched alkyl residue having from 1 to 12 carbon atoms, or R<sub>1</sub> and R<sub>2</sub>, together with the carbon atom to which they are attached, form a cycloalkyl residue having from 5 to 12 carbon atoms, or the group:



wherein R<sub>1</sub> and R<sub>2</sub> are as defined above and Y' is a straight- or branched alkyl having from 5 to 20 carbon atoms, an alkenyl or alkynyl having from 3 to 20 carbon atoms, an aralkyl selected from benzyl, α-methylbenzyl, p-methyl-α-methylbenzyl and α-naphthylmethyl or the group —CH<sub>2</sub>X' wherein X' is the group



wherein R<sub>3</sub>' is hydrogen or a methyl residue, or X is the group



wherein R<sub>4</sub> is alkyl residue having from 1 to 20 carbon atoms.

4,014,888

SUBSTITUTED PYRIDINE CARBOXYLIC ACIDS AND  
DERIVATIVES

Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 572,024, April 28, 1975,

abandoned, which is a division of Ser. No. 412,944, Nov. 5,

1973, Pat. No. 3,920,641. This application Apr. 13, 1976, Ser.

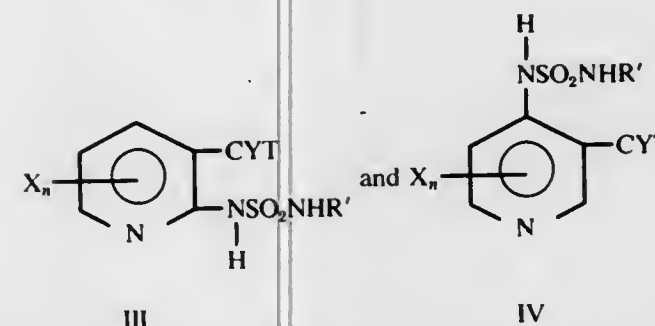
No. 676,591

Int. Cl.<sup>2</sup> C07D 213/55

U.S. Cl. 260—294.8 F

18 Claims

1. A compound of the formulae:



wherein:

each X independently represents loweralkyl, of 1 to 6 carbon atoms, haloloweralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, SR<sup>5</sup>, OR<sup>5</sup>, aryl wherein aryl is phenyl, halophenyl or tolyl, —NR<sup>3</sup>R<sup>4</sup>, halo or nitro;

n represents an integer of 0 to 3, inclusive;

Y represents oxygen;

T represents a member selected from the group consisting of hydroxy, alkoxy of 1 to 3 carbon atoms and halo;

R' represents hydrogen, loweralkyl of 1 to 6 carbon atoms, haloloweralkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, haloalkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, haloalkynyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, loweralkoxyalkyl wherein each of alkoxy and alkyl are of from 1 to 6 carbon atoms, dialkylaminoalkyl wherein each alkyl is of from 1 to 6 carbon atoms, or —C(CH<sub>3</sub>)<sub>2</sub>C≡N;

each of R<sup>3</sup> and R<sup>4</sup> independently represent hydrogen or loweralkyl of 1 to 6 carbon atoms;

R<sup>5</sup> represents loweralkyl of 1 to 6 carbon atoms.

4,014,889

## PROCESS FOR PREPARING KETONES

Hermann Stetter, Aachen-Laurensberg, and Manfred Schreckenberg, Aachen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 424,231, Dec. 12, 1973, abandoned. This

application June 11, 1975, Ser. No. 586,118

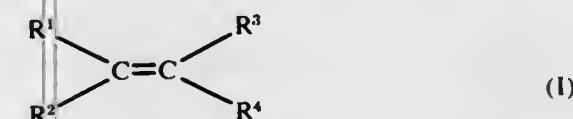
Int. Cl.<sup>2</sup> C07D 213/50

U.S. Cl. 260—294.9

9 Claims

1. Process for preparing ketones which comprises contacting in the presence of a cyanide ion:

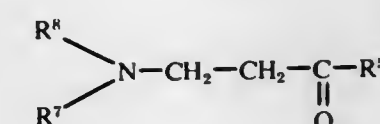
A. an unsaturated compound having the formula (I):



wherein R<sup>1</sup>, and R<sup>2</sup> and R<sup>3</sup> are the same or different and are

selected from the group of hydrogen, unsubstituted aliphatic having up to 12 carbon atoms, unsubstituted cycloaliphatic having up to 18 carbon atoms, unsubstituted araliphatic having up to 18 carbon atoms where the aryl portion is naphthyl or phenyl and the alkyl portion contains up to 6 carbon atoms, unsubstituted phenyl or naphthyl, unsubstituted heterocyclic groups having 5 or 6 members in the groups including heterocyclic groups containing a condensed benzene group where the heteroatom is oxygen, nitrogen or sulfur and carboxylic acid ester and substituted components thereof where the substituent is a halogen atom, a cyano group, a nitro group, a mono- or di-substituted or unsubstituted amino group, an alkyl group having up to 6 carbon atoms, a phenyl group, hydroxyl, alkoxy, alkylthio, carboxylic acid ester and a thiocarboxylic acid ester group with up to 6 carbon atoms, alkylcarbonyl, arylcarbonyl, alkylthiocarbonyl or arylthiocarbonyl group and R<sup>4</sup> is nitrile (CN), —CO—R<sup>5</sup> or —CO—OR<sup>5</sup> wherein R<sup>5</sup> is selected from the group of unsubstituted aliphatic having up to 12 carbon atoms, unsubstituted cycloaliphatic having up to 18 carbon atoms, unsubstituted araliphatic having up to 18 carbon atoms where the aryl portion is naphthyl or phenyl and the alkyl portion is up to 6 carbon atoms, phenyl, naphthyl, a 5 or 6 member heterocyclic group including heterocyclic groups containing a condensed benzyl group, a carboxylic acid group and substituted groups thereof where the substituents are selected from the group consisting of a halogen atom, a nitro group, a cyano group, an unsubstituted mono- or di-substituted amino group, an alkyl group containing up to 6 carbon atoms, a phenyl group, a hydroxyl group, an alkoxy group, an alkylthio group, a carboxylic acid ester group having up to 6 carbon atoms, a thiocarboxylic acid ester group having up to 6 carbon atoms, an alkylcarbonyl group, an arylcarbonyl group, an alkylthiocarbonyl group and an arylthiocarbonyl group and R<sup>1</sup>, R<sup>2</sup> and/or R<sup>3</sup> and/or R<sup>4</sup> and/or R<sup>5</sup> or R<sup>3</sup> and R<sup>5</sup> together with the carbon atoms to which they are attached as substituents can form a carboxylic or heterocyclic ring, or

B. a Mannich base having the formula



wherein

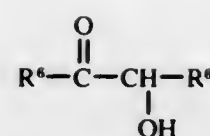
R<sup>5</sup> is an unsubstituted aliphatic having up to 12 carbon atoms, unsubstituted cycloaliphatic having up to 18 carbon atoms, unsubstituted araliphatic having up to 18 carbon atoms where the aryl portion is naphthyl or phenyl and the alkyl portion contains up to 6 carbon atoms, unsubstituted phenyl or naphthyl, unsubstituted heterocyclic groups having 5 or 6 members in the groups including heterocyclic groups containing a condensed benzene group where the heteroatom is oxygen, nitrogen or sulfur and substituted components of said aliphatic, cycloaliphatic, araliphatic, phenyl, naphthyl or heterocyclic groups where the substituent is a halogen atom, a cyano group, a nitro group, a mono- or di-substituted or unsubstituted amino group, an alkyl group having up to 6 carbon atoms, a phenyl group, hydroxyl, alkoxy, alkylthio, carboxylic acid ester and a thiocarboxylic acid ester group with up to 6 carbon atoms, alkylcarbonyl, arylcarbonyl, alkylthiocarbonyl or arylthiocarbonyl groups;

R<sup>2</sup> and R<sup>3</sup> are each independently aliphatic having up to 12 carbon atoms or together with the nitrogen atom of said Mannich base form a 5 or 6 membered ring, with:

C. an aromatic or heterocyclic aldehyde; or

D. a benzoin having the formula





wherein

R<sup>6</sup> is a substituted or unsubstituted naphthyl or phenyl group or a 5 or 6 member heterocyclic group where the hetero atom is oxygen, sulfur or nitrogen.

4,014,890

**PROCESS FOR PREPARING INDOLE DERIVATIVES**  
Willard M. Welch, Jr., Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

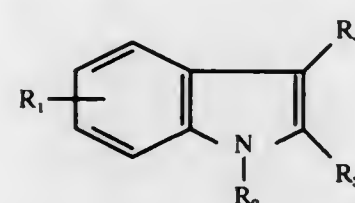
Filed Mar. 23, 1976, Ser. No. 669,507

Int. Cl.<sup>2</sup> C07D 471/04

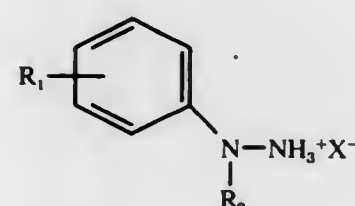
U.S. Cl. 260—296 A

11 Claims

1. The process for preparing compounds of the formula:



which comprises reacting a phenylhydrazine acid addition salt of the formula:



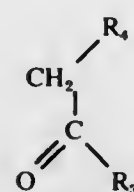
where

X is Cl or Br;

R<sub>1</sub> is a member selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl and methoxy;

R<sub>2</sub> is a member selected from the group consisting of hydrogen, alkyl having from one to three carbon atoms, —C<sub>6</sub>H<sub>4</sub>R<sub>1</sub>, —CH<sub>2</sub>CH<sub>2</sub>NR<sub>7</sub>R<sub>8</sub> and —CH<sub>2</sub>CH<sub>2</sub>—CH<sub>2</sub>NR<sub>7</sub>R<sub>8</sub> wherein R<sub>7</sub> and R<sub>8</sub> are each alkyl having from one to three carbon atoms;

with the proviso that when R<sub>2</sub> is —C<sub>6</sub>H<sub>4</sub>R<sub>1</sub>, both R<sub>1</sub> are the same; with an equimolar amount of a ketone of the formula:

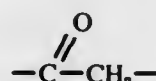


wherein

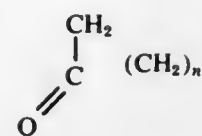
R<sub>3</sub> is methyl;

R<sub>4</sub> is hydrogen;

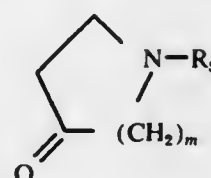
and R<sub>3</sub> and R<sub>4</sub> when taken together with the



moiety to which they are attached, form

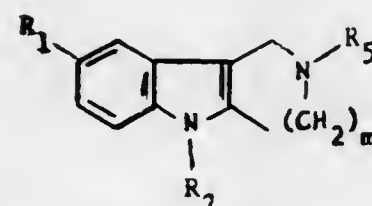


wherein n is an integer from 3 to 6, or

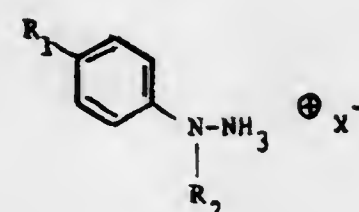


wherein m is 1 or 2; R<sub>5</sub> is —COOR<sub>6</sub> or —SO<sub>2</sub>R<sub>6</sub> and R<sub>6</sub> is methyl or ethyl; in the presence of at least an equimolar amount of a weakly basic solvent selected from the group consisting of pyridine, quinoline, N,N-dimethylaniline, picoline and lutidine, at a temperature in the range of about 50° to 180° C.

2. The process for preparing compounds of the formula:



which comprises the reaction of a phenylhydrazine acid addition salt of the formula:

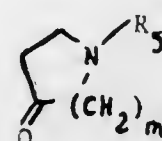


wherein X is Cl or Br;

R<sub>1</sub> is a member selected from the group consisting of fluoro, chloro, bromo, methyl and hydrogen;

R<sub>2</sub> is a member selected from the group consisting of hydrogen, phenyl and phenyl substituted in the 4-position by a member of the group consisting of fluoro and chloro; with the proviso that when R<sub>2</sub> is said phenyl substituted by fluoro, R<sub>1</sub> is fluoro and when R<sub>2</sub> is said phenyl substituted by chloro, R<sub>1</sub> is chloro;

with an equimolar amount of a ketone of the formula:



wherein m is 1 or 2; R<sub>5</sub> is —COOR<sub>6</sub> or —SO<sub>2</sub>R<sub>6</sub> and R<sub>6</sub> is methyl or ethyl;

in the presence of at least an equimolar amount of a weakly basic solvent selected from the group consisting of pyridine, quinoline, N,N-dimethylaniline, picoline, and lutidine, at a temperature in the range of about 50 to 180° C.

3. The process according to claim 2 wherein m is 2; R<sub>1</sub> is selected from the group consisting of fluoro, chloro, bromo, methyl and hydrogen; R<sub>2</sub> is hydrogen; and R<sub>5</sub> is —COOC<sub>2</sub>H<sub>5</sub>.

4,014,891

# PROCESS FOR MAKING ARYL CHLOROMETHYL SULFIDES

Christian T. Goralski, Midland, and George A. Burk, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 17, 1975, Ser. No. 540,734

Int. Cl.<sup>2</sup> C07C 148/00, 149/34; C07D 277/36

U.S. Cl. 260—302 SD

14 Claims

1. A process for preparing an aryl chloromethyl sulfide comprising reacting by contacting in liquid phase (a) an alkali metal aryl mercaptide with (b) bromochloromethane in the presence of (c) a small but sufficient amount of a quaternary ammonium salt to catalyze the reaction between (a) and (b); said quaternary ammonium salt having an aggregate carbon content of at least 10 carbon atoms.

4,014,892

# 6-SUBSTITUTED AMINO

## PHENYL-2,3,5,6-TETRAHYDRO[2,1-B]THIAZOLES

Larry Dean Spicer, Princeton, and John James Hand, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 289,016, Sept. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,939, Aug. 25, 1971, abandoned, which is a

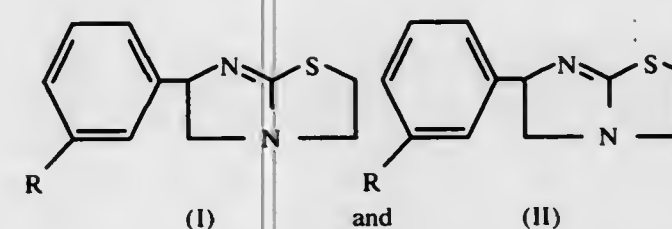
continuation-in-part of Ser. No. 22,701, March 25, 1970, Pat. No. 3,673,205. This application June 11, 1975, Ser. No. 585,994

Int. Cl.<sup>2</sup> C07D 513/04

U.S. Cl. 260—306.7 T

19 Claims

1. A racemic or levorotatory isomer of a compound represented by the formulae:



wherein R is furfurylamino, p-methoxybenzylamino, 3-pyridylmethylamino, methoxycarbonylamino, cyclohexylcarbonylamino, benzylcarbonylamino, benzoylamino, p-methoxybenzoylamino, p-chlorobenzoylamino, m-chlorobenzoylamino, 3,4-dichlorobenzoylamino, p-nitrobenzoylamino, 2-furoylamino, benzylamino, cinnamoylamino, n-butylamino, isobutylamino, trimethylacetylaminom, adamantanecarbonylamino, chloroacetylaminom or C<sub>4</sub>-C<sub>10</sub> alkanoylamino and a pharmaceutically acceptable salt thereof.

4,014,893

# 3,4-CYCLOALKANO FUROXANS

John Crosby; Robert Allan Campbell Rennie; John Tanner, all of Runcorn, England, and Robert Michael Paton, Edinburgh, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 467,512, May 6, 1974, Pat. No. 3,931,106.

This application Aug. 5, 1975, Ser. No. 602,011

Claims priority, application United Kingdom, May 11, 1973, 22582/73; June 26, 1973, 30218/73; Nov. 12, 1973, 52380/73

Int. Cl.<sup>2</sup> C07D 271/12

U.S. Cl. 260—307 DB

2 Claims

1. 3,4-(1',4'-methano-2,3'-Δ<sup>2</sup>-propeno)butano furoxan.  
2. 3,4-(1',4'-methano)butano furoxan.

4,014,894

# BENZOTRIAZOLE DERIVATIVES

Harry J. Andress, Jr., Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 430,870, Jan. 4, 1974, Pat. No. 3,969,237, which is a continuation-in-part of Ser. No. 344,007, March 27, 1973, abandoned. This application Feb. 12, 1976, Ser. No. 657,415

Int. Cl.<sup>2</sup> C07D 249/18

U.S. Cl. 260—308 B

9 Claims

1. The reaction product of (A) benzotriazole and (B) a reactant selected from the group consisting of oleic acid, dimer acid, trimer acid, mono (nonylphenyl) phosphate, di (nonylphenyl) phosphate, mono (nonylphenyl) phosphonate and di (nonylphenyl) phosphonate, wherein said reaction is conducted at a temperature from about 100° C. to about 200° C. and in a mole ratio of (A) to (B) of from about 1:1 to about 1:0.5.

4,014,895

# METHOD FOR SYNTHESIS OF OPTICALLY ACTIVE THIOLACTONES

Yasuhiko Aoki, Toyonaka; Hiroyuki Suzuki, Takarazuka; Hisao Akiyama, Nishinomiya, and Shigeru Okano, Kawanishi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 372,606, June 22, 1973, Pat. No. 3,876,656. This application Dec. 13, 1974, Ser. No. 532,477 Claims priority, application Japan, June 22, 1972, 47-63032; Mar. 23, 1973, 48-33912

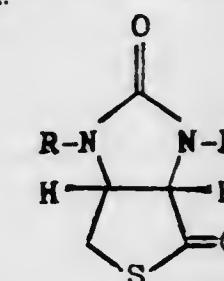
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C07D 49/34

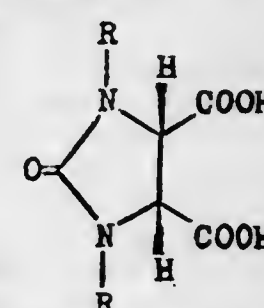
U.S. Cl. 260—309.7

8 Claims

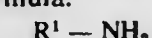
1. A process for producing an optically active (+)-thiolactone of the formula:



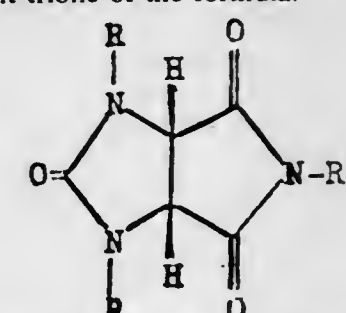
wherein R is a benzyl group, which comprises reacting a dicarboxylic acid of the formula:



wherein R is as defined above or the acid anhydride, ester or halide thereof with an optically active primary amine of the formula:

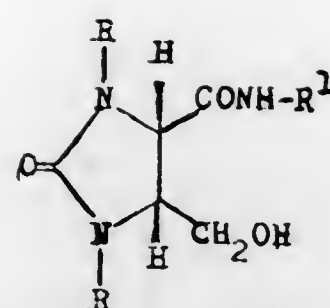


where R<sup>1</sup> is an optically active primary amine residue, reducing the resultant triene of the formula:

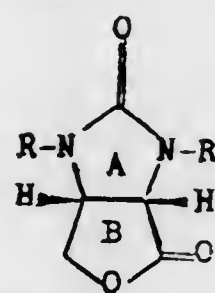


wherein R and R<sup>1</sup> are each as defined above, hydrolyzing the resulting amide-alcohol of the formula:





wherein R and R¹ are each defined above and treating the thus obtained lactone of the formula:



wherein R is as defined above with an alkali metal hydrosulfide and carbon disulfide or phosphorus pentasulfide and imidazole.

4,014,896

**CATALYTIC DEHYDROGENATION PROCESS FOR THE PREPARATION OF 3,4,5-TRISUBSTITUTED PYRAZOLES**  
Murray Garber, Trenton; Lawrence James Ross, Martinsville, and Walter Joseph Stepek, Trenton, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 549,219, Feb. 12, 1975, Pat. No. 3,952,010, which is a continuation-in-part of Ser. No. 398,284, Sept. 17, 1973, abandoned. This application Jan. 8, 1976, Ser. No. 647,384

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.² C07D 231/12, 231/18

U.S. Cl. 260—310 R

5 Claims

1. The method for the preparation of 3,5-diphenyl-4-alkyl or 4-alkoxy pyrazole which comprises the steps of: reacting either (1) an  $\alpha$ -lower alkyl chalcone prepared by bringing in reaction equimolar amounts of a ketone selected from the group consisting of propiophenone and butyrophenone and benzaldehyde in the presence of a base and a C₁-C₄ alcohol solvent, at a temperature between about 10° and 70° C, or (2) the corresponding  $\alpha$ -lower alkoxy chalcone, acidifying said reaction mixture to a pH of 7 or below with a mineral acid, treating the acidified reaction mixture with from about 1.0 to 1.5 mole equivalents of hydrazine under a blanket of an inert gas selected from the group consisting of nitrogen, argon, helium and carbon dioxide, while maintaining the temperature of the reaction mixture between about 10° and 70° C, separating from about 65% to 90% of said C₁-C₄ alcohol solvent from the reaction mixture and admixing with the remainder of the reaction mixture an amount of solvent approximately equal to the alcohol separated therefrom and selected from the group consisting of an aromatic solvent, a chlorinated hydrocarbon, and an ether, maintaining the said mixture under a blanket of inert gas selected from the group consisting of nitrogen, argon, helium and carbon dioxide, adding a catalyst selected from the group consisting of platinum, palladium, platinum on alumina, platinum on barium sulfate, palladium on alumina, palladium on barium sulfate, palladium on carbon, palladium on silica, platinum on silica, pre-reduced copper chromite and platinum on carbon to the reaction mixture, said mixture being brought to reflux temperatures, removing water azeotropically from said mixture, cooling said mixture to between 100° and 130° C, filtering the latter to remove catalyst therefrom, further cooling said filtrate mixture to about 10° C, whereby the 3,5-diphenylpyrazole precipitates, and recovering said pyrazole from the reaction mixture.

4,014,897  
**PROCESS FOR PREPARING CYCLICDICARBOXIMIDO-SUBSTITUTED PHOSPHONOTHIOATES**

Ian McLachlan, King's Lynn, England, assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 7, 1974, Ser. No. 512,779

Claims priority, application United Kingdom, Oct. 23, 1973, 49325/73

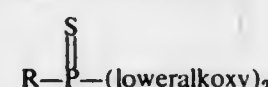
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.² C07D 209/48

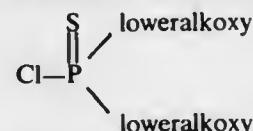
U.S. Cl. 260—326 E

6 Claims

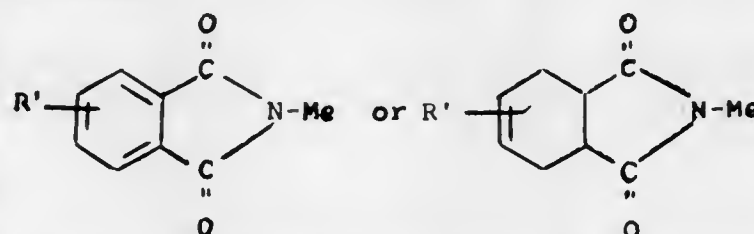
1. A process for preparing cyclicdicarboximido phosphonothioates corresponding to the formula



wherein R represents phthalimido, mono-methyl phthalimido, 4-cyclohexene-1,2-dicarboximido or mono-methyl-4-cyclohexene-1,2-carboximido which comprises reacting a phosphorochloridothioate corresponding to the formula



with an N-alkali-metal cyclicdicarboximide corresponding to the formula



wherein R' represents hydrogen or methyl and Me represents sodium or potassium at a temperature of from about 0° to about 100°C. in the presence of an inert tertiary alcohol solvent and a catalytic amount of a 1-(loweralkyl)imidazole.

4,014,898

**N,N-DIALKYLAMINOETHOXYETHYLPH-THALIMIDOMALONATES**

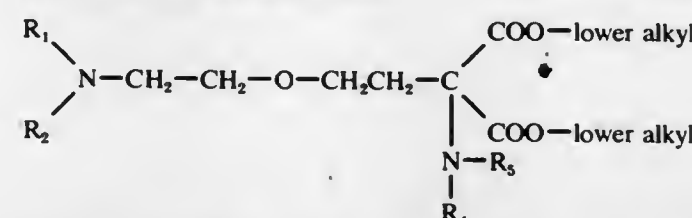
Dennis Keith, Montclair, and Manfred Weigle, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 457,340, April 3, 1974, Pat. No. 3,887,615. This application Mar. 18, 1975, Ser. No. 559,602  
Int. Cl.² C07D 209/34

U.S. Cl. 260—326 N

1 Claim

1. A compound of the formula



wherein R₁ and R₂ are lower alkyl; and R₄ and R₅ taken together with their attached nitrogen atom form the phthalimido group.

4,014,899

**5,6-BENZOISOINDOLINES**

Robert Mathews Bowman, Summit, and Heinz Werner Gschwend, New Providence, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

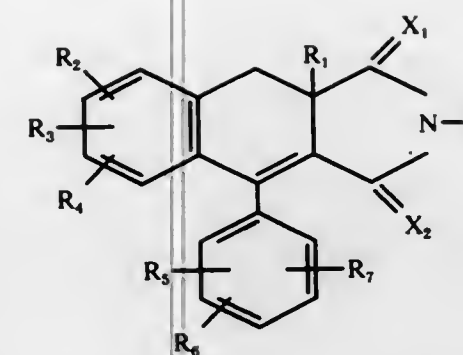
Continuation-in-part of Ser. No. 410,940, Oct. 29, 1973, Pat. No. 3,973,030. This application Mar. 25, 1975, Ser. No. 561,820

Int. Cl.² C07D 209/44

U.S. Cl. 260—326.1

6 Claims

1. A compound of the formula



wherein R is methyl, each of R₁ and R₂ is hydrogen, each of R₃ and R₄ is hydrogen or methoxy in 6- and 7-position, and each of R₅, R₆ and R₇ is methoxy in the 3'-, 4'- and 5'-positions, or R₅ and R₆, when taken together, are methylene-dioxy, and R₇ is hydrogen, and both of X₁ and X₂ are two hydrogens, or a therapeutically acceptable acid addition salt thereof.

4,014,900

**PURIFICATION OF 2-PYRROLIDONE**

Stephen F. Pusztaszeri, P.O. Box 1181, Port Chester, N.Y. 10573

Continuation-in-part of Ser. No. 224,274, Feb. 7, 1972, abandoned. This application June 24, 1974, Ser. No. 482,166  
Int. Cl.² C07D 207/26

U.S. Cl. 260—326.5 FN

10 Claims

1. A process for producing substantially pure, substantially anhydrous 2-pyrrolidone from impure liquid 2-pyrrolidone comprising the steps of:

- dissolving therein from about 0.1 to 0.8% by weight, based upon the weight of the impure 2-pyrrolidone, of a solid substantially anhydrous hydroxide of a metal selected from the group consisting of; sodium, potassium, lithium, barium and calcium;
- applying the hydroxide-pyrrolidone solution as a moving thin film to a heated surface under a vacuum pressure in a molecular distillation apparatus whereby the 2-pyrrolidone is selectively flash vaporized from the heated surface while the non-volatile impurities of the solution remain on the heated surface;
- condensing the vaporized 2-pyrrolidone on a cooled surface; and
- collecting the condensed 2-pyrrolidone as substantially pure, substantially anhydrous, colorless and odorless 2-pyrrolidone, wherein the vacuum pressure and the distance between the heated surface and the cooled surface and their respective temperatures are selected so that no vapor-liquid equilibrium is formed and substantially all of the vaporized 2-pyrrolidone molecules move directly from the heated surface to the cooled surface without recondensing on the heated surface.

4,014,901

**SYNTHETIC HORMONES FOR INSECT CONTROL**

William S. Bowers, Bowie, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

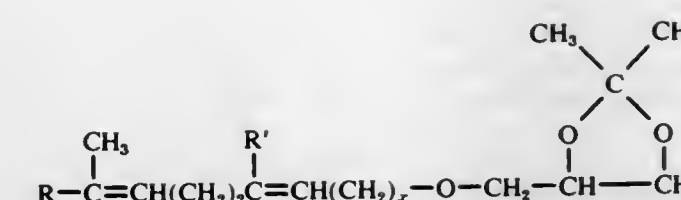
Division of Ser. No. 363,294, May 23, 1973, which is a division of Ser. No. 78,577, Oct. 6, 1970, abandoned. This application July 2, 1975, Ser. No. 592,697

Int. Cl.² C07D 317/10

U.S. Cl. 260—340.9

1 Claim

1. A compound of the general formula



wherein R and R' are selected from the group consisting of methyl and ethyl; and x is a number from 1 to 2.

4,014,902

**INTERMEDIATE IN THE PROCESS FOR THE PREPARATION OF TRANS-Δ⁹-ISOAMBRETTOLIDE**  
Ching Y. Tseng, Middletown, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

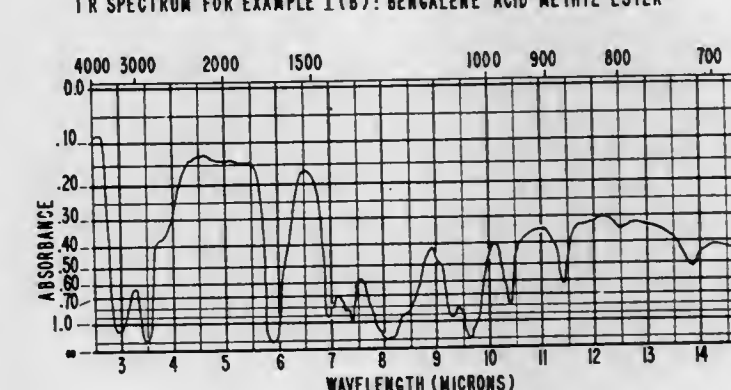
Filed June 9, 1976, Ser. No. 694,452

Int. Cl.² C07D 317/10

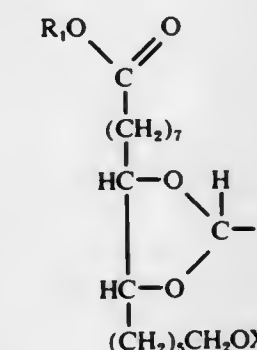
U.S. Cl. 260—340.9

4 Claims

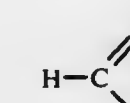
IR SPECTRUM FOR EXAMPLE I (B): BENZALNE ACID METHYL ESTER



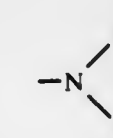
1. A mixture of dioxolane derivatives of aleuritic acid having the structure:



wherein X represents H— and



and wherein Z is selected from the group consisting of —OR₂ and



and R₁, R₂, R₃ and R₄ are the same or different lower alkyl.



4,014,903

**RECOVERY OF DICARBOXYLIC ACIDS FROM AQUEOUS SOLUTION CONTAINING NITRIC ACID**  
William Percy Moore, Hopewell, Va., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Aug. 11, 1975, Ser. No. 603,829  
Int. Cl.<sup>2</sup> B01D 3/38

U.S. Cl. 260—345.9

4 Claims

1. A process for treating an adipic acid bleed stream obtained in the manufacture of adipic acid by oxidizing with nitric acid a mixture of cyclohexanol and cyclohexanone in the presence of a catalyst consisting of a mixture of copper and vanadium salts, said adipic acid bleed stream consisting mainly of nitric, adipic, glutaric, and succinic acids and said catalyst; the process comprising:

- recovering a portion of the adipic acid from the adipic acid bleed stream by chilling the adipic acid bleed stream to precipitate adipic acid and separating the precipitated adipic acid from the residual adipic acid bleed stream;
- dissolving said precipitated adipic acid in aqueous nitric acid to produce a solution which is recycled to said manufacture of adipic acid;
- maintaining said residual adipic acid bleed stream in aqueous solution by addition of water as required, and stripping nitric acid from said aqueous solution at about atmospheric pressure with steam at a temperature of about 100° to 110° C. while maintaining in said aqueous solution at least 10–25 weight percent of water and a water to nitric acid weight ratio of at least 6, to remove substantially all of the nitric acid therefrom, thereby forming an aqueous nitric acid free mixture of said dibasic acids and said catalyst, which can be safely dehydrated and distilled to produce useful chemicals.

4. The process of claim 1 wherein the aqueous nitric acid free mixture of dibasic acids obtained from said stripping step is dehydrated to form succinic anhydride and glutaric anhydride, and said anhydrides are batch distilled at subatmospheric pressure.

4,014,904

**SUBSTITUTED DIHYDRO BENZOFURANYL ESTERS**  
Adolf Fischer, deceased, late of Mutterstadt, Germany (by Caecilia Emma Fischer, administratrix); Wolfgang Rohr, Mannheim, and Christian Reitel, Ziegelhausen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Dec. 20, 1974, Ser. No. 534,680

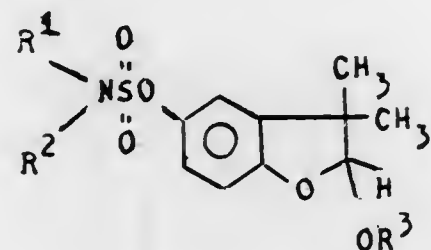
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 20, 1976

Int. Cl.<sup>2</sup> C07D 307/83

U.S. Cl. 260—346.2 R

12 Claims

1. A compound of the formula



wherein:

R<sup>1</sup> denotes hydrogen, unsubstituted or chloro- or methoxy-substituted alkyl of 1–4 carbon atoms, allyl, methallyl, propargyl or butynyl;

4,014,905

**ESTERS OF CERTAIN TETRAMETHYL AND PENTAMETHYL-1-OXA-SPIRO [4-5] DECAN-6-OLS WITH CERTAIN ALKANOIC ACIDS**

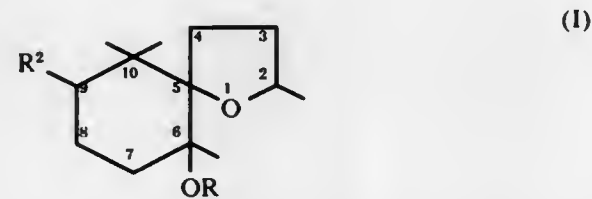
Werner Skorianetz, Geneva; Walter Renold, Onex; Gunther Ohloff, Bernex, and Karl-Heinrich Schulte-Elte, Onex, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 542,072, Jan. 17, 1975, abandoned. This application Oct. 23, 1975, Ser. No. 625,452  
Claims priority, application Switzerland, Feb. 4, 1974, 1488/74; June 7, 1974, 7776/74; July 30, 1975, 9920/75  
Int. Cl.<sup>2</sup> C07D 307/94

U.S. Cl. 260—347.4

7 Claims

1. A spirane derivative of formula



wherein the symbol R represents an alkanoyl radical containing from 1 to 6 carbon atoms and R<sup>2</sup> represents a hydrogen atom or a methyl radical.

4,014,906

**PROCESS FOR THE MANUFACTURE OF ANTHRAQUINONE COMPOUNDS**

Urs Karlen, Magden, and Hans Morawietz, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,935

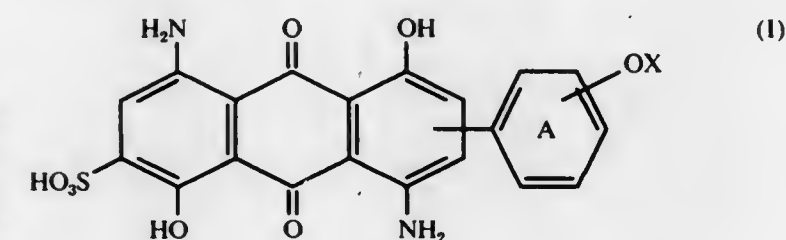
Claims priority, application Switzerland, Dec. 20, 1974, 17034/74

Int. Cl.<sup>2</sup> C09B 1/52

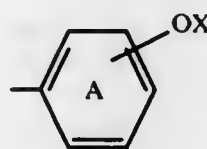
U.S. Cl. 260—373

9 Claims

1. A process for the manufacture of anthraquinone compounds of formula



wherein X represents a hydrogen atom or a substituted or unsubstituted lower alkyl radical of 1 to 6 carbon atoms or a substituted or unsubstituted aryl radical, and the ring A can be further substituted, by sulphonating 1,5-dialkoxy-, 1,5-dicycloalkoxy- or diaryloxy-anthraquinone in the 2 and 6 positions, introducing two amino groups in positions 4 and 8 by treating the sulphonated intermediate with hydroxylamine or a salt thereof in sulphuric acid medium, in the presence of a metal catalyst, introducing the radical



by reacting the boric acid complex of 1,5-dihydroxy-4,8-diaminoanthraquinone-2,6-disulphonic acid with a compound of formula

4,014,909

**ESTERS OF 21-THIOL STEROIDS**

(II) Dieran Robert Torossian, Bourg-La-Reine; Gilbert Gustave Aubard, Palaiseau, and Jacky Marcel Gerard Legeai, Antony, all of France, assignors to Jouveinal S.A., Cachan, France

Filed May 28, 1974, Ser. No. 473,388

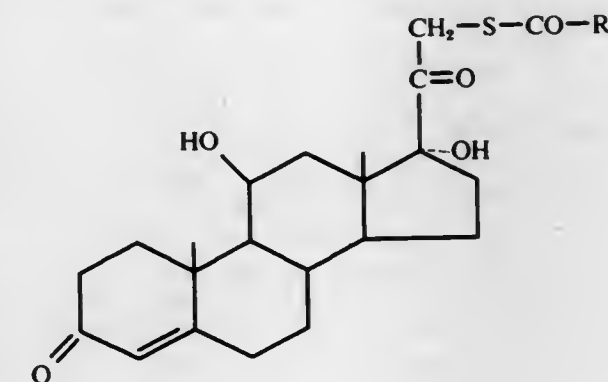
Claims priority, application France, May 30, 1974, 73.19734

Int. Cl.<sup>2</sup> C07J 31/00

U.S. Cl. 260—397.45

4 Claims

1. As a new compound a hydrocortisone derivative of the general formula:



wherein:

R<sub>1</sub> is an alkyl radical having 4 or 6 carbon atoms or is the p-fluorophenyl radical.

4,014,907

**2-HYDROXY-3-NITRO-1,4-NAPHTHOQUINONES**

Barry Christian Charles Cantello; Derek Richard Buckle, both of Redhill, and Harry Smith, Maplehurst near Horsham, all of England, assignors to Beecham Group Limited, England  
Filed Apr. 24, 1975, Ser. No. 571,253

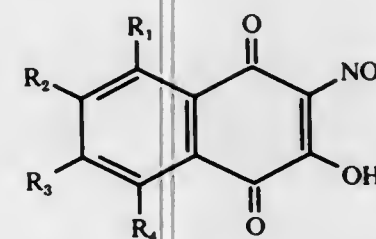
Claims priority, application United Kingdom, May 28, 1974, 23563/74

Int. Cl.<sup>2</sup> C07C 49/62, 49/66

U.S. Cl. 260—396 R

11 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are each hydrogen, lower alkyl, lower alkoxy, phenyl, hydroxy, or halogen, or any adjacent two of R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> taken together with the carbon atoms to which they are joined form a 5- or 6-membered carbocyclic ring, provided that R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are not all hydrogen.

4,014,908

**CHEMICAL PROCESS**

William H. Saltzman, New Rochelle, N.Y., assignor to Intellectual Property Development Corporation, New Rochelle, N.Y.  
Continuation-in-part of Ser. No. 474,735, May 30, 1974, abandoned, which is a continuation of Ser. No. 467,710, May 7, 1974, abandoned, and a continuation-in-part of Ser. No. 417,170, Nov. 19, 1973, Pat. No. 3,919,266, and a continuation-in-part of Ser. No. 290,910, Sept. 21, 1972, abandoned. This application Feb. 20, 1976, Ser. No. 660,037  
Int. Cl.<sup>2</sup> C07J 9/00

U.S. Cl. 260—397.1

19 Claims

1. The method of obtaining organic solvent free 3α, 7α-dihydroxy-5β-cholanic acid from a clathrate consisting of a needle like, crystalline inclusion complex of 3α, 7α-dihydroxy-5β-cholanic acid and an organic solvent of crystallization included compound, which method comprises:

- Treating the said clathrate with an alkali metal base to obtain complete dissolution of said clathrate and to yield a solution having a pH of from about 9 to 11;
- Treating said resultant solution with a mineral acid to yield a solution having a pH of from about 1 to 3; and
- Recovering the resultant organic solvent-free 3α, 7α-dihydroxy-5β-cholanic acid,

4,014,911

**METHOD FOR PREPARING ETHYL VANADATE**

Ronald L. Muntz, Bedford Hills, N.Y., and Robert W. Lerner, Trumbull, Conn., assignors to Stauffer Chemical Company, Adrian, Mich.

Filed Oct. 16, 1975, Ser. No. 623,170

Int. Cl.<sup>2</sup> C07F 9/00

U.S. Cl. 260—429 R

5 Claims

1. An improved method for preparing ethyl vanadate by reacting under substantially anhydrous conditions vanadium oxytrichloride with ethanol in a mole ratio of vanadium oxytri-



chloride to ethanol of from 1:1 to 1:6 and at a temperature of from about 0° to about 80° C in the presence of ammonia, the improvement which comprises conducting the reaction in the presence of an inert hydrocarbon solvent and thereafter adding an amide selected from the class consisting of formamide and methyl formamide in a weight ratio of amide to vanadium oxytrichloride of at least 1.5:1, said hydrocarbon solvent is immiscible with the amide and is a nonsolvent for the ammonium chloride.

4,014,912

**METHOD FOR PREPARING ORGANIC VANADATES**  
 Ronald L. Muntz, Bedford Hills, N.Y., and Robert W. Lerner, Trumbull, Conn., assignors to Stauffer Chemical Company, Adrian, Mich.

Filed Oct. 16, 1975, Ser. No. 623,169

Int. Cl.<sup>2</sup> C07F 9/00

U.S. Cl. 260—429 R

8 Claims

1. A process for preparing organic vanadates which comprises reacting vanadium oxytrichloride with a monohydric alcohol having from 2 to 10 carbon atoms in a molar ratio of vanadium oxytrichloride to alcohol of from 1:1 to 1:5 in the presence of ammonia at a temperature of from about 0° up to about 100° C under substantially anhydrous conditions and thereafter adding sufficient dimethyl sulfoxide to the reaction mixture to form a vanadate phase and a dimethyl sulfoxide-ammonium chloride phase and thereafter recovering the organic vanadate.

4,014,913

**PROCESS FOR PRODUCING OXYGENATED TWO CARBON COMPOUNDS**

Paul Clifford Ellgen, St. Albans, and Madan Mohan Bhasin, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 26, 1975, Ser. No. 590,717

Int. Cl.<sup>2</sup> C07C 27/06

U.S. Cl. 260—449 R

5 Claims

1. The process for selectively producing oxygenated hydrocarbon products of two-carbon atoms from a gaseous mixture containing carbon monoxide and hydrogen wherein said gaseous mixture is continuously contacted with a solid catalyst comprising a combination of rhodium and manganese at reaction conditions correlated to achieve such product in efficiencies, based on carbon consumption, in excess of 10% and obtain the formation of acetic acid, ethanol, and/or acetaldehyde in an amount which is at least about 50 weight percent of the two or more carbon atom compounds obtained by the reaction, which reaction conditions include a temperature within the range of about 150°–450° C, and a pressure within the range of about 15–10,000 psig and wherein the mole ratio of manganese to rhodium in the catalyst is not less than 1:1000.

4,014,914

**MANUFACTURE OF 4,4'-DIPHENYLMETHANE DIISOCYANATE AND A MIXTURE OF DIISOCYANATES AND POLYISOCYANATES**

Hans Joachim Pistor, Walldorf; Herwig Hoffmann, Frankenthal; Hans-Ingo Joschek, Mannheim, and Gotthilf Wenner, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 2,123, Jan. 12, 1970, abandoned.

This application Oct. 25, 1974, Ser. No. 518,076

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 30, 1976

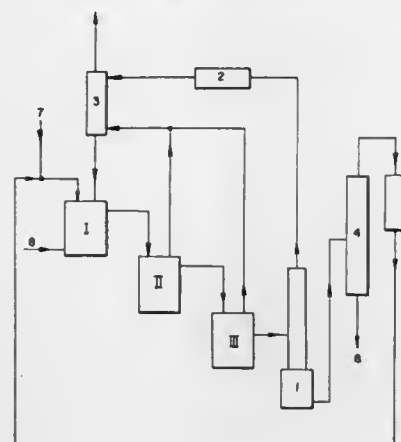
Int. Cl.<sup>2</sup> C07C 119/02

U.S. Cl. 260—453 PH

6 Claims

1. A process for the manufacture of 4,4'-diphenylmethane diisocyanate and a mixture of diisocyanates and polyisocyanates which consists essentially of

- condensing aniline with formaldehyde in a molar ratio of from 2:1 to 6:1 in the presence of a strong aqueous mineral acid at temperatures of 10° to 90° C at the start of the reaction rising to temperatures ranging from 80° to 150° C as condensation proceeds;
- neutralizing the reaction mixture on completion of condensation;
- distilling off from the mixture obtained after neutralization all or a portion of the diamines;



- recovering substantially pure 4,4'-diaminodiphenylmethane from the mixture of separated diamines by crystallization from a solvent;
- combining the distillation residue from step (c) and the mother liquor from step (d);
- reacting the substantially pure 4,4'-diaminodiphenylmethane with phosgene to form 4,4'-diphenylmethane diisocyanate; and
- reacting the mixture from step (e) containing diamines and polyamines with phosgene to form a mixture of diisocyanates and polyisocyanates.

4,014,915

OXIME CARBONATES

Masumi Itoh, Takatsuki, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 26, 1975, Ser. No. 607,758

Claims priority, application United Kingdom, Apr. 22, 1975, 16707/75

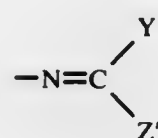
Int. Cl.<sup>2</sup> C07C 69/96

U.S. Cl. 260—463

24 Claims

1. Carbonic acid esters of the formula:

$R'_1OCOOR'_2$   
 ps wherein  $R'_1$  is lower alkyl which may have substituents selected from the group consisting of halogen, lower alkoxy and aryloxy, or ar(lower) alkyl which may have substituents selected from the group consisting of lower alkoxy, halogen, nitro and cyano, and  $R'_2$  is a group represented by the formula:



wherein  $Y'$  is selected from the group consisting of cyano, nitro, carbamoyl, esterified carboxy, lower alkanoyl, aroyl, di-substituted carbamoyl, or aryl which may have substituents selected from the group consisting of halogen, lower alkoxy, nitro, cyano and halo(lower)alkyl and  $Z'$  is aryl which may have substituents selected from the group consisting of halogen, lower alkoxy, nitro, cyano and halo(lower)alkyl; provided that when  $R'_1$  is lower alkyl,  $Y'$  is cyano, and  $Z'$  is aryl, the number of carbon atoms of lower alkyl for  $R'_1$  is 4 or 5.

4,014,916

**INTERMEDIATES IN THE PRODUCTION OF TRICYCLIC BENZODIAZEPINES**

Michael Edward Derieg, Caldwell; James Valentine Earley, Cedar Grove; Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

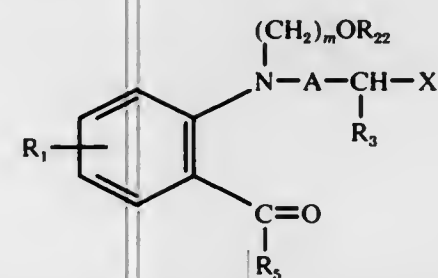
Division of Ser. No. 557,438, March 11, 1975, Pat. No. 3,965,151, which is a division of Ser. No. 45,928, June 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,068, April 6, 1970, Pat. No. 3,905,956, which is a continuation-in-part of Ser. No. 863,377, Oct. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 768,909, Oct. 18, 1968, abandoned. This application Apr. 12, 1976, Ser. No. 676,091

Int. Cl.<sup>2</sup> C07C 69/96

U.S. Cl. 260—463

1. Compounds of the formula

1 Claim



wherein  $R_1$  is hydrogen, nitro, trifluoromethyl, halogen, lower alkyl, lower alkyl mercapto or lower alkoxy;  $R_3$  is the group  $-\text{COO}-$  lower alkyl;  $R_5$  is phenyl and phenyl substituted with a member selected from the group consisting of halogen, nitro, trifluoromethyl and lower alkyl;  $R_{22}$  is carbobenzyloxy;  $m$  is an integer from 1–7;  $A$  is selected from the group consisting of  $-\text{CH}_2-$  and



and  $X'$  is chlorine, bromine or iodine.

4,014,917

AMINOMETHYLENEMALONITRILES

Peter Laurence Carter, Bishop's Stortford, England, assignor to Fisons Limited, England

Filed Oct. 3, 1973, Ser. No. 403,076

Claims priority, application United Kingdom, Oct. 6, 1972, 46180/72

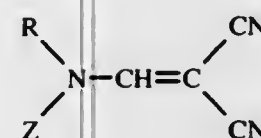
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C07C 121/78

U.S. Cl. 260—465 E

8 Claims

1. An aminomethylenemalononitrile compound of the formula



(I)

in which  $R$  represents phenyl; naphthyl; phenyl or naphthyl substituted by one or more substituents selected from halogen, alkyl of 1–4 carbon atoms and alkoxy of 1–4 carbon atoms; phenylalkyl; or phenylalkyl whose phenyl group is substituted by one or more substituents selected from halogen and alkyl of 1–4 carbon atoms; and  $Z$  represents trichloromethylthio or dichlorofluoromethylthio.

4,014,918

**PROCESS FOR THE PREPARATION OF CYCLOPROPANE DERIVATIVES AND COMPOUNDS PRODUCED THEREIN**

Jacques Martel, Bondy, France, assignor to Roussel-UCLAF, Paris, France

Continuation of Ser. No. 237,892, March 24, 1972, abandoned, which is a continuation of Ser. No. 841,132, July 11, 1969, abandoned. This application Sept. 23, 1975, Ser. No. 616,048

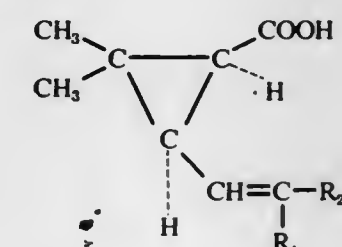
Claims priority, application France, July 12, 1968, 68.159066

Int. Cl.<sup>2</sup> C07C 51/00

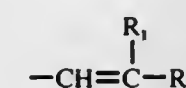
U.S. Cl. 260—468 H

4 Claims

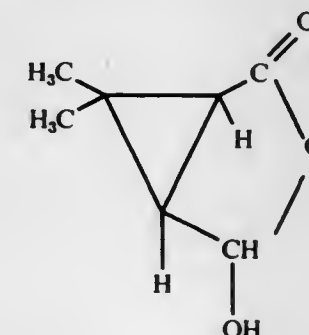
1. A process for the preparation of racemic or optically active cyclopropane carboxylic acids of the formula



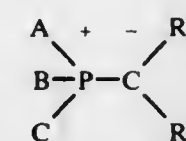
wherein the  $\text{COOH}$  on the 1-carbon and the



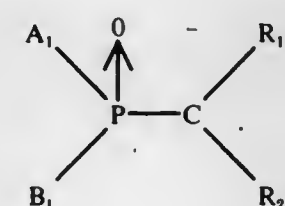
on the two carbon are cis relative to each other and  $R_1$  and  $R_2$  are selected from the group consisting of ethyl and methyl or  $R_1$  is methyl and  $R_2$  is methoxy carbonyl or  $R_1$  and  $R_2$  together with the carbon atom to which they are attached form a cyclopentyl comprising submitting the internal hemiacetal of racemic or optically active cis 3,3-dimethyl-2-formyl-cyclopropane-1-carboxylic acid of the formula



in the presence of an organic solvent to the action of a phosphorus reagent selected from the group consisting of an ylide of the formula



in the presence of an alkali metal hydride and a carbanion of the formula





wherein A, B, and C are selected from the group consisting of phenyl, dialkylamino and dialkylamino diaryl, A<sub>1</sub> and B<sub>1</sub> are selected from the group consisting of phenyl, dialkylamino and alkoxy and R<sub>1</sub> and R<sub>2</sub> have the above meaning in the presence of an alkali metal amide or alkali metal alcoholate to form the corresponding racemic or optically active cyclopropane carboxylic acid.

4,014,919

# PROCESS FOR PREPARING METHYL JASMONATE AND RELATED COMPOUNDS

Francis Johnson, Setauket, N.Y.; Kenneth G. Paul, West Newton, Mass., and Duccio Favara, Como, Italy, assignors to The Dow Chemical Company, Midland, Mich.

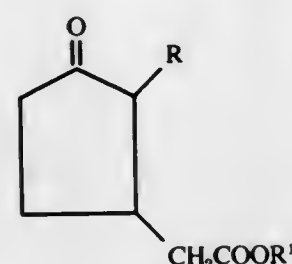
Filed Mar. 1, 1974, Ser. No. 447,101

Int. Cl.<sup>2</sup> C07C 69/74, 67/30

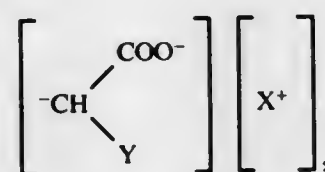
U.S. Cl. 260—468 K

3 Claims

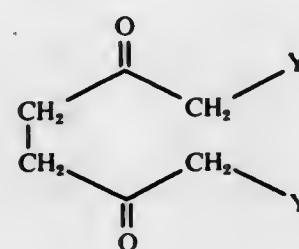
1. A process for preparing a 3-oxo-cyclopentaneacetic acid derivative represented by following formula I



wherein R represents an alkenyl radical of 4 to 6 carbon atoms wherein the unsaturation is in the 2-, 3- or 4-position and R<sup>1</sup> is methyl or ethyl, which comprises the following steps: (A) mixing at a temperature between about -30° and +30° C in an inert organic solvent substantially one molar proportion of a succinyl halide with substantially four molar proportions of a salt represented by the formula

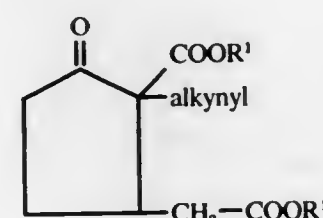


wherein Y represents a COOR<sup>1</sup> group wherein R<sup>1</sup> represents methyl or ethyl, X<sup>+</sup> represents an alkali metal cation or a monovalent magnesium cation selected from the group MgBR<sup>+</sup>, MgCl<sup>+</sup> and MgI<sup>+</sup>, pouring the reaction mixture into a vigorously stirred mixture of an excess of concentrated mineral acid, ice and water, separating the organic layer, washing it free of excess mineral acid with aqueous concentrated alkali metal bicarbonate and drying and recovering the said reaction product, a diketone compound represented by following formula II



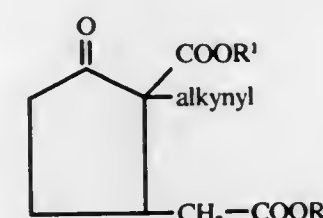
wherein Y has the meaning previously given; (B) mixing compound II in aqueous alkaline medium at about 0° to 30° C for about 0.5 to 2 hours to cyclize compound II to form the corresponding 3-oxo-1-cyclopenteneacetic acid derivative; (C) reducing the cyclopentene ring of the last-named compound with hydrogen in the presence of a noble metal or a noble metal oxide as the catalyst to give the corresponding cyclo-

pentane derivative; (D) alkylating the so-obtained 3-oxo-cyclopentaneacetic acid derivative at position 2 with a compound of the formula alkynyl-X wherein "alkynyl" represents a C<sub>4</sub>-C<sub>6</sub> aliphatic chain containing a triple bond in the 2-, 3- or 4- position and X represents a leaving group selected from Cl, Br, ONO<sub>2</sub>, tosylate and mesylate, to give a compound of following formula V



wherein R<sup>1</sup> and alkynyl have the meaning previously given; (E) eliminating the COOR<sup>1</sup> group at position 2 of the cyclopentane ring; and (F) selectively hydrogenating the alkynyl group to a cis-olefin group by means of hydrogen gas at substantially room temperature and substantially atmospheric pressure in the presence of a palladium catalyst and recovering the product.

2. A compound represented by the formula



wherein R<sup>1</sup> represents methyl or ethyl and alkynyl represents a C<sub>4</sub> to C<sub>6</sub> aliphatic radical containing a triple bond in the 2-, 3- or 4- position.

4,014,920

# N-CINNAMYL CARBAMIC ACID ESTERS

Knut Alfred Jaeggi, Basel; Franz Ostermayer, Riehen, and Herbert Schroter, Fullinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 4, 1973, Ser. No. 367,092

Claims priority, application Switzerland, June 8, 1972, 8505/72; Apr. 18, 1973, 5634/73

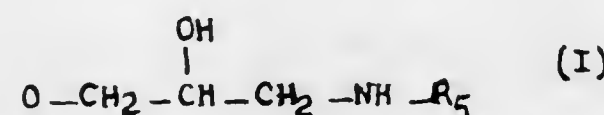
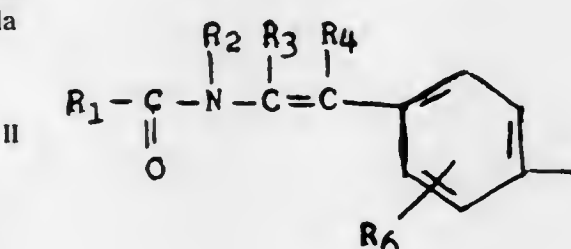
Disclosure was also published under second Trial Voluntary Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C07C 125/06

U.S. Cl. 260—471 C

13 Claims

1. Amines of the formula I



wherein R<sub>1</sub> is lower alkoxy, R<sub>2</sub> is hydrogen or lower alkyl, R<sub>3</sub> is hydrogen, lower alkyl, carboxyl or lower alkoxy-carbonyl, R<sub>4</sub>

is hydrogen or lower alkyl, R<sub>5</sub> is lower alkyl, phenyl optionally substituted by lower alkyl, lower alkoxy, halo or trifluoromethyl, carboxy-lower alkyl esterified with an aliphatic alcohol, carbamoyl-lower alkyl, N-mono-lower alkyl carbamoyl-lower alkyl, or N,N-di-lower alkyl carbamoyl-lower alkyl, and R<sub>6</sub> denotes halogen, trifluoromethyl, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, nitro, lower alkoxy-methyl, carbamoyl, N-lower alkylcarbamoyl, lower alkenyloxy or hydrogen, and therapeutically acceptable acid addition salts thereof.

4,014,921

# O-ACETOXY BENZOATE ESTER OF 2(p-ACETAMIDO-PHENYLOXY)ETHYL ALCOHOL

Carlos Sunkel Letelier, and Fernando Cillero Grafalia, both of Madrid, Spain, assignors to Alter, S.A., Spain

Filed Aug. 15, 1975, Ser. No. 605,090

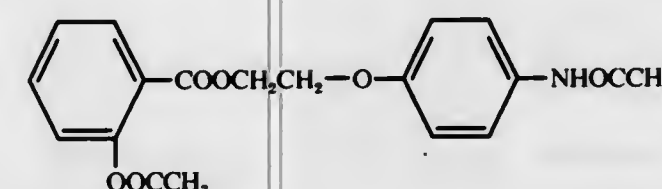
Claims priority, application Spain, July 11, 1975, 439340

Int. Cl.<sup>2</sup> C07C 69/66

U.S. Cl. 260—473 R

1 Claim

1. O-acetoxy benzoate ester of 2(p-acetamido-phenyloxy)-ethyl alcohol of the formula



4,014,922

# ORGANIC COMPOSITIONS

Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zeecon Corporation, Palo Alto, Calif.

Division of Ser. No. 489,279, July 17, 1974, Pat. No.

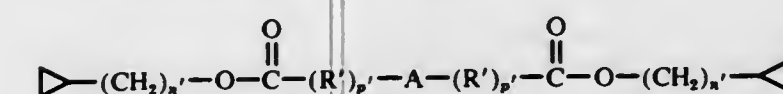
3,948,961. This application July 25, 1975, Ser. No. 599,207

Int. Cl.<sup>2</sup> C07C 69/76, 69/82

U.S. Cl. 260—475 R

5 Claims

1. A compound selected from the formula:



wherein,

n' is the odd integer 3, 5, 7 or 9;

R' is alkylene of one to six carbon atoms or alkenylene of two to six carbon atoms;

p' is zero or one; and

A is arylene of six to 20 carbon atoms, optionally substituted by one or two groups selected from alkyl of one to 20 carbon atoms, halogen or nitro.

4,014,923

# N-CARBOXYLATED N-METHYLCARBAMIC ACID ARYL ESTERS

Engelbert Kühle, Bergisch-Gladbach; Peter Siegle, Cologne; Wolfgang Behrenz, Cologne, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 265,843, June 23, 1972, Pat. No. 3,857,860. This application June 27, 1974, Ser. No. 483,746

Claims priority, application Germany, July 2, 1971, 2132936

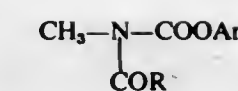
Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07C 125/06

U.S. Cl. 260—479 C

4 Claims

1. An N-carboxylated N-methylcarbamic acid aryl ester of the formula



in which

Ar is phenyl, naphthyl, or phenyl or naphthyl substituted one or more times by a lower alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkynoxy, alkylmercapto, alkenylmercapto or alkynylmercapto each of up to 4 carbon atoms, or by dimethylamino, trifluoromethyl, chlorine, bromine, fluorine nitro, cyano, cycloalkyl of 5 or 6 ring carbon atoms substituted with lower alkyl of 1 to 4 carbon atoms, or by N,N-dimethyl- or N,N-diethylformamidino, or by a lower dialkoxymethyl radical; and

R is optionally substituted lower alkoxy, alkenoxy, alkynoxy or alkylmercapto each with 1 to 4 carbon atoms, or anilino, chloranilino, nitroanilino, methoxy anilino, or -NR<sub>2</sub> wherein R' is individually selected from the group consisting of hydrogen and alkyl, alkenyl, cycloalkyl or cycloalkenyl each of up to 12 carbon atoms, phenylmercapto or phenylmercapto substituted by lower alkyl of 1 to 4 carbon atoms or chlorine, or OAr.

4,014,924

# ALKYL-4-ALKYL-N-ALKOXYCARBONYL-1-THIOALLOPHANIMIDATE

Julius J. Fuchs, Wilmington, and Kang Lin, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 325,357, Jan. 26, 1973, Pat. No.

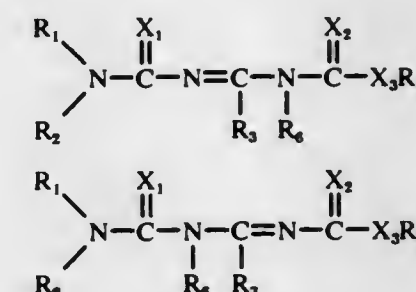
3,959,331, which is a continuation-in-part of Ser. No. 181,201, Sept. 16, 1971, abandoned. This application Feb. 27, 1976, Ser. No. 662,002

Int. Cl.<sup>2</sup> C07C 127/00, 155/08

U.S. Cl. 260—481 C

6 Claims

1. A compound of the formula



where

X<sub>1</sub>, X<sub>2</sub> and X<sub>3</sub> are oxygen;

R<sub>1</sub> is hydrogen;

R<sub>2</sub> is alkyl of 1 through 6 carbon atoms, cycloalkyl of 3 through 8 carbon atoms, cycloalkylalkyl of 4 through 7 carbon atoms, alkenyl of 3 through 4 carbon atoms or alkynyl of 3 through 4 carbons;

R<sub>3</sub> is SR<sub>4</sub> or OR<sub>4</sub>;

R<sub>4</sub> is methyl or ethyl;

R<sub>5</sub> is methyl or ethyl; and

R<sub>6</sub> is hydrogen or methyl.



4,014,925

## PROCESS FOR PREPARING METHYL ACRYLATE OR MIXTURES OF METHYL ACRYLATE AND ACRYLIC ACID

Natale Ferlazzo, Segrate (Milan); Gian Fausto Buzzi, Arona (Novara); Marcello Ghirga, Bresso (Milan), and Benedetto Calcagno, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

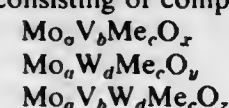
Filed Nov. 5, 1974, Ser. No. 521,016

Claims priority, application Italy, Nov. 28, 1973, 31746/73  
Int. Cl.<sup>2</sup> C07C 69/54

U.S. Cl. 260—486 R

16 Claims

1. A method for preparing methyl acrylate or a mixture of methyl acrylate and acrylic acid by contacting acrolein, methanol and oxygen with a catalyst, which comprises continuously delivering said methanol in part at the bottom of a bed of the fluidized catalyst as a gaseous mixture with a gaseous flow comprising said acrolein and oxygen and in part at least one intermediate point between the top and bottom of the fluidized catalyst bed, said catalyst being selected from the group consisting of compounds defined by the following formulae:



wherein Me is an element selected from the group consisting of chromium, manganese, iron, cobalt, nickel, copper, zinc, silver, cadmium, gold, mercury, sodium, barium, calcium, cerium, bismuth, thorium, uranium, lead, antimony, tin, phosphorus and boron; and wherein  $a, b, c, d, x, y, z$  are respectively:  $a$  from 6 to 12,  $b$  from 1 to 6,  $c$  from 0 to 5,  $d$  from 1 to 6,  $x$  from 20.5 to 58.5,  $y$  from 21 to 61.5 and  $z$  from 23.5 to 76.5.

4,014,926

## FLUORINATED SULFONIC ACIDS AND DERIVATIVES THEREOF

Robert Ernest Arthur Dear, Mount Kisco, and Eduard Karl Kleiner, New York, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

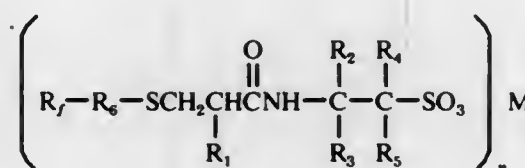
Filed Dec. 19, 1975, Ser. No. 642,271

Int. Cl.<sup>2</sup> C07C 143/08

U.S. Cl. 260—513 N

9 Claims

1. A compound of the formula



wherein

$\text{R}_7$  is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbons,  
 $\text{R}_1$  is hydrogen or lower alkyl,  
 $\text{R}_2, \text{R}_4$  and  $\text{R}_5$  are independently hydrogen or alkyl group of 1 to 12 carbons,  
 $\text{R}_3$  is hydrogen or alkyl of 1 to 12 carbons,  
 $\text{R}_6$  is a straight or branched chain alkylene of 1 to 12 carbons, and  
 $\text{M}$  is hydrogen, a monovalent alkali metal or an alkaline earth metal, and  
 $n$  is an integer corresponding to the valency of  $\text{M}$ .

4,014,927

## PROCESS FOR PRODUCTION OF UNSATURATED ACIDS FROM CORRESPONDING UNSATURATED ALDEHYDES

Koju Kadowaki, Ami, Japan, assignor to Mitsubishi Petrochemical Company Limited, Japan

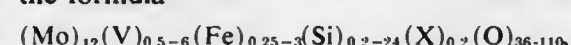
Filed Aug. 31, 1973, Ser. No. 393,469

Claims priority, application Japan, Sept. 7, 1972, 47-89921; Dec. 5, 1972, 47-121876; July 5, 1973, 48-75886  
Int. Cl.<sup>2</sup> C07C 51/32

U.S. Cl. 260—530 N

3 Claims

1. A process for the production of unsaturated acids by the vapor-phase catalytic oxidation of the corresponding unsaturated aldehyde selected from the group consisting of acrolein and methacrolein at a temperature of 200°–400° C. in the presence of a catalyst consisting essentially of molybdenum vanadium, iron silicon, element X and oxygen represented by the formula



wherein X is at least one element selected from the group consisting of Na, K and Rb, and has a specific surface of 0.1 m<sup>2</sup>/g to 8 m<sup>2</sup>/g, and the catalyst is prepared by drying a homogeneous aqueous solution or slurry mixture of the catalyst-raw materials by evaporation to dryness or spray drying and calcining the dried product thus obtained at a temperature of from 280° C to 450° C.

4,014,928

PROCESS FOR PURIFYING  $\alpha$ -AMINO ACIDS

Osamu Furuya; Koichi Wada, both of Tokyo; Yoshihiko Hosaki, Yokohama, and Nobutake Mihara, Kawasaki, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed July 31, 1975, Ser. No. 600,859

Claims priority, application Japan, Aug. 8, 1974, 49-90231  
Int. Cl.<sup>2</sup> C07C 99/12

U.S. Cl. 260—534 R

8 Claims

1. A process for purifying a synthesized  $\alpha$ -amino acid containing cyano impurities which comprises heating an aqueous solution of the  $\alpha$ -amino acid in the form of its alkali metal salt in the presence of an alkali metal hydroxide to decompose the cyano impurities present in the aqueous solution without decomposing the alkali metal salt of the  $\alpha$ -amino acid, wherein the heating temperature is 130° to 160° C., wherein alkali metal hydroxide is present in said aqueous solution in an amount sufficient to maintain a pH in said aqueous solution of at least 13.5, and wherein said synthesized  $\alpha$ -amino acid is produced by aminating a cyanohydrin with ammonia to form the corresponding  $\alpha$ -aminonitrile, converting the  $\alpha$ -aminonitrile to an alkali metal salt of the corresponding  $\alpha$ -amino acid by alkaline hydrolysis and finally neutralizing the salt with an acid to form the corresponding free  $\alpha$ -amino acid.

4,014,929

## ETHER CARBOXYLATE MONOHYDRATE

Norman Earl Stahlheber, Columbia, Ill., assignor to Monsanto Company, St. Louis, Mo.

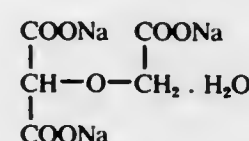
Filed Nov. 17, 1975, Ser. No. 632,347

Int. Cl.<sup>2</sup> C07C 59/23

U.S. Cl. 260—535 P

5 Claims

1. A compound represented by the formula:



and characterized by an X-ray diffraction pattern exhibiting strong diffraction lines corresponding to the approximate values of interplanar spacing  $d$ : 8.14 Å, 5.65 Å, 5.45 Å, 5.24 Å, 4.50 Å, 4.35 Å, 3.42 Å, 2.77 Å, 2.59 Å, and 2.38 Å.

4,014,930

## CARBOXY METHOXY MALONATE

William A. Feiler, Kirkwood, Mo., and Norman Earl Stahlheber, Columbia, Ill., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 468,713, May 10, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 638,793  
Int. Cl.<sup>2</sup> C07C 59/23

U.S. Cl. 260—535 P

2 Claims

1. A crystalline hydrate of trisodium carboxy methoxy malonate having a copper K $\alpha$  X-ray diffraction pattern characterized by strong diffraction lines at the approximate values of the angle  $2\theta$ : 20.10°, 8.00°, 14.30°, 30.37°, 16.20°, 5.80°, 37.00°, and 10.00°, said values of the angle  $2\theta$  corresponding, respectively, to the values of interplanar spacing  $d$ : 4.414 Å, 11.04 Å, 6.188 Å, 2.941 Å, 5.467 Å, 15.22 Å, 2.428 Å, and 8.838 Å.

4,014,931

PRODUCTION OF  $\beta$ -HALOALKYLAMINOSULFONYL HALIDES

Gerhard Hamprecht, Mannheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation-in-part of Ser. No. 431,702, Jan. 8, 1974, Pat. No. 3,919,308. This application Feb. 13, 1975, Ser. No. 549,658

Claims priority, application Germany, Feb. 22, 1974, 2408530

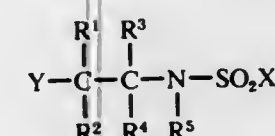
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> C07C 143/155, 143/21

U.S. Cl. 260—543 R

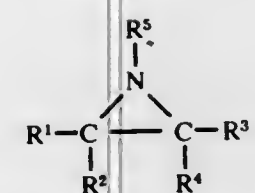
8 Claims

1. A process for the production of a  $\beta$ -haloalkylaminosulfonyl halide of the formula:

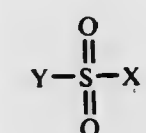


in which the individual radicals  $\text{R}^1, \text{R}^2, \text{R}^3$  and  $\text{R}^4$  may be identical or different and each is hydrogen, or an aliphatic, araliphatic or aromatic radical, and  $\text{R}^1$  and  $\text{R}^3$  and/or  $\text{R}^2$  and  $\text{R}^4$  together with the two adjacent carbon atoms may form an alicyclic ring, X and Y may be identical or different and each is a chlorine atom or a fluorine atom, and  $\text{R}^5$  is an aliphatic radical, which comprises:

reacting an aziridine of the formula



in which  $\text{R}^1, \text{R}^2, \text{R}^3, \text{R}^4$  and  $\text{R}^5$  have the above meanings, with a sulfonyl halide of the formula



in which X and Y have the above meanings.

4,014,932

## ALKYLTHIO BENZOIC ACID PHENYL-HYDRAZIDES

Girts Kaugars, Cooper Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

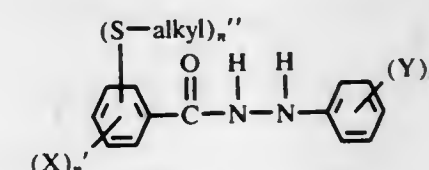
Division of Ser. No. 530,085, Dec. 6, 1974, Pat. No. 3,931,318, which is a division of Ser. No. 54,622, July 13, 1970, Pat. No. 3,930,020. This application Aug. 4, 1975, Ser. No. 601,502

Int. Cl.<sup>2</sup> C07C 109/10

U.S. Cl. 260—558 H

12 Claims

1. The chemical compounds ar or ar' (alkylthio) benzoic acid 2-phenylhydrazides having the structural formula:



wherein "alkyl" is of from 1 to 6 carbon atoms, inclusive; X is halogen, alkyl of from 1 to 6 carbon atoms, inclusive, alkylthio of from 1 to 6 carbon atoms, inclusive,  $\alpha$ -F<sub>n</sub>alkyl of from 1 to 3 carbon atoms, inclusive, wherein  $n$  is the integer 2 or 3, and nitro; Y is alkyl of from 1 to 6 carbon atoms, inclusive, halogen, alkylthio of from 1 to 6 carbon atoms, inclusive,  $\alpha$ -F<sub>n</sub>alkyl of from 1 to 3 carbon atoms, inclusive, and nitro;  $n'$  is an integer 0 to 3, inclusive;  $n''$  is 1 except when Y is alkylthio, when it can be zero; and  $m$  is an integer from 0 to 3, inclusive, the sum of  $n' + n'' + m$  being not more than 6, the sum of carbon atoms in the alkyl substituents being not more than 15, there being no more than one nitro group in the molecule, and no more than two  $\alpha$ -F<sub>n</sub>alkyl groups on any benzene ring or three total.

4,014,933

## PRODUCTION OF AMINES FROM ALCOHOLS

Guenther Boettger; Hubert Corr, both of Ludwigshafen; Herwig Hoffmann; Herbert Toussaint, both of Frankenthal, and Siegfried Winderl, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 81,144, Oct. 15, 1970, abandoned. This application Aug. 27, 1973, Ser. No. 391,828

Claims priority, application Germany, Oct. 23, 1969, 1953263

Disclosure was also published under second Trial Voluntary Protest Program on Apr. 6, 1976

Int. Cl.<sup>2</sup> C07C 85/02

U.S. Cl. 260—563 R

6 Claims

1. In a process for the production of an amine by reacting an alkanol having one to eighteen carbon atoms; or a cycloalkanol having five to twelve carbon atoms; or an alkanolamine selected from the group consisting of ethanolamine, propanolamine, isopropanolamine, and hexanolamine; or a polyalcohol selected from the group consisting of diethanolamine, diisopropanolamine, ethylene glycol, propylene glycol, butanediol, pentanediol, hexanediol, 4,4'-bishydroxycyclohexyl-propane-(2,2); or a glycol ether selected from the group consisting of methyl glycol, ethyl glycol and butyl glycol; or a polyalkylene glycol ether selected from the group consisting of polyethylene glycol ether, polypropylene glycol ether, and polybutylene glycol ether, with ammonia or a primary or a secondary amine, the ammonia or amine being present in an excess of from 5 to 50 moles over the stoichiometric amount of alcohol in the presence of hydrogen and a cobalt, nickel and copper-containing aluminum oxide or silicon dioxide supported catalyst at a temperature of from 100° to 200° C and at a pressure of from 10 to 250 atmospheres, the improvement which consists essentially of using a supported catalyst containing, based on the metal content of the catalyst, from 70 to 95% by weight of a mixture of cobalt and nickel and from 5 to 30% by weight of copper, the ratio by weight of cobalt to nickel being from 4:1 to 1:4, the metal content of the catalyst being from 5 to 80% by weight, based on the whole catalyst.



4,014,934

## SUBSTITUTED 4'-HYDROXYPHENYL GUANIDINES AND METHODS OF USING THE SAME

John Lawrence Hughes, and Robert Chung-Huan Liu, both of Kankakee, Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

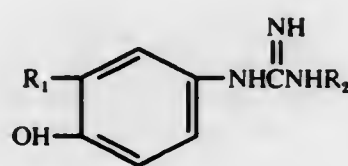
Continuation-in-part of Ser. No. 460,815, April 15, 1974, Pat. No. 3,908,013, which is a division of Ser. No. 73,244, Sept. 17, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,925

Int. Cl.<sup>2</sup> C07C 129/08

U.S. Cl. 260—565

2 Claims

1. Aromatic guanidine compounds having the formula

wherein: R<sub>1</sub> is hydroxyl; and R<sub>2</sub> is hydrogen or methyl.

4,014,935

## CARBODIIMIDES

Arthur Ibbotson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 25, 1976, Ser. No. 670,155

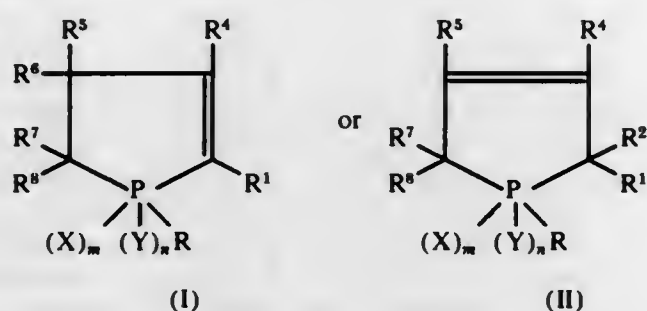
Claims priority, application United Kingdom, Apr. 3, 1975, 13656/75; Apr. 3, 1975, 13657/75; Apr. 3, 1975, 13658/75; Apr. 3, 1975, 13659/75; Apr. 16, 1975, 15649/75; Oct. 30, 1975, 44965/75

Int. Cl.<sup>2</sup> C07C 119/00

U.S. Cl. 260—566 R

19 Claims

1. A process for the conversion of from 3% to 35% of the isocyanate groups in a refined aromatic polyisocyanate having two or more isocyanate groups, into carbodiimide groups which comprises heating said isocyanate with a catalyst of the formula:

wherein R is phenyl, benzyl or ethyl, R<sup>1</sup>, R<sup>2</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup> and R<sup>8</sup> are hydrogen, R<sup>4</sup> is methyl, X and Y may be chlorine or bromine or X and Y taken together may represent the divalent atoms =O or =S or the divalent radical =N aryl, m and n represent 0 or 1 and are the same in any one compound, followed by deactivation of the catalyst by adsorption on a substrate or by addition of one or more of the halides of hydrogen, phosphorus or tin or an oxyhalide of phosphorus or sulphur.

4,014,936

## ANTIDEPRESSANT

1,1A,6,10B-TETRAHYDRODIBENZO[A,E]-CYCLO-PROPA-[C]-CYCLOHEPTEN-6-SUBSTITUTED OXIMES Roy Teruyuki Uyeda, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

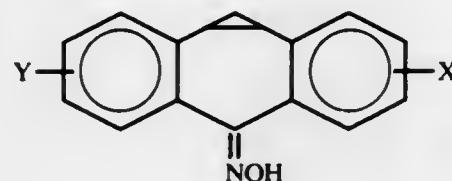
Division of Ser. No. 616,483, Sept. 26, 1975, Pat. No. 3,960,956, which is a continuation-in-part of Ser. No. 525,877, Nov. 21, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,277

Int. Cl.<sup>2</sup> C07C 131/08

U.S. Cl. 260—566 A

2 Claims

1. A compound of the formula



where

X or Y = H, F, Cl, Br, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, CF<sub>3</sub>, CH<sub>3</sub>S, CH<sub>3</sub>SO<sub>2</sub>, SO<sub>2</sub>N(CH<sub>3</sub>)<sub>2</sub>, provided that at least one of X or Y is H.

4,014,937

## 3,4-AND 3,5-DIALKOXYPHENETHYLAMINES

Kenneth Richardson, Canterbury, England, assignor to Pfizer Inc., New York, N.Y.

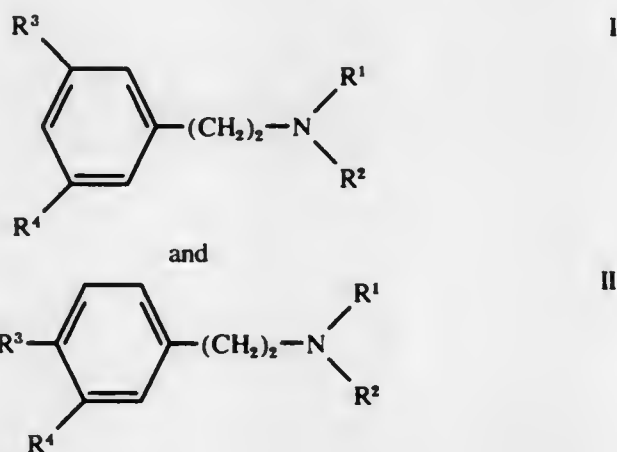
Division of Ser. No. 500,377, Aug. 26, 1974, Pat. No. 3,960,958. This application Mar. 11, 1976, Ser. No. 666,079

Int. Cl.<sup>2</sup> C07C 87/28

U.S. Cl. 260—570.8 R

7 Claims

1. A compound selected from those of the formulae:



and the pharmaceutically acceptable acid addition salts thereof, wherein

R<sup>1</sup> is hydrogen, methyl or hydroxyalkyl of from 2 to 6 carbon atoms;R<sup>2</sup> is hydrogen, alkyl of from 1 to 6 carbon atoms, or hydroxyalkyl of from 2 to 6 carbon atoms; andR<sup>3</sup> and R<sup>4</sup> are each alkoxy of from 12 to 20 carbon atoms.

4,014,938

4-TRICYCLO[5,2,1,0<sup>2,6</sup>]DECYL-8-BUTANAL

Theodor Leidig, Holzminden, Germany, assignor to Haarmann &amp; Reimer GmbH, Holzminden, Germany

Filed Nov. 18, 1974, Ser. No. 524,849

Claims priority, application Germany, Nov. 30, 1973, 2359659

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.<sup>2</sup> C07C 47/30

U.S. Cl. 260—598

1 Claim

1. 4-Tricyclo [5,2,1,0<sup>2,6</sup>] decyl-8-butanal.

4,014,939

## PROCESS FOR PRODUCING FORMALDEHYDE

Minoru Osugi, and Takako Endo, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed June 5, 1975, Ser. No. 584,366

Claims priority, application Japan, June 7, 1974, 49-63984; Dec. 26, 1974, 50-148390

Int. Cl.<sup>2</sup> C07C 45/16, 47/04

U.S. Cl. 260—603 R

6 Claims

1. A process for the production of formaldehyde which comprises dehydrogenating methanol in the presence of a catalytically effective amount of a catalyst consisting of copper, zinc and sulfur as catalyst components at a temperature of 500° to 750° C. wherein the atomic ratio of said catalyst components is 1:0.001-0.1:0.001-0.3 for Cu:Zn:S.

4,014,940

## PROCESS FOR PREPARING m-PHENOXYBENZYLALCOHOL AND SIDE-CHAIN HALOGENATED m-PHENOXYTOLUENE

Yoshitaka Ume, Toyonaka; Takashi Matsuo; Nobushige Itaya, both of Nishinomiya, and Nobuo Ohno, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 18, 1974, Ser. No. 434,734

Claims priority, application Japan, Jan. 19, 1973, 48-9022; Jan. 25, 1973, 48-10859

Int. Cl.<sup>2</sup> C07C 41/00

U.S. Cl. 260—612 R

9 Claims

1. A process for preparing m-phenoxybenzyl, m-phenoxybenzal or a mixture thereof which comprises halogenating m-phenoxytoluene with a halogen in the presence of a phosphorus halide in the high temperature region above 220° C.

4,014,941

## METHOD OF PRODUCING α,β-UNSATURATED ETHER

Kazuaki Tanaka; Yasuto Ishida; Kimiyoshi Yanagi, all of Yokkaichi; Noriaki Kassai, Kameyama, and Toshiyuki Tanaka, Yokkaichi, all of Japan, assignors to Kyowa Yuka Co., Ltd., Japan

Continuation of Ser. No. 203,897, Dec. 1, 1971, abandoned.

This application Feb. 28, 1974, Ser. No. 446,764

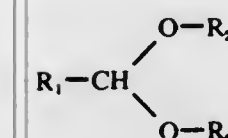
Claims priority, application Japan, Dec. 11, 1970, 45-109337

Int. Cl.<sup>2</sup> C07C 41/00

U.S. Cl. 260—614 R

13 Claims

1. A method for producing an α,β-ethylenically unsaturated ether comprising decomposing an acetal having the formula:

wherein R<sub>1</sub> is an alkyl group having 1 to 3 carbon atoms and R<sub>2</sub> is an alkyl group having 1 to 4 carbon atoms, at a temperature from 200° to 350° C. in the presence of a catalyst selected from hydrous or anhydrous Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>, Ca(H<sub>2</sub>PO<sub>4</sub>)<sub>2</sub> and CaHPO<sub>4</sub> or calcined products thereof either alone or supported on a carrier selected from alumina, asbestos, pumice and unglazed ceramics to produce a reaction product comprising the corresponding α,β-ethylenically unsaturated ether, 0.001 to 1 mol of said acetal being contacted with each gram of catalyst per hour, said catalyst having a size of 2 to 100 mesh.

4,014,942

## NOVEL ACETAL

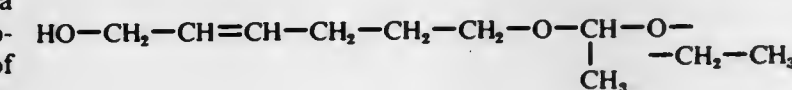
Jeffery N. Labovitz, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zeecon Corporation, Palo Alto, Calif. Division of Ser. No. 602,153, Aug. 6, 1975. This application Mar. 29, 1976, Ser. No. 671,911

Int. Cl.<sup>2</sup> C07C 43/30

U.S. Cl. 260—615 A

1 Claim

1. The trans compound of the formula:



4,014,943

## NITROALKANE BASED HINDERED PHENOL COMPOUNDS AND PREPARATION THEREOF

Harry Douchis, Lawrenceville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

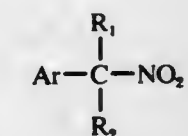
Continuation-in-part of Ser. No. 475,318, May 31, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,836

Int. Cl.<sup>2</sup> C07C 77/00, 79/16

U.S. Cl. 260—619 B

10 Claims

1. A compound selected from the group having the formula

wherein Ar represents a 3,5-di-tertiarybutyl-4-hydroxybenzyl radical and R<sub>1</sub> and R<sub>2</sub> each may represent hydrogen, a lower C<sub>1</sub>-C<sub>4</sub> alkyl radical or an Ar radical.

4,014,944

## PROCESS AND PRODUCT PRODUCED BY SAID PROCESS

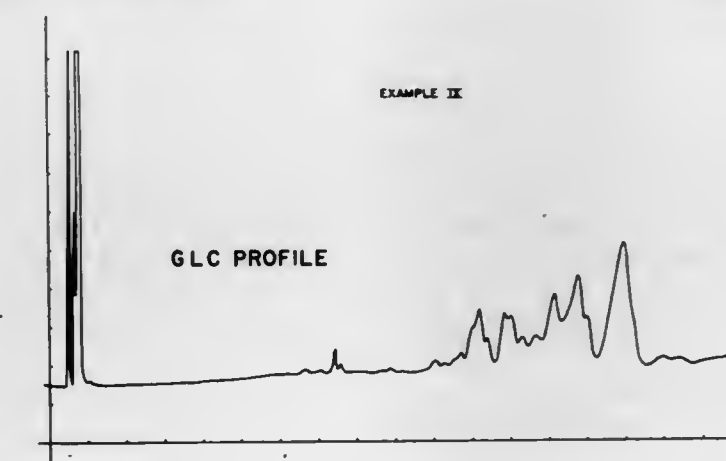
John B. Hall, Rumson, and Wilhelmus Johannes Wieggers, Red Bank, both of N.J., assignors to International Flavors &amp; Fragrances Inc., New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,818

Int. Cl.<sup>2</sup> C07C 35/00

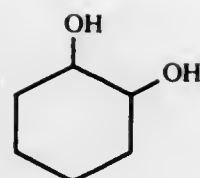
U.S. Cl. 260—631.5

2 Claims

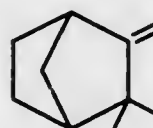


1. The product produced by the process which comprises reacting catechol having the structure:





with camphene having the structure:



in the presence of a Friedel Crafts Catalyst to form a catechol-camphene alkylation product, recovering said alkylation product at a temperature in the range of from 186° up to 236° C and at a pressure of from 2.3 up to 3.8 mm Hg, hydrogenating the said catechol-camphene alkylation product in the presence of a hydrogenation catalyst to form a hydrogenated catechol-camphene addition product, and recovering the said hydrogenated catechol-camphene addition product at a temperature in the range of from 150° C up to 172° C and a pressure of about 2.5 mm Hg, the Friedel Crafts Catalyst being selected from the group consisting of boron trifluoride etherate, sulfuric acid, acid clay, aluminum trichloride, boron trifluoride, boron trifluoride-acetic acid, boron trifluoride-phosphoric acid, zinc chloride, aluminosilicate molecular sieve, and ferric chloride, the reaction between catechol and camphene being carried out at a temperature in the range of from about 120° up to 175° C and the mole ratio of catechol to camphene being in the range of from about 0.5:1 up to about 4:1, the hydrogenation reaction being carried out within a temperature range of 100° up to 300° C, the latter portion of the reaction time being at from 200° up to 300° C.

4,014,945

#### PROCESS FOR THE PREPARATION OF ETHYLENE GLYCOL

Wilford J. Zimmerschied; David A. Palmer, both of Naperville, Ill., and Ralph J. Bertolacini, Chesterton, Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 28, 1975, Ser. No. 608,553

Int. Cl.<sup>2</sup> C07C 29/00

U.S. Cl. 260—635 E

12 Claims

1. A process for production of ethylene glycol which comprises contacting at reaction conditions a mixture of ethylene oxide and water with a catalyst essentially consisting of aluminum phosphate and containing from about 0.05 to about 10 percent by weight of copper based on aluminum phosphate which catalyst has been calcined at a temperature of less than 900° F. to effect the production of said glycol.

4,014,946

#### SYNTHESIS OF 1-BROMONON-4-EN-6-YNE

Jeffery N. Labovitz, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zeecon Corporation, Palo Alto, Calif.

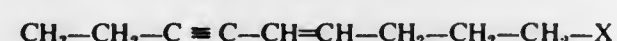
Division of Ser. No. 526,496, Nov. 25, 1974, Pat. No. 3,954,818. This application Mar. 26, 1976, Ser. No. 670,774

Int. Cl.<sup>2</sup> C07C 21/00

U.S. Cl. 260—654 R

2 Claims

1. A compound of the formula:



wherein X is bromo, iodo or chloro.

4,014,947

#### METHOD OF PRODUCING VINYL CHLORIDE

Nikolai Lvovich Volodin, Revoljutsionnaya ulitsa, 7, kv. 12, Sterlitamak; Lev Solomonovich Polak, ulitsa Obrucheva, 18, kv. 22, Moscow; Petr Nikolaevich Endjuskun, ulitsa Druzhby, 68, kv. 14, Sterlitamak; Rafail Izrailevich Levenzon, ulitsa Krasikova, 17, kv. 39; Samuil Markovich Krugly, ulitsa Khlobystova, 6, kv. 14, both of Moscow, and Viktor Trofimovich Dyatlov, ulitsa Bljukhera, 2, kv. 78, Sterlitamak, all of U.S.S.R.

Filed May 27, 1970, Ser. No. 40,933

Claims priority, application U.S.S.R., June 3, 1969, 1334597; June 3, 1969, 1334593; June 3, 1969, 1334594

Int. Cl.<sup>2</sup> C07C 21/02

U.S. Cl. 260—656 R

1 Claim

1. A method of producing vinyl chloride, comprising forming a plasma jet of gases consisting essentially of (A) a member selected from the group consisting of hydrogen and a mixture of hydrogen and methane, and (B) a plasma-forming gas selected from the group consisting of chlorine, HCl gas and a mixture of chlorine and HCl gas; pyrolyzing gaseous and liquid hydrocarbons in said plasma jet of gases to form a pyrolysis gas of acetylene, ethylene, HCl gas and higher unsaturated hydrocarbons, the plasma-forming gas being added in such an amount that the content of the HCl gas in the pyrolysis gas is equal to the content of the acetylene in said pyrolysis gas; quenching said pyrolysis gas with liquid hydrocarbons; removing said higher unsaturated hydrocarbons containing at least 3 carbon atoms from said pyrolysis gas; reacting the acetylene with HCl gas to form vinyl chloride; separating the vinyl chloride; reacting the ethylene with chlorine to form dichloroethane; pyrolyzing the dichloroethane to form vinyl chloride and HCl gas; separating said vinyl chloride from said HCl gas; and recycling said HCl gas to the stage of forming said plasma jet.

4,014,949

#### SEPARATION OF CYCLIC COMPOUNDS WITH MOLECULAR SIEVE ADSORBENT

John A. Hedge, Wilmington, Del., assignor to Sun Ventures, Inc., St. Davids, Pa.

Division of Ser. No. 263,372, June 6, 1962, Pat. No. 3,840,610, which is a continuation-in-part of Ser. No. 7,273, Jan. 30, 1970, Pat. No. 3,668,267; and a continuation-in-part of Ser. No. 207,870, Dec. 14, 1971, and a continuation-in-part of Ser. No. 256,863, May 25, 1972, Pat. No. 3,772,399. This application Dec. 19, 1973, Ser. No. 426,274

The portion of the term of this patent subsequent to June 6, 1989, has been disclaimed.

Disclosure was also published under second Trial Voluntary Protest Program on Jan. 20, 1976

Int. Cl.<sup>2</sup> C07C 7/13

U.S. Cl. 260—674 SA

5 Claims

1. A process for separating two structurally similar cyclic hydrocarbons selected from the group consisting of benzene, toluene and xylenes, said process comprising:

A. contacting a fluid feed mixture comprising said cyclic hydrocarbons with a solid adsorbent comprising a partially dehydrated, substantially crystalline aluminosilicate sodium Y zeolite having a critical pore diameter greater than about 6 Å, the ratio Al/Si of the aluminosilicate framework of the zeolite being in the range of 0.65–0.2, the zeolite having been partially dehydrated to a water content of 6–20 weight percent exposure to a temperature in the range of 80°–300°C., whereby there is obtained a rich adsorbent containing an adsorbate which is richer in one said cyclic hydrocarbon than was said fluid feed mixture; and a raffinate product which contains less of the one said cyclic hydrocarbon than did said fluid feed mixture;

B. separating said raffinate product from said rich adsorbent and,

C. removing the one said cyclic hydrocarbon from said rich adsorbent.

4,014,950

#### PROCESS FOR THE PURIFICATION OF LIQUID SORBENTS COMPRISING BIMETALLIC SALT COMPLEXES

Donald A. Keyworth, Houston, and Jerome R. Sudduth, Pasadena, both of Tex., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

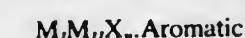
Filed July 2, 1975, Ser. No. 592,564

Int. Cl.<sup>2</sup> C07C 11/02

U.S. Cl. 260—677 A

7 Claims

1. In the process for the separation of olefins having 2 to 4 carbon atoms from a gas feedstream wherein (a) the feedstream is contacted with a liquid sorbent that is a solution in an aromatic hydrocarbon or halogenated aromatic hydrocarbon of a bimetallic salt complex having the formula



wherein  $M_I$  is a Group I-B metal,  $M_{II}$  is a Group III-A metal, X is halogen, n is the sum of the valences of  $M_I$  and  $M_{II}$ , and Aromatic is a monocyclic aromatic hydrocarbon or halogenated aromatic hydrocarbon having 6 to 12 carbon atoms, thereby forming a reaction mixture that comprises a solution of a complex of the olefin and the bimetallic salt complex in the liquid sorbent, (b) the reaction mixture is separated from the feedstream, (c) the olefin is separated from the liquid sorbent in the reaction mixture, and (d) the liquid sorbent is recycled, the improvement that comprises removing from the liquid sorbent impurities selected from the group consisting of polyalkylated aromatic compounds, olefin oligomers, and mixtures thereof by contacting the liquid sorbent containing impurities with a sorbent-immiscible organic solvent that is a paraffinic hydrocarbon having 5 to 14 carbon atoms in the amount of from 0.1 part to 10 parts by volume of the sorbent-

4,014,951

#### PROCESS FOR THE PREPARATION OF POLY-UNSATURATED HYDROCARBONS

Ferdinand Näf, Geneva; Günther Ohloff, Bernex-Geneva, and Albert Eschenmoser, Kusnacht, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

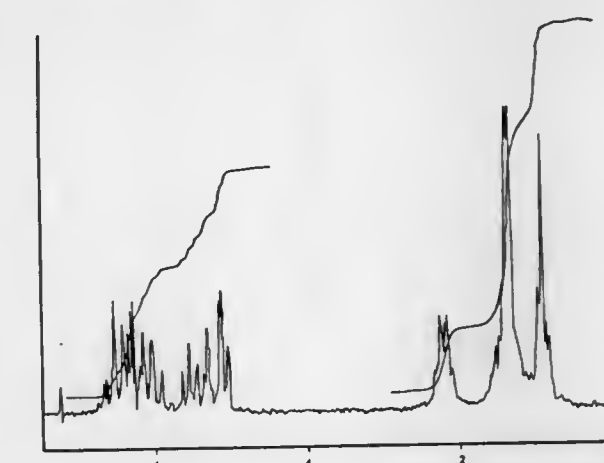
Division of Ser. No. 473,087, May 24, 1974, Pat. No. 3,960,977. This application Jan. 28, 1976, Ser. No. 653,245

Claims priority, application Switzerland, June 7, 1973, 8247/73

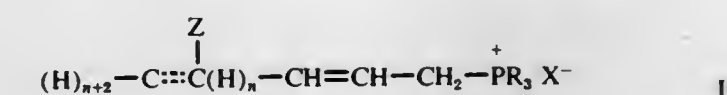
Int. Cl.<sup>2</sup> C07C 11/21

U.S. Cl. 260—677 R

10 Claims



1. Process for the preparation of undeca-1,3trans,5cis-triene and/or undeca-1,3trans,5trans-triene, which comprises reacting a quaternary phosphonium salt of formula



wherein symbol R represents an aliphatic, cycloaliphatic or aromatic radical and X represents a halogen atom, such as chlorine, bromine or iodine, or a group such as  $BF_4$  or  $C10_4$ , and wherein:

- index n stands for 1, Z represents a halogen atom and the dotted lines define a single bond; or
  - index n stands for zero, Z represents a hydrogen atom and the dotted lines define a double bond,
- with hexanal, and subsequently separating the pure geometrical isomers.

4,014,952

#### PROCESS FOR THE PREPARATION OF ISOPRENE

Eduard H. Adema, Geleen; Albert A. Van Geenen, Brunssum, and Marinus J. A. M. Den Otter, Munstergeleen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed July 15, 1975, Ser. No. 596,096

Claims priority, application Netherlands, July 22, 1974, 7409855

Int. Cl.<sup>2</sup> C07C 1/20

U.S. Cl. 260—681

6 Claims

1. Process for the preparation of isoprene by conversion of isobutylene or an isobutylene-containing composition with formaldehyde in the gasphase, according to a one-step method, at temperatures of 150°–400° C, and in the presence of a catalyst, wherein the catalyst used is a copper-phosphate composition on a carrier.



4,014,953

## METHOD FOR PURIFYING HF CATALYST IN AN ISOPARAFFIN-OLEFIN ALKYLATION

Webster W. Brown, Jr., Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

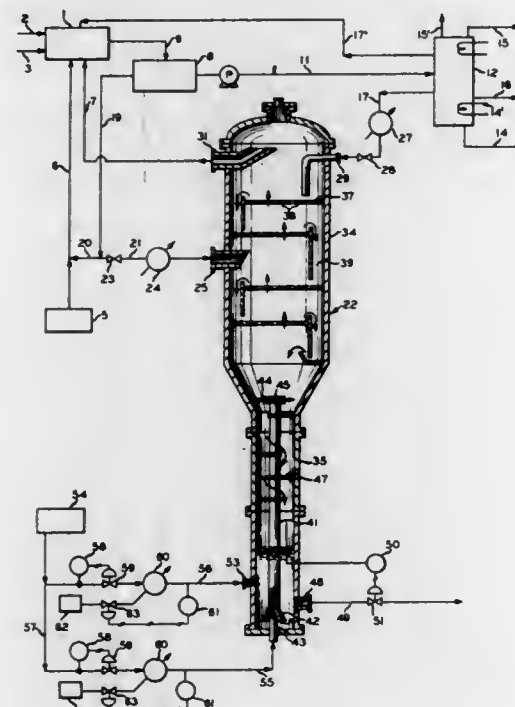
Division of Ser. No. 547,261, Feb. 5, 1975, Pat. No. 3,975,164.

This application Apr. 22, 1976, Ser. No. 679,283

Int. Cl.<sup>2</sup> C07C 3/54

U.S. Cl. 260—683.48

4 Claims



1. In an olefin and isoparaffin alkylation process employing an HF catalyst, in which effluent from a reaction zone is passed to a settling zone to separate an acid stream containing HF and acid soluble oil which stream is then purified by separating the HF and acid soluble oil by a process comprising the steps of:

- introducing said acid stream into the intermediate region of an upper chamber of a purification column, said column comprising said upper chamber and a lower leg in communication with said chamber;
- introducing the isoparaffin as a liquid into an upper region of said chamber as a reflux;
- introducing the first portion of vaporous isoparaffin into said lower region of a leg, said vaporous isoparaffin flowing upwardly through said leg and said upper chamber to strip HF from said acid stream
- intimately contacting said first portion of vaporous isoparaffin with acid soluble oil collected in said leg;
- introducing a second portion of said vaporous isoparaffin into an eductor positioned at the bottom of a stand pipe in said leg to provide circulation of acid soluble oil upwardly therethrough and back into said leg;
- removing a stream containing vaporous isoparaffin and purified HF from the top of said upper chamber; and
- recovering acid soluble oil substantially free of entrained HF from the lower portion of said leg.

4,014,954

## METHOD FOR PREPARING MOLDINGS AND COATINGS

Fritz Gude; Siegfried Brandt; Elmar Wolf, all of Herne, and Johann Obendorf, Dorsten, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Filed May 30, 1975, Ser. No. 582,534

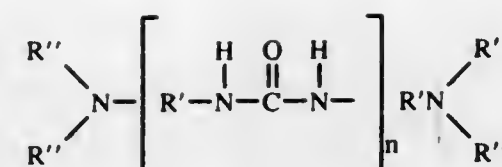
Claims priority, application Germany, June 21, 1974, 2429765

Int. Cl.<sup>2</sup> C08L 63/02

U.S. Cl. 260—830 P

6 Claims

4. Molding composition for the manufacture of molded objects and coatings comprising polyadducts of 1,2-epoxy compounds having more than one epoxy group in the molecule and polyureas having the formula

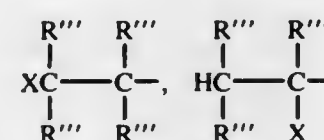


wherein

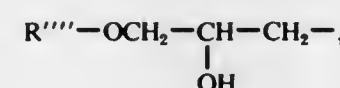
 $n \geq 1$ ,

R' is an alkylene or arylene radical,

R'' is hydrogen and at least one radical from the group of



and



R''' being the same or different radical from the group of hydrogen and alkyl, X being an R'''OOC—, R'''<sub>2</sub>NOC— or NC— radical and R''' being alkyl or aryl.

4,014,955

## PROCESS FOR THE MANUFACTURE OF POLYETHERS CONTAINING IONIC BONDS

Alfred Renner, Munchenstein, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 7, 1974, Ser. No. 440,632

Claims priority, application Switzerland, Feb. 14, 1973, 2087/73

Disclosure was also published under second Trial Voluntary

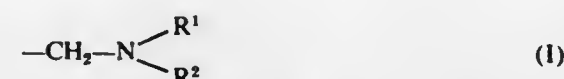
Protest Program on Apr. 13, 1976

Int. Cl.<sup>2</sup> C08G 45/08

U.S. Cl. 260—831

18 Claims

1. A process for the manufacture of crosslinked macromolecular polyethers containing ionic bonds, wherein polyhydric mononuclear or polynuclear phenols which contain as substituents, in the o- or p-positions to the OH groups, at least 2 radicals of the formula I



in which R<sup>1</sup> and R<sup>2</sup> are identical or different and denote a saturated or unsaturated hydrocarbon radical with 1 to 4 carbon atoms or together denote the morpholino radical (Mannich bases) are subjected, optionally in the presence of water or organic solvents, at temperatures of 20° to 200°C

A. on the one hand, to a polyaddition, in a manner which is in itself known, with compounds containing an average of more than one 1,2-epoxide group, the epoxide groups reacting with the phenol groups, and

B. on the other hand, to a polyquaternization, in a manner which is in itself known, with organic compounds containing at least 2 chlorine, bromine or iodine atoms.

4,014,956

## THERMOPLASTIC POWDER COATING COMPOSITIONS

Oliver Wendell Smith, South Charleston; Joseph Victor Koleske, Charleston, and Julius John Brezinski, St. Albans, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 353,514, April 23, 1973, abandoned. This application Sept. 13, 1974, Ser. No. 505,770

Int. Cl.<sup>2</sup> C08L 27/06

U.S. Cl. 260—853

14 Claims

1. A dry vinyl chloride copolymer powder coating composition suitable for the production of thin films, said powder composition having essentially all of the powder particles ranging in size from 1 micron to 75 microns and consisting of a mixture of two or more vinyl chloride copolymers that have at least 50 weight percent vinyl chloride polymerized in each copolymer in said mixture, wherein the mixture comprises (a) a positive amount up to 85 weight percent, based on the total weight of copolymers present, of at least one vinyl chloride copolymer having an inherent viscosity up to 0.3 dl/gm with (b) the balance being one or more vinyl chloride copolymers having an inherent viscosity above 0.3 dl/gm, said mixture having an average inherent viscosity of from 0.2 to 0.55 dl/gm.

4,014,957

## THERMOPLASTIC POLYAMIDE MOULDING COMPOSITIONS

Günther Kirsch, Frankfurt am Main; Harald Cherdron, Nau-rod, Taunus, and Walter Herwig, Neuenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 2, 1975, Ser. No. 609,674

Claims priority, application Germany, Sept. 4, 1974, 2442391

Int. Cl.<sup>2</sup> C08L 77/00

U.S. Cl. 260—857 PG

9 Claims

1. A thermoplastic molding composition consisting essentially of:

- 99.5 to 80% by weight of an amorphous linear polyamide derived from
  - 5 to 50 mole percent of a cycloaliphatic or aromatic aliphatic diamine,
  - 0 to 45 mole percent of an aliphatic diamine of 4 to 20 carbon atoms in which the amino groups are separated by at least four carbon atoms,
  - 5 to 50 mole percent of an aromatic dicarboxylic acid of 7 to 20 carbon atoms,
  - 0 to 45 mole percent of a saturated aliphatic dicarboxylic acid of 6 to 20 carbon atoms, the carboxy groups of which are separated by at least four carbon atoms, and
  - 0 to 80 mole percent of an aliphatic aminocarboxylic acid of 2 to 20 carbon atoms,
 the sum of the mole percent of α<sub>1</sub> and α<sub>2</sub> being equal to the sum of the mole percent of β<sub>1</sub> and β<sub>2</sub>, the sum of the mole percent of components α<sub>1</sub>, α<sub>2</sub>, β<sub>1</sub>, β<sub>2</sub> and γ being 100 mole percent, the sum of α<sub>1</sub> and β<sub>1</sub> being from 20 to 95 mole percent and the sum of α<sub>2</sub>, β<sub>2</sub> and γ being from 5 to 80 mole percent, said polyamide having a second order transition temperature of at least 100° C. and a reduced specific viscosity of 0.7 to 1.8 dl/g, and
- 0.5 to 20% by weight of at least one segmented thermoplastic elastomeric copolyester comprising
  - long chain ester units derived from a dicarboxylic acid or its equivalent ester-forming derivatives having a molecular weight of less than about 300 and a long chain glycol or its equivalent ester-forming derivative having a molecular weight of more than about 350, and
  - short chain ester units derived from a dicarboxylic acid or its equivalent ester-forming derivatives having a molecular weight of less than about 300 and a low molecular weight diol or its equivalent ester-forming derivatives having a molecular weight of less than about 250,

the ester units being linked head-to-tail by ester linkages and the short chain ester units B) being present to the extent of about 25% to 65% by weight of the copolyester.

4,014,958

## DRY-SPUN MODACRYLIC FILAMENTS WITH IMPROVED COLORISTIC PROPERTIES

Ralf Miessen, Dormagen; Günter Blankenstein, Stommeln; Siegfried Korte, Leverkusen, and Carlhans Siling, Oden- thal-Hahnenberg, all of Germany, assignors to Bayer Aktien- gesellschaft, Leverkusen, Germany

Filed Nov. 11, 1975, Ser. No. 630,775

Claims priority, application Germany, Nov. 15, 1974, 2454322; May 30, 1975, 2524125

Int. Cl.<sup>2</sup> C08L 33/20

U.S. Cl. 260—898

5 Claims

1. A dry-spun modacrylic filament with improved coloristic properties and adequate dimensional stability under dyeing conditions based on a polymer mixture, which comprises at least one acrylonitrile-vinyl chloride copolymer and a copolymer containing chlorine and sulphonic acid groups or sulphuric acid ester groups.

4,014,959

## PHOSPHONOETHER CARBOXYLATES

Marvin M. Crutchfield, Creve Coeur, Mo., and Ludwig Maier, Kiechberg, Switzerland, assignors to Monsanto Company, St. Louis, Mo.

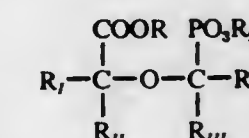
Filed Apr. 24, 1975, Ser. No. 571,347

Int. Cl.<sup>2</sup> C07C 9/40

U.S. Cl. 260—942

3 Claims

1. A compound represented by the formula:



wherein R is selected from the group consisting of alkyl groups containing from 1 to 4 carbon atoms and benzyl; R<sub>I</sub> is selected from the group consisting of hydrogen, alkyl groups containing from 1 to 3 carbon atoms, and CH<sub>2</sub>COOR; R<sub>II</sub> is selected from the group consisting of hydrogen, alkyl groups containing from 1 to 3 carbon atoms, CH<sub>2</sub>COOR and COOR; R<sub>III</sub> and R<sub>IV</sub> each are selected from the group consisting of hydrogen, alkyl groups containing from 1 to 3 carbon atoms and CH<sub>2</sub>COOR; at least one of R<sub>I</sub>, R<sub>II</sub>, R<sub>III</sub>, and R<sub>IV</sub> being COOR or CH<sub>2</sub>COOR.

4,014,960

## CARBURATOR FOR A STRATIFIED COMBUSTION ENGINE WITH A PRECHAMBER

Kenji Goto, and Takao Niwa, both of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

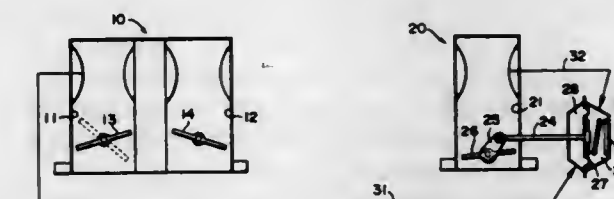
Filed Feb. 26, 1975, Ser. No. 553,408

Claims priority, application Japan, Sept. 7, 1974, 49-103340

Int. Cl.<sup>2</sup> F02M 11/02

U.S. Cl. 261—23 A

1 Claim



1. A carburetor assembly for use with a stratified combustion engine having a main combustion chamber and a precom-



bustion chamber, said assembly comprising a first body having first and second bores to supply lean gaseous mixture into the main combustion chamber, a second body having a third bore to supply rich gaseous mixture into the precombustion chamber, said second body being separate from said first body and being adapted to be disposed at any desired location spaced from said first body, a throttle valve in said third bore, and an actuator for pivoting said throttle valve, said actuator comprising a closed housing having a diaphragm disposed therein, said diaphragm dividing the interior of said closed housing into two chambers, a first conduit connected to said actuator for introducing a negative pressure in said first bore into one of said chambers so as to deflect said diaphragm in one direction, a second conduit connected to said actuator for introducing a negative pressure in said third bore into the other of the two chambers so as to deflect said diaphragm in the opposite direction, and means connecting said diaphragm to said throttle valve whereby variations in the position of said diaphragm vary the position of said throttle valve in said third bore.

4,014,961

## EJECTOR MIXER FOR GASES AND/OR LIQUIDS

Vitaly Fedorovich Popov, ulitsa Gogolya, 4, kv.13, Severodnetsk, Voroshilovgradskoi oblasti, U.S.S.R.

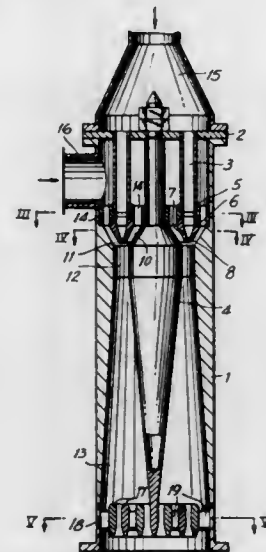
Continuation of Ser. No. 354,004, April 24, 1973, abandoned.

This application Apr. 21, 1975, Ser. No. 570,224

Int. Cl.<sup>2</sup> B05B 7/10

U.S. Cl. 261—76

4 Claims



1. An ejector mixer for fluids comprising a casing, a tube sheet mounted in said casing and dividing the same into first and second spaces, a plurality of vertical distributing tubes having upper ends mounted in said tube sheet around the circumference of a circle, said upper ends of the tubes communicating with said first space, a first inlet for a first fluid communicating with said first spaces to feed said fluid to said tubes, a second inlet for a second fluid communicating with said second space, a pair of coaxial annular rings in said casing defining an annular nozzle, said distributing tubes having lower ends, an annular grid coupled to said lower ends of the distributing tubes and to said annular rings to provide communication between said lower ends of the tubes and said annular nozzle such that the latter receives the first fluid from the tubes, means in said casing forming inner and outer nozzles coaxially arranged with respect to the first said annular nozzle which forms a middle nozzle between said inner and outer nozzles, said inner and outer nozzles being in communication with said second space to receive the second fluid therefrom, an annular mixing chamber in said casing facing said nozzles for receiving the streams of fluids discharged from the three nozzles for mixing of the streams, the stream of the first fluid from the middle nozzle being confined between the streams of the second fluid from the inner and outer nozzles, guide vanes mounted around said annular grid at the inner and outer

peripheries thereof for swirling the streams discharged from the first and second nozzles in opposite directions to promote mixing with the stream discharged from the middle nozzle, and a diffuser in said casing coupled to the mixing chamber for receiving the mixed streams therefrom, said diffuser having a discharge end for discharging the mixed streams from the casing.

4,014,962

## HEAT AND/OR MASS EXCHANGER OPERATING BY DIRECT CONTACT BETWEEN A LIQUID AND A GAS

Pedro Perez del Notario, Zamudio (Vizcaya), Spain

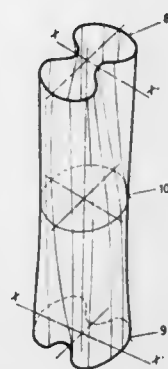
Continuation of Ser. No. 342,800, March 19, 1973, abandoned. This application Apr. 2, 1975, Ser. No. 564,356

Claims priority, application Spain, Mar. 23, 1972, 401117

Int. Cl.<sup>2</sup> B01F 3/04

U.S. Cl. 261—112

4 Claims



1. Heat and or mass exchanger operating by direct contact between a liquid and a gas comprising a cooling tower including a casing and a filling disposed in said casing through which liquid and gas circulate in direct contact in opposite directions, said filling comprising a plurality of independent and separate tubular elements extending in parallel abutting relation to form a self-supporting cluster in said casing, support means in said casing for said tubular elements including a perforate structure on which said tubular elements directly bear, each element having a cross-section which periodically varies in shape and size along the length thereof in successive wave-lengths, said elements being disposed vertically and extending the entire height of the filling and defining internal and external passages of variable section in shape and size through which both liquid and gas circulate in direct contact, the internal passages being confined within the interior of the tubular elements whereas the external passages are collectively bounded by the external surfaces of the different tubular elements and the inner surface of the casing, said tubular elements being disposed such that the variations in section of the internal and external passages are periodically repeated therealong, the cross-sections of each element for every two consecutive variations in section at half wave-length positions being irregular and turned 90° relative to one another while the cross-section at the intermediate quarter wave-length positions is regular and gradually undergoes change in shape to said irregular cross-sections at the half wave-length positions, the tubular elements having axial generatrices which are of continuously changing curvature and means at the lower end of each tubular element defining a respective separate dripping point for such element.

4,014,963

## MOLDING A PRIMER CHARGE WITHIN A CASELESS PROPELLANT CHARGE

Heinz Gawlick, Furth, Bay, and Guenther Marondel, Erlangen, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

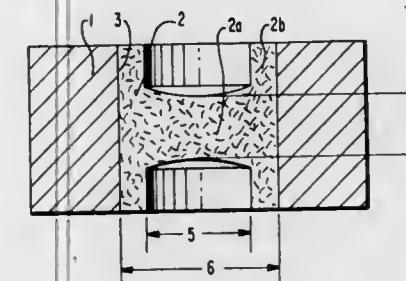
Division of Ser. No. 445,896, Feb. 26, 1974, Pat. No. 3,911,825, which is a continuation of Ser. No. 163,173, July 16, 1971, abandoned. This application May 23, 1975, Ser. No. 580,357

Claims priority, application Germany, July 18, 1970, 2035851

Int. Cl.<sup>2</sup> C06B 21/00

U.S. Cl. 264—3 R

9 Claims



1. A process for making a caseless propellant charge comprising providing a shaped propellant powder charge having a hole therethrough, introducing a percussion-sensitive mixture into said hole and compressing the central portion of said percussion-sensitive mixture on both sides thereof in a manner such that superfluous portions of said mixture are displaced to the periphery of the hole to line the interior of said shaped propellant powder charge whereby a primer charge having an H-shaped cross section is formed in said hole.

4,014,964

## PROCESS FOR MAKING METAL POWDER USING A LASER

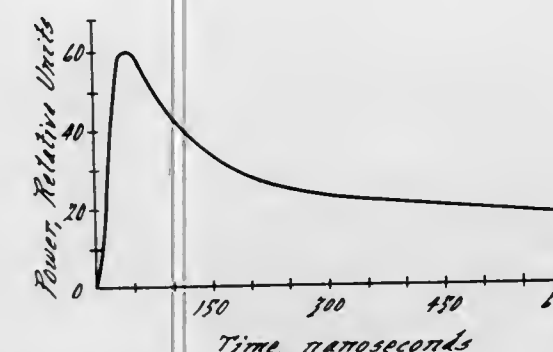
Robert L. Probst, Ann Arbor, Mich., and Barry P. Fairand, Columbus, Ohio, assignors to Federal-Mogul Corporation, Southfield, Mich.

Filed July 16, 1975, Ser. No. 596,402

Int. Cl.<sup>2</sup> B01J 2/02

U.S. Cl. 264—10

9 Claims



1. A process for producing metal powder which comprises the steps of providing a supply of molten metal, introducing said molten metal in the form of a stream having a preselected cross sectional area into a chamber, directing a transversely excited laser beam in impinging relationship against said stream and controlling the pulse rate and power of said laser beam to effect a fragmentation of said stream into a plurality of molten droplets, cooling said droplets to effect a solidification thereof, and recovering the resultant metal powder product.

4,014,965

## PROCESS FOR SCRAPLESS FORMING OF PLASTIC ARTICLES

Steven H. Stube, and Douglas S. Chisholm, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 24, 1972, Ser. No. 309,249

Int. Cl.<sup>2</sup> B06B 3/00

U.S. Cl. 264—23

12 Claims

1. In a process for forming articles from a powder of a thermoplastic resinous polymer wherein the powder in an amount sufficient to produce the article is compressed at a temperature below the melt temperature of the powder into a briquette containing polymer particles and having green strength and the briquette having been maintained at a temperature in the range from about the alpha transition temperature to less than the melt temperature of the polymer for a time sufficient to effect sintering of the polymer particles of the briquette is forged into an article of fused polymer; the improvement which comprises compacting the powder with vibratory energy to form the briquette having a percent compaction of at least about 85 percent.

4,014,966

## METHOD FOR INJECTION MOLDING A COMPOSITE FOAMED BODY HAVING A FOAMED CORE AND A CONTINUOUS SURFACE LAYER

Robert Hanning, Cavernago Parc 1, Campione d'Italia, Italy

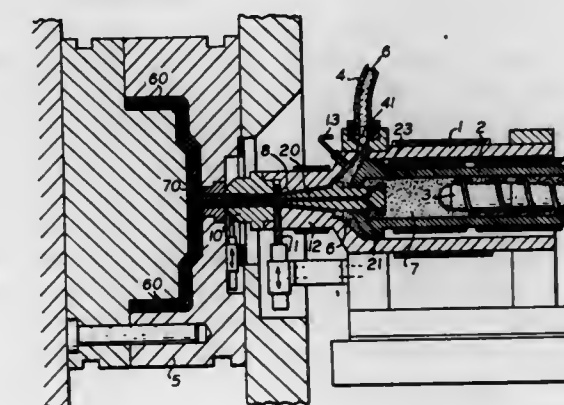
Continuation of Ser. No. 286,733, Sept. 6, 1972, abandoned.

This application Nov. 5, 1974, Ser. No. 521,184

Int. Cl.<sup>2</sup> B29D 27/00; B29F 1/03

U.S. Cl. 264—45.1

1 Claim



1. A method of making a composite synthetic resin body having a foamed core and a continuous surface layer, said method comprising the steps of:

- injecting into a mold cavity of given volume an initial quantity of a melt of a first synthetic thermoplastic resin material adapted to form surface portions of said body through a passageway surrounding a tube penetrating into said mold cavity for a distance at least equal to the thickness of said layer, said passageway terminating short of the end of said tube penetrating into said mold; and
- thereafter injecting into said mold cavity through said tube a quantity of a melt of a second synthetic thermoplastic resin material containing an expanding agent to spread said first material along the walls of said cavity and concurrently therewith continuing to inject said first material through said passageway in a sheath around said melt of said second material at a rate such that the spreading of said the melt of first material by said second material is incapable of interrupting the continuity of the layer of said first material.



4,014,967

# METHOD AND MOLD FOR THE DISCONTINUOUS PRODUCTION OF FOAM PLASTIC PARTS

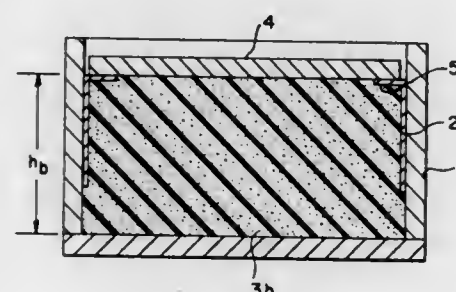
Adolf Hattenberger; Walter Lind, and Hubert Strasser, all of Ferndorf, Austria, assignors to Österreichische Heraklith Aktiengesellschaft, Radenthein, Austria

Filed Jan. 23, 1975, Ser. No. 543,447

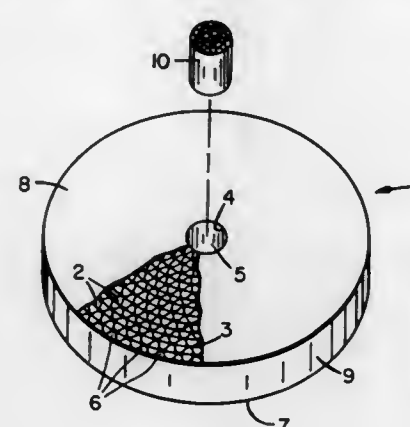
Claims priority, application Austria, Jan. 28, 1974, 671/74 Int. Cl.<sup>2</sup> B29D 27/04

U.S. Cl. 264—51

3 Claims



goes substantially the same radial shrinkage as the honeycomb ceramic matrix during the firing cycle and



removing the plug from the hub cavity after completion of the firing cycle.

4,014,969

# METHOD OF MAKING A MOLDED ARTICLE WITH ORIENTED FIBER REINFORCEMENTS

Werner Gürtler, Baden; Erich Kresta, Perchtoldsdorf, and Horst Stumpf, Baden, all of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

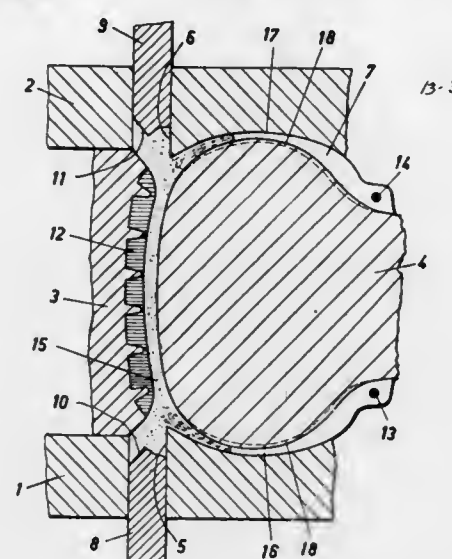
Continuation of Ser. No. 367,473, June 6, 1973, Pat. No. 3,901,961, which is a division of Ser. No. 167,768, July 30, 1971, Pat. No. 3,837,986. This application Feb. 6, 1975, Ser. No. 547,713

Claims priority, application Austria, Aug. 5, 1970, 7107/70 The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.

Int. Cl.<sup>2</sup> B29D 3/02; B29H 5/02

U.S. Cl. 264—108

11 Claims



1. A method of fabricating a molded article composed of elastomeric material having oriented reinforcing fibers therein, comprising:

- providing a moldable preform of elastomeric material containing oriented reinforcing fibers;
- disposing said moldable and curable elastomeric material preform in a first portion of a mold cavity and extending into a chamber adjoining said mold cavity, said first portion of said mold cavity having adjoining thereto and communicating therewith a second portion of said mold cavity;
- displacing said moldable elastomeric material preform from said chamber, causing flow of said elastomeric material into said second portion of said mold cavity;
- reorienting, by said flow, said fibers in the elastomeric material flowing into said second portion of said mold cavity into a second fiber orientation direction, while leaving fibers in said first portion of said mold cavity as originally oriented; and
- curing said elastomeric material preform, thereby forming said molded article.

4,014,968

# SHRINKAGE CONTROL OF CELLULAR CERAMIC BODIES HAVING AXIAL CAVITIES

Raphael A. Simon, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 19, 1974, Ser. No. 489,925

Int. Cl.<sup>2</sup> C04B 33/32; B21D 53/02

U.S. Cl. 264—56

3 Claims

1. A method of controlling the firing shrinkage and delamination in the inner half of a disc-type, honeycomb ceramic matrix having a plurality of unobstructed gas passages extending therethrough substantially parallel to the central axis of the matrix and defined by alternate layers of flat and corrugated ceramic sheets wrapped around an axial hub cavity extending therethrough, the improvement comprising firing the honeycomb ceramic matrix with a temporary plug which substantially fills the hub cavity and which under-

4,014,970

# SOLID STATE FORMING OF THERMOPLASTIC MATERIAL

Herbert A. Jahnle, Havertown, Pa., assignor to The Budd Company, Troy, Mich.

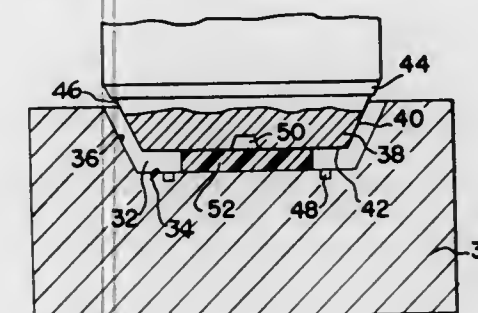
Continuation of Ser. No. 464,279, April 25, 1974, abandoned.

This application Aug. 21, 1975, Ser. No. 606,344

Int. Cl.<sup>2</sup> B29F 5/00

U.S. Cl. 264—161

9 Claims



1. A method of solid state forming an article or thermoplastic material, said method comprising: heating a blank of said thermoplastic material to a temperature proximate to and below the temperature at which said material experiences a transition from its solid to its plastic phase; placing said blank heated at said temperature in an open mold between a rigid portion thereof displaceable relative to another rigid portion thereof, said blank having a surface area relatively smaller than the surface area of said mold and a volume relatively larger than the volume of the mold cavity defined when said mold is closed; maintaining said mold at room temperature; displacing one of said rigid portions of said mold relative to the other rigid portion of said mold at a relative velocity of at least 6.4 cm per second for impacting said blank and placing said blank under compressive strain and causing a substantial decrease in thickness of said blank; maintaining said blank in said mold under said compressive strain for less than 5 seconds for causing said blank to abruptly expand between said mold rigid portions and the material of said blank to flow and fill said mold cavity for forming said article, with the excess of said material exuding from said mold cavity forming a flash; allowing said article to cool sufficiently to remove from said mold without distorting said article; and removing said flash.

4,014,971

# METHOD FOR MAKING A TYMPANIC MEMBRANE PROSTHESIS

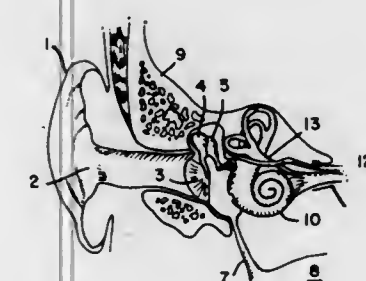
Rodney C. Perkins, Palo Alto, Calif.

Filed May 11, 1973, Ser. No. 359,346

Int. Cl.<sup>2</sup> B29C 23/00

U.S. Cl. 264—219

3 Claims



1. A method of making a biosynthetic tympanic membrane and a biosynthetic tympanic membrane ossicular substitute having a concave and a convex surface, comprising the steps of:

making a mold having the shape of a natural tympanic membrane; preparing collagenous tissue for placement on said mold; placing said tissue on said mold and shaping said tissue thereon; treating said tissue with buffered formaldehyde, glutaraldehyde or another functionally similar fixative agent on said mold for causing said tissue to retain the external shape of said mold upon removal from said mold; forming a prosthetic receiving means of collagenous material on a surface of said tissue for receiving natural and prosthetic ossicle members; and removing said treated tissue from said mold.

4,014,972

# METHOD OF MOLDING A MULTI-COLORED DISC

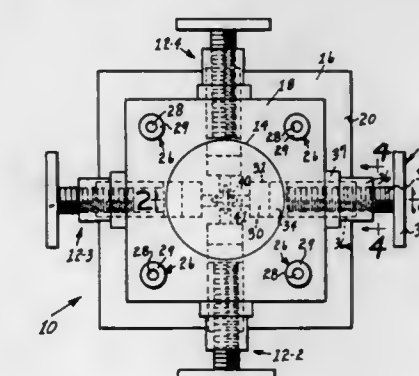
Robert I. Rentz, 1818 Devils Backbone Road, Cincinnati, Ohio 45238

Division of Ser. No. 20,883, March 19, 1970, Pat. No. 3,859,020. This application Nov. 7, 1974, Ser. No. 521,867

Int. Cl.<sup>2</sup> B29C 5/00; B29D 7/02

U.S. Cl. 264—245

5 Claims



1. In a method of injection molding, the steps comprising: a. superimposing two, smooth plate-like members in closely spaced parallel relationship such that a space between at least portions of confronting surfaces of said plate-like member defines or shallow mold cavity, and b. forming into a thin disc plural, flat, successive, annular, concentric visible rings of different colors by sequentially injecting successive charges of flowable coherent material of different colors into said mold cavity in a direction substantially normal to one of said plates through an orifice in the other of said plates located remote from a periphery of said other of said plates while maintaining said plates in said superimposed closely spaced parallel relationship and causing each successive charge to flow between said plate-like members substantially only radially outwardly in plural directions from said orifice.

4,014,973

# METHOD OF COMPACTING SILK SUTURES BY STRETCHING

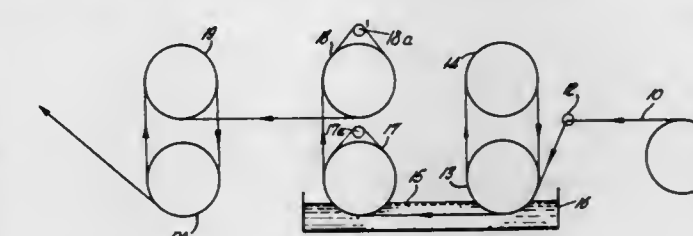
Darrell R. Thompson, Somerville, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed July 31, 1973, Ser. No. 384,318

Int. Cl.<sup>2</sup> B29C 17/02; A61L 17/00

U.S. Cl. 264—290 R

3 Claims



1. A process for compacting a braided silk suture which



comprises: (1) presoaking an unstretched braided silk suture in a non-corrosive liquid for at least about one-half hour to wet the silk fibers; (2) stretching said presoaked suture, while the same is immersed in a non-corrosive liquid, until the suture is stretched from about 5 to about 35% of its original length; and (3) drying said stretched suture in a temperature range of from about 70° to about 300° F., while maintaining the same under tension.

4,014,974

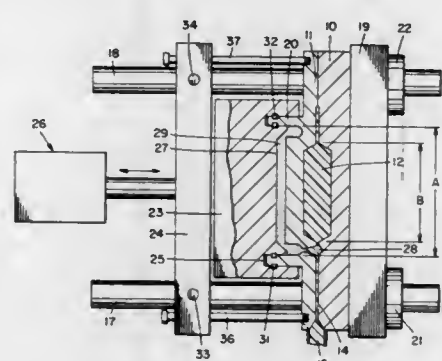
## PRESSLESS INJECTION MOLDING

Lawrence C. Cessna, Jr., Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 551,178, Feb. 19, 1975, Pat. No. 3,972,668. This application Dec. 31, 1975, Ser. No. 645,762 Int. Cl.<sup>2</sup> B29F 1/06

U.S. Cl. 264—328

2 Claims



1. A method of injection molding comprising: providing a pair of mold plates at least one of which is movable relative to the other, the adjacent faces of said mold plates being formed to define a mold cavity therebetween;
- providing a backing plate mounted for limited linear movement relative to the rear face of the movable mold plate, the adjacent faces of said backing plate and movable mold plate being formed to define a false cavity therebetween which is filled with a substantially incompressible compliant material;
- initially urging said backing plate and said movable mold plate against said other mold plate;
- locking said backing plate against rearward motion;
- injecting fluid plastic material under pressure into said mold cavity; and
- utilizing the pressure of said injected material to act against said compliant material to generate additional forces urging the mold plates together to counteract the forces generated by said plastic material within said mold cavity.

4,014,975

## METHOD FOR SEPARATING THE ISOTOPES OF A CHEMICAL ELEMENT

Fernand Marcel Devienne, 117 La Croisette, 06400 Cannes, France

Continuation-in-part of Ser. No. 549,843, Feb. 13, 1975, abandoned. This application Apr. 29, 1975, Ser. No. 572,632 Claims priority, application France, Feb. 21, 1974, 74.05943

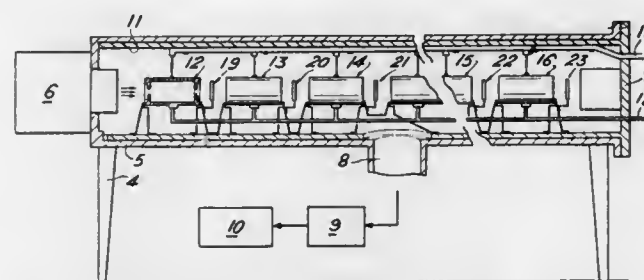
Int. Cl.<sup>2</sup> C01G 43/00; B01D 59/50

U.S. Cl. 423—19

15 Claims

1. A method for separating the isotopes of a chemical element, wherein said method consists in producing a beam of positive or negative primary ions of at least one compound of said element, in accelerating said ion beam in order to pass said beam through a predetermined number of collision boxes which are open at both ends and placed one after another in series, in successively initiating within each collision box, by inelastic collisions of said ions with the molecules of a neutral target gas with which said boxes are filled at low pressure, the

dissociation of a given percentage of the primary ions into at least two fragments such that one fragment is a secondary ion which appears in the form of at least two different isotopic species with respect to the element to be separated, and in



choosing the potential  $V_2$  to which said collision boxes are brought in order to trap preferentially therein one of the isotopic species aforesaid which is caused to condense within each collision box.

4,014,976

## PROCESS FOR PRODUCTION OF TITANIUM TETRACHLORIDE

Masaaki Adachi, Ohtsu; Takayoshi Shirai, Yokkaichi, and Norio Nakasuzi, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

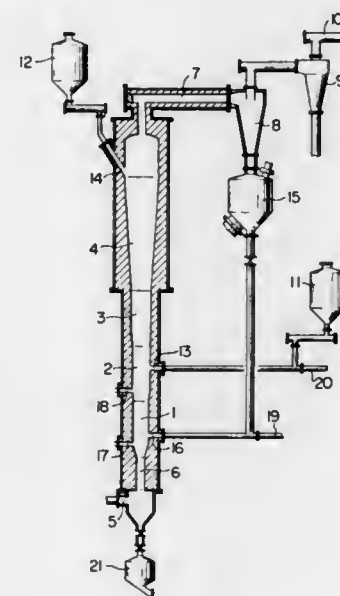
Filed Mar. 24, 1976, Ser. No. 670,074

Claims priority, application Japan, Mar. 28, 1975, 50-38260

Int. Cl.<sup>2</sup> C01G 23/02

U.S. Cl. 423—79

12 Claims



1. An improved process for continuous production of titanium tetrachloride by chlorinating a titaniferous material in a dilute-phase fluidization system, which comprises 1 feed (a) a fine particulate titaniferous material having a particle size of 400 to 150 mesh (Tyler standard) as a mean value, (b) a coarse particulate solid carbonaceous substance having a particle size as a median value of at least three times as large as that of the titaniferous material and (c) a chlorine-containing gas to a reactor, the reactor having (d) a substantially vertical and long solid suspension zone of a ratio of height to lower part diameter of at least 10 in which (e) a ratio of upper part sectional area to lower part sectional area is from 1.2 to 10 so that the velocity of the upwardly flowing gas does not increase as the gas ascends. (2) controlling the amounts of said reactants fed so that, in the solid suspension zone, (f) the maximum value of the superficial linear velocity of the gas is from 1 to 10 m/sec., (g) the solid concentration is from 10 to 200 kg/m<sup>3</sup>, and (h) a ratio of the solid carbonaceous substance in solids is from 70 to 99% by weight, (3) repeating pneumatic transport and reflux of most of the solid carbonaceous substance in the upward flow of the gas to form a dilute-phase suspension in which the titaniferous material is chlorinated at

a temperature of 900° to 1400° C while it ascends being entrained by the gas flow, and 4 removing the reaction product gas from the upper part of the reactor and separating the reaction product gas into a chloride gas containing titanium tetrachloride and the unreacted solid substances.

4,014,977

## PROCESS FOR THE HYDROLYSIS OF TITANIUM SULPHATE SOLUTIONS

Luigi Piccolo; Antonio Paolinelli, both of Milan, and Tullio Pellizzon, Paderno Dugnano, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Apr. 21, 1976, Ser. No. 679,125

Claims priority, application Italy, Apr. 30, 1975, 22878/75 Int. Cl.<sup>2</sup> C01G 23/06

U.S. Cl. 423—85

12 Claims

1. A method for the hydrolysis of titanium sulphate solutions obtained in the sulphate process from the reaction products of titaniferous materials with sulfuric acid, which comprises

- a. gradually bringing into contact a first solution of titanium sulphate, solution A, having a titer, expressed as TiO<sub>2</sub>, of from 230 to 260 g/l and an acid factor of from 1.75 to 1.85, heated to a temperature of from 88° to 98° C, and water heated to a temperature of from 88° to 98° C, thus inducing the formation of hydrolysis nuclei by auto-nucleation;
- b. gradually adding a second solution of titanium sulphate, sodium B, having a titer, expressed as TiO<sub>2</sub>, of from 230 to 260 g/l and an acid factor of from 2.1 to 2.4, heated to a temperature of from 88° to 98° C, to the mixture obtained at stage (a), maintained at a temperature of from 88° to 98° C, while maintaining a volumetric ratio of from 3:100 to 12:100 between the solution A and the solution B and a volumetric ratio of from 3:1 to 5:1 between the sum of the solutions A and B and the water used at stage (a);
- c. heating the resulting mixture at boiling point, thereby to provoke the hydrolysis of the titanium sulphate added at stage (b) by induced nucleation by means of the hydrolysis nuclei obtained at stage (a).

4,014,978

## AIR POLLUTION CONTROL SYSTEM AND METHOD

Herschel A. Klein, Windsor, and Carl R. Bozzuto, Waterbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 24, 1970, Ser. No. 66,272

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.<sup>2</sup> B01D 53/34

U.S. Cl. 423—242

4 Claims

1. A method of removing sulfur dioxide from the flue gas produced by the combustion of sulfur-containing fuels comprising the steps of:

- a. contacting said flue gas in a scrubbing zone with an aqueous scrubbing stream containing an alkaline earth metal bicarbonate in solution, the amount of said alkaline earth metal bicarbonate in solution being in excess of the amount required to completely react with said sulfur dioxide in said flue gas whereby said sulfur oxides react with said bicarbonate to produce alkaline earth metal bisulfite in solution and whereby the pH of said aqueous scrubbing stream during said contact is maintained between 6.0 and 4.5,
- b. withdrawing said aqueous scrubbing solution from said scrubbing zone,
- c. contacting said aqueous scrubbing stream containing said bisulfite in solution with an oxygen-containing gas stream whereby said bisulfite is oxidized to form alkaline earth metal sulfate precipitate and sulfuric acid in solution,
- d. introducing alkaline earth metal carbonate into said

aqueous scrubbing stream whereby said carbonate reacts with said sulfuric acid to form additional alkaline earth metal sulfate precipitate and said excess alkaline earth metal bicarbonate in solution,

- e. separating said alkaline earth metal sulfate precipitate from said aqueous scrubbing stream, and
- f. recycling said aqueous scrubbing stream containing said excess alkaline earth metal bicarbonate to step (a).

4,014,979

## METHOD OF PRODUCING WURTZITE-LIKE BORON NITRIDE

Anatoly Nikolaevich Dremine, p.o. Chernogolovka, 3 ulitsa, 3, kv. 4; Oleg Nikolaevich Breusov, p.o. Chernogolovka, 1 ulitsa, 25, kv. 26; Tamara Vasilievna Bavina, p.o. Chernogolovka, 1 ulitsa, 14a, kv. 21, all of Moskovskaya oblast, Noginsky raion, and Sergei Vladimirovich Pershin, ulitsa Komsomolskaya, 132, Noginsk Moskovskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 248,526, April 28, 1972, abandoned. This application July 3, 1975, Ser. No. 592,715

Claims priority, application U.S.S.R., July 19, 1971, 1692355

Int. Cl.<sup>2</sup> C01B 21/06, 35/14

U.S. Cl. 423—290

5 Claims

1. A method of producing highly imperfect wurtzitic boron nitride with enhanced activity, comprising preparing a mixture consisting essentially of a powder of graphitic boron nitride and a sufficient amount of an additive selected from the group consisting of water and aqueous alkaline solutions to fill the pores between the particles of said graphitic boron nitride, and subjecting said mixture to the action of a shock wave with a pressure of not less than 100 kbar.

4,014,980

## METHOD FOR MANUFACTURING GRAPHITE WHISKERS USING CONDENSED POLYCYCLIC HYDROCARBONS

Hiroto Fujimaki; Haruhisa Hayashi, and Takashi Kawahara, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of Japan

Continuation-in-part of Ser. No. 382,128, July 24, 1973, abandoned. This application July 29, 1975, Ser. No. 600,078

Claims priority, application Japan, July 27, 1972, 47-74557 Int. Cl.<sup>2</sup> C01B 31/04

U.S. Cl. 423—448

7 Claims

1. A method for manufacturing graphite whiskers having a diameter of from 1 to 50 microns, a tensile strength of at least 1,000 kg/mm<sup>2</sup> and a modulus of elasticity of at least  $5 \times 10^4$  kg/mm<sup>2</sup>, which comprises the steps of gasifying one or more liquefied organic compounds having a condensed polycyclic structure of substantially two to five benzene rings, the atomic ratio of H/C thereof being 1 at most; mixing the gasified substance derived from one part by volume of the liquefied organic compound with 500 to 5000 parts by volume of an inert gas mixed with 0.1 to 5 parts by volume of an active gas selected from the group consisting of carbon monoxide, carbon dioxide and water vapor; passing the resulting gaseous mixture at a substantially atmospheric pressure through a reaction furnace containing therein a heat-resistant substrate to deposit thereon thermally cracked carbon nuclei at a temperature of from 700° to about 890° C. for a period of at least 5 minutes, followed by 900° to 1200° C. to obtain precursory carbon whiskers at a growing velocity of at least 0.5 mm per minute; and graphitizing the precursory carbon whiskers in another furnace at a temperature of from 2700° to 3000° C. for a period of from 1 to 10 minutes in an atmosphere of inert gas.



4,014,981

## REMOVAL OF SULFUR FROM STACK GASES

Eugene Wainer, Shaker Heights, Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Filed May 21, 1973, Ser. No. 362,013

Int. Cl.<sup>2</sup> B01D 57/00; C01B 17/00

U.S. Cl. 423—506

10 Claims

1. A process for diminishing environmental pollution resulting from the burning of sulfur containing fuels which comprises:

- burning said sulfur containing fuels thereby producing hot products of combustion containing oxides of sulfur and carbon;
- separating said oxides of sulfur from said hot combustion products before they cool to any appreciable extent and while they are still at an elevated temperature, by purely physical means in which the hot combustion products are subjected to centrifugal force;
- and recovering the hot sulfur oxides before they have cooled to any appreciable extent.

4,014,982

COMBINED PROCESS FOR UPGRADING SPENT ALKYLATION ACID AND REDUCING NOXIOUS GAS CONTENT OF WASTE GASEOUS STREAMS

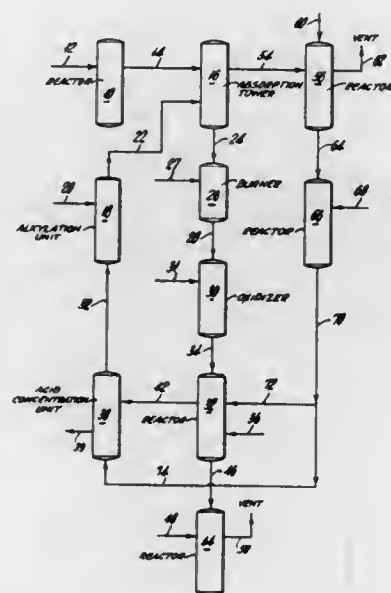
Peter L. Paull, Weston, Conn., and James M. Caffrey, Jr., Wappingers Falls, N.Y., assignors to Texaco Development Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,745

Int. Cl.<sup>2</sup> C01B 17/72

U.S. Cl. 423—528

18 Claims



1. In the continuous formation of carbon dioxide, nitrogen and concentrated sulfuric acid from industrial flue gas comprising nitrogen oxides, sulfur dioxide, oxygen, and water and spent alkylation acid including hydrocarbons, water and sulfuric acid, the steps that comprise:

- a. contacting said flue gas with a first oxidation catalyst to effect conversion of the nitrogen oxides to nitrogen dioxide and a portion of said sulfur dioxide to sulfur trioxide;
- b. admixing the oxidized flue gas of step (a) with spent alkylation acid to absorb at least a part of the oxides of sulfur and nitrogen resulting in step (a);
- c. treating the unabsorbed gases from step (b) composed of sulfur dioxide and nitrogen oxides with carbon monoxide in the presence of a second oxidation catalyst to yield nitrogen, carbon dioxide and sulfur and separating said nitrogen and carbon dioxide from said sulfur;
- d. burning said alkylation acid containing absorbed flue gases in the presence of oxygen to reduce hydrocarbon

and water content thereof to produce a mixture comprising carbon dioxide, nitrogen oxides and sulfur dioxide;

- e. contacting said mixture resulting from step (d) with a third oxidation catalyst in the presence of oxygen to effect conversion therein of said sulfur dioxide to sulfur trioxide;
- f. combining the sulfur trioxide containing mixture resulting from step (e) with a portion of the sulfur trioxides formed in step (i) with water to form sulfuric acid in the aqueous phase;
- g. separating the sulfuric acid formed in step (f) from unabsorbed nitrogen oxides and carbon dioxide gases of step (f), contacting said unabsorbed carbon dioxide and nitrogen oxides with carbon monoxide in the presence of a fourth oxidation catalyst to form carbon dioxide and nitrogen;
- h. adding a portion of the sulfur trioxide formed in step (i) to the separated sulfuric acid of step (g) to effect greater concentration thereof;
- i. oxidizing the sulfur separated in step (c) in the presence of a fifth oxidation catalyst and oxygen to produce sulfur trioxide.

4,014,983

## REMOVAL OF HYDROGEN SULFIDE FROM GASES

Leslie C. Hardison, Barrington, Ill., assignor to Air Resources, Inc., Palatine, Ill.

Filed Apr. 7, 1975, Ser. No. 566,042

Int. Cl.<sup>2</sup> C01B 17/04

U.S. Cl. 423—575

3 Claims

1. In a Claus process wherein a hydrogen sulfide rich gas is treated in reactors for removal of hydrogen sulfide and the effluent tail gas from said reactors is passed through an incinerator, the improved method of treating said tail gas which comprises:

- a. contacting said tail gas, in a first contacting zone, with an aqueous chelated iron solution which has been contacted previously with sulfur dioxide, whereby to effect reaction of the hydrogen sulfide in said tail gas with sulfur dioxide;
- b. withdrawing from said first contacting zone a residual gas stream which has substantially all the hydrogen sulfide removed therefrom but which contains other sulfur-containing compounds, such as CS<sub>2</sub>, COS, and free sulfur, and passing said residual gas stream through said incinerator wherein said sulfur-containing compounds are converted to sulfur dioxide;
- c. withdrawing used solution from said first contacting zone and contacting the same, in a second contacting zone, with the sulfur dioxide-containing gas stream from said incinerator, thereby removing sulfur dioxide;
- d. recycling the resultant sulfur dioxide-containing solution from said second contacting zone to said first contacting zone;
- e. discharging the treated gas from said second contacting zone; and
- f. recovering the sulfur formed by the reaction of hydrogen sulfide with sulfur dioxide in step (a).

4,014,984

RECOMBINING OF DISSOCIATED HYDROGEN AND OXYGEN

Marvin J. Parnes, Norwalk, Conn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 301,698, Oct. 27, 1972, Pat. No. 3,859,053. This application Oct. 8, 1974, Ser. No. 513,029

Int. Cl.<sup>2</sup> C01B 5/00

U.S. Cl. 423—580

3 Claims

1. A method for removing and recombining dissociated H<sub>2</sub> and O<sub>2</sub> occurring in a radioactive atmosphere of a containment zone to preclude a build-up of free H<sub>2</sub>, which comprises:

- a. introducing the dissociated gaseous stream to the inlet end of and passing the same through an elongated tubular

4,014,986

## X-RAY CONTRAST MEDIA

Guy Tilly, Michel Jean Charles Hardouin, and Jean Lautrou, all of Aulnay-sous-Bois, France, assignors to Laboratoires Andre Guerbet, Aulnay-sous-Bois, France

Filed May 20, 1975, Ser. No. 579,279

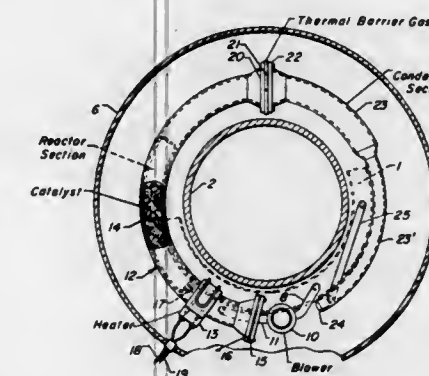
Claims priority, application United Kingdom, May 31, 1974, 24169/74; July 31, 1974, 33900/74

Int. Cl.<sup>2</sup> C07C 63/10; A61K 29/02

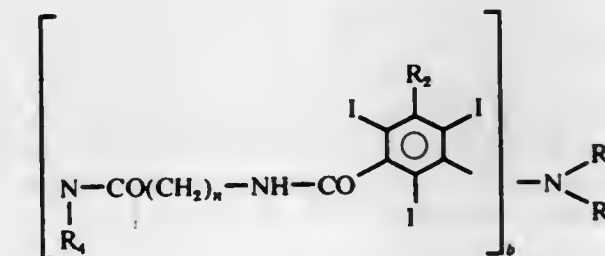
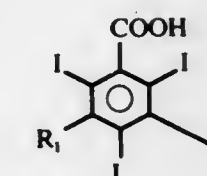
U.S. Cl. 424—5

5 Claims

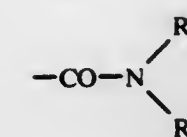
1. An iodobenzene derivative selected from the group consisting of a compound of the formula



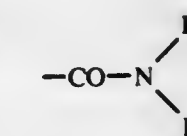
- d. passing said preheated stream through a thermal barrier zone to prevent heat transfer to a following cooling portion of said tubular and circular zone then cooling the reacted gaseous stream in a final cooling portion of said tubular and circular zone to condense said H<sub>2</sub>O vapor; and
- e. returning the resultant water condensate by gravity flow from the outlet end of said tubular and circular zone to said containment zone.



in which:  
R<sub>1</sub> is



R<sub>5</sub> and R<sub>6</sub> being each selected from the group consisting of hydrogen, lower alkyl, lower hydroxyalkyl and lower alkanoyloxyalkyl,  
R<sub>2</sub> is



in which R<sub>9</sub> and R<sub>10</sub> have the meanings given for R<sub>5</sub> and R<sub>6</sub>,  
R<sub>4</sub> is selected from the group consisting of hydrogen, lower alkyl and lower hydroxyalkyl,  
R<sub>15</sub> is selected from the group consisting of hydrogen, lower alkanoyl and polyhydroxy lower alkanoyl,  
R<sub>16</sub> is selected from the group consisting of hydrogen, lower alkyl, lower hydroxyalkyl and lower alkanoyl,  
n is an integer from 1 to 5  
b is 1 or 2  
and the different R<sub>2</sub>, R<sub>4</sub> and n which exist when b = 2 may have the same or different meanings,  
a lower alkyl ester thereof and a salt thereof with a pharmaceutically acceptable base.

4,014,985

PRECIPITATION OF ALUMINUM OXIDE HAVING LOW SODIUM OXIDE CONTENT

Leonard W. Haleen, Edwardsville, Ill., and Alan Pearson, St. Louis, Mo., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 22, 1975, Ser. No. 643,380

Int. Cl.<sup>2</sup> C01F 7/14

U.S. Cl. 423—629

2 Claims

1. The process of producing an aluminum oxide having a sodium oxide content after calcining of less than 0.1% by weight which comprises:

- a. continuously precipitating aluminum oxide in a first tank maintained at a temperature of 55°–80° C and an alumina-to-caustic ratio of 0.68 while
  - 1. adding feed liquor at an alumina-to-caustic ratio of 1.04 into said tank at a flow rate in liters per minute equal to approximately 0.043% of the volume of said tank; and
  - 2. simultaneously adding aluminum hydroxide seed slurry to said tank at a rate in meters<sup>3</sup> per hour to maintain a precipitation rate in said tank of less than 0.03 grams Al<sub>2</sub>O<sub>3</sub> per hour per meter<sup>2</sup> of said aluminum hydroxide seed added to the tank per hour;
- b. feeding the resultant precipitate slurry from said first tank to a second tank maintained at a temperature of about 70° C at a flow rate in liters per minute equal to 0.115% of the volume of said second tank to maintain an alumina-to-caustic ratio of about 0.61 in said second tank; and
- c. recovering a low soda aluminum hydroxide precipitate from said second tank characterized by a sodium oxide content after calcining of less than 0.1% by weight.



4,014,987

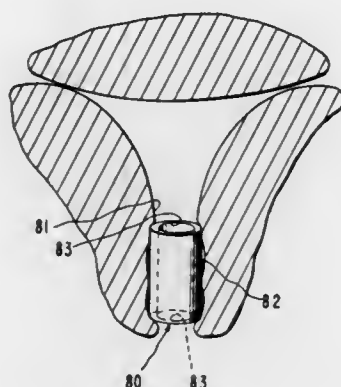
## DEVICE FOR DELIVERY OF USEFUL AGENT

Jorge Heller, Palo Alto, Calif., and Richard W. Baker, Bend, Oreg., assignors to Alza Corporation, Palo Alto, Calif.  
Continuation-in-part of Ser. No. 476,246, June 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 318,831, Dec. 27, 1972, abandoned. This application June 30, 1975, Ser. No. 591,443

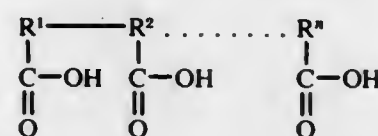
Int. Cl.<sup>2</sup> A61K 47/00, 9/02

U.S. Cl. 424—15

13 Claims



1. A device for the controlled local administration of drug to the vagina comprising a matrix or hollow body made of drug release rate controlling material formed of a hydrophobic poly(acid) represented by the formula:



wherein the R's are organic radicals independently selected to provide on the average from 8 to 22 total carbon atoms for each carboxylic hydrogen, said body of drug release rate controlling material containing a vaginally acceptable drug dispersed therethrough, the device shaped and adapted for insertion and placement in the vagina, and wherein the release rate controlling material erodes at a controlled rate over a prolonged period of time when the device is in the vagina in response to the environment of the vagina, thereby releasing the dispersed drug to the vagina at a controlled rate over a prolonged period of time.

4,014,988

## METHOD FOR TREATING HYPERMENORRHEA WITH UTERINE THERAPEUTIC SYSTEM

Bruce B. Pharriss, Palo Alto; Ross R. Erickson, Sunnyvale, and Stephen A. Tillson, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Oct. 31, 1975, Ser. No. 627,506

Int. Cl.<sup>2</sup> A61K 9/02, 31/58, 31/56

U.S. Cl. 424—14

17 Claims

1. A method for treating hypermenorrhea in a warm blooded animal which method comprises administering to the uterus of the animal from a means sized, shaped and adapted for placement in the uterus a therapeutically effective amount of a progestational steroid for a prolonged period of time to impart relief from said hypermenorrhea.

4,014,989

## PHARMACEUTICAL AEROSOL COMPOSITIONS COMPRISING PUTRESCINE PROSTAGLANDINS

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 413,514, Nov. 7, 1973, abandoned, which is a division of Ser. No. 72,869, Sept. 16, 1970, Pat. No. 3,845,111. This application Oct. 1, 1975, Ser. No. 618,581

Int. Cl.<sup>2</sup> A61K 9/00, 31/215, 31/205

U.S. Cl. 424—45

1 Claim

1. A pharmaceutical aerosol formation for inhalation therapy wherein the aerosol is comprised of about 100 mg to 500

mg of a prostanoate selected from the group consisting of 1,4-diaminobutane-11 $\alpha$ ,15(S)-dihydroxy-9-oxo-5-cis,13-trans-prostadienoate; 15(S)-hydroxy-9-oxo-10,13-trans-prostadienoate; 9 $\alpha$ ,11 $\alpha$ ,15(S)-trihydroxy-5-cis,13-trans-prostadienoate; and 9 $\alpha$ ,11 $\alpha$ ,15(S)-trihydroxy-5-cis,13-trans,17-cis-prostatrienoate wherein the prostanoate is mixed with an inert non-toxic gaseous propellant and a pharmaceutically acceptable cosolvent for the propellant and the prostanoate.

4,014,990

ANIMATED- $\gamma$ -DIALDEHYDES IN HAIR STRENGTHENING COMPOSITIONS

Guy Vanlerberghe, Montjay-La-Tour par Claye-Souilly, and Georges Rosenbaum, Asnieres, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Division of Ser. No. 210,217, Dec. 20, 1971, Pat. No. 3,812,246. This application Apr. 24, 1974, Ser. No. 463,808  
Claims priority, application Luxembourg, Dec. 24, 1970, 62317

The portion of the term of this patent subsequent to May 21, 1991, has been disclaimed.

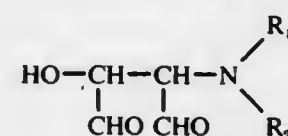
Int. Cl.<sup>2</sup> A61K 7/66

U.S. Cl. 424—70

11 Claims

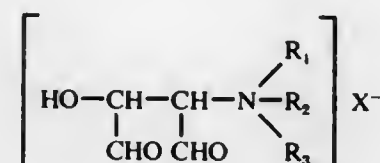
1. A process for strengthening the hair for the purpose of improving its cosmetic qualities comprising applying to the hair for a period of 5 to 60 minutes at a temperature of 15°–50° C a composition comprising a solution in a solvent selected from the group consisting of ethanol and isopropanol, of 2–25 percent by weight of said composition of a dialdehyde selected from the group consisting of

1. an aminated  $\gamma$ -dialdehyde having the formula



wherein R<sub>1</sub> and R<sub>2</sub> each independently are selected from the group consisting of hydrogen, alkyl having 1–6 carbon atoms, hydroxy alkyl wherein the alkyl moiety has 1–6 carbon atoms, cycloalkyl having 3–6 carbon atoms, phenyl, benzyl, (2,5-dialkoxy-4-hydroxy)-3-tetrahydrofuryl wherein each of the alkoxy moieties has 1–4 carbon atoms,  $\beta$ -N-aminoethyl wherein each of the alkoxy moieties has 1–4 carbon atoms, and together with the nitrogen atom to which they are attached form a heterocycle selected from the group consisting of piperidiny and morpholinyl; and

2. a quaternary ammonium salt having the formula



wherein R<sub>1</sub> and R<sub>2</sub> each independently are selected from the group consisting of alkyl having 1–6 carbon atoms, hydroxyalkyl wherein the alkyl moiety has 1–6 carbon atoms, cycloalkyl having 3–6 carbon atoms, phenyl, benzyl, (2,5-dialkoxy-4-hydroxy)-3-tetrahydrofuryl wherein each of the alkoxy moieties has 1–4 carbon atoms,  $\beta$ -N-aminoethyl wherein each of the alkoxy moieties has 1–4 carbon atoms and together with the nitrogen atom to which they are attached form a heterocycle selected from the group consisting of piperidiny and morpholinyl, R<sub>3</sub> is selected from the group consisting of lower alkyl having 1–4 carbon atoms and benzyl, and X<sup>–</sup> represents a member selected from the group consisting of chloride, bromide, iodide, methosulfate, ethosulfate, paratoluene sulfonate and methane sulfonate, said composition having a pH between 1.5 and 9.

4,014,991

## ORAL RABIES IMMUNIZATION OF CARNIVORES

George M. Baer, and William G. Winkler, both of Stone Mountain, Ga., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jan. 23, 1976, Ser. No. 651,810

Int. Cl.<sup>2</sup> A61K 39/28

U.S. Cl. 424—89

18 Claims

1. A method of protecting wild carnivores from rabies virus which comprises orally administering to said carnivores an immunizing dose of an attenuated liquid antirabies vaccine containing a temperature stabilizer obtained from a casein hydrolysate, said vaccine being enclosed in a bite-permeable hydrophobic plastic container and said container being surrounded by an acceptable meat bait for said carnivore.

4,014,992

## ACETYLATED WATERSOLUBLE EXTRACTS OF CORYNEBACTERIA, PROCESS FOR OBTAINING THEM AND THEIR USE

Pierre Jolles, Paris, and Daniele Migliore-Samour, Kremlin-Bicetre (Val de Marne), both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Apr. 30, 1975, Ser. No. 573,199

Claims priority, application France, May 6, 1974, 74.15571

Int. Cl.<sup>2</sup> A61K 39/02, 39/00

U.S. Cl. 424—92

7 Claims

1. An immunological adjuvant composition comprising low molecular weight acetylated water soluble fragments consisting essentially of a disaccharide-tetrapeptide, a tetrasaccharide-heptapeptide and the dimer, trimer and tetramer of the latter, said adjuvant being produced by the steps of subjecting delipidated bacterial residue of *Corynebacterium Parvum* containing diaminopimelic acid to acetylation, and extraction with watersoluble alcohol and water, said fragments being acetylated, containing diaminopimelic acid, having a molecular weight between 1000 $\pm$ 200 and 8000 $\pm$ 200 and being associated with acetylated non-aminated reducing sugars.

4,014,993

## INHIBITION OF PLATELET AGGREGATION WITH SUBSTITUTED PHENYLHYDRATROPIC ACID COMPOUNDS

Neel C. Sekhar, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

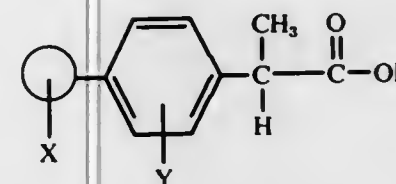
Continuation of Ser. No. 514,840, Oct. 15, 1975, abandoned, which is a continuation of Ser. No. 324,027, Jan. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 235,659, March 17, 1972, abandoned. This application Nov. 17, 1975, Ser. No. 632,206

Int. Cl.<sup>2</sup> A61K 35/14, 31/19; C12B 3/00

U.S. Cl. 424—101

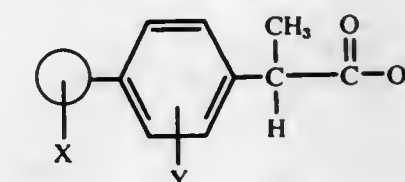
6 Claims

1. A process for inhibiting platelet aggregation in vitro comprising the addition of an effective amount of a compound of the formula:

wherein  $\bigcirc$ 

is phenyl or cyclohexane and X and Y can be the same or different and are hydrogen, fluoro, chloro, bromo, alkyl of from 1 to 8 carbon atoms inclusive or alkoxy of from 1 to 8 carbon atoms, inclusive and the pharmacologically acceptable salts thereof to whole blood or platelet-rich concentrates.

4. A process of prophylactic treatment to prevent clot formation comprising the administration of an effective amount of a compound of the formula:



wherein  $\bigcirc$  is phenyl or cyclohexane and X and Y can be the same or different and are hydrogen, fluoro, chloro, bromo, alkyl of from 1 to 8 carbon atoms, inclusive or alkoxy of from 1 to 8 carbon atoms, inclusive, and the pharmacologically acceptable salts thereof to a human or animal having elevated platelet adhesiveness.

4,014,994

## PROCESS FOR THE RECOVERY AND PURIFICATION OF PARTRICIN

Sergio Magnaghi, Milan; Eustorgio Felci, Pogliano Milanese (Mi), and Rodolfo Ferrari, Milan, all of Italy, assignors to SPA-Societa Prodotti Antibiotici S.p.A., Milan, Italy

Filed Aug. 29, 1975, Ser. No. 609,147

Claims priority, application United Kingdom, Aug. 29, 1974, 37773/74

Int. Cl.<sup>2</sup> A61K 35/00

U.S. Cl. 424—123

9 Claims

1. A process for the recovery of partricin from a fermented liquor containing said partricin, which comprises adding a surface-active agent selected from the group consisting of a cationic alkyl aryl ammonium salt and an anionic alkali metal alkyl sulphate to the fermented liquor in an amount of from 10 to 40 g of the surface-active agent per liter of the fermented liquor at a pH of from 9 to 11, removing insoluble material from the resultant mixture and isolating the partricin from the resultant aqueous solution.

4,014,995

## COSMETICS CONTAINING FINELY DIVIDED OAT FLOUR

Angelo L. Juliano, Chicago, and Aaron Miller, Northbrook, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 398,651, Sept. 19, 1973, abandoned.

This application Apr. 7, 1975, Ser. No. 565,695

Int. Cl.<sup>2</sup> A61K 31/00, 47/00

U.S. Cl. 424—168

5 Claims

1. A liquid cosmetic preparation comprising a colloidal stable dispersion of oat flour having a particle size such that at least about 98% thereof passes through a 200 mesh screen (U.S. Sieve Series) in a liquid vehicle, said oat flour being employed in an amount of from about 1 to 20% by weight of the preparation.

4,014,996

## O-ALKYL-O-PYRIMIDIN (2)YL-THIONOPHOSPHONIC ACID ESTERS

Fritz Maurer; Hans-Jochem Riebel, both of Wuppertal; Wolfgang Behrenz, Overath-Steinenbrueck; Ingeborg Hammann, Cologne, and Bernhard Homeyer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 25, 1975, Ser. No. 607,327

Claims priority, application Germany, Aug. 24, 1974, 2440677

Int. Cl.<sup>2</sup> C07F 9/65; A01N 9/36

U.S. Cl. 424—200

11 Claims

1. An O-alkyl-O-pyrimidin(2)yl-thionophosphonic acid ester of the formula







4,015,003

## ANTIDEPRESSANT

1,1A,6,10B-TETRAHYDRODIBENZO[A,E]-CYCLO-  
PROPA-[C]-CYCLOHEPTEN-6-SUBSTITUTED OXIMES  
Roy Teruyuki Uyeda, Newark, Del., assignor to E. I. Du Pont  
de Nemours and Company, Wilmington, Del.

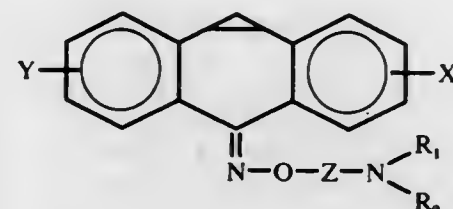
Division of Ser. No. 616,483, Sept. 26, 1975, Pat. No.  
3,960,956, which is a continuation-in-part of Ser. No. 525,877,  
Nov. 21, 1974, abandoned. This application Mar. 15, 1976,  
Ser. No. 667,275

Int. Cl.<sup>2</sup> C07D 295/00, 211/06, 207/08

U.S. Cl. 424—248.5

3 Claims

1. A compound of the formula



where

X or Y = H, F, Cl, Br, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, CF<sub>3</sub>, CH<sub>3</sub>S,  
CH<sub>3</sub>SO<sub>2</sub>, SO<sub>2</sub>N(CH<sub>3</sub>)<sub>2</sub>, provided that one is H;

Z = C<sub>2</sub>-C<sub>3</sub> alkylene;R<sub>1</sub> and R<sub>2</sub> together form a ring with N:

in which W can be —(CH<sub>2</sub>)<sub>4</sub>—, —(CH<sub>2</sub>)<sub>5</sub>—, or —(CH<sub>2</sub>)<sub>6</sub>—  
O(CH<sub>2</sub>)<sub>2</sub>—; and its pharmaceutically suitable salts.

4,015,004

## PHENYLSULFENYLPIPERAZINES

Solomon S. Klioze, and Richard C. Allen, both of Flemington,  
N.J., assignors to American Hoechst Corporation, Bridge-  
water, N.J.

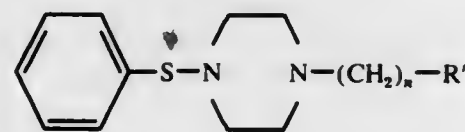
Filed Aug. 26, 1975, Ser. No. 607,927

Int. Cl.<sup>2</sup> C07D 295/22

U.S. Cl. 424—250

13 Claims

1. A compound of the formula



wherein n is the integer 0 or 1 and R' is pyridyl, phenyl or  
phenyl substituted by halogen, lower alkyl, lower alkoxy or  
trifluoromethyl.

4,015,005

1,2,5,6-TETRAHYDRO-4H-PYRROLO(3,2,1-ij)QUINOLIN-  
2-ONES

Goetz E. Hardtmann, Morristown, N.J., assignor to Sandoz,  
Inc., E. Hanover, N.J.

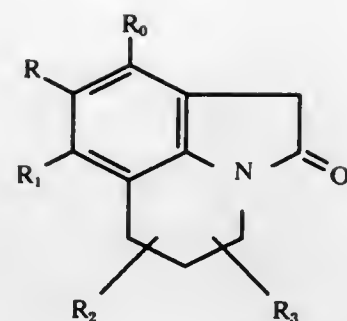
Continuation-in-part of Ser. No. 473,778, May 28, 1974,  
abandoned. This application June 23, 1975, Ser. No. 589,371

Int. Cl.<sup>2</sup> C07D 471/06

U.S. Cl. 424—258

16 Claims

1. A pharmaceutical composition for tranquilizing or inducing  
sleep comprising in unit dosage form an inert pharmaceuti-  
cally acceptable carrier and from 40 to 1600 milligrams of a  
compound of the formula:



wherein

R<sub>0</sub>, R and R<sub>1</sub> are independently hydrogen, fluoro, chloro or  
lower alkyl of 1 to 4 carbon atoms, and

R<sub>2</sub> and R<sub>3</sub> are independently hydrogen or alkyl of 1 to 4  
carbon atoms,

with the proviso that at least one of R<sub>0</sub>, R and R<sub>1</sub> is hydrogen.

4,015,006

## 3(2H)-ISOQUINOLONES THERAPEUTIC PROCESS

William E. Kreighbaum, and William T. Comer, both of Ev-  
ansville, Ind., assignors to Mead Johnson & Company, Ev-  
ansville, Ind.

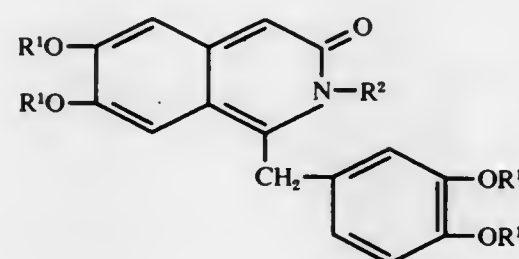
Division of Ser. No. 423,841, Dec. 11, 1973, Pat. No.  
3,910,927, which is a division of Ser. No. 184,197, Sept. 27,  
1971, Pat. No. 3,798,225. This application Sept. 12, 1975, Ser.  
No. 612,884

Int. Cl.<sup>2</sup> A61K 31/47

U.S. Cl. 424—258

15 Claims

1. A process for eliciting a hypotensive and vasodilating  
effect in a mammal in need thereof which comprises systemic  
administration to said mammal a non-toxic effective dose of  
from about 0.05 to 20 mg./kg. of body weight of said mammal  
of a compound selected from the group consisting of those  
having the formula



wherein

R<sup>1</sup> is lower alkyl having up to 4 carbon atoms;

R<sup>2</sup> is selected from the group consisting of hydroxy, amino,  
lower alkylamino having up to 4 carbon atoms, lower  
dialkylamino having up to 4 carbon atoms, lower alkyl  
having up to 4 carbon atoms, alkenyl having from 3 to 6  
carbon atoms, cycloalkyl having from 3 to 5 carbon  
atoms, phenylalkyl having up to 10 carbon atoms and  
substituted phenylalkyl having up to 10 carbon atoms  
apart from the substituent, said substituent being in the  
2-, 3-, 4-, 5-, or 6-ring positions and being selected from  
the group consisting of halogen, lower alkyl having up to  
4 carbon atoms, and methylenedioxy, or from 1 to 3  
lower alkoxy groups having up to 4 carbon atoms each;  
and a pharmaceutically acceptable acid addition salt  
thereof.

4,015,007

## HETEROCYCLIC SPIRO COMPOUNDS

Karl Schaffner, Binningen; Alex Meisels, Basel, both of Swit-  
zerland; Jean Claude Roger, New York, N.Y., and Claus D.  
Weis, Pfeffingen, Switzerland, assignors to Ciba-Geigy Cor-  
poration, Ardsley, N.Y.

Division of Ser. No. 356,545, May 2, 1973, Pat. No. 3,914,222.

This application July 23, 1975, Ser. No. 598,304

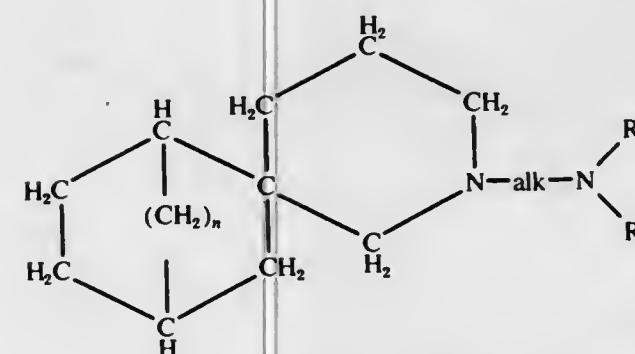
Claims priority, application Switzerland, May 4, 1972,  
6613/72

Int. Cl.<sup>2</sup> C07D 221/20

U.S. Cl. 424—267

6 Claims

1. An antiviral pharmaceutical composition comprising an  
antivirally effective amount of a heterocyclic spiro compound



in which alk represent ethylene, trimethylene or 2-hydroxy-  
trimethylene, R<sub>2</sub> represents hydrogen, methyl or benzyl, R<sub>3</sub>  
represents hydrogen or methyl, or R<sub>2</sub> and R<sub>3</sub> together repre-  
sent tetramethylene, pentamethylene, 2,2-pentamethylene-  
pentamethylene, or 2,2-(1,4-methanopentamethylene)-pen-  
tamethylene and n denotes 1 or 2, or of a pharmaceutically  
acceptable acid addition salt thereof together with a pharma-  
ceutically acceptable carrier.

4,015,008

N,N-DICHLORO SUBSTITUTED AMINOCARBOXYLIC  
ACIDS AS MICROBIOCIDES

Sol Joseph Barer, Elizabeth; Richard Frederick Stockel,  
Bridgewater Township, and Peter Carl Valenti, East  
Windsor, all of N.J., assignors to National Patent Develop-  
ment Corporation, New York, N.Y.

Division of Ser. No. 438,712, Feb. 1, 1974, Pat. No. 3,950,536.

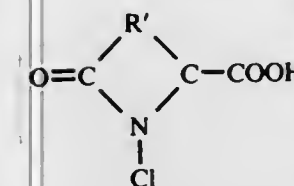
This application Sept. 10, 1975, Ser. No. 611,972

Int. Cl.<sup>2</sup> A01N 9/22

U.S. Cl. 424—274

12 Claims

1. A method for treating fungal and bacterial infections of  
any area of the skin or mucous membrane comprising bringing  
said area into contact with a microbicidally effective amount  
of an N-chloro carboxylic acid compound having the formula:



wherein R' is a divalent aliphatic hydrocarbon group having 2  
to 4 carbon atoms.

4,015,009

PHARMACEUTICAL COMPOSITIONS COMPRISING  
SUBSTITUTED

## 3-CINNAMOYL-2H-PYRAN-2,6(3H)-DIONES

Lawrence William Chakrin, Haddonfield, N.J.; Kenneth  
Means Snader, Hatboro, Pa., and Chester Rhodes Willis,  
Kingston, Jamaica, assignors to SmithKline Corporation,  
Philadelphia, Pa.

Continuation-in-part of Ser. No. 511,153, Oct. 2, 1974,  
abandoned. This application Feb. 19, 1976, Ser. No. 659,305

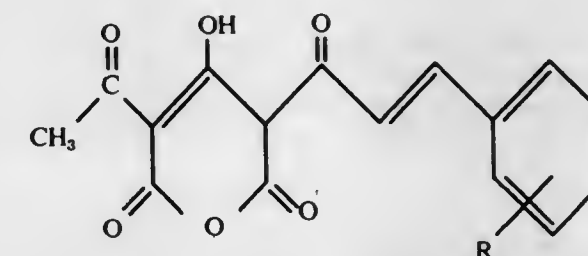
Claims priority, application United Kingdom, Sept. 11,  
1975, 37418/75

Int. Cl.<sup>2</sup> A61K 31/35

U.S. Cl. 424—283

12 Claims

1. A pharmaceutical composition for inhibiting the symp-  
toms of asthma comprising a nontoxic pharmaceutical carrier  
or diluent and an amount sufficient to produce said inhibition  
of a compound of the formula:



wherein R is hydrogen, methoxy, dimethoxy, hydroxy, methyl,  
carboxymethyleneoxy, acetamido or 3-acetamido-4-hydroxy.

4,015,010

ALKANOYL SUBSTITUTED BENZOIC ACIDS AND  
ESTERS

William J. Houlihan, Mountain Lakes, and Jeffrey Nadelson,  
Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E.  
Hanover, N.J.

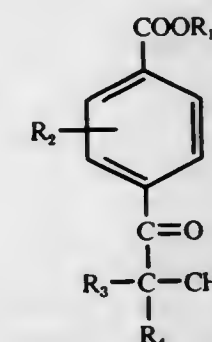
Filed Mar. 3, 1975, Ser. No. 554,508

Int. Cl.<sup>2</sup> A61K 31/235, 31/19

U.S. Cl. 424—308

25 Claims

1. A method of treating obesity which comprises adminis-  
tering to a mammal in need of said treatment an anti-obesity  
effective amount of a compound of the formula:



where

R<sub>1</sub> represents hydrogen, or straight chain lower alkyl, and  
R<sub>2</sub> represents hydrogen, halo having an atomic weight of  
about 19 to 36, or straight chain lower alkoxy, and  
R<sub>3</sub> and R<sub>4</sub> each independently represent alkyl having 1 to 2  
carbon atoms.



4,015,011

## PHENYLALKYLAMINES AND SALTS THEREOF

Kurt Schromm; Anton Mentrup; Ernst Otto Renth, all of Ingelheim Am Rhein, Germany; Ludwig Pichler, Vienna, Austria, and Werner Traunecker, Ingelheim Am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Apr. 25, 1975, Ser. No. 571,719

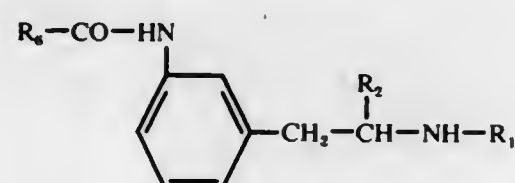
Claims priority, application Germany, Apr. 27, 1974, 2420618

Int. Cl.<sup>2</sup> A61K 31/165

U.S. Cl. 424—324

5 Claims

1. A compound of the formula



wherein

R<sub>1</sub> is hydrogen or  $-(CH_2)_n-H$ , where  $n$  is 1 or 2,R<sub>2</sub> is hydrogen or methyl, andR<sub>3</sub> is hydrogen or methyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,015,012

## 4-ACYLAMINOPHENYLACETAMIDINES AND A METHOD FOR THEIR PREPARATION

Hartmund Wollweber; Ekkehard Niemers; Hans Peter Schulz; Herbert Thomas, and Peter Andrews, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 505,738, Sept. 13, 1974, Pat. No. 3,970,699. This application May 21, 1975, Ser. No. 579,446

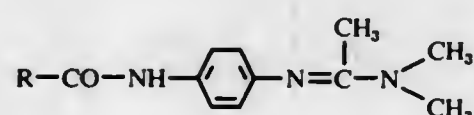
Claims priority, application Germany, Sept. 18, 1973, 2346939

Int. Cl.<sup>2</sup> A61K 31/165

U.S. Cl. 424—324

51 Claims

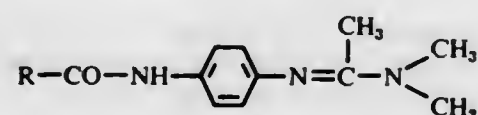
1. A pharmaceutical composition useful for treating helminthic infections in humans and animals which comprises an anthelmintically effective amount of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof wherein

R is straight or branched chain alkoxyalkyl having 3 to 8 carbon atoms, either unsubstituted or substituted in the alkoxy moiety by one or two of the same or different members selected from the group consisting of alkoxy of 1 to 4 carbon atoms and phenyl; or straight or branched chain alkenyloxyalkyl having 3 to 8 carbon atoms either unsubstituted or substituted in the alkoxy moiety by one or two of the same or different members selected from the group consisting of alkoxy of 1 to 4 carbon atoms and phenyl in combination with a pharmaceutically acceptable non-toxic diluent or carrier.

28. A method of treating helminthic infections in humans and animals which comprises administering to a human or animal in need thereof an anthelmintically effective amount of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof, wherein

R is straight or branched chain alkoxyalkyl having 3 to 8 carbon atoms, either unsubstituted or substituted in the alkoxy moiety by one to two of the same or different members selected from the group consisting of 1 to 4 carbon atoms and phenyl; or straight or branched chain alkenyloxyalkyl having 3 to 8 carbon atoms either unsubstituted or substituted in the alkoxy moiety by one or two of the same or different members selected from the group consisting of alkoxy of 1 to 4 carbon atoms and phenyl.

4,015,013

## CERTAIN QUATERNARY AMMONIUM SALTS USED TO CONTROL GRAM-NEGATIVE BACTERIA

André Henri Passedouet, Maisons-Laffite, and Robert Pipon, Melle, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 406,024, Oct. 12, 1973, abandoned.

This application June 10, 1975, Ser. No. 585,755

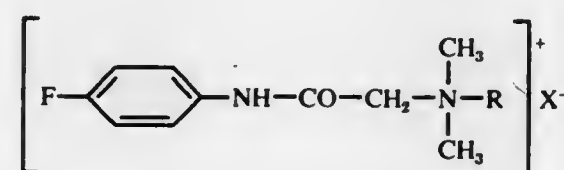
Claims priority, application France, Oct. 16, 1972, 72,36571

Int. Cl.<sup>2</sup> A01N 9/20; A01L 13/00

U.S. Cl. 424—324

13 Claims

1. A method of killing or preventing the growth of Gram-negative bacteria which comprises contacting said bacteria with an amount of a quaternary ammonium compound of the formula:



in which R is straight or branched alkyl of 7 to 16 carbon atoms and X<sup>-</sup> is a monovalent anion, sufficient to kill or prevent the growth of said bacteria.

4,015,014

## METHOD FOR THE USE OF ARYL AZINES AS ANTHELMINTICS

Robert D. Vatne; Paul B. Budde, and Jack P. Arrington, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

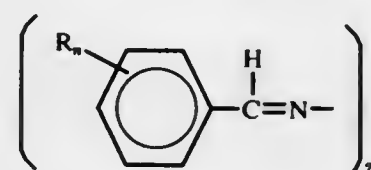
Filed Mar. 17, 1976, Ser. No. 667,779

Int. Cl.<sup>2</sup> A61K 31/165, 31/115

U.S. Cl. 424—324

28 Claims

1. A method for the control of Haemonchus in ruminant animals which comprises orally administering to said animals an anthelmintically effective amount of an aryl azine corresponding to the formula



wherein R independently represents hydrogen, hydroxy, loweralkyl of 1 to 4 carbon atoms, loweralkoxy of 1 to 4 carbon atoms, alkylamino of 1 to 4 carbon atoms, acetamido or halo and  $n$  represents an integer of 1 or 2.

15. An animal feed composition which comprises an animal feed and from 1-95 percent by weight of an aryl azine corresponding to the formula

and  $n$  represents an integer of 1 or 2 with the proviso that when  $n$  is 1, the X representation is in the 4 ring position and when  $n$  is 2, the X representations are in any of the 3, 4 or 5 ring positions.

4,015,017

## CERTAIN BIPHENYL DERIVATIVES USED TO TREAT DISORDERS CAUSED BY INCREASED CAPILLARY PERMEABILITY

Jean-Maurice Gazave, Paris; Alain Rancurel, Chartres, and Georges Grenier, Epervon, all of France, assignors to Laboratoires Pharmascience, Courbevoie, France

Filed Jan. 14, 1975, Ser. No. 541,022

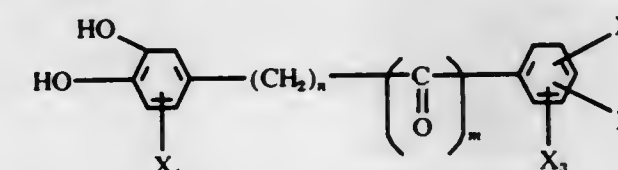
Claims priority, application France, Jan. 15, 1974, 74,01228

Int. Cl.<sup>2</sup> A61K 31/12

U.S. Cl. 424—331

2 Claims

1. A method of treating a patient suffering from a disorder caused by an increase of capillary permeability which comprises administering to such patient one to 30 mg/kg of body weight daily of a compound of the following formula:



wherein X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, and X<sub>4</sub> are selected from the group consisting of H and OH,  $n$  is a number from 0 to 1 and  $(n+m)$  equals 1 or 2, together with a pharmaceutically acceptable carrier.

4,015,018

## SILAGE PROCESS AND PRODUCT

Elmer F. Glabe, Northbrook, Ill., and Herbert J. Rebhan, New Richmond, Wis., assignors to Food Technology Products, Chicago, Ill.

Continuation-in-part of Ser. No. 629,500, Nov. 6, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,211

Int. Cl.<sup>2</sup> A23K 3/03

U.S. Cl. 426—2

10 Claims

1. A process of making silage which comprises intimately mixing with moisture-containing chopped vegetation from which the silage is produced a quantity of sodium diacetate and dehydrated whey in synergistic proportions, and fermenting the resultant mixture, the proportions of sodium diacetate and dehydrated whey being sufficient to enhance the protein availability of the finished silage.

4,015,019

## PREPARATION OF FOAMING SOYBEAN PRODUCTS AND THE PRODUCTS THEREFROM

Koshichi Sawada, Suita; Masahiro Kajikawa, Kawanishi, and Koichi Kotani, Sakai, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 1, 1975, Ser. No. 564,210

Claims priority, application Japan, Apr. 3, 1974, 49-38339

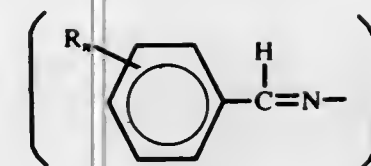
Int. Cl.<sup>2</sup> C12B 1/00

U.S. Cl. 426—46

5 Claims

1. A method for preparing soybean products having good foaming properties, which comprises:

1. subjecting soybean materials selected from the group of whole soybean, deoiled soybean, ground soybean, soybean flakes, coarsely ground soybean and defatted soybean in powdery or flake form containing both whey component and protein to enzymatic hydrolysis, without removing the whey component, until a partially hydrolyzed product, of which the analytical value at 660 mμ showing degree of hydrolysis coming within the range of 0.4 to 0.7, is obtained;



wherein R independently represents hydrogen, hydroxy, loweralkyl of 1 to 4 carbon atoms, loweralkoxy of 1 to 4 carbon atoms, alkylamino of 1 to 4 carbon atoms, acetamido or halo and  $n$  represents an integer of 1 or 2.

4,015,015

## CHEMICAL FIRE ALARM

Richard Norris Knowles, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 300,811, Oct. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 279,832, Aug. 11, 1972, abandoned. This application July 15, 1975, Ser. No. 596,191

Int. Cl.<sup>2</sup> A61K 31/165, 31/135, 31/445

U.S. Cl. 424—324

11 Claims

1. A heat-activated chemical fire and heat alarm for warning humans of a fire hazard comprising

a. a flammable solid substrate having bound thereto

b. 0.0001-1.0% by weight, basis weight of the substrate, of a non-vaporous organic compound having a molecular weight no greater than about 400 which becomes vaporized upon being heated to a temperature no lower than about 200° C and forms in air at a concentration of 100 ppm or less a respiratory mucous membrane irritant, the organic compound being bound to the substrate in non-vaporous form under normal conditions of use, but is vaporized from the surface of the substrate upon exposure to a temperature no lower than about 200° C.

4,015,016

## [(2-ALKOXYBERZYLIDINE)AMINO]QUANIDINES AND THEIR ANTICOCCIDAL USE

John E. Livak, Rutland, Vt., and Paul B. Budde, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 546,568, Feb. 3, 1975, Pat. No. 3,973,039.

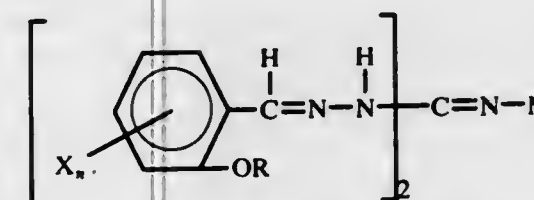
This application May 14, 1976, Ser. No. 686,358

Int. Cl.<sup>2</sup> C07C 133/12; A61K 31/155

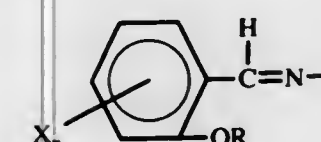
U.S. Cl. 424—326

30 Claims

1. A [(substituted-2-alkoxybenzylidene)amino]-guanidine compound and the pharmacologically acceptable acid addition salts thereof, the guanidine compound corresponding to the formula



wherein R represents methyl, ethyl or benzyl; X represents chloro, bromo, amino, dimethylamino, diethylamino or acetamido; M represents the radical





2. heating the partially hydrolyzed product at about 90° C for 1-10 minutes, cooling to a temperature no greater than 60° C, the pH of the partially hydrolyzed product being brought to a value from 5 to 7 before or after said heating or cooling step;
3. removing precipitates formed; and
4. concentrating and/or drying the resultant solution.

4,015,020

# TARTAR REMOVAL BY ELECTRODIALYSIS AND POTASSIUM LEVEL CONTROL IN WINE

Taro Nagasawa; Mamoru Tomita; Yoshitaka Tamura, all of Tokyo, and Teruhiko Mizota, Fuchi, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan  
Filed Apr. 29, 1975, Ser. No. 572,726

Disclosure was also published under second Trial Voluntary Protest Program on Feb. 24, 1976

Int. Cl.<sup>2</sup> A27D 6/00

U.S. Cl. 426-239

10 Claims

1. A method of treating wine, which comprises: introducing crude wine to both the dilution and concentration chambers of an electrodialysis apparatus; operating said apparatus so that the potassium concentration of the wine in the dilution chamber falls to below 500 mg/liter and the potassium content of the wine in the concentration chamber is increased into the range 1000 to 2000 mg/liter; cooling the wine from the concentration chamber to below 10°C and adding tartaric acid crystals to said wine in order to adjust the pH into the range 2.8 to 3.2 thereby precipitating tartar; separating the tartar from the wine and admixing said wine with wine emerging from the dilution chamber of the electrodialysis apparatus in a ratio such that the potassium content of the resulting mixture is below 500 mg/liter.

4,015,021

# METHOD FOR PRODUCING INDIVIDUALLY WRAPPED FOODSTUFF SLICES

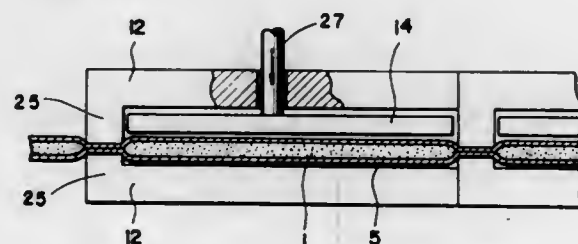
Eiichi Harima, c/o Miyamoto-so, No. 734, Takahata, Hiraoka-cho, Kakogawa, Hyogo, and Yosiro Okubo, No. 14-12, Akabane-kita, 3-chome, Kita, Tokyo, both of Japan  
Continuation of Ser. No. 312,691, Dec. 6, 1972, abandoned.

This application May 13, 1975, Ser. No. 577,052

Int. Cl.<sup>2</sup> B65B 25/06, 9/00

U.S. Cl. 426-393

9 Claims



1. A method for producing a wrapped foodstuff in single slice form comprising:  
extruding the foodstuff into an envelope or tube of wrapping film to form a wrapped foodstuff;  
flattening the wrapped foodstuff into a continuous strip;  
applying a first pressing force against said flat strip at spaced intervals to express the wrapped foodstuff from between said wrapping film at said spaced intervals and form enclosed portions of said strip between said spaced intervals to establish individually wrapped press-molded foodstuff slices of a predetermined length;  
applying a second pressing force transversely against the strip in each enclosed portion after the first pressing force has been applied and while the first pressing force is retained at spaced intervals to further mold the individually wrapped foodstuff slices to a predetermined thickness;  
cooling the wrapped foodstuff slices thus formed;  
heat sealing the wrapping film at said spaced intervals; and

cutting the wrapping film at said spaced intervals to produce individually wrapped and sealed foodstuff slices.

4,015,022

# METHOD OF REDUCING THE CONTENT OF IRRITANT SUBSTANCES IN COFFEE

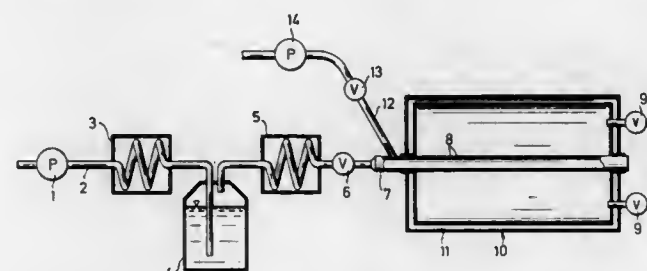
Peter A. W. Emich, deceased, late of Hamburg, Germany; by Edith G. H. Emich nee Leirmann, Hamburg, Germany; by Peter-Michael Emich, Hamburg, Germany; by Ulrich Emich, Hamburg, Germany, and by Barbara Emich, heirs, Hamburg, Germany, assignors to Kaffee-Veredelungs-Werk Koffeinfrei Kaffee GmbH & Co., Hamburg, Germany  
Continuation of Ser. No. 340,665, March 13, 1973, abandoned. This application July 18, 1975, Ser. No. 597,074

Claims priority, application Germany, Mar. 14, 1972, 2212171

Int. Cl.<sup>2</sup> A23F 1/04

U.S. Cl. 426-460

4 Claims



1. A method of reducing the content of hydroxy tryptamides and ether soluble irritant substances in raw coffee to improve digestibility, the method comprising repeatedly first heating followed by cooling of the coffee, the heating treatments comprising continuously passing a stream of hot, humid air at about 257° F through a quantity of such coffee with the coffee maintained below the dew-point of the hot, humid air and moisture condensing on the coffee, and the cooling treatments comprising subjecting the raw coffee to cooling to about 104° F while concurrently subjecting the raw coffee to subatmospheric pressure.

4,015,023

# FOODS WITH SUBSTITUTED SUCCINIC ACID COMPOUNDS

Vincent Lamberti, Upper Saddle River, and Warren J. Urban, River Vale, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

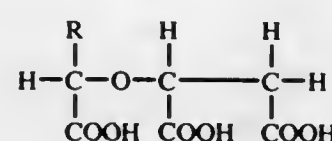
Continuation-in-part of Ser. No. 475,008, May 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 373,339, June 25, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,789

Int. Cl.<sup>2</sup> A23L 1/226

U.S. Cl. 426-531

9 Claims

1. A method of imparting a tart taste to a food which comprises adding thereto a flavor enhancing amount of a compound having substantially no primate caloric value of the formula:



wherein R is hydrogen or methyl.

4,015,024

# AROMATIZING TEA WITH GERANYL ACETONE AND 8-DECALACTONE

Ian Horman, Corseaux, and Paul Cazenave, Chavornay, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., La Tour-de-Peilz, Switzerland  
Division of Ser. No. 519,627, Oct. 31, 1974, abandoned. This application Nov. 7, 1975, Ser. No. 629,979

Claims priority, application Switzerland, Nov. 23, 1973, 16515/73

Int. Cl.<sup>2</sup> A23F 3/00; A23L 1/221, 1/226

U.S. Cl. 426-536

4 Claims

1. An aromatizing agent for enhancing soluble tea solids consisting essentially of geranyl acetone and 8-decalactone wherein said geranyl acetone and 8-decalactone are in a ratio of 1:1 to 1:2 relative to each other.

4,015,025

# HYDROCOLLOIDS AS POTENTIATORS OF DIMETHYL SULFIDE FLAVOR

Alina Surmacka Szczesniak, Mount Vernon, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sept. 24, 1974, Ser. No. 508,956

Int. Cl.<sup>2</sup> A23L 1/226

U.S. Cl. 426-575

4 Claims

1. A method of potentiating the flavor of dimethyl sulfide in foodstuffs which are consumed in the moist or liquid state which method comprises combining alginate with dimethyl sulfide in a respective weight ratio of from about 10:1 to about 120:1 alginate to dimethyl sulfide, in combination with the foodstuff, the dimethyl sulfide thereby being enhanced in flavor in the moist or liquid foodstuff.

4,015,026

# PROCESS FOR PREPARING A MOIST PET FOOD ADDITIVE, THE ADDITIVE, AND THE RESULTANT PET FOOD

Morris P. Burkwall, Jr., Marengo; Carl D. Engstrom, Elmwood Park, and Robert F. Snyder, Hoffman Estates, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 14, 1975, Ser. No. 604,654

Int. Cl.<sup>2</sup> A23C 19/12; A23L 1/32; A23K 1/10

U.S. Cl. 426-582

18 Claims

1. In a moist pet food comprising:  
a. at least 50% moisture;  
b. 10 to 90% of at least one component selected from the group consisting of meat and meat by-products;  
c. 0 to 20% meat meal;  
d. 0 to 25% vegetable or cereal products; and  
e. a visible amount of simulated cottage cheese pieces—the percentages of (a) through (e) being based on the weight of the moist pet food, the improvement comprising: the simulated cottage cheese pieces being retort stable and having a composition consisting essentially of:  
A. about 1 to about 50% cottage cheese;  
B. about 7.5 to about 40% of at least one binder selected from the group consisting of a gluten compound, egg white, and whole egg;  
C. about 5 to about 70% amylaceous ingredients;  
D. about 15 to about 60% moisture content;  
E. 0 to about 20% of at least one protein extender selected from the group consisting of an oil seed protein and a vegetable protein;  
F. 0 to about 2% white coloring; and  
G. 0 to 5% of a natural or synthetic gum — all percentages of (A) through (G) being based on the weight of the simulated cottage cheese pieces.

4,015,027

# ELECTROPHOTOGRAPHIC TONER TRANSFER AND FUSING METHOD

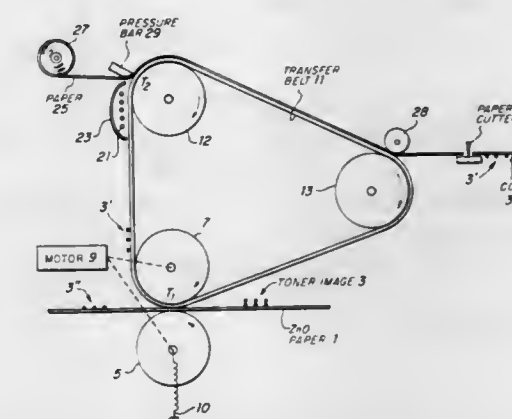
William R. Buchan, Lincoln, Mass., and Robert A. Moore, Amherst, N.H., assignors to Ittek Corporation, Lexington, Mass.

Division of Ser. No. 403,696, Oct. 4, 1973, Pat. No. 3,893,761, which is a continuation-in-part of Ser. No. 303,168, Nov. 2, 1972, abandoned. This application Feb. 20, 1975, Ser. No. 551,583

Int. Cl.<sup>2</sup> G03G 13/20, 13/22

U.S. Cl. 427-22

2 Claims



1. A method for transferring and fusing a non-fused toner image from a first support material to a second support material, comprising:

- a. transferring a toner image from said first support material to an intermediate transfer member having a smooth elastomeric surface with a surface free energy of below about 40 dynes per centimeter, a hardness of from about 3 to about 70 durometers, said intermediate transfer member having a heat capacity of below about  $3.1 \times 10^{-3}$  calories/cm<sup>2</sup>/° C and being formed from a substrate coated with a layer of silicone or fluoroelastomer rubber having a thickness of from 0.1 to about 10 mils and having a thin reflecting layer therebetween, said substrate having a thickness of from about 0.5 to about 5 mils and being a material which has an ultimate tensile strength of at least about 5,000 psi and a creep of below about 3% under a load of 1,000 psi at 175° C;
- b. selectively preheating the toner image on said intermediate transfer member to at least its melting point temperature; and
- c. bringing said second support material into pressure contact with the heated toner image on said intermediate transfer member in a manner sufficient to thereby transfer and fuse the toner image to said second support material.

4,015,028

# METHOD FOR FORMING AN IMPROVED CONTACT FOR A RADIATION SWITCH

Dominic A. Cusano, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 490,585, July 22, 1974, Pat. No. 3,944,961. This application Oct. 20, 1975, Ser. No. 623,586  
Int. Cl.<sup>2</sup> B05D 3/12, 5/12

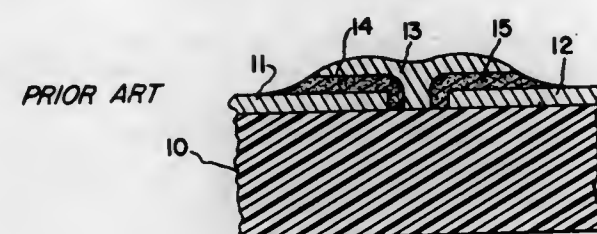
U.S. Cl. 427-58

4 Claims

1. A method of making a radiation switch comprising the steps of:  
applying a pair of conductors to a non-conductive substrate; scribing said conductors over a portion of each of said conductors to a depth sufficient to reduce heat sinking effectiveness of contact portions of said conductors; and



depositing a quantity of conductor precursor material over



said scribed portions of said conductors and a portion of said substrate therebetween.

4,015,029

# SELENIUM AND SELENIUM ALLOY EVAPORATION TECHNIQUE

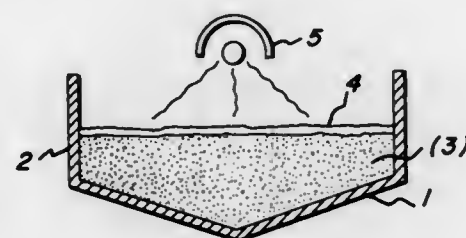
John J. Elchisak, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 27, 1975, Ser. No. 590,972

Int. Cl.<sup>2</sup> C23C 11/00; F27B 14/10

U.S. Cl. 427-76

12 Claims



1. A method for limiting spattering while vacuum coating one or more vaporizable inorganic photoconductive materials or components thereof onto one or more prepared substrates or bases in conjunction with at least one infra red heating device

comprising incorporating 1-80% by weight of at least one non-volatile infra red absorbing heat sink material on or within the body of said inorganic photoconductive material or components thereof prior to effecting evaporation of the materials or components.

10. A crucible for vacuum coating one or more vaporizable inorganic photoconductive materials in conjunction with at least one infrared heating means, said crucible consisting essentially of walls and a bottom element of non-contamination heat resistant materials and a plurality of non-volatile infrared absorbing rods, baffles or projections of the same or different materials arranged at an angle of 90° or less to the horizontal.

4,015,030

# PROCESS FOR STABILIZATION OF FERROMAGNETIC MATERIAL AND MAGNETIC RECORDING MEMBER

Koji Sasazawa; Yasuyuki Yamada; Tatsuji Kitamoto, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 30, 1975, Ser. No. 591,681

Claims priority, application Japan, June 28, 1974, 49-74005

Int. Cl.<sup>2</sup> H01F 10/02

U.S. Cl. 427-130

9 Claims

1. A process for stabilizing the magnetic properties of a ferromagnetic material which comprises heat-treating a needle-like ferromagnetic material having the formula  $\text{FeO}_x$  and containing at least 0.5 atom % of cobalt wherein  $x$  is the degree of oxidation and ranges from 1.36 to 1.47 at a temperature of at least about 40° to 80° C for a time sufficient to achieve the stabilization of said magnetic properties.

6. A process for stabilizing the magnetic properties of a magnetic recording member which comprises providing a

ferromagnetic recording layer comprising (1) a ferromagnetic powder represented by the formula  $\text{FeO}_x$  and containing at least 0.5 atom % of cobalt wherein  $x$  is the degree of oxidation and ranges from 1.36 to 1.47 and (2) a binder, on a support, and heat-treating said ferromagnetic recording layer at a temperature of at least about 40° to 80° C for a time sufficient to achieve the stabilization of said magnetic properties.

4,015,031

# PROCESS FOR HYDROPHOBIZING SILICAS AND SILICATES WITH ORGANOSILANES

Helmut Reinhardt, Rodenkirchen; Karl Trebinger, and Gottfried Kallrath, both of Wesseling, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Rosessler, Frankfurt, Germany

Filed Feb. 2, 1976, Ser. No. 654,707

Claims priority, application Germany, Mar. 27, 1975, 2513608

Int. Cl.<sup>2</sup> B05D 1/00, 7/00

U.S. Cl. 427-213

9 Claims

1. In a process for hydrophobization of finely divided silica or silicate by treatment of dry moving particles of powdery silica or silicate produced by wet precipitation or pyrogenically with an organosilane at an elevated temperature the improvement comprising stirring the silica or silicate in a container at about 200° to 300° C. to bring the silica or silicate to a fluidized condition and while the silica or silicate is in said fluidized condition at said temperature treating the silica or silicate dropwise with an organosilane which is stable at said temperature and boils below 300° C., said organosilane having an active group which will react with the surface of the silica or silicate to be hydrophobized.

4,015,032

# METHOD OF WAXING CARS

Daniel C. Hanna, 1133 SW. Rivington Drive, Portland, Oreg. 97201

Filed Apr. 28, 1975, Ser. No. 572,093

Int. Cl.<sup>2</sup> B05D 1/38, 3/12, 7/14

U.S. Cl. 427-327

7 Claims

1. The method of waxing and polishing cars comprising: applying an aqueous emulsion of wax in a foam state to a car, polishing the foam wax on the car while wet to form a wet, polished wax coating thereon, and applying a self-polishing wax to the wet waxed coating.

4,015,033

# LAMINATES OF ACRYLONITRILE/STYRENE COPOLYMERS

Eric Nield, Watton-at-Stone, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 330,463, Feb. 7, 1973, abandoned.

This application Mar. 6, 1975, Ser. No. 555,834

Claims priority, application United Kingdom, Feb. 24, 1972, 8567/72; Jan. 17, 1973, 2397/73; Feb. 24, 1972, 8568/72

Int. Cl.<sup>2</sup> B32B 27/08

U.S. Cl. 428-35

6 Claims

1. A process for making a thick-walled laminated tube for blow-forming into a laminated moulded container which comprises the step of simultaneously melt extruding

i. a thermoplastic polymer comprising a homogeneous copolymer of acrylonitrile in a molar unit concentration of from 86% to 90% and styrene, with

ii. another thermoplastic polymer, so as to produce a laminated moulded container said polymers being melt-extruded into a tubular laminate suitable for blow-forming into a laminated moulded container.

4,015,034

# REGISTER FOR INDEX MARKING ARTICLE

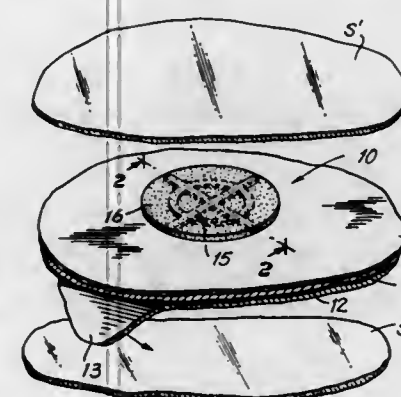
Benjamin Edward Smolen, 1501 Broadway, New York, N.Y. 10036

Continuation-in-part of Ser. No. 693,496, June 7, 1976, abandoned. This application Aug. 23, 1976, Ser. No. 716,788

Int. Cl.<sup>2</sup> B32B 3/16; B44C 1/16

U.S. Cl. 428-40

8 Claims



1. An article for applying an index mark and a silhouette thereof in precise registry respectively on a superimposed pair of receiver sheets between which said article is disposed comprising, in combination, a carrier sheet having a release surface, an indicia marking comprised of a coherent, opaque, discontinuous film releasably bonded to said release surface, said film at least partially encompassing uncoated areas of said release surface, a second, continuous, opaque, readily frangible marking disposed in registry with said indicia marking and said encompassed areas, said second marking being firmly adherent to said encompassed areas of said release surface and to the films of said indicia marking, and an adhesive layer covering said second marking whereby, when said adhesive layer is secured to a receiver sheet and said carrier sheet peeled away from said receiver sheet, said adhesive, said first indicia marking, and the portions of said second marking in registry with said first marking will be transferred to said receiver sheet and the portions of said second marking in registry with said encompassed areas will remain on said carrier.

4,015,035

# METHOD OF FORMING FIBER-REINFORCED EPOXY COMPOSITE JOINTS, AND PRODUCT THEREOF

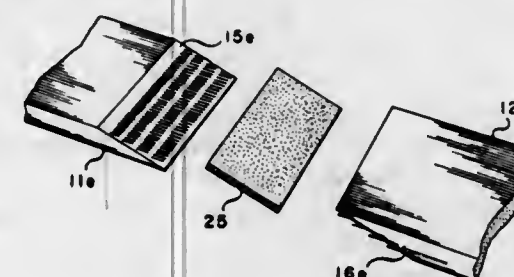
Leiv H. Blad, Van Nuys, and Robert F. Warkow, Granada Hills, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Division of Ser. No. 279,703, Aug. 10, 1972, Pat. No. 3,885,071. This application Dec. 9, 1974, Ser. No. 530,523

Int. Cl.<sup>2</sup> B32B 3/10, 5/12; B29C 17/08; B65H 69/02

U.S. Cl. 428-60

16 Claims



1. In a method of producing an improved joint wherein at least one element thereof is an epoxy composite adherend internally reinforced with fibers oriented in a substantially parallel relation and having a prepared mating portion including a beveled surface, the improvement comprising the steps of removing by an

etching process the epoxy matrix of the adherend at the beveled surface of the mating portion to expose lengths of its reinforcing fibers, and utilizing an unsupported adhesive material between the etched mating surface portion of such adherend and an element to be joined to said adherend, whereby subsequent bonding of such adherend, adhesive, and the joined element provides for the intermeshing and contiguity of the lengths of fibers between such joined adherend and element to produce an improved joint.

4,015,036

# BONDED CARPETING

Laurence F. Haemer, Fairfield, N.J., assignor to Congoleum Corporation, Kearny, N.J.

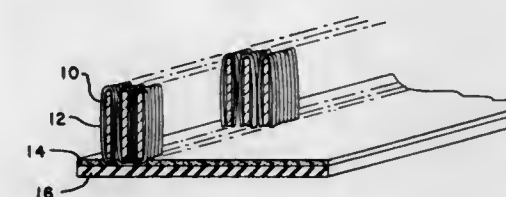
Continuation-in-part of Ser. No. 444,058, Feb. 20, 1974, Pat. No. 3,947,306. This application Feb. 17, 1976, Ser. No. 658,746

The portion of the term of this patent subsequent to Mar. 30, 1993, has been disclaimed.

Int. Cl.<sup>2</sup> B32B 5/00

U.S. Cl. 428-88

18 Claims



11. Bonded pile carpeting including:

- a backing sheet,
- a plurality of parallel rows of yarn tufts,
- each of said yarn tufts within a row being individual and unconnected to any adjacent yarn tuft,
- said rows including a first preselected portion in which each tuft therein is formed from a single first yarn and a second preselected portion in which each tuft is formed from a single second yarn.

4,015,037

# DURABLE FLAME RETARDANT FINISHES FOR TEXTILE MATERIALS

Ray E. Smith, and James A. Albright, both of Ann Arbor, Mich., assignors to Michigan Chemical Corporation, Chicago, Ill.

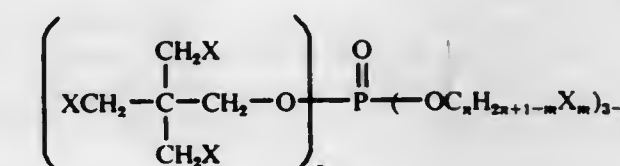
Filed Mar. 22, 1976, Ser. No. 660,520

Int. Cl.<sup>2</sup> C09D 1/00

U.S. Cl. 428-245

47 Claims

1. A flame retardant textile finish comprising: a. from about 16 percent to about 30 percent of a flame retardant compound of the formula



wherein each X is independently selected from chlorine, bromine, and hydrogen, wherein  $a$  is an integer from 1 to 2, wherein  $n$  is an integer from 1 to 8, and wherein  $m$  is an integer from 0 to  $n$ , provided that when  $n$  is 1,  $m$  is 0; b. from about 3.2 percent to about 4.8 percent of a substantially water immiscible organic solvent characterized by having a flash point of at least 80° F. and a boiling point within the range of from about 300° to about 350° F.; c. from about 3.2 percent to about 4.8 percent of an emulsifying agent possessing a hydrophile lipophile balance value of from about 10 to about 14;



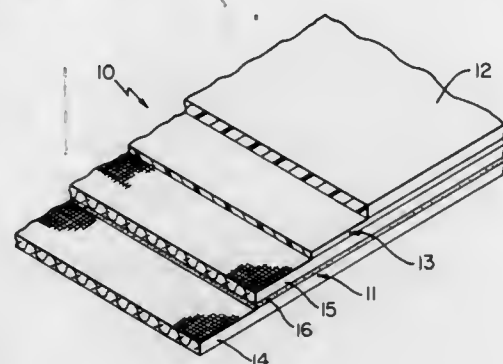




4,015,046

**PRINTING BLANKET AND METHOD OF MAKING SAME**  
Melvin D. Pinkston, Waynesville, and Robert L. Hartenstein,  
Canton, both of N.C., assignors to Dayco Corporation, Day-  
ton, Ohio

Filed Feb. 23, 1976, Ser. No. 660,750  
Int. Cl.<sup>2</sup> B41N 9/00; B32B 31/04, 27/00  
U.S. Cl. 428-422 19 Claims



1. A printing blanket comprising a base structure, a surface layer made of a fluorocarbon elastomer, and a binder layer; said binder layer being comprised of 100 parts of polychloroprene elastomer, 5 to 20 parts of a resin binder, and 30 to 50 parts of a hydrated silica, said binder serving as an exciter and said hydrated silica serving as a vehicle in said binder layer, said binder layer providing a tenacious bond and optimum adhesion between said surface layer and said base structure.

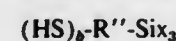
19. A method of making a printing blanket comprising the steps of forming a base structure, applying on said base structure a binder layer comprised of a polychloroprene elastomer having adhesion promoters therein, said binder layer being compounded from materials comprising at least 50 parts by weight of polychloroprene elastomer, 5 to 20 parts by weight of resin binder, and 30 to 50 parts by weight of hydrated silica, and disposing a surface layer made of a fluorocarbon elastomer on said binder layer by building up consecutive thin layers until a desired thickness for said surface layer is attained.

4,015,047

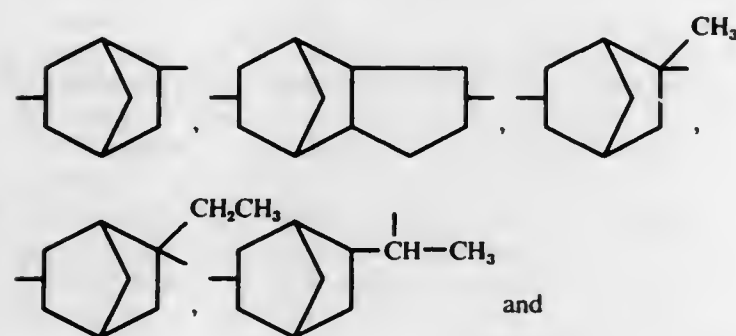
**POLYURETHANE SEALANT AND CAULK SYSTEMS**  
Maurice W. Ranney, Rockland, and Robert J. Pickwell, West-  
chester, both of N.Y., assignors to Union Carbide Corpora-  
tion, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,776  
Int. Cl.<sup>2</sup> B05D 1/36, 5/10; B32B 27/06, 27/40  
U.S. Cl. 428-425 2 Claims

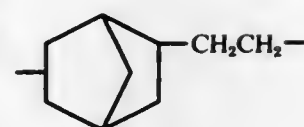
1. The process for enhancing the bonding of polyurethane sealant or caulks to solid inorganic substrates which comprises providing at the interface of the substrate and the sealant or caulk a silane or its hydrolyzate or condensate of the formula



in which  $b$  is 1 or 2,  $X$  is a hydrolyzable group comprised of chlorine, alkoxy or acetoxy radicals,  $R''$  is one of the polyvalent cycloaliphatic hydrocarbon radicals of the formula



-continued



and when  $b$  is two, the two mercapto groups are attached to separate carbon atoms and such carbon atoms are adjacent to one another.

4,015,048

**CERAMIC ARTICLES HAVING CORDIERITE COATINGS**  
Francis W. Martin, Painted Post, N.Y., assignor to Corning  
Glass Works, Corning, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,655  
Disclosure was also published under second Trial Voluntary  
Protest Program on Feb. 24, 1976  
Int. Cl.<sup>2</sup> C03C 3/22, 12/00  
U.S. Cl. 428-428 10 Claims

1. A ceramic article having on at least a portion of the surface thereof a non-porous sintered cordierite glass-ceramic coating, wherein

- said coating has an oxide composition consisting essentially, in mole percent, of about 22.2-26 mole percent MgO, 23.6-27.8 mole percent  $Al_2O_3$ , 44.3-52.7 mole percent  $SiO_2$ , 0.7-5.6 mole percent MO, wherein MO is one or more modifying oxides selected from the group consisting of BaO, PbO, SrO and CaO, and at least 23.6 mole percent total of (MO + MgO), said  $Al_2O_3$  being present in an amount which exceeds the amount of said modifying oxides by about 21-23 mole percent;
- said coating contains crystals of a structure corresponding to hexagonal cordierite as the sole crystal phase, being essentially free of residual glass and the secondary crystal phases magnesia quartz, sapphirine and celsian; and
- said coating is provided by heating a glass powder coating having said oxide composition at a temperature in the range of about 900°-1050°C. for a time sufficient to obtain the sintering and crystallization thereof.

5. A glass-ceramic article having on at least a portion of the surface thereof a nonporous, sintered cordierite glass-ceramic coating, wherein

- said coating has an oxide composition consisting essentially in mole percent, of about 22.2-26 mole percent MgO, 23.6-27.8 mole percent  $Al_2O_3$ , 44.3-52.7 mole percent  $SiO_2$ , 0.7-5.6 mole percent MO, wherein MO is one or more modifying oxides selected from the group consisting of BaO, PbO, SrO, and CaO, and at least 23.6 mole percent total of (MO + MgO), said  $Al_2O_3$  being present in an amount which exceeds the amount of said modifying oxides by about 21-23 mole percent;
- said coating contains crystals of a structure corresponding to hexagonal cordierite as the sole crystal phase, being essentially free of residual glass and the secondary crystal phases magnesia quartz, sapphirine and celsian; and
- said coating is provided by heating a glass powder coating having said oxide composition at a temperature in the range of about 900°-1050°C. for a time sufficient to obtain the sintering and crystallization thereof.

4,015,049

**METAL COATED UNSATURATED CARBOXYLIC ACID MODIFIED POLYOLEFIN ARTICLE AND METHOD OF MAKING SAME**

Makoto Yoda, Kawagoe; Kazushige Ishibashi, Ohi, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1975, Ser. No. 575,054  
Claims priority, application Japan, May 9, 1974, 49-50704  
Int. Cl.<sup>2</sup> B05D 3/02; B32B 15/08; C23C 13/02  
U.S. Cl. 428-461 21 Claims

1. A method of forming a metallic layer on the surface of a polyolefin which comprises vapor depositing in a vacuum a metallic layer on a polyolefin article modified by 0.002 to 3 mole percent of one or more unsaturated fatty acids or their functional derivatives and then subjecting the composite article so formed to a heat treatment at a temperature 5° C. to 70° C. lower than the melting point of the polyolefin.

7. A composite article comprising a metallic layer on a polyolefin film made by the process of claim 1.

4,015,050

**PLASTICS FILM WITH AN ALUMINIUM PHOSPHATE COATING**

James Derek Birchall, Norley, and John Edward Cassidy, Hartford, both of England, assignors to Imperial Chemical Industries Limited, London, England  
Continuation-in-part of Ser. No. 42,499, June 1, 1970. This application Dec. 10, 1971, Ser. No. 206,910

Claims priority, application United Kingdom, Dec. 11, 1970, 59021/70

The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.  
Int. Cl.<sup>2</sup> B32B 27/06, 27/36

U.S. Cl. 428-480 7 Claims

1. A glass like coated, organic, plastics film having a coating on at least one surface of said film of aluminium phosphate derived from a solution of a halogen-containing complex phosphate of aluminium containing at least one chemically bound molecule of a hydroxy compound R-OH wherein R is a hydrogen atom or an organic group.

4,015,051

**POLYETHYLENE PACKAGING FILM**

Richard A. Offermann, Countryside, and Robert J. Vorrier, Palos Hills, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,591  
Disclosure was also published under second Trial Voluntary  
Protest Program on Mar. 30, 1976  
Int. Cl.<sup>2</sup> B32B 27/32; B06D 3/02

U.S. Cl. 428-523 8 Claims

1. A transparent, flexible thermoplastic polyethylene packaging film having a thin transparent coating consisting essentially of a film-forming polyester resin applied to at least a portion of one surface thereof in an amount of at least 0.081 gms. of polyester resin per sq. meter of film and not more than an amount which would affect the transparency and flexibility of said film, said resin coated surface remaining transparent and being readily separable from contiguous surfaces of thermoplastic film after heating at temperatures employed in heat-shrinking thermoplastic film.

4,015,052

**FUEL CELL**

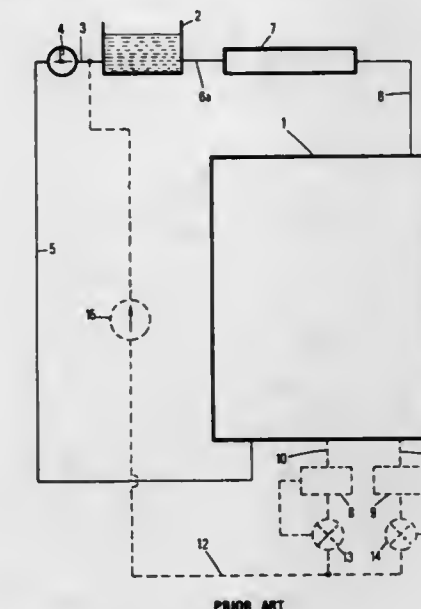
Jacques Cheron, Maisons-Lafitte, France, assignor to Institut Francais du Pétrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activités Pétrolières Elf, France  
Filed Sept. 30, 1975, Ser. No. 617,993

Claims priority, application France, Sept. 10, 1974, 74.34193

Int. Cl.<sup>2</sup> H01M 8/04

U.S. Cl. 429-14

5 Claims



- In a fuel cell system including: a fuel cell block defining at least one fuel cell, said fuel cell block being provided with a first group of chambers for receiving electrolyte, a second group of chambers for receiving fuel and a third group of chambers for receiving comburent, each group of chambers having respective inlet and outlet orifices for receiving and discharging the fluids passing therethrough; an electrolyte feeding circuit defining an electrolyte recirculation flow path, said feeding circuit including an electrolyte tank, pump means for pumping electrolyte around said flow path and conduit means connecting said first group of chambers, said electrolyte tank and said pump means so that electrolyte flowing through said flow path passes in order through said first group of chambers, through said tank, through said pump means and then back to said first group of chambers; collecting means for collecting electrolyte leaking into said second group of chambers and said third group of chambers; and return means for returning electrolyte collected in said collecting means to said electrolyte recirculation flow path; the improvement wherein:

- said electrolyte tank and said fuel cell block are so arranged that the inlet orifice of said tank is above the outlet orifice of said first group of chambers;
- said electrolyte tank and said pump means are arranged so that the outlet orifice of said tank is above the inlet orifice of said pump means;
- said fuel cell system further includes pressure drop means interposed between said tank and said pump means producing when said pump means is pumping electrolyte through said flow path a dynamic pressure drop, the value of said dynamic pressure drop being between (a) the static pressure of the electrolyte measured between the inlet of said pump means and the electrolyte liquid level in said electrolyte tank and (b) the pressure difference between the pressure at the inlet of said pump means and the outlet of said pump means; and
- said return means returns electrolyte from said collecting means to said flow path at a location intermediate said pressure drop means and said pump means.



4,015,053

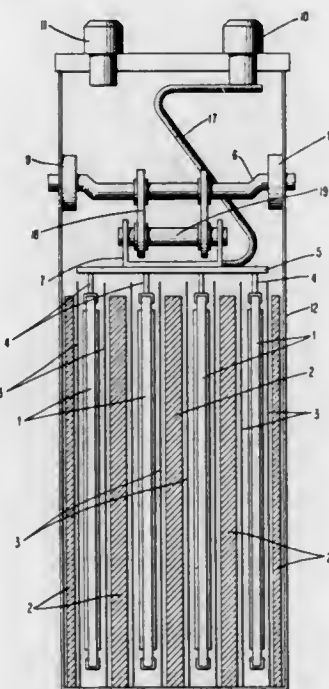
## RECHARGEABLE ELECTRIC ACCUMULATOR CELL WITH AT LEAST ONE ZINC ELECTRODE

Otto von Krusenstierna, Tabby, Sweden, assignor to Aktiebolaget Tudor, Sundyberg, Sweden  
Continuation-in-part of Ser. No. 422,591, Dec. 6, 1973, Pat. No. 3,923,550, which is a continuation of Ser. No. 186,219, Oct. 4, 1971, abandoned. This application Dec. 1, 1975, Ser. No. 636,603

Int. Cl.<sup>2</sup> H01M 4/29, 4/42

U.S. Cl. 429-49

4 Claims



1. A rechargeable electric accumulator cell comprising at least one cathode, at least one zinc anode part and a separator part disposed between each said cathode and zinc anode part arranged in a liquid alkaline electrolyte, vibratory means operatively connected with at least one said part to subject said part to a vibratory movement in the direction of the plane of the part, wherein the said electrolyte contains zinc in an amount of from about 250 to 60 grams of zinc per liter of electrolyte when the cell is discharged, which amount is in excess of that soluble in the electrolyte whereby solid zinc oxide is contained in the electrolyte of the fully charged cell.

4,015,054

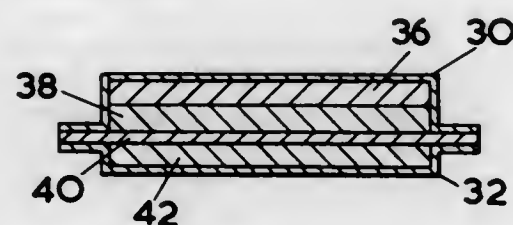
## ELECTROLYTIC CELLS

Brian Cleaver, Eastleigh, and Geoffrey John Rowlands, Chelmsford, both of England, assignors to National Research Development Corporation, London, England  
Filed Aug. 18, 1975, Ser. No. 605,325

Int. Cl.<sup>2</sup> H01M 43/00

U.S. Cl. 429-104

11 Claims



1. An electrolytic cell comprising:  
a. an anode formed of a material including lithium,  
b. a ceramic electrolyte selected from the group consisting of  $\beta$  alumina and  $\beta''$  alumina,  
c. a cathode containing a chalcogen, and  
d. a salt containing lithium ions which salt is interposed between the anode and the electrolyte.

4,015,055

## METAL OXIDE CELLS HAVING LOW INTERNAL IMPEDANCE

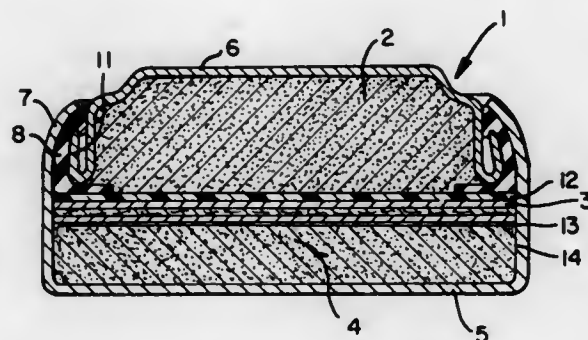
Richard Allen Langan, Parma; Nicholas Joseph Smilanich, Rocky River, and Akiya Kozawa, Middleburg Heights, all of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,636

Int. Cl.<sup>2</sup> H01M 6/06

U.S. Cl. 429-145

13 Claims



1. In a metal oxide alkaline cell comprising a negative electrode, a positive electrode housed in an electronically conductive container having a bottom and a side wall, a separator disposed between said negative electrode and said positive electrode, and an electrolyte, said positive electrode comprising a metal oxide wherein the improvement comprises a layer of electronically conductive material selected from the group consisting of gold, platinum, rhodium, palladium, lead, tungsten, tantalum, nickel, iron disulfide and lead oxide, said electronically conductive material being disposed solely at the interface of the separator and the positive electrode and extending sufficiently to contact the wall of the conductive container so as to decrease the internal resistance at the separator-cathode-cathode collector interfaces and thereby substantially eliminate the voltage variations usually associated with the initial discharge of metal oxide cells and said electronically conductive material being sufficiently porous so as not to effectively interface with the ionic flow between the negative and positive electrodes of the cell.

4,015,056

## METHOD OF MANUFACTURING A STABLE DIVALENT SILVER OXIDE DEPOLARIZER MIX

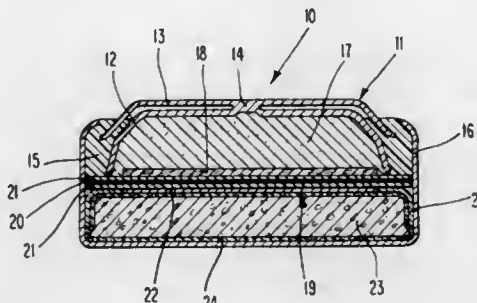
El Sayed Megahed, Madison, and Patrick Joseph Spellman, Middleton, both of Wis., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Mar. 15, 1976, Ser. No. 666,656

Int. Cl.<sup>2</sup> H01M 6/06

U.S. Cl. 429-219

18 Claims



1. A method for manufacturing a stable divalent silver oxide depolarizer mix which comprises (1) forming a divalent silver oxide depolarizer mix containing divalent silver oxide, (2) compressing the depolarizer mix in a press to form a depolarizer mix pellet, (3) treating the depolarizer mix pellet with a mild reducing solution which is sufficiently mild that no substantial portion of the divalent silver oxide is reduced to silver under the treatment conditions, (4) consolidating the treatment depolarizer mix pellet in a cathode container by com-

pressing it in the container, and (5) treating the consolidated depolarizer mix/cathode container assembly with a strong reducing solution to form a substantially continuous and electrolyte permeable layer of silver on the exposed surface of the depolarizer mix.

4,015,057

## ABRASION RESISTANT FLUOROOLEFIN COATING COMPOSITION

Walter George Gall, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.  
Continuation-in-part of Ser. No. 415,665, Nov. 14, 1973, abandoned. This application June 2, 1975, Ser. No. 582,793

Int. Cl.<sup>2</sup> C08K 5/05, 5/07

U.S. Cl. 526-30

5 Claims

1. A thermally curable coating composition comprising a solution in a compatible solvent of an esterification catalyst and

- I. an aliphatic carboxylic acid containing at least four carboxyl groups and having at least four carbon atoms in its chain and in which the carbon chain may be interrupted by oxygen or sulfur atoms, said acid being free of ester groups, and
- II. a fluoroolefin copolymer of the fluoroolefin of the formula  $CFX = CX'X''$ , wherein X is hydrogen or fluorine, X' is hydrogen, fluorine or chlorine and X'' is hydrogen, chlorine, fluorine, lower perfluoroalkyl or lower perfluoroalkoxy, and a vinyl ether compound of the formula  $CH_2 = CHOR$  wherein R is an alkyl or oxyalkyl group of up to 13 carbon atoms which contains at least one hydroxyl group, said fluoroolefin copolymer having a ratio of fluorine atoms to hydroxyl groups of between 1:1 and 22:1, said copolymer containing between about 6 and about 65% by weight fluorine and having a number average molecular weight of about from 30,000 to 80,000 and a weight average molecular weight of about from 350,000 to 550,000;

wherein the amount of acid present in said solution is such that the number of carboxylic groups is at least about equal to and as high as about twice the number of hydroxyl groups present in the copolymer wherein the copolymer and the acid are dissolved in the solvent or solvent mixture in an amount sufficient to provide a solution viscosity which is suitable for coating operations and wherein the solvent is substantially inert to the fluoroolefin copolymer and the aliphatic carboxylic acid.

4,015,058

## COMPOSITION WITH DICUMYL PEROXIDE AND PROCESS FOR AVOIDING SCORCHING OF ETHYLENE POLYMER COMPOSITION

Donald Lincoln Schober, Belle Mead, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 527,852, Nov. 27, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,774

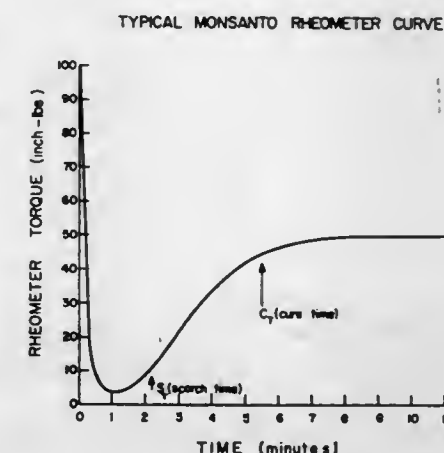
Int. Cl.<sup>2</sup> C08F 8/06, 8/00

U.S. Cl. 526-57

18 Claims

10. A process for preventing the scorching of a vulcanizable composition which is susceptible to scorching during the processing thereof at temperatures of about 120° to 160° C. prior to the intended vulcanization thereof, said composition comprising, in weight ratio, 100 parts by weight of ethylene polymer, and about 0.1 to 5.0 parts by weight of dicumyl peroxide, which comprises, admixing into said composition, prior to said processing, sufficient amounts of at least one hydroperoxide selected from the group consisting of cumene hydroperoxide and tertiary butyl hydroperoxide as to increase the efficiency factor of said compositions at least about 3 units when said efficiency factor is determined on the basis of rheometer curves obtained from a Monsanto Rheometer at a

cure temperature of 360° F. using a rheometer oscillation of 110 CPM and an arc of  $\pm 5^\circ$ ,



said dicumyl peroxide and said hydroperoxide being used in a weight ratio, to each other, of about 4:1 to 40:1, and vulcanizing the resulting composition.

4,015,059

## FUSED RING CATALYST AND ETHYLENE POLYMERIZATION PROCESS THEREWITH

Fredrick John Karol, Bellemead, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,814

Int. Cl.<sup>2</sup> C08F 4/02, 10/02

U.S. Cl. 526-130

23 Claims

1. An olefin polymerization catalyst which comprises, supported on activated inorganic oxide, organochromium compound of the structure  $Ar-Cr II-Ar'$  wherein Ar and Ar' are the same or different and are indenyl or fluorenyl radicals which are unsubstituted or substituted with  $C_1$  to  $C_{10}$ , inclusive hydrocarbon radicals.

4,015,060

## CATALYST AND PROCESS FOR THE POLYMERIZATION OF OLEFINS

Nicholas M. Karayannis, Hinsdale; James A. Turner, Naperville, and Sam S. Lee, Hoffman Estates, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

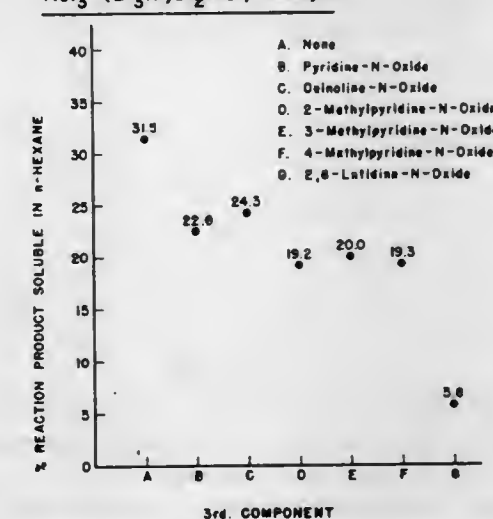
Filed Nov. 8, 1971, Ser. No. 196,335

Int. Cl.<sup>2</sup> C08F 4/66, 10/06

U.S. Cl. 526-141

1 Claim

Stereospecific Effect of Amine Oxides on Polypropylene Prepared Using a  $TiCl_3 \cdot (Et_3Al, Et_2AlCl)$  Catalyst



1. In the process of forming highly-crystalline polypropylene or highly-crystalline terminal block or pure block copolymers of propylene with ethylene or another alpha-olefin with up to 10 carbon atoms using a catalyst comprised of (a) a dialkylaluminum halide, (b) a titanium trichloride, and (c) an amine oxide, the improvement which consists essentially of



using for (c) about two to about eight mol percent, based upon the amount of said dialkylaluminum halide present, of 2,6-lutidine-n-oxide.

4,015,061

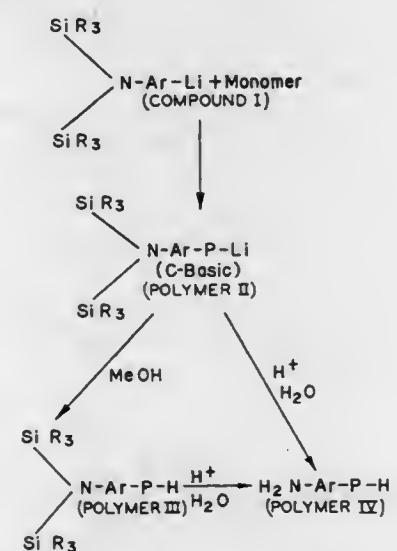
# PROTECTED AMINO-FUNCTIONAL INITIATORS AND AMINO-TERMINATED POLYMERS AND THEIR PRODUCTION

Donald Norman Schulz, Hartville, and Adel Farhan Halasa, Bath, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 550,237, Feb. 14, 1975, abandoned, which is a continuation of Ser. No. 442,695, Feb. 15, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 606,801

Int. Cl.<sup>2</sup> C08F 4/48, 8/12, 12/08, 36/14  
U.S. Cl. 526—178

7 Claims



1. The method of producing a terminally functional lithium-terminated polymer which comprises (a) reacting a monomer from the class consisting of (1) conjugated dienes containing 4 to 8 carbon atoms, (2) mixtures of such conjugated dienes and (3) a mixture copolymer of such a conjugated diene and a vinyl monomer and (b) an initiator of the formula  $(SiR_3)_2-N-Ar-Li$  in which R is an alkyl group of 1 to 8 carbon atoms and Ar is from the class consisting of phenyl, tolyl, xylyl and naphthyl, (c) in a non-protic solvent at a temperature of -50 to 100° C.

4,015,062

# DIOXAZOLONE GROUP-CONTAINING POLYMERS

Heinz Eilingsfeld, Frankenthal, and Herbert Naarmann, Wattenheim, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

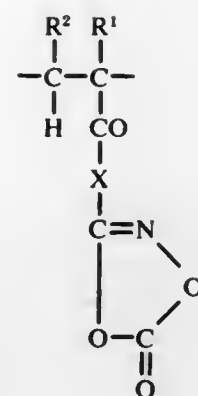
Filed Sept. 29, 1975, Ser. No. 617,783  
Claims priority, application Germany, Oct. 4, 1974, 2447370

Int. Cl.<sup>2</sup> C08F 120/26

U.S. Cl. 526—260

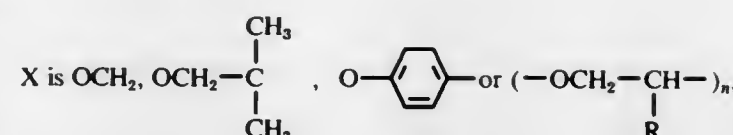
5 Claims

1. A polymer containing units of the formula:



wherein:

R<sup>1</sup> is hydrogen or methyl;  
R<sup>2</sup> is H; and  
X is OCH<sub>2</sub>,



where n is an integer of from 1 to 50 and R is hydrogen, alkyl, cycloalkyl or aryl.

4,015,063

# CRUDE OILS AND RESIDUAL FUEL OILS CONTAINING A TERPOLYMER OF ETHYLENE, VINYL ESTER, AND DIALKYL VINYL CARBINOL

Robert J. Basalay, Naperville; Peter G. Pappas, Downers Grove, and Walter C. Edmisten, Olympia Fields, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill. Division of Ser. No. 522,471, Nov. 11, 1974, Pat. No. 3,915,668. This application June 17, 1975, Ser. No. 587,635

Int. Cl.<sup>2</sup> C08F 218/12  
U.S. Cl. 526—331

4 Claims

1. An oil-soluble terpolymer composition consisting of: 45–80 wt. % ethylene, 10–25 wt. % vinyl ester of a fatty acid having up to about eight carbon atoms, and 10–30 wt. % of a dialkylvinyl carbinol wherein the alkyl groups have up to about six carbon atoms, said terpolymer having a number average molecular weight in the range of from about 500 to about 10,000.

4,015,064

# MANUFACTURE OF POLYVINYL CHLORIDE OF LOW VINYL CHLORIDE MONOMER CONTENT

Martin L. Feldman, E. Brunswick, and Robert S. Miller, Bridgewater, both of N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed June 24, 1974, Ser. No. 482,115  
Int. Cl.<sup>2</sup> C08F 6/10

U.S. Cl. 528—491

8 Claims

1. The process for the removal of vinyl chloride from a slurry or latex that contains from about 100 parts to 15,000 parts by weight of vinyl chloride per million parts by weight of said slurry or latex and from 5% to 50% by weight of a polymer selected from the group consisting of polyvinyl chloride and copolymers of vinyl chloride with at least one monomer copolymerizable therewith that comprises the steps of

- adding to the slurry of latex from about 0.5% to 20% by weight, based on the weight of the slurry or latex, of a compound selected from the group consisting of vinyl acetate, methylene chloride, di-tert-butyl-p-cresol, and mixtures thereof,
- maintaining the slurry or latex at a temperature in the range of 25° C. to 125° C. at a vacuum in the range of about 28 mm. to 630 mm. Hg, and

c. removing the vinyl chloride vapor that is evolved until the slurry or latex contains less than 50 ppm. of vinyl chloride.

4,015,065

# TREATMENT OF VINYL HALIDE POLYMERS

Anthony John Park, South Croydon, and Alan Charles Sturt, Guildford, both of England, assignors to The British Petroleum Company Limited, London, England

Filed May 5, 1975, Ser. No. 574,396  
Claims priority, application United Kingdom, May 17, 1974, 22254/74

Int. Cl.<sup>2</sup> C08F 6/00, 6/16, 6/24, 6/28

U.S. Cl. 528—503

17 Claims

1. A process for treating vinyl halide polymer containing residual vinyl halide produced by the polymerization of monomeric material consisting of vinyl halide and 0 to 30% by weight of total monomeric material of comonomers copolymerizable with vinyl halide which comprises subjecting said polymer to radio frequency dielectric heating in the presence of added free radical polymerization initiator.

4,015,066

# CRYSTALLINE MONOSODIUM

## N<sup>6</sup>,2'-O-DIBUTYRYL-ADENOSINE-3',5'-CYCLIC MONOPHOSPHATE AND PRODUCTION THEREOF

Takashi Nagata; Goro Motoki; Morio Suzuki, and Hiroshi Yoshino, all of Choshi, Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Japan

Filed Apr. 8, 1974, Ser. No. 459,203  
Claims priority, application Japan, Apr. 6, 1973, 48-38756; Apr. 6, 1973, 48-38757

Int. Cl.<sup>2</sup> C07H 19/20

U.S. Cl. 536—27

9 Claims

1. Crystalline N<sup>6</sup>,2'-O-dibutyryl-adenosine-3',5'-cyclic monophosphate, monosodium salt, produced by the step of causing a crystallizing solvent selected from a group consisting of ethyl ether, tetrahydrofuran, dioxane acetone, diethyl ketone, methyl ethyl ketone, or an ester selected from C<sub>1</sub>-C<sub>4</sub> alkyl acetates to contact an alcoholic solution, an aqueous alcoholic solution, wherein the alcohol is selected from the group consisting of methanol, ethanol, propanols, and butanols, or a

simple aqueous solution of the N<sup>6</sup>,2'-O-dibutyryl-adenosine-3',5'-cyclic monophosphate, monosodium salt, said crystallizing solvent being of such a nature that said N<sup>6</sup>,2'-O-dibutyryl-adenosine-3',5'-cyclic monophosphate monosodium salt is insoluble in it but it is at least partly miscible with the solvent constituting said solution, said crystalline salt having the following lattice distance upon X-ray diffraction:

Angstrom	Note
1.994	weak
2.818	weak
6.303	slightly weak
7.865	weak
11.787	weak
17.327	very intense

4,015,067

# METHOD OF PREPARING POLYSACCHARIDE ETHERS AND APPARATUS

Gordon Y. T. Liu, Baton Rouge, and Carl P. Strange, Walker, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 18, 1975, Ser. No. 605,794

Int. Cl.<sup>2</sup> C08B 11/00

U.S. Cl. 536—96

17 Claims

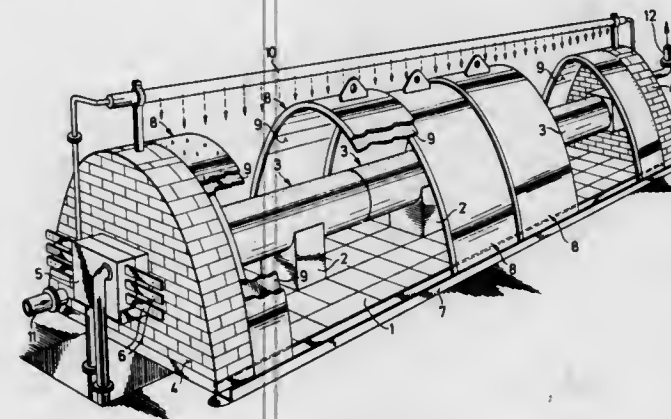
1. A method of preparing an ether of a polysaccharide comprising

- continuously preparing a slurry of a finely divided polysaccharide, an alkali metal hydroxide in an amount sufficient to provide from about 0.25 to about 1.7 parts by weight based on the polysaccharide, and an etherifying ingredient with or without an inert carrier fluid in the substantial absence of free oxygen,
- feeding said slurry into a tubular reactor, free of obstructions to passage of the slurry, under a pressure of from about 100 to about 400 psig at a rate to provide a reaction period of from about 10 to about 60 minutes at a temperature of from about 30 to about 135° C.
- removing the reacted slurry from the reactor and
- purifying and recovering the ether of the polysaccharide.



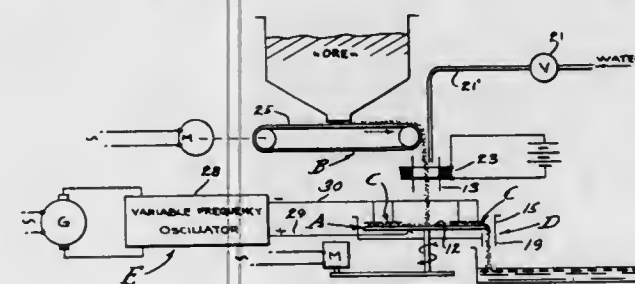
# ELECTRICAL

4,015,068  
**GRAPHITIZATION FURNACE**  
 Otto Vohler, Nordendorf, Germany, assignor to Sigri Elektrographit GmbH, Augsburg, Germany  
 Filed Oct. 20, 1975, Ser. No. 624,274  
 Claims priority, application Germany, Dec. 7, 1974, 2457923  
 Int. Cl.<sup>2</sup> F27D 11/04  
 U.S. Cl. 13-7 3 Claims



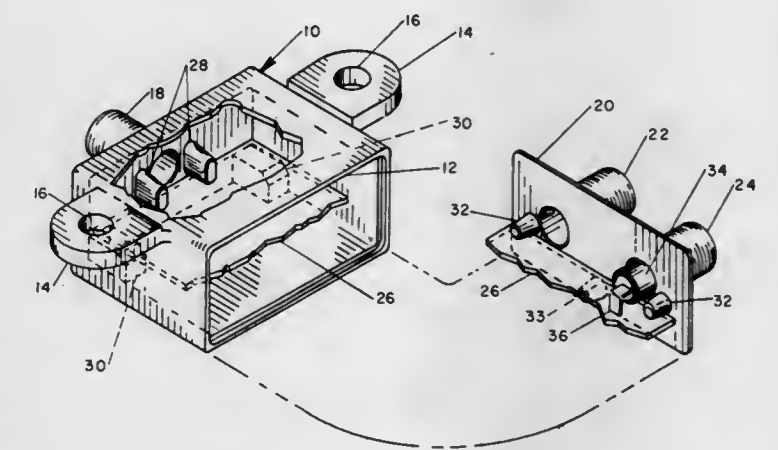
1. Furnace for the graphitization of carbon bodies by direct resistance heating which comprises two current conducting electrodes movable in the longitudinal furnace axis, carbon bodies in an arrangement of at least one row clamped between said electrodes with the end surface of each body in contact with an end surface of an adjacent body in the row, and each end surface of bodies at the end of a row contacting an electrode, carrier members disposed in the furnace floor for receiving the carbon bodies, said furnace gas-tightly enclosing said carbon bodies, said furnace having shell-shaped walls with movable segments and said furnace having layers consisting of isolation materials to protect said carbon bodies from attack by oxygen from the air, and said furnace having a space containing gases between the carbon bodies and the furnace walls.

4,015,069  
**APPARATUS FOR EXTRACTING METALS FROM ORE**  
 Robert G. Owen, 1980 Lake St., Huntington Beach, Calif. 92646  
 Division of Ser. No. 498,209, Aug. 16, 1974. This application Sept. 11, 1975, Ser. No. 612,268  
 Int. Cl.<sup>2</sup> H05B 7/00  
 U.S. Cl. 13-9 R 20 Claims



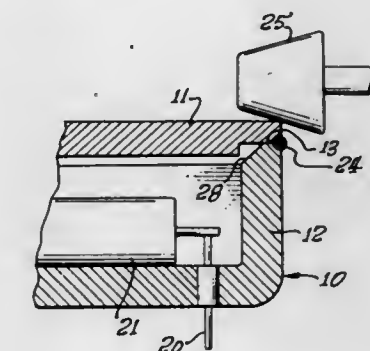
1. Apparatus for reducing metallic values from granular ore, and including; an upwardly disposed planar electrode for the support of a layer of said granular ore, at least one electrode member with a face opposed to the first mentioned planar electrode and having a multiplicity of electrode points spaced uniformly from the first mentioned electrode to contact the granules of ore, and electrical power means applying potential to the electrodes for discharge of energy through the granules of ore to heat and fuse the said metallic values into the melted state which subsequently solidifies into stable metal form smaller than the ore granules to thereby shift the resistive conductivity from electrode point to electrode point, whereby random discharge of electrical energy is coextensive of said layer of ore with commensurate distribution of subjection of the same to fusion.

4,015,070  
**SIGNAL DISTRIBUTION ASSEMBLY AND METHOD FOR ASSEMBLING**  
 Donald Leroy Theurer, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.  
 Filed June 23, 1975, Ser. No. 589,272  
 Int. Cl.<sup>2</sup> H05K 5/04  
 U.S. Cl. 174-52 R 14 Claims



1. A CATV distribution assembly for splitting CATV signals supplied by a main cable into a plurality of CATV signals for output cables, comprising: an electrically conductive housing; a plurality of cable connectors formed as an integral portion of the housing; a plurality of projections located in predetermined positions on the interior of the housing; a circuit board fixedly held in the housing by the projections; and an electrical conductor fixed to the circuit board in a predetermined position so that the electrical conductor fits within a predetermined cable connector in position to mate with a cable when the cable is attached to the predetermined cable connector.

4,015,071  
**MICROELECTRONIC CIRCUIT CASE**  
 Robert L. Peet, Yorba Linda, Calif., assignor to Bliss & Laughlin Ind., Inc., Anaheim, Calif.  
 Filed June 5, 1975, Ser. No. 584,105  
 Int. Cl.<sup>2</sup> H05K 5/06  
 U.S. Cl. 174-52 S 2 Claims



1. A microelectronic circuit case comprising a unitary metal container with an open top and upstanding sides having a smooth flat upper edge with a substantially square outer corner for continuous seam welding at the outer corner to a lid placed over the open top to form a hermetically sealed package, the improvement comprising a chamfer at the inner corner of said upper edge.



4,015,072

**RE-ENTERABLE CABLE SPLICE ENCLOSURE AND KIT INCLUDING RE-CLOSABLE TUBULAR HOUSING AND END CAPS**

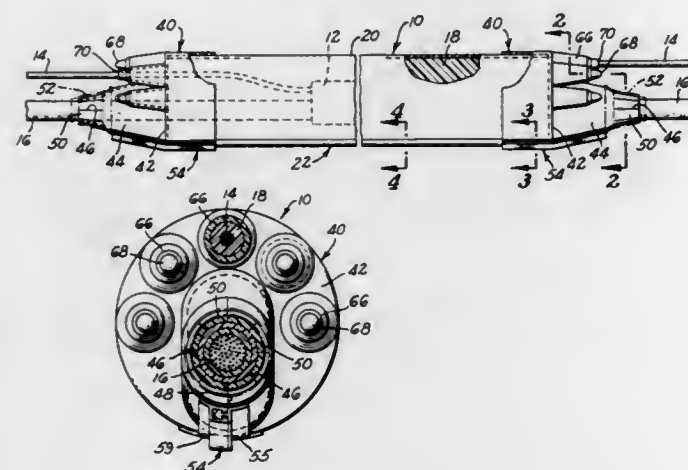
George W. Gillemot, Santa Monica, Calif., assignor to John T. Thompson, Los Angeles, Calif., a part interest

Filed Sept. 18, 1975, Ser. No. 614,375

Int. Cl.<sup>2</sup> H02G 15/18

U.S. Cl. 174-92

7 Claims



1. A re-enterable cable splice enclosure kit including:
  - a. a longitudinally split tubular housing;
  - b. releasable housing locking means for releasably locking said tubular housing against circumferential expansion intermediate the ends thereof and for closing the longitudinal split in said housing intermediate the ends thereof;
  - c. flexible, longitudinally split end caps respectively telescopic over the ends of said tubular housing;
  - d. two releasable end cap locking means for respectively releasably locking said end caps against circumferential expansion and for closing the longitudinal splits therein;
  - e. at least one of said end caps including an outer end provided with a longitudinally extending nipple having circumferentially spaced slits extending longitudinally inwardly from the outer end thereof; and
  - f. at least one of said end caps including an outer end provided with at least one longitudinally extending nipple having a closed outer end adapted to be severed to open same.

4,015,073

**UNIVERSAL LINE TIE AND METHOD OF MAKING SAME**

Gary R. Dickerson, Centralia, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Jan. 2, 1976, Ser. No. 646,042

Int. Cl.<sup>2</sup> H01B 17/22; B21F 3/027; F16G 11/00

U.S. Cl. 174-148

23 Claims

1. A line tie for tying an elongated line to a support therefor, said support including a line-receiving opening and a line tie-engaging area spaced from said opening, said line tie comprising:
  - a. an elongated, unitary strand of substantially shape-retaining, yieldable material configured to present a generally U-shaped bight portion having spaced arms for receiving said line adjacent one side of said support, with an elongated leg portion extending from each of said arms,

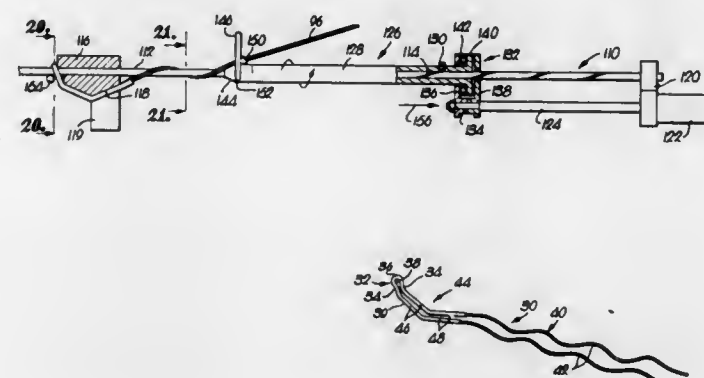
each of said leg portions being configured to present a line-gripping section spaced from a corresponding arm which includes a series of generally helical convolutions which are dimensioned for wrapping about and gripping

said line at a point adjacent the side of said support opposite said one side thereof,

each of said leg portions also including an intermediate section between each of said arms and a corresponding line-gripping section and having at least a pair of interconnected, generally straight segments disposed at an angle relative to each other,

said intermediate sections each being of length and configuration for yieldably engaging the line tie-engaging area of said support for securing the line to the support.

20. A method of forming a line tie comprising the steps of: providing an elongated strand of material; forming said strand of material to present a generally U-shaped bight portion having spaced arms intermediate the



ends of said strand, and an elongated leg portion extending from each arm with the respective leg portions extending in the same general direction from said bight portion;

positioning said strand of material adjacent an elongated forming rod with said leg portions extending generally along the length of the latter;

positioning strand-engaging means in engagement with at least one of said leg portions; and

causing relative, generally helical shifting movement between said rod and strand-engaging means for causing the latter to slidably engage said leg portion and form at least a part of both of said leg portions about said rod in a generally helical manner.

4,015,074

**VOLUNTARY INFORMATION TRANSMITTING APPARATUS IN A WIRED TELEVISION SYSTEM**

Yoshikatsu Inoue, and Takeshi Takeuchi, both of Tokyo, Japan, assignors to Hochiki Corporation, Tokyo, Japan

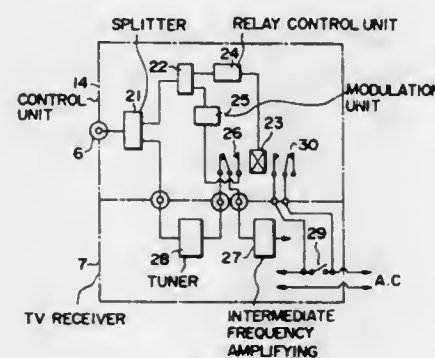
Filed Feb. 9, 1976, Ser. No. 656,692

Claims priority, application Japan, Feb. 13, 1975, 50-20144[U]

Int. Cl.<sup>2</sup> H04N 7/18

U.S. Cl. 358-86

3 Claims



1. In a wired television system wherein television broadcast signals received by a community antenna are transmitted through a splitter to television receivers of receiving subscrib-

ers, voluntary information transmitting apparatus in a wired television system comprising an information signal generator which transmits a guide information signal at an ordinary time and an alarm information signal in an emergency, a modulator which modulates the signal from said information signals generator into a frequency band of the television broadcast signal, a control signal generator which provides in the emergency a control signal for causing the television receiver on the subscriber side to pick out said alarm information signal, a mixer which mixes said information signal and said control signal with said television broadcast signal, a branching filter which separately transmits said information signal and said control signal among said television broadcast signal, information signal and control signal to be transmitted to said television receiver, a frequency converter which converts said alarm information a signal from said branching filter into an intermediate frequency of said television receiver, and a change-over switch disconnects a tuner of said television receiver and an intermediate frequency amplifier stage thereof and connects said frequency converter and said intermediate frequency amplifier stage by said control signal.

4,015,075

**TELEVISION RECEIVER AUTOMATIC FREQUENCY CONTROL SYSTEM**

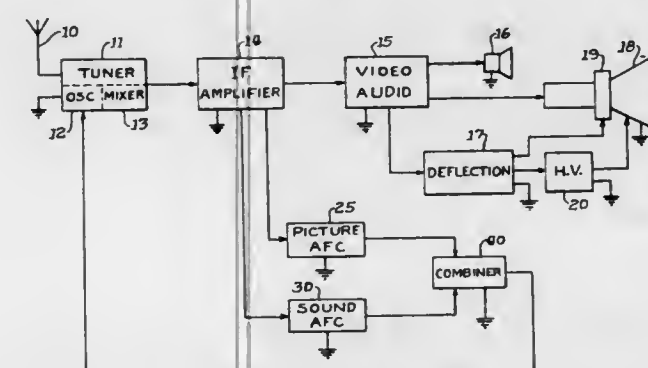
John Y. Ma, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 2, 1975, Ser. No. 619,084

Int. Cl.<sup>2</sup> H04N 5/60

U.S. Cl. 358-158

9 Claims



3. A wide range AFC circuit including separate picture and sound detection means, for use in a television receiver, exhibiting an amplitude versus frequency response characteristic having two portions and producing a first polarity correction voltage for signal frequencies falling in one of said portions and a second polarity correction voltage for signal frequencies falling in the other of said portions; said wide range being bounded by detection slopes at the nominal IF frequencies of the sound and picture IF carriers of a translated television signal.

4,015,076

**NOISE ELIMINATING CIRCUIT FOR VIDEO TELEVISION SIGNAL**

Makoto Ishiodori, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 9, 1975, Ser. No. 584,822

Claims priority, application Japan, June 17, 1964, 39-70464[U]

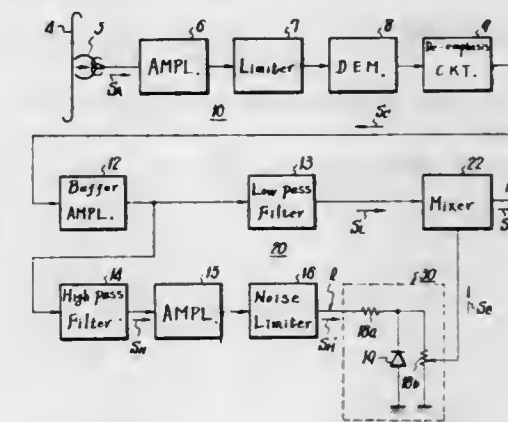
Int. Cl.<sup>2</sup> H04N 5/21

U.S. Cl. 358-167

8 Claims

1. A noise eliminating circuit for video television signals having synchronous denoting signals comprising:
  - a. a low pass filter through which a substantially low frequency band component of said video television signals is passed;
  - b. a high pass filter through which a substantially high frequency band component of said video television signals is passed;

- c. a signal clipping circuit connected to said high pass filter by which black peak signals over a predetermined black signal level are clipped from said high frequency band component; and



- d. a mixer for combining the output signals of said low pass filter and said signal clipping circuit.

4,015,077

**FACSIMILE TRANSMITTER HAVING IMPROVED RESPONSE**

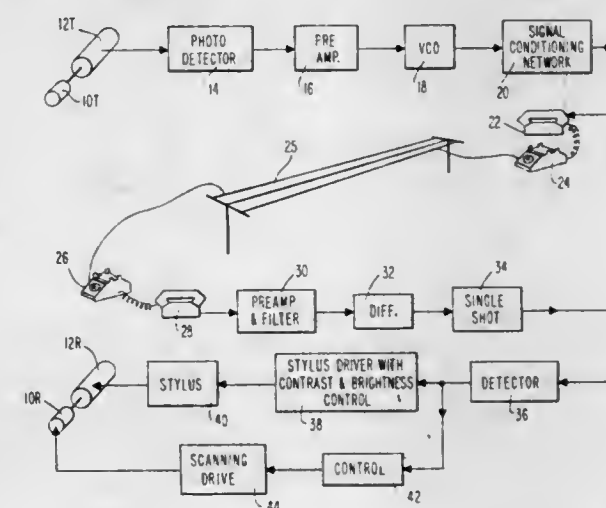
Richard L. Nelson, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 21, 1975, Ser. No. 606,507

Int. Cl.<sup>2</sup> H04N 1/02

U.S. Cl. 358-280

18 Claims

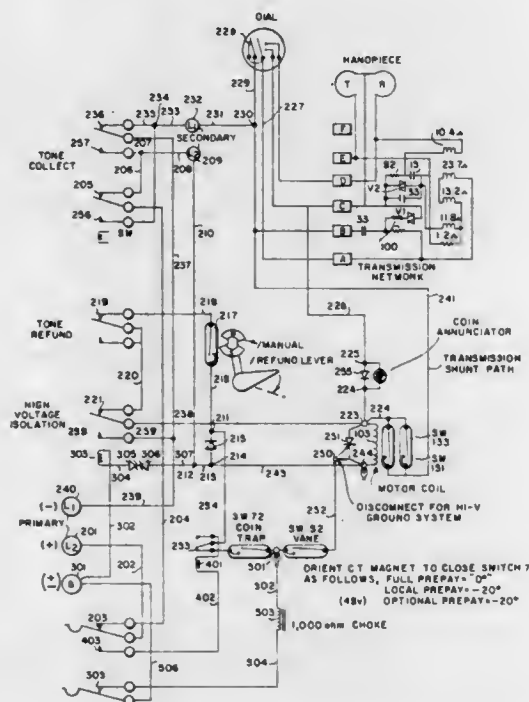


1. A facsimile transmitter for use in producing a copy at one location which is a facsimile of a document at another location comprising:
  - means for illuminating the document;
  - photodetector means in optical communication with the document for detecting dark-light variations between dark regions and light regions in the illuminated document, said photodetector means generating a signal representing said dark-light variations;
  - means for scanning said photodetector means relative to said document;
  - amplifier means coupled to said photodetector means for amplifying said photodetector signals; and
  - automatic gain control means associated with said amplifier means including electronically controlled means responsive to the output of said amplifier means for increasing the gain of said amplifier in response to a lesser amount of light detected by said photodetector means when detecting dark regions, said gain control means also including adjustable means which may be set so as to limit the increase in gain by said electronically controlled means when detecting dark regions for extended duration thereby assuring a substantial and continuing difference between transmission signals representing light regions on



said document and transmission signals representing dark regions on said document.

**4,015,078**  
**OPTIONAL PREPAY COIN OPERATED TELEPHONE SYSTEM**  
 Charles E. Dawson, 4924 Gachet Blvd., Lakeland, Fla. 33803  
 Division of Ser. No. 99,727, Feb. 2, 1971, Pat. No. 3,842,210.  
 This application Oct. 10, 1974, Ser. No. 513,766  
 Int. Cl.<sup>2</sup> H04M 17/02  
 U.S. Cl. 179-6.3 R 28 Claims

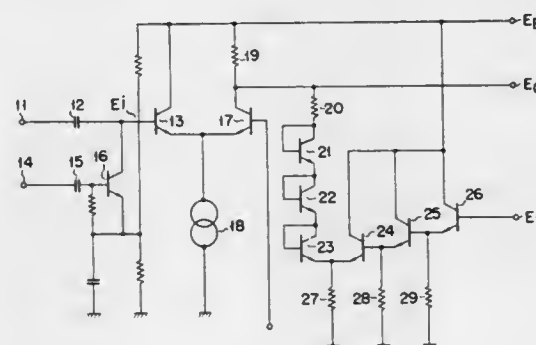


1. A system responsive to multiple wire coin paystation operation using transmission means and dial means and having an L<sub>1</sub> line, an L<sub>2</sub> line and a ground line wherein coin control is achieved using applied potential polarity selectively to operate a motor coil to establish a coin collect path or a coin refund path, comprising in combination,

- a first circuit between L<sub>1</sub> line and L<sub>2</sub> line comprising first unidirectional means connected in shunt with said motor coil to bypass the motor coil to a first polarity voltage across L<sub>1</sub> line to L<sub>2</sub> line and connected in series with the transmission means and the dial means to enable dialing and transmission;
- a second circuit between L<sub>1</sub> line and L<sub>2</sub> line for applying a second polarity opposite to said first polarity across said motor coil to energize the same and establish said collect path;
- a shunt third circuit comprising a motor coil switch means in a shunt connection from the motor coil to L<sub>1</sub> line by bypassing said transmission means and dial means wherein the motor coil switch means are closed in response to energization of said motor coil;
- a fourth circuit comprising a normally open unidirectional switch means connected in shunt with said motor coil and oriented oppositely to said first unidirectional means;
- fifth circuit means for closing said second switch means in response to coin passage along the collect path to bypass the motor coil and remove the shunt connection across the transmission means and the dial means to establish transmission;
- a sixth series circuit comprising voltage discriminator means, relay coil means, said first unidirectional means, switch contacts, said transmission means and dial means between L<sub>1</sub> line and ground for carrying current when voltage applied thereto exceeds the voltage discriminated by said discriminator means; and
- a seventh circuit established by said last-mentioned current by energizing the relay coil means to actuate said switch contacts to connect the motor coil in series with the relay

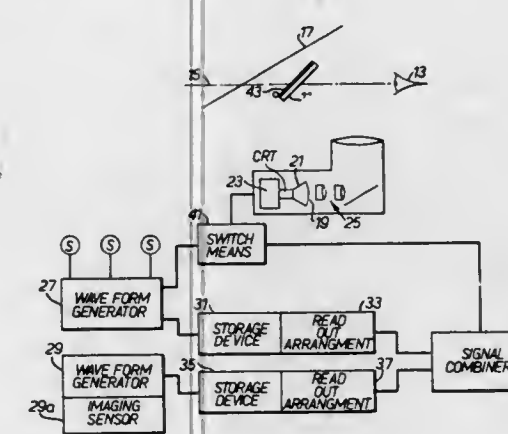
coil and discriminator means between L<sub>1</sub> line and ground to provide for coin refund or collect depending upon the polarity of any discriminated voltage between L<sub>1</sub> line and ground.

**4,015,079**  
**GAMMA CORRECTION CIRCUIT**  
 Itsuzou Satou, and Kikuo Saitou, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan  
 Continuation of Ser. No. 476,794, June 6, 1974, abandoned.  
 This application Apr. 8, 1976, Ser. No. 675,144  
 Claims priority, application Japan, June 12, 1973, 48-66217  
 Int. Cl.<sup>2</sup> H04N 5/20  
 U.S. Cl. 358-164 4 Claims



1. A gamma correction circuit comprising:
- amplifying means for amplifying an input signal, said amplifying means including input and output terminals;
  - a non-linear circuit having a first terminal and a second terminal and a plurality of series-connected diode means connected between said first terminal and said second terminal, the first terminal of said non-linear circuit being coupled to the output terminal of said amplifying means and each of said diode means being connected to have the same polarity so that current flows from the first terminal to the second terminal of said non-linear circuit, wherein the voltage of a signal appearing at the first terminal of said non-linear circuit is varied non-linearly in accordance with the change in the voltage of an input signal to said amplifying means;
  - an emitter follower circuit having an input terminal and an output terminal and a plurality of cascaded emitter follower transistors connected between said input and output terminals of said emitter follower circuit, the output terminal of said emitter follower circuit being coupled to the second terminal of said non-linear circuit, each of said emitter follower transistors being connected so that current flows from the input terminal of the emitter follower circuit to the output terminal of the emitter follower circuit, said plurality of cascaded emitter follower transistors being equal in number to said plurality of diode means; and
  - circuit means for applying a control signal coupled to the input terminal of said emitter follower circuit, for varying nonlinearity of said input signal;
- whereby a change due to ambient temperature in a voltage across said non-linear circuit is compensated by a change due to ambient temperature in a voltage across said emitter follower circuit.

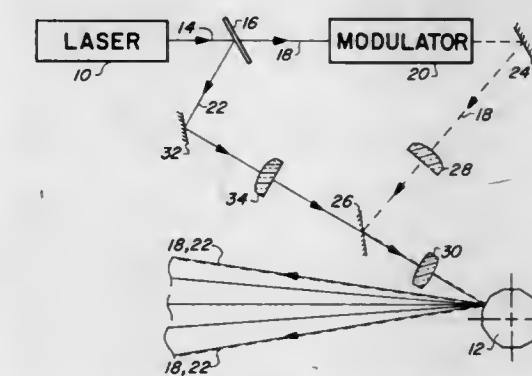
**4,015,080**  
**DISPLAY DEVICES**  
 Leslie Donald Moore-Searson, Tunbridge Wells, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England  
 Continuation-in-part of Ser. No. 465,146, April 29, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,731  
 Claims priority, application United Kingdom, Apr. 30, 1973, 20400/73  
 Int. Cl.<sup>2</sup> H04N 7/18  
 U.S. Cl. 358-104 4 Claims



1. A head-up display system for a vehicle comprising:
- a. a semi-reflective image combiner element adapted to be installed in the vehicle on the line of sight of an observer in the vehicle of a scene outside the vehicle;
  - b. a display surface;
  - c. activating means operable to activate substantially any portion of the said surface so as to cause the said portion to emit light;
  - d. between the combiner element and the display surface a collimating optical system which, when a display is present on the display surface as a result of activation as aforesaid, projects a collimated image of the display to the combiner element for reflection to the observer's eyes, thereby effectively superimposing the image of the display on the observer's view of the outside scene through the combiner;
  - e. a first waveform generator responsive to input data signals derived from sensors carried by the vehicle and representing the relationship of the vehicle to its environment so as to repetitively develop a time sequence of output signals capable of being employed for controlling the activating means to activate desired line segments of the display surface thereby to present at said surface symbols representative of the aforesaid relationship;
  - f. a second waveform generator operable in response to signals derived from an imaging sensor carried by the vehicle to develop a raster scan output signal representative of the vehicle environment as sensed by the imaging sensor during the scan;
  - g. a symbol storage device operable in response to output signals from the first waveform generator so as to store symbols to be presented at the display surface;
  - h. a symbol read-out arrangement operable to develop a raster scan output signal representative of the symbols stored in the symbol storage arrangement, said output signal having a higher scan rate than the output signal of said second waveform generator;
  - i. an image storage device operable in response to the output signal of the second waveform generator so as to store a representation of the environment sensed by the imaging sensor;
  - j. an image read-out arrangement operable to develop a raster scan output signal representative of the representation of the environment stored in the image storage device, the image read-out arrangement output signal having the same format as the symbol read-out arrangement output signal;

- k. signal combiner circuitry operable to receive the output signals from both read-out arrangements so as to develop a raster scan output signal representative of both said symbols and said environment; and
- l. means for connecting either the output of the signal combiner circuitry or the output signal of the first waveform generator to the activating means.

**4,015,081**  
**MULTIFUNCTION SCANNING SYSTEM**  
 Gary K. Starkweather, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.  
 Filed Feb. 3, 1975, Ser. No. 546,476  
 Int. Cl.<sup>2</sup> H04N 3/08  
 U.S. Cl. 358-206 10 Claims



1. In a flying spot scanning system: an illumination source generating a collimated beam, a beam splitter in the path of said beam permitting a portion of said beam to pass there-through and redirecting another portion of the beam, a pair of imaging stations, a reading station, a rotatable polygon scanner optically located between said beam splitter and each of said stations, a modulator located between said beam splitter and said polygon in the path of one of said beam portions for modulating said one beam portion, means for directing each portion of said beam along separate paths to said polygon, the width of each beam portion in the direction of scan at the polygon being substantially the same, said beam portions being aligned on said polygon in a direction parallel to the axis of rotation, said directing means directing said beam portions to said polygon along such paths that said beam portions will reflect from said polygon along separate paths, an imaging lens optically located between said polygon and said beam splitter and located in the path of both said modulated and unmodulated beams, a cylinder lens for each beam located between said beam splitter and said imaging lens, said cylinder lenses each having its power plane in a plane generally perpendicular to the axis of rotation of said polygon, said reading station being in the path of the unmodulated beam, a beam splitter optically located between said imaging stations and in the path of said modulated beam reflected from said polygon, said last named beam splitter directing a portion of said modulated beam to one of said imaging stations and allowing another portion of said modulated beam to pass to the other of said imaging stations.

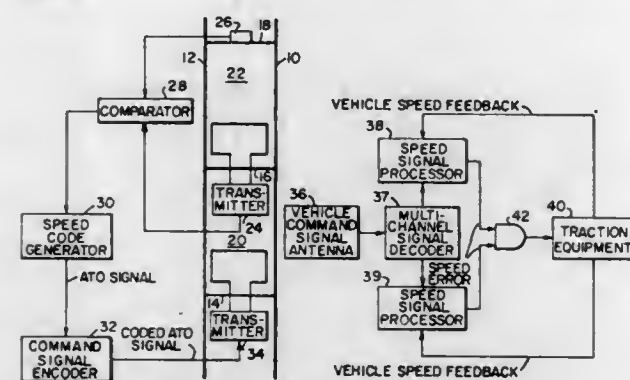
**4,015,082**  
**MULTI-CHANNEL SIGNAL DECODER**  
 Thomas C. Matty, North Huntingdon, and Arun P. Sahasrabudhe, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.  
 Filed Mar. 13, 1975, Ser. No. 558,108  
 Int. Cl.<sup>2</sup> H04L 27/14  
 U.S. Cl. 178-66 R 17 Claims

1. In apparatus for providing an output control signal by decoding control information messages from a message signal containing multiple message frequencies, the apparatus comprising:
- means for filtering first and second message frequencies from said message signal;



means for detecting first and second information messages from the respective first and second message frequencies, with one filtering means being operative with one detecting means in relation to each of said first and second message frequencies;

means for storing said first and second information messages;



means for decoding said first and second information messages; and

means for comparing said decoded first and second information messages to provide said output control signal when said first information message has a predetermined relationship with said second information message.

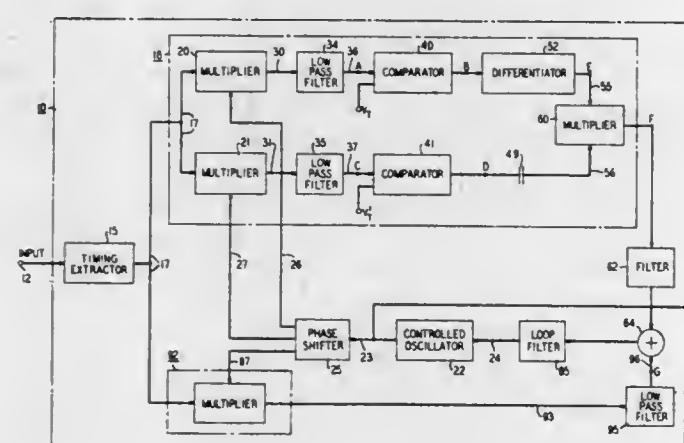
4,015,083

**TIMING RECOVERY CIRCUIT FOR DIGITAL DATA**  
Jules Angelo Bellisio, Wall Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1975, Ser. No. 607,331  
Int. Cl.<sup>2</sup> H04L 7/00

U.S. Cl. 178—69.1

16 Claims



1. A timing recovery circuit comprising means for receiving a timing component, means for generating a signal having a frequency varying in response to a control signal, means responsive to a difference between phase of the variable frequency signal and phase of the timing component for producing a control component, means responsive to cycle slips between the variable frequency signal and the timing component for producing a series of pulses having a polarity related to the sense of the cycle slips and having a repetition rate directly related to the rate of the cycle slips except when amplitude of the timing component falls below a predetermined value whereupon no pulses are produced, and means for combining the control component with the series of pulses into the control signal that adjusts the frequency of the signal from the generating means into synchronization with the timing component.

#### 4,015,084 PROTECTIVE DEVICE FOR INDUCTION HEATING APPARATUS

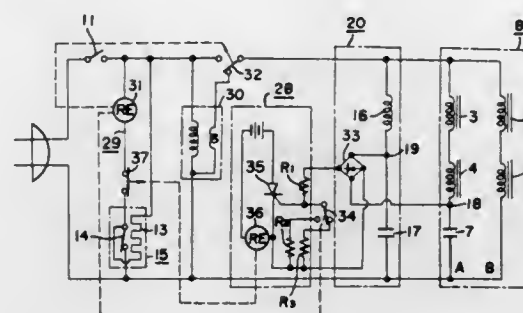
Akihiro Tsumori, Shizuoka, and Kenji Shima, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1975, Ser. No. 582,154  
Claims priority, application Japan, July 15, 1974, 49-83619; Mar. 6, 1975, 50-27667

Int. Cl.<sup>2</sup> H05B 5/04

U.S. Cl. 219—10.49

2 Claims



1. A protective device for induction heating apparatus comprising:  
a specific heating element for holding a substance to be cooked,  
an excitor for induction heating the specific heating element,  
means for applying an operating voltage to the excitor,  
a power switch for turning on the excitor,  
means for delaying the application of the operating voltage to the excitor for a predetermined time after the turning on of the power switch,  
means for detecting immediately after the turning on of the power switch and thereafter the presence of a heating element other than the specific heating element, the absence of the specific heating element of any other heating element or an undesirably high temperature of the specific heating element,  
means for preventing the application of operating voltage to the excitor in response to detection of the presence of a heating element other than the specific heating element, the absence of the specific heating element or any other heating element or an undesirably high temperature of the specific heating element,  
the detecting device comprising a first series circuit of a detector winding wound on a detector core for forming a magnetic flux circuit with the heating element to impart a weak attractive force and a capacitor connected to the detector winding and a second series circuit of a mimic winding and a capacitor which is connected in parallel to the first series circuit to pass current having substantially the same phase as that of the current passing through the first series circuit during normal operation, and means for preventing the passage of current to the excitation windings of the excitor for the predetermined time for detecting the presence of a heating element other than the specific heating element, the absence of the specific heating element or any other heating element or an undesirably high temperature of the specific heating element.

#### 4,015,085 CONTAINER FOR THE MICROWAVE HEATING OF FROZEN SANDWICHES

Francis J. Woods, Fort Worth, Tex., assignor to Larry Lakey, Dallas, Tex., a part interest

Filed Apr. 30, 1975, Ser. No. 573,036

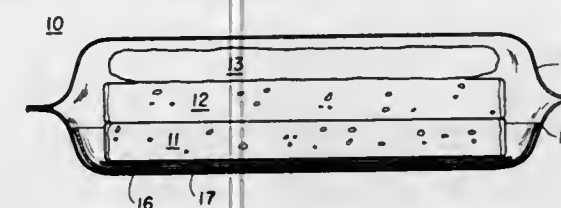
Int. Cl.<sup>2</sup> H02B 9/06

U.S. Cl. 219—10.55 E

15 Claims

1. In a system for heating a frozen sandwich including a nonmetallic film enclosing said sandwich, the combination which comprises:

a. a conductive metallic layer placed over the inner bottom surface of said film and adapted for partial deflection of microwave energy applied to said film;



b. a moisture containing bread base placed over said metallic layer; and

c. a sandwich filler placed over said bread base.

4,015,086

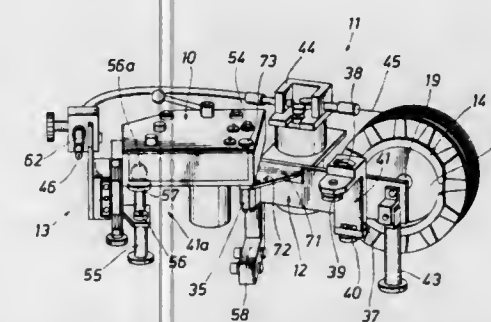
#### HINGED WELDING MACHINE

Russell S. Thatcher, 813 Sidnor, Alvin, Tex. 77511  
Filed Apr. 9, 1975, Ser. No. 566,252

Int. Cl.<sup>2</sup> B23K 9/02

U.S. Cl. 219—60 A

11 Claims



1. A welding machine assembly for joining the abutting ends of substantially vertically extending workpieces in end-to-end relation, comprising:

a central panel assembly including means for supporting a welding torch proximate a work area;

a wire feed module assembly hinged to and adjacent said central panel assembly, said wire feed module assembly being adapted to support a wire spool and reel having welding wire stored thereon;

a first roller assembly affixed to said wire feed module assembly for engaging a track mounted proximate a substantially vertically extending workpiece or pipe section and adjacent the work area;

a second roller assembly affixed to said central panel assembly for engaging said track, said first and second roller assemblies being oppositely disposed from one another with respect to the hinge point between said central panel assembly and said wire feed module assembly, said roller assemblies engaging said track to maintain the electrode of said welding torch in proper relation to the work area; drive means including a driven sprocket gear carried by said welding machine for engaging a roller chain attached to said track for driving said welding machine assembly at a controllable rate along said track extending along said workpiece adjacent the work area;

control means for selectively engaging said sprocket gear with said roller chain to control movement of said welding machine assembly relative to said track; and

radius adjustment means connected between said central panel assembly and said wire feed module assembly for adjusting the effective radius of said welding machine assembly to correspond with the radius of said track.

4,015,087

#### SPECTROGRAPH APPARATUS FOR ANALYZING AND DISPLAYING SPEECH SIGNALS

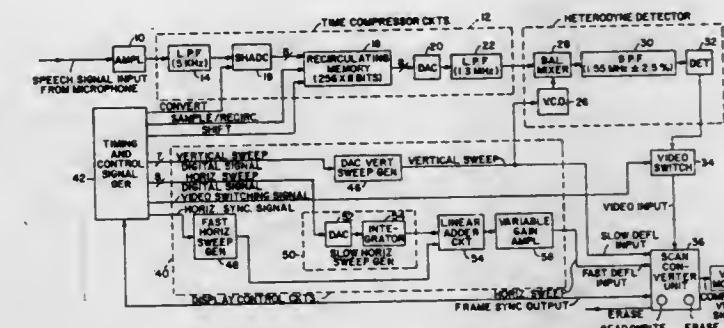
Leslie C. Stewart, Rochester, N.Y., assignor to Center for Communications Research, Inc., Rochester, N.Y.

Filed Nov. 18, 1975, Ser. No. 633,142

Int. Cl.<sup>2</sup> G10L 1/14

U.S. Cl. 179—1 SP

16 Claims



1. In a frequency spectrum analyzer having means for repetitively providing a plurality of successive signals, each corresponding to the energy in a different frequency range of a successive frequency spectrum of an input signal to be analyzed, apparatus for providing a real time spectrogram of said input signal consisting of a plurality of interval spectrograms each for a different one of said successive frequency spectrums, which spectrogram displays variations with respect to time in the energy thereof in each of said different frequency ranges, said apparatus comprising:

means for generating a plurality of display control signals which are repetitive, the first of said plurality of control signals being repetitive at a rate corresponding to the repetition rate of said successive signals, the second of said plurality of control signals being repetitive at a rate corresponding to the repetition rate of said plurality of successive signals and having a period equal to the period of each of said interval spectrograms of a submultiple thereof, the third of said plurality of control signals being repetitive at a rate of a plurality of said successive spectrums, and

means operated by said control signals for visibly displaying said successive signals along a raster which is defined in one direction by said first and third control signals and in a second direction, transverse to said first direction, by said second control signals whereby to produce a plurality of concatenated interval spectrograms which display the spectrogram of the input signal in real time.

4,015,088

#### REAL-TIME SPEECH ANALYZER

John Joseph Dubnowski, Hampton; Lawrence Richard Rabiner, Berkeley Heights, both of N.J.; Ronald William Schaffer, Atlanta, Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 31, 1975, Ser. No. 627,865

Int. Cl.<sup>2</sup> G10L 1/04

U.S. Cl. 179—1 SC

35 Claims

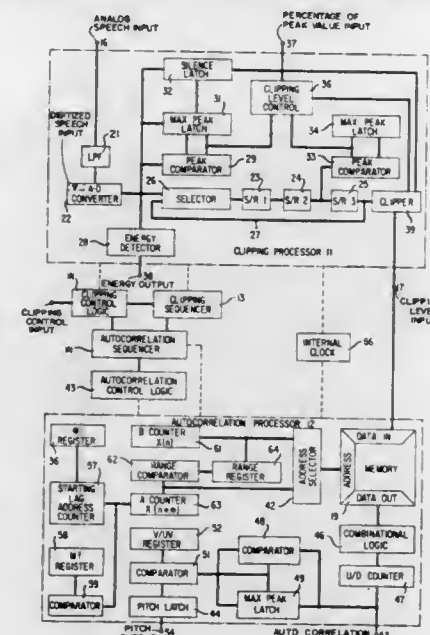
1. A speech analyzer for continuously determining the pitch period of an applied speech signal comprising:

means for dividing said speech signal into a succession of intervals, each of said intervals including a predetermined number of digitally encoded speech samples;

clipping means responsive to an applied clipping level signal for clipping  $n$  consecutive intervals of said applied speech signal, said clipping means supplying a first predetermined signal for positive speech samples of a magnitude which exceeds said applied clipping level signal, said clipping means supplying a second predetermined signal for negative speech samples of a magnitude which exceeds said applied clipping level signal, said clipping means supplying a third predetermined signal for speech samples of magnitude less than said applied clipping level signal;

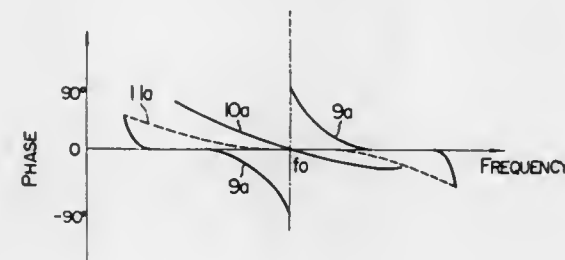
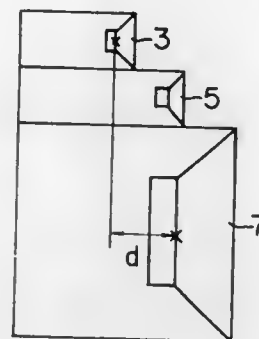


means for adjusting said clipping level signal in response to the peak signal samples within preselected ones of said  $n$  consecutive intervals of applied speech; autocorrelation means responsive to said first, second and third predetermined signals supplied by said clipping means for deter-



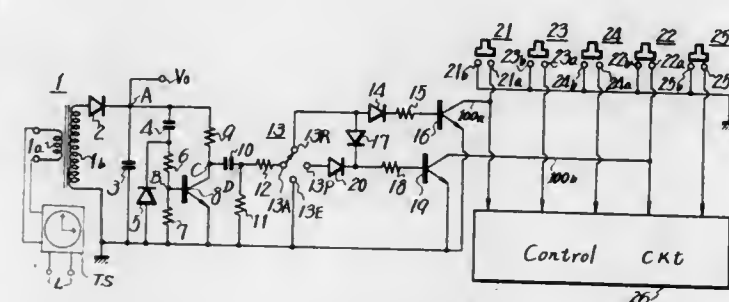
mining the value of the autocorrelation function of said  $n$  consecutive speech intervals at a plurality of predetermined lag elements; and means responsive to the peak value of said autocorrelation function for supplying a signal indicative of said pitch period.

said squawker, at said listening area, is laid substantially at the center of a phase-frequency characteristic of the



sound wave synthesized from sound waves radiated from said tweeter and said woofer.

**4,015,090**  
**RECORDING AND/OR REPRODUCING APPARATUS**  
Takaharu Kitada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan  
Filed May 20, 1975, Ser. No. 579,044  
Claims priority, application Japan, May 28, 1974, 49-59911  
Int. Cl.<sup>2</sup> H04N 1/64; G11B 5/008, 15/02  
U.S. Cl. 179-6 R 12 Claims



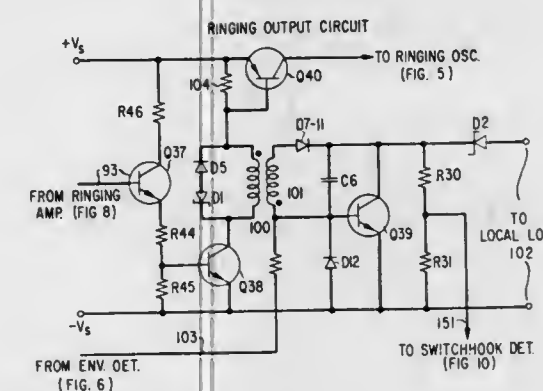
1. A recording and/or reproducing apparatus having a plurality of modes of operation, comprising main operating mode selecting means which are selectively actuatable for producing operation-initiating trigger pulses respectively corresponding to said modes of operation, a self-holding operation-controlling circuit comprising signal-responsive means actuatable by said operation-initiating trigger pulses for establishing and maintaining respective conditions corresponding to selected modes of operation, auxiliary trigger signal generating means operative in response to applying of electric power thereto for producing an auxiliary trigger signal, auxiliary operating mode-selecting means selectively disposable and maintainable in an inoperative position and in at least one operative position corresponding to a respective one of said modes of operation of the apparatus, and triggering means responsive to said auxiliary trigger signal in said operative position of the auxiliary mode-selecting means for applying a respective automatic

**4,015,089**  
**LINEAR PHASE RESPONSE MULTI-WAY SPEAKER SYSTEM**  
Shinichiro Ishii, Neyagawa; Kanji Kakao, Katano; Takafumi Ueno, Kadoma, and Jun Kimura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Feb. 17, 1976, Ser. No. 658,758  
Claims priority, application Japan, Mar. 3, 1975, 50-26239  
Int. Cl.<sup>2</sup> H04R 1/02, 3/14

U.S. Cl. 179-1 E 8 Claims  
1. A multi-way speaker system comprising a low pass filter, a high pass filter each having a predetermined slope in the stop band and a band pass filter having a single resonance characteristic each for dividing an input audio signal to predetermined frequency bands, and a woofer, a tweeter and a squawker each connected to an output terminal of said low pass filter, said high pass filter and said band pass filter respectively, said tweeter being stepped back from said woofer such that when said woofer and said tweeter are driven by outputs of said low pass filter and said high pass filter the phases of sound waves radiated from said woofer and said tweeter are reverse at a listening area in front of said woofer, said tweeter and said squawker at the center frequency in the overlap region of the sound pressure-frequency characteristics for said woofer and said tweeter, said squawker being arranged such that when said squawker is driven by an output from said band pass filter a phase-frequency characteristic of sound wave radiated from

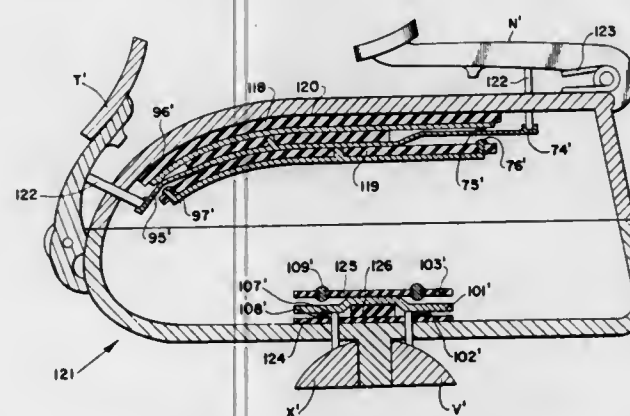
operation-initiating trigger signal to said signal-responsive means for causing the latter to automatically assume the condition thereof corresponding to the mode of operation selected by said auxiliary mode-selecting means.

**4,015,091**  
**TELEPHONE RINGING GENERATORS**  
Tadikonda Narasimha Rao, Morristown, N.J., and Rouben Toumani, Teheran, Iran, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.  
Filed Dec. 5, 1975, Ser. No. 638,151  
Int. Cl.<sup>2</sup> H04M 1/26  
U.S. Cl. 179-84 R 11 Claims



11. An excitation source for telephone ringers comprising a direct current voltage level converter, switching means for disabling said converter at a ringing signal rate, and means for coupling said converter to said telephone ringer.

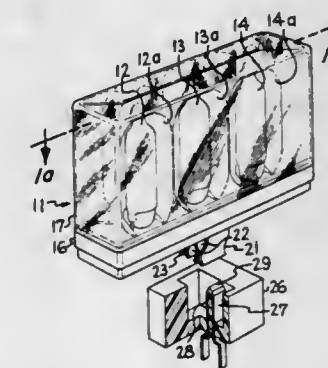
**4,015,092**  
**MULTIPLE SWITCH ASSEMBLY FOR ELECTRICALLY OPERATED INSTRUMENT**  
Yoshiro Suzuki, No. 7-15, 1 chome, Shirakawa Koto-ku, Tokyo, Japan  
Division of Ser. No. 472,688, May 23, 1974, Pat. No. 3,897,708. This application Apr. 25, 1975, Ser. No. 571,626  
Claims priority, application Japan, May 24, 1973, 48-58469  
Int. Cl.<sup>2</sup> H01H 1/34, 5/18; G10D 7/06  
U.S. Cl. 200-5 R 1 Claim



1. In combination with keys on an electrical musical instrument, the keys of which are oriented on a casing of the instrument to correspond to the orientation of keys on a woodwind or like instrument, a composite switch structure for providing a plurality of independently actuatable switches and comprising at least three superposed, aligned panels at least two of which are provided with a plurality of paired contacts fixed approximate at least one of the corresponding edge thereof in facing and aligned spaced apart relation, the third panel being interposed between said two panels and carrying resilient movable contact arms each of said arms being associated with a pair of fixed contacts and conductive means extending through the respective panels for connecting individual ones of said

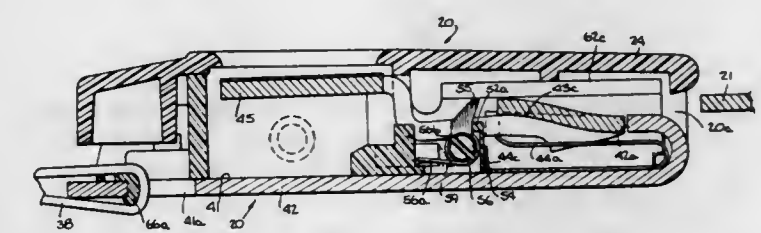
contacts to a utilization device, said movable contact having a normal position determined by the natural resilience of the arms, and being displaceable from said normal position by said keys upon operation thereof, said movable arms engaging one of the fixed contacts in its associated pair in the said normal position thereof and engaging the other of said fixed contacts in its associated pair in an other position thereof upon actuation of selected ones of said keys.

**4,015,093**  
**PHOTOFLASH ARRAY HAVING ELECTRICAL SHORTING MEANS**  
Paul T. Coté, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.  
Filed Jan. 2, 1975, Ser. No. 538,036  
Int. Cl.<sup>2</sup> H01R 33/30  
U.S. Cl. 200-51.1 4 Claims



1. A flash lamp array having a set of electrical connector terminals adapted to be connected to a socket, said terminals comprising substantially rigid blades in mutually parallel spaced apart relationship, at least one of said blades being provided with an integral tab struck out of the blade and shaped to normally touch another of said blades, said socket being provided with a rib which forces said tab away from its said normal contact with a terminal blade.

**4,015,094**  
**SAFETY SEAT BELT BUCKLE SWITCH WITH COIL SPRING CONTACT**  
James A. Gavagan, Center Line, and Carl Mogens Petersen, III, Pontiac, both of Mich., assignors to Irvin Industries, Inc., Greenwich, Conn.  
Division of Ser. No. 439,732, Feb. 5, 1974, abandoned. This application Sept. 12, 1975, Ser. No. 612,856  
Int. Cl.<sup>2</sup> H01H 3/20  
U.S. Cl. 200-61.58 B 2 Claims



1. A safety seat belt buckle comprising: a buckle housing having a base and first and second opposed side walls, a clip-holding latching lever having a push button releasing portion, said lever mounted for limited movement within said housing, said lever having a clip holding latch portion and an opening rearward of said latch portion, a spring mounted between said lever and said base of said housing, said lever when depressed compressing said spring, said lever being held in a normal upward position by said spring, the forward portion of said housing having guide means to receive a mating clip.



a switch housing mounted in said buckle housing rearward of said latch portion of said latching lever,  
 a transverse shaft mounted for rotation on said switch housing,  
 a finger extending radially outward from said shaft,  
 a coil spring mounted on said shaft to bias said shaft to a position, in a normal unbuckled state, in which said finger extends upward through said lever opening, said finger being pushed backward when an associated clip is inserted through said guide means causing rotation of said shaft prior to latching engagement between said clip and said latch portion,  
 first and second electrical contacts incorporating respectively first and second ends of said coil spring, rotation of said shaft through backward movement of said finger changing the state of said first electrical contact,  
 said first electrical contact comprising a stationary portion having a contact surface and a movable portion constituting said first end of said coil spring, movement of said shaft causing movement of said first end of said coil spring,  
 said contact surface being oriented such that the axis of said first end of said coil spring remains substantially parallel to said contact surface during said movement of said first end so that engagement of said first end of said spring and said contact surface entails movement of said first end across said contact surface under pressure of said coil spring.

4,015,095

## CONTACT ARRANGEMENT FOR AN ELECTRIC COMPRESSED-GAS CIRCUIT BREAKER

Rainer Bitsch; Heiner Marin, and Helmut Beier, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

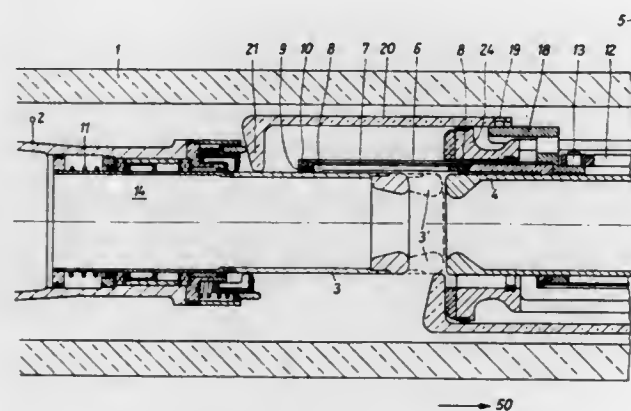
Filed Sept. 4, 1975, Ser. No. 610,230

Claims priority, application Germany, Sept. 17, 1974, 2444943

Int. Cl.<sup>2</sup> H01H 33/42

U.S. Cl. 200—148 A

9 Claims



1. In an electric compressed-gas circuit breaker, a contact arrangement for interrupting an electric current comprising:  
 first base contact means and a second base contact conjointly defining a gap therebetween;

a bridging contact member movable between first and second positions for electrically joining said first base contact means and said second base contact in said first position and for moving in a direction toward said second base contact and running-off of said first base contact means to said second position thereby electrically separating said first base contact means from said second base contact, said first and second positions corresponding to the closed and open positions of the breaker, respectively;

said first base contact means including: a contact structure, a spring arranged at said contact structure and a first base contact movably mounted on said structure so as to be movable in said direction toward said second base contact against the force of said spring; and,

an electrodynamic control device including: first coil means for developing a force dependent upon the current to be interrupted for urging said first base contact toward said second base contact against the force of said spring when said breaker is opened;  
 second coil means for developing a repelling force in response to the current to be interrupted, said repelling force coacting with said spring for decelerating said first base contact in its movement toward said second base contact and for accelerating the same away from said second base contact shortly before zero crossover of said current whereby the spacing of said gap is adjusted for quenching the arc drawn when said bridging contact member separates from said first base contact; and,  
 commutation means for commutating the current to be interrupted to said first coil means and to said second coil means when the breaker is opened.

4,015,096

## CHANGE-OVER SWITCH MECHANISM FOR PUSH-BUTTON TUNER

Kazumasa Fujita, Iwaki, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

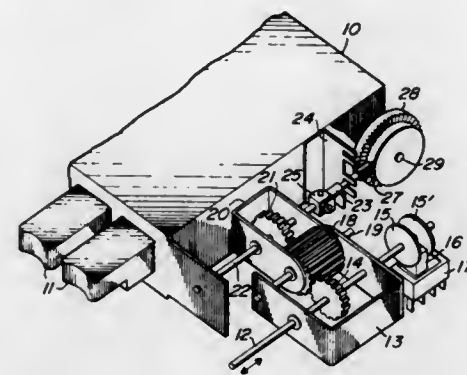
Filed Aug. 29, 1975, Ser. No. 608,863

Claims priority, application Japan, Aug. 31, 1974, 49-104619[U]

Int. Cl.<sup>2</sup> H01H 19/18

U.S. Cl. 200—156

8 Claims



1. A change-over switch mechanism for use in a push-button tuner in which the in and out positions of a core in a coil tuner are controlled by the rotational movement of a crown gear engaged with a pinion shaft, said switch mechanism comprising:

a frame,  
 a tuning shaft,  
 tuning means for transmitting all manual rotational movement of said tuning shaft to the pinion shaft,  
 said tuning shaft being rotatably and axially slidably mounted on said frame and extending through said frame for direct manual rotational and axial control thereof, and  
 a switch means mounted for actuation by the sliding axial movement of said tuning shaft, said rotational movement of said tuning shaft being transmitted to the pinion shaft regardless of the axial position of said tuning shaft,  
 said tuning means including a toothed wheel means rigidly attached to said tuning shaft for transmitting the rotation movement of said tuning shaft to a gear mounted at a fixed axial position with respect to said frame, said gear and toothed wheel means being dimensioned such that said gear and toothed wheel means are in engagement regardless of the axial position of said tuning shaft.

4,015,097

## ELECTRICAL CONTACT CONSTRUCTION

Manfred Schmeisser, Amberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

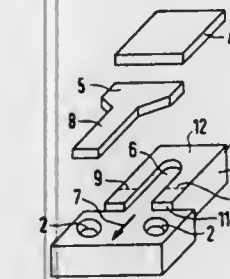
Filed May 21, 1975, Ser. No. 579,545

Claims priority, application Germany, May 27, 1974, 2425490

Int. Cl.<sup>2</sup> H01H 1/06

U.S. Cl. 200—275

5 Claims



1. In an electrical contact for an electric switching apparatus, said contact including a contact carrier and a contact overlay soldered to one of the surfaces of said carrier, the improvement comprising said contact including at least one longitudinal slot disposed therein between said contact carrier and said contact overlay along the arc travel direction of said contact for forming a blind hole in said contact, said blind hole being open at the end thereof along said arc travel direction and forming a canal between said contact carrier and said contact overlay within said contact which is open at one end thereof.

4,015,098

## APPARATUS FOR MAKING INTERCELL CONNECTORS BY AN EXTRUSION-FUSION TECHNIQUE

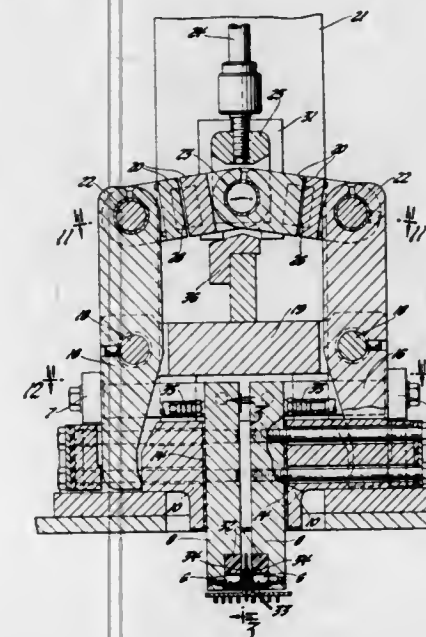
Robert C. Matter, Anderson, and Larry D. Spangler, Yorktown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 418,590, Nov. 23, 1970, Pat. No. 3,947,290. This application Nov. 12, 1975, Ser. No. 630,958

Int. Cl.<sup>2</sup> B23K 11/10

U.S. Cl. 219—90

2 Claims



1. A welding gun for working in the narrow confines of adjacent cells of a lead-acid storage battery and for therein extruding lead alloy from plate strap lugs into an aperture in a partition separating said adjacent cells and then melting said alloy to completely fill said aperture with the alloy, said gun comprising:

a pair of opposing substantially cylindrical plunger-electrodes adapted to move toward each other to extrude

alloy from said lugs into said aperture and thereafter supply electrical current to said extruded alloy to soften and melt it in the aperture;

a compressible lug-clamping means surrounding each of said plunger-electrodes and adapted to engage said lugs and hold them against said partition during said extrusion and melting;

a pair of opposed plunger-electrode holders each carrying one each of said plunger-electrodes and adapted to non-interferingly extend into said adjacent cells and therein coact with each other in a pincer-like motion to cause clamping of said lugs tightly against the partition surrounding the aperture, extruding of alloy from said lugs into the aperture until contact therebetween is made therein and welding the contacting extrusions to form an intercell connector through said aperture; and

means for forcefully driving said holders together, said driving means including a compressible means for storing rapidly-expendable potential energy behind said plunger-electrodes for immediate release to said plunger-electrodes as said electrical current is supplied.

4,015,099

## METHOD OF JOINING A COPPER CONTACT BUTTON TO THE ALUMINUM HEADBAR OF AN ELECTRODE PLATE

William Seniuk, and Régis Gagnon, both of Valleyfield, Canada, assignors to Noranda Mines Limited, Toronto, Canada

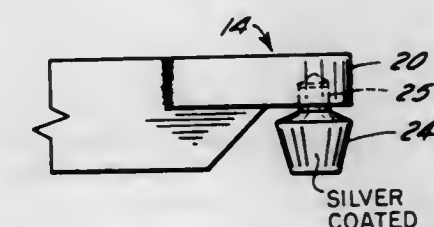
Filed Feb. 21, 1975, Ser. No. 551,995

Claims priority, application Canada, Apr. 29, 1974, 198378

Int. Cl.<sup>2</sup> B23K 9/00

U.S. Cl. 219—118

3 Claims



1. A method of joining a copper contact button to the aluminum or aluminum alloy headbar of an electrode plate, comprising the steps of:

- coating the copper contact button with a thin layer of silver;
- mechanically threading the copper contact button into the aluminum or aluminum alloy headbar;
- preheating the assembled silver coated copper button and aluminum or aluminum alloy headbar to a temperature ranging from 375° to 475° F for the purpose of achieving rapid fusion of copper and aluminum, and for preventing overheating of aluminum and diffusion of oxygen from the copper button into the weld; and
- welding the coated copper contact button to the preheated aluminum or aluminum alloy headbar, after said preheating, and by an arc welding technique using an aluminum alloy filler rod and a shield of inert gas, whereby the strong mechanical joint provided by the threaded connection is reinforced by a strong metallurgical bond having a low electrical contact resistance.



4,015,100

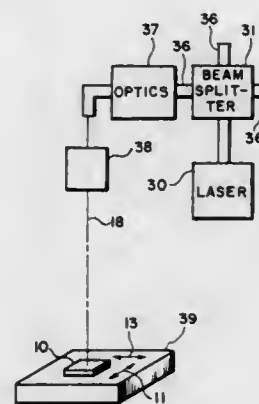
## SURFACE MODIFICATION

Daniel S. Gnanamuthu, Weymouth, and Edward V. Locke, Rockport, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Continuation-in-part of Ser. No. 431,240, Jan. 7, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,628 Int. Cl.<sup>2</sup> B23K 26/00

U.S. Cl. 219—121 LM

9 Claims



1. Surface layer production method comprising, coating metal substrate with a coating layer comprising desired alloying ingredients, relatively scanning a continuous wave laser beam of 1-20 kilowatts focused to a 0.025 to 0.7 inch diameter circle or area equivalent of other form over the coated surface in a linear trace at a rate of 5-500 inches per minute to melt the coating and a predetermined depth and width of the substrate surface along said linear trace and forcibly intermix the melted substrate layer and the entirety of the coating through mass transfer predominant over any diffusion mixing and rapidly cooling to produce a solid alloy casing and a substantial weight per cent of which is obtained from the substrate along said linear trace of the produced alloy composition throughout said predetermined depth,

the depth of melting being selected in relation to amount of minority alloying ingredients and the time of residence in molten state and cooling rate and heat transfer conditions at said layer being controlled to produce a desired alloy composition and so that the secondary dendrite spacing of said alloy is 1-100 microns.

4,015,101

## SCANNING DEVICE FOR WELDING TORCHES

Günther Hannappel, Frankfurt am Main, and Günther Hahn, Hausen, both of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany

Filed Apr. 17, 1975, Ser. No. 568,889

Claims priority, application Germany, Apr. 20, 1974, 2419084

Int. Cl.<sup>2</sup> B23K 9/10

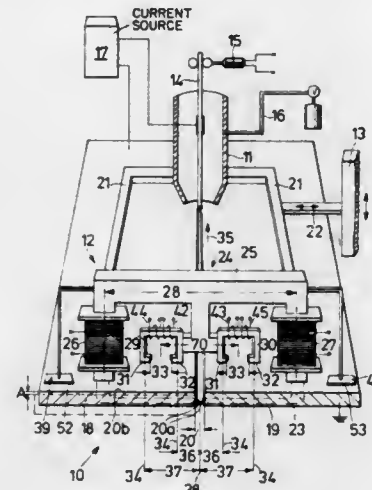
U.S. Cl. 219—125 PL

7 Claims

1. A device for controlling the automatic following of a welding tool along a welding gap between two workpieces, said device including:

- a. a magnetic scanning device for scanning the welding gap without contacting the workpieces and being connected to the welding tool for controlling the movement thereof over the workpieces and along the welding gap, said scanning device comprising
  - i. a magnetic field generator for generating a magnetic flux through the workpieces and across the welding gap,
  - ii. a pair of transducer heads disposed for being arranged on both sides over the welding gap for sensing the magnetic flux perturbations along the welding gap,
- b. a horizontal adjusting device for centering the tool and said scanning device over the welding gap, said adjusting device comprising

- i. an adjusting motor
- ii. said motor being electrically connected to the outlet of said transducer heads,
- c. a control system for maintaining constant the distance of the scanning device from the workpieces, said control system comprising
  - i. a pair of capacitive detector heads disposed for being arranged on both sides over the welding gap,
  - ii. a vertical adjusting means electrically connected to



said detector heads for the height correction of said scanning device,

- iii. difference amplifier means for forming a correction signal which is proportional to the average value of the two height signals from said detector heads,
- iv. the outlets of each of said detector heads being electrically connected to said difference amplifier means, and
- v. said difference amplifier means being electrically connected to the input of said adjusting motor of said horizontal adjusting device.

4,015,102

## APPARATUS FOR MAKING AN ELECTRIC CONDUCTOR

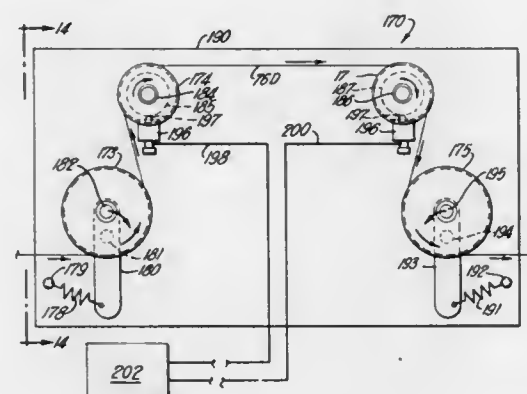
Peter Zadorozny, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 1, 1975, Ser. No. 573,493

Int. Cl.<sup>2</sup> C21D 9/62

U.S. Cl. 219—155

9 Claims



1. Apparatus for controlling the electrical resistance in a moving electrical conductor during its production, the conductor being a bundle of continuous filaments coated with a thermally curable liquid dispersion of conductive particles, the electrical resistance of the conductor being determined by the degree of thermal curing of the coating comprising:

- a. a first rotatable contact member on a fixed axis position such that the moving conductor contacts the member;
- b. means before the first member for controlling the tension in the conductor moving to the first member;
- c. a second rotatable contact member on a fixed axis, the second member being spaced from the first member such

that the moving conductor contacts the second member after leaving the first member, the first and second members being on fixed axes so that the length of moving conductor between the members is kept at a constant length;

- d. means for supplying current to the moving conductor at the first member to conduct a current along the constant length of conductor between the member;
- e. means for measuring the voltage drop across the constant length of conductor and comparing that voltage drop with a standard voltage drop;
- f. means for varying the resistance of the conductor by varying the extent of thermal curing of the coating when the voltage drop measured varies from the standard.

4,015,103

## FUSER CONVEYOR BELT

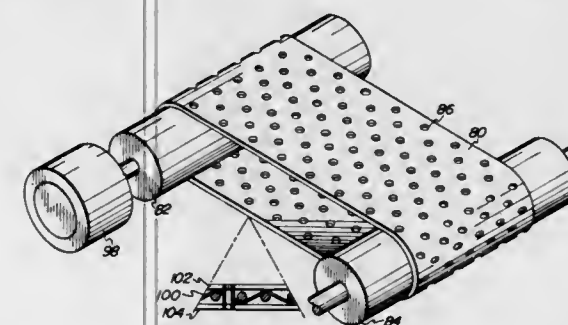
Abraham Cherian, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 19, 1975, Ser. No. 551,213

Int. Cl.<sup>2</sup> H05B 1/00; G03G 15/20

U.S. Cl. 219—216

2 Claims



1. An apparatus for affixing permanently a powder pattern to a sheet of support material, including:

- a resilient conveyor belt for transporting the sheet of support material with the powder pattern deposited on one surface thereof along a path of movement, said belt having a corrugated surface, allowing it to be extendable in a direction substantially parallel to the path of movement of the sheet of support.
- means for moving and resiliently extending said belt so as to create a normal force thereon to maintain a frictional force between said belt and said moving means preventing relative movement therebetween;
- means for heating said belt so as to raise the temperature of the surface of the sheet of support material in contact therewith; and
- a radiant energy source in thermal communication with the sheet of support material so as to heat, and, thereby, permanently affix the powder pattern to the sheet of support material; and
- said belt including a first layer of glass fibers woven to create a fabric having, in the unextended condition, a corrugation therein in a direction substantially parallel to the path of movement of the sheet of support material; and
- at least a pair of layers of elastomeric material having said first layer interposed therebetween and secured thereto.

4,015,104

## CONTROL SYSTEM FOR ELECTRICALLY OPERATED HEAT GENERATING APPARATUS

Raymond L. Eckman, Manlius, and Russell E. Wood, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 17, 1975, Ser. No. 541,750

Int. Cl.<sup>2</sup> H05B 1/02

U.S. Cl. 219—485

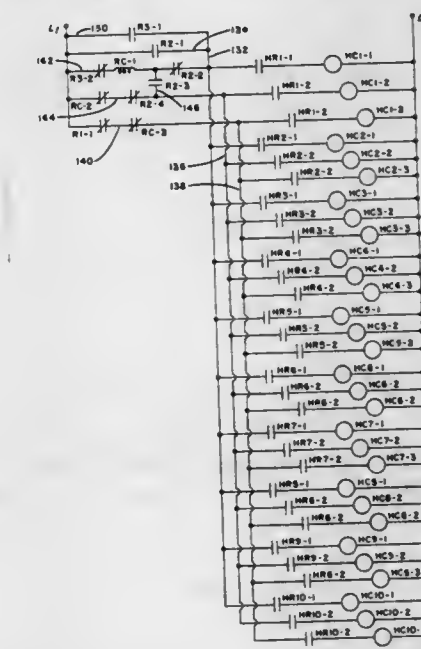
8 Claims

1. A control system for controlling the energization of electrically operated heat generating apparatus included in a

multizone electrical heating system, the heating apparatus in each of said zones including at least two parallel connected heat generating stages, the heat generating apparatus in the various zones being connected in a parallel electrical arrangement, said control system comprising:

a source of electrical energy;

means for supplying said electrical energy to said heat generating apparatus including thermostatic means to sense the temperature in each zone served by said multizone heating system, individual thermostatic means being disposed in each separate zone to sense the particular temperature therein, said individual thermostatic means including a first switch to connect a first one of said stages



in a zone to said source of electrical energy when the temperature in said zone is at a first level below a desired level in said zone, said individual thermostatic means including a second switch to connect said other stage in said zone to said source of said electrical energy when the temperature in said zone is at a second level below the desired level, said first stage being maintained energized when the second stage is also energized; and

overriding means to prevent energization of said other stage irrespective of the temperature level in said zone, said overriding means being operable when the number of said first stages energized in each of said zones is greater than a preselected fraction of the total of said first stages.

4,015,105

## PANEL ELECTRICAL HEATING ELEMENT

Stanley Austin Dunn, Madison, Wis., assignor to Bjorksten Research Laboratories, Inc., Madison, Wis.

Continuation-in-part of Ser. No. 421,073, Dec. 3, 1973, Pat. No. 3,924,098, which is a continuation-in-part of Ser. No. 376,721, June 22, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 636,973

Int. Cl.<sup>2</sup> H05B 3/10

U.S. Cl. 219—553

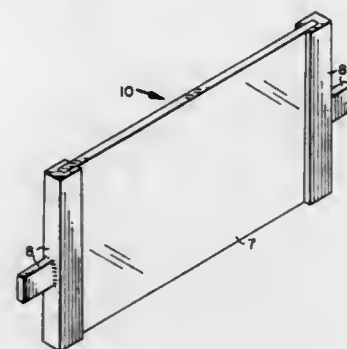
1 Claim

1. An electrical heating element in the form of a laterally extended member having a resistivity of  $10^{-3}$  to  $10^3$  ohm centimeters, operable at a surface temperature of 70° F. to 150° F. in the presence of moisture and oxygen without substantial degradation which

comprises a product of fusing from 4% to 30% by volume of finely comminuted particles consisting essentially of iron with a mixture of finely comminuted particles of recycled bottle glass, having electrodes attached to opposite portions of said laterally extended member, having from 100 to 135 volts applied across said electrodes,



having a leakage to ground from the surface below that



detectable by a human under conditions of 100% humidity.

4,015,106

## ELECTRONIC VOTING MACHINE

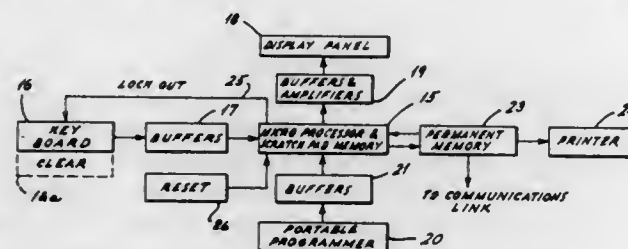
Thomas E. De Phillip, Laurel Springs, N.J., assignor to EVM Limited, Elkins Park, Pa.

Filed May 20, 1975, Ser. No. 579,147

Int. Cl.<sup>2</sup> G07C 13/00

U.S. Cl. 235-54 F

6 Claims



1. An electronic voting machine for use by a voter in casting a vote in an election, said machine comprising:  
 a display panel, said panel including a plurality of selectively energized light sources located in pre-determined regions of said panel and means for locating a transparent overlay on said panel in registry with said regions, said overlay having printed thereon the names of the candidates to be voted upon and the party affiliation of said candidates,  
 a keyboard associated with said panel, said keyboard including a plurality of touch actuated switches with at least one switch being associated with each candidate,  
 a micro processor coupled by buffer means to said switches and to said light sources of said panel, said micro processor including means for accepting programming instructions that determine the responses of said light sources to said switches, said micro processor further including a scratch pad memory for storing the data indicating the nature of the state of said lamps on said panel,  
 means for altering any of the switch selected choices of said voter during the balloting of said voter,  
 a permanent memory for storing the contents of said scratch pad memory,  
 means for transferring the contents of said scratch pad memory to said permanent memory upon completion of the selection process by said voter,  
 means responsive to said transfer for rendering said machine inoperative until a subsequent voter is permitted access to said machine, and  
 means for programming said micro processor to conform the operation of said keyboard to said overlay in accordance with said election.

4,015,107

## WEIGHTED PULSE SIGNAL COUNT SYSTEM

Shinichi Tanaka, Tenri; Kenji Sano, Osaka, and Seiji Kimura, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

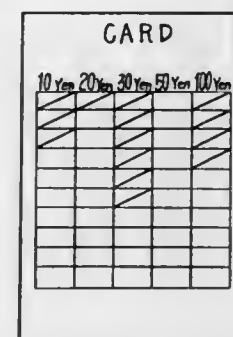
Filed Oct. 18, 1974, Ser. No. 515,866

Claims priority, application Japan, Oct. 19, 1973, 48-118035

Int. Cl.<sup>2</sup> G06K 7/10, 19/06; G09B 7/00; G06F 7/385

U.S. Cl. 235-61.6 R

6 Claims



2. In a weighted pulse signal count system for introducing pulse signals of different weights from a record having areas corresponding to said different weights, counting each number of the pulse signals of different weights and calculating the introduced information, the improvement comprising:  
 plural input terminals each of which introduces the pulse signals of different weights from said record areas;  
 plural registers connected to the input terminals each of which counts the number of the pulse signals of different weights;  
 means for generating weight signals dependent upon the weight of the pulse signals of different weights in a binary coded decimal notation; and  
 means for repeatedly adding the weight signals at different timings, each number of the repetition being identical with the counted number of the pulse signals of different weights introduced into the registers.

4,015,108

## METHODS OF AND APPARATUS FOR DETERMINING THE PHYSICAL PARAMETERS OF SELECTED OBJECTS

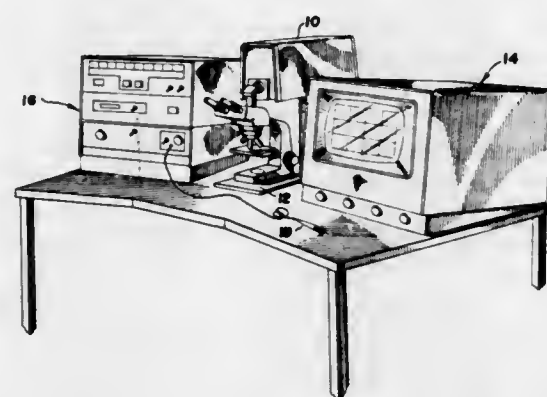
Roger Roy Adams Morton, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 434,529, Jan. 18, 1974, abandoned, which is a division of Ser. No. 210,278, Dec. 20, 1971, Pat. No. 3,805,028, which is a continuation of Ser. No. 835,673, June 23, 1969, abandoned. This application Nov. 28, 1975, Ser. No. 636,273

Int. Cl.<sup>2</sup> G06M 11/02

U.S. Cl. 235-92 PC

22 Claims



1. An analysis system for determining a value representative of a parameter of a selected feature in a field of view by dissociating from a video signal generated from the field of view that portion of the video signal representative of the selected feature, comprising:

video means for imaging and line scanning in a predetermined line scan format along lines traversing a plurality of features in the field of view and for generating a video signal representative of line scan intercepts with the features, from which the value of at least one parameter of the scanned features can be derived;  
 means to generate a position signal defining a position within the field of view of at least a single point to identify the selected feature;  
 means responsive to the position signal and the video signal for generating a first signal by comparing a signal generated from one line of scan as a function of the position signal, with a signal generated from a subsequent line of scan as a function of the position signal, including gating means responsive to the video signal and the first signal for generating a dissociated signal representative of the intercepts of the selected feature; and  
 means for determining the value of the parameter as a function of the dissociated signal.

4,015,109

## RESET ODOMETER MECHANISM

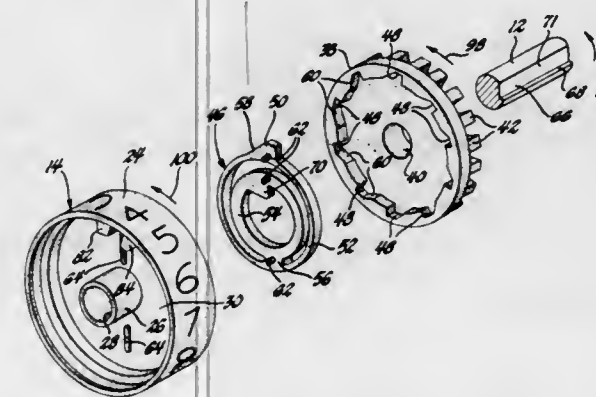
Kenneth R. Deming, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 19, 1975, Ser. No. 614,976

Int. Cl.<sup>2</sup> G01C 22/00

U.S. Cl. 235-96

3 Claims



1. A rotary motion transfer mechanism for use in an odometer assembly of the type including a shaft on which are supported for rotation a number of counting wheels with pinion gears therebetween, one end portion of which is engaged by means on the adjacent lower order counting wheel located to the right of the pinion gear to produce rotation of the pinion gear with each revolution of the lower order counting wheel, the transfer mechanism comprising: a gear wheel mounted for rotation on the shaft and located to the right of each counting wheel with a circumferentially continuous gear tooth configuration on its righthand side for receiving a rotative input from the pinion gear to its right; said gear wheel having a number of detents formed on its leftward side; a ratchet spring mounted for rotation about the shaft and located between each counting wheel and gear wheel; said ratchet spring having inner and outer hoop portions of resilient material connected together by a bridge portion; means on the outer hoop of said ratchet spring for engaging one of said gear wheel detents to form a drive connection therebetween for rotation together during a counting mode of operation; means between said inner hoop portion and the shaft to permit simultaneous rotation together during a reset mode of operation whereby said gear wheel remains stationary and said outer hoop means slips from one detent to another adjacent detent made possible by simultaneous inward and outward flexing of said outer hoop portion.

4,015,110

## ELECTRONIC CONTROL MEANS FOR PAPER COUNTING AND HANDLING MACHINES

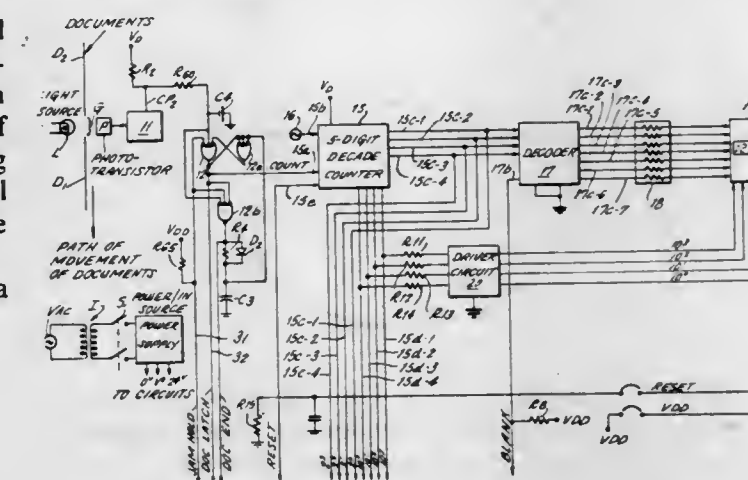
Alan P. Jones, Levittown, Pa., assignor to Brandt-Pra, Inc., Cornwells Heights, Pa.

Filed Sept. 15, 1975, Ser. No. 613,633

Int. Cl.<sup>2</sup> G06M 7/02, 3/12

U.S. Cl. 235-925 B

17 Claims



1. Electronic means for controlling the operation of paper handling and counting machine adapted to feed paper documents and the like in single file through a counting location so that the adjacent edges of documents are spaced by a minimum gap distance, said machine including a drive motor, wherein said control means comprises:  
 a light source and a light responsive element positioned on opposite sides of the moving documents at the counting location; whereby said light responsive element generates a count pulse during the time when the trailing edge of a document and the leading edge of the following document pass the counting location;  
 display means comprising counter means for accumulating said count pulses and a plurality of digit display means for collectively displaying a multidigit number responsive to said counter means representing the count in said counter means;  
 means coupled to said light responsive element for generating a jam signal when the time interval between the trailing edge of a count pulse and the leading edge of the next count pulse is greater than a predetermined threshold;  
 bistable circuit means being set to a first state responsive to a jam signal;  
 means responsive to the set state of said bistable means for stopping said motor;  
 means responsive to the set state of said bistable circuit means for resetting said counter means to a zero count;  
 flash means being activated responsive to the set state of said bistable circuit means for alternately disabling and enabling said display means to create a "flashing zero" display indicative of a jam condition.

4,015,111

## INFLATABLE, CHEMI-LUMINESCENT ASSEMBLY

Donald Spector, 380 Mountain Road, Union City, N.J. 07087

Filed Aug. 19, 1975, Ser. No. 605,809

Int. Cl.<sup>2</sup> F21V 9/16

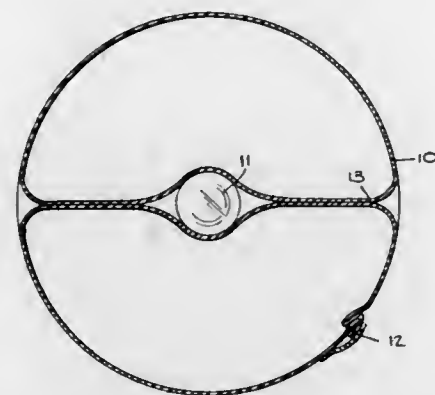
U.S. Cl. 240-2.25

10 Claims

1. A globular chemical lighting assembly comprising:  
 A. a chemi-luminescent device constituted by two separate chambers each containing one component of a two-component chemi-luminescent system and activating means to interconnect said chambers to intermingle said components and thereby cause a light-producing reaction, whereby said device is normally in a non-reactive state; and  
 B. an inflatable globe formed of translucent material and including conduit means communicating with the exterior of the globe adapted to receive said device and to hold it at a central position within the globe when the globe is



inflated, whereby by first activating the device and then inserting it in the conduit means, the globe then functions as a globular light emitter, said conduit means being constituted by an open-ended tubular duct extending diametrically through said globe and formed of collaps-



ible flexible material which when the globe is inflated to a level above atmospheric pressure is caused to collapse except the region therein enveloping said device which is now trapped within the duct, the collapsed portion of the duct on either side of the trapped device acting as flattened straps to hold the device in place.

4,015,112

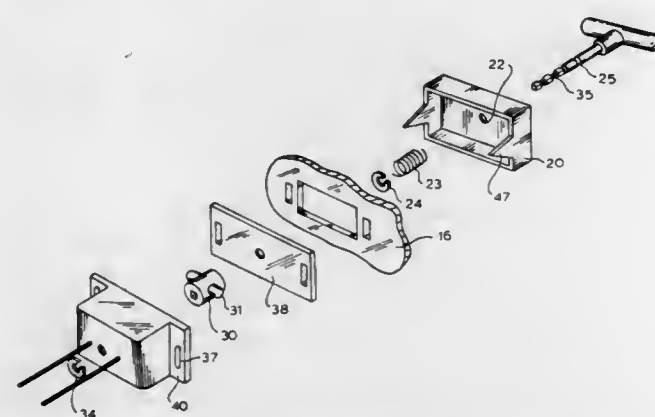
**METHOD OF MAKING ILLUMINATED HANDBAG**  
Stanley C. Castaldo, 704 N. Lake Pleasant Road, Apopka, Fla. 32703

Filed Dec. 5, 1974, Ser. No. 529,702

Int. Cl.<sup>2</sup> A45C 15/06

U.S. Cl. 240—6.45 P

9 Claims



1. A method of making an illuminatable handbag comprising the steps of:

- positioning a switch on an interior wall of a handbag;
- positioning a latching clasp on an exterior wall of said handbag across said handbag wall from said switch;
- operatively attaching said positioned clasp through said wall to said positioned switch whereby said switch is actuated by operation of said latching mechanism including inserting a protruding shaft from said latching clasp into a sleeve in said switch to operatively connect said latching clasp and said switch;
- attaching an illumination source operatively connected to said switch to the interior of said handbag and including attaching a battery power source to said handbag operatively connected to said illumination source and to said switch to operate said illumination source when a circuit is completed through said switch whereby said illumination source will be actuated by said switch when said latching clasp is actuated; and
- said latching clasp having a plurality of pointed protrusions which are pushed through said handbag wall and through flanges on said switch and then bent over said flanges to lock the latching clasp and switch together to the wall of said handbag.

4,015,113

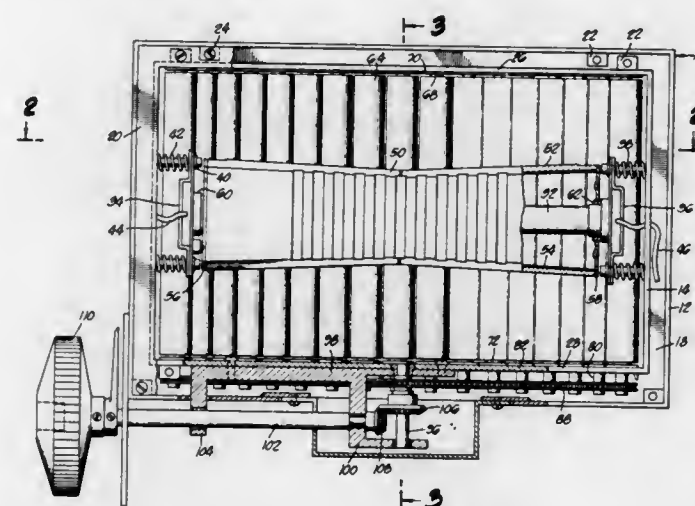
**APPARATUS FOR VARYING INTENSITY OF LIGHT**  
Robert E. Gottschalk, 10660 Chalon Road, Los Angeles, Calif. 90024

Filed May 2, 1975, Ser. No. 574,048

Int. Cl.<sup>2</sup> F21V 7/00

U.S. Cl. 240—41.35 R

16 Claims



1. Reflector apparatus for use with a light source for varying the intensity of light received from said light source, comprising: a housing; and a plurality of adjacent reflector members each pivotally mounted for relative movement on said housing and positioned to reflect diffused light toward the light source, each of said members having at least first and second surface areas which receive light from said source, said first surface area having an average reflectivity different from the average reflectivity of said second surface area, and means for turning said reflector members.

4,015,114

**LIGHTING FITTING**

Paavo Antero Paajanen, and Pentti Kauko Tapani Väänänen, both of Iittala, Finland, assignors to A. Ahlstrom Osakeyhtio, Finland

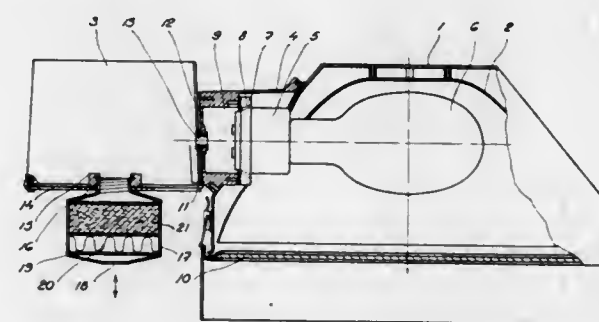
Filed Oct. 14, 1975, Ser. No. 621,832

Claims priority, application Finland, Dec. 20, 1974, 743739

Int. Cl.<sup>2</sup> F21V 29/00

U.S. Cl. 240—47

1 Claim



1. A light fitting comprising a ballast casing enclosing first means for communicating with a source of electrical current, a large shade provided with a reflector, second means connecting the ballast casing with the lamp shade, a bulb holder and a bulb mounted on said bulb holder, said bulb holder being located on said second means, third means defining a chamber surrounding said bulb, the ballast casing having a cover and defining together with said cover a cavity, a filter connected with said cover, said filter being placed away from said bulb whereby it is not substantially heated by the heat generated by the bulb when the light is on, fourth means for communicating said bulb chamber with the cavity defined by said ballast casing and said cover, an orifice in said filter located opposite said cover, said orifice providing for the flow of air from the bulb chamber to the surrounding when the light is on and when the air in the bulb chamber is under increased

pressure and providing for the flow of air from the surrounding into the bulb chamber when the light is turned off and the pressure in the interior of the bulb chamber becomes lower than the pressure in the surrounding, said filter comprising filter elements retaining dust, smoke and vapor and activated carbon as a filter element adsorbing gases, said filter being connected to said cover by means of a threaded joint, the filter being a casing of large diameter as compared with the size of the threaded joint.

4,015,115

**PICTURE PHONE**

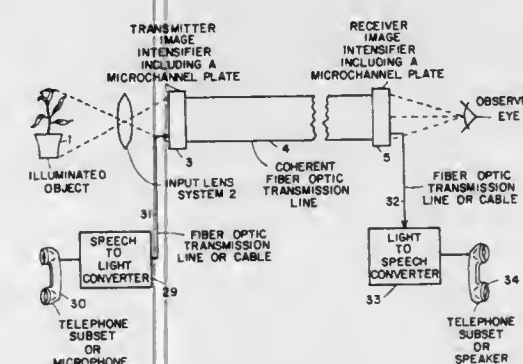
Donald Gerald Corcoran, Montvale, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 9, 1975, Ser. No. 639,151

Int. Cl.<sup>2</sup> H04B 9/00

U.S. Cl. 250—199

41 Claims



1. A picture communication system comprising: at least a first image intensifier; first means to optically couple an image of an illuminated picture to be transmitted to the input of said first intensifier; said first intensifier providing an intensity amplified version of said image at the output thereof; a coherent fiber optic transmission line having one end thereof optically coupled to the output of said first intensifier to transmit said amplified version of said image to the other end thereof; at least a second image intensifier having its input optically coupled to said other end of said transmission line to intensity amplify said transmitted image at said other end of said transmission line and to reproduce said amplified transmitted image for presentation to an observer; said first means including a lens system to direct said image of said picture upon the input of said first intensifier; each of said first and second intensifiers including a proximity focused planar device having a microchannel plate for image amplification; second means disposed between said lens system and said one end of said transmission line; and third means disposed between said said other end of said transmission line and said observer; said second and third means cooperating to present said reproduced image as a colored image to said observer.

4,015,116

**MEASUREMENT OF SOLAR RADIATION**

Raymond J. Bahm, Albuquerque, N. Mex., assignor to Rho Sigma Corporation, Van Nuys, Calif.

Filed Oct. 20, 1975, Ser. No. 624,111

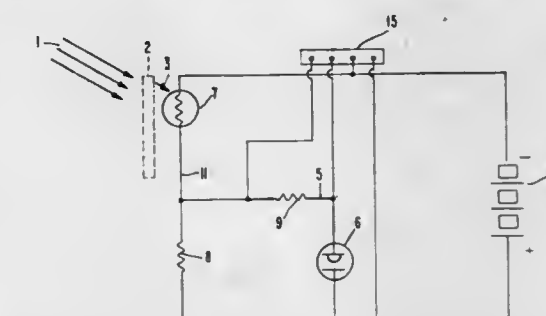
Int. Cl.<sup>2</sup> H01J 3/14

U.S. Cl. 250—206

5 Claims

1. A solar radiation measuring and recording system comprising: an integrating solar radiometer and a solar recorder, said integrating solar radiometer comprising: a constant voltage source, a photo-resistive element, and a current integrating device connected in series,

said photo-resistive element having an electrical resistance inversely proportional to the radiation falling thereupon to produce a detectable change of state therewithin to control the current passing through said current integrating device, and said solar recorder comprising: a light-tight enclosure having a pin hole therein, a medium, sensitive to a portion of the solar spectrum to create a change of state in said medium, located within



said enclosure, whereby only direct rays from said portion of the solar spectrum which pass through the pin hole impinge upon said medium, and at least one sight attached to said enclosure, said at least one sight comprising: a circular angular scale having equiangular divisions on a flat surface upon said enclosure, and a conical shaped pedestal in the center of said scale having the axis of the cone normal to said flat surface and the base of said pedestal lying in the same plane and said flat surface.

4,015,117

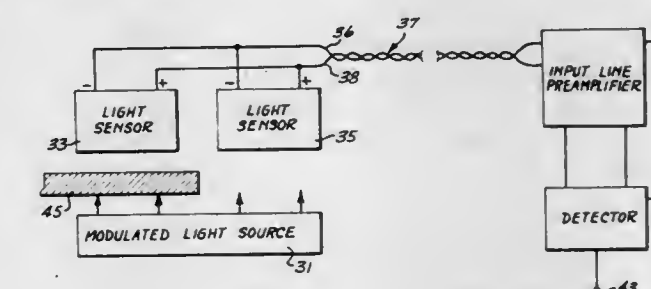
**UNBIASED MODULATED PHOTO SENSING SYSTEMS**  
Joseph B. Wicklund, Jr., Bothell, Wash., assignor to Opcon, Inc., Everett, Wash.

Filed Aug. 28, 1975, Ser. No. 608,664

Int. Cl.<sup>2</sup> H01J 39/12

U.S. Cl. 250—208

14 Claims



1. A modulated photosensing system comprising: a modulated light source producing light rays modulated at a frequency in the KHz range or above; an unbiased photovoltaic device having a photosensitive surface positioned so as to receive at least a portion of the light rays produced by said modulated light source and produce an output in accordance therewith, the amount of light received and the resultant output being controlled by the presence or absence of an object located between said modulated light source and said unbiased photovoltaic device; a cable including a pair of wires, one end of said pair of wires being directly connected to said at least one unbiased photovoltaic device; a balanced, low impedance differential input line preamplifier, connected to the other end of said pair of wires for receiving the output of said unbiased photovoltaic device, said balanced, low impedance, differential input line preamplifier having an input impedance of 1000 ohms or less and a common mode rejection ratio of 40 db or more; and, a detector connected to the output of said balanced, low impedance, differential input line preamplifier for detect-



ing when said preamplifier receives an output from said unbiased photovoltaic device indicating that said photovoltaic device is receiving light rays produced by said modulated light source.

4,015,118

# CONTROLLING THE AMPLIFICATION IN A RADIATION DETECTING AVALANCHE DIODE

Karl-Gustaf Leif Andersson, and Klas Rudolf Wiklund, both of Taby, Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

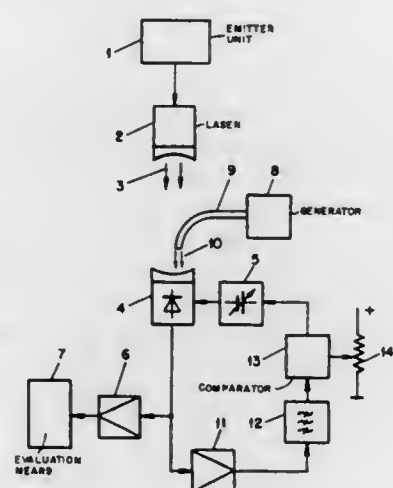
Filed May 21, 1975, Ser. No. 579,369

Claims priority, application Sweden, June 5, 1974, 74073891

Int. Cl.<sup>2</sup> H01J 39/12

U.S. Cl. 250-211 J

3 Claims



1. Apparatus comprising a radiation detecting avalanche diode wherein said diode generates electric signals in dependence upon received radiation, evaluation means for receiving said electric signals, control signal selection means for deriving a control signal from said diode electric signals, said control signal having a frequency differing from the frequency used in said evaluation means, comparison means for comparing the amplitude of said control signal with at least one predetermined value, and supply voltage means for said diode, said supply voltage means being varied in accordance with the output of said comparison means for controlling the amplification of the diode.

4,015,119

# UNDER EXPOSURE AND FADE INDICATOR

Teruhiko Miyake, Tokorozawa, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Higashimurayama, Japan

Filed Dec. 24, 1975, Ser. No. 644,780

Claims priority, application Japan, Dec. 25, 1974, 50-2681

Int. Cl.<sup>2</sup> H01J 39/12; G03B 21/36

U.S. Cl. 250-214 D

3 Claims

1. For a camera having an exposure control system driving a diaphragm and having a fade system, an indicator system for informing the camera operator of the status of the exposure control system and the status of the fade system, the exposure control system varying the opening of the diaphragm for correct film exposure in accordance with the brightness of a scene being photographed, and fade control circuitry gradually closing the diaphragm opening from the correct exposure opening during a fade-out sequence, and gradually opening the diaphragm opening from a substantially closed condition to the diaphragm opening for the correct exposure opening during a fade-in sequence, the indicator system being connected in combination with a camera control circuit comprising:

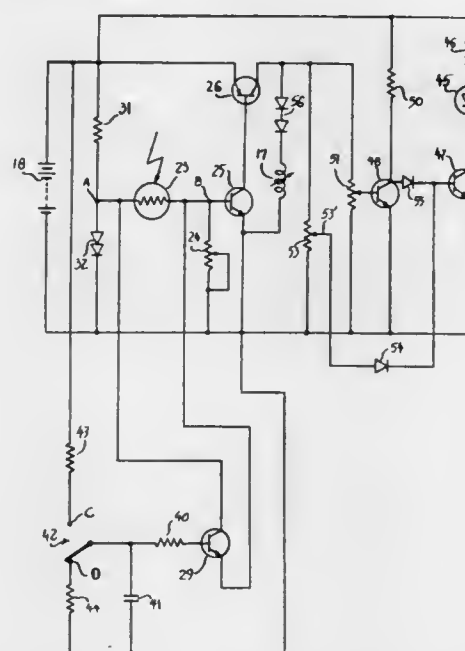
- the camera control system including:
- a power supply;
- the exposure control system including:
- a photocell in circuit with said power supply, having a resistance variable in response to the quantity of light impinging thereon;

ance variable in response to the quantity of light impinging thereon;

a meter in circuit with said photocell;

first circuit means connecting said photocell to said meter and said power supply for driving said meter in response to light impinging on said photocell to maintain constant said light impinging on said photocell; said circuit means including transistor means in circuit with said photocell to be made conductive when the resistance of said photocell varies from a predetermined value;

an indicator lamp;



second circuit means connecting said photocell and said power supply to said indicator lamp for energizing said lamp when an inadequate quantity of light impinges on said photocell causing said transistor means to become conductive;

third circuit means including fade means connecting said photocell, said meter, and said indicator lamp for altering the status of said meter independent of light impinging on said photocell wherein said indicator lamp is energized during selected conditions of said fade means; and

fourth means for selectively connecting said third circuit means with said first and second circuit means for causing initiation of a fade sequence.

4,015,120

# OPTICAL SYSTEMS AND ASSOCIATED DETECTING MEANS

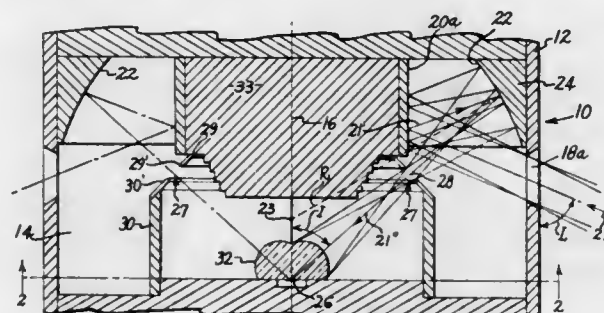
Henry B. Cole, East Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Feb. 21, 1961, Ser. No. 90,887

Int. Cl.<sup>2</sup> H01J 3/14

U.S. Cl. 250-216

7 Claims



1. An opaque hollow main supporting housing and a combined light-collecting and detecting system disposed within and surrounded by said main housing at a location intermediate its spaced opposite ends, said combined system being arranged to simultaneously view through a plurality of relatively small peripherally spaced light apertures in side wall

portions of said main housing all azimuths of a predetermined endless annular object field outwardly of said housing and in concentric relation to a longitudinal axis extending centrally through said housing and to detect any appreciable change in light intensity occurring at any location in said annular object field, said combined system comprising a single relatively small photosensitive detecting element disposed at a fixed axial location in said main housing, a plurality of similar relatively small light apertures circumferentially arranged in side wall portions of said housing and appreciably spaced from each other in such a predetermined manner as to have each aperture face outwardly toward a different sector of said endless annular object field and jointly simultaneously admitting into said housing light from all parts of said annular object field, an optical system aligned with each aperture and with said single photosensitive detecting element, and each optical system comprising first and second specularly reflecting surfaces, said first surface being a plane surface positioned within said housing in a plane substantially parallel to said longitudinal axis and at a location substantially midway between the aperture associated therewith and said longitudinal axis, and said second surface being a spherically curved concave surface having its center of curvature disposed substantially upon said longitudinal axis, said first surface being so disposed in said housing and relative to the light aperture associated therewith as to intercept substantially all of the light rays from said object field which enter said housing therethrough and to reflect same toward said second surface, and said second surface being so disposed in said system as to receive said reflected light rays and direct same generally toward said detecting element, the spherical curvature of said second surface being such as to focus the light rays being reflected thereby at a focal plane in said housing intermediate said second surface and said detecting element, and a positive lens element centrally disposed within said housing and in optical contact with said detecting element so as to collect the light rays passing beyond said focal plane and direct same onto said relatively small detecting element.

4,015,121

# CATALSIMETER WITH TIME MEASURING CIRCUITRY FOR DETERMINING REACTANT CONCENTRATION LEVEL

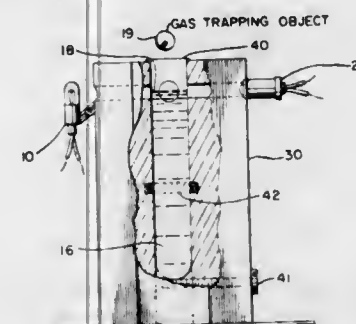
Marcel Gagnon, St. Lambert; Michel Baril, Pointe Claire; Francois-Gros D'Aillon, Rosemere, and Claude Savoie, St. Basil Le Grand, all of Canada, assignors to Allica Instruments Co. Ltd., Montreal, Canada

Division of Ser. No. 487,615, July 11, 1974, Pat. No. 3,948,730. This application July 15, 1975, Ser. No. 596,166

Int. Cl.<sup>2</sup> G01D 21/04; G01N 21/26, 21/28

U.S. Cl. 250-221

12 Claims



2. A circuit for electronically measuring and displaying a readout of elapsed time for a gas-trapping object saturated with a medium containing a first reactant to buoyantly rise within and break the plane of the surface of a fluid containing a second reactant at a predetermined concentration in a container due to the reaction of said first and second reactants to produce a gas following said gas-trapping object having broken said plane and sunken in the fluid, said circuit comprising:

- a. photo-detector means for producing a start pulse when said gas-trapping object breaks said plane to sink in said

fluid and a stop pulse when said gas-trapping object buoyantly rises and again breaks said plane of said fluid;

- b. clock means for displaying said elapsed time between said start pulse and said stop pulse, said elapsed time being of at least a predetermined duration thereby to be proportional to the concentration of said first reactant in said medium; and,
- c. means for electrically connecting said clock means and said photo-detector means.

4,015,122

# PHOTO-ELECTRIC OBJECT DETECTION SYSTEM

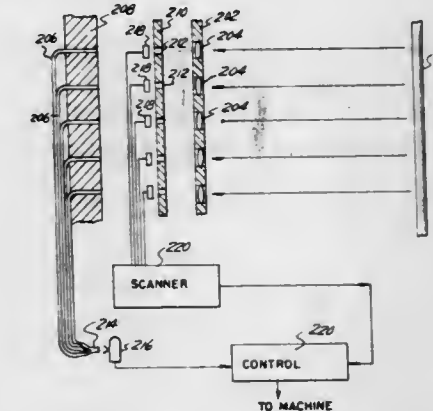
Walter M. Rubinstein, 25535 Briar, Oak Park, Mich. 48237

Filed July 12, 1974, Ser. No. 487,898

Int. Cl.<sup>2</sup> G01D 21/04

U.S. Cl. 250-221

6 Claims



1. A safety device of the type described, comprising: a constant radiation source, a plurality of radiation receivers; a single radiation detector; means for causing the radiation detector to sequentially monitor the conditions of the radiation receivers; means for developing timing signals in timed relation to the monitoring of individual radiation receivers by the radiation detector; a plurality of shift registers connected serially, having the outputs of the radiation detector provided as an input to the first register in the serial chain and the timing signals connected to advance the contents of all of the registers; means for simultaneously receiving the outputs of all of said shift registers and for generating an alarm signal upon the occurrence of a particular pattern in the outputs from said shift registers.

4,015,123

# SYSTEM FOR ASSURING HOT FACE IDENTIFICATION OF REFRACTORY KILN LINERS

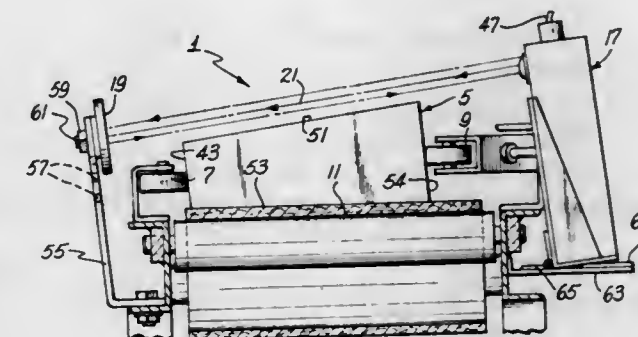
John F. Small, Dover, and Richard J. Shaffer, York, both of Pa., assignors to Dolomite Brick Corporation of America, York, Pa.

Filed Nov. 6, 1975, Ser. No. 629,419

Int. Cl.<sup>2</sup> G01D 21/04

U.S. Cl. 250-223 R

10 Claims



1. A system for placing an identifying mark on a specific surface portion of an irregular article, which system comprises, in combination: means for supporting and moving the article among a given route; a first sensing means positioned



along said route for ascertaining if said specific surface portion of said irregular article is in the desired orientation for marking, by means of a scan line of detection positioned adjacent and parallel to the plane of a given side of the moving irregular article such that incorrect orientation of the article will be evidenced by interruption of the scan line of detection by the article; marking means positioned further along said route for applying an identifying mark to said specific surface portion of a properly oriented article; and a second sensing means positioned downstream from said marking means for ascertaining the presence of a sufficient identifying mark on the specific surface portion of said article.

4,015,124

# **DETERMINING THE CONCENTRATION OF SULPHUR IN COAL**

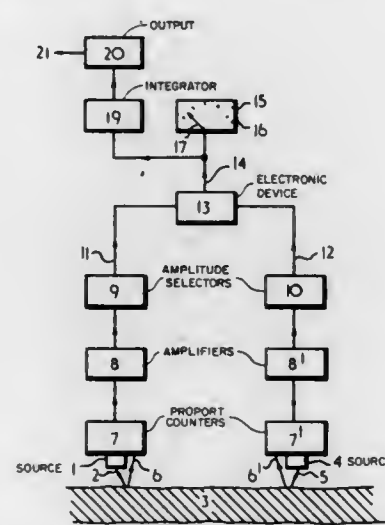
Dennis Page, Gateshead, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Feb. 20, 1976, Ser. No. 659,972

Claims priority, application United Kingdom, Mar. 14, 1975, 10713/75

Int. Cl.<sup>2</sup> G01N 23/00

U.S. Cl. 250—273



1. A method for continuously measuring the concentration of sulphur in coal, including the steps of bombarding a sample of coal with electromagnetic radiation in the X-ray region of the spectrum to cause the iron and sulphur atoms in the sample to emit their characteristic fluorescent radiations, detecting said fluorescent radiations, measuring the intensities of said fluorescent radiations, and combining the measures mathematically to produce an output from which the concentration of sulphur in the sample may be determined.

4,015,125

# **RESOLVING CONE-AXIS CAMERA**

Gabrielle Donnay, Montreal, and Yvon Le Page, Brossard, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Nov. 17, 1975, Ser. No. 632,849

Claims priority, application Canada, Feb. 28, 1975, 221018

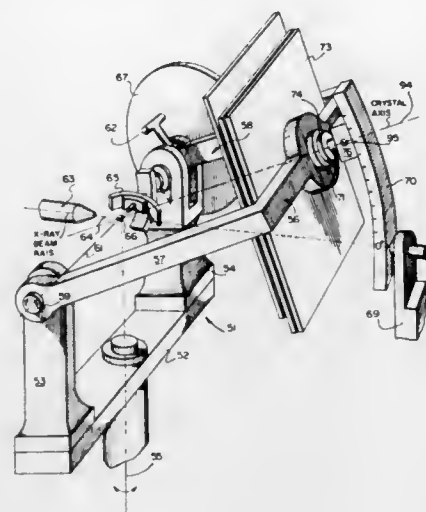
Int. Cl.<sup>2</sup> G01N 23/20

U.S. Cl. 250—275

8 Claims

2. In a cone axis camera having a crystal holder means for processing a crystal about an x-ray beam axis to produce diffraction spots from successive levels of the reciprocal lattice of the crystal which are recorded on a film that is mounted in a film holder which maintains the film parallel to the reciprocal lattice of the crystal at a fixed distance from the crystal along the crystal axis:

means for providing a predetermined offset point on said film with an additional translation motion in the plane of



the film such that said offset point follows a circular path which has the crystal axis as its center.

4,015,126

# **X-RAY INTENSIFICATION AND MINIFICATION SYSTEM**

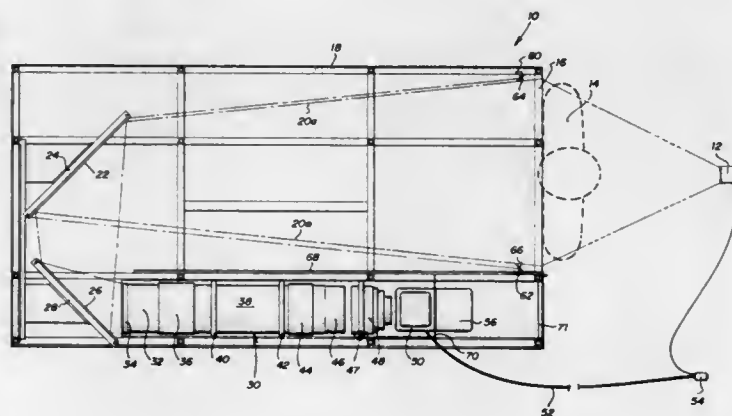
James R. Herrington, Garland, Tex., assignor to Varo Semiconductor, Inc., Garland, Tex.

Filed Oct. 10, 1975, Ser. No. 621,405

Int. Cl.<sup>2</sup> G03B 5/17

U.S. Cl. 250—320

39 Claims



1. A radiation minification and recording system comprising:

- a housing,
- a screen in a first end of said housing for being positioned to receive radiation and for converting the radiation into visible images,
- reflecting surfaces disposed in a second end of said housing for reflecting said visible images toward said first end of said housing,
- image intensifying means disposed in said housing for intensifying and minifying the reflected images, and
- recording means disposed in the region of said first end of said housing for recording the amplified minified images.

4,015,127

# **MONITORING FILM PARAMETERS USING POLARIMETRY OF OPTICAL RADIATION**

Allen J. Sharkins, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 30, 1975, Ser. No. 627,248

Int. Cl.<sup>2</sup> G01J 4/04

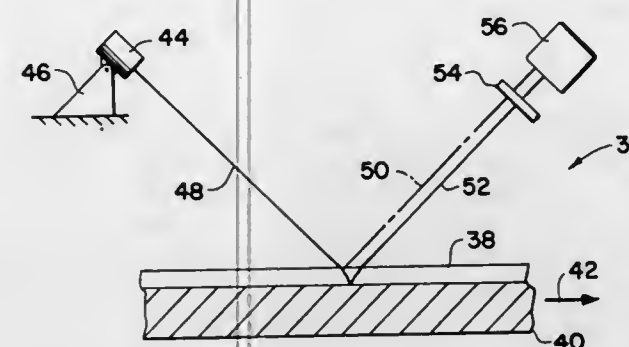
U.S. Cl. 250—341

34 Claims

1. A method of monitoring physical parameters of films or coatings having first and second at least partially reflective surfaces, including the steps of:

- directing a beam of optical radiation having at least a portion thereof which will be absorbed by the film onto said first surface at a predetermined angle so as to plane pola-

size any radiation reflected from said first surface and transmitting at least a portion of the radiation through said film to said second surface;  
reflecting the transmitted radiation from said second surface back through said film;



transducing said radiation reflected from said second surface having a narrow band width with respect to which the film is absorptive to provide an output signal which is a function of absorption of said radiation by said film; and polarizing said radiation to be transduced to block any component of said radiation other than that transmitted through said film.

4,015,128

# **DEVICE FOR AND METHOD OF CONTROLLING THE LEVEL IN APPROPRIATE CONTAINERS OF A LIQUID WHICH WILL EMIT INFRA-RED RAYS AND, IN PARTICULAR, THE LEVEL OF MOLTEN METAL**

Ferruccio Della Vedova, Pozzuolo Del Friuli, Italy, assignor to CEDA, S.p.A., Buttrio (UD), Italy

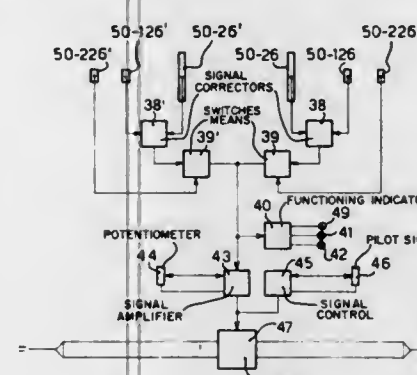
Filed July 28, 1975, Ser. No. 599,477

Claims priority, application Italy, Sept. 26, 1974, 83404/74; Sept. 26, 1974, 83405/74

Int. Cl.<sup>2</sup> G01N 21/26

U.S. Cl. 250—342

25 Claims



1. A device for controlling the level in a container of a liquid which will emit infra-red rays comprising in reciprocal coordination and cooperation a housing, at least one longitudinal window constructed and arranged at one end of said housing, at least one photo-element in cooperation with said window for sending out an electrical signal through said window to a liquid in a container, at least a second window constructed and arranged at said one end of said housing which is substantially punctiform, a second photo-element in cooperation with said second window for sending out a pilot signal, and circuitry in cooperation with said photo-elements for correcting, amplifying, and comparing said signals.

4,015,129

# **POSITION INDICATING CONTROL METHOD AND APPARATUS IN RADIATION SCANNING SYSTEMS**

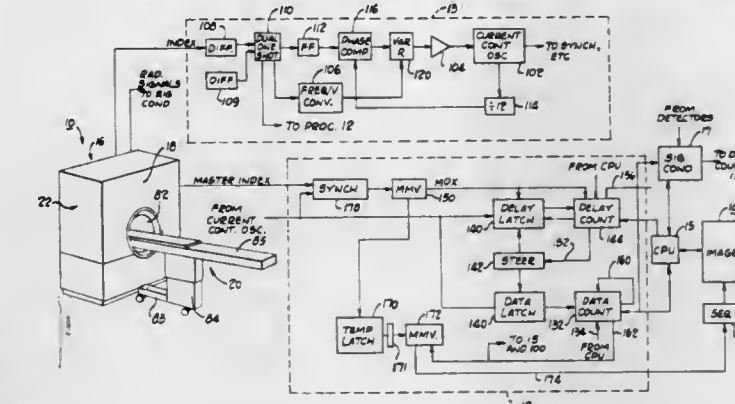
John Michael Manning, Cleveland Heights, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Filed Nov. 28, 1975, Ser. No. 635,949

Int. Cl.<sup>2</sup> G01N 23/08

U.S. Cl. 250—360

50 Claims



1. A system for indicating motion of a member of a radiation sensing apparatus movable along a path, said system comprising:

- a. an incremental encoder producing index signals each indicating motion by said member past one of a plurality of locations on said path;
- b. circuitry for multiplying the frequency of said index signals by a predetermined factor to define gradations of traversal by said member between said path locations; and
- c. phase lock loop circuitry including a phase comparator having an output and being coupled to said frequency multiplying circuitry to facilitate the maintenance of a constant value for said predetermined factor so that said multiplied signals accurately represent uniform gradations of said traversal between said path locations.

4,015,130

# **METHOD AND APPARATUS FOR MONITORING OPTICAL RADIATION**

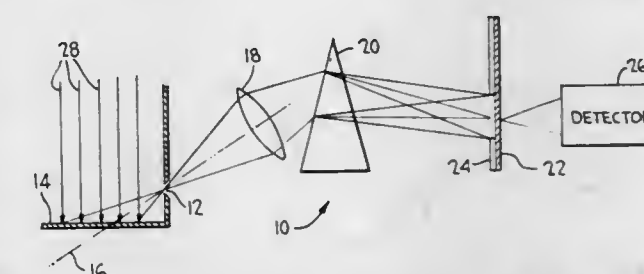
Robert Joseph Landry, Poolesville; Robert G. Bostrom, and Richard W. Peterson, both of Rockville, all of Md., assignors to The United States of America, Washington, D.C.

Filed Oct. 7, 1975, Ser. No. 620,375

Int. Cl.<sup>2</sup> G01J 1/42

U.S. Cl. 250—372

16 Claims



1. Apparatus for monitoring radiation from a source thereof to which a biological system may be exposed, said radiation having a known effect on said biological system, which comprises:

- means for spectrally dispersing the radiation emitted from said optical radiation source;
- means for masking a portion of the output of said spectral dispersion means in accordance with a predetermined wavelength-dependent sensitivity similar to the biological system desired; and
- means for detecting the intensity of the portion of radiation passed by said masking means.



4,015,131

## MULTI-DETECTABLE INK COMPOSITIONS AND METHOD OF USE

William F. McDonough, Trumbull; James A. Montlick, Darien, and Richard A. Bernard, Norwalk, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Division of Ser. No. 433,806, Jan. 16, 1974, Pat. No. 3,928,226. This application Dec. 15, 1975, Ser. No. 641,079 Int. Cl.<sup>2</sup> G01N 21/38

U.S. Cl. 250—461 R

4 Claims

1. The method of processing and distinguishing articles comprising the steps of

A. marking the articles with an ink,

i. said ink having a first coloration in ordinary mixed light, but which fluoresces within a predetermined wavelength range when irradiated, said fluorescent color being different than the mixed light color of said ink,

a. said ink containing

i. 2 to 25% by weight of at least one fluorescent pigment,

ii. 0.3 to 10% of at least one non-fluorescent pigment,

iii. 0.25 to 5% gellant, and

iiii. 0 to 1% antioxidant

iiii. all being in an ink vehicle essentially comprising the remainder of said ink; then

B. processing the articles by detection means comprising a detector responsive to at least the fluorescent wavelength of said ink,

whereby said articles may be processed by a machine having at least fluorescent detection means covering the range of fluorescent wavelength of said ink and said articles may be further optically processed by differentiation of the mixed light color of said inks.

4,015,132

## X-RAY FILM HOLDER

Jürgen Buschbeck, Norderstedt, and Wilfried Pfeiffer, Quickborn, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

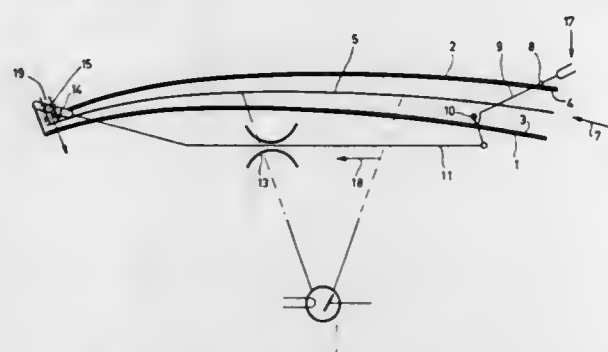
Filed Aug. 4, 1975, Ser. No. 601,462

Claims priority, application Germany, Aug. 3, 1974, 2437453

Int. Cl.<sup>2</sup> G03C 5/16

U.S. Cl. 250—481

1 Claim



1. An x-ray film holder, comprising:

a generally rectangular rigid base plate for receiving x-ray film on one side thereof, said base plate arching toward the x-ray film from first and second opposing edges thereof;

a flexible cover plate for said base plate;

first and second rods supporting said flexible cover plate along first and second edges thereof corresponding respectively to said first and second opposing edges of said base plate;

two lever arms supporting opposite ends of said first rod for displacing said first rod toward said base plate and flexing said cover plate about and against said base plate, said arms being pivotable about a common axis which is parallel to said first edge of said base plate and in substantially

the plane of said base plate at a position intermediate said first and second edges thereof;

a trunnion supporting each end of said second rod; and a guide rod corresponding to and longitudinally displaced by each of said lever arms, each of said guide rods having a slot supporting one of said trunnions for displacing said second rod toward and away from said base plate.

4,015,133

## METHOD OF PRODUCING STRING OF POLYAMIDE AND STRINGED RACKETS AND STRINGED MUSICAL INSTRUMENTS WITH SUCH STRINGS

Harry Ferrari, 144 W. Swissvale Ave., Pittsburgh, Pa. 15218

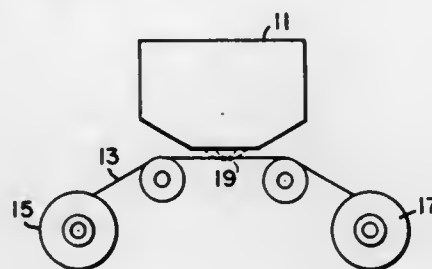
Continuation-in-part of Ser. No. 540,794, Jan. 14, 1975,

abandoned. This application Feb. 10, 1976, Ser. No. 656,808

Int. Cl.<sup>2</sup> G21G 5/00

U.S. Cl. 250—492 R

7 Claims



1. The method of substantially improving the elasticity and decreasing and damping of string composed of polyamide for stringed apparatus which comprises irradiating the string with radiation, the magnitude of the energy of said radiation being in the range between the energy for which cleavage is predominately produced and the energy for which linkage alone is produced, so that a decrease in the modulus of elasticity of the treated string is accompanied by a decrease in the damping loss coefficient of the treated string.

4,015,134

## APPARATUS FOR CONTROLLING THE ABSORPTION OF ONE OR MORE COLOR COMPONENTS CONTAINED IN A TEXTILE DYEING FLUID

Walter H. Sturm, Hanau, Germany, assignor to Original Hanau Quarzlampen GmbH, Hanau, Germany

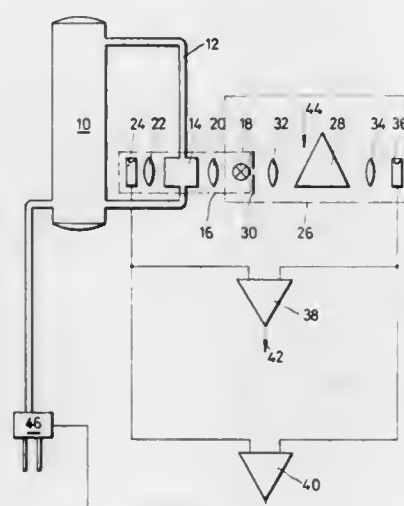
Filed Mar. 31, 1976, Ser. No. 671,930

Claims priority, application Germany, Apr. 9, 1975, 2515499

Int. Cl.<sup>2</sup> G01N 21/28

U.S. Cl. 250—565

10 Claims



1. An apparatus for optimally controlling the attachment of at least one color component in a dyeing fluid to textile goods by regulating the temperature of the dyeing fluid as a function of its transparency, comprising:

a. a light source,

4,015,136

## ELECTRICAL SYSTEMS FOR ROAD VEHICLES

William David Holt, Colne, England, assignor to Lucas Electrical Company Limited, Birmingham, England

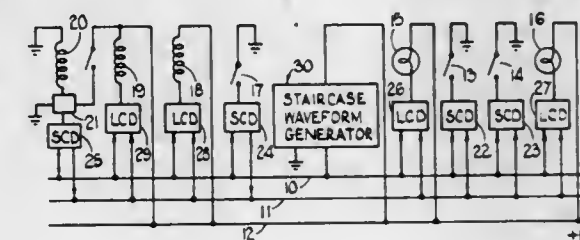
Filed Sept. 16, 1975, Ser. No. 613,807

Claims priority, application United Kingdom, Sept. 19, 1974, 40843/74

Int. Cl.<sup>2</sup> H02J 1/08

U.S. Cl. 307—10 R

3 Claims



b. means for directing light from the source through the dyeing fluid,

c. a first photocell positioned to detect light passing through the dyeing fluid,

d. a transparent container of varying width containing a reference fluid,

e. means for directing light from the source through the reference fluid,

f. a second photocell positioned to detect light passing through the reference fluid,

g. first and second differential amplifiers,

h. means connecting the outputs from each of the photocells to the inputs of each of the amplifiers,

i. means for moving the container transverse to the light passing through it,

j. means for supplying heat to the dyeing fluid,

k. means coupling the output from the first amplifier to the moving means, and

l. means coupling the output from the second amplifier to the heat supplying means.

4,015,135

## METHOD AND APPARATUS FOR PARTICULATE MONITORING

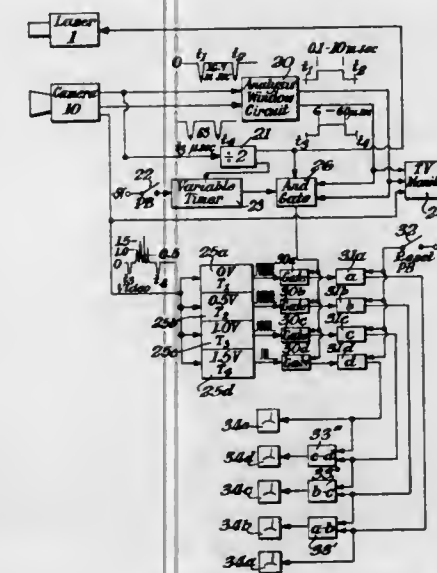
Douglas F. Tipton, Jr., Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Jan. 10, 1975, Ser. No. 539,982

Int. Cl.<sup>2</sup> G01N 15/02

U.S. Cl. 250—574

12 Claims



1. Apparatus for the real time measurement of the size and number of fluid-suspended particles in general conformity with the Mie Theory comprising a pulsed monochromatic radiation source directing a collimated illuminating beam into the fluid suspension of said particles, means directing particle-scattered radiation to a two-dimensional multiple sensor radiation detector, and electronic means measuring in real time particle size and particle number responsive to said multiple sensor radiation detector, the pulse interval of said radiation source being preselected in time duration to afford complete examination of a given sample of said fluid suspension.

4,015,137

## CONTROL FOR ACTIVATING MOTOR VEHICLE ELECTRICAL LOAD

Richard A. Kniesly, Kokomo; Larry L. Colville, and Jerrold L. Mullen, both of Anderson, all of Ind., assignors to Ko An, Inc., Kokomo, Ind.

Division of Ser. No. 470,971, May 17, 1974, Pat. No.

3,909,619. This application Apr. 14, 1975, Ser. No. 568,014

Int. Cl.<sup>2</sup> H02G 3/00

U.S. Cl. 307—10 LS

3 Claims

1. A control for activating a lighting circuit in a motor vehicle comprising:

a motor vehicle lighting circuit;

photosensitive means for producing an electrical signal dependent upon the level of ambient light of the motor vehicle;

first relay circuit means, having an input, for coupling electrical power to the lighting circuit when the input of the first relay circuit means is energized;

electronic switching means for energizing the input of said first relay circuit means in response to the electrical signal of the photosensitive means;

said lighting circuit including the motor vehicle taillight circuit;

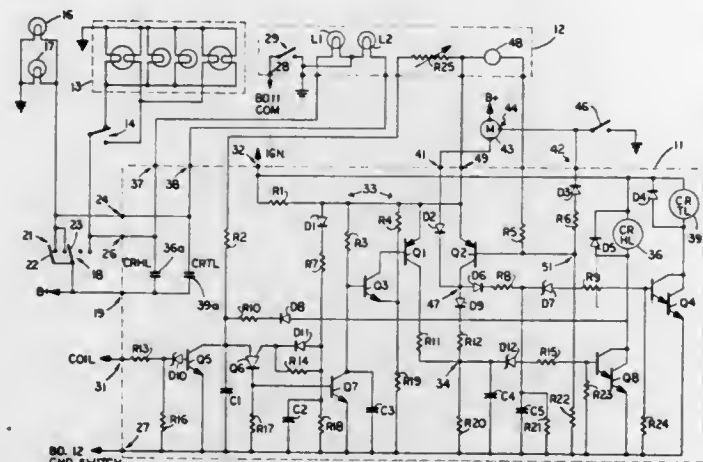
a motor vehicle headlight circuit;

second relay circuit means, having an input, for coupling electrical power to the headlight circuit when the input of



the second relay circuit means is energized, the electronic switching means including means for energizing the input of the second relay circuit means in response to the electrical signal of the photosensitive means;

ignition circuit means, having an input coupled to ignition pulses in the ignition system of the motor vehicle, for producing at an output a first electrical signal dependent upon the frequency of the ignition pulses;



reference circuit means for producing at an output a reference electrical signal; and

comparison circuit means, having a first input coupled to the output of the ignition circuit means and having a second input coupled to the output of the reference circuit means, for energizing the input of the second relay circuit means when the first electrical signal from the ignition circuit means differs from the reference electrical signal by a predetermined amount.

#### 4,015,138 SEQUENCE CONTROL CIRCUIT

John Frederick Collett Andrews, Lingfield; Edward Stanislaw Budzinski, Ickenham, and David Henry Pearson, Harrow, all of England, assignors to Coal Industry (Patents) Limited, London, England

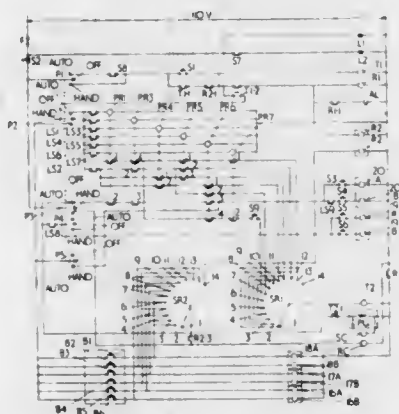
Filed Oct. 18, 1974, Ser. No. 516,076

Claims priority, application United Kingdom, Nov. 2, 1973, 50987/73

Int. Cl.<sup>2</sup> H02J 1/00, 3/00

U.S. Cl. 307-41

14 Claims



1. A sequence control circuit for an automatic sequence control system comprising a power supply, a plurality of limit switches separately connected to the power supply and each arranged to be associated with a separate movement of an operation of apparatus to be controlled, position proving switches having power-driven operators connected respectively with each limit switch, the position proving switches being arranged to be operated when a limit switch has reached an extreme position, a plurality of contacts connected to operators of the proving switches, and a multiple contact stepping switch adapted to initiate each next stage in the

sequence, the contacts of the stepping switch being connected with selected contacts of the said proving switches and selected limit switches to enable sequential circuits to be completed and supply power to stepping means connected to the stepping switch to step the stepping switch through its sequence.

#### 4,015,139 CONTROLLED DURATION SWITCH

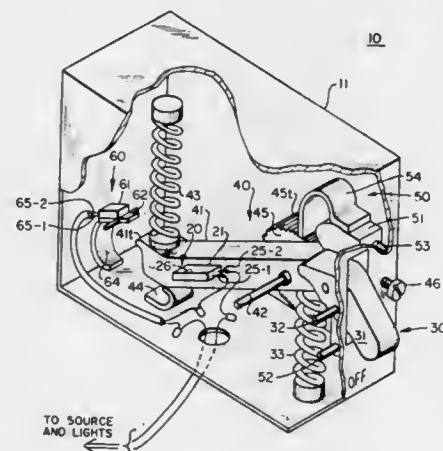
John M. Cleary, 426 Washington Valley Road, Martinsville, N.J. 08836, and John P. Mohrhauser, 7 Washington Ave., Avon-by-the-Sea, N.J. 07717

Filed May 6, 1975, Ser. No. 574,955

Int. Cl.<sup>2</sup> H01H 43/00

U.S. Cl. 307-141

15 Claims



1. An electrical control system, comprising

a housing;

a switch actuator mounted in said housing for movement between a first position and a second position;

an auxiliary switch mounted in said housing for movement between a first position and a second position;

means in said housing and extendable outwardly therefrom for connecting said auxiliary switch to an energy source and a load;

means in said housing for operating said auxiliary switch in accordance with the operation of said actuator switch;

regulator means operable during a prescribed time interval;

means for actuating said regulator means in response to the movement of said actuator switch from said first position to said second position;

restoring means for returning said actuator switch from said second position to said first position;

and means responsive to said regulator means for activating said restoring means at the end of the prescribed time interval of said regulator means.

#### 4,015,140 MULTIPLIER FOR PRODUCING PHASE SHIFT ERROR-FREE SIGNAL REPRESENTING PRODUCT OF OUT-OF-PHASE INPUTS

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Dover, N.H.

Division of Ser. No. 474,519, May 30, 1974, Pat. No. 394,763.

This application Dec. 5, 1975, Ser. No. 638,004

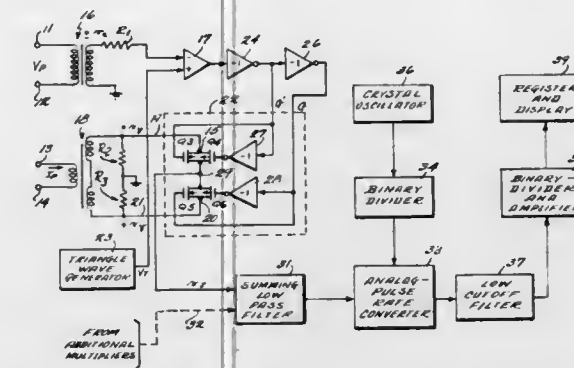
Int. Cl.<sup>2</sup> G06G 7/12

U.S. Cl. 307-229

9 Claims

1. A multiplier for producing an output signal free of phase shift error and representative of the product of two out-of-phase input analog signals comprising means for generating a cyclically varying reference signal, comparator means for linearly superimposing said reference signal and one of said analog signals to form a pulse train width-modulated in accordance with the comparison of said reference signal with the one analog signal, a selectively actuated bipolar switch directly coupling the other analog signal that is out-of-phase

with said one analog signal to the multiplier output, said switch being actuated by the width-modulated pulse train to form at the multiplier output an output pulse train which is



width-modulated in accordance with the one analog signal and amplitude-modulated in accordance with the other analog signal.

#### 4,015,141 APPARATUS FOR COMPARING VOLTAGES

Herbert Reiter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

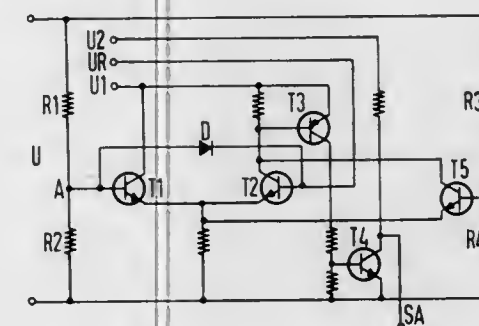
Filed Dec. 4, 1974, Ser. No. 529,496

Claims priority, application Germany, Dec. 4, 1973, 2360364

Int. Cl.<sup>2</sup> H03K 5/153, 5/08

U.S. Cl. 307-235 N

2 Claims



1. Apparatus for indicating when an input voltage reaches predetermined lower and upper threshold voltage levels comprising:

differential comparator circuit means,

a reference voltage source coupled to a first input of said differential comparator circuit means,

first voltage divider means connected across terminals for said input voltage and having a first junction point therein connected to a second input of said differential comparator circuit means,

said first voltage divider being constructed to produce an output exceeding the value of the output of said reference voltage source when said input voltage reaches said lower threshold level,

a transistor output stage, the conductive state of which is changed for producing an output signal having a first value when said lower threshold level at said first voltage divider exceeds the voltage level of said reference voltage source,

second voltage divider means connected across the terminals for said input voltage and having a second junction point therein,

said second voltage divider being constructed to produce an output voltage exceeding the reference voltage level when the said input voltage reaches said upper threshold level and

switching means coupled to said second junction point as to have its conductive state changed when said upper threshold level appears at said second voltage divider,

said switching means being coupled to said transistor output stage, the conductive state of which is changed for producing an output signal having a second level when said switching means has changed its conductive state.

#### 4,015,142 ELECTRIC TIMING CIRCUITRY WITH MEANS TO COMPENSATE FOR SWITCH CHATTER

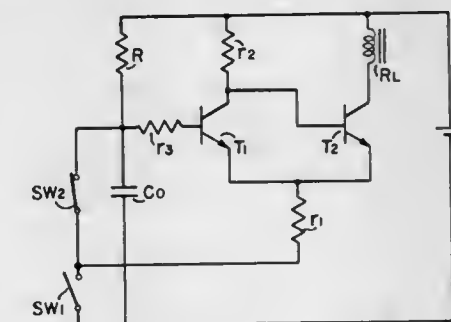
Shinji Nagaoka, Yotsukaido, and Yuzuru Takazawa, Togane, both of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 598,073, July 22, 1975, abandoned. This application Sept. 2, 1975, Ser. No. 609,537

Int. Cl.<sup>2</sup> H03K 17/00

U.S. Cl. 307-247 A

2 Claims



1. An electric timing circuitry connectable to a source of electric energy during use and of the type having a switching circuit switchable to one state after the closing of a normally open source switch to effect current flow through a load and switchable to another state to terminate current flow through said load, and a timing circuit including a series connection of a resistor and capacitor having a junction point connected to said switching circuit and operable in response to the opening of a normally closed starting switch to initiate the running of a predetermined time period and effect switching of said switching circuit from said one state to said another state after the elapse of said predetermined time period: means for compensating for switch chatter of said source switch comprising means connecting said source switch and starting switch in a series circuit and connecting said series circuit in parallel with said capacitor so that said capacitor performs the dual function of a chatter-compensating capacitor for said source switch and a timing capacitor for said timing circuit.

#### 4,015,143 SEMICONDUCTOR SWITCH

Michio Tokunaga, Zushi; Ichiro Ohhinata, Yokohama, and Shinji Okuhara, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

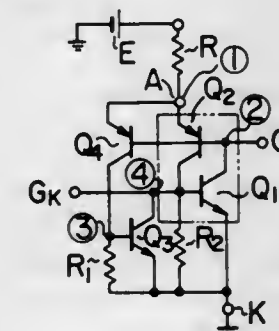
Filed Mar. 7, 1975, Ser. No. 556,326

Claims priority, application Japan, Mar. 11, 1976, 49-27115; July 19, 1974, 49-82185

Int. Cl.<sup>2</sup> H03K 17/72

U.S. Cl. 307-252 J

9 Claims



1. A semiconductor switch comprising:



a PNP switch having at least three PN-junctions and having a P-type anode, an N-type gate, a P-type gate and an N-type cathode;  
switching means having input, output, and control terminals;  
a passive element; and  
driver means for driving the control terminal of said switching means, the input and output terminals of said switching means and said passive element both being connected across one of said PN-junctions at one end of said PNP switch; with said drive means supplying to the control terminal of said switching means a current divided from a current flowing through another one of said PN-junctions at another end of said PNP switch thereby driving said switching means.

4,015,144

# CIRCUIT ARRANGEMENT FOR CONVERSION OF AN ANALOG SIGNAL INTO A BINARY SIGNAL

Freddy Achiel Cornelius Brouckaert, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

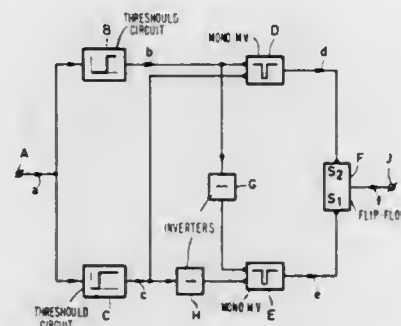
Filed Nov. 7, 1974, Ser. No. 521,584

Claims priority, application Netherlands, Nov. 21, 1973, 7315904

Int. Cl.<sup>2</sup> H03K 5/00

U.S. Cl. 307—261

4 Claims



1. A circuit arrangement comprising input means for receiving an analog signal; two threshold limiter circuits each having a signal threshold differing from each other, an input coupled to said input means, and an output; two monostable multivibrators each coupled to both of said limiter circuit outputs and each having an output; said monostable multivibrators responding to threshold crossings of differing directions respectively, and a flipflop circuit coupled to said multivibrator outputs and having an output means for supplying a digital signal having transitions as a function of the analog signal passing said signal thresholds; whereby said circuit arrangement is operable to regard as redundant and without effect second crossings of the two thresholds in the same direction but to respond to each crossing of either threshold in a direction which differs from that of the previous threshold crossing.

4,015,145

# VOLTAGE COMPENSATED TIMING CIRCUIT

John W. Stewart, Wichita, Kans., assignor to NCR Corporation, Dayton, Ohio

Filed Sept. 19, 1975, Ser. No. 614,808

Int. Cl.<sup>2</sup> H03K 5/13, 1/12

U.S. Cl. 307—293

1 Claim

1. An electrical circuit comprising a multi-state device having first and second inputs and at least one output, with said output constituting the output for the circuit;

input means for applying an input signal to a first one of said inputs of said multi-state device;

first and second signal translating devices having a corresponding first electrode of each coupled together and to a reference potential over an impedance, and having a

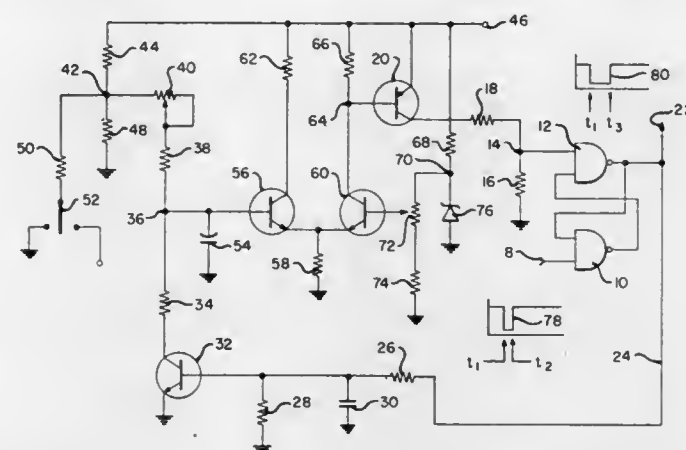
corresponding second electrode of each coupled over an impedance to a source of potential;

a third signal translating device having a first electrode coupled to a reference potential, a second electrode coupled to a control electrode of said first signal translating device, and a control electrode coupled to the output of said multi-state device;

variable charging means coupled to the control electrode of said first signal translating device, to a source of circuit potential, and to said reference potential;

fixed biasing means coupled to a control electrode of said second signal translating device to provide a fixed bias thereto;

a fourth signal translating device having a first electrode



coupled to a source of potential, a second electrode coupled to a second input of said multi-state device, and a control electrode coupled to the second electrode of the second signal translating device; and

time delay means included in the path coupling the output of the multi-state device to the control electrode of the third signal translating device;

whereby said multi-state device is caused to assume a first state by application of an input signal to said first input thereof, and is caused to assume a second state by application of a signal to said second input thereof, thereby controlling the pulse width of the output signal of said multi-state device to vary said pulse width in accordance with the magnitude of the voltage of said source of circuit potential.

4,015,146

# NEGATIVE RESISTANCE NETWORK

Mitsuo Aihara, Tokyo; Shigeo Takada, Ooita, and Hisaharu Ogawa, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

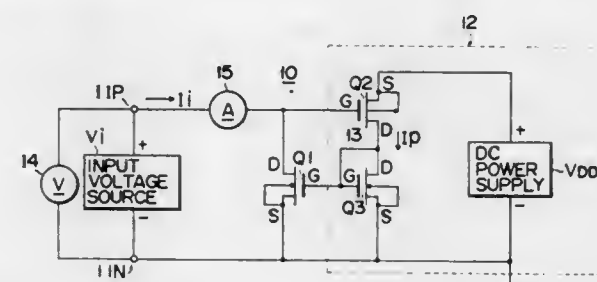
Filed Dec. 16, 1975, Ser. No. 641,385

Claims priority, application Japan, Dec. 16, 1974, 49-144874

Int. Cl.<sup>2</sup> H03K 3/53

U.S. Cl. 307—304

4 Claims



1. A negative resistance network having positive and negative input terminals to which a predetermined input voltage is applied comprising  
a first predetermined channel insulated gate enhancement

field effect transistor with a drain-source path connected across the positive and negative input terminals;  
a second insulated gate enhancement type field effect transistor of an opposite channel type to the first field effect transistor, the gate of the second field effect transistor being connected to the drain of the first field effect transistor and to a predetermined one of the positive and negative input terminals, and the source of the second field effect transistor being connected to one pole of a dc power supply having a predetermined voltage; and  
a third insulated gate enhancement type field effect transistor of the same channel type as the first field effect transistor, the drain and the gate of the third field effect transistor being connected to the drain of the second field effect transistor and to the gate of the first field effect transistor, and the source of the third field effect transistor being connected to the source of the first field effect transistor, to the other input terminal and to the other pole of the dc power supply.

4,015,147

# LOW POWER TRANSMISSION LINE TERMINATOR

Evan E. Davidson, Hopewell Junction, and Ralph D. Lane, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

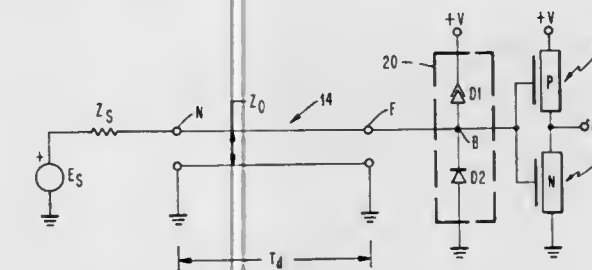
Continuation of Ser. No. 483,269, June 26, 1974, abandoned.

This application Sept. 8, 1975, Ser. No. 611,462

Int. Cl.<sup>2</sup> H01L 27/04, 29/48; H03K 5/08; H01P 1/26

U.S. Cl. 307—304

5 Claims



1. An integrated circuit structure comprising:

a semiconductor body;

a first field effect transistor having source and drain regions of a first conductivity type formed in a semiconductor region of a second conductivity type within said body;

a semiconductor region of said first conductivity type formed in said same semiconductor region of said second conductivity type is proximity to said first field effect transistor;

a second field effect transistor having source and drain regions of the second conductivity type formed in the said semiconductor region of said first conductivity type, such that a parasitic bipolar transistor latch is formed in said semiconductor body, said bipolar transistor latch including three P-N junctions, the first P-N junction being formed by the source region of said first field effect transistor and the semiconductor region of the second conductivity type within the semiconductor body, the second P-N junction being formed by the semiconductor region of the second conductivity type within the semiconductor body and the semiconductor region of said first conductivity type formed in said same semiconductor region of said second conductivity type, the third P-N junction being formed by the semiconductor region of said first conductivity type formed in said same semiconductor region of said second conductivity type and the drain region of said second field effect transistor, said three P-N junctions being sufficiently closely spaced for transistor action;

a first potential source directly coupled to the source region of said first field effect transistor;

a second potential source directly coupled to the source region of said second field effect transistor;

a transmission line having a near end and a far end,

a conductive path connecting the drain region of said first field effect transistor and the drain region of said second field effect transistor forming an output connected to the near end of said transmission line; and  
a pair of reverse biased terminator diodes connected in series and also connected to said transmission line for preventing reflected signals on said transmission line from setting said parasitic bipolar transistor latch.

4,015,148

# HALL EFFECT DEVICE FOR USE IN OBTAINING SQUARE OR SQUARE ROOT OF A VOLTAGE AMPLITUDE

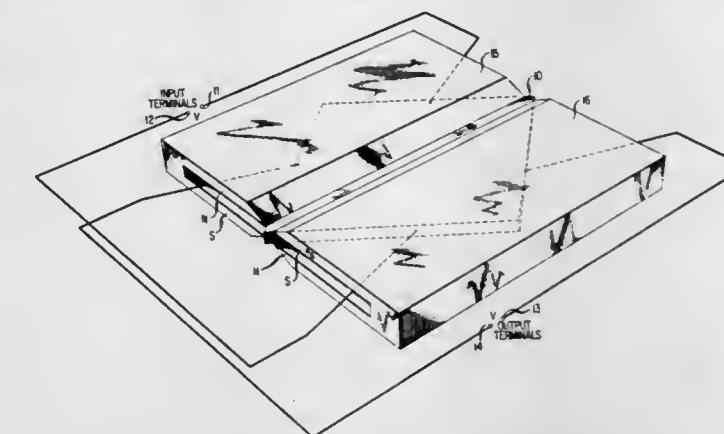
Robert Lee Wallace, Jr., Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 5, 1976, Ser. No. 683,499

Int. Cl.<sup>2</sup> H03K 17/90, 19/18; H01L 27/22, 29/82

U.S. Cl. 307—309

2 Claims



1. In a Hall effect device comprising semiconductive material, a magnet establishing a magnetic field which passes in a first direction through said material, a pair of terminals connected to said material so that the straight line path therebetween is substantially perpendicular to the path of said magnetic field, and a second pair of terminals connected to said material so that the straight line path therebetween is substantially perpendicular to both said magnetic field path and said path of said first terminals, AN IMPROVEMENT CHARACTERIZED IN THAT

means are provided for reversing a portion of said magnetic field where said portion intersects part of the straight line path between said first pair of terminals and also part of the straight line path between said second pair of terminals.

4,015,149

# TEMPERATURE COMPENSATING DEVICE FOR DEVICES HAVING SEMICONDUCTORS

Tokuichi Tsunekawa, Yokohama; Masanori Uchidoi; Tetsuya Taguchi, both of Kawasaki; Yoshiyuki Takishima, Machida; Tadashi Ito, Yokohama, and Hiroshi Aizawa, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 3, 1975, Ser. No. 583,445

Claims priority, application Japan, June 6, 1974, 49-64384

Int. Cl.<sup>2</sup> H01V 3/00; H03F 1/32

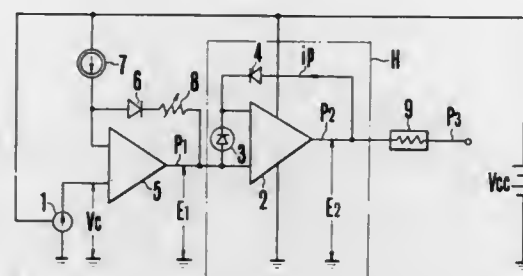
U.S. Cl. 307—310

6 Claims

1. In a temperature compensating device wherein a semiconductor circuit has a signal input terminal and a bias terminal and wherein a signal output terminal, a signal source is connected to the signal input terminal and a bias voltage is impressed on said bias terminal and wherein said circuit includes a first temperature responsive semiconductor diode for adjusting an input signal from said signal source to a varying degree of adjustment according to the variation of temperature, wherein said temperature compensating device also includes a temperature compensating circuit which comprises a second temperature responsive semiconductor diode which lowers voltage as temperature varies and an output terminal



which is connected to the bias terminal of said semiconductor circuit in such a manner that the voltage reduction by said second temperature responsive diode serves to minimize the variation of the output signal from the signal output terminal of said semiconductor circuit due to temperature variation, an improvement comprising:



an electric current source for feeding said second temperature responsive semiconductor diode with an electric current  $i_c$  which corresponds to the difference in operating characteristics between said first temperature responsive diode and said second diode and which is based on the following formula:

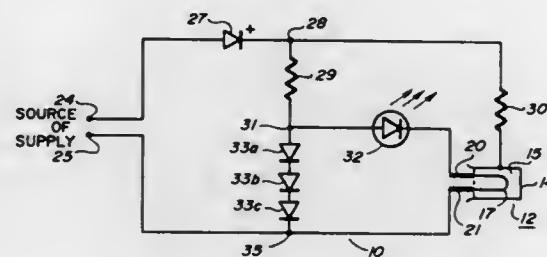
$$i_c = \exp \left\{ \ln i_{PM} + \frac{T_0}{T_1 - T_0} \ln \frac{i_{op}(T_0)}{i_{oc}(T_0)} + \frac{T_1}{T_1 - T_0} \ln \frac{i_{oc}(T_1)}{i_{op}(T_1)} \right\}$$

wherein

- $i_{PM}$  : quantity of current corresponding to the mean value of the input signal from said signal source
- $T_0$  : ambient temperature of said semiconductor circuit
- $T_1$  : same as  $T_0$ , except that  $T_1 > T_0$ , and
- $i_{oc}(T_0)$  : the reverse saturation current of said second temperature responsive semiconductor diode at temperature  $T_0$
- $i_{op}(T_0)$  : the reverse saturation current of said first temperature responsive semiconductor diode at temperature  $T_0$

**4,015,150**  
**NORMALLY ON LED COULOMETRIC TIMING SYSTEM**  
 John Paul Jones, Wayne, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.  
 Filed Feb. 13, 1976, Ser. No. 658,092  
 Int. Cl.<sup>2</sup> H03K 3/42; G01R 27/22  
 U.S. Cl. 307—311

6 Claims



1. A coulometric timing system comprising a DC source of supply, a coulometric cell having a cathode electrode and an elongated erodable anode filament coupled between two anode terminals and disposed in an electrolyte solution, the resistance between said anode terminals being substantially low at the time said filament initially opens due to electrolytic erosion whereby said resistance increases with time, coulometric timing circuit means coupled to said cathode electrode, an anode terminal and said source of supply for providing current flow for said electrolytic erosion of said filament,

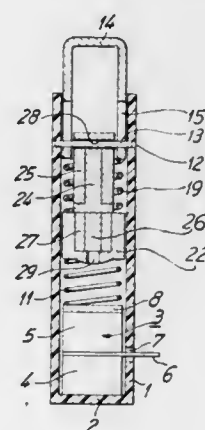
a light emitting diode indicator coupled in series circuit with said filament, constant voltage clamping diode means coupled in parallel circuit with said series circuit and also coupled in parallel circuit with said DC source for providing a substantially constant voltage thereacross only when said diode means conducts, said constant voltage diode means being (1) normally non-conductive with said filament unbroken and said light emitting diode conducting and illuminating and (2) conductive and providing a substantially constant voltage with said filament open initially and thereafter for extinguishing said light emitting diode.

#### **4,015,151** **PIEZOELECTRIC IGNITER WITH A STRIKING MECHANISM**

Hans-Dieter Klauer, Wehrheim, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany  
 Division of Ser. No. 469,762, May 14, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,068  
 Int. Cl.<sup>2</sup> H01L 41/04

U.S. Cl. 310—8.7

5 Claims



1. A piezoelectric igniter with a striking mechanism, more especially for lighters, having a piezoelectric transducer, a hammer which is movable in the direction of the latter and which co-operates with a compression spring, a movement release device for said hammer, and a housing which receives these parts and adjacent the closed front end of which the piezoelectric transducer is arranged, wherein a bounce plate is mounted at the side face of the piezoelectric transducer facing said hammer, wherein said hammer and said bounce plate form magnetically conductive parts, and wherein at least one of these parts is provided with a permanent magnet.

#### **4,015,152** **IMPACT MECHANISM FOR PIEZOELECTRIC TRANSDUCERS**

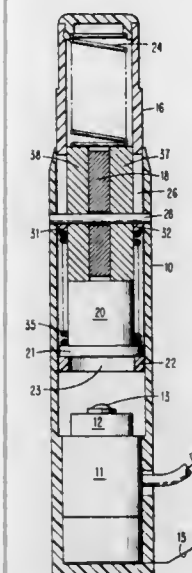
Walter Mohr, Frankfurt, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany  
 Continuation-in-part of Ser. No. 496,588, Aug. 12, 1974, Pat. No. 3,936,678. This application Dec. 1, 1975, Ser. No. 636,626  
 Int. Cl.<sup>2</sup> H01L 41/04

U.S. Cl. 310—8.7

5 Claims

1. An impact mechanism for piezoelectric transducers for use in lighters, including an outer housing accommodating said transducer, a support frame member slidably arranged within said housing and extending therefrom for manual actuation, said member incorporating a return spring, an actuating spring, a permanent magnet, and a striking hammer in magnetically retentive relationship, slots in said frame member accommodating a pin transverse to said housing and affixed thereto, said pin passing through a bore in said magnet,

whereby upon inward movement of said member within said housing, said spring is compressed by said member, causing



said hammer to overcome the retentive force of said magnet and impact upon said transducer.

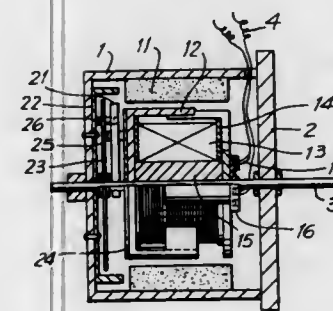
#### **4,015,153** **SMALL SYNCHRONOUS MOTOR WITH LASH COUPLING**

Sentaro Furuno, 22-16, Kami-Igusa, 2-chome, Suginami, Tokyo, Japan  
 Continuation-in-part of Ser. No. 531,347, Dec. 10, 1974, abandoned, which is a continuation of Ser. No. 361,627, May 18, 1973, abandoned. This application June 19, 1975, Ser. No. 588,462

Claims priority, application Japan, May 29, 1972, 47-53110  
 Int. Cl.<sup>2</sup> H02K 7/10

U.S. Cl. 310—41

1 Claim



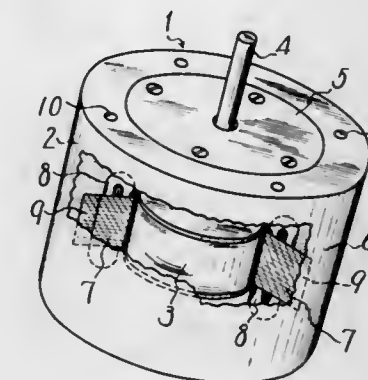
1. A small synchronous motor comprising:

- a. a housing;
- b. a stator having a stator magnet;
- c. an output shaft;
- d. a rotor rotatably mounted on the output shaft in a manner whereby the rotor is rotatable through a predetermined angle around and relative to the output shaft; and
- e. a torque transmitting mechanism for transmitting torque from the rotor to the output shaft,

the synchronous motor being started upon application of electric power thereto, first, by a rotation of the rotor to its synchronous speed under no load, and, then, a rotation of the output shaft by the torque thus transmitted from the rotor by said torque transmitting mechanism, said stator being rotatably mounted on said housing with a predetermined angle around said output shaft, said stator having an engaging member which can engage with another engaging member of the rotor directly after the start of the rotor.

**4,015,154**  
**MOTOR AND METHOD FOR MAKING SAME**  
 Sadao Tanaka, Machida; Kiyosi Endo, and Fumio Karakawa, both of Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
 Continuation of Ser. No. 535,794, Dec. 23, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,337  
 Claims priority, application Japan, July 3, 1975, 70-4188  
 Int. Cl.<sup>2</sup> H02K 5/02, 15/02  
 U.S. Cl. 310—42

4 Claims



1. A method for making a stator structure for a motor, said method comprising the steps of:

- A. providing a stack of first ferromagnetically soft rings, each of said rings comprising an innerconnecting ring portion and a plurality of teeth portions extending outwardly from the respective interconnecting ring portion;
- B. disposing a plurality of coils around said teeth portions;
- C. providing a stack of second ferromagnetically soft rings;
- D. inserting said stack of first rings with said coils disposed around said teeth portions into said stack of second rings;
- E. molding the combined stacks of first and second rings with a dimensionally stable resin mixture of thermosetting resin and thermoplastic resin to hold said first and second rings rigidly together to form a motor casing structure entirely enclosing said rings and said coils and comprising a recess coaxial with said rings and extending inwardly from one end of said casing structure to permit a rotor to be inserted therein, said casing structure comprising an integrally molded section at the other end thereof having a first concave portion formed therein coaxial with said recess to hold bearing means to provide a first accurately placed receptacle for supporting one end of the rotor;
- F. molding a bracket of said dimensionally stable resin mixture to attach to said one end of said casing structure to close said recess, said bracket being molded to have a second concave portion to provide a second accurately placed bearing receptacle for supporting the other end of the rotor; and
- G. assembling said bracket and said casing structure together such that said first and second concave portions are aligned to support said rotor.

#### **4,015,155** **COVER AND BASE ARRANGEMENT FOR AN ELECTRICAL MACHINE**

Karl Lang, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany  
 Filed May 19, 1975, Ser. No. 578,803  
 Claims priority, application Germany, June 6, 1974, 2427427

Int. Cl.<sup>2</sup> H02K 5/00

U.S. Cl. 310—89

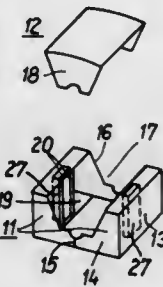
10 Claims

1. In an electric machine equipped with cable terminals and served by supply lines having a stator 6 including a stator lamination stack 7, a winding 7a supported on said stack, shield-like pressure plates 5 overlapping the stack at respective ends of said stack, and means for holding the stack together; a rotor having a rotor shaft and bearings; and a base and cover arrangement for supporting and protecting said machine, the improvement comprising:



a base structure 1 for supporting said stator and said rotor bearings including a frame 2 made of a hollow section, transverse walls 3 enclosed in said frame, said walls extending perpendicular to the direction of the longitudinal axis of said rotor and having a profile corresponding to the shape of said pressure plates;

a cover including two side members 11 seated on said frame and a central upper cap 12, said side members each having a mid-portion 13 forming a side wall of said machine and configured to receive said cable terminals and said supply lines, and end-portions 14 disposed at respective sides of said mid-portion in juxtaposed relationship to



adjacent end-portions of said side members so as to form end-face walls of said machine, each two of said juxtaposed end-portions conjointly defining a vertical interface 15 in line with the center line of said rotor shaft and having a composite contour defining an upwardly opening cut-out 17 encompassing said shaft for lifting said stator and said rotor upwardly together, said upper cap having end-face extensions 18 covering corresponding ones of said cut-outs; and

elastic sealing means, disposed at the interface of and between said central upper cap and said side members, and having a sound attenuation capability corresponding to the wall thickness of said cover.

4,015,156

# **DYNAELECTRIC MACHINE LOCKING WEDGE FOR COIL RETENTION**

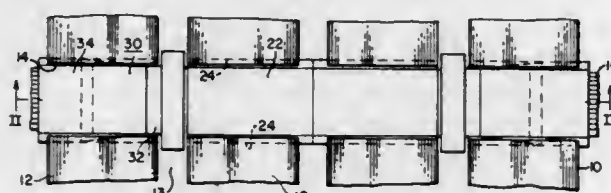
Paul S. Johrde, Franklin Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1975, Ser. No. 589,975

Int. Cl.<sup>2</sup> H02K 3/48

U.S. Cl. 310-214

4 Claims



## **1. A dynamoelectric machine comprising:**

- a core including a plurality of spaced packs of metallic laminations;
- a slot in said core;
- a coil in said slot;
- means for securing said coil in said slot including a flexible insulating tape on said coil, a slot filler of insulating material disposed on said tape, a first slot wedge over said slot filler and engaged within lateral grooves in a first of said plurality of spaced packs of metallic laminations that is in the interior of said core, said first pack being adjacent a second of said plurality of packs that is on the exterior of said core, a two-part locking slot wedge disposed over said slot filler and said tape in the slot of said second pack, said tape being folded back on said filler and continuing along said filler with an extremity of said tape extending between said first slot wedge and said locking slot wedge;

said locking slot wedge comprising a first part of a generally T configuration with the top of the T in the space between said first and second packs and the bottom of the T within said slot of said second pack, said first part being tapered from the top of the T over a substantial portion of its length with decreasing thickness to the bottom of the T, said locking slot wedge also comprising a second part with a taper similar to that of said first part, said second part being frictionally fit within lateral grooves in said second pack and fitting over said tapered portion of said first part, said first part of said locking slot wedge being spaced from said lateral grooves.

4,015,157

# **IODINE LAMP WITH MOLYBDENUM PARTS**

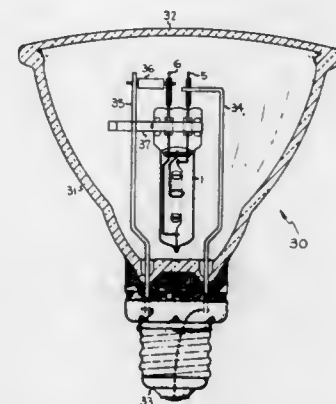
Robert S. Roller, Lyndhurst; Richard H. Holcomb, Chagrin Falls, and George K. Danko, Bedford Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 507,672, Sept. 20, 1974, abandoned. This application June 16, 1975, Ser. No. 586,883

Int. Cl.<sup>2</sup> H01K 1/20, 1/40, 1/50

U.S. Cl. 313-25

10 Claims



1. A halogen regenerative cycle incandescent lamp comprising a compact envelope of light-transmitting material of high softening temperature, inleads including inner portions of molybdenum sealed into said envelope, an incandescible tungsten filament coil connected across said inner portions, the distance from the filament to the envelope wall being small enough that the inner wall temperature immediately surrounding the filament is at least about 700° C and the low point temperature is at least about 250° C during operation, said inner portions being of molybdenum wire which has been treated to increase its ductility to a minimum elongation of 15% and reduce the concentration of impurities at the surface, and a fill gas comprising nitrogen, an inert gas and an iodine-providing component at a total minimum pressure of 2000 torr, said component providing from  $3.1 \times 10^{-7}$  to  $9.6 \times 10^{-7}$  gram atoms of iodine per cubic centimeter of envelope volume.

4,015,158

# **BROMINE LAMP WITH MOLYBDENUM PARTS**

Robert S. Roller, Lyndhurst; Richard H. Holcomb, Chagrin Falls, and George K. Danko, Bedford Heights, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 502,142, Aug. 30, 1974, abandoned. This application June 16, 1975, Ser. No. 586,884

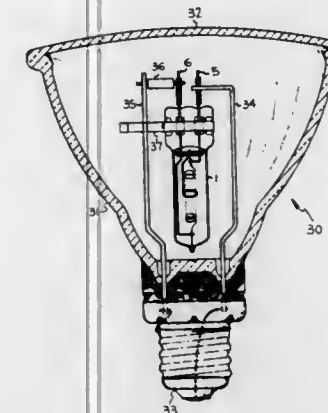
Int. Cl.<sup>2</sup> H01K 1/20, 1/40, 1/50

U.S. Cl. 313-25

10 Claims

1. A bromine regenerative cycle incandescent lamp comprising an envelope of light-transmitting material of high softening temperature, inleads including inner portions of molybdenum sealed into said envelope, an incandescible tungsten filament coil connected across said inner portions, the distance from the filament to the envelope wall being small enough that the inner wall temperature immediately surrounding the filament is at least about 700° C and the low point

temperature at the ends of the envelope is at least about 350° C during operation, said inner portions being of molybdenum wire which has been treated to increase its ductility to a minimum elongation of 15% and reduce the concentration of



impurities at the surface, and a fill gas comprising nitrogen, an inert gas and a bromine-providing component at a total minimum pressure of 2000 torr, said component providing from  $1.6 \times 10^{-9}$  to  $8.0 \times 10^{-8}$  gram atoms of bromine per cubic centimeter of envelope volume.

4,015,159

# **SEMICONDUCTOR INTEGRATED CIRCUIT TRANSISTOR DETECTOR ARRAY FOR CHANNEL ELECTRON MULTIPLIER**

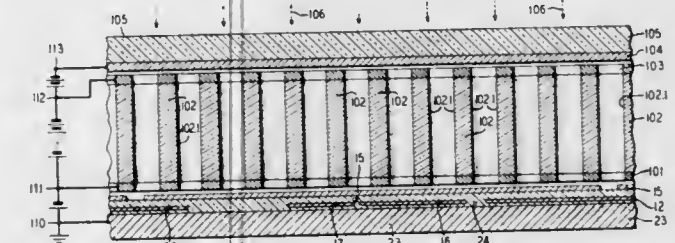
George Gustave Zipfel, Jr., Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 15, 1975, Ser. No. 613,218

Int. Cl.<sup>2</sup> H01J 39/14, 43/22; H01L 29/78

U.S. Cl. 313-95

10 Claims



## **1. Semiconductor apparatus which comprises**

- a. a semiconductor wafer of essentially one type relatively low electrical conductivity including an array of essentially mutually parallel relatively high conductivity elongated common bus strip regions of opposite type conductivity in said wafer, each of said bus regions being bounded on one side by a major surface of the semiconductor wafer;
- b. an insulating layer coating said major surface of the semiconductor wafer;
- c. an array of metal plates located on an exposed surface of the insulating layer for collecting electrons incident on said plates;
- d. electrically conductive means for connecting each metal plate through a different aperture in the insulating layer to a different localized surface zone in a first array of localized surface zones in said wafer, said localized zones of opposite type conductivity to said one type in said wafer, each said zone being isolated from all the strip regions;
- e. a second array of localized surface zones of said opposite type conductivity in said wafer, each said zone in the second array being isolated from all the strip regions and from all the zones in the first array, each zone in the second array located proximate to a corresponding zone in the first array, each zone of the second array being connected to an output bus electrode through a different aperture in the insulating layer; and

f. dual electrode gating means located in said insulating layer for controlling the surface conductivity of the semiconductor wafer between each localized zone of the first array and its said corresponding proximate localized zone in the second array, one of said electrode means being connected to one of the common bus regions through an aperture in the insulating layer and the other of said electrode means being elongated to form a common bus electrode essentially orthogonal to the common bus regions.

4,015,160

# **SPARK PLUG HAVING ELECTRODES SHAPED TO PRODUCE A HOLLOW SPARK COLUMN**

Jose Hector Lara, and Edward B. Williams, Jr., both of P.O. Box 876, Greenville, Tex. 75401

Filed Jan. 14, 1976, Ser. No. 649,094

Int. Cl.<sup>2</sup> H01T 13/20

U.S. Cl. 313-139

8 Claims



## **8. A spark plug for internal combustion engines and comprising:**

- a. a metal shell having a central passage therethrough;
- b. an insulator member positioned in said central passage;
- c. an elongated first electrode in said insulator member and having one end portion thereof spaced from an end of said insulator member;
- d. a second electrode extending from said metal shell and having one end portion thereof in spaced and facing relation with said one end portion of said first electrode; and
- e. means on said end portions of said first and second electrodes defining respective facing ridges each in the form of a closed geometric figure thereby defining a spark discharging portion on said first electrode and a spark landing portion on said second electrode whereby said spark discharging portion and said spark landing portion cooperate to provide a spark in the form of a hollow column in the shape of the geometric figure, said means defining said spark discharging portion including means on the one end portion of said first electrode defining a recess within said ridge on the one end portion of said first electrode, said means defining said spark landing portion including means on the one end portion of said second electrode defining a recess within said ridge on the one end portion of said second electrode, said ridges on said end portions of said first and second electrodes being of corresponding size and shape whereby the spark is in the form of a hollow column having a substantially identical cross section for the length thereof.

4,015,161

# **ANTI-POLLUTION SPARK PLUG**

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,297

Int. Cl.<sup>2</sup> H01T 13/20

U.S. Cl. 313-143

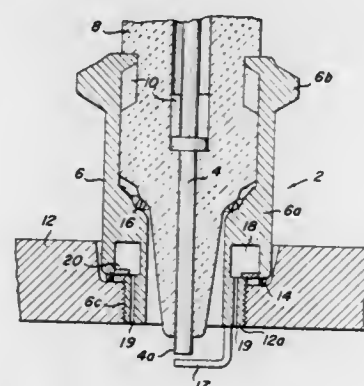
2 Claims

1. A spark plug adapted to reduce the oxides of nitrogen



contained in the combustion products of an internal combustion engine, said oxides of nitrogen having an excess concentration relative to an equilibrium value defined by the pressure, temperature and composition parameters of said products of combustion, comprising

- a. a tubular metal shell having a body portion, a non-circular enlarged portion at one end of said body portion, and an externally threaded portion of reduced diameter at the other end of said body portion, said reduced externally threaded opening contained in the head of an internal combustion engine;
- b. a center electrode extending coaxially in spaced relation through said shell;
- c. a tubular ceramic insulator arranged concentrically between said center electrode and said shell for supporting said electrode in said shell, said center electrode projecting at one end beyond said insulator adjacent the reduced end of said shell; and



- d. a ground electrode connected with said shell and extending in spaced relation adjacent said projecting center electrode end, thereby to establish a spark in a cylinder of the engine when said shell is threadably connected in the head opening;
- e. said shell body portion containing a closed continuous annular storage chamber arranged concentrically about the longitudinal axis of said shell, and said reduced portion containing at least one longitudinal passage communicating at one end with said storage chamber, the other end of said passage terminating in an orifice contained in the free end surface of said reduced portion, whereby unburned hydrocarbons stored in said storage chamber during the compression stroke of the engine are returned to the cylinder during the expansion stroke following combustion, thereby to reduce the oxides of nitrogen to the equilibrium value.

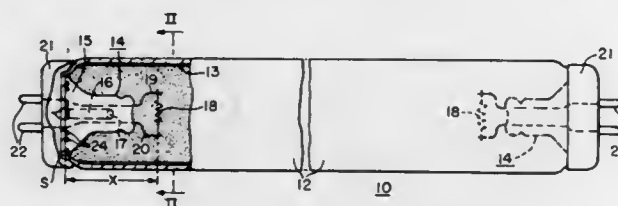
#### 4,015,162 FLUORESCENT LAMP HAVING IMPLANTED AMALGAMATIVE METAL FOR MERCURY VAPOR REGULATION

George S. Evans, Caldwell, and Henry Skwirut, Verona, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 7, 1975, Ser. No. 593,814  
Int. Cl.<sup>2</sup> H01J 61/24

U.S. Cl. 313-490

14 Claims



1. In combination with an electric discharge lamp having an envelope that contains spaced electrodes and an ionizable medium which includes mercury, integral means for regulating

the mercury vapor pressure within the envelope during the operation of said lamp comprising:

- a member that is secured to a portion of said envelope by a juncture which comprises a part of the interior structure of the lamp, and
- a body of amalgamative metal that is bonded to and protrudes from the surface of said juncture and is thus anchored at a fixed location within the envelope and exposed to the lamp atmosphere, said body of amalgamative metal being of such size that it extends over only a small segment of the juncture and is held in place on the juncture solely by the bond between the metal and said juncture, and said amalgamative metal being of a type that combines with mercury to form an amalgam and is thus adapted to serve as a source of mercury vapor when the lamp is energized and effects concomitant heating of the body of amalgamative metal.

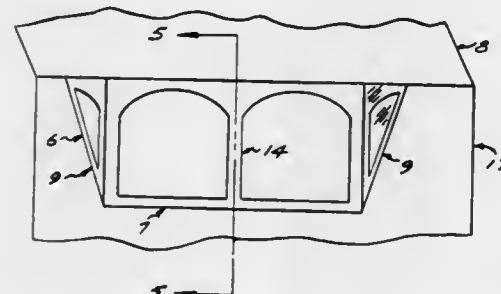
#### 4,015,163 ORNAMENTAL DEVICE

Michael D. Iacobelli, 565 Morse Road, Apt. 104, Troy, Mich. 48064

Filed June 12, 1975, Ser. No. 586,250  
Int. Cl.<sup>2</sup> A47B 77/08

U.S. Cl. 312-223

4 Claims



1. Improvement in an ornamental device for ornamenting a room having a light source therefor comprising joined together front and opposite side members, said side members projecting rearwardly from the rear face of said front member and means for attaching said device to a corner of said room formed by the junction of a wall and a ceiling thereof so that said device covers said light source and one edge of said front and side members presses against said ceiling and another edge thereof presses against said wall, said attaching means being yieldable means arranged to pull upon said rear face so as to pull said device inwardly toward said corner, said device having at least one translucent panel therein for passing light from said source therethrough from inside said device to the outside thereof, whereby to decoratively affect the illumination of said room.

#### 4,015,164 METALLIC HALIDE HIGH-PRESSURE GAS DISCHARGE LAMP

Ernst Fischer, Stolberg; Roland Lorenz, and Ludwig Rehder, both of Aachen, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,536

Claims priority, application Germany, Nov. 30, 1974, 2456757

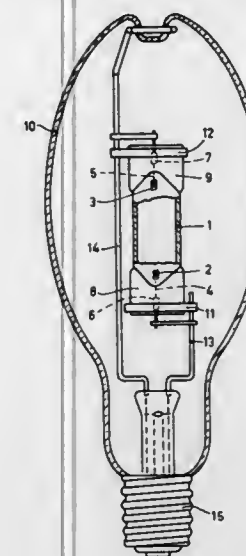
Int. Cl.<sup>2</sup> H01J 17/20

U.S. Cl. 313-223

9 Claims

1. A metallic halide high-pressure gas discharge lamp having a hermetically closed, radiation transmissive discharge

vessel, having two electrodes arranged therein between which the discharge takes place and a filling comprising at least one



metallic halide and a buffer substance, and during operation of the lamp the filling contains elementary arsenic.

#### 4,015,165 ELECTRIC LAMP WITH MOLYBDENUM CONTACT PINS SURROUNDED BY NON-CORROSIVE METAL SLEEVES

Alfons Eugen Maria Hardies, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

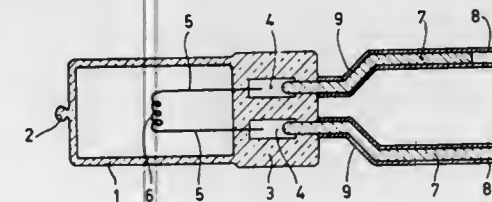
Filed Dec. 18, 1975, Ser. No. 642,078

Claims priority, application Netherlands, Apr. 2, 1975, 7501272

Int. Cl.<sup>2</sup> H01J 5/46, 61/36; H01K 1/40

U.S. Cl. 313-318

4 Claims



1. An electric lamp having a quartz glass lamp envelope with pinched seal, a molybdenum foil being incorporated in the pinch to which foil are connected an inner current conductor and a contact pin which comprises an outer current conductor of molybdenum, a sleeve disposed about part of the outer current conductor projecting beyond the lamp envelope, said sleeve being a corrosion-resistant metal, said current conductor and said sleeve each having a cooperatively dimensioned and configured kink preventing relative movement therebetween.

#### 4,015,166 X-Y MATRIX TYPE ELECTROLUMINESCENT DISPLAY PANEL

Nobumasa Ohshima; Hiroshi Kawarada, both of Hirakata; Shinichi Noma, Katono, and Toshio Tatsumichi, Ando, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 394,860, Sept. 6, 1973, abandoned. This application May 4, 1976, Ser. No. 683,215  
Claims priority, application Japan, Sept. 6, 1972, 47-89747; Oct. 20, 1972, 47-105432

Int. Cl.<sup>2</sup> H05B 33/02, 33/14, 33/22

U.S. Cl. 313-503

6 Claims

1. An X-Y matrix type electroluminescent display panel comprising:  
a transparent insulating substrate; flat transparent and parallel strip-shaped X-electrodes on said transparent insulating substrate; a formed D.C. electroluminescent layer on said flat transparent parallel electrodes; parallel strip-

shaped Y-electrodes on said D.C. electroluminescent layer, the direction of said Y-electrodes being perpendicular to that of said X-electrodes, said X- and Y-electrodes and said D.C. electroluminescent layer defining display elements at the crossing points of said X- and Y-electrodes; and a mesh-shaped insulating layer within said



D.C. electroluminescent layer and mounted on said X-electrodes and extending at least part way through the thickness of said D.C. electroluminescent layer for insulating said display elements from each other at least in the vicinity of said X-electrodes, said insulating layer being a photo-resist material.

#### 4,015,167 CIRCUITS FOR OPERATING ELECTRIC DISCHARGE LAMPS

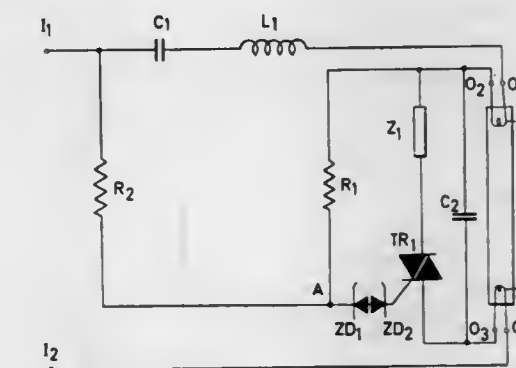
Philip Rufus Samuels, London, England, assignor to The General Electric Company Limited, London, England  
Filed June 25, 1975, Ser. No. 590,296

Claims priority, application United Kingdom, July 2, 1974, 29290/74

Int. Cl.<sup>2</sup> H05B 41/23

U.S. Cl. 315-99

9 Claims



1. A circuit for operating an electric discharge lamp comprising: a pair of input terminals for connection to an alternating current supply; a pair of output terminals for connection with the discharge lamp; and circuit means connected between said input terminals and said output terminals for controlling the supply of current to a lamp connected with the output terminals from a supply connected to said input terminals, said circuit means including means for changing the mode of operation of the circuit in response to a change in the phase of the voltage applied to the lamp relative to the phase of the voltage of the supply.

#### 4,015,168 CURRENT LIMITING DEVICE FOR AN ELECTRICAL NETWORK

Ernst Massar, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 30, 1975, Ser. No. 600,372

Claims priority, application Germany, July 31, 1974, 2436929

Int. Cl.<sup>2</sup> H02H 3/00

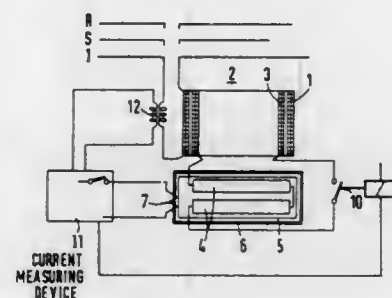
U.S. Cl. 361-19

8 Claims

1. A current limiting device for electrical network comprising:  
a. a superconductor coupled to the network;  
b. a winding through which the network current flows;



c. magnetically conducting shielding means shielding said superconductor from the magnetic field produced by said winding; and



d. means for transversely magnetizing said shielding means up to the point of saturation.

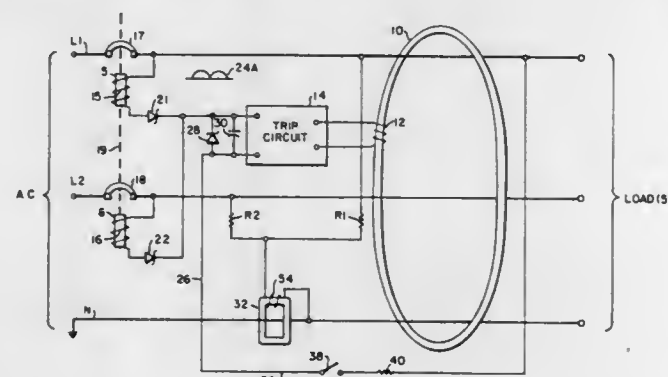
#### 4,015,169 TWO POLE GROUND FAULT CIRCUIT INTERRUPTER WITH IMPROVED RECTIFIED SUPPLY AND TRANSIENT SUPPRESSION FOR A TRIP CIRCUIT

John J. Misencik, Shelton, Conn., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 14, 1975, Ser. No. 558,617  
Int. Cl.<sup>2</sup> H02H 3/28

U.S. Cl. 361-45

3 Claims



1. A two pole ground fault circuit interrupter comprising: a differential transformer core, a plurality of primary windings on said core, said plurality of primary windings including at least two line conductors and a neutral conductor of an AC electrical distribution system; a secondary sensing winding on said core for sensing current unbalance between said primary windings; means responsive to a predetermined sensed signal to open said line conductors and comprising a trip circuit having two terminals connected across said sensing winding, said means also comprising circuit breaker contacts and associated solenoids for each of said line conductors, each solenoid having a respective trip coil having one end connected to one of said line conductors, each of said coils having another end connected respectively to first and second like poled zener diodes, said first and second zener diodes having a common connection remote from said trip coils, said common connection being conductively connected to a third terminal of said trip circuit; a conductive circuit branch connecting a fourth terminal of said trip circuit to said neutral conductor, and a third zener diode connected between said conductive circuit branch and said common connection.

#### 4,015,170 METHOD FOR OVERVOLTAGE PROTECTION OF HVDC TRANSMISSION LINE SYSTEMS

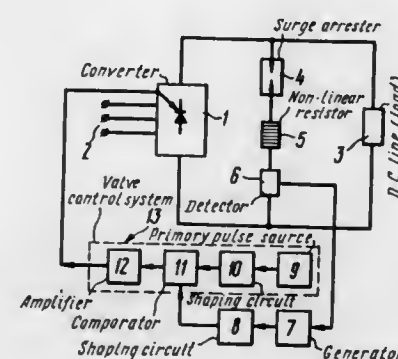
Khrystofor Fedorovich Barakaev, ulitsa Molostovyykh, 19, kv. 344; Alexandr Sergeevich Glim, ulitsa Miklukho-Maklaya, 65, korpus 2, kv. 40; Anatoly Viktorovich Stukachev, Festivalnaya ulitsa, 7, kv. 34, all of Moscow, and Robert Nikolaevich Shulga, ulitsa Pobedy, 14a, kv. 41, Reutov Moskovskoi oblasti, all of U.S.S.R.

Filed June 30, 1975, Ser. No. 592,071

Int. Cl.<sup>2</sup> H02H 7/10

U.S. Cl. 361-91

3 Claims



1. A method for overvoltage protection of an HVDC transmission line system in which AC is supplied to the valves of a converter and a surge arrester and resistor are connected on the DC side of the converter, said method comprising supplying control pulses to the valves of the converter for operation thereof, detecting the presence of overvoltage in the converter by actuation of the surge arrester, blocking passage of a control pulse to a valve of the converter in response to actuation of the surge arrester to produce misfire of the valve and zero output of the converter whereby the surge arrester becomes deactuated and the control pulses are then again supplied to the converter valves and the converter resumes normal operation.

#### 4,015,171 RESETTABLE OVERCURRENT-PROTECTED DIRECT CURRENT POWER SUPPLY

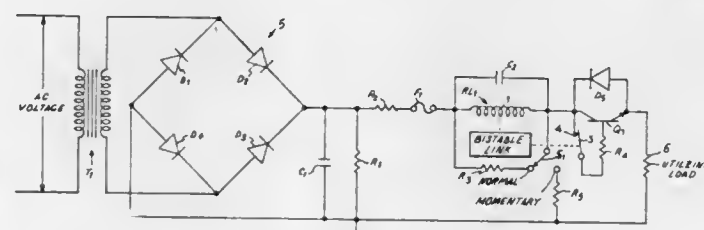
Dale Lloyd Miller, Harrisburg, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 6, 1976, Ser. No. 655,808

Int. Cl.<sup>2</sup> H02H 7/00

U.S. Cl. 361-18

22 Claims



1. A resettable overcurrent-protected direct current power supply comprising:

- a source of direct current voltage;
- a utilising load;
- a bistable magnetic switch circuit having one terminal coupled to said source of direct current voltage, a contact coupled to the other terminal of said bistable switch circuit and an armature controlled by said bistable switch circuit to make and break contact with said contact, said bistable switch circuit being energized at a given trip-rated current;
- a transistor having its collector coupled to said other terminal of said bistable switch circuit, its emitter coupled to said load and its base coupled to said armature remote from said contact; and

a reset switch coupled to said other terminal of said bistable switch circuit having a normal position to complete a portion of said bistable switch circuit and a momentary contact position, said reset switch being actuated to said momentary contact position after said bistable switch circuit has been energized due to an overcurrent condition to place said armature and said contact in a break state to render said transistor non-conductive and providing the desired overcurrent-protection, said bistable switch circuit de-energizing prior to actuation of said reset switch but said armature and said contact remaining in a break state and actuation of said reset switch causes said bistable switch circuit to re-energize, and the return of said reset switch to said normal position de-energizing said bistable switch circuit to cause said armature and said contact to assume a make state and render said transistor conductive to prepare said bistable switch circuit to protect against a continuing or a new overcurrent condition.

#### 4,015,172 TWO PATH VOLTAGE ARRESTER

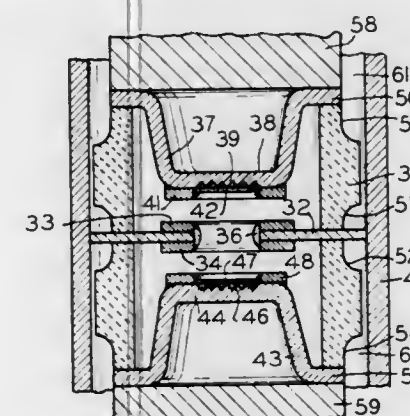
Gerhard Peché, and Gerhard Lange, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 17, 1975, Ser. No. 559,224

Int. Cl.<sup>2</sup> H01J 17/04

U.S. Cl. 361-129

3 Claims



1. An over voltage arrester comprising: an insulating tubular member, a pair of main electrodes mounted and sealed to opposite ends of said insulating tubular member, a central electrode attached to said tubular insulating member between said main electrodes and with a central opening and forming two discharge paths therewith, four metallic rings with two of said rings attached to the facing surfaces of said pair of main electrodes and two other of said rings attached to opposite sides of said central electrode about said central opening, activation material mounted on said main electrodes within said two rings and activation material also mounted on the inside of said central openings of said central electrode and said other two rings, and wherein said tubular insulator member mounted in said tubular frame member and formed with a pair of ring-shaped shoulders and positioned at the centers of said planar portions of said main electrodes so that protrusions exceeding the outer diameters of said main electrodes are formed in the center part of said insulator member and insulating gaps are formed between said shoulders and said tubular frame.

#### 4,015,173 SUPPORT FOR MOUNTING THE ELECTRONIC COMPONENTS OF A SINGLE PHASE UNIT FOR AN INVERTER

Herbert Nitsche, Spardorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

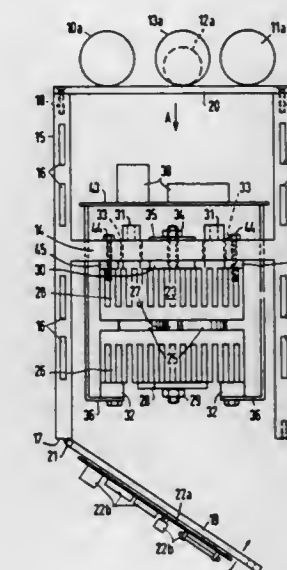
Filed May 27, 1975, Ser. No. 580,773

Claims priority, application Germany, May 29, 1974, 2426229

Int. Cl.<sup>2</sup> H05K 7/20

U.S. Cl. 361-388

10 Claims



1. In a support for mounting electronic components of a single phase unit for an inverter, said support having an H-shaped cross-section in all cross-sectional planes disposed perpendicular to the longitudinal axis thereof and including a planar center plate member and a pair of planar end plate members coupled to the center plate member and disposed in spaced-apart parallel relationship transversely with respect to the plane of said center plate member, said electronic components being mounted on at least one of the planar surfaces of said center plate member and said end plate members extending transversely with respect to the plane of said center plate member beyond said electronic components mounted thereon, the improvement comprising,

- cover plate members, fastened to the ends of said end plate members and disposed parallel to said center plate member, the surfaces of said cover plate members facing away from said center plate member providing a mounting surface for additional electronic components, said cover plate members having a width which is less than that of said support;
- electronic control means for said electronic components mounted on one of said cover plate members, said components being mounted on the surface of said center plate member which faces said one of said cover plate members and comprising thyristor and diode assemblies and including electrically conductive heat sinks;
- circuit protection means, mounted on the other surface of said center plate member; and
- a commutation choke, a current limiting choke, and a commutation capacitor mounted on the surface of said other of said cover plate members facing said center plate member.



4,015,174

DEVICES FOR MAGNETIC CONTROL WITH  
PERMANENT MAGNETS

Michel Cotton de Benetot, Brest, France, assignor to Le Materiel Magnetique, France

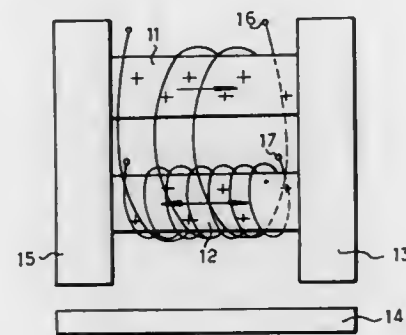
Filed July 30, 1975, Ser. No. 600,238

Claims priority, application France, July 30, 1974, 74.26380

Int. Cl.<sup>2</sup> H01H 47/32

U.S. Cl. 361—153

4 Claims



1. Magnetic device comprising at least one pair of permanent magnets, armature members forming with at least said one pair a closed magnetic circuit and also defining at least one air gap external to said circuit, said magnetic device comprising first and second coil and means energizing said coils for inverting the direction of magnetisation of one of the magnets of at least said one pair in such a manner as to modify the path of magnetic flux, by obliging it in one case to re-close itself by passing through at least said one air gap and in the other case, after inverting the direction of magnetisation of one of the magnets, to re-close itself through the said magnet and partially or wholly suppressing the flux in the region of at least said one air gap, wherein only the first coil is energized for establishing the magnetic flux in the region of at least said one air gap, and only the second coil is energized for obtaining the partial or total suppression of the said flux, the direction of flow of current being constant in each of the coils.

4,015,175

## DISCRETE, FIXED-VALUE CAPACITOR

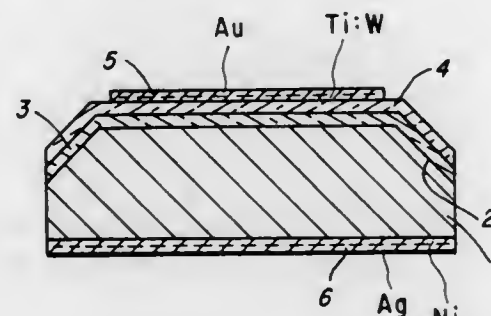
Don L. Kendall, Pueblo, Mexico; Byron T. Ahlborn, Dallas, and Klaus C. Wiemer, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 2, 1975, Ser. No. 582,951

Int. Cl.<sup>2</sup> H01G 1/01

U.S. Cl. 361—313

5 Claims



5. A semiconductor capacitor chip comprising a monocrystalline silicon body doped to a concentration in excess of  $10^{19}$  atoms per  $\text{cm}^3$  and having first and second substantially parallel opposite faces, a first dielectric layer of thermally grown silicon oxide about 300–600 angstroms thick on said first face, a second dielectric layer on said oxide comprising silicon nitride about 200–600 angstroms thick, a first metal film comprising Ti:W on said nitride layer, a gold-comprising film on said Ti:W, and a metal contact comprising silver-coated nickel on said second face.

4,015,176

APPARATUS FOR REMOVING BIRDS AND OTHER  
PESTS

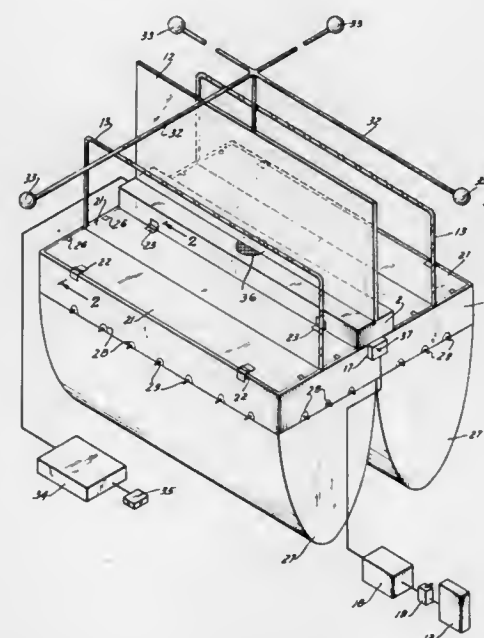
Francis V. Shanahan, Valley Stream, and Herman H. Feller, Brooklyn, both of N.Y., assignors to Shock-M-All, Inc., Valley Stream, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,802

Int. Cl.<sup>2</sup> H05C 1/00

U.S. Cl. 361—232

13 Claims



1. Apparatus for removing birds from a selected environment, comprising:  
a narrow elongated perch of non-electrically-conductive material,  
a pair of electrically-conductive wires carried by, and exposed on the surface of, said perch, said wires being spaced apart by a distance small enough such that when a bird alights on said perch its foot engages both of said wires,  
means for connecting said wires to a source of electric power for providing a voltage difference between said two wires, and  
a receptacle beneath said perch for catching a bird which falls from said perch after alighting thereon.

4,015,177

## TAPE RECORDER

Filinto Vaz Martins, rue Coulon 2, 2000 Neuchatel, Switzerland

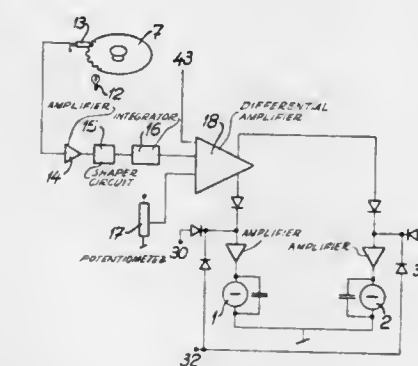
Filed Feb. 15, 1974, Ser. No. 442,787

Claims priority, application Switzerland, Feb. 23, 1973, 2627/73

Int. Cl.<sup>2</sup> G05B 11/06

U.S. Cl. 318—7

7 Claims



1. A tape recorder comprising, two hubs for driving two tape spools to pass a tape from one spool to the other along a

given path, two individual reversible motors for driving respective ones of said hubs, a tachometer wheel disposed so as to be driven by a tape passing along said given path at a speed proportional to the speed of the tape along said given path, means cooperative with said tachometer wheel for providing an electrical signal representing the speed of rotation of the tachometer wheel, direction-detecting means for detecting the direction of advance of the tape and for developing a tape direction signal representative of the direction of advance, and an electronic control circuit, said electronic control circuit including means for comparing said signal with a reference value and for providing to said motors control signals having current values dependent upon the voltage values thereof and the impedance of said motors, said voltage values being proportional to the difference value between said electrical signal and said reference value for differentially controlling the speeds of the two motors to maintain the speed of the tape along said given path at a constant value.

4,015,178

REFERENCE VALUE TRANSMITTER FOR A PHASE  
CLIPPING CONTROL FOR STARTING A SQUIRREL  
CAGE-ASYNCHRONOUS MOTOR

Charles Phillot, Aarau, and Heinz Unterwiesing, Buchs, both of Switzerland, assignors to Sprecher &amp; Schuh AG, Aarau, Switzerland

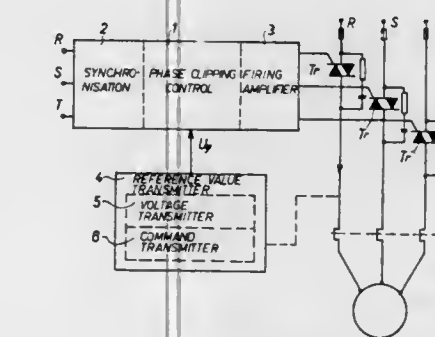
Filed June 20, 1975, Ser. No. 588,958

Claims priority, application Switzerland, June 27, 1974, 8854/74

Int. Cl.<sup>2</sup> H02P 5/40

U.S. Cl. 318—227

7 Claims



1. A reference value transmitter for a phase clipping control for starting a squirrel cage-asynchronous motor comprising start-up regulator means for the upward regulation of a reference value transmitter-output voltage from a start-up voltage value which is constant during a primary start-up phase to a rated voltage value having a predetermined build-up speed during a terminal start-up phase, a command transmitter for delivering a command signal to the start-up regulator means, an adjustment mechanism for adjusting a reference voltage value which deviates from the start-up voltage value, a regulation device triggered upon switching-on the reference voltage transmitter for leading the reference voltage from the starting voltage value to the start-up voltage value during a start-up starting phase with predetermined lead speed and which start-up starting phase precedes the primary start-up phase, said start-up regulator means containing means for triggering the terminal start-up phase by the command signal, said command transmitter incorporating a current measuring device for the motor current and a threshold value indicator connected with the current measuring device for generating the command signal, said current measuring device including a current voltage converter equipped with rectifier means, said threshold value indicator including a voltage comparator having a first input and a second input; means for applying a measurement voltage to the first input of the voltage comparator, and a circuit arrangement connected with the second input of the voltage comparator for applying thereto a comparison voltage

determining the threshold value, and wherein by means of the threshold value of the threshold value indicator there is detected the intensity of the motor current intensity amounts to a predetermined fraction of the motor current intensity at the start of the primary start-up phase.

4,015,179

## DC MOTOR CONTROL CIRCUIT

Takeshi Endo, Matsumoto, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

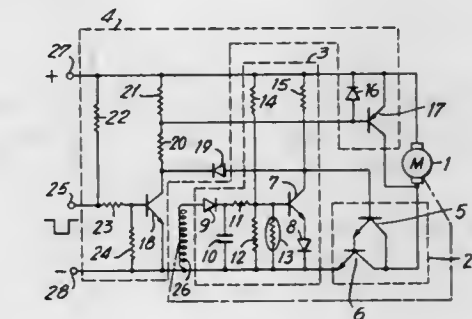
Filed Dec. 23, 1974, Ser. No. 535,916

Claims priority, application Japan, Dec. 21, 1973, 48-146827[U]

Int. Cl.<sup>2</sup> H02P 1/18

U.S. Cl. 318—275

10 Claims



1. A DC motor control circuit comprising a DC constant voltage source, control circuit means, a DC motor, a switching transistor means having a first switching control electrode, and two further electrodes defining a current path connected in parallel with said DC motor, said parallel connection being series connected to said DC voltage source and said control circuit means, and drive means coupled to said first switching control electrode, said drive means being adapted to produce a starting signal for opening said switching transistor means current path, and a stopping signal for closing said switching transistor means current path in response to the respective application of one of a START signal and STOP signal to said drive means, said drive means including a drive transistor having a first driving control electrode for receiving one of a START and STOP signal, and two further electrodes defining a current path, a first of said drive transistor current path electrodes being coupled to a reference potential, said other drive transistor current path electrode being coupled to said first switching control electrode to apply said starting signal and stopping signal thereto, and diode means coupled to said other drive transistor current path electrode and to said control circuit means for preventing said switching transistor means current path from closing when a START signal is applied to said first driving control electrode.

4,015,180

SPEED REGULATING DEVICES FOR ROTARY  
MACHINES OR THE LIKE

Yoshio Tetsugu, Katano; Tsunemi Mitsui, Osaka, and Hiroshi Minakuchi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

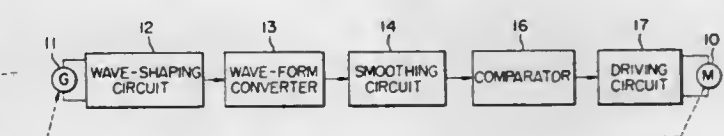
Filed Feb. 21, 1975, Ser. No. 551,751

Claims priority, application Japan, Mar. 8, 1974, 49-27532

Int. Cl.<sup>2</sup> H02P 5/06

U.S. Cl. 318—314

6 Claims



1. A speed regulating device for rotary machines powered by a supply voltage comprising



- means for obtaining from a rotational speed detector attached to a rotary machine a first time varying signal which is dependent upon the rotational speed of said rotary machine;
- means for combining said first time varying signal with a reference timing signal to generate a rectangular waveform signal whose amplitude changes in response to the variation in supply voltage;
- means for smoothing said rectangular waveform signal to derive a time varying DC voltage signal;
- means for comparing said time varying DC voltage signal with a reference DC voltage signal derived by dividing the supply voltage; and
- means operating in response to the output signal from said comparator means, for controlling said rotary machine to rotate at predetermined rate.

#### 4,015,181 DC MOTOR

Yukuo Karube; Koji Suzuki, both of Yokohama, and Ryoichi Ezaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

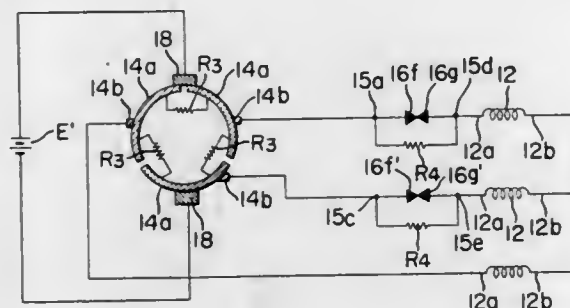
Filed June 16, 1975, Ser. No. 586,926

Claims priority, application Japan, June 18, 1974, 49-69489; July 22, 1974, 49-83960; July 22, 1974, 49-83961

Int. Cl.<sup>2</sup> H02P 5/08

U.S. Cl. 318—325

18 Claims



1. A DC motor comprising: a rotary shaft; an armature core having a plurality of salient poles and secured to said rotary shaft; armature windings coiled on said salient poles; a commutator electrically connected to said windings and secured to said rotary shaft; switch means capable of cutting off the current flow path to said windings and disposed between said salient poles of said core and operable to be opened and closed by centrifugal force in a plane containing the axis of said rotary shaft, said switch means being electrically connected in the current flow path to said windings; and means for supporting said switch means between said salient poles of said core and disposed with respect to said windings on the same side that said commutator is disposed, said support means including means for electrically connecting said switch means in the current flow path to said windings and electrically connected to said switch means; whereby the speed of revolution of said motor may be made constant independently of the direction of revolution.

#### 4,015,182

REFRIGERATION SYSTEM AND CONTROL THEREFOR  
David M. Erdman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 24, 1974, Ser. No. 482,407

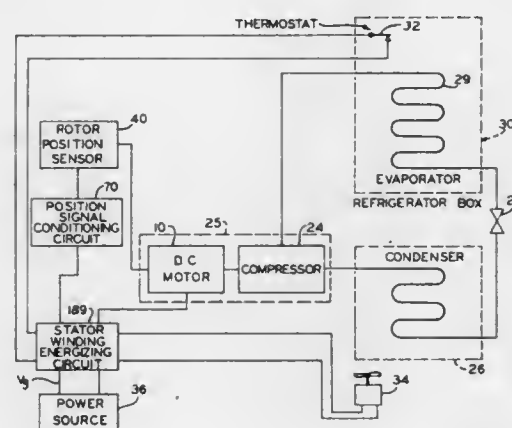
Int. Cl.<sup>2</sup> H02K 29/00

U.S. Cl. 318—334

10 Claims

1. A refrigeration system comprising a compressor assembly including a compressor mechanism for circulating a refrigerant

through an evaporator and a D.C. motor coupled with said compressor mechanism and comprising a stationary armature core having a longitudinal axis, at least one excitable winding disposed on said armature core to produce at least one magnetic field, and a permanent magnet rotor adapted to rotate about said longitudinal axis in response to the at least one magnetic field produced by said winding; electronic commutating means for selectively switching a source voltage to energize in sequence different portions of said winding, whereby said D.C. motor is efficiently energized; temperature



control means for providing an output indicative of the desired temperature to be maintained by said refrigeration system; and control means responsive to the temperature control means output for controlling the stator winding energization in accordance with the desired temperature; said system further including a power source controllable for providing a variable source voltage, and said control means comprising regulator means responsive to the output of said temperature control means for controlling the output of said power source in accordance with the desired temperature.

#### 4,015,183

ROTARY CUTTER DRIVE CONTROL WITH  
ELECTRO-HYDRAULIC PULSE MOTOR

Hiroshi Miyakita, Toyonaka, Japan, assignor to Ichiro Miyakita, Japan

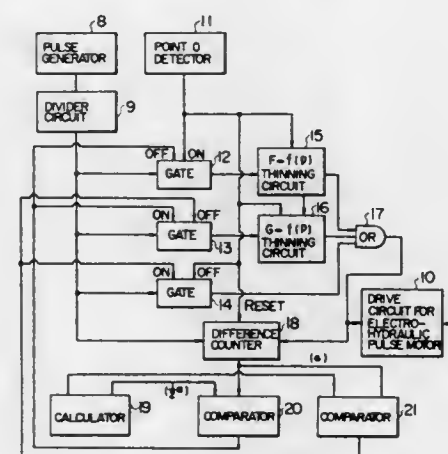
Filed Apr. 10, 1974, Ser. No. 459,620

Claims priority, application Japan, Oct. 4, 1973, 48-111679

Int. Cl.<sup>2</sup> G05B 19/28; B26D 5/20

U.S. Cl. 318—601

6 Claims



1. An apparatus for controlling the speed of a rotary cutter driven by an electro-hydraulic pulse motor for cutting to length a sheet material continuously supplied to said rotary cutter comprising:

- first means for producing a first pulse train having a pulse rate in synchronism with the feed rate of said sheet material,
- second means for decreasing the pulse rate of said first pulse train applied thereto thereby to produce a second pulse

train and operative selectively in a first mode where the rate of decrease of the pulse rate increased progressively according to a predetermined first pattern and in a second mode where the rate of decrease of the pulse rate decreases progressively according to a predetermined second pattern.

detecting means for producing a first signal when the blades of said rotary cutter reach a predetermined position after cutting,

comparator means for producing second and third signals when the difference between the number of pulses of said first pulse train applied to said second means and that of said second pulse train produced by said second means reaches a predetermined first value and a predetermined second value, respectively,

first gate means for causing said second means to operate in said first mode during a first period from occurrence of said first signal to occurrence of said second signal and to operate in said second mode during a second period from occurrence of said second signal to occurrence of said third signal thereby to apply said second pulse train produced by said second means to said pulse motor during said first and second periods, and

second gate means for applying said first pulse train to said pulse motor during a third period from occurrence of said third signal to occurrence of said first signal.

#### 4,015,184

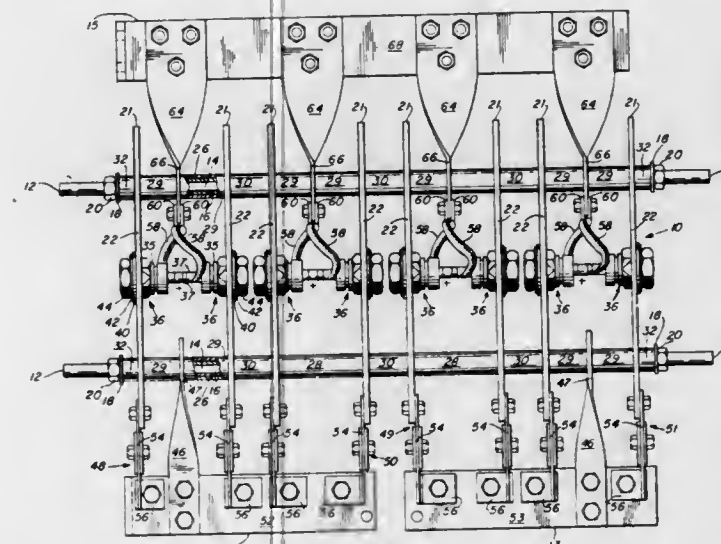
SILICON JUNCTION DIODE RECTIFIER POWER PACK  
Seymour A. Cooperman, Chicago, Ill., assignor to Clinton Supply Company, Chicago, Ill.

Filed Nov. 20, 1975, Ser. No. 633,573

Int. Cl.<sup>2</sup> H02M 7/06

U.S. Cl. 321—8 C

8 Claims



1. In an air-cooled, full-wave silicon junction diode rectifier having long bolts with tubular insulation thereabout arranged in parallel side-by-side relation and a pack of elongated heat sink plates mounted in parallel side-by-side relation thereon over said tubular insulation, the improvement in conductor for transfer of D.C. current from the anode electrodes of the diodes to the main rectifier D.C. positive output busbar lying in the direction of elongation of said heat sink plates and bearing a perpendicular relation thereto comprising:

- a cable operationally connected at one end to the anode electrodes of each of said diodes; and
- twisted straps for support of said D.C. positive output busbar having bored flat portions at one end for slidably mounting on said tubular insulation, each strap installed on one of said long bolts at locations corresponding to alternate pairs of heat sink plates, said straps extending from said pack in the direction of elongation of said heat sink plates having cross-sections in said direction lying in planes perpendicular to the planes of said heat sink plates, and operationally connected at said one end to the

other end of said cable, and said straps fastened to and supporting and operationally connecting to said D.C. positive output busbar at the other end.

#### 4,015,185

SEMICONDUCTOR SWITCHING CIRCUIT WITH  
TRANSISTOR SWITCHING POWER LOSS REDUCTION  
MEANS

Werner Pollmeier, Verl, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

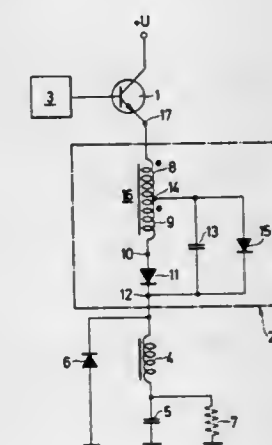
Filed Sept. 11, 1975, Ser. No. 612,535

Claims priority, application Germany, Sept. 13, 1974, 2443892; Oct. 10, 1974, 2448408

Int. Cl.<sup>2</sup> H02M 3/155

U.S. Cl. 321—44

5 Claims



1. A semiconductor switching circuit including a semiconductor switch having a switching path and a control electrode, said control electrode connected to a source of control signals; a voltage source; an inductor; a capacitor; a series combination comprising said inductor and said capacitor connected across said voltage source in series with said switching path; a diode; means connecting said diode in parallel with said series combination, said diode poled to pass current in response to inductive turn-off voltages appearing on said inductor; means connecting a load in parallel with said capacitor; a further inductor and a further diode; said further inductor and further diode connected in series combination coupled between said switching path and said series combination of said inductor and capacitor, said further diode poled to be energized in the forward direction in response to both turning on and turning off of said semiconductor switch; and further comprising an additional capacitor, and means connecting said additional capacitor to be charged by way of said further diode by the energy stored in said further inductor, whereby the power lost upon switching on said semiconductor switch is reduced.

#### 4,015,186

SYSTEM FOR LIMITING TORQUE IN A  
TURBINE-GENERATOR SHAFT

Kurt Fork, Rosenbach near Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Sept. 23, 1975, Ser. No. 615,842

Claims priority, application Germany, Oct. 11, 1974, 2448635

Int. Cl.<sup>2</sup> H02H 3/00, 7/06

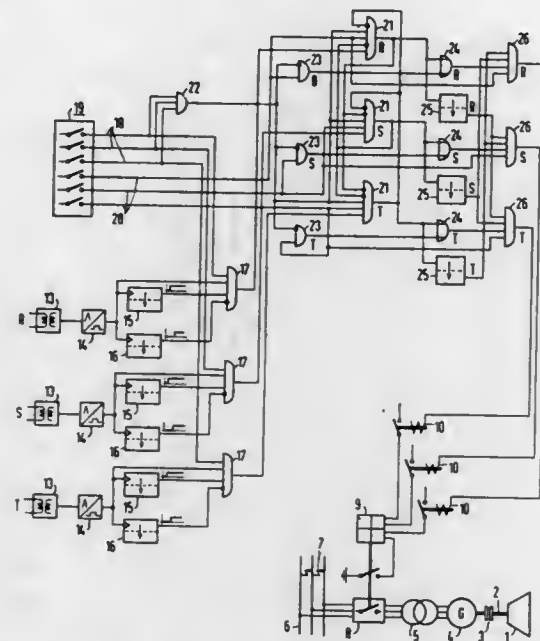
U.S. Cl. 322—8

2 Claims

1. System for limiting the torque produced in a turbine generator shaft when a three-pole electric supply net short circuit is switched off comprising at least one power switch connected between the generator and a location of a supply net having three phase lines wherein a short circuit is formed, said power switch having a respective switch member for each of the poles of the three-pole supply net and a respective actuating coil for displacing each of said switch members, and a selector device connected to said actuating coils for actuat-



ing the latter to displace said switch members so as to switch off two phase lines with a delay relative to switching off the third phase line that is greater than the duration of a half-wave of the supply net voltage, said selector device comprising



4,015,187

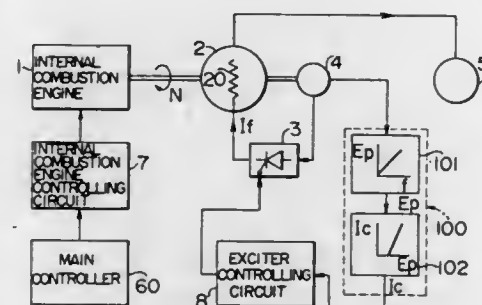
**EXCITER ARRANGEMENT FOR GENERATORS**

Akio Sasaki, Kiyoteru Kuwabara, and Hisakatsu Kiwaki, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan  
Filed Oct. 4, 1974, Ser. No. 512,156

Claims priority, application Japan, Oct. 8, 1973, 48-112353  
Int. Cl.<sup>2</sup> H02P 9/04

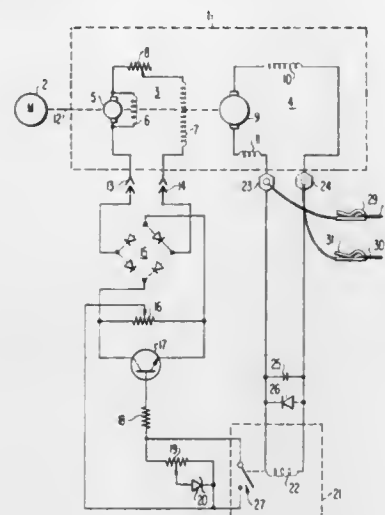
U.S. Cl. 322-14

18 Claims



1. An exciter arrangement for generators comprising an internal combustion engine, main and auxiliary generators both being driven by said internal combustion engine, exciter means including static exciter means for receiving the output of said auxiliary generator for supplying an exciting current to said main generator, a detecting circuit for producing an output corresponding to the rotational speed of said internal combustion engine in response to the output of said auxiliary generator, a command circuit for producing a command for said exciting current as a function of said output of said detecting circuit, and a control for controlling the operation of said static exciter means according to said command circuit, wherein said command circuit sets the value of said exciting current at a small value greater than zero when the rotational speed of said engine is less than a predetermined value and at a value which varies substantially in a linear relationship with variation of the rotational speed of said engine when the rotation speed is greater than said predetermined value.

4,015,188  
**WELDING GENERATOR EXCITER CONTROL**  
Albert P. Denis, 2050 Brookview Road, Castleton, N.Y. 12033  
Filed Sept. 19, 1975, Ser. No. 614,982  
Int. Cl.<sup>2</sup> H02P 9/10, 9/26  
U.S. Cl. 322-28 5 Claims



1. A method of controlling the open circuit output voltage of a separately excited, differentially compounded welding generator prior to arc start, said welding generator including an exciter armature connected in series with generator separately excited fields and a generator supplying output terminals, said method comprising the steps of:

breaking of the series connection between said exciter armature and said generator separately excited fields;  
inserting an exciter current control device across the broken connection;  
sensing the open circuit output voltage across said output terminals; and

regulating the exciter current control device in response to the sensed output voltage, said exciter control device including a transistor having its collector to emitter circuit electrically connected in series between said exciter armature and said generator separately excited fields and the step of regulating comprises the steps of:

connecting a first base bias circuit to said transistor to maintain a minimum voltage output from said generator and prevent loss of excitation when the open circuit output voltage sensed across said output terminals is below a predetermined value; and

connecting a second voltage regulated base bias circuit to said transistor when the open circuit output voltage sensed across said output terminals exceeds said predetermined value.

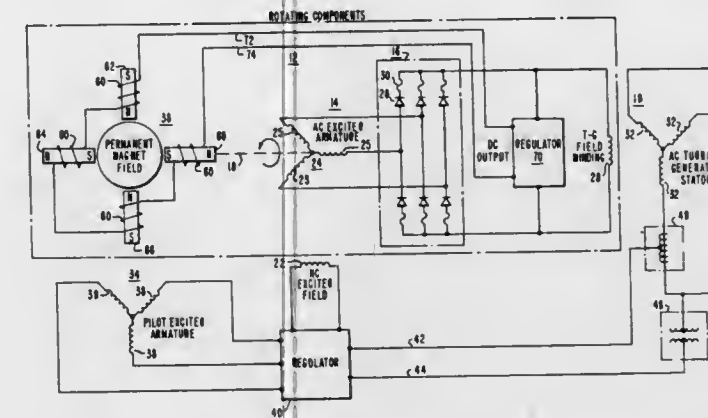
2. An exciter control circuit for controlling the open circuit output voltage of a separately excited, differentially compounded welding generator including an exciter armature connected in series with generator separately excited fields and a generator connected to supply output terminals, comprising:

voltage sensing means connected to said output terminals for providing a regulating signal in response to the sensed open circuit output voltage across said output terminals;  
a transistor having its collector to emitter circuit electrically connected in series between said exciter armature and said generator separately excited fields;

a first base bias circuit connected to said transistor to maintain a minimum voltage output from said generator and prevent loss of excitation when the open circuit output voltage sensed across said output terminals is below a predetermined value; and

a second voltage regulated base bias circuit connected to said transistor in response to said regulating signal only when the open circuit output voltage across said output terminals exceeds said predetermined value.

4,015,189  
**SUPPLEMENTAL FIELD EXCITATION FOR PERMANENT MAGNET ROTOR OF PILOT EXCITER**  
Dale I. Gorden, North Versailles, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.  
Filed Mar. 15, 1976, Ser. No. 666,810  
Int. Cl.<sup>2</sup> H02P 9/14  
U.S. Cl. 322-46 2 Claims



1. In a synchronous dynamoelectric machine having a rotor member disposed upon a shaft, said shaft being disposed for rotation by a prime mover, a field winding disposed on said rotor member, a main exciter having a stator member carrying a field winding and a rotor member disposed on said shaft carrying an armature winding, a rotatable rectifier assembly operable to convert alternating current to direct current having an input circuit connected to receive alternating current excitation from said main exciter armature and an output circuit connected to conduct direct current excitation through said synchronous dynamoelectric machine field winding, a pilot exciter operable to derive electrical power from the rotational energy of said shaft, said pilot exciter having a permanent magnet rotor member comprising a plurality of permanent magnets arranged in alternating magnetic polarity to establish a rotating magnetic field when said shaft is rotated, and said pilot exciter having a stator member carrying an armature winding which is coupled by magnetic induction with the magnetic field provided by said permanent magnet rotor member,

the combination with said pilot exciter of a plurality of field coils disposed upon selected ones of said permanent magnets, said field coils being connected together in series electrical relation to constitute a field winding, and means for deriving direct current excitation from the output circuit of said rotating rectifier assembly connected to supply a predetermined function of said direct current excitation to said permanent magnet field winding.

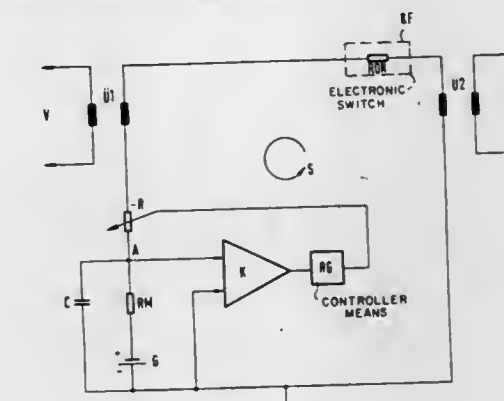
4,015,190  
**CONTROLLABLE NEGATIVE RESISTANCE ELECTRONIC SWITCH ARRANGEMENT**  
Lorenz Gasser, Stuttgart-Mohringen, and Kalman Széchenyi, Stuttgart, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.  
Filed Apr. 16, 1975, Ser. No. 568,547  
Claims priority, application Germany, Apr. 22, 1974, 2419357  
Int. Cl.<sup>2</sup> G05F 1/40 6 Claims

U.S. Cl. 323-4

2. A arrangement for reversing the damping of electronic switches having linear current voltage characteristics comprising:

current input means for coupling current into said arrangement;  
an electronic switch;  
a controllable negative resistance;  
a series resistor;  
a dc voltage source, said electronic switch, said controllable

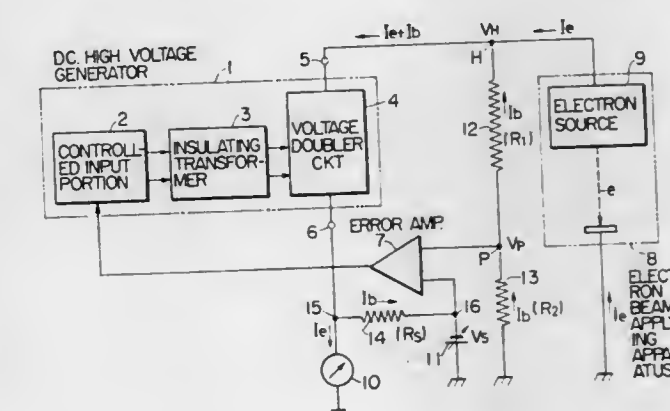
resistance, said series resistor, and said dc source are connected in series, so that current is coupled in and out of said arrangement on both sides of said electronic switch, said series resistor and dc source are shunted by a capacitor to provide alternate current transfer, and a comparator circuit provides measurement for a voltage drop across said dc source and said resistor for transmitting said voltage drop to a controller whereby said controller adjusts said negative resistance in order to cause said voltage drop to disappear;



wherein said negative resistance comprises two operational amplifiers having a plurality of inputs coupled with a respective plurality of outputs by means of a plurality of feedback resistances so that said electronic switch is coupled to an inverting input of a first operational amplifier, and a non-inverting input of said first operational amplifier is coupled to an inverting input of a second operational amplifier by means of a resistor, and a non-inverting input of said second operational amplifier is connected to said series resistor; and current output means for coupling current out of said arrangement.

4,015,191  
**D.C. HIGH VOLTAGE POWER SOURCE WITH PRECISE LOAD CURRENT MEASUREMENT**  
Masahide Okumura, Hachioji, Japan, assignor to Hitachi, Ltd., Japan  
Filed Feb. 9, 1976, Ser. No. 656,435  
Claims priority, application Japan, Feb. 14, 1975, 50-17293  
Int. Cl.<sup>2</sup> G05F 1/46 10 Claims

U.S. Cl. 323-16



1. A d.c. high voltage power source comprising:  
a d.c. high voltage generator having high and low voltage outputs terminals;  
voltage divider means connected to said high voltage output terminal of said generator for detecting the output voltage of said high voltage generator;  
a reference voltage source;  
error amplifier means connected to said voltage divider means and said reference voltage source for detecting an amplifying the voltage difference between the voltage



detected by said voltage divider and the reference voltage derived from said reference voltage source;  
control means for controlling the output voltage of said high voltage generator in response to the output of said error amplifier so as to maintain said output of said error amplifier substantially equal to zero;  
a current measuring instrument connected between said low voltage output terminal of said d.c. high voltage generator and ground potential; and  
correcting means for applying a correcting current to said current measuring instrument having a value equal to the current flowing through said current measuring instrument due to the current of said voltage divider means.

4,015,192

## VOLTAGE GENERATING SYSTEM

Yukio Koyanagi, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

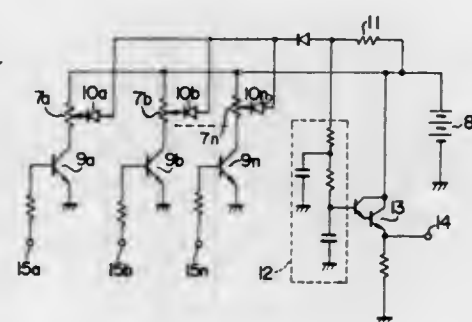
Filed July 3, 1975, Ser. No. 592,992

Claims priority, application Japan, July 5, 1974, 49-77550; Nov. 15, 1974, 49-132144; Nov. 15, 1974, 49-132145

Int. Cl.<sup>2</sup> H04N 5/50

U.S. Cl. 323—19

11 Claims



1. A voltage generating system comprising: a plurality of means for generating at least two different reference voltages  $V_A$  and  $V_B$ ; a plurality of switching means, coupled to said reference voltage generating means, respectively, for selectively taking out the reference voltages; a switching pulse generating means for generating switching pulses and for supplying the switching pulses to said switching means, the switching pulses having certain duty ratios to cause at least one of said switching means to switch with a certain duty ratio, and the other said switching means to switch to their on state or with an inverse phase with respect to the switching phase of said at least one switching means; smoothing means for smoothing the switched reference voltages taken out from said switching means, and for outputting any of a plurality of output voltages which are obtained by dividing the reference voltages into a plurality of steps, the voltage to be outputted being determined by the duty ratios; and means for selecting which of the plurality of output voltages is to be outputted by changing the duty ratios of the switching pulses supplied to said switching means.

4,015,193

## FIRING CIRCUIT

Robert S. Lundin, Northfield, and John F. Carragan, Woodbury, both of Conn., assignors to General Time Corporation, Thomaston, Conn.

Filed Nov. 11, 1975, Ser. No. 631,172

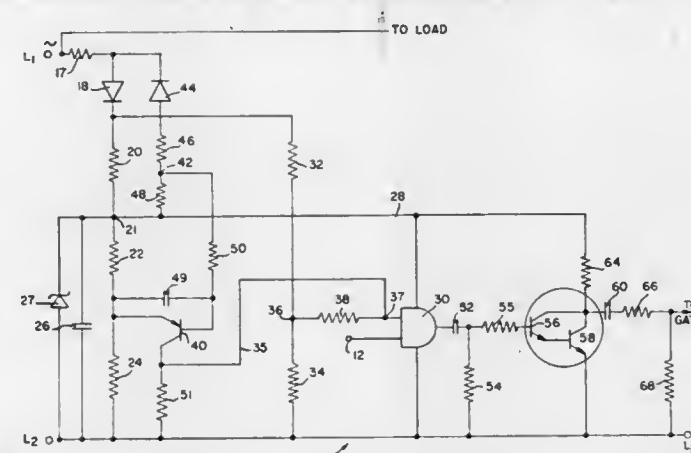
Int. Cl.<sup>2</sup> G05F 3/04

U.S. Cl. 323—19

4 Claims

1. A firing circuit providing an input signal during each half cycle at a control gate of a semiconductor device in a load circuit across an alternating current source, each said input signal energizing said load circuit during the remainder of said half cycle, and said firing circuit comprising a logic gate having a pair of input terminals, control means providing an input signal at one of said input terminals, first circuit means includ-

ing a first diode connected between said alternating current source and the other of said input terminals providing half wave rectification during the positive half cycle of said alternating current source, a pair of voltage divider means, said voltage divider means connected in series with said diode across said alternating current source, said pair of voltage divider means including a first junction and a second junction at a lower voltage potential, second circuit means connected between said alternating current source and said other input terminal providing an input signal during the negative half



cycle of said alternating current source, said second circuit means including transistor means, the emitter of said transistor means being connected to said second junction, and a second diode connecting the base of said transistor means to said alternating current source during said negative half cycle, said logic gate providing an output signal during each half cycle, a D.C. source connected to said first junction, said logic gate being powered by said D.C. source, and means for electrically connecting said logic gate output signals to said control gate at selected times during each half cycle.

4,015,194

## OIL WELL LOGGING DEVICE HAVING PLURAL WELL FLUID PARAMETER MEASURING DEVICES AND A SINGLE CONDUCTOR FOR ACCOMMODATING BOTH MEASUREMENT AND POWER SIGNALS

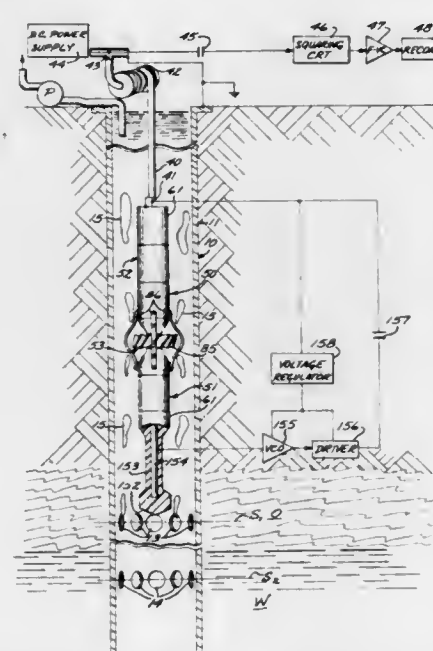
Karol E. Epling, Fountain Valley, Calif., assignor to Production Data Inc., Long Beach, Calif.

Filed July 3, 1975, Ser. No. 592,981

Int. Cl.<sup>2</sup> G01V 3/18

U.S. Cl. 324—1

4 Claims



1. An instrumentation array for use in oil well logging, by measuring the parameters of the fluid in the well, comprising: a cylindrical housing;  
a plurality of circuit segments adapted for axial receipt

within said housing, each circuit segment including feed-through connections to transfer electrical signals between adjacent ones thereof;  
a plurality of sensing means interposed between selected ones of said segments, each sensing means being adapted to respond to a selected physical parameter of said fluid by producing a continuous analog signal indicative in amplitude of the amplitude of said parameter;  
an associated voltage controlled oscillator connected and disposed proximate each said sensing means for producing electrical pulses at a pulse rate corresponding to the amplitude of said analog signal from said sensing means;  
an associated voltage regulator connected to each said voltage controlled oscillator for applying a reference signal thereto;  
recording means disposed above said well bore producing a record indicative of said pulse rate;  
power supply means disposed above said well bore for producing a D.C. electrical signal; and  
cable means including a single conductive element connected to said recording and power supply means and across said feedthrough connections to each said sensing means for conveying said electrical pulses to said recording means and said D.C. electrical signal to each said voltage regulators in superposed relationship thereacross.

4,015,195

## METHOD OF DETERMINING HYDROCARBON SATURATION IN SHALY FORMATIONS BY MEASURING DIELECTRIC CONSTANT IN FIRST AND SECOND PORTIONS OF THE FORMATIONS

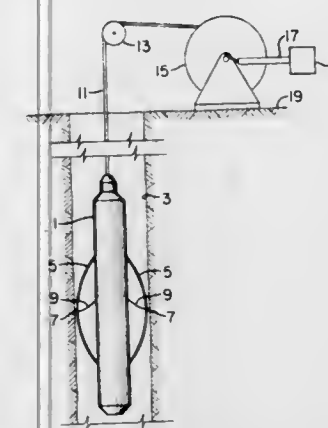
Wilmer A. Hoyer, Houston, and Michael M. Spann, Stafford, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 554,997, March 3, 1975, abandoned. This application June 3, 1976, Ser. No. 692,616

Int. Cl.<sup>2</sup> G01V 3/18, 3/06; G01N 27/00

U.S. Cl. 324—1

29 Claims

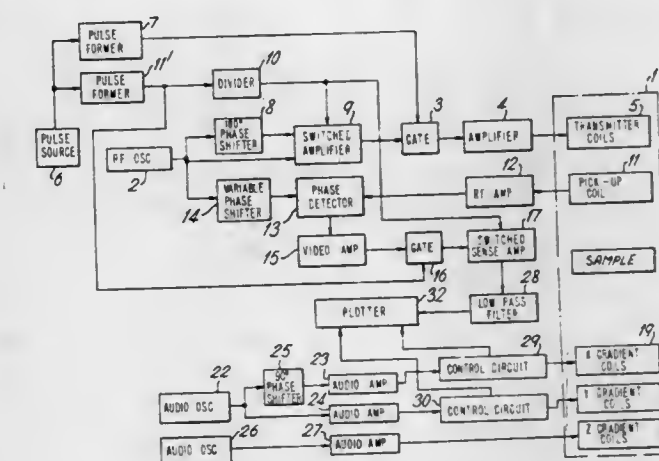


1. In a method of electrical well-logging a subsurface shaly sand formation having a first portion thereof saturated with native formation saturants which may include an aqueous saturant and having a second portion thereof adjacent said first portion in which native formation saturants have been at least partially displaced by injected fluids, wherein the relation between dielectric constant and conductivity due to shaliness is utilized to determine the aqueous portion of the native formation saturants, the steps comprising:  
making a first measurement of dielectric content at a selected frequency less than about 50 KHz in said first portion of said formation; and  
making a second measurement of dielectric constant at said selected frequency in said second portion of said formation.

4,015,196  
ANALYSIS OF MATERIALS  
William Stanley Moore, Nottingham, England, and Waldo Stephen Hinshaw, Pittsburgh, Pa., assignors to National Research Development Corporation, London, England  
Filed Apr. 3, 1975, Ser. No. 564,833  
Claims priority, application United Kingdom, Apr. 5, 1974, 15280/74; Oct. 7, 1974, 43365/74  
Int. Cl.<sup>2</sup> G01R 33/08

U.S. Cl. 324—.5 R

7 Claims



1. A method of investigating a sample, the method comprising the steps of:  
causing gyromagnetic resonance to occur in said sample by irradiating said sample with radio frequency energy while subjecting said sample to a magnetic field, said field having a systematically varying non-homogeneous component such that said field is substantially invariant with time in a localized volume of said sample but varies with time in all other parts of said sample;  
receiving from said sample a signal resulting from said gyromagnetic resonance; and  
deriving from said signal information relating to gyromagnetic resonance effects specific to said localized volume, said information being distinguished by virtue of the difference between said localized volume and said other parts of said sample in respect of the time dependence of said field.

4,015,197

## METHOD AND APPARATUS FOR DETERMINING PERMEABLE ZONES IN SUBSURFACE EARTH FORMATIONS

Christian M. Clavier, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed June 24, 1975, Ser. No. 589,970

Int. Cl.<sup>2</sup> G01V 3/18

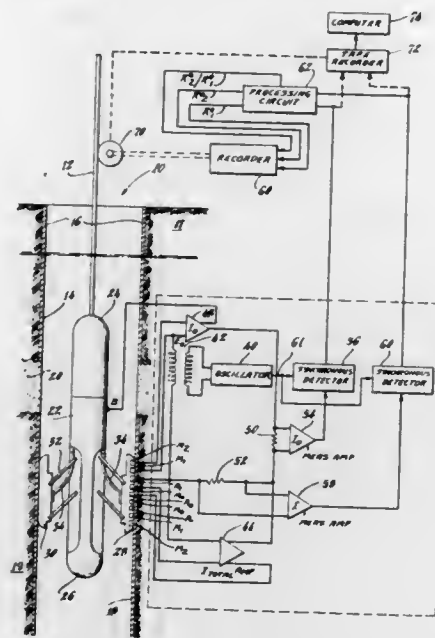
U.S. Cl. 324—10

16 Claims

1. Apparatus for investigating subsurface earth formations traversed by a borehole, comprising:  
a. means for supporting a plurality of electrodes adapted for movement in a borehole, the plurality of electrodes including at least one current emitting electrode adapted for emitting current into a borehole and the formation surrounding a borehole;  
b. means for emitting a main and an auxiliary current from the at least one current emitting electrode, the main current flowing primarily in the formation surrounding a borehole and the auxiliary current being confined primarily to a borehole and the formation immediately surrounding a borehole; and  
c. means for detecting said main and auxiliary currents to



produce first and second resistivity parameters, the first resistivity parameter being related to the auxiliary current



and the second resistivity parameter being related to the main current and the first resistivity parameter.

4,015,198

**SHUTTER-TIME-PREFERENCE SINGLE LENS REFLEX CAMERA WITH AUTOMATIC FILM WIND-UP**  
Tomonori Iwashita, Chofu; Hiroshi Aizawa, Machida; Susumu Kozuki, Yokohama; Masanori Uchidoi, Kawasaki; Tadashi Ito, Yokohama, and Yukio Iura, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

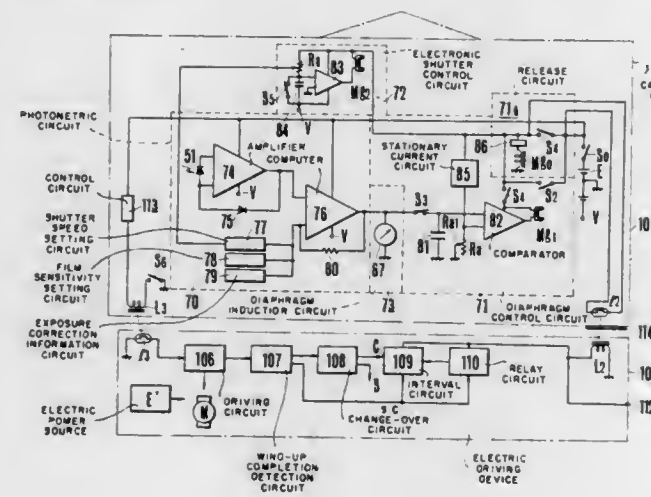
Filed Dec. 18, 1974, Ser. No. 534,151

Claims priority, application Japan, Dec. 26, 1973, 48-493253; Apr. 15, 1974, 49-4942449

Int. Cl.<sup>2</sup> G03B 7/14, 1/18

U.S. Cl. 354-29

13 Claims



13. A shutter time preference single lens reflex camera having an electric driving device, which comprises:

1. a camera body having,
  - a. a photographing lens having a diaphragm device,
  - b. means for measuring transmitted light of the photographing lens,
  - c. photographing information setting means having shutter time setting means,
  - d. computation means for computing the output of the photometric means and the output of the photographing information setting means,
  - e. diaphragm control means for controlling the operation of the diaphragm device, which means determines the diaphragm aperture of the diaphragm device in correspondence to the output computation of the computation means,

- f. time control means for controlling shutter time in correspondence to the value set by the shutter time setting means,
  - g. means for actuating the diaphragm control means and the time control means,
  - h. magnetic release means for driving the actuating means,
  - i. a first switching means for controlling conductivity of the magnetic release means,
  - j. operation means for controlling "on" and "off" of the switching means,
  - k. film winding means for charging the time control means and the diaphragm control means,
  - l. a second switching means for controlling the action of said electric driving device, which second switching means changes over to a first position for driving the electric driving device upon completion of the operation of the time control means and changes over to a second position for making non-operative the electric driving device upon completion of charging of the time control means, and
  - m. connecting means on the camera body side for connecting the second switching means to the electric driving device, having a terminal on the camera body side connected to the second switching means;
2. an electric driving device comprising:
- a. winding driving means which is engageable with the winding means,
  - b. connecting means on the electric driving device side for connecting the second switching means on the camera body side, said connecting having a terminal on the electric driving side connecting to the terminal on the camera body side,
  - c. control means for controlling the winding driving means, said control means being operative when the terminal on the electric driving device side is connected and the second switching means is changed over to the first position, and being non-operative when the second switching means is changed over to the second position,

in which said electric driving device further comprises a delay circuit which starts to operate upon the change-over of the second switching means to the first position, said circuit being functional for making said wind-up drive control means to be inoperative when the period between completion of operation and completion of charging said time control means is longer than the predetermined time given by said delay circuit; and in which said electric driving device further comprises means for indicating inaction of said wind-up drive control means, said indication means being active to indicate when said wind-up drive control means is inoperative due to said relay circuit.

4,015,199

**CELL FOR MEASUREMENT OF THE ELECTRICAL CONDUCTIVITY OF LIQUIDS**

Klaus Rommel, Jona, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Oct. 29, 1975, Ser. No. 627,020

Claims priority, application Switzerland, Nov. 14, 1974, 15176/74

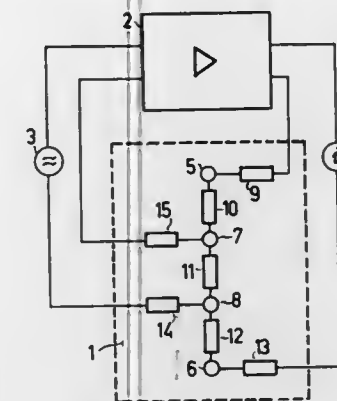
Int. Cl.<sup>2</sup> G01N 27/42

U.S. Cl. 324-30 B

10 Claims

1. In a cell for measurement of electrical conductivity of liquids having two current electrodes with a defined spacing therebetween and voltage electrode means for providing a voltage tap-off according to the four electrode measuring technique, the improvement wherein the voltage electrode means comprises at least two voltage electrodes associated with each current electrode, the at least two voltage elec-

trodes being electrically connected in parallel for providing a voltage tap-off and being disposed along an equipotential line



**4,015,200**  
**MULTICONDUCTOR CABLE TESTING APPARATUS**  
Mix Tommy Strandh, Horby, Sweden, assignor to Malmo Testequiment AB, Horby, Sweden

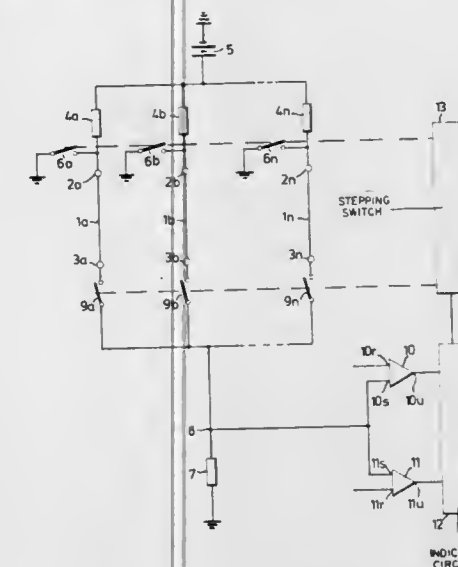
Filed Nov. 24, 1975, Ser. No. 634,350

Claims priority, application Sweden, Nov. 25, 1974, 7414740

Int. Cl.<sup>2</sup> G01R 31/02

U.S. Cl. 324-51

5 Claims



1. A multiconductor cable testing apparatus, comprising:
  - a. a plurality of pairs of terminal connectors for connection to the ends of a corresponding plurality of conductors to be tested;
  - b. a test voltage source in series with each of said pairs of connectors;
  - c. a corresponding plurality of normally open first contacts, each in series with a corresponding one of said pairs of terminal connectors;
  - d. a corresponding plurality of first impedance means, each in series with a corresponding one of said pairs of terminal connectors;
  - e. second impedance means in series with each of said first contacts;
  - f. a corresponding plurality of normally open second contacts for applying a reference potential when closed, to one terminal connector of a corresponding one of said pairs of terminal connectors;
  - g. the testing apparatus having a first testing position wherein a selected one of said first contacts is closed and the corresponding second contact open, and a second testing position wherein said selected one of said first contacts and said corresponding second contact are both closed; and

- h. a single voltage sensing means for sensing the voltage across said second impedance means in said first and second testing positions, predetermined values of the sensed voltages across said second impedance means representing open-circuit, short-circuit and incorrect wiring, respectively, for the conductor under test.

4,015,201

**ELECTRICAL CONTINUITY AND VOLTAGE TESTING DEVICE**

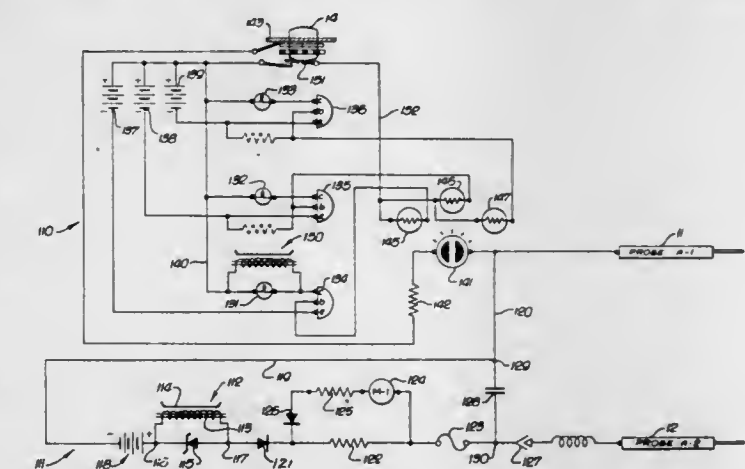
Bertram J. Chaffee, Anaheim, Calif., assignor to Mono-Probe Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 519,747, Oct. 31, 1974, Pat. No. 3,962,630. This application Dec. 30, 1975, Ser. No. 645,386

Int. Cl.<sup>2</sup> G01R 31/02

U.S. Cl. 324-51

15 Claims



1. In a circuit testing device,
  - a. a casing,
  - b. two probes, one of which projects from the casing
  - c. a voltage level testing circuit operatively connected with said one probe, and
  - d. electrical continuity testing circuitry connected between said two probes,
  - e. said voltage level testing circuit including voltage level indicator means, transistor amplifier means connected with the indicator means to energize same in response to different voltages applied to said one probe, the indicator means connected in the emitter-collector circuitry of the transistor amplifier means, said one probe operatively coupled to the base electrode of said transistor amplifier means, and DC voltage means directly connected with the emitter-collector circuitry of said transistor amplifier means.

4,015,202

**AUTOMATIC MEASUREMENT AND DISPLAY OF RESONANCE FREQUENCIES OF SEISMIC DETECTION ELEMENTS**

Oke A. Fredriksson, and Elmer L. Thomas, both of Fullerton, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 1, 1975, Ser. No. 618,606

Int. Cl.<sup>2</sup> G01R 27/00

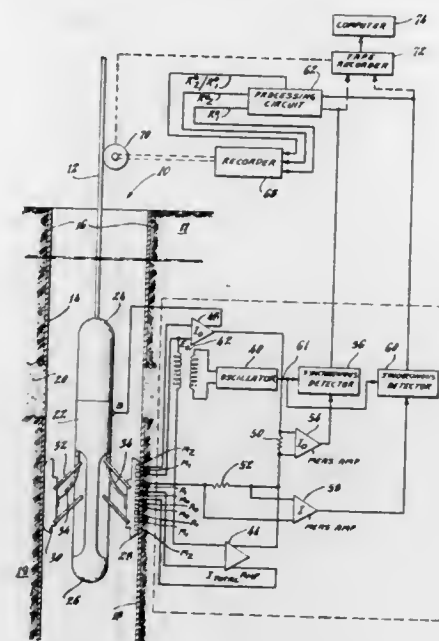
U.S. Cl. 324-57 Q

7 Claims

1. Circuit means for automatically determining the resonance frequency of a seismic detector element of a geophysical data acquisition system, comprising:
  - a. a sine wave voltage synthesizer generating a series of discrete voltages changing from one discrete voltage value to the next discrete value in response to activation pulses of a relatively high repetition rate, the entire series of discrete voltages collectively approximating an ideal smooth first sinusoidal voltage, said relatively high repetition rate being at least a hundred times the frequency of said approximated first sinusoidal voltage;



produce first and second resistivity parameters, the first resistivity parameter being related to the auxiliary current



and the second resistivity parameter being related to the main current and the first resistivity parameter.

4,015,198

### SHUTTER-TIME-PREFERENCE SINGLE LENS REFLEX CAMERA WITH AUTOMATIC FILM WIND-UP

Tomonori Iwashita, Chofu; Hiroshi Aizawa, Machida; Susumu Kozuki, Yokohama; Masanori Uchidoi, Kawasaki; Tadashi Ito, Yokohama, and Yukio Iura, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

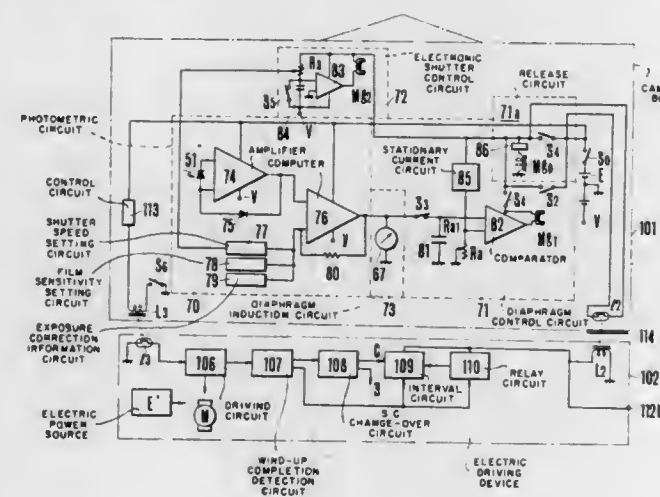
Filed Dec. 18, 1974, Ser. No. 534,151

Claims priority, application Japan, Dec. 26, 1973, 48-493253; Apr. 15, 1974, 49-4942449

Int. Cl.<sup>2</sup> G03B 7/14, 1/18

U.S. Cl. 354-29

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  - d. computation means for computing the output of the photometric means and the output of the photographing information setting means,
  - e. diaphragm control means for controlling the operation of the diaphragm device, which means determines the diaphragm aperture of the diaphragm device in correspondence to the output computation of the computation means,

- f. time control means for controlling shutter time in correspondence to the value set by the shutter time setting means,
- g. means for actuating the diaphragm control means and the time control means,
- h. magnetic release means for driving the actuating means,
- i. a first switching means for controlling conductivity of the magnetic release means,
- j. operation means for controlling "on" and "off" of the switching means,
- k. film winding means for charging the time control means and the diaphragm control means,
- l. a second switching means for controlling the action of said electric driving device, which second switching means changes over to a first position for driving the electric driving device upon completion of the operation of the time control means and changes over to a second position for making non-operative the electric driving device upon completion of charging of the time control means, and

- m. connecting means on the camera body side for connecting the second switching means to the electric driving device, having a terminal on the camera body side connected to the second switching means;

2. an electric driving device comprising:
  - a. winding driving means which is engageable with the winding means,
  - b. connecting means on the electric driving device side for connecting the second switching means on the camera body side, said connecting having a terminal on the electric driving side connecting to the terminal on the camera body side,
  - c. control means for controlling the winding driving means, said control means being operative when the terminal on the electric driving device side is connected and the second switching means is changed over to the first position, and being non-operative when the second switching means is changed over to the second position,

in which said electric driving device further comprises a delay circuit which starts to operate upon the change-over of the second switching means to the first position, said circuit being functional for making said wind-up drive control means to be inoperative when the period between completion of operation and completion of charging said time control means is longer than the predetermined time given by said delay circuit; and in which said electric driving device further comprises means for indicating inaction of said wind-up drive control means, said indication means being active to indicate when said wind-up drive control means is inoperative due to said relay circuit.

4,015,199

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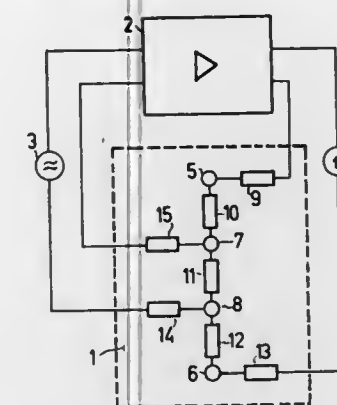
Int. Cl.<sup>2</sup> G01N 27/42

U.S. Cl. 324-30 B

10 Claims

1. In a cell for measurement of electrical conductivity of liquids having two current electrodes with a defined spacing therebetween and voltage electrode means for providing a voltage tap-off according to the four electrode measuring technique, the improvement wherein the voltage electrode means comprises at least two voltage electrodes associated with each current electrode, the at least two voltage elec-

trodes being electrically connected in parallel for providing a voltage tap-off and being disposed along an equipotential line



### MULTICONDUCTOR CABLE TESTING APPARATUS

Mix Tommy Strandh, Horby, Sweden, assignor to Malmo Testequiment AB, Horby, Sweden

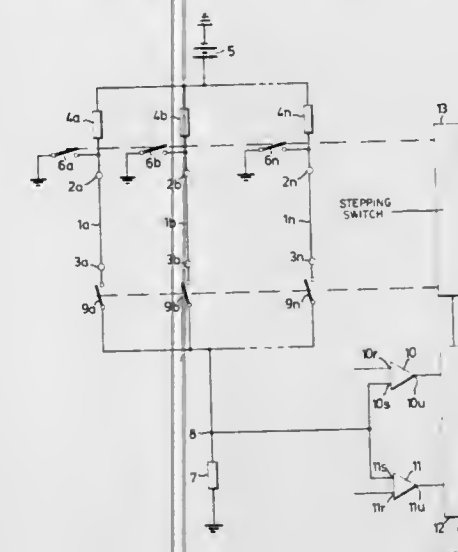
Filed Nov. 24, 1975, Ser. No. 634,350

Claims priority, application Sweden, Nov. 25, 1974, 7414740

Int. Cl.<sup>2</sup> G01R 31/02

U.S. Cl. 324-51

5 Claims



1. A multiconductor cable testing apparatus, comprising:
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  - b. a test voltage source in series with each of said pairs of connectors;
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  - d. a corresponding plurality of first impedance means, each in series with a corresponding one of said pairs of terminal connectors;
  - e. second impedance means in series with each of said first contacts;
  - f. a corresponding plurality of normally open second contacts for applying a reference potential when closed, to one terminal connector of a corresponding one of said pairs of terminal connectors;
  - g. the testing apparatus having a first testing position wherein a selected one of said first contacts is closed and the corresponding second contact open, and a second testing position wherein said selected one of said first contacts and said corresponding second contact are both closed; and

- h. a single voltage sensing means for sensing the voltage across said second impedance means in said first and second testing positions, predetermined values of the sensed voltages across said second impedance means representing open-circuit, short-circuit and incorrect wiring, respectively, for the conductor under test.

4,015,201

### ELECTRICAL CONTINUITY AND VOLTAGE TESTING DEVICE

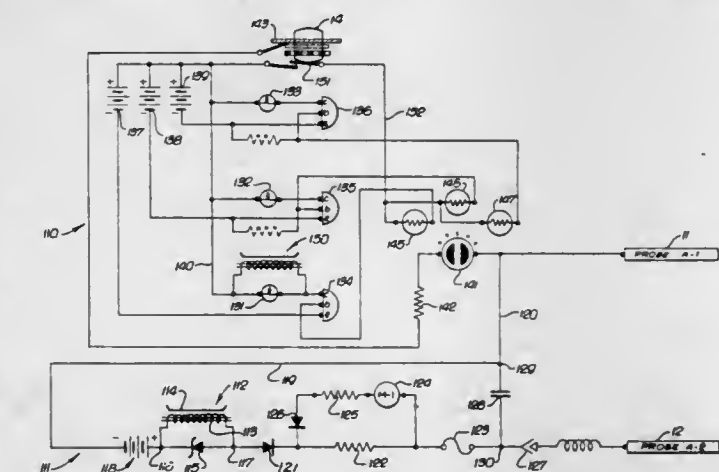
Bertram J. Chaffee, Anaheim, Calif., assignor to Mono-Probe Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 519,747, Oct. 31, 1974, Pat. No. 3,962,630. This application Dec. 30, 1975, Ser. No. 645,386

Int. Cl.<sup>2</sup> G01R 31/02

U.S. Cl. 324-51

15 Claims



1. In a circuit testing device,
  - a. a casing,
  - b. two probes, one of which projects from the casing
  - c. a voltage level testing circuit operatively connected with said one probe, and
  - d. electrical continuity testing circuitry connected between said two probes,
  - e. said voltage level testing circuit including voltage level indicator means, transistor amplifier means connected with the indicator means to energize same in response to different voltages applied to said one probe, the indicator means connected in the emitter-collector circuitry of the transistor amplifier means, said one probe operatively coupled to the base electrode of said transistor amplifier means, and DC voltage means directly connected with the emitter-collector circuitry of said transistor amplifier means.

4,015,202

### AUTOMATIC MEASUREMENT AND DISPLAY OF RESONANCE FREQUENCIES OF SEISMIC DETECTION ELEMENTS

Oke A. Fredriksson, and Elmer L. Thomas, both of Fullerton, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 1, 1975, Ser. No. 618,606

Int. Cl.<sup>2</sup> G01R 27/00

U.S. Cl. 324-57 Q

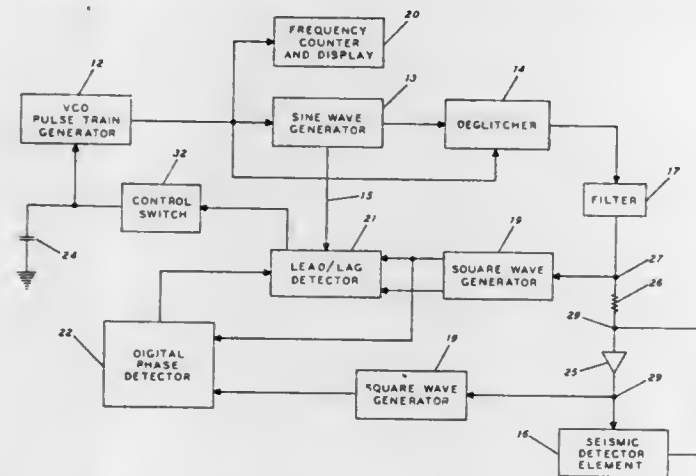
7 Claims

1. Circuit means for automatically determining the resonance frequency of a seismic detector element of a geophysical data acquisition system, comprising:
  - a. a sine wave voltage synthesizer generating a series of discrete voltages changing from one discrete voltage value to the next discrete value in response to activation pulses of a relatively high repetition rate, the entire series of discrete voltages collectively approximating an ideal smooth first sinusoidal voltage, said relatively high repetition rate being at least a hundred times the frequency of said approximated first sinusoidal voltage;



means responsive to said first sinusoidal voltage for imposing across said seismic detector element a second sinusoidal voltage identical in frequency therewith for driving through said element a current exactly inverse to a reference current driven through a pure resistance by said first sinusoidal voltage;

c. automatic means responsive to said first and second sinusoidal voltages for (i) first sensing a phase difference between said first voltage driving said reference current through said pure resistance and said second voltage driving the inverse of said reference current through said seismic detector element, and (ii) then automatically



adjusting said repetition rate associated with the generation of said series of discrete voltages, to change said sensed phase difference until a final phase difference of substantially 180° exists between said first and second sinusoidal voltages, the frequency finally occurring being the resonance frequency of said seismic detector element; and

d. means for continuously indicating and displaying the frequency of said sinusoidal voltages, including said finally occurring resonance frequency, with relatively high precision, by counting the activation pulses of said synthesizer generating said approximated first sinusoidal voltage in a time period  $\Delta t$  given by the relationship:

$$\Delta t = \frac{10^D}{C} \text{ seconds}$$

where D = the number of decimal places desired in the frequency to be represented and C = the number of activation pulses associated with said synthesizer per cycle of said generated voltages.

4,015,203

### CONTACTLESS LSI JUNCTION LEAKAGE TESTING METHOD

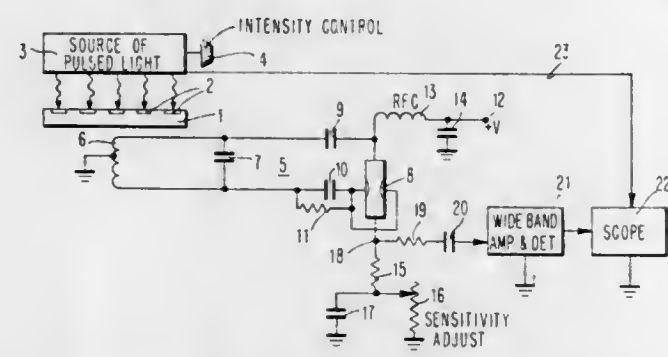
Roger Leonard Verkuil, Poughkeepsie, N.Y.; assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,759

Int. Cl.<sup>2</sup> H01J 39/12; G01R 31/00

U.S. Cl. 324—158 D

5 Claims



1. A method for testing PN junctions in a wafer comprising:

irradiating said wafer with pulsed light of selected intensity to charge the capacitance of the junction in a direction tending to render said junction forwardly conductive, said junction having a forward conduction threshold, inductively coupling to said wafer high frequency oscillations for inducing eddy currents in said wafer, said oscillations becoming amplitude modulated each time said wafer receives a pulse of said light, and monitoring said amplitude modulation while varying the intensity of said pulsed light to determine a value of said pulsed light which charges said capacitance to a value beneath said threshold.

4,015,204

### METHOD OF TELECOMMUNICATIONS

Kuniaki Miyazawa, 1548 Nishiozumicho, Nerimaku Tokyo, Japan (177)

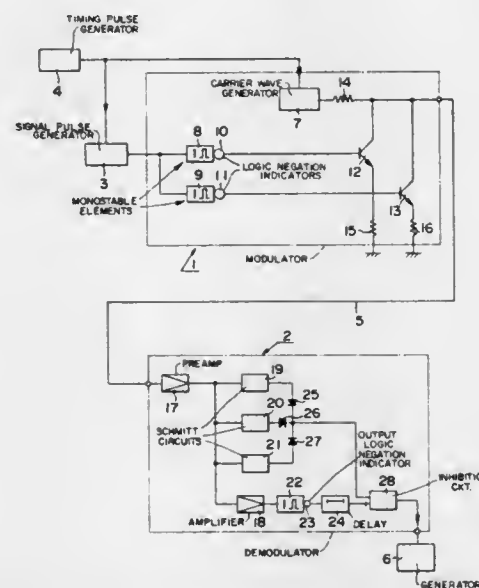
Filed Aug. 8, 1975, Ser. No. 603,227

Claims priority, application Japan, Aug. 21, 1974, 49-94943; Sept. 6, 1974, 49-102823

Int. Cl.<sup>2</sup> H04B 1/00

U.S. Cl. 325—38 R

18 Claims



1. A method of telecommunication comprising providing a plurality of separate carrier waves of different frequency, providing a train of binary signals, dividing said binary signals into groups, one group for each of said plurality of carrier waves, the ratio of the frequency of a carrier wave to the number of binary signals in the group that is complementary to that particular carrier wave being the same for each carrier wave and its complementary group of binary signals, amplitude modulating each carrier wave according to its complementary group of binary signals with the amplitude of at least a part of each cycle of each carrier wave representing one binary signal, transmitting said modulated carrier waves to a receiving location, demodulating, at the receiving location, each carrier wave to extract therefrom the group of binary signals that it carried, to thereby provide a plurality of separate groups of binary signals, and combining the separate groups of binary signals to reconstruct the first-named train of binary signals.

4,015,205

### BASEBAND SIGNAL SWITCHING ARRANGEMENT FOR DIVERSITY RECEPTION IN A PCM RADIO COMMUNICATION SYSTEM

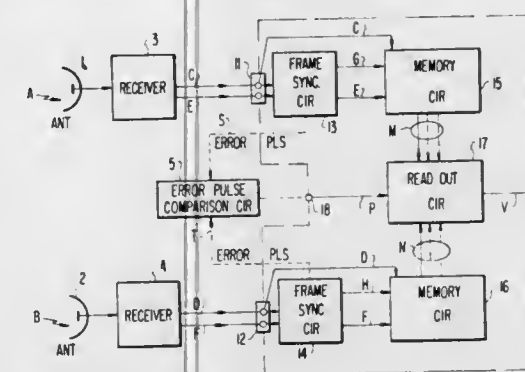
Kiyoshi Ikeda, and Toshihiko Mitani, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Feb. 17, 1976, Ser. No. 658,785

Claims priority, application Japan, Feb. 17, 1975, 50-20264 Int. Cl.<sup>2</sup> H04B 7/08

U.S. Cl. 325—304

2 Claims



1. A baseband signal switching arrangement for diversity reception in PCM communication system of the type having a receiver for each of a plurality of propagation paths, said switching arrangement comprising:

a plurality of 1/n write-in frequency-dividing counters (n being a positive integer equal to or larger than 2), said 1/n write-in frequency-dividing counters being provided at respective baseband stages of the receivers for said plurality of propagation paths, each of the receivers including clock signal regenerating circuits for producing clock signals and frame synchronization circuits for producing error pulses and frame signals, said 1/n write-in counters counting said clock signals in response to being reset by a frame signal;

n buffer memory circuits for successively writing bit information of a received PCM signal at each of said baseband stages in response to the n frequency-divided outputs of the corresponding 1/n frequency-dividing counter, said outputs having their phases shifted in sequence;

a 1/n read-out frequency-dividing counter provided in common to all of said baseband stages to successively read out memory outputs of one set of said n buffer memory circuits; and

switching means responsive to said error pulses for enabling said 1/n read-out frequency-dividing counter to selectively read out memory outputs of a given set of said n buffer memory circuits.

4,015,206

### PROTECTIVE RELAYING MODEM RECEIVER

Christopher Ryland Huntley, Burnaby, Canada, assignor to GTE Lenkurt (Canada) Ltd., Burnaby, Canada

Filed Dec. 22, 1975, Ser. No. 643,166

Int. Cl.<sup>2</sup> H04B 1/16

U.S. Cl. 325—435

6 Claims

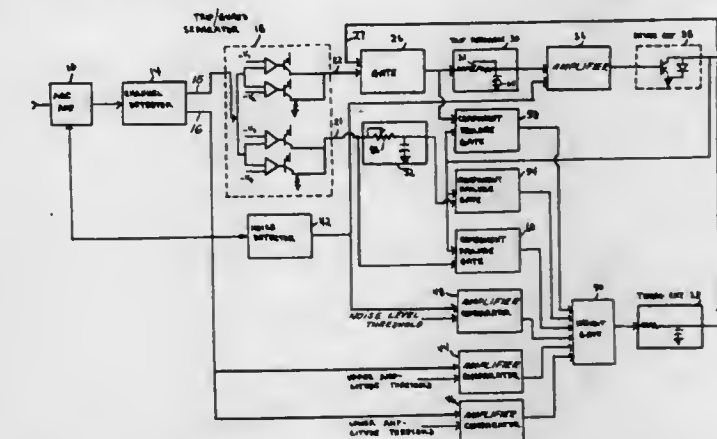
1. A receiver for receiving and distinguishing between first and second mutually exclusive signal frequencies transmitted in a defined frequency channel of center frequency  $f_0$  by remote transmitting means which comprises:

an input means for receiving a signal that is at said first or said second signal frequency;

channel detector means turned to the frequency  $f_0$  coupled to said input means and generating first and second DC signals appearing at first and second channel detector outputs respectively, said first DC signal being proportional to the difference in frequency between the center frequency  $f_0$  and the frequency of the received signal, said first DC signal thereby having either a first or a second DC amplitude, and said second DC signal being proportional to the amplitude of the received signal;

separator means coupled to said first channel detector output for generating a first separator output signal when said first DC signal is at said first DC amplitude and a second separator output signal when said first DC signal is at said second DC amplitude;

comparator means coupled to said second channel detector output for generating an output inhibit signal when the amplitude of said second DC signal varies by a predetermined amount;



gating means coupled to said comparator output and responsive to said inhibit signal, said gating means for inhibiting said first separator output signal; and timing means having an input coupled to said first separator output, and being responsive only to said first separator output signal, said timing means for generating a control signal after said first separator output signal is present for a predetermined period of time at said timing input, said control signal being operable to control electrical functions external to the receiver.

4,015,207

### ANTI-RECIPROCAL NETWORK

Johannes Otto Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

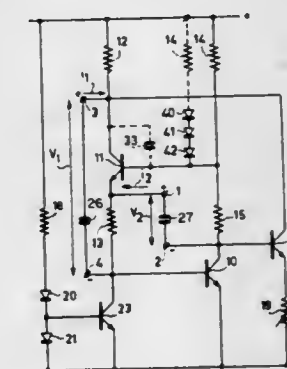
Filed Nov. 4, 1975, Ser. No. 628,591

Claims priority, application Netherlands, Nov. 14, 1974, 7414850; Dec. 18, 1974, 7416482

Int. Cl.<sup>2</sup> H03H 7/44, 1/100

U.S. Cl. 333—80 T

9 Claims



1. An anti-reciprocal network, comprising:

a first and a second port, each having two terminals, included in a closed loop being formed, in order, by the first terminal of the first port, a first impedance element, a second impedance element, the first and the second terminal of the second port, a third impedance element, and the second terminal of the first port;

a first transistor having a base-collector path included between the second terminal of the second port and the first terminal of the first port, the emitter of said first transistor being connected to its base through a resistor, the connection point of said emitter and said resistor being connected to a point of constant potential; and

a second transistor having a collector-emitter path included



between said first terminal of said second port and said second terminal of said first port, the base of said second transistor being connected to the terminal of the first impedance element which is remote from said first terminal of said first port.

4,015,208

# **FREQUENCY GENERATOR COMPENSATED AS A FUNCTION OF AT LEAST ONE PHYSICAL PARAMETER OF THE ENVIRONMENT**

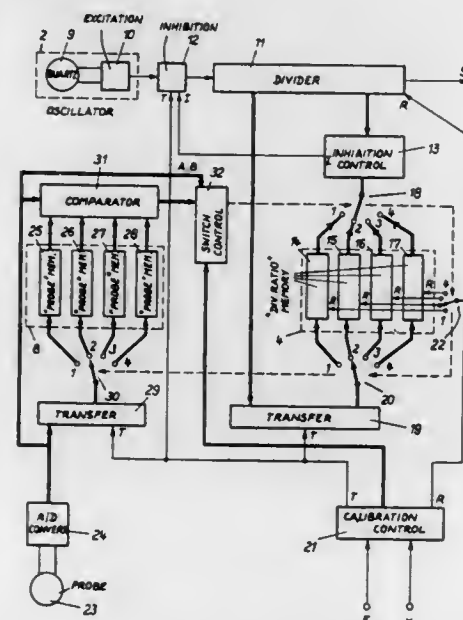
Walter Hammer, and Jean-Claude Martin, both of Boudry, Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Sept. 8, 1975, Ser. No. 611,157

Claims priority, application Switzerland, Sept. 16, 1974, 12533/74

Int. Cl.<sup>2</sup> H03K 21/00, 23/06; G04C 3/00  
U.S. Cl. 328—39

13 Claims



1. A compensated frequency generator, comprising: time-base oscillator means; divider means coupled to said oscillator means for dividing the output frequency of said oscillator means; a first plurality of memory means coupled to said divider means for storing a plurality of predetermined division ratios to selectively control the division ratio of said divider means; physical parameter sensing means for detecting a predetermined physical parameter which affects the oscillation frequency of said oscillator means and for generating signals representative of said detected physical parameter; Converter means coupled to said sensing means for converting said signals representative of said detected physical parameter to coded signals; a second plurality of memory means coupled to said converter means for storing the signals generated by said sensing means as coded signals, each of said second plurality of memory means storing a coded signal representing one of said detected physical parameter values; comparing means for comparing the signals generated by said sensing means with the coded signals stored in said second plurality of memory means and for generating output signals representing coincidence between the output of said sensing means and said second memory means; control means coupled to said comparing means and to said first plurality of memory means for selectively coupling one of first said memory means to said divider means as a function of the output of said comparing means; and calibration means coupled to said control means, said divider means and said first and second memory means for controlling inscription into said first memory means of

said predetermined division ratios and for controlling inscription into said second memory means of coded signals representing predetermined values of said physical parameter detected by said sensing means.

4,015,209

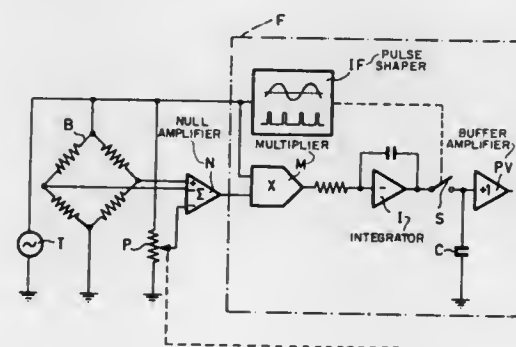
# **CARRIER WAVE COMPENSATOR WITH INTERFERENCE SUPPRESSION CIRCUIT MEANS**

Dietrich Meyer-Ebrecht, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.  
Continuation of Ser. No. 497,066, Aug. 13, 1974, abandoned.  
This application Apr. 26, 1976, Ser. No. 680,457

Claims priority, application Germany, Sept. 14, 1973, 2341066

Int. Cl.<sup>2</sup> H04B 1/10; G01R 27/02, 17/06  
U.S. Cl. 328—162

5 Claims



2. An electrical measuring system with means for suppressing interference voltages comprising, a source of AC supply voltage, a measuring bridge having input terminals coupled to the AC supply source, an amplifier having input means coupled to the output terminals of the measuring bridge, and compensation feedback means coupled to the output of said amplifier for deriving a compensation signal for compensating the bridge unbalance to be measured, said compensation feedback means comprising, a multiplier having first and second inputs coupled to the output of the amplifier and the AC supply source, respectively, an integrator with its input coupled to the output of the multiplier, and a sample and hold circuit coupled to the output of the integrator and comprising a capacitor coupled to the integrator output via a sampling switch and pulse generator means coupled to the AC supply source for generating short duration control pulses during the zero crossover passages of the AC supply and which control pulses periodically control the operation of the sampling switch.

4,015,210

# **CIRCUIT FOR DETECTING PREDETERMINED VOLTAGE LEVEL CROSSINGS OF THE MODULATING COMPONENT OF A FREQUENCY MODULATED SIGNAL**

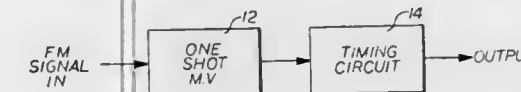
Stephen F. Weiss, 2157 N. 64th, Seattle, Wash. 98103  
Filed Apr. 15, 1976, Ser. No. 677,365

Int. Cl.<sup>2</sup> H03D 3/18; H03K 9/06  
U.S. Cl. 329—50

5 Claims

1. A circuit for detecting the crossing of a predetermined voltage level by a modulating signal component of a frequency modulated signal, comprising:
  - a. means adapted to receive at an input connection thereof the frequency modulated signal for generating a series of pulses coincident in time with the same point on successive cycles of the waveform of the frequency modulated signal, the interval between successive pulses in said series of pulses being a varying interval of time in accordance with a variation in frequency of the frequency modulated signal;
  - b. timing means for generating a train of pulses having a preset interval of time between successive pulses thereof, said preset interval of time being equal to said varying

interval of time when the modulating signal component has an instantaneous voltage level which is equal to said predetermined voltage level;  
c. means resetting and initiating said timing means upon the occurrence of each pulse in said series of pulses, said



timing means thereby providing an output signal when said varying interval of time is substantially equal to said preset interval of time, the occurrence of said output signal being indicative that the instantaneous voltage level of the modulating signal component has crossed said predetermined voltage level.

4,015,211

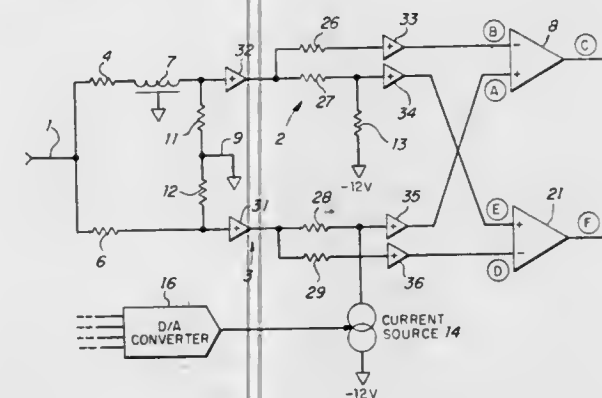
# **DUAL CHANNEL PULSE WIDTH DETECTOR HAVING DELAY AND D.C. OFFSET MEANS THEREIN**

Louis A. Sanchez, San Jose, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 9, 1976, Ser. No. 675,391

Int. Cl.<sup>2</sup> H03K 9/08  
U.S. Cl. 329—106

10 Claims



1. A pulse width detector comprising:
  - a. an input circuit;
  - b. first and second pulse transmission means coupled to said input circuit, said first transmission means including a delay means therein for delaying pulses emanating from said first channel with respect to pulses emanating from said second channel;
  - c. offsetting means coupled to at least one of said channels for producing a relative shift between the D.C. levels of said pulses emanating from said channels;
  - d. first comparator means coupled to said first and second channels for detecting the voltage crossover points of the leading edges of the pulses emanating from said first and second pulse transmission means; and
  - e. second voltage comparator means coupled to said first and second channels for detecting the voltage crossover points of the trailing edges of the pulses emanating from said first and second pulse transmission means.

4,015,212

# **AMPLIFIER WITH FET HAVING GATE LEAKAGE CURRENT LIMITATION**

Toshihiko Miyata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

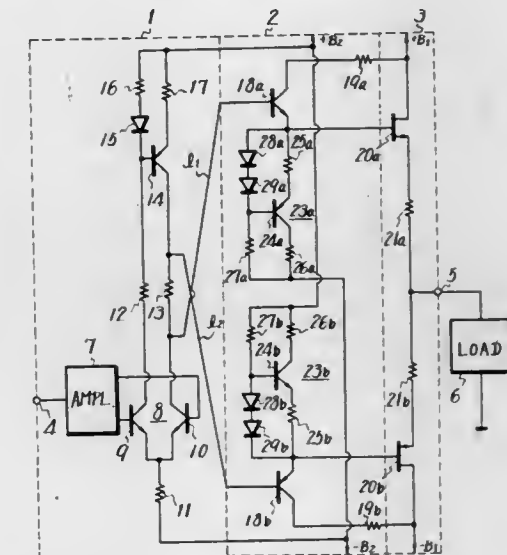
Filed Oct. 28, 1975, Ser. No. 626,370

Claims priority, application Japan, Oct. 31, 1974, 49-125875

U.S. Cl. 330—13

Int. Cl.<sup>2</sup> H03F 3/16

22 Claims



1. An amplifier including a drive stage and an output stage, comprising:
  - a field effect transistor included in said output stage, one of the source and drain electrodes being connected to an output load and the other of said electrodes being supplied with an operating voltage;
  - transistor emitter-follower means included in said drive stage having a control electrode supplied with a signal to be amplified and an emitter electrode direct coupled to the gate electrode of said field effect transistor; and
  - means for limiting the gate leakage current of said field effect transistor including constant current means coupled as a load to said emitter electrode of said transistor means for providing a current of predetermined magnitude, said constant current means also being coupled to said gate electrode of said field effect transistor.

4,015,213

# **PULSE WIDTH MODULATED SIGNAL AMPLIFIER**

Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 23, 1976, Ser. No. 660,351

Claims priority, application Japan, Feb. 24, 1975, 50-22589  
Int. Cl.<sup>2</sup> H03F 3/38; H03K 7/08

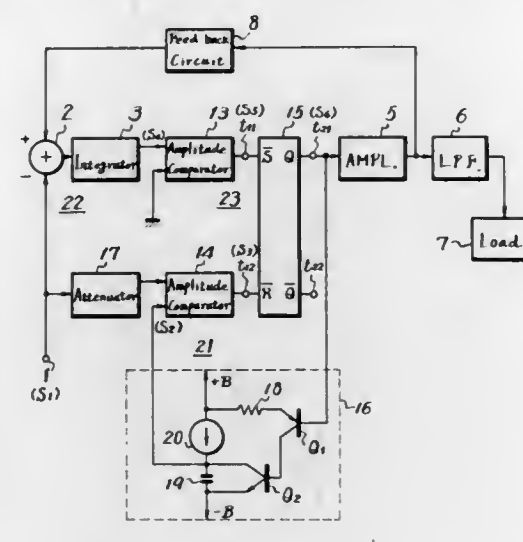
U.S. Cl. 330—10

11 Claims

9. A pulse width modulator comprising:
  - A. source means for supplying an input signal to be modulated;
  - B. means for generating a first reference signal;
  - C. a first comparator means for comparing said input signal and said first reference signal;
  - D. bistable circuit means for producing a pulse width modulated signal, the output of said first comparator being connected to said bistable circuit means to reset the same;
  - E. means for generating a second reference signal; and



F. a second comparator means for comparing said input signal and said second reference signal, the output of said



second comparator being connected to said bistable circuit means to set the same.

#### 4,015,214 PUSH-PULL AMPLIFIER

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

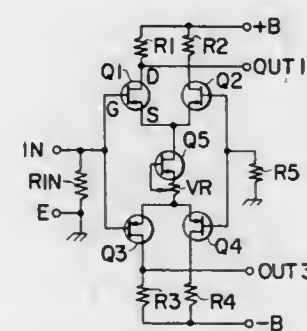
Filed Apr. 3, 1975, Ser. No. 564,751

Claims priority, application Japan, Apr. 9, 1974, 49-40297; Apr. 30, 1974, 49-49860; Apr. 9, 1974, 49-40298

Int. Cl.<sup>2</sup> H03F 3/185

U.S. Cl. 330-13

4 Claims



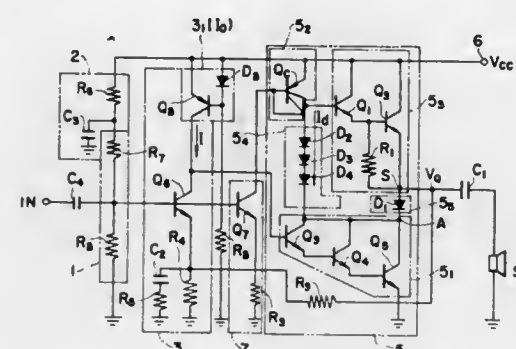
1. A push-pull amplifier comprising:
  - a first amplification circuit including at least one n-channel field effect transistor and having a first output terminal connected to the drain electrode of said n-channel field effect transistor;
  - a second amplification circuit including at least one p-channel field effect transistor and having a second output terminal connected to the drain electrode of said p-channel field effect transistor;
  - a constant-current circuit connected in series within a single current path through which the source currents of both said n-channel and p-channel field effect transistors flow in common;
  - a positive voltage supply connected to the drain current path of said n-channel field effect transistor;
  - a negative voltage supply connected to the drain current path of said p-channel field effect transistor; and
  - an input terminal connected to the gate electrodes of both said n-channel and p-channel field effect transistors.

#### 4,015,215 PUSH-PULL POWER AMPLIFIER CIRCUIT

Kunio Seki, Tokyo, Japan, assignor to Hitachi, Ltd., Japan  
Filed Aug. 28, 1975, Ser. No. 608,735  
Claims priority, application Japan, Aug. 28, 1974, 49-97908  
Int. Cl.<sup>2</sup> H03F 3/26

U.S. Cl. 330-15

22 Claims





transistor, the drain electrode of the third transistor being connected to the gate electrode of the first transistor, the source electrodes of the first, second and third transistors being connected to a first voltage source;

fourth, fifth and sixth insulated gate field effect transistors of the depletion type, the source electrodes of the fourth, fifth and sixth transistors being connected to the drain electrodes of the first, second and third transistors, respectively, the drain electrodes of the fourth, fifth and sixth transistors being connected to a second voltage source, the gate electrodes of the fourth, fifth and sixth transistors being connected in common;

a seventh gate field effect transistor of the enhancement type, the gate electrode of which is coupled to said second voltage source;

an eighth insulated gate field effect transistor of the depletion type connected in parallel to said seventh transistor, the commonly connected source electrodes being connected to said first voltage source, the commonly connected drain electrodes being connected to the commonly connected gate electrodes of said fourth, fifth and sixth transistors, the gate electrode of the eighth transistor being connected to the source electrode thereof; and

a resistor connected between the commonly connected drain electrodes of said seventh and eighth transistors and said second voltage source.

4,015,220

## FREQUENCY SHIFT KEYED TONED GENERATOR

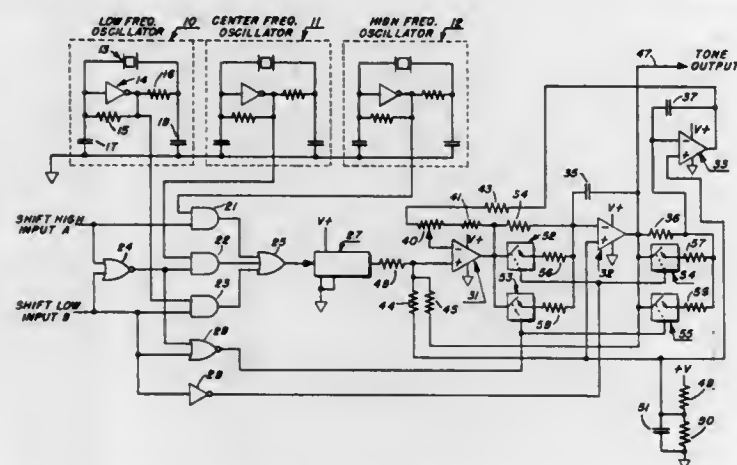
Barry M. Kaufman, Pine Brook, N.J., assignor to R F L Industries, Inc., Boonton, N.J.

Filed Nov. 3, 1975, Ser. No. 628,568

Int. Cl.<sup>2</sup> H03C 3/06

U.S. Cl. 331-179

2 Claims



1. A frequency shift keyed tone generator for providing an output tone frequency in response to an applied control signal, said generator comprising:

- a source of crystal controlled oscillations of predetermined frequency,
- a digital frequency divider responsive to said oscillations,
- tracking active bandpass filter means driven by the output of said divider and providing a sinewave output, and
- means controlled by said control signal and simultaneously controlling the output frequency of said divider and the operating frequency of said filter means, the said sine wave output having no phase or amplitude discontinuities when the operating frequency of the said filter means is changed.

4,015,221

## PREPARATION OF GRAVURE PRINTING SURFACES

Brian L. Dalton, London, England, assignor to Crosfield Electronics Limited, London, England

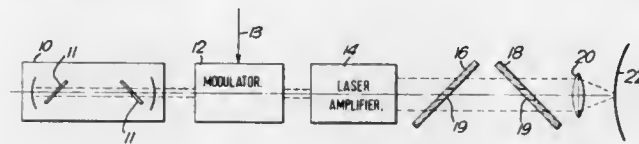
Filed Jan. 21, 1976, Ser. No. 650,844

Claims priority, application United Kingdom, Jan. 22, 1975, 2839/75; Mar. 26, 1975, 12763/75

Int. Cl.<sup>2</sup> H01S 3/10; H04N 1/08

U.S. Cl. 332-7.51

7 Claims



1. Apparatus for removing material from a surface to be engraved, comprising:

- a laser and polarising means for generating a polarised coherent light beam to excavate material from the said surface to a depth depending on the beam intensity at the surface;
- a polarisation modulator for modulating the polarisation of the beam of coherent radiation;
- and an analysing polariser system through which the modulated beam is directed to a focusing lens for focusing the laser beam on to the said surface, the analysing polariser system being formed with a central aperture through which a central portion of the beam passes to the focusing lens regardless of its polarisation, whereby the width, at the surface to be engraved, of that portion of the beam for which the intensity is above the excavation threshold, is maintained substantially constant irrespective of the beam modulation.

4,015,222

## MODULATED PASSBAND SIGNAL GENERATOR

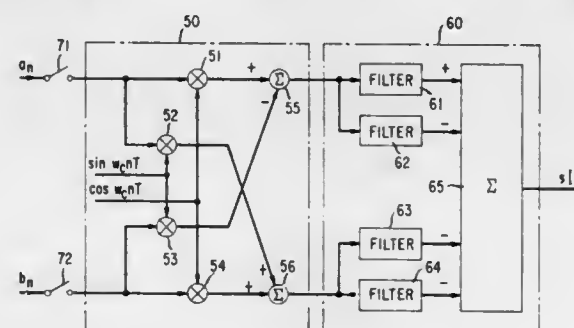
Jean-Jacques Werner, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 1, 1975, Ser. No. 636,563

Int. Cl.<sup>2</sup> H03C 3/00

U.S. Cl. 332-9 R

22 Claims



1. A bandpass signal generator comprising:

- means for sampling applied input signals at a preselected rate;
- means for multiplying the output signals of said means for sampling by a phasor whose angle is advanced by a preselected additive constant at each sampling interval of said means for sampling; and
- means for convolving the output signal of said means for multiplying with a preselected impulse response.

4,015,223

## HF ANTENNA MATCHING DEVICE

René Chezé, Paris, France, assignor to Thomson-CSF, Paris, France

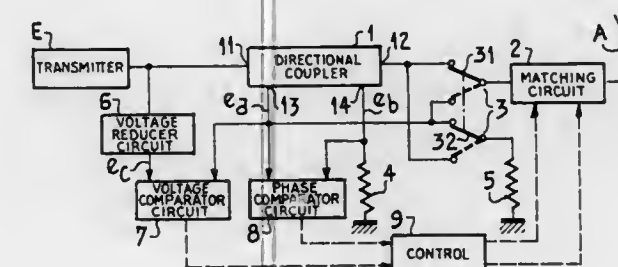
Filed Jan. 21, 1976, Ser. No. 650,855

Claims priority, application France, Jan. 22, 1975, 75.01969

Int. Cl.<sup>2</sup> H03H 7/40

U.S. Cl. 333-17 M

3 Claims



1. A HF antenna matching device comprising: a directional coupler having first and second pairs of conjugate ports, said first pair having first and second ports, said second pair having a high-power port having a given coupling coefficient with said first port and a low-power port having a lower coupling coefficient with said first port, said first and second ports being adapted for respectively coupling to signal generating means and to measuring means during a matching phase a controllable matching circuit for being controlled as a function of the indications of said measuring means during a matching phase; a matched load; and a switching device for coupling the matching circuit to the high-power port and the matched load to the low-power port during a communication phase and vice versa during a matching phase.

4,015,224

## ACTIVE BAND-PASS FILTER

Hans Benzinger, Duisburg, Germany, assignor to Thielscher-Electronic Gerhard Thielscher, Duisburg, Germany

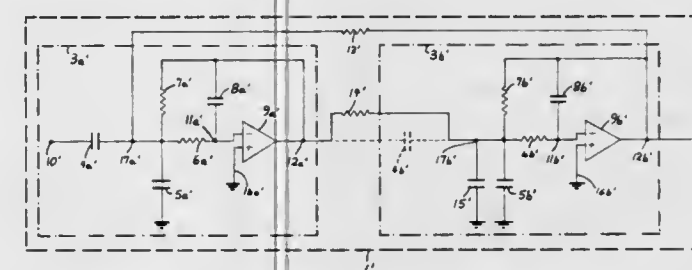
Filed July 31, 1975, Ser. No. 600,907

Claims priority, application Germany, July 31, 1974, 2436966

Int. Cl.<sup>2</sup> H03F 1/36

U.S. Cl. 333-70 R

8 Claims



1. An active band-pass filter comprising at least one unit formed from a first and second filter section in tandem, each of said sections including an operational amplifier with an inverting input, a common terminal and an output, said operational amplifier being provided with a resistive/capacitive feedback network having two parallel impedance branches connected between said output and said inverting input, one of said branches being divided into two series impedances of a first type forming a junction therebetween, the other of said branches being an impedance of a second type, one of said types being resistive, the other of said types being capacitive, each of said sections further including a shunt impedance of said second type connected between said junction and said common terminal; an input impedance of said second type connected to said junction of said first section; a coupling impedance of said first type connected between said output of said first section and said junction of said second section; and

a feedback impedance of said first type connected between said output of said second section and said junction of said first section.

4,015,225

## ENCAPSULATED ELECTROMECHANICAL RELAY

Ronald W. Lomax, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

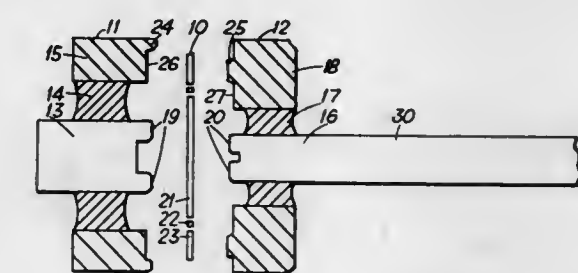
Filed Nov. 20, 1974, Ser. No. 525,605

Claims priority, application United Kingdom, Dec. 20, 1973, 59169/73

Int. Cl.<sup>2</sup> H01H 63/02

U.S. Cl. 335-133

11 Claims



1. An encapsulated electromechanical relay having contact and winding terminals extending from the encapsulation for dual-in-line configurations comprising:

- a first contact unit having a fixed contact provided by an inner ferromagnetic member and an outer ferromagnetic member, said inner member sealed through an aperture in said outer member;
- a ferromagnetic diaphragm movably attached to said outer member at the periphery of said diaphragm, said diaphragm providing a movable contact; and
- a relay winding proximate said diaphragm for providing magnetic attraction to said diaphragm, said diaphragm being positioned apart from said inner member when said relay is non-energized and said diaphragm becoming magnetically attracted into contact with said inner member when said relay is energized.

4,015,226

## CARTRIDGE FOR MAGNETICALLY OPERATED CONTACTS

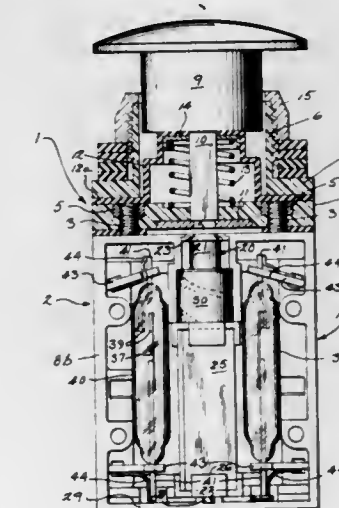
Thaddeus Stomma, and Edwin J. Wroblewski, both of Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 4, 1975, Ser. No. 610,121

Int. Cl.<sup>2</sup> H01H 13/50

U.S. Cl. 335-206

8 Claims



1. An actuator for magnetically operated switch contacts, the combination comprising:



a cam operator mounted for sliding motion along a switch axis;  
 a cam member mounted for rotary motion about said switch axis and being responsive to the sliding motion of said cam operator to rotate between first and second positions;  
 a magnet mounted to said cam member for rotation thereby about said switch axis between first and second positions, said magnet being polarized to generate magnetic flux which extends radially outward from said switch axis;  
 shunt means mounted for rotation with said magnet for blocking the radial extension of the generated magnetic flux over a sector; and  
 means for mounting said magnetically operated switch contacts alongside said magnet for operation thereby as the magnet is rotated between its two positions.

4,015,227

**ELECTROMAGNETIC TRANSDUCER**

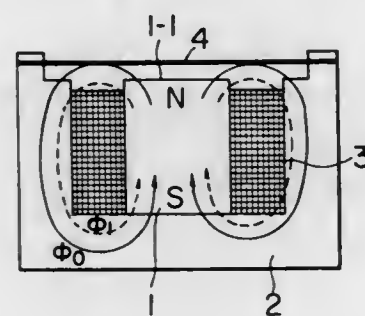
Yasuhiro Riko, and Kenzo Miura, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 25, 1975, Ser. No. 552,887

Claims priority, application Japan, Feb. 28, 1974, 49-24012  
 Int. Cl.<sup>2</sup> H01F 7/08

U.S. Cl. 335—231

7 Claims



1. An electromagnetic transducer, comprising:
  - a. a diaphragm
  - b. a first yoke, of U-shaped section and magnetic material, having one end connected to the periphery of said diaphragm, said first yoke including an armature at a center part thereof and a first single magnetic flux generating means including a permanent magnet having one end adjacent said armature and providing a D.C. magnetic flux; and
  - c. a second yoke of magnetic material having a sound outlet and one end connected to the periphery of said diaphragm, said second yoke including a projection at a center part thereof adjacent said armature and a second single magnetic flux generating means including a coil generating an A.C. magnetic flux, said first generating means and said second generating means being spaced apart on opposite sides of said diaphragm to form a balanced transducer.

4,015,228

**SURGE ABSORBER**

Kazuo Eda, Neyagawa; Masanobu Tanaka, Hirakata; Harumasa Kajita, Neyagawa; Mikio Ishida, Neyagawa, and Michio Matsuoka, Ibaragi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 5, 1975, Ser. No. 584,211

Claims priority, application Japan, June 10, 1974, 49-66406; July 19, 1974, 49-83457

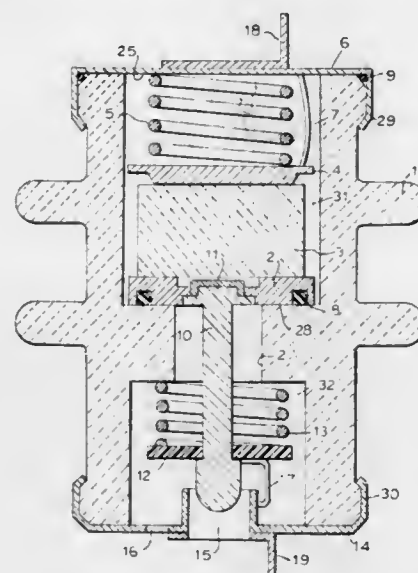
Int. Cl.<sup>2</sup> H01H 71/20; H02H 1/04

U.S. Cl. 337—28

20 Claims

1. A surge absorber comprising:
  - a hollow insulator having a top and a lower opening at a top and a lower portion thereof, respectively;

a top electrical terminal at said top portion and hermetically sealing said top opening;  
 a metal oxide varistor positioned in said hollow insulator and having a top and a bottom electrode at the top and bottom surfaces thereof, respectively, the top electrode being electrically connected to said top electrical terminal; and  
 a sealing means sealing the lower opening of said hollow insulator and comprised of a lower electrical terminal and a conductive rod electrically connected to ground, the bottom end of which is a free end and the top end of which is soldered to said lower electrical terminal by a



solder, said metal oxide varistor being supported by said top and lower portions of said insulator through said top and lower electrical terminals, respectively, and said conductive rod being thermally connected to said metal oxide varistor through said bottom electrode of said metal oxide varistor and said lower electrical terminal, whereby when said metal oxide varistor is heated by an electric current therethrough to a temperature to heat said solder above the melting point of said solder, said conductive rod is separated from said lower electrical terminal to fall downwardly, thereby stopping the electrical current through said metal oxide varistor to ground.

4,015,229

**THERMALLY RESPONSIVE SWITCH**

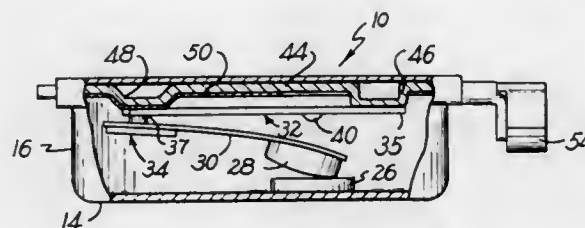
Ronald E. Senior, North Attleboro, and Frederick G. Perry, Norton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1975, Ser. No. 535,634

Int. Cl.<sup>2</sup> H01H 61/02

U.S. Cl. 337—107

6 Claims



1. A thermostatic switch comprising an electrically conductive can having a bottom wall and upstanding side walls forming a cavity therein, an outwardly extending flange attached to the free end of the side walls with an upwardly extending lip from two opposite flange portions, a stationary contact mounted on said bottom wall, an electrically conductive lid having a dimple therein, said lid received on said flange for closing said can, an electrically insulative gasket interposed between said flange and said lid with a cut out portion fitted over said dimple, said lip being bent to clampingly engage said

lid and gasket, a flat heater element welded at one end to said dimple and another end extending in cantilever relation therefrom generally parallel to said lid, means for insulating and precisely locating said other end relative to said lid, a thermostatic member cantilever mounted on said other end of said heater and extending alongside said heater, a movable contact mounted on said thermostatic member movable into and out of engagement with said stationary contact, and terminal means attached to said lid and said can respectively.

4,015,230

**HUMIDITY SENSITIVE CERAMIC RESISTOR**

Tsuneharu Nitta, Katano; Ziro Terada, Yao, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

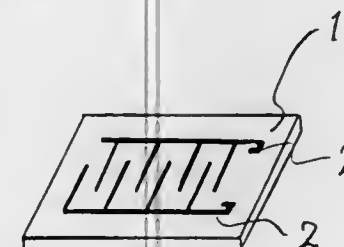
Filed Jan. 27, 1976, Ser. No. 652,702

Claims priority, application Japan, Feb. 3, 1975, 50-14508; Feb. 17, 1975, 50-20136; Feb. 12, 1975, 50-18244

Int. Cl.<sup>2</sup> H01L 7/00

U.S. Cl. 338—35

17 Claims



1. A humidity sensitive ceramic resistor comprising a ceramic plate having a conductive electrode secured to a surface thereof; said ceramic plate consisting essentially of, as solid ingredients, more than 98 to 99.95 percent by weight of main component consisting essentially of 99.99 to 80 percent by mole of at least one metal oxide selected from the group consisting of titanium oxide, zirconium oxide, hafnium oxide, tin oxide, niobium oxide, tantalum oxide, tungsten oxide, manganese oxide, molybdenum oxide, cerium oxide, dysprosium oxide, vanadium oxide, silicon oxide and germanium oxide; and 0.05 to less than 2 percent by weight of an additive of at least one metal oxide selected from the group consisting of beryllium oxide, magnesium oxide, calcium oxide, strontium oxide, barium oxide, iron oxide, nickel oxide, copper oxide, zinc oxide, cadmium oxide and lead oxide.

4,015,231

**VARIABLE RESISTORS**

Shougo Seno, Yokohama, and Masao Takeda, Osaka, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 7, 1975, Ser. No. 565,373

Claims priority, application Japan, Apr. 10, 1974, 49-39995

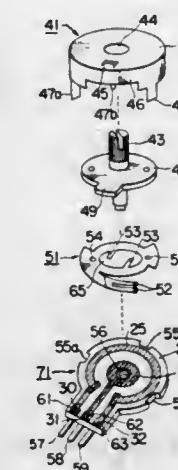
Int. Cl.<sup>2</sup> H01C 10/34

U.S. Cl. 338—174

3 Claims

1. A variable resistor, comprising an insulation plate, a resistance layer of a cermet material formed on said insulation plate, at least one first conductive layer of a cermet material formed on said insulation plate and having one end in contact with one end portion of said resistance layer, a second conductive layer of a cermet material formed on said insulation plate so as to be spaced from said first conductive layer, a metallic slider member having first and second wiper members, means for supporting said slider member on said insulation plate with said first wiper member sliding on said resistance layer and over a selected portion of said first conductive layer and with said second wiper member sliding over a selected portion of said second conductive layer, and additional resistance layers of a cermet material formed on said first and

said second conductive layers at least on said selected portions thereof over which said wiper members slide, so that said first



4,015,232

**ULTRASONIC DISTANCE DETECTOR FOR VEHICLES**

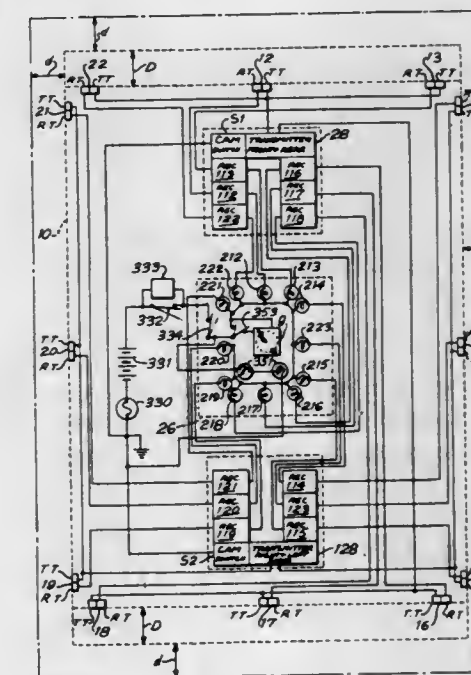
Thomas Sindle, 15 Roosevelt St., Staten Island, N.Y. 10304

Filed Aug. 5, 1975, Ser. No. 602,054

Int. Cl.<sup>2</sup> G01S 9/66

U.S. Cl. 340—1 T

10 Claims



1. An ultrasonic distance determining device for use on vehicles and the like comprising:
  - a plurality of ultrasonic transmitting transducers and receiving transducers each located along the back and front of the vehicle;
  - an ultrasonic transmitter means having its input coupled to each of said transmitting transducers, said transmitter means comprising an individual transmitter coupled to the input of said transmitting transducers;
  - a relay receiver coupled to each of said receiving transducers, said relay receiver comprising an individual receiver coupled to the output of each of said receiving transducers;
  - switch means coupled to the input of said transmitter means and said individual receiver so as to selectively operate said ultrasonic transmitter means for each of said transmitting transducers and then operate a corresponding one of said receiver relays for a predetermined time interval;
  - indication means comprising a plurality of indicating lamps wherein each of said lamps are connected respectively to the output of said relay receiver for providing an indica-



tion of the proximity of external objects located a predetermined distance from the vehicle corresponding to the predetermined time interval of the individual receiver for each of said transducers; and  
said switch means comprising at least one motor, cam means connected to the output shaft of said motor, and electrical contact means coupled to said cam means and responsive thereto for alternately switching between said ultrasonic transmitter means and said relay receiver, said motor having input terminals operatively being connected to a power source, and a rheostat connected to one of said input terminals, said rheostat being operatively connected to a speedometer of the vehicle, and including a sliding pointer for changing the resistance thereof corresponding to predetermined safe distances to be monitored.

4,015,233

# PRESSURE SENSOR OF LOW SENSITIVITY WITH RESPECT TO ACCELERATION

Jean Laurent, St. Germain-en-Laye, and François Villain, Soustons, both of France, assignors to Institut Français du Pétrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activités Pétrolières Elf, France

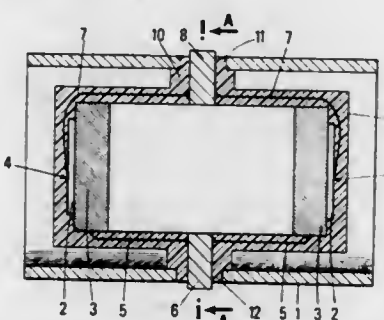
Filed Mar. 21, 1974, Ser. No. 453,499

Claims priority, application France, Mar. 27, 1973, 73.11249

Int. Cl.<sup>2</sup> H04B 13/00

U.S. Cl. 340—10

8 Claims



1. A pressure sensing device comprising a rigid tubular member, an elongated dampering support member of a flexible deformable material, said support member including a projecting portion at approximately the central portion of the longitudinal dimension of said elongated support member, said projecting portion being secured to said rigid tubular member for dampering vibrations from said rigid tubular member, and said support member including two further dampering portions, each of said two further dampering portions having a smaller cross-section than that of said projecting portion, and each of two further dampering portions extending inside said rigid tubular member from opposite sides of said projecting portion to opposite ends of said elongated support member, sensing means including two sensing elements each provided with electrodes, each of said two sensing elements being supported by respective ones of said two further dampering portions at respective opposite ends of said elongated support member, each of said opposite ends of said elongated support member being laterally distant from said projecting portion, and metal terminals arranged within said projecting portion, said metal terminals being operatively connected with said electrodes of said two sensing elements.

8. A pressure sensing device comprising a rigid tubular member having an internal wall, an elongated dampering support member, said support member including at least a projecting portion of a flexible deformable material, said projecting portion including at least two annular sectors projecting from said support member and engaging said internal wall of said rigid tubular member for dampering vibrations from said rigid tubular member, said two annular sectors being annularly separated from one another, and said support member including at least one further dampering portion having a

cross-section smaller than that of said annular sectors, said at least one further dampering portion laterally extending inside said rigid tubular member from said two annular sectors, and sensing means provided with electrodes, said sensing means being supported by said at least one further dampering portion at an end position of said support member laterally distant from said two annular sectors.

4,015,234

# APPARATUS FOR MEASURING AND FOR WIRELESS TRANSMISSION OF MEASURED VALUES FROM A BORE HOLE TRANSMITTER TO A RECEIVER ABOVEGROUND

Erich Krebs, Roskampstrasse 67D, 3 Hannover, Germany

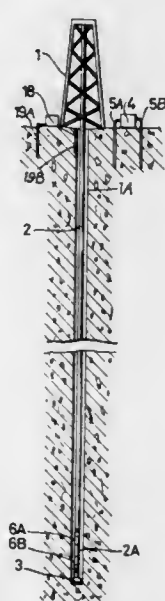
Filed Apr. 3, 1975, Ser. No. 564,666

Claims priority, application Germany, Apr. 3, 1974, 2416063

Int. Cl.<sup>2</sup> G01V 1/40; H04B 13/02

U.S. Cl. 340—18 NC

10 Claims



1. Apparatus for wireless transmission of measurement values from a probe in a well being drilled by a drill bit on a sectional drill rod, comprising an underground unit on a connecting section of the drill rod just above the drill bit and an aboveground unit at the earth's surface, said aboveground unit having spaced terminals in the earth, the underground unit comprising two axially spaced electrodes on said connecting section of the drill rod and insulated from one another, a capacitor having its terminals connected respectively with said electrodes, an electrical energy source for charging the capacitor, a short circuiting switch for short circuiting said capacitor, sensing means for sensing measurement values it is desired to transmit and means connecting said sensing means to said short circuiting switch to control the frequency or duration of closing of said short circuiting switch in accordance with a coded value to be transmitted, the energy pulses resulting from said short circuiting being transmitted from said electrodes through the earth to said terminals of said aboveground unit.

4,015,235

# AIRCRAFT PARKING GUIDANCE INDICATOR

David George Anthony Demaine, Leeds; John David Archer, Halifax, and Richard Lawrence Fisher, Leeds, all of England, assignors to The Rank Organisation Limited, London, England

Filed June 6, 1975, Ser. No. 584,528

Claims priority, application United Kingdom, June 5, 1974, 24884/74

Int. Cl.<sup>2</sup> G08G 5/00

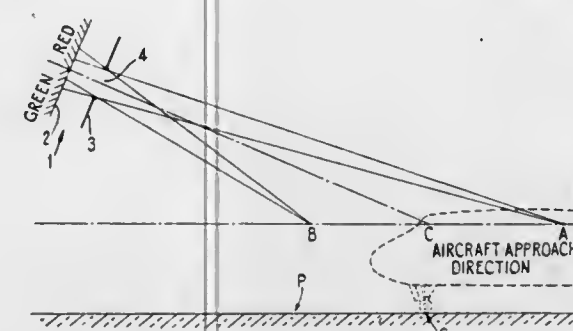
U.S. Cl. 340—26

10 Claims

1. An optical system for guiding the pilot of a ground-maneuvering aircraft along an approach line to a predetermined ground position such as a parking bay, comprising:

means defining a stop aperture, at least one fixed reference element located in the stop aperture, the reference element obscuring an area of the target as viewed through the stop aperture, said obscured area changing progressively according to the viewing position along said approach line,

a target positioned behind and spaced from the stop aperture, the target and the stop aperture being coaxial and located at a predetermined fixed position above said ground position, the line passing through the center of the target and the center of the stop aperture being inclined downwardly towards the direction of approach of aircraft along said approach line,



illumination means for illuminating the target, and means subdividing the target into upper and lower zones of different color visible through the stop aperture, the size of the target as viewed by the pilot of an approaching aircraft through the stop aperture, being larger than the size of the stop aperture,

whereby the relative areas of the two colored zones as viewed through the stop aperture vary according to the viewing position along said approach line, indicating to the pilot the position of the aircraft along the said approach line relative to said predetermined ground position.

4,015,236

# DEVICE FOR CONTROLLING SAFETY SEAT BELTS

Jean-Claude Boudeville, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Hauts de Seine, France

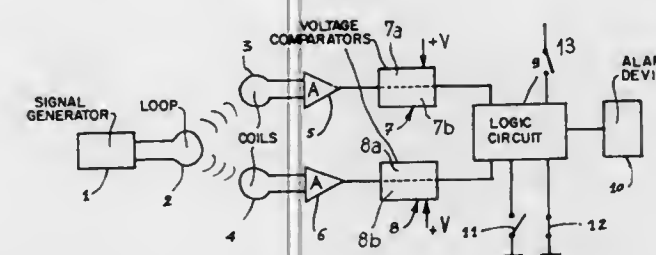
Filed Jan. 14, 1976, Ser. No. 649,082

Claims priority, application France, Jan. 15, 1975, 75.01077

Int. Cl.<sup>2</sup> B60R 21/10

U.S. Cl. 340—52 E

4 Claims



1. A device for checking and controlling the proper closing and locking of a safety belt of the seat of a vehicle, which comprises an emitter system for emitting electrical oscillations and at least one receiver, position sensing switches for detecting the closure of the belt and the presence of an occupant on the seat, and an alarm system, wherein said emitter system comprises a low-frequency non-radio frequency electromagnetic oscillator, said oscillator being located on the lap portion of the belt strap, said receiver comprises two identical receiving circuits disposed in parallel, each of said two identical receiving circuits includes the series connection of a receiving coil, an amplifier and a double voltage comparator receiving in each comparator a predetermined reference voltage

whereby the voltages of the signals representing the highest voltage limit or the lowest voltage limit received on the corresponding coil, are compared, as a function of the position of the oscillator in the emitter system, wherein said coils are located the one under the upholstery of the seat back and the other under the upholstery of the seat bottom respectively, a logic system connected to the outputs of said comparators and to said position sensing switches and said alarm system being connected at the output of said logic system.

4,015,237

# VEHICLE ALARM SYSTEM

Masayoshi Takatani, and Yuji Amaya, both of Kobe, Japan, assignors to Fujitsu Ten Ltd., Kobe, Japan

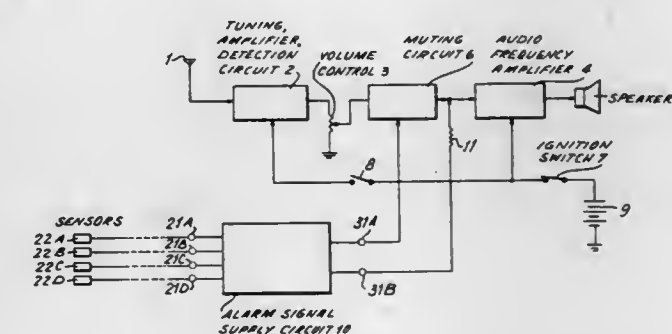
Filed June 16, 1976, Ser. No. 696,648

Claims priority, application Japan, June 18, 1975, 50-74757

Int. Cl.<sup>2</sup> G08B 19/00

U.S. Cl. 340—52 F

10 Claims



1. A vehicle alarm system for a vehicle having a plurality of operating parts, a plurality of sensors each monitoring a corresponding operating part and an audio reproduction system including an audio frequency amplifier, said vehicle alarm system comprising

a switching circuit for controlling the supply of audio signals to the audio frequency amplifier of the audio reproduction system of a vehicle; and

an alarm signal supply circuit connected between the sensors and the audio reproduction system of the vehicle for producing an alarm signal when an abnormal condition is detected in an operating part of the vehicle by the corresponding one of the sensors, said switching circuit cutting off the supply of audio signals to the audio frequency amplifier and supplying an alarm signal to said audio frequency amplifier when a sensor provides an abnormal condition signal indicating the occurrence of an abnormal condition in an operating part.

4,015,238

# METRIC UPDATER FOR MAXIMUM LIKELIHOOD DECODER

Robert Curtis Davis, Melbourne Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Nov. 24, 1975, Ser. No. 634,904

Int. Cl.<sup>2</sup> G06F 11/12

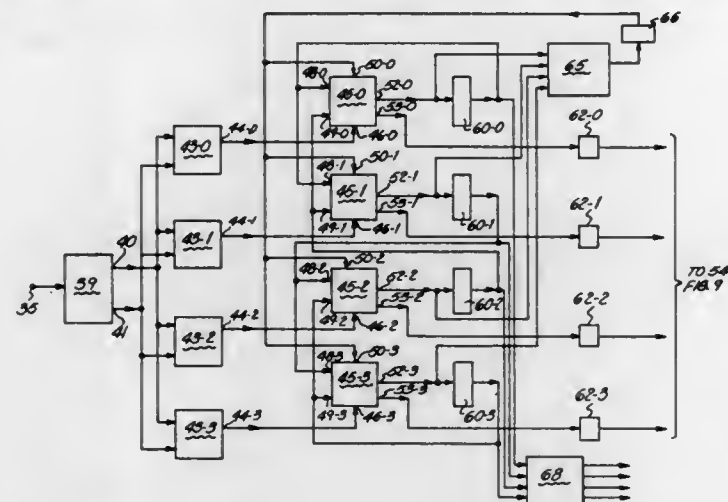
U.S. Cl. 340—146.1 AQ

7 Claims

1. In a convolutional code decoder for decoding data which coalesces into a predetermined plurality of possible states, said data occurring at branches corresponding to data states in a sequence, and including correlation means having a data input indicative of a message digit comprising received convolutional data and in which branch metrics are utilized to update path metrics and in which magnitudes of survivor path metrics are compared to determine the most likely sequence of received data, the improvement wherein said correlation means comprises a trellis connection computer having a first storage means associated with one possible data state of a received sequence, said first storage means being coupled to be addressed by the data input and being preset to provide an output address indicative of branch metrics associated with



the likelihood of data input entering the state from one data path; second storage means for providing an updated path metric; third storage means for storing a path metric of said data path; means coupling said path metric and said output address to provide addresses to said second storage means;



said second storage means being preset to provide an updated path metric in response to said address, and means for replacing said path metric with said updated path metric in said third storage means whereby said third storage means is set to address said second storage means after the occurrence of a next data input.

4,015,239

## CHARACTER RECOGNITION APPARATUS

Yoshiji Fujimoto, and Shozo Kadota, both of Hachioji, Japan, assignors to Hitachi, Ltd., Japan

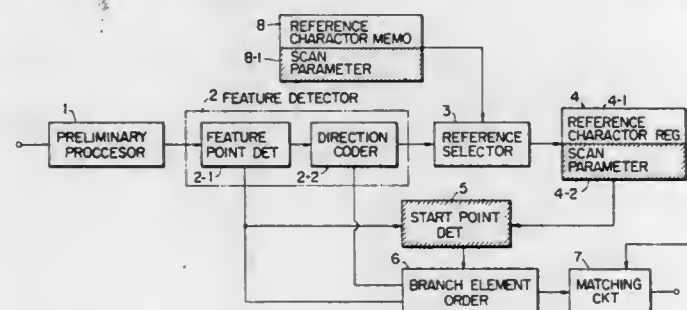
Filed Oct. 21, 1975, Ser. No. 624,339

Claims priority, application Japan, Oct. 21, 1974, 49-120393

Int. Cl.<sup>2</sup> G06K 9/12

U.S. Cl. 340-146.3 H

5 Claims



1. Character recognition apparatus comprising:

- preliminary processing means for obtaining two dimensional binary information representing an unknown character and for storing such information in matrix form;
- feature detecting and storage means for detecting terminal points, branch points and line elements of the unknown character from said two dimensional information stored by said preliminary processing means and for providing code signals representing such information;
- reference character memory means for storing scan parameters particular to each of a plurality of reference characters together with a code train of said reference characters obtained by the use of the associated scan parameters;
- start point detecting means responsive to said feature detecting and storage means for selecting one of the terminal points of said unknown character as a start point based on the associated scan parameter of a reference character selected from the reference character memory means;
- processing means for combining code signals representing the line elements stored in said feature detecting and

storage means and converting them into a code train on the basis of the start point selected by said start point detecting means; and

- comparing means for comparing the code train of the unknown character with that of the selected reference character.

4,015,240

## PATTERN RECOGNITION APPARATUS

Claron W. Swonger, Elma; Hollis F. Ryan, Cheektowaga, both of N.Y.; Robert M. Stock, Severna Park, Md., and Charles M. Vossler, Williamsville, N.Y., assignors to Calspan Corporation, Buffalo, N.Y.

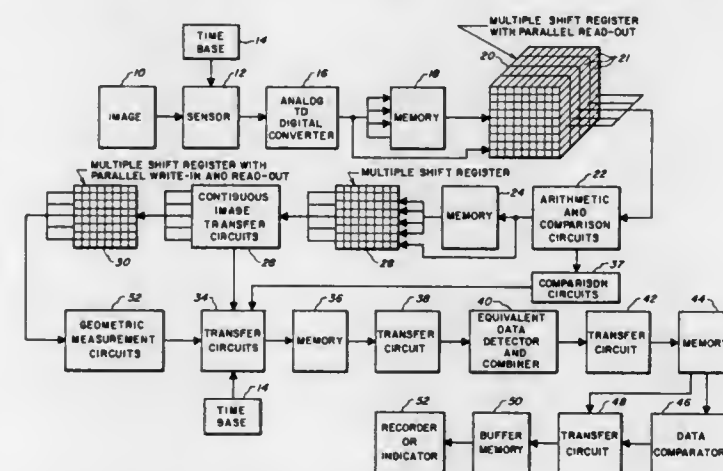
Continuation of Ser. No. 349,349, April 9, 1973, abandoned.

This application Feb. 12, 1975, Ser. No. 549,399

Int. Cl.<sup>2</sup> G06K 9/12

U.S. Cl. 340-146.3 E

7 Claims



1. Pattern recognition apparatus enabling the determination of the coordinates and angular positions of characteristic points such as fingerprint minutiae, comprising:

- sensing means developing a plurality of signals in response to a presented pattern containing characteristic points which are to be identified;
- conversion means responsive to said signals for converting said pattern into a binary encoded image containing many levels of gray scale data;
- temporary storage means for temporarily storing in a predetermined sequence portions of said data, which portions comprise sets of points corresponding to said binary encoded image, each point of which having a value indicative of the gray scale level thereof;
- means for comparing and averaging said data in said storage means for converting said data into a second binary encoded image comprised of sets of points, each containing one of two levels of gray scale data and which image has been corrected for imperfections in said presented pattern; said means comprise a plurality of logic circuits all of which simultaneously compare and average portions of said data;
- continuity means for detecting only those points of said second binary encoded image that are contiguous to a predetermined set of coordinates in said presented pattern; said means comprise a plurality of continuity logic circuits all of which simultaneously detect contiguous points located in portions of said second binary encoded image whereby the detection of all points therein is simultaneous;
- means for detecting and determining values indicative of various geometric properties of said contiguous points including the coordinates and angular positions thereof and comparing the same with a plurality of predetermined threshold values; and
- characteristic point storage means for receiving the coordinate and angular positions of said contiguous points which fall within said threshold values.

4,015,241

## INFORMATION PROCESSING SYSTEM

Fumihiko Takezoe, Kawasaki, Japan, assignor to Fuji Electric Company Ltd., Kawasaki, Japan

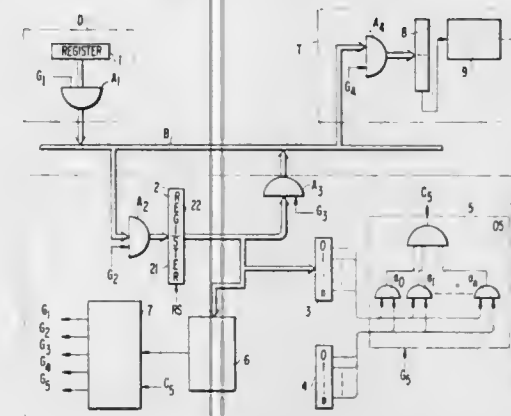
Filed Feb. 12, 1976, Ser. No. 657,663

Claims priority, application Japan, Feb. 12, 1975, 50-17629

Int. Cl.<sup>2</sup> H04Q 9/00

U.S. Cl. 340-147 SC

10 Claims



1. In an information processing system of the type having a plurality of widely dispersed stations interconnected in cascade by means of a transmission link for transmitting information between stations, said system further being of the type wherein non-operating stations are by-passed by means of a bypass connection, and wherein each of the stations of said system is of the type which has a controller for controlling the routing of all information in the station and which is capable of transmitting and receiving information words having at least an address part, the improvement comprising means at at least one station for preventing said station from transmitting information words destined for a non-operating station.

4,015,242

## DEVICE FOR COUPLING SEVERAL DATA PROCESSING UNITS TO A SINGLE MEMORY

Francois Anceau, Gieres; Claude Beauducel, Franconville; Pierre Courboulay, Paris, and Jacques Creten, Le Chesnay, all of France, assignors to Institut Francais du Pétrole, des Carburants et Lubrifiants et Entreprise de Recherches et d'Activités Pétrolières Elf, France

Continuation-in-part of Ser. No. 416,401, Nov. 16, 1973, abandoned. This application Apr. 28, 1976, Ser. No. 681,249

Claims priority, application France, Nov. 29, 1972, 72-42516

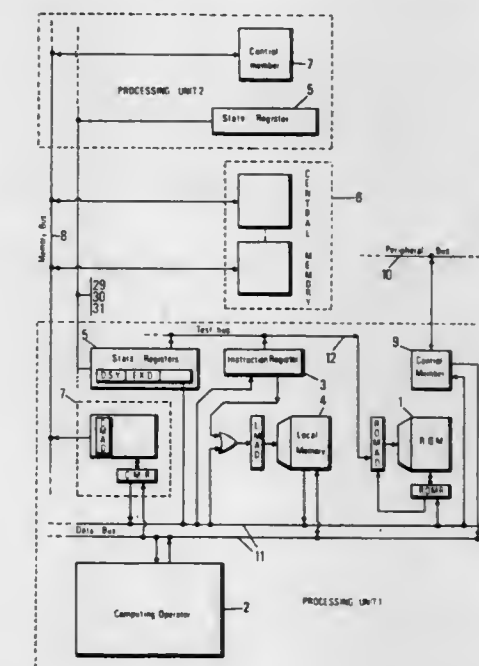
Int. Cl.<sup>2</sup> G06F 15/16

U.S. Cl. 340-172.5

7 Claims

1. In a system comprising a plurality of data processing system units coupled to a central memory and a plurality of peripheral units, each data processing system unit comprising an instruction processing means, means for exchanging data with the peripheral units through at least one data transfer channel and a microprogrammed means including means for decoding microinstructions, said microprogrammed means including a first managing system means for controlling the execution of instructions stored in said central memory, a second managing system means for defining a hierarchy between task lists, each task list including tasks of the same type which can be executed only through said means for exchanging data or only through said instruction processing means and for making said instruction processing means available for processing the task heading the priority task list, a third managing system means for storing lists of tasks to be executed and for arranging actuable tasks of the same type respectively in the corresponding task lists, and means for synchronizing said first, second and third managing system means comprising a first storage means connected with said second and third managing system means for storing a signal from said third managing system means indicating the current state of the task lists and providing an output to said second managing system

means in accordance therewith, a second storage means connected with said first, second and third managing system means for storing a signal from said third managing system means indicating that an actuable task takes priority over the currently active task and for providing an output to said first managing system means in accordance therewith, and a third storage means connected with said first and second managing system means for storing a signal from said second managing system means indicating the type of task being performed and providing an output to said first managing system means in accordance therewith, the improvement



comprising a system coupling means for coupling said data processing system units with each other and with said central memory including a plurality of commutating means connected respectively to an associated data processing system unit, each commutating means having a number of outputs equal to the number of data processing system units, and decoding means for establishing a connection path through said commutating means and being responsive to a signal from said third managing system means of any one of said data processing system units for outputting a signal to said second storage means of a designated one of said data processing system units.

4,015,243

## MULTI-PROCESSING COMPUTER SYSTEM

Horst G. Kurpanek, 802 Allison Way, Sunnyvale, Calif. 94087, and Gail P. Cone, 2276 Edsel Drive, Milpitas, Calif. 95035

Filed June 2, 1975, Ser. No. 582,778

Int. Cl.<sup>2</sup> G06F 15/16

U.S. Cl. 340-172.5

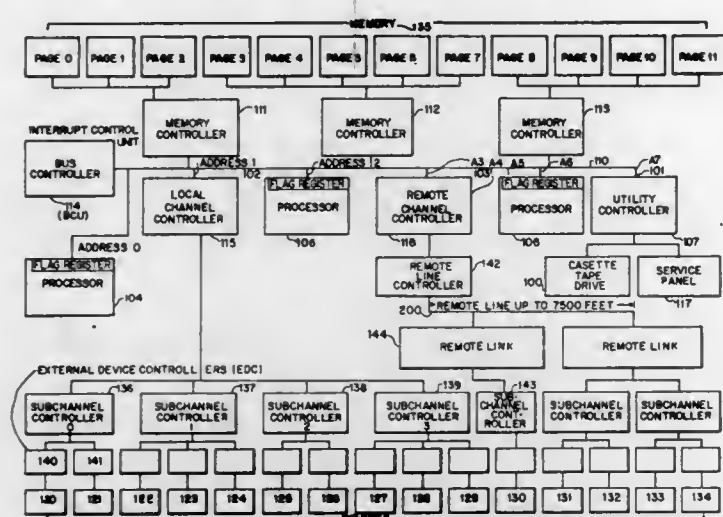
10 Claims

1. A digital communication system for transferring information represented by digital data signals comprising:

- a bus;
- a plurality of processors operatively connected to said bus;
- at least one channel controller attached to said bus;
- bus control means responsively connected to said bus for receiving interrupt signals from one or more controllers



attached to said bus and for determining the state of each of said processors, and for interrupting a given processor



when the processor is in a predetermined interruptable state.

4,015,244

## SELECTIVE ADDRESSING SYSTEM

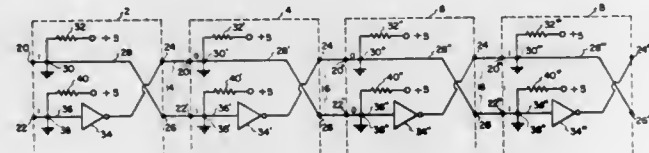
Gary R. Simpson, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 16, 1975, Ser. No. 641,247

Int. Cl.<sup>2</sup> G06F 7/00, 7/06

U.S. Cl. 340—172.5

6 Claims



1. In a data processing system, means for selectively addressing individual ones of a plurality of signal modules comprising:

- a plurality of component units each arranged to contain a plurality of signal modules,
- said plurality of component units being electrically identical with respect to each other,
- each of said component units having an input terminal means and an output terminal means,
- each of said component units including means for internally establishing a self-address code at said input terminal means, said self-address code being the same for all of said component units,
- each of said component units further including means for developing at the output terminal means thereof an address code which is different from the address code established at the input terminal means thereof, and
- means for so interconnecting said component units that the different address code appearing at the output terminal means of the preceding component unit overrides the self-address code of the succeeding component unit and constitutes the address code for that succeeding component unit whereby to provide a succession of unique address codes for successive component units.

# 4,015,245 BIPROGRAMMABLE ELECTRONIC ACCOUNTING MACHINE

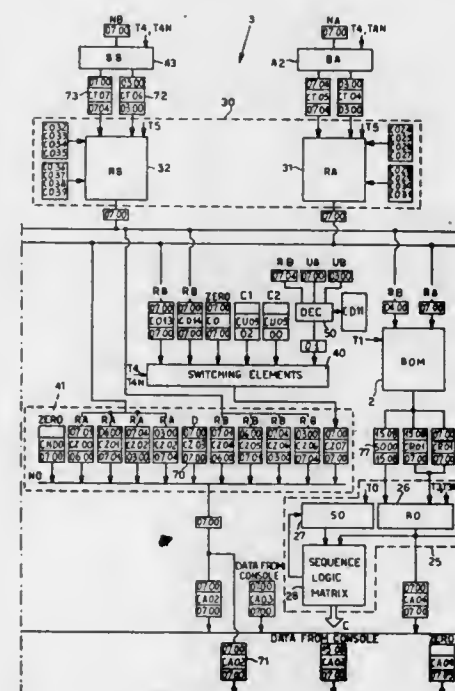
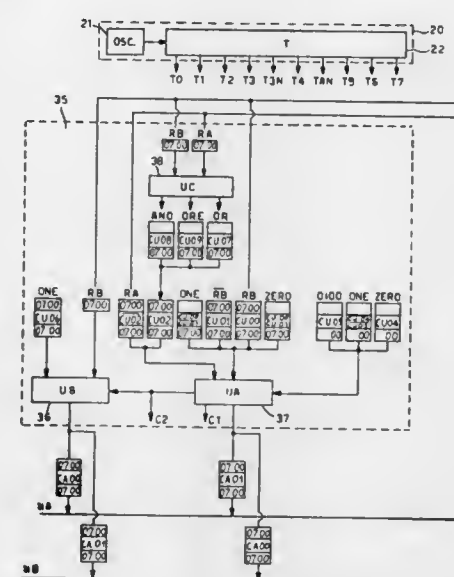
Luigi Mercurio, Ivrea (Turin), and Piercarlo Ravasio, Calolziocorte (Bergamo), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Sept. 2, 1975, Ser. No. 609,803

Claims priority, application Italy, Sept. 2, 1974, 69664/74  
Int. Cl.<sup>2</sup> G06F 9/18, 3/00

U.S. Cl. 340—172.5

5 Claims



1. Biprogrammable electronic accounting system comprising
  - a single keyboard for introducing information into the system,
  - a single visual display for visually displaying messages for an operator,
  - a memory comprising a first and second zone each recording data and instructions relating to a first and a second program respectively,
  - a processing unit for executing in parallel the instructions of said first and second programs,
  - control means for conditioning the processing unit to alternately execute either the instructions associated with the first program or the second program, said programs being thereby alternately rendered active or inactive,
  - a single service console for signalling to said operator a condition requiring said operator's attention in either of said first and second programs running in parallel,
  - a change-over switch for establishing a signal level having a first value associated with the first program and a second value associated with the second program,

means for storing an indication of the active or inactive status of said first and second programs, and means for checking said stored indication against the signal values established by the change-over switch for allocating at least one of the keyboard and the visual display and the console selectively to the first or the second program

4,015,246

# SYNCHRONOUS FAULT TOLERANT MULTI-PROCESSOR SYSTEM

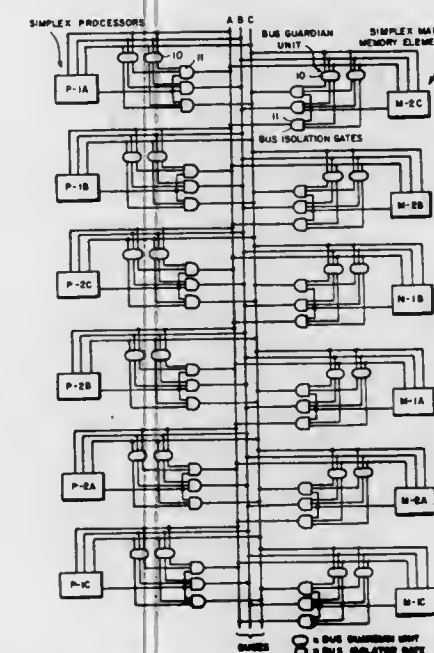
Albert L. Hopkins, Jr., Cambridge, and Thomas Basil Smith, III, Sudbury, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Apr. 14, 1975, Ser. No. 567,629

Int. Cl.<sup>2</sup> G06F 11/00, 13/00, 15/16, 3/00

U.S. Cl. 340—172.5

4 Claims



1. In a synchronous fault tolerant multi-processor system which includes at least three buses, at least six processors, each processor coupled to each of the buses, at least two redundant bus guardian units for each processor, each bus guardian unit coupled to each of said buses, and a plurality of bus isolation gates, at least three gates coupled to each one of said processors and to said two bus guardian units for each respective processor, each of said three gates per processor coupled to a different one of said buses, said bus guardian units receiving messages only from said buses and providing output signals to control said gates in order to permit or deny transmission of messages from each of said processors to said buses.

4,015,247

# METHOD FOR OPERATING CHARGE TRANSFER MEMORY CELLS

Roger T. Baker, Box 240, Mount Tabor, N.J. 07878

Filed Dec. 22, 1975, Ser. No. 642,721

Int. Cl.<sup>2</sup> G11C 11/40, 7/00

U.S. Cl. 340—173 R

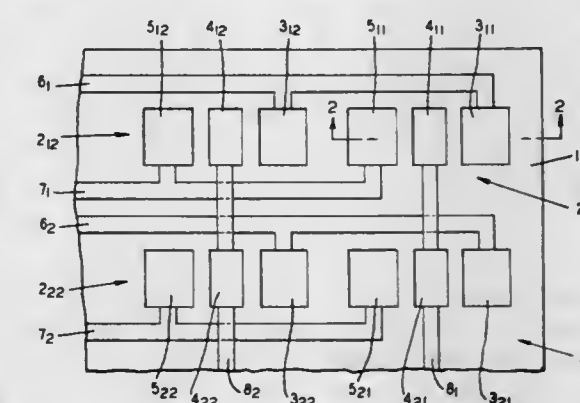
10 Claims

1. A method of representing, entering, and storing the value of a binary valued variable in a semiconductor memory cell, comprising the steps of:

- a. utilizing a first electrode in proximity to a semiconducting material to establish for charge carriers of one polarity a first localized minimum potential energy region in said semiconducting material,
- b. utilizing a second electrode in proximity to the said semiconducting material to establish for said polarity of charge carriers, a second localized minimum potential energy region in said semiconducting material,
- c. representing the first possible value of said binary valued variable in the said memory cell by storing a relatively

large number of charge carriers of said polarity in said first localized minimum potential energy region and storing a relatively small number of charge carriers of said polarity in said second localized minimum potential energy region,

- d. representing the second possible value of said binary valued variable in the said memory cell by storing a relatively large number of charge carriers of said polarity in said second localized minimum potential energy region and storing a relatively small number of charge carriers of said polarity in said first localized minimum potential energy region,
- e. entering the first possible value of said binary valued variable in the said memory cell by altering the number of charge carriers of said polarity stored in said first and said second localized minimum potential energy regions such that the aforementioned conditions for representing the first possible value of the said binary valued variable in said memory cell are established,



- f. entering the second possible value of said binary valued variable in said memory cell by altering the number of charge carriers of said polarity stored in said first and said second localized minimum potential energy regions such that the aforementioned conditions for representing the second possible value of the said binary valued variable in said memory cell are established,
- g. storing the value of the said binary valued variable so entered in the said memory cell by maintaining said first and said second localized minimum potential energy regions in said semiconducting material and maintaining the ratio of the number of charge carriers of said polarity stored in the said first localized minimum potential energy region to the number of charge carriers of said polarity stored in the said second localized minimum potential energy region at substantially the same value established for said ratio when the said value of the binary valued variable was entered in said memory cell.

4,015,248

# PROCESS FOR RECORDING LOW-FREQUENCY WIDE-BAND SIGNALS ON A THERMOPLASTIC STORAGE MEDIUM

Dietlind Pekau, Taufkirchen, and Eckhard Storck, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 521,395, Nov. 6, 1974, abandoned.

This application Mar. 17, 1976, Ser. No. 667,564

Claims priority, application Germany, Nov. 7, 1973, 2355702

Int. Cl.<sup>2</sup> G11C 11/46; H04N 5/82; G11B 7/24

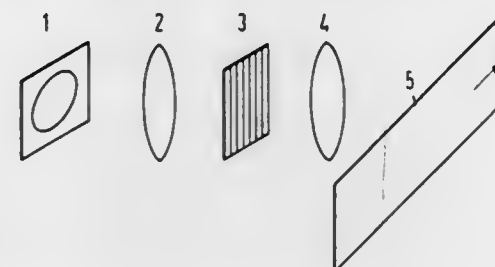
U.S. Cl. 340—173 TP

6 Claims

1. In a process for recording low-frequency, wide-band signals on a thermoplastic storage medium having a resonance frequency considerably higher than the frequency of the signal being recorded and particularly adapted for recording electrical interference signals of sonar holograms on the storage medium, which process includes providing a thermoplastic storage medium on a transparent photoconducting carrier,



sensitizing the thermoplastic material by applying a charge of uniform distribution to a surface thereof, converting the electrical signals of information to be recorded with an electro-optical transducer into optical signals, exposing the thermoplastic medium with the optical signals to create a charge profile corresponding to the optical signals and developing the exposed storage medium by heating the medium to at least a



softening point so that a surface relief corresponding to the charge profile is formed in the surface, the improvement comprising imposing a lattice signal on the storage medium prior to developing the storage medium, so that the sum or difference of the frequencies of the optical signals and the lattice signal correspond to the resonance frequency of the storage medium.

4,015,249

## TRANSFER OF DOMAINS BETWEEN FIELDS

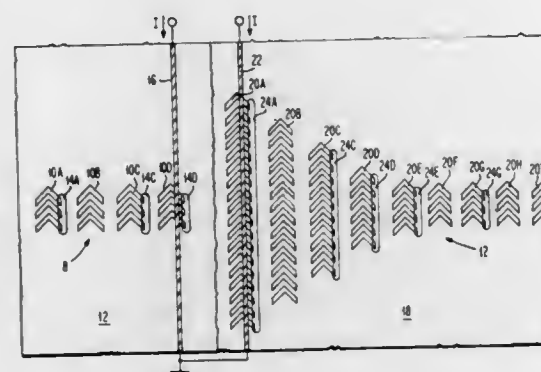
Hung Liang Hu, Sunnyvale, and Laurence Lee Rosier, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,356

Int. Cl.<sup>2</sup> G11C 19/08

U.S. Cl. 340—174 TF

14 Claims



1. The combination adapted to move a magnetic domain from an outlet in a first field to a second field comprising outlet means from a first field, propagation means in said first field adapted to move a domain in a first direction out of said field through said outlet means, inlet means to a second field positioned next to said outlet means wherein a domain leaving said outlet means enters said inlet means, and propagation means in said second field adapted to move a domain in said first direction.

4,015,250

## ALARM FOR REMOVAL OF A FIRE EXTINGUISHER

William L. Fudge, Minneapolis, Minn., assignor to Larsen's Manufacturing Company, Minneapolis, Minn.

Filed Sept. 2, 1975, Ser. No. 609,350

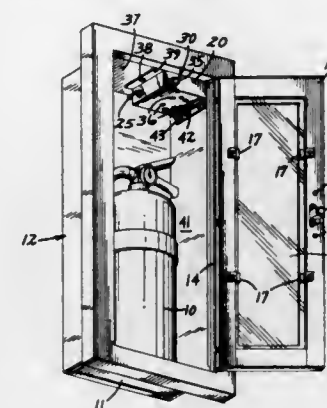
Int. Cl.<sup>2</sup> G08B 13/08

U.S. Cl. 340—280

3 Claims

1. In combination: a fire extinguisher mount comprising a first cabinet for containing said fire extinguisher, having a door to be opened to gain access thereto;

an electric module including a second cabinet, a source of electrical energy, an electrically energizable alarm device, and switch means for controlling energization of said device from said source;



and hinge means positioning said second cabinet within said first cabinet so that said switch means prevents energization of said device when said door is closed, but acts, as an incident to opening of said door, to cause energization of said device.

4,015,251

## CIRCUIT ARRANGEMENT FOR THE DIGITALIZATION OF AN ANGLE OR ROTATION

Klaus V. Pieverling, Wolfratshausen-Waldram; Gerhard Klemt, Munich; Bruno Maier, Munich, and Dieter Leypold, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

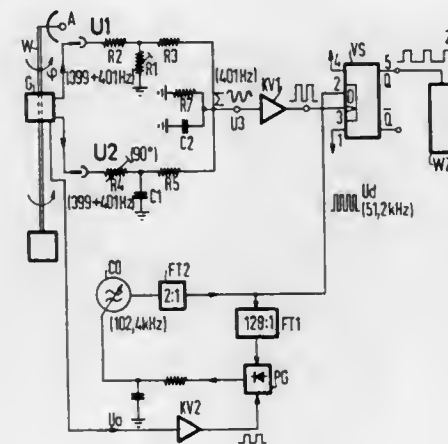
Filed Feb. 10, 1975, Ser. No. 548,861

Claims priority, application Germany, Feb. 18, 1974, 2407678

Int. Cl.<sup>2</sup> H03K 13/02

U.S. Cl. 340—347 SY

17 Claims



1. In a circuit arrangement for the digitalization of an angle of rotation  $\phi$  of a rotatable device which is operated at  $f_a$  rotations per second, employing auxiliary voltages modulated with the  $\sin \phi$  and the  $\cos \phi$  of a fundamental frequency  $f_0$ , whereby, due to the modulation, said auxiliary voltages comprise respective mixtures of the frequency component  $(f_0 - f_a)$ , and the frequency component  $(f_0 + f_a)$ , the combination of means for effecting a phase shift of  $90^\circ$  of one of said auxiliary voltages, means for coupling the two auxiliary voltages (U1, U2) following such phase shift, whereby a third auxiliary voltage (U3), having the frequency of only one of said auxiliary frequency components remains, and a D-flip-flop (S), operating as a comparator circuit, to the clock input of which said third auxiliary voltage is supplied in the form of rectangular impulses, and to whose D-inputs a comparison voltage (Ud) is applied, in the form of rectangular impulses having a frequency of  $n \cdot f_0$ , whereby counter pulse trains (Z1) with a frequency of  $n \cdot f_a$  appear at the output of the D-flip-flop, in which  $n$  corresponds to the angle of rotation equal to  $\phi/360^\circ$  and represents a power of 2.

4,015,252

## HIGH SPEED SERIAL DATA SYNCHRONIZATION SCHEME

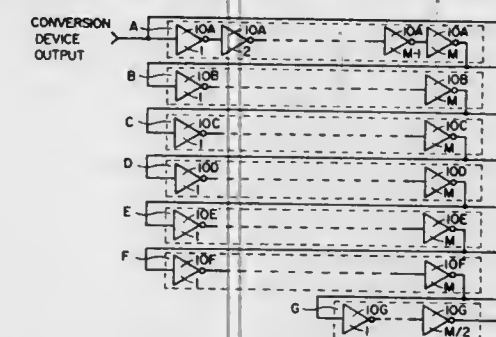
Jerome J. Symanski, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1975, Ser. No. 590,005

Int. Cl.<sup>2</sup> G06F 5/04

U.S. Cl. 340—347 DD

6 Claims



1. A device for synchronizing and converting a serial data bit stream to a parallel data format comprising: a serially connected plurality of strings of active logic devices, each said string of active logic devices introducing a delay equal to the period of one said data bit; one additional string of active logic devices having an input serially connected to said plurality of strings and an output, introducing a delay less than the period of one said data bit; a plurality of flip-flops each having data and clock inputs and an output, each data input being connected to one end of one of said plurality of strings of active logic devices and each clock input being connected to said output of said one additional string.

4,015,253

## ROTARY DIGITAL CHANNEL SELECTION APPARATUS

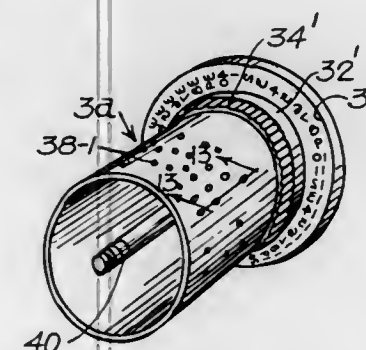
Richard Goldstein, Deerfield, Ill., assignor to Dynascan Corporation, Chicago, Ill.

Filed Mar. 29, 1976, Ser. No. 671,180

Int. Cl.<sup>2</sup> G08C 9/06

U.S. Cl. 340—347 P

10 Claims



8. Rotary digital encoding apparatus comprising, in combination: a combination knob and encoder unit including a cylindrical light opaque encoder drum having circumferentially spaced groups of light-transparent areas thereon, each group of which are axially aligned and permit light to pass through the drum radially to form a light pattern constituting binary coded information representing a distinctive number or other information, and an outer knob portion to be grasped by an operator rotating the combination knob and encoder unit; and a cylindrical drum-receiving housing having an aperture at one end into which said encoder drum passes, the housing having a rear wall with a shaft-receiving bearing thereon; the combination knob and encoder unit having a shaft adapted to engage said bearing when the combination knob and encoder unit is fully inserted within said housing; said housing rear wall supporting light means adapted to pass within the drum when the combination knob and encoder unit is fully inserted within

said housing; said combination knob and encoder unit having spaced recesses therein circumferentially spaced in accordance with the spacing of said groups of light-transparent areas on said drum; spring-urged radially extending projecting means adapted releasably to enter one of said recesses so that the combination knob and encoder unit can be adjusted to any one of a number of different angular positions; said housing having a light pattern reading station opposite which the different groups of light-transparent areas on said drum are brought as the combination knob and encoder unit is rotated to said different positions; and light pattern responsive means at said light pattern reading station of said housing for intercepting the light pattern passing through the group of light-transparent areas of the drum opposite the light pattern reading station.

4,015,254

## KEYBOARD ENCODING CIRCUIT UTILIZING AN A/D CONVERTER

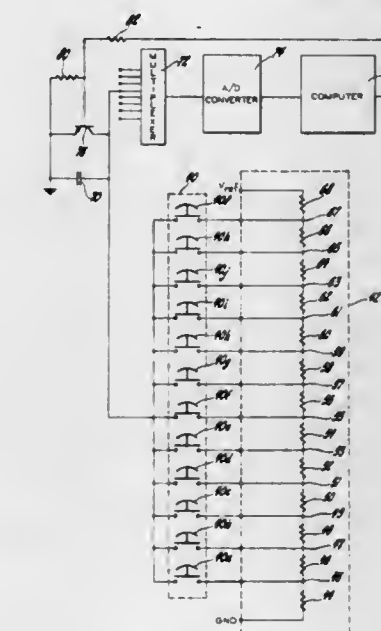
Earl R. Strandt, Greendale, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 4, 1975, Ser. No. 637,517

Int. Cl.<sup>2</sup> G06F 3/02

U.S. Cl. 340—365 S

3 Claims



3. A keyboard encoding circuit comprising a plurality of manually actuable keyboard switches, a source of voltage, a plurality of voltage divider resistors serially connected across said source for establishing a different voltage at each junction between said resistors, means connecting one side of each of said switches with a respective one of said junctions, a capacitor connected with the other side of each of said switches whereby said capacitor is charged to the voltage established at the junction connected with the particular keyboard switch upon closure of the switch, multiplexing means including a plurality of channels one of which is connected with said capacitor, an analog-to-digital converter connected with the output of said multiplexer, computer means responsive to the output of said analog-to-digital converter and providing a clearing signal in response to conversion of any one of said different voltages, semiconductor switch means responsive to said clearing signal for discharging said capacitor.



4,015,255

## MAGNETICALLY OPERATED SIGN

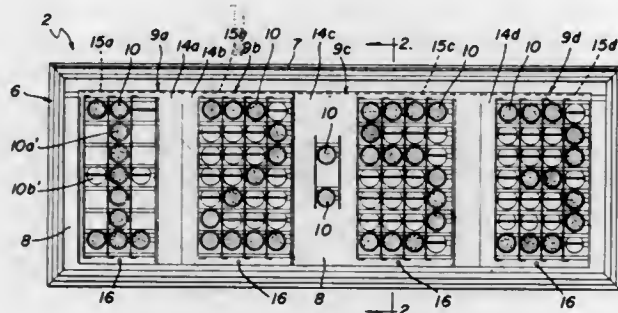
Keith S. Wood, Danville, Ill., assignor to Time-O-Matic, Inc., Danville, Ill.

Filed June 25, 1975, Ser. No. 590,322

Int. Cl.<sup>2</sup> G08B 5/24

U.S. Cl. 340-373

28 Claims



1. A magnetically operated sign comprising: a panel made of a material of low magnetic reluctance, and a plurality of magnetically operated indicating devices carried by the panel, each indicating device comprising a reversibly energizable electromagnet having a core with only a single leg projecting from said panel and a coil around said leg for producing at the end of said core leg when said winding is energized a magnetic field which is of one polarity or the other depending upon the direction of energization of the coil, a permanent magnet confronting each core and having a magnetic axis extending between opposite magnetic poles, means for rotatably mounting said permanent magnet for rotation in a plane transverse to said panel about an axis of rotation which is between the poles thereof and parallel to said panel, the coil of the electromagnet upon momentary energization thereof in one direction or the other causing the magnetic field produced at said one end of the core leg to react with the magnetic field of the permanent magnet to rotate the permanent magnet about said axis of rotation to a position where one pole or the other thereof confronts the end of the associated core leg, and an indicating element having contrasting appearing surfaces on opposite sides thereof secured to each permanent magnet and rotatably mounted for rotation with said permanent magnet about said axis of rotation, to present one or the other of said contrasting surfaces to view, depending upon which pole of said permanent magnet confronts the associated core.

4,015,256

## ELECTRONIC CONTROL UNIT FOR INTRUSION SYSTEM

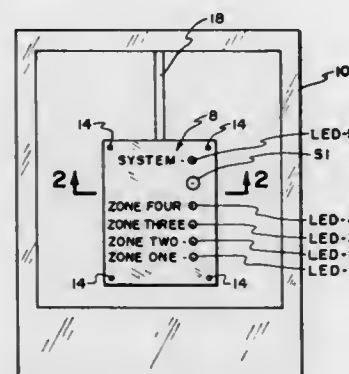
Arnold T. Pratt, 1526 S. 1100 West, Woods Cross, Utah 84087

Filed Oct. 2, 1975, Ser. No. 618,977

Int. Cl.<sup>2</sup> G01D 21/09

U.S. Cl. 340-409

8 Claims



1. An intrusion alarm system for surveillance of a restricted area comprising:  
a source of electrical power having a positive output voltage of relatively small magnitude;  
circuitry for delaying the enabling of surveillance of the restricted area which restricted area comprises an exit

site, said circuitry comprising first switch means exposed, within the restricted area that actuates said delaying circuitry when manually operated and second switch means at said exit site which are open and closed by egress from said restricted area;

said delaying circuitry further comprising at least first and second logic circuits each comprising integrated circuit components, said logic circuits comprising input and output means;

the second switch means, when closed, communicating electrical power from said source to at least the input of the first logic circuit causing the input and output thereof to be high, the input and output of said first logic circuit becoming low when the switch means are opened;

RC delay circuit means comprising capacitor means connected between the source output voltage and the input to the second logic circuit and resistor means connected in series with the capacitor means between the input to the second logic circuit and ground, the RC circuit means having a time discharge constant exceeding the time for the system user to leave the restricted area via the exit sites;

circuitry means for delaying the issuance of a low output when said circuitry means are implemented by the user immediately prior to the user leaving the restricted area via the exit site which temporarily communicates the source output voltage to the input of the second logic circuit whereby the input and output of said second logic circuit are high;

means connecting the output of the first and second logic circuits to alarm means;

means blocking the communication of a low output of the first logic circuit to the alarm means;

whereby opening of the second switch means by the user leaving the restricted area via the exit site as mentioned will cause the first logic circuit to be low at its input and output which low is blocked by said blocking means and said RC delay circuit means will retain the second logic circuit in a high state for a period of time equal to the time discharge constant during which time said second switch means will again be closed, the first logic circuit becoming high at its input and output and said high being communicating to said alarm means whereby no alarm is issued.

4,015,257

## RADAR DETECTION OF TURBULENCE IN PRECIPITATION

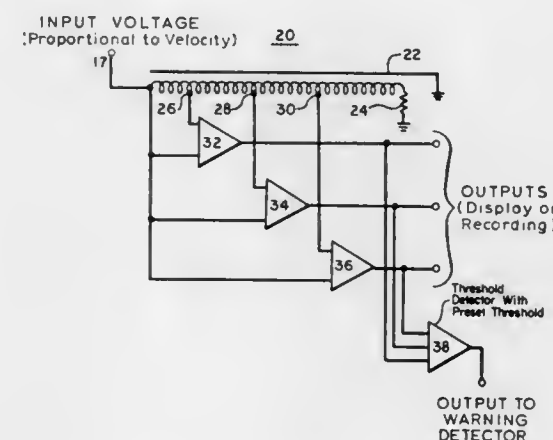
Richard W. Fetter, Warrenville, Ill., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 11, 1975, Ser. No. 612,384

Int. Cl.<sup>2</sup> G01S 9/60

U.S. Cl. 343-5 W

4 Claims



1. A method of detecting turbulence within precipitation using an IF portion of a radar system wherein the IF portion has a center frequency comprising:

applying the IF portion of the radar system to a discriminator for detecting frequency variations from the center frequency, which variations are indicative of the velocity of the precipitation;  
producing a voltage proportional to said detected frequency variations;  
splitting the voltage proportional to the detected frequency variations into a first and second part;  
applying said first part to a delay line;  
comparing said second part to the delayed first part;  
amplifying any amplitude difference between the compared parts to provide a voltage indication of turbulence at a particular range.

4,015,258

## WEAPON AIMING SYSTEM

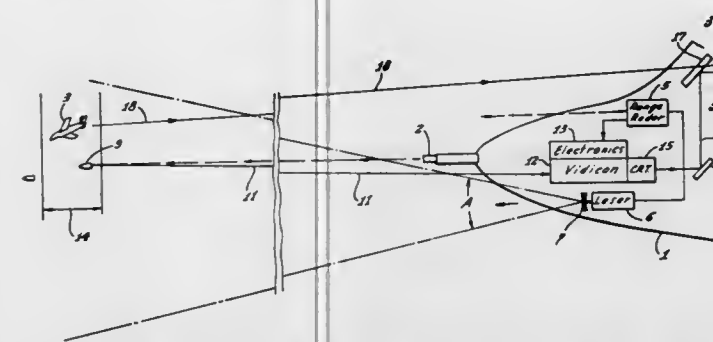
William W. Smith, Palos Verdes Peninsula, and John N. Monroe, Altadena, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Apr. 7, 1971, Ser. No. 132,190

Int. Cl.<sup>2</sup> G01S 9/62

U.S. Cl. 343-6 R

7 Claims



1. The method of indicating to an aircraft gun operator or the like the real time position of a bullet fired from his gun at a target rapidly changing direction relative to the gun's line of fire, the position indication of the bullet being as the bullet passes through the target range, comprising: determining the range of said target, providing a reflective means on the rear of said bullet, transmitting a diverged pulsed light beam of between about 10° and about 40° conical angle in the general direction of the bullet path, to thus keep the bullet in said beam as the gun's line of fire changes, detecting the reflected light from said bullet, and imaging said reflected light into the line of sight of the gun operator in true relative azimuth and elevation position to a simultaneous indication of the position of said target, said reflected light being admitted to said line of sight only during the time interval when said bullet is substantially at the range of said target.

4,015,259

## METHOD AND APPARATUS FOR INTERROGATING AND IDENTIFYING FIXED OR MOVING TARGETS

Ardell V. Siverhus, Neptune; Joseph A. Matava, Belmar, and Dirk R. Klose, Eatontown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 21, 1975, Ser. No. 579,658

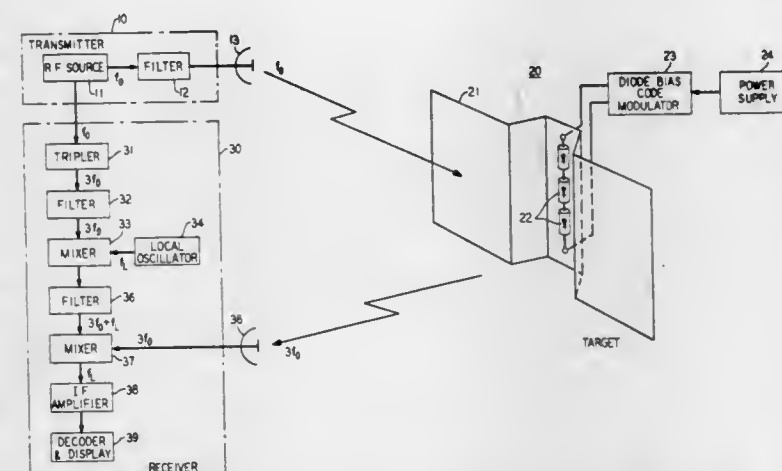
Int. Cl.<sup>2</sup> G01S 9/56

U.S. Cl. 343-6.8 LC

10 Claims

1. An object identification system comprising:  
a transponder mounted on an object to be identified;  
means for interrogating said transponder with a beam of electromagnetic wave energy;  
said transponder including at least one non-linear device having a conductive state and a non-conductive state and reradiating a signal back to the means for interrogating in response to impingement upon said device of energy from the means for interrogating, the frequency of said signal being harmonically related to the frequency of said wave energy;

means for modulating the harmonic signal reradiated back towards the interrogating means to identify uniquely the object on which said interrogating means is mounted, said modulating means including  
means for generating a repetitive  $m$ -bit identification code;  
means responsive to each bit of said  $m$ -bit code for generating an  $n$ -bit pseudo-random code sequence for said each



bit corresponding to the instantaneous logical value and relative position of that bit of said identification code; and means responsive to said pseudo-random code sequence generating means for selectively biasing said at least one non-linear device to either one or the other of said two states  $m \times n$  times for each occurrence of said  $m$ -bit identification code.

4,015,260

## DIGITAL MTI RADAR

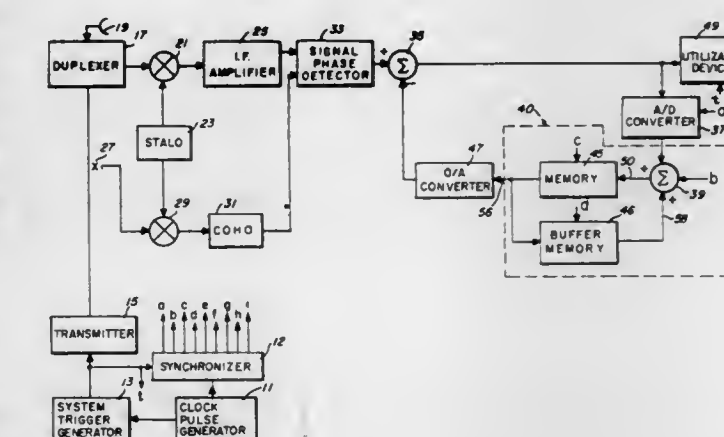
Ronald B. Campbell, Jr., Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 2, 1970, Ser. No. 85,941

Int. Cl.<sup>2</sup> G01S 9/42

U.S. Cl. 343-7.7

5 Claims



5. In an MTI radar system, the combination comprising:  
a. differencing means for producing an analog difference signal corresponding to the difference between a composite video signal produced during a range sweep and an analog signal representative of a prediction of such composite video signal;  
b. an analog-to-digital converter for digitizing such analog difference signal;  
c. predictor means, responsive to the digital signal produced by the analog-to-digital converter, for producing a digital signal representative of a prediction of the composite video signal for a succeeding range sweep; and  
d. a digital-to-analog converter for converting the digital signal produced by the predictor means into the analog signal, such analog signal being the analog signal representative of a prediction of the composite video signal which is coupled to the differencing means.



4,015,261

**TIME SHARING CIRCUIT FOR GUARD RADAR RECEIVER IN RADAR RANGING SYSTEM**

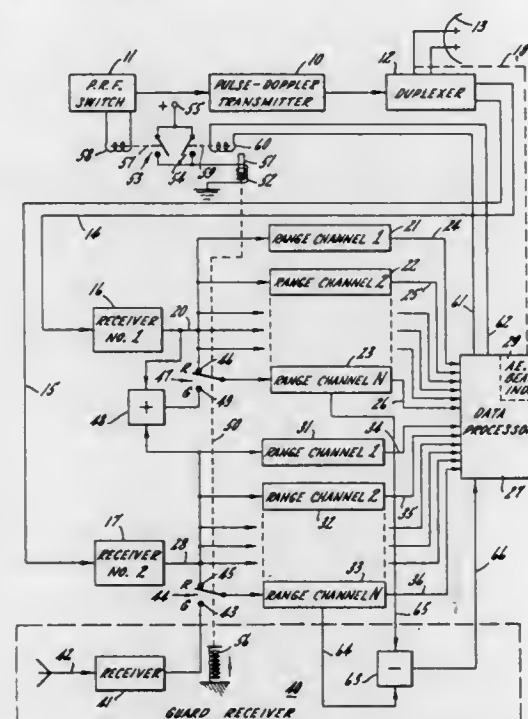
Robert R. Campbell, Towson, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 7, 1964, Ser. No. 336,318

Int. Cl.<sup>2</sup> G01S 7/36, 9/10, 9/48

U.S. Cl. 343—18 E

8 Claims



1. A time sharing circuit for a multiple pulse repetition frequency, pulse-Doppler target bearing and ranging radar having dual antenna horns with a receiver and a plurality of range channels coupled in a receiver channel from each antenna horn to a data processor with the plurality of range channels in each receiver channel being in parallel, and having a pulse repetition frequency switching means coupled to control transmission of different pulse repetition frequencies in sequence, the invention which comprises:

first and second alternately poled switches in the coupling of said receiver and one range channel of each receiver channel, the switch blade of each switch being coupled to the respective range channel and one pole of each switch being coupled to the respective receiver;  
means adding the outputs of said receivers, the summation being coupled to the alternate pole of one of said alternately poled switches;  
a guard receiver having an output coupled to the alternate pole of the other alternately poled switch;  
means subtracting the outputs of said one range channel of each receiver channel, the quotient thereof being coupled to said data processor; and  
means for actuating said alternately poled switches by control means of said pulse repetition frequency switching means and said data processor to time share alternate switch positions of said alternately poled switches for different pulse repetition frequencies and to maintain said guard receiver in circuit with the respective range channel when target and jamming signals are received.

4,015,262

**DIGITAL FILTERS FOR OBTAINING QUADRATURE COMPONENTS OF A PERIODIC SIGNAL**

Fred Etcheverry, San Pedro, and Harold Ray Samuelson, Los Angeles, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Dec. 30, 1974, Ser. No. 537,245

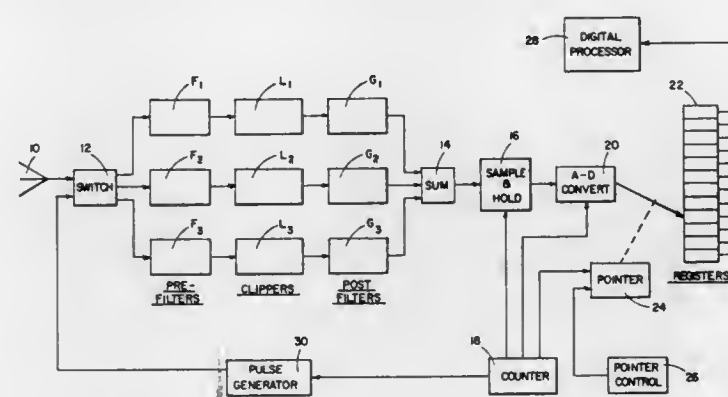
Int. Cl.<sup>2</sup> G01S 1/30

U.S. Cl. 343—105 R

13 Claims

8. An omega type navigation receiver comprising:

a. antenna means for receiving a transmitted composite signal comprised of a plurality of pre-established frequencies of interest which have a common subharmonic frequency,  
b. input means operatively connected to said antenna means to receive the transmitted composite signal,  
c. sampling and conversion means operatively connected to said input means for receiving the composite signal for sampling portions thereof and generating a digital equivalent thereof at a preselected sample rate,



d. sample timing means operatively connected to the sampling and conversion means for enabling the generation of samples of the frequencies of interest at a preselected sample rate,  
e. and a digital type processor operatively connected to said sampling and conversion means to construct a set of sums of the samples to determine the phase relationship of the frequencies of interest contained within the composite signal.

4,015,263

**DUAL POLARIZED BLADE ANTENNA**

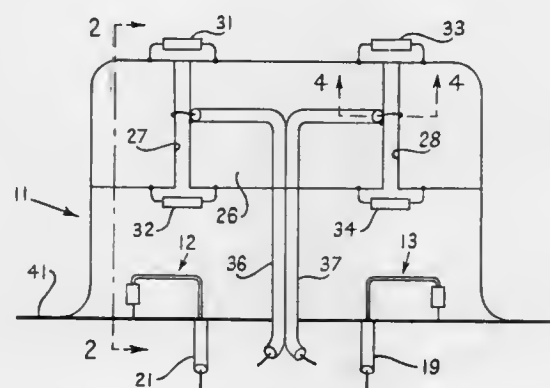
John A. Koerner, Belmont; James P. Scherer, Sunnyvale; Donald J. Stoddard, Woodside, and George N. Voronoff, San Francisco, all of Calif., assignors to Textron, Inc., Belmont, Calif.

Filed Feb. 23, 1976, Ser. No. 660,051

Int. Cl.<sup>2</sup> H01Q 1/28, 13/10

U.S. Cl. 343—708

6 Claims



1. An improved dual polarized antenna comprising  
a dielectric blade adapted to extend upwardly from a ground plane,  
a metal coating upon the upper portion of said blade and having a pair of vertical slots extending completely through said metal to define a pair of slot radiators,  
a plurality of resistors connected one across each end of each of said slots,  
electrical connections across each of said slots providing horizontally polarized antenna connections,  
a pair of vertically polarized antenna elements disposed in said blade between said slots and said ground plane, and  
electrical connections to said vertically polarized antenna elements providing vertically polarized antenna connections.

4,015,264

**DUAL MODE BROADBAND ANTENNA**

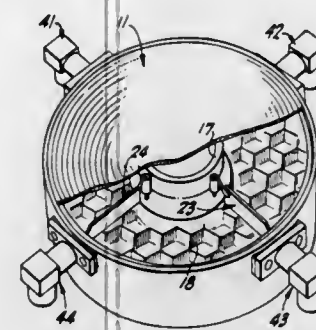
John A. Koerner, Belmont, Calif., assignor to Textron, Inc., Belmont, Calif.

Filed Nov. 20, 1975, Ser. No. 633,632

Int. Cl.<sup>2</sup> H01Q 1/36

U.S. Cl. 343—725

6 Claims



1. A dual mode broadband antenna comprising  
a spiral antenna  
means defining a cavity having an open end across which said spiral antenna is disposed,  
electrical connections to said spiral antenna,  
a plurality of monopoles disposed in said cavity behind said spiral antenna and in orthogonal relation to the windings of said spiral antenna, and  
means for energizing said monopoles separately from said spiral antenna.

4,015,265

**FOLDED DOUBLET ANTENNA**

Gérard Dubost, Rennes, and Henri Albert Paul Havot, Cesson-Sevigne, both of France, assignors to Etat Francais, France

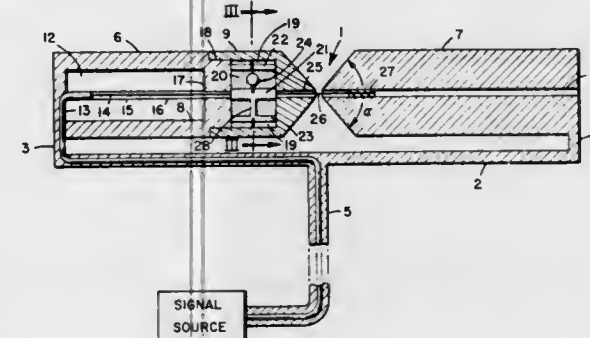
Filed July 8, 1975, Ser. No. 593,957

Claims priority, application France, July 18, 1974, 74.24951

Int. Cl.<sup>2</sup> H01Q 9/26

U.S. Cl. 343—747

7 Claims



1. A folded doublet antenna comprising:  
first and second substantially cylindrical members, each having a frusto-conical end portion;  
a third substantially cylindrical member coupled to the ends of said first and second members distant from said frusto-conical end portions for supporting said first and second members axially spaced from each other with their respective frusto-conical end portions facing each other;  
a coaxial conductor having an inner conductor extending through a bore in said first member and into a facing bore in said second member, said inner conductor terminating within and electrically insulated from said second member;  
means for supplying signals to said coaxial conductor, the wavelength of said signals having a desired relationship to a dimension of said antenna; and  
impedance compensation circuit means mounted in one of said first and second members and interposed in said coaxial conductor for compensating the impedance of said doublet antenna alone.

4,015,266

**RADAR DIPOLE ANTENNA ARRAY**

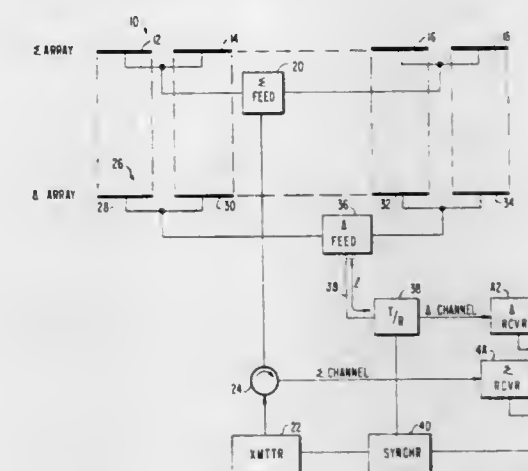
John Borowick, Bricktown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 5, 1976, Ser. No. 664,340

Int. Cl.<sup>2</sup> G01S 9/22

U.S. Cl. 343—815

10 Claims



1. In a microwave antenna system, the improvement comprising, in combination:  
a pair of dipole antenna arrays mutually arranged so that one of said pair of arrays is adapted to operate as a passive array for the other during a transmit mode but as an independent active array during a receive mode;  
respective RF feed networks coupled to said pair of arrays; RF transmitter means including coupling means coupled to the feed network for said other antenna array during said transmit mode for transmitting RF signals therefrom;  
first receiver means coupled to said coupling means and being responsive to signals received at said other array during said receive mode;  
means coupled to said feed network for said one antenna array, being operable during said transmit mode to reflect a short circuit at said one antenna array which thereby acts as a passive array, said means being operable during said receive mode, however, to translate signals from said feed network for said one array to second receiver means whereby said one array acts as an active array during said receive mode; and  
second receiver means coupled to said feed network for said one antenna array.

4,015,267

**INK JET PRINTER HAVING AIR RESISTANCE DISTORTION CONTROL**

Takeshi Kasubuchi, Nara; Kaoru Ozawa, Yamatokoriyama, and Tomoo Makita, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed July 19, 1973, Ser. No. 380,571

Int. Cl.<sup>2</sup> G01D 18/00

U.S. Cl. 346—1

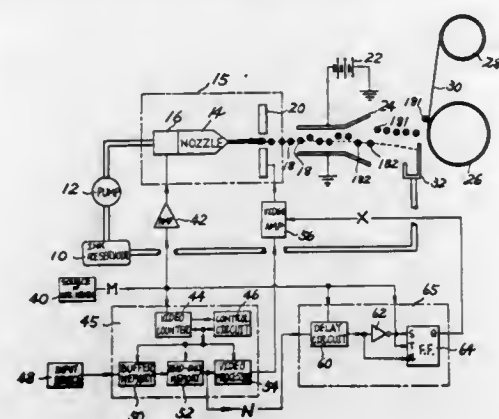
15 Claims

1. A method obviating air resistance distortion of ink drop trajectories in an ink drop recording system wherein character signals are applied to ink drop charging means for applying a charge of predetermined amplitude to selected ones of a plurality of ink drops travelling in a stream to constrain predetermined trajectories on said charged ink drops, said method comprising the steps of:

sensing the presence of one or more uncharged ink drops immediately preceeding the next ink drop to be charged to anticipate air resistance distortion of the trajectory of said next ink drop to be charged; and  
adjusting the amplitude of the charge to be applied to said



next ink drop to be charged as a function of the presence of one or more of said uncharged ink drops to obviate the



anticipated distortion from air resistance of the resulting trajectory of said charged ink drop.

4,015,268

**RECORDING DEVICE WITH FLEXIBLE CHART**

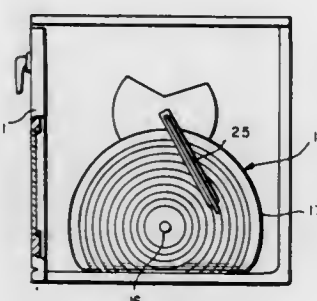
Austin S. Norcross, Waban, Mass., assignor to Norcross Corporation, Newton, Mass.

Filed Mar. 15, 1976, Ser. No. 666,791

Int. Cl.<sup>2</sup> G01D 15/34

U.S. Cl. 346—137

6 Claims



1. A recording device comprising a chart; means for rotating said chart so that a first major portion of said chart containing the central portion thereof rotates substantially in a first plane and a second lesser portion thereof rotates substantially in a second plane which is angularly disposed with respect to said first plane; recording means coacting with said chart during rotation thereof for placing recorded information on said major portion of said chart, said recording means being in contact with said major portion of said chart so that recordal occurs on said chart in said first plane; and means for enclosing said chart, said rotating means and said recording means, the inner surface of one side of said enclosing means being adjacent said portion of said chart and forming means for retaining said lesser portion in place during the rotation of said chart.

4,015,269

**AUTOMATIC PENCIL APPARATUS FOR AN AUTOMATED DRAFTING SYSTEM**

Tsukasa Edo, Narashino, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed July 17, 1975, Ser. No. 596,606

Claims priority, application Japan, July 26, 1974, 49-85896

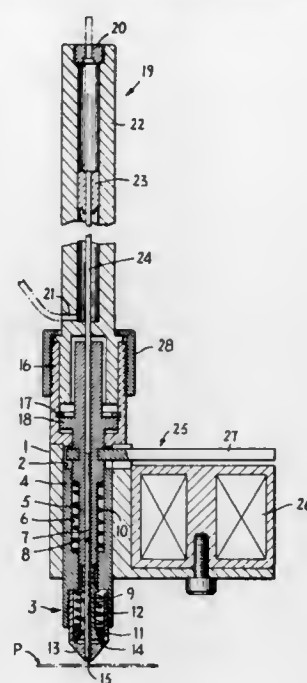
Int. Cl.<sup>2</sup> G01D 15/24

U.S. Cl. 346—139 C

6 Claims

1. An automatic pencil apparatus for use with an automated drafting system comprising: gripping means for gripping and releasing a lead during use of the apparatus, said gripping means including an actuatable collet slidably receiving there-through the lead and operable when actuated to release the lead and when not actuated to releasably grip the lead, and

means for normally biasing said collet to its non-actuated state; driving means for selectively driving said gripping means to thereby automatically actuate said collet to effect release of the lead; and pressing means for exerting a constant pressure on the lead while it is released from said collet to thereby press



4,015,270

**SHOCK PROOF EVENT RECORDER**

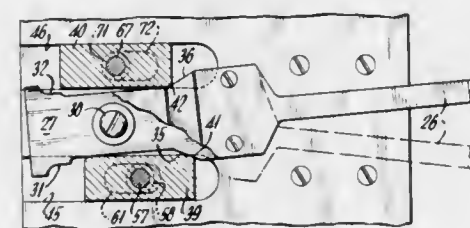
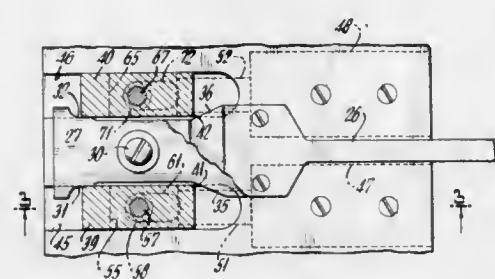
Vernon M. Barnes, Jr.; Norman E. Flournoy, and Eugene B. Horton, Jr., all of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,536

Int. Cl.<sup>2</sup> G01D 5/04

U.S. Cl. 346—139 R

9 Claims



1. In combination with an event recorder which may be subjected to high acceleration shocks during operation thereof, stylus means for indicating said event upon actuation thereof,

said stylus means being pivoted to be movable from a locked position to at least one event actuated position, locking means for holding said stylus means to prevent inadvertent actuation thereof, and means for actuating said stylus means upon happening of an event, comprising means for concurrently unlocking and actuating said stylus means which comprises stop means for holding said stylus means in said locked position, and means for moving said stop means to release said stylus means and pivot it to said event actuated position.

4,015,271

**PRINTING HEAD FOR USE WITH AN INK JET PRINTER**

Stig Bertil Sultan, Floda, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

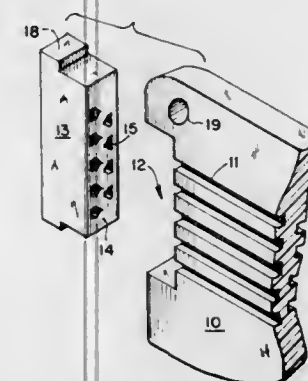
Filed Feb. 11, 1976, Ser. No. 657,037

Claims priority, application Sweden, July 23, 1975, 75083865

Int. Cl.<sup>2</sup> G01D 15/18; B05B 1/20

U.S. Cl. 346—140 R

2 Claims



1. A printing head for an ink jet printer having a plate-shaped part with two large oppositely located front and back surfaces, a plurality of spaced ink transport channels in each surface, said plate-shaped part being provided with a recess in one short side surface thereof and having said channels opening therein, a second plate adapted to be inserted in said recess and having a plurality of spaced channels which correspond to the channels in said plate-shaped part, each of said channels in said second plate tapering to form a fine capillary tube having an outlet at one short side of said second plate, said capillary tubes being operatively connected alternately to channels on the front and back surfaces of said plate-shaped part, and each channel in said second plate opening at its broadest portion only into the other short side of said second plate.

4,015,272

**INK EJECTION TYPE WRITING UNIT**

Kiyoshi Yamamori; Masayoshi Miura, and Akira Mizoguchi, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 7, 1975, Ser. No. 602,914

Claims priority, application Japan, Aug. 14, 1974, 49-93711

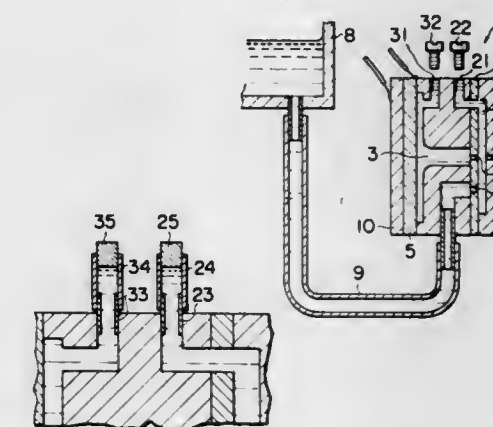
Int. Cl.<sup>2</sup> G01D 15/18

U.S. Cl. 346—140 R

2 Claims

1. In an arrangement for applying liquid droplets to a surface comprising, a liquid-applying unit including a housing with a front wall facing a surface to which the unit is to apply a liquid, a chamber having an intake channel connected to a liquid supply container and a discharge channel in said front wall through which the liquid is discharged from the chamber into the atmosphere, pressure-producing means for producing short duration pressure increases in the liquid in the chamber, the chamber having means dividing the chamber into an outer chamber portion adjacent to the discharge channel and an inner chamber portion, a connecting channel in the dividing

means connecting outer and inner chamber portions, the connecting channel being axially aligned with the discharge channel and the intake channel being in communication with the outer chamber portion, the inner chamber portion having a larger diameter portion in contact with the pressure-producing means and a smaller diameter portion adjacent to the connecting channel, the improvement comprising: means defining a first vent passageway for connecting the outer chamber portion to the atmosphere; means defining a second



vent passageway connecting the larger diameter portion of said inner chamber portion to the atmosphere; first and second transparent tubes connected at one end to the first and second vent passageways, respectively, and extending outwardly of the liquid applying unit; and first and second closure means removably attached to the other end of the first and second tubes, respectively, so that bubbles in the liquid in the outer and inner chamber portions are collected in the tubes and visible from externally thereof.

4,015,273

**TYPE CARRIERS**

Hans Linde, and Horst Maecker, both of Berlin, Germany, assignors to H. Berthold A.G., Germany

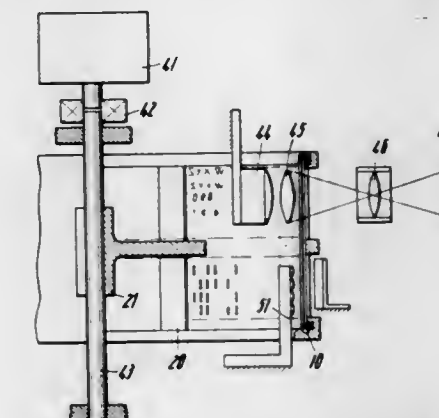
Filed Apr. 21, 1975, Ser. No. 569,956

Claims priority, application Germany, May 15, 1974, 2423952

Int. Cl.<sup>2</sup> B41B 17/32; G03B 17/06

U.S. Cl. 354—15

5 Claims



1. A type symbol selecting device designed to be used in photocomposing machines, said device comprising: a plurality of identical type carriers with different groups of type symbols and/or code information, each of said type carriers comprising a thin sheet of elastic material, sur-



rounded by a protective edge and having a deformable cylindrical segment shape and a normal flat storable shape;

a cylindrical holder-carrier comprising a cylindrical body and a centrally situated disk;

means releasably clipping several of said type carriers to said holder-carrier on a peripheral surface of said cylindrical body such that said attached type carriers are sequentially located next to each other and are uniformly distributed around said peripheral surface of said holder-carrier, said type carriers being separated from each other by a plurality of support struts on said central disk;

a guidance groove located on said disk, said type carriers being inserted into said guidance groove; and

said releasably clipping means comprising a plurality of arresting devices located along the upper edge of said cylindrical body, said arresting devices providing a force to hold said type carriers in place when the holder-carrier is rotated, said force being proportional to the centrifugal force generated during rotation.

4,015,274

# MEMORY DEVICE OF AN ELECTRICAL SHUTTER FOR SINGLE LENS REFLEX CAMERA

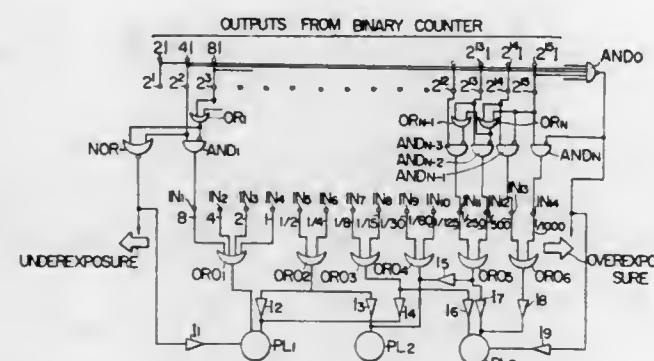
Akira Takahashi, Tokyo, and Masamichi Furukawa, Kawasaki, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 414,643, Nov. 12, 1973, abandoned. This application July 7, 1975, Ser. No. 593,295  
Claims priority, application Japan, Nov. 13, 1972, 47-113649; Nov. 13, 1972, 47-113650

Int. Cl.<sup>2</sup> G03B 7/00, 7/08, 17/20

U.S. Cl. 354—23 D

7 Claims



1. In a memory device of an electrical shutter for single lens reflex cameras wherein light which is transmitted through the taking lens is measured and converted into an electric photometric value by a light receiving element to provide an indication of an appropriate shutter speed, the improvement comprising: an A-D converter including a memory means for storing said photometric value by conversion into a digital quantity; a D-A converter having a plurality of storage means, which correspond in number to one more than the number of manually settable shutter speeds, for receiving the output of said memory means and producing an output indicative of an appropriate shutter speed; three illuminating elements, each producing light of a different color; and means for receiving said indicative output and lighting only said three illuminating elements in six different combinations respectively indicative of the appropriate shutter speed.

# 4,015,275 DIGITAL TIMER FOR A PHOTOGRAPHIC CAMERA SHUTTER

Walter Bletz, Braunsfels, Germany, assignor to Ernst Leitz G.m.b.H., Wetzlar, Germany

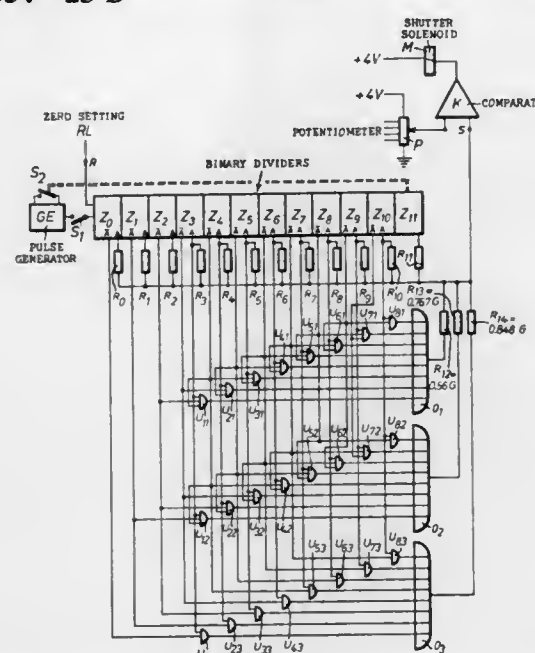
Filed Feb. 19, 1975, Ser. No. 551,136

Claims priority, application Germany, Feb. 25, 1974, 2408908

Int. Cl.<sup>2</sup> G03B 7/08

U.S. Cl. 354—23 D

4 Claims



1. A digital timer circuit for the electric control of a camera shutter, comprising:

- a pulse generator;
- a sequence of binary dividers ( $Z_0$ - $Z_{10}$ ) connected with said pulse generator;
- a resistor ( $R_0$ - $R_{10}$ ) connected to each of said binary dividers, each of said resistors having the same conductance and all resistors together performing a digital to analog conversion;
- a comparator having a first input and a second input; all resistors ( $R_0$ - $R_{11}$ ) being connected to said first input, the electrical potential of which corresponds to the number of said binary dividers having "1" state, and thus corresponding to the logarithm of the shutter time to be obtained, which shutter times differ from one another by powers of 2 in the reference timing series;
- means for generating a predetermined electrical potential, said means being connected to said second comparator input; and
- a solenoid connected to the output of said comparator, said solenoid actuating said camera shutter when said comparator output carries a signal as a consequence of the potential of said first comparator input reaching said predetermined potential of said second comparator input.

4,015,276

# ELECTRIC SHUTTER OPERATING CIRCUITS FOR USE IN PHOTOGRAPHIC CAMERAS

Masaru Yamamoto, Machida, Japan, assignor to Yashica Co., Ltd., Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,328

Claims priority, application Japan, Sept. 13, 1973, 48-102657; Sept. 13, 1973, 48-102658

Int. Cl.<sup>2</sup> G03B 7/00, 7/08

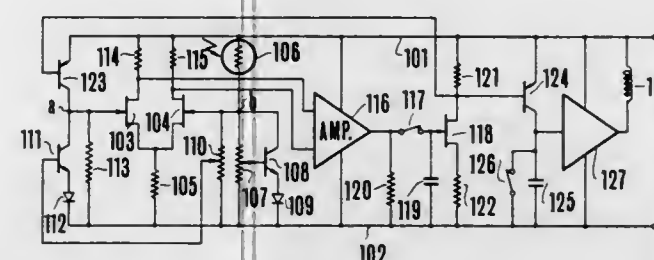
U.S. Cl. 354—37

5 Claims

1. An electric shutter operating circuit for use in a photographic camera comprising:
- a photoelectric element for generating an electric signal corresponding to the brightness of an object to be photographed;
  - a first potentiometer which is set in accordance with the iris

opening of the camera and a second potentiometer connected parallel with said first potentiometer which is set in accordance with the photosensitivity of photographic film used;

- a high input impedance comparator circuit for comparing signals from said first and second potentiometers, said comparator circuit including a first field effect transistor with its gate connected to said first potentiometer and said photoelectric element and a second field effect transistor with its gate inter-connected to the gate of said first field effect transistor through a transistor which is controlled from said second potentiometer in accordance with the setting representing said photosensitivity of film



used, the drain electrodes of said first and second field effect transistors being connected via an operational amplifier to a memory capacitor connected on the output side of said comparator circuit to store an electric quantity corresponding to said brightness;

an amplifier connected to respond to the terminal voltage of said memory capacitor;

operating circuit means responsive to the output of said amplifier for controlling the operation of a shutter of said camera; and

a feedback circuit responsive to the output from said amplifier for feeding back a feedback signal to said gate of said second field effect transistor.

4,015,277

# SHUTTER DEVICE FOR A CAMERA

Mutsunobu Yazaki; Noriaki Sanada, both of Yokohama, and Tetsuya Taguchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

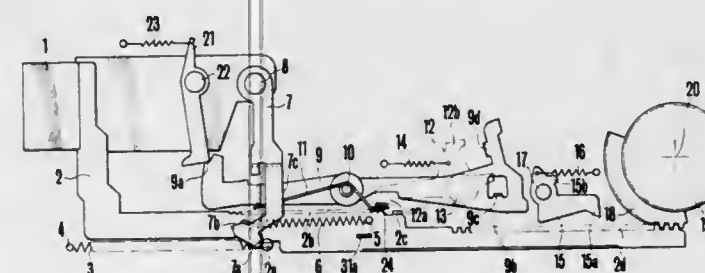
Filed June 23, 1975, Ser. No. 589,395

Claims priority, application Japan, June 25, 1974, 49-72655; Aug. 25, 1974, 49-96496

Int. Cl.<sup>2</sup> G03B 17/42

U.S. Cl. 354—206

3 Claims



1. A shutter charging device for a camera using a film providing one perforation per one frame, comprising a shutter including a shutter driving spring, a film winding mechanism, means for charging said shutter driving spring, operation means operatively engageable with said means for charging said shutter driving spring and said film winding mechanism for effecting at the same time the operation of said film winding mechanism and the charging of said shutter driving spring, said operation means including a set plate movably displaceable through an operating stroke, an operation lever having a part engageable with said means for charging said shutter driving spring, a spring extending between and connected to said set

plate and said operation lever so that said operation lever is moved by said set plate during the operating stroke thereof and engages with said means for charging said shutter driving spring for effecting the charging of said shutter driving spring, a fixed stopping member located in the path of said operation lever for engagement therewith after said set plate completes a predetermined portion of the operating stroke so that said stopping member disengages said operation lever from said means for charging said shutter driving spring while said set plate continues the remainder of the operating stroke for completing the film winding operation.

4,015,278

# FIELD EFFECT SEMICONDUCTOR DEVICE

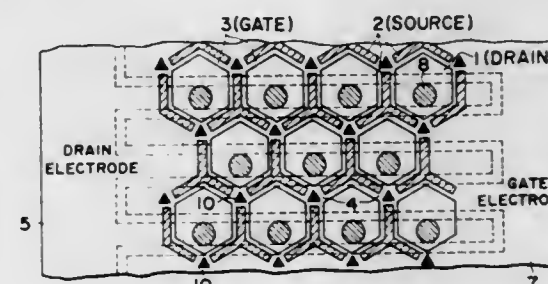
Masumi Fukuta, Kobe, Japan, assignor to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 527,208, Nov. 26, 1974, abandoned, which is a continuation of Ser. No. 318,629, Dec. 26, 1972, abandoned. This application May 13, 1976, Ser. No. 686,250

Int. Cl.<sup>2</sup> H01L 29/80, 27/02, 27/10, 29/06

U.S. Cl. 357—22

14 Claims



1. A field effect semiconductor device having source and drain regions and a gate region, comprising:

a semiconductor substrate of high resistivity material, the resistivity thereof substantially being that of an insulator, and having first and second opposite main surfaces,

a layer of semiconductor material of a given conductivity type disposed on said first main surface,

said layer of semiconductor material being formed to include a reduced thickness portion of a desired polygonal configuration defining said gate region and said gate region surrounding and thereby defining a portion of said first layer of corresponding polygonal configuration comprising a first region of said semiconductor layer, and the remaining portion of said layer surrounding said polygonal gate region comprising a second region of said semiconductor layer,

said gate region thereby being elongated and surrounding and isolating said first region from said second region and defining a conducting path extending parallel to said first main surface of said substrate between said first and second regions of said semiconductor layer,

first and second electrodes in ohmic contact with said first and second regions and a gate electrode in rectifying contact with said gate region, and

means for applying voltages to said first and second electrodes to selectively operate one of said first and second regions as the source and the other thereof as the drain of said transistor and to said gate electrode to control the conductivity of the current channel between said source and drain regions.

4,015,279

# EDGELESS TRANSISTOR

William Edward Ham, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 581,042

Int. Cl.<sup>2</sup> H01L 27/12, 29/78

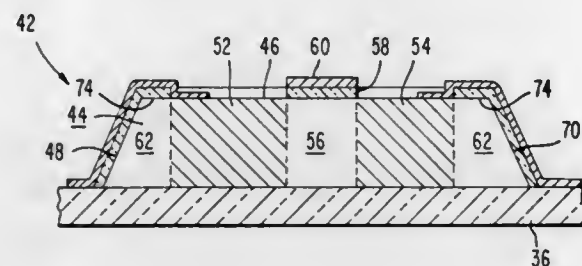
U.S. Cl. 357—23

10 Claims

1. A transistor comprising a semiconductor mesa with a



principal surface, the surface having a region thereunder, sidewalls surrounding the region, a source, a drain, a channel consisting of the semiconductor between the source and the drain, separating the source from the drain, said source and said drain being portions of said region containing doping in addition to the doping in the remainder of said region, a dielectric on the principal surface adjacent the channel, a gate electrode spaced above the channel by the dielectric, and a



portion of the mesa undoped by source and drain additional doping containing only impurities of a single type located between the sidewalls and the region, separating the sidewalls from the region and any junctions between the source and channel and between the drain and the channel, the region comprising the source, the drain, and the channel, the portion comprising a band of the semiconductor, the band encircling the region.

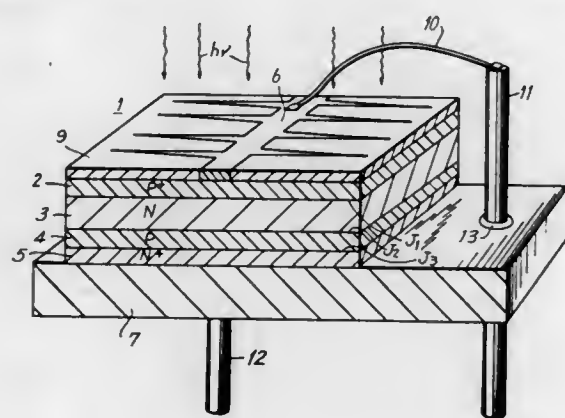
#### 4,015,280 MULTI-LAYER SEMICONDUCTOR PHOTOVOLTAIC DEVICE

Takeshi Matsushita, Sagami-hara, and Takayoshi Mamine, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 15, 1975, Ser. No. 622,500  
Claims priority, application Japan, Oct. 19, 1974, 49-120616

Int. Cl.<sup>2</sup> H01L 31/04  
U.S. Cl. 357-30

18 Claims



1. A semiconductor photovoltaic device comprised of 2n contiguous stacked regions of semiconductor material arranged so that successive regions are of alternating conductivity type material, wherein n is an integer greater than one, the outer regions being of opposite conductivity type material and each inner region having a thickness less than the diffusion length of a minority carrier therein, said contiguous regions defining (2n-1) PN junctions, respectively, therebetween, said regions being excited by incident light that successively traverses each said region in said stack to cause charge carriers to be produced, said outer regions collecting charge carriers of opposite polarity, and each respective outer region cooperating with the next succeeding two inner regions to support transistor action to urge majority charge carriers in an inner region to traverse at least two junctions toward said respective outer region, whereby said photovoltaic device functions as a source of electrical energy to supply current from said outer regions to a load.

#### 4,015,281 MIS-FETS ISOLATED ON COMMON SUBSTRATE

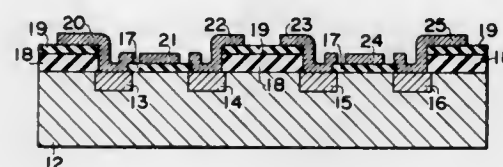
Minoru Nagata, Kodaira; Toshiaki Masuhara, Tokorozawa; Masaharu Kubo, and Norikazu Hashimoto, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 5, 1971, Ser. No. 121,375  
Claims priority, application Japan, Mar. 30, 1970, 45-26023; Mar. 30, 1970, 45-26024

U.S. Cl. 357-41

Int. Cl.<sup>2</sup> H01L 27/02

4 Claims



1. A semiconductor device comprising:
  - a semiconductor substrate of p-conductivity type having at least one planar surface;
  - a first n-channel insulated-gate field effect transistor disposed on the planar surface of said semiconductor substrate, and having spaced first source and first drain regions of n-conductivity type in the surface of said substrate, a first channel portion of said substrate intermediate said first source and first drain regions, a first gate insulator layer on said first channel portion and a first gate electrode on said first gate insulator layer, the first gate insulator layer being of a film which has a thickness less than 2000 Å and is selected from the group consisting of an SiO<sub>2</sub> film and a composite film of an SiO<sub>2</sub> layer and a phosphosilicate glass layer, so that said first transistor is of depletion type; and
  - a second n-channel insulated-gate field effect transistor disposed on the planar surface of said semiconductor substrate in spaced relation from said first transistor, said second transistor having spaced second source and second drain regions of n-conductivity type in the surface of said substrate, a second channel portion of said substrate intermediate said second source and second drain regions, a second gate insulator layer on said second channel portion and a second gate electrode on said second gate insulator layer, the second gate insulator layer including a first film which has a thickness less 2000 Å and is selected from the group consisting of an SiO<sub>2</sub> film and a composite film of an SiO<sub>2</sub> layer and a phosphosilicate glass layer and a second film Al<sub>2</sub>O<sub>3</sub> which has an effective oxide thickness one-half to five times that of said first film, said second gate insulator layer being capable of inducing holes in the second channel portion, so that said second transistor is of enhancement type; wherein the improvement comprises

isolating film means disposed on a planar surface portion of said semiconductor substrate intermediate said first source and first drain regions of said first transistor and said second source and second drain regions of said second transistor for inducing holes in the surface portion of said substrate, the total effective oxide thickness of said isolating film means being more than two times that of the second gate insulator layer of said second transistor, thereby electrically isolating said first insulated-gate field effect transistor from said second insulated-gate field effect transistor, in which said isolating film means comprises a first film disposed on the surface portion of said substrate and selected from the group consisting of a film of Al<sub>2</sub>O<sub>3</sub> and a film of silicon dioxide formed through thermal decomposition of tetraethoxy silane and a second film disposed on the first film and selected from the group consisting of a film of SiO<sub>2</sub> and a double-layer film consisting of a layer of SiO<sub>2</sub> and a layer of phosphosilicate glass.

#### 4,015,282 SOLID STATE AMPLIFIER DEVICE AND CIRCUIT THEREFOR

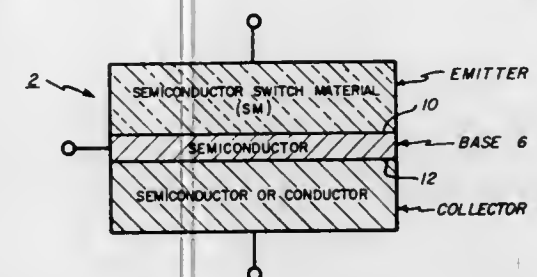
Melvin P. Shaw, Southfield, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 354,687, April 26, 1973, abandoned. This application Mar. 5, 1976, Ser. No. 664,260

U.S. Cl. 357-2

Int. Cl.<sup>2</sup> H01L 45/00

19 Claims



1. A solid state current control device comprising: contiguous interfacing layers of material of alternating conductivity type to form one of a pnp and npn device transistor-like device with emitter, base and collector layer with transistor junctions at their interfaces in the order named, terminal-forming layers for making electrical connection to the emitter and collector layers and terminal means for making electrical connection to said base layer, at least one of the emitter and collector layers being made of a switch material which, when a voltage above a given threshold value is applied to opposite sides thereof, switches from a relatively non-conductive state to a relatively conductive state which is of an opposite conductivity type to that of the base layer at least in the conductive state thereof, substantially decreases from the threshold value when a finite resistance is connected in series therewith, the collector layer being of a material which collects electrical charge carriers directed thereto through the base layer, and said base layer always being of sufficiently high resistance not to short circuit the junction between it and the adjacent layers and being of a thinness to be less than the diffusion length of electrical charge carriers therethrough so the majority carriers of the emitter layer are not substantially neutralized or trapped before reaching the junction between the base and collector layers.

#### 4,015,283 HIGH SPEED ELEMENT OF AN INTEGRATED CIRCUIT WITH A MAJORITY CARRIER JUNCTION HAVING A LARGE CURRENT CAPABILITY

Yutaka Hayashi, Hoya, and Yasuo Tarui, Tokyo, both of Japan, assignors to Kogyo Gijutsuin, Tokyo, Japan

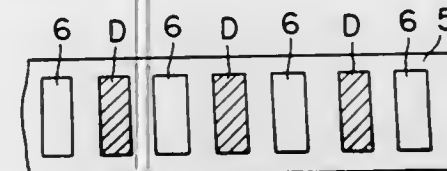
Continuation of Ser. No. 125,789, March 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 809,654, March 24, 1969, abandoned. This application July 25, 1975, Ser. No. 599,083

Claims priority, application Japan, Mar. 25, 1968, 43-18984; Apr. 21, 1968, 43-12973

U.S. Cl. 357-15

Int. Cl.<sup>2</sup> H01L 29/48

6 Claims



1. An element of an integrated circuit comprising a semiconductor body having emitter, base and collector regions of a transistor with collector-base and base-emitter P-N junctions and a majority carrier junction formed on one surface of said

body, said one surface further having an insulating layer thereon; said collector region comprising first and second spaced apart surface portions, said first surface portion being disposed laterally to one side of said base region at said one surface of said body and said second surface portion being continuous with said first portion in said body and disposed laterally to the opposite side of said base region at said one surface of said body, said base region separating said collector region into said first surface portion and said second surface portion at said one surface of said body, said base region being surrounded by said collector region in said body; said majority carrier junction being formed through an opening in said insulating layer by an electrode on said first surface portion of said collector region, an electrode ohmically contacting said base region through an opening in said insulating layer, a collector electrode being formed on said second surface portion of said collector region, an electrical conductor means providing electrical connections to said majority junction, base, collector and emitter electrodes and further effecting a continuous connection of said majority carrier junction electrode and said base electrode, whereby load current capability is improved without increasing storage time of said transistor.

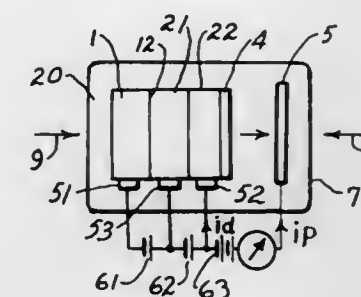
#### 4,015,284 SEMICONDUCTOR PHOTOELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 455,231, March 27, 1974, Pat. No. 3,953,880. This application Jan. 9, 1976, Ser. No. 647,761

U.S. Cl. 357-16

9 Claims



1. A semiconductor photoelectron emission device comprising a p-type GaSb which is a direct transition type semiconductor, a layer of an intrinsic Ga<sub>1-x</sub>Al<sub>x</sub>Sb, wherein x is less than 1, a p-type Ga<sub>1-y</sub>Al<sub>y</sub>Sb layer, wherein y is less than x and larger than 0.4 which is a crossover point x<sub>c</sub>, an alkali metal or alkali metal-oxygen activation layer on the opposite side of said Ga<sub>1-x</sub>Al<sub>x</sub>Sb layer, and means for applying a bias voltage to junctions between said GaSb and Ga<sub>1-x</sub>Al<sub>x</sub>Sb, and between Ga<sub>1-x</sub>Al<sub>x</sub>Sb and Ga<sub>1-y</sub>Al<sub>y</sub>Sb.

#### 4,015,285 METHOD OF RECORDING TELEVISION SIGNALS ON A DATA CARRIER AND A RECORDING OBTAINED BY SAID METHOD

René Romeas, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Jan. 9, 1975, Ser. No. 539,625  
Claims priority, application France, Jan. 11, 1974, 74.01033

Int. Cl.<sup>2</sup> H04N 5/76

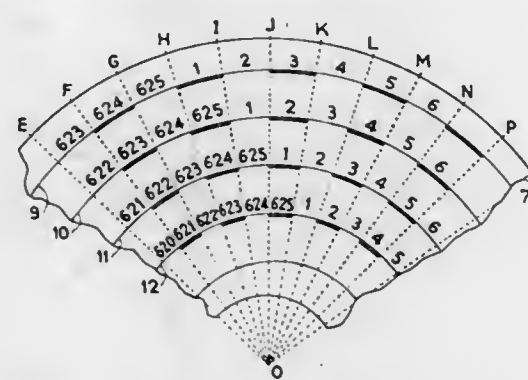
U.S. Cl. 358-4

12 Claims

1. A method of recording a color television signal at the surface of a rotatable data carrier, said signal comprising a sequence of items respectively carrying video information pertaining to the successive scan lines of a television image, said sequence having alternate lines with alternate color



phase, said method comprising the steps of: rotating said record carrier at uniform speed; recording said items in the form of a track made of successive turns lying in said surface; splitting each said turns into N successive equal sections of a revolution of said data carrier, and respectively storing said sequence of items within said successive equal sections; two



items of said sequence stored along immediately adjacent turns and located within one of said successive equal sections being separated from one another by an odd number of intermediate items; N being an even integer differing by an integer from the number of said scan lines in one frame of said color television signal; said uniform speed being adjusted for making said items register with said equal sections.

4,015,286

## DIGITAL COLOR TELEVISION SYSTEM

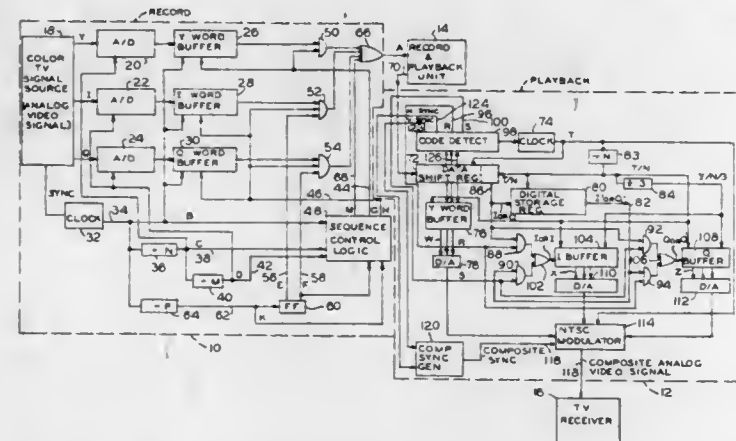
James T. Russell, Richland, Wash., assignor to Eli S. Jacobs, New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,361

Int. Cl.<sup>2</sup> H04N 5/86, 9/34

U.S. Cl. 358-13

14 Claims



1. A digital color television system comprising: input means for supplying a digital video color television line signal including a luminance signal component and two different chrominance signal components, said input means including a plurality of digital storage means for storing said digital line signal components so that said two chrominance components are each stored in different storage means;

gate means connected to the outputs of said plurality of storage means, and including control logic means for selectively transmitting said television line signal components through said gate means so that altered digital television line signals are produced at the output of the gate means which each include a luminance component and only one of said two chrominance components with said two chrominance components alternating in successive television line signals;

said gate means causing chrominance component words and corresponding luminance component words to be provided in the altered digital line signal at positions adjacent each other, each of said words being shorter than one television line, so that successive luminance words in the same television line are separated by the chrominance words in an alternating manner;

digital delay means for delaying the chrominance components of the altered digital television line signals to produce delayed digital chrominance components at the output of said delay means; and output means for combining the delayed chrominance components with components of said altered line signals to produce a television line signal output including a luminance component and two different chrominance components at least one of which was obtained from an altered line signal other than that from which its luminance component was obtained.

4,015,287

## COLOR TELEVISION RECEIVER INCLUDING A CHROMINANCE SUBCARRIER REGENERATOR

Paulus Joseph Maria Hovens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

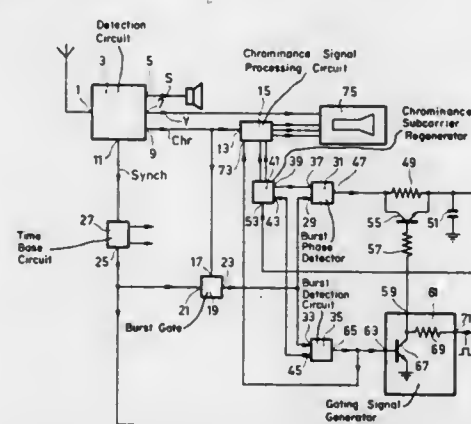
Filed Feb. 2, 1976, Ser. No. 654,556

Claims priority, application Netherlands, Feb. 25, 1975, 7502200

Int. Cl.<sup>2</sup> H04N 9/44

U.S. Cl. 358-17

1 Claim



1. A colour television receiver including a chrominance subcarrier regenerator having a phase control circuit comprising a filter having a resistor and a capacitor incorporated between an output of a burst phase detector and a control signal input of the regenerator, the time constant of said filter being switchable by means of an output signal from a burst detection circuit, characterized in that a transistor is arranged in parallel with at least part of the resistor, the base of said transistor being coupled to an output of a gating signal generator, an input of said gating signal generator being coupled to an output of the burst detection circuit and a further input being coupled to an output of a pulse generator so that in a non-synchronised state of the regenerator a gating signal occurs at the base of the transistor resulting in the said part of the resistor being substantially shunted by the transistor during the occurrence of the burst.

4,015,288

## WRITE CLOCK GENERATOR FOR DIGITAL TIME BASE CORRECTOR

Norio Ebihara, and Mitsushige Tatami, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 658,087

Claims priority, application Japan, Feb. 17, 1975, 50-19597

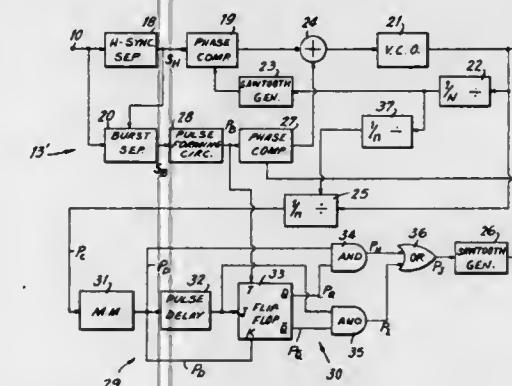
Int. Cl.<sup>2</sup> H04N 1/28

U.S. Cl. 358-19

9 Claims

1. A write clock generator for a digital time base corrector employed for removing time base errors from information signals containing first and second reference signals respectively having different standard frequencies and which may have varying time relations to each other; said write clock generator comprising a voltage controlled oscillator for producing a write clock pulse with a center frequency which is a first multiple of the standard frequency of said first reference signal and a second multiple of the standard frequency of said

second reference signal, first and second dividers receiving said write clock pulse and dividing the latter by said first and second multiples, respectively, for providing first and second divided outputs, first and second separators for separating said first and second reference signals, respectively, from the information signals, first phase comparing means receiving the separated first reference signal and said first divided output for producing a first control voltage corresponding to the phase difference therebetween, signal generating means receiving said second divided output and producing at least first and second trains of pulses at the frequency of said second



divided output and having different phases from each other, signal selecting means responsive to the separated second reference signal for selecting the one of said trains of pulses which is substantially out of phase in respect to said separated second reference signal, second phase comparing means receiving said separated second reference signal and the selected one of said trains of pulses for producing a second control voltage corresponding to the phase difference therebetween, and means for combining said first and second control voltages so as to control said voltage controlled oscillator therewith.

4,015,289

## VIDEO DISC RECORDING AND/OR REPRODUCING APPARATUS WITH A SINGLE TRANSDUCER HEAD

Hisao Kinjo; Fumio Akiwa, and Yasuo Haneji, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Continuation of Ser. No. 423,677, Dec. 11, 1973, abandoned.

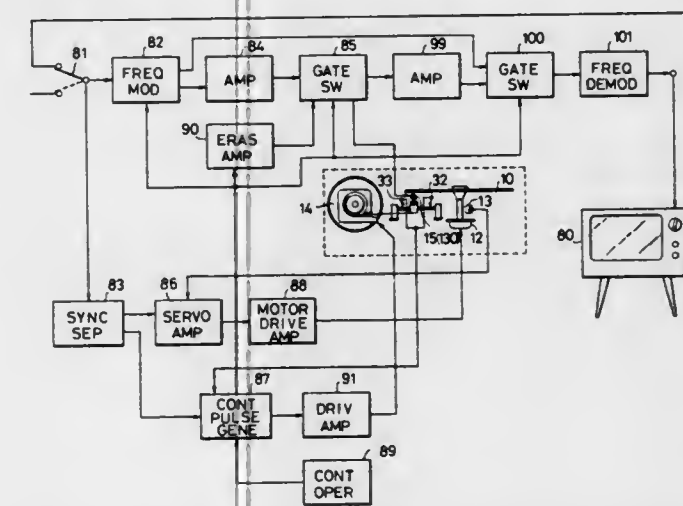
This application June 20, 1975, Ser. No. 588,769

Claims priority, application Japan, Dec. 12, 1972, 47-124600; Dec. 12, 1972, 47-124601; Dec. 29, 1972, 48-1540; Dec. 30, 1972, 48-3198

Int. Cl.<sup>2</sup> H04N 5/795; G11B 21/08

U.S. Cl. 360-11

4 Claims



1. A recording and/or reproducing apparatus comprising a rotating disc recording medium having a recording surface; means for rotating said medium at a predetermined speed and in synchronization with synchronizing signals sup-

plied thereto during the recording and reproducing modes;

single signal transducing head means for recording and reproducing on said surface an input video signal including cyclically recurring vertical blanking periods, said video signals being recorded in each of a plurality of concentric tracks, each with a successive field recorded thereon;

single step driving means operated responsive to each of said synchronizing signals and each of said vertical blanking periods for intermittently moving said single signal transducing head means step-by-step, said driving means moving said single signal transducing head means from an outer periphery toward an inner periphery of said medium, stopping at each track in a first set of concentric tracks, said driving means reversing the moving direction of the single signal transducing head means responsive to its reaching a given circular track at said inner periphery, and said driving means thereafter intermittently moving the single signal transducing head means step-by-step from the inner periphery toward the outer periphery of the medium, said single signal transducing head means stopping at each track in a second set of concentric tracks, each of said second set of tracks being located midway between corresponding ones of the first set of concentric tracks, said driving means again reversing the moving direction of the single signal transducing head means responsive to its reaching a given circular track at said outer periphery, said single signal transducing head means being moved only in each of said vertical blanking periods;

means effective after each of the steps and during recording for applying said video signals to said single signal transducing head means, said video signal being applied to said single transducing head means by said signal applying means with one complete field being recorded as a unit on each of said tracks;

means effective after each of the steps during reproducing for stepping said single signal transducing head means during a period corresponding to a vertical blanking period and for reproducing the previously recorded video information signal during the period when said single signal transducing head means is stopped;

gate means for removing from the video signal reproduced by said single signal transducing head means that part of each field of signals which substantially corresponds to the period during which said single signal transducing head means steps and for passing the remaining part of said video signal;

means for generating a new vertical synchronizing signal responsive to synchronizing signals continuously supplied from an outside source, said new vertical synchronizing signal corresponding to the vertical synchronizing signal of said video signal reproduced by said signal transducing head means; and

means for inserting the new vertical synchronizing signal into a part of the reproduced video signal which has passed through the gate means in each field of said video signal.

4,015,290

## LOW POWER RECORDING INSTRUMENT WITH TWO OR MORE TRACKS

Jack R. Bowers, Petersburg, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

Filed July 31, 1975, Ser. No. 600,871

Int. Cl.<sup>2</sup> G11B 5/02, 5/44

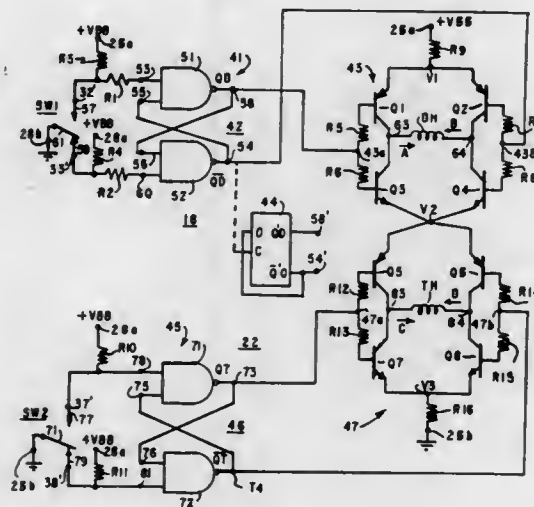
U.S. Cl. 360-63

15 Claims

1. In a recording device including a plurality of recording heads for data recording purposes, a recorder circuit for controlling the energization of said recording heads comprising a plurality of switching circuits, each of which has an input terminal and an output terminal and each of which includes



switching means operable to a first state to connect an associated one of said recording heads to its input and output terminals to provide current flow over said recording head in a first direction and operable to a second state to connect the associated recording head to its input and output terminals to provide current flow over said head in a second direction, said plurality of switching circuits being connected in series to enable the switching means for said plurality of switching



circuits to provide a series circuit path including said plurality of recording heads between a first terminal of one of said switching circuits and a second terminal of another one of said switching circuits, and means for connecting said first and second terminals to respective first and second outputs of a current source to provide current flow over each of said heads in said series circuit path with the direction of current flow over each head being determined by the state of the switching means for such head.

4,015,291

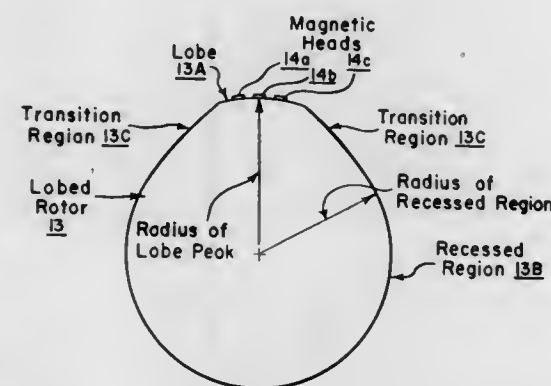
**FLYING HEAD HELICAL SCAN MAGNETIC RECORDING DEVICE EMPLOYING A LOBED ROTOR**  
Peter Alan Stevenson, and Stephen Martin Vogel, both of Boulder, Colo., assignors to International Business Machines Corporation, New York, N.Y.

Filed Sept. 3, 1975, Ser. No. 609,915

Int. Cl.<sup>2</sup> G11B 5/60, 21/20, 15/64

U.S. Cl. 360-102

9 Claims



1. In a helical scan magnetic recording device of the type comprising a tape source; a mandrel having a cylinder axis for supporting a helical wrap of magnetic tape at a substantially constant radial distance from said axis; a rotor positioned along said axis at a location radially within said helical wrap of tape for carrying about said axis at least one magnetic head in

scanning adjacency to said tape along a path which is slanted with respect to the length of said tape; means for generating an air bearing for supporting said tape above said rotor; and a tape sink, the improvement wherein said rotor has a periphery characterized by:

- at least one lobe peak comprising a circumferential region of maximum radial displacement from said axis extending radially beyond the mandrel surface for carrying at least one mandrel head; and
- a recessed circumferential region which is recessed radially inwardly towards said axis by a distance sufficient to substantially preclude aerodynamic interaction between the recessed region of the rotor periphery and said magnetic tape.

4,015,292

**ROTATABLE MULTIFACETED TAPE GUIDE FOR USE IN A CASSETTE**

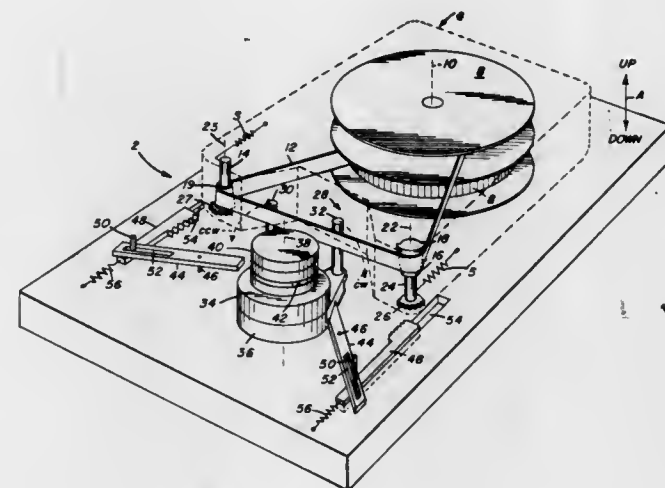
Thomas G. Kirn, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1975, Ser. No. 606,995

Int. Cl.<sup>2</sup> G11B 23/04, 5/52, 15/66

U.S. Cl. 360-130

12 Claims



1. For use in a tape cassette of the type having first and second rotatable reels, said cassette being useful with a helical scan recorder, and said cassette having a window out of which tape may be withdrawn and helically wrapped around a recording drum, the cassette further having at least one guide post disposed in the path of travel of the tape as it passes from one of the reels to the other, the improvement:

- Wherein the post comprises first and second guiding surfaces provided on said post, said first surface being part of a cylinder and said second surface being part of a cone, said post being mounted for rotation within said cassette and being so oriented that tape passes around said second surface when the tape is not withdrawn out of the cassette window; and
- wherein said cassette includes means for rotating the first surface of said post into guiding contact with said tape when said tape is withdrawn through the cassette window.

4,015,293

**CUTAWAY TAPE GUIDE FOR SELECTIVELY COOPERATING WITH A CAPSTAN AND GUIDING A TAPE**

Douglass L. Blanding, Leroy, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1975, Ser. No. 607,001

Int. Cl.<sup>2</sup> G11B 23/04, 15/66, 5/52

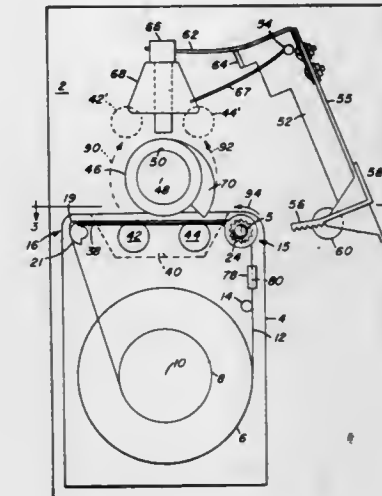
U.S. Cl. 360-130

11 Claims

1. For use in a cassette of the type adapted for cooperation with a helical scan recorder having a rotatable capstan for driving a tape, the cassette having first and second coaxial reels and a window out of which the tape may be withdrawn and helically wrapped around a recording drum, the cassette further having at least one guide post disposed in the path of travel of the tape as it passes from one of the reels to the other, the improvement:

- wherein the post comprises a guiding surface provided on said post for guiding the tape between the first and second reels when the tape is not withdrawn out of the cassette window, said post having a cavity therewithin and a cut-away sidewall exposing said cavity, whereby the capstan of said recorder may be freely received within said cavity and exposed through said cut-away sidewall; and

- wherein said cassette includes means for rotating said guiding surface of said post away from guiding contact with said tape whereby said tape may ride against the capstan disposed within said post cavity.





# DESIGN PATENTS

GRANTED MARCH 29, 1977

## ERRATA

For CLASS	See PATENT NO.
023-163.....	243,856
013-010.....	243,858
013-010.....	243,859
014-005.....	243,860
014-068.....	243,861
011-145.....	243,869
011-026.....	243,870
015-147.....	243,881
024-007.....	243,882
024-033.....	243,885
028-007.....	243,886
008-351.....	243,887
028-049.....	243,890

# DESIGNS

MARCH 29, 1977

243,801

## DRESS ENSEMBLE

Jerrine Bourne Wilson, P.O. Box 155, Petal, Miss. 39465

Filed Jan. 8, 1975, Ser. No. 539,548

Term of patent 14 years

Int. Cl. D2-02

U.S. Cl. D2-125



243,802

## YARN HOLDER

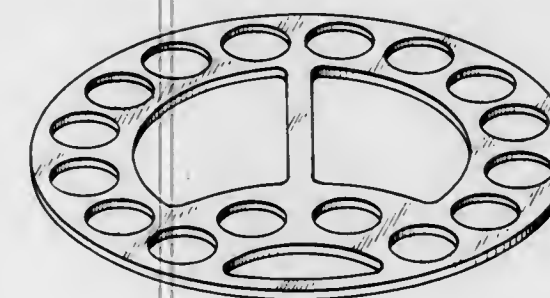
Sylvia L. Samet, 910 Parkwood Circle, P.O. Box 2012, High Point, N.C. 27261

Filed Sept. 8, 1975, Ser. No. 611,184

Term of patent 14 years

Int. Cl. D15-06

U.S. Cl. D3-19 R



243,803

## TABLE

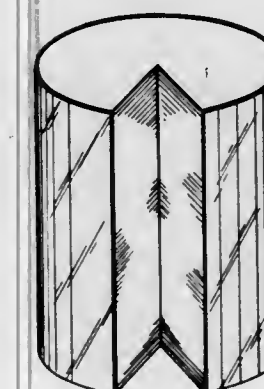
Janet Schwietzer, New York, N.Y., assignor to The Pace Collection Inc., New York, N.Y.

Filed Jan. 23, 1975, Ser. No. 543,373

Term of patent 14 years

Int. Cl. D6-03

U.S. Cl. D6-27



243,804

## GARMENT RACK

Ray L. Underwood, 921 Schuyler St., Milford, Mich. 48042,

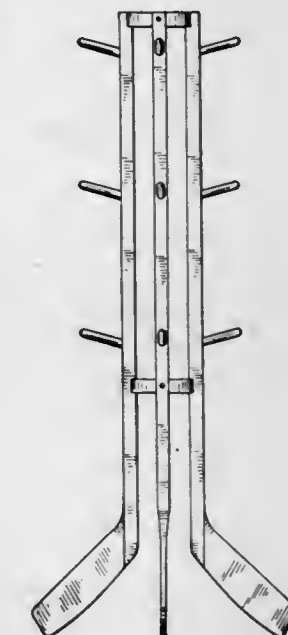
and Herbert Eschendal, 4400-6 Elizabeth Lake Road, Pontiac, Mich. 48054

Filed Aug. 11, 1975, Ser. No. 603,691

Term of patent 14 years

Int. Cl. D6-04

U.S. Cl. D6-29



243,805

## CHAIR

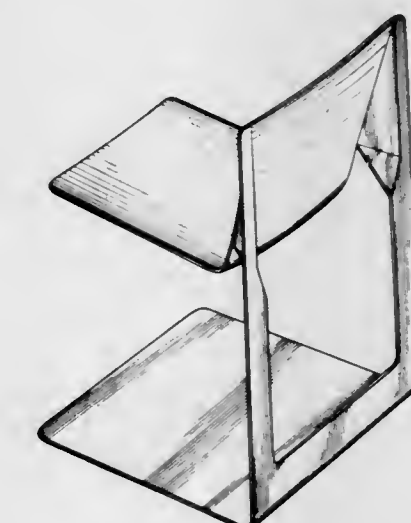
Eric Laroye, Koningstraat 14, Bus 2, Oostende, Belgium

Filed June 12, 1975, Ser. No. 586,340

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-30

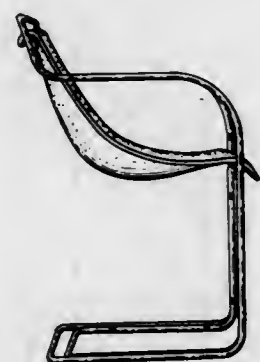




243,806  
CHAIR

Ernesto Radaelli, Gallarate, Italy, assignor to Fratelli Saporiti, Hal Hendrixson, 11645 Logan St., Denver, Colo. 80233  
Besnate (Varese), Italy  
Filed Mar. 18, 1975, Ser. No. 559,446  
Claims priority, application Italy, Sept. 19, 1974, 60917/74  
Term of patent 14 years  
Int. Cl. D6-01

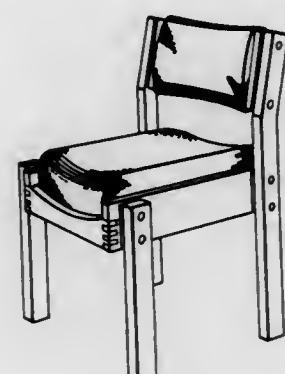
U.S. Cl. D6-56



243,807  
CHAIR

Alvin Earl Palmer, Fresno, Calif.  
Filed July 31, 1975, Ser. No. 600,716  
Term of patent 14 years  
Int. Cl. D6-01

U.S. Cl. D6-78



243,808

HANGING CONTAINER FOR POTTED PLANTS  
Richard K. Helm, P.O. Box 287, Polson, Mont. 59860  
Filed Nov. 19, 1975, Ser. No. 633,269  
Term of patent 14 years  
Int. Cl. D6-04

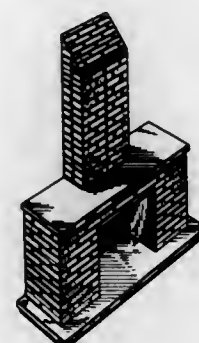
U.S. Cl. D6-113



243,809  
BAR OR SIMILAR ARTICLE

Hal Hendrixson, 11645 Logan St., Denver, Colo. 80233  
Filed Dec. 18, 1974, Ser. No. 534,081  
Term of patent 14 years  
Int. Cl. D6-04

U.S. Cl. D6-144

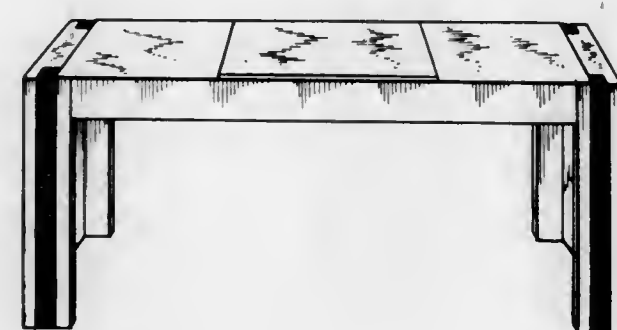


243,810  
TABLE

Vittorio Introini, Gallarate, Italy, assignor to Fratelli Saporiti, Besnate (Varese), Italy  
Filed Mar. 18, 1975, Ser. No. 559,449  
Claims priority, application Italy, Sept. 19, 1974, 60920/74; Sept. 19, 1974, 60919/74; Sept. 19, 1974, 60923/74; Sept. 19, 1974, 60924/74

Term of patent 14 years  
Int. Cl. D6-03

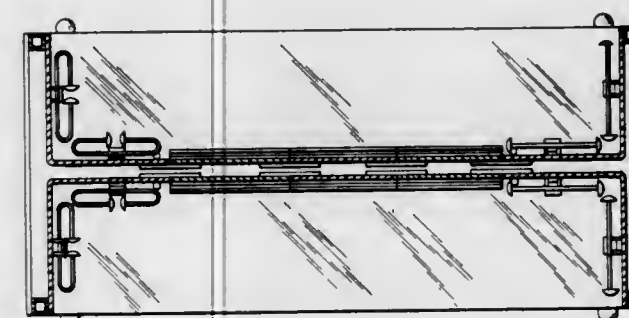
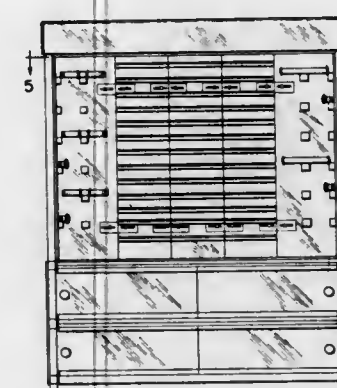
U.S. Cl. D6-177



243,811  
JEWELRY DISPLAY CABINET

Gerry Hansen, Glen Ridge, N.Y., assignor to Richton International Corporation  
Filed Nov. 17, 1975, Ser. No. 632,711  
Term of patent 14 years  
Int. Cl. D20-02

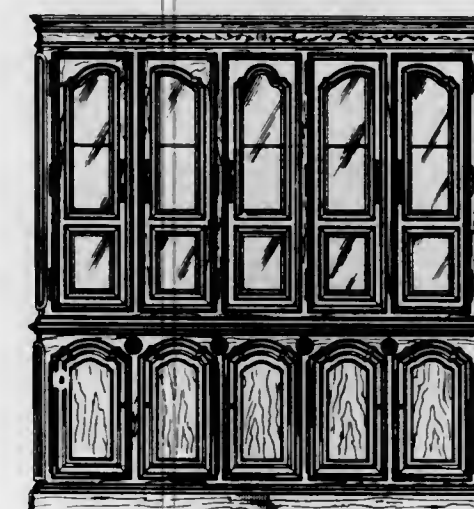
U.S. Cl. D6-172



243,812  
CREDENZA

Marion Pratt, 1027 Eastchester, High Point, N.C. 27260  
Filed June 13, 1975, Ser. No. 586,559  
Term of patent 3½ years  
Int. Cl. D6-04

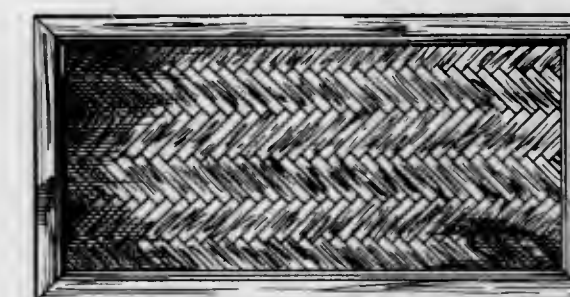
U.S. Cl. D6-172



243,813  
TABLE

Marion Pratt, 1027 E. Chester Drive, High Point, N.C. 27260  
Filed Dec. 9, 1975, Ser. No. 640,232  
Term of patent 3½ years  
Int. Cl. D6-03

U.S. Cl. D6-177



243,814

ADJUSTABLE CHAIR FRAME  
Jose Figueras Mitjans, Calle Muntaner 515, Barcelona, Spain  
Filed Apr. 24, 1975, Ser. No. 571,356  
Term of patent 14 years  
Int. Cl. D6-06

U.S. Cl. D6-192

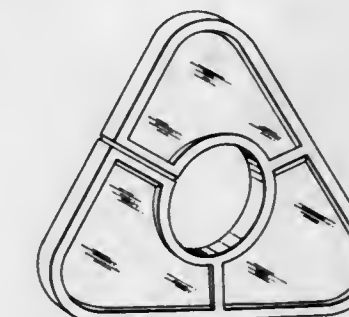


243,815

WARDROBE SYSTEMIZER DEVICE  
Franklin H. Henry, 1431 Prentice Drive, Healdsburg, Calif. 95448

Filed Dec. 22, 1975, Ser. No. 642,725  
Term of patent 14 years  
Int. Cl. D6-08

U.S. Cl. D6-257





243,816

## BEVERAGE GLASS OR SIMILAR ARTICLE

Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 424,354, Dec. 13, 1973. This application

Feb. 24, 1975, Ser. No. 552,374

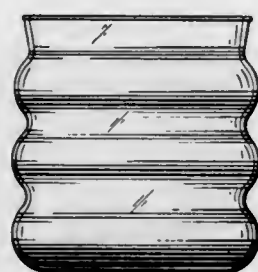
The portion of the term of this patent subsequent to Sept. 30, U.S. Cl. D7-153

1989, has been disclaimed.

Term of patent 14 years

Int. Cl. D7-01

U.S. Cl. D7-15



243,818

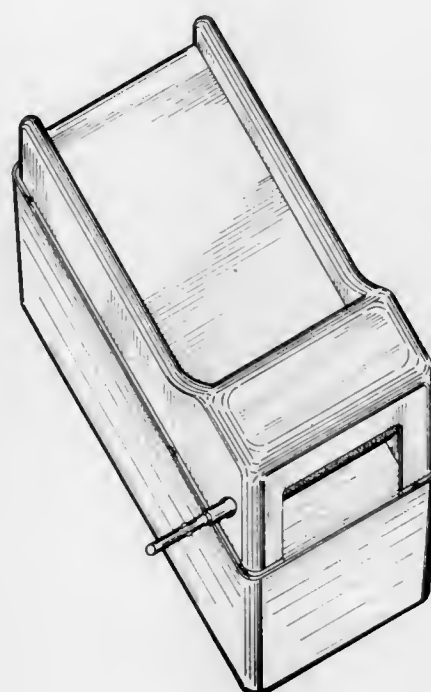
## GREEN BEAN AND PEA SHELLER

Charles E. Bottcher, Redbud Road, Oneonta, Ala. 35121

Filed July 9, 1975, Ser. No. 594,215

Term of patent 14 years

Int. Cl. D7-04



243,819

## CAN OPENER

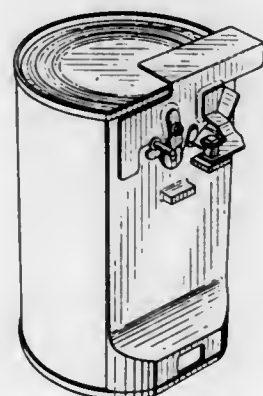
Donald Lee Avise, Kansas City; David Edgar Keepper, Lee's Summit, both of Mo., and Lewis Aaron Mendelson, Overland Park, Kans., assignors to Dazey Products Company, Kansas City, Mo.

Filed Jan. 7, 1976, Ser. No. 647,052

Term of patent 14 years

Int. Cl. D7-99

U.S. Cl. D8-36



243,817

## DRINKING STRAW

Robert K. Cloyd, 1309 Middleneck Drive, Apt. F, Salisbury, Md. 21801

Filed May 21, 1975, Ser. No. 579,586

Term of patent 14 years

Int. Cl. D7-06

U.S. Cl. D7-42



243,820

## EXTENSION ARM FOR A VISE

Ronald Price Hickman, Waltham Abbey, England, assignor to Hickman Designs Limited

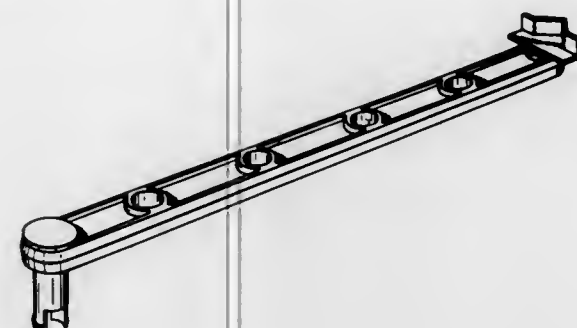
Filed Dec. 3, 1975, Ser. No. 637,158

Claims priority, application Canada, Oct. 9, 1975, 0910752

Term of patent 14 years

Int. Cl. D8-05

U.S. Cl. D8-74



243,821

## WALL PLATE

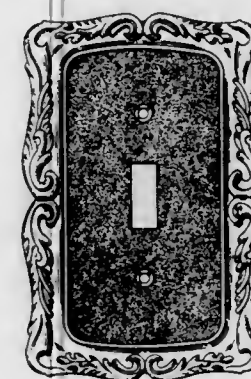
Joan Grieb, Westfield, N.J., assignor to General Electric Company

Filed Oct. 20, 1975, Ser. No. 624,085

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-350



243,822

## WALLPLATE

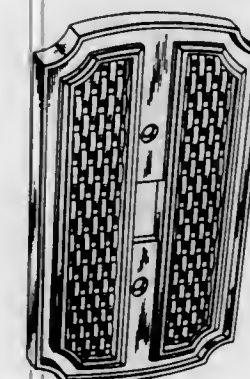
Joan Grieb, Westfield, N.J., assignor to General Electric Company

Filed Sept. 16, 1975, Ser. No. 613,826

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-351



243,823

## WALL PLATE

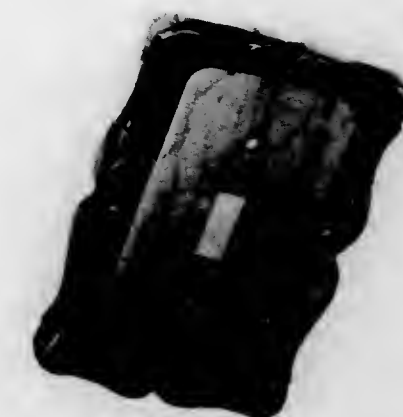
Joan Grieb, Westfield, N.J., assignor to General Electric Company

Filed Oct. 20, 1975, Ser. No. 624,073

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-351



243,824

## WALL PLATE

Leonard Fine, Brooklyn, N.Y., assignor to General Electric Company

Filed Oct. 20, 1975, Ser. No. 624,077

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-353



243,825

## WALL PLATE-BUTCHER BLOCK

Monte L. Levin, New York, N.Y., assignor to General Electric Company

Filed Oct. 20, 1975, Ser. No. 624,034

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-351





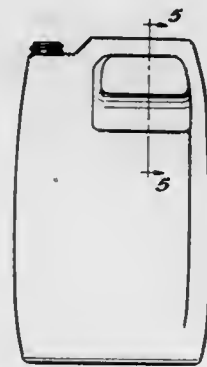
243,826

## BOTTLE OR SIMILAR ARTICLE

Wayne R. Hutter, and John Andrew Miller, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1975, Ser. No. 608,861  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-53



243,828

## BOTTLE OR SIMILAR ARTICLE

Salvatore Ruriani, Elmira, N.Y., assignor to Lever Brothers Company, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,765  
The portion of the term of this patent subsequent to Nov. 9, 1990, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-149



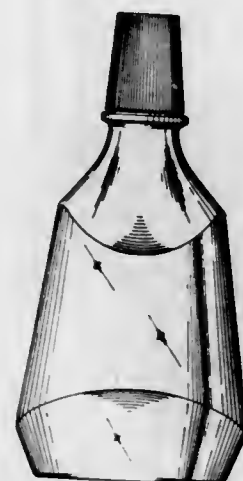
243,827

## BOTTLE OR SIMILAR ARTICLE

Salvatore Ruriani, Elmira, N.Y., assignor to Lever Brothers Company, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,764  
The portion of the term of this patent subsequent to Nov. 9, 1990, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-149



243,829

## BOTTLE OR SIMILAR ARTICLE

Salvatore Ruriani, Elmira, N.Y., assignor to Lever Brothers Company, New York, N.Y.

Filed May 8, 1975, Ser. No. 575,766  
The portion of the term of this patent subsequent to Nov. 9, 1990, has been disclaimed.  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-149



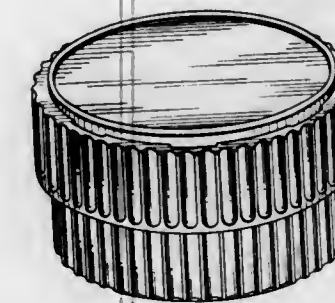
243,830

## CLEANING COMPOSITION CONTAINER

David A. Jones, Dayton, and Philip R. Goyert, Cincinnati, both of Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed Nov. 11, 1975, Ser. No. 630,824  
Term of patent 14 years  
Int. Cl. D9-01

U.S. Cl. D9-157



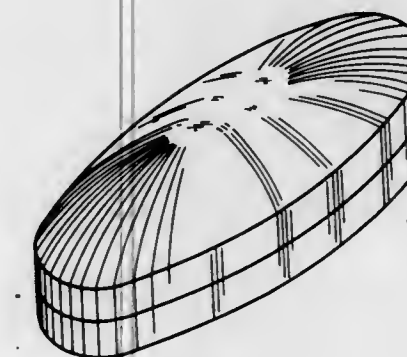
243,831

## COMPARTMENTED CONTAINER

Russell Frederick Lehn, Lake County, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 16, 1975, Ser. No. 541,682  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-184



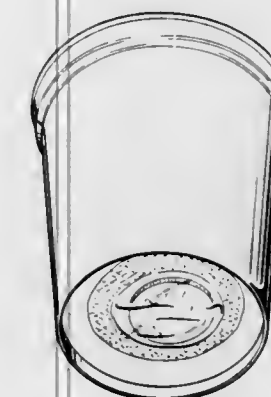
243,832

## COMBINED CUP AND TOKEN OR THE LIKE

Andrew P. Shveda, New Canaan, Conn., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 1, 1974, Ser. No. 519,819  
Term of patent 14 years  
Int. Cl. D9-03

U.S. Cl. D9-193



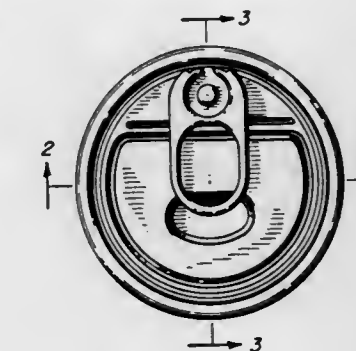
243,833

## END CLOSURE FOR A CONTAINER

Herman Rupert Markert, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Dec. 11, 1975, Ser. No. 639,785  
Term of patent 14 years  
Int. Cl. D9-07

U.S. Cl. D9-255



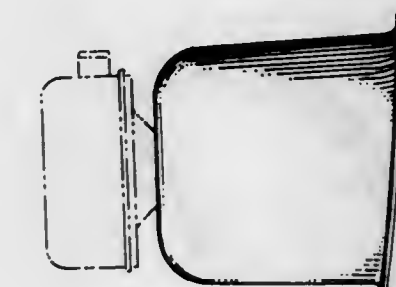
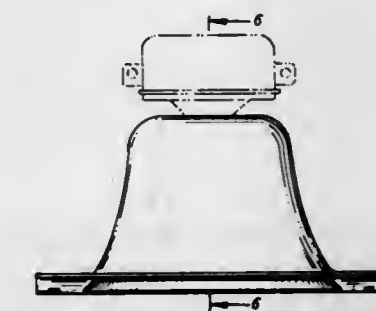
243,834

## SIREN HORN HOUSING

Harry A. Leeder, Skaneateles, N.Y., assignor to R. E. Dietz Company, Syracuse, N.Y.

Filed June 23, 1975, Ser. No. 589,249  
Term of patent 14 years  
Int. Cl. D10-06

U.S. Cl. D10-120





243,835

## HEIGHT MEASURING DEVICE

William Y. Hutchinson, Chicago, and Walter P. Kushmuk, Niles, both of Ill., assignors to Continental Scale Corporation, Bridgeview, Ill.

Filed Aug. 13, 1975, Ser. No. 604,359

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-71



243,837

## DUCTED FAN AIRCRAFT

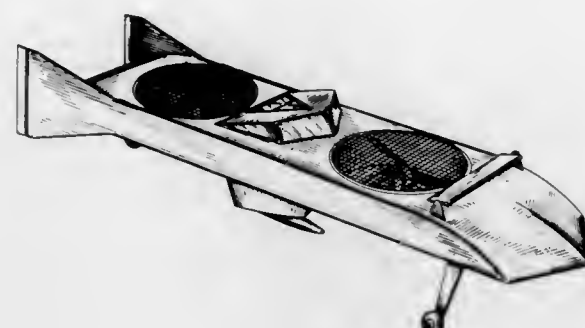
James T. Adams, 320 Murray Drive, Apt. A, King of Prussia, Pa. 19406

Filed Mar. 25, 1976, Ser. No. 670,144

Term of patent 14 years

Int. Cl. D12-07

U.S. Cl. D12-79



243,838

## AUTOMOBILE BODY

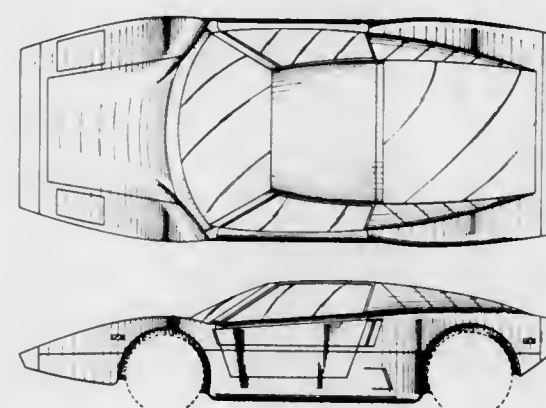
Lewis G. Peterson, 137 W. 80th St., New York, N.Y. 10024

Filed Dec. 1, 1975, Ser. No. 636,559

Term of patent 14 years

Int. Cl. D12-08

U.S. Cl. D12-91



243,836

## BRACELET

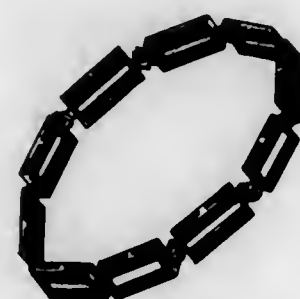
Alfred Joseph Durante, Forest Hills, N.Y., assignor to Cartier, Inc., New York, N.Y.

Filed Oct. 6, 1975, Ser. No. 620,067

Term of patent 14 years

Int. Cl. D11-01

U.S. Cl. D11-12



243,839

## SPARE TIRE MOUNT FOR TRAILERS

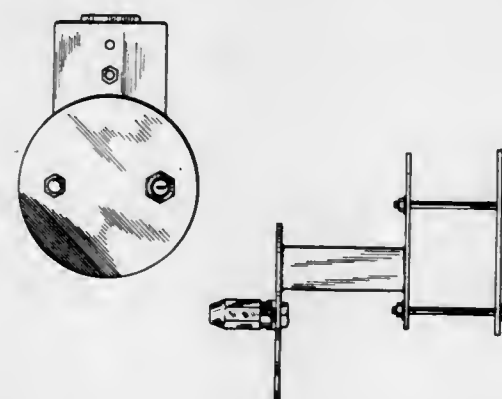
James A. Driscoll, 1219 Garfield, Sand Springs, Okla. 74063

Filed Oct. 14, 1975, Ser. No. 622,100

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-202



243,840

## VISOR FOR VEHICLES OR THE LIKE

Rickey W. Gafnea, 1643 Cherry Ave., Long Beach, Calif. 90813

Filed June 30, 1975, Ser. No. 591,849

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-191



243,842

SPRAY ETCHER FOR WORK PIECES IN WHICH THE WORK PIECES FIRST MOVE INTO THE ETCHER IN ONE DIRECTION AND THEN LEAVE THE ETCHER IN A REVERSE DIRECTION

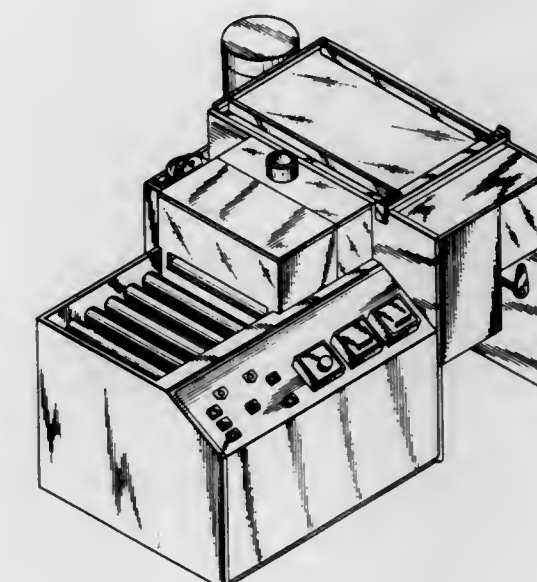
Burke Leon, Phoenix; Victor Johansen, Tempe; Peter Rose, Phoenix, and Gary Rolih, Tempe, all of Ariz., assignors to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.

Filed Oct. 20, 1975, Ser. No. 623,742

Term of patent 14 years

Int. Cl. D15-99

U.S. Cl. D15-199



243,841

## SEWING MACHINE

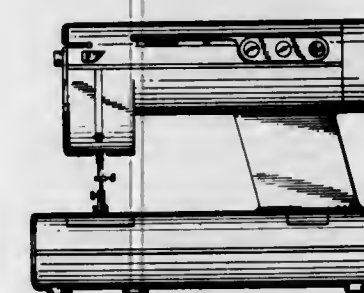
Tibor Arvai, Paris, France, assignor to Tokyo Juki Kogyo Kabushiki Kaisha, Chofu, Japan

Filed Aug. 25, 1975, Ser. No. 607,813

Term of patent 14 years

Int. Cl. D15-06

U.S. Cl. D15-69



243,843

## TOOTH FOR POWER DIGGER

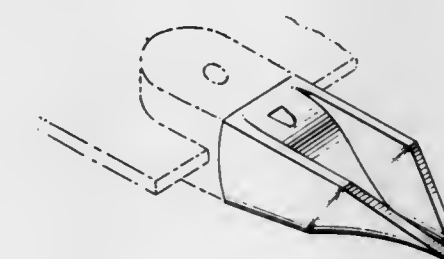
Gerald D. Edwards, Rte. 1, Box 15-A, Dubberly, La. 71024

Filed Aug. 13, 1975, Ser. No. 604,476

Term of patent 14 years

Int. Cl. D15-04

U.S. Cl. D15-29





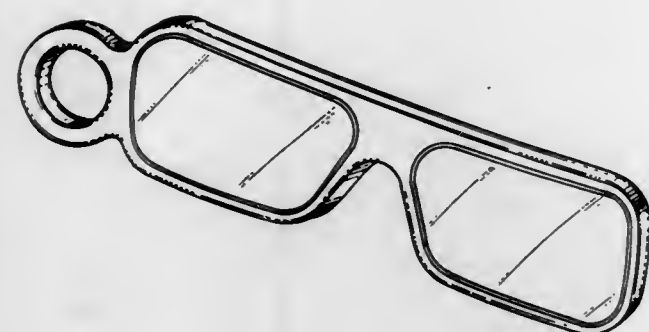
243,844

## PAIR OF EYEGLASSES

Elinor B. Petschnikoff, Newport Beach, Calif., assignor to Beverly L. Ricono, a part interest  
 Filed Nov. 24, 1975, Ser. No. 634,937

Term of patent 14 years  
 Int. Cl. D16-06

U.S. Cl. D16-64



243,846

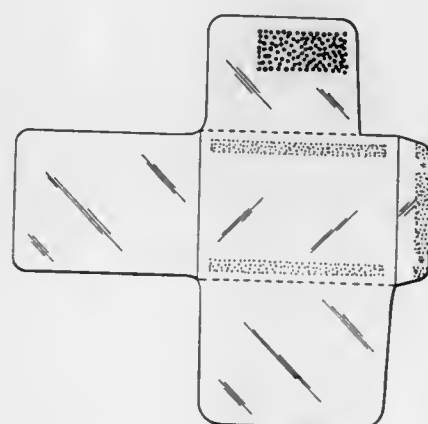
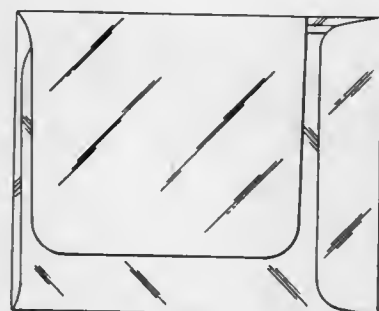
## ENVELOPE

Charles S. Watson, Glen Ridge, N.J., assignor to Berlin & Jones Company, Inc., East Rutherford, N.J.  
 Filed May 12, 1975, Ser. No. 576,552

The portion of the term of this patent subsequent to Jan. 27, 1990, has been disclaimed.

Term of patent 14 years  
 Int. Cl. D19-01

U.S. Cl. D19-3



243,847

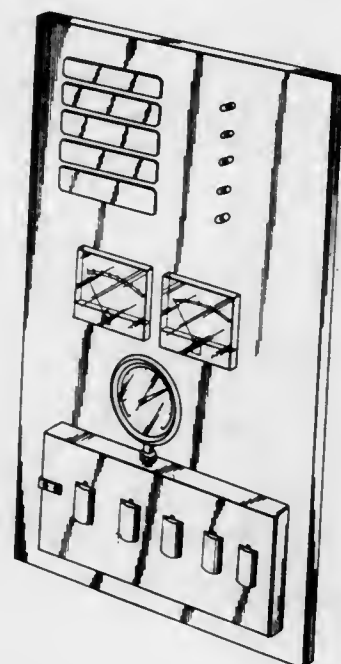
## BATTERY COMPARATOR EDUCATIONAL BOARD

Jack N. Holcomb, P.O. Box 23130, Fort Lauderdale, Fla. 33307

Filed Oct. 15, 1974, Ser. No. 514,896  
 Term of patent 14 years

Int. Cl. D19-07

U.S. Cl. D19-64



243,845

## EYEGLASS FRAME

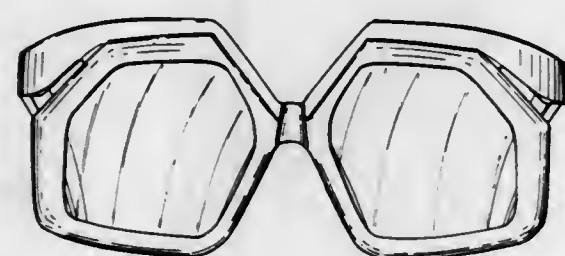
Elfriede Teufelhart, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France

Filed Oct. 21, 1975, Ser. No. 624,326

Term of patent 14 years

Int. Cl. D16-06

U.S. Cl. D16-65



243,848

## CIGAR-SHAPED FISHING LURE

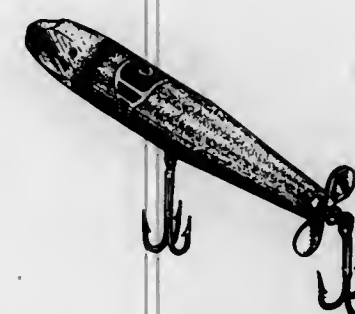
Benjamin W. Price, P.O. Drawer 16875, Jacksonville, Fla. 32216

Filed Mar. 15, 1976, Ser. No. 666,927

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D22-27



243,850

## DISPENSER FOR A TOILET BOWL DISINFECTANT

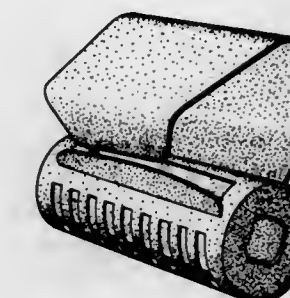
Richard L. Davenport, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed June 11, 1976, Ser. No. 695,235

Term of patent 14 years

Int. Cl. D23-04

U.S. Cl. D23-150



243,851

## VENTILATOR

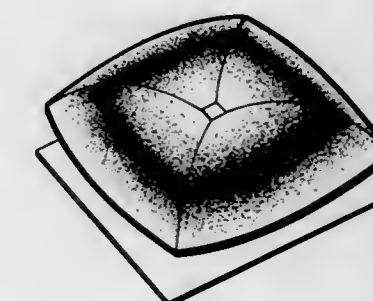
John V. Felter, P.O. Box 7464, Houston, Tex. 77008

Filed June 11, 1975, Ser. No. 585,964

Term of patent 14 years

Int. Cl. D23-04

U.S. Cl. D23-153



243,849

## COMBINATION BATHTUB AND SHOWER STALL

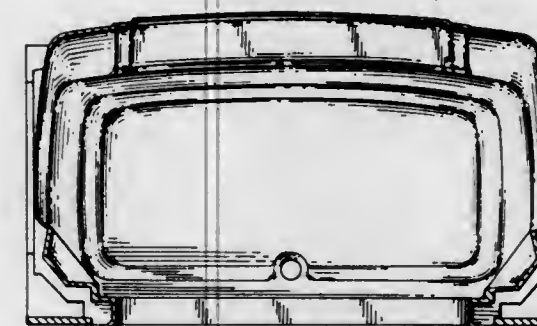
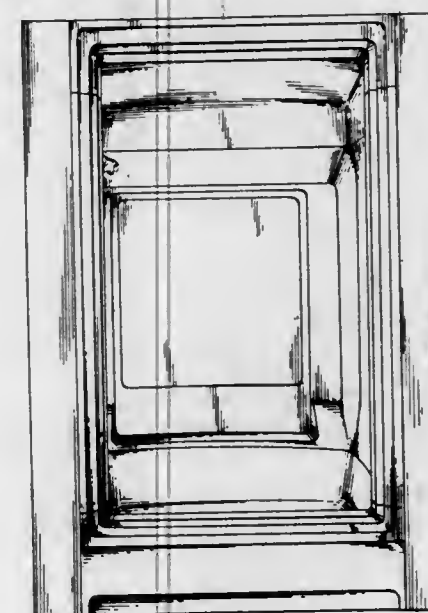
Merritt W. Seymour, Sylvania, and David D. Tompkins, Columbus, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 6, 1975, Ser. No. 620,485

Term of patent 14 years

Int. Cl. D23-02

U.S. Cl. D23-49



243,852

## CHIMNEY COWL

Roger Ouimet, 164 Bellevue Street, Sherbrooke, Quebec, and Clermont Lessard, R.R. No. 1, St-Elie d'Orford, Quebec, both of Canada

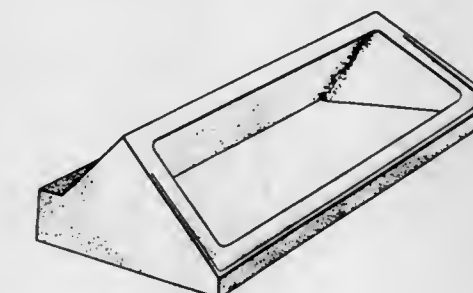
Filed July 21, 1975, Ser. No. 597,881

Claims priority, application Canada, Feb. 11, 1975, 1102754

Term of patent 14 years

Int. Cl. D23-04, 01

U.S. Cl. D23-154





243,853

**ROOF SCREEN SUPPORT SYSTEM**

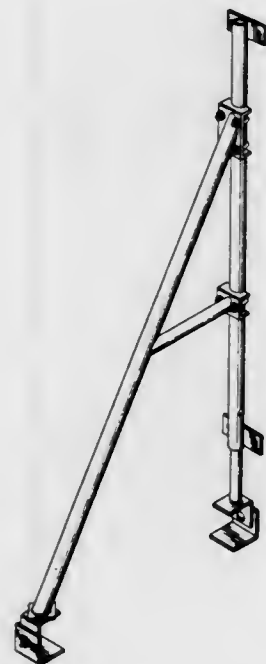
Olgierd Z. Ejchorszt, 5580 Vesuvian Walk, Long Beach, Calif. 90803

Filed June 9, 1975, Ser. No. 585,090

Term of patent 14 years

Int. Cl. D25-02

U.S. Cl. D25-43



243,855

**BUILDING BRICK**

Paul Thomas Hynes, 9 Trevor St., Ulverstone, Tasmania, Australia

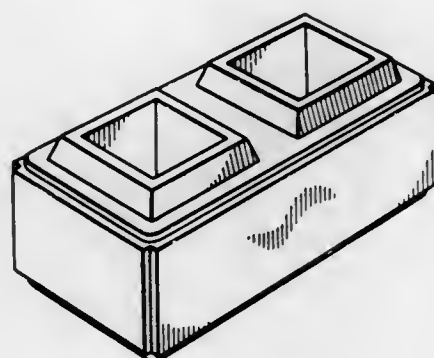
Filed Apr. 3, 1975, Ser. No. 564,840

Claims priority, application Australia, Oct. 7, 1974, 65833/74

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-87



243,856

**ACCESSORY COVER FOR PROTECTING AN AIR CONDITIONER FROM SOLAR RADIATION**

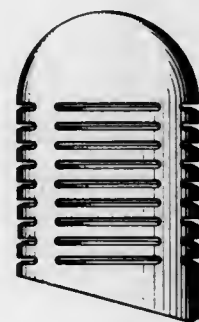
George J. Panek, 1401 E. San Miguel, Phoenix, Ariz. 85014

Filed Oct. 6, 1975, Ser. No. 619,581

Term of patent 14 years

Int. Cl. D23-04

U.S. Cl. D23-163



243,857

**BUILDING BOARD**

Kiyoshi Hori, Suita, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

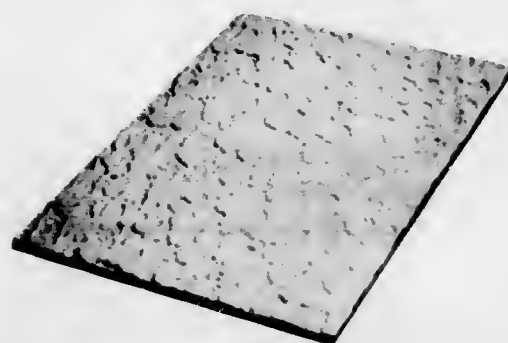
Filed Mar. 31, 1975, Ser. No. 563,835

Claims priority, application Japan, Oct. 29, 1974, 49-37674

Term of patent 14 years

Int. Cl. D25-01

U.S. Cl. D25-80



243,854

**BOAT STEPS**

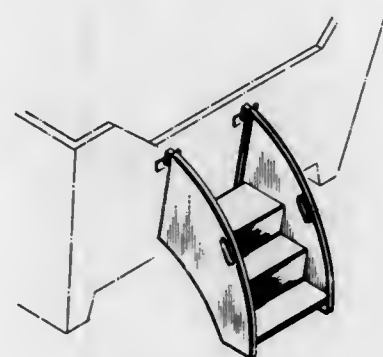
Donald A. Pelkey, 8665 Elm Ave., Orangevale, Calif. 95662

Filed Nov. 28, 1975, Ser. No. 635,961

Term of patent 14 years

Int. Cl. D25-02

U.S. Cl. D25-63



243,858

**FRAME FOR BATTERY ELECTRODES**

Leif Erik Skold, Akersberga, Sweden, assignor to Svenska Utvecklings AB (SUAB), Swedish National Development Co., Stockholm, Sweden

Filed Dec. 16, 1975, Ser. No. 641,306

Claims priority, application Sweden, June 18, 1975, 751257 U.S. Cl. D14-5

Term of patent 14 years

Int. Cl. D13-02

U.S. Cl. D13-10



243,860

**PORTABLE STEREO TAPE PLAYER**

Peyton G. Simpson, Jr., 5618 Melshire, Dallas, Tex. 75230

Filed May 29, 1975, Ser. No. 581,895

Term of patent 14 years

Int. Cl. D14-01



243,861

**TRANSCEIVER**

Toshimasa Akazawa, Yao, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 4, 1976, Ser. No. 711,669

Claims priority, application Japan, Feb. 10, 1976, 51-514061

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-68



243,859

**FRAME FOR BATTERY ELECTRODES WITH INSULATING INTERMEDIATE SUPPORT**

Leif Erik Skold, Akersberga, Sweden, assignor to Svenska Utvecklings AB (SUAB), Swedish National Development Co., Stockholm, Sweden

Filed Dec. 16, 1975, Ser. No. 641,360

Claims priority, application Sweden, June 18, 1975, 751258

Term of patent 14 years

Int. Cl. D13-02

U.S. Cl. D13-10



243,862

**FIREPLACE MATCH HOLDER**

Donald R. Phares, 510 1/2 Larkspur Ave., Corona del Mar, Calif. 92625

Filed July 7, 1975, Ser. No. 593,884

Term of patent 14 years

Int. Cl. D27-99

U.S. Cl. D27-32





243,863

## COVER FOR CIGARETTE LIGHTER

Hans Lowenthal, London, England, assignor to Colibri Lighters Ltd., London, England

Filed Dec. 12, 1975, Ser. No. 640,160

Claims priority, application United Kingdom, July 4, 1975, 971730/75

Term of patent 14 years

Int. Cl. D27-05

U.S. Cl. D27-36



243,864

## PIG FEEDER

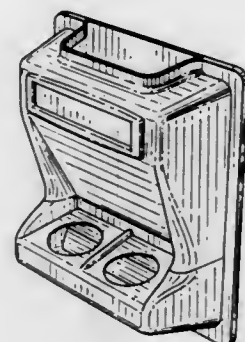
Julius C. Becker, Downs, Kans., assignor to Becker Manufacturing Company, Incorporated, Downs, Kans.

Filed Apr. 19, 1976, Ser. No. 678,226

Term of patent 14 years

Int. Cl. D30-03

U.S. Cl. D30-13



243,865

## GAME TARGET

Stanley Laut, 1253 E. 73rd St., New York, N.Y. 10021

Filed Sept. 15, 1975, Ser. No. 613,440

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-5 PP



243,866

## GOLF BALL

Michael Shaw, Widnes, and Robert Christopher Haines, Huddersfield, both of England, assignors to Dunlop Limited, London, England

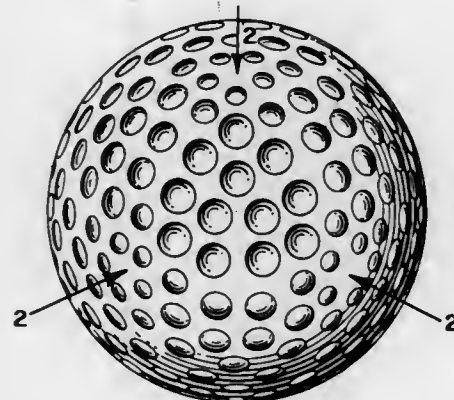
Filed May 5, 1975, Ser. No. 574,390

Claims priority, application United Kingdom, Nov. 6, 1974, 968607/74

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-5 QQ



243,867

## GOLF RANGE FINDER

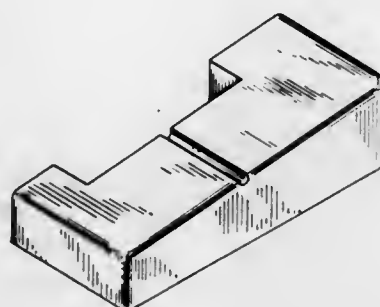
Albert J. Williams, Jr., 901 Llanfair Road, Ambler, Pa. 19002

Filed May 14, 1976, Ser. No. 687,407

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-5 CB



243,868

## COMBINED DIVOT AND CLEAT TOOL AND DISTANCE ESTIMATING DEVICE

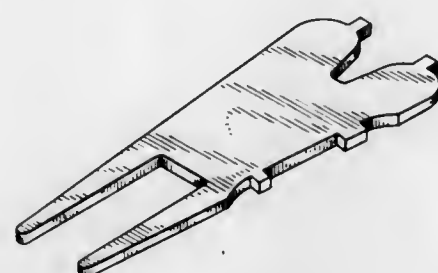
Albert J. Williams, Jr., 901 Llanfair Road, Ambler, Pa. 19002

Filed May 14, 1976, Ser. No. 687,405

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D34-5 CB



243,869

## PLANTER

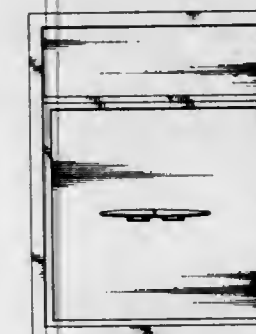
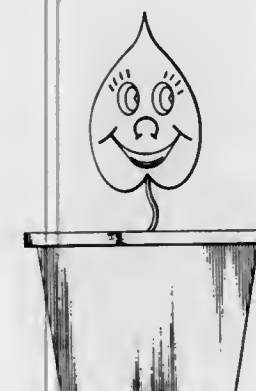
James F. Skalicky, 925 S. Montecito Drive, San Gabriel, Calif. 91776

Filed Aug. 18, 1975, Ser. No. 605,604

Term of patent 14 years

Int. Cl. D11-02

U.S. Cl. D11-145



243,871

## CURTAIN FABRIC

Peter E. Schroeder, Oberwil, near Breungarten, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland

Filed Sept. 30, 1974, Ser. No. 510,716

Claims priority, application Germany, Mar. 30, 1974, 212/74

Term of patent 14 years

Int. Cl. D5-05

U.S. Cl. D47-6 E



243,872

## CURTAIN MATERIAL

Peter E. Schroeder, Am Falter 8, CH866, Lucerne, Switzerland

Filed Aug. 25, 1975, Ser. No. 607,620

Claims priority, application Germany, May 26, 1975, 360/75

Term of patent 14 years

Int. Cl. D5-05

U.S. Cl. D47-6 E



243,870

## RING

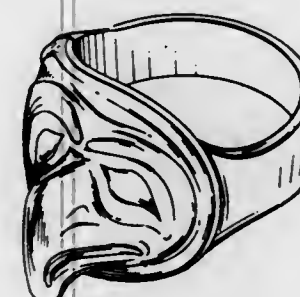
Martin C. Towne, 4515 Aldon Road, Tucson, Ariz. 85714

Filed Oct. 28, 1975, Ser. No. 626,089

Term of patent 14 years

Int. Cl. D11-01

U.S. Cl. D4-26





243,873

## CURTAIN MATERIAL

Peter E. Schroeder, Am Falter 8, CH866 Oberwil, Switzerland  
 Filed Sept. 29, 1975, Ser. No. 617,663

Claims priority, application Germany, May 13, 1975,  
 289/75

Term of patent 14 years  
 Int. Cl. D5-05

U.S. Cl. D47-6 E



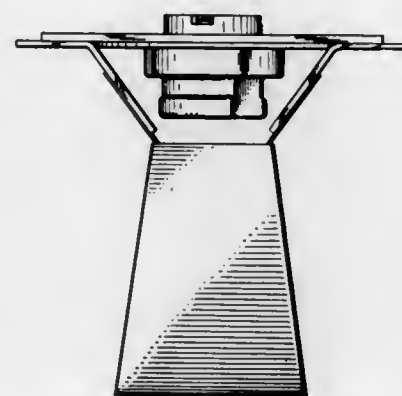
243,875

## LIGHT BULB REFLECTOR

Sheldon D. Schwartz, 75 Gary Place, Staten Island, N.Y.  
 10314

Filed Feb. 23, 1976, Ser. No. 660,671  
 Term of patent 14 years  
 Int. Cl. D26-05

U.S. Cl. D48-16 D



243,876

## LIGHT FIXTURE

Achille Castiglioni, Piazza Castello 27, Milan, Italy  
 Filed May 5, 1975, Ser. No. 574,520

Claims priority, application Italy, Feb. 13, 1975; 6926/75  
 Term of patent 14 years  
 Int. Cl. D26-05

U.S. Cl. D48-20 R



243,874

## WALL-MOUNTED CANDLE STICK ASSEMBLY

Eugene P. Smith, 220 Spring St., Newport, R.I. 02840  
 Filed Apr. 8, 1976, Ser. No. 674,905

Term of patent 14 years  
 Int. Cl. D26-01

U.S. Cl. D48-2



243,877

## DECORATIVE NIGHT LIGHT

Curtis G. Dickson, Bar Jac Trailer Court, Perry, Iowa 50220  
 Filed May 9, 1975, Ser. No. 575,944

Term of patent 14 years  
 Int. Cl. D26-05; D11-02  
 U.S. Cl. D48-20 E



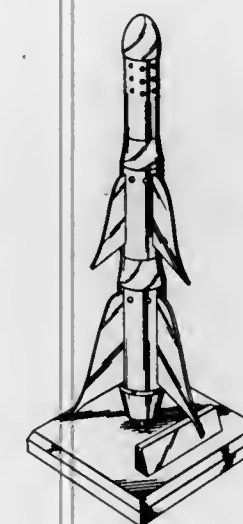
243,878

## LAMP

Julius Kaprinyak, 7211 N. 1st St., Phoenix, Ariz. 85020  
 Filed Dec. 4, 1975, Ser. No. 637,578

Term of patent 14 years  
 Int. Cl. D26-05

U.S. Cl. D48-20 C



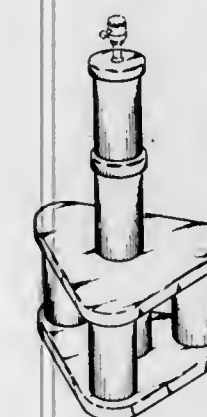
243,879

## LAMP BASE

Robert Daniel O'Connell, 13262 Shasta Circle, Westminster,  
 Calif. 92683

Filed June 7, 1976, Ser. No. 693,350  
 Term of patent 14 years  
 Int. Cl. D26-05

U.S. Cl. D48-20 R



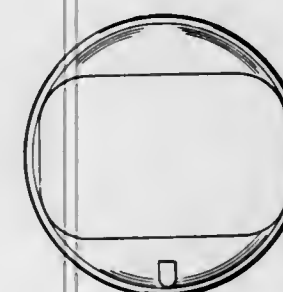
243,880

## HEADLIGHT BEZEL

John W. Anderson, 815 Briarcliff Road, Jackson, Mich. 49203  
 Filed Nov. 13, 1975, Ser. No. 631,711

Term of patent 14 years  
 Int. Cl. D26-06

U.S. Cl. D48-32 C



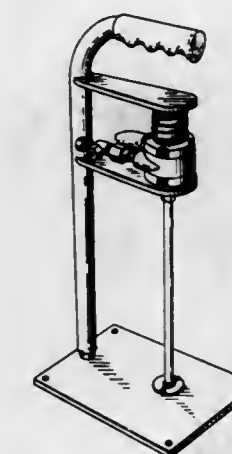
243,881

## PNEUMATIC PAINT STIRRING APPARATUS

Robert A. Arnold, 4116 N. Cleveland, Kansas City, Mo. 64117  
 Filed Jan. 22, 1976, Ser. No. 651,454

Term of patent 14 years  
 Int. Cl. D15-99

U.S. Cl. D15-147



243,882

## PLASTIC INSERT FOR EXAMINING TABLE STIRRUP

Paul W. Frame, Jr., 3300 3rd Ave., Sacramento, Calif. 95817  
 Filed Feb. 18, 1975, Ser. No. 550,614

Term of patent 14 years  
 Int. Cl. D24-01

U.S. Cl. D24-7



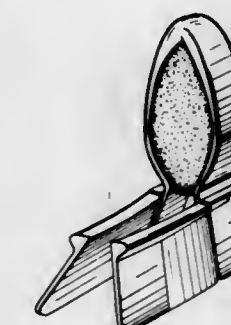
243,883

## FEMALE URINARY DEVICE OR THE LIKE

J. Robert Cade, 529 NW. 58th St., Gainesville, Fla. 32601, and  
 James D. Raulerson, Rte. 2, Box 104, Alachua, Fla. 32615

Filed Feb. 19, 1976, Ser. No. 659,343  
 Term of patent 14 years  
 Int. Cl. D24-99, 04

U.S. Cl. D83-1 U





243,884

## SHOULDER PROSTHESIS

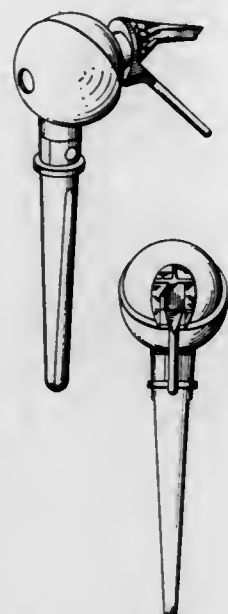
John M. Fenlin, 248 S. 21st St., Philadelphia, Pa. 19103

Filed Mar. 31, 1976, Ser. No. 672,179

Term of patent 14 years

Int. Cl. D24-03

U.S. Cl. D83-1 E



243,885

## SHOULDER PROSTHESIS

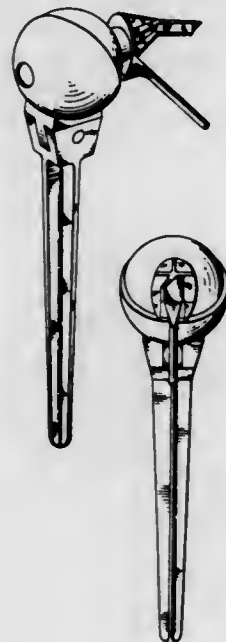
John M. Fenlin, 248 S. 21st St., Philadelphia, Pa. 19103

Filed Mar. 31, 1976, Ser. No. 672,180

Term of patent 14 years

Int. Cl. D24-03

U.S. Cl. D24-33



243,886

## COSMETIC PENCIL OR THE LIKE

Enea Rho, Milan, Italy, assignor to Fabbrica Italiana Lapis Ed Affini (FILA) S.p.A., Italy

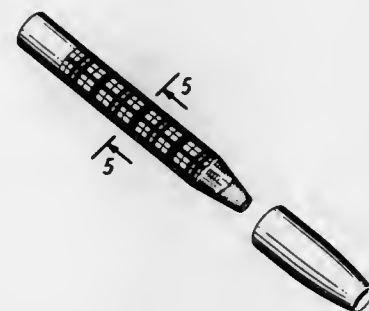
Filed July 8, 1974, Ser. No. 486,326

Claims priority, application Italy, June 28, 1974, 21450/74

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-7



243,887

## WALL PLATE-BAMBOO

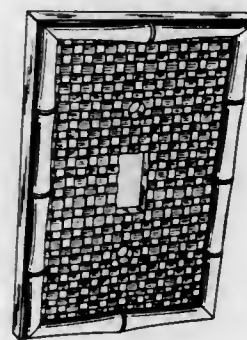
Monte Levin, New York, N.Y., and Joan Grieb, Westfield, N.J., assignors to General Electric Company

Filed Sept. 16, 1975, Ser. No. 613,833

Term of patent 14 years

Int. Cl. D8-09

U.S. Cl. D8-351



243,888

## CARRYING CASE FOR A TENNIS RACKET AND ACCESSORIES

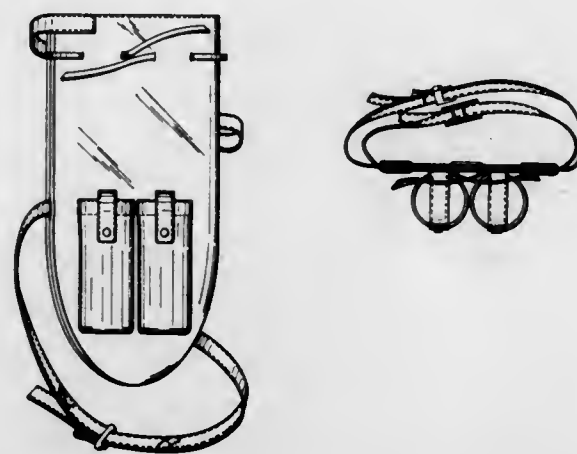
Alvin T. Smith, 4915 Indian Wood Road, No. 601, Culver City, Calif. 90250

Filed July 22, 1974, Ser. No. 490,372

Term of patent 14 years

Int. Cl. D3-02

U.S. Cl. D87-1 R



243,889

## SCUBA DIVER BACK PACK

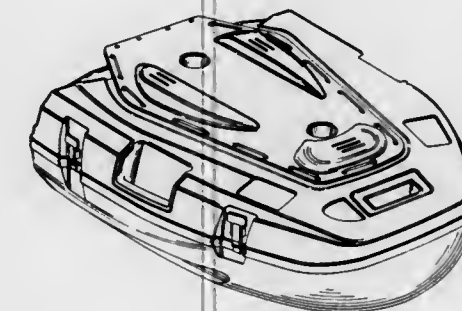
William D. Walters, Costa Mesa, Calif., assignor to William D. Waters, Costa Mesa, Calif.

Filed Sept. 22, 1975, Ser. No. 615,237

Term of patent 14 years

Int. Cl. D21-02

U.S. Cl. D87-1 R



243,890

## CAP OF AN ELECTRIC SHAVER

Yozo Yajima, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Japan

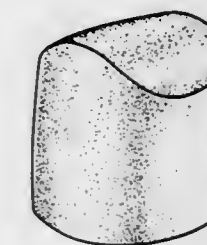
Filed June 19, 1975, Ser. No. 588,191

Claims priority, application Japan, Dec. 19, 1974, 49-44564

Term of patent 14 years

Int. Cl. D28-03

U.S. Cl. D28-49





# LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MARCH, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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- Adachi, Masaaki; Shirai, Takayoshi; and Nakasuzi, Norio, to Ishihara Sangyo Kaisha Ltd. Process for production of titanium tetrachloride. 4,014,976, Cl. 423-79.000.
- Adams, Frederick John, to TRW Inc. Plural-service hydraulic system. 4,014,360, Cl. 137-118.000.
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- Addressograph Multigraph Corporation: *See—*  
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- Adelson, Jury Abramovich; and Tamkovich, Oleg Antonovich. Stacker crane for storehouses. 4,014,442, Cl. 214-16.40A.
- Adema, Eduard H.; Van Geenen, Albert A.; and Den Otter, Marinus J. A. M., to Stamicarbon B.V. Process for the preparation of isoprene. 4,014,952, Cl. 260-681.000.
- Aegerter, Henry F., Jr.: *See—*  
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- AGA Aktiebolag: *See—*  
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- Aihara, Mitsuo; Takada, Shigeho; and Ogawa, Hisaharu, to Tokyo Shibaura Electric Co., Ltd. Negative resistance network. 4,015,146, Cl. 307-304.000.
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- Aizawa, Hiroshi: *See—*  
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**Anderson, James R., to Central Sprinkler Corporation. Concealed sprinkler assembly. 4,014,388, Cl. 169-37.000.**  
**Anderson, Richard H., to Clow Corporation. Sealing ring means for pipe couplings. 4,014,556, Cl. 277-181.000.**  
**Andersson, Karl-Gustaf Leif; and Wiklund, Klas Rudolf, to AGA Aktiebolag. Controlling the amplification in a radiation detecting avalanche diode. 4,015,118, Cl. 250-211.00J.**  
**Andersson, Louis. Loading and unloading of combustible liquids on, and from tanker ships. 4,014,358, Cl. 137-1.000.**  
**Ando, Yoshio: See—**  
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**Bahn, Raymond J., to Rho Sigma Corporation. Measurement of solar radiation. 4,015,116, Cl. 250-206.000.**  
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**Bailey, Ronald L., to Young Dental Manufacturing Company. Dental handpiece. 4,014,099, Cl. 32-27.000.**  
**Baird, Bennett Ray; and Sherbeck, Leander Adair, to Du Pont de Nemours, E. I., and Company. Flame resistant fiber blends. 4,014,829, Cl. 260-17.200.**  
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- Feldman, Martin L.; and Miller, Robert S., to Tenneco Chemicals, Inc. Manufacture of polyvinyl chloride of low vinyl chloride monomer content. 4,015,064, Cl. 528-491.000.
- Feldman, Nicholas; and Langer, Arthur W., Jr., to Exxon Research and Engineering Company. Synergistic low temperature flow improver in distillate fuel. 4,014,663, Cl. 44-71.000.
- Feller, Herman H.: See—  
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- Ferguson, George R., to Duff-Norton Company, Inc. Dishwasher and coupling. 4,014,467, Cl. 239-261.000.
- Ferlazzo, Natale; Buzzi, Gian Fausto; Ghirga, Marcello; and Calcagno, Benedetto, to Societa Italiana Resine S.I.R. S.p.A. Process for preparing methyl acrylate or mixtures of methyl acrylate and acrylic acid. 4,014,925, Cl. 260-486.00R.
- Ferraguti, Luigi, to Matec S.p.A. Method of forming a closed end on a knitted tubular fabric. 4,014,186, Cl. 66-95.000.
- Ferranti, Limited: See—  
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- Figuerola, David C.; and Corneliuz, David R. Protective device. 4,014,044, Cl. 2-2.000.
- Fink, Leonhard, to Thyssen Plastik Anger KG. Apparatus and process for drawing water from a water-bearing strata. 4,014,387, Cl. 166-314.000.
- Fink, Roger H.; and Porter, William D., to Akzona Incorporated. String up and shutdown process for a yarn texturizing apparatus. 4,014,085, Cl. 28-72.140.
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- Fischer, Adolf, deceased (by Fischer, Caecilia Emma, administratrix);

- Rohr, Wolfgang; and Reitel, Christian, to BASF Aktiengesellschaft. Substituted dihydro benzofuranyl esters. 4,014,904, Cl. 260-346.20R.
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- Fischer, Hanspeter, to Ciba-Geigy Corporation. 5-Nitropyrimidine derivatives and their use in agents for influencing plant growth. 4,014,677, Cl. 71-92.000.
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- Foxworthy, Milton Kearney; Huston, John Timothy; and Ziels, Burton Davis, to Diamond Power Specialty Corporation. Nuclear control rod position indicating assembly. 4,014,741, Cl. 176-19.0EC.
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- Frechin, Lucette, to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Method for preparing fibrous metal materials by electrolytic deposition and the resulting fibrous metal material. 4,014,757, Cl. 204-27.000.
- Fredriksson, Oke A.; and Thomas, Elmer L., to Chevron Research Company. Automatic measurement and display of resonance frequencies of seismic detection elements. 4,015,202, Cl. 324-57.00Q.
- Freeman Supply Company, The: See—  
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- French, Gordon B.; Bartel, William J.; Ridley, Richard D.; Cha, Chang Yul; and Burton, Robert S., III, to Occidental Petroleum Corporation. System for fuel and products of oil shale retort. 4,014,575, Cl. 299-2.000.
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- Fromson, Howard A. Process for making metal powders. 4,014,756, Cl. 204-10.000.
- Frye, John S.; and Fuss, James B. Fastener. 4,014,245, Cl. 85-5.00P.
- Fryer, Rodney Ian; Ning, Robert Ye-Fong; Sternbach, Leo Henryk; and Walser, Armin, to Hoffmann-La Roche Inc. Indoloquinolines, intermediates and processes. 4,014,883, Cl. 260-288.0CF.
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- Fuchs, Werner; Platz, Rolf; Rieber, Norbert; and Scholz, Andreas, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Propylene oxide recovery by azeotropic distillation of methyl formate-2-methylpentane. 4,014,753, Cl. 203-1.000.
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- Fuji Electric Company Ltd.: See—  
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- Fujimaki, Hiroto; Hayashi, Haruhisa; and Kawahara, Takashi, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Method for manufacturing graphite whiskers using condensed polycyclic hydrocarbons. 4,014,980, Cl. 423-448.000.
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- Fujita, Kazumasa, to Motorola, Inc. Change-over switch mechanism for push-button tuner. 4,015,096, Cl. 200-156.000.
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- Fukami, Toshihiro, to Fukami Co., Ltd. Apparatus for bandsawing operation with profiling mechanism capable of automatic copying of a model. 4,014,235, Cl. 83-565.000.
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- Fulghum Industries, Inc.: See—  
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- Fullinwider, James H.; and Knight, Bruce L., to Marathon Oil Company. Process for breaking polymer-containing emulsions. 4,014,801, Cl. 252-8.55D.
- Funke, Peter, to ISPOW AG. Ski pole assembly. 4,014,559, Cl. 280-11.37N.
- Furgal, Henry P.; and Larsen, Ingrid A., to Colgate-Palmolive Company. Article, apparatus and method for conditioning fibrous materials with liquid conditioning composition. 4,014,105, Cl. 34-12.000.
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- Furuno, Sentaro. Small synchronous motor with lash coupling. 4,015,153, Cl. 310-41.000.
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- Furuya, Osamu; Wada, Koichi; Hosaki, Yoshihiko; and Mihara, Nobutake, to Showa Denko Kabushiki Kaisha. Process for purifying  $\alpha$ -amino acids. 4,014,928, Cl. 260-534.00R.
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- Galer, Herbert W., to United States Steel Corporation. Plastic lids and pails. 4,014,452, Cl. 220-74.000.
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- Galtz, Charles S. Temperature set back. 4,014,500, Cl. 236-46.00R.
- Gamble, Fred R., Jr.; and Levy, Ricardo B., to Exxon Research and Engineering Company. Removal of carbon and vanadium or lead from spent catalysts by means of controlled high temperature treatment with sulfur. 4,014,815, Cl. 252-412.000.
- Gamble, George W. Synthetic woodwind reed. 4,014,241, Cl. 84-383.00A.
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- Garber, Murray; Ross, Lawrence James; and Stepek, Walter Joseph, to American Cyanamid Company. Catalytic dehydrogenation process for the preparation of 3,4,5-trisubstituted pyrazoles. 4,014,896, Cl. 260-310.00R.
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- Garner, Edward, to Imperial Chemical Industries Limited. Smoking mixture. 4,014,348, Cl. 131-2.000.
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- Garrett, Terry N. Dental flossing tool. 4,014,354, Cl. 132-90.000.
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- Gasser, Lorenz; and Szechenyi, Kalman, to International Standard Electric Corporation. Controllable negative resistance electronic switch arrangement. 4,015,190, Cl. 323-4.000.
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- Getselev, Zinoviy Naumovich. Method of forming ingot in process of continuous and semi-continuous casting of metals. 4,014,379, Cl. 164-4.000.
- Ghirga, Marcello: See—  
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- Gianos, Edward A.; Hunter, H. Eric; and Lazo-Wasem, Edgar A., to Denver Chemical Manufacturing Company. Micro-filter. 4,014,653, Cl. 23-259.000.
- Gijzen, Wilhelmus Adrianus Henricus; and Potma, Theodorus Gerhar-dus, to U.S. Philips Corporation. Recording element for a matrix printer. 4,014,425, Cl. 197-1.00R.
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- Gillemot, George W., to Thompson, John T., a part interest. Re-entera-ble cable splice enclosure and kit including re-closable tubular housing and end caps. 4,015,072, Cl. 174-92.000.
- Gilliams, Yvan Karel; Van Engeland, Jozef Leonard; and De Volder, Noel Jozef, to AGFA-GEVAERT, N.V. Liquid electrophotographic developers. 4,014,856, Cl. 252-62.10L.
- Gilmer, James Ray; Bowers, Harry Alvin; and Day, Robert Earl. Elec-trotherapy system. 4,014,323, Cl. 128-2.10Z.
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- Gisewsky, Karl-Robert. Self-cleaning device for detachably connecting electrical conductor wires. 4,014,600, Cl. 339-48.000.
- Gist, Lanny J. Retractable chair for small children. 4,014,592, Cl. 297-143.000.
- Gittings, Robert S., to Gold Medal, Inc. Collapsible chair. 4,014,591, Cl. 297-55.000.
- Glabe, Elmer F.; and Rebhan, Herbert J., to Food Technology Prod-ucts. Silage process and product. 4,015,018, Cl. 426-2.000.
- Glagolev, Nikolai Alexeevich; Klimenko, Gennady Alexeevich; Chvertko, Anatoly Ivanovich; Kononets, Boris Ivanovich; Gursky, Pavel Ivanovich; Nosachev, Vladimir Alexandrovich; Kravchenko, Leonid Grigorievich; Basov, Valentin Georgievich; Bogomolova, Larisa Evgenievna; Ivanov, Viktor Andreevich; and Khrenov, Kon-stantin Konstantinovich. Cold butt-welding machine. 4,014,494, Cl. 228-3.100.
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- Gold Medal, Inc.: See—  
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- Golden, Harold. Attache cases. 4,014,416, Cl. 190-42.000.
- Goldstein, Richard, to Dynascan Corporation. Rotary digital channel selection apparatus. 4,015,253, Cl. 340-347.00P.
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- Goloff, Alexander, to Caterpillar Tractor Co. Heat pipe cooling of a rotary engine rotor. 4,014,631, Cl. 418-85.000.
- Golz, Reinhard Heinz; and Johnson, William James, to B. F. Goodrich Company, The. Pneumatic tire mold. 4,014,632, Cl. 425-28.00R.
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- Gomez, Edward; and Gomez, Charles. Mathematical board game. 4,014,547, Cl. 273-134.00C.
- Gonzalez, Jesus: See—  
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- Good, William K.; and Harbage, Wilson J., to Koppy Corporation. Retainer ring and splined member assembly. 4,014,619, Cl. 403-359.000.
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- Gordon, David L.: See—  
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- Goretta, Louis A.: See—  
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- Gossett, Charles W.; and Dauenhauer, William J. Air and light impervi-ous water purification and product dispensing system. 4,014,792, Cl. 210-123.000.
- Gotaverken Angteknik AB: See—  
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- Goto, Kenji; and Niwa, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor for a stratified combustion engine with a pre-chamber. 4,014,960, Cl. 261-23.00A.
- Gottschalk, Robert E. Apparatus for varying intensity of light. 4,015,113, Cl. 240-41.35R.
- Goughnour, Roy Robert, to A. C. Aukerman Co. Adjustable slip form. 4,014,633, Cl. 425-63.000.
- Graafma, Richard S., to Auto Specialties Manufacturing Company. Snubber for one end lift jacks. 4,014,515, Cl. 254-2.00B.
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- Granberg, Frederick M., to International Paper Company. Mold con-struction having removable base member. 4,014,739, Cl. 162-274.000.
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- Green, Paul James: See—  
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- Greenbaum, George. Modular channel culture device. 4,014,135, Cl. 47-86.000.
- Greenberg, Jerome S., to Regal China Corporation. Fired ceramic bottle having threaded neck. 4,014,448, Cl. 215-31.000.
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- Greenspan, Donald J., to U.S. Medical Research and Development, Inc. Method of and apparatus for collecting cultures. 4,014,746, Cl. 195-103.50R.
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- Gresko, William. Weight distribution measuring instruments. 4,014,398, Cl. 177-208.000.
- Grier, John D.; and Taylor, Lynn J., to Owens-Illinois, Inc. Fugitive vehicle system. 4,014,845, Cl. 260-31.80R.
- Griffin, Timothy L., Jr., to Amanita Sound, Incorporated. Speaker enclosures. 4,014,597, Cl. 312-7.00R.
- Groff, Eugene R., to Caterpillar Tractor Co. Shoe assembly. 4,014,581, Cl. 305-54.000.
- Grogan, Robert D., to Briggs & Stratton Corporation. Pillar lock. 4,014,195, Cl. 70-379.00R.
- Grolman, Bernard: See—  
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- Gross, Jerome A.: See—  
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- Grott, Charles N.; and Rollins, Dallas W., to ACF Industries, Incorporated. Variable metering drop valve. 4,014,578, Cl. 302-52.000.
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- Gschwend, Heinz Werner: See—  
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- Gunther, W. H. H.: See—  
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- Gursky, Pavel Ivanovich: See—  
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- Haarmann & Reimer GmbH: See—  
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- Haemer, Laurence F., to Congoleum Corporation. Bonded carpeting. 4,015,036, Cl. 428-88.000.
- Haemmerle, A.G.: See—  
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- Haga, Hideo; Kosugi, Mitosi; Kimura, Yoshiyuki; and Takabatake, Masakazu, to Japan Metals and Chemicals Co., Ltd. Method of and an apparatus for measuring the electrode length in an electric fur-nace. 4,014,102, Cl. 33-126.600.
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- Hahn, Gunther: See—  
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- Hahnkamm, Volker: See—  
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- Hall, John B.; and Wieggers, Wilhelmus Johannen, to International Flavors & Fragrances Inc. Process and product produced by said process. 4,014,944, Cl. 260-631.500.
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- Joyce, Donald James, to Consort Project Development Limited. Apparatus for feeding and applying features to continuous webs or items thereon. 4,014,490, Cl. 226-76.000.
- Juliano, Angelo L.; and Miller, Aaron, to Quaker Oats Company, The. Cosmetics containing finely divided oat flour. 4,014,995, Cl. 424-168.000.
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- Jurowski, Willi; Kohler, Alfred; Prohaska, Hans; and Schrade, Eugen, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Vehicle wiper blade construction. 4,014,061, Cl. 15-250.420.
- Kabas, Guglielmo: See—  
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- Kabushiki Kaisha Daini Seikoshia: See—  
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- Kabushiki Kaisha Suwa Seikoshia: See—  
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- Fujita, Kinji, 4,014,164.
- Kabushikikaisha Ochiai Seisakusho: See—  
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- Kadin, Saul B.; and Moore, Peter F., to Pfizer Inc. 1-Oxo-1H-6-piperidinopyrimido[1,2-a]quinoline-2-carboxylic acids and esters. 4,014,881, Cl. 260-256.40Q.
- Kadota, Shozo: See—  
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- Kadowaki, Koju, to Mitsubishi Petrochemical Company Limited. Process for production of unsaturated acids from corresponding unsaturated aldehydes. 4,014,927, Cl. 260-530.00N.
- Kaffee-Veredelungs-Werk Koffeinfrei Kaffee GmbH & Co.: See—  
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- Kahler, Richard W. Fluid-cooled smoking device. 4,014,353, Cl. 131-173.000.
- Kaido, Tsutomu; Asahi, Seiichi; and Nishikawa, Sinjiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of manufacturing knitted long-pile fabrics and fabrics made by the method. 4,014,185, Cl. 66-84.00R.
- Kaiser, Bernd-Ulrich; Dhein, Rolf; Kuchenmeister, Rolf; and Fischer, Hans-Michael, to Bayer Aktiengesellschaft. Liquid stoving-lacquer systems based on oil-free polyesters. 4,014,708, Cl. 106-287.00R.
- Kaiser, Hans-Joachim: See—  
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- Kaiser, Joachim: See—  
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- Kajikawa, Masahiro: See—  
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- Kajima Corporation: See—  
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- Kajita, Harumasa: See—  
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- Kakao, Kanji: See—  
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- Kaki, Koji: See—  
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- Kakinuma, Atsushi; Sugino, Hiromu; Moriya, Norihiko; and Isono, Masao, to Takeda Chemical Industries, Ltd. Plasminostreptin (enzyme inhibitor) and method for producing it from streptomyces. 4,014,860, Cl. 260-112.00R.
- Kalart Victor Corporation: See—  
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- Kallrath, Gottfried: See—  
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- Kamath, Venkatesh: See—  
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- Kamensky, Vyacheslav Tikhonovich: See—  
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- Kameny, Stanley L. Electrode. 4,014,345, Cl. 128-417.000.
- Kanagafuchi Kagaku Kogyo Kabushiki Kaisha: See—  
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- Kosugi, Takumi; Yasunaga, Shigeki; Tanaka, Yutaka; and Hashimoto, Yoshihiko, 4,014,842.
- Suzuki, Kazuo; Nanao, Tsutomu; and Miyazaki, Hiroshi, 4,014,770.
- Kanner, Bernard, to Union Carbide Corporation. Tertiary alcohol-bearing organosilicone polymers. 4,014,825, Cl. 260-2.5AH.
- Kano, Hiroya: See—  
Oda, Tatsuharu; Iwasaki, Yukio; Koyam, Hideo; Maruyama, Shigeo; Matsubara, Takashi; Hozumi, Keiichi; and Kano, Hiroya, 4,014,495.
- Kanzaki Paper Manufacturing Co., Ltd.: See—  
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- Karady, Sandor: See—  
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- Karakawa, Fumio: See—  
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- Karami, Hamzeh, to Colgate-Palmolive Company. Absorbent article and method. 4,014,341, Cl. 128-287.000.
- Karayannis, Nicholas M.; Turner, James A.; and Lee, Sam S., to Standard Oil Company (Indiana). Catalyst and process for the polymerization of olefins. 4,015,060, Cl. 526-141.000.
- Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., to M & T Chemicals Inc. Electrodeposition of copper. 4,014,760, Cl. 204-52.00R.
- Karlen, Urs; and Morawietz, Hans, to Ciba-Geigy Corporation. Process for the manufacture of anthraquinone compounds. 4,014,906, Cl. 260-373.000.
- Karol, Fredrick John, to Union Carbide Corporation. Fused ring catalyst and ethylene polymerization process therewith. 4,015,059, Cl. 526-130.000.
- Karube, Yukuo; Suzuki, Koji; and Ezaki, Ryoichi, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. DC motor. 4,015,181, Cl. 318-325.000.
- Kassai, Noriaki: See—  
Tanaka, Kazuaki; Ishida, Yasuto; Yanagi, Kimiyoshi; Kassai, Noriaki; and Tanaka, Toshiyuki, 4,014,941.
- Kasubuchi, Takeshi; Ozawa, Kaoru; and Makita, Tomoo, to Sharp Kabushiki Kaisha. Ink jet printer having air resistance distortion control. 4,015,267, Cl. 346-1.000.
- Kasuya, Masamitsu: See—  
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- Kaufman, Barry M., to R F L Industries, Inc. Frequency shift keyed tone generator. 4,015,220, Cl. 331-179.000.
- Kaugars, Girts, to Upjohn Company, The. Alkylthio benzoic acid phenyl-hydrazides. 4,014,932, Cl. 260-558.00H.
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- Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, to Pilot Man-Nen-Hitsu Kabushiki Kaisha; and Toyo Giken Kogyo Kabushiki Kaisha. Continuous electrolytical treatment of aluminum or its alloys. 4,014,758, Cl. 204-28.000.
- Kawarada, Hiroshi: See—  
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- Keagle, Walter S. Variable height stand. 4,014,517, Cl. 254-45.000.
- Keeling, Walter William. System for increasing the effective head of a dam without physically increasing the height of the dam. 4,014,173, Cl. 61-19.000.
- Keim, Roy L. Ring toss game. 4,014,545, Cl. 273-95.00H.
- Keiser, David H., Jr. Hedge shears. 4,014,093, Cl. 30-248.000.
- Keith, Billy M.: See—  
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- Keith, Dennis; and Weigle, Manfred, to Hoffmann-La Roche Inc. N,N-dialkylaminoethoxyethylphthalimidomalonates. 4,014,898, Cl. 260-326.00N.
- Kelley Company, Inc.: See—  
Artzberger, Thomas G.; and Wiener, Thomas J., 4,014,059.
- Kells, John D. Refrigerator temperature controls. 4,014,178, Cl. 62-3.000.
- Kelly, James A.; Ames, Thomas J.; Lochte, Glen E.; and Bowen, Burlie R., to Hydro Tech International, Inc. Method for making a remote controlled sub-sea pipe connection. 4,014,180, Cl. 61-110.000.
- Kelsey, Paul V., Jr.; and Mathers, James E., to GTE Sylvania Incorporated. Method of preparing rare earth pyrohafnate phosphors. 4,014,812, Cl. 252-301.40F.
- Kendall Company, The: See—  
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- Shah, Nayan S., 4,014,322.
- Kendall, Don L.; Ahlbum, Byron T.; and Wiemer, Klaus C., to Texas Instruments Incorporated. Discrete, fixed-value capacitor. 4,015,175, Cl. 361-313.000.
- Kenics Corporation: See—  
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- Kennedy, David Rankine: See—  
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- Kenyon, Charles L. Cartridge for a bacteria screening device for continuously monitoring and recording the existence of air borne bacteria and other microorganisms. 4,014,747, Cl. 195-127.000.
- Key, Ferris Gene: See—  
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- Keyworth, Donald A.; and Sudduth, Jerome R., to Tenneco Chemicals, Inc. Process for the purification of liquid sorbents comprising bimetallic salt complexes. 4,014,950, Cl. 260-677.00A.
- Khrenov, Konstantin Konstantinovich: See—  
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- Kiesow, Lutz A., to Baxter Travenol Laboratories, Inc. Method and apparatus for delivering blood oxygen association curve information. 4,014,649, Cl. 23-230.00B.
- Kikkawa, Takahiro: See—  
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- Kikuchi, Masaru: See—  
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- Kimura, Seiji: See—  
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- Kimura, Shigeo: See—  
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- Kimura, Yoshiyuki: See—  
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- King, Paul Anstee Frank. Knock-down construction. 4,014,270, Cl. 108-111.000.
- Kinjo, Hisao; Akuwa, Fumio; and Haneji, Yasuo, to Victor Company of Japan, Limited. Video disc recording and/or reproducing apparatus with a single transducer head. 4,015,289, Cl. 360-11.000.
- Kinnaird, Laird D.; and Moorhead, Seth B., Jr., to Martin Marietta Corporation. Gas cooling system for hypersonic vehicle nosetip. 4,014,485, Cl. 244-117.00A.
- Kinnison, Daniel E. Air precleaner. 4,014,673, Cl. 55-396.000.
- Kinsell, Robert C.: See—  
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- Kintish, Irving L., to United States of America, Army. Vehicle incapacitator. 4,014,265, Cl. 102-70.00S.
- Kippenberg, Horst: See—  
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- Kircher, Morton S.; and Engler, Maynard F., to Olin Corporation. Diaphragm cell having uniform and minimum spacing between the anodes and cathodes. 4,014,775, Cl. 204-252.000.
- Kirilov, Ivan Ivanovich; Agishev, Alexandr Petrovich; Amelushkin, Vladimir Nikolaevich; Bogdanovich, Sabir Yakubovich; Guseinov, Chingiz Saibovich; Medvedev, Valentin Valentinovich; Faddeev, Igor Petrovich; and Rozin, Viktor Sergeevich. Turboexpander. 4,014,674, Cl. 62-38.000.
- Kirm, Thomas G., to Eastman Kodak Company. Rotatable multifaceted tape guide for use in a cassette. 4,015,292, Cl. 360-130.000.
- Kirsch, Gunther; Cherdron, Harald; and Herwig, Walter, to Hoechst Aktiengesellschaft. Thermoplastic polyamide moulding compositions. 4,014,957, Cl. 260-857.0PG.
- Kitada, Takaharu, to Sony Corporation. Recording and/or reproducing apparatus. 4,015,090, Cl. 179-6.00R.

- Kitamoto, Tatsuji: See—  
Sasazawa, Koji; Yamada, Yasuyuki; Kitamoto, Tatsuji; and Akashi, Goro, 4,015,030.
- Kitterman, Roger L. Thermal engine. 4,014,170, Cl. 60-529.000.
- Kiwaki, Hisakatsu: See—  
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- Klahn, Uwe; and Oberwelland, Klaus, to August Storck KG. Method of producing individually wrapped confections and apparatus for performing the same. 4,014,156, Cl. 53-34.000.
- Klaiber, Erich Manfred: See—  
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- Klauser, Hans-Dieter, to Braun Aktiengesellschaft. Piezoelectric igniter with a striking mechanism. 4,015,151, Cl. 310-8.700.
- Kleber, Rolf, to Hoechst Aktiengesellschaft. Fiber-lubricating compositions. 4,014,800, Cl. 252-8.800.
- Kleid, Robert E.; Illk, Donald J.; and Key, Ferris Gene, to Pitney-Bowes, Inc. Continuous sheet collating method and apparatus. 4,014,535, Cl. 270-19.000.
- Klein, Gunter Peter: See—  
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- Klein, Herschel A.; and Bozzuto, Carl R., to Combustion Engineering, Inc. Air pollution control system and method. 4,014,978, Cl. 423-242.000.
- Kleine-Weischede, Klaus: See—  
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- Klingebiel, Ward John, to Union Carbide Corporation. Dispersing apparatus. 4,014,524, Cl. 259-6.000.
- Kloze, Solomon S.; and Allen, Richard C., to American Hoechst Corporation. Phenylsulfenylpiperazines. 4,015,004, Cl. 424-250.000.
- Klomp, Edward D., to General Motors Corporation. Rich-core stratified charge spark ignition engine with rich mixture scoop. 4,014,300, Cl. 123-30.00C.
- Klose, Dirk R.: See—  
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- Kniesly, Richard A.; Colville, Larry L.; and Mullen, Jerrold L., to Ko An, Inc. Control for activating motor vehicle electrical load. 4,015,137, Cl. 307-10.0LS.
- Knight, Bruce L.: See—  
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- Knobbe, Karl-Heinz: See—  
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- Ko An, Inc.: See—  
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- Kobashi, Uichiro, to Aisin Seiki Co., Ltd. Hydraulic brake booster. 4,014,171, Cl. 60-547.000.
- Kobe Steel Ltd.: See—  
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- Kobres, Adolph, Jr., to Exxon Research and Engineering Company. Triple pipe low temperature pipeline. 4,014,369, Cl. 138-112.000.
- Koch, Friedrich-Karl; and Schneiders, Hugo, to Peltzer & Ehlers. Ejector mechanism for ejecting pressed parts from the bottom die of press. 4,014,203, Cl. 72-427.000.
- Koch, Robert E.: See—  
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- Kochanowski, George A., to United States Gypsum Company. Structure for slidable doors having snap-mounted glide retainer. 4,014,377, Cl. 160-186.000.
- Kochanowski, George A., to United States Gypsum Company. Structure for slidable doors having glide retainer integral with door panel. 4,014,378, Cl. 160-186.000.
- Kochsieck, Adolf; and Wilhelm, Franz, to Wikotool-Systemtechnik Maschinenbau GmbH & Co. KG. Eccentric positioning device for tools and workpieces. 4,014,439, Cl. 214-1.00R.
- Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, to Ciba-Geigy Corporation. 6-Acylamino-penam-3-carboxylic and 7-acylamino-3-cephem-4-carboxylic acids. 4,015,000, Cl. 424-246.000.
- Kodera, Yoichi; and Toyoda, Tetsuo, to Sony Corporation. Method and apparatus for an electret transducer. 4,014,091, Cl. 29-592.000.
- Koehring GmbH - BOMAG Division: See—  
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- Koerner, John A.; Scherer, James P.; Stoddard, Donald J.; and Vornoff, George N., to Textron, Inc. Dual polarized blade antenna. 4,015,263, Cl. 343-708.000.
- Koerner, John A., to Textron, Inc. Dual mode broadband antenna. 4,015,264, Cl. 343-725.000.
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- Kolomoets, Nikolai Vasilievich: See—  
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- Kondo, Shinichi: See—  
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- Konishiroku Photo Industry Co., Ltd.: See—  
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- Koponen, Martti; and Veijonen, Lassi, to Valmet Oy. Structure for transferring a web from the press section to the drying section of a paper machine. 4,014,740, Cl. 162-289.000.
- Koppy Corporation: See—  
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- Kosakai, Tamajiro, to France Bed Co., Ltd. Method and machine for sewing together mattress covers. 4,014,274, Cl. 112-3.00R.
- Koschatzky, Bruno; and Angioletti, Attilio, to Industrie Pirelli S.p.A. Upholstery articles and process for their manufacture. 4,015,041, Cl. 428-310.000.
- Kosmos, Peter: See—  
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- Kosugi, Hideaki: See—  
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Markman, Mikhail Abramovich; Simanovsky, Leonid Mikhailovich; Kolomoets, Nikolai Vasilievich; Kamensky, Vyacheslav Tikhonovich; Matskov, Igor Mikhailovich; Protsenko, Valentin Prokofievich; Sporyshev, Boleslav Viktorovich; and Baby, Valentina Sergeevna, 4,014,713.

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Matty, Thomas C.; and Sahasrabudhe, Arun P., to Westinghouse Electric Corporation. Multi-channel signal decoder. 4,015,082, Cl. 178-66.00R.

Mauger, David W., to Clevepak Corporation. Die-set assembly. 4,014,232, Cl. 83-144.000.

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McCombs, Frank Paul, to Owens-Corning Fiberglass Corporation. Composition comprising a blend of a resorcinol-aldehyde resin; an elastomer and an organo silicon coupling system. 4,014,835, Cl. 260-29.300.

McCord, James W. Vapor generating and recovering apparatus. 4,014,751, Cl. 202-160.000.

McCoy, Drew E., to Texaco Inc. Recovery of oil from refinery sludges by steam distillation. 4,014,780, Cl. 208-13.000.

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McGrane, George M. Hose nozzle diverter. 4,014,471, Cl. 239-510.000.

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McKelvey, Harold E.; and Maciejewski, Leonard B., to Shatterproof Glass Corporation. Oven door windows. 4,014,312, Cl. 126-198.000.

McKendry, Lennon H., to Dow Chemical Company, The. Substituted pyridine carboxylic acids and derivatives. 4,014,888, Cl. 260-294.80F.

McKnight, Jimmy, to Fulghum Industries, Inc. Sequential operator for clutch and brake. 4,014,419, Cl. 192-13.00R.

McLachlan, Ian, to Dow Chemical Company, The. Process for preparing cyclicdicarboximido-substituted phosphonothioates. 4,014,897, Cl. 260-326.00E.

McMullen, Warren H.; and Mooney, Thomas J., to M & T Chemicals Inc. Electroplating iron alloys containing nickel, cobalt or nickel and cobalt. 4,014,759, Cl. 204-43.00T.

McNulty, Frank E. Outer wrap for pipelines. 4,014,370, Cl. 138-144.000.

McRoskey, John W.: See—  
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Megahed, El Sayed; and Spellman, Patrick Joseph, to ESB Incorporated. Method of manufacturing a stable divalent silver oxide depolarizer mix. 4,015,056, Cl. 429-219.000.

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Schellenberg, Matthias; Chylewski, Christoph; and Meier, Max, 4,014,699.

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Meyer, Edward P.; and Wright, William L., to Picker Electronics, Inc. Sector scanning ultrasonic inspection apparatus. 4,014,207, Cl. 73-67.80S.

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Miller, Ralph L., to United States of America, Army. Ordnance training aid. 4,014,111, Cl. 35-25.000.

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Milltenberger, Robert S., to National Steel Corporation. Method of making Drawing Quality steel. 4,014,683, Cl. 75-49.000.

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- Mizusawa, Masashi: See—  
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- Mookherjee, Braja Dulal; Kamath, Venkatesh; and Shuster, Edward J., to International Flavors & Fragrances Inc.  $\pi$ -Tricyclic-9-alkanone perfumes. 4,014,823, Cl. 252-522,000.
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- Moore, John F.; and Coate, Forrest M., to Rockwell International Corporation. Ultrasonic system for measuring dimensional or stress change in structural member. 4,014,208, Cl. 73-67,900.
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- Moore, William Percy, to Allied Chemical Corporation. Recovery of dicarboxylic acids from aqueous solution containing nitric acid. 4,014,903, Cl. 260-345,900.
- Moore, William Stanley; and Hinshaw, Waldo Stephen, to National Research Development Corporation. Analysis of materials. 4,015,196, Cl. 324-50R.
- Moorhead, Seth B., Jr.: See—  
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- Morinaga, Shigeki; and Onishi, Kazuo, to Hitachi, Ltd. Control apparatus for sewing machine with automatic needle stopping means. 4,014,277, Cl. 112-219,00A.
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- Moser, Robert D. Photograph holder. 4,014,121, Cl. 40-158,00R.
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- Muller, Robert, to Cameco AB. Respirator system. 4,014,326, Cl. 128-145,600.
- Muntz, Ronald L.; and Lerner, Robert W., to Stauffer Chemical Company. Method for preparing ethyl vanadate. 4,014,911, Cl. 260-429,00R.
- Muntz, Ronald L.; and Lerner, Robert W., to Stauffer Chemical Company. Method for preparing organic vanadates. 4,014,912, Cl. 260-429,00R.
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- Muto, Goro, to Tanaka Kogyo Kabushiki Kaisha. Bicycle engine. 4,014,402, Cl. 180-33,00D.
- Muto, Iwao, to Toshiba Seiki Kabushiki Kaisha. Apparatus for binding articles with tape. 4,014,731, Cl. 156-350,000.
- Myers, John W., to Phillips Petroleum Company. Hydrocarbon conversion process utilizing group VIII metal/alumina catalysts activated with hydrogen halide/halosilane/organic halide. 4,014,948, Cl. 260-666,00P.
- N L Industries, Inc.: See—  
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- Naarmann, Herbert: See—  
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- Nadelson, Jeffrey: See—  
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- Naf, Ferdinand; Ohloff, Gunther; and Eschenmoser, Albert, to Firmenich S.A. Process for the preparation of polyunsaturated hydrocarbons. 4,014,951, Cl. 260-677,00R.
- Nagaoka, Shinji; and Takazawa, Yuzuru, to Seiko Koki Kabushiki Kaisha. Electric timing circuitry with means to compensate for switch chatter. 4,015,142, Cl. 307-247,00A.
- Nagasawa, Masao, to Nippondenso Co., Ltd. Capacitor discharge type contactless ignition system for internal combustion engines. 4,014,309, Cl. 123-148,0CC.
- Nagasawa, Taro; Tomita, Mamoru; Tamura, Yoshitaka; and Mizota, Teruhiko, to Morinaga Milk Industry Co., Ltd. Tartar removal by electrodialysis and potassium level control in wine. 4,015,020, Cl. 426-239,000.
- Nagata, Minoru; Masuhara, Toshiaki; Kubo, Masaharu; and Hashimoto, Norikazu, to Hitachi, Ltd. MIS-FETs isolated on common substrate. 4,015,281, Cl. 357-41,000.
- Nagata, Takashi; Motoki, Goro; Suzuki, Morio; and Yoshino, Hiroshi, to Yamasa Shoyu Kabushiki Kaisha. Crystalline monosodium N<sup>4</sup>,2'-O-dibutyl-adenosine-3',5'-cyclic monophosphate and production thereof. 4,015,066, Cl. 536-27,000.
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- Hess, Howard V.; Franz, William F.; and Cole, Edward L., 4,014,661.
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- Texas Instruments Incorporated: See—  
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- Kendall, Don L.; Ahlbum, Byron T.; and Wiemer, Klaus C., 4,015,175.
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B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
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B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977	B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 223,678	3,989,159	Mar. 9, 1976	Nov. 2, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 386,673	3,993,717	Feb. 3, 1976	Nov. 16, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977	B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976



PI 42 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976	B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977	B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977	B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976	B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977	B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976	B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977	B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976	B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976	B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 419,582	3,989,683	Mar. 2, 1976	Nov. 2, 1976	B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977	B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976	B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976	B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977	B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977	B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976	B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977	B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976	B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977	B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 453,238	3,997,063	Mar. 16, 1976	Dec. 28, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977	B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977	B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976

PI 43 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977	B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976	B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976	B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976	B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977	B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976	B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976	B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977	B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976	B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977	B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976	B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976	B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976	B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976	B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976	B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976	B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977	B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977	B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976	B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976	B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976	B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976	B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976	B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976	B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976	B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976	B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976	B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977	B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976	B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977	B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976	B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976	B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976	B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976	B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976	B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976	B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976	B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976	B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976	B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977	B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977	B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977	B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977	B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976	B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976	B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977	B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976	B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976	B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977	B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976	B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977	B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977	B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977	B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976	B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976	B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977	B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977	B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976	B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976	B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976	B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977	B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976	B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977	B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976	B 489,081	3,998,081	Feb. 17, 1976	Dec. 21, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977	B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976



PI 44 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976	B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977	B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976	B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976	B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976	B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977	B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976	B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976	B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976	B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976	B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976	B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976	B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976	B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976	B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976	B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976	B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976	B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976	B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977	B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976	B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976	B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976	B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976	B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 492,039	D 242,223	Feb. 10, 1976	Nov. 9, 1976	B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 492,093	3,997,541	Feb. 24, 1976	Dec. 14, 1976	B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 492,120	4,003,658	Mar. 23, 1976	Jan. 18, 1977	B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 492,301	3,995,692	Feb. 24, 1976	Dec. 7, 1976	B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 492,373	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977	B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976	B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977	B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976	B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976	B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976	B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977	B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977	B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976	B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977	B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976	B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976	B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976	B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977	B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976	B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976	B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976	B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976	B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976	B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976	B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976	B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976	B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976	B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976	B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976	B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976	B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977	B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976	B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977	B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976	B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977	B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977	B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976	B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976	B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976	B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976	B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976

PI 45 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 509,043	3,986,767	Feb. 24, 1976	Dec. 14, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977	B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976	B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976	B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976	B 520,115	4,003,072	Mar. 30, 1976	Jan. 11, 1977
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976	B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977	B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977	B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976	B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976	B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976	B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 510,988	3,992,336	Feb. 10, 1976	Nov. 16, 1976	B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976	B 520,546	4,001,133	Mar. 16, 1976	Nov. 9, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976	B 520,613	3,991,341	Mar. 9, 1976	Dec. 21, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976	B 520,658	3,998,778	Mar. 9, 1976	Mar. 29, 1977
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976	B 520,878	4,014,849	Apr. 6, 1976	Dec. 28, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976	B 520,884	4,000,433	Mar. 16, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976	B 520,924	3,982,113	Jan. 27, 1976	Oct. 5, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977	B 520,928	3,983,617	Jan. 13, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976	B 520,952	4,000,876	Mar. 16, 1976	Mar. 1, 1977
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976	B 520,995	4,009,996	Mar. 23, 1976	Dec. 21, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976	B 521,025	3,998,838	Mar. 23, 1976	Sep. 28, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976	B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976	B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976	B 521,046	3,983,434	Feb. 24, 1976	Nov. 30, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977	B 521,125	3,994,865	Feb. 10, 1976	Dec. 14, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976	B 521,126	3,997,510	Feb. 10, 1976	Dec. 7, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976	B 521,127	3,996,201	Feb. 17, 1976	Dec. 14, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976	B 521,128	3,997,511	Feb. 10, 1976	Sep. 28, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976	B 521,128	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976	B 521,480	3,982,665	Jan. 13, 1976	Sep. 21, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977	B 521,600	3,981,458	Jan. 27, 1976	Dec. 28, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976	B 521,612	4,000,251	Mar. 9, 1976	Oct. 5, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976	B 521,620	3,983,749	Jan. 27, 1976	Dec. 14, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976	B 521,643	3,997,567	Mar. 2, 1976	Nov. 2, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976	B 521,711	3,989,835	Feb. 10, 1976	Dec. 14, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977	B 521,793	3,996,981	Feb. 24, 1976	Sep. 28, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976	B 521,984	3,983,220	Mar. 23, 1976	Mar. 15, 1977
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977	B 521,985	4,012,404	Feb. 3, 1976	Sep. 21, 1976
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977	B 521,986	3,981,607	Feb. 3, 1976	Dec. 7, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976	B 522,009	3,995,444	Feb. 17, 1976	Nov. 23, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976	B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 515,303	3,987,939	Mar. 20, 1976	Oct. 26, 1976	B 522,227	3,992,904	Mar. 30, 1976	Nov. 16, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977	B 522,354	3,991,603	Feb. 3, 1976	Oct. 12, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976	B 522,446	3,984,959	Jan. 20, 1976	Jan. 4, 1977
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976	B 522,537	4,001,194	Mar. 30, 1976	Dec. 28, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977	B 522,567	3,999,587	Mar. 30, 1976	Dec. 7, 1976
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976	B 522,568	3,996,238	Feb. 17, 1976	Dec. 21, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976	D 242,785	3,982,123	Apr. 6, 1976	Sep. 21, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976	B 522,577	3,982,123	Jan. 27, 1976	Jan. 4, 1977
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976	B 522,629	4,001,155	Mar. 16, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976	B 523,226	4,006,367	Mar. 23, 1976	Sep. 21, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976	B 523,696	3,986,071	Jan. 13, 1976	Oct. 26, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976	B 523,885	3,981,040	Feb. 17, 1976	Nov. 16, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976	B 523,952	3,988,707	Mar. 23, 1976	Sep. 28, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976	B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976	B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977	B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976	B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976	B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976	B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976	B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977	B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976	B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977	B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977	B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977	B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977	B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976	B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977	B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
				B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976



PI 46 CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977	B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977	B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976	B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976	B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976	B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976	B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976	B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976	B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976	B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976	B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977	B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976	B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977	B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976	B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976	B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977	B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976	B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976	B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976	B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976	B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976	B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PI 47  
PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM  
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 561,387	3,985,706	Oct. 10, 1976	Oct. 12, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976	B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976	B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976	B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977	B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977	B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976	B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976	B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976	B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976	B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977	B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
				B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976



## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF MARCH, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Barthelemy, Gabriel: *See—*  
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.
- Becher, Elisabeth; Els, Hans; and Schocher, Arno Johannes, to Hoffmann-La Roche Inc. 1,2,3,4,10,19-Hexanor-9-oxo-5,9-seco-25D-spirostan-5-oi acid. Re. 29,163, Cl. 260-345.700.
- Bode, George Fred. Electromotive device including magnetic shield interacting with permanent magnet pole faces. Re. 29,165, Cl. 310-46.000.
- Bristol-Myers Company: *See—*  
Crast, Leonard Bruce, Jr., Re. 29,164.
- Cinquanta, Alain: *See—*  
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.
- Compagnie Francaise de Raffinage: *See—*  
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.
- Crast, Leonard Bruce, Jr., to Bristol-Myers Company. 7-Amino-cephalosporanic and decephalosporanic acid derivatives. Re. 29,164, Cl. 260-243.000.
- Doyotte, Claude Charles: *See—*  
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.
- Drapeau, Yves: *See—*  
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.
- Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, to Compagnie Francaise de Raffinage. Devices for the generation of ultrasonics and their application to the preparation of emulsions. Re. 29,161, Cl. 259-4.00R.
- Els, Hans: *See—*  
Becher, Elisabeth; Els, Hans; and Schocher, Arno Johannes, Re. 29,163.
- Forster, Friedrich M. O. Magnetic flaw detector system for reciprocating pairs of leakage field detectors with means for adjusting the spacing between each pair of detectors. Re. 29,166, Cl. 324-37.000.
- Hoffmann-La Roche Inc.: *See—*  
Becher, Elisabeth; Els, Hans; and Schocher, Arno Johannes, Re. 29,163.
- Jaffa, David, to Precision Screen Machines Inc. Screen printing machine with oval rail for indexing pallets. Re. 29,160, Cl. 101-123.000.
- McLennan, Lyall A. Abutment swivel doorstop. Re. 29,162, Cl. 292-67.000.
- Precision Screen Machines Inc.: *See—*  
Jaffa, David, Re. 29,160.
- Schocher, Arno Johannes: *See—*  
Becher, Elisabeth; Els, Hans; and Schocher, Arno Johannes, Re. 29,163.
- Seguela, Claude Jean-Marie: *See—*  
Duthion, Louis; Doyotte, Claude Charles; Seguela, Claude Jean-Marie; Barthelemy, Gabriel; Cinquanta, Alain; and Drapeau, Yves, Re. 29,161.

## LIST OF PLANT PATENTEEES

- Moore, Ralph S. Miniature rose plant. 4,026, 3-29-77, Cl. 9.000.
- Moore, Ralph S. Rose plant. 4,027, 3-29-77, Cl. 10.000.
- Moore, Ralph S. Miniature rose plant. 4,028, 3-29-77, Cl. 8.000.
- Moore, Ralph S. Miniature rose plant. 4,029, 3-29-77, Cl. 7.000.
- Moore, Ralph S. Rose plant. 4,030, 3-29-77, Cl. 10.000.
- Moore, Ralph S. Rose plant. 4,031, 3-29-77, Cl. 9.000.

## LIST OF DESIGN PATENTEEES

- Abbott Laboratories: *See—*  
Lehn, Russell Frederick, 243,831.
- Achenbach, Walter B., to Owens-Illinois, Inc. Beverage glass or similar article. 243,816, 3-29-77, Cl. D7-15.000.
- Adams, James T. Ducted fan aircraft. 243,837, 3-29-77, Cl. D12-79.000.
- Akazawa, Toshimasa, to Matsushita Electric Industrial Co., Ltd. Transceiver. 243,861, 3-29-77, Cl. D14-68.000.
- Anderson, John W. Headlight bezel. 243,880, 3-29-77, Cl. D48-32.000.
- Arnold, Robert A. Pneumatic paint stirring apparatus. 243,881, 3-29-77, Cl. D15-147.000.
- Arvai, Tibor, to Tokyo Juki Kogyo Kaisha. Sewing machine. 243,841, 3-29-77, Cl. D15-69.000.
- Avis, Donald Lee; Keepper, David Edgar; and Mendelson, Lewis Aaron, to Dazey Products Company. Can opener. 243,819, 3-29-77, Cl. D8-36.000.
- Becker, Julius C., to Becker Manufacturing Company, Incorporated. Pig feeder. 243,864, 3-29-77, Cl. D30-13.000.
- Becker Manufacturing Company, Incorporated: *See—*  
Becker, Julius C., 243,864.
- Berlin & Jones Company, Inc.: *See—*  
Watson, Charles S., 243,846.
- Botcher, Charles E. Green bean and pea sheller. 243,818, 3-29-77, Cl. D7-153.000.
- Cade, J. Robert; and Raulerson, James D. Female urinary device or the like. 243,883, 3-29-77, Cl. D83-1.00U.
- Cartier, Inc.: *See—*  
Durante, Alfred Joseph, 243,836.
- Castiglioni, Achille. Light fixture. 243,876, 3-29-77, Cl. D48-20.00R.
- Christian Dior, S.A.R.L.: *See—*  
Teufelhart, Elfriede, 243,845.
- Cloyd, Robert K. Drinking straw. 243,817, 3-29-77, Cl. D7-42.000.
- Colibri Lighters Ltd.: *See—*  
Lowenthal, Hans, 243,863.
- Continental Scale Corporation: *See—*  
Hutchinson, William Y.; and Kushmuk, Walter P., 243,835.
- Davenport, Richard L., to S. C. Johnson & Son, Inc. Dispenser for a toilet bowl disinfectant. 243,850, 3-29-77, Cl. D23-150.000.
- Dazey Products Company: *See—*  
Avis, Donald Lee; Keepper, David Edgar; and Mendelson, Lewis Aaron, 243,819.
- Dickson, Curtis G. Decorative night light. 243,877, 3-29-77, Cl. D48-20.00E.
- Dow Chemical Company, The: *See—*  
Hutter, Wayne R.; and Miller, John Andrew, 243,826.
- Drackett Company, The: *See—*  
Jones, David A.; and Goyert, Philip R., 243,830.
- Driscoll, James A. Spare tire mount for trailers. 243,839, 3-29-77, Cl. D12-202.000.
- Dunlop Limited: *See—*  
Shaw, Michael; and Haines, Robert Christopher, 243,866.
- Durante, Alfred Joseph, to Cartier, Inc. Bracelet. 243,836, 3-29-77, Cl. D11-12.000.

## LIST OF DESIGN PATENTEEES

PI 49

- Edwards, Gerald D. Tooth for power digger. 243,843, 3-29-77, Cl. D15-29.000.
- Ejchorszt, Olgierd Z. Roof screen support system. 243,853, 3-29-77, Cl. D25-43.000.
- Eschendal, Herbert: *See—*  
Underwood, Ray L.; and Eschendal, Herbert, 243,804.
- Fabbrica Italiana Lapis Ed Affini (FILA) S.p.A.: *See—*  
Rho, Enea, 243,886.
- Felter, John V. Ventilator. 243,851, 3-29-77, Cl. D23-153.000.
- Fenlin, John M. Shoulder prosthesis. 243,884, 3-29-77, Cl. D83-1.00E.
- Fenlin, John M. Shoulder prosthesis. 243,885, 3-29-77, Cl. D24-33.000.
- Fine, Leonard, to General Electric Company. Wall plate. 243,824, 3-29-77, Cl. D8-353.000.
- Frame, Paul W., Jr. Plastic insert for examining table stirrup. 243,882, 3-29-77, Cl. D24-7.000.
- Fratelli Saporiti: *See—*  
Introini, Vittorio, 243,810.
- Radaelli, Ernesto, 243,806.
- Gafnea, Rickney W. Visor for vehicles or the like. 243,840, 3-29-77, Cl. D12-191.000.
- Gardisette International AG: *See—*  
Schroeder, Peter E., 243,871.
- General Electric Company: *See—*  
Fine, Leonard, 243,824.
- Grieb, Joan, 243,821.
- Grieb, Joan, 243,822.
- Grieb, Joan, 243,823.
- Levin, Monte; and Grieb, Joan, 243,887.
- Levin, Monte L., 243,825.
- Goyert, Philip R.: *See—*  
Jones, David A.; and Goyert, Philip R., 243,830.
- Grieb, Joan, to General Electric Company. Wall plate. 243,821, 3-29-77, Cl. D8-350.000.
- Grieb, Joan, to General Electric Company. Wall plate. 243,822, 3-29-77, Cl. D8-351.000.
- Grieb, Joan, to General Electric Company. Wall plate. 243,823, 3-29-77, Cl. D8-351.000.
- Grieb, Joan: *See—*  
Levin, Monte; and Grieb, Joan, 243,887.
- Haines, Robert Christopher: *See—*  
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		104 S	4,014,383	133 R	4,014,426	61	666 P	4,014,549	4,014,944	4,014,944
		167	4,014,384	189	4,014,427	105	677 A	4,014,550	4,014,945	4,014,945
		CLASS 166		CLASS 198		311.1	677 R	4,014,551	4,014,946	4,014,946
		314	4,014,387	345	4,014,428	407	681	4,014,552	4,014,947	4,014,947
		321	4,014,386	396	4,014,429	451	683.48	4,014,553	4,014,948	4,014,948
		CLASS 169		588	4,014,430	CLASS 250	830 P	4,014,554	4,014,949	4,014,949
		37	4,014,388	660	4,014,431	199	831	4,014,555	4,014,950	4,014,950
		CLASS 171		CLASS 200		206	853	4,014,556	4,014,951	4,014,951
		16	4,014,389	5 R	4,015,092	208	857 PG	4,014,557	4,014,952	4,014,952
		124	4,014,390	51.1	4,015,093	211 J	898	4,014,558	4,014,953	4,014,953
		CLASS 172		61.58 B	4,015,094	214 D	942	4,014,559	4,014,954	4,014,954
		13	4,014,391	148 A	4,015,095	216	23 A	4,014,560	4,014,955	4,014,955
		CLASS 173		156	4,015,096	221	112	4,014,561	4,014,956	4,014,956
		118	4,014,392	275	4,015,097	223 R	112.7	4,014,562	4,014,957	4,014,957
		CLASS 174		CLASS 202		273	154	4,014,563	4,014,958	4,014,958
		52 R	4,015,070	139	4,014,750	275	157	4,014,564	4,014,959	4,014,959
		52 S	4,015,071	160	4,014,751	320	163	4,014,565	4,014,960	4,014,960
		92	4,015,072	185 A	4,014,752	341	200	4,014,566	4,014,961	4,014,961
		148	4,015,073	CLASS 203		360	239 B	4,014,567	4,014,962	4,014,962
		CLASS 175		1	4,014,753	372	239.1	4,014,568	4,014,963	4,014,963
		58	4,014,393	64	4,014,754	461 R	240 C	4,014,569	4,014,964	4,014,964
		72	4,014,394	73	4,014,755	492 R	240 CA	4,014,570	4,014,965	4,014,965
		410	4,014,395	CLASS 204		565	240 J	4,014,571	4,014,966	4,014,966
		CLASS 176		94	4,014,461	574	243 C	4,014,572	4,014,967	4,014,967
		19 EC	4,014,741	136	4,014,462	CLASS 251	247.1 R	4,014,573	4,014,968	4,014,968
		CLASS 177		145	4,014,463	26	247.2 A	4,014,574	4,014,969	4,014,969
		169	4,014,396	146 HE	4,014,464	63	247.5 EP	4,014,575	4,014,970	4,014,970
		200	4,014,397	563	4,014,465	306	247.5 GP	4,014,576	4,014,971	4,014,971
		208	4,014,398	CLASS 224		309	251 R	4,014,577	4,014,972	4,014,972
		CLASS 178		45 R	4,014,466	317	256.4 Q	4,014,578	4,014,973	4,014,973
		66 R	4,015,082	CLASS 226		331	256.5 R	4,014,579	4,014,974	4,014,974
				5	4,014,487	CLASS 252	288 CE	4,014,580	4,014,975	4,014,975
				6	4,014,488	8	288 CF	4,014,581	4,014,976	4,014,976
				9	4,014,489	8.55 D	289 A	4,014,582	4,014,977	4,014,977
				76	4,014,490	12.2	293.6	4,014,583	4,014,978	4,014,978
				113	4,014,491		293.84	4,014,584	4,014,979	4,014,979

CLASS 270	2	4,014,575	4,015,193	280	4,015,250	4,015,293	4,015,014
19	4,014,535	CLASS 302		347 DD	4,015,252	CLASS 361	4,015,015
CLASS 271	31	4,014,576	4,015,194	347 P	4,015,253	18	4,015,016
162	4,014,536	35	4,014,577	347 SY	4,015,251	331	4,015,017
166	4,014,537	52	4,014,578	365 S	4,015,254	CLASS 425	
176	4,014,538	CLASS 303		373	4,015,255	28 R	4,014,632
184	4,014,539	3	4,014,579	409	4,015,256	45	4,015,169
		82	4,014,580	CLASS 343		91	4,015,170
		54	4,014,581	5 W	4,015,257	129	4,015,172
		CLASS 305		6 R	4,015,258	153	4,015,174
		10 LS	4,015,137	6.8 LC	4,015,259	232	4,015,176
		10 R	4,015,136	7.7	4,015,260	313	4,015,175
		10 R	4,015,138	18 E	4,015,261	388	4,015,173
		141	4,015,139	105 R	4,015,262	CLASS 401	2
		141	4,015,140	708	4,015,263	46	4,015,018
		229	4,015,141	725	4,015,264	239	4,015,019
		235 N	4,015,142	747	4,015,265	393	4,015,020
		247 A	4,015,143	815	4,015,266	460	4,015,022
		252 J	4,015,144	CLASS 328		531	4,015,023
		261	4,015,145	39	4,015,208	536	4,015,024
		293	4,015,146	162	4,015,209	575	4,015,025
		304	4,015,147	CLASS 329		582	4,015,026
		309	4,015,148	50	4,015,210	CLASS 426	
		310	4,015,149	106	4,015,211	2	4,



## CLASSIFICATION OF PATENTS

109	4,014,368	69.1	4,015,083	159.14	4,014,769	CLASS 227	32.7 R	4,014,803	294.8 F	4,014,888
112	4,014,369	CLASS 179		159.23	4,014,771		62.1 L	4,014,856	294.9	4,014,889
144	4,014,370	1 E	4,015,089	180 R	4,014,772	156	4,014,493	4,014,804	296 A	4,014,890
		1 SC	4,015,088	206	4,014,773	CLASS 228		4,014,805	302 SD	4,014,891
3 CA	4,014,371	1 SP	4,015,087	213	4,014,774			4,014,806	306.7 T	4,014,892
		6 R	4,015,090	252	4,014,775	3.1	4,014,494	4,014,807	307 DB	4,014,893
392	4,014,372	6.3 R	4,015,078	257	4,014,776	7	4,014,495	4,014,808	308 B	4,014,894
		84 R	4,015,091	270	4,014,777	CLASS 229		4,014,809	309.7	4,014,895
		CLASS 144		297 W	4,014,778			4,014,810	310 R	4,014,896
3 D	4,014,373	8 C	4,014,399	298	4,014,779	31 R	4,014,496	4,014,812	326 E	4,014,897
		9.2 R	4,014,400	CLASS 206		CLASS 233		4,014,813	326 N	4,014,898
1.5	4,014,714	22	4,014,401	0.5	4,014,432	20 R	4,014,497	4,014,814	326.5 FN	4,014,899
6.17	4,014,715	33 D	4,014,402	63.3	4,014,433		4,014,498	4,014,815	340.9	4,014,900
11.5 C	4,014,716	CLASS 181			4,014,434	CLASS 235		4,014,816		4,014,901
111	4,014,717	114	4,014,403	386	4,014,435	54 F	4,015,106	4,014,817	Re.29,163	4,014,902
187	4,014,718	CLASS 182		492	4,014,436	61.6 R	4,015,107	4,014,818	4,015,903	4,014,903
		155	4,014,404	CLASS 208		92 PC	4,015,108	4,014,819	346.2 R	4,014,904
19.7	4,014,719	181	4,014,405	13	4,014,780	96	4,015,109	4,014,820	4,014,905	4,014,905
19.8	4,014,720	204	4,014,406	40	4,014,781	925 B	4,015,110	4,014,821	373	4,014,906
108.6	4,014,721	CLASS 186		130	4,014,782	CLASS 236		4,014,822	396 R	4,014,907
		1 C	4,014,407	255	4,014,783	46 R	4,014,499	4,014,823	397.1	4,014,908
33	4,014,374	CLASS 188		73	4,014,784	CLASS 239		4,014,824	397.45	4,014,909
		24	4,014,408	CLASS 210		58	4,014,501	4,014,825	413	4,014,910
52	4,014,722	58	4,014,409	22 D	4,014,785	206	4,014,502	4,014,826	429 R	4,014,911
69	4,014,723	71.6	4,014,410	22 R	4,014,786	261	4,014,503	4,014,827	449 R	4,014,912
86	4,014,724	71.9	4,014,411	22 F	4,014,787	327	4,014,504	4,014,828	453 PH	4,014,913
148	4,014,725	138	4,014,412	42 R	4,014,788	404	4,014,505	4,014,829		4,014,914
167	4,014,726	170	4,014,413	84	4,014,789	472	4,014,506	4,014,830		4,014,915
205	4,014,727	196 D	4,014,414	107	4,014,790	510	4,014,507	4,014,831		4,014,916
244	4,014,728	114	4,014,415	114	4,014,791	533.1	4,014,472	4,014,832		4,014,917
275	4,014,729	123	4,014,792	123	4,014,792	542	4,014,473	4,014,833		4,014,918
331	4,014,730	198 C	4,014,793	199	4,014,794	CLASS 240		4,014,834		4,014,919
350	4,014,731	242 R	4,014,795	242 R	4,014,795	2.25	4,015,111	4,014,835		4,014,920
380	4,014,732	29 DM	4,014,796	437	4,014,796	6.45 P	4,015,112	4,014,836		4,014,921
446	4,014,733	45 R	4,014,797	446	4,014,797	41.35 R	4,015,113	4,014,837		4,014,922
459	4,014,734	500 M	4,014,798	500 M	4,014,798	47	4,015,114	4,014,838		4,014,923
		CLASS 157		13 R	4,014,419	CLASS 241		4,014,839		4,014,924
1.17	4,014,375	CLASS 159		48.91	4,014,421	20	4,014,474	4,014,840		4,014,925
		13 A	4,014,735	67 R	4,014,422	36	4,014,475	4,014,841		4,014,926
		CLASS 160		106.2	4,014,423	CLASS 242		4,014,842		4,014,927
172	4,014,376	102	4,014,424	102	4,014,424	19	4,014,476	4,014,843		4,014,928
186	4,014,377	CLASS 194		102	4,014,424	96	4,014,477	4,014,844		4,014,929
		6 A	4,014,441	107.4 A	4,014,480	107	4,014,478	4,014,845		4,014,930
		6 H	4,014,440	107.4 R	4,014,479	107.4 A	4,014,480	4,014,846		4,014,931
		CLASS 195		16.4 A	4,014,442	107.4 R	4,014,479	4,014,847		4,014,932
38	4,014,736	27	4,014,443	16.4 A	4,014,442	CLASS 244		4,014,848		4,014,933
226	4,014,737	85	4,014,444	27	4,014,443	29.2 EP	4,014,833	4,014,849		4,014,934
258	4,014,738	89	4,014,445	85	4,014,444	29.2 N	4,014,832	4,014,850		4,014,935
274	4,014,739	103.5 K	4,014,745	89	4,014,445	29.3	4,014,833	4,014,851		4,014,936
289	4,014,740	103.5 R	4,014,744	520	4,014,446	29.6 MN	4,014,841	4,014,852		4,014,937
		127	4,014,746	620	4,014,447	29.6 RB	4,014,842	4,014,853		4,014,938
		CLASS 164		117 A	4,014,485	29.6 S	4,014,840	4,014,854		4,014,939
4	4,014,379	127	4,014,747	129.6	4,014,486	29.6 TA	4,014,836	4,014,855		4,014,940
		CLASS 165		31	4,014,448	CLASS 246		4,014,856		4,014,941
2	4,014,380	116	4,014,749	215	4,014,449	34 R	4,014,503	4,014,857		4,014,942
		CLASS 197		10.49	4,015,084	CLASS 248		4,014,858		4,014,943
60	4,014,381	1 R	4,014,425	10.55 E	4,015,085	61	4,014,504	4,014,859		4,014,944
95	4,014,382	133 R	4,014,426	60 A	4,015,086	105	4,014,505	4,014,860		4,014,945
104 S	4,014,383	189	4,014,427	90	4,015,087	311.1	4,014,506	4,014,861		4,014,946
167	4,014,385	CLASS 198		118	4,015,089	407	4,014,507	4,014,862		4,014,947
		121 LM	4,015,100	121 LM	4,015,100	451	4,014,508	4,014,863		4,014,948
314	4,014,387	345	4,014,428	125 PL	4,015,101	CLASS 250		4,014,864		4,014,949
321	4,014,386	396	4,014,429	155	4,015,102	199	4,015,115	4,014,865		4,014,950
		588	4,014,430	216	4,015,103	206	4,015,116	4,014,866		4,014,951
		660	4,014,431	485	4,015,104	208	4,015,117	4,014,867		4,014,952
37	4,014,388	CLASS 200		553	4,015,105	211 J	4,015,118	4,014,868		4,014,953
		5 R	4,015,092	CLASS 220		214 D	4,015,119	4,014,869		4,014,954
16	4,014,389	51.1	4,015,093	4 E	4,014,450	216	4,015,120	4,014,870		4,014,955
124	4,014,390	61.58 B	4,015,094	20.5	4,014,451	221	4,015,121	4,014,871		4,014,956
		148 A	4,015,095	74	4,014,452	223 R	4,015,123	4,014,872		4,014,957
		156	4,015,096	90	4,014,453	223 R	4,015,123	4,014,873		4,014,958
13	4,014,391	275	4,015,097	225	4,014,454	223 R	4,015,123	4,014,874		4,014,959
		CLASS 173		269	4,014,455	223 R	4,015,123	4,014,875		4,014,960
118	4,014,392	139	4,014,750	306	4,014,456	223 R	4,015,123	4,014,876		4,014,961
		160	4,014,751	331	4,014,457	223 R	4,015,123	4,014,877		4,014,962
		185 A	4,014,752	335	4,014,458	223 R	4,015,123	4,014,878		4,014,963
52 R	4,015,070	CLASS 202		380	4,014,459	223 R	4,015,123	4,014,879		4,014,964
52 S	4,015,071	1	4,014,753	CLASS 221		223 R	4,015,123	4,014,880		4,014,965
92	4,015,072	64	4,014,754	156	4,014,460	223 R	4,015,123	4,014,881		4,014,966
148	4,015,073	73	4,014,755	481	4,015,132	223 R	4,015,123	4,014,882		4,014,967
		CLASS 175		492 R	4,015,133	223 R	4,015,123	4,014,883		4,014,968
58	4,014,393	94	4,014,461	565	4,015,134	223 R	4,015,123	4,014,884		4,014,969
72	4,014,394	136	4,014,462	574	4,015,135	223 R	4,015,123	4,014,885		4,014,970
410	4,014,395	145 HE	4,014,463	CLASS 251		223 R	4,015,123	4,014,886		4,014,971
		27	4,014,757	26	4,014,509	223 R	4,015,123	4,014,887		4,014,972
		28	4,014,758	63	4,014,510	223 R	4,015,123	4,014,888		4,014,973
		43 T	4,014,759	306	4,014,511	223 R	4,015,123	4,014,889		4,014,974
19 EC	4,014,741	52 R	4,014,760	309	4,014,512	223 R	4,015,123	4,014,890		4,014,975
		55 R	4,014,761	317	4,014,513	223 R	4,015,123	4,014,891		4,014,976
		79	4,014,762	331	4,014,514	223 R	4,015,123	4,014,892		4,014,977
169	4,014,396	106	4,014,763	CLASS 252		223 R	4,015,123	4,014,893		4,014,978
200	4,014,397	109	4,014,764	8	4,014,799	223 R	4,015,123	4,014,894		4,014,979
208	4,014,398	129.43	4,014,765	8.55 D	4,014,801	223 R	4,015,123	4,014,895		4,014,980
		152	4,014,766	8.8	4,014,800	223 R	4,015,123	4,014,896		4,014,981
		CLASS 178		76	4,014,490	223 R	4,015,123	4,014,897		4,014,982
66 R	4,015,082	158 R	4,014,768	113	4,014,491	223 R	4,015,123	4,014,898		4,014,983

## CLASSIFICATION OF PATENTS

	2	4,014,575	4,015,193	280	4,015,250	4,015,293	4,015,014
19		CLASS 302	CLASS 324	347 DD	4,015,252	CLASS 361	4,015,015
	31	4,014,576	1	347 P	4,015,253	18	4,015,016
	35	4,014,577	4,015,194	347 SY	4,015,251	19	4,015,017
162		4,014,578	4,015,195	365 S	4,015,254	45	4,015,168
166			4,015,196	373	4,015,255	91	4,015,169
176		CLASS 303	4,015,197	409	4,015,256	129	4,015,170
184		3	Re.29,166	CLASS 343		153	4,015,172
		82	4,015,200	5 W	4,015,257	232	4,015,174
			4,015,201	6 R	4,015,258	313	4,015,176
85		CLASS 305	4,015,202	6.8 LC	4,015,259	388	4,015,175
		54	4,015,203	7.7	4,015,260		4,015,173
		CLASS 307	CLASS 325	18 E	4,015,261	CLASS 401	2
33		10 LS	38 R	105 R	4,015,262	292	4,015,018
72 R		10 R	304	708	4,015,263		46
85 H		41	435	725	4,015,264	CLASS 403	239
85 R		141		747	4,015,265		393
95 H		229	CLASS 328	815	4,015,266	111	460
102.2 S		235 N	39	CLASS 346		205	4,015,021
134 AD		247 A	162	1	4,015,267	359	4,015,022
134 C		252 J		137	4,015,268	CLASS 404	460
135 D		261	CLASS 329	139 C	4,015,269	133	4,015,023
152.41		293	50	139 R	4,015,270		531
153 R		304	106	140 R	4,015,271	16	536
161			CLASS 330		4,015,272	127	4,015,024
185 C		309	10	CLASS 350		183	4,015,025
200 R		310	13	3.5	4,014,602	CLASS 415	582
		311	15		4,014,603		4,015,026
		CLASS 308	CLASS 331	CLASS 353		1	CLASS 427
3		8.2	8	120	4,014,604	54	22
181		72	84.5 E	CLASS 354		102	58
230			111	15	4,015,273	189	76
		CLASS 309	179	23 D	4,015,274	CLASS 417	130
		8.7	CLASS 332	29	4,015,275	203	213
		41	7.51	37	4,015,276	259	327
		42	9 R	206		283	CLASS 428
		46	CLASS 333	CLASS 355		85	35
		89	17 M	3 R	4,014,605	CLASS 418	40
		214	70 R	4	4,014,606	203	60
		CLASS 312	80 T	14	4,014,607	259	88
		7 R	CLASS 335	50	4,014,608	283	245
		223	133	CLASS 356	4,014,611	85	255
		236	206	72	4,014,612	259	297
		CLASS 313	231	88	4,014,613	283	310
		25	CLASS 337	106 R	4,014,614	CLASS 423	325
		139	107	106 S	4,014,615	85	342
		143	35	200	4,014,616	CLASS 424	410
		223	174	201	4,014,610	5	419
		318	CLASS 338	CLASS 357		14	422
		490	CLASS 339	2	4,015,282	15	425
		503	5 R	15	4,015,283	45	428
		CLASS 315	275 B	16	4,015,284	70	461
		99	CLASS 340	22	4,015,278	89	480
		CLASS 318	1	23	4,015,279	92	523
		7	10	41	4,015,281	101	CLASS 429
		227	18 NC	CLASS 358		123	14
		275	26	4	4,015,285	168	49
		314	52 E	13	4,015,286	200	57
		325	52 F	17	4,015,287	216	104
		334	146.1 AQ	19	4,015,288	246	145
		601	146.3 E	86	4,015,074	248.5	219
		CLASS 321	146.3 H	104	4,015,080	248.58	CLASS 431
		8 C	147 SC	158	4,015,075	250	4
		44	172.5	167	4,015,076	258	95 R
		CLASS 322	CLASS 341	206	4,015,081	267	353
		8	1	280	4,015,077	274	CLASS 432
		14	10	CLASS 360		283	10
		28	18	11	4,015,289	308	58
		46	52	63	4,015,290	324	77
		CLASS 323	173 R	102	4,015,291		118
		4	173 TP	130	4,015,292		200
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